SECOND ADDENDUM TO INVITATION TO BID
FOR THE DURHAM WRRF ODOR CONTROL PHASE 3 HEADWORKS
PROJECT NO. 7202

CLEAN WATER SERVICES

ISSUED: APRIL 6, 2026

Clean Water Services' Invitation to Bid for the Durham WRRF Odor Control Phase 3 Headworks Project No. 7202 dated March 9, 2026 (ITB) is hereby amended as follows:

1. **Advertisement for Bids**

   a. Delete the bid due date of "April 9, 2026" in the first paragraph and replace it with the following:

      "April 23, 2026"

   b. Delete the telephone conference date of "April 9, 2026" in the second paragraph and replace it with the following:

      "April 23, 2026"

2. **Drawings**

   a. Delete "SEE DETAIL 2010" from Keynote 1 on Drawing 005-CD-101.

   b. Delete "11" north of the force mains pointing to an existing "SAN" line on Drawing 005-CD-101 and replace it with the following:

      "10"

   c. Delete the following Drawing and replace it with the Drawing included in Exhibit A of this Addendum:

      1. 005-C-501

3. **Specifications**

   a. Add the following immediately after "DIVISION 09—FINISHES" in the Table of Contents:

"09850 Chemical-Resistant Coatings.....1-17
Supplements:
Chemical-Resistant Coating System Data Sheet (CRCSDS).....1-1
Chemical-Resistant Coating Product Data Sheet (CRCPDS).....1-1"

b. Add the following section included in Exhibit B of this Addendum:

1. Section 09850 – Chemical-Resistant Coatings

Except as modified in this Addendum, the ITB will remain in effect as originally written.

Clarifications which do not modify the ITB are as follows:

1. Question 1: Please provide correct as-built detail of Keynote 1 demolition of existing retaining wall. Detail 2010 as noted references Typical Concrete Sidewalk.

   Answer 1: The reference to "See Detail 2010" has been deleted from Drawing 005-CD-101 as modified in this Addendum.

2. Question 2: Please provide as-built of existing headworks building.

   Answer 2: See drawings dated 1989 prepared by HDR Engineering, Inc., entitled Unified Sewerage Agency of Washington County, Durham Advanced Wastewater Treatment Plant Phase I Expansion and drawings dated 2010 prepared by CH2MHill, entitled Durham Advanced Wastewater Treatment Facility, Phase 5B1 Headworks Improvements included in Exhibit C of this Addendum.

3. Question 3: Please provide as-builts for 42-inch FM 1 & 2 from 85th Ave

   Answer 3: See drawings dated 1989 prepared by HDR Engineering, Inc., entitled Unified Sewerage Agency of Washington County, Durham Advanced Wastewater Treatment Plant Phase I Expansion.

4. Question 4: Provide details of mystery utility north of 42-inch FM 1 & 2, Noted as 11 on 005-CY-101.

   Answer 4: The short section of pipe with a line break noting continuation is a 3" reuse/irrigation (RE/IRR) pipe and is connected to a 4" RE/IRR pipe that is running north/south. The depth, extent, and material type of the RE/IRR pipe are unknown and will require field verification by the Contractor to verify existing conditions.

5. Question 5: Note 11 over existing 12-inch SS on sheet 005-CD-101 corresponds to the doghouse MH note 10 on sheet 005-CY-101. The second note 11 on 005-CD-101 north of the 42-inch FM should be note 10 for field verify note. Pease advise.

   Answer 5: Yes, Sheet Keynote "11", north of the force mains pointing to an existing "SAN" line has been replaced Sheet Keynote "10" as modified in this Addendum.

6. Question 6: Please provide the as-built information with weight of existing odor scrubber 200OS4101.

   Answer 6: The record equipment submittal is included in Exhibit C of this Addendum. The weight of the Headworks odor scrubber (OS-354) is not specifically listed, but the overall dimensions and shell thickness are provided.

7. Question 7: Please provide the quantity of material in existing odor scrubber.

   Answer 7: The odor scrubber does not contain any media.

8. Question 8: Provide as-built of building (noted in request 2)

   Answer 8: Refer to Answer 2 above.

9. Question 9: Please provide as-built information of existing odor control fan 200EF4101

   Answer 9: The record equipment submittal is included in Exhibit C of this Addendum. The original tag number for the existing odor control fan is EF-301.

10. Question 10: Odor continuity vs. duct transition sequence: Sec. 01140 requires continuous odor control (max 8-hour shutdowns) but also implies the FA duct transition can be sequenced to avoid temporary odor control. These can be in conflict depending on duct routing geometry. Does the Engineer expect a temporary odor control system during any duct cut over, and if so, who provides it?

    Answer 10: A temporary odor control system is not expected during the 8-hour shut down. Temporary fans may be required to keep the spaces adequately ventilated to the outside of the building.

11. Question 11: Owner PLC/SCADA programming schedule: Sec. 17050 indicates PLC and SCADA programming is Owner-furnished. What is the Owner's expected timeline for programming delivery, and who controls float on the PLC/SCADA critical path to SC?

    Answer 11: Owner will provide PLC/SCADA programming. The majority of the programming will be completed before and finalized during startup activities. The float is jointly owned by Owner and Contractor as described in Supplementary Condition 11.05.C.

12. Question 12: Fan or-equal VFD compatibility: Owner-furnished VFDs are pre-selected. If an or-equal fan is submitted with a different motor nameplate (speed, frame, power factor), who is responsible for confirming VFD compatibility, and what is the process/timeline for Owner VFD reprogramming?

    Answer 12: Owner will coordinate VFD compatibility with VFD manufacturer. Initial VFD programming and testing will be completed ahead of startup activities, with any final programming completed during startup (ORT). Owner-furnished VFDs are 60 hp.

13. Question 13: Temporary drain bypass pumping: Sec. 01531 references a 210-gpm flow from the screenings sluice trough that requires bypass pumping during biofilter drain tie-in. Is this the only flow requiring bypass, and is this the total peak flow, or an average?

    Answer 13: The 210 gpm flow rate is the average flow. The flow rate is based on the biofilter drain tie-in occurring during the dry season. As such, the flow from the screenings dumpster room and the sluice trough is all that is anticipated. If the tie-in occurs during the wet season, additional flow from stormwater runoff will need to be managed from a trench drain located just west of the screenings dumpster room. Total flow to be field verified by the Contractor per Section 01531, Part 1.03.A.

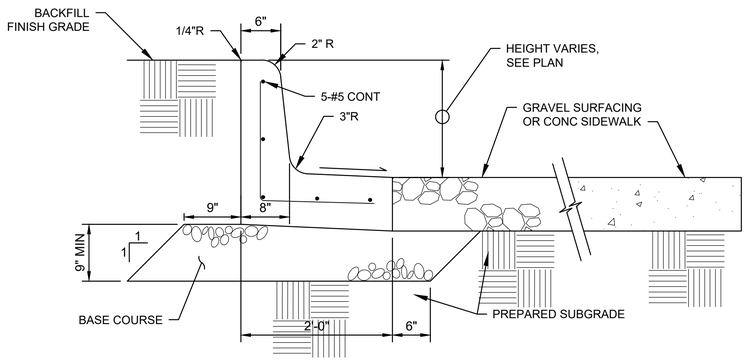
14. Question 14: Hallsten Bio Floor System as well as Bac Tee make an alternative product that has been utilized with good results on other Jacobs projects. Would these be acceptable plenum systems.

    Answer 14: Bids shall be based on the baseplate air distribution plenum floor system specified in Section 13222. An alternative floor system may be proposed as a substitute or "or-equal" item by the Contractor after the effective date of the Agreement per Section 00100 Instructions to Bidders, Article 13.

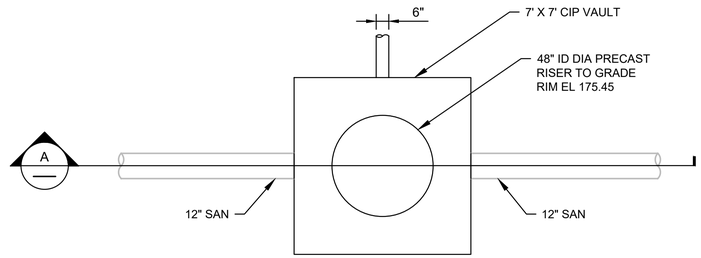
15. Question 15: I had a quick technical question for section 15892 paragraphs 2.02 & 2.03. Would you allow another high-quality manufacturer for the FRP ductwork and dampers? Would you consider MWF or Crimar Industrial?

    Answer 15: Bids shall be based on the fiberglass reinforced plastic ductwork and butterfly dampers specified in Section 15892. Alternative fiberglass reinforced plastic ductwork and butterfly dampers may be proposed as a substitute or "or-equal" item by the Contractor after the effective date of the Agreement per Section 00100 Instructions to Bidders, Article 13.

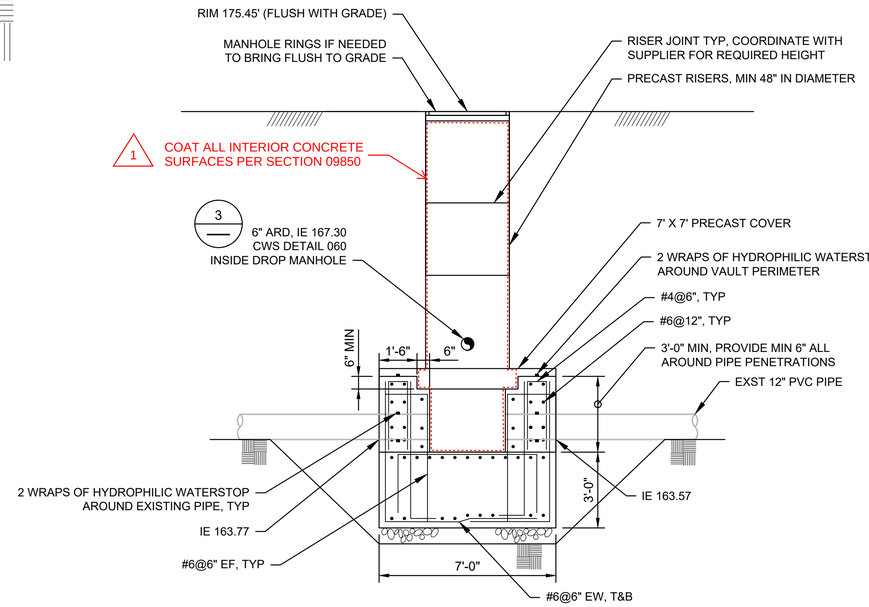
END OF ADDENDUM



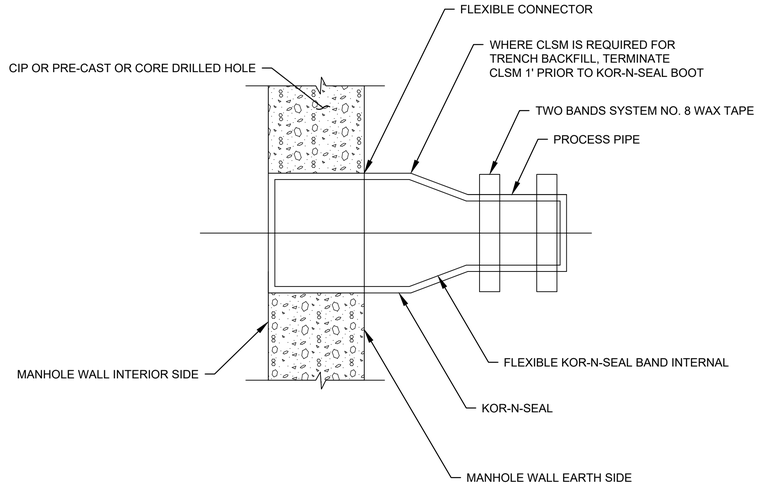
1 HIGH BARRIER CURB DETAIL
1"=1'
005-C-401
005-CG-201
005-CY-101



PLAN



SECTION A



3 KOR-N-SEAL BOOT DETAIL
1"=2'
005-CY-101

NOTES:

1. FIELD VERIFY ALL UTILITIES IN AREA OF WORK PRIOR TO CONSTRUCTION. NOTIFY ENGINEER OF DISCREPANCIES BETWEEN ACTUAL CONDITIONS AND DESIGN CONDITIONS IMMEDIATELY.
2. PROVIDE BYPASSING PLAN FOR WORK IN THIS AREA PRIOR TO CONSTRUCTION.
3. CLEAN THE INSIDE OF THE PIPE PENETRATION HOLE PRIOR TO INSTALLATION OF 6" PVC PIPE PER SECTION.
4. SUPPORT AND PROTECT EXISTING UTILITY DURING CONSTRUCTION. TYP FOR ALL UTILITIES.
5. PROVIDE PVC AS SHOWN IN THE PIPE SCHEDULE AND IN SECTION 15200
6. REFER TO DESIGN LOADS, SEE GENERAL STRUCTURAL NOTES.
7. DESIGN FOR HS-20 TRAFFIC LOADING.
8. PROVIDE DEWATERING PLAN TO CONSTRUCTION AND EXCAVATION.
9. REFER TO SECTION 02600 MANHOLES, PART 3.08 FOR MANHOLE CONSTRUCTION OVER EXISTING PIPING.

2 SANITARY SEWER MANHOLE DETAIL
1"=3'
005-C-401
005-CG-201
005-CY-101

DRN: QN	ORIG DATE: OCTOBER 2024	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.		
DSN: JK	DWG #:			
CHK: DP	CAD FILE #: 005-C-501_D3704505.dwg			
APPD: CM	SCALE:			

REV #	DATE	DRN	APPD	DESCRIPTION
1	04/2026			ADDENDUM NO. 2

Clean Water Services
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

PROJ NAME: CLEAN WATER SERVICES DURHAM WRRF
ODOR CONTROL PHASE 3 HEADWORKS

SHEET TITLE: CIVIL STANDARD DETAILS

SHEET: 30 OF: 73
PLOT DATE: 2024-10-31
PLC #:
CWS PROJ #: 7202

Jacobs
DWG #: 005-C-501

REGISTERED PROFESSIONAL ENGINEER
13708PE
Digital Signature
OREGON
JULY 16, 1982
DANIEL J PETERSON
EXP. 12-31-24
ENGR STAMP:

ISSUED FOR CONSTRUCTION

SECTION 09850
CHEMICAL-RESISTANT COATINGS

PART 1 GENERAL

1.01 SUMMARY OF WORK

A. Preparation and application of new chemical-resistant coatings on the interior concrete surfaces of a new sanitary sewer concrete manhole.

1.02 REFERENCES

A. The following is a list of standards which may be referenced in this section:

1. The Association for Materials Protection and Performance (AMPP), formerly The Society for Protective Coatings (SSPC):
   a. Guide 6, Guide for Containing Surface Preparation Debris Generated During Paint Removal Operations.
   b. PA 9, Measurement of Dry Coating Thickness Using Ultrasonic Gages.
   c. PA Guide 10, Guide to Safety and Health Requirements for Industrial Painting Projects.
   d. SP 13/NACE No. 6, Surface Preparation of Concrete.
2. ASTM International (ASTM):
   a. D4263, Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
   b. D4787, Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates.
   c. D6132, Standard Test Method for Nondestructive Measurement of Dry Film Thickness of Applied Organic Coatings Using an Ultrasonic Coating Thickness Gage.
   d. F1869, Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
3. International Concrete Restoration Institute (ICRI): 310.2R, Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays, and Concrete Repairs.

1.03 REMOVAL AND DISPOSAL OF SPENT AGGREGATE AND PAINT

A. Contractor’s bid price for surface preparation and coating shall include all costs associated with the collection, storage, handling, transportation, and disposal of all waste associated with the Project, including dangerous and hazardous wastes associated with lead containing paint.

1.04 ABBREVIATIONS

A. CRC: Chemical-Resistant Coating.

B. MDFT: Minimum Dry Film Thickness, mils.

C. Mils: Thousandths of an inch.

1.05 SUBMITTALS

A. Action Submittals:

1. Shop Drawings:
   a. Furnish a CRC System Data Sheet (CRCSDS) and a CRC Product Data Sheet (CRCPDS) for each CRC system. The CRCSDS and CRCPDS forms are appended to the end of this section.
   b. Indiscriminate submittal of manufacturer's literature only is not acceptable.
   c. The following information shall be appended to each CRCSDS:
      1) Manufacturer's technical data sheets.
      2) Manufacturer's application specification.
      3) Chemical-resistance test results for exposure to service conditions.
      4) Configuration details for the following:
         a) Expansion joints and structural isolation joints.
         b) Construction joints.
         c) Cracks.
         d) Wall base details.
         e) Equipment bolts (when installed before or after CRC application).
         f) Transition and termination detail at edge of CRC system.
         g) Pipe penetrations (vertical and horizontal).
         h) Other details specific to the structure being coated.

B. Informational Submittals:

1. Letter from manufacturer stating that:
   a. Applicator has notified manufacturer of proposed installation.
   b. Manufacturer is in agreement with the intended application.
   c. Applicator is qualified to do the Work and meets the quality assurance minimum experience requirements.
2. Applicator Qualifications:
   a. List of references substantiating experience. Include projects with at least 3 years of successful service history, including project

name and location, names of Owner and Engineer, and description of product used, substrates coated, and application procedures.

b. Certification from coating manufacturer showing current status as an approved applicator.

3. Manufacturer's Product Qualifications: List of projects substantiating successful application and performance of the proposed products to the specific exposure and process conditions. Include project name and location, application dates, and names of Owner, Engineer, and Applicator.
4. Field quality control personnel qualifications.
5. Field inspection and test reports.
6. Manufacturer's Certificate of Proper Installation, in accordance with Section 01640, Manufacturers' Services and Training, and this section.
7. Safety Data Sheets (SDS).

1.06 QUALITY ASSURANCE

A. Manufacturer's Experience: Minimum 5 years manufacturing proposed products.

B. Applicator's Experience: Minimum 3 years applying proposed products.

C. Subcontractor is solely responsible for quality control inspection and testing. Subcontractor shall monitor and be responsible for all environmental, surface preparation, application, and quality control testing compliance at the locations where coating work is undertaken.

D. Applicator Quality Control Plan: Applicator shall maintain an in-house quality assurance program that monitors surface preparation, coating application, and quality control testing for coating and lining operations. Level of experience, quality assurance program, and quality control testing by the applicator shall meet the minimum requirements specified herein, the coating manufacturer's instructions, and related government regulations.

1.07 PREINSTALLATION MEETING

A. Prior to beginning painting Work, schedule a meeting and be prepared to discuss the following subjects, as a minimum:

1. Required schedule.
2. Sequence of critical path work items.
3. Use of Site, access, office and storage areas, security, and temporary facilities.
4. Major product delivery and priorities.
5. Safety plan.

B. Attendees shall include:

1. Owner’s representatives.
2. Owner’s plant painter.
3. Contractor’s office representative.
4. Contractor’s resident superintendent.
5. Contractor’s quality control representative.
6. Subcontractors’ representatives whom Contractor may desire, or Engineer may request to attend.
7. Engineer’s representative.
8. Paint manufacturer’s technical representative.
9. Others as appropriate.

1.08 REGULATORY REQUIREMENTS

A. Meet applicable federal, state, and local requirements for coating product selection, surface preparation, and painting activities.

1.09 SURFACE PREPARATION AND COATING APPLICATION

A. Perform surface preparation and painting in accordance with recommendations of the following:

1. These Specifications.
2. Coating manufacturer’s instructions.
3. SSPC PA 10 and SP 13.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer’s original, unopened containers.

B. Storage:

1. Maintain materials in clean and dry condition.
2. Maintain storage temperatures within the manufacturer’s requirements.
3. Follow manufacturer’s instructions.

C. Shelf Life: Do not apply coating materials that have exceeded the manufacturer’s recommended shelf life.

1.11 ENVIRONMENTAL REQUIREMENTS

A. Provide dehumidification, heating, and other environmental controls necessary to meet application and curing requirements of the coatings used.

B. Provide a temporary enclosure over gravity thickeners and scum wet wells to allow field abrasive blasting and coating work to be performed in a controlled environment. Submit proposed enclosure procedure to the Engineer for review prior to the beginning of the Work.

C. The temporary enclosure shall be sealed and a slight negative pressure maintained in accordance with SSPC Guide 6, Containment Classification 3A or better. Filter the air escaping the enclosure as required in order to prevent dust from field blasting operations from entering the atmosphere. Verify effectiveness of dust containment using Method A, General Surveillance, Level 2, as described in SSPC Guide 6.

1.12 SCHEDULING

A. Scheduling shall be in accordance with Section 01140, Work Restrictions.

1.13 SPECIAL GUARANTEE

A. Furnish extended guarantee or warranty. Special guarantee shall provide for correction, or at the option of Owner, removal and replacement of Work specified in this specification section found defective during a period of 2 years after date of Substantial Completion. Duties and obligations for correction or removal and replacement of defective Work as specified in General Conditions.

1. 23-Month Warranty Period Inspection: Owner will conduct inspection of interior concrete coated surfaces prior to the end of warranty period. Owner will notify Contractor in advance of inspection and Contractor may attend at its option. Owner will prepare list of coating defects and failures identified during inspection and transmit to Contractor. List shall serve as notice of repairs required under warranty.
2. Repairs:
    a. If repairs are required, requirements of Contract shall apply, including but not limited to, requirements to remove standing water and perform repair work.
    b. Repair defective coatings using coating materials, equipment, and methods similar to those used in original work. Materials shall be of fresh manufacture and within manufacturer’s stated shelf life at time of application.
    c. Provide extended warranty of 1 year for repairs.
    d. Complete repairs within 30 calendar days of Warranty Period Inspection.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Carboline; St. Louis, MO.

B. “Or-equal.”

2.02 MATERIALS

A. Chemical-Resistant Coatings:

1. A mixture of liquid resin-based material, setting agent, and filler designed to be sprayed into place to cure to a hard state.
2. As Described in Coating Systems. Provide manufacturer’s highest quality products suitable for the intended service.

B. Product Service Experience: Minimum 3 years of verifiable successful product performance in the listed exposure and process condition.

C. Only compatible materials from a single manufacturer shall be used within any system.

D. Meet federal, state, and local requirements limiting the emission of volatile organic compounds.

E. Materials shall not contain lead or lead compounds.

F. Joints:

1. Provide joint filler material of type, size, and composition as recommended by the CRC manufacturer for the particular joint condition.
2. Joint materials shall maintain a liquid tight joint for the life of the coating system.
3. Chemical resistance of the joint material shall be the same or better than the coating system.
4. Provide joint backing material per CRC manufacturer’s recommendations.

2.03 COATING SYSTEMS

A. CRC-4—100 percent Solids Flake Filled Novolac Epoxy Coating, Spray Applied:

1. Description: Chemical resistant barrier lining suitable for application to new and existing underground concrete hydraulic structures.
2. Service Conditions: Immersion and head space exposure to wastewater subject to hydrogen sulfide and dilute hydrochloric and sulfuric acid, pH of 2 to 5.
3. CRC Components:
   a. Primer: Specifically recommended by the manufacturer and based on the presence of moisture and moisture values tested, one coat of penetrating epoxy primer, 4 MDFT.
   b. Surfacer/Filler: Epoxy modified cementitious mortar, application rate as required to fill bug holes or other concrete surface defects that could affect adhesion of the Corrosion Barrier Lining.
   c. Corrosion Barrier Lining: One coat of spray or trowel applied, 100 percent solids, reinforced, chemically resistant, novolac, amine-cured epoxy lining material, 60 mils to 80 mils DFT.
      1) Manufacturer and Products:
         a) Plasite; 4550 or 4550 S.
         b) “Or-equal.”
      2) For all areas where new coatings overlap onto previously applied coatings, a thorough inspection must be performed and removal of all amine blush is required per the manufacturer’s recommendations.

PART 3 EXECUTION

3.01 EXAMINATION

A. Surface Preparation:

1. Inspect and provide substrate surfaces prepared in accordance with these Specifications and the printed directions and recommendations of the system manufacturer whose products are to be applied.
2. Provide Engineer minimum 3 days’ advance notice of start of surface preparation and system application Work.
3. Perform Work only in presence of Engineer, unless Engineer grants prior approval to perform Work in Engineer’s absence.

B. Schedule inspection with Engineer in advance for cleaned surfaces and system application Work.

3.02 PREPARATION

A. Do not begin surface preparation activities until 30 days after new concrete has been placed, or longer if required to meet coating manufacturer's limit for moisture in the concrete.

B. All surface preparation shall be in accordance with SSPC SP 13 and manufacturer's printed directions and recommendations. Concrete surfaces shall be prepared as per the below paragraph.

C. Prepare concrete in Work Areas to receive coating as indicated herein.

1. Use abrasive blasting or high-pressure water blasting as required to achieve suitable surface preparation for coating application to concrete surfaces.
    a. If high-pressure water blasting is used, operating pressure shall not exceed 15,000 psi, to reduce risk of concrete removal depth greater than approved. Concrete removal shall be closely monitored to avoid excess concrete removal depth, and maximum pressure shall be reduced if excess depth of removal is encountered.
2. Abrade substrate concrete surfaces to provide a Concrete Surface Profile (CSP) of 3 to 5 per the International Concrete Repair Institute (ICRI), unless a higher value is required by the coating manufacturer.

D. Square edges of patch areas by sawing or chipping to avoid tapered shoulders or featheredges. Avoid cutting embedded steel reinforcement. Roughen polished saw-cut edges with high-pressure water blasting or abrasive hand operated power tools.

E. Keep areas from which concrete has been removed free of dirt, dust, high-pressure water blasting waste slurry, and other contaminants. Remove laitance and other bond-inhibiting contaminates from prepared areas.

F. Remove grease, oil, dirt, salts, chemicals, and other foreign matter by solvent, detergent, or other cleaning methods.

G. Fill holes and cracks with manufacturer's recommended materials to produce even surfaces for application of systems. Secure the manufacturer's recommendations for additional preparation if required for excessive bug holes exposed after blasting.

H. Ensure that concrete surfaces are sufficiently dry prior to coating.

1. Test for moisture using plastic sheets in accordance with ASTM D4263.
2. If the test indicates moisture is present, conduct tests to determine moisture content in accordance with ASTM F1869. If the moisture content exceeds 3 pounds per 1,000 square feet in a 24-hour period, or exceeds manufacturer's allowable levels, provide the manufacturer's recommendations for mitigation of moisture effect on lining application and long term lining performance.

3.03 APPLICATION

A. General:

1. This specification section is intended for coating and lining concrete with special chemical-resistant coatings.
2. Apply the manufacturer's recommended primer to prepared concrete surfaces in accordance with manufacturer's written instructions.
3. Apply surfacer/filler to concrete with methods recommended by the coating manufacturer as required to provide a surface that is continuous, smooth, void-free surface. Force material into voids and irregularities and remove excess filter before the material sets.
4. Spray or trowel apply coating system components in accordance with manufacturer's written instructions.
5. Cove corners at vertical and horizontal intersections, and reinforce as specified in Paragraph Joints, this section.
6. Lightly back roll coats as recommended by CRC manufacturer to eliminate pinholes.
7. Provide minimum number of coats required for each coating system, regardless of application method. Do not apply succeeding coats until previous coat has cured in accordance with coating manufacturer's recommendations.
8. Observe manufacturer's published recoat windows. If recoat window is exceeded, mechanically abrade before recoating in accordance with manufacturer's directions and as approved by Engineer.

B. Priming and Holiday Prevention on Concrete and Substrates: Follow manufacturer's written instructions related to application during decreasing substrate temperature conditions, adequate surface preparation, and other application techniques that may be necessary to reduce the potential for outgassing and formation of pinholes during coating application and cure. Apply manufacturer's recommended penetrating epoxy primer to minimize the effects of vapor transmission through the concrete.

C. Product Mixing:

1. Thoroughly mix until homogeneous following manufacturer's instructions.
2. Mix only components furnished by coating manufacturer.

D. Film Thickness: Provide specified thickness of material. Use screeds or wet film gauges to monitor thickness during application.

E. Joints:

1. Provide continuous sealant, backing material, and joint-lining treatment recommended by the coating manufacturer at all expansion, isolation, and construction joints.
2. Provide continuous sealant bead at joints between different coating systems.
3. Provide fiberglass or synthetic fabric reinforcement at construction joints and large substrate cracks to maintain liquid-tight requirements under the specified service conditions.

F. Penetrations: Coat over or around equipment anchors, base plates, pipes, and similar items installed in areas receiving CRC to maintain continuous liquid tight seal.

G. Terminations:

1. Conform to manufacturer's details.
2. For coatings exposed to wastewater or vapor space above wastewater liquid levels, terminate leading edges in beveled saw cuts 1/4 inch wide by 1/4 inch deep, or as required by manufacturer. Prime and extend coating into the saw cut. Do not fill saw cut with epoxy surfacer. Saw cut shall be provided by CRC subcontractors.

3.04 UNSATISFACTORY APPLICATION

A. If an item has an improper appearance or insufficient film thickness, the surface shall be cleaned, prepared, and top coated as required to achieve proper appearance and/or thickness. Provide specific procedures in writing from manufacturer prior to cleaning and preparation.

3.05 DAMAGED COATINGS

A. Damaged coatings, pinholes, and holidays shall have the edges feathered and repaired in accordance with the recommendations of the manufacturer.

B. All finish coats, including touchup and damage-repair coats, shall be applied in a manner that will present a uniform texture and color-matched appearance.

C. All visible areas of chipped, peeled, or abraded coatings shall be hand or power sanded. Prime and finish coat these in accordance with these Specifications and the manufacturer's recommendations.

3.06 FIELD QUALITY CONTROL

A. Visual Inspection: Inspect finished system for complete, uniform coverage of specified area. Evidence of defects include, but are not limited to, pinholes and improper thickness, hardness, and appearance.

B. Holiday Testing:

1. One hundred percent of surfaces provided with a barrier lining shall be electrically checked with high-voltage holiday test equipment to determine location of discontinuities:
   a. Do not perform electrical inspection until the barrier lining is sufficiently cured, as determined by the manufacturer.
   b. Provide suitable electrical contact to reinforcing steel. Verify conductivity of electrical contact by touching the second, ungrounded, electrode to another metallic ground connected to the concrete structure.
   c. All electrical inspection testing shall be performed in accordance with ASTM D4787.

C. Film Thickness:

1. Dry film thickness measurements must be measured using an ultrasonic thickness gauge in accordance with ASTM D6132.
2. Measurement frequency and acceptance criteria must conform to SSPC PA 9.
3. Provide additional coats of barrier lining as required to meet specified film thickness. Abrade surface by brush blasting if manufacturer's recommended recoat window is exceeded.

D. Repair:

1. Repair all lining defects in accordance with the manufacturer's written instructions.
2. After repaired and recoated areas have dried sufficiently, visually inspect and retest each area until pinhole free, monolithic coating systems are achieved in all locations.

3. Repair all defects, discontinuities, and damaged coatings associated with film thickness and holiday testing in accordance with manufacturer's written instructions to achieve pinhole free, monolithic coating systems.

3.07 MANUFACTURER'S SERVICES

A. Provide manufacturer's representative at Site in accordance with Section 01640, Manufacturers' Services and Training, for installation assistance, inspection, and Manufacturer's Certificate of Proper Installation.

B. Manufacturer's representative shall visit the Project Site at the following intervals:

1. At Preinstallation Meeting.
2. On first day of application of any system.
3. As necessary during surface preparation and application to ensure installations are made in accordance with the manufacturer's recommendations.
4. As required to resolve field problems attributed to or associated with manufacturer's product.
5. Minimum Number of Site Visits:
   a. Four site visits, each for a minimum of 4 hours.
   b. Travel time is not included as part of duration listed above.

3.08 APPLICATION SCHEDULE

A. Unless otherwise shown or specified, apply coatings in accordance with the following application schedule. In the event of discrepancies or omissions in the following, request clarification from Engineer before starting Work in question.

B. Coating System CRC-4:

1. Use in the following areas:
   a. Concrete surfaces as detailed below:
      1) Sanitary Sewer Manhole: All interior concrete surfaces.

3.09 SUPPLEMENTS

A. The supplements listed below, following “End of Section,” are a part of this specification:

1. Chemical-Resistant Coating System Data Sheet (CRCSDS).
2. Chemical-Resistant Coating Product Data Sheet (CRCPDS).

END OF SECTION

CHEMICAL-RESISTANT COATING DATA SHEET (CRCSDS)

Complete this CRCSDS for each coating system, include all components of the system (surface preparation, primer, intermediate coats, and finish coats). Include all components of a given coating system on a single CRCSDS.

CRC Number (from Spec.):		
CRC System Title (from Spec.):		
Coating Manufacturer:		
Representative:		
Surface Preparation:		
CRC Material (Generic)	**Product Name/Number (Proprietary)**	**Min. Coats, Coverage**

CHEMICAL-RESISTANT COATING PRODUCT DATA SHEET (CRCPDS)

Complete and attach manufacturer's Technical Data Sheet to this CRCPDS for each product submitted. Provide manufacturer's recommendations for the following parameters at temperature (F)/relative humidity.

Product Name:_____

Temperature/RH	**50/50**	**70/30**	**90/25**
Induction Time			
Pot Life			
Shelf Life			
Drying Time			
Curing Time			
Min. Recoat Time			
Max. Recoat Time			

Provide manufacturer's recommendations for the following:

Mixing Ratio: _____

Maximum Permissible Thinning: _____

Ambient Temperature Limitations: min.: _____ max.: _____

Surface Temperature Limitations: min.: _____ max.: _____

Surface Profile Requirements: min.: _____ max.: _____

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM ADVANCED WASTEWATER TREATMENT PLANT

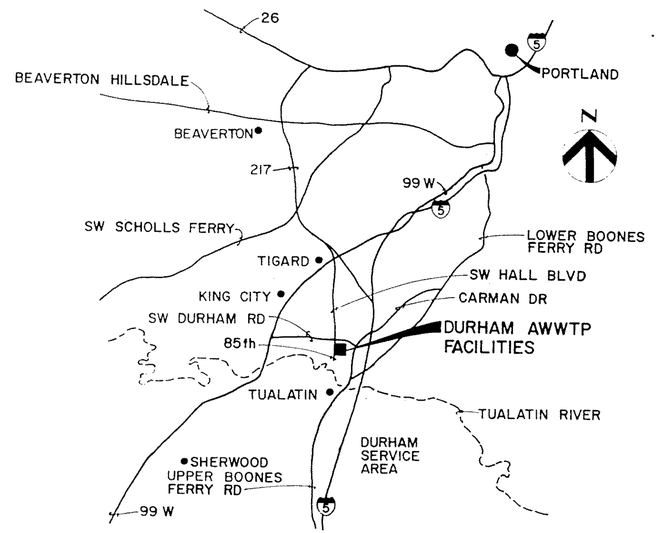
PHASE I EXPANSION

1989

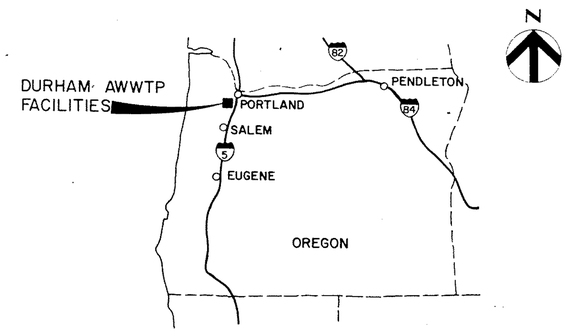
AS RECORDED DRAWINGS

HDR Engineering, Inc.

Vicinity Map



Location Map



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CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY
OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

SHEET LIST

Designed: DKT
Drawn: CWA
Checked: BRW
Approved: John E Hoch
Date: MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	MFA	AS RECORDED DRAWING	12/8/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1985 BRUCE R. WILLE

Sheet Number: 2

1 AS RECORDED DRAWINGS

SR 89

Abbreviations

A	
AB	ANCHOR BOLT
AC	ASPHALTIC CONCRETE
A/C	AIR CONDITIONER(ING)
ADDN	ADDITION, ADDITIONAL
ADMIN	ADMINISTRATION
AFF	ABOVE FINISH FLOOR
AHU	AIR HANDLING UNIT
AL	ALUM
ALT	ALTERNATE
ALUM	ALUMINUM
APPROX	APPROXIMATE
ARV	AIR RELEASE VALVE
AS	ACTIVATED SLUDGE
ATA	AIR TOOL ASSEMBLY
AV	ACID VENT
AVG	AVERAGE
AVS	AUTOMATIC VALVE STATION
AW	ACID WASTE
B	
BF	BLIND FLANGE
BFV	BUTTERFLY VALVE
BLDG	BUILDING
BM	BENCHMARK
BOD	BOTTOM OF DUCT
BOG	BOTTOM OF GRILL
BOU	BOTTOM OF UNIT
BSP	BLACK STEEL PIPE
BU	BELL UP
BV	BALL VALVE
C	
CAD	CADMIUM
CB	CATCH BASIN
CG	CHLORINE GAS
CHKD	CHECKERED
CI	CAST IRON
CIP	CAST IRON PIPE
CISP	CAST IRON SOIL PIPE
CJ	CONTRACTION JOINT
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
CO2	CARBON DIOXIDE
COMM	COMMUNICATION
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS, CONTINUATION
CPLG	COUPLING
CS	CHLORINE SOLUTION
CTR	CENTER
CV	CHECK VALVE
CW	COLD WATER, CITY WATER
D	
D	DRAIN, DOOR
DIA	DIAMETER
DIM	DIMENSION
DIP	DUCTILE IRON PIPE
DISCH	DISCHARGE
DMJ	DOUBLE MECHANICAL JOINT
DN	DOWN
DO	DISSOLVED OXYGEN
DPA	DIAPHRAGM PUMP ASSEMBLY
DRWG	DRAWING
DW	DISTILLED WATER
E	
E	ELECTRICAL CONDUIT
EA	EACH, EXHAUST AIR
ECC	ECCENTRIC
EF	EACH FACE
EFFL	EFFLUENT
EFP	EXCESS FLOW PIPE
EJ	EXPANSION JOINT
EL	ELEVATION
ELB	ELBOW
ELEC	ELECTRICAL
ENGR	ENGINEER
EPDM	TERPOLYMER ELASTOMER
EQUIP	EQUIPMENT
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR, EXTERNAL
EW	EACH WAY
F	
FAD	FOUL AIR DUCT
FC	FLUSHING CONNECTION
FCA	FLANGED COUPLING ADAPTOR
FCV	FLOW CONTROL VALVE
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER, FLOW ELEMENT
FEC	FIRE EXTINGUISHER CABINET
FH	FIRE HYDRANT
FIG	FIGURE
FIN	FINISHED
FLG	FLANGE
FM	FLOW METER, FORCE MAIN
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FEET
FTG	FOOTING
G	
GA	GAGE, METAL THICKNESS
GAL	GALLON
GALV	GALVANIZED
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
GWB	GYPSUM WALLBOARD

H	
HB	HOSE BIBB
HID	HIGH DENSITY DISCHARGE
HM	HOLLOW METAL
HMC	HARNASSED MECHANICAL COUPLING
HORIZ	HORIZONTAL
HPA	HIGH PRESSURE AIR
HPS	HIGH PRESSURE SODIUM
HR	HANDRAIL
HT	HEIGHT
HV	HOSE VALVE
HVAC	HEATING, VENTILATION, AIR CONDITIONING
HW	HOT WATER
HWL	HIGH WATER LEVEL
I	
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IN	INCH
INCAN	INCANDESCENT
INFL	INFLUENT
INSTR	INSTRUMENT(TATION)
INV	INVERT
IR	IRRIGATION
J	
JB	JUNCTION BOX
JT	JOINT
L	
L	LOUVER
LAB	LABORATORY
LAV	LAVATORY
LCV	LEVEL CONTROL VALVE
LF	LINEAR FEET
LP	LOW PRESSURE
LPA	LOW PRESSURE AIR
LWL	LOW WATER LEVEL
M	
MATL	MATERIAL
MAX	MAXIMUM
MC	MECHANICAL COUPLING
MECH	MECHANICAL
MED	MEDIUM
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MLSS	MIXED LIQUOR
MO	MASONRY OPENING
MOD	MODIFIED, MOTOR OPERATED DAMPER
MOV	MOTOR OPERATED VALVE
MRGWB	MOISTURE RESISTANT GYPSUM WALLBOARD
N	
NG	NATURAL GAS
NIC	NOT IN CONTRACT
NO	NUMBER
NPT	NATIONAL PIPE THREADS
NPW	NONPOTABLE WATER
NRS	NONRISING STEM
NTS	NOT TO SCALE
O	
OA	OUTSIDE AIR
OC	ON CENTER(S)
OD	OUTSIDE DIAMETER
OED	OPEN END DUCT
OH	OVERHEAD
OPNG	OPENING
OPP	OPPOSITE
OX	OXIDATION
P	
P	POLYMER
PC	PIPE COLUMN
PE	PLAIN END
PFP	POLYMER FEED PUMP
PG	PRESSURE GAGE
PI	POINT OF INTERSECTION
PL	PLATE, PROPERTY LINE
POT	POINT OF TANGENCY
PRI	PRIMARY
PRS	PRESSURE REDUCING STATION, PRIMARY SLUDGE
PRV	PRESSURE RELIEF VALVE
PS	PIPE SUPPORT, PRIMARY SLUDGE
PTD	PAPER TOWEL DISPENSER
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PW	POTABLE WATER
R	
R	RADIUS, RISERS
RA	RETURN AIR
RAS	RETURN ACTIVATED SLUDGE
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
RDL	ROOF DRAIN LEADER
RECIRC	RECIRCULATION
RECT	RECTANGULAR
RED	REDUCER
REINF	REINFORCE(ING)
REQD	REQUIRE(ED)
RLF	RELIEF AIR
RM	ROOM(S)
ROW	RIGHT OF WAY
RR	RAILROAD
RS	RAW SEWAGE

S	
SA	SUPPLY AIR
SAM	SAMPLE
SAN	SANITARY SEWER
SD	STORM DRAIN
SED	SEDIMENTATION
SEP	SEPTAGE
SH	SHEET
SIM	SIMILAR
SG	SLIDE GATE
SP	SUMP PUMP, STOP PLATE
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL, SERVICE SINK
STA	STATION
STD	STANDARD
STL	STEEL
SL	SLUICE GATE
SYM	SYMMETRICAL
T	
T	TREADS
T&B	TOP AND BOTTOM
TBM	TEMPORARY BENCHMARK
TEL	TELEPHONE
TEMP	TEMPORARY
TH	TEST HOLE
TYP	TYPICAL
U	
UH	UNIT HEATER
UR	URINAL
V	
VAC	VACUUM
VC	VICTAULIC COUPLING
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VTR	VENT THRU ROOF
W	
W	WATER, WINDOW, WEIR
W/	WITH
W/O	WITHOUT
WAS	WASTE ACTIVATED SLUDGE
WC	WATER CLOSET
WD	WOOD
WF	WATER FOUNTAIN
WP	WATERPROOF(ED),(ING)
WS	WATERSTOP
WT	WEIGHT
WWF	WELDED WIRE FABRIC

Mechanical Symbols

- CAP
- CLEANOUT
- CROSS
- BELL UP
- DRAIN
- ATA — AIR TOOL ASSEMBLY
- AVS — AUTOMATIC VALVE STATION
- PRS — PRESSURE REDUCING STATION
- HOSE RACK
- ELBOW
- F — FILTER
- FLEXIBLE HOSE OR TUBING
- FE — FLOW ELEMENT
- FLOW TUBE
- PRESSURE GAGE
- LINE SIZE CHANGE (REDUCER)
- LINE TURNING DOWN
- LINE TURNING UP
- WALL SLEEVE
- STRAINER
- TEE
- TRAP
- UNION
- DIAPHRAGM VALVE
- WAFER BUTTERFLY VALVE
- FLANGED BUTTERFLY VALVE
- VENT
- WYE
- BALL VALVE
- FLOW CONTROL VALVE
- CHECK VALVE
- GATE VALVE
- PRESSURE REDUCING VALVE
- PRESSURE RELEASE VALVE
- PLUG VALVE
- 3-WAY VALVE
- 4-WAY VALVE
- VACUUM RELIEF VALVE
- AIR RELIEF VALVE
- SOLENOID VALVE
- PRESSURE SWITCH
- ROTAMETER
- PRESSURE REGULATING VALVE
- FLANGED COUPLING ADAPTOR
- FLANGED JOINT
- WEIR

- MECHANICAL JOINT
- MECHANICAL JOINT OR PUSH ON JOINT
- VICTAULIC JOINT
- BLIND FLANGE
- MECHANICAL COUPLING
- WELDED CONNECTION
- WELDED ELBOW
- HARNESSED MECHANICAL COUPLING
- HOSE BIBB
- PIPE IN SECTION
- SLUICE GATE
- PRESSURE GAGE (W/COCK)
- POTABLE COLD WATER PIPING
- POTABLE HOT WATER PIPING
- DRAINAGE VENT
- DRAINAGE BELOW GROUND
- —AV— ACID VENT
- —AW— ACID WASTE
- —AS— ACTIVATED SLUDGE
- —AL— ALUM
- —BSP— BLACK STEEL PIPE
- —CS— CHLORINE SOLUTION
- —CD— CHLORINE DRAIN
- —CG— CHLORINE GAS
- —CON— CONDENSATE
- —CO_2— CARBON DIOXIDE
- —DW— DISTILLED WATER, DEIONIZED WATER
- —SD— STORM DRAIN
- —D— DRAIN
- —DF— DIESEL FUEL
- —E— ELECTRICAL CONDUIT
- —NG— NATURAL GAS
- —HPA— HIGH PRESSURE AIR
- —LPA— LOW PRESSURE AIR
- —NPW— NONPOTABLE WATER
- —P— POLYMER
- —PW— POTABLE WATER
- —PRS— PRIMARY SLUDGE
- —RAS— RETURN ACTIVATED SLUDGE
- —SEP— SEPTAGE
- —SAM— SAMPLE
- —SAN— SANITARY SEWER
- —WAS— WASTE ACTIVATED SLUDGE
- —V— VACUUM

Material Symbols In Section

- CAST-IN-PLACE CONCRETE
- PRECAST CONCRETE
- EXISTING CONCRETE
- GROUT
- GRAVEL OR AGGREGATE BASE
- SAND
- EARTH OR GRADE
- BACKFILL
- STEEL OR IRON
- CONCRETE MASONRY UNIT
- BATT OR FILL INSULATION
- RIGID INSULATION
- WOOD IN SECTION
- WOOD, STUDWALL

Material Symbols In Plan

- CHECKERED PLATE
- GRATING (SPAN IS IN DIRECTION OF MORE CLOSELY SPACED BARS)
- CONCRETE PAVEMENT & SIDEWALK
- ASPHALT PAVEMENT

Site Legend

- EXIST / NEW — EMBANKMENT SLOPE
- DRAINAGE FLOW
- CHAIN LINK FENCE
- FIELD FENCE
- MANHOLE
- TH — IDENTIFICATION AND APPROXIMATE LOCATION OF SOIL TEST HOLE
- CATCH BASIN
- CONCRETE REACTION BLOCKING
- PROPERTY LINE
- HORIZONTAL CP-X, CONTROL POINT
- CENTERLINE
- —T— TELEPHONE LINE
- HANDRAIL
- 75.50 — NEW SPOT ELEVATION
- 68.50 — EXISTING ELEVATION

General Symbols And Designations

SYMBOLS NOTED MAY REPRESENT NEW OR EXISTING STRUCTURES, LINES AND WORK. NEW WORK WILL BE DISTINGUISHED FROM EXISTING WITH A HEAVIER LINE WEIGHT. EXAMPLE:

- TO BE DEMOLISHED
- EXISTING
- NEW

Section Mark

D / 501 — SECTION LETTER; DIRECTION OF VIEW; SHEET ON WHICH SECTION IS DRAWN

Detail Marker

3 / 101 — DETAIL IDENTIFICATION; SHEET ON WHICH DETAIL IS SHOWN

Door / Window / Louver Mark

D / 601 — MARK; NUMBER

D - DOOR
W - WINDOW
L - LOUVER

Weir / Gate / Hatch Mark

TYPE / SP-101 / NUMBER

W - WEIR
SP - STOP PLATE
SL - SLUICE GATE
SG - SLIDE GATE
H - HATCH

Equipment Tag

CV-101 — NUMBER; EQUIPMENT PREFIX

Valve Mark

CV-101 — NUMBER

Room ID

601

Equipment Prefixes

A	
ACC	AIR CONDITIONING CONDENSING UNIT
B	
B	BLOWER
C	
C	CONVEYOR
CAP	CAPACITOR
CD	CLARIFIER DRIVE
CL	CHLORINATOR
CP	CONTROL PANEL
CV	CONTROL VALVE
D	
D	DOOR
DF	DRINKING FOUNTAIN
DP	SUMP PUMP
DS	DUPLEX MANUAL STRAINER
E	
EF	EXHAUST VENTILATION FAN
EMO	ELECTRIC MOTOR OPERATOR
EV	CHLORINE EVAPORATOR
F	
FC	FAN COIL
FE	FLOW ELEMENT
G	
GC	GRIT CLASSIFIER
GCL	GRIT CYCLONE
GP	GRIT PUMP
GI	GRAVITY INLET
H	
H	HOIST
HF	HARMONIC FILTER
I	
IP	INSTRUMENT PANEL
K	
KGV	KNIFE GATE VALVE
L	
L	LOUVER
M	
MCC	MOTOR CONTROL CENTER
MU	GAS-FIRED MAKEUP AIR UNIT
N	
NPW	NONPOTABLE WATER BOOST PUMP
O	
OCF	ODOR CONTROL FAN
OS	ODOR SCRUBBER
P	
PH	pH PROBE
PLPA	LIGHTING PANEL
PPA	POWER PANEL
PR	GRIT REMOVAL EQUIPMENT
PRV	PRESSURE REDUCING VALVE
PSP	PRIMARY SLUDGE PUMP
R	
RSP	RAW SEWAGE PUMP
S	
S	BAR SCREEN
SG	SLIDE GATE
SL	SLUICE GATE
ST	STORAGE TANK
SV	SOLENOID VALVE
V	
VFD	VARIABLE FREQUENCY DRIVE
W	
WC	WATER CLOSET
WF	WATER FOUNTAIN
WH	WATER HEATER
WS	WATER SOFTENER
X	
XFMR	TRANSFORMER

NOTE:

FOR HVAC LEGEND, ABBREVIATIONS AND DETAILS, SEE SHEET 805.
FOR ELECTRICAL LEGEND, ABBREVIATIONS AND DETAILS, SEE SHEET 901.
FOR INSTRUMENTATION ABBREVIATIONS, SEE SHEET 1001.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ABBREVIATIONS, LEGENDS AND GENERAL NOTES

Designed: DKT
Drawn: IKD
Checked: BRW
Approved: John E Hoch
Date: MAY, 1989

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No	By	Revision	Date
1	JEK	ADDENDUM NO. 1	6-27-89

REGISTERED PROFESSIONAL ENGINEER 1339 OREGON July 17 1985 BRUCE R. WILLEY

Sheet Number: 3

SR 904

SCALE: 1"=100'

CWC-HDR, Inc.
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UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

SITE LAYOUT

SHEET NOTES:

1. Approximate locations of soil boring test holes are shown for reference. See Section 00220 of the bidding documents for further information.
2. See SH 107 for modification of irrigation system during construction and restoration of irrigation system after construction.
3. For construction of temporary worker's parking area, provide filter fabric, 8 inches of crushed surfacing base course and 2 inches of base course asphalt over the existing ground surface. Slope parking lot surface to allow drainage and prevent ponding. Maintain temporary worker's parking lot during entire construction period. Upon completion of construction, remove base course asphalt, crushed surfacing base course and filter fabric. Relevel and sod disturbed area.

TIGARD STREET INVESTMENT CO.
P.O. BOX 23516
TIGARD, OREGON 97223

WILLAMETTE CABLE TELEVISION
4800 SW MACADAM SUITE 103
PORTLAND, OREGON 97201

N 640685.259
E 418?17.?

N 640900.692
E 418117.608

420'
200'

STAGING AREA

TIGARD HIGH SCHOOL
TIGARD SCHOOL DISTRICT 23J
13137 SW PACIFIC HIGHWAY
TIGARD, OREGON 97223

TH B-10
TH B-9
TH B-17
TH B-15
TH B-16
TH B-8

HEADWORKS BUILDING
SEE SH 301-332

FOR PRIMARY CLARIFIER MODIFICATIONS SEE SH 415-416

N 640218.174
E 418099.812

CHARLES & ZADA LAMB
R.A. & LINDA GRAY
11445 SW TIEDEMAN
TIGARD, OREGON 97223

N 640182.459
E 418701.550

ENTRY TO THOMAS PROPERTY

JOHN M. & [illegible]LY P. THOMAS
16575 S[illegible]TH AVE.
TIGARD, [illegible]GON 97223

UNIFIED SEWERAGE AGENCY
150 NORTH FIRST AVE.
HILLSBORO, OREGON 97123

R (TYP)

WATER QUALITY LABORATORY

DONAL D L. & JOAN K. MOORE
8170 SW DURHAM ROAD
TIGARD, OREGON 97224

NEW ROADWAY BY OTHERS

JOANNE A. EDWARDS
8100 SW DURHAM ROAD
TIGARD, OREGON 97224

DURHAM GRADE SCHOOL
TIGARD SCHOOL DISTRICT 23J
13137 SW PACIFIC HIGHWAY
TIGARD, OREGON 97223

PLANT ENTRY DRIVE

TEMPORARY WORKER'S PARKING LOT, SEE DETAIL THIS SHEET

FOR NEW STRUCTURES SEE SH 401 - 414

PRIMARY SLUDGE PUMPING STATION

FOR SURGE BASIN MODIFICATIONS SEE SH 601, 602 & 604

PRIMARY EFFLUENT FLOW SPLIT BOX, SEE SHEET 117D

FOR EXISTING HEADWORKS MODIFICATIONS SEE SH 108, 109 & 129

FOR SECONDARY CLARIFIER MODIFICATIONS SEE SH 501

FOR CHLORINE FEED FACILITIES MODIFICATIONS SEE SH 502-503

TH B-2
TH B-6
TH B-5
TH B-4
TH B-1

PRIMARY CLARIFIER NO. 2
PRIMARY CLARIFIER NO. 1
AERATION BASIN NO. 2
AERATION BASIN NO. 1
SECONDARY CLARIFIER NO. 2
SECONDARY CLARIFIER NO. 1
RECARBONATION
FLOW DISTRIBUTION STRUCTURE
SURGE BASIN NO. 2
SURGE BASIN

FOR BIOFILTER MODIFICATIONS SEE SH 418-419

FOR FILTER TUNNEL MODIFICATIONS SEE SH 603

FILTER GALLERY

CHLORINE STORAGE

TH B-12
N 640180.859
E 418761.530
N 640181.679
E 418731.540

FOR PRIMARY SLUDGE PUMPING STATION MODIFICATIONS SEE SH 417

INCINERATION BUILDING
SERVICE BUILDING
SLUDGE THICKENERS
TH B-13

SOLIDS HANDLING ODOR CONTROL FOR MODIFICATIONS SEE SH 701-702

FOR EVAPORATOR BUILDING SEE SHEETS 504-507

EXISTING CURB AND GUTTER

20' LOWERED CURB SEE SHEET 120

TEMPORARY CHAIN LINK FENCE

SUBSTATION

BURLINGTON NORTHERN RAILROAD

TH

RAW SEWAGE PUMPING STATION FOR MODIFICATIONS SEE SH 601-602

TEMPORARY WORKER'S PARKING LOT DETAIL

AS RECORDED DRAWINGS

No	By	Revision	Date
1	JEK	ADDENDUM NO. 1	6-27-89
2	JEK	CPR NO. 25	12-6-92
3	JEK	AS RECORDED DRAWING	12-6-92

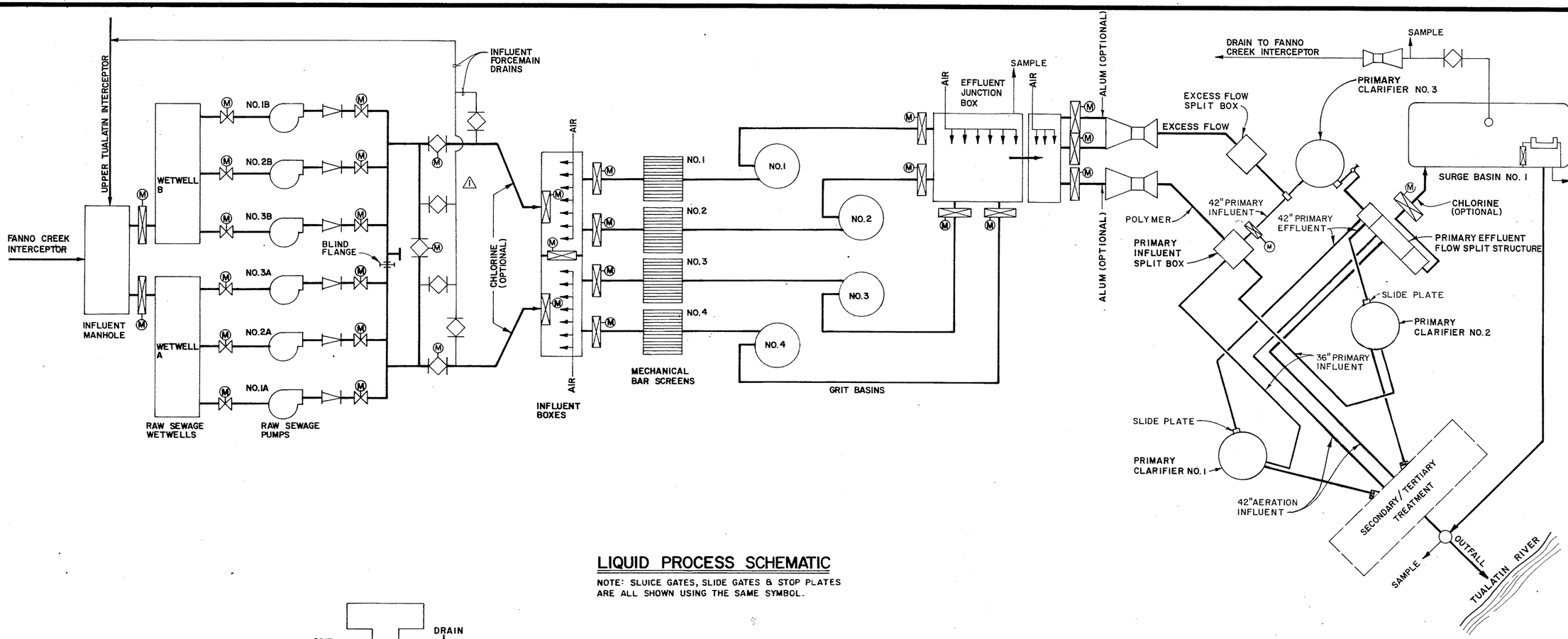
Designed: BAW, AHK
Drawn: MMK
Checked: BAW
Approved: John E. Kock
Date: MAY 1989

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REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1985 BRUCE R. WILLEY

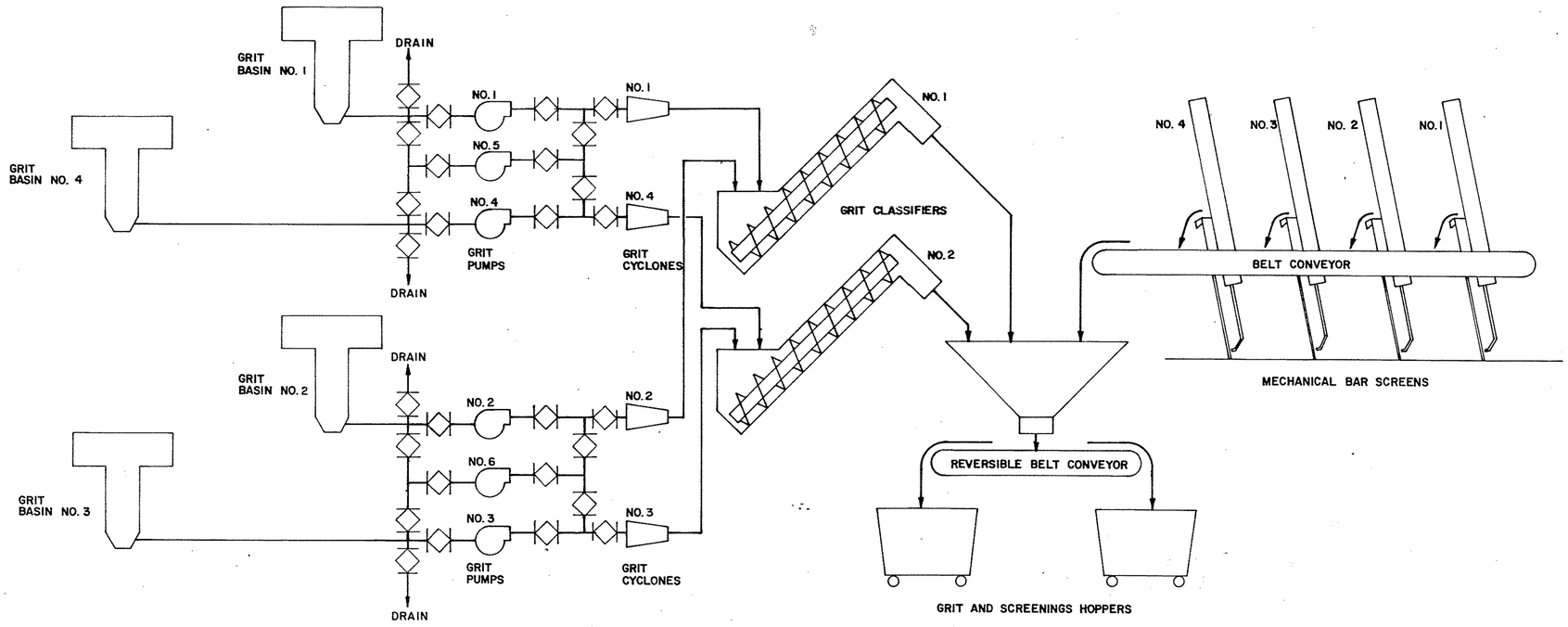
Sheet Number: 4

SR 891



LIQUID PROCESS SCHEMATIC

NOTE: SLUICE GATES, SLIDE GATES & STOP PLATES ARE ALL SHOWN USING THE SAME SYMBOL.



HEADWORKS SOLID PROCESS SCHEMATIC

△2 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PROCESS SCHEMATICS

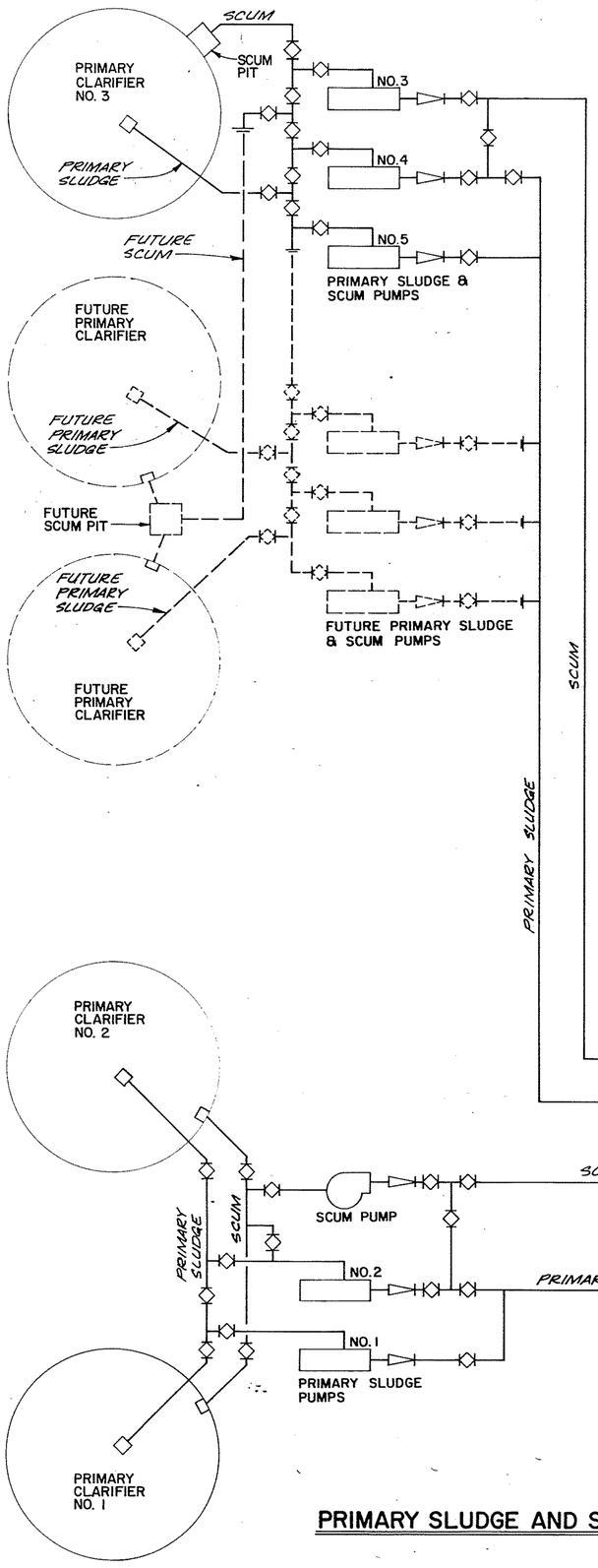
Designed	BRW
Drawn	CWA
Checked	BRW
Approved	John E. Bloch
Date	MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	TDM	ADDENDUM NO.1	6-27-89
△2	JSK	AS RECORDED DRAWING	11-30-92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1985 BRUCE R. WILLEY

Sheet Number 5



PRIMARY SLUDGE AND SCUM PUMPING SCHEMATIC

PROCESS DESIGN SUMMARY

Design Conditions

PHASE I EXPANSION

Average Dry Weather Flow (ADWF), mgd	20
Average Wet Weather Flow, mgd	34
Peak Flow, mgd	90
Maximum Flow to Secondary Treatment, mgd	40
Secondary Bypass (Excess) Flow at 90 mgd, mgd	50

FUTURE EXPANSION

Average Dry Weather Flow, mgd	30
Average Wet Weather Flow, mgd	48
Peak Flow, mgd	140

Phase I Expansion- Liquid Process Summary

RAW SEWAGE PUMPS	
Constant Speed Pumps (Existing)	
Number	1
Capacity, each, mgd	10
Eddy Current Pumps (Existing)	
Number	2
Capacity, each, mgd	16
Variable Frequency Drive Pumps (Existing)	
Number	1
Capacity, each, mgd	18
Variable Frequency Drive Pumps (New)	
Number	2
Capacity, each, mgd	33
Firm Capacity, mgd	93
Total Capacity, mgd	126
MECHANICAL BAR SCREENS	
Number	4
Width, Feet	2 @ 5 2 @ 6.5
GRIT BASINS	
Number	4
Capacity, each, mgd	2 @ 30 2 @ 40
PARSHALL FLUMES	
Normal Flow Flume	
Throat Width, feet	4
Excess Flow Flume	
Throat Width, feet	6
PRIMARY CLARIFIERS	
Existing Circular Basins	
Number	2
Diameter, feet	120
Sidewater Depth, feet	12
Overflow Rate, gpd/sf	
ADWF[a]	590
Peak Flow[b]	1,770
Detention Time, hours	
ADWF[a]	3.7
Peak Flow[b]	1.2
New Circular Basin	
Number	1
Diameter, feet	130
Sidewater Depth, feet	12
Overflow Rate, gpd/sf	
ADWF[a]	500
Peak Flow[c]	3,770
Detention Time, hours	
ADWF[a]	4.3
Peak Flow[c]	0.6
SURGE BASIN	
Number	1
Volume, million gallons	5.87
Detention Time at Peak Flow, hours[c]	2.8

Phase I Expansion- Solids Proccess Summary

GRIT PUMPS	
Number	6
Capacity, each, gpm	440
Firm Capacity, gpm	1,760
GRIT CLASSIFIERS	
Number	2
Capacity, each, gpm	880
Total Capacity, gpm	1,760
EXISTING PRIMARY SLUDGE PUMPING STATION	
Primary Sludge Pumps (New)	
Number	2
Capacity, each, gpm	200
Scum Pumps (Existing)	
Number	1
Capacity, each, gpm	200
NEW PRIMARY SLUDGE PUMPING STATION	
Primary Sludge and Scum Pumps	
Number	3
Capacity, each, gpm	200

[a] Based on 20 mgd flow rate and Primary Clarifier Nos. 1, 2 and 3 in service.

[b] Based on 40 mgd flow rate and Primary Clarifier Nos. 1 and 2 in service.

[c] Based on 50 mgd flow rate through Primary Clarifier No. 3 and Surge Basin.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PROCESS SCHEMATIC AND PROCESS DESIGN SUMMARY

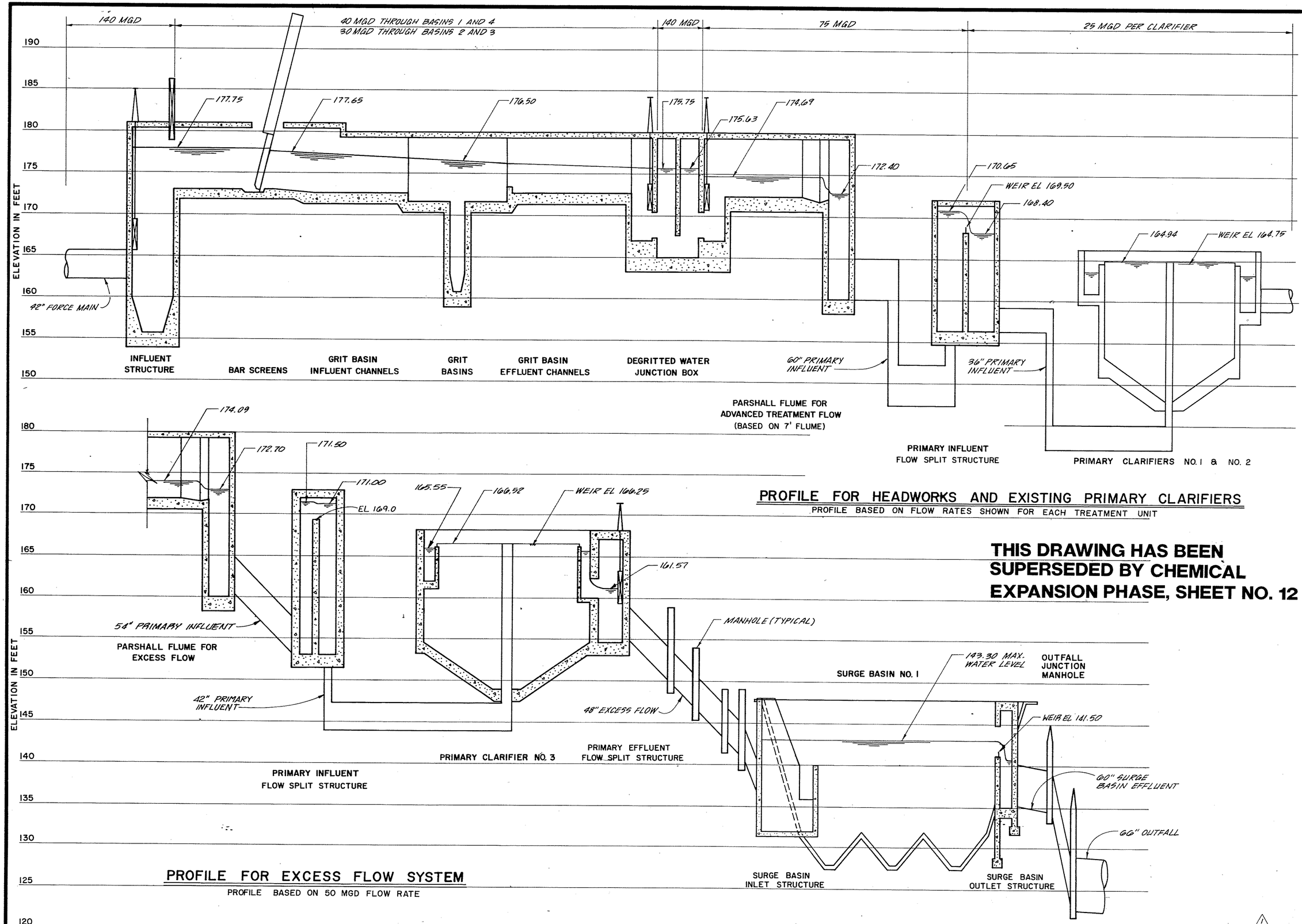
Designed: BAW
Drawn: CWA
Checked: BAW
Approved: John E. Hoch
Date: MAY 1989

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No	By	Revision	Date
1	JEK	AS RECORDED DRAWING	11-20-92

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Sheet Number: 6



PROFILE FOR HEADWORKS AND EXISTING PRIMARY CLARIFIERS

PROFILE BASED ON FLOW RATES SHOWN FOR EACH TREATMENT UNIT

PROFILE FOR EXCESS FLOW SYSTEM

PROFILE BASED ON 50 MGD FLOW RATE

THIS DRAWING HAS BEEN SUPERSEDED BY CHEMICAL EXPANSION PHASE, SHEET NO. 12

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HYDRAULIC PROFILES

Designed: BRW/JPT
Drawn: BDM
Checked: BRW
Approved: John E. Hock
Date: MAY 1989

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1	JFK	AS RECORDED DRAWING	11-20-92

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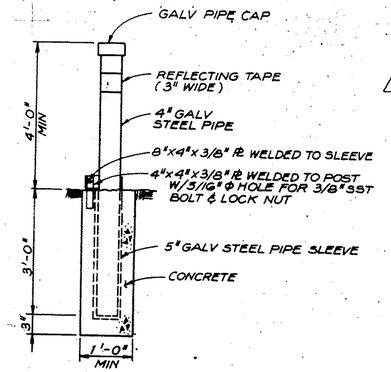
Sheet Number 7

E. 1,418,500 E. 1,418,750 E. 1,419,000 E. 1,419,250 E. 1,419,500 E. 1,419,750

SHEET NOTES

1. REMOVE EXISTING PAVEMENT AND CRUSHED SURFACING TO SUBGRADE IN EXISTING PAVED AREAS TO BE RECONSTRUCTED. PREPARE SUBGRADE IN ACCORDANCE WITH SPECIFICATIONS. PLACE CRUSHED SURFACING AND ASPHALT IN ACCORDANCE WITH SPECIFICATIONS TO NEW LINE AND GRADE. MATCH EXISTING ASPHALT FINISH GRADE AT CENTERLINE OF EXISTING PAVEMENT TO REMAIN. SAWCUT VERTICAL SURFACE AT MATCH LINE IN ACCORDANCE WITH SPECIFICATIONS. MATCH FINISH GRADE AT CURB AND GUTTER OF EXISTING CURB AND GUTTER TO REMAIN. SAWCUT EXISTING CURB AND GUTTER AND EXISTING CONCRETE SURFACES AT MATCH LINE IN ACCORDANCE WITH SPECIFICATIONS.

2. THE DURHAM GRADE SCHOOL HAS CONSTRUCTED A NEW 30 FT ACCESS ROADWAY FROM 85TH AVENUE TO THEIR PROPERTY AS SHOWN. OTHER MODIFICATIONS INCLUDE RELANDSCAPING ALONG THE SOUTH SIDE OF THE WATER QUALITY LAB AND CONSTRUCTION OF A NEW USA ROCK MONUMENT AT THE SOUTHEAST CORNER OF THE REVISED ENTRY WAY.



DETAIL 1-REMOVABLE BOLLARD

N.T.S.

N. 641,750 N. 641,500 N. 641,250 N. 641,000

N°1 N°2 N°20 N°25 (17468)

WATER QUALITY LAB

RELOCATED OVERHEAD UTILITIES BY OTHERS SEE NOTE 5 SHEET 102 (TYP OF 4 LOCATIONS THIS SHEET)

BEGIN HALF STREET & CURB IMPROVEMENTS LEFT. MATCH ASPHALT @ CENTERLINE WEST & NORTH. PROVIDE FULL DEPTH ROADWAY SECTION UNDER HALF STREET IMPROVEMENT. SEE NOTE 1.

MATCH ASPHALT AT EXISTING CURB & GUTTER AND MATCH PAVEMENT AT EXIST PATCH LINE. SEE NOTE 1

AREA RELANDSCAPED BY OTHERS NOT IN THIS CONTRACT SEE NOTE 2

PATCH LINE FROM NEW ROADWAY RELOCATION BY OTHERS SEE NOTE 2

BEGIN NEW 8 FT. SIDEWALK 2 FT. WEST OF EXIST. F.H.

DEPRESSED DRIVEWAY APRON. SEE SH. 103

EXIST. F.H. TO REMAIN. PROTECT FROM DAMAGE

NEW USA ROCK MONUMENT BY OTHERS NOT IN THIS CONTRACT SEE NOTE 2

NEW 30 FOOT ACCESS ROADWAY BY OTHERS NOT IN THIS CONTRACT SEE NOTE 2

PROVIDE 3 REMOVABLE BOLLARDS AT EQUAL SPACING SEE DETAIL 1

RAISE EXISTING CATCH BASIN FRAME & GRATE SEE SH. 110

PROTECT EXISTING IRRIGATION VAULTS FROM DAMAGE

8 FT. LOWERED CURB EA. SIDE OF EXIST ROADWAY SEE DETAIL, SHEET 123

NEW 30 FOOT ACCESS ROADWAY TO DURHAM ELEMENTARY SCHOOL CONSTRUCTED BY OTHERS NOT IN THIS CONTRACT SEE NOTE 2

BEGIN FULL WIDTH PAVEMENT IMPROVEMENTS SOUTH. PROVIDE FULL DEPTH ROADWAY SECTION SOUTH SEE NOTE 1

CLEARING & GRUBBING LIMITS

MATCH LINE SEE SHEET 102

CBD

SCALE: 1" = 50'

AS RECORDED DRAWINGS

SR 691

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

GRADING AND PAVING - NORTH AREA

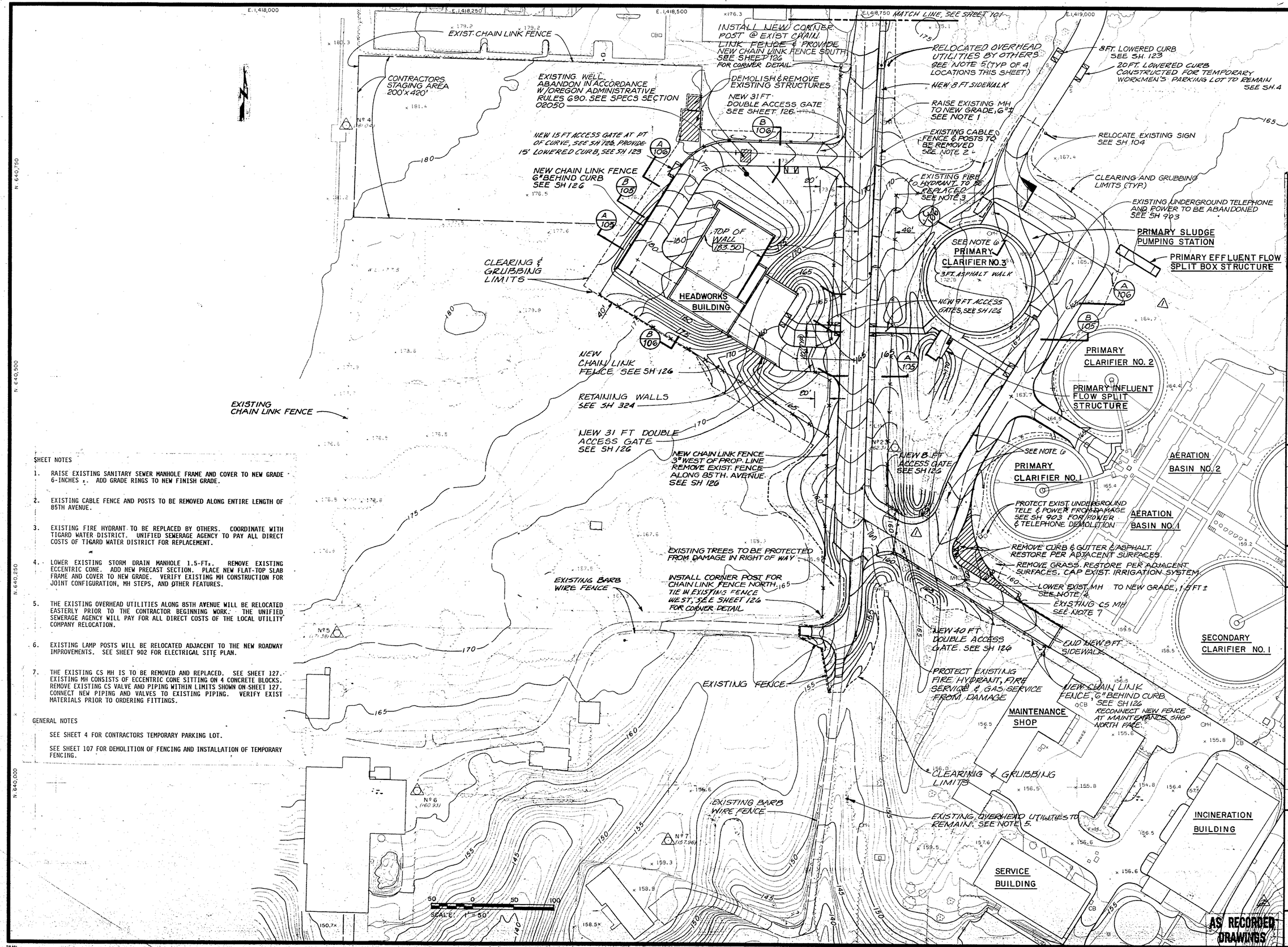
Designed AHK
Drawn LLB
Checked BRW
Approved John E. Hoefel
Date MAY, 1989

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No	By	Revision	Date
2	AHK	ADDENDUM NO. 2	6-30-89
3	JEK	AS RECORDED DRAWING	11-20-92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1986 BRUCE R. WILLEY

Sheet Number 101



SHEET NOTES

1. RAISE EXISTING SANITARY SEWER MANHOLE FRAME AND COVER TO NEW GRADE 6-INCHES ±. ADD GRADE RINGS TO NEW FINISH GRADE.

2. EXISTING CABLE FENCE AND POSTS TO BE REMOVED ALONG ENTIRE LENGTH OF 85TH AVENUE.

3. EXISTING FIRE HYDRANT TO BE REPLACED BY OTHERS. COORDINATE WITH TIGARD WATER DISTRICT. UNIFIED SEWERAGE AGENCY TO PAY ALL DIRECT COSTS OF TIGARD WATER DISTRICT FOR REPLACEMENT.

4. LOWER EXISTING STORM DRAIN MANHOLE 1.5-FT±. REMOVE EXISTING ECCENTRIC CONE. ADD NEW PRECAST SECTION. PLACE NEW FLAT-TOP SLAB FRAME AND COVER TO NEW GRADE. VERIFY EXISTING MH CONSTRUCTION FOR JOINT CONFIGURATION, MH STEPS, AND OTHER FEATURES.

5. THE EXISTING OVERHEAD UTILITIES ALONG 85TH AVENUE WILL BE RELOCATED EASTERLY PRIOR TO THE CONTRACTOR BEGINNING WORK. THE UNIFIED SEWERAGE AGENCY WILL PAY FOR ALL DIRECT COSTS OF THE LOCAL UTILITY COMPANY RELOCATION.

6. EXISTING LAMP POSTS WILL BE RELOCATED ADJACENT TO THE NEW ROADWAY IMPROVEMENTS. SEE SHEET 902 FOR ELECTRICAL SITE PLAN.

7. THE EXISTING CS MH IS TO BE REMOVED AND REPLACED. SEE SHEET 127. EXISTING MH CONSISTS OF ECCENTRIC CONE SITTING ON 4 CONCRETE BLOCKS. REMOVE EXISTING CS VALVE AND PIPING WITHIN LIMITS SHOWN ON SHEET 127. CONNECT NEW PIPING AND VALVES TO EXISTING PIPING. VERIFY EXIST MATERIALS PRIOR TO ORDERING FITTINGS.

GENERAL NOTES

SEE SHEET 4 FOR CONTRACTORS TEMPORARY PARKING LOT.

SEE SHEET 107 FOR DEMOLITION OF FENCING AND INSTALLATION OF TEMPORARY FENCING.

SR 891

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

GRADING AND PAVING - WEST AREA

Designed: AHK
Drawn: LLB
Checked: BRW
Approved: John E. Hoch
Date: MAY, 1989

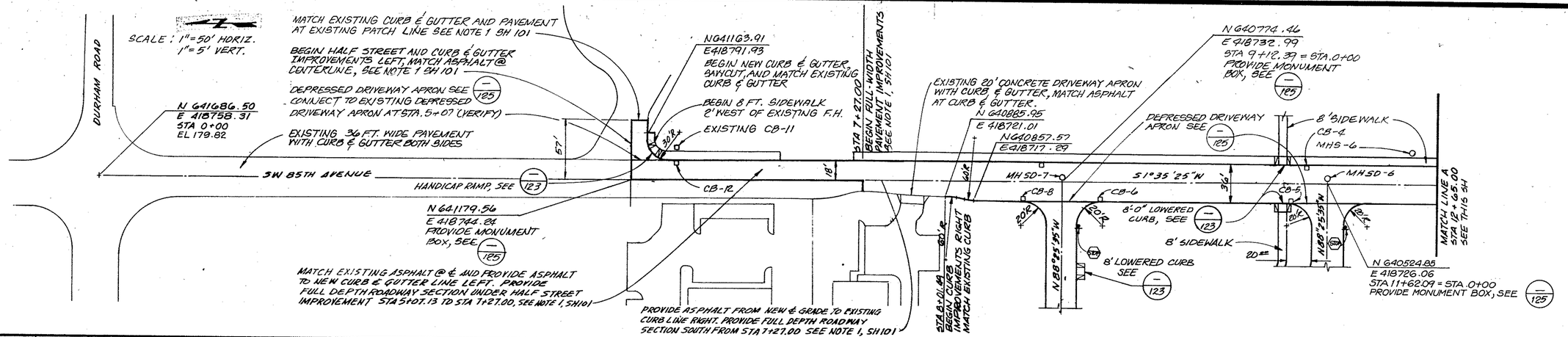
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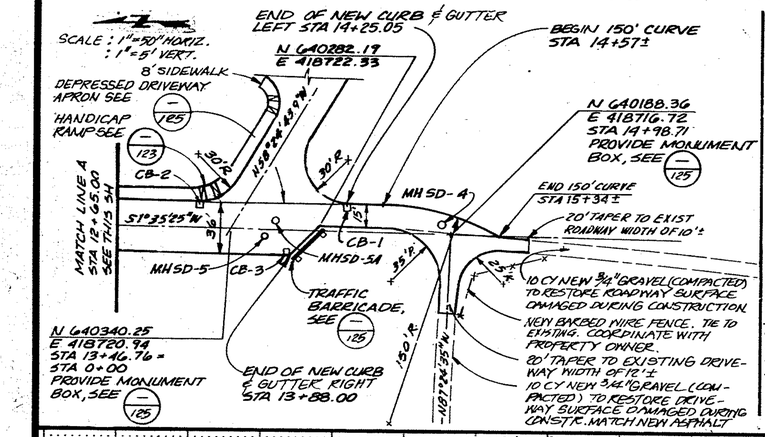
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1	AFA		11-20-92

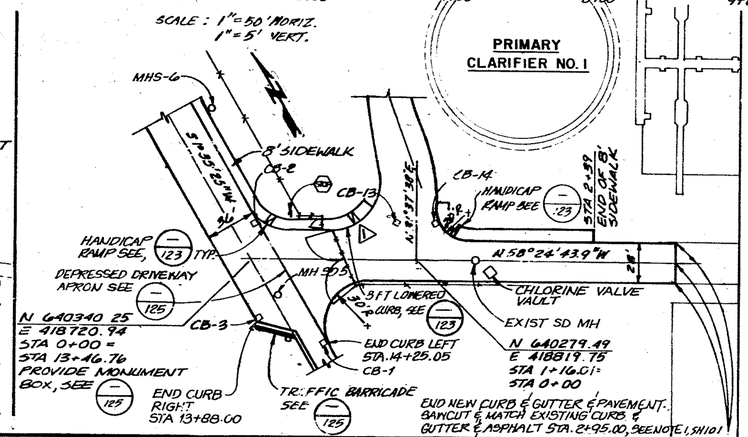
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17 1985 BRUCE R. WILLEY

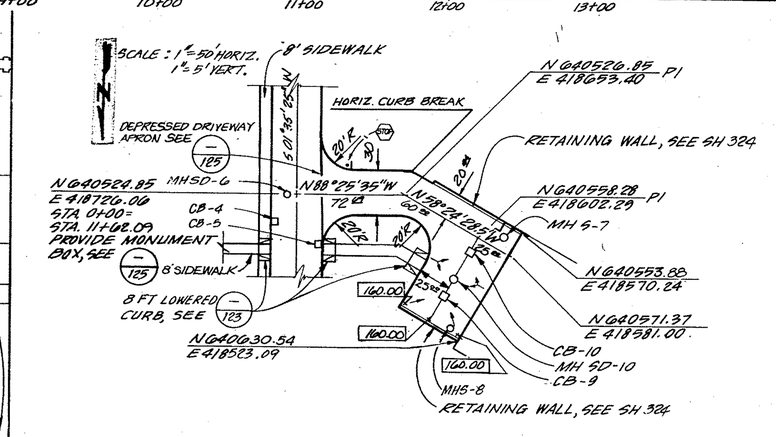
Sheet Number 102

AS RECORDED DRAWINGS









CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

Designed AHK
Drawn MMK
Checked BRW
Approved John E. Ostrock
Date MAY, 1989

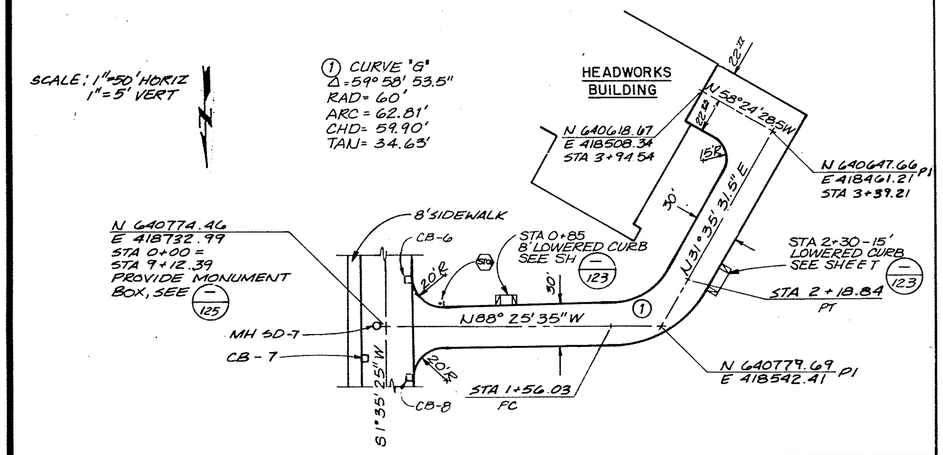
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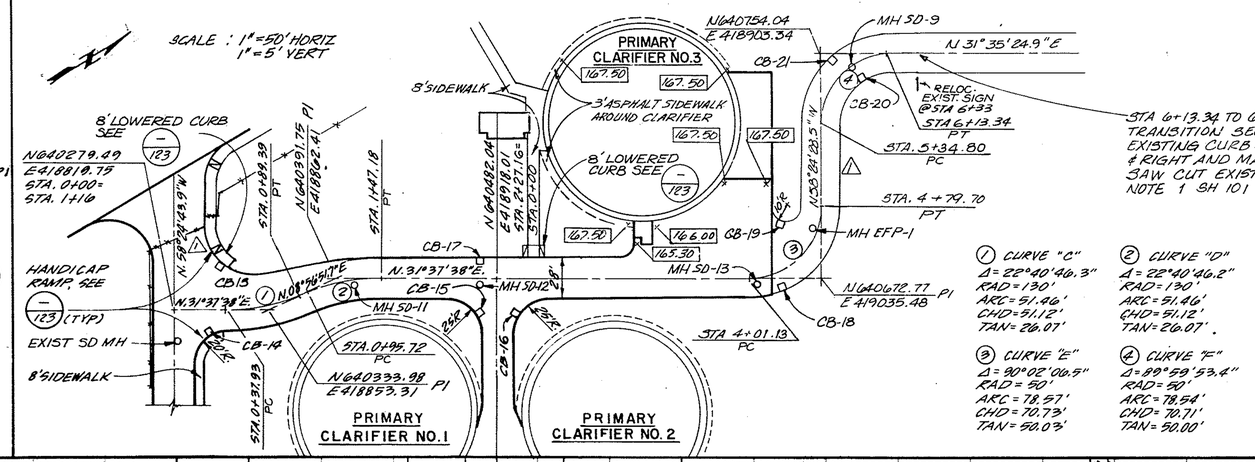
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2	AFA	AS RECORDED DRAWING	11-20-92

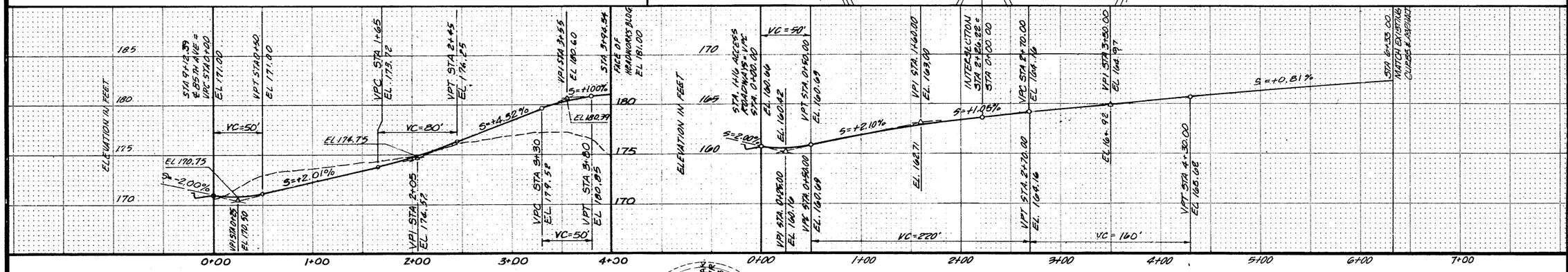
REGISTERED PROFESSIONAL ENGINEER 1991 OREGON JULY 17 1989 BRUCE R. WILKES

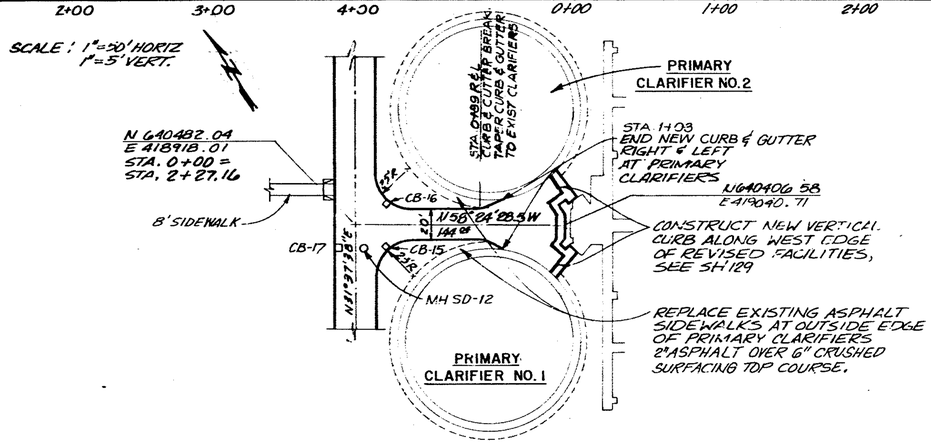
Sheet Number 10

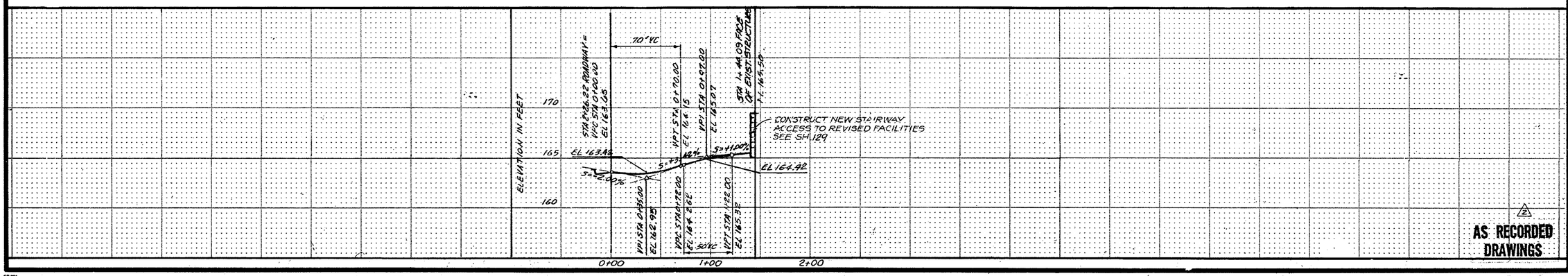
AS RECORDED DRAWINGS











AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PAVING PLAN AND PROFILE

Designed AHK
Drawn SDS
Checked BRW
Approved John E Hodt
Date MAY, 1989

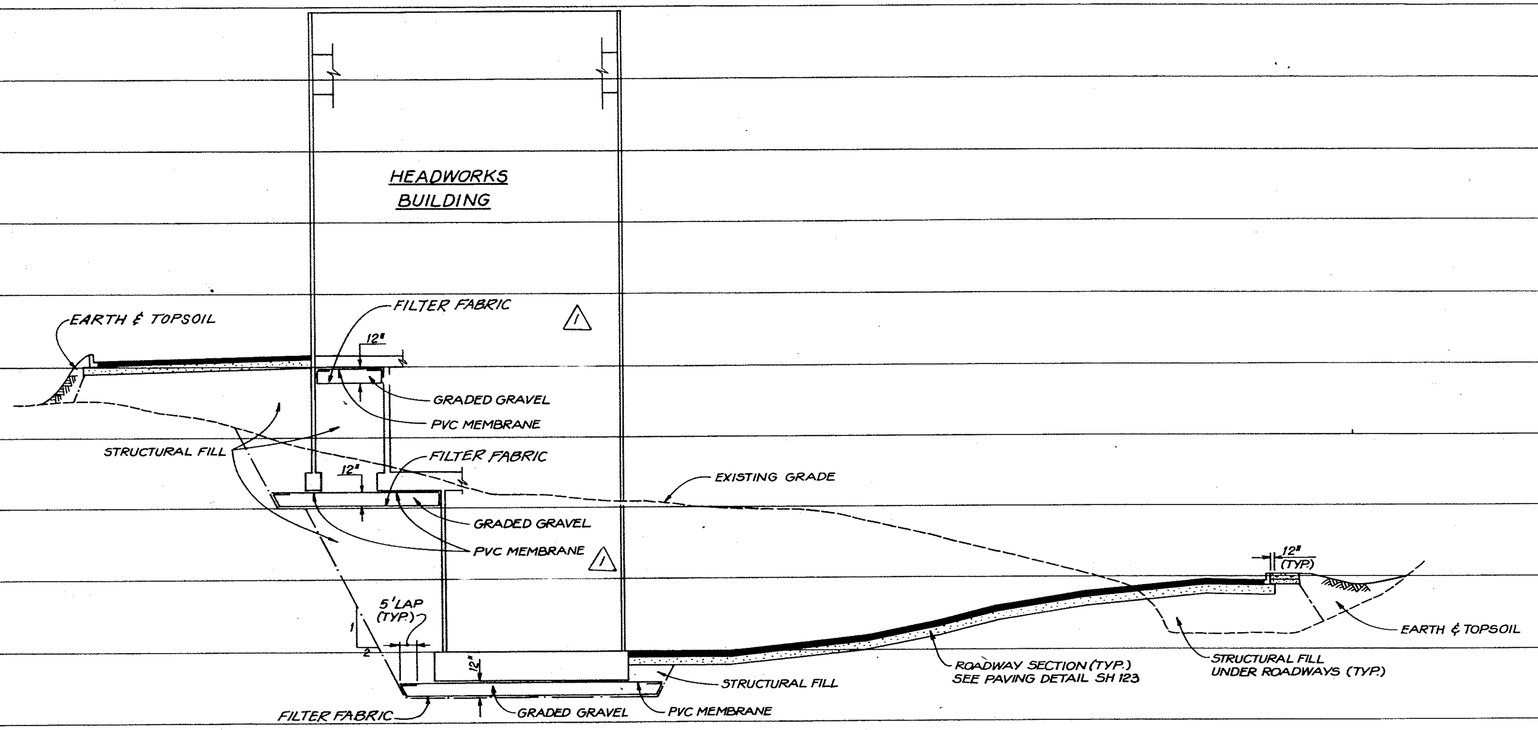
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	AFA	CPE #94,110 AS RECORDED DRAWING	11-20-92
1	AFA		11-20-92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1986 BRUCE R. WILLEY

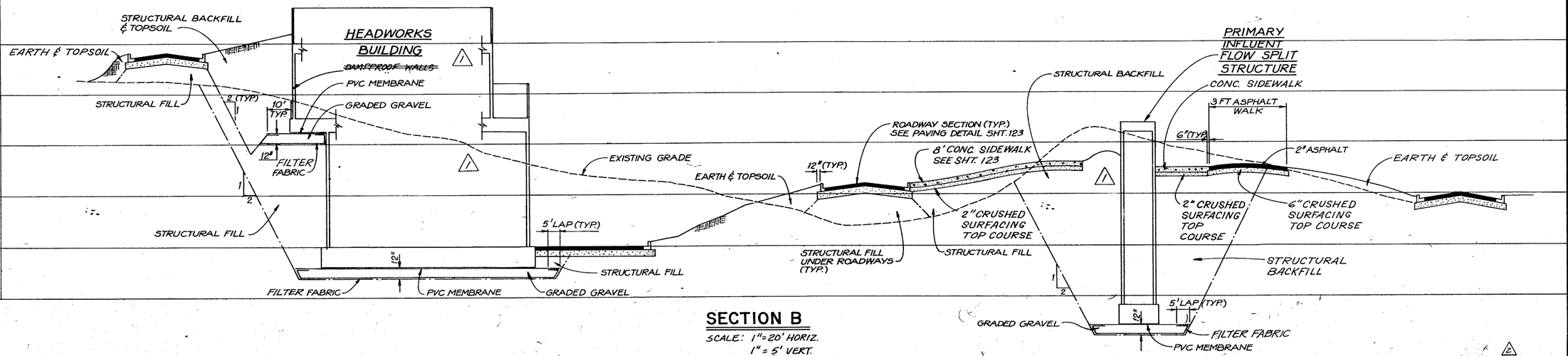
Sheet Number 104

SR 881



SECTION A

SCALE: 1"=20' HORIZ.
1"=5' VERT.
SEE SH 102



SECTION B

SCALE: 1"=20' HORIZ.
1"=5' VERT.
SEE SH 102

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

EXCAVATION SECTION AT HEADWORKS/ PRIMARY CLARIFIER

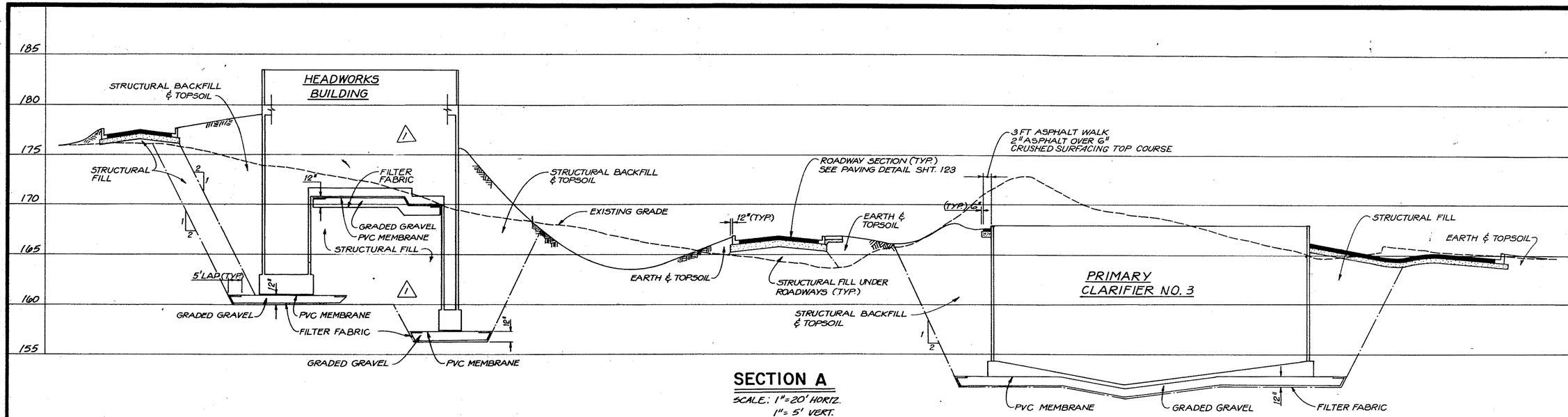
Designed	AHK
Drawn	IKD
Checked	BRW
Approved	John Efford
Date	MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	JEK	ADDENDUM NO. 1	6-27-89
2	AFA	AS RECORDED DRAWING	12/1992

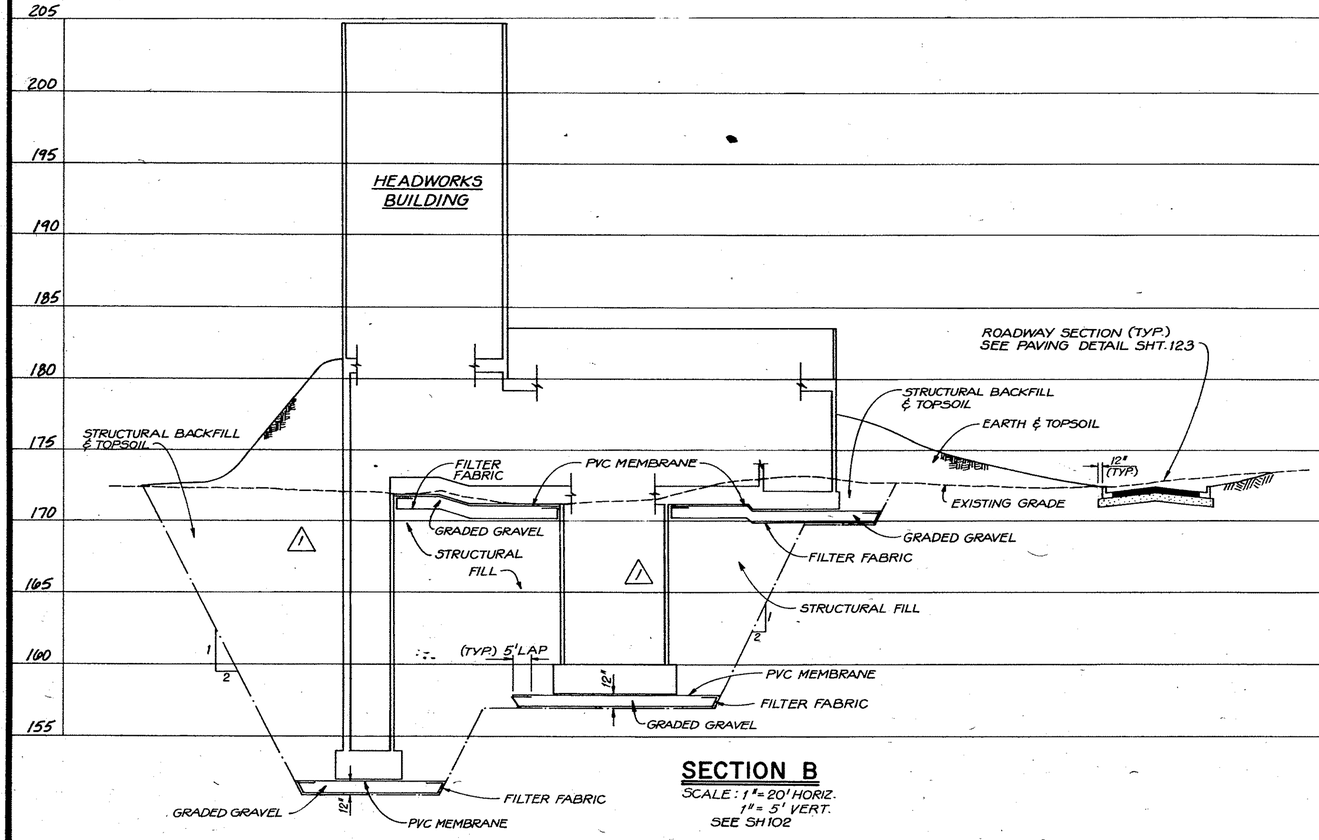
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1986 BRUCE R. WILLEY

Sheet Number 105



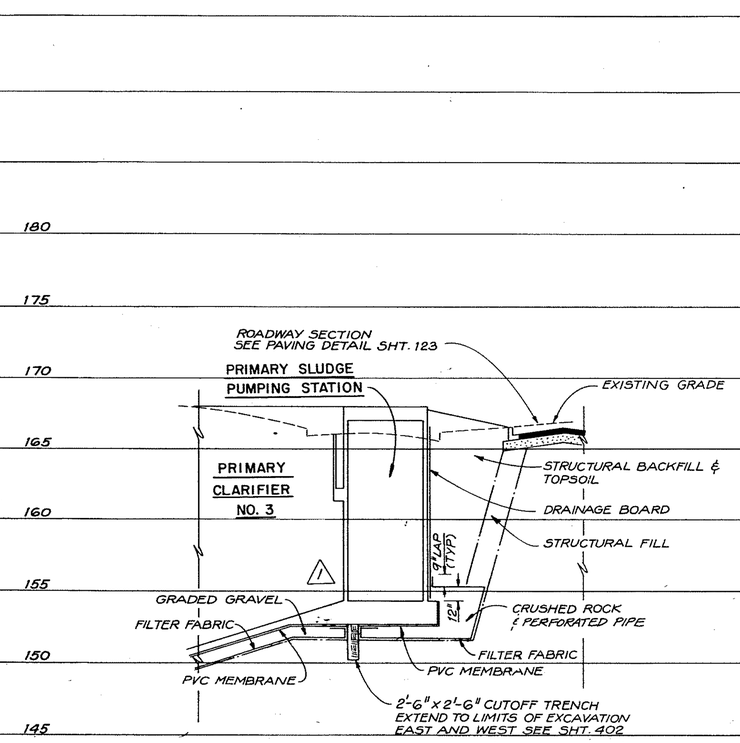
SECTION A

SCALE: 1"=20' HORIZ.
1"= 5' VERT.
SEE SH 102



SECTION B

SCALE: 1"=20' HORIZ.
1"= 5' VERT.
SEE SH 102



SECTION C

SCALE: 1"=20' HORIZ.
1"= 5' VERT.
SEE SH 102

2 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

EXCAVATION SECTION AT HEADWORKS/ PRIMARY CLARIFIER

Designed AHK
Drawn ID
Checked BRW
Approved John E. Hoch
Date MAY, 1989

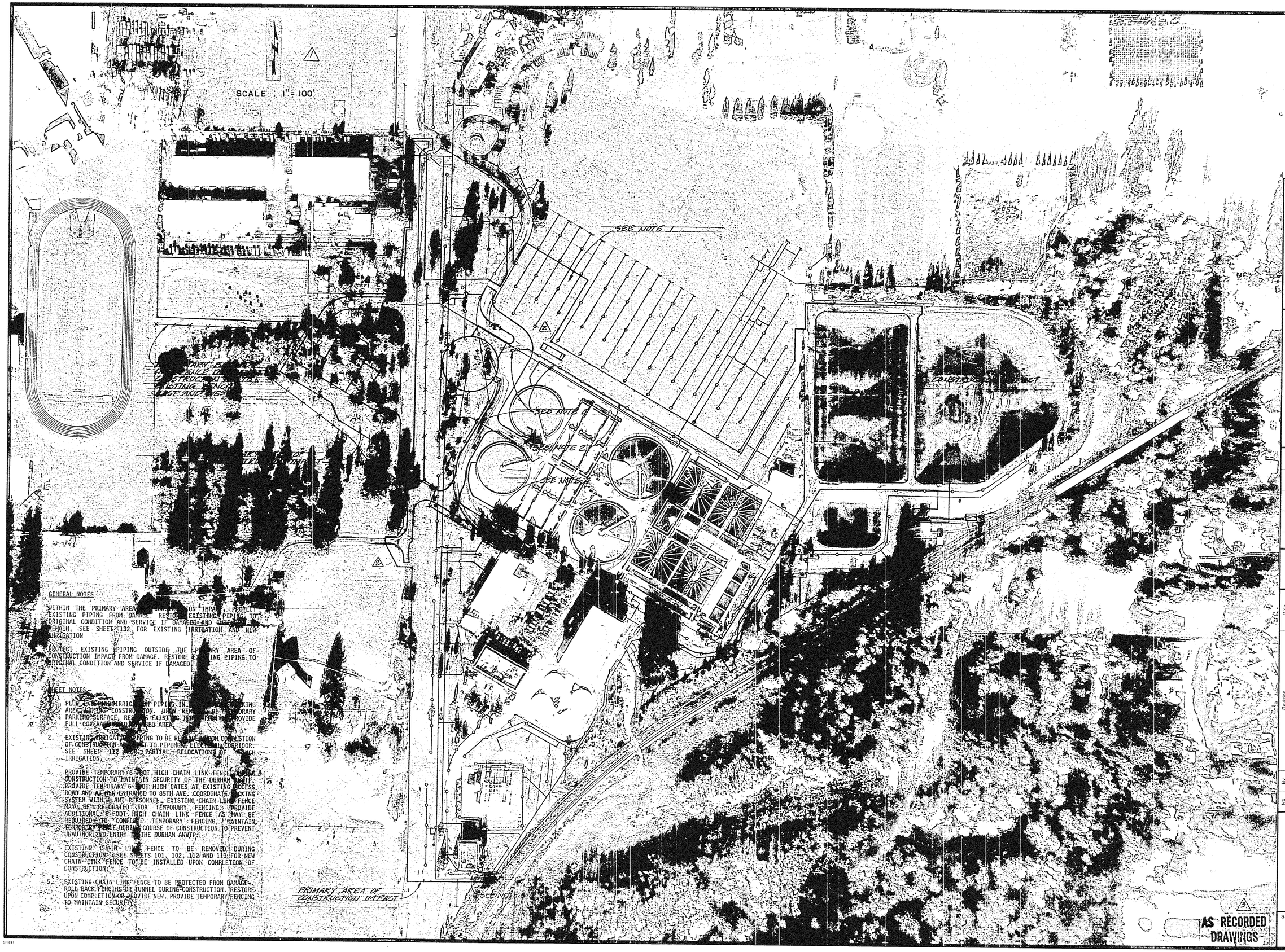
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	JEK	ADDENDUM NO. 1	6-27-89
2	AFA	AS RECORDED DRAWING	12/8/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1986 BRUCE R. WILLEY

Sheet Number 106

SH 904



GENERAL NOTES

WITHIN THE PRIMARY AREA OF CONSTRUCTION IMPACT, PROTECT EXISTING PIPING FROM DAMAGE. RESTORE EXISTING PIPING TO ORIGINAL CONDITION AND SERVICE IF DAMAGED AND INTENDED TO REMAIN. SEE SHEET 132 FOR EXISTING IRRIGATION AND NEW IRRIGATION.

PROTECT EXISTING PIPING OUTSIDE THE PRIMARY AREA OF CONSTRUCTION IMPACT FROM DAMAGE. RESTORE EXISTING PIPING TO ORIGINAL CONDITION AND SERVICE IF DAMAGED.

KEY NOTES

1. PLUG EXISTING IRRIGATION PIPING IN EXISTING PARKING AREA AND IN CONSTRUCTION. UPON REMOVAL OF TEMPORARY PARKING SURFACE, RESTORE EXISTING IRRIGATION TO PROVIDE FULL COVERAGE TO DISTURBED AREA.

2. EXISTING IRRIGATION PIPING TO BE RESTORED UPON COMPLETION OF CONSTRUCTION ADJACENT TO PIPING & ELECTRICAL CORRIDOR. SEE SHEET 112 FOR PARTIAL RELOCATION OF EXISTING IRRIGATION.

3. PROVIDE TEMPORARY 6-FOOT HIGH CHAIN LINK FENCE DURING CONSTRUCTION TO MAINTAIN SECURITY OF THE DURHAM AWWTP. PROVIDE TEMPORARY 6-FOOT HIGH GATES AT EXISTING ACCESS ROAD AND AT NEW ENTRANCE TO 85TH AVE. COORDINATE LOCKING SYSTEM WITH PLANT PERSONNEL. EXISTING CHAIN LINK FENCE MAY BE RELOCATED FOR TEMPORARY FENCING. PROVIDE ADDITIONAL 6-FOOT HIGH CHAIN LINK FENCE AS MAY BE REQUIRED TO COMPLETE TEMPORARY FENCING. MAINTAIN TEMPORARY FENCE DURING COURSE OF CONSTRUCTION TO PREVENT UNAUTHORIZED ENTRY TO THE DURHAM AWWTP.

4. EXISTING CHAIN LINK FENCE TO BE REMOVED DURING CONSTRUCTION. SEE SHEETS 101, 102, 112 AND 113 FOR NEW CHAIN LINK FENCE TO BE INSTALLED UPON COMPLETION OF CONSTRUCTION.

5. EXISTING CHAIN LINK FENCE TO BE PROTECTED FROM DAMAGE. ROLL BACK FENCING OR TUNNEL DURING CONSTRUCTION. RESTORE UPON COMPLETION OR PROVIDE NEW. PROVIDE TEMPORARY FENCING TO MAINTAIN SECURITY.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

DEMOLITION-IRRIGATION, FENCING AND TEMPORARY FENCING

Designed: AHK, DKT
Drawn: LLB
Checked: BRW
Approved: John E. Ekdahl
Date: MAY, 1989

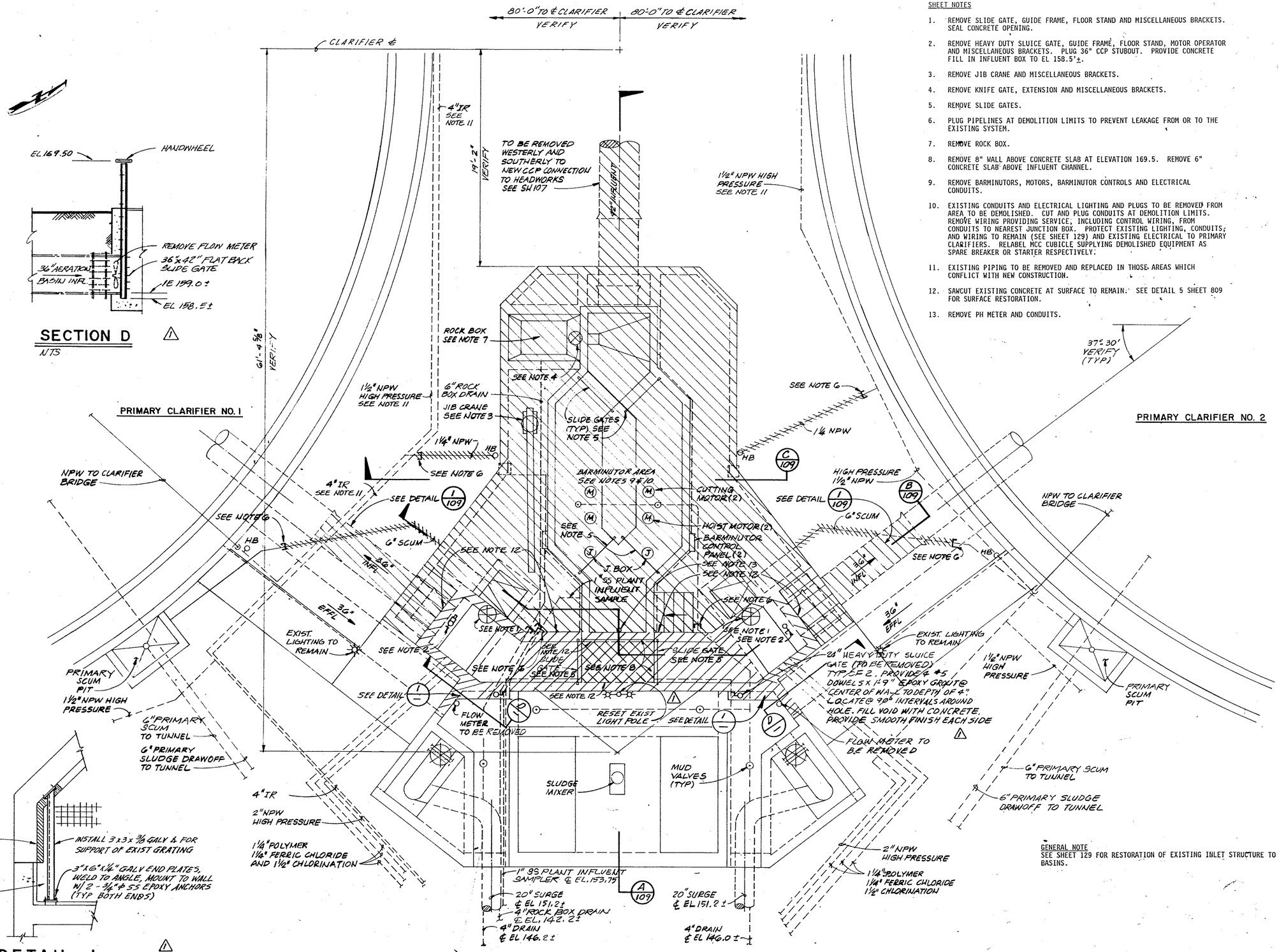
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	JEK	ADDENDUM NO. 1	6-27-89
2	AFA	CPR #49 & CPR #25	12/8/92
3	AFA	AS RECORDED DRAWING	12/8/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JUN 17 1985 BRUCE R. WILLEY

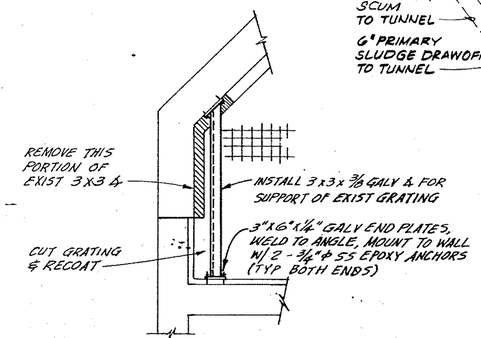
Sheet Number: 107

SR 691



SECTION D

NTS



DETAIL 1

NTS

GRATING MODIFICATIONS FOR INSTALLATION OF SLIDE GATES. PRIMARY CLARIFIER NO.1 SIDE, PRIMARY CLARIFIER NO.2 SIDE MIRROR IMAGE.

SHEET NOTES

1. REMOVE SLIDE GATE, GUIDE FRAME, FLOOR STAND AND MISCELLANEOUS BRACKETS. SEAL CONCRETE OPENING.
2. REMOVE HEAVY DUTY SLUICE GATE, GUIDE FRAME, FLOOR STAND, MOTOR OPERATOR AND MISCELLANEOUS BRACKETS. PLUG 36" CCP STUBOUT. PROVIDE CONCRETE FILL IN INFLUENT BOX TO EL 158.5'±.
3. REMOVE JIB CRANE AND MISCELLANEOUS BRACKETS.
4. REMOVE KNIFE GATE, EXTENSION AND MISCELLANEOUS BRACKETS.
5. REMOVE SLIDE GATES.
6. PLUG PIPELINES AT DEMOLITION LIMITS TO PREVENT LEAKAGE FROM OR TO THE EXISTING SYSTEM.
7. REMOVE ROCK BOX.
8. REMOVE 8" WALL ABOVE CONCRETE SLAB AT ELEVATION 169.5. REMOVE 6" CONCRETE SLAB ABOVE INFLUENT CHANNEL.
9. REMOVE BARMINUTORS, MOTORS, BARMINUTOR CONTROLS AND ELECTRICAL CONDUITS.
10. EXISTING CONDUITS AND ELECTRICAL LIGHTING AND PLUGS TO BE REMOVED FROM AREA TO BE DEMOLISHED. CUT AND PLUG CONDUITS AT DEMOLITION LIMITS. REMOVE WIRING PROVIDING SERVICE, INCLUDING CONTROL WIRING, FROM CONDUITS TO NEAREST JUNCTION BOX. PROTECT EXISTING LIGHTING, CONDUITS, AND WIRING TO REMAIN (SEE SHEET 129) AND EXISTING ELECTRICAL TO PRIMARY CLARIFIERS. RELABEL MCC CUBICLE SUPPLYING DEMOLISHED EQUIPMENT AS SPARE BREAKER OR STARTER RESPECTIVELY.
11. EXISTING PIPING TO BE REMOVED AND REPLACED IN THOSE AREAS WHICH CONFLICT WITH NEW CONSTRUCTION.
12. SAWCUT EXISTING CONCRETE AT SURFACE TO REMAIN. SEE DETAIL 5 SHEET 809 FOR SURFACE RESTORATION.
13. REMOVE PH METER AND CONDUITS.

GENERAL NOTE

SEE SHEET 129 FOR RESTORATION OF EXISTING INLET STRUCTURE TO AERATION BASINS.

SCALE: 1/4"=1'-0"

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

DEMOLITION - EXISTING HEADWORKS

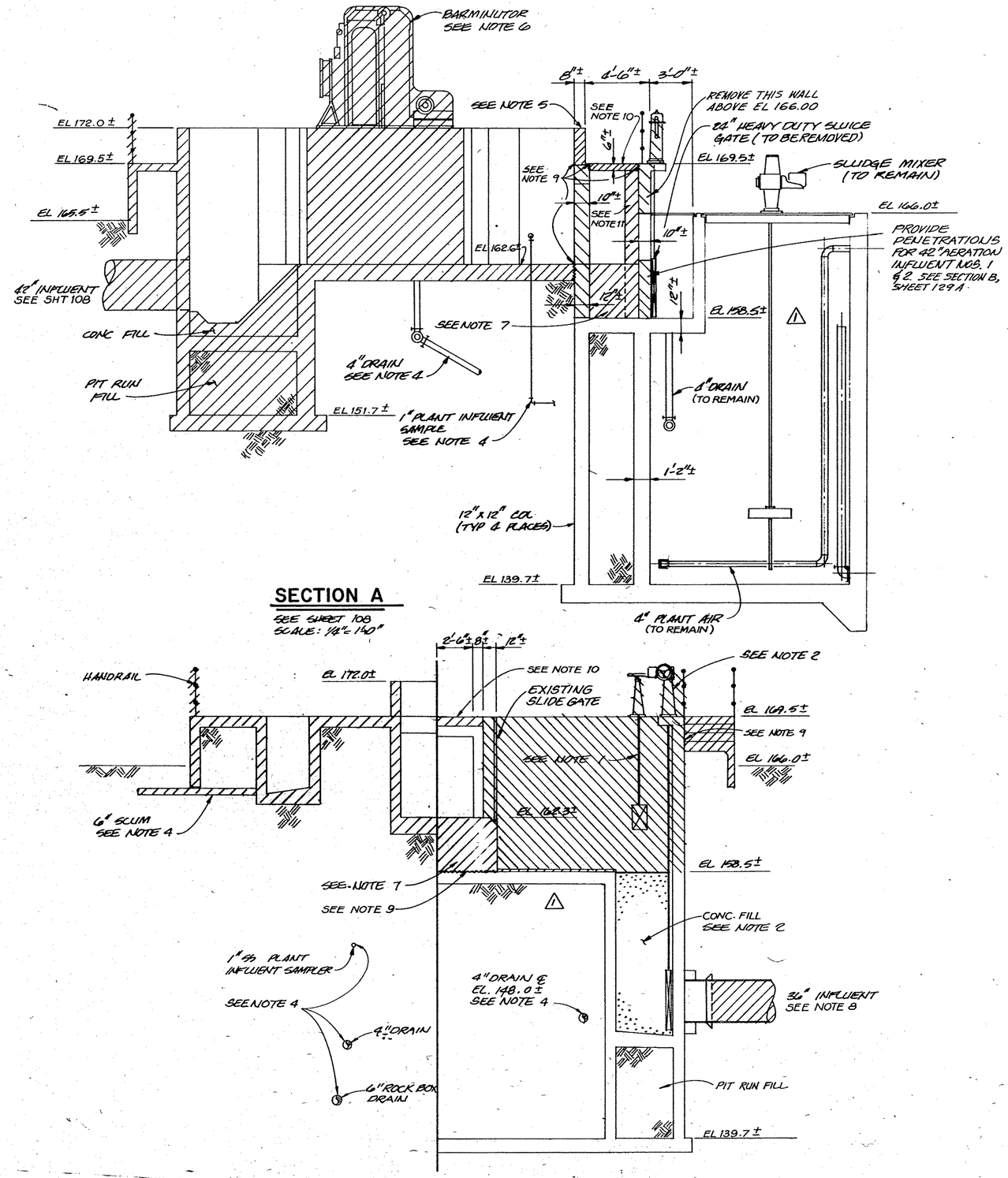
Designed AHK
Drawn RKB
Checked BRW
Approved John E. Kroll
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	AFA	AS RECORDED DRAWING CPR - 25	12/8/92
1			3/15/90

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1985 BRUCE R. WILLEY

Sheet Number 108



SECTION A

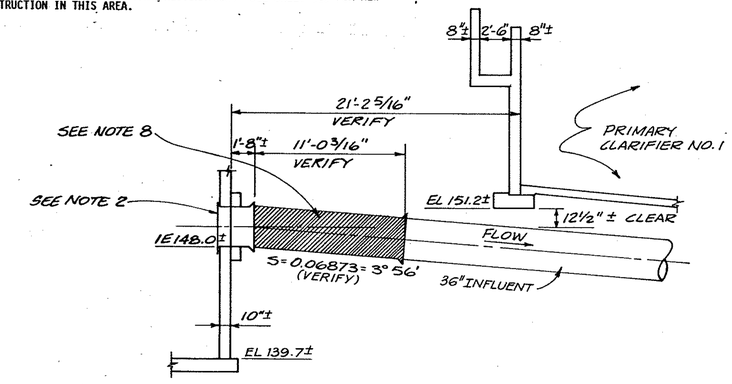
SEE SHEET 108
SCALE: 1/4"=1'-0"

SECTION B

SEE SHEET 108
SCALE: 1/4"=1'-0"

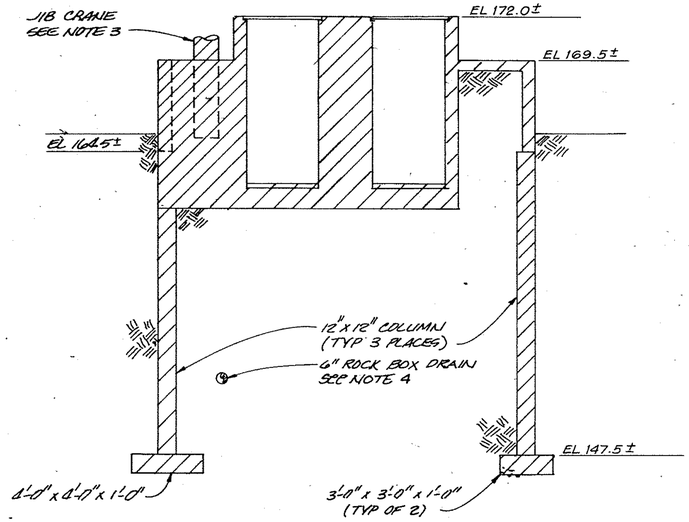
SHEET NOTES

1. REMOVE SLIDE GATE, GUIDE FRAME, FLOOR STAND AND MISCELLANEOUS BRACKETS. SEAL CONCRETE OPENING.
2. REMOVE HEAVY DUTY SLUICE GATE, GUIDE FRAME, FLOOR STAND, MOTOR OPERATOR AND MISCELLANEOUS BRACKETS. PLUG 36" CCP STUBOUT. PROVIDE CONCRETE FILL IN INFLUENT BOX TO EL 158.5 ±.
3. REMOVE JIB CRANE AND MISCELLANEOUS BRACKETS INCLUDING ELECTRICAL.
4. PLUG PIPELINES TO BE ABANDONED IN-PLACE WITH CONCRETE PLUG AT DEMOLITION LIMITS.
5. REMOVE 8" WALL ABOVE CONCRETE SLAB AT ELEVATION 169.5. SEE DETAIL 5 SHEET 809 FOR SURFACE RESTORATION.
6. REMOVE BARMINUTORS AND MOTORS.
7. EXISTING CONCRETE TO BE REMOVED FROM CHANNEL. SEE DETAIL 5 SHEET 809 FOR SURFACE RESTORATION. REMOVE CHANNEL GROUT TO ELEV 158.50.
8. DEMOLISH AND REMOVE EXISTING 36" CCP. PROTECT DOWNSTREAM BELL JOINT FROM DAMAGE DURING DEMOLITION FOR CONNECTION OF NEW 36" CCP. SEE SHEET 108 FOR EXISTING HEADWORKS DEMOLITION.
9. SAWCUT EXISTING CONCRETE AT SURFACE TO REMAIN (TYPICAL). SEE DETAIL 5 SHEET 809 FOR SURFACE RESTORATION.
10. REMOVE 6" CONCRETE SLAB ABOVE INFLUENT CHANNEL.
11. EXISTING CONCRETE FILLET TO BE REMOVED FROM BACK CHANNEL WALL. SEE DETAIL 5 SHEET 809 FOR SURFACE RESTORATION. SEE SHEET 129 FOR NEW CONSTRUCTION IN THIS AREA.



DETAIL 1

SCALE: 3/16"=1'-0"
SEE SH 108



SECTION C

SEE SHEET 108
SCALE: 1/4"=1'-0"

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

DEMOLITION-EXISTING HEADWORKS SECTIONS

Designed: AHK, DKT
Drawn: JW
Checked: BRW
Approved: John E. Hyde
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	AFA	AS RECORDED DRAWING	12/19/92
1		C.P.P. - 25	3/15/90

REGISTERED PROFESSIONAL ENGINEER 13291 OREGON JULY 17 1985 BRUCE R. WILLEY

AS RECORDED DRAWINGS

Sheet Number: 109

E. 1,418,500 E. 1,418,750 E. 1,419,000 E. 1,419,250 E. 1,419,500 E. 1,419,750

N. 641,750 N. 641,500 N. 641,250 N. 641,000

GENERAL NOTES

IRRIGATION PIPELINES, LATERALS AND SPRINKLER CONNECTIONS LESS THAN 3-INCH ARE NOT SHOWN. THE CONTRACTOR IS TO REMOVE AND REPLACE IRRIGATION PIPELINES, LATERALS AND SPRINKLER CONNECTIONS. SEE SHEETS 107 AND 132.

ELECTRICAL AND COMMUNICATION CONDUITS AND VAULTS ARE NOT SHOWN ON THIS SHEET. SEE SHEETS 902 AND 903 FOR ELECTRICAL AND COMMUNICATION WORK.

8 FOOT SIDEWALK NOT SHOWN THIS SHEET. SEE SHEETS 101 AND 102.

N#32 N#25 N#20

EXISTING OVERHEAD UTILITIES (TYP) SEE SH 101 & 102

WATER QUALITY LAB

EXISTING 36'-0" PAVEMENT W/CURB & GUTTER BOTH SIDES

1½ CITY WATER

EXIST. SAN. MH

6" SAN

4" SA

IRRIGATION VALVE BOX TO HIGH SCHOOL

EXIST. SD MH

PROTECT EXIST. IRRIGATION VAULTS FROM DAMAGE

CB-12
10" SD (EAST)
OUT = IE 168.50

8" IR

10" SD

CB-11 (EXISTING) RAISE EXISTING CATCHBASIN FRAME & GRATE TO ELEV. 171.3 CONNECT NEW 10" SD FROM CB-12 TO EXISTING CB-11
IN = IE 168.00

NEW 30 FOOT ACCESS ROADWAY TO DURHAM ELEMENTARY SCHOOL CONSTRUCTED BY OTHERS. NOT IN THIS CONTRACT. SEE NOTE 2 SH. 101

EXISTING PLANT ENTRY DRIVE

12" SD

6" SAN

18" SAN & 8" CITY WATER

12" IA & 6" SA

4" IR

2"NG BY OTHERS. COORDINATE WITH NORTHWEST NATURAL GAS COMPANY

175 MATCH LINE, SEE SH 111

SCALE: 1" = 50'

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

YARD PIPING - NORTH AREA

Designed AHK
Drawn CWA
Checked BRW
Approved John E. Kock
Date MAY, 1989

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No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/6/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1986 BRUCE R. WILLEY

Sheet Number 110

SR 691

GENERAL NOTES

IRRIGATION PIPELINES, LATERALS AND SPRINKLER CONNECTIONS LESS THAN 3-INCH ARE NOT SHOWN. THE CONTRACTOR IS TO REMOVE AND REPLACE IRRIGATION PIPELINES, LATERALS AND SPRINKLER CONNECTIONS. SEE SHEETS 107 AND 132.

NEW NATURAL GAS SERVICE, NEW WATER SERVICE AND OTHER NEW MISC. PIPELINES 2 1/2-INCH AND SMALLER ARE NOT SHOWN ON THIS SHEET. SEE SHEETS 114 AND 115 FOR EXPANDED PLAN AT THE HEADWORKS AND PRIMARY CLARIFIER NO. 3.

ELECTRICAL AND COMMUNICATION CONDUITS AND VAULTS ARE NOT SHOWN ON THIS SHEET. SEE SHEETS 902 AND 903 FOR ELECTRICAL AND COMMUNICATION WORK.

8 FOOT SIDEWALK NOT SHOWN THIS SHEET. SEE SHEETS 101 AND 102.

SHEET NOTES

1. EXISTING STRUCTURE TO BE DEMOLISHED. SEE SHEET 102. EXISTING SANITARY, WATER, GAS, ELECTRICITY, AND OTHER UTILITIES TO BE ABANDONED. REMOVE EXISTING ON-SITE UTILITIES TO PROPERTY LINE. PLUG SANITARY AT PROPERTY LINE WITH CONCRETE. COORDINATE ABANDONMENT OF OTHER UTILITIES WITH LOCAL UTILITY COMPANIES.

2. EXISTING SANITARY TO PROPERTY WHICH IS NOT IN USE IS TO BE ABANDONED IN-PLACE. PLUG SANITARY AT CROSSING LOCATIONS WITH CONCRETE.

3. EXISTING SANITARY AND WATER SERVICE TO PROPERTY OWNED BY OTHERS TO REMAIN IN SERVICE. PROTECT EXISTING SERVICES FROM DAMAGE. COORDINATE WITH LOCAL UTILITY COMPANIES. RECONNECT 6-INCH SAN TO NEW SANITARY SEWER.

4. THE EXISTING 8-INCH FIRE LINE IS TO REMAIN IN SERVICE AT ALL TIMES.

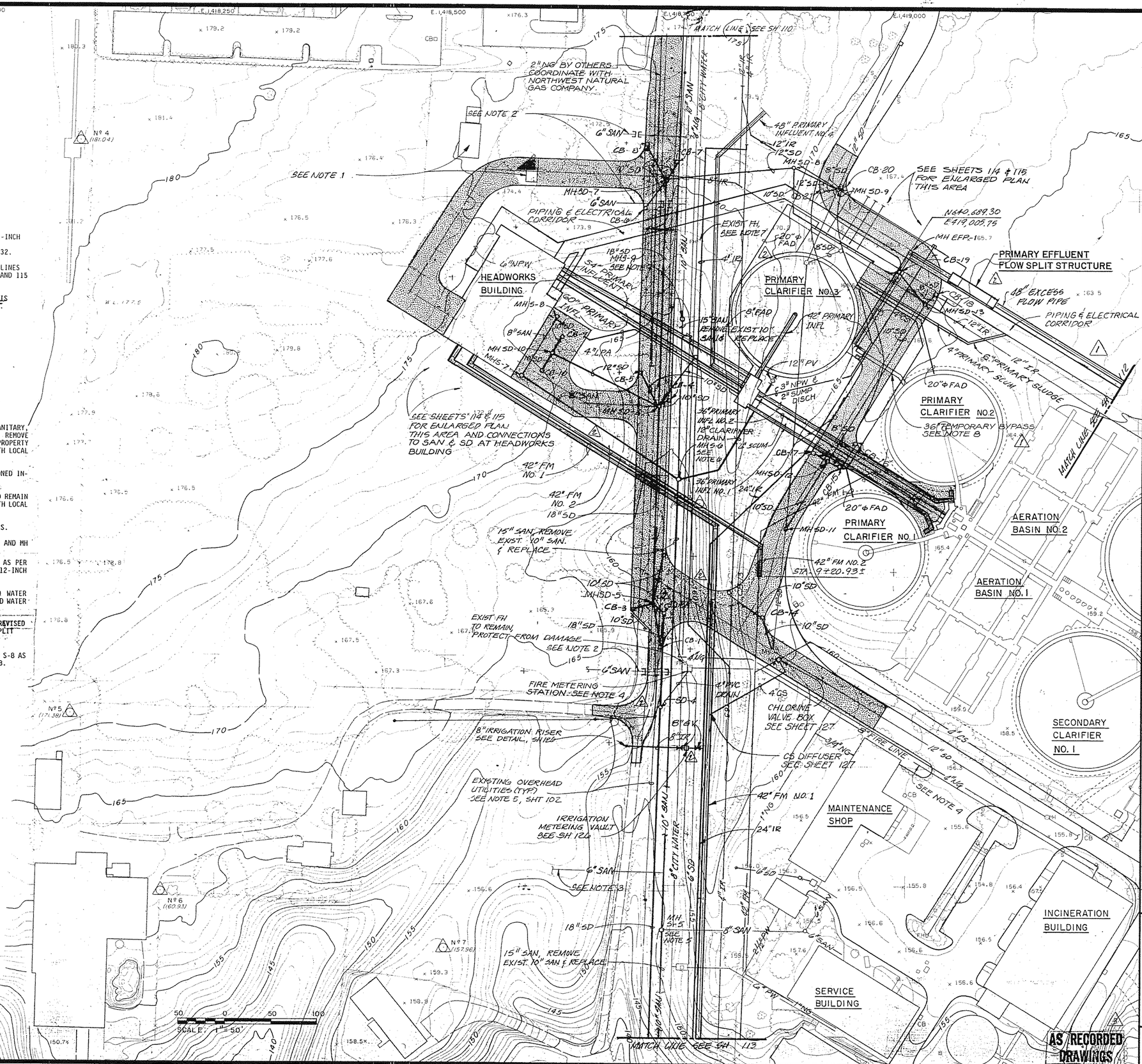
5. REMOVE EXISTING SAN MH AND 10-INCH SAN. INSTALL NEW 15-INCH SAN AND MH S-5 AS PER REVISED GRADE. RECONNECT EXIST 8-INCH SANITARY.

6. REMOVE EXISTING 10-INCH SAN. INSTALL NEW 15-INCH SAN AND MH S-6 AS PER REVISED GRADE. INSTALL NEW 8-INCH SAN TO HEADWORKS STRUCTURE AND 12-INCH CLARIFIER DRAIN TO PRIMARY CLARIFIER NO. 3.

7. EXISTING FIRE HYDRANT TO BE REPLACED. COORDINATE WITH TIGARD WATER DISTRICT. UNIFIED SEWERAGE AGENCY TO PAY ALL DIRECT COSTS OF TIGARD WATER DISTRICT.

8. PROVIDE 36-INCH TEMPORARY BYPASS DURING PHASE B CONSTRUCTION. SEE REVISED SHEET 406 AND SHEET 416 FOR CONNECTIONS AT PRIMARY EFFLUENT FLOW SPLIT STRUCTURE AND AT PRIMARY CLARIFIER NO. 2.

9. REMOVE EXISTING 10-INCH SAN SOUTH. INSTALL NEW 15-INCH SAN AND MH S-8 AS PER REVISED GRADE. RECONNECT EXISTING 10-INCH SAN NORTH TO MH S-8.



CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

YARD PIPING - WEST AREA

Designed AHK, DKT
Drawn CWA
Checked BRW
Approved John E. Koch
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1		RELOCATED 48"ø EFF. & MH S-7	2-14-90
2		2 NO. REVISED PRI. EFF. FLOW SPLIT STRUC. & RELOCATED 36" TEMP BYPASS	12/18/92
3	AFA	CPR #1, 4, 30, 43, 44, 81, 82, 94, 16, 22, 25	12/18/92
4	AFA	AS RECORDED DRAWING	12/18/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1985 BRUCE R. WILLEY

AS RECORDED DRAWINGS

Sheet Number 111

SR 891

SHEET NOTES

1. REMOVE EXISTING 12-INCH IRRIGATION FROM TUNNEL TO 90° ELL. CONSTRUCT NEW 12-INCH IRRIGATION IN PIPING & ELECTRICAL CORRIDOR ALIGNMENT. RECONNECT 12-INCH IRRIGATION AT EXTERIOR WALL OF TUNNEL AND RECONNECT TO 12-INCH AT WEST SIDE OF PIPING & ELECTRICAL CORRIDOR AT 124 FT± (VERIFY) FROM NORTH WALL OF TUNNEL.

2. ROUTE 4-INCH IRRIGATION TO AVOID CONFLICT WITH NEW PIPING & ELECTRICAL CORRIDOR BOTH NORTH AND SOUTH. PROVIDE 2 - 4-INCH GATE VALVES IN IRRIGATION PIPING AS SHOWN. SEE VALVE BOX DETAIL SHEET 124.

3. EXTEND 1 1/2-INCH SAMPLE LINE FROM MHE-1 TO INTERIOR OF LOWER ROOM OF FILTER EFFLUENT PUMP STATION. CORE/3 INCH HOLE IN EXTERIOR WALL OF FILTER EFFLUENT PUMP STATION AT ELEVATION 138.5± PROVIDE ANNULAR SEAL. PROVIDE 1 1/2-INCH PLUG VALVE INSIDE LOWER ROOM OF FILTER EFFLUENT PUMP STATION.

4. EXISTING AERATORS, ANCHOR CABLES AND ELECTRICAL TO BE REMOVED FROM SURGE BASIN NO. 1. SEAL ELECTRICAL CONNECTIONS AT TOP OF EMBANKMENT TO PREVENT MOISTURE FROM ENTERING ELECTRICAL BOX.

5. REPLACE EXISTING CURB AND GUTTER AND SYMMETRICAL GUTTER ALONG 60" EFFLUENT PIPE BETWEEN OUTLET STRUCTURE AND MHE-2 ON WEST SIDE UPON COMPLETION OF PIPELINE INSTALLATION TO EXISTING LINE AND GRADE.

6. REMOVE AND REPLACE IRRIGATION PIPELINES AS REQUIRED FOR INSTALLATION OF 48" EXCESS FLOW PIPE. VERIFY LOCATION.

GENERAL NOTE

IRRIGATION PIPELINES, LATERALS AND SPRINKLER CONNECTIONS LESS THAN 3-INCH ARE NOT SHOWN. THE CONTRACTOR IS TO REMOVE AND REPLACE IRRIGATION PIPELINES, LATERALS AND SPRINKLER CONNECTIONS. SEE SHEET 107.

WARNING

THE 1-INCH DIAMETER LINE CONTAINS CHLORINE LIQUID UNDER PRESSURE. DO NOT PERFORM ANY WORK IN THIS AREA WITHOUT A THOROUGH INVESTIGATION OF THE PIPE'S LOCATION. USE EXTREME CAUTION WHEN WORKING AROUND THIS PIPE.

4" PVC CHLORINE GAS VACUUM LINE

THE TWO 4-INCH LINES ARE CURRENTLY NOT IN SERVICE. THEY ARE TO BE CONVERTED TO SERVICE FOR CONVEYING CHLORINE GAS UNDER VACUUM. AT EACH EXISTING MANHOLE, 4-PLACES, CONNECT FLEXHOSE TO LINE AND TEST.

DETAIL 1
NTS

DETAIL 2
NTS

DETAIL 3
NTS

DETAIL 4
NTS

DETAIL 5
NTS

DETAIL 6
NTS

DETAIL 7
NTS

DETAIL 8
NTS

DETAIL 9
NTS

DETAIL 10
NTS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

YARD PIPING - EAST AREA

Designed AHK
Drawn SDS, MMK
Checked BRW
Approved John E. Kloch
Date MAY, 1989

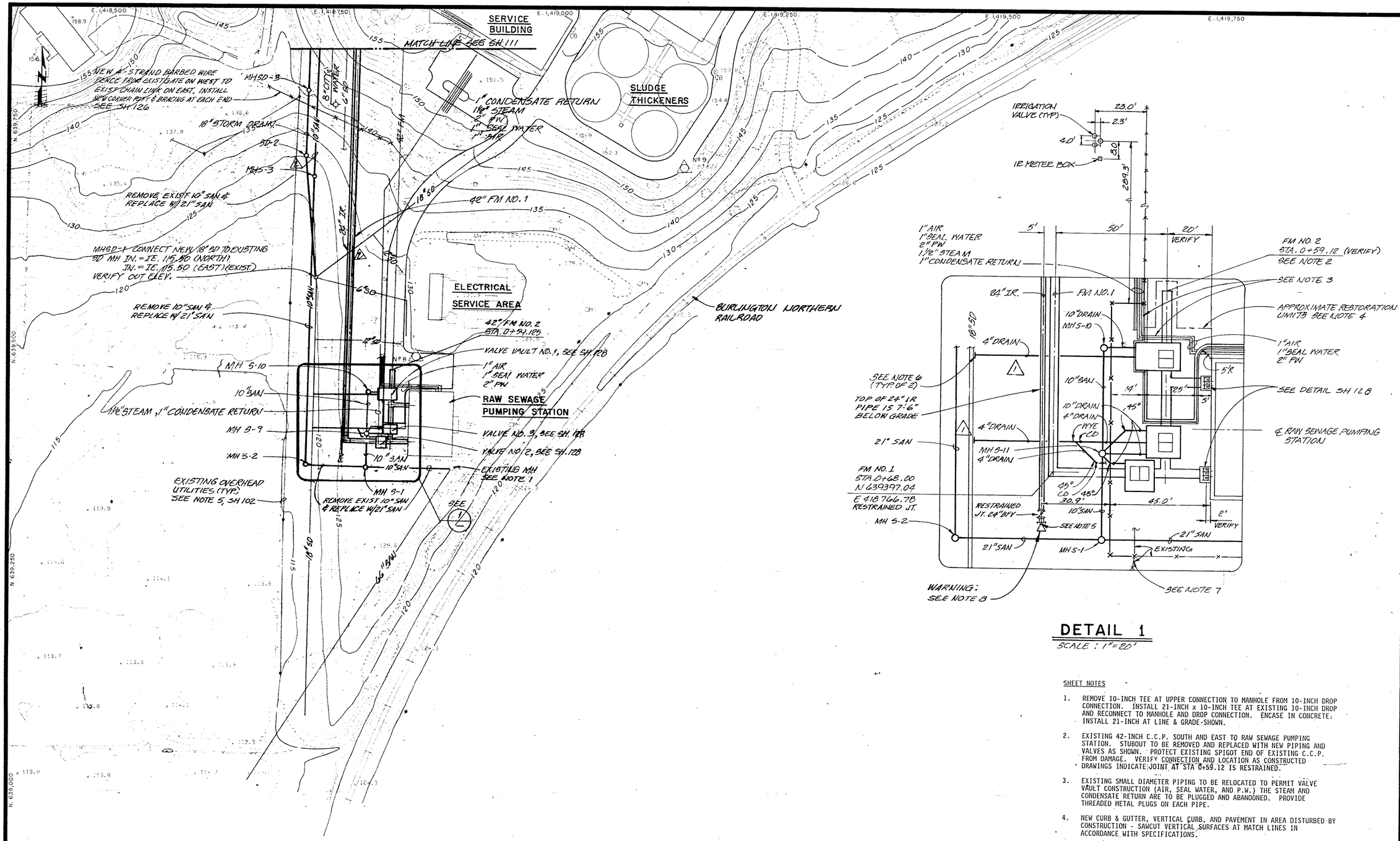
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	VEK	ADDENDUM NO. 1	6-27-89
2	AHA	CPRT-25, 28	3-15-90
3	AHA	CPR # 26, 27	12/6/92
4	AHA	AS RECORDED DRAWING	12/8/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1986 BRUCE R. WILLEY

AS RECORDED DRAWINGS

Sheet Number 112



DETAIL 1

SCALE : 1"=20'

GENERAL NOTE

IRRIGATION PIPELINES, LATERALS AND SPRINKLER CONNECTIONS LESS THAN 3-INCH ARE NOT SHOWN. THE CONTRACTOR IS TO REMOVE AND REPLACE IRRIGATION PIPELINES, LATERALS AND SPRINKLER CONNECTIONS. SEE SHEET 107 AND 132.

SHEET NOTES

1. REMOVE 10-INCH TEE AT UPPER CONNECTION TO MANHOLE FROM 10-INCH DROP CONNECTION. INSTALL 21-INCH x 10-INCH TEE AT EXISTING 10-INCH DROP AND RECONNECT TO MANHOLE AND DROP CONNECTION. ENCASE IN CONCRETE: INSTALL 21-INCH AT LINE & GRADE SHOWN.
2. EXISTING 42-INCH C.C.P. SOUTH AND EAST TO RAW SEWAGE PUMPING STATION. STUBOUT TO BE REMOVED AND REPLACED WITH NEW PIPING AND VALVES AS SHOWN. PROTECT EXISTING SPIGOT END OF EXISTING C.C.P. FROM DAMAGE. VERIFY CONNECTION AND LOCATION AS CONSTRUCTED DRAWINGS INDICATE JOINT AT STA 0+59.12 IS RESTRAINED.
3. EXISTING SMALL DIAMETER PIPING TO BE RELOCATED TO PERMIT VALVE VAULT CONSTRUCTION (AIR, SEAL WATER, AND P.W.) THE STEAM AND CONDENSATE RETURN ARE TO BE PLUGGED AND ABANDONED. PROVIDE THREADED METAL PLUGS ON EACH PIPE.
4. NEW CURB & GUTTER, VERTICAL CURB, AND PAVEMENT IN AREA DISTURBED BY CONSTRUCTION - SAWCUT VERTICAL SURFACES AT MATCH LINES IN ACCORDANCE WITH SPECIFICATIONS.
5. NEW 24-INCH IRRIGATION. INSTALL 24-INCH BFV AND MJ PLUG AT END OF 24-INCH IRRIGATION. RESTRAIN 24-INCH PLUG FROM MOVEMENT PRIOR TO CONNECTING, SHUT OFF IRRIGATION SYSTEM.
6. SADDLE TAP EXISTING 18-INCH STORM DRAIN. VERIFY SD MATERIALS AND LOCATION BEFORE ORDERING TAPPING MATERIAL. 24-INCH CONNECTIONS REQUIRED.
7. THE EXISTING FENCE FROM THE FENCE CORNER SOUTH OF THE PUMPING STATION TO 25 FEET NORTH OF THE PUMPING STATION WILL BE RECONSTRUCTED WITH NEW FENCE 14 FEET WEST OF THE NEW ACCESS ROADWAY. INSTALL CORNER POSTS NORTH AND SOUTH. TIE IN EXISTING FENCING EAST AND NORTH. SEE SHEET 126.
8. PRIOR TO REMOVAL OF EXISTING THRUST BLOCK, THE 24" RE SYSTEM MUST BE SHUT DOWN AND PRESSURE RELIEVED.

50 0 50 100
SCALE: 1"=50'

3 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

YARD PIPING - SOUTH AREA

Designed AHK
Drawn CWA
Checked BRW
Approved John E. Hall
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

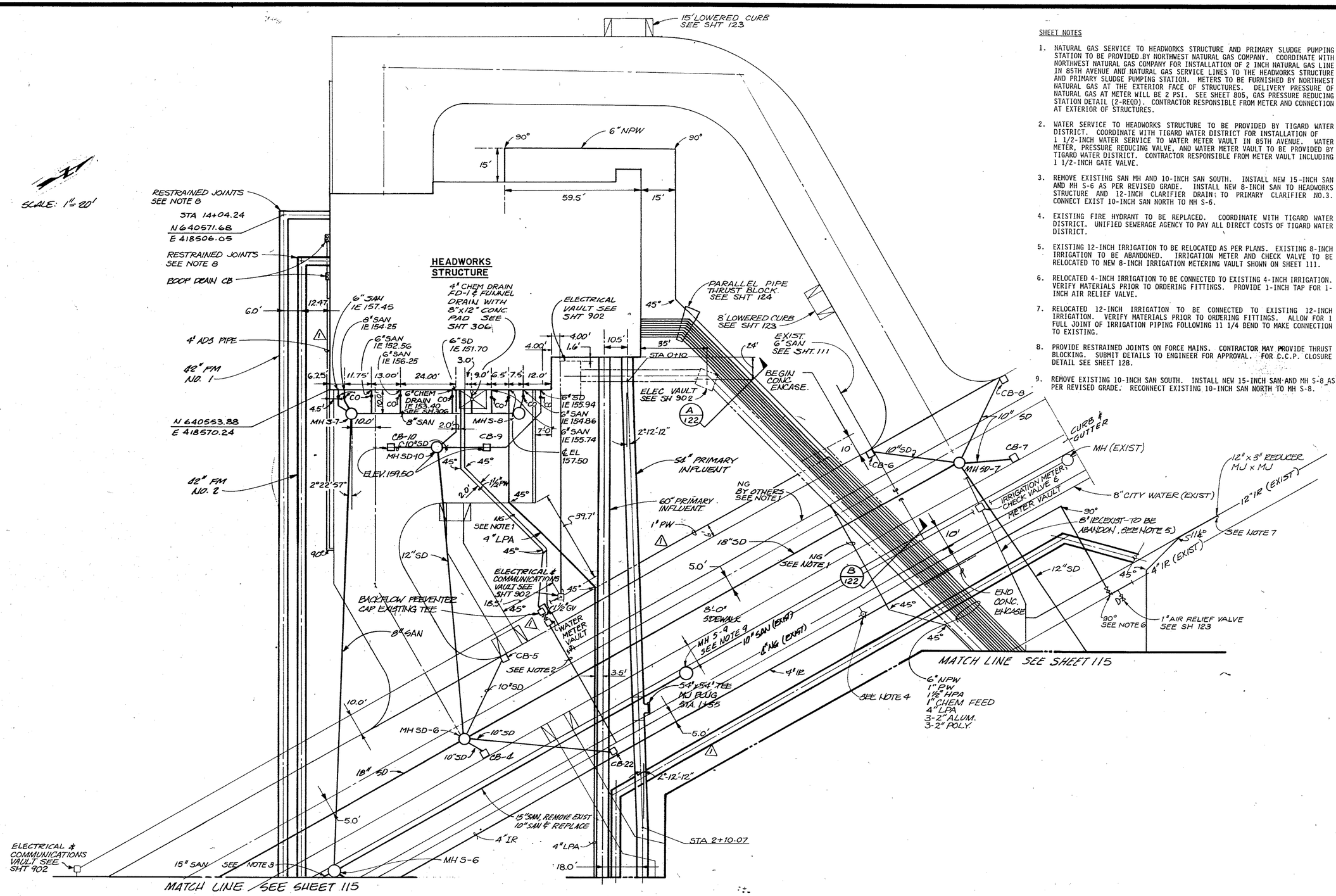
No	By	Revision	Date
1	JEK	ADDENDUM NO. 2	6-30-89
2	AFA	CPZ # 5,135	12/8/92
3	AFA	AS RECORDED DRAWING	12/8/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1985 BRUCE R. WILEY

Sheet Number 113

SR 891

SCALE: 1"=20'



SHEET NOTES

1. NATURAL GAS SERVICE TO HEADWORKS STRUCTURE AND PRIMARY SLUDGE PUMPING STATION TO BE PROVIDED BY NORTHWEST NATURAL GAS COMPANY. COORDINATE WITH NORTHWEST NATURAL GAS COMPANY FOR INSTALLATION OF 2 INCH NATURAL GAS LINE IN 85TH AVENUE AND NATURAL GAS SERVICE LINES TO THE HEADWORKS STRUCTURE AND PRIMARY SLUDGE PUMPING STATION. METERS TO BE FURNISHED BY NORTHWEST NATURAL GAS AT THE EXTERIOR FACE OF STRUCTURES. DELIVERY PRESSURE OF NATURAL GAS AT METER WILL BE 2 PSI. SEE SHEET 805, GAS PRESSURE REDUCING STATION DETAIL (2-REQD). CONTRACTOR RESPONSIBLE FROM METER AND CONNECTION AT EXTERIOR OF STRUCTURES.
2. WATER SERVICE TO HEADWORKS STRUCTURE TO BE PROVIDED BY TIGARD WATER DISTRICT. COORDINATE WITH TIGARD WATER DISTRICT FOR INSTALLATION OF 1 1/2-INCH WATER SERVICE TO WATER METER VAULT IN 85TH AVENUE. WATER METER, PRESSURE REDUCING VALVE, AND WATER METER VAULT TO BE PROVIDED BY TIGARD WATER DISTRICT. CONTRACTOR RESPONSIBLE FROM METER VAULT INCLUDING 1 1/2-INCH GATE VALVE.
3. REMOVE EXISTING SAN MH AND 10-INCH SAN SOUTH. INSTALL NEW 15-INCH SAN AND MH S-6 AS PER REVISED GRADE. INSTALL NEW 8-INCH SAN TO HEADWORKS STRUCTURE AND 12-INCH CLARIFIER DRAIN TO PRIMARY CLARIFIER NO.3. CONNECT EXIST 10-INCH SAN NORTH TO MH S-6.
4. EXISTING FIRE HYDRANT TO BE REPLACED. COORDINATE WITH TIGARD WATER DISTRICT. UNIFIED SEWERAGE AGENCY TO PAY ALL DIRECT COSTS OF TIGARD WATER DISTRICT.
5. EXISTING 12-INCH IRRIGATION TO BE RELOCATED AS PER PLANS. EXISTING 8-INCH IRRIGATION TO BE ABANDONED. IRRIGATION METER AND CHECK VALVE TO BE RELOCATED TO NEW 8-INCH IRRIGATION METERING VAULT SHOWN ON SHEET 111.
6. RELOCATED 4-INCH IRRIGATION TO BE CONNECTED TO EXISTING 4-INCH IRRIGATION. VERIFY MATERIALS PRIOR TO ORDERING FITTINGS. PROVIDE 1-INCH TAP FOR 1-INCH AIR RELIEF VALVE.
7. RELOCATED 12-INCH IRRIGATION TO BE CONNECTED TO EXISTING 12-INCH IRRIGATION. VERIFY MATERIALS PRIOR TO ORDERING FITTINGS. ALLOW FOR 1 FULL JOINT OF IRRIGATION PIPING FOLLOWING 11 1/4 BEND TO MAKE CONNECTION TO EXISTING.
8. PROVIDE RESTRAINED JOINTS ON FORCE MAINS. CONTRACTOR MAY PROVIDE THRUST BLOCKING. SUBMIT DETAILS TO ENGINEER FOR APPROVAL. FOR C.C.P. CLOSURE DETAIL SEE SHEET 128.
9. REMOVE EXISTING 10-INCH SAN SOUTH. INSTALL NEW 15-INCH SAN AND MH S-8 AS PER REVISED GRADE. RECONNECT EXISTING 10-INCH SAN NORTH TO MH S-8.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

YARD PIPING-EXPANDED PLAN AT HEADWORKS

Designed: AHK, DKT
Drawn: SDS
Checked: BRW
Approved: John E. Hoch
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	CO#2 # 29, 44, 85	12/18/92
2	AFA	AS RECORDED DRAWING	12/18/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1986 BRUCE R. WILLEY

Sheet Number: 114

SHEET NOTES

1. RELOCATED 4-INCH IRRIGATION TO BE CONNECTED TO EXISTING 4-INCH IRRIGATION. VERIFY MATERIALS PRIOR TO ORDERING FITTINGS. PROVIDE 1-INCH TAP FOR 1-INCH AIR RELIEF VALVE.

2. THE EXISTING CS MH IS TO BE REMOVED AND REPLACED. SEE SHEET 127. EXISTING MH CONSISTS OF ECCENTRIC CONE SETTING ON 4 CONCRETE BLOCKS. REMOVE EXISTING CS VALVE AND PIPING WITHIN LIMITS SHOWN ON SHEET 127. CONNECT NEW PIPING AND VALVES TO EXISTING PIPING. VERIFY EXISTING MATERIALS PRIOR TO ORDERING FITTINGS. PROVIDE 2-INCH DRAIN WITH 2-INCH CHECK VALVE FROM CHLORINE VALVE BOX TO EXISTING SD MH.

3. LOWER TOP OF EXISTING STORM DRAIN MANHOLE 1.5-FT±. REMOVE EXISTING ECCENTRIC CONE. ADD NEW PRECAST SECTION. PLACE NEW FLAT-TOP SLAB. ADJUST FRAME AND COVER TO NEW GRADE. VERIFY EXISTING MH CONSTRUCTION FOR JOINT CONFIGURATION, MH STEPS, AND OTHER FEATURES. CONNECT NEW 2-INCH AND 8-INCH DRAIN TO EXISTING SD MH.

4. EXISTING 42-INCH C.C.P. NORTH AND EAST TO EXISTING HEADWORKS STRUCTURE TO BE REMOVED. PROVIDE NEW PIPING AS SHOWN. PROTECT EXISTING BELL END OF EXISTING C.C.P. FROM DAMAGE. VERIFY CONNECTION AND LOCATION. AS-CONSTRUCTED DRAWINGS INDICATE JOINT AT STA 9+20.93 IS RESTRAINED.

5. PROVIDE RESTRAINED JOINTS ON FORCE MAINS. CONTRACTOR MAY PROVIDE THRUST BLOCKING. SUBMIT DETAILS TO ENGINEER FOR APPROVAL. FOR C.C.P. CLOSURE DETAIL SEE SHEET 128.

6. CONSTRUCT MH SD-11 OVER EXISTING 12-INCH SD. INSTALL NEW 10-INCH SD AS PER PLANS. PLUG EXISTING PIPING TO BE ABANDONED IN-PLACE WITH CONCRETE PLUG (TYPICAL).

7. CONSTRUCT MH SD-9 OVER EXIST 12-INCH SD. INSTALL NEW 12-INCH SD AS PER PLANS. PLUG EXISTING PIPING TO BE ABANDONED IN-PLACE WITH CONCRETE PLUG (TYPICAL).

8. NEW 24-INCH IRRIGATION. INSTALL 24-INCH BFV AND MJ PLUG AT END OF 24-INCH IRRIGATION. RESTRAIN 24-INCH PLUG FROM MOVEMENT.

9. EXISTING 12-INCH IRRIGATION TO BE RELOCATED AS PER PLANS AND CONNECTED TO EXISTING 12-INCH IRRIGATION. VERIFY MATERIALS PRIOR TO ORDERING FITTINGS. ALLOW FOR 1 FULL JOINT OF IRRIGATION PIPING PRECEDING TEE TO MAKE CONNECTION TO EXISTING.

10. INSTALL 11 1/4° BEND AND DEFLECT JOINTS FOR 15 DEGREE ANGLE.

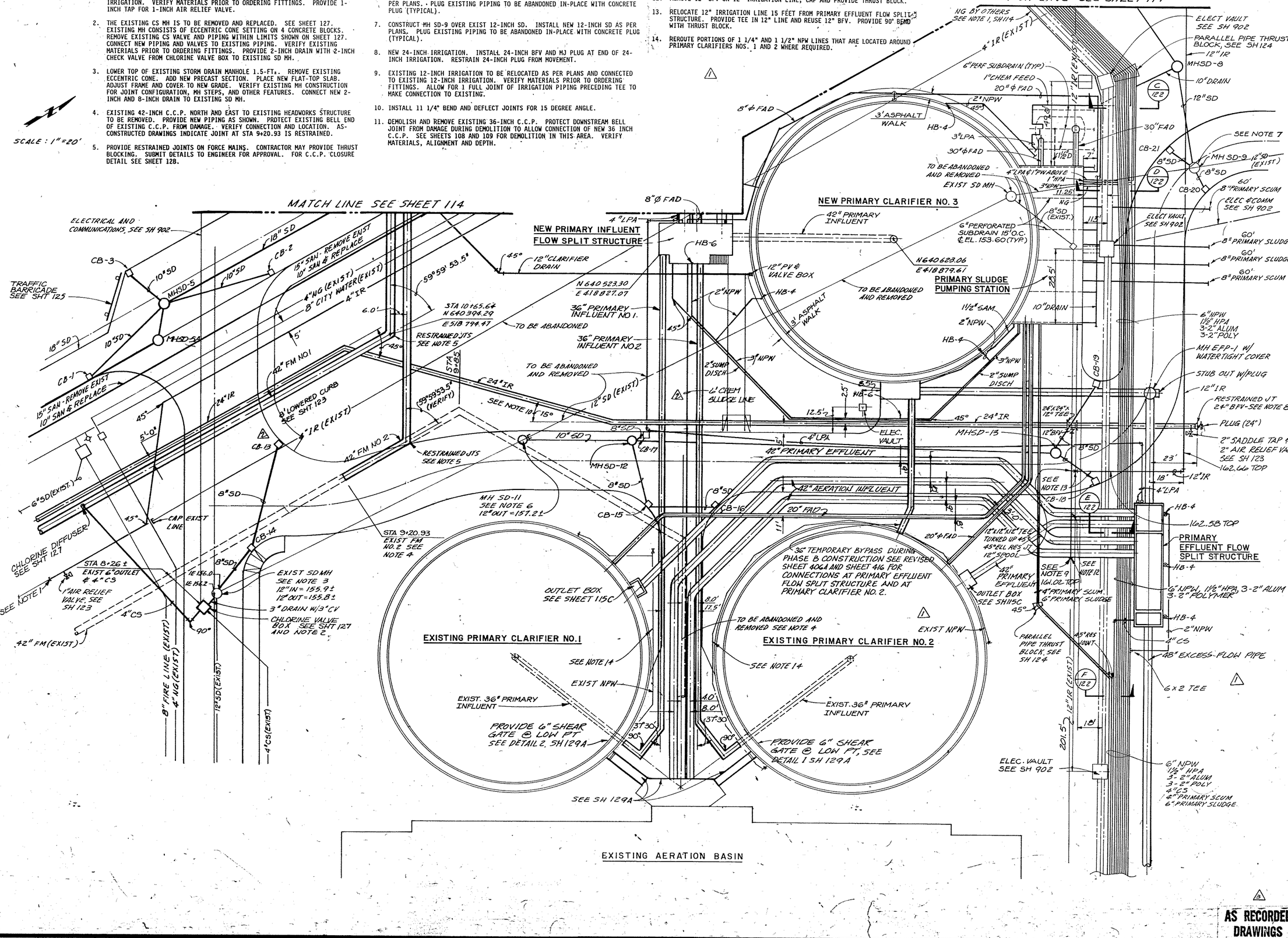
11. DEMOLISH AND REMOVE EXISTING 36-INCH C.C.P. PROTECT DOWNSTREAM BELL JOINT FROM DAMAGE DURING DEMOLITION TO ALLOW CONNECTION OF NEW 36 INCH C.C.P. SEE SHEETS 108 AND 109 FOR DEMOLITION IN THIS AREA. VERIFY MATERIALS, ALIGNMENT AND DEPTH.

12. REMOVE 12" BFV ON 12" IRRIGATION LINE, CAP AND PROVIDE THRUST BLOCK.

13. RELOCATE 12" IRRIGATION LINE 15 FEET FROM PRIMARY EFFLUENT FLOW SPLIT STRUCTURE. PROVIDE TEE IN 12" LINE AND REUSE 12" BFV. PROVIDE 90° BEND WITH THRUST BLOCK.

14. REROUTE PORTIONS OF 1 1/4" AND 1 1/2" NPW LINES THAT ARE LOCATED AROUND PRIMARY CLARIFIERS NOS. 1 AND 2 WHERE REQUIRED.

SCALE : 1" = 20'



CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

YARD PIPING EXPANDED PLAN AT CLARIFIERS

Designed AHK, DKT
Drawn MMK
Checked BRW
Approved John S. Hock
Date MAY, 1989

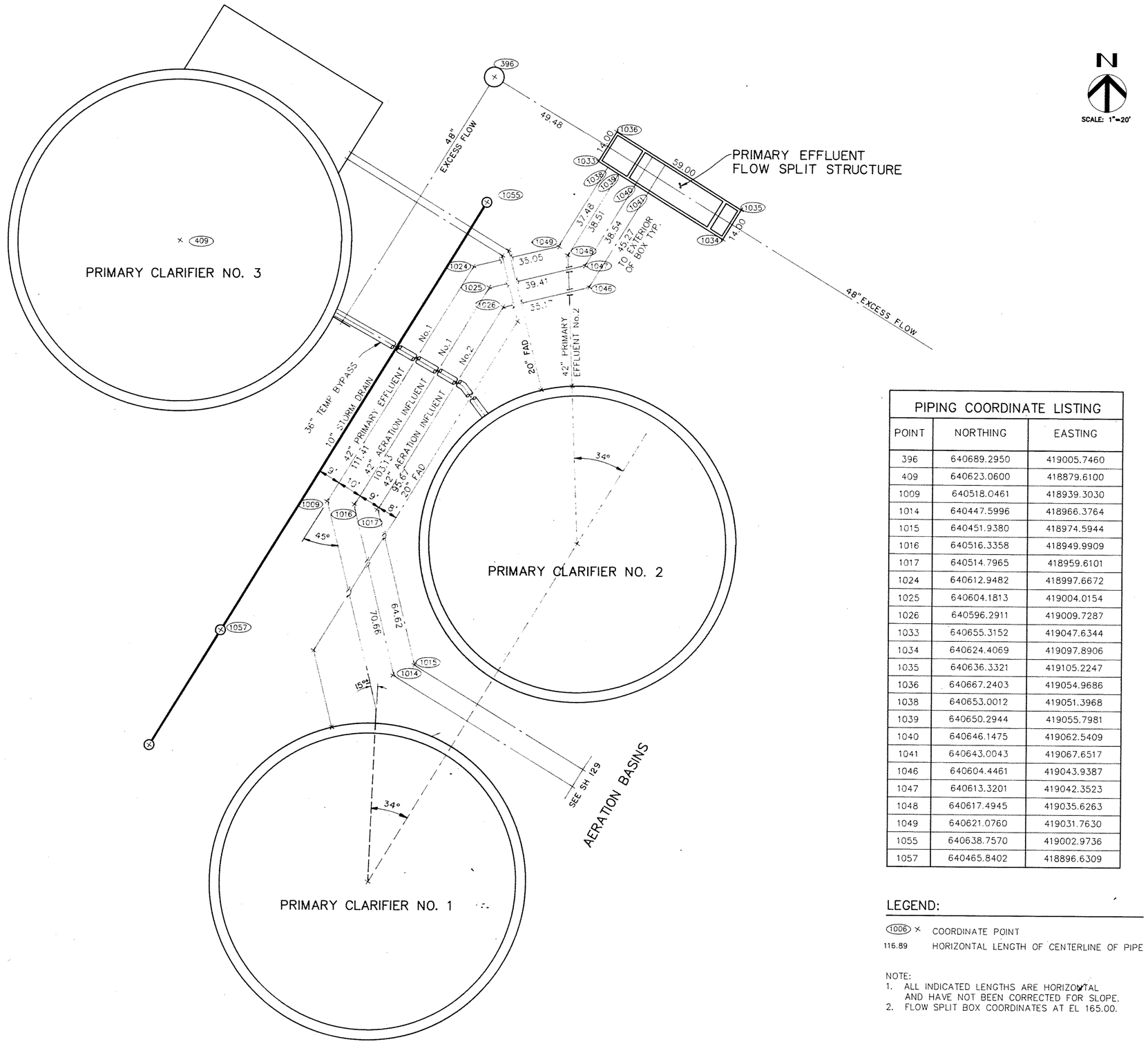
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
3	AFA	AS RECORDED DRAWING	12/8/92
2	AFA	CPR #81, 94	12/8/92
1		CPR - 2.5	3-15-90

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1985 BRUCE R. WILLEY

AS RECORDED DRAWINGS

Sheet Number 115



PIPING COORDINATE LISTING		
POINT	NORTHING	EASTING
396	640689.2950	419005.7460
409	640623.0600	418879.6100
1009	640518.0461	418939.3030
1014	640447.5996	418966.3764
1015	640451.9380	418974.5944
1016	640516.3358	418949.9909
1017	640514.7965	418959.6101
1024	640612.9482	418997.6672
1025	640604.1813	419004.0154
1026	640596.2911	419009.7287
1033	640655.3152	419047.6344
1034	640624.4069	419097.8906
1035	640636.3321	419105.2247
1036	640667.2403	419054.9686
1038	640653.0012	419051.3968
1039	640650.2944	419055.7981
1040	640646.1475	419062.5409
1041	640643.0043	419067.6517
1046	640604.4461	419043.9387
1047	640613.3201	419042.3523
1048	640617.4945	419035.6263
1049	640621.0760	419031.7630
1055	640638.7570	419002.9736
1057	640465.8402	418896.6309

LEGEND:

(1006) × COORDINATE POINT

116.89 HORIZONTAL LENGTH OF CENTERLINE OF PIPE

NOTE:
1. ALL INDICATED LENGTHS ARE HORIZONTAL AND HAVE NOT BEEN CORRECTED FOR SLOPE.
2. FLOW SPLIT BOX COORDINATES AT EL 165.00.

△2 AS RECORDED DRAWINGS

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I

PRIMARY CLARIFIER-PIPING LOCATION DETAILS

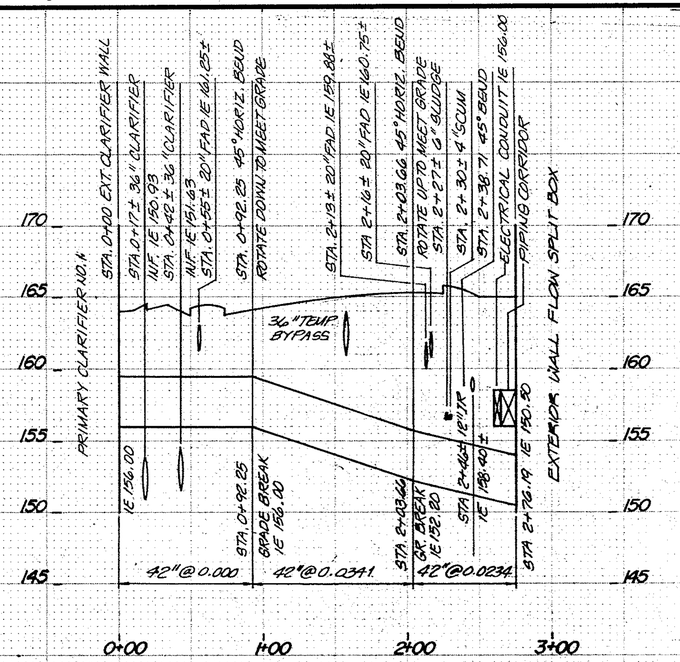
Project Manager: BRW
Designed: ALL
Drawn: ALL/LN
Checked: BE
Project Number:
Date: MARCH 1, 1990

THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE. IF NOT ONE INCH, SCALE ACCORDINGLY.

No	By	Description	
△1	AFA	CPR-25 AS RECORDED DRAWING	3-15-90
△2			12/6/92

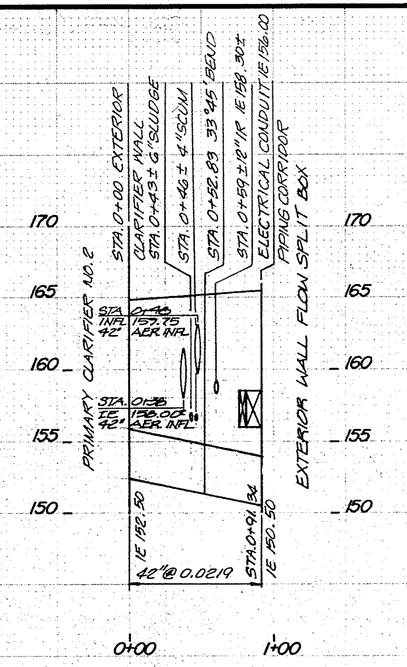
Sheet Number: 115-A

DATE: 03/08/90 TIME: 1020 SCALE: 20.00000
FILENAME: PIPEPLN
SCREEN: COMPOSITE OVERLAY



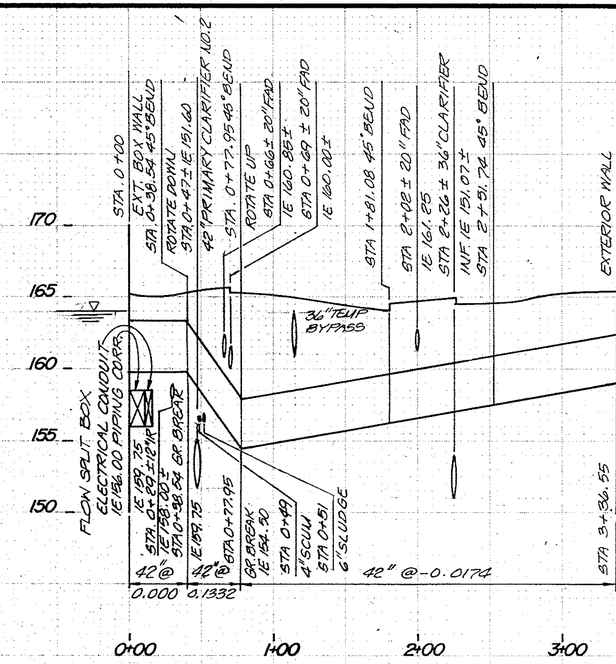
42" PRIMARY EFFLUENT NO.1

SCALE : HORIZ. 1"=50'
VERT. 1"=5'



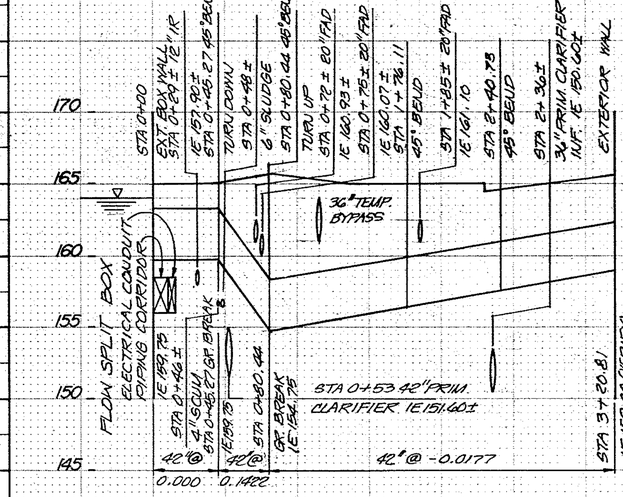
42" PRIMARY EFFLUENT NO.2

SCALE : HORIZ. 1"=50'
VERT. 1"=5'



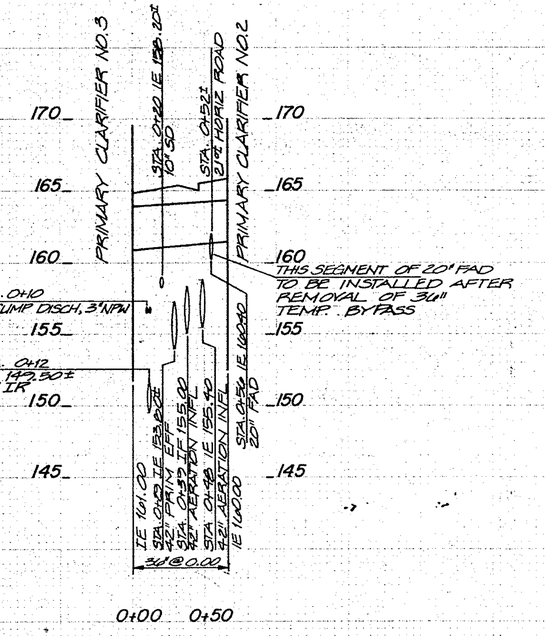
42" AERATION INFLUENT NO.1

SCALE : HORIZ. 1"=50'
VERT. 1"=5'



42" AERATION BASIN NO.2 INFLUENT

SCALE : HORIZ. 1"=50'
VERT. 1"=5'



36" TEMPORARY BYPASS

SCALE : HORIZ. 1"=50'
VERT. 1"=5'

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

CLARIFIER & FLOW SPLIT BOX-PROFILES

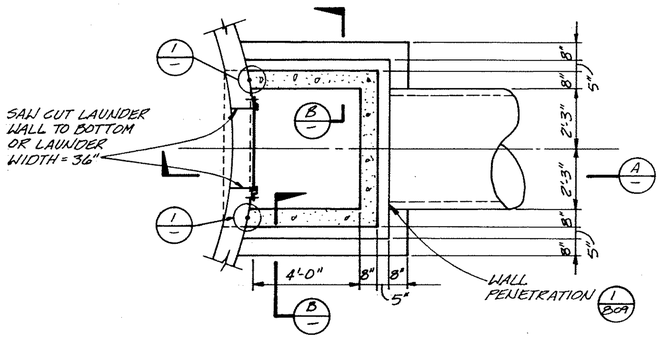
Project Manager: BRW
Designed: ALL
Drawn: NCB/CWA
Checked: BJE
Project Number:
Date: 3-15-90

THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE. IF NOT ONE INCH, SCALE ACCORDINGLY.

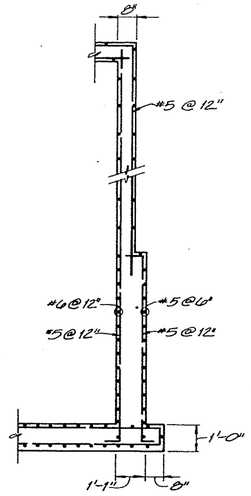
No	By	Description	Date
1		CPR-25	3-15-92
2	AFA	AS RECORDED DRAWING	12/8/92

Sheet Number: 115-B

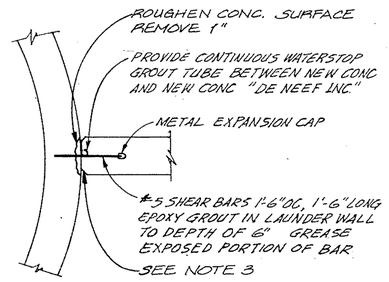
COMPOSITE OVERLAY



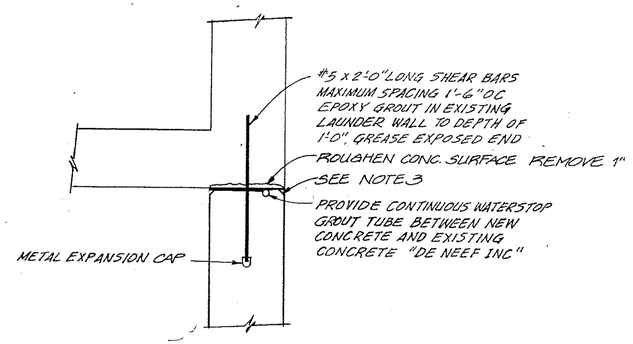
PRIMARY CLARIFIER NO. 1 AND NO. 2
OUTLET STRUCTURE-LOWER PLAN
SCALE: 3/8"=1'-0"



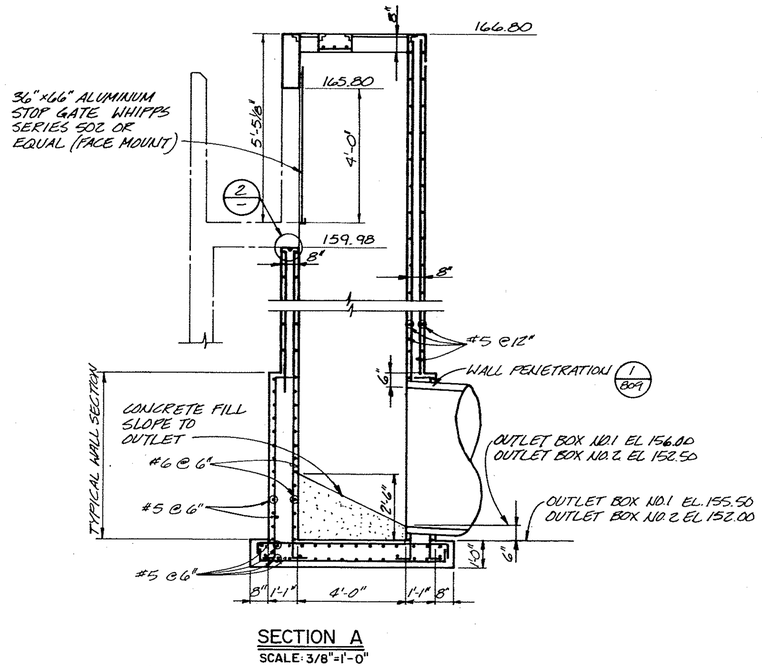
SECTION B
SCALE: 3/8"=1'-0"



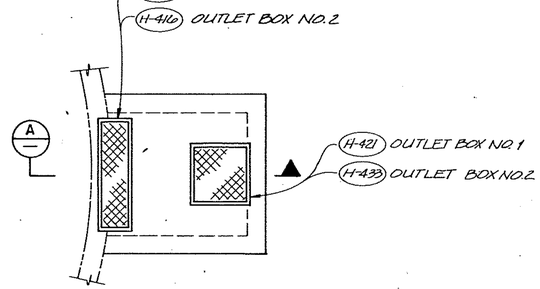
DETAIL 1
NTS



DETAIL 2
NTS



SECTION A
SCALE: 3/8"=1'-0"



PRIMARY CLARIFIER NOS. 1 AND 2

OUTLET STRUCTURE - UPPER PLAN
SCALE: 3/8"=1'-0"

NOTES:
1. ALL REINFORCING SHALL BE #5@12" UNLESS OTHERWISE NOTED.
2. ALL DOWELS SHALL EXTEND 2'-0" ABOVE SURFACE OF SLAB UNLESS OTHERWISE NOTED.
3. PROVIDE ¾" CHAMFER AND CAULK

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PRIMARY CLARIFIER NO. 1 AND NO. 2 OUTLET BOX

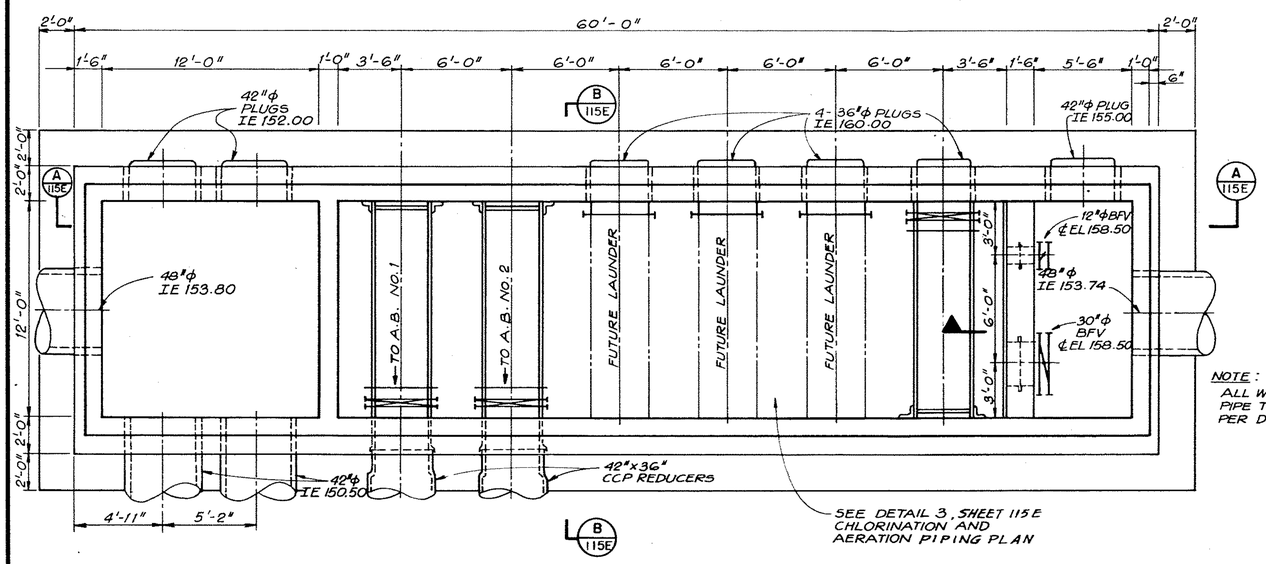
Project Manager	BRW
Designed	BJE
Drawn	CWA
Checked	JEK
Project Number	
Date	3-15-90

THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE. IF NOT ONE INCH, SCALE ACCORDINGLY.

No	By	Description	Date
1	AFA	CPR-25	3-15-90
2	AFA	AS RECORDED DRAWING	12/18/92

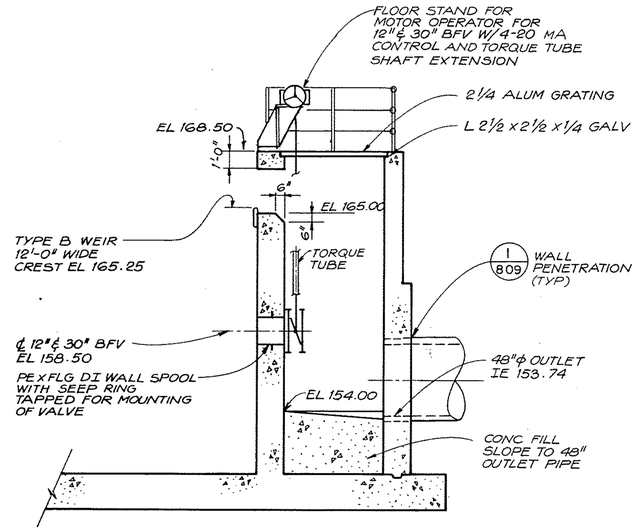
Sheet Number
115C

SCREEN COMPOSITE OVERLAY

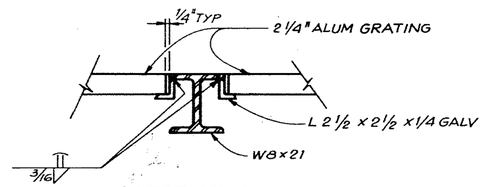


NOTE:
ALL WALL PENETRATIONS FOR PIPE TO BE CCP BELL CONNECTIONS PER DETAIL 1, SHEET 809

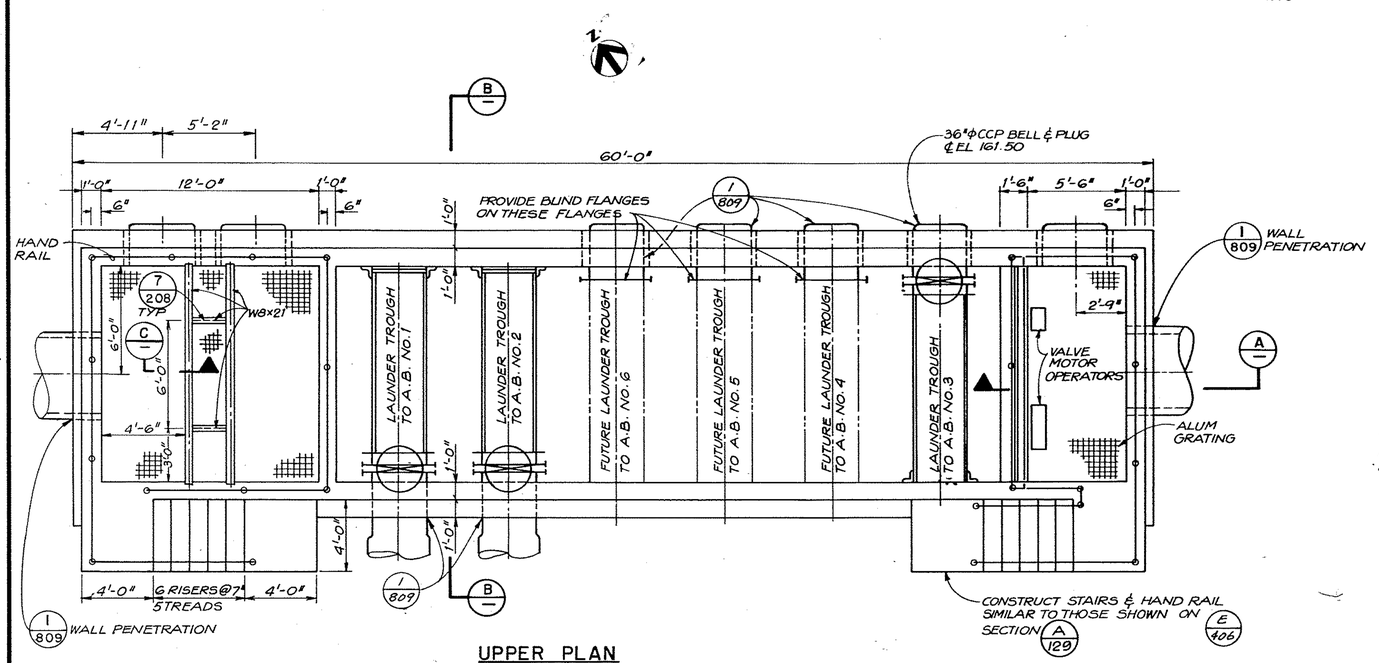
SECTIONAL PLAN AT EL 164.50
SCALE: 1/4" = 1'-0"



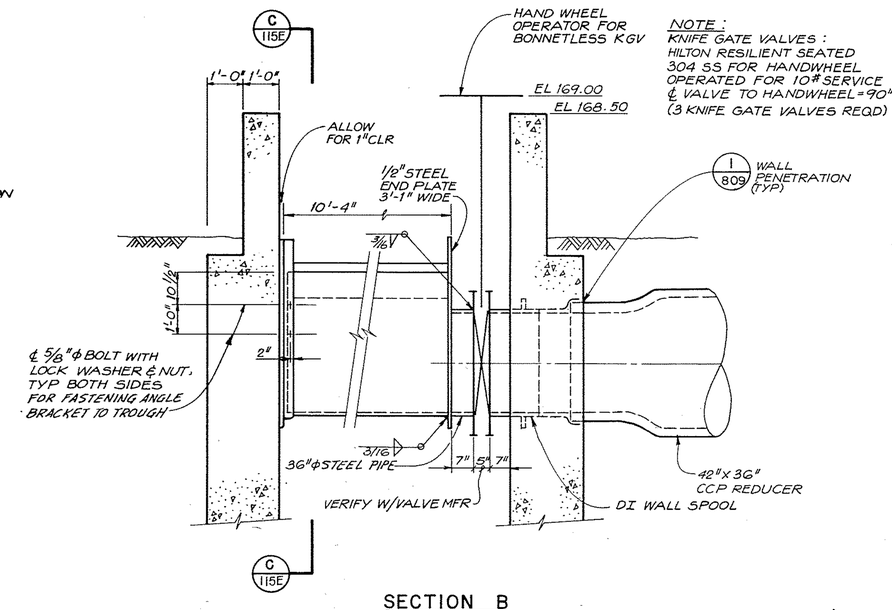
SECTION A
SCALE: 1/4" = 1'-0"



SECTION C
NTS



UPPER PLAN
SCALE: 1/4" = 1'-0"



SECTION B
SCALE: 1/2" = 1'-0"

2

AS RECORDED DRAWINGS

CWC-HDR, Inc.

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PRIMARY EFFLUENT FLOW SPLIT BOX-PLANS

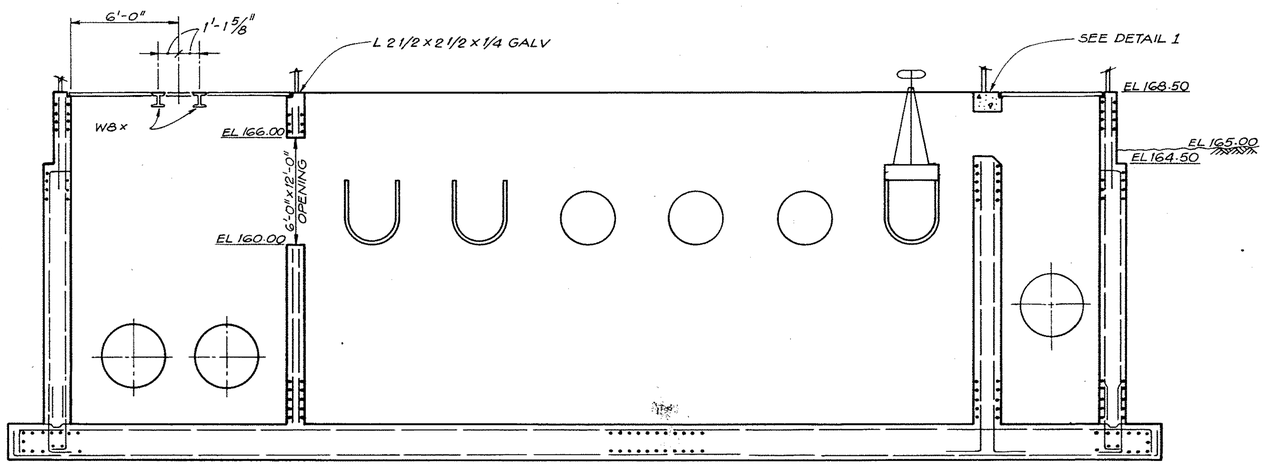
Project Manager: BRW
Designed: BJE
Drawn: IKD
Checked: JEK
Project Number:
Date: 3-15-90

THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY.

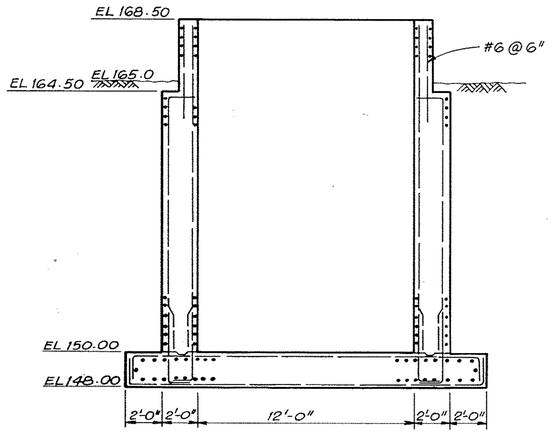
No	By	Description	Date
1	AFA	CPR-25	3-15-90
2	"	AS RECORDED DRAWING	12/18/92

Sheet Number: 115 D

COMPOSITE OVERLAY

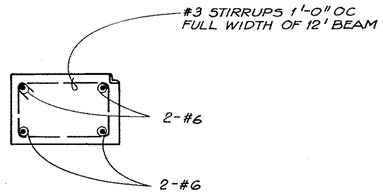


SECTION A
SCALE : 1/4" = 1'-0"

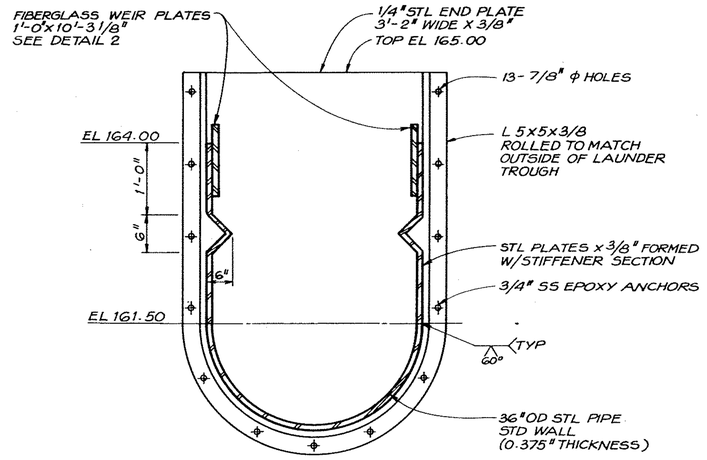


SECTION B
SCALE : 1/4" = 1'-0"

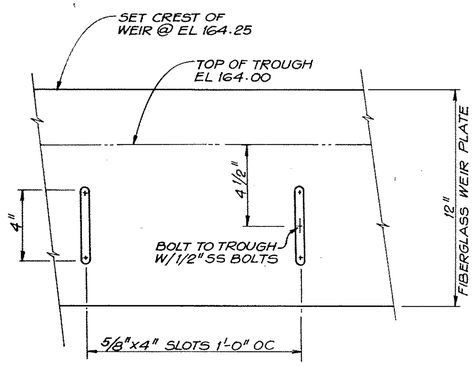
NOTES :
1. ALL REINFORCING SHALL BE #6 @ 6" UNLESS OTHERWISE NOTED.
2. ALL DOWELS SHALL EXTEND 2'-6" ABOVE SURFACE OF SLAB UNLESS OTHERWISE NOTED.



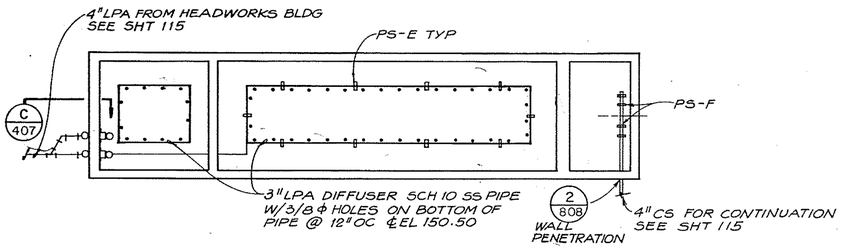
DETAIL 1
SCALE : 1/ "= 1'-0"



SECTION C
SCALE : 1" = 1'-0"



DETAIL 2
NTS



DETAIL 3
NTS

AS RECORDED DRAWINGS

CWC-HDR, Inc.

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PRIMARY EFFLUENT FLOW SPLIT BOX SECTIONS AND DETAILS

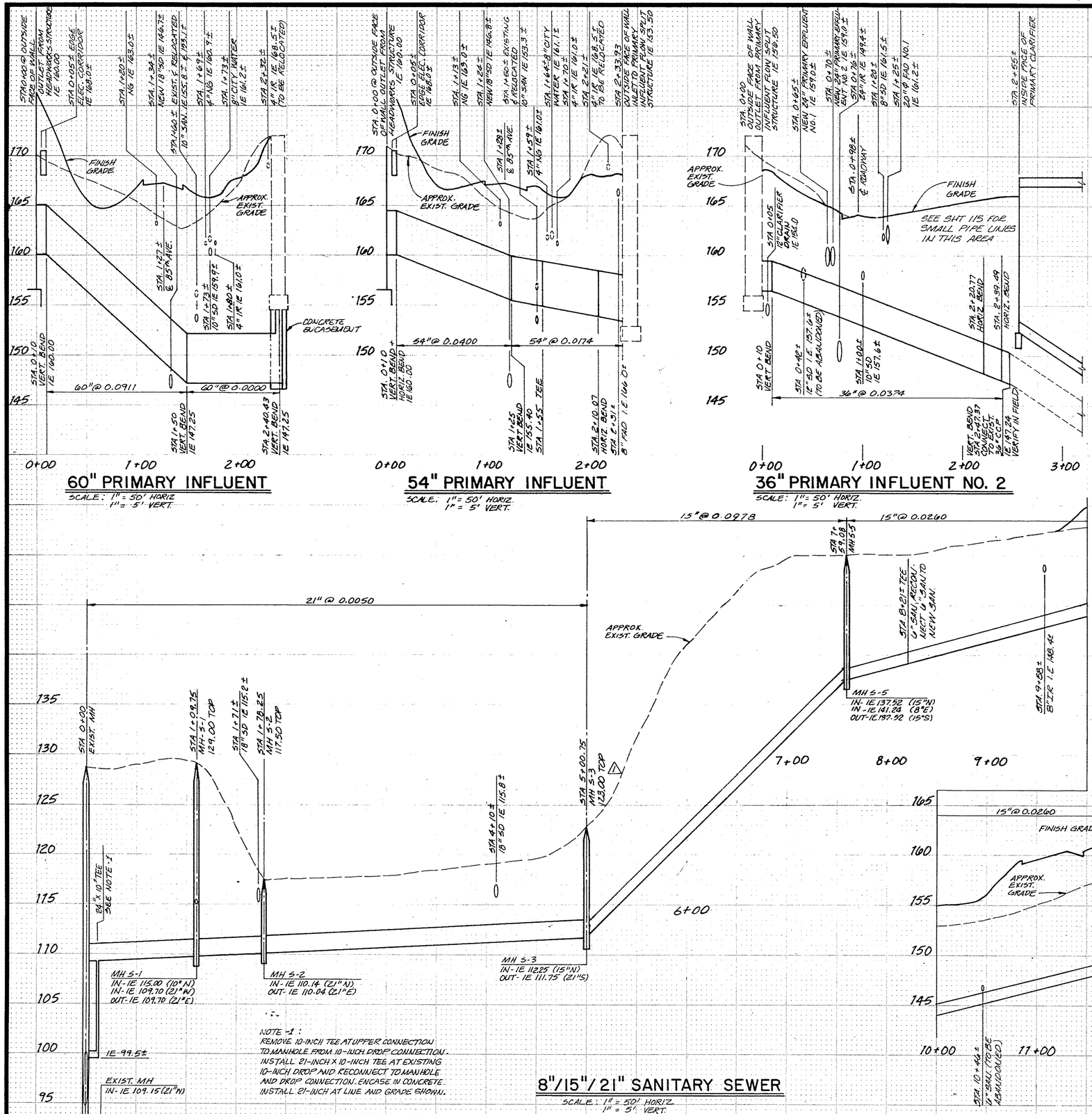
Project Manager: BRW
Designed: BJE
Drawn: IKD & EGM
Checked: JEK
Project Number:
Date: 3-15-90

THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY.

No	By	Description	Date
2	AFA	CPR-25 AS RECORDED DRAWING	12/8/92
1			3-15-90

Sheet Number: 115E

SCREEN COMPOSITE OVERLAY



CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PIPING PROFILES- I

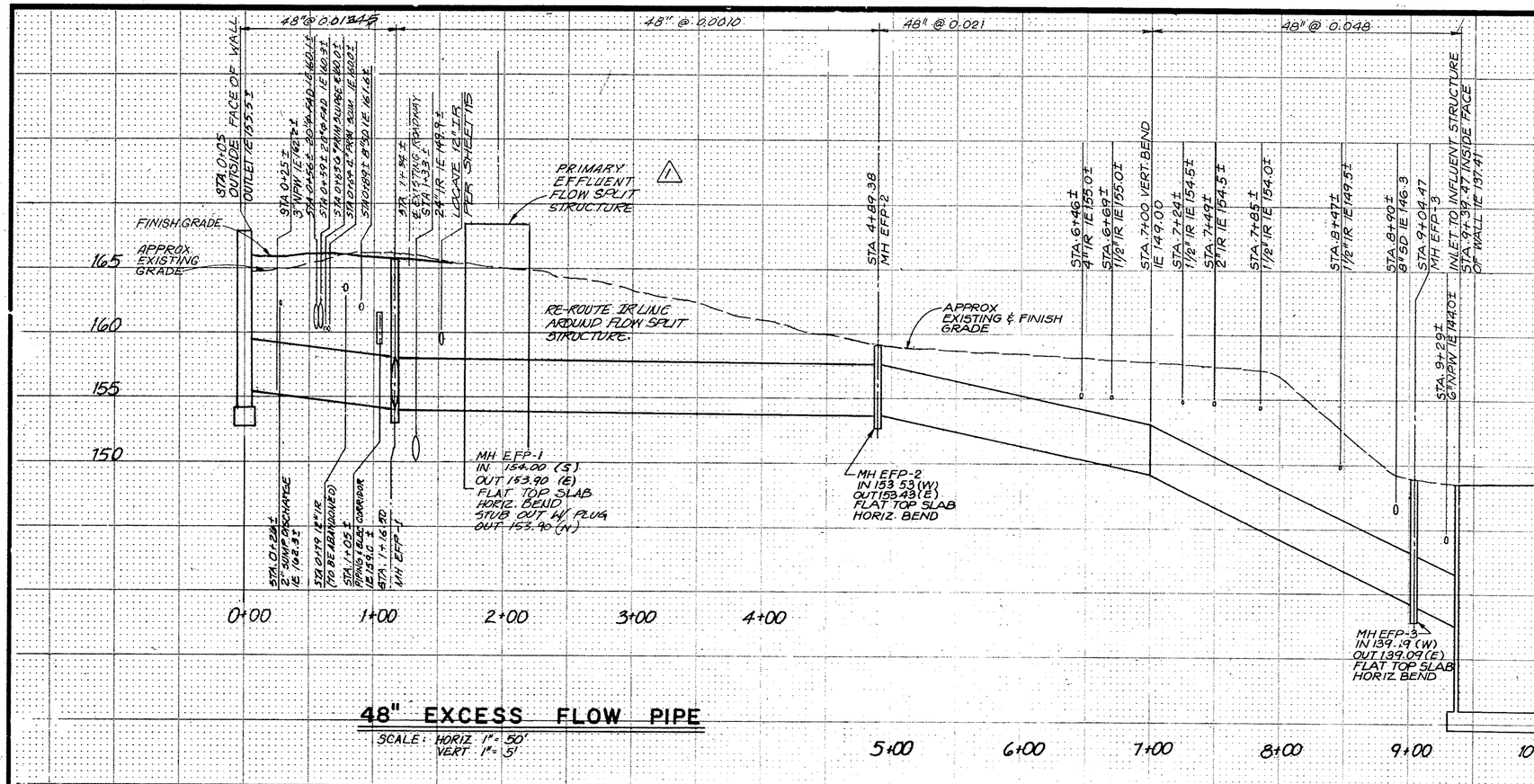
Designed DKT, AHK
Drawn LLB
Checked BRW
Approved John E. Koch
Date MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	CPE #19	11-25-92
2	AFA	AS RECORDED DRAWING	12/5/92

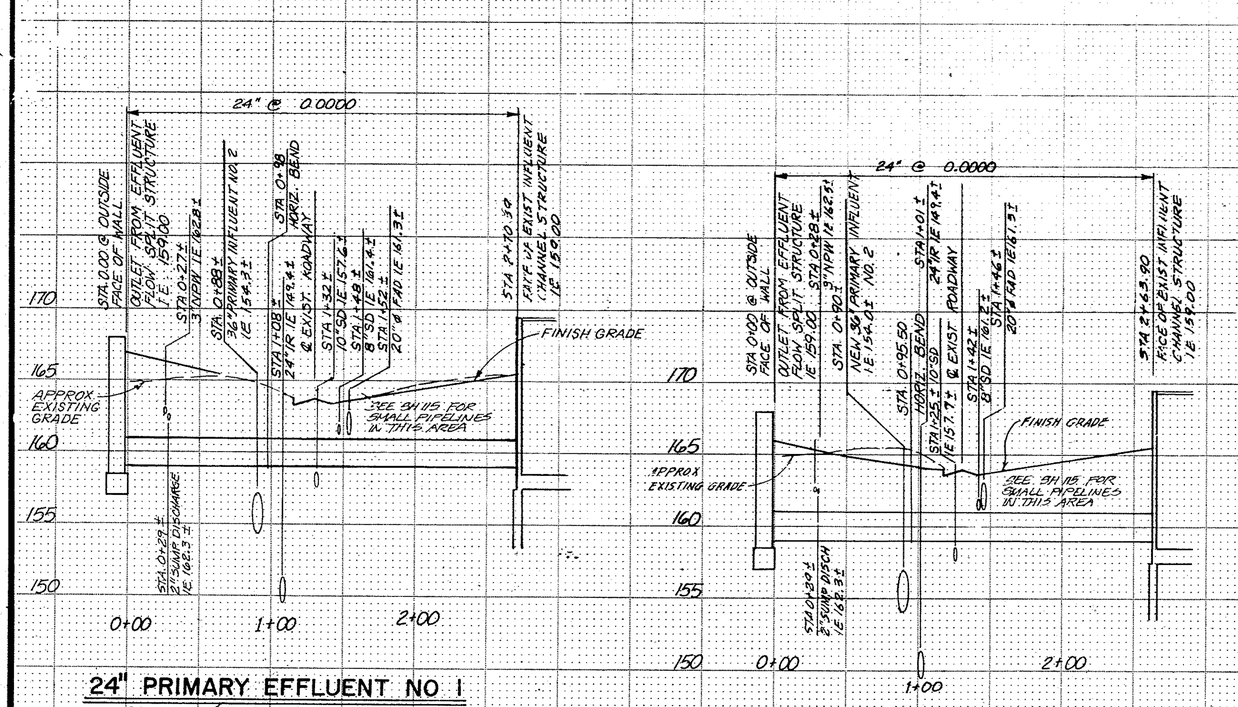
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1986 BRUCE R. WILLEY

Sheet Number 116



48" EXCESS FLOW PIPE

SCALE: HORIZ 1"= 50'
VERT 1"= 5'

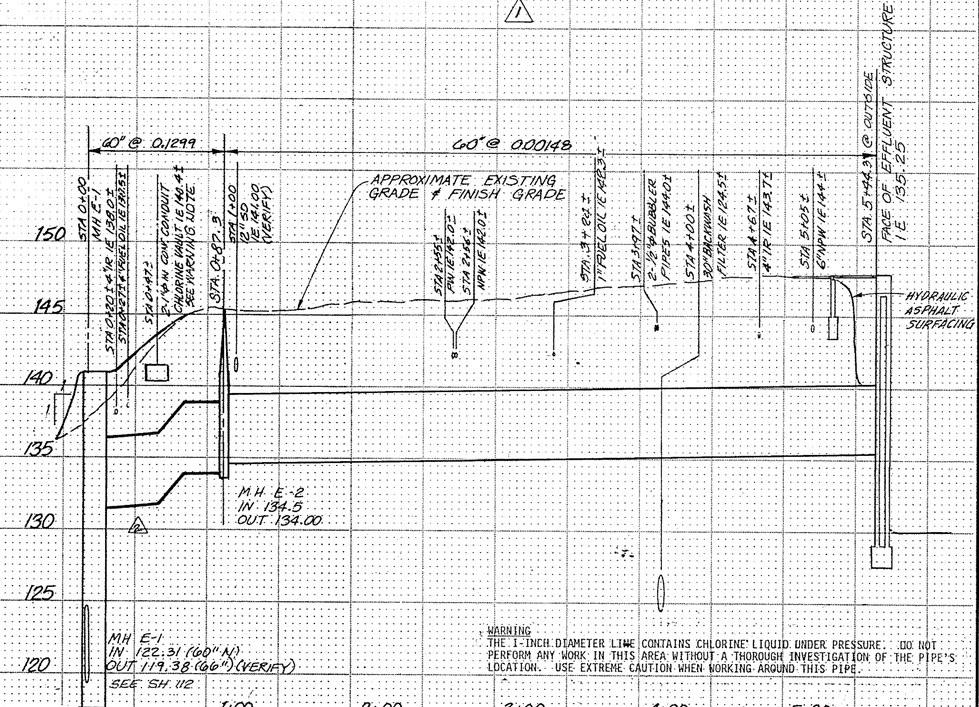


24" PRIMARY EFFLUENT NO 1

SCALE: HORIZ 1"= 50'
VERT 1"= 5'

24" PRIMARY EFFLUENT NO 2

SCALE: HORIZ 1"= 50'
VERT 1"= 5'



60" EFFLUENT

SCALE: HORIZ 1"= 50'
VERT 1"= 5'

WARNING
THE 1-INCH DIAMETER LINE CONTAINS CHLORINE LIQUID UNDER PRESSURE. DO NOT PERFORM ANY WORK IN THIS AREA WITHOUT A THOROUGH INVESTIGATION OF THE PIPE'S LOCATION. USE EXTREME CAUTION WHEN WORKING AROUND THIS PIPE.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PIPING PROFILES- II

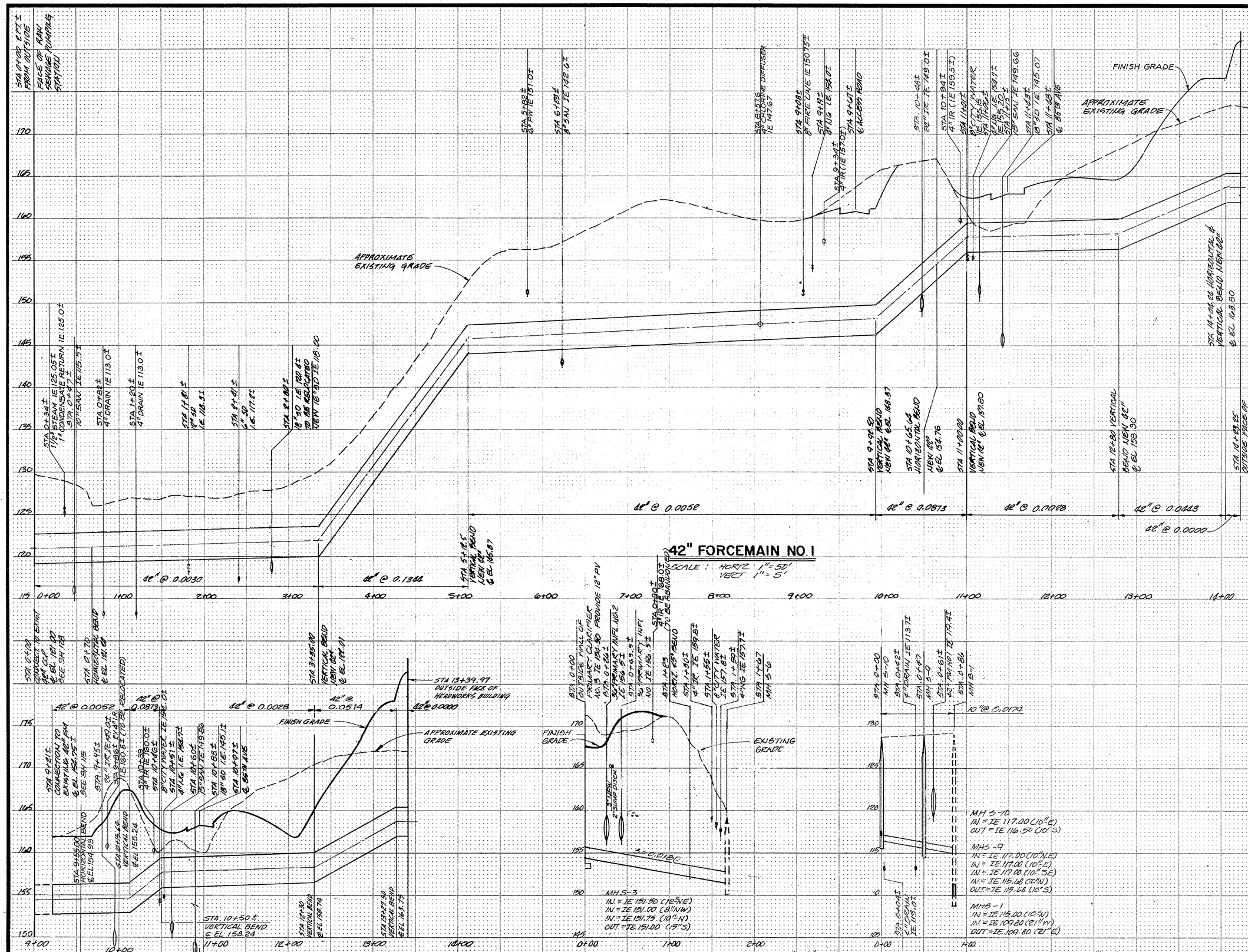
Designed DKT, AHK
Drawn LLB, MMK
Checked BRW
Approved John Elliott
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE - NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
		CPR-25	3-15-90
1	AFA	CPE #67	12/8/92
2	AFA	AS RECORDED DRAWING	12/8/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17 1986 BRUCE R. WILLEY

Sheet Number 117



CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PIPING PROFILES- III

Designed DKT, AHK
Drawn SDS
Checked BRW
Approved John E Flock
Date MAY, 1989

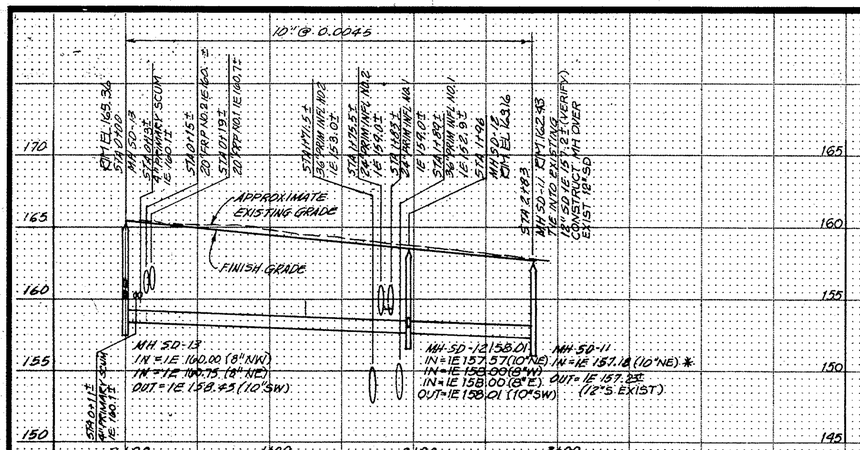
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	11-25-92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1986 BRUCE R. WILLEY

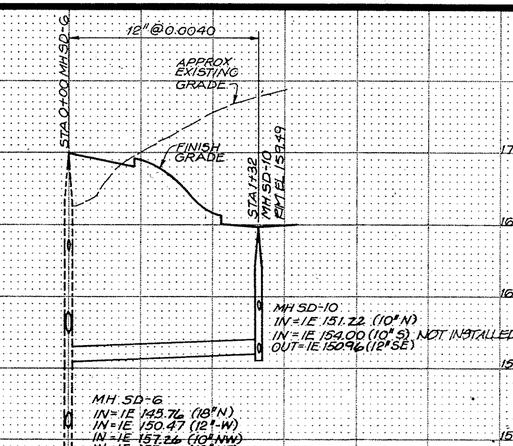
AS RECORDED DRAWINGS

Sheet Number 118



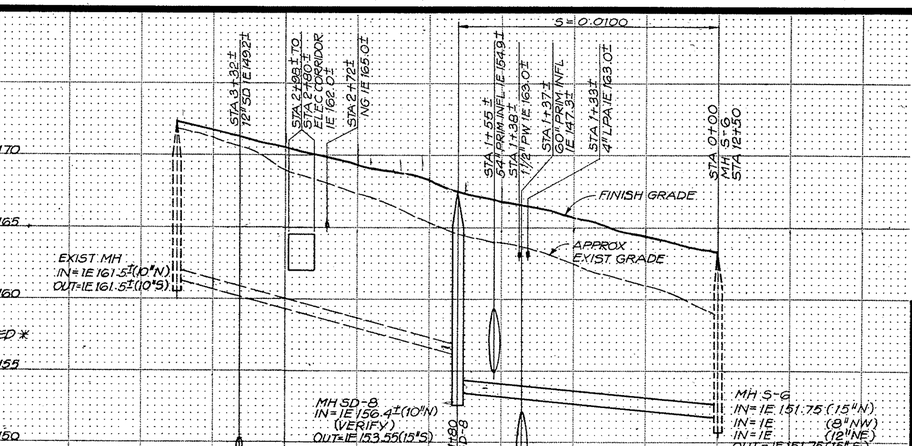
10" STORM DRAIN NO. 1

SCALE: HORIZ 1" = 50'
VERT 1" = 5'



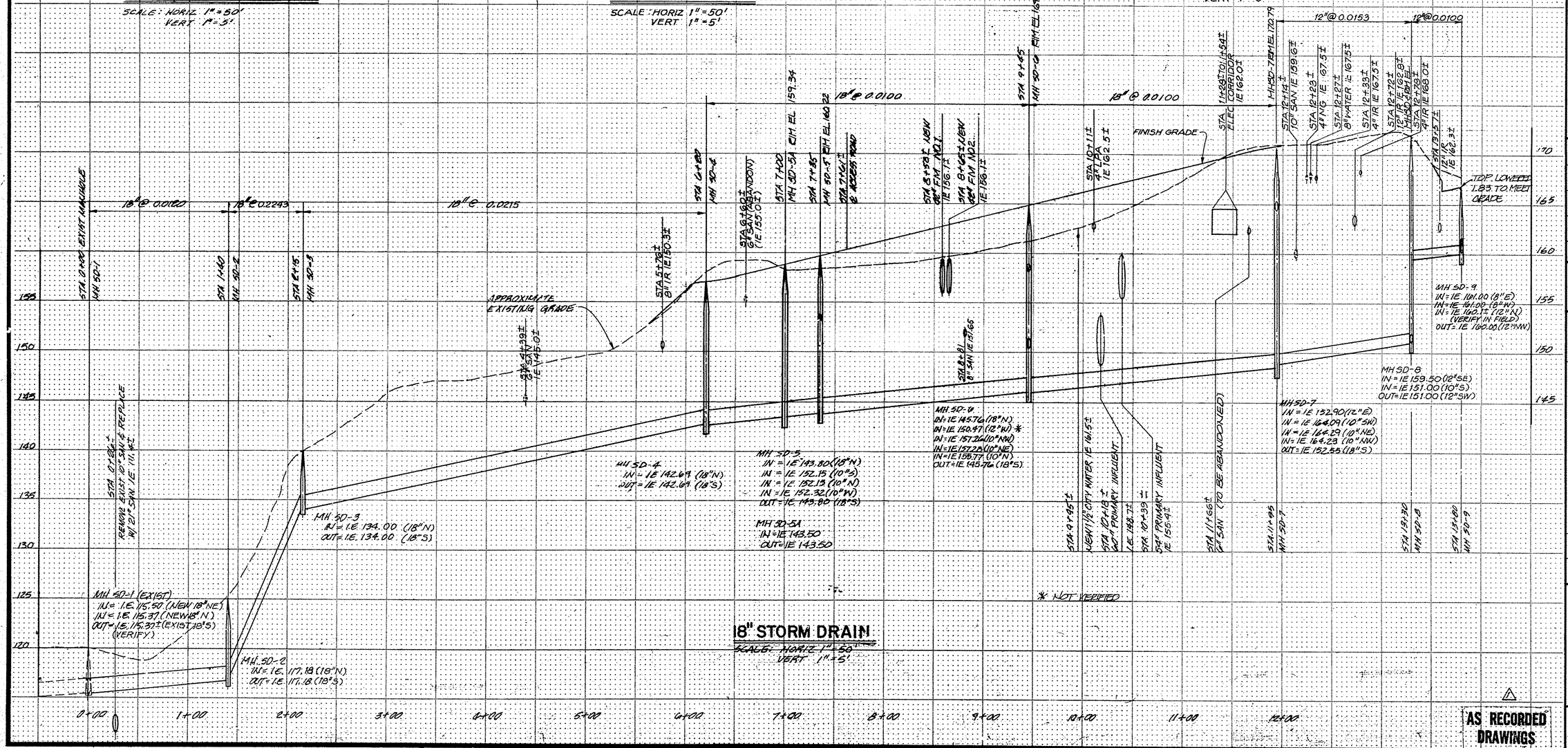
12" STORM DRAIN

SCALE: HORIZ 1" = 50'
VERT 1" = 5'



15" SANITARY REPLACEMENT

SCALE: HORIZ 1" = 50'
VERT 1" = 5'



18" STORM DRAIN

SCALE: HORIZ 1" = 50'
VERT 1" = 5'

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PIPING PROFILES- IV

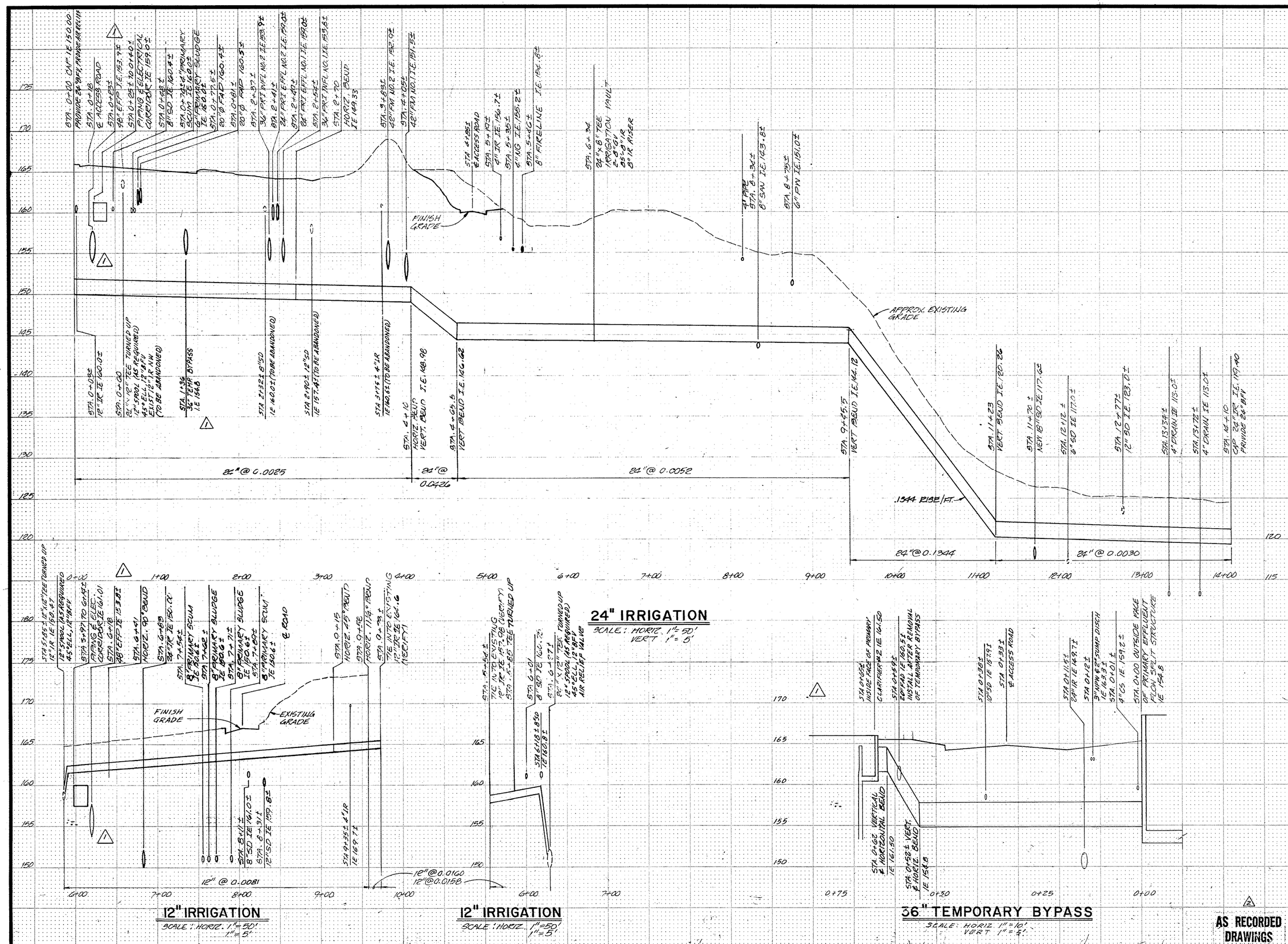
Designed DKT, AHK
Drawn LLB
Checked BRW
Approved John E. Hoel
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	11-25-92

REGISTERED PROFESSIONAL ENGINEER 13381 OREGON July 17, 1985 BRUCE R. WILLEY

Sheet Number 119



24" IRRIGATION
SCALE: HORIZ. 1"= 50'
VERT. 1"= 5'

12" IRRIGATION
SCALE: HORIZ. 1"=50'
1"= 5'

12" IRRIGATION
SCALE: HORIZ. 1"=50'
1"=5'

36" TEMPORARY BYPASS
SCALE: HORIZ. 1"=10'
VERT. 1"= 5'

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PIPING PROFILES- V

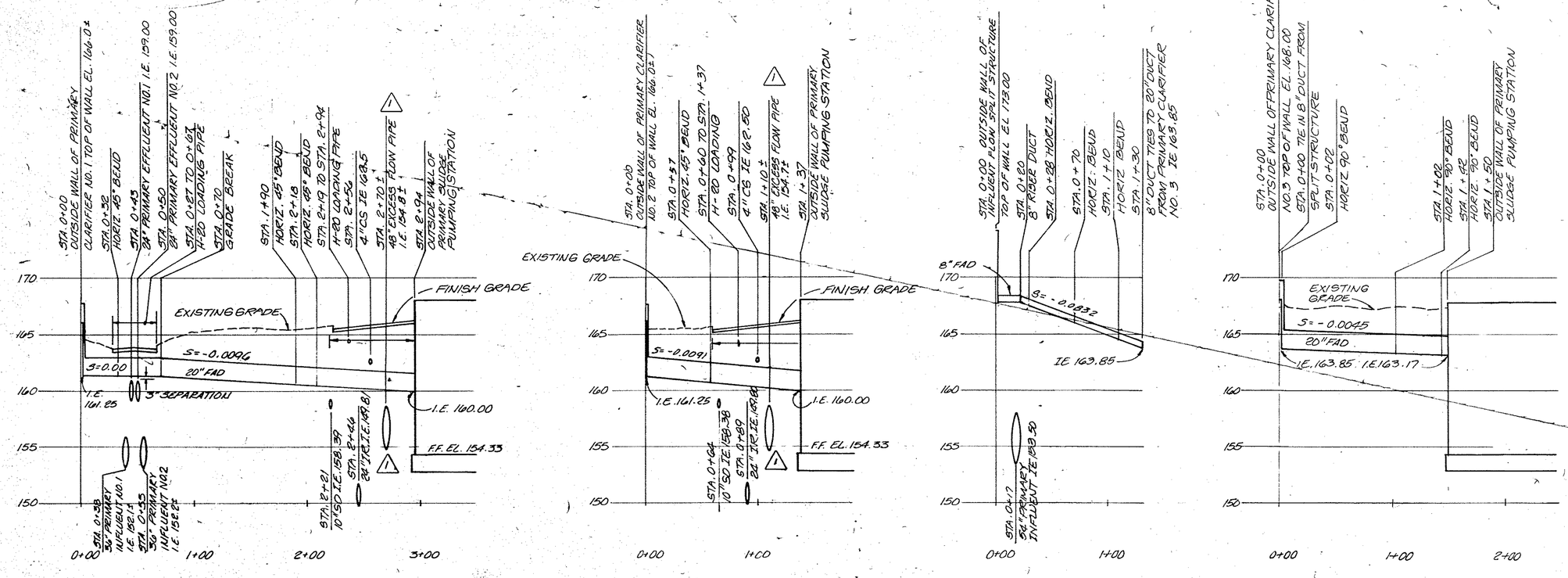
Designed: DKT, AHK
Drawn: LLB
Checked: BRW
Approved: John E. Koel
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

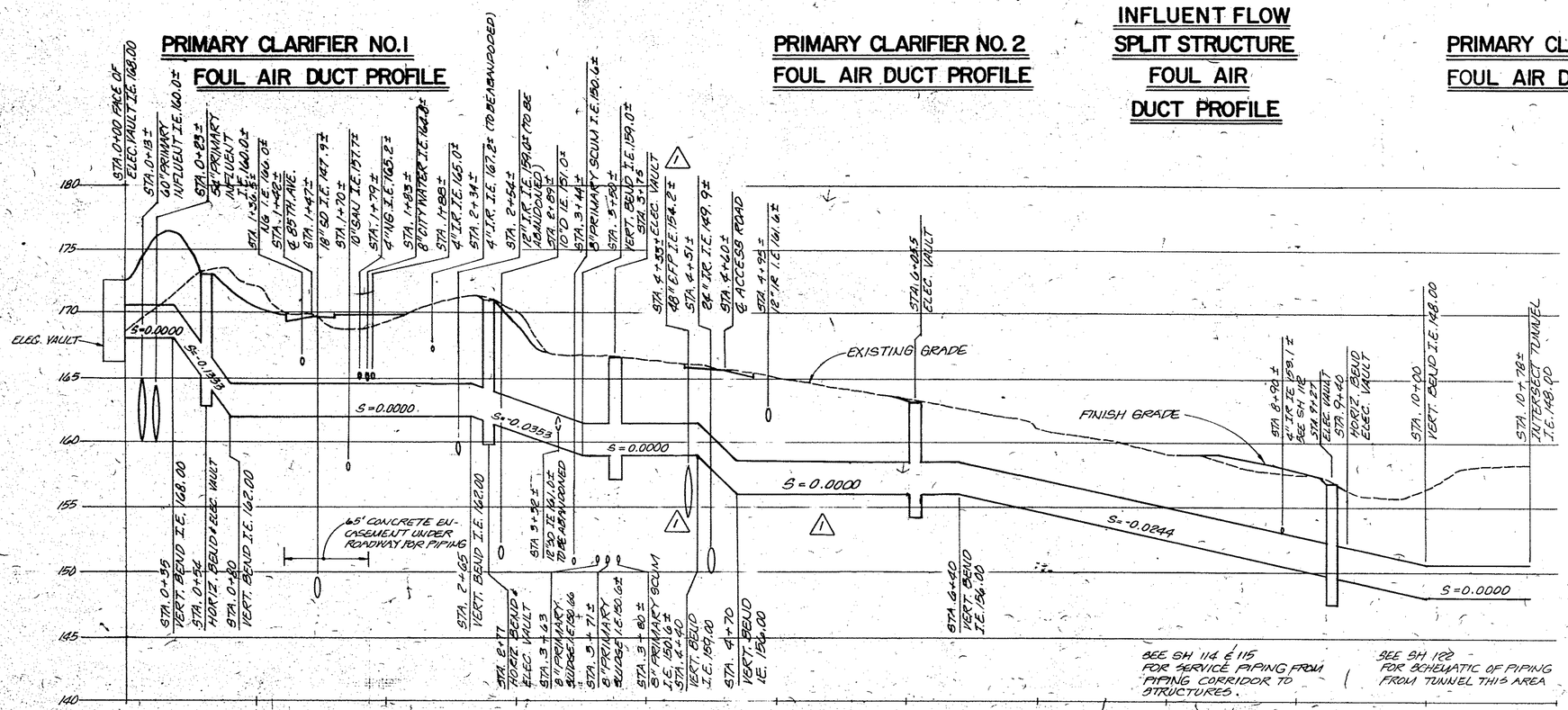
No	By	Revision	Date
1		REVISED IE OF 48" EFF & 36" TEMP. BYPASS PROFILE	12-7-89
2		AFA AS RECORDED DRAWING	11-25-92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1985 BRUCE R. WILLEY

Sheet Number 120



INFLUENT FLOW



PROFILE SCALES
HORIZ. 1"=50'
VERT. 1"=5'

PIPING & ELECTRICAL CORRIDOR

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PROFILES- ODOR CONTROL DUCT AND PIPING & ELECTRICAL CORRIDOR

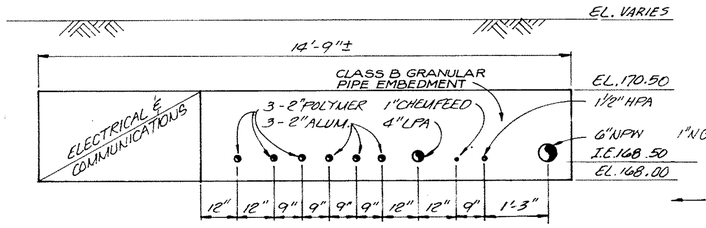
Designed DKT, AHK
Drawn NCB, CSAM
Checked BRW
Approved
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	CPR-25 AS RECORDED DRAWING	12/18/92
2			5-15-90

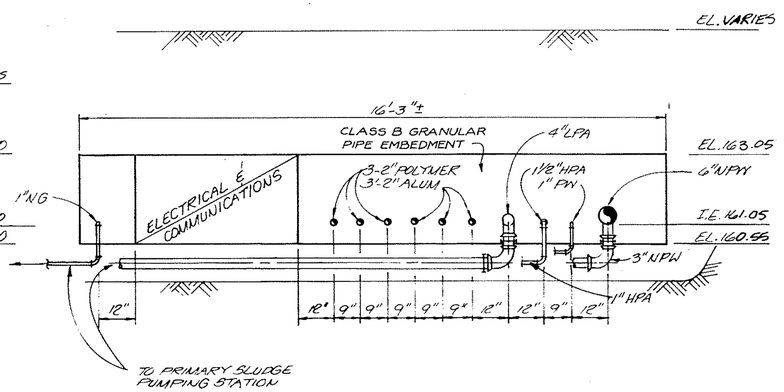
REGISTERED PROFESSIONAL ENGINEER 1981 OREGON JULY 17, 1985 BRUCE R. WILLEY

Sheet Number 121



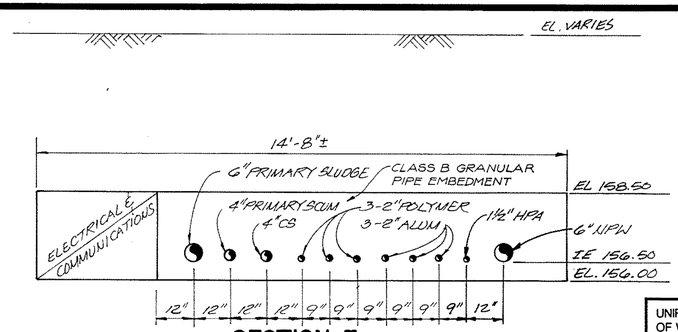
SECTION A

SCALE: 1/2"=1'-0" SEE SH 114



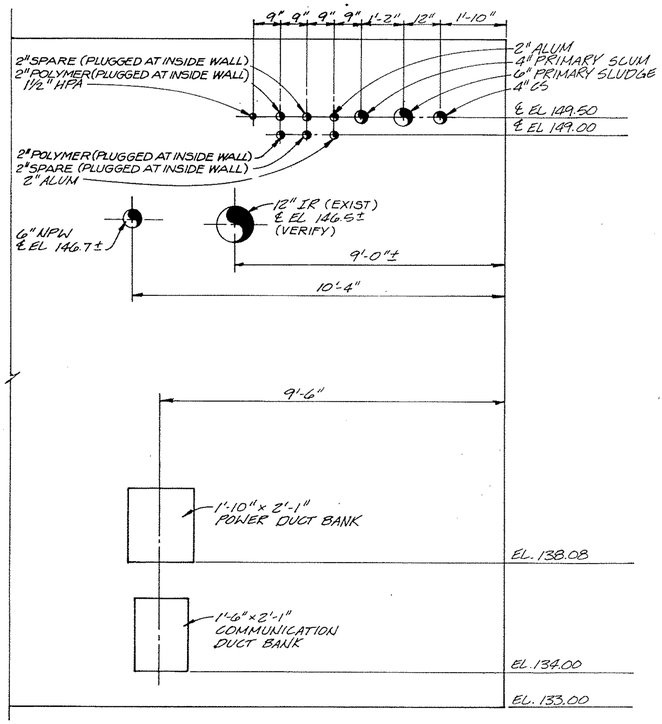
SECTION D

SCALE: 1/2"=1'-0" SEE SH 116



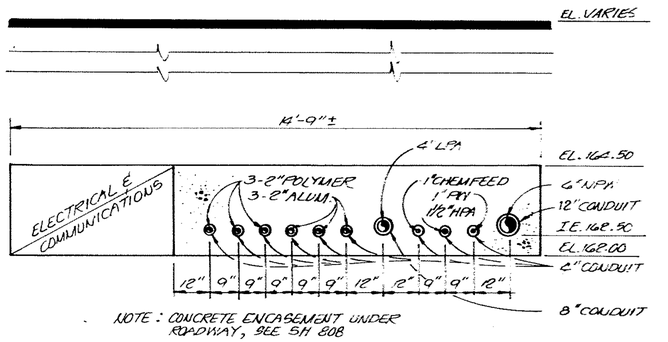
SECTION F

SCALE 1/2"=1'-0" SEE SHE SH. 115



SECTION G

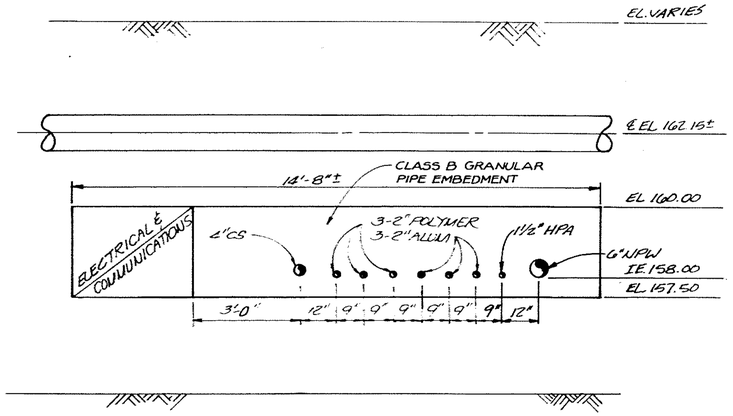
SCALE: 1/2"=1'-0" SEE SH 112



NOTE: CONCRETE ENCASEMENT UNDER ROADWAY, SEE SH 808

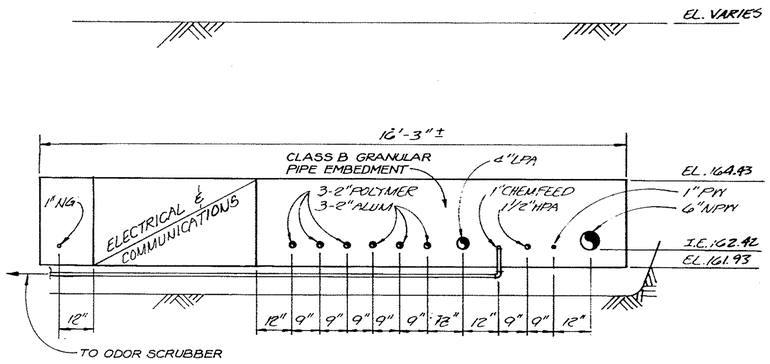
SECTION B

SCALE: 1/2"=1'-0" SEE SH. 114



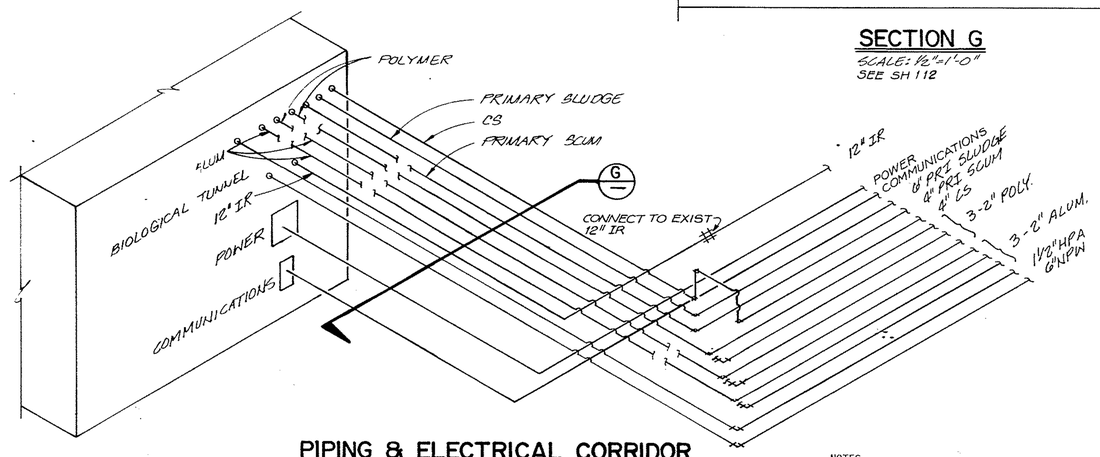
SECTION E

SCALE: 1/2"=1'-0" SEE SH. 115



SECTION C

SCALE: 1/2"=1'-0" SEE SH. 115



PIPING & ELECTRICAL CORRIDOR PARTIAL ISOMETRIC

N.T.S. SEE SH. 119

NOTES:

1. SEE SHEET 902 FOR CONFIGURATION OF ELECTRICAL AND COMMUNICATIONS CONDUITS.
2. SEE DETAIL ON SHEET 124 FOR CONNECTIONS TO PARALLEL PIPING.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PIPING & ELECTRICAL CORRIDOR SECTIONS

Designed: DKT, AHK
Drawn: JWW
Checked: BRW
Approved: John E Hoch
Date: MAY, 1989

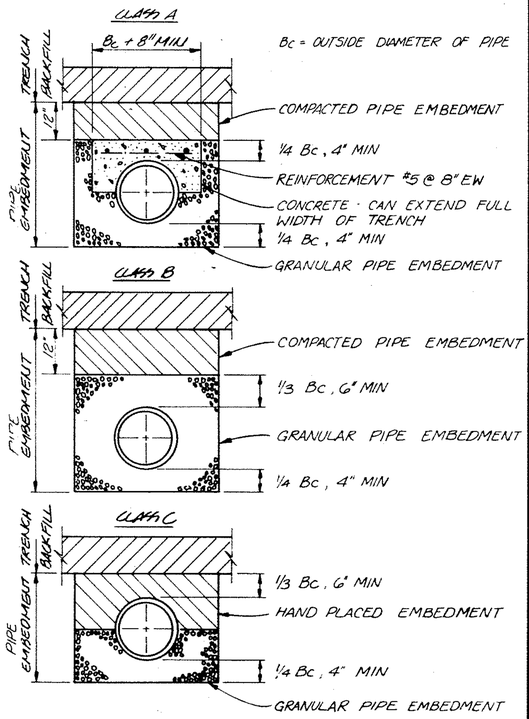
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/8/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1986 BRUCE R. WILLEY

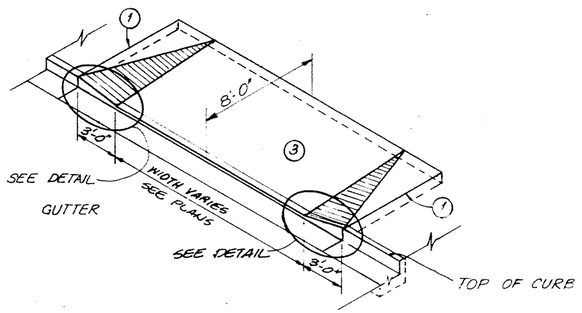
Sheet Number: 122

SH 904



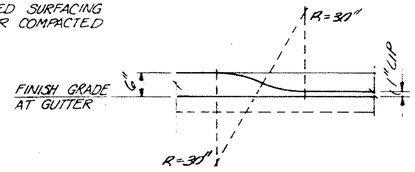
PIPE EMBEDMENT DETAIL

NO SCALE



NOTES:

1. FULL DEPTH EJ W/ PREMOLDED JT FILLER (3/8" x 6")
2. EJ AT MID-WIDTH OVER 24'-0"
3. CONCRETE SURFACE
4. CEMENT CONCRETE TO BE A MIN 6" IN THICKNESS AND PLACED ON 2" COMPACTED CRUSHED SURFACING TOP COURSE OVER COMPACTED SUBGRADE

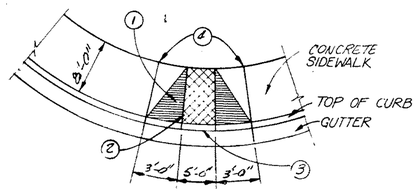


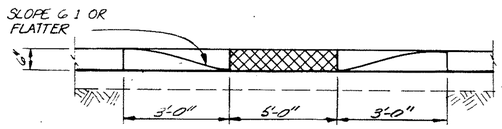
LOWERED CURB DETAIL

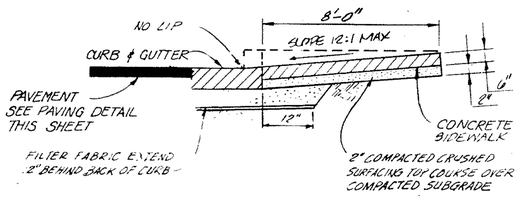
NO SCALE

NOTES:

1. USE STIFF BROOM FINISH ON TRANSITION SLOPES
2. IMPRINT CENTER PORTION OF RAMP W/ 1" DIAGONAL GRID PATTERN - 1/4" DEEP (MAX)
3. NO LIP AT GUTTER LINE
4. FULL DEPTH EJ. W/ PREMOLDED JT FILLER (3/8" x 6")



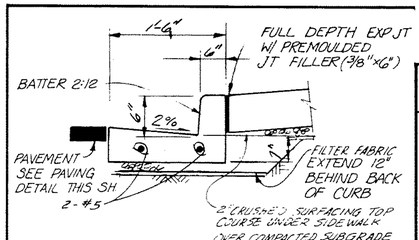




SIDE VIEW

WHEELCHAIR RAMP DETAIL

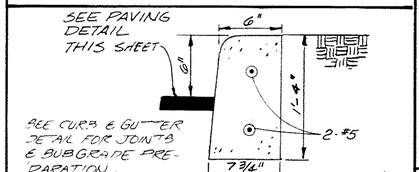
NO SCALE



JOINTS: DUMMY JT TO BE PLACED NOT TO EXCEED 15'-0" OC AND NOT LESS THAN 10'-0" OC. THRU JT TO BE PLACED AT POINTS OF TANGENCY OR 45°-0" INTERVALS

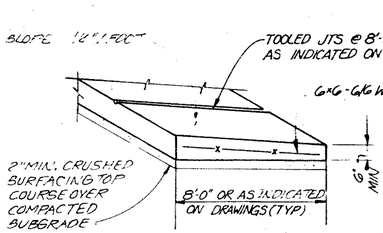
CURB & GUTTER DETAIL

NO SCALE



VERTICAL CURB DETAIL

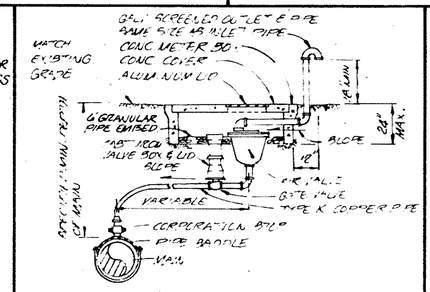
NO SCALE



NOTE:
AT ALL UTILITY POLES, METER BOXES, ETC., PROVIDE 1/4" PREMOLDED JT FILLER (FULL DEPTH) ALL AROUND

SIDEWALK DETAIL

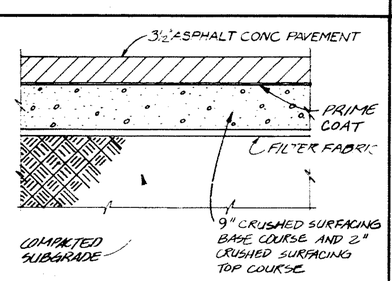
NO SCALE



NOTE: PIPING & VALVE TO BE INDICATED ON DWGS.

AIR RELEASE VALVE ASSEMBLY

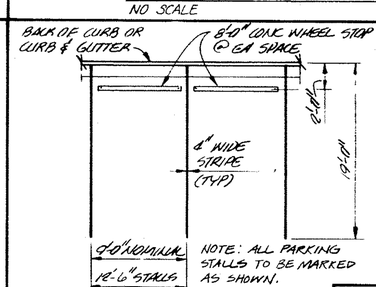
NO SCALE



NEW PAVEMENT SECTION FOR ROADWAY & PARKING AREA.

PAVING DETAIL

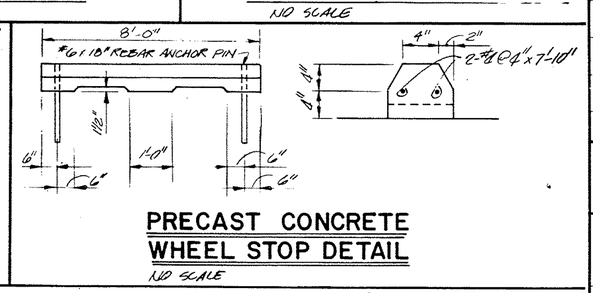
NO SCALE



NOTE: ALL PARKING STALLS TO BE MARKED AS SHOWN.

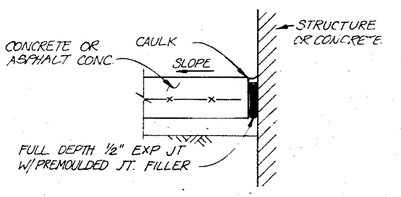
TYPICAL STALL MARKING DETAIL

NO SCALE



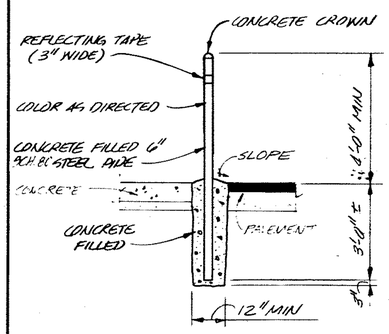
PRECAST CONCRETE WHEEL STOP DETAIL

NO SCALE



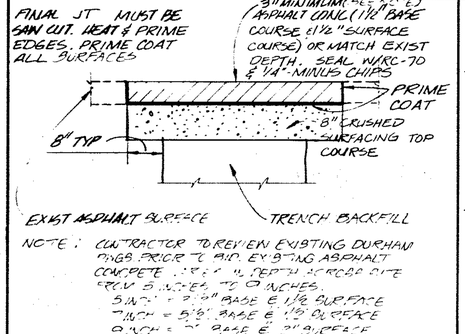
TYPICAL ABUTMENT DETAIL

NO SCALE



BARRIER POST DETAIL

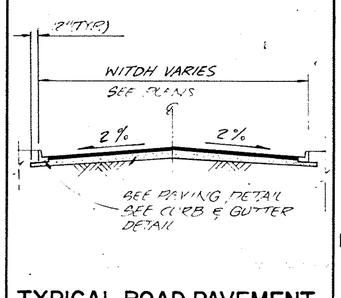
NO SCALE



NOTE: CONTRACTOR TO REVIEW EXISTING DURHAM DWGS PRIOR TO BID. EXISTING ASPHALT CONCRETE PAVEMENT DEPTH ACROSS SITE FROM 3 INCHES TO 9 INCHES.
3 INCH = 2'-0" BASE & 1 1/2" SURFACE
6 INCH = 3'-6" BASE & 1 1/2" SURFACE
9 INCH = 7" BASE & 2" SURFACE

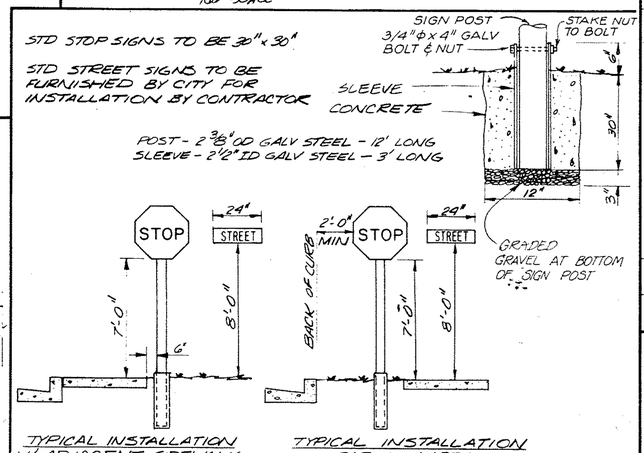
PAVEMENT PATCH DETAIL

NO SCALE



TYPICAL ROAD PAVEMENT SECTION

NO SCALE



TYPICAL INSTALLATION W/ ADJACENT SIDEWALK

TYPICAL INSTALLATION PARKWAY AREA

SIGN ANCHORAGE DETAIL

NO SCALE

△ AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

SITE DETAILS-I

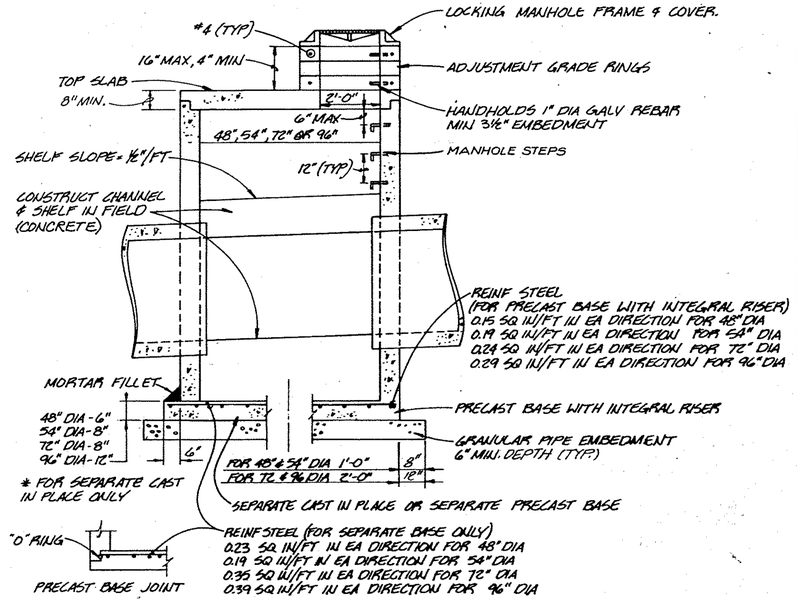
Designed: AHK
Drawn: SDS
Checked: JPT/DJH
Approved: John E Kroll
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/8/92

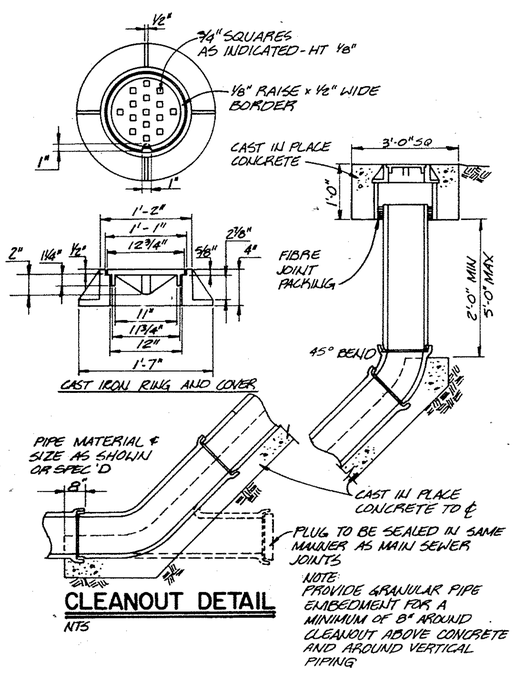
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON EXPIRES: 12-31-1994 BRUCE R. WILLEY

Sheet Number 123



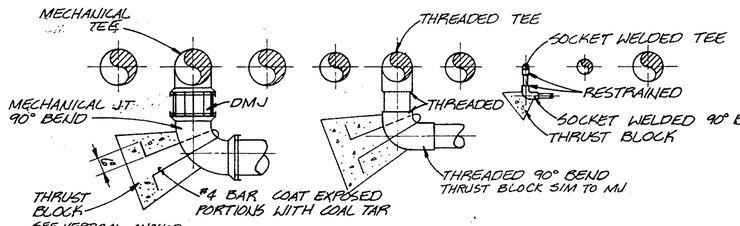
NOTE:
KNOCKOUT OR CUTOUT HOLE SIZE IS EQUAL TO PIPE OUTER DIAMETER PLUS MANHOLE WALL THICKNESS. MAXIMUM HOLE SIZE IS 36" FOR 48" MANHOLE. 42" FOR 54" MANHOLE. MINIMUM DISTANCE BETWEEN HOLES IS 8". MAXIMUM HOLE SIZE IS 60" FOR 72" MANHOLE, 84" FOR 96" MANHOLE. MINIMUM DISTANCE BETWEEN HOLES IS 12".

FLAT TOP MANHOLE DETAIL
NTS

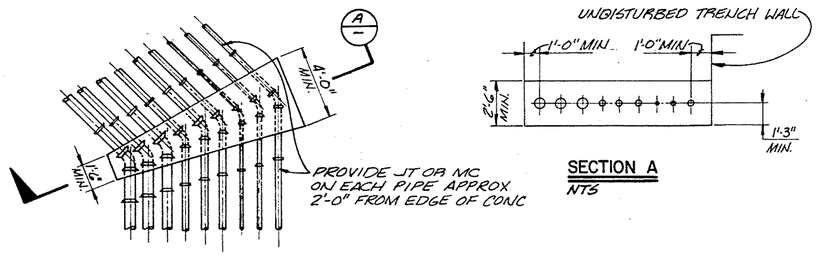


NOTE:
PROVIDE GRANULAR PIPE EMBEDMENT FOR A MINIMUM OF 8" AROUND CLEANOUT ABOVE CONCRETE AND AROUND VERTICAL PIPING

CLEANOUT DETAIL
NTS

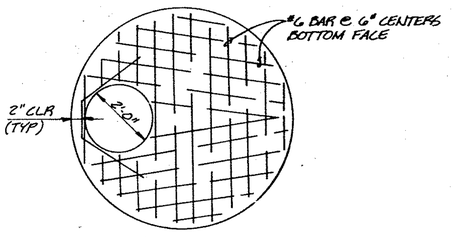


CONNECTION FOR PARALLEL PIPING
NTS

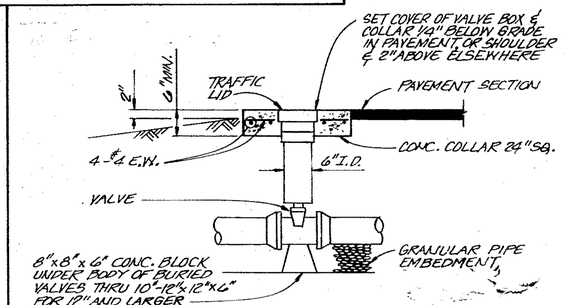


SECTION A
NTS

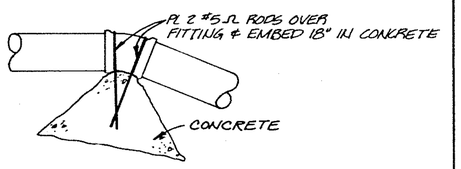
PARALLEL PIPING THRUST BLOCK
NTS



MANHOLE TOP SLAB DETAIL
NTS

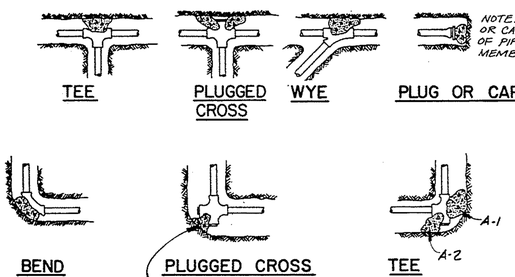


VALVE BOX DETAIL
NTS



FITTING SIZE	VOLUME OF ANCHOR BLOCK IN CUBIC YARD			
	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND
4"	0.8	0.6		
6	1.3	0.8		
8	2.3	1.1	0.6	
10	3.7	1.8	0.8	
12	5.5	2.8	1.2	0.6
14	7.6	3.9	1.7	0.8
16	9.9	5.1	2.3	0.9

VERTICAL ANCHOR BLOCK DETAIL
NTS



NOTES:

1 - CONCRETE THRUST BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.

2. - KEEP CONCRETE CLEAR OF JOINT AND ACCESSORIES.

3. - THE REQUIRED THRUST BEARING AREAS FOR SPECIAL CONNECTIONS ARE SHOWN ENCIRCLED ON THE PLANS: E.G. (15) INDICATES 15 SQUARE FEET BEARING AREA REQUIRED.

4. - IF NOT SHOWN ON PLANS, REQUIRED BEARING AREAS AT FITTING TO BE AS INDICATED BELOW, ADJUST IF NECESSARY, TO CONFORM TO TEST PRESSURE(S) AND ALLOWABLE SOIL BEARING STRESS(ES) IDENTIFIED DURING CONSTRUCTION.

5. - BEARING AREAS AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER BEARING AREAS AND BLOCKING DETAILS SHOWN ON THIS STANDARD DETAIL.

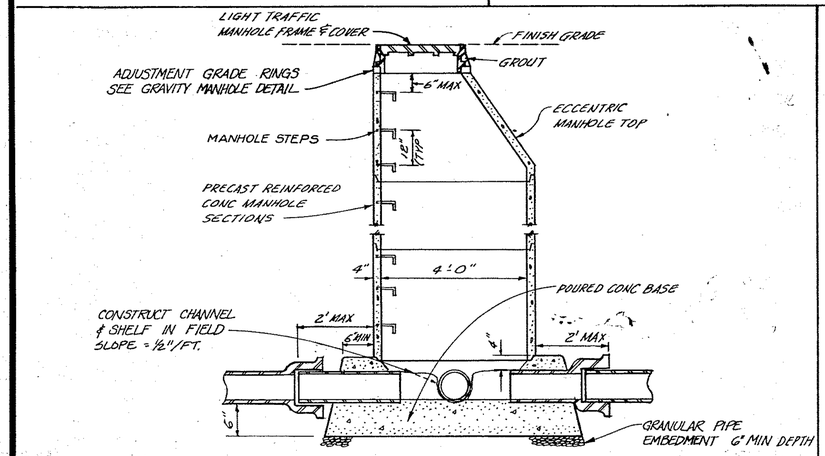
NOTE:

LISTED BEARING AREAS ARE BASED ON TEST PRESSURE OF 150 P.S.I. AND AN ALLOWABLE SOIL BEARING STRESS OF 2,000 LBS. PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION:

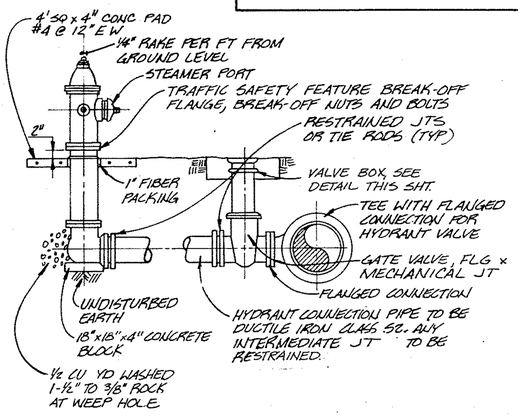
BEARING AREA = (TEST PRESSURE/150) X (2000/SOIL BEARING STRESS) X (TABLE VALUE).

FITTING SIZE	BEARING AREA OF THRUST BLOCKS IN SQUARE FEET							
	TEE, WYE PLUG OR CAP	90° BEND PLUGGED CROSS	TEE PLUGGED ON RUN		45° BEND	22-1/2° BEND	11-1/4° BEND
			A_1	A_2			
4	1.0	1.4	1.9	1.4	1.0	---	---
6	2.1	3.0	4.3	3.0	1.6	1.0	---
8	3.8	5.3	7.6	5.4	2.9	1.5	1.0
10	5.9	8.4	11.8	8.4	4.6	2.4	1.2
12	8.5	12.0	17.0	12.0	6.6	3.4	1.7
14	1.5	16.3	23.0	16.3	8.9	4.6	2.3
16	15.0	21.3	30.0	21.3	11.6	6.0	3.0
18	19.0	27.0	38.0	27.0	14.6	7.6	3.8
20	23.5	33.3	47.0	33.3	18.1	9.4	4.7
24	34.0	48.0	68.0	48.0	26.2	13.6	6.8

THRUST BLOCK DETAIL
NTS



ECCENTRIC MANHOLE DETAIL
NTS



FIRE HYDRANT ASSEMBLY DETAIL
NTS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

SITE DETAILS-II

Designed: AHK
Drawn: CWA
Checked: JPT/DJH
Approved: John E Hoch
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

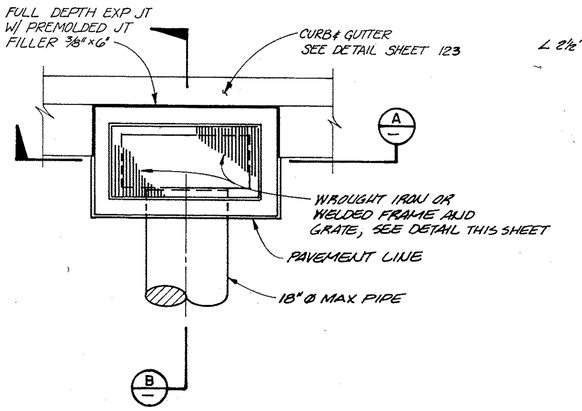
No	By	Revision	Date
1	AEA	AS RECORDED DRAWING	12/8/92

REGISTERED PROFESSIONAL ENGINEER 13591 OREGON JULY 17, 1985 BRUCE R. WILLEY

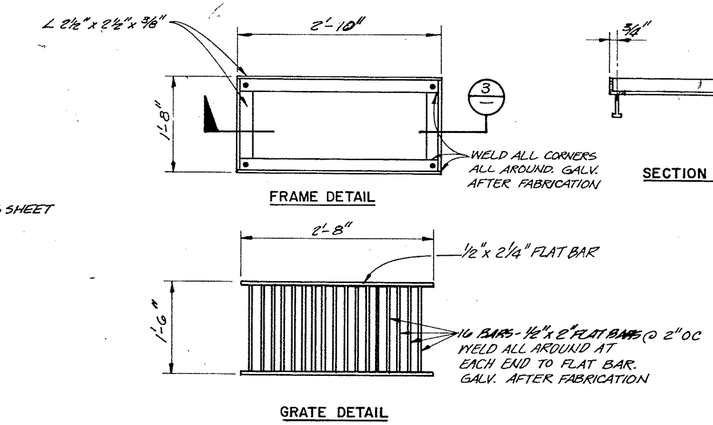
Sheet Number 124

AS RECORDED DRAWINGS

SR 904

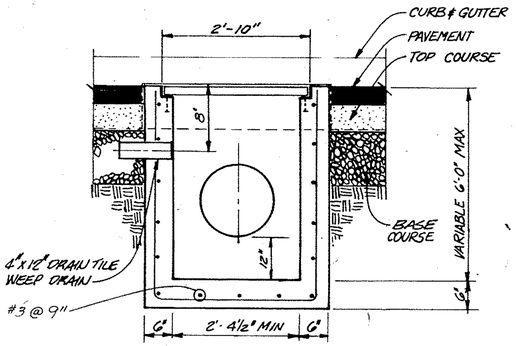


PLAN VIEW

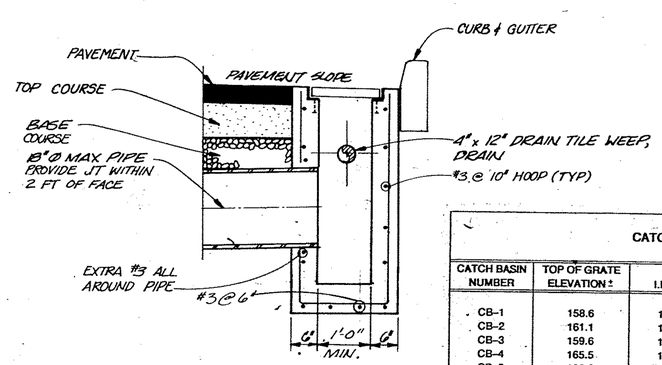


WELDED FRAME & GRATE DETAIL

NO SCALE



SECTION A



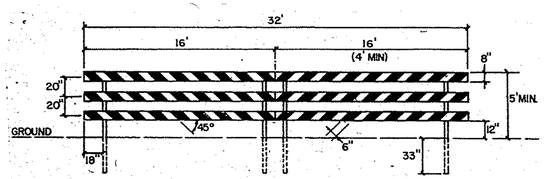
SECTION B

STANDARD CATCH BASIN DETAIL

NO SCALE

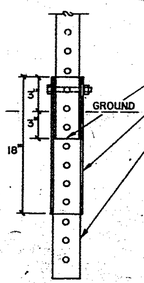
CATCH BASIN SCHEDULE

CATCH BASIN NUMBER	TOP OF GRATE ELEVATION ±	I.E. OUT	DOWN STREAM CONNECTION	PIPE SIZE	PIPE LENGTH
CB-1	158.6	155.00	MHSD-5	10" N.	49'
CB-2	161.1	156.00	MHSD-5	10" S.	53'
CB-3	159.6	155.50	MHSD-5	10" E.	22'
CB-4	165.5	161.00	MHSD-6	10" W.	11'
CB-5	165.8	161.00	MHSD-6	10" S.	40'
CB-6	169.7	165.50	MHSD-7	10" N.	39'
CB-7	171.4	167.00	MHSD-7	10" S.	24'
CB-8	171.5	166.00	MHSD-7	10" S.	41'
CB-9	159.7	155.00	MHSD-10	10" S.	22'
CB-10	159.7	155.00	MHSD-10	10" N.	20'
CB-11	171.3	167.30	MHSD (EXIST)	12" N.	—
CB-12	171.7	168.50	CB-11	10" E.	15'
CB-13	160.1	156.40	CB-14	10" E.	36'
CB-14	160.1	156.20	MHSD (EXIST)	10" S.	27'
CB-15	163.4	159.00	MHSD-12	8" W.	15'
CB-16	163.4	159.75	CB-15	8" S.	32'
CB-17	163.3	159.50	MHSD-12	8" E.	18'
CB-18	165.6	161.50	MHSD-13	8" S.	17'
CB-19	165.9	161.75	MHSD-13	8" S.	47'
CB-20	166.8	162.90	MHSD-9	8" W.	11'
CB-21	166.9	162.75	MHSD-9	8" E.	14'
CB-22	165.7	160.00	MHSD-6	10" S.	66'

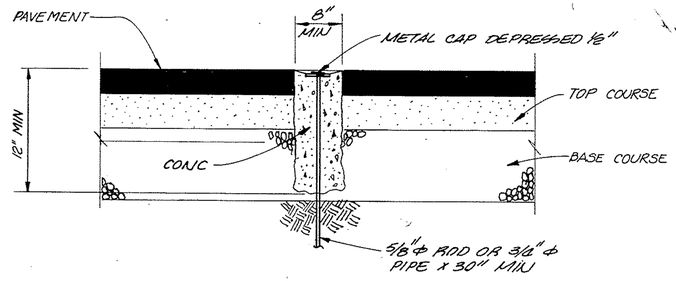


TRAFFIC BARRICADE DETAIL

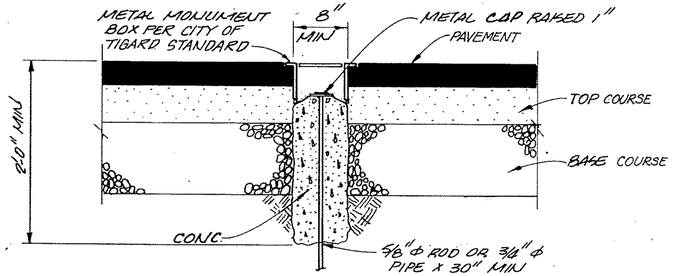
NO SCALE



1. MATERIALS:
   - 2" x 2" x 40", 12 GA. GALVANIZED PERFORATED STEEL POST.
   - 2 1/2" x 2 1/2" x 18", 12 GA. GALV. PERFORATED STEEL STIFFNER POST
   - 2 1/4" x 2 1/4" x 36", 12 GA. GALV. PERFORATED STEEL ANCHOR
   - 3/8" x 3 1/2", GALVANIZED HEX HEAD BOLT WITH LOCK WASHER, OR 5/16" CORNER BOLT.
   - 7/16" x 5", GALVANIZED CARRIAGE WITH FLAT AND LOCK WASHER, 2 BOLTS PER RAIL PER POST.
   - 2" x 8" CROSSRAILS-PAINTED WITH REFLECTORIZED RED AND WHITE PAINT
2. SEE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS AND THE OREGON SUPPLEMENT.
   - 3F-1 BARRICADES
   - 6C-8 BARRICADE DESIGN
   - 6C-9 BARRICADE APPLICATION
3. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CURRENT STATE OF OREGON STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.



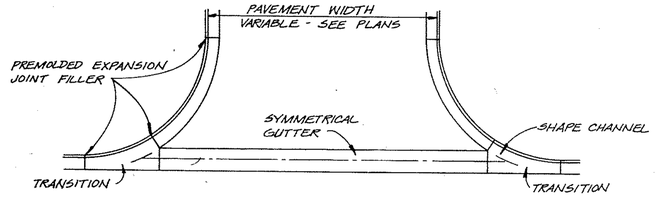
ASPHALT SURFACE-NO MONUMENT BOX



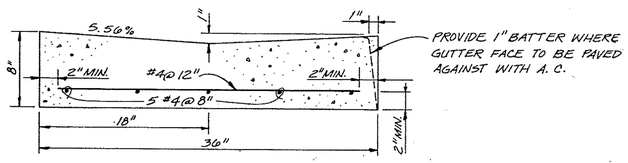
ASPHALT SURFACE-MONUMENT BOX

MONUMENT PLACEMENT DETAIL

NO SCALE



PLAN



SYMMETRICAL GUTTER DETAIL

DEPRESSED DRIVEWAY APRON DETAIL

NO SCALE

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

SITE DETAILS-III

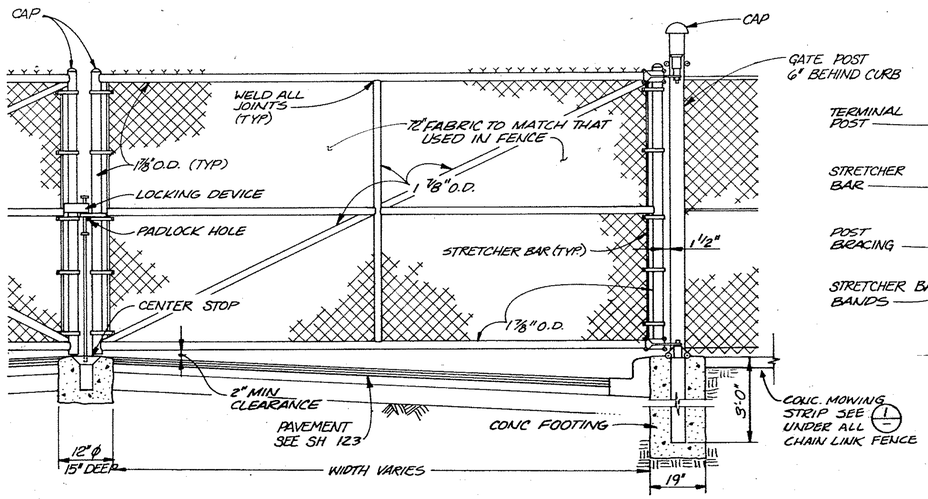
Designed AHK, DKT
Drawn DRV
Checked BRW
Approved John Ekholt
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/8/92

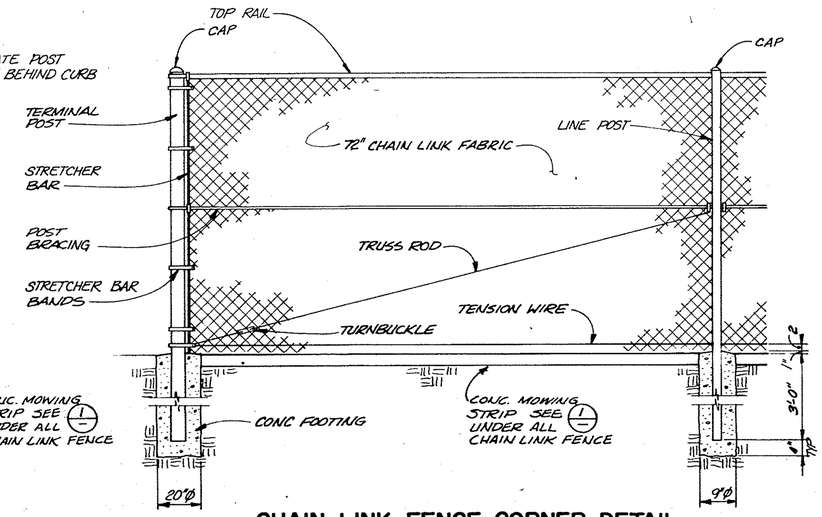
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1986 BRUCE R. WILLEY

Sheet Number 125



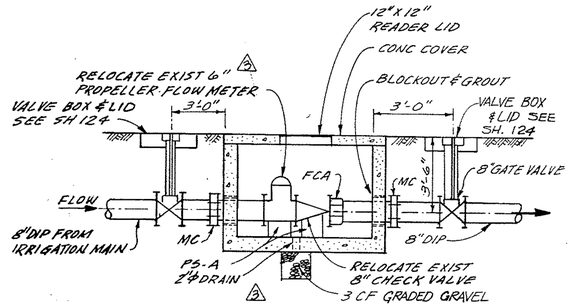
DOUBLE SWING GATE DETAIL

NTS NOTE: SINGLE WIDTH GATES TO BE REINFORCED SIM TO DOUBLE SWING GATE DETAIL



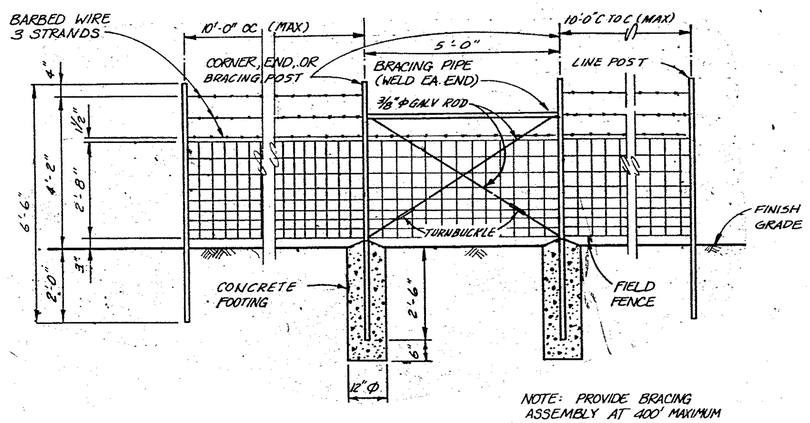
CHAIN LINK FENCE CORNER DETAIL

NTS NOTE: PROVIDE AT CORNER AND AT ENDS



IRRIGATION FLOW METER ASSEMBLY

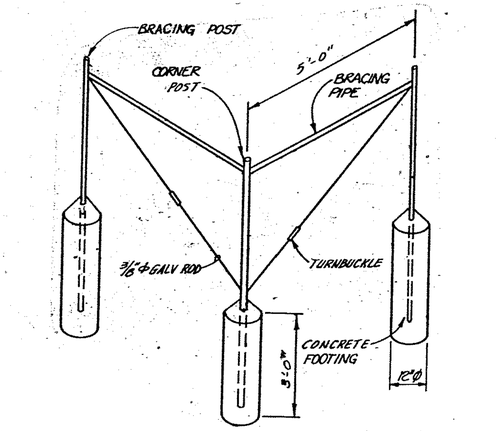
NTS



NOTE: PROVIDE BRACING ASSEMBLY AT 400' MAXIMUM SPACING AND AT END

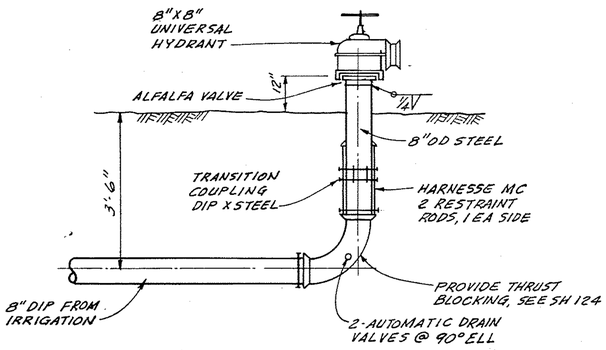
FIELD FENCE - FENCE AND BRACING ASSEMBLY

NTS NOTE: SIMILAR FOR BARB WIRE (5 - WIRES MINIMUM)



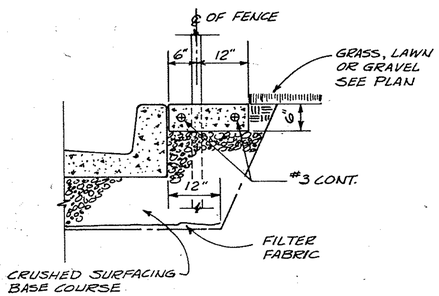
FIELD FENCE - STANDARD CORNER BRACE

NTS NOTE: SIMILAR FOR BARB WIRE



IRRIGATION RISER

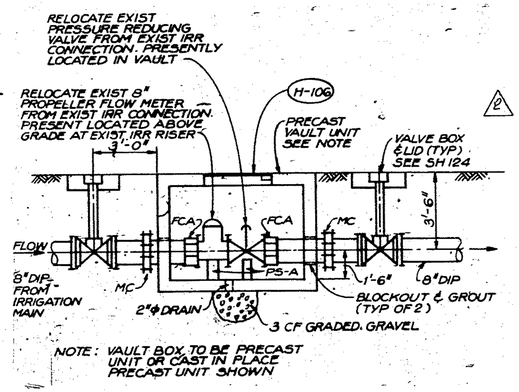
NTS



DETAIL 1 - MOWING STRIP

NTS

NOTE: MOWING STRIP MAY BE REDUCED TO 12 INCHES IN WIDTH WHEN NOT CONSTRUCTED UNDER FENCE. SEE PLANS.



NOTE: VAULT BOX TO BE PRECAST UNIT OR CAST IN PLACE PRECAST UNIT SHOWN

IRRIGATION FLOW METER/PRESSURE REDUCING VALVE ASSEMBLY

NTS

4 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

SITE DETAILS-IV

Designed AHK, DKT
Drawn DRV
Checked BRW
Approved
Date MAY, 1989

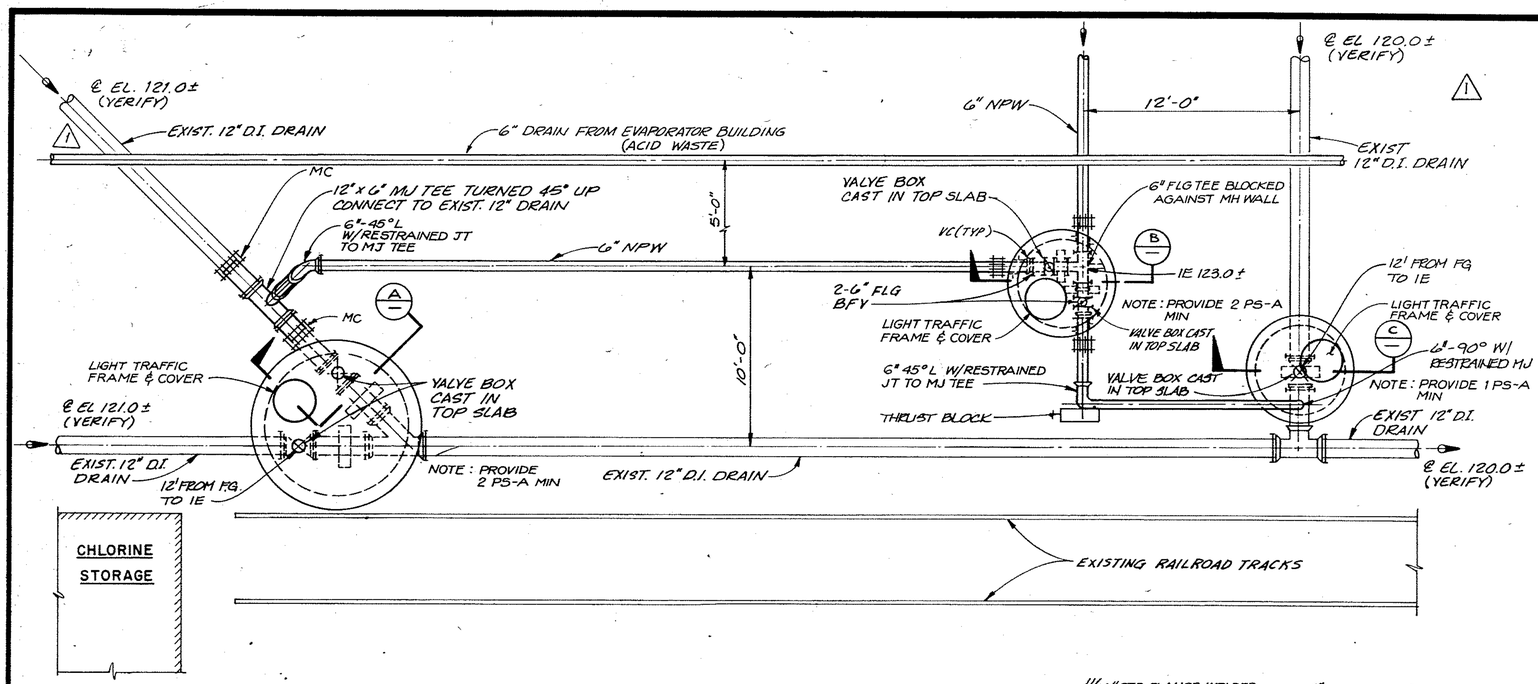
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No	By	Revision	Date
2	AHK	ADDENDUM NO. 2	6-30-89
3	AFK	CPE # 27,43	12/10/92
4	AFA	AS RECORDED DRAWING	12/10/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1985 BRUCE R. WILLEY

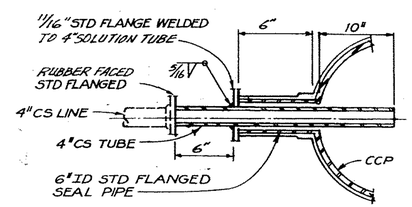
Sheet Number 126

SR 904



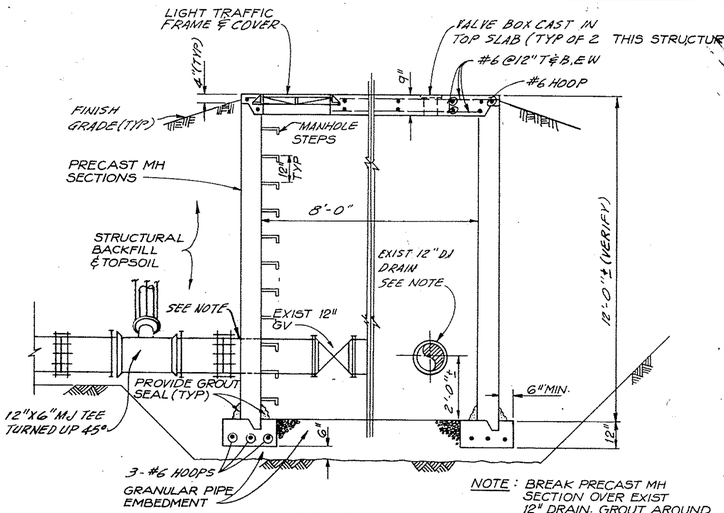
NON-POTABLE WATER CONNECTION TO DRAIN DETAIL

SCALE: 1/4" = 1'-0"



CHLORINATION DIFFUSER DETAIL

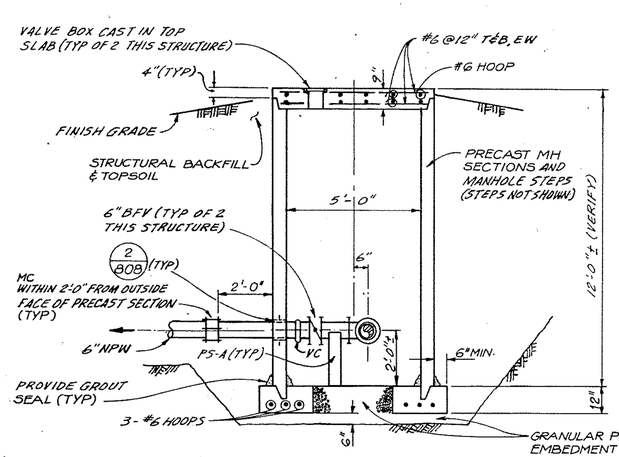
NO SCALE



NOTE : BREAK PRECAST MH SECTION OVER EXIST 12" DRAIN. GROUT AROUND PIPELINES AFTER SECTION IS SET IN PLACE.

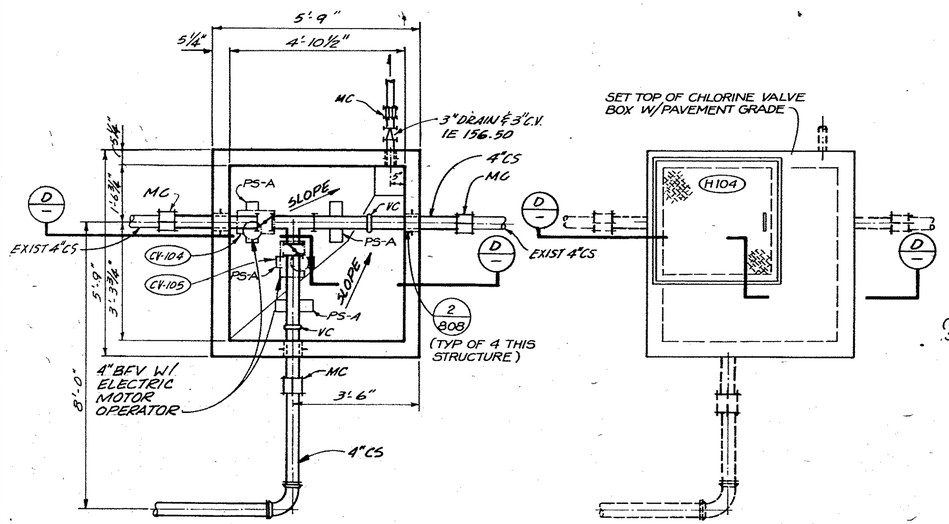
SECTION A

SCALE: 3/8" = 1'-0"



SECTION B

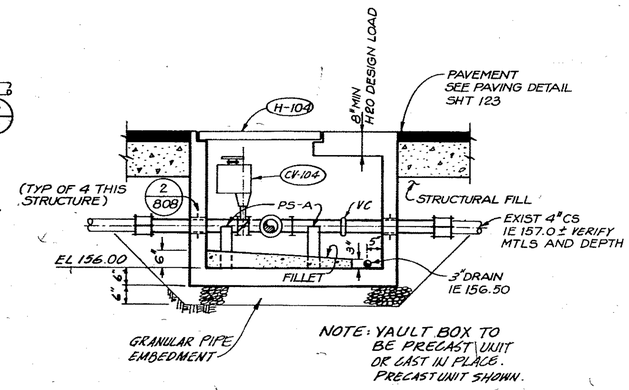
SCALE: 3/8" = 1'-0"



FLOOR PLAN ROOF PLAN

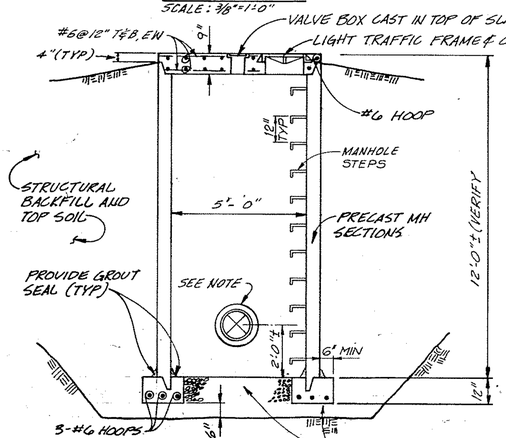
CHLORINE VALVE BOX

SCALE: 1/2" = 1'-0"



SECTION D

SCALE: 1/2" = 1'-0"



SECTION C

SCALE: 3/8" = 1'-0"

NOTE: BREAK PRECAST MH SECTION OVER EXISTING 12" DRAIN. GROUT AROUND PIPELINES AFTER SECTION IS SET IN PLACE

2 AS RECORDED DRAWINGS*

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

SITE DETAILS-V

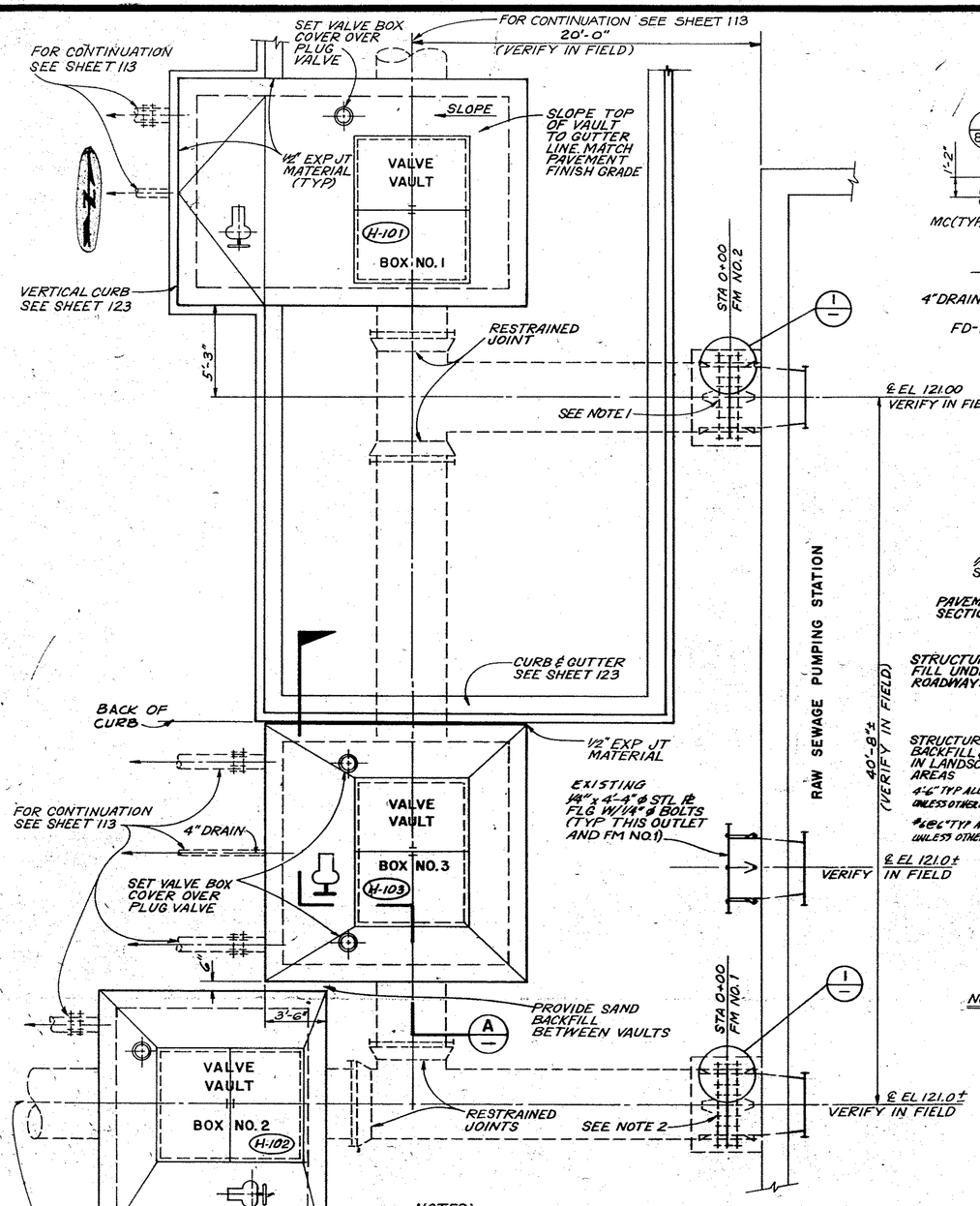
Designed	DKT
Drawn	MMK
Checked	B.R.W
Approved	John E. Ford
Date	MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	JEK	AS RECORDED DRAWING	12/18/92
1	AFK	ADDENDUM NO. 1	6-22-89

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1986 BRUCE R. WILLEY

Sheet Number
127

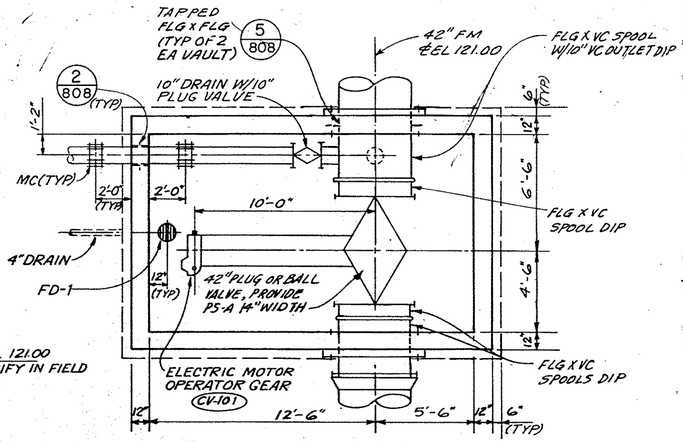


NOTES:

1. EXISTING 42 INCH CCP TO BE REMOVED. VERIFY EXISTING CONNECTION IN THE FIELD. CLEAN END OF EXISTING 42 INCH STEEL PIPE OUTLET. PROVIDE BUTT WELD CONN. AS DETAILED TO CONNECT NEW 42 INCH CCP. (3)
2. REMOVE EXISTING STEEL PLATE. VERIFY EXISTING CONNECTION IN THE FIELD. CLEAN END OF EXISTING 42 INCH STEEL PIPE OUTLET. PROVIDE BUTT WELD CONN. AS DETAILED TO CONNECT NEW 42 INCH CCP. (3)

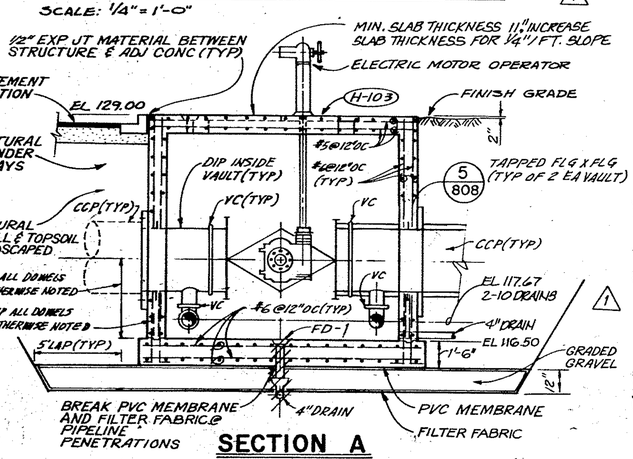
VALVE VAULT BOXES — SITE PLAN & ROOF PLANS

SCALE: 1/4" = 1'-0"



VALVE VAULT BOX NO. 1 — FLOOR PLAN

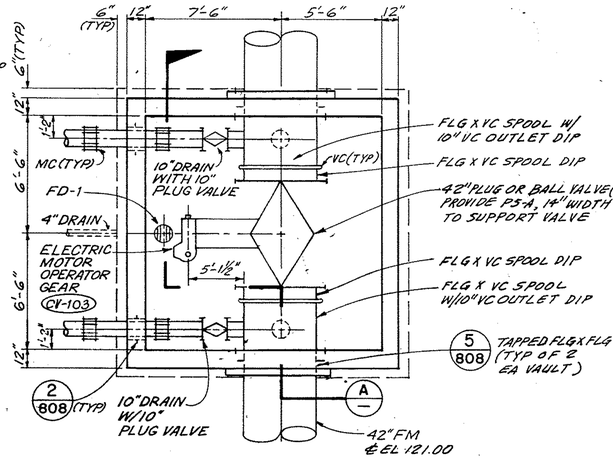
SCALE: 1/4" = 1'-0"



SECTION A

SCALE: 1/4" = 1'-0"

NOTE: SECTIONS THROUGH VAULTS NO.1 AND NO.2 ARE SIMILAR. PROVIDE 2-42" VC PLUGS.

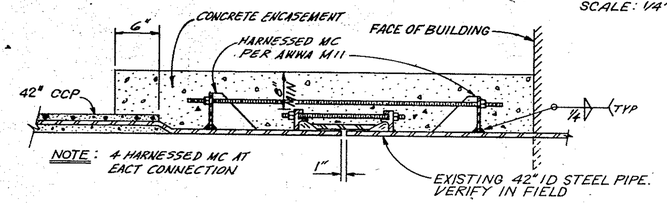


VALVE VAULT BOX NO. 3 — FLOOR PLAN

SCALE: 1/4" = 1'-0"

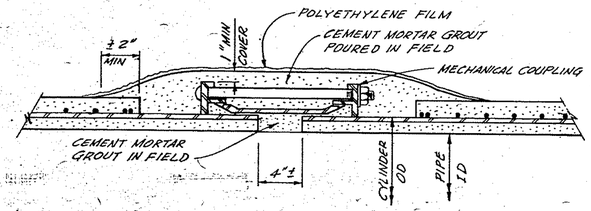
VALVE VAULT BOX NO. 2 — FLOOR PLAN

SCALE: 1/4" = 1'-0"



DETAIL 1 — SECTION THROUGH JOINT

N.T.S.



DETAIL 2 - CONCRETE CYLINDER PIPE CLOSURE

N.T.S.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

VAULT BOX DETAILS

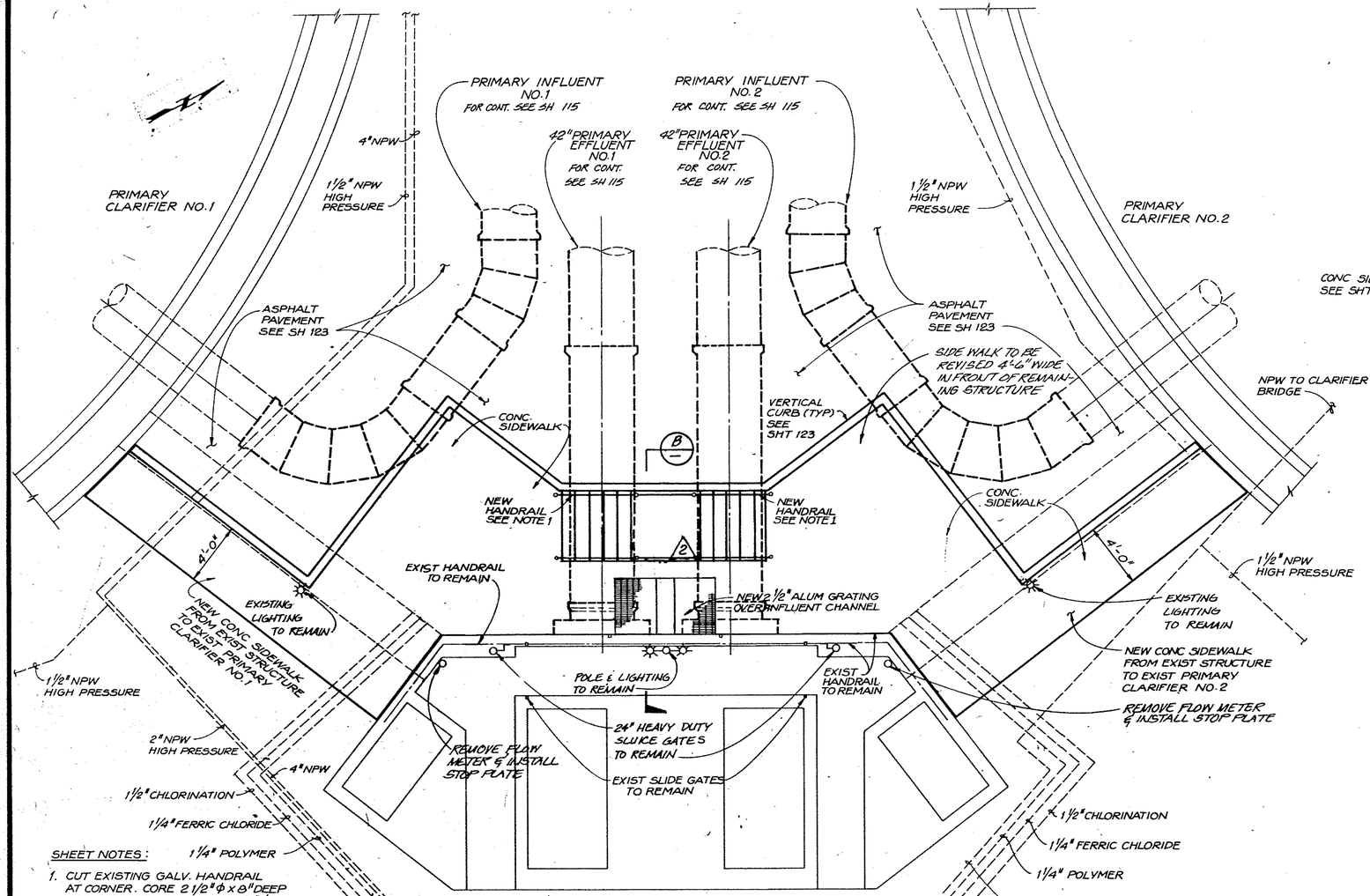
Designed: AHK, DKT
Drawn: M J
Checked: BRW
Approved: John Eckel
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	JEK	ADDENDUM NO. 1	6-27-89
2	JEK	ADDENDUM NO. 2	6-30-89
3	AFA	CPE # 30,119	12/8/92
4	AFA	AS RECORDED DRAWING	12/8/92

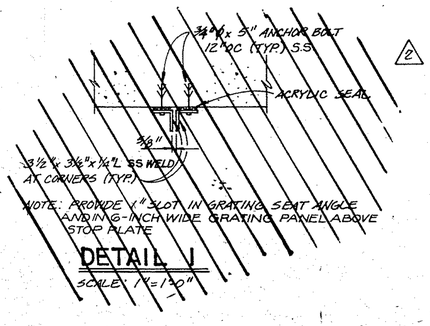
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1986 BRUCE R. WILLEY

Sheet Number: 128



SHEET NOTES:

1. CUT EXISTING GALV. HANDRAIL AT CORNER. CORE 2½"ϕ x 8" DEEP POST POCKETS FOR NEW 1½"ϕ HANDRAIL POSTS IN EXISTING CONCRETE. VERIFY SPACING AND DIAMETER OF CUT RAILING. FIELD WELD NEW HANDRAIL TO EXISTING HANDRAIL AT CORNERS. FIELD COAT WELDED SURFACES. PROVIDE KICKPLATE AT ALL NEW HANDRAIL. GROUT POST POCKETS TO NEW HANDRAIL POSTS.
2. SAW CUT 24" SQ OPNG FOR SL-101. ℄ EL = 160.50. PROVIDE S.S. ANCHOR BOLTS TO ATTACH YOKE TO CONC. WALL PER MANUFACTURERS RECOMMENDATIONS. PROVIDE CAST IRON WALL BRACKET AT EL 169.5 ± FOR CAST IRON FLOOR STAND. PROVIDE SS ANCHOR BOLTS PER MANUFACTURERS RECOMMENDATIONS. MODIFY EXISTING GRATING.



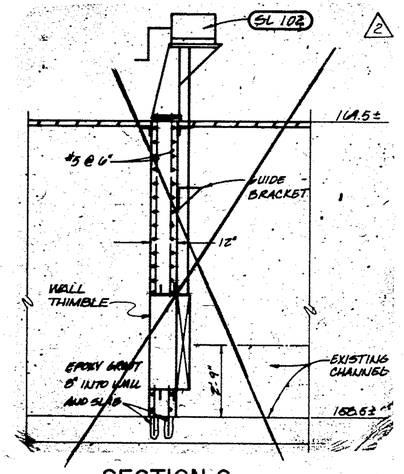
NOTE: PROVIDE ¼" SLOT IN GRATING SEAT ANGLE AND NINE-INCH WIDE GRATING PANEL ABOVE STOP PLATE

DETAIL V

SCALE: 1" = 1'-0"

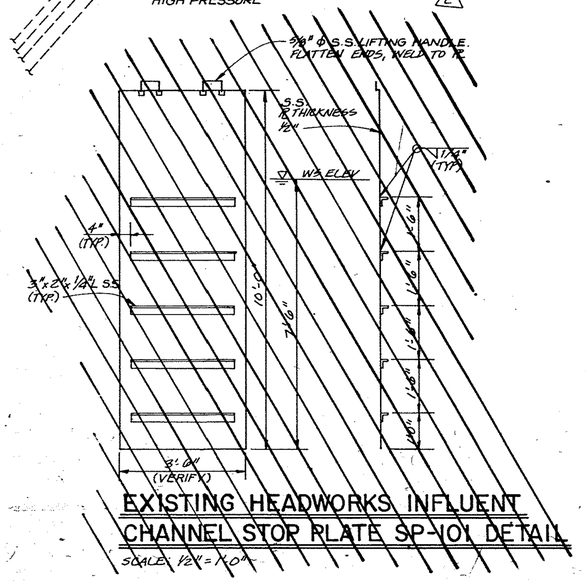
REVISED STAIRWAY ACCESS

SCALE: 1/4" = 1'-0"



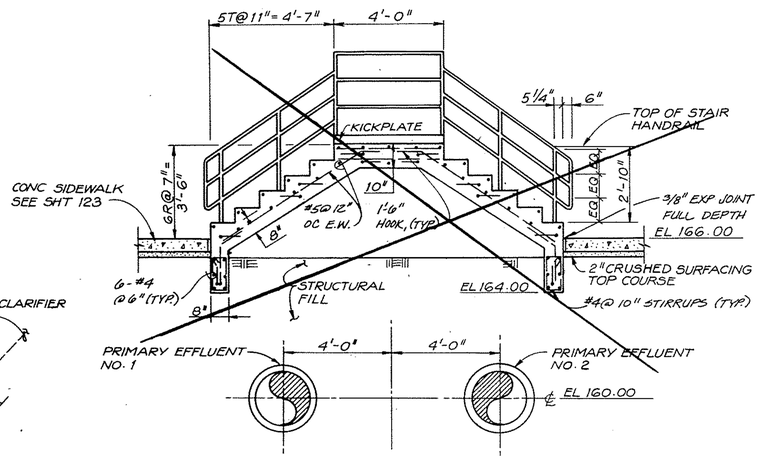
SECTION C

SCALE: 3/8" = 1'-0"



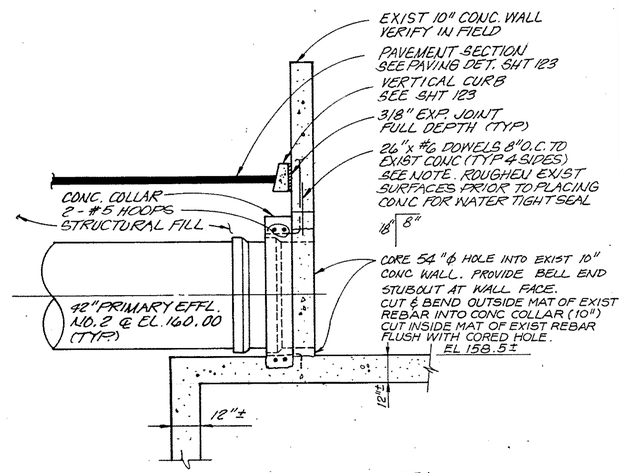
EXISTING HEADWORKS INFLUENT CHANNEL STOP PLATE SP-101 DETAIL

SCALE: ½" = 1'-0"



SECTION A

SCALE: 3/8" = 1'-0"



SECTION B

SCALE: 3/8" = 1'-0"

NOTE: DRILL 1⅛"ϕ HOLE 8" DEEP FOR #6 DOWEL. FILL WITH CARTRIDGE OF POLYESTER RESIN (TYP.)

△2 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

INLET STRUCTURE TO AERATION BASINS-REVISED STAIRWAY ACCESS

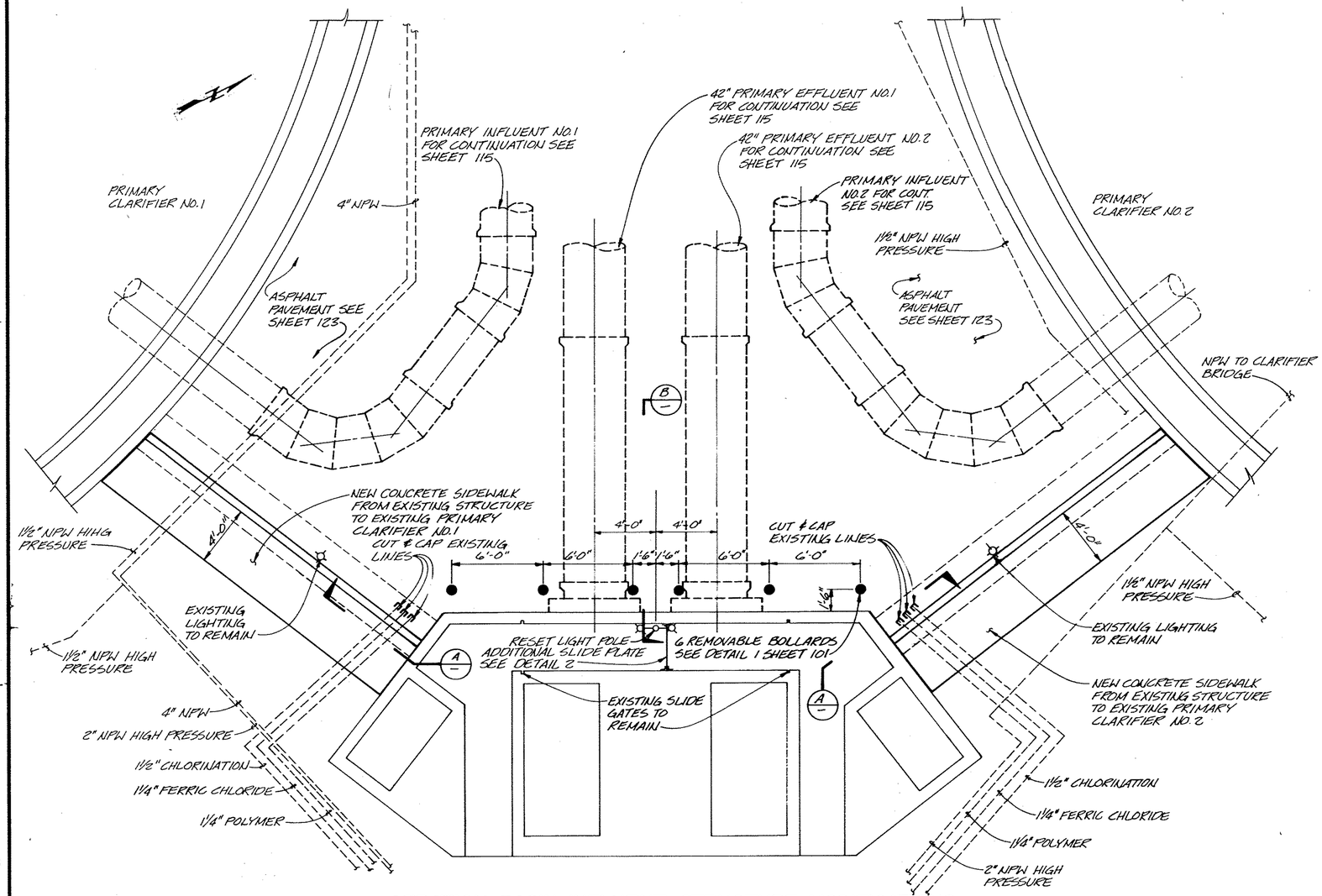
Designed	AHK, DKT
Drawn	IKD
Checked	BRW
Approved	John E. Kroll
Date	MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
△2	AHK	ADDENDUM NO 2	6-30-89
△3	APA	AS RECORDED DRAWING	12/10/92

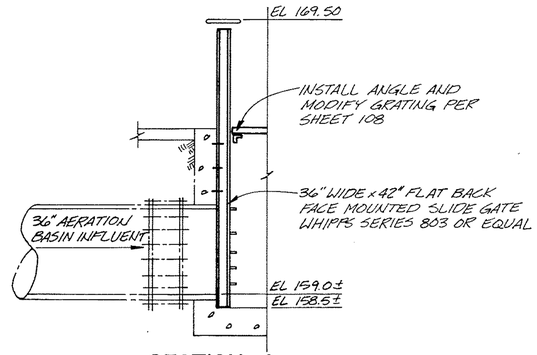
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JANUARY 1985 BRUCE R. WILLEY

Sheet Number 129



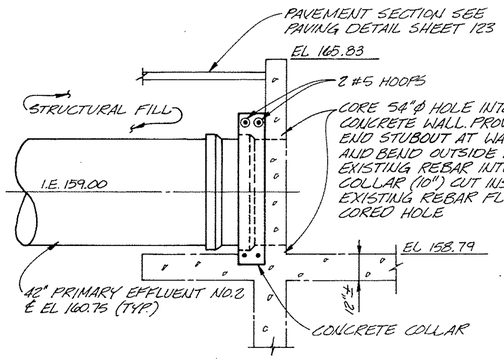
AERATION BASIN INFLUENT STRUCTURE MODIFICATIONS

SCALE: ¼"=1'-0"



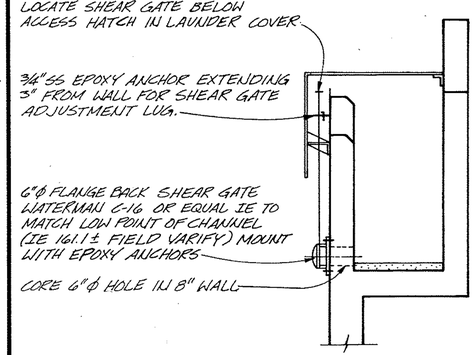
SECTION A

SCALE: ⅜"=1'-0"



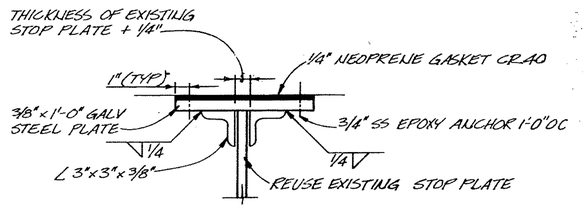
SECTION B

SCALE: ⅜"=1'-0"



DETAIL 1

SCALE: ½"=1'-0"
SECTION AT PRIMARY CLARIFIERS NO.1 & NO.2 LAUNDERS



NOTE:
FABRICATED STOP PLATE GUIDE TO BE INSTALLED ON EACH SIDE OF CHANNEL BETWEEN 42"ø INFLUENT LINES

DETAIL 2

NTS

AS RECORDED DRAWINGS

THIS SHEET SUPERCEEDS SHEET 129

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

INLET STRUCTURE TO AERATION BASINS - REVISED STAIRWAY ACCESS

Project Manager	J
Designed	JEK/BE
Drawn	CWA
Checked	JEK
Project Number	39-20-02
Date	

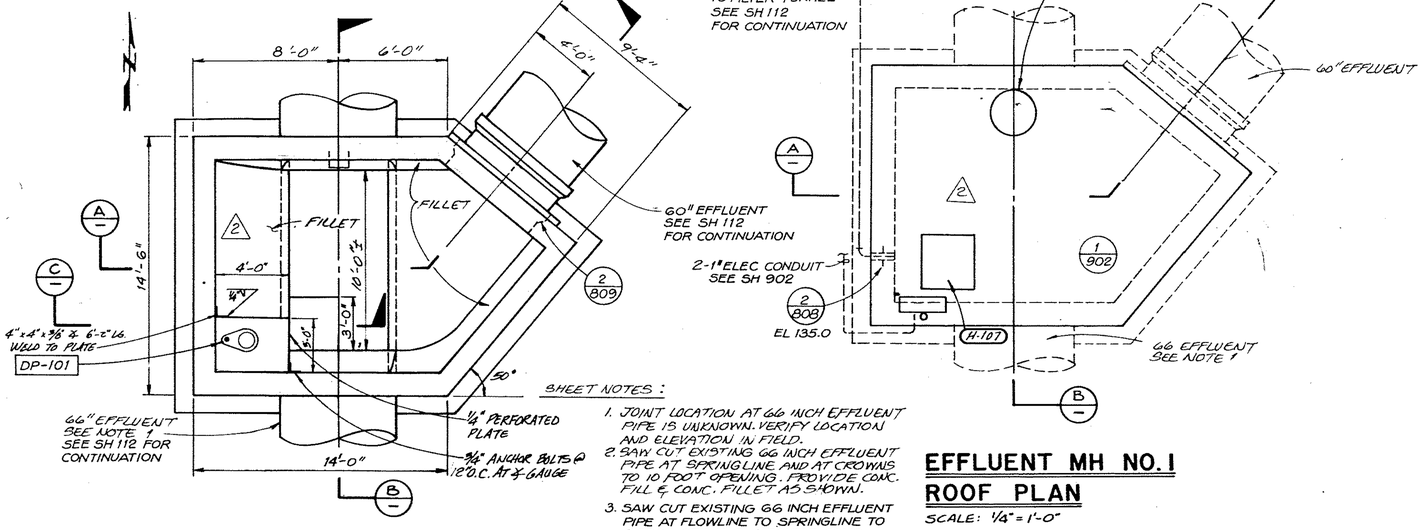
THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY.

No	By	Description	Date
1	AHA	CPR-25	3-15-90
2	AHA	AS RECORDED DRAWING	11-25-92

REGISTERED PROFESSIONAL ENGINEER 13261 OREGON JULY 17 1986 BRUCE R. WILLEY

Sheet Number
129A

SCREEN
COMPOSITE
OVERLAY



SHEET NOTES :

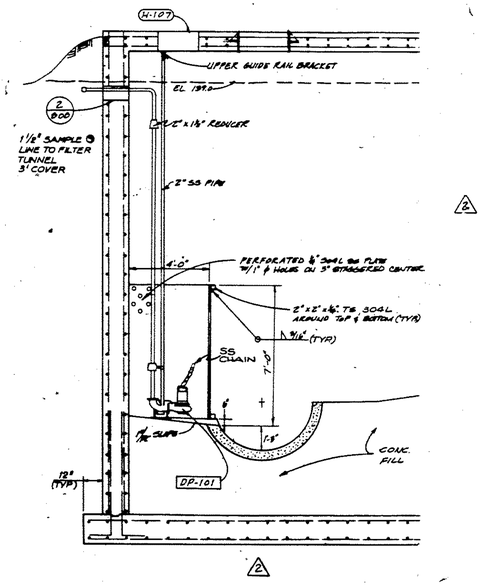
1. JOINT LOCATION AT 66 INCH EFFLUENT PIPE IS UNKNOWN. VERIFY LOCATION AND ELEVATION IN FIELD.
2. SAW CUT EXISTING 66 INCH EFFLUENT PIPE AT SPRINGLINE AND AT CROWNS TO 10 FOOT OPENING. PROVIDE CONC. FILL & CONC. FILLET AS SHOWN.
3. SAW CUT EXISTING 66 INCH EFFLUENT PIPE AT FLOWLINE TO SPRINGLINE TO 3 FOOT OPENING. PROVIDE CONC. FILL & CONC FILLET AS SHOWN.

EFFLUENT MH NO. 1 FLOOR PLAN

SCALE: 1/4"=1'-0"

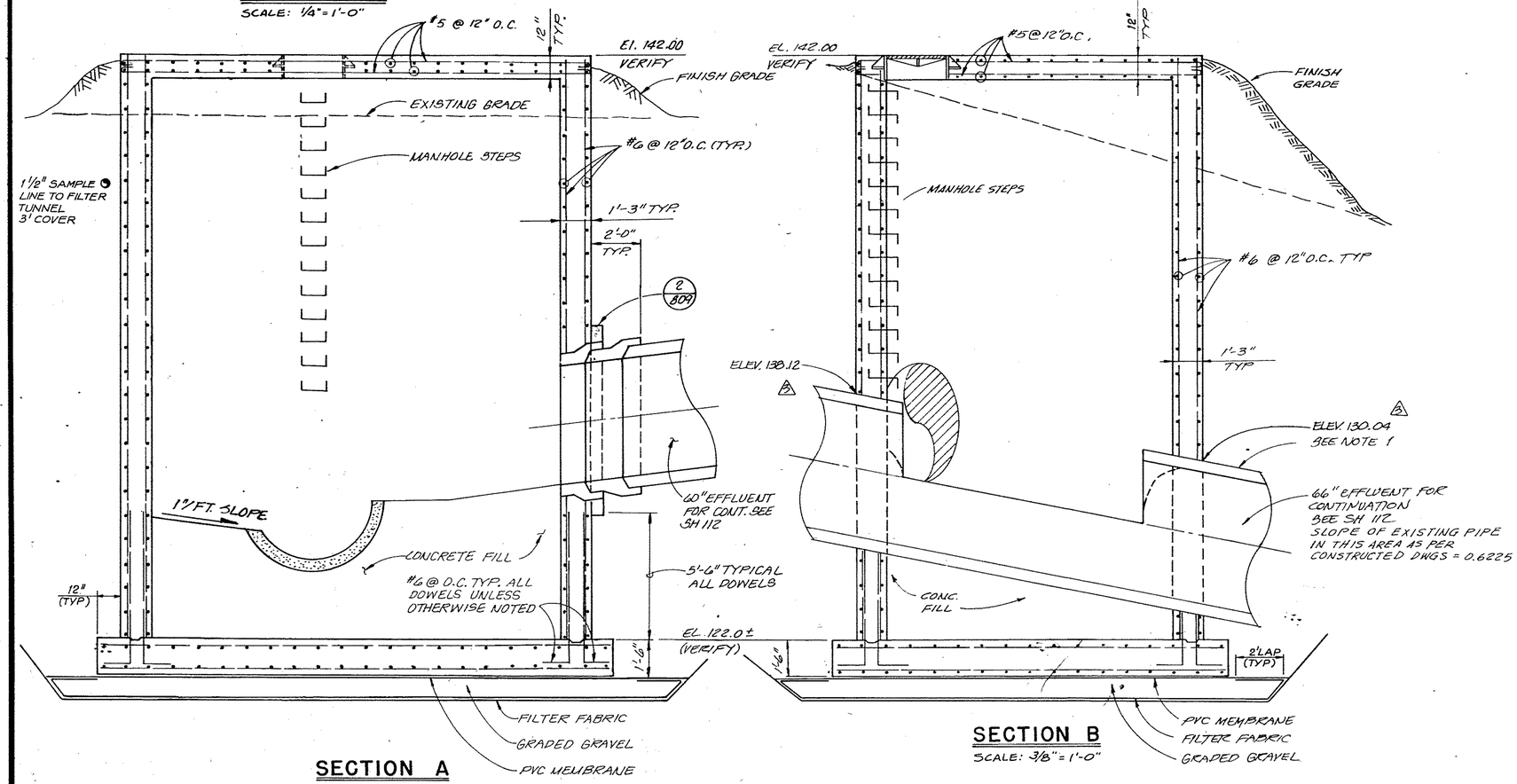
EFFLUENT MH NO. 1 ROOF PLAN

SCALE: 1/4"=1'-0"



SECTION C

NTS



SECTION A

SCALE: 3/8"=1'-0"

SECTION B

SCALE: 3/8"=1'-0"

4 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

EFFLUENT MANHOLE PLANS AND SECTIONS

Designed	AHK, DKT
Drawn	
Checked	BRW
Approved	John E. Hoch
Date	MAY, 1989

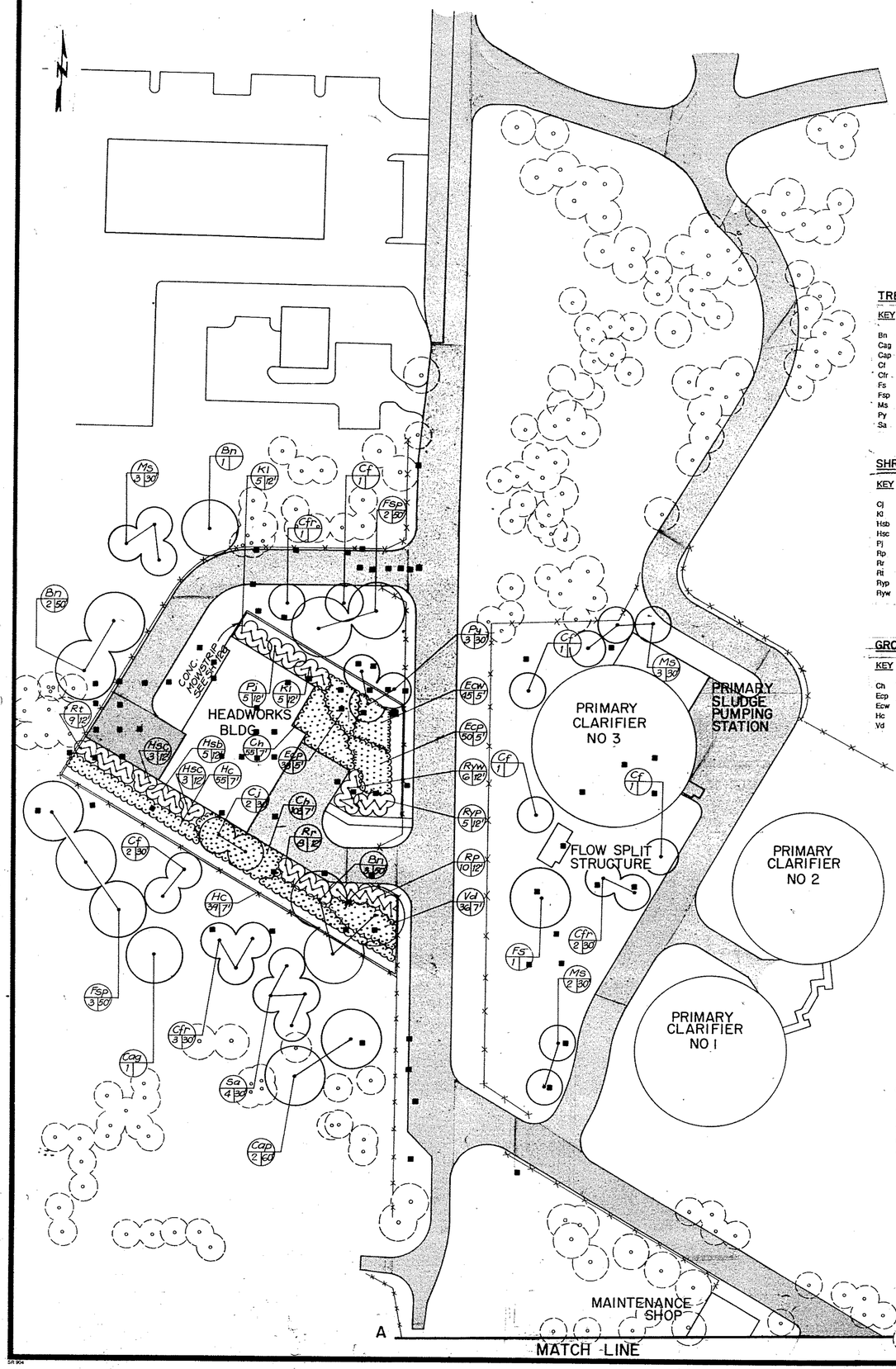
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	JEK	ADDENDUM NO. 2	6-30-89
3	AFA	CRF # 67	11-25-92
4	AFA	AS RECORDED DRAWING	12/18/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1986 BRUCE R. WILLE

Sheet Number 130

SA 904



PLANT TYPE

QUANTITY — Ps 2 50 — ON CENTER SPACING

PLANTING KEY SYMBOL

- NEW TREES & PLANTINGS
- EXISTING TREES & PLANTINGS TO REMAIN
- EXISTING TREES TO BE REMOVED (>6" SHOWN ONLY)

PLANT SCHEDULE

TREES:

KEY	NO.	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
Bn	7	BETULA JACQUEMONTII	RIVER BIRCH	4" CAL.	B & B
Cag	3	CEDRUS ATLANTICA 'GLAUCA'	SILVERY BLUE ATLAS CEDAR	4" CAL.	B & B
Cap	2	CEDRUS ATLANTICA 'PENDULA'	WEEPING ATLAS CEDAR	4" CAL.	B & B
Cf	10	CORNUS FLORIDA	FLOWERING DOGWOOD	3" CAL.	B & B
Cfr	10	CORNUS FLORIDA "CHEROKEE CHIEF"	RED FLOWERING DOGWOOD	3" CAL.	B & B
Fs	5	FAGUS SYLVATICA 'PENDULA'	WEEPING EUROPEAN BEECH	4" CAL.	B & B
Fsp	4	FAGUS SYLVATICA 'PURPUREA PENDULA'	PURPLE WEEPING EUROPEAN BEECH	4" CAL.	B & B
Ms	3	MAGNOLIA SOULANGIANA	SAUCER MAGNOLIA	3" CAL.	B & B
Py	1	PRUNUS YEDOENSIS	YOSHINO FLOWERING CHERRY	3" CAL.	B & B
Sa	4	SORBUS AUCUPARIA 'CARDINAL ROYAL'	EUROPEAN MOUNTAIN ASH	3" CAL.	B & B

SHRUBS:

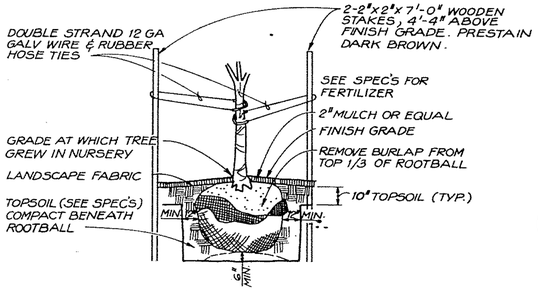
KEY	NO.	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
Cj	2	CAMELLIA JAPONICA	JAPANESE CAMELLIA	4 - 6'	B & B
Kl	10	KALMIA LATIFOLIA 'FUSCATA'	CALICO MOUNTAIN LAUREL	3 - 4'	B & B
Hsb	5	HIBISCUS SYRIACUS 'COLLIE MULLENS'	DOUBLE PINK ROSE-OF-SHARON	3 - 4'	B & B
Hsc	6	HIBISCUS SYRIACUS 'BLUSHING BRIDE'	DOUBLE LAVENDER ROSE-OF-SHARON	3 - 4'	B & B
Pj	5	PIERIS JAPONICA 'WADA'	PINK JAPANESE PIERIS	3 - 4'	B & B
Rp	10	RHODODENDRON-EXBURY HYBRID	PINK AZALEA	3 - 4'	B & B
Rr	8	RHODODENDRON-EXBURY HYBRID	ROSE AZALEA	3 - 4'	B & B
Rt	9	RHODODENDRON-EXBURY HYBRID	TOUCAN AZALEA	3 - 4'	B & B
Ryp	5	RHODODENDRON-YAKUSIMANUM	PINK YAKU RHODODENDRON	2 - 3'	B & B
Ryw	6	RHODODENDRON-YAKUSIMANUM	WHITE YAKU RHODODENDRON	2 - 3'	B & B

GROUND COVERS:

KEY	NO.	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
Ch	158	COTONEASTER HORIZONTALIS	ROCK COTONEASTER	2 GAL.	CONT.
Ecp	88	ERICA CARNEA	SPRINGWOOD PINK SPRING HEATH	1 GAL.	TRI. SPACING
Ecw	45	ERICA CARNEA	SPRINGWOOD WHITE SPRING HEATH	1 GAL.	TRI. SPACING
Hc	94	HYPERICUM CALYCINUM	AARON'S-BEARD ST. JOHN'S WORT	1 GAL.	TRI. SPACING
Vd	36	VIBURNUM DAVIDII	DAVID VIBURNUM	2 GAL.	CONT.

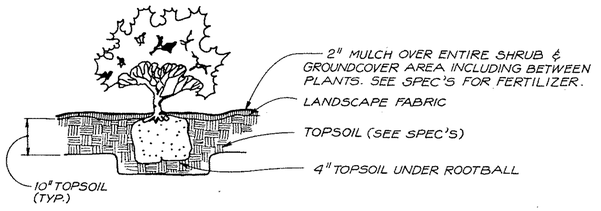
NOTES:

1. CONTRACTOR TO LOCATE ALL UTILITY LINES AND SUBSTRUCTURES PRIOR TO COMMENCEMENT OF WORK.
2. ALL AREAS TO RECEIVE 10" MIN. COMPACTED DEPTH TOPSOIL UNLESS OTHERWISE INDICATED.
3. ALL AREAS LOCATED OUTSIDE CLEARING AND GRUBBING LIMITS (SEE SHEETS 101 AND 102) AND DISTURBED BY CONSTRUCTION SHALL BE GRADED SMOOTH FOR UNIFORM DRAINAGE, RESTORED AND SODDED.
4. SEE SHT 126 FOR CONCRETE MOWSTRIP UNDER PERMANENT FENCING AND AROUND LANDSCAPE PLANTING.



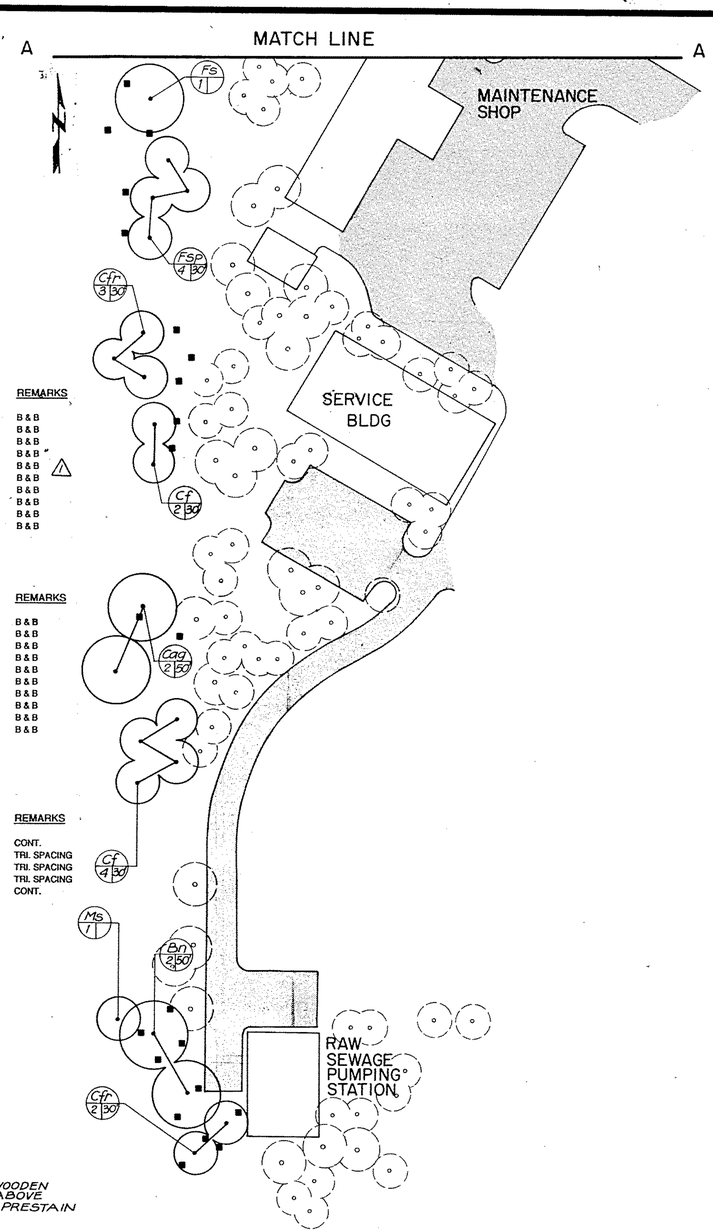
TREE PLANTING DETAIL

NTS



SHRUB PLANTING DETAIL

NTS



CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

LANDSCAPING

Designed DKT
Drawn IKD
Checked BRW
Approved John E Koch
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	AFA	AS RECORDED DRAWING	12-8-92
1	AFA	CPR # 48	11-25-92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1985 BRUCE R. WILLER

2 AS RECORDED DRAWINGS

Sheet Number 131

SR 904

GENERAL KEY	
	PVC PIPE
	PVC PIPE IN SLEEVE
	AUTOMATIC VALVE ASSEMBLY
A-1	CONTROLLER STATION AND NUMBER
	AIR RELIEF VALVE
	PRESSURE REDUCING VALVE

PROTECT EXIST IRRIGATION SYSTEM FROM DAMAGE FROM RAW SEWAGE PUMPING STATION NORTH TO NEW ACCESS ROAD DURING CONSTRUCTION. RESTORE TO ORIGINAL CONDITION IF DAMAGED. SEE DURHAM WASTEWATER TREATMENT PLANT AS-CONSTRUCTED DRAWINGS, SH G-20 THRU G-24 FOR ADDITIONAL INFORMATION ON PLANT IRRIGATION SYSTEM.

CONTROL VALVE KEY FOR CONTROLLERS "B" AND "E"					
CONTROL VALVE NO.	B-2	B-3	B-4	E-1	E-2
G.P.M.	134	133	103	40	31
CONTROL VALVE SIZE	3"	2-1/2"	2-1/2"	3"	2"
CONTROLLER STATION	EXIST 2	EXIST 3	EXIST 4	1	2

EXISTING IRRIGATION TO BE REPLACED UPON COMPLETION OF CONSTRUCTION ADJACENT TO PIPING AND ELECTRICAL CORRIDOR. ADDITIONAL SPRINKLERS EAST OF THIS DRWG TO BE RESTORED. SEE SH 112 FOR PARTIAL RELOCATION OF 4-INCH IRRIGATION.

SPRINKLER HEAD KEY					
HEAD	COMPANY (OR EQUAL)	CATALOG NO.	RADIUS	G.P.M.	P.S.I.
●	RAINBIRD	2045A-SAM FULL	36'	2.6	50
◓	RAINBIRD	2045A-SAM 20°-340°	36'	1.3	50
⊙	RAINBIRD	25AFP-TNT-7	24'	2.4	30
⊖	RAINBIRD	25AFP-TNT-7 20 TO 340	24'	1.2	30
⬡	RAINBIRD	41-51A-SAM 1/4" X 3/16"	60'	19	50
△	RAINBIRD	41-51A-SAM 1/4" X 3/16"	60'	9.5	50

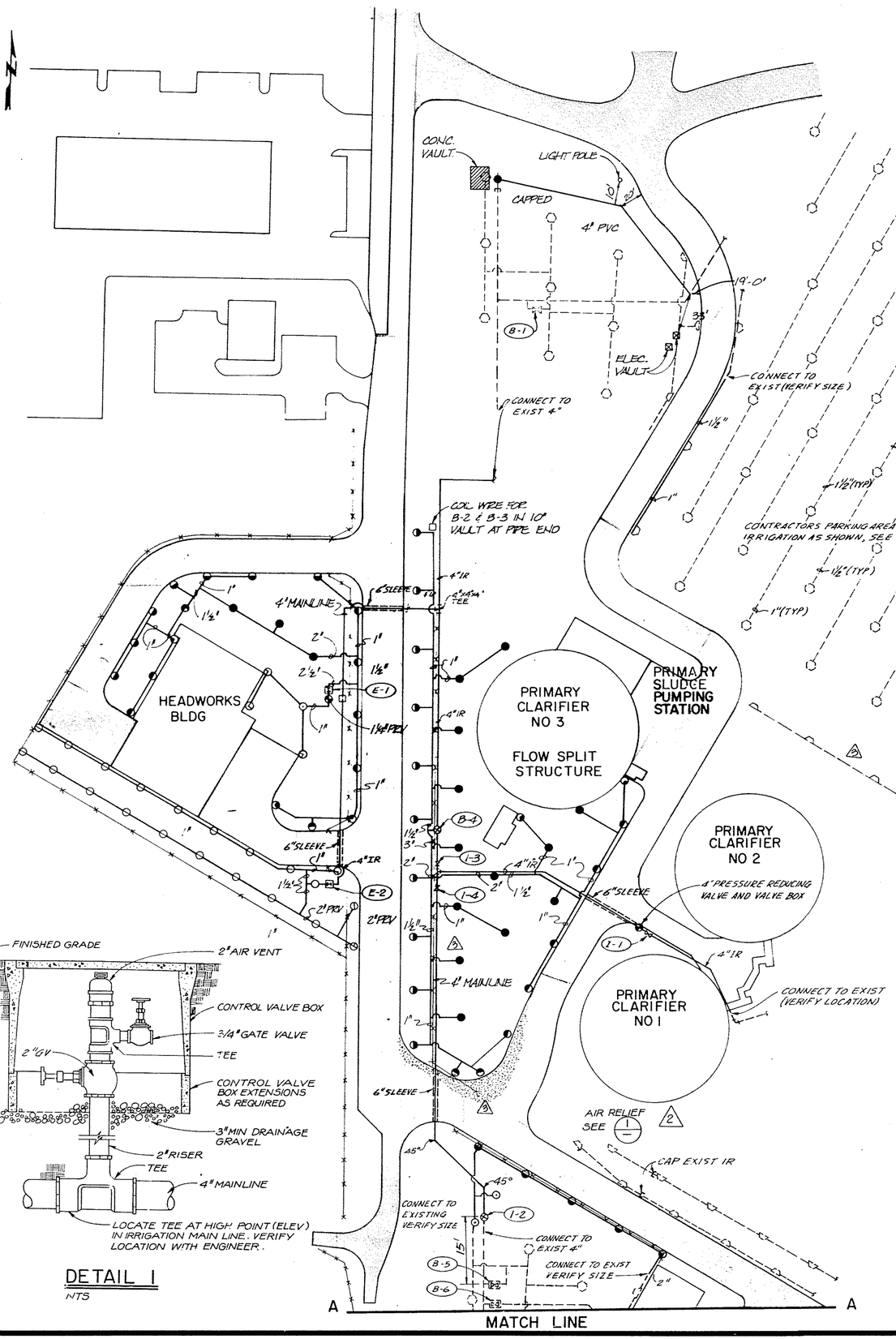
I-1 THRU I-5 - 4" GATE VALVES & VALVE BOX
B-2 THRU B-4 - NEW CONTROL VALVES (REPLACE EXISTING)
B-1 AND B-5 THRU B-9 - EXIST CONTROL VALVES
D-1 AND D-2 - EXIST CONTROL VALVES
E-1 AND E-2 - NEW CONTROL VALVES

DETAIL 1
NTS

DETAIL 2
SHRUB SPRAY
NTS

DETAIL 3
LAWN SPRAY RISER
NTS

AUTOMATIC VALVE ASSEMBLY
NTS
B-2, B-3, B-4, E-1 AND E-2



AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

IRRIGATION

Designed	DKT
Drawn	IKD
Checked	BRW
Approved	John E Kjorlien
Date	MAY, 1989

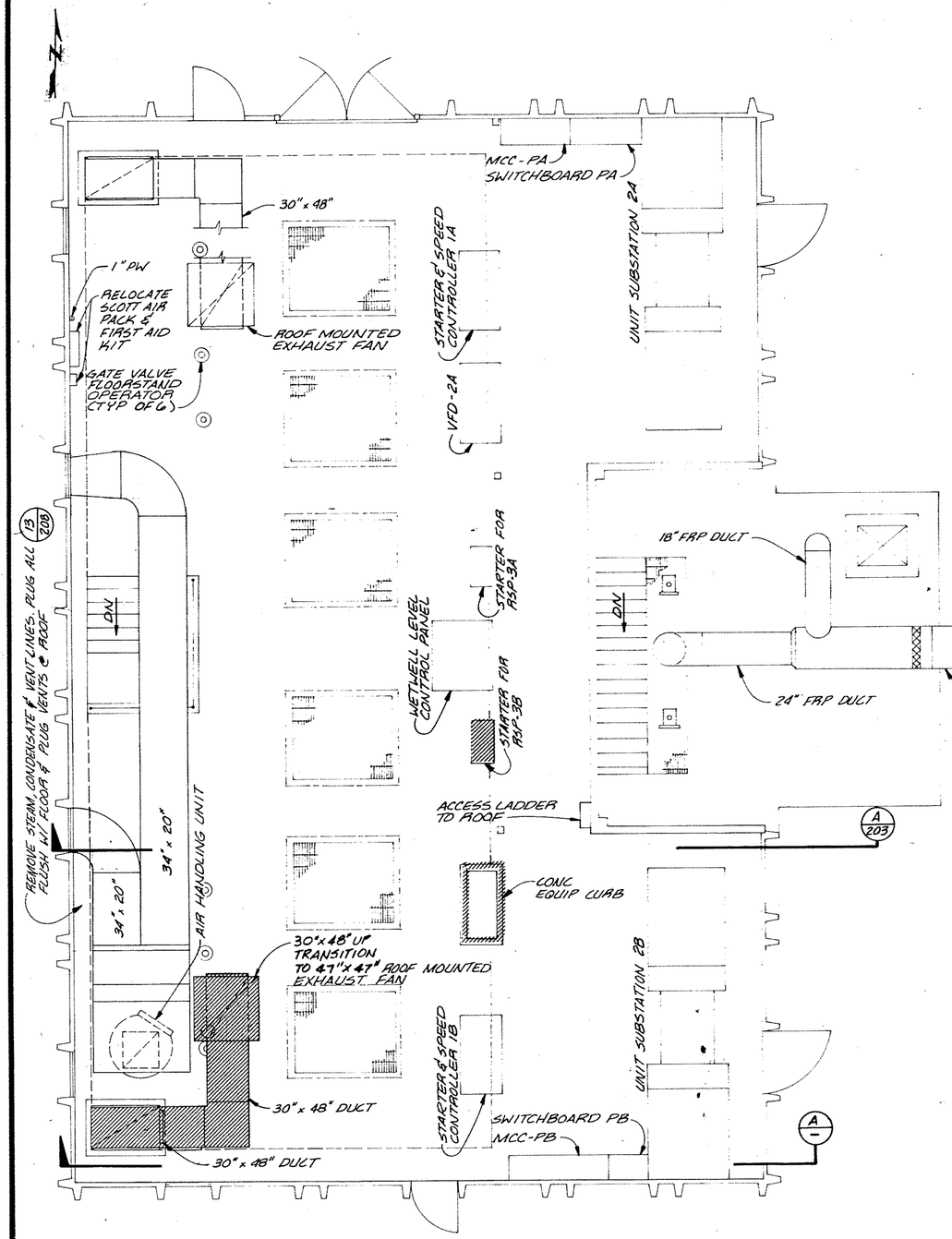
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
4	AHK	ADDENDUM NO 2	6-30-89
3	AFA	CPO # 49, 86, 94, 95	11-27-92
2	AFA	AS RECORDED DRAWING	2/8/92
1			

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1986 BRUCE R. WILLEY

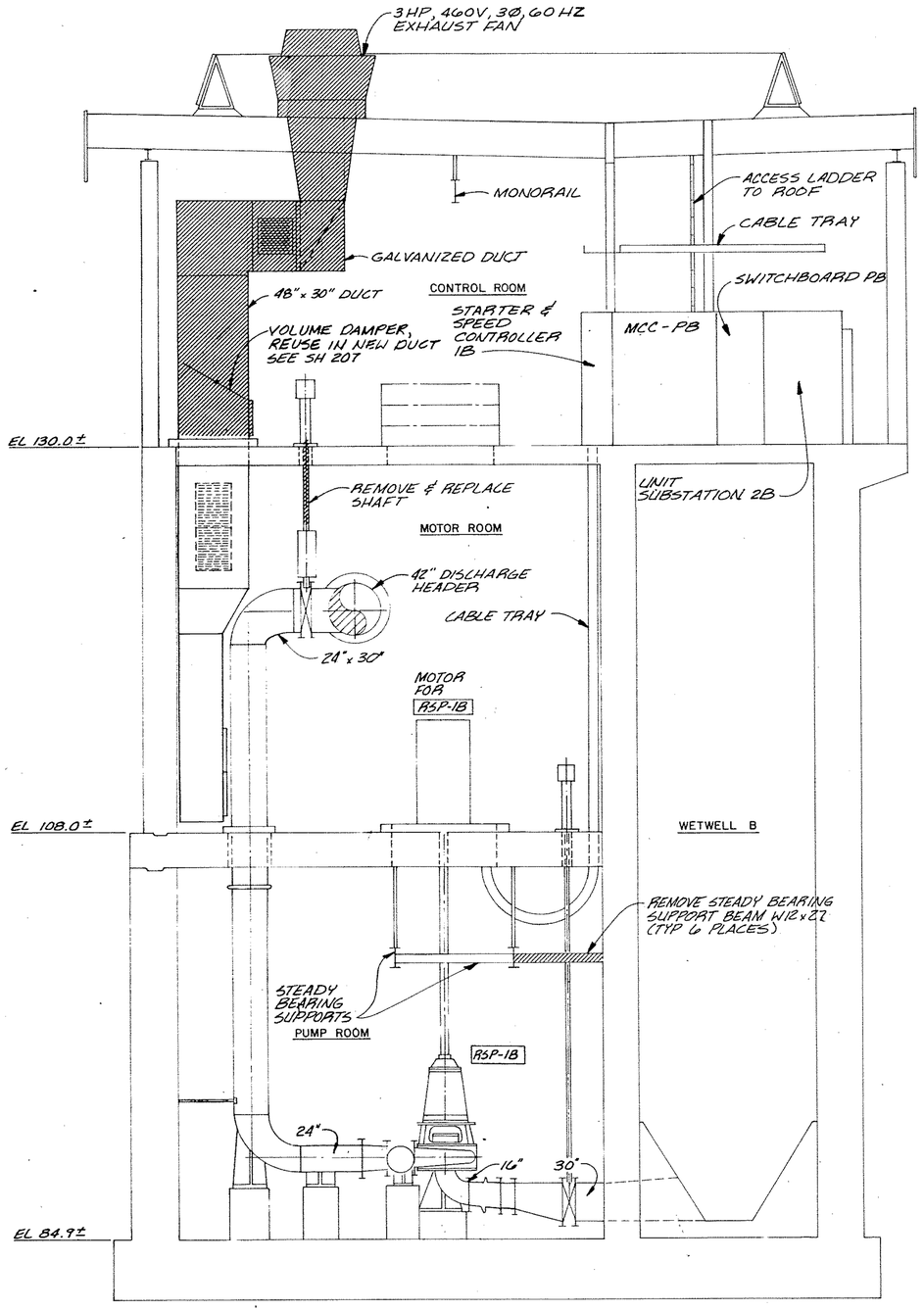
Sheet Number
132

SR 904



RAW SEWAGE PUMPING STATION - CONTROL ROOM DEMOLITION PLAN

SCALE: 1/4" = 1'-0"



SECTION A

SCALE: 1/4" = 1'-0"

△ AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

RAW SEWAGE PUMPING STATION - DEMOLITION

Designed: JEK
Drawn: CWA
Checked: BAW
Approved: John E Hoch
Date: MAY 1989

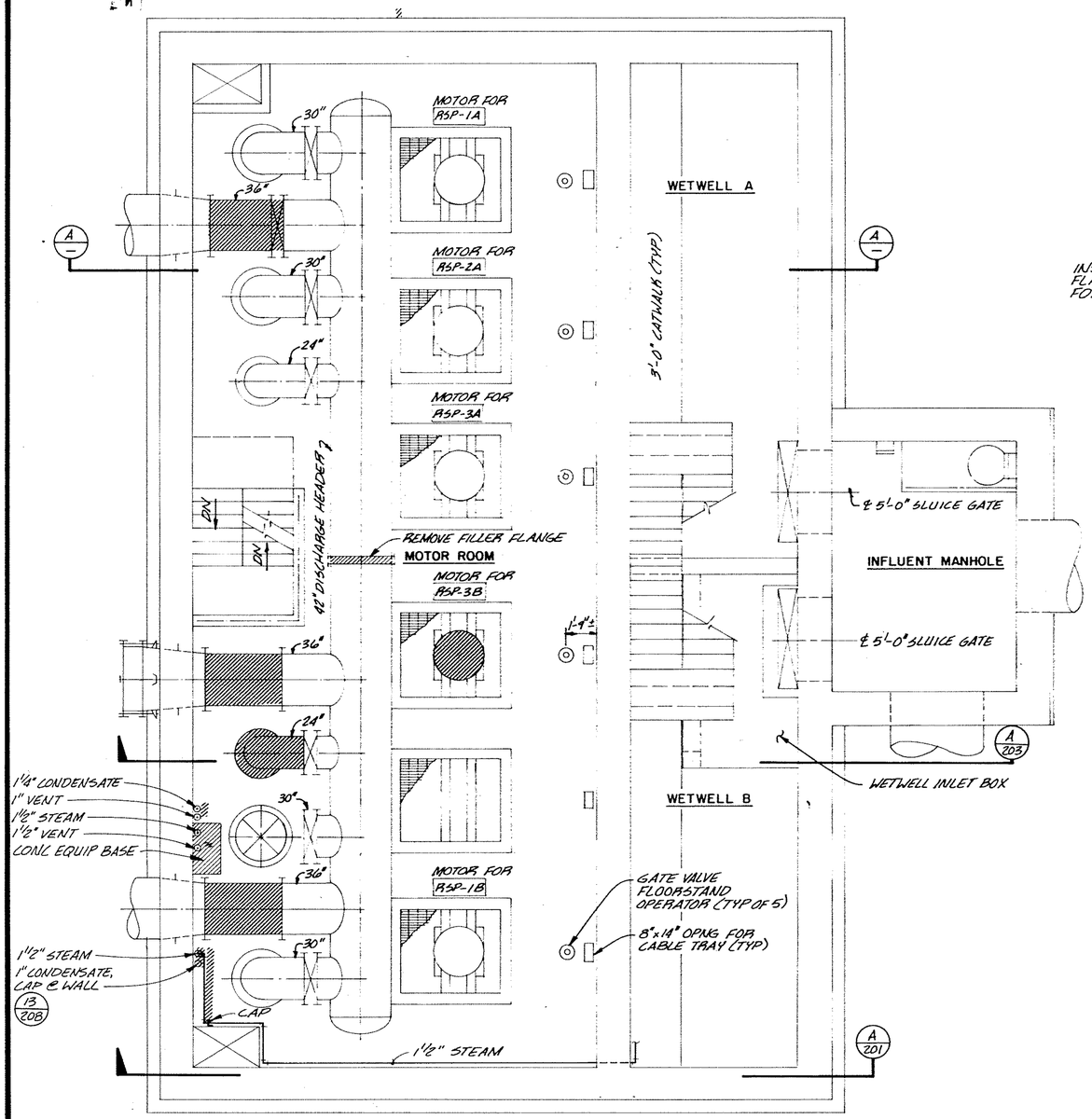
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/8/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17 1986 BRUCE R. WILLEY

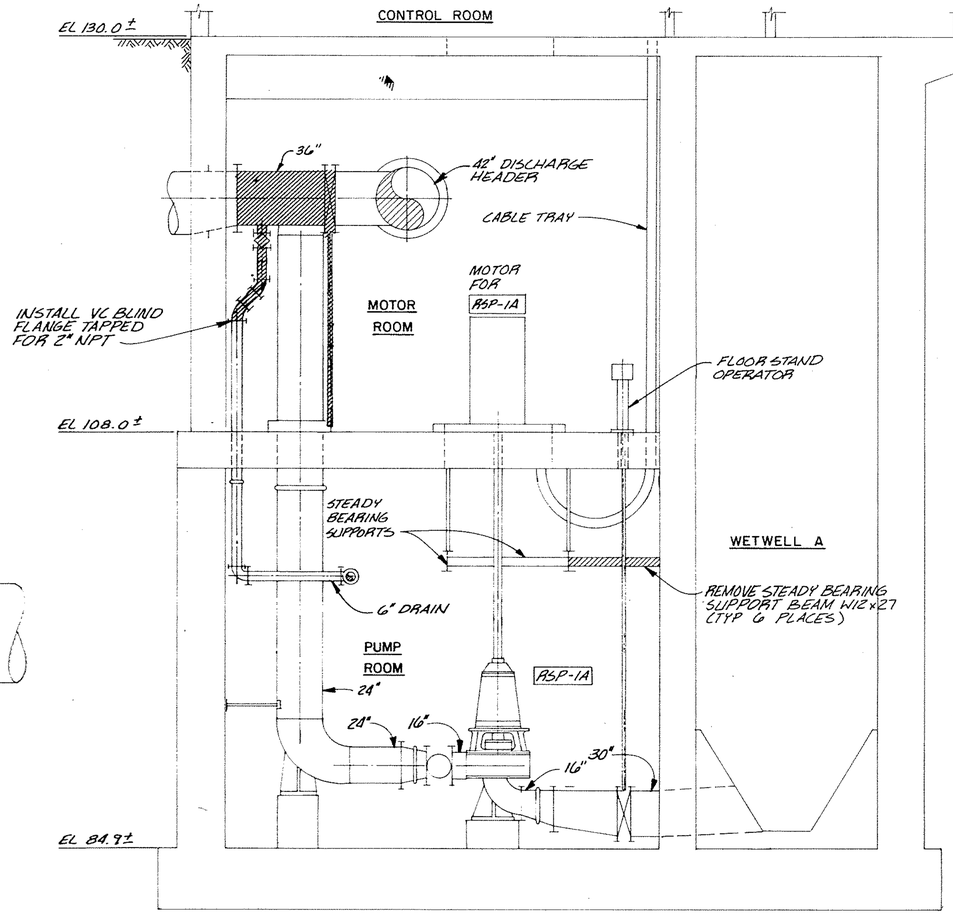
Sheet Number: 201

SR 904



RAW SEWAGE PUMPING STATION – MOTOR ROOM DEMOLITION PLAN

SCALE: 1/4" = 1'-0"



SECTION A

SCALE: 1/8" = 1'-0"

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

RAW SEWAGE PUMPING STATION-DEMOLITION

Designed	JEK
Drawn	CWA
Checked	BRW
Approved	John E. Kloch
Date	MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

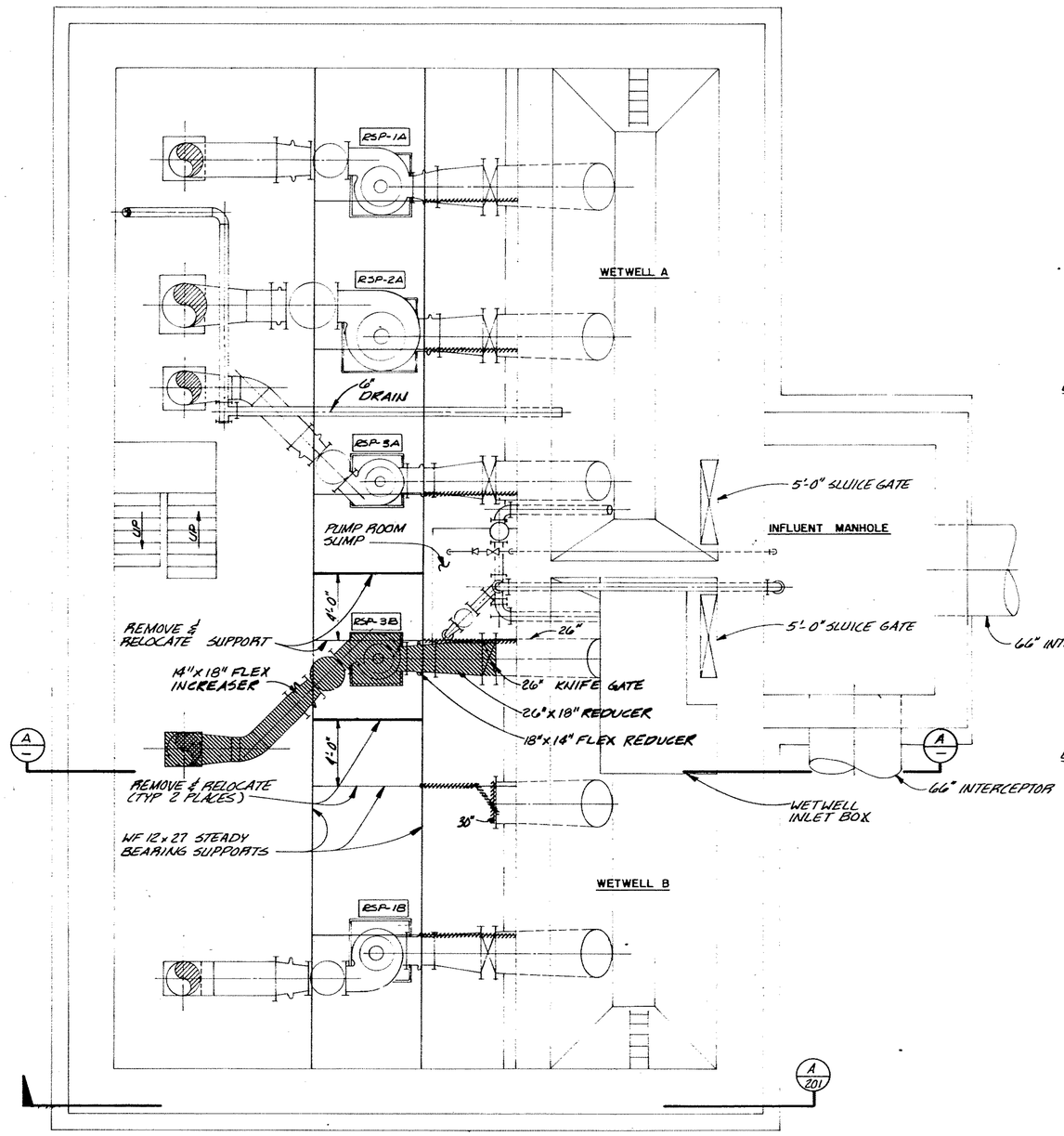
No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/31/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17 1985 BRUCE R. WILLEY

Sheet Number 202

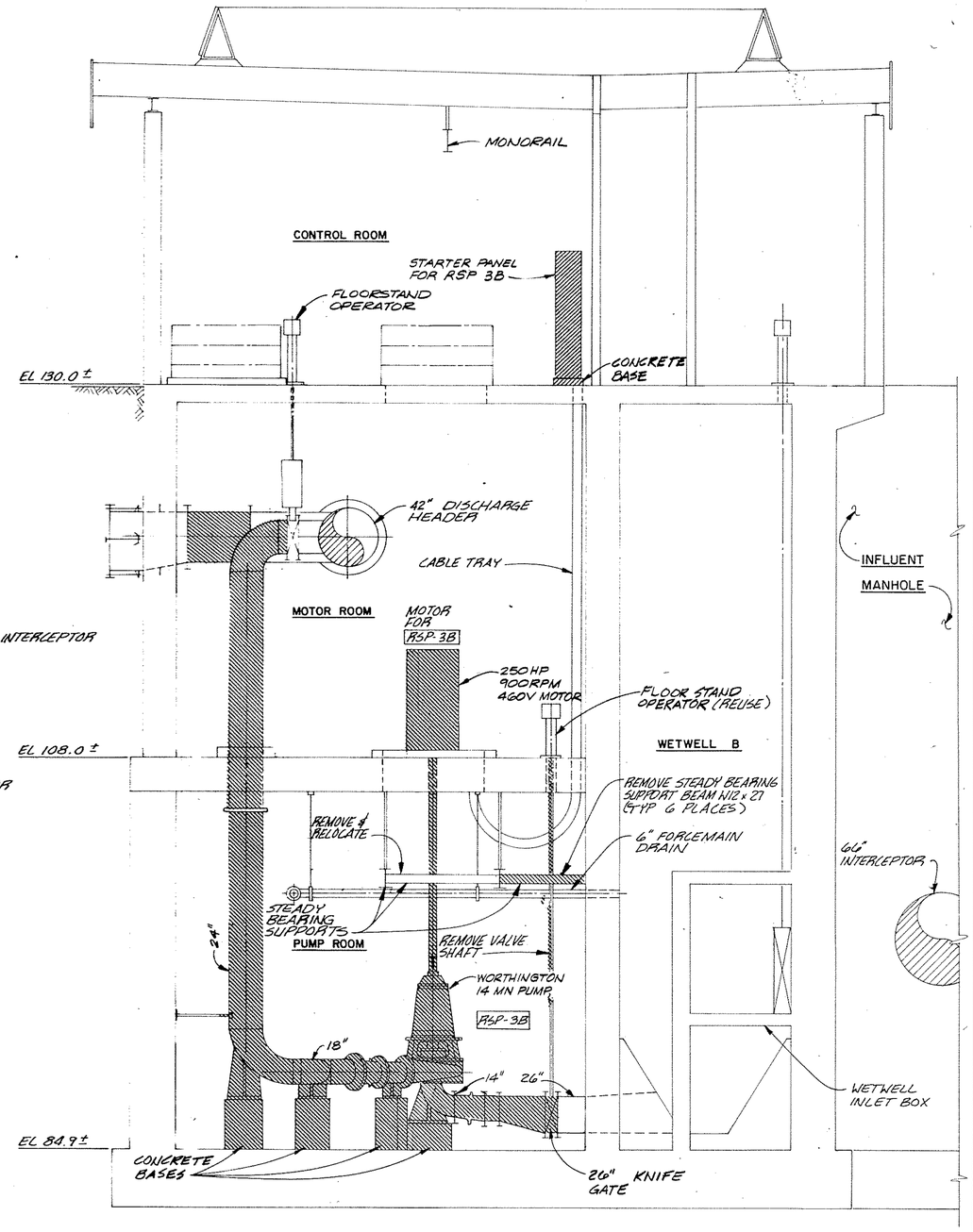
AS RECORDED DRAWINGS

SR 904



RAW SEWAGE PUMPING STATION - PUMP ROOM DEMOLITION PLAN

SCALE: 1/4" = 1'-0"



SECTION A

SCALE: 1/4" = 1'-0"

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

RAW SEWAGE PUMPING STATION - DEMOLITION

Designed: JEK
Drawn: CWA
Checked: BRW
Approved: John E. Koch
Date: MAY 1989

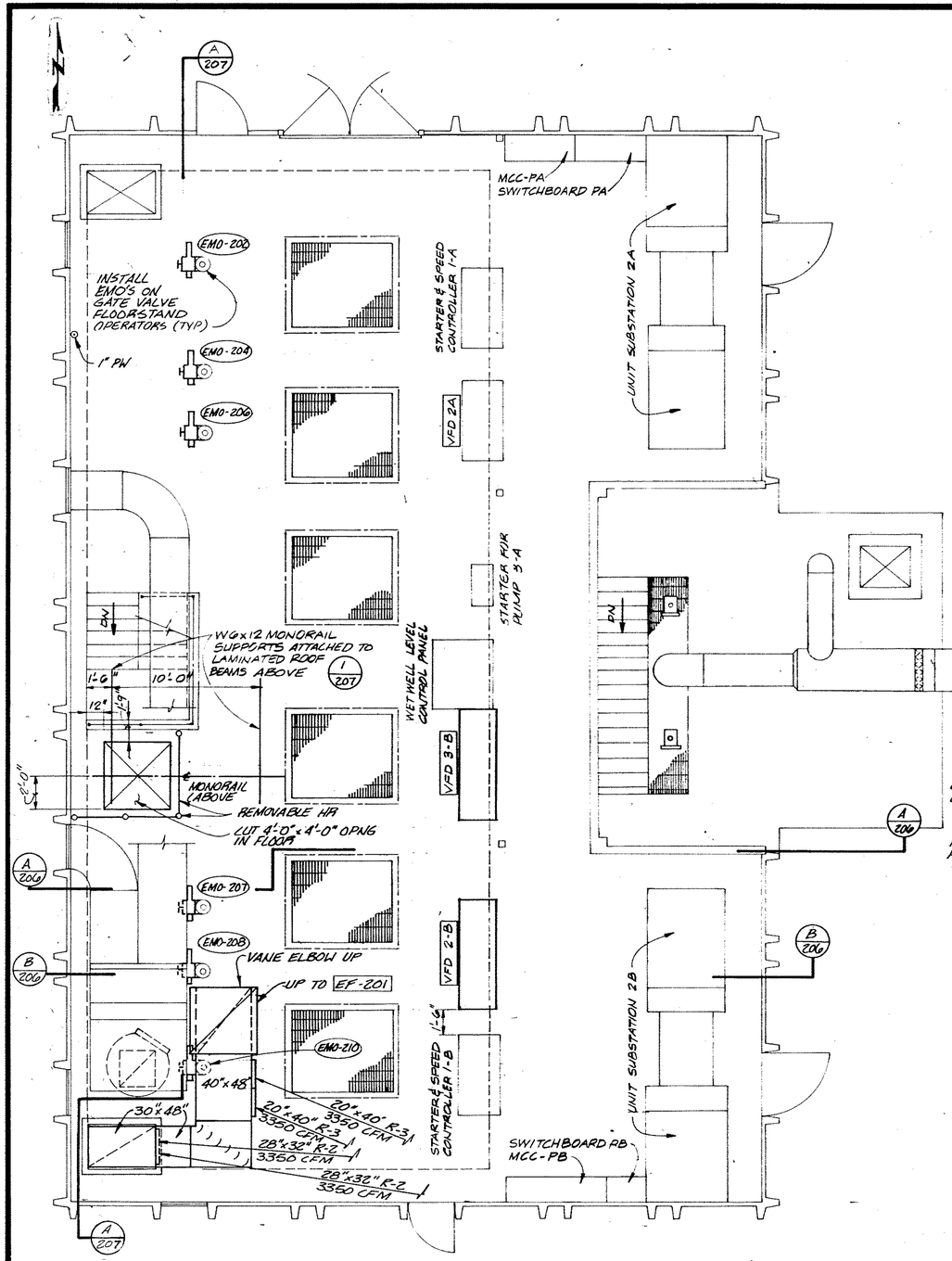
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	ASH	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1986 BRUCE R. WILLEY

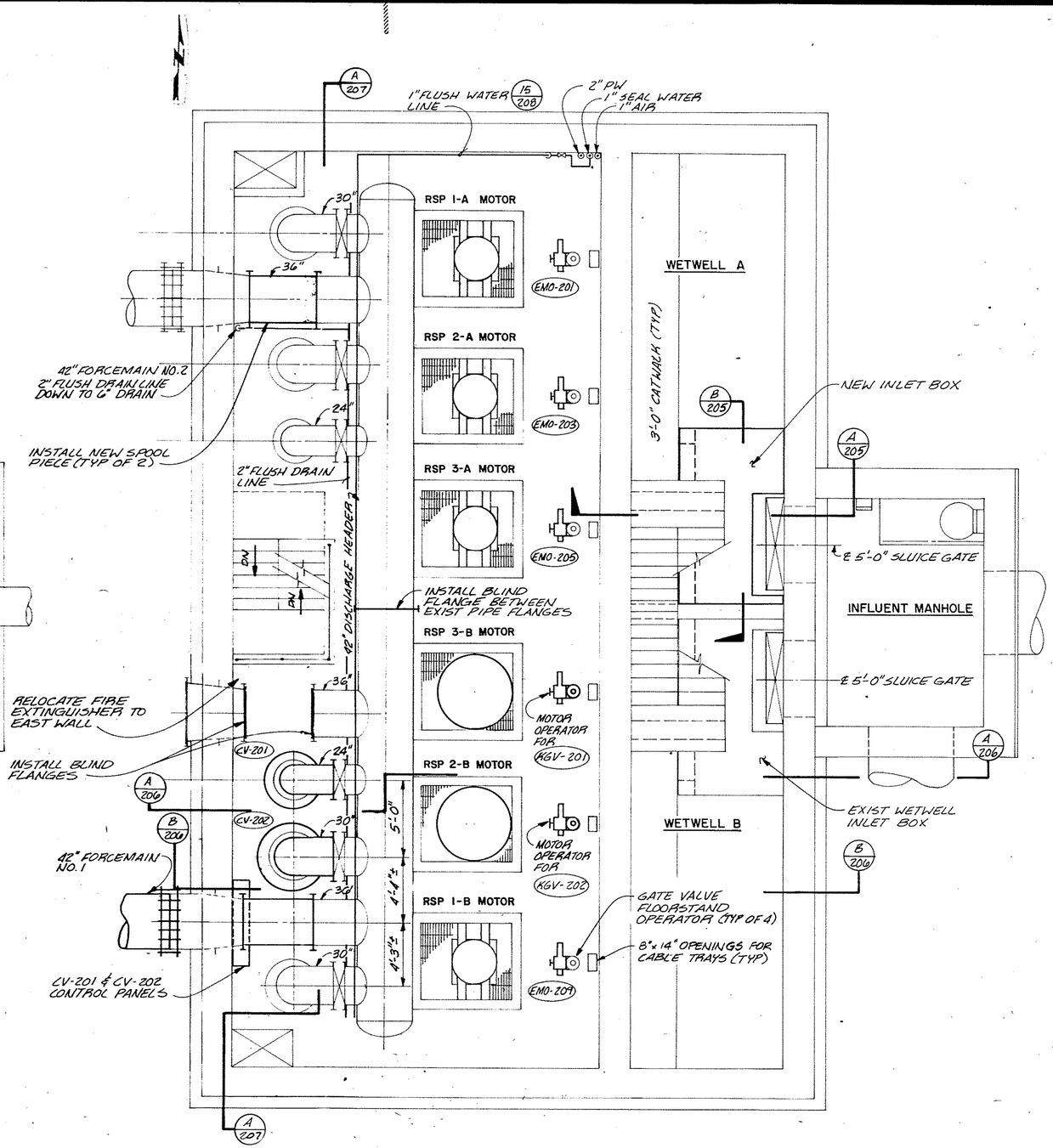
AS RECORDED DRAWINGS

Sheet Number: 203



RAW SEWAGE PUMPING STATION - CONTROL ROOM PLAN

SCALE: 1/4" = 1'-0"



RAW SEWAGE PUMPING STATION - MOTOR ROOM PLAN

SCALE: 1/4" = 1'-0"

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

RAW SEWAGE PUMPING STATION - CONTROL AND MOTOR ROOM PLANS

Designed JEK
Drawn RKB
Checked BRW
Approved John E Block
Date MAY 1989

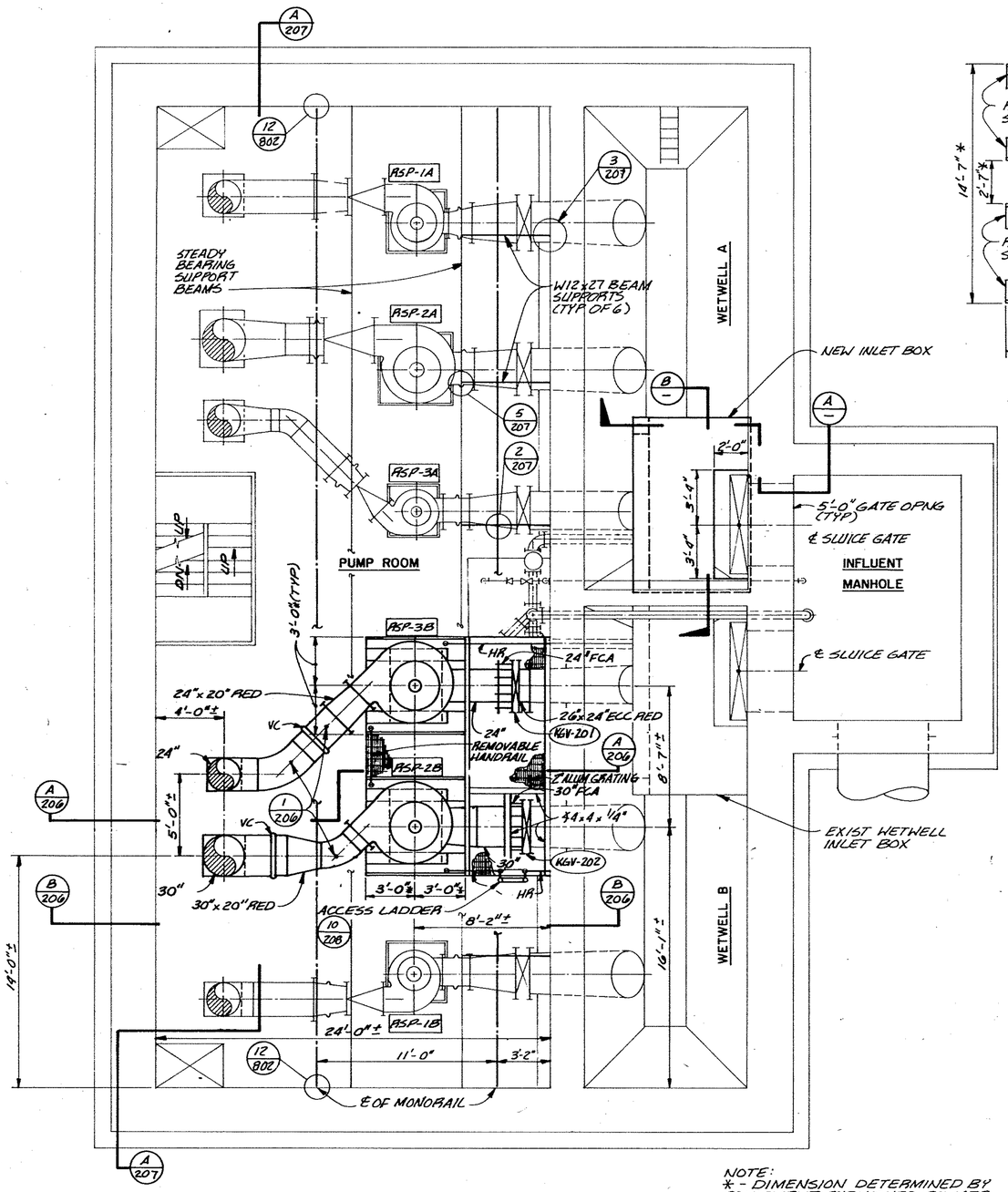
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	CBE # 90,123-A AS RECORDED DRAWING	12/19/92
2	AFA		12/18/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1985 BRUCE R. WILLEY

2 AS RECORDED DRAWINGS

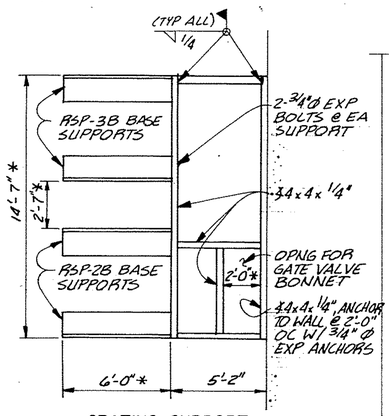
Sheet Number 204



NOTE:
* - DIMENSION DETERMINED BY EQUIPMENT FURNISHED BY MFR

RAW SEWAGE PUMPING STATION - PUMP ROOM PLAN

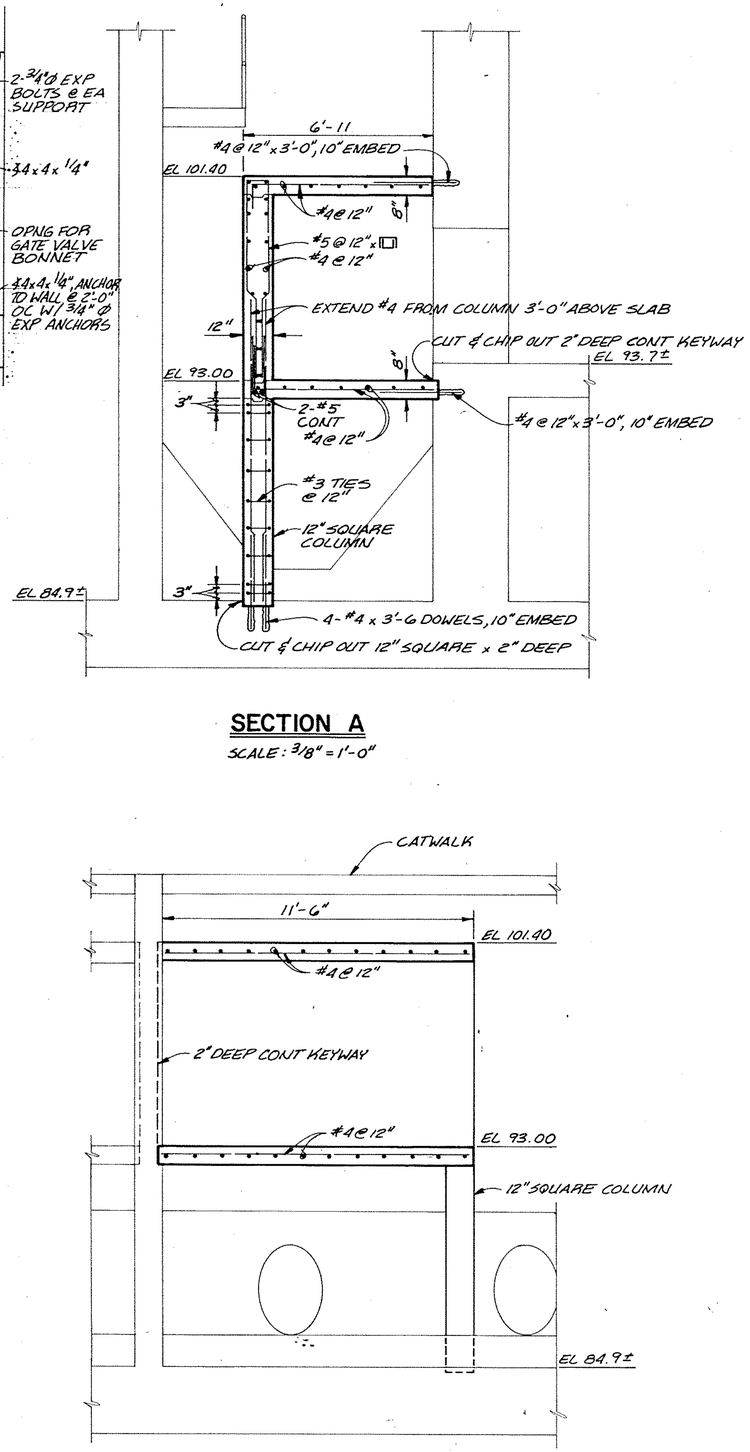
SCALE: 1/4" = 1'-0"



GRATING SUPPORT

DETAIL 1

SCALE: 1/4" = 1'-0"



SECTION A

SCALE: 3/8" = 1'-0"

SECTION B

SCALE: 3/8" = 1'-0"

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

RAW SEWAGE PUMPING STATION-PUMP ROOM PLAN AND DETAILS

Designed JEK
Drawn CWA
Checked B.P.W.
Approved John E. Kloc
Date MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

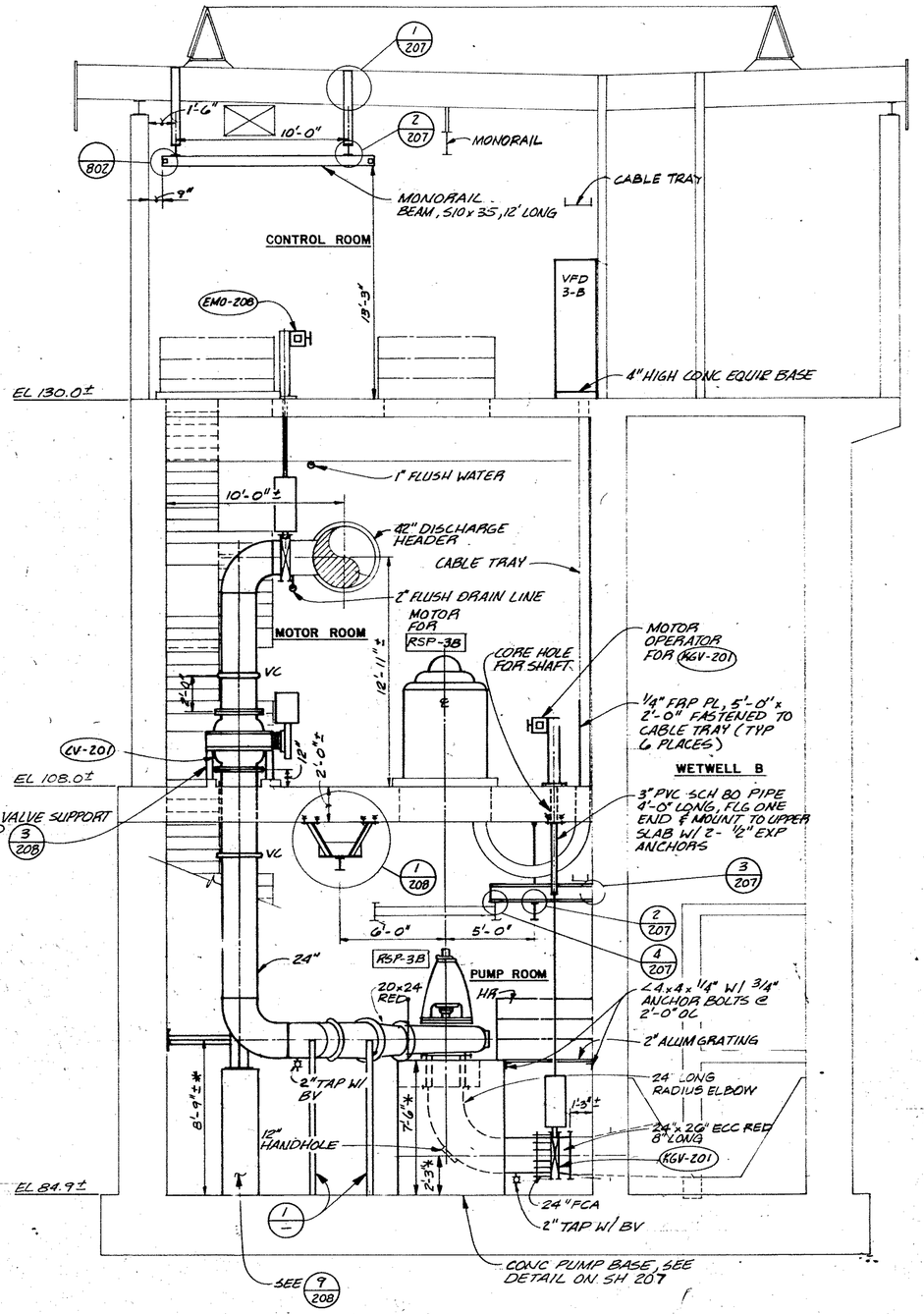
No	By	Revision	Date
2	AFA	AS RECORDED DRAWING	12/1/92
1	AFA	CPE # 65	12/19/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1986 BRUCE R. WILLEY

2 AS RECORDED DRAWINGS

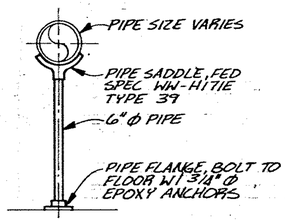
Sheet Number 205

SR 904



SECTION A

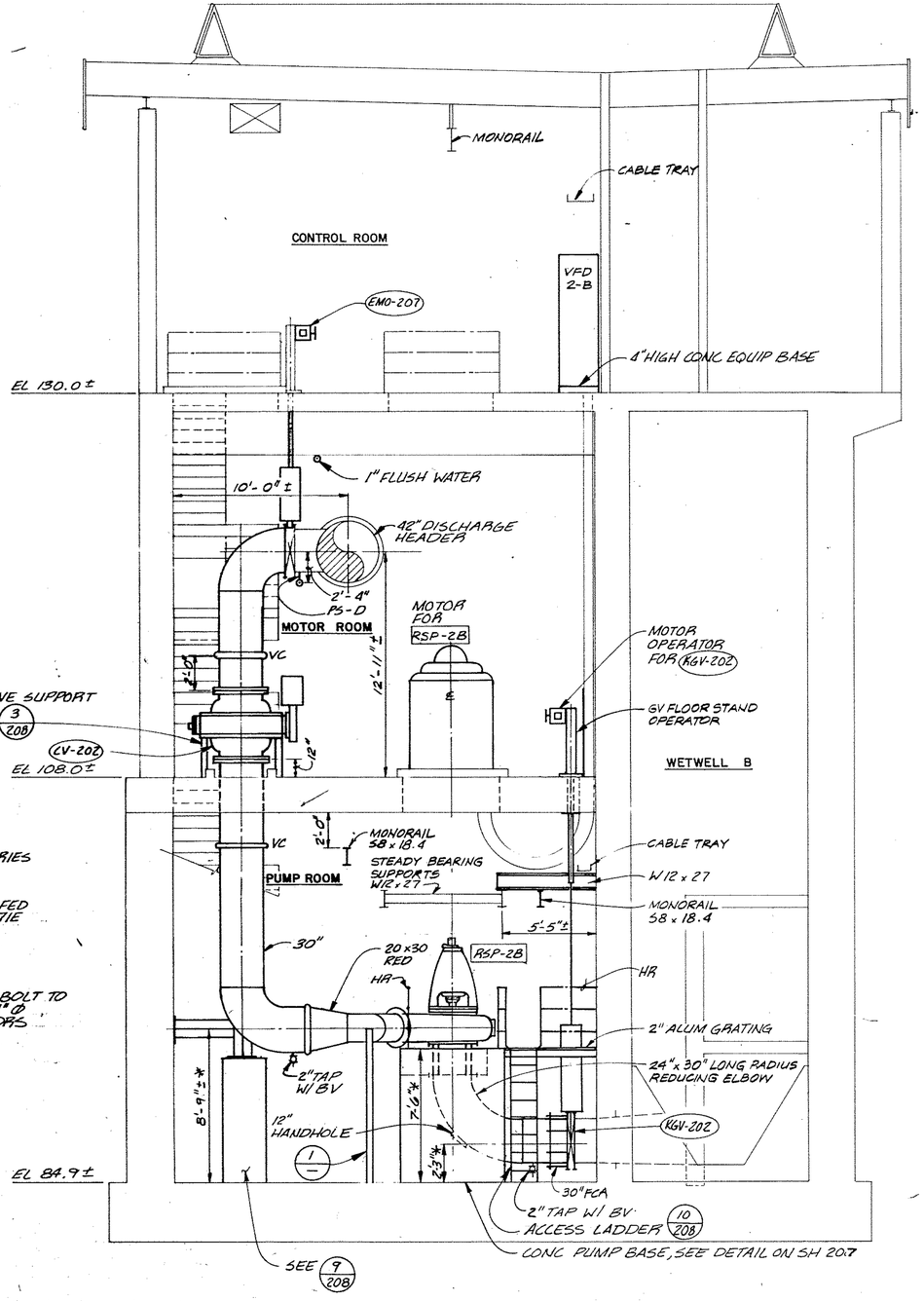
SCALE: 1/4" = 1'-0"



DETAIL 1

NTS

NOTE:
* - DIMENSION DETERMINED BY EQUIPMENT FURNISHED BY MFR



SECTION B

SCALE: 1/4" = 1'-0"

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

RAW SEWAGE PUMPING STATION-SECTIONS

Designed	JEK
Drawn	RKB
Checked	BRW
Approved	John Eckhoff
Date	MAY 1989

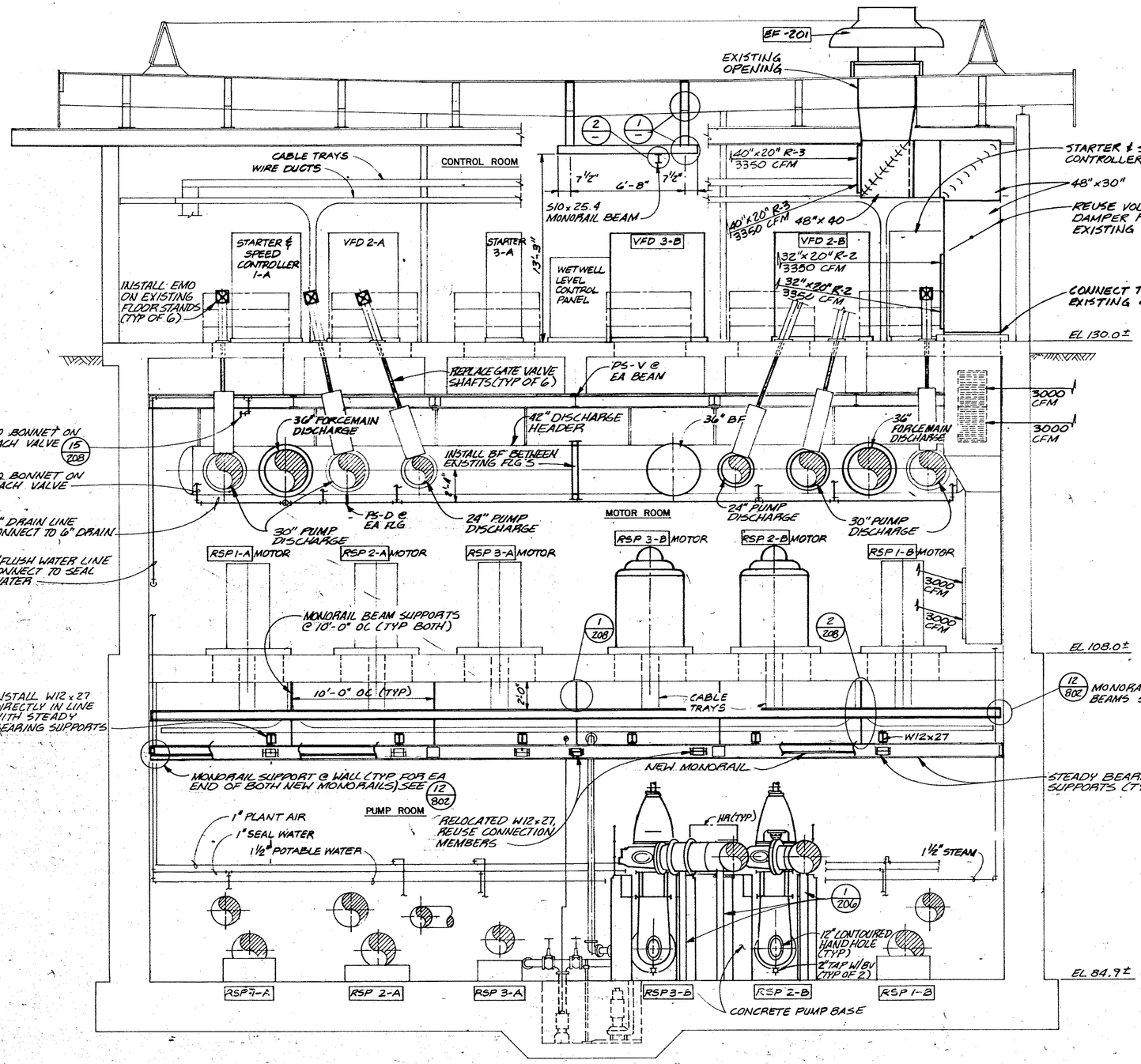
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	AFA	AS RECORDED DRAWING CPR# 65	12/19/92
1	AFA		

REGISTERED PROFESSIONAL ENGINEER 1391 OREGON July 17 1985 BRUCE R. WILLEY

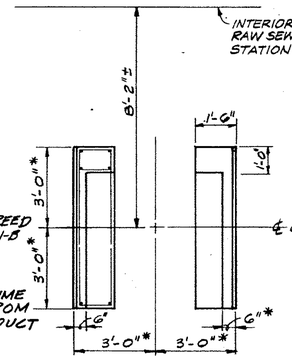
2 AS RECORDED DRAWINGS

Sheet Number 206

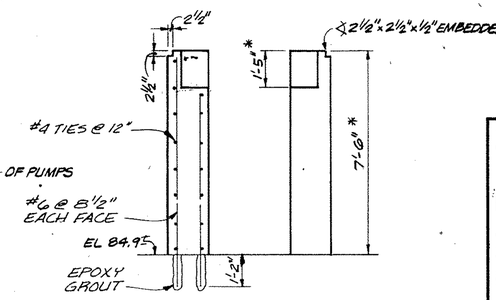


SECTION A

SCALE: 1/4"=1'-0"



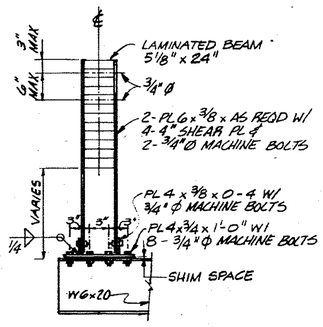
PLAN



ELEVATION

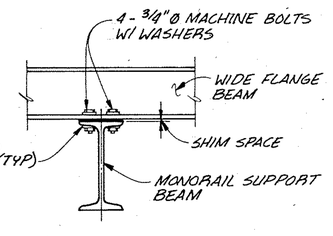
CONCRETE PUMP BASE DETAIL

SCALE: 3/8" = 1'-0" *DIMENSIONS ARE EQUIPMENT SPECIFIC



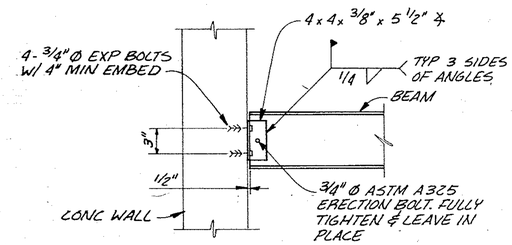
DETAIL 1

NTS



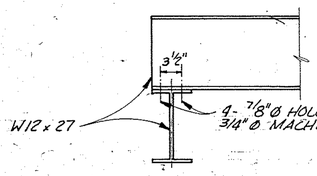
DETAIL 2

SCALE: 1½" = 1'-0"



DETAIL 3

NTS



DETAIL 4

SCALE: 1" = 1'-0"

2 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

RAW SEWAGE PUMPING STATION - SECTIONS AND DETAILS

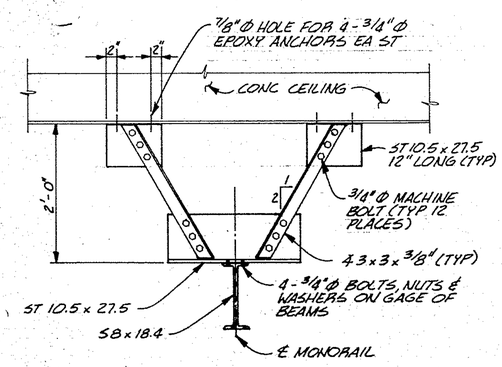
Designed JEK
Drawn RKB
Checked BRW
Approved John Elford
Date MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

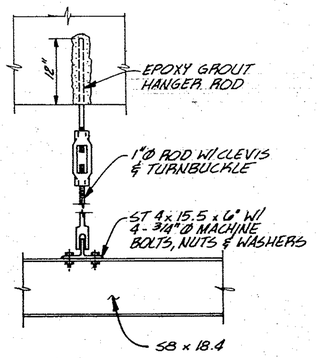
No	By	Revision	Date
1	AFA	ORD #123-A	12/9/92
2	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1981 BRUCE R. WILLEY

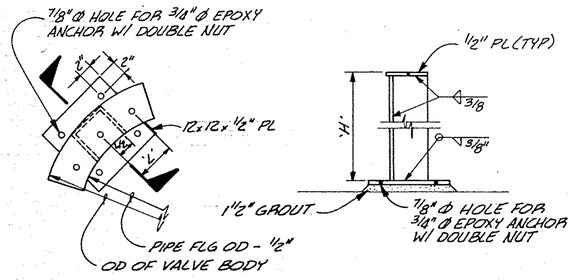
Sheet Number 207



DETAIL 1
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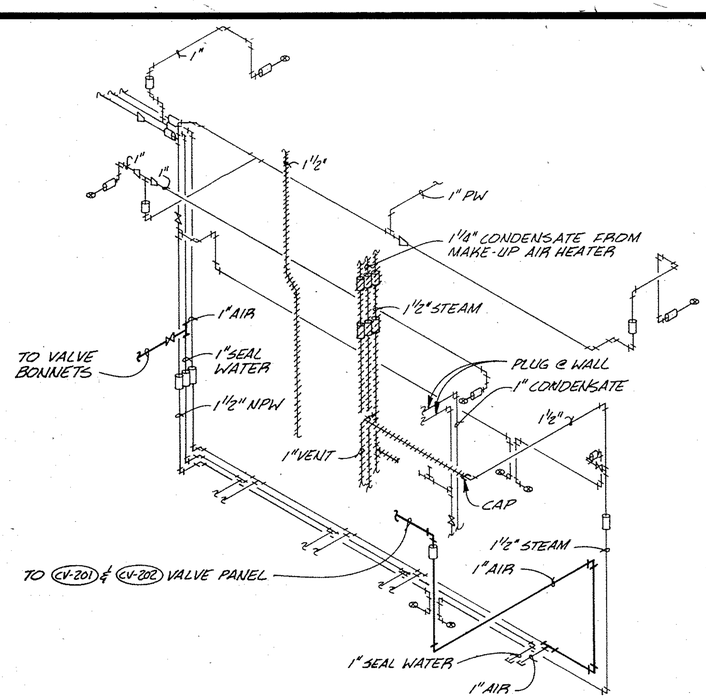


DETAIL 2
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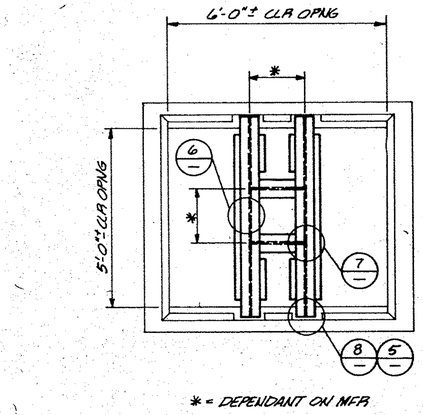


NOTES:
1) 'H' & 'L' DEPENDANT ON VALVE SIZE & MFR.
2) 3 SUPPORTS @ 120° APART REQ'D PER VAVLE.
3) OUTER FLANGE OF LOWER BODY TO REST ON EA SUPPORT.

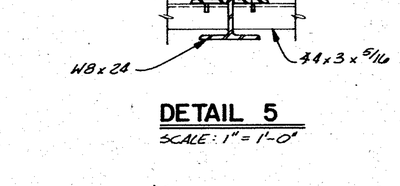
DETAIL 3
NO SCALE



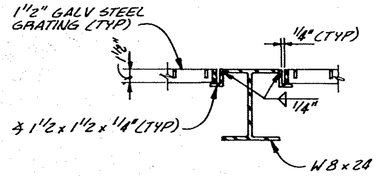
PLUMBING MODIFICATIONS SCHEMATIC
NO SCALE



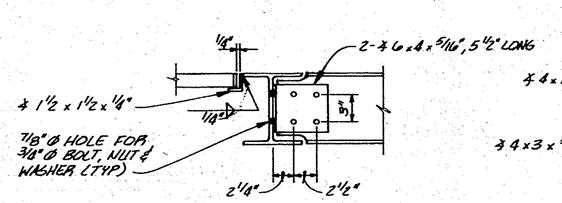
DETAIL 4
SCALE: 1/2" = 1'-0"



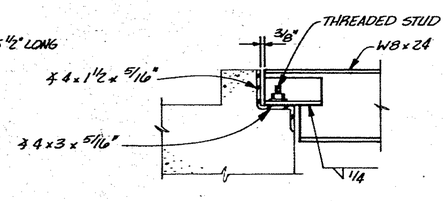
DETAIL 5
SCALE: 1" = 1'-0"



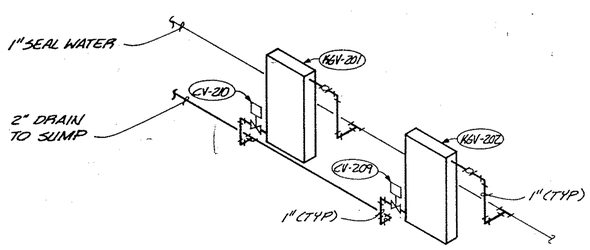
DETAIL 6
SCALE: 1" = 1'-0"



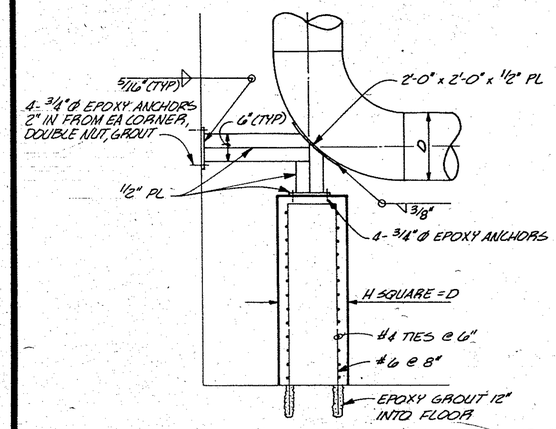
DETAIL 7
SCALE: 1" = 1'-0"



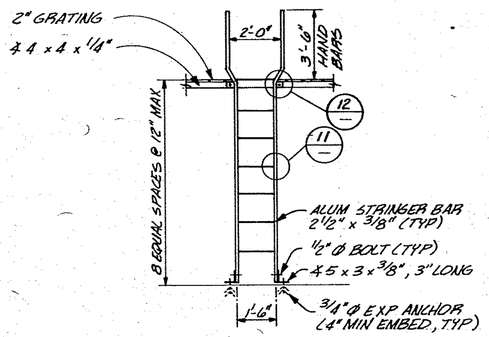
DETAIL 8
SCALE: 1" = 1'-0"



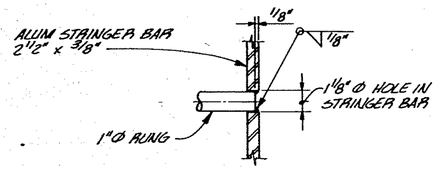
SUCTION FLUSH WATER SCHEMATIC
NO SCALE



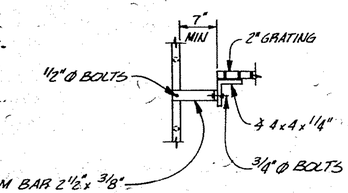
DETAIL 9
NO SCALE



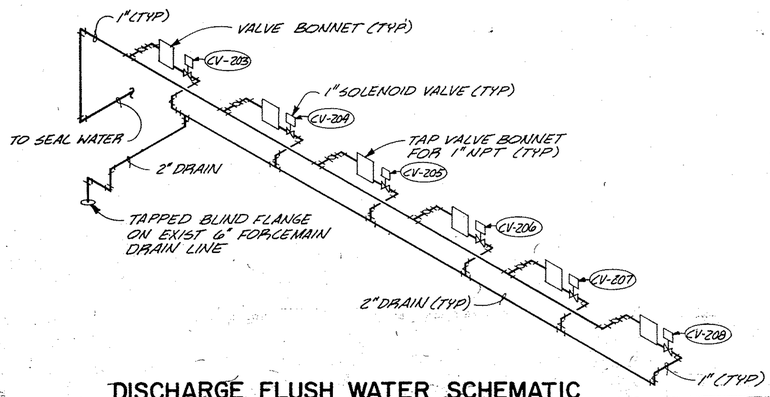
DETAIL 10
NO SCALE



DETAIL 11
NO SCALE



DETAIL 12
NO SCALE



DISCHARGE FLUSH WATER SCHEMATIC
NO SCALE

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

RAW SEWAGE PUMPING STATION-DETAILS

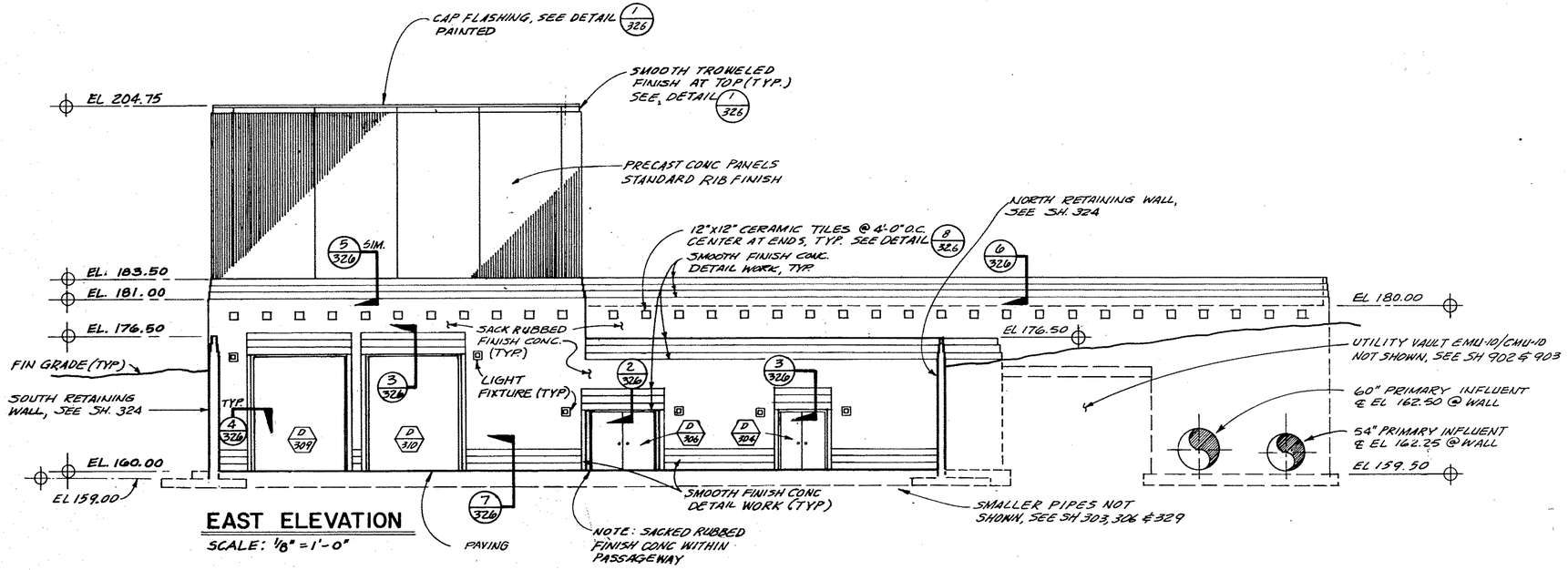
Designed JEK
Drawn DAV
Checked BRW
Approved John E. Hoch
Date MAY. 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/19/92

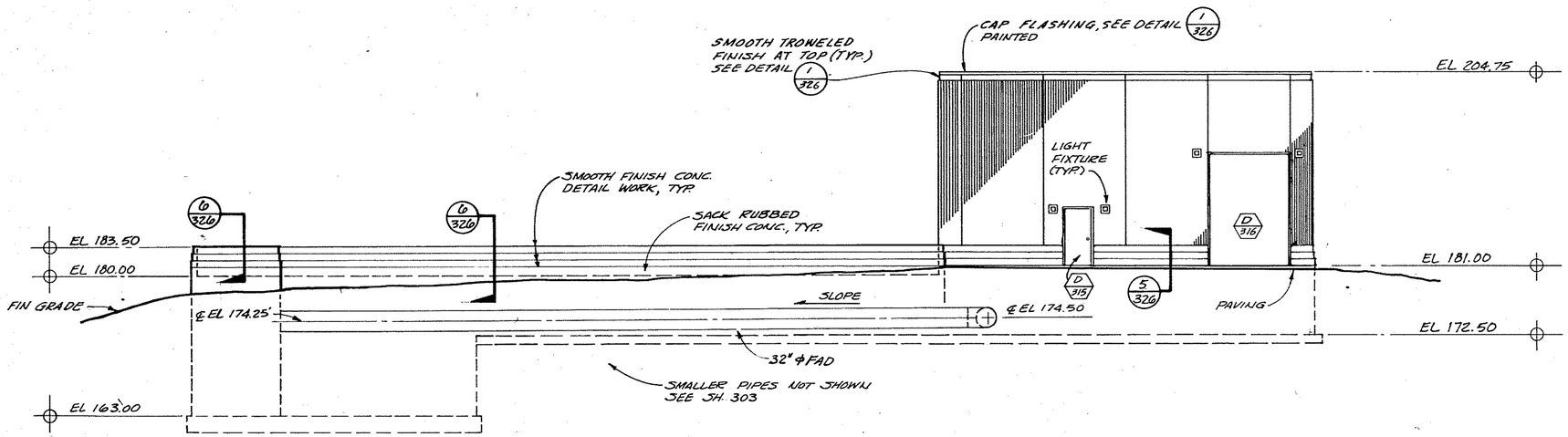
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17, 1985 BRUCE R. WILLEY

Sheet Number 208



EAST ELEVATION

SCALE: 1/8" = 1'-0"



WEST ELEVATION

SCALE: 1/8" = 1'-0"

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - ELEVATIONS

Designed	DH
Drawn	WRB
Checked	RN, NDC
Approved	Jack E. Kodl
Date	MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT, 1 INCH. SCALE ACCORDINGLY.

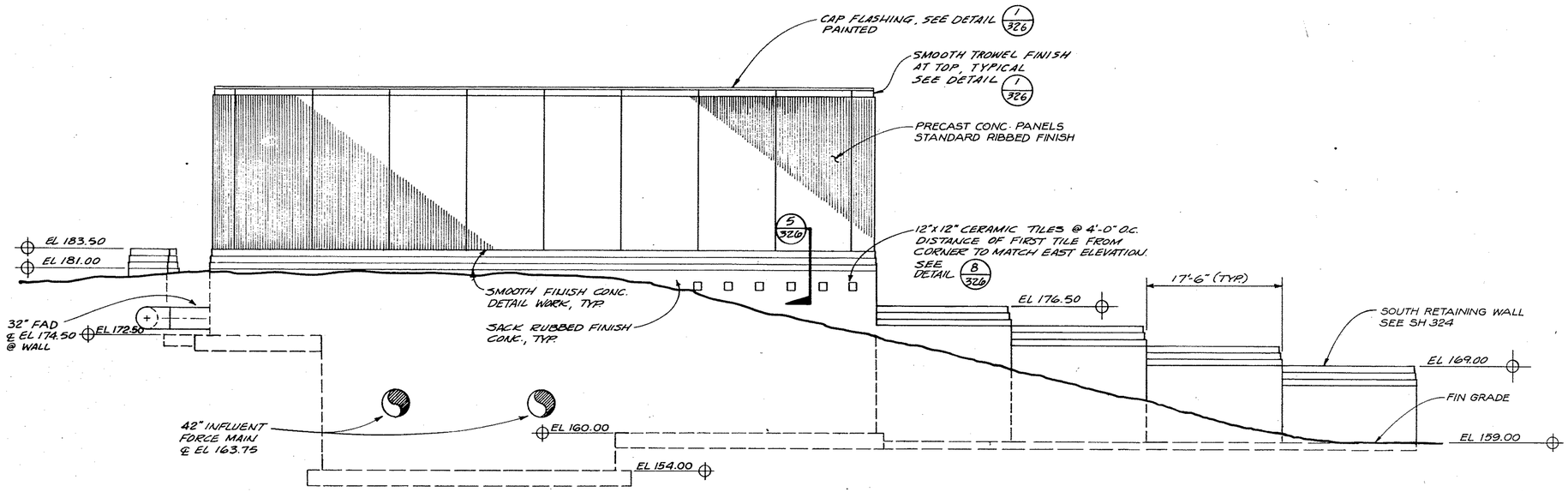
No	By	Revision	Date
1	APM	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 13591 OREGON JULY 17, 1985 BRUCE R. BELL

AS RECORDED DRAWINGS

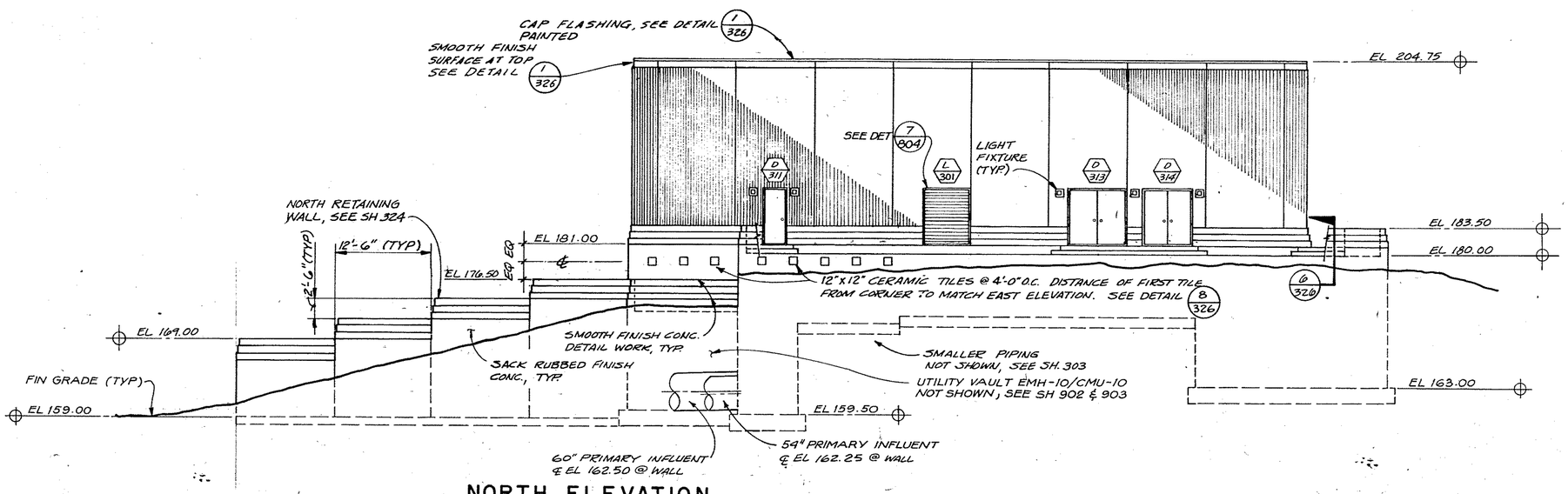
Sheet Number 301

SR 904



SOUTH ELEVATION

SCALE: 1/8" = 1'-0"



NORTH ELEVATION

SCALE: 1/8" = 1'-0"

SH 904

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - ELEVATIONS

Designed: DH
Drawn: WRB
Checked: RH, NDC
Approved: Jack E Hook
Date:

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER JACK E. HOOK OREGON JULY 17, 1990

AS RECORDED DRAWINGS

Sheet Number: 302

NOTES:
1. CHEMICAL FILL, VENT & FEED PIPING AND SOFTWATER PIPING NOT SHOWN SEE SCHEMATIC SH 332, AND SECTIONS (B 314) (A 318) (A 319) (A 320)
2. [illegible]
3. FAN ROOM HEIGHT AND DOOR SCHEDULES, SEE SH 804.
4. HOT LOW RATE PLENUM & ELIMINATOR ON ALL UNIT SYSTEM SUCTION AND DISCHARGE PIPELINES
5. ACOUSTIC PANELS ON INLET FAN ROOM [305] WALLS NOT SHOWN
6. PLUMBING NOT SHOWN, SEE SH 306, 307, 330 & 331

HEADWORKS BUILDING - LOWER LEVEL PLAN

SCALE: 3/16" = 1'-0"

AS RECORDED DRAWINGS

CWC HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

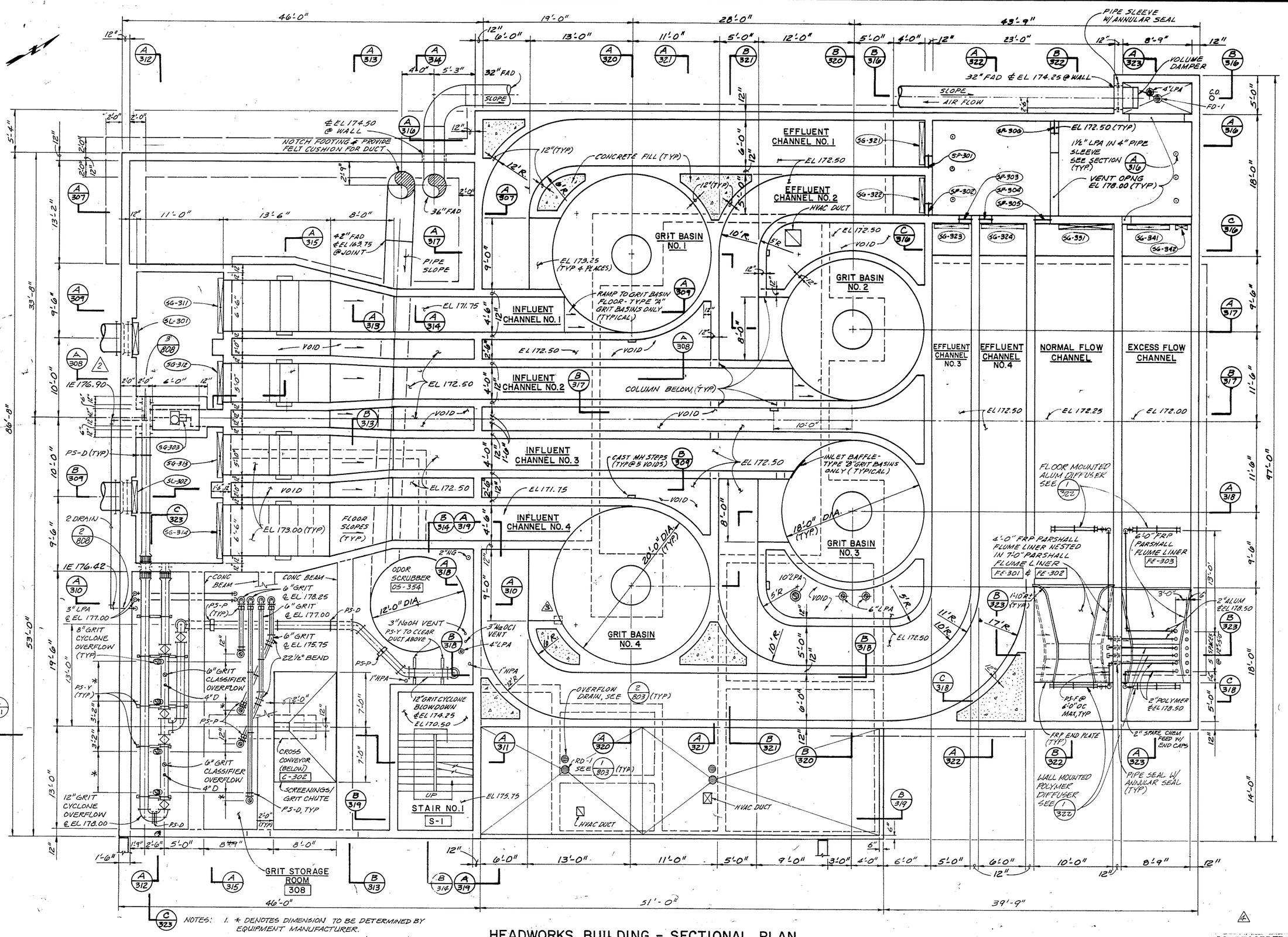
HEADWORKS - LOWER LEVEL PLAN

Designed JPT
Drawn LLB
Checked RN, NDC, BRW
Approved John E. Hall
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE IF NOT 1 INCH, SCALE ACCORDINGLY

No	By	Revision	Date
1	JEK	ADDENDUM NO. 1	6-27-89
2	JEK	ADDENDUM NO. 2	6-30-89
3	AFA	CPE #20.23	12/9/92
4	AFA	AS RECORDED DRAWING	12/9/92

Sheet Number 303



NOTES: 1. * DENOTES DIMENSION TO BE DETERMINED BY EQUIPMENT MANUFACTURER.
2. PLUMBING NOT SHOWN, SEE SH 306, 329, 330 & 331.

HEADWORKS BUILDING - SECTIONAL PLAN

SCALE: 3/16" = 1'-0"

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

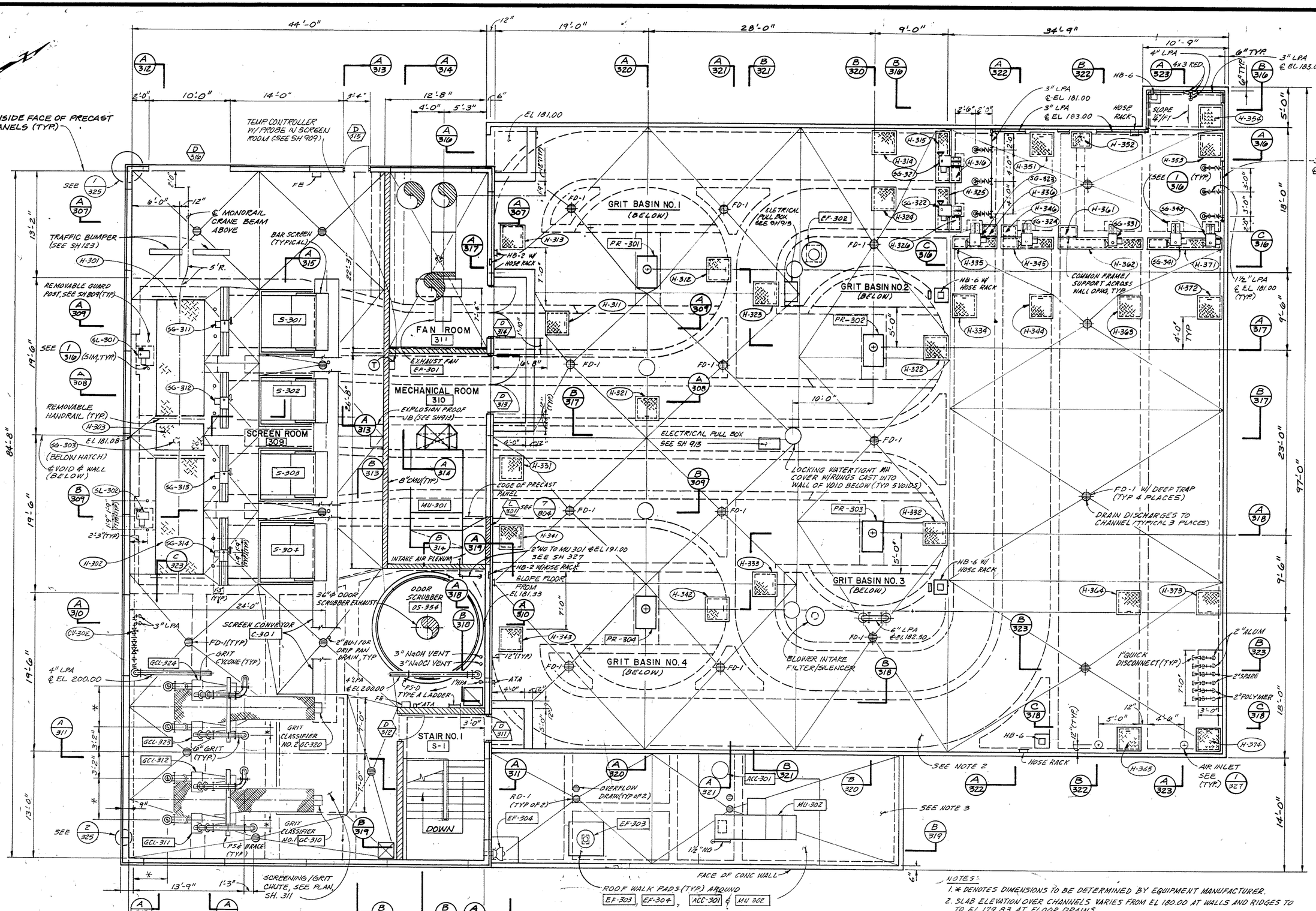
HEADWORKS - SECTIONAL PLAN

Designed JPT
Drawn LLB, MMK
Checked RN, NDC, BW
Approved John E Hoel
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	VEK	ADDENDUM NO. 2	6-30-89
3	AFA	OPE# 23	12/9/92
4	AFA	AS RECORDED DRAWING	12/9/92

Sheet Number 304



HEADWORKS BUILDING - UPPER LEVEL PLAN

SCALE: 3/16" = 1'-0"

NOTES:

1. * DENOTES DIMENSIONS TO BE DETERMINED BY EQUIPMENT MANUFACTURER.
2. SLAB ELEVATION OVER CHANNELS VARIES FROM EL 180.00 AT WALLS AND RIDGES TO TO EL 179.83 AT FLOOR DRAINS.
3. ROOF ELEVATION OVER LOWER LEVEL ROOMS VARIES FROM EL 173.00 AT WALLS AND RIDGES TO EL 172.75 AT ROOF DRAINS.
4. SLAB ELEVATION IN SCREEN ROOM VARIES FROM EL 181.00 AT WALLS AND RIDGES TO EL 180.83 AT FLOOR DRAINS EXCEPT WHERE SHOWN OTHERWISE.
5. FOR ROOM FINISH AND DOOR SCHEDULES, SEE SHEET 804.
6. PLUMBING NOT SHOWN, SEE SH 306, 329, 330 AND 331.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - UPPER LEVEL PLAN

Designed JPT
Drawn LLB, MMK
Checked RN, NDC, BRW
Approved
Date MAY, 1989

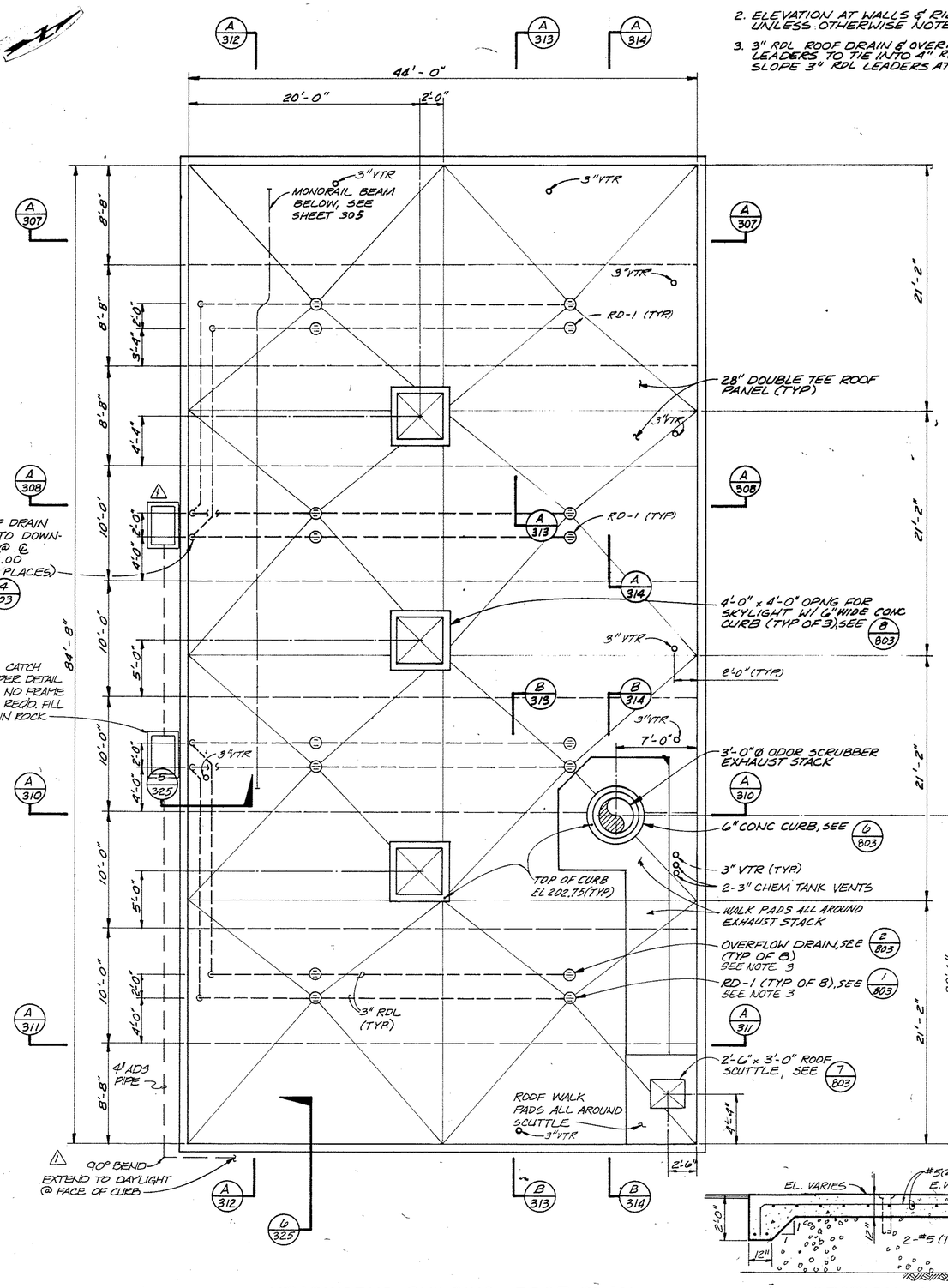
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

Sheet Number 305

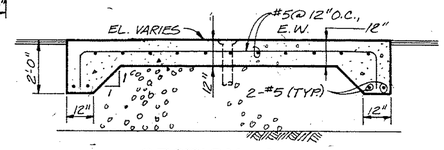
SR 904

NOTES:
1. ELEVATION AT ROOF DRAINS IS 202.00 UNLESS OTHERWISE NOTED.
2. ELEVATION AT WALLS & RIDGES IS 202.25 UNLESS OTHERWISE NOTED.
3. 3" RDL ROOF DRAIN & OVERFLOW DRAIN LEADERS TO TIE INTO 4" RDL DOWNSPOUTS. SLOPE 3" RDL LEADERS AT 1/4"/FT.



HEADWORKS BUILDING - ROOF PLAN

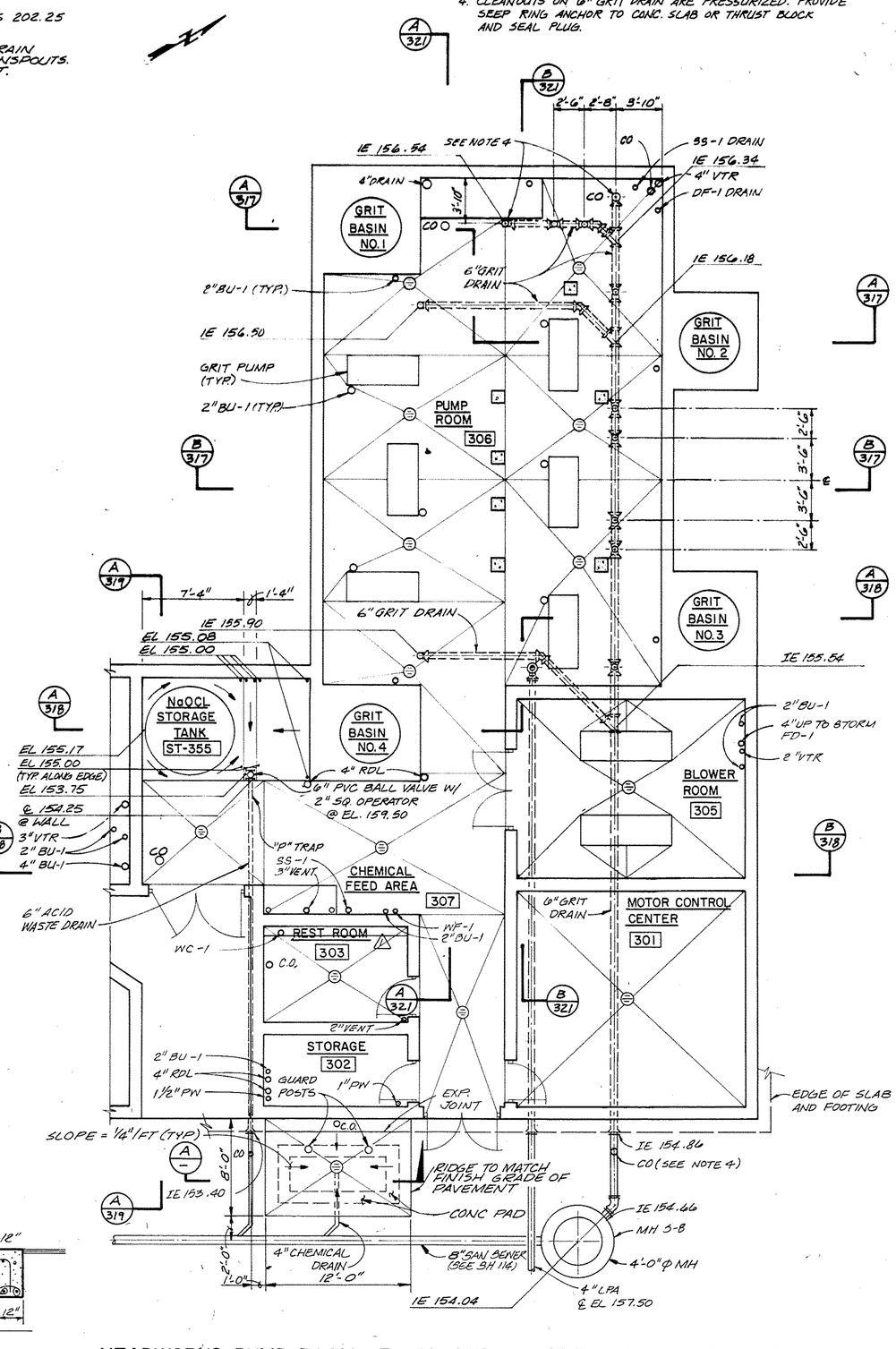
SCALE: 3/16" = 1'-0"



SECTION A

SCALE: 3/8" = 1'-0"
SEE THIS SHEET

NOTES:
1. ELEVATION AT FLOOR DRAINS IS 159.83 UNLESS OTHERWISE NOTED.
2. ELEVATION AT WALLS & RIDGES IS 160.00 UNLESS OTHERWISE NOTED.
3. SEE PLUMBING PLAN & SCHEMATICS, SHS 329 & 331.
4. CLEANOUTS ON 6" GRIT DRAIN ARE PRESSURIZED. PROVIDE SEEP RING ANCHOR TO CONC. SLAB OR THRUST BLOCK AND SEAL PLUG.



HEADWORKS PUMP ROOM - FLOOR AND PROCESS DRAIN SYSTEM PLAN

SCALE: 3/16" = 1'-0"

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS-ROOF AND MISCELLANEOUS PLANS

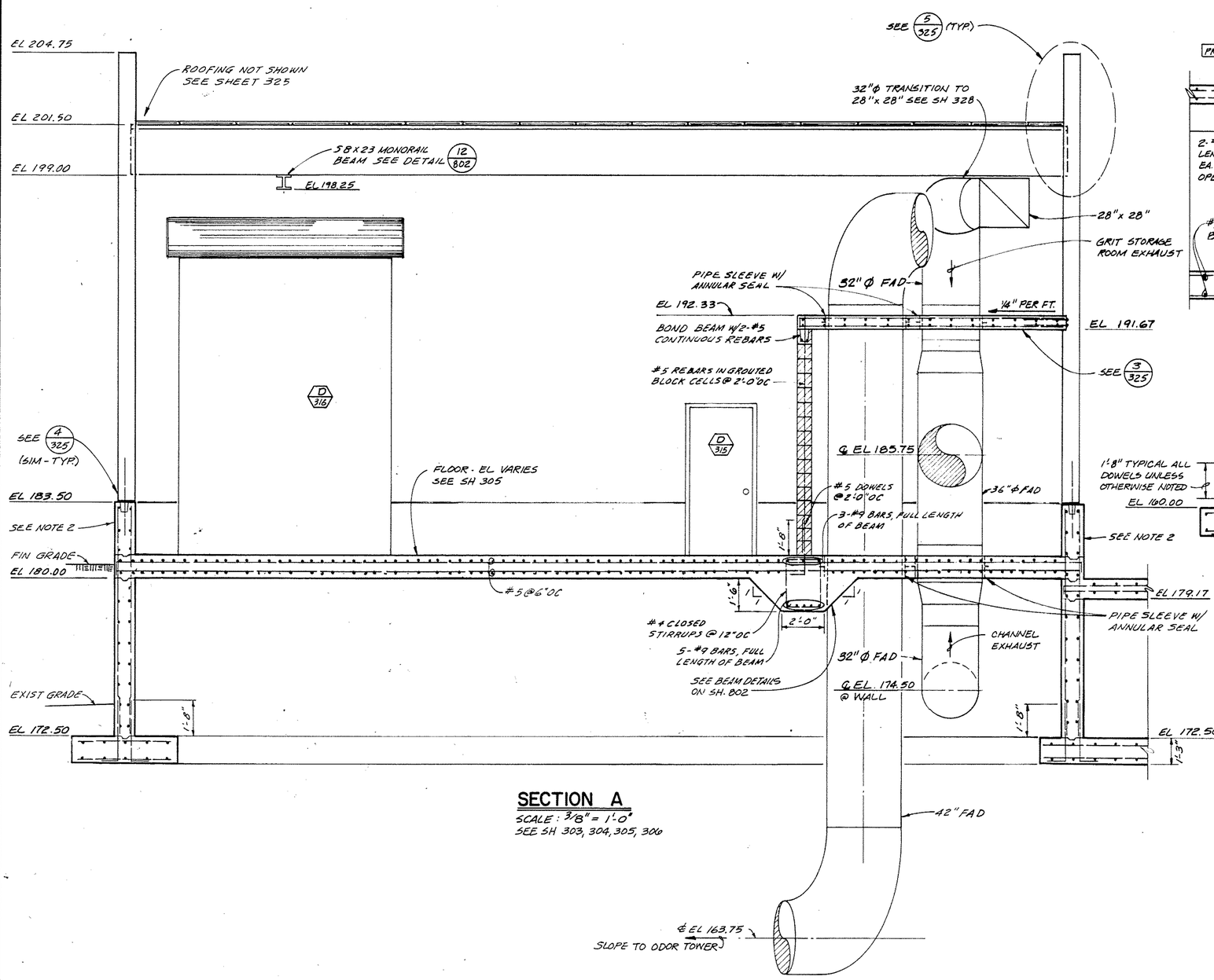
Designed: JPT, DRV
Drawn: DRV
Checked: RN, NDC, PFO
Approved: John Shaw
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY

No	By	Revision	Date
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2	AFA	AS RECORDED DRAWING	12/9/92

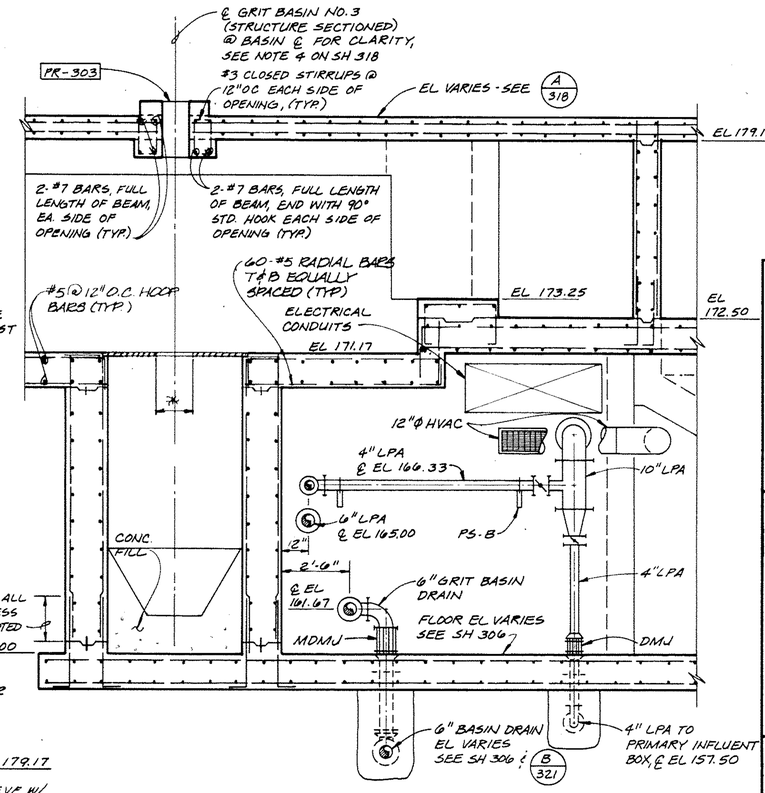
AS RECORDED DRAWINGS

Sheet Number: 306



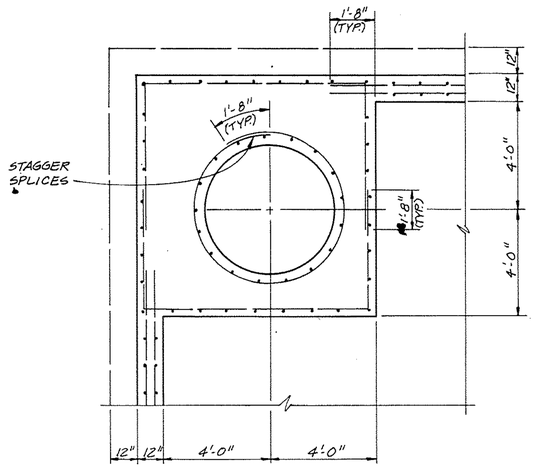
SECTION A

SCALE: 3/8" = 1'-0"
SEE SH 303, 304, 305, 306



SECTION B

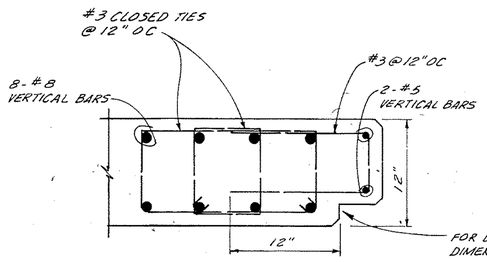
SCALE: 3/8" = 1'-0"
SEE SHEET 303



NOTE: THIS DETAIL SIMILAR FOR ALL GRIT BASINS.

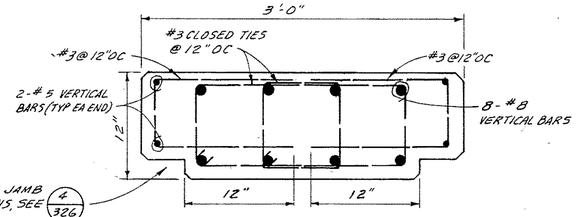
DETAIL 3

SCALE: 3/8"=1'-0"
SEE SHEET 303



DETAIL 1

SCALE: 1½"=1'-0"
SEE SH 303



DETAIL 2

SCALE: 1½"=1'-0"
SEE SH 303

NOTES:
1. ALL REINFORCING TO BE #5@12" UNLESS OTHERWISE NOTED.
2. ARCHITECTURAL DETAIL NOT SHOWN, SEE DETAIL 5/326 SIM. SHOP BEND VERTICAL REBARS AS NECESSARY TO MAINTAIN 1½" MIN CONC COVER OVER REBARS.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

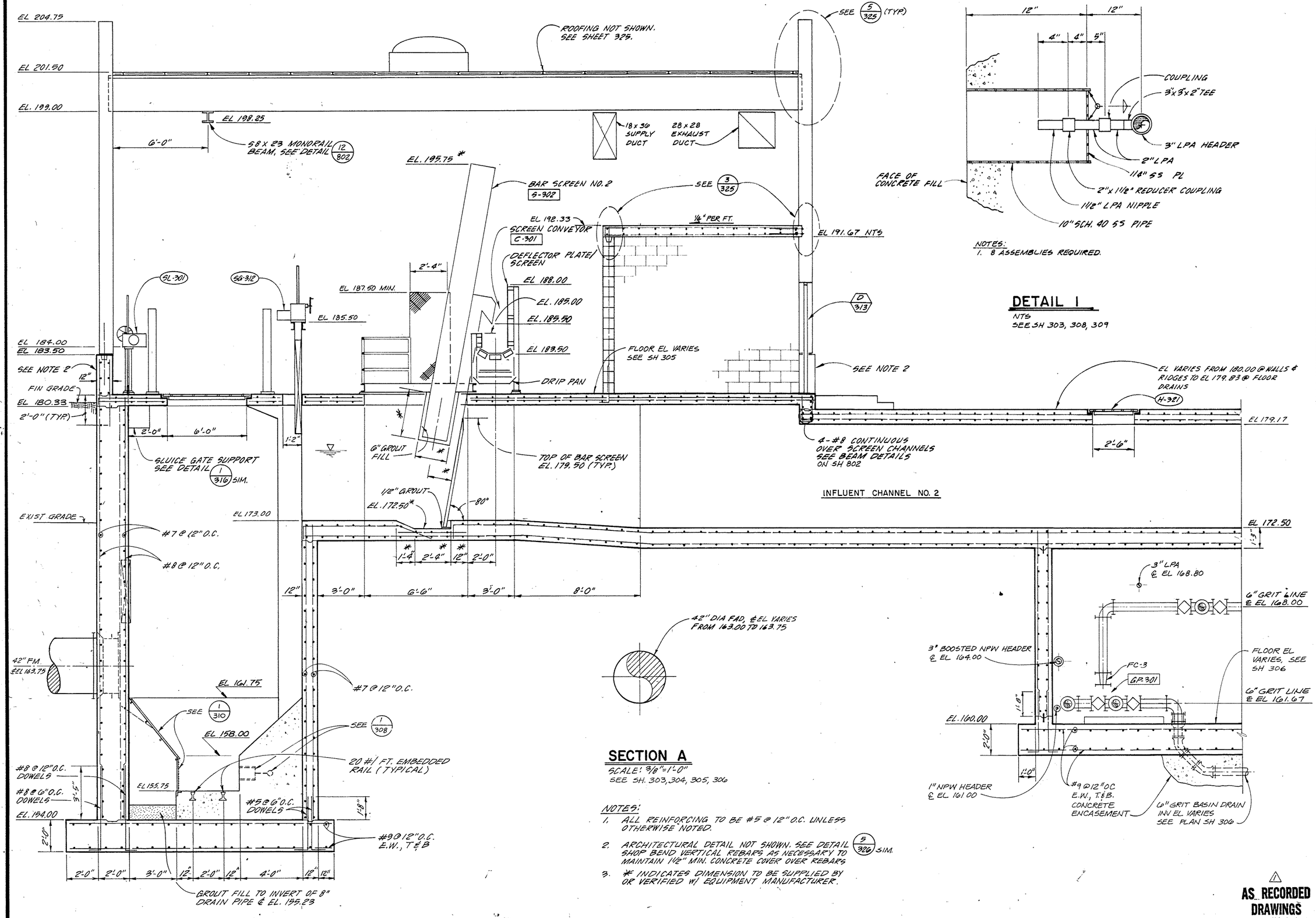
HEADWORKS - SCREEN BUILDING SECTIONS

Designed: JPT, NDC
Drawn: DRV, MMK
Checked: RN, NDC
Approved: John E. Ward
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

Sheet Number: 307



NOTES:
1. 8 ASSEMBLIES REQUIRED.

DETAIL 1

NTS
SEE SH 303, 308, 309

SECTION A

SCALE: 3/8"=1'-0"
SEE SH. 303, 304, 305, 306

NOTES:
1. ALL REINFORCING TO BE #5 @ 12" O.C. UNLESS OTHERWISE NOTED.
2. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL 5/326 SIM. SHOP BEND VERTICAL REBARS AS NECESSARY TO MAINTAIN 1 1/2" MIN. CONCRETE COVER OVER REBARS
3. * INDICATES DIMENSION TO BE SUPPLIED BY OR VERIFIED W/ EQUIPMENT MANUFACTURER.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - SCREEN BUILDING SECTIONS

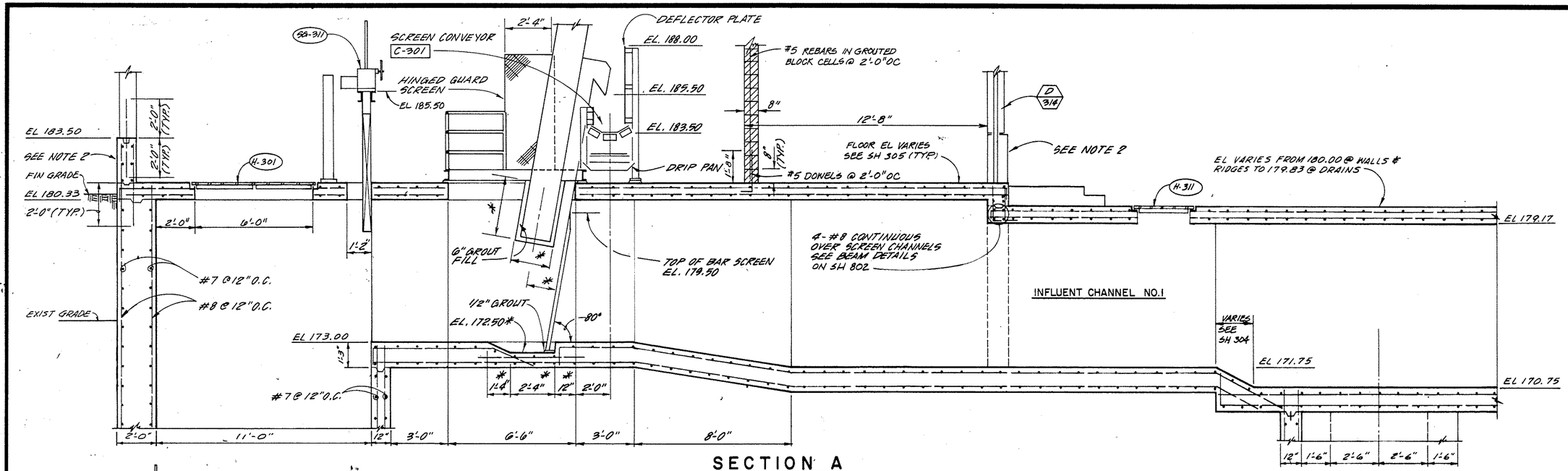
Designed JPT, NDC
Drawn DRV, MMK
Checked RN, NDC
Approved John E Hoch
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY

No	By	Revision	Date
1	APA	AS RECORDED DRAWING	12/9/92

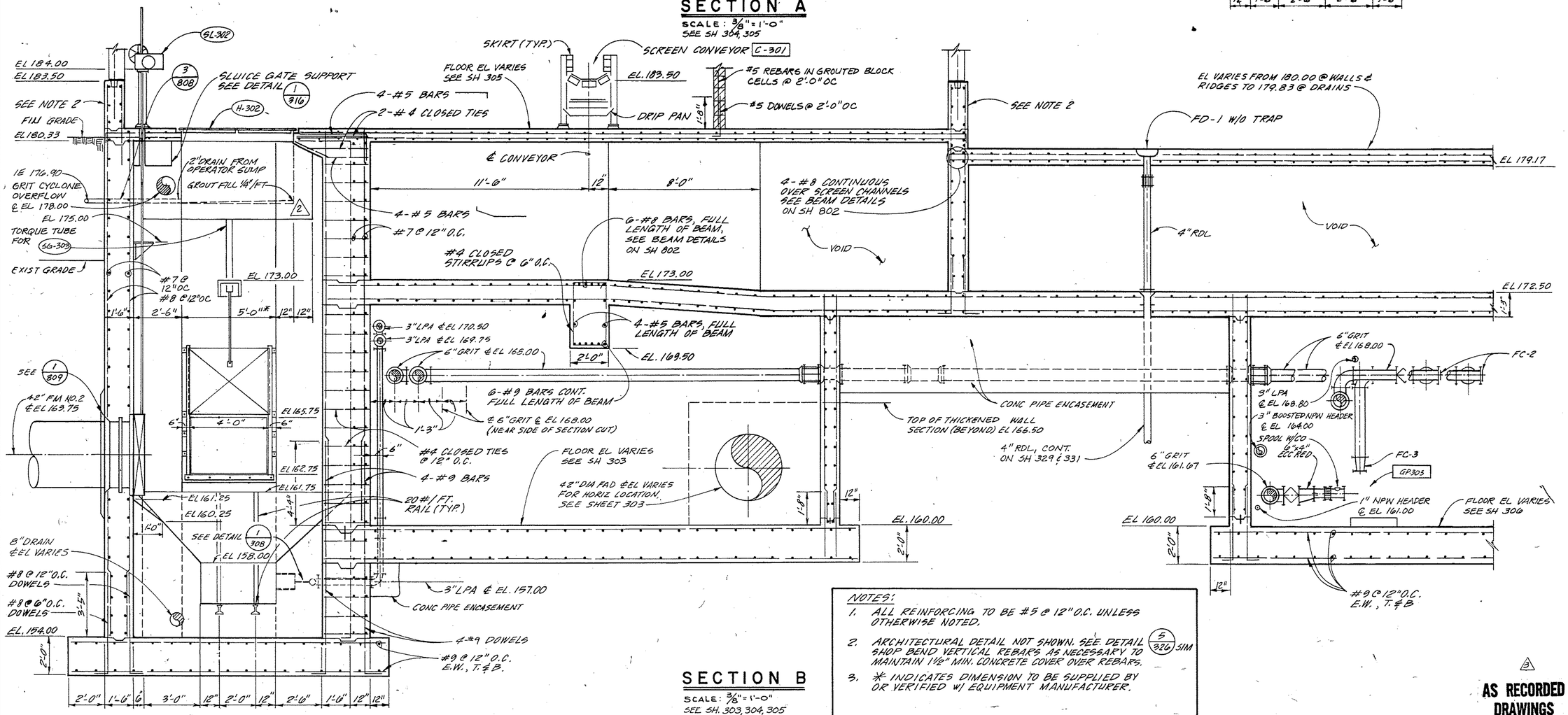
Sheet Number 308

SH 904



SECTION A

SCALE: 3/8" = 1'-0"
SEE SH 304, 305



SECTION B

SCALE: 3/8" = 1'-0"
SEE SH. 303, 304, 305

NOTES:

1. ALL REINFORCING TO BE #5 @ 12" O.C. UNLESS OTHERWISE NOTED.
2. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL 5/320 SIM SHOP BEND VERTICAL REBARS AS NECESSARY TO MAINTAIN 1½" MIN. CONCRETE COVER OVER REBARS.
3. * INDICATES DIMENSION TO BE SUPPLIED BY OR VERIFIED W/ EQUIPMENT MANUFACTURER.

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - SCREEN BUILDING SECTIONS

Designed: J.P.T, NDC.
Drawn: MMK
Checked: RN, NDC
Approved: John E. Ford
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

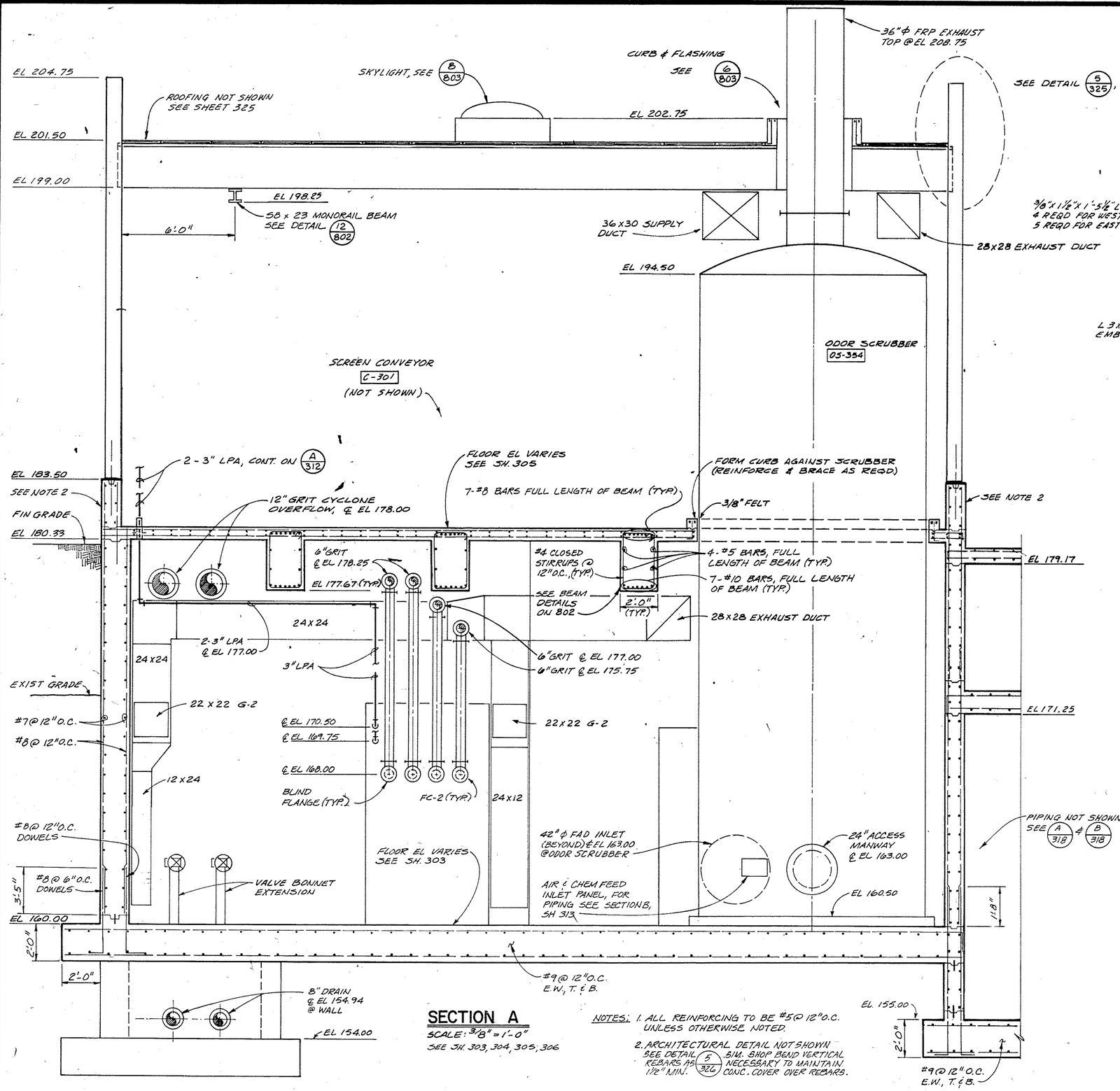
No	By	Revision	Date
2	JEK	ADDENDUM NO 2	6-30-89
3	AFA	AS RECORDED DRAWING	12/9/92

3

AS RECORDED DRAWINGS

Sheet Number: 309

SR 904



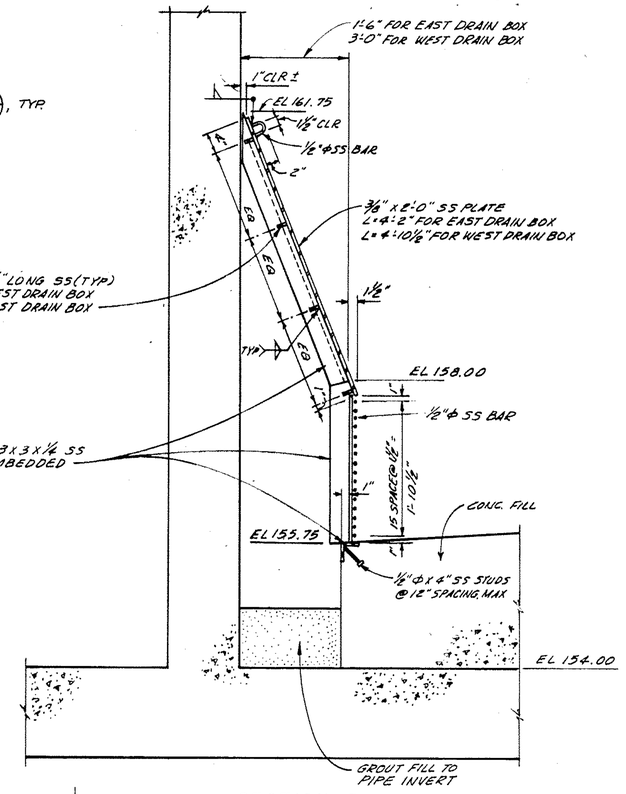
SECTION A

SCALE: 3/8" = 1'-0"

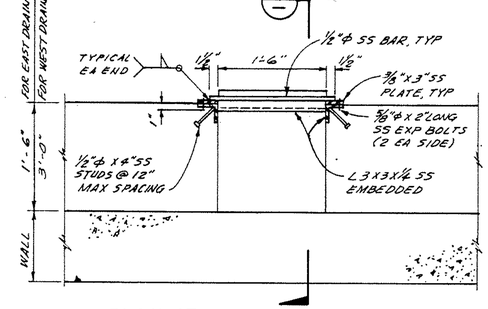
SEE SH 303, 304, 305, 306

NOTES: 1. ALL REINFORCING TO BE #5@12" O.C. UNLESS OTHERWISE NOTED.

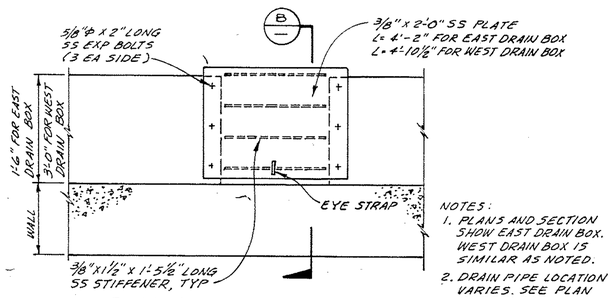
2. ARCHITECTURAL DETAIL NOT SHOWN SEE DETAIL (5/326) SIM. SHOP BEND VERTICAL REBARS AS NECESSARY TO MAINTAIN 1½" MIN. CONC. COVER OVER REBARS.



SECTION B



PLAN AT ELEVATION 157.00



PLAN AT ELEVATION 162.00

DRAIN BOX, COVER & GRATE

DETAIL 1

SCALE: 1" = 1'-0"

SEE SH 303, 308 & 312

NOTES:
1. PLANS AND SECTION SHOW EAST DRAIN BOX. WEST DRAIN BOX IS SIMILAR AS NOTED.
2. DRAIN PIPE LOCATION VARIES. SEE PLAN SHEET 303

⚠ AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - SCREEN BUILDING SECTIONS

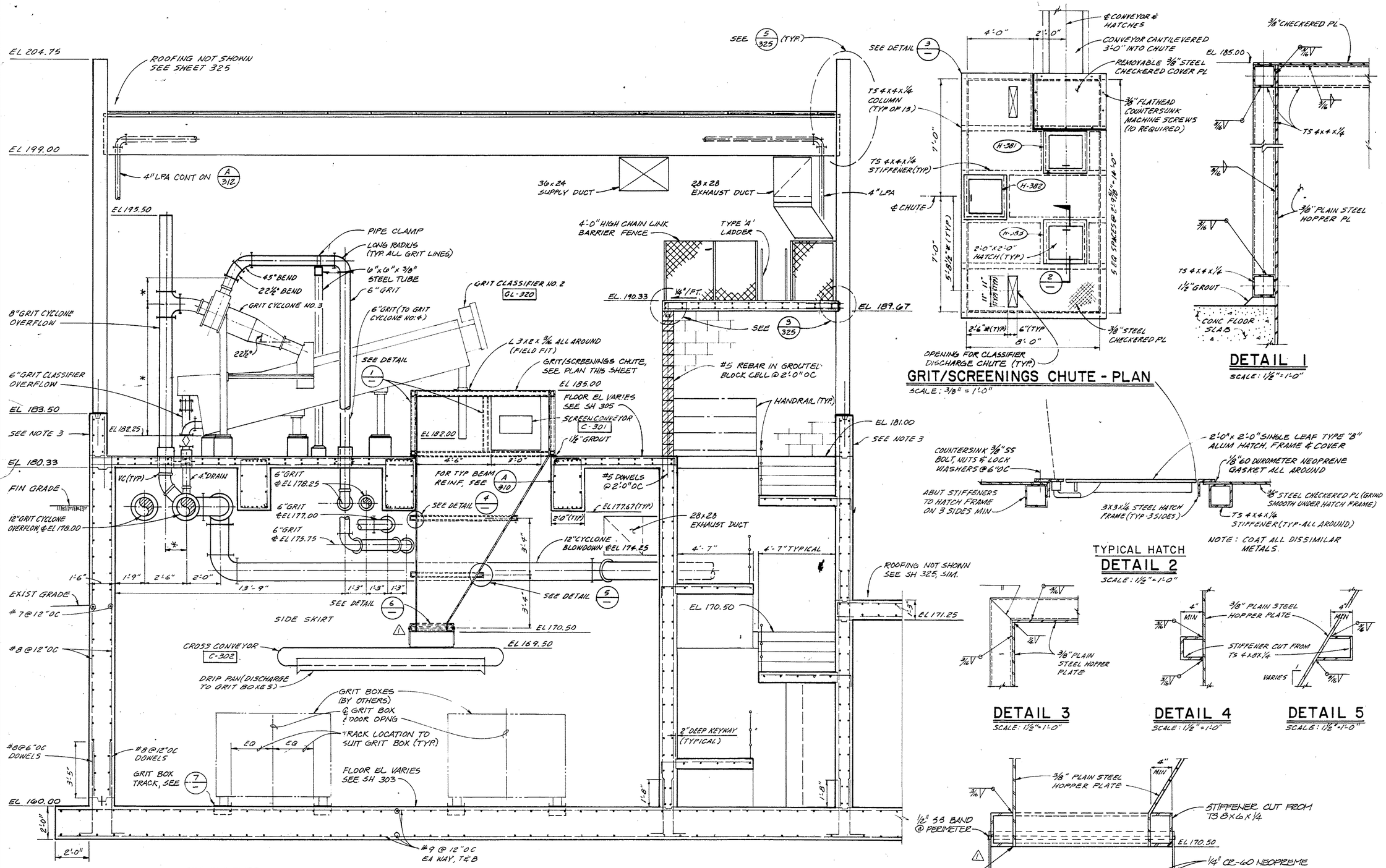
Designed: JPT, NDC
Drawn: DRV, MMK
Checked: RN, NDC
Approved: John Eklund
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/19/92

Sheet Number: 310

SR 904



GRIT/SCREENINGS CHUTE - PLAN

SCALE: 3/8" = 1'-0"

DETAIL 1

SCALE: 1½" = 1'-0"

NOTE: COAT ALL DISSIMILAR METALS.

TYPICAL HATCH DETAIL 2

SCALE: 1½" = 1'-0"

DETAIL 3

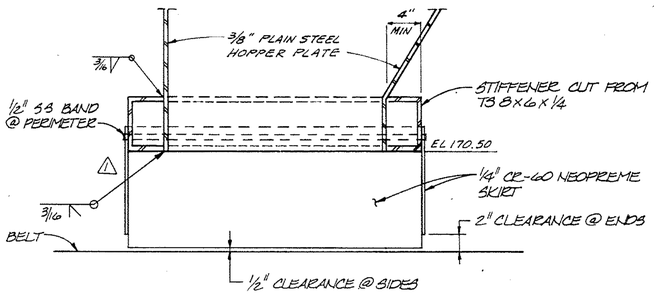
SCALE: 1½" = 1'-0"

DETAIL 4

SCALE: 1½" = 1'-0"

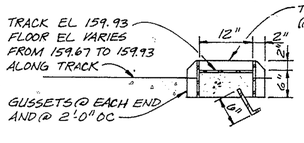
DETAIL 5

SCALE: 1½" = 1'-0"



DETAIL 6

SCALE: 1½" = 1'-0"



NOTES:
1. CONSTRUCT TRACKS & ANCHOR STRAPS FROM ¼" 304L STAINLESS STEEL PLATE.
2. SEE SH 303 FOR FLAIRS @ EACH END.
3. VERIFY DIMENSIONS & DESIGN WITH GRIT BOX MANUFACTURER.
4. ALL WELDS CONTINUOUS, EACH SIDE.

DETAIL 7

NTS

SECTION A

SCALE: 3/8" = 1'-0"
SEE SH 303, 304, 305, 306

NOTES:
1. * DIMENSIONS TO BE DETERMINED BY EQUIPMENT MANUFACTURER.
2. ALL REINFORCING TO BE #5 @ 12" OC UNLESS OTHERWISE NOTED.
3. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL 5/326 SHOP BEND VERTICAL REBARS AS NECESSARY TO MAINTAIN 1½" MINIMUM CONCRETE COVER OVER REBAR

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - SCREEN BUILDING SECTIONS

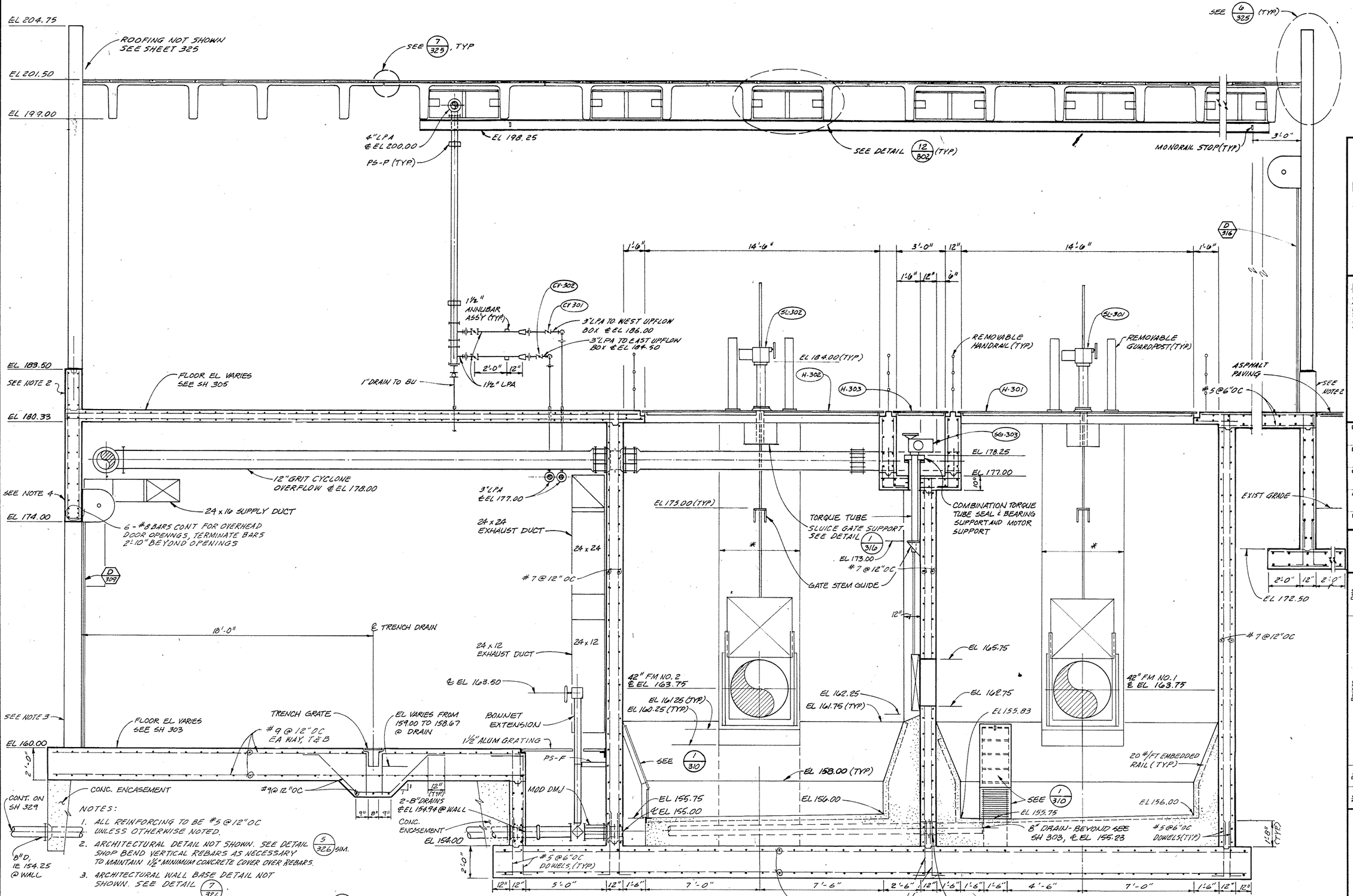
Designed: JPT, NDC
Drawn: DRV
Checked: RN, NDC
Approved: John E. Hood
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY

No	By	Revision	Date
1	AFA	CPZ # 59,113	12/9/92
2	AFA	AS RECORDED DRAWING	12/9/92

Sheet Number: 311

SR 904



NOTES:

1. ALL REINFORCING TO BE #5 @12"OC UNLESS OTHERWISE NOTED.
2. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL (5/326) SIM. SHOP BEND VERTICAL REBARS AS NECESSARY TO MAINTAIN 1½" MINIMUM CONCRETE COVER OVER REBARS.
3. ARCHITECTURAL WALL BASE DETAIL NOT SHOWN. SEE DETAIL (7/326).
4. ARCHITECTURAL DOOR HEAD NOT SHOWN. SEE DETAIL (3/326) SHOP BEND VERTICAL REBARS AS NECESSARY TO MAINTAIN 1½" MIN. CONCRETE COVER OVER REBARS.
5. * INDICATES DIMENSION TO BE DETERMINED BY EQUIPMENT MANUFACTURER.

SECTION A

SCALE: 3/8"=1'-0"

SEE SH 303, 304, 305, 306

△ AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - SCREEN BUILDING SECTIONS

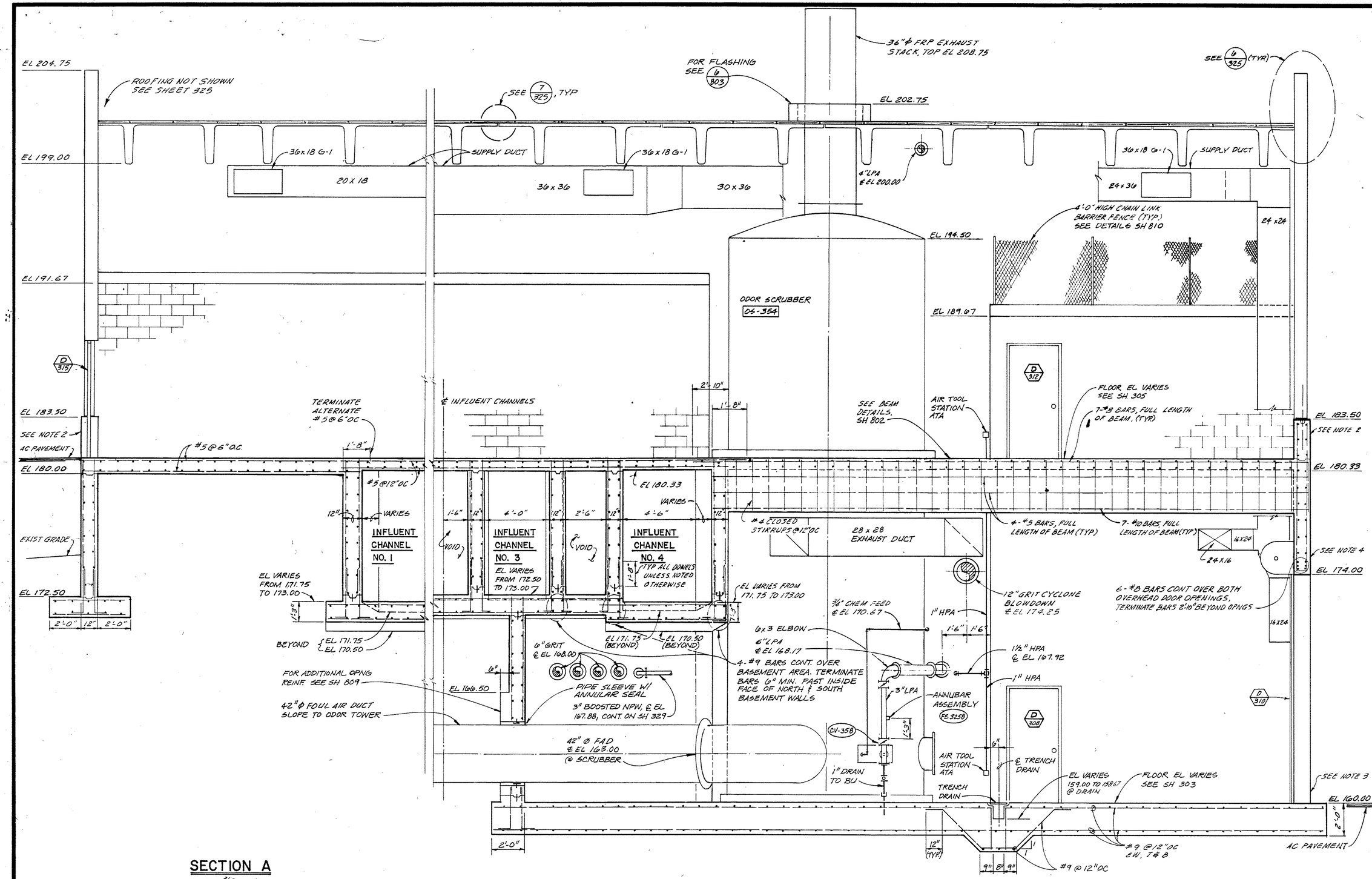
Designed: JPT, NDC
Drawn: DRV
Checked: RN, NDC
Approved: John E Kvach
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
△	AFA	AS RECORDED DRAWING	12/9/92

Sheet Number: 312

SR 904



SECTION A

SCALE: 3/8"=1'-0"
SEE SH 304, 305, 306

SECTION B

SCALE: 3/8"=1'-0"
SEE SH 303, 304, 305, 306

NOTES:

1. ALL REINFORCING TO BE #5@12"OC UNLESS OTHERWISE NOTED.
2. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL (5/326) SHOP BEND VERTICAL REBARS AS NECESSARY TO MAINTAIN 1½" MINIMUM CONCRETE COVER OVER REBARS.
3. ARCHITECTURAL WALL BASE NOT SHOWN. SEE DETAIL (7/326)
4. ARCHITECTURAL DOOR HEAD NOT SHOWN. SEE DETAIL (3/326) SHOP BEND VERTICAL REBARS AS NECESSARY TO MAINTAIN 1½" MIN. CONCRETE COVER OVER REBARS.

1 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - SCREEN BUILDING SECTIONS

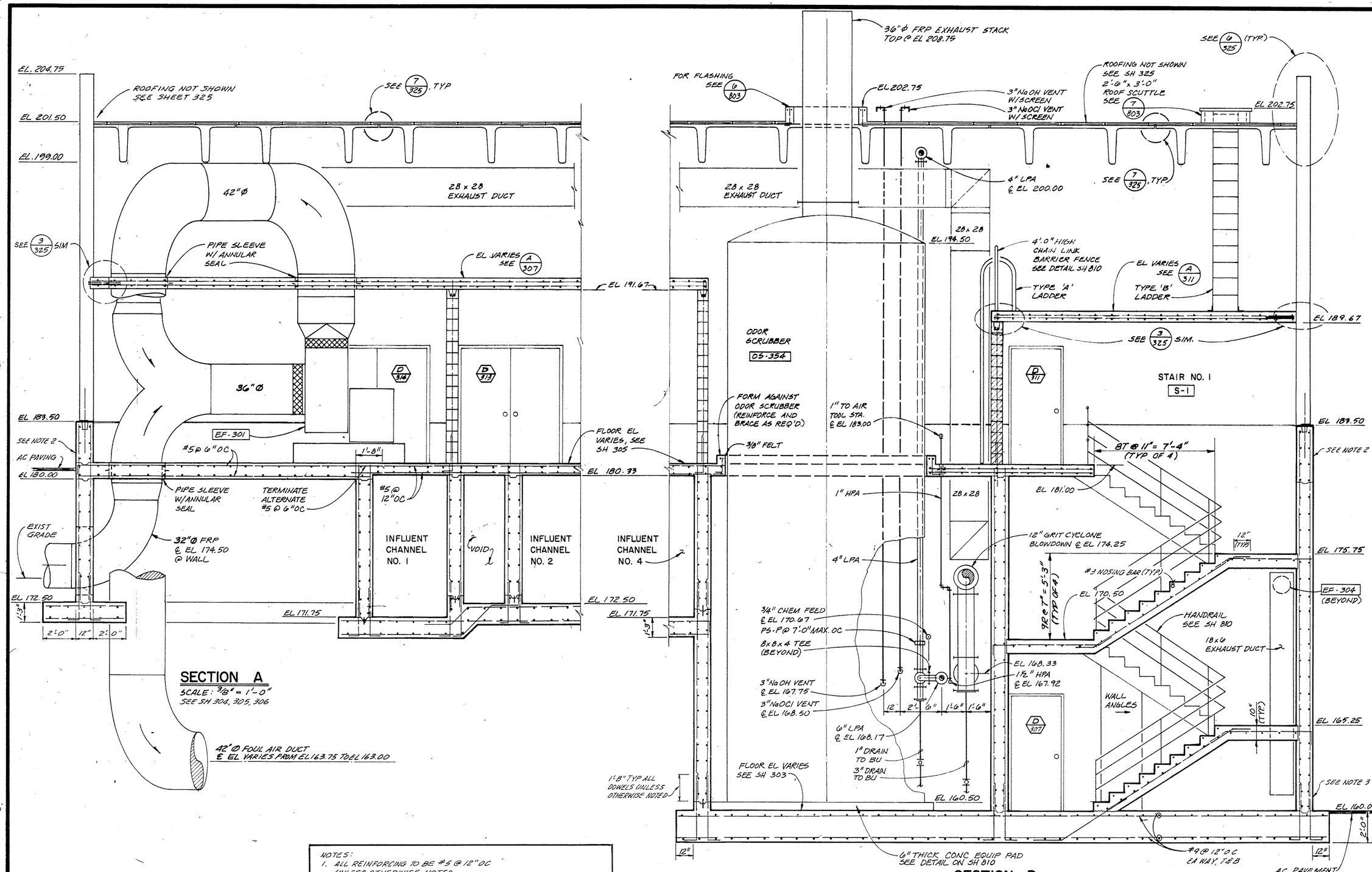
Designed: JPT, NDC
Drawn: DEV
Checked: RN, NDC
Approved: John E. Hoch
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

Sheet Number: 313

SR 904



NOTES:
1. ALL REINFORCING TO BE #5 @ 12" OC UNLESS OTHERWISE NOTED.
2. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL 5/326 SIM. SHOP BEND VERTICAL REBARS AS NECESSARY TO MAINTAIN 1½" MIN CONC COVER OVER REBARS.
3. ARCHITECTURAL WALL BASE DETAIL NOT SHOWN. SEE DETAIL 7/326.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - SCREEN BUILDING SECTIONS

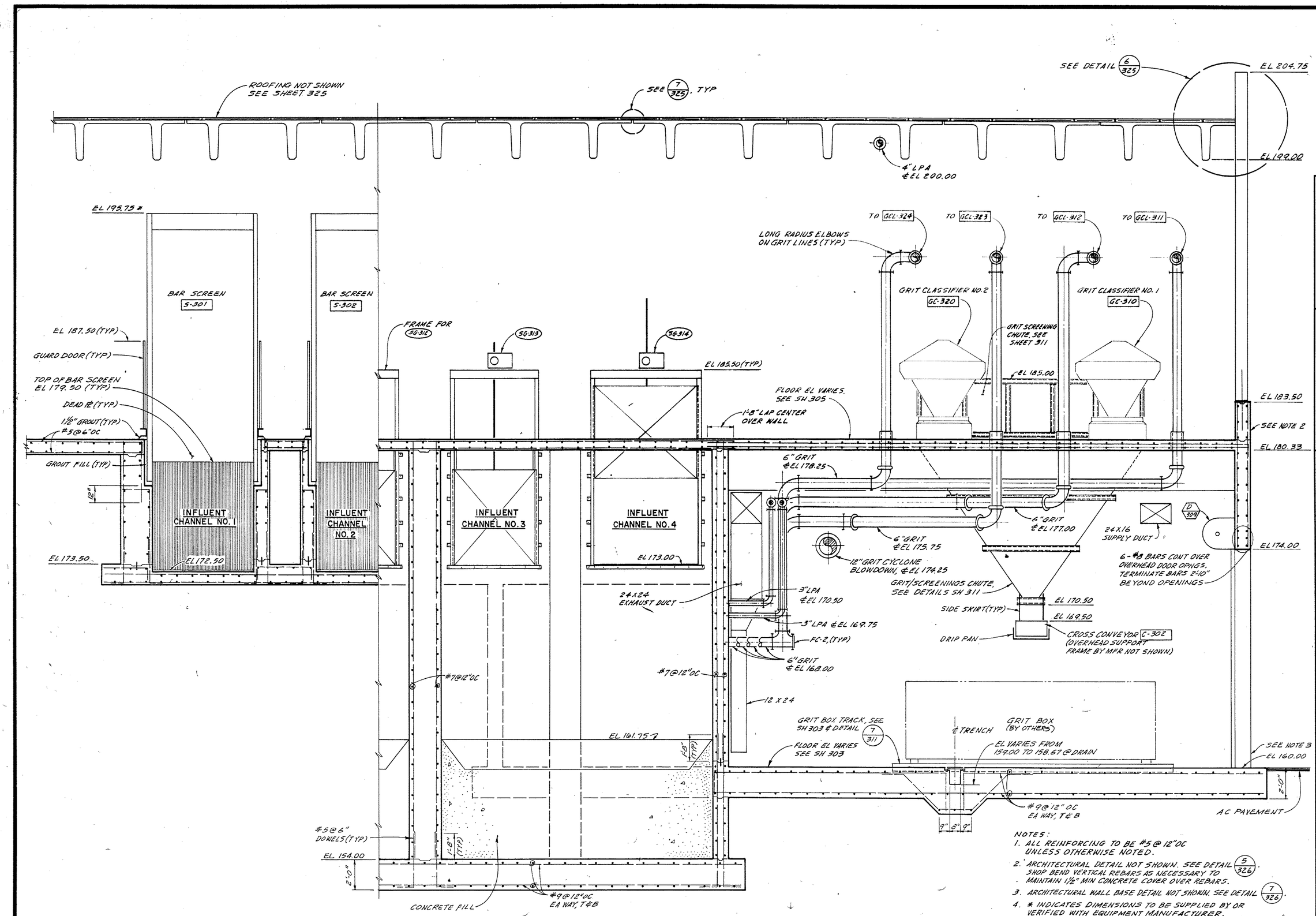
Designed: JPT, NDC
Drawn: DRV
Checked: RN, NDC
Approved: John E. Hurd
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

Sheet Number: 314

SH 304



NOTES:
1. ALL REINFORCING TO BE #5 @ 12"OC UNLESS OTHERWISE NOTED.
2. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL (5/326). SHOP BEND VERTICAL REBARS AS NECESSARY TO MAINTAIN 1½" MIN CONCRETE COVER OVER REBARS.
3. ARCHITECTURAL WALL BASE DETAIL NOT SHOWN. SEE DETAIL (7/326).
4. * INDICATES DIMENSIONS TO BE SUPPLIED BY OR VERIFIED WITH EQUIPMENT MANUFACTURER.
5. FOR PIPE SUPPORTS, SEE SH 303, 304 & 305.

SECTION A

SCALE: 3/8" = 1'-0"
SEE SH 303, 304, 305, 306

△1 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

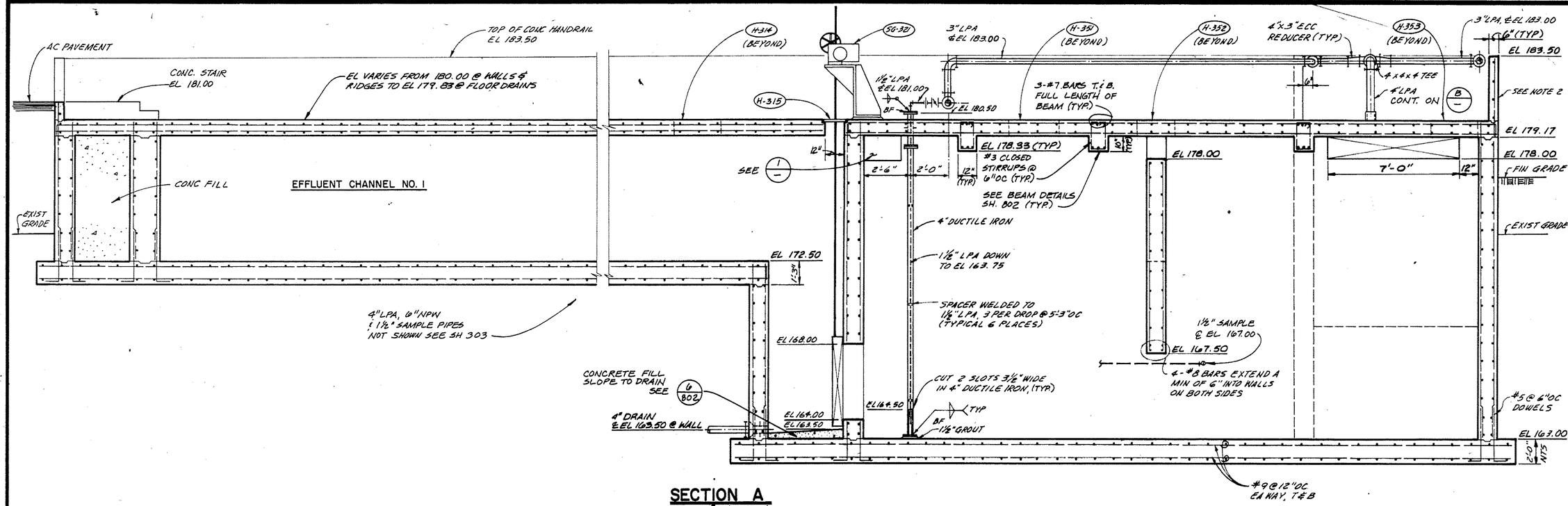
HEADWORKS-SCREEN BUILDING SECTIONS

Designed JPT / NDC
Drawn MMK
Checked RN / NDC
Approved
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY

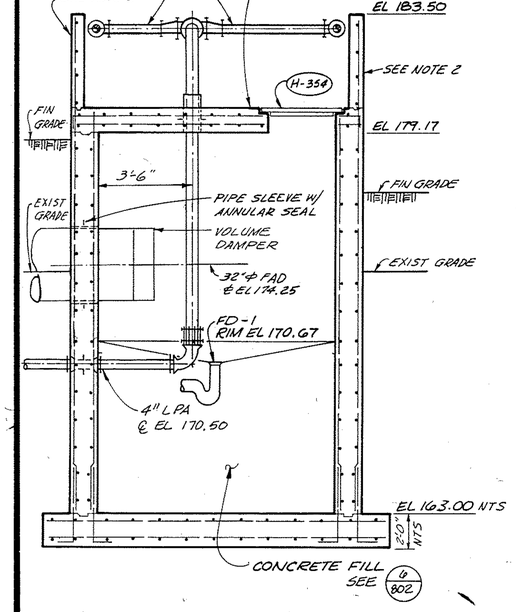
No	By	Revision	Date
△1	AFA	AS RECORDED DRAWING	12/9/92

Sheet Number 315



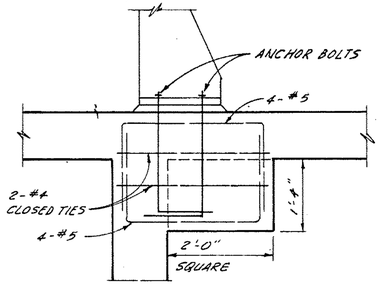
SECTION A

SCALE: 3/8" = 1'-0"
SEE SH 303, 304, 305



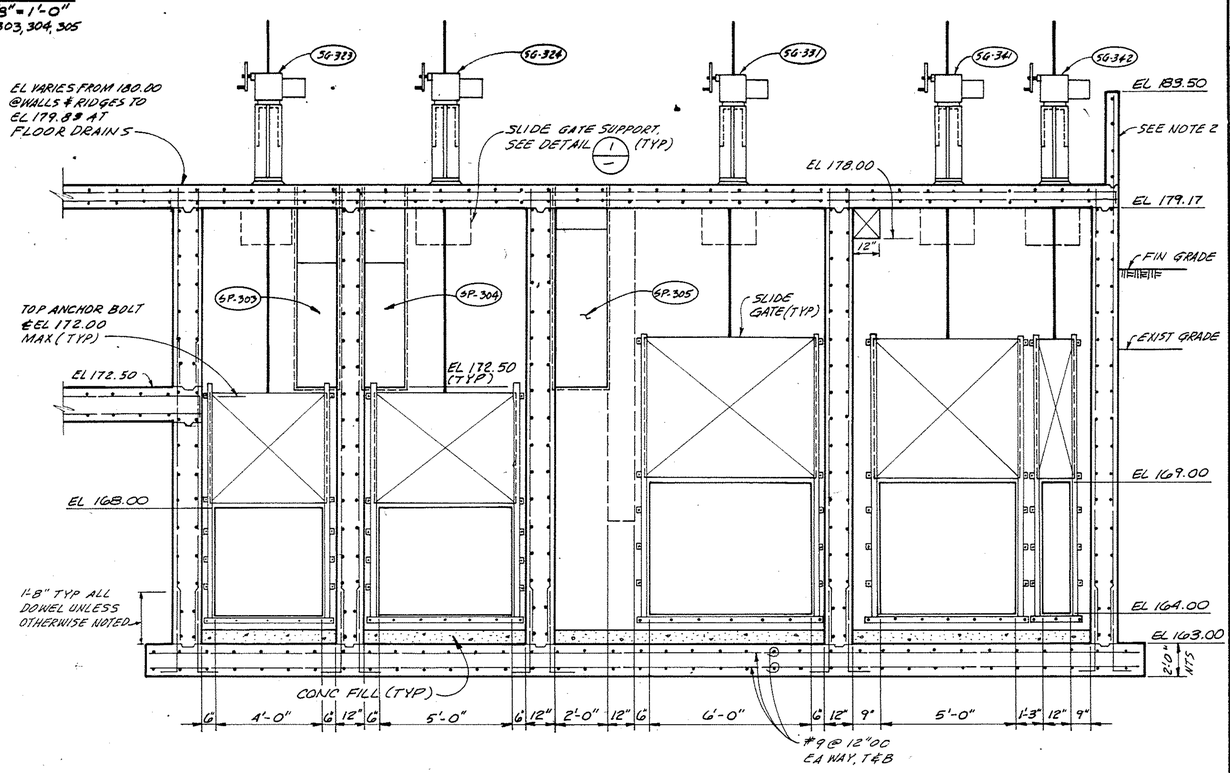
SECTION B

SCALE: 3/8" = 1'-0"
SEE SH 303, 304, 305



SLIDE GATE SUPPORT DETAIL 1

SCALE: 3/4" = 1'-0"



SECTION C

SCALE: 3/8" = 1'-0"
SEE SH 303, 304, 305

NOTES:
1. ALL REINFORCING TO BE #5 @ 12"OC UNLESS OTHERWISE NOTED.
2. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL 6/326 SHOP BEND VERTICAL STEEL TO CENTERLINE OF PARARET WALL.

△ AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - GRIT STRUCTURE SECTIONS

Designed JPT, NDC
Drawn MMK
Checked RN, NDC
Approved John Schlieck
Date MAY, 1989

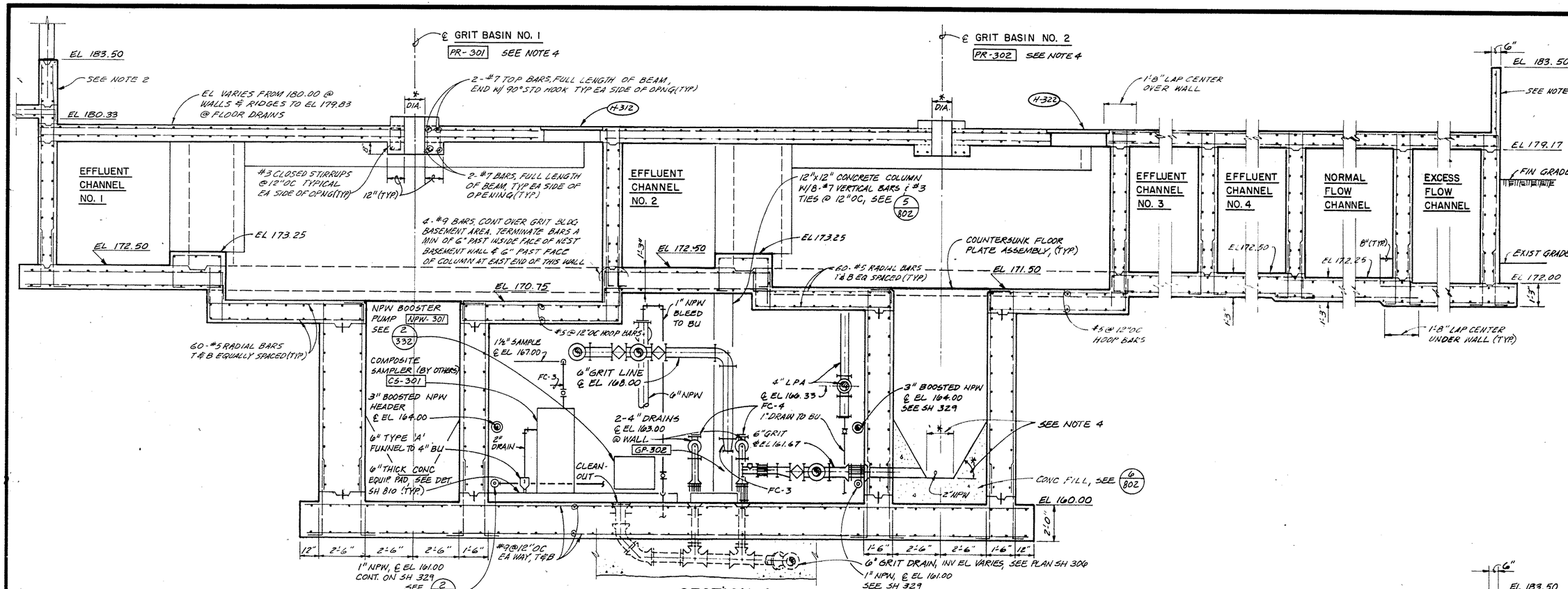
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
△	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 13351 STATE OF OREGON EXPIRES: 12-31-93 SIGNED WHITE

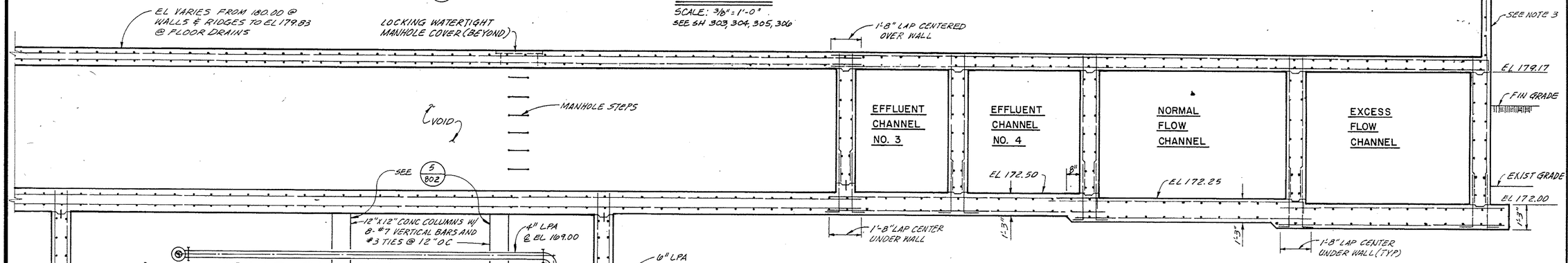
Sheet Number 316

SH 904



SECTION A

SCALE: 3/8" = 1'-0"
SEE SH 303, 304, 305, 306



SECTION B

SCALE: 3/8" = 1'-0"
SEE SH 303, 304, 305, 306

NOTES:

1. ALL REINF TO BE #5 @ 12"OC UNLESS OTHERWISE NOTED.
2. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL 5/326 SHOP BEND VERTICAL REBARS AS NECESSARY TO MAINTAIN 1½" MIN CONCRETE COVER OVER REBARS.
3. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL 6/326 SHOP BEND VERTICAL STEEL TO ℄ OF PARAPET WALL.
4. GRIT BASINS 1 & 2 ARE SHOWN FOR TYPE 'A' GRIT ROTORS WHILE GRIT BASINS 3 & 4 ARE SHOWN ELSEWHERE FOR TYPE 'B' GRIT ROTORS. UTILIZE DESIGN THAT SUITS EQUIPMENT PROVIDED.
5. * DIMENSION TO BE DETERMINED BY EQUIPMENT MANUFACTURER.

⚠ AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - GRIT STRUCTURE SECTIONS

Designed: JPT, NDC
Drawn: DRV, MMK
Checked: RN, NDC
Approved: John E. Ekholm
Date: MAY, 1989

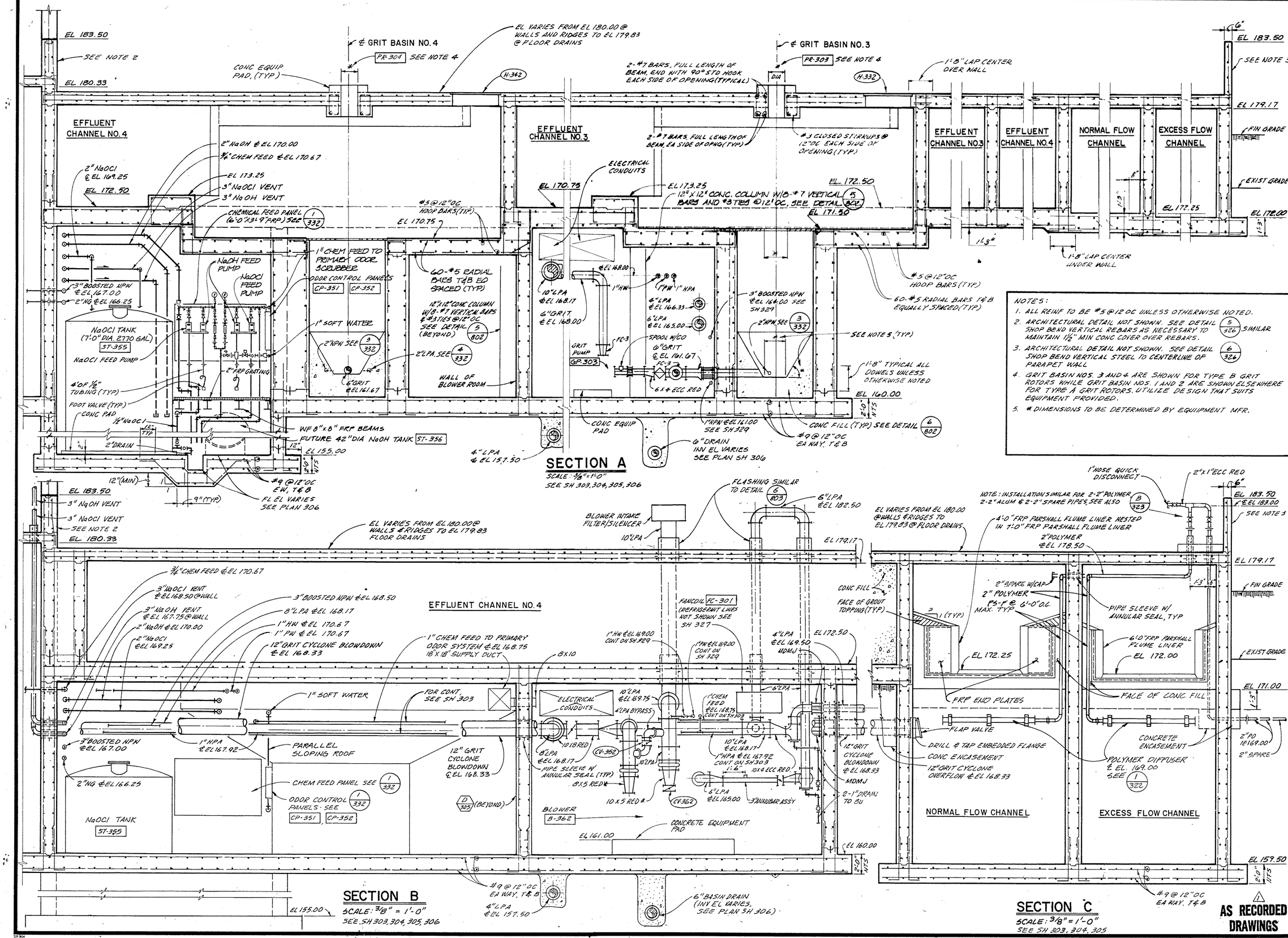
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 12191 STATE OF WASHINGTON GEORGE R. WILLIS

Sheet Number 317

SR 904



NOTES:

1. ALL REINF TO BE #5 @ 12 OC UNLESS OTHERWISE NOTED.
2. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL 5/326 SIMILAR SHOP BEND VERTICAL REBARS AS NECESSARY TO MAINTAIN 1½" MIN CONC COVER OVER REBARS.
3. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL 6/326 SHOP BEND VERTICAL STEEL TO CENTERLINE OF PARAPET WALL
4. GRIT BASIN NOS. 3 AND 4 ARE SHOWN FOR TYPE B GRIT ROTORS WHILE GRIT BASIN NOS. 1 AND 2 ARE SHOWN ELSEWHERE FOR TYPE A GRIT ROTORS. UTILIZE DESIGN THAT SUITS EQUIPMENT PROVIDED.
5. # DIMENSIONS TO BE DETERMINED BY EQUIIPMENT MFR.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

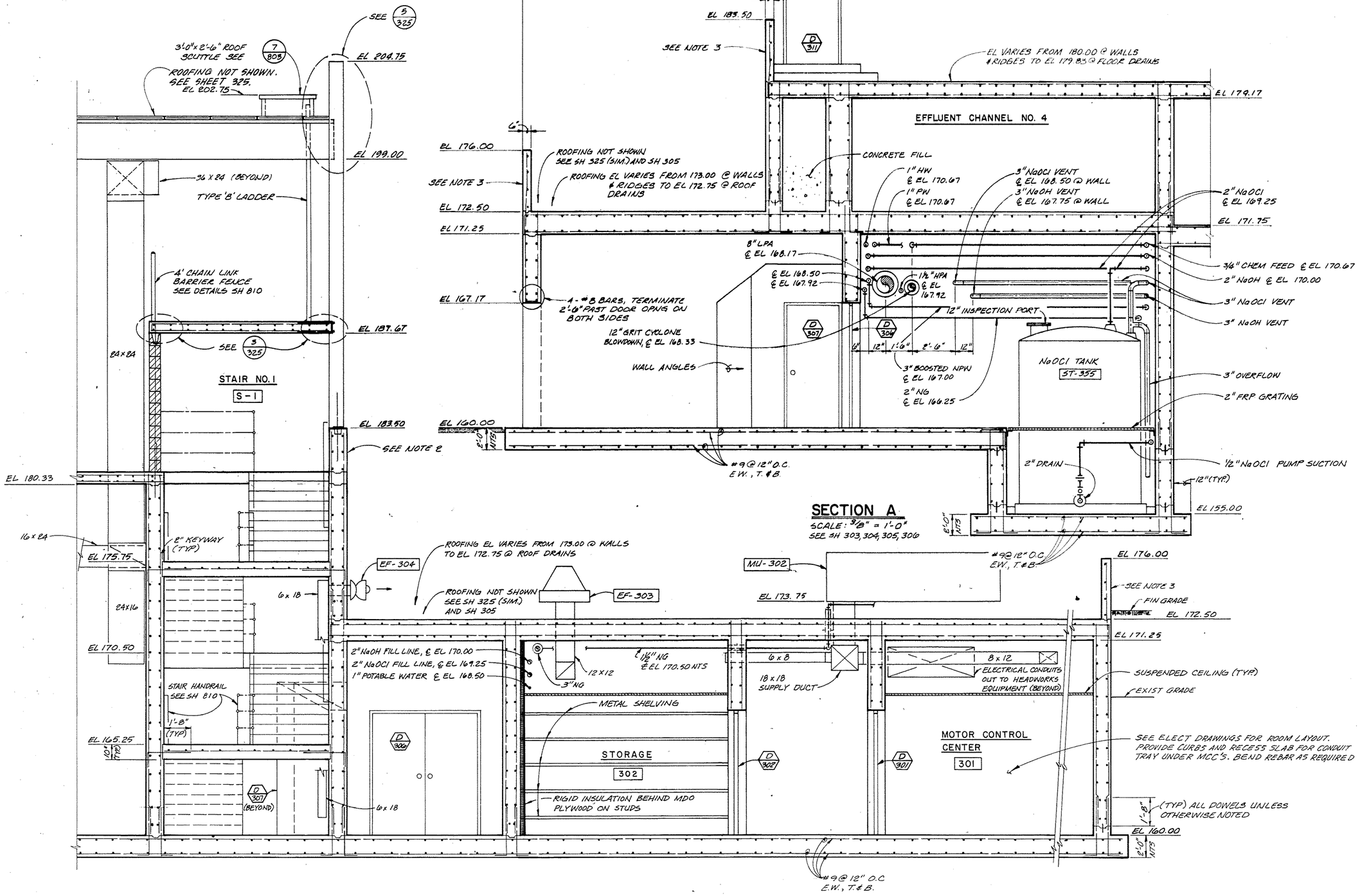
HEADWORKS - GRIT STRUCTURE SECTIONS

Designed: JPT, NDC
Drawn: DRV, MMK
Checked: RN, NDC
Approved: John E Hoch
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWINGS	12/1992

Sheet Number: 318



SECTION A

SCALE: 3/8" = 1'-0"
SEE SH 303, 304, 305, 306

SECTION B

SCALE: 3/8" = 1'-0"
SEE SH 303, 304, 305

NOTES:

1. ALL REINFORCING TO BE #5 @ 12" O.C. UNLESS OTHERWISE NOTED.
2. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL 5/326 (SIM) SHOP BEND VERTICAL REBAR AS NECESSARY TO MAINTAIN 1½" MIN CONC COVER OVER REBARS.
3. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL 6/326. SHOP BEND VERTICAL STEEL TO @ OF PARAPET WALL.

△ AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - GRIT STRUCTURE SECTIONS

Designed: JPT, NDC
Drawn: DRV, MMK
Checked: RN, NDC
Approved: John E. Kyack
Date: MAY, 1989

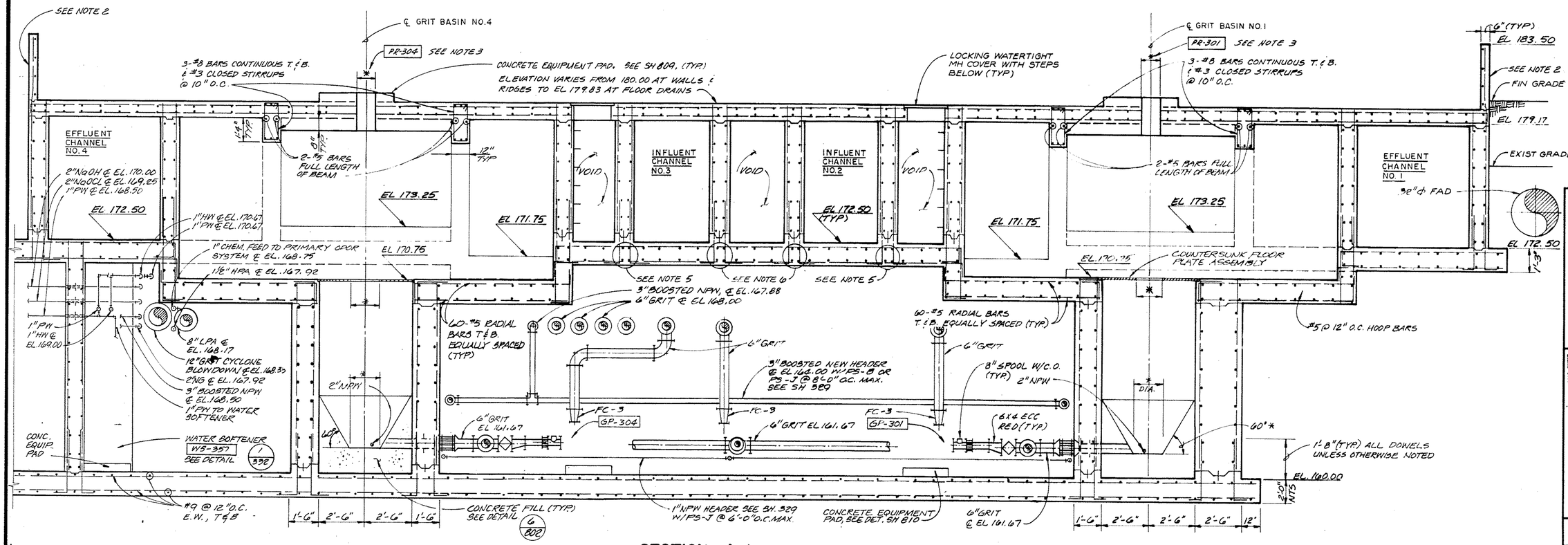
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
△	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 13991 KEVIN W. KELLEY 12/9/92 STATE OF WASHINGTON

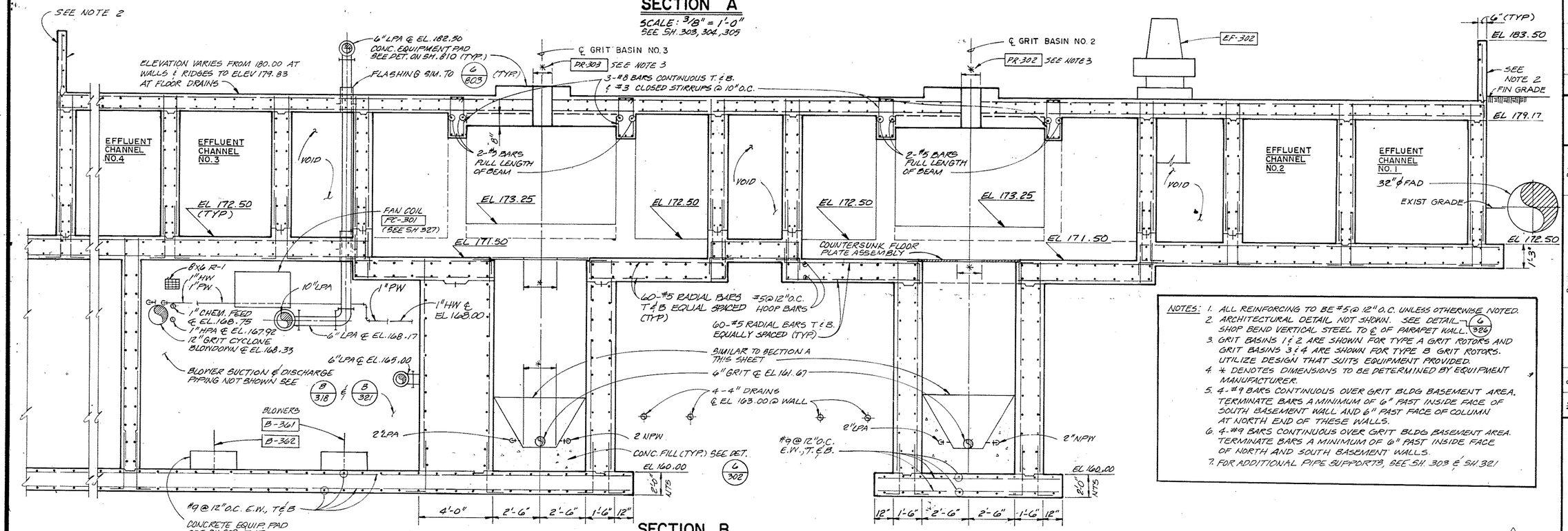
Sheet Number 319

SA 904



SECTION A

SCALE: 3/16" = 1'-0"
SEE SH. 303, 304, 305



SECTION B

SCALE: 3/8" = 1'-0"
SEE SH. 303, 304, 305

NOTES:
1. ALL REINFORCING TO BE #5 @ 12" O.C. UNLESS OTHERWISE NOTED.
2. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL 4/326 SHOP BEND VERTICAL STEEL TO ℄ OF PARAPET WALL.
3. GRIT BASINS 1 & 2 ARE SHOWN FOR TYPE A GRIT ROTORS AND GRIT BASINS 3 & 4 ARE SHOWN FOR TYPE B GRIT ROTORS. UTILIZE DESIGN THAT SUITS EQUIPMENT PROVIDED.
4. * DENOTES DIMENSIONS TO BE DETERMINED BY EQUIPMENT MANUFACTURER.
5. 4-#9 BARS CONTINUOUS OVER GRIT BLDG BASEMENT AREA. TERMINATE BARS A MINIMUM OF 6" PAST INSIDE FACE OF SOUTH BASEMENT WALL AND 6" PAST FACE OF COLUMN AT NORTH END OF THESE WALLS.
6. 4-#9 BARS CONTINUOUS OVER GRIT BLDG BASEMENT AREA. TERMINATE BARS A MINIMUM OF 6" PAST INSIDE FACE OF NORTH AND SOUTH BASEMENT WALLS.
7. FOR ADDITIONAL PIPE SUPPORTS, SEE SH. 303 & SH. 321

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

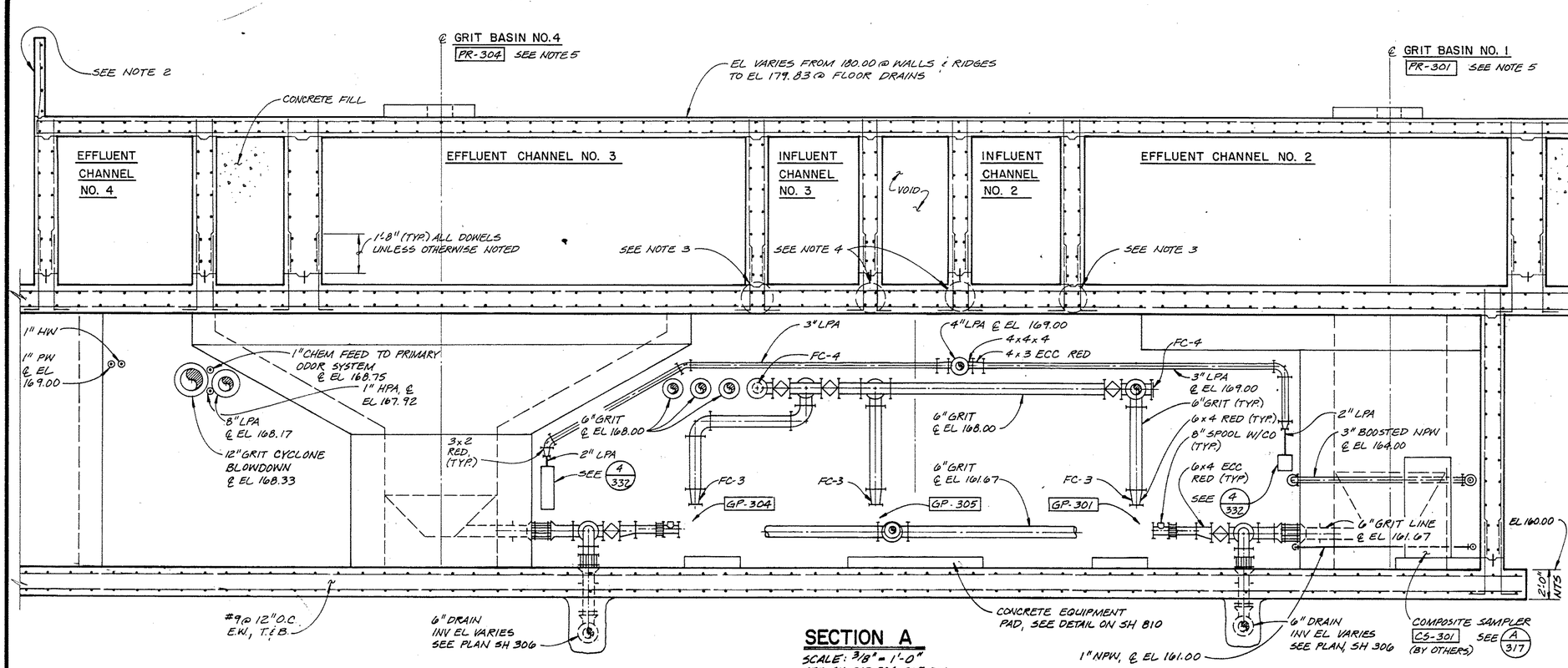
HEADWORKS - GRIT STRUCTURE SECTIONS

Designed JPT, NDC
Drawn DRV, RKB
Checked R.N, NDC
Approved John E. Kirk
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

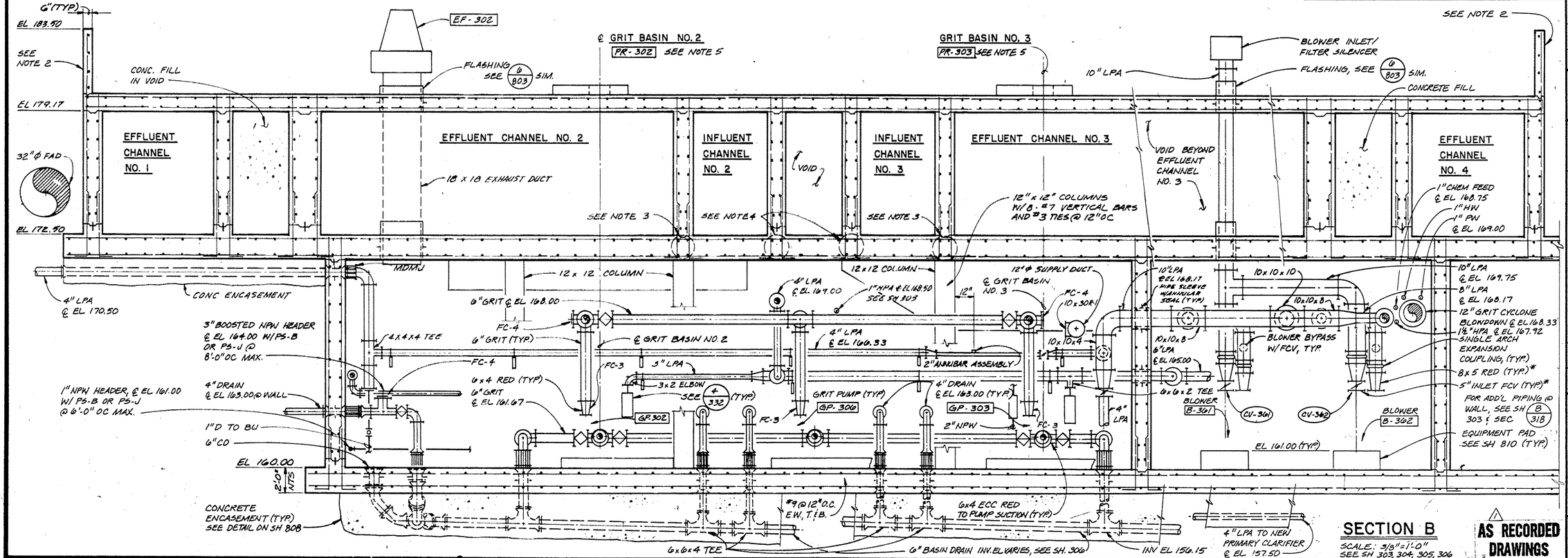
No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

Sheet Number 320



SECTION A

SCALE: 3/8" = 1'-0"
SEE SH 303, 304, 305, 306



SECTION B

SCALE: 3/8" = 1'-0"
SEE SH 303, 304, 305, 306

AS RECORDED DRAWINGS

NOTES:

1. ALL REINFORCING TO BE #5 @ 12" O.C. UNLESS OTHERWISE NOTED.
2. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL 6/326 SHOP BEND VERTICAL STEEL TO ℄ OF PARAPET WALL
3. 4-#9 BARS CONTINUOUS OVER GRIT BLDG. BASEMENT AREA. TERMINATE BARS A MINIMUM OF 6" PAST INSIDE FACE OF SOUTH BASEMENT WALL AND 6" PAST FACE OF COLUMN AT NORTH END OF THESE WALLS.
4. 4-#9 BARS CONTINUOUS OVER GRIT BLDG. BASEMENT AREA. TERMINATE BARS A MINIMUM OF 6" PAST INSIDE FACE OF NORTH AND SOUTH BASEMENT WALLS.
5. GRIT BASINS 1 & 2 ARE SHOWN FOR TYPE A GRIT ROTORS AND GRIT BASINS 3 & 4 ARE SHOWN FOR TYPE B GRIT ROTORS. UTILIZE DESIGN THAT SUITS EQUIPMENT PROVIDED.
6. FOR ADDITIONAL PIPE SUPPORTS SEE SH 303 & SH 320.
7. * DIMENSIONS TO BE DETERMINED BY EQUIP MANUFACTURER.

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - GRIT STRUCTURE SECTIONS

Designed: JPT, NDC
Drawn: DRV, MMK
Checked: RN, NDC
Approved: John E. Hoot
Date: MAY, 1989

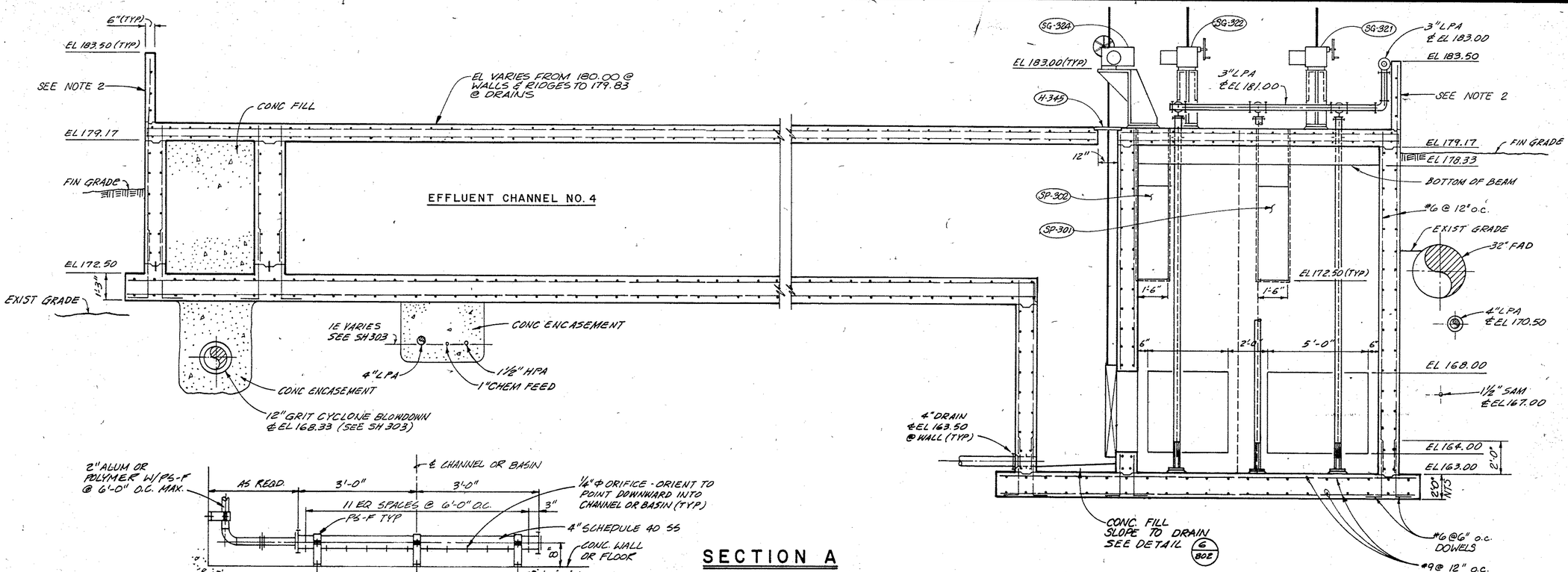
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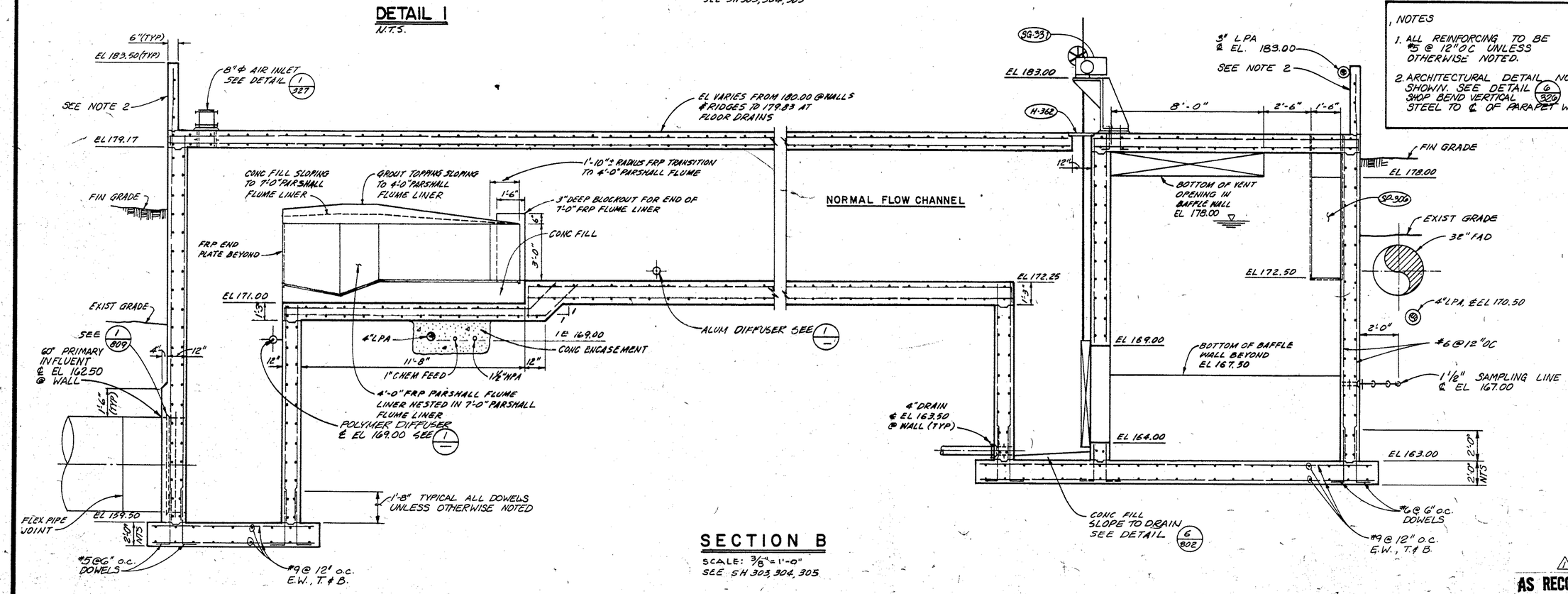
No	By	Revision	Date
1	AFA	AS RECORDED DRAWINGS	12/1992

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JAN. 17, 1985 BRUCE R. WILLE

Sheet Number: 321

SH 904





NOTES

1. ALL REINFORCING TO BE #5 @ 12" O.C UNLESS OTHERWISE NOTED.
2. ARCHITECTURAL DETAIL NOT SHOWN. SEE DETAIL 6/326 SHOP BEND VERTICAL STEEL TO ℄ OF PARAPET WALL

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS-GRIT STRUCTURE SECTIONS

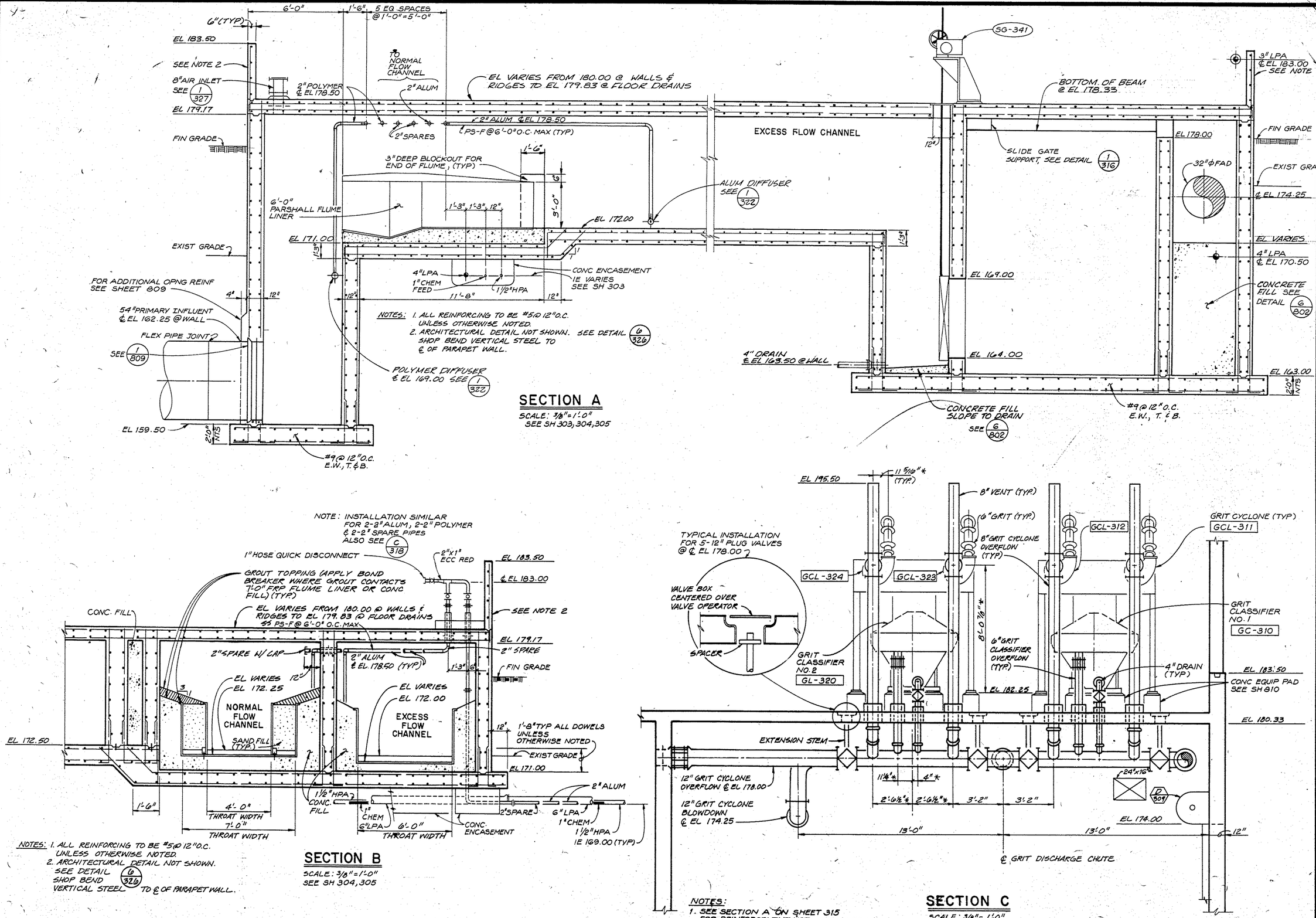
Designed	JPT, NDC
Drawn	DRV, MMK
Checked	RN, NDC
Approved	
Date	MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/7/92

REGISTERED PROFESSIONAL ENGINEER 13391 BRUCE R. WILLEY

Sheet Number 322



CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS-GRIT STRUCTURE SECTIONS

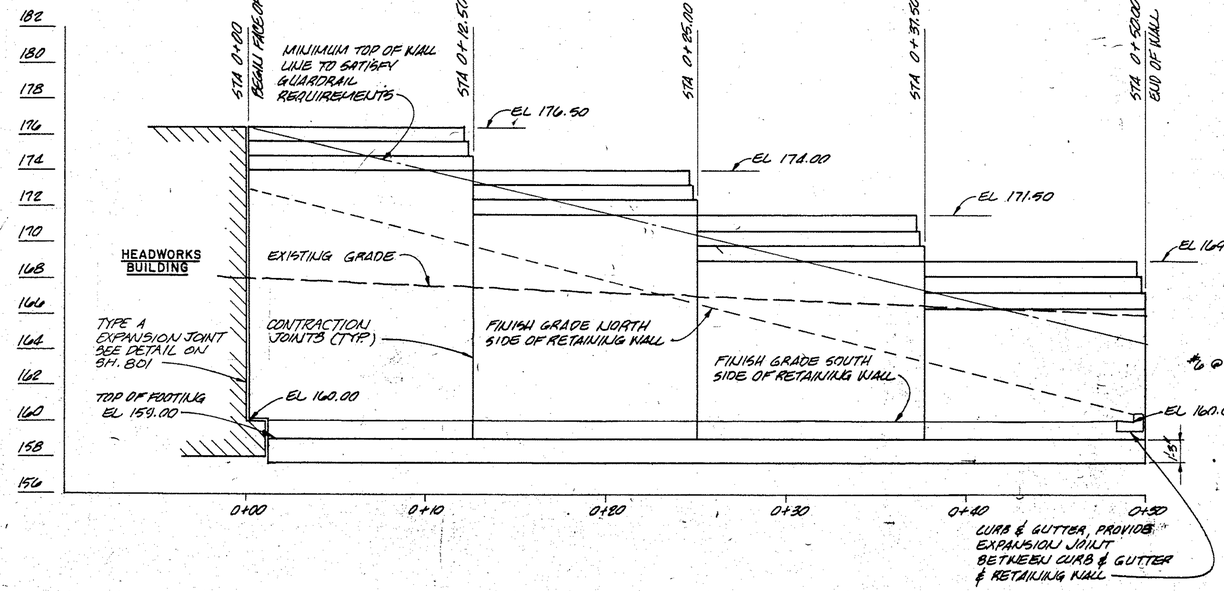
Designed JPT, NDC
Drawn DRV, MMK
Checked RN; NDC
Approved John E. Hoel
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	MFA	AS RECORDED DRAWING	12/7/92

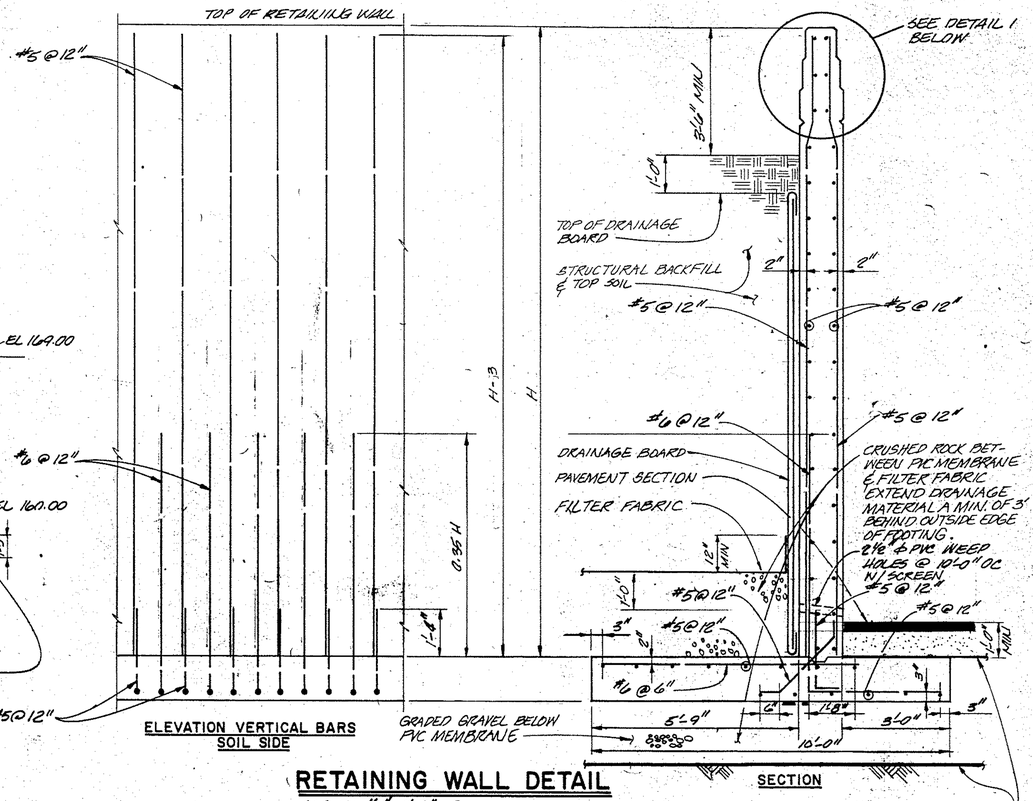
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17, 1990 BRUCE A. WILLEY

Sheet Number 323



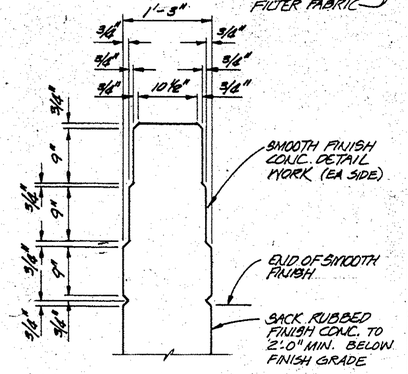
NORTH RETAINING WALL ELEVATION

SCALE: 1/8"=1'-0" HORIZONTAL & VERTICAL



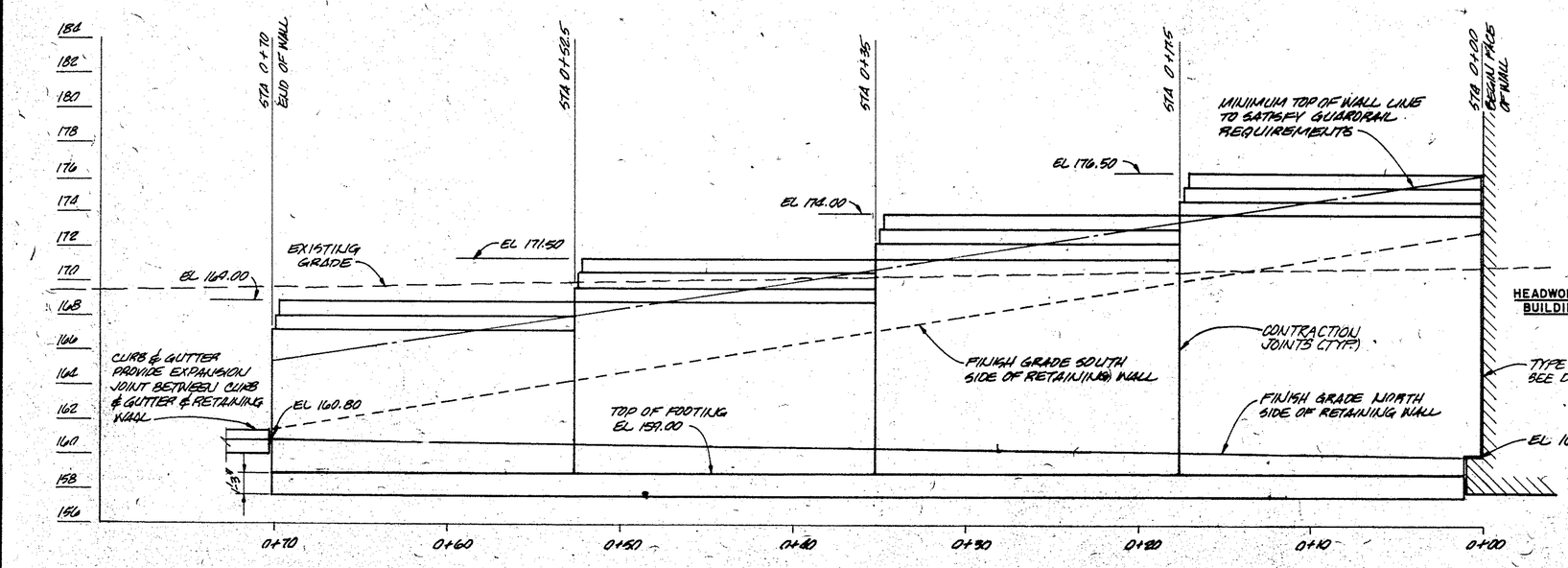
RETAINING WALL DETAIL

SCALE: 1/2"=1'-0"



DETAIL 1

SCALE: 1"=1'-0"



SOUTH RETAINING WALL ELEVATION

SCALE: 1/8"=1'-0" HORIZONTAL & VERTICAL

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS & RETAINING WALLS

Designed NDC
Drawn SDS
Checked AHK, RN
Approved John E Kvel
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

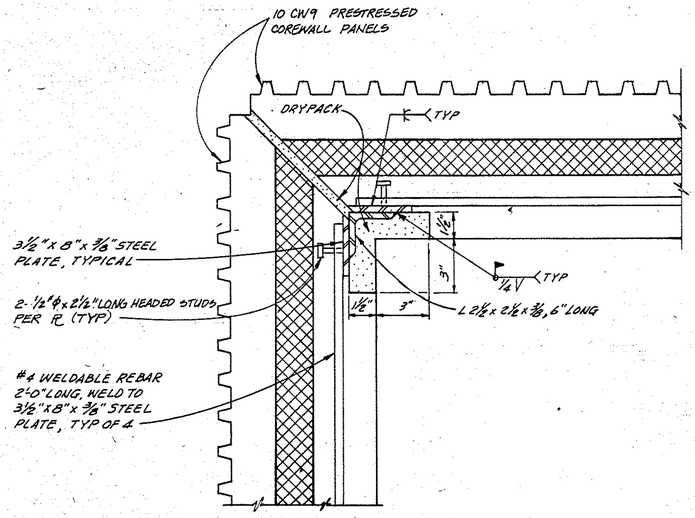
No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/7/92

REGISTERED PROFESSIONAL ENGINEER 13081 OREGON JULY 23, 1985 BRUCE R. WILLEY

AS RECORDED DRAWINGS

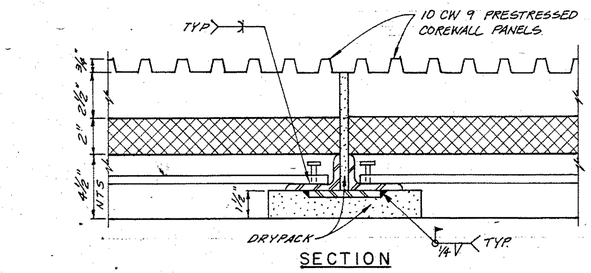
Sheet Number 324

SR 804

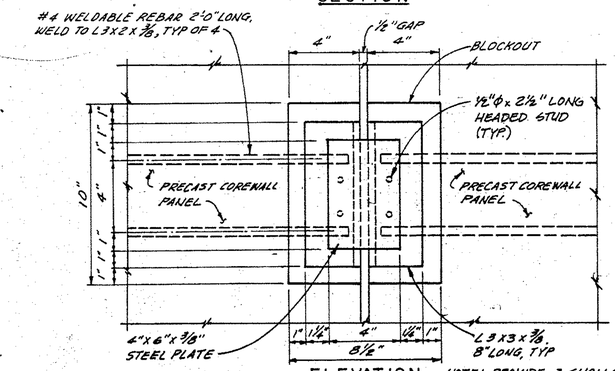


NOTE: PROVIDE 3 SUCH CONNECTIONS AT EACH CORNER. SPACE CONNECTIONS AT APPROXIMATELY 10'-0" O.C.

DETAIL 1
SCALE: 3" = 1'-0"



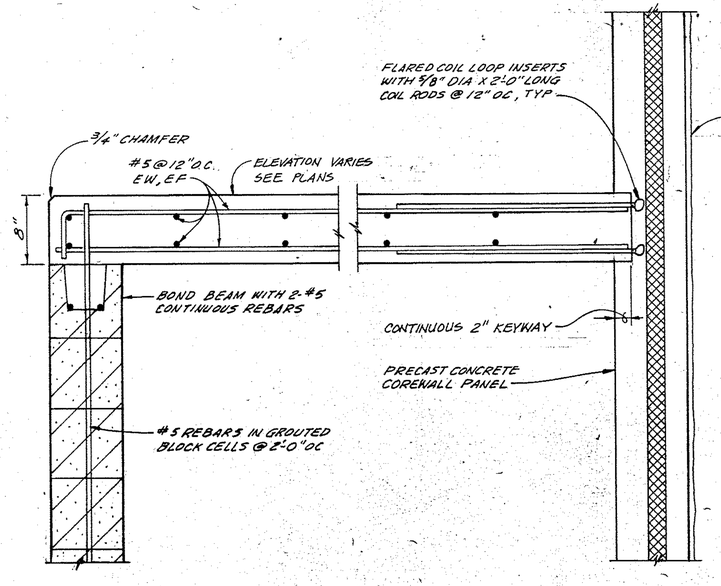
SECTION



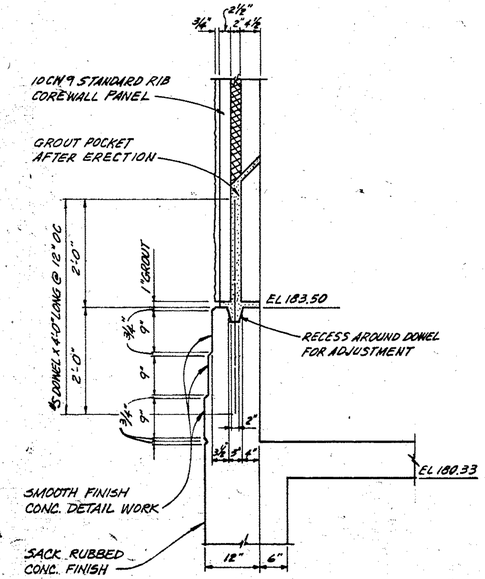
ELEVATION

NOTE: PROVIDE 3 SUCH CONNECTIONS AT EACH JOINT BETWEEN PRECAST CORE WALL PANELS. SPACE CONNECTIONS AT APPROXIMATELY 10'-0" O.C.

DETAIL 2
SCALE: 3" = 1'-0"

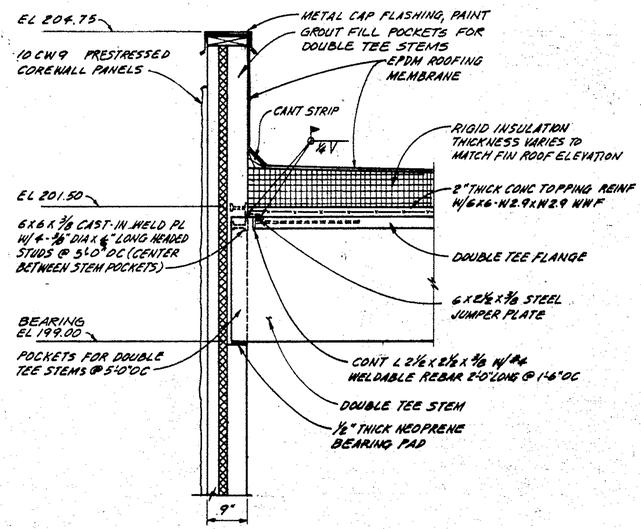


DETAIL 3
SCALE: 1½" = 1'-0"

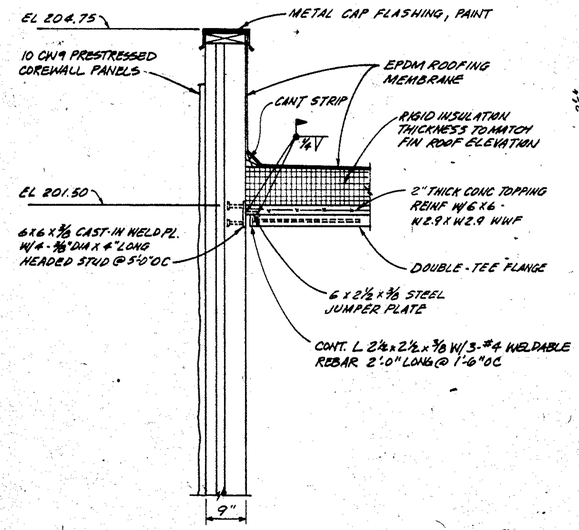


NOTES:
1. SEE PLANS FOR REINFORCING NOT SHOWN IN THIS DETAIL.
2. SEE SH 326 FOR ADDITIONAL CONC. DETAILS.

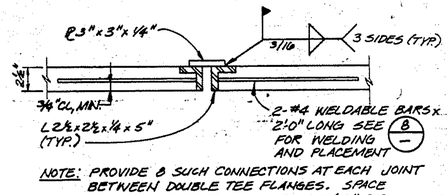
DETAIL 4
SCALE: ¾" = 1'-0"



DETAIL 5
SCALE: ¾" = 1'-0"

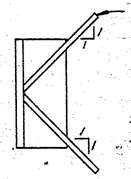


DETAIL 6
SCALE: ¾" = 1'-0"



NOTE: PROVIDE 8 SUCH CONNECTIONS AT EACH JOINT BETWEEN DOUBLE TEE FLANGES. SPACE CONNECTIONS AT APPROXIMATELY 5'-0" O.C.

DETAIL 7
NTS



DETAIL 8
NTS

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - STATS

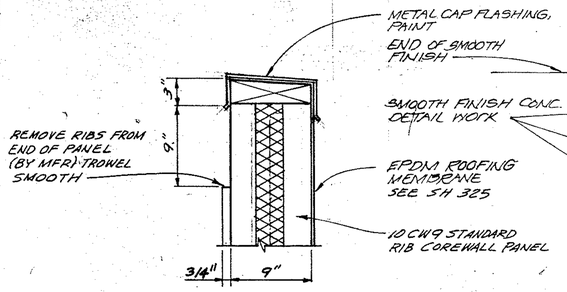
Designed: JPT, NDC
Drawn: MMK
Checked: RN, NDC
Approved: John E. Hall
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWINGS	12/1992

REGISTERED PROFESSIONAL ENGINEER 12231 OREGON JULY 27, 1989 BRUCE A. WILLEY

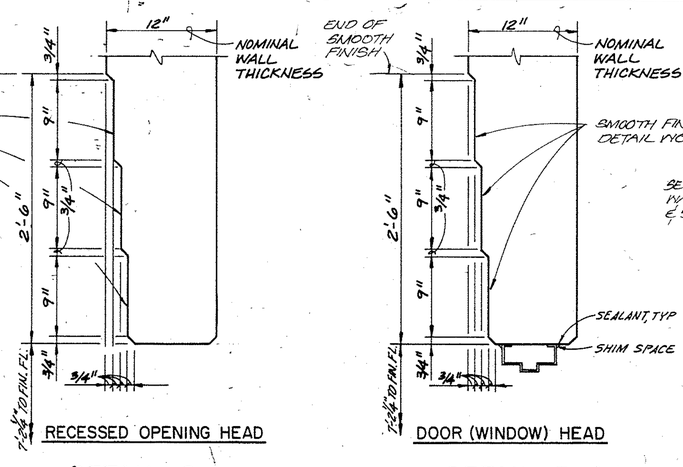
Sheet Number: 325



PARAPET

DETAIL 1

SCALE: 1 1/2" = 1'-0"



RECESSED OPENING HEAD

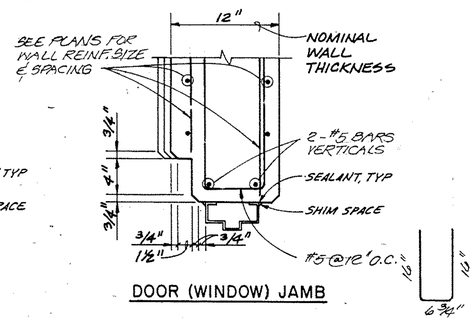
DETAIL 2

SCALE: 1 1/2" = 1'-0"

DOOR (WINDOW) HEAD

DETAIL 3

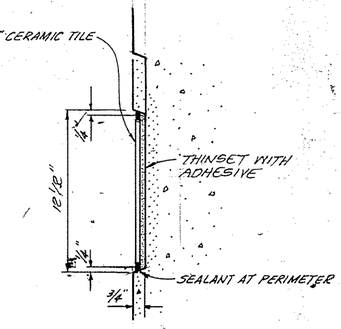
SCALE: 1 1/2" = 1'-0"



DOOR (WINDOW) JAMB

DETAIL 4

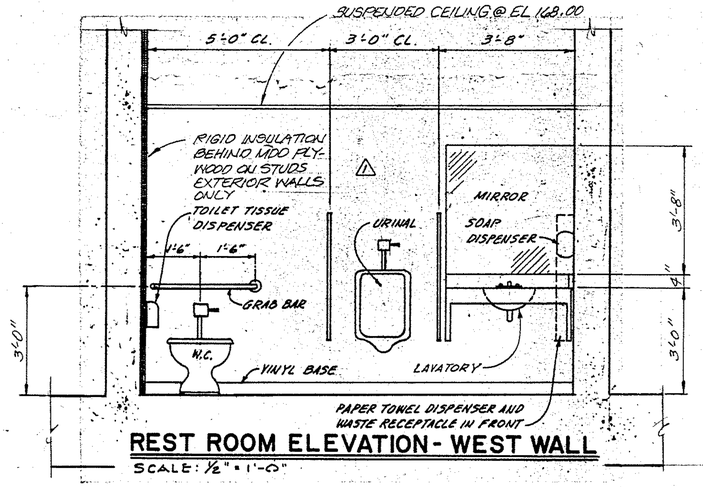
SCALE: 1 1/2" = 1'-0"



CERAMIC TILE FEATURE

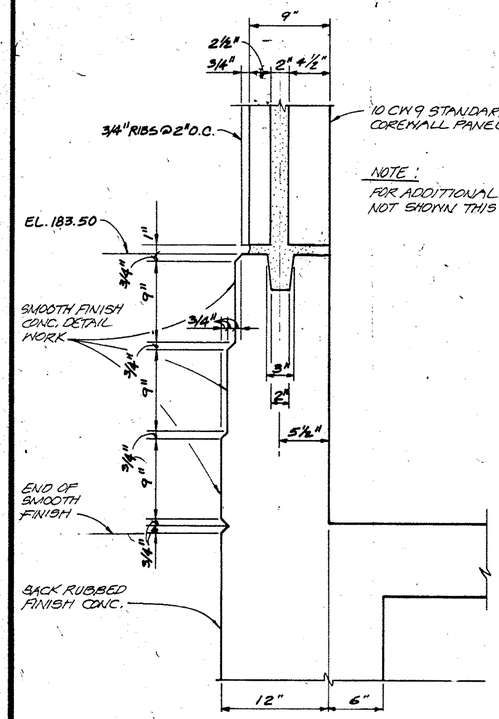
DETAIL 8

SCALE: 3" = 1'-0"



REST ROOM ELEVATION - WEST WALL

SCALE: 1/2" = 1'-0"

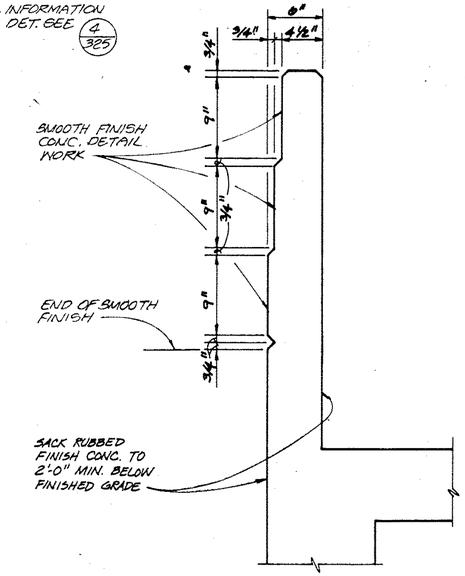


NOTE:
FOR ADDITIONAL INFORMATION NOT SHOWN THIS DET. SEE (4/325)

PRECAST WALL SECTION

DETAIL 5

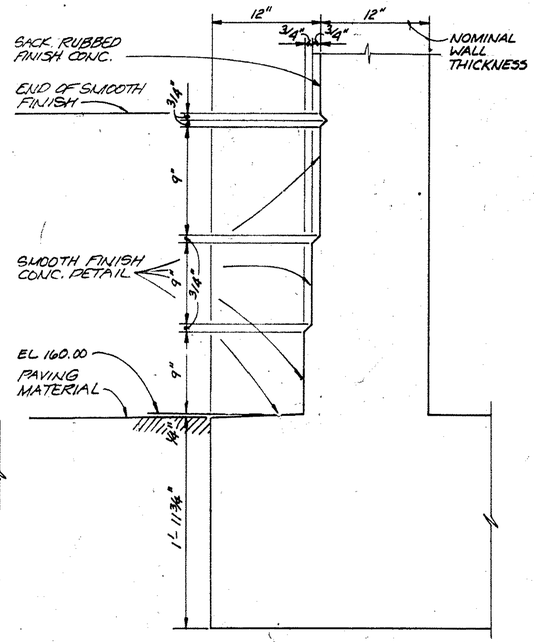
SCALE: 1 1/2" = 1'-0"



SHORT WALL SECTION

DETAIL 6

SCALE: 1 1/2" = 1'-0"



WALL BASE

DETAIL 7

SCALE: 1 1/2" = 1'-0"

NOTES: 1. SEE PLANS FOR REINFORCING NOT SHOWN IN DETAILS ON THIS SHEET.
2. SHOP BEND REINFORCING BARS TO MAINTAIN CONCRETE COVER AS SPECIFIED ON SHEET 801.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - DETAILS

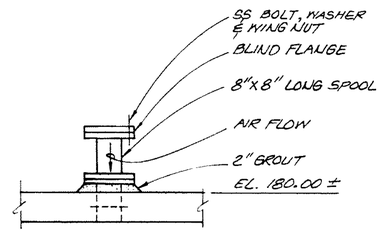
Designed DH, ND, JPT
Drawn LLB
Checked RN, NDC
Approved John E. Hoch
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	CRF# 20 AS RECORDED DRAWING	12/7/92
2	AFA		12/9/92

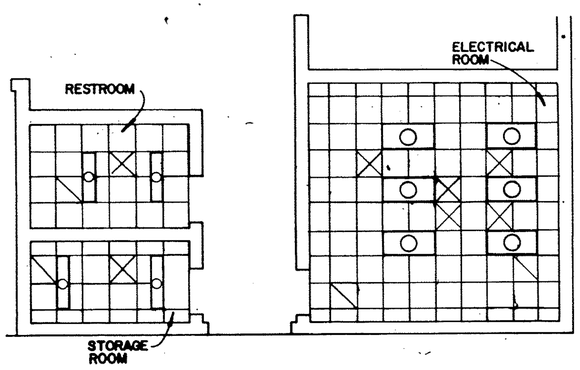
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 12, 1989 BRUCE R. WILLEY

Sheet Number 326

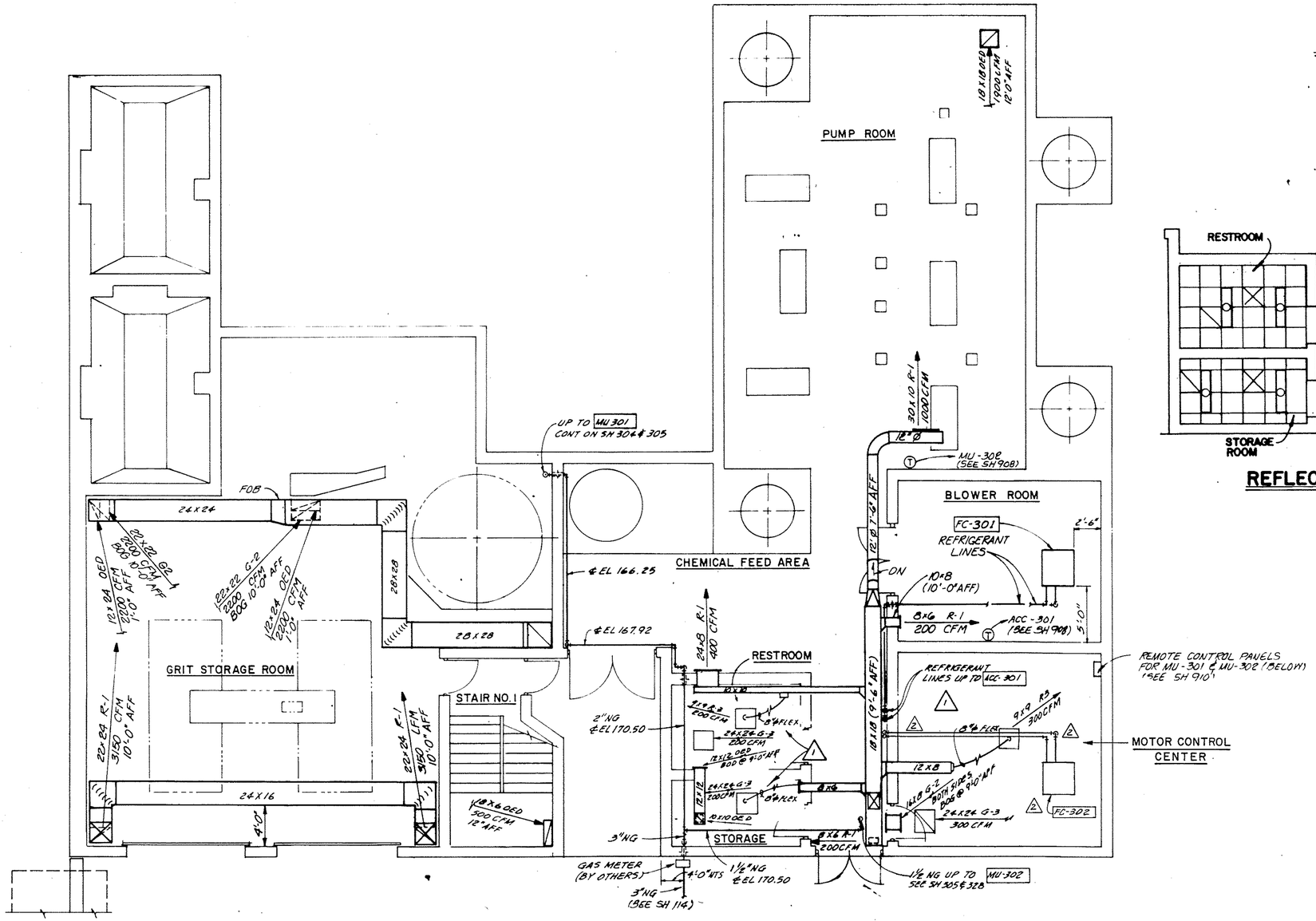


AIR INLET - DETAIL I

NTS



REFLECTED CEILING PLAN



HEADWORKS BUILDING - LOWER LEVEL HVAC PLAN

SCALE: 3/16" = 1'-0"

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS-LOWER LEVEL HVAC PLAN

Designed PFO, JPT
Drawn MMK
Checked PFO, RN
Approved John E. Ford
Date MAY, 1989

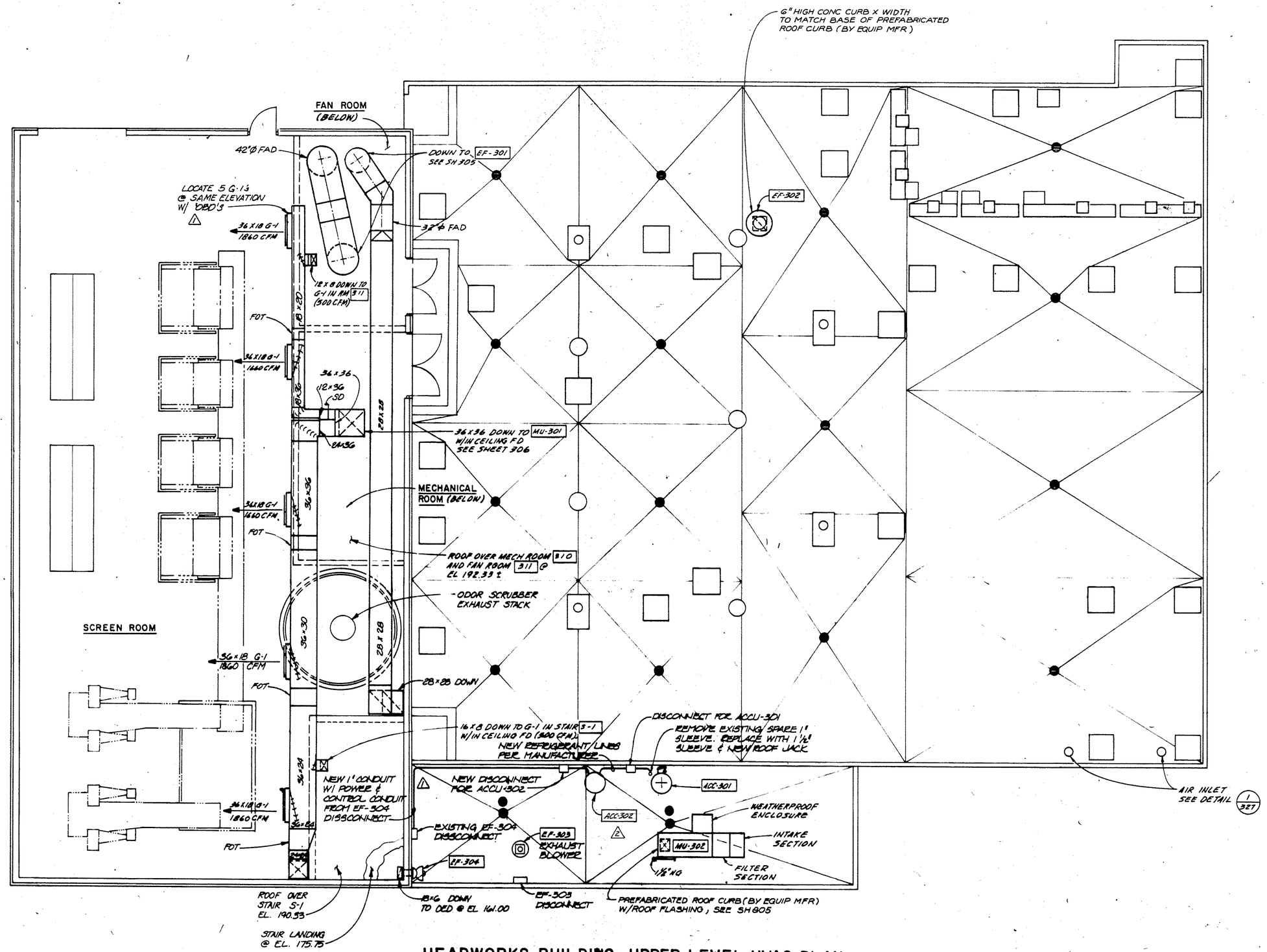
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	JEK	CHEM PHASE CTR-35	6-27-89
2	MMK	AS RECORDED DRAWING	3-31-92
3			6-17-94

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON BRUCE E. WILLEY

2 AS RECORDED DRAWINGS

Sheet Number 327



HEADWORKS BUILDING - UPPER LEVEL HVAC PLAN

SCALE: 3/16" = 1'-0"

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS-UPPER LEVEL HVAC PLAN

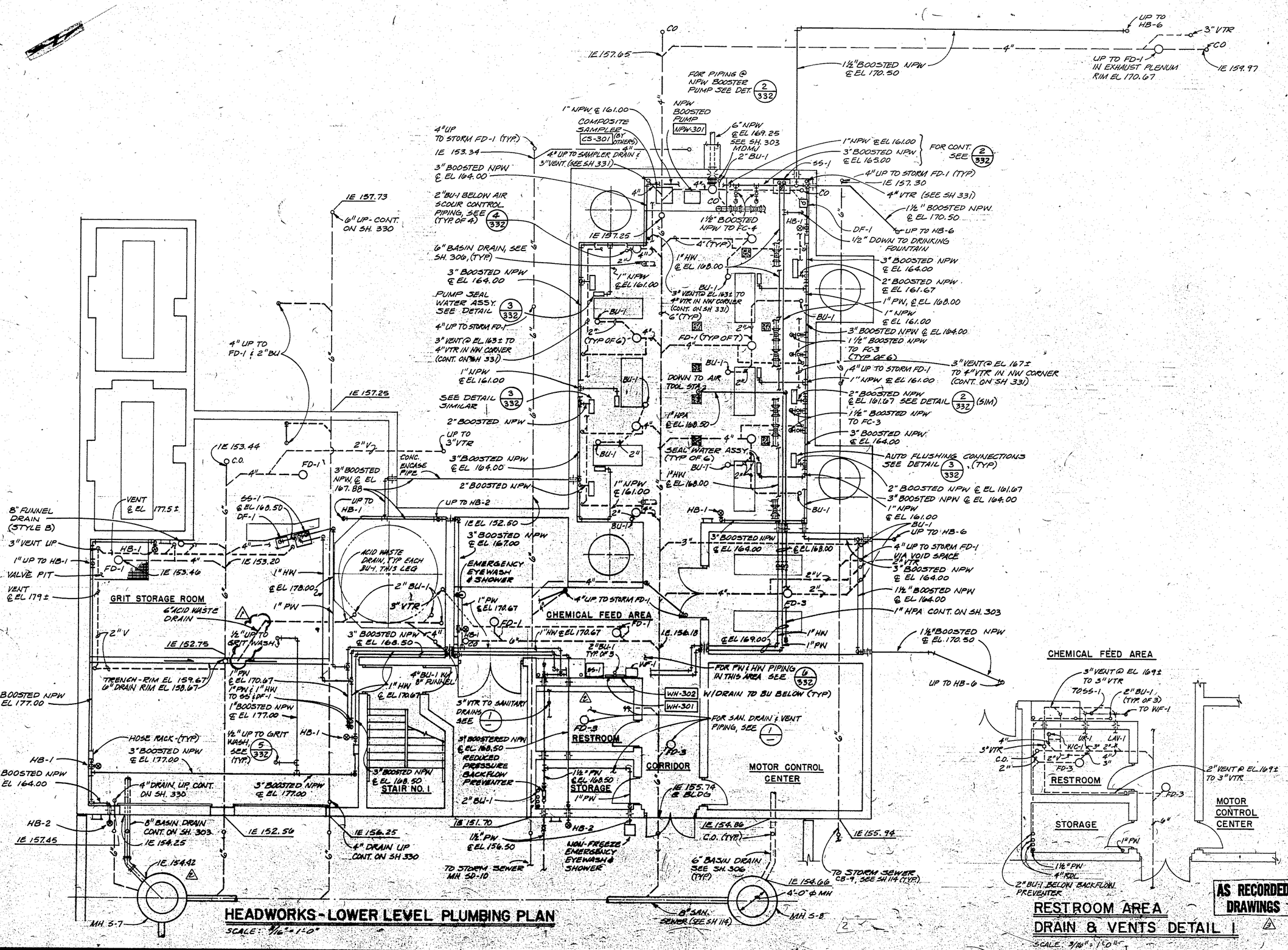
Designed	PFO, JPX
Drawn	MMK
Checked	PFO, RN
Approved	John E. Eckhardt
Date	MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	APX	CPE # 105.35	12/9/91
1	JCK	CHEM PHASE CPE-35	3-31-92
	MMK	AS RECORDED DRAWING	6-17-94

REGISTERED PROFESSIONAL ENGINEER 13591 OREGON June 17, 1994 BRUCE R. WELLER

Sheet Number 328



CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - LOWER LEVEL PLUMBING PLAN

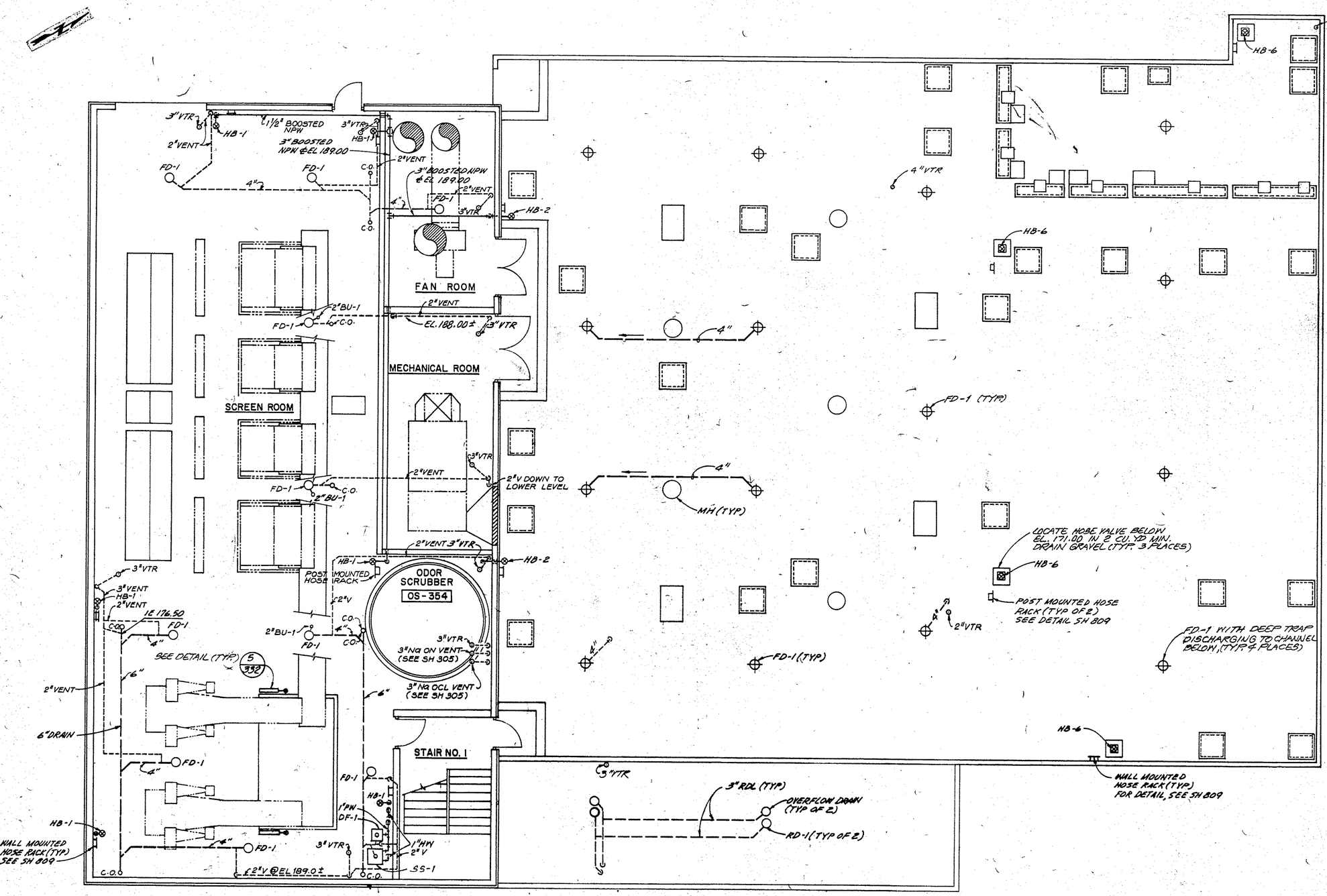
Designed: RAV, JPT
Drawn: LLB
Checked: PFO
Approved: John E. Hoel
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	PDW	REVISED & ACID WASTE LINE TO DRAIN INTO TRENCH	10-2-89
2	AFA	CR#19.20	12/7/92
3	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1990 BRUCE R. WILLEY

Sheet Number: 329



HEADWORKS - UPPER LEVEL PLUMBING PLAN

SCALE: 3/16" = 1'-0"

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS-UPPER LEVEL PLUMBING PLAN

Designed	JPT, RAV
Drawn	MMK
Checked	PFO
Approved	John E Hoch
Date	MAY, 1989

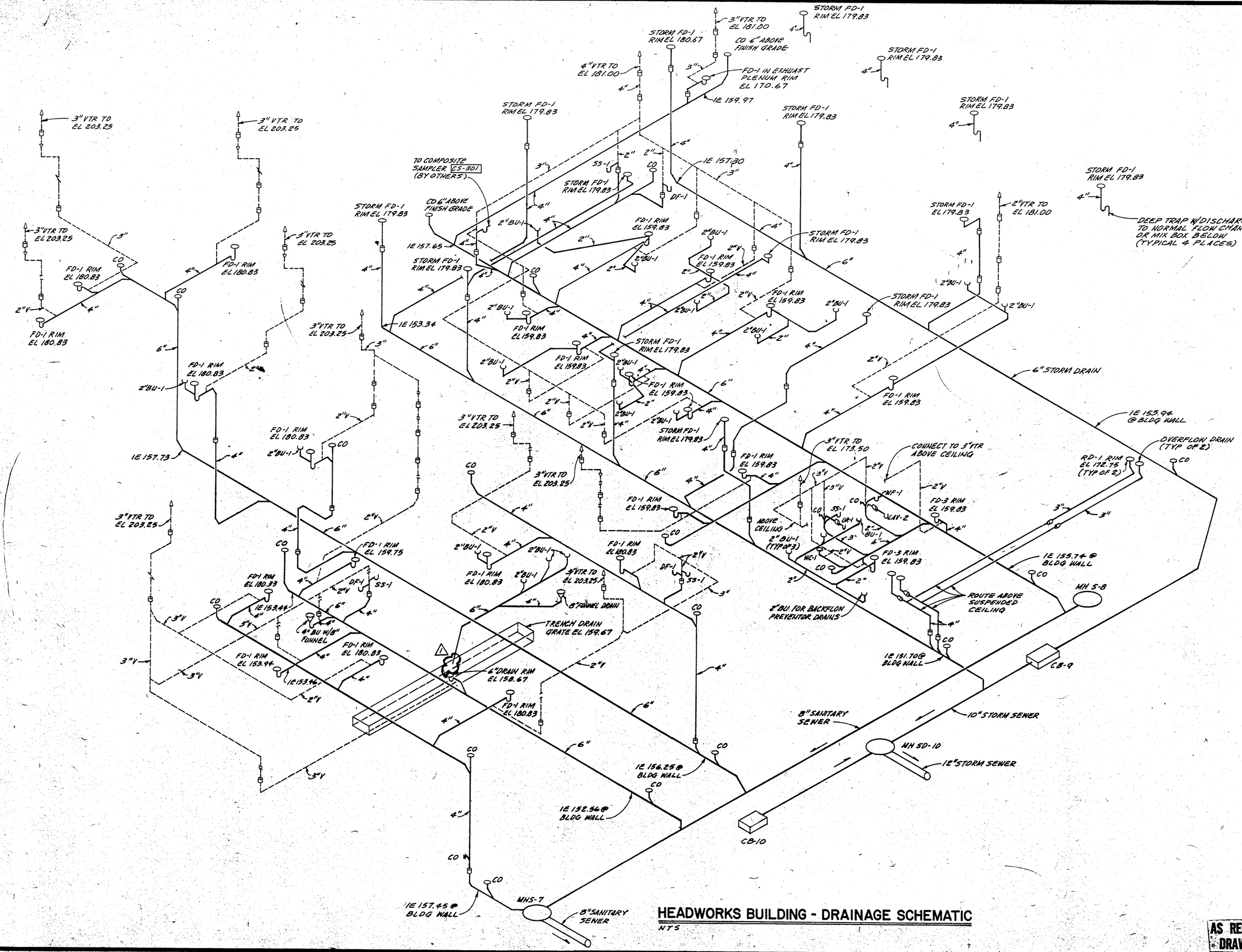
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/7/92

REGISTERED PROFESSIONAL ENGINEER 13297 OREGON JULY 17, 1984 BRUCE R. WILLE

AS RECORDED DRAWINGS

Sheet Number 330



HEADWORKS BUILDING - DRAINAGE SCHEMATIC

NTS

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS-DRAINAGE SCHEMATICS

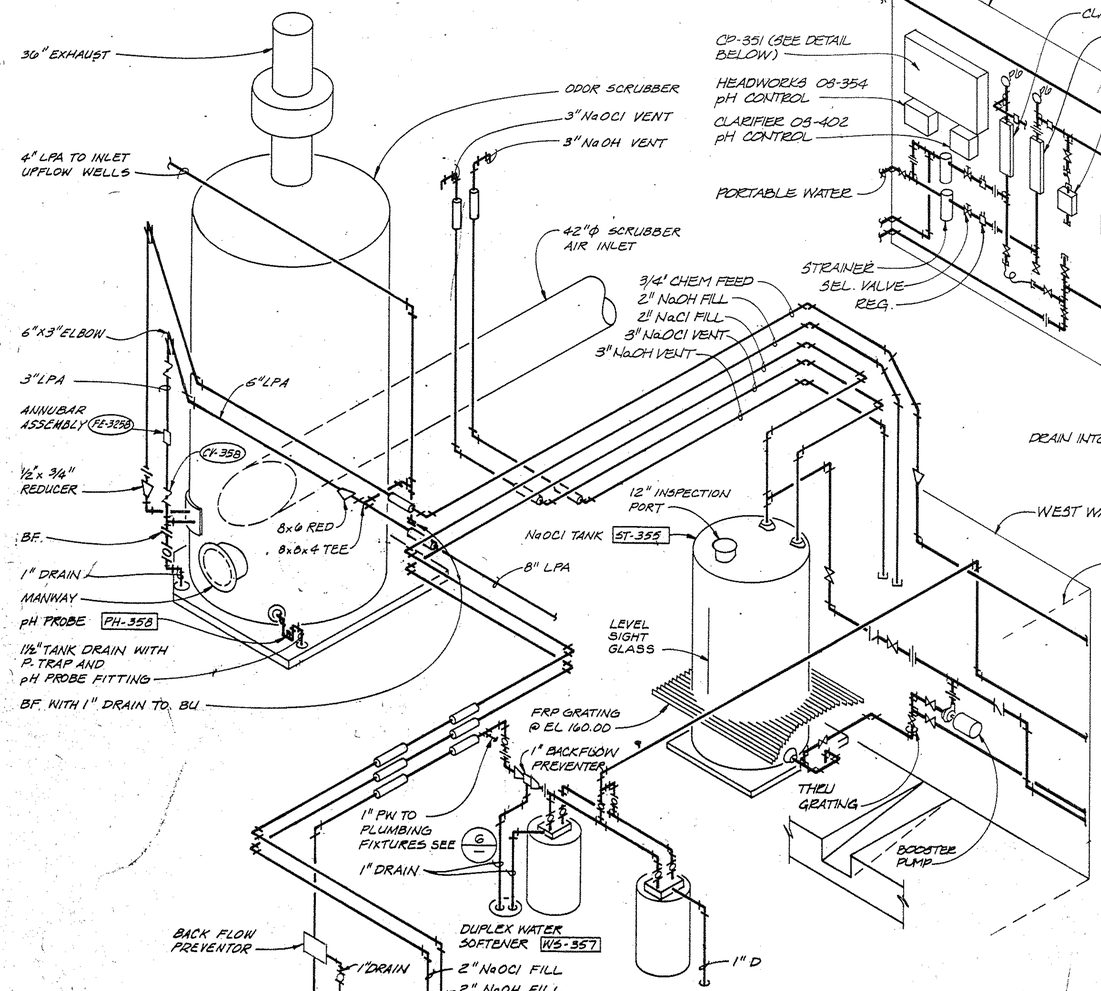
Designed	RAV, JPT
Drawn	KMK
Checked	PFO
Approved	John E Hoel
Date	MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	PDH	REVISED 6" ACID WASTE LINE TO DRAIN INTO TRENCH	10-2-89
2	AFA	AS RECORDED DRAWING	12/7/92

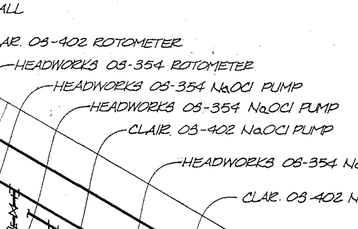
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 27, 1989 BRUCE R. WILLEY

Sheet Number 331

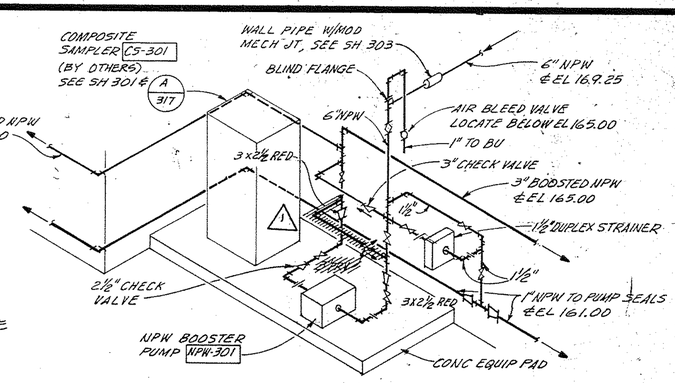


ODOR CONTROL SCHEMATIC - DETAIL 1

NTS

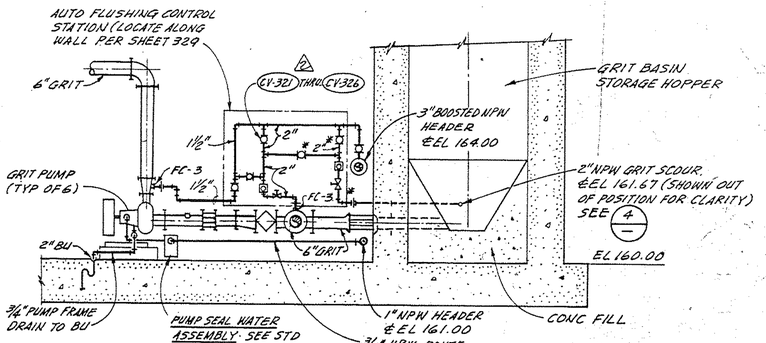


CONTROL PANEL CP-351



NPW BOOSTER PUMP SCHEMATIC - DETAIL 2

NTS

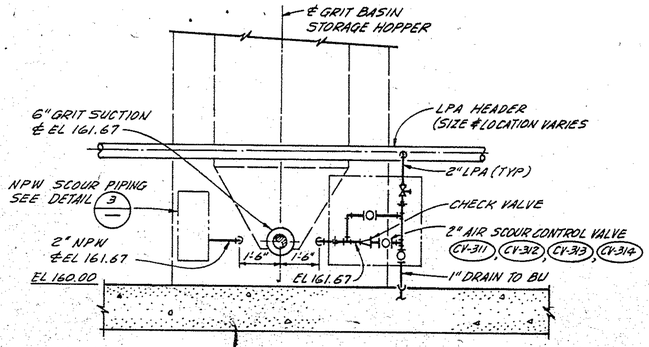


NOTES:

1. PIPING SHOWN IS TYPICAL FOR GRIT PUMP NOS. 1 TO 4 AND SIMILAR FOR PUMP NOS. 5 AND 6.
2. * INDICATES VALVES AND PIPING NOT REQUIRED AT PUMP NOS. 5 & 6.

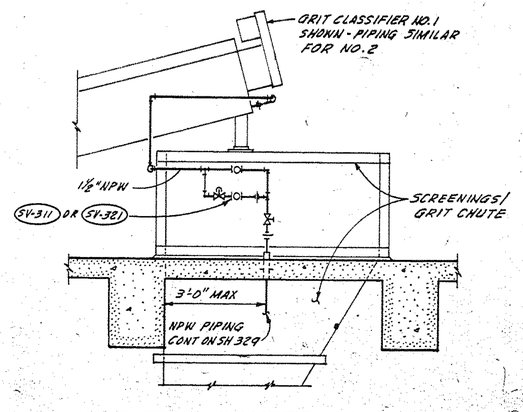
GRIT PUMP SEAL, FLUSHING & GRIT SCOUR PIPING SCHEMATICS - DETAIL 3

NTS



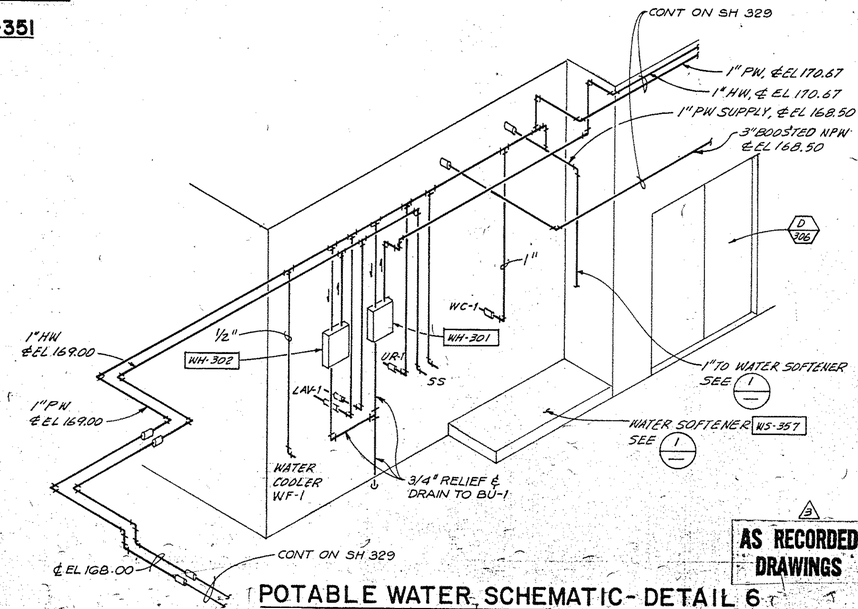
AIR SCOUR PIPING SCHEMATIC - DETAIL 4

NTS



GRIT CLASSIFIER WASH WATER SUPPLY - DETAIL 5

NTS



POTABLE WATER SCHEMATIC - DETAIL 6

NTS

3 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HEADWORKS - ODOR CONTROL SYSTEM

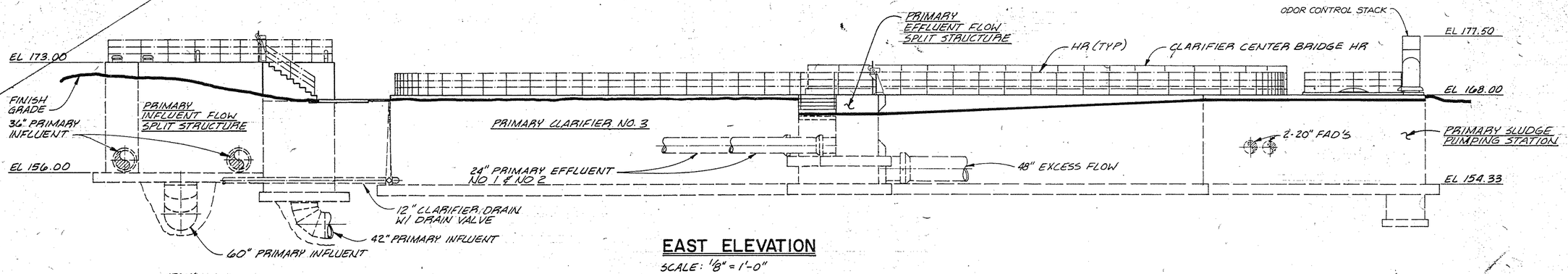
Designed: JPT, JEK
Drawn: LLB, MMK
Checked: RM, PFO
Approved: John E. Kvel
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	JEK	ADDENDUM NO.1	6-27-89
2	AFA	CPE#52	12/7/92
3	AFA	AS RECORDED DRAWING	12/9/92

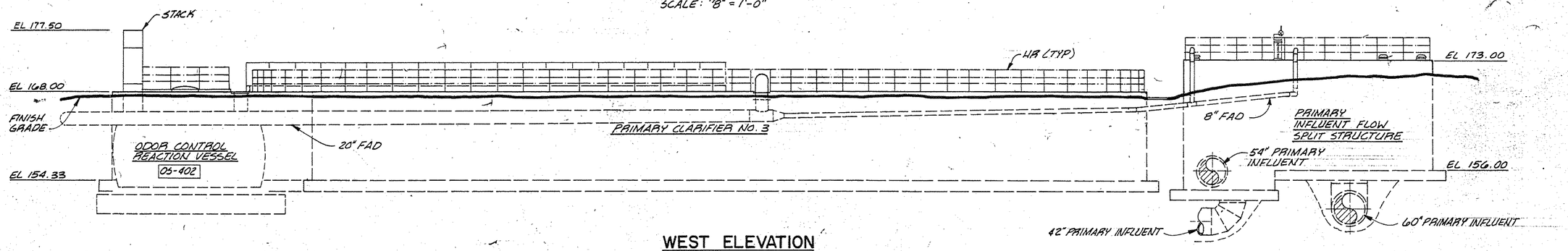
REGISTERED PROFESSIONAL ENGINEER 13351 OREGON JULY 17 1985 BRUCE R. WILLEY

Sheet Number 332



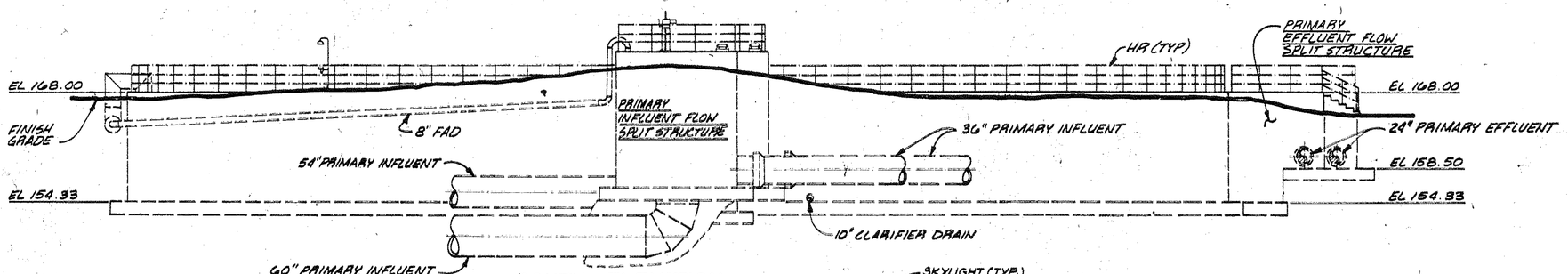
EAST ELEVATION

SCALE: 1/8" = 1'-0"



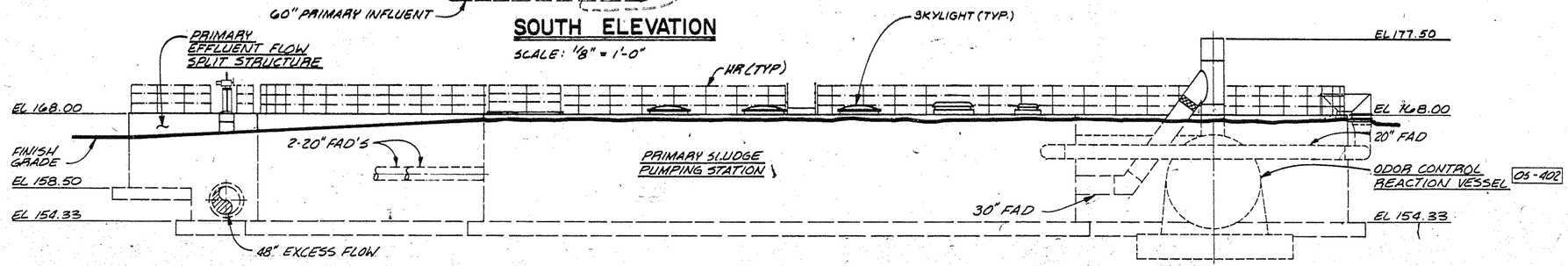
WEST ELEVATION

SCALE: 1/8" = 1'-0"



SOUTH ELEVATION

SCALE: 1/8" = 1'-0"



NORTH ELEVATION

SCALE: 1/8" = 1'-0"

SHEET NOTE:
1. SMALLER PROCESS PIPING NOT SHOWN. SEE PLANS & SECTIONS.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

NEW PRIMARY CLARIFIER ELEVATIONS

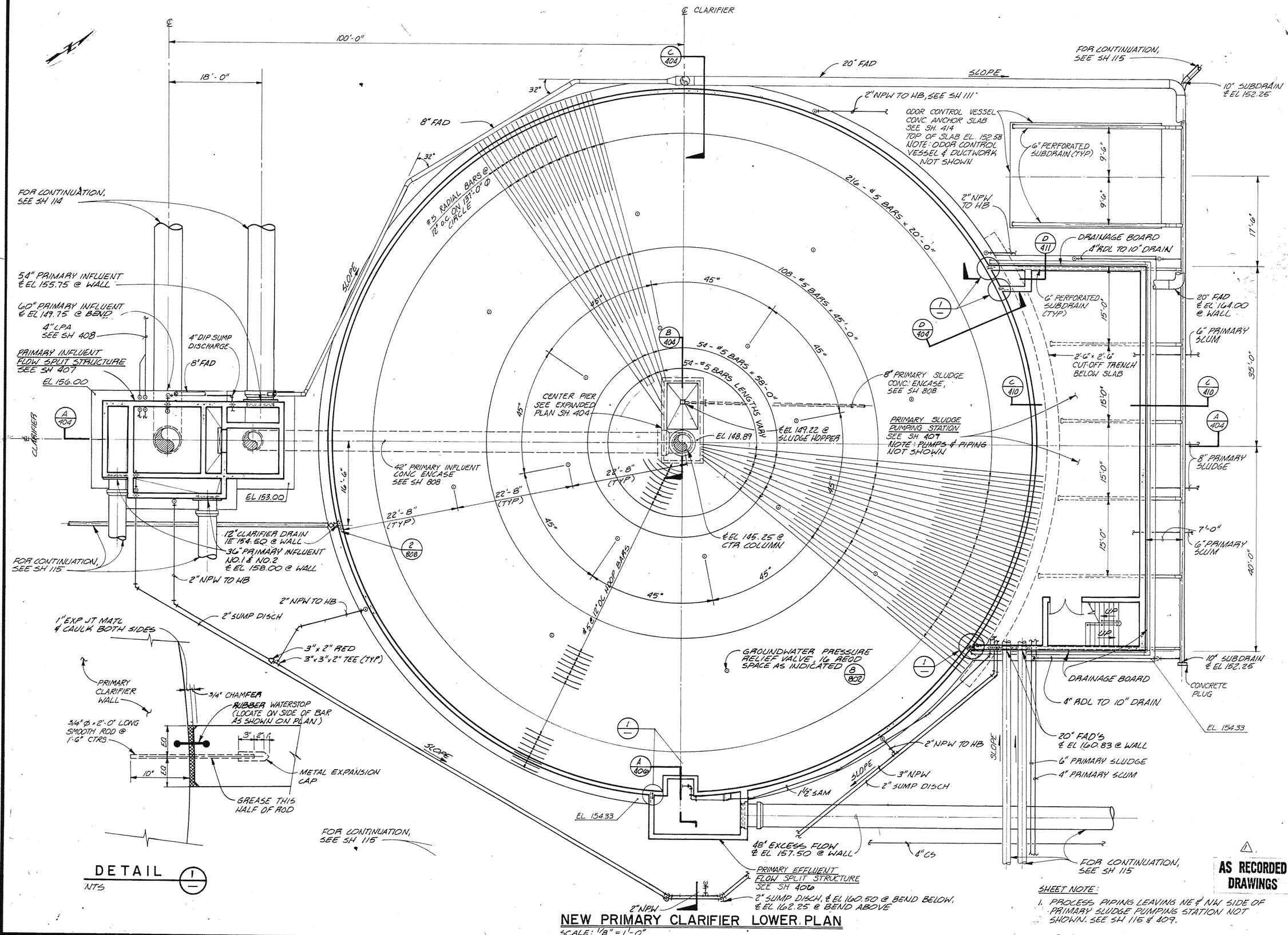
Designed: DJH, JDC
Drawn: SDS
Checked: JEK, AHK, BAW
Approved: John E Hock
Date: MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/7/92

REGISTERED PROFESSIONAL ENGINEER 13331 OREGON July 17 1986 BRUCE R. WILLEY

Sheet Number: 401



DETAIL 1 — NTS

NEW PRIMARY CLARIFIER LOWER PLAN

SCALE: 1/8" = 1'-0"

SHEET NOTE:

1. PROCESS PIPING LEAVING NE & NW SIDE OF PRIMARY SLUDGE PUMPING STATION NOT SHOWN. SEE SH 115 & 409.

⚠ AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

NEW PRIMARY CLARIFIER - LOWER PLAN

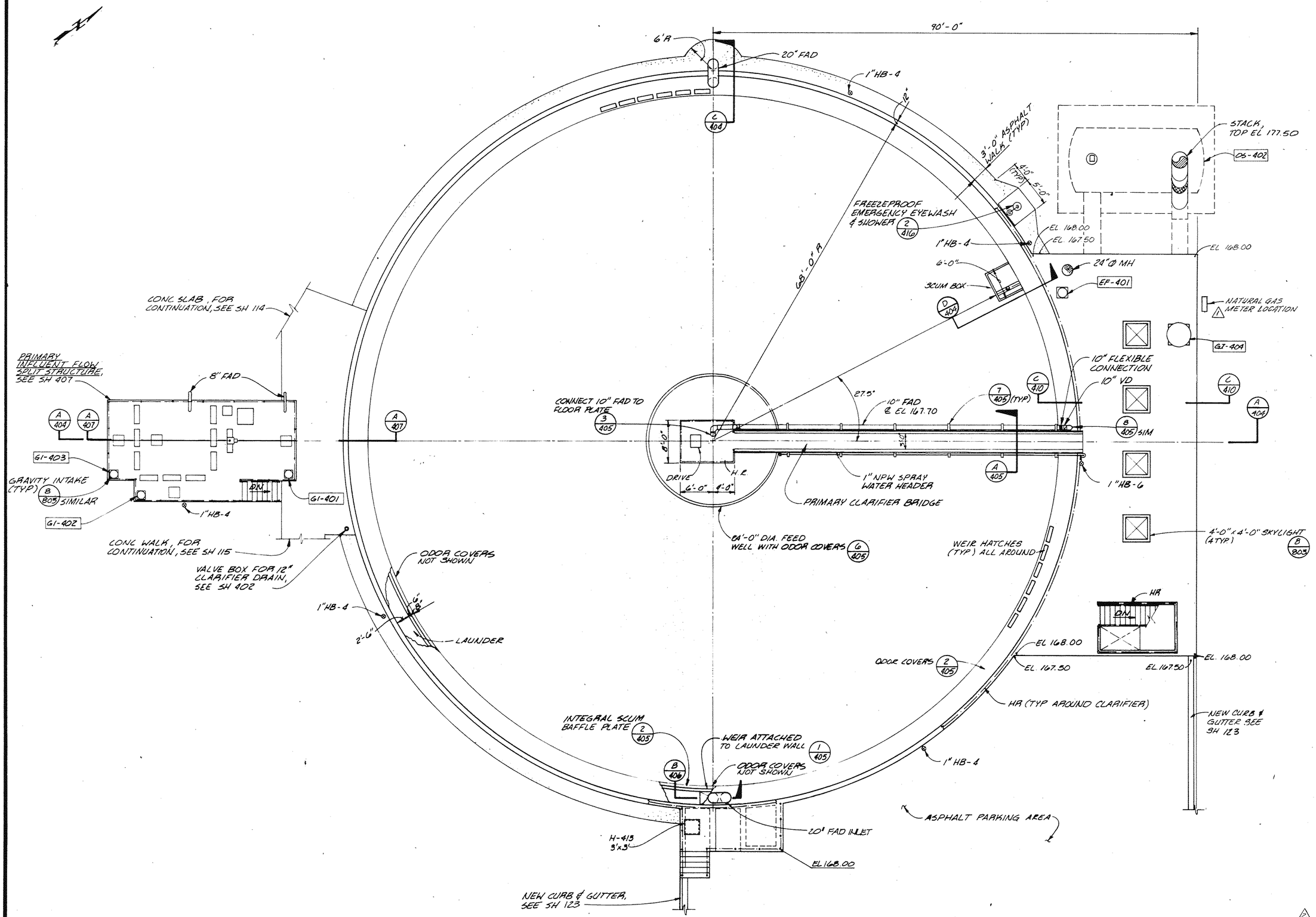
Designed: DJH, JDC
Drawn: SDS
Checked: AHK, BAW
Approved: John E Hodek
Date: MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY

No	By	Revision	Date
⚠	AFH	AS RECORDED DRAWING	12/7/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 1, 1986 BRUCE R. WILLEY

Sheet Number: 402



NEW PRIMARY CLARIFIER - UPPER PLAN

SCALE: 1/8" = 1'-0"

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

NEW PRIMARY CLARIFIER - UPPER PLAN

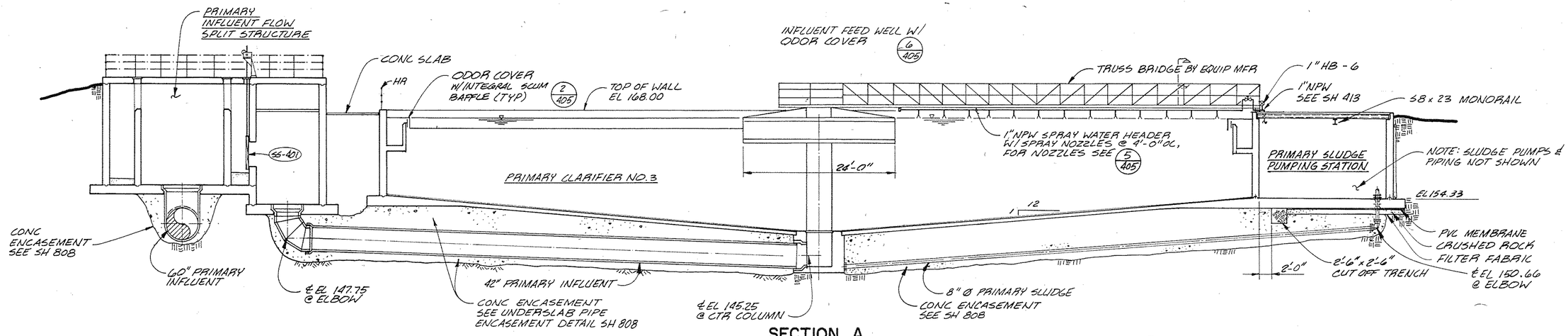
Designed: DJH, JDC
Drawn: SDS
Checked: AHK, BAW
Approved: John Estlock
Date: MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	JEK	CHEM EXPANSION PHASE CAP-261 AS RECORDED DRAWING	2-15-94
1	MMK		6-17-94

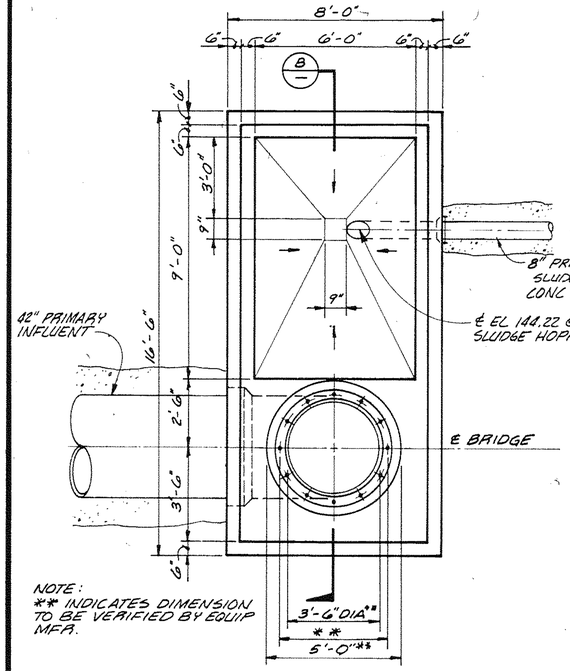
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17 1985 BRUCE R. WILLEY

Sheet Number 403



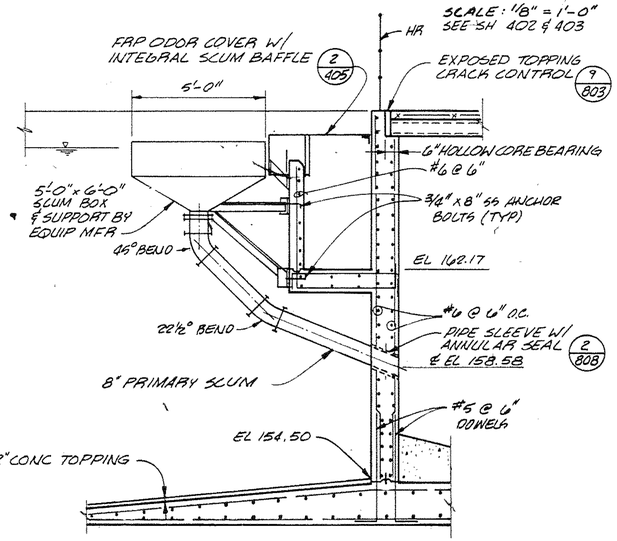
SECTION A

SCALE: 1/8" = 1'-0"
SEE SH 402 & 403



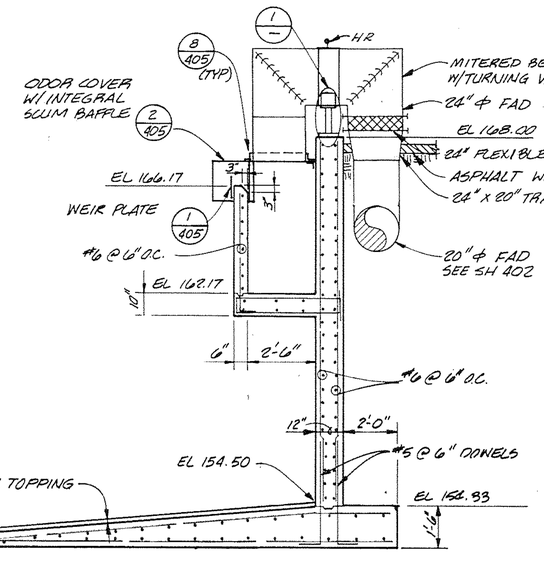
CENTER PIER PLAN

SCALE: 3/8" = 1'-0"
SEE SH 402



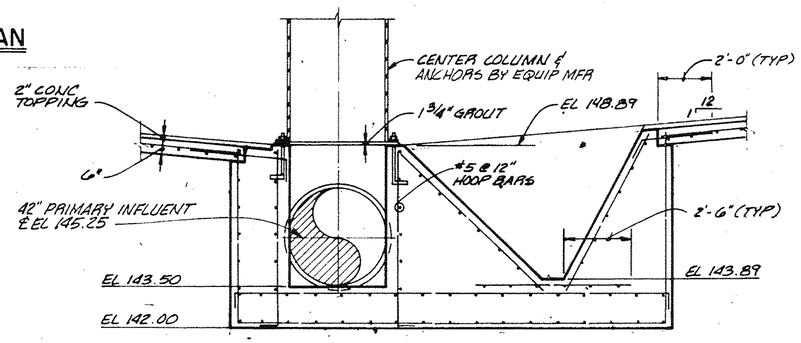
SECTION D

SCALE: 3/8" = 1'-0"
SEE SH 402 & 403



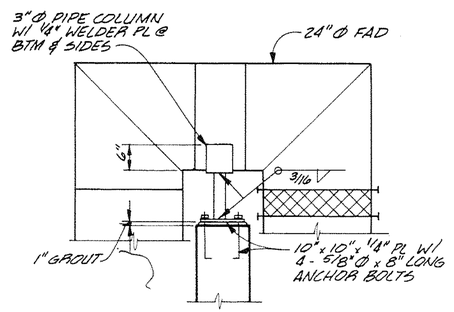
SECTION C

SCALE: 3/8" = 1'-0"
SEE SH 402 & 403



SECTION B

SCALE: 3/8" = 1'-0"
SEE SH 402



NOTE: HOT DIP GALVANIZE AFTER FABRICATION.

DETAIL 1

SCALE: 3/4" = 1'-0"

SHEET NOTES:
1) ALL REINFORCING SHALL BE #5 @ 12" UNLESS OTHERWISE NOTED.
2) ALL DOWELS SHALL EXTEND 2'-6" ABOVE SURFACE OF SLAB UNLESS OTHERWISE NOTED.

△ AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

NEW PRIMARY CLARIFIER - SECTION AND DETAILS

Designed: DJH, JDC
Drawn: SDS
Checked: AHH, BRW
Approved: John Estlock
Date: MAY 1989

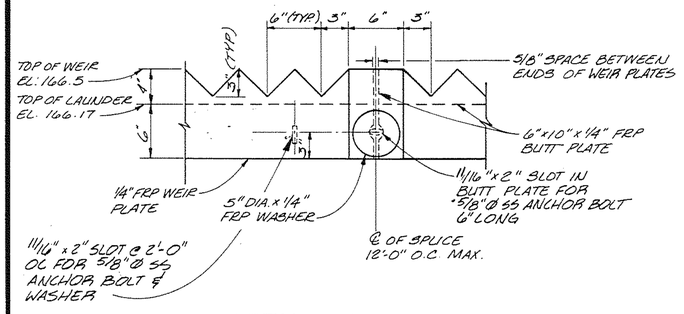
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
△	AFA	AS RECORDED DRAWING	12/7/92

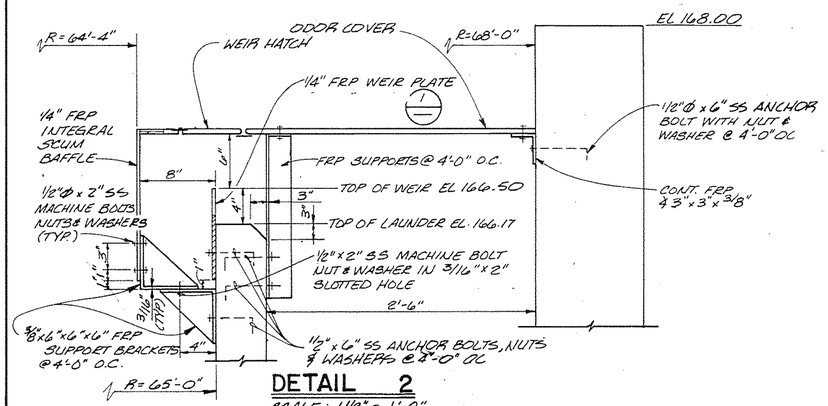
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1985 BRUCE R. WILLEY

Sheet Number: 404

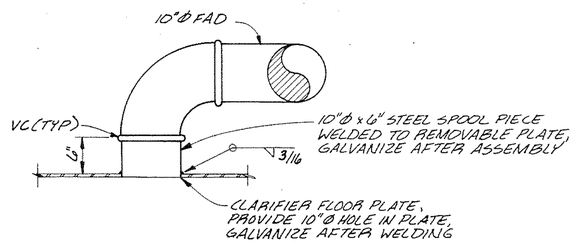
SR 904



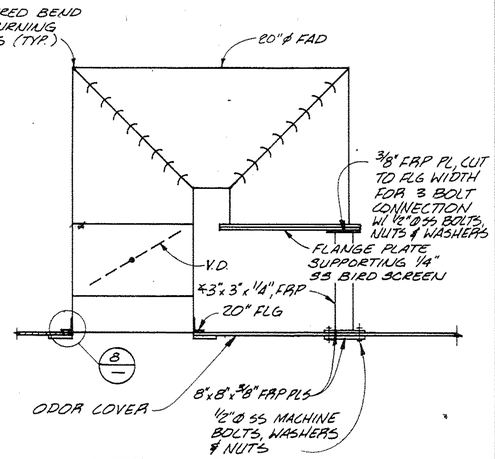
DETAIL 1
SCALE: 1 1/2" = 1'-0"



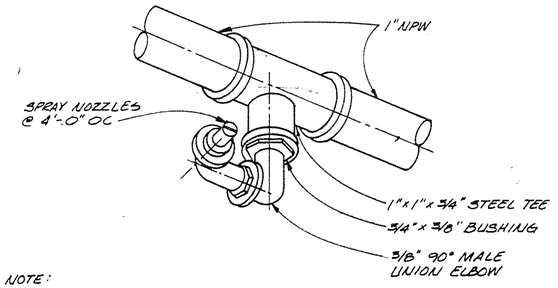
DETAIL 2
SCALE: 1 1/2" = 1'-0"



DETAIL 3
NTS

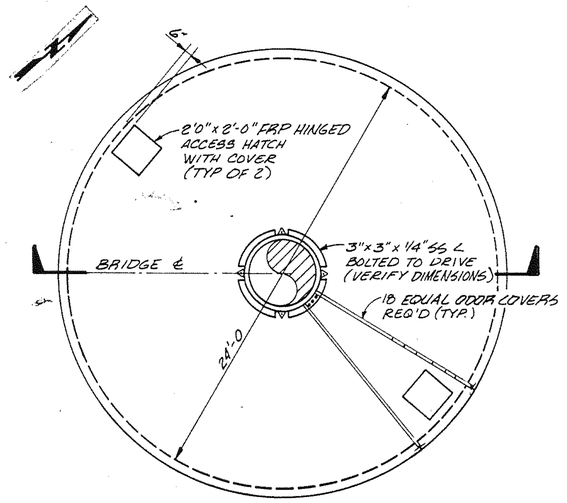


DETAIL 4
SCALE: 1"=1'-0"

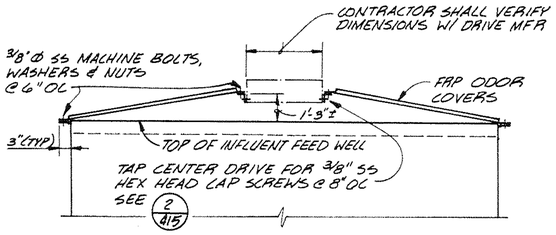


NOTE:
SPRAY DIRECTION SHALL BE OPPOSITE THE DIRECTION OF CLARIFIER MECHANISM ROTATION.

DETAIL 5
NTS



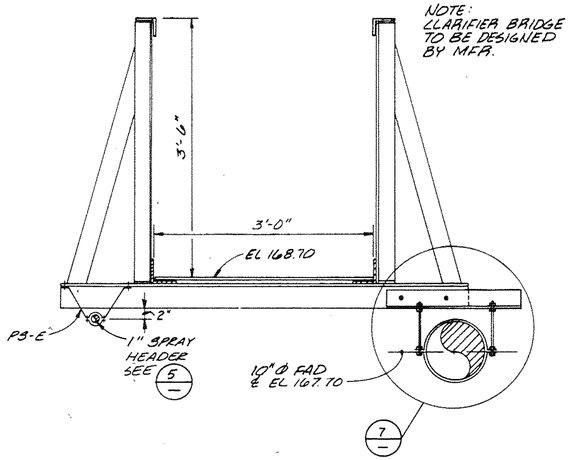
PLAN



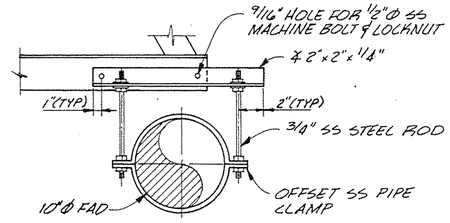
SECTION

DETAIL 6
SCALE: 1/4" = 1'-0"

DETAIL 9
NTS

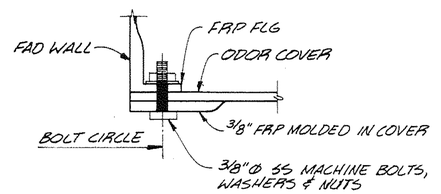


SECTION A
NTS



NOTE:
SUPPORT 10"Ø FAD @ 10'-0" OC

DETAIL 7
SCALE: 1 1/2" = 1'-0"



DETAIL 8
NTS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PRIMARY CLARIFIER - DETAILS

Designed: JEK, JDC
Drawn: SDS
Checked: AHK, BRW
Approved: John E. Hacl
Date: MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

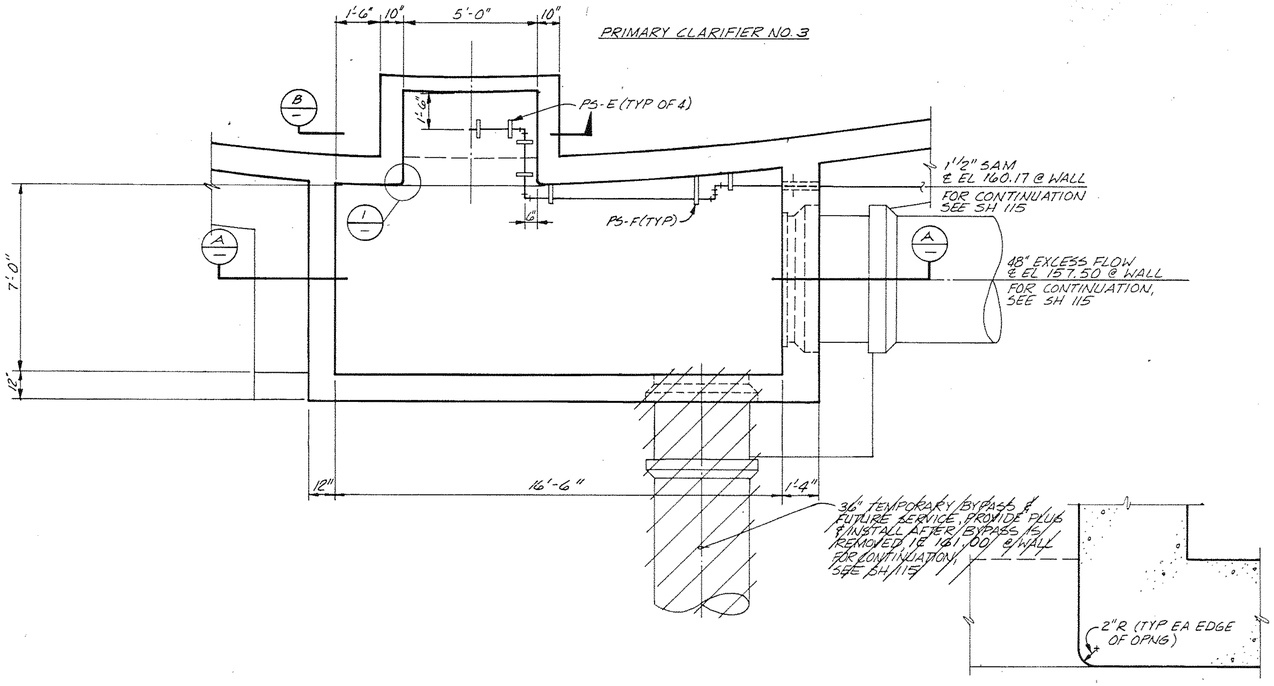
No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/7/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1986 BRUCE R. WILLEY

1 AS RECORDED DRAWINGS

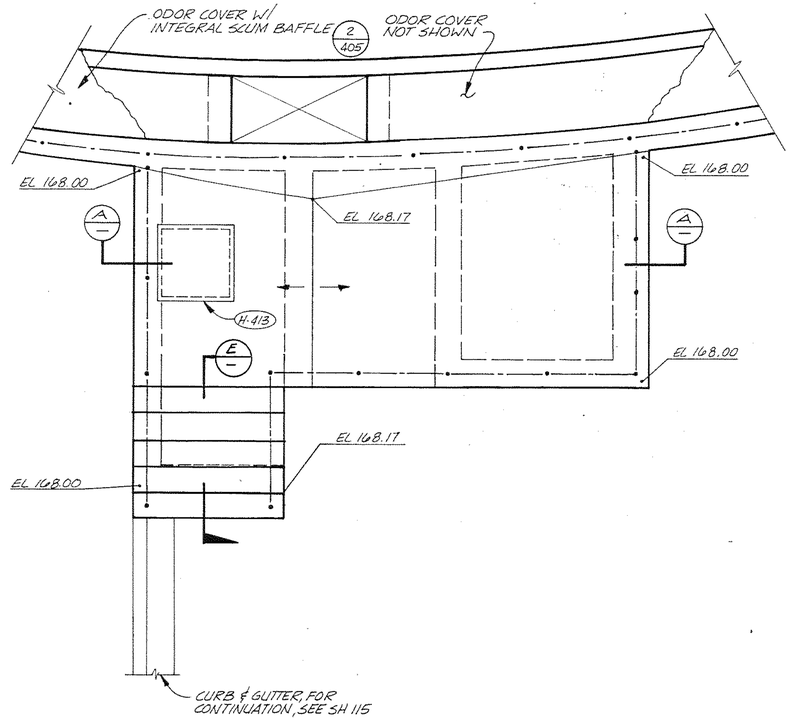
Sheet Number: 405

SH 904



DETAIL 1

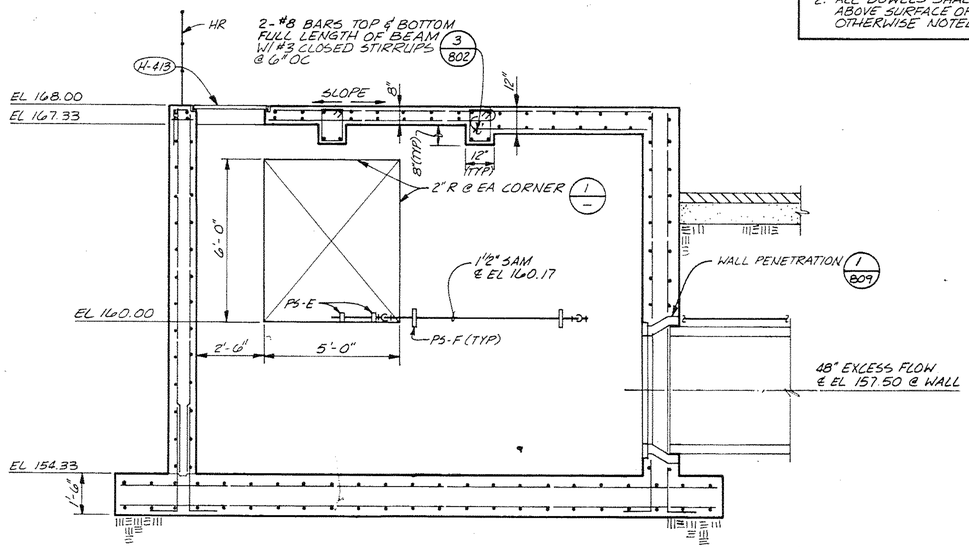
SCALE: 1 1/2" = 1'-0"



PRIMARY CLARIFIER NO. 3 OUTLET STRUCTURE - LOWER PLAN

SCALE: 3/8" = 1'-0"

SHEET NOTES:
1. ALL REINFORCING SHALL BE #5@12" UNLESS OTHERWISE NOTED.
2. ALL DOWELS SHALL EXTEND 2'-6" ABOVE SURFACE OF SLAB UNLESS OTHERWISE NOTED.

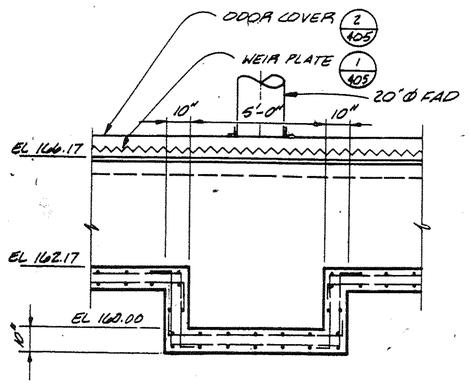


SECTION A

SCALE: 3/8" = 1'-0"

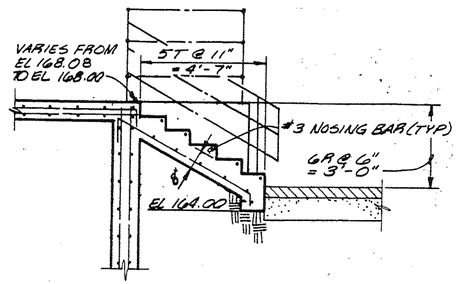
PRIMARY CLARIFIER NO. 3 OUTLET STRUCTURE - ROOF PLAN

SCALE: 3/8" = 1'-0"



SECTION B

SCALE: 3/8" = 1'-0"



SECTION E

SCALE: 3/8" = 1'-0"

AS RECORDED DRAWINGS

HDR Engineering, Inc.

DURHAM AWWTP PHASE I EXPANSION

NEW PRIMARY CLARIFIER EFFLUENT FLOW SPLIT STRUCTURE REVISIONS

Project Manager

Designed: HHB

Drawn: DRV

Checked: JEK

Project Number: 39-33-02

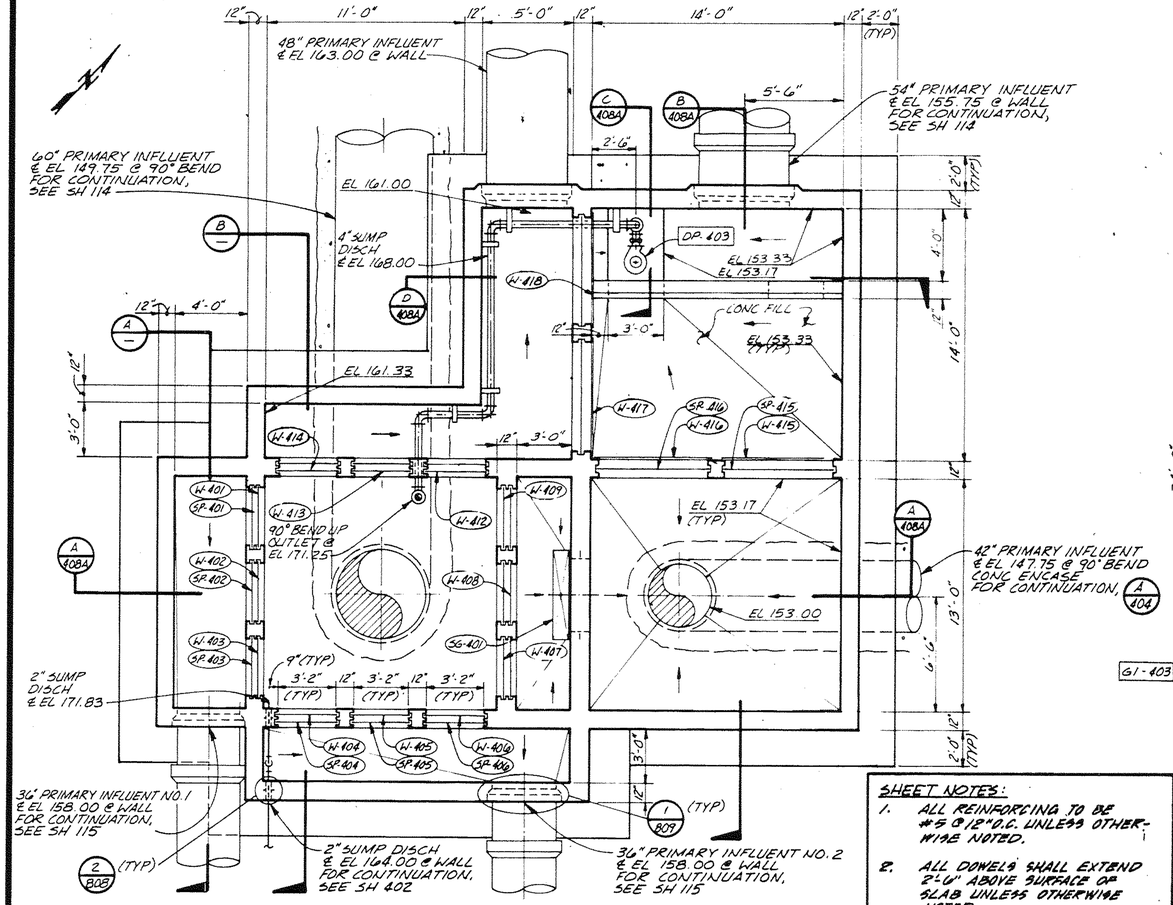
Date: DECEMBER 1989

THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE. IF NOT ONE INCH, SCALE ACCORDINGLY.

No	By	Description	
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1		CPR-25	12.17.92

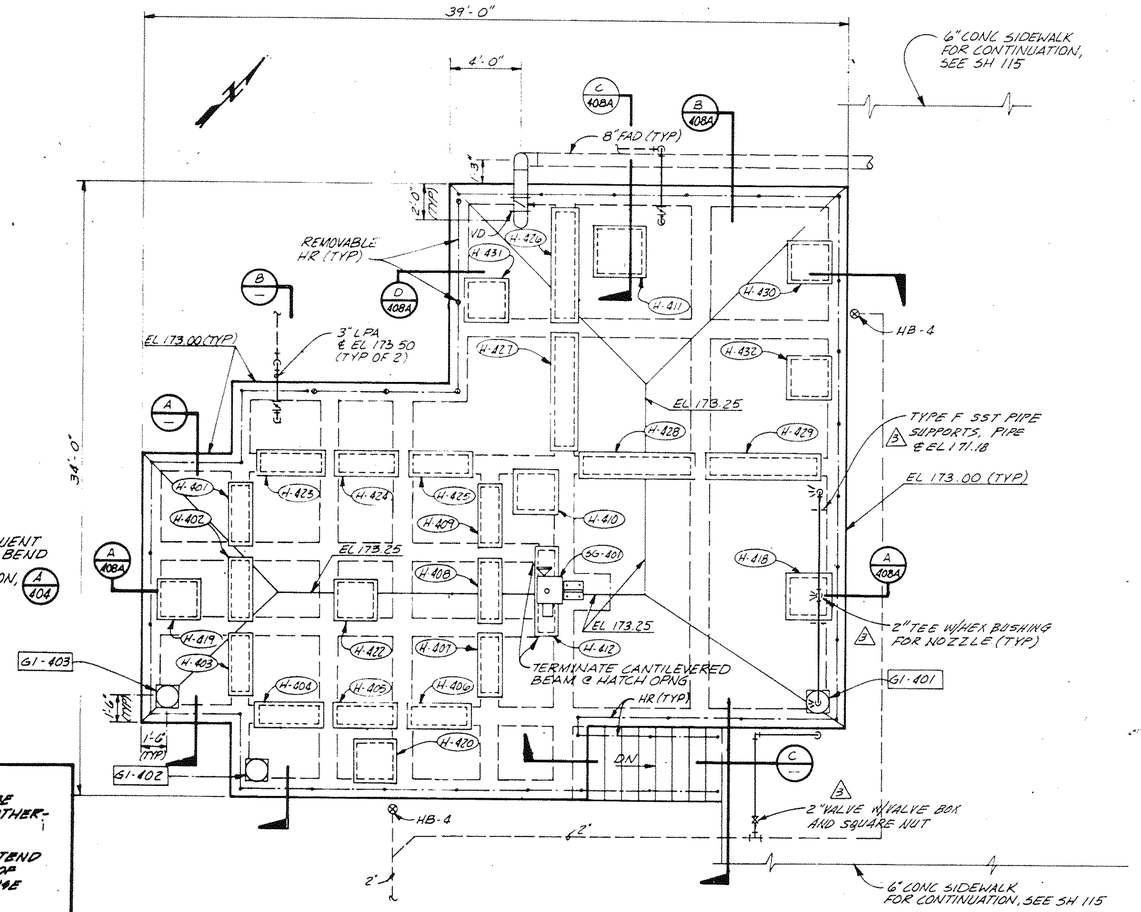
Sheet Number: 406

COMPOSITE OVERLAY



PRIMARY INFLUENT FLOW SPLIT STRUCTURE - LOWER PLAN

SCALE: 1/4" = 1'-0"

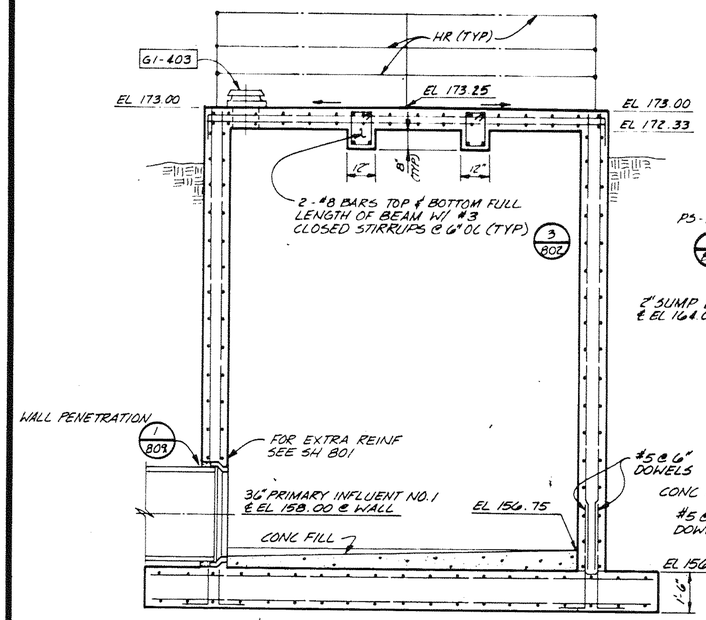


PRIMARY INFLUENT FLOW SPLIT STRUCTURE - ROOF PLAN

SCALE: 1/4" = 1'-0"

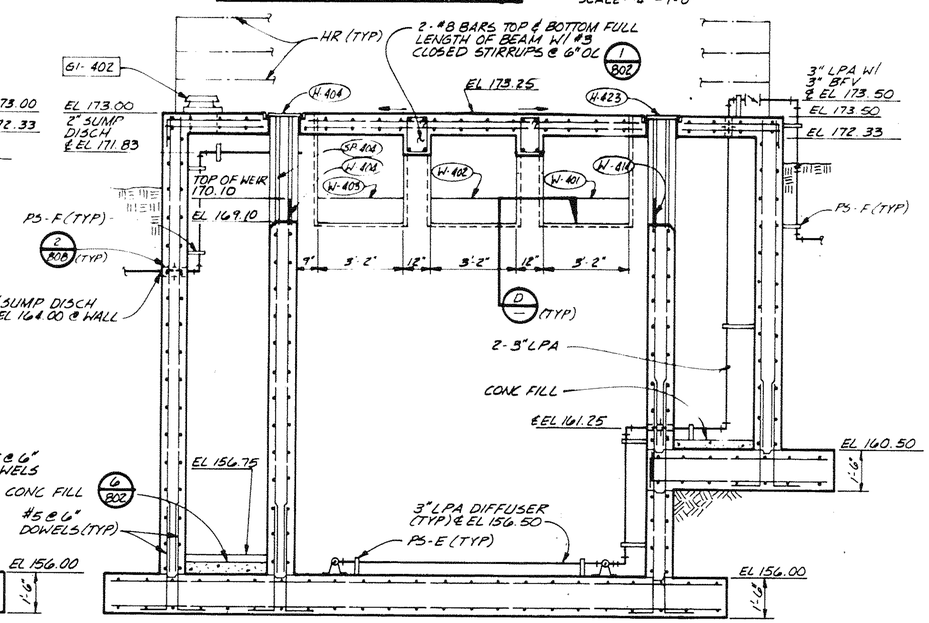
SHEET NOTES:

1. ALL REINFORCING TO BE #5 @ 12" O.C. UNLESS OTHERWISE NOTED.
2. ALL DOWELS SHALL EXTEND 2'-6" ABOVE SURFACE OF SLAB UNLESS OTHERWISE NOTED.
3. FOR LPA PIPING, SEE LPA PIPING PLAN, SH 408B.



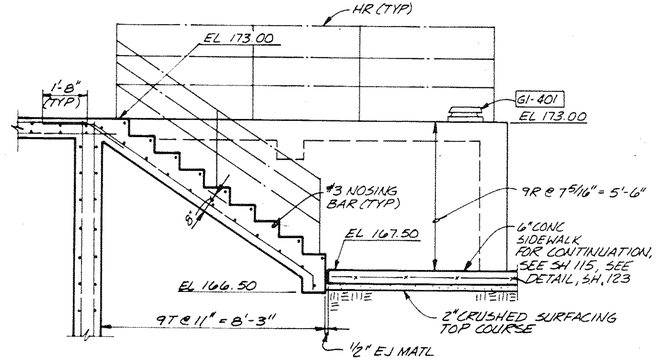
SECTION A

SCALE: 3/8" = 1'-0"



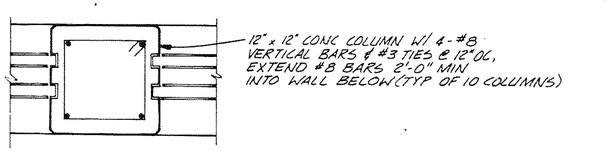
SECTION B

SCALE: 3/8" = 1'-0"



SECTION C

SCALE: 3/8" = 1'-0"



SECTION D

SCALE: 1 1/2" = 1'-0"

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PRIMARY INFLUENT FLOW SPLIT STRUCTURE - PLANS AND SECTIONS

Designed	DJH, RAV
Drawn	DRV
Checked	JEK
Approved	
Date	OCTOBER, 1989

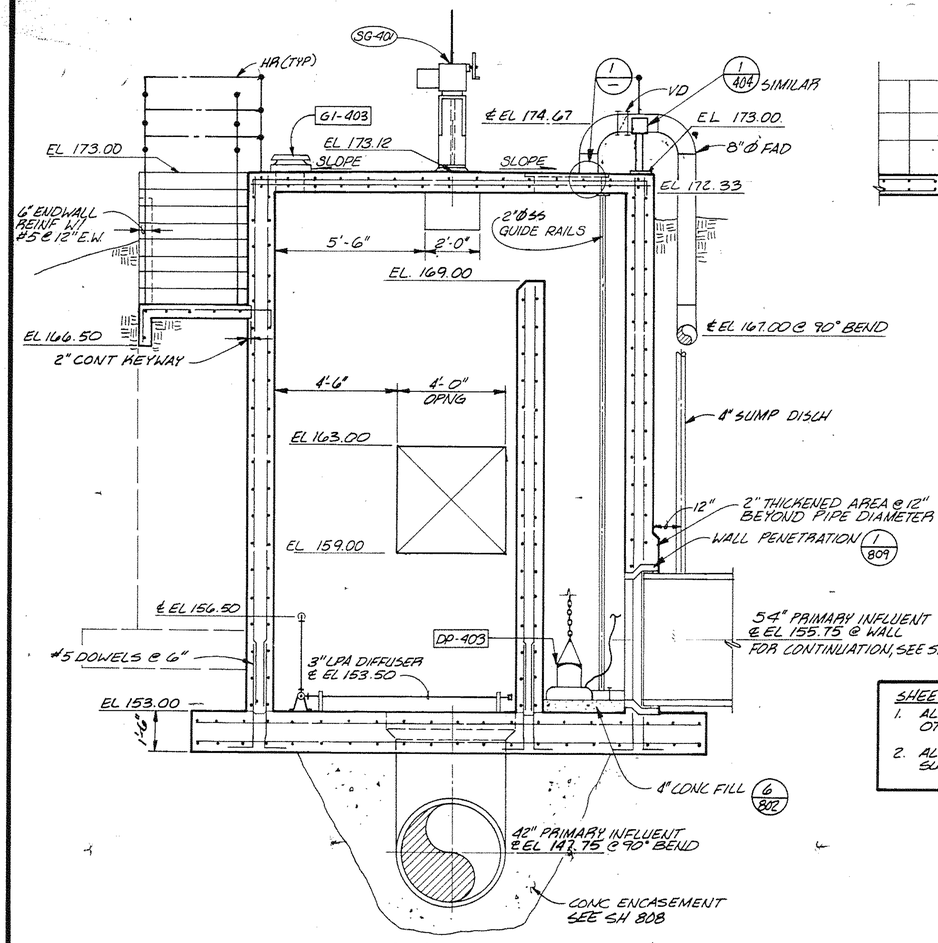
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
	JK	SHEET REVISION	11-89
	AFA	CPR# 13.44	12/7/92
3	JEK	CHEM PHASE CTR-122	7-14-94
4	MMK	AS RECORDED DRAWING	10-11-94

AS RECORDED DRAWINGS

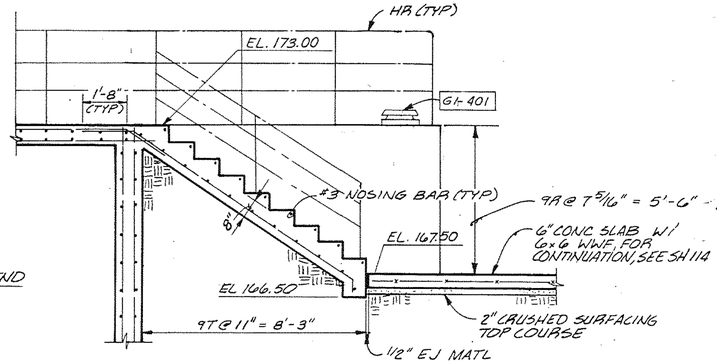
Sheet Number 407

SR 801



SECTION A

SCALE: 3/8" = 1'-0"
SEE SH 407

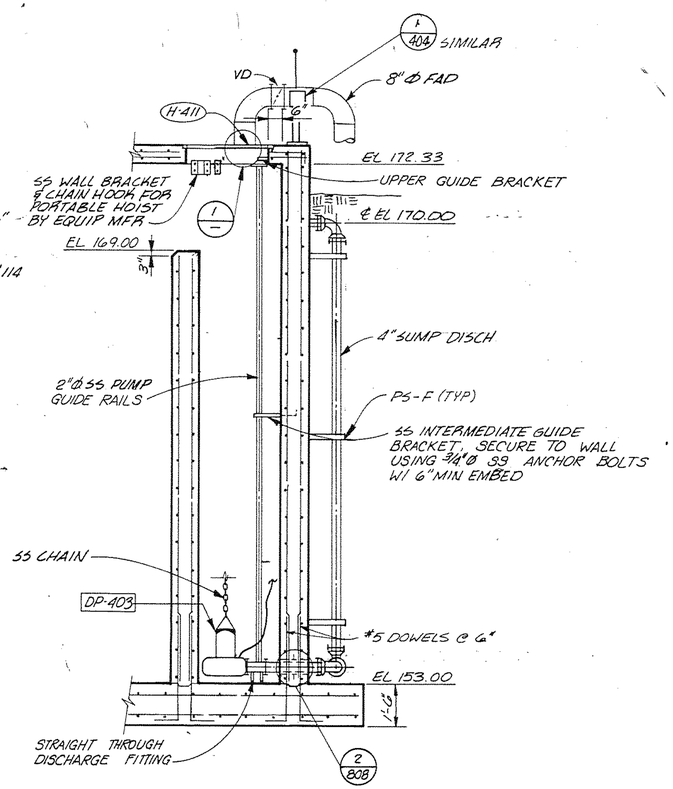


SECTION B

SCALE: 3/8" = 1'-0"
SEE SH 407

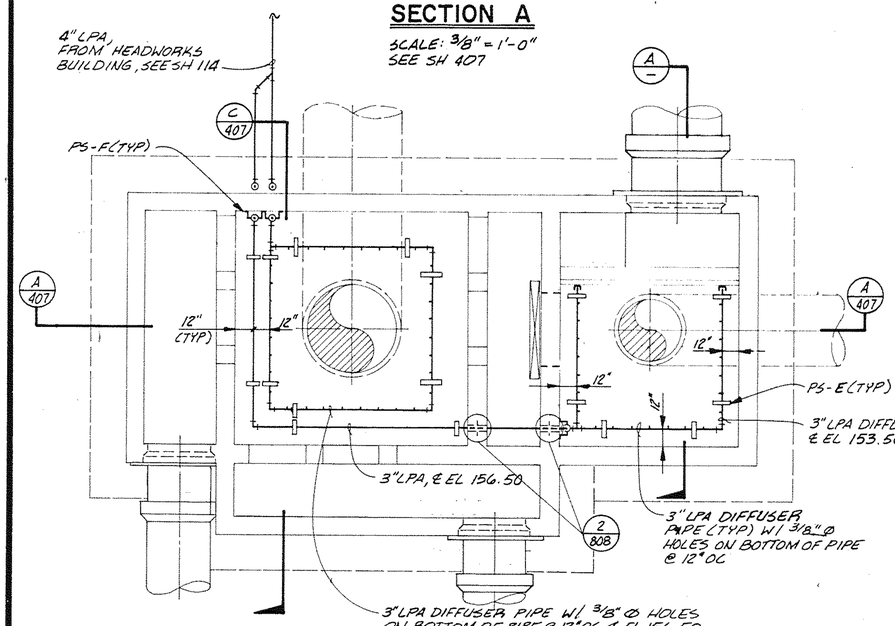
SHEET NOTES:

1. ALL REINFORCING TO BE #5 @ 12" OC UNLESS OTHERWISE NOTED.
2. ALL DOWELS SHALL EXTEND 2'-6" ABOVE SURFACE OF SLAB UNLESS OTHERWISE NOTED.



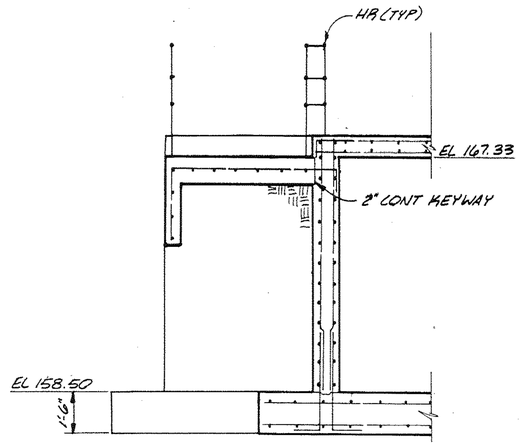
SECTION C

SCALE: 3/8" = 1'-0"
SEE SH 407



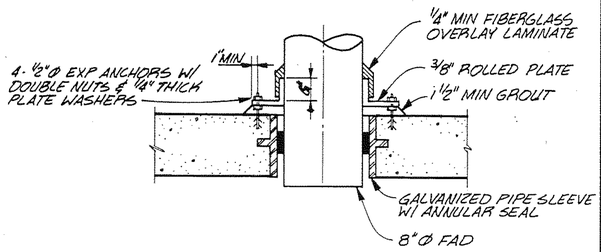
PRIMARY INFLUENT FLOW SPLIT STRUCTURE - LPA PIPING PLAN

SCALE: 1/4" = 1'-0"
SEE SH 407



SECTION D

SCALE: 3/8" = 1'-0"
SEE SH 406



ROOF PENETRATION FOR FAD

DETAIL 1

NTS

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PRIMARY INFLUENT FLOW SPLIT STRUCTURE - SECTIONS AND DETAILS

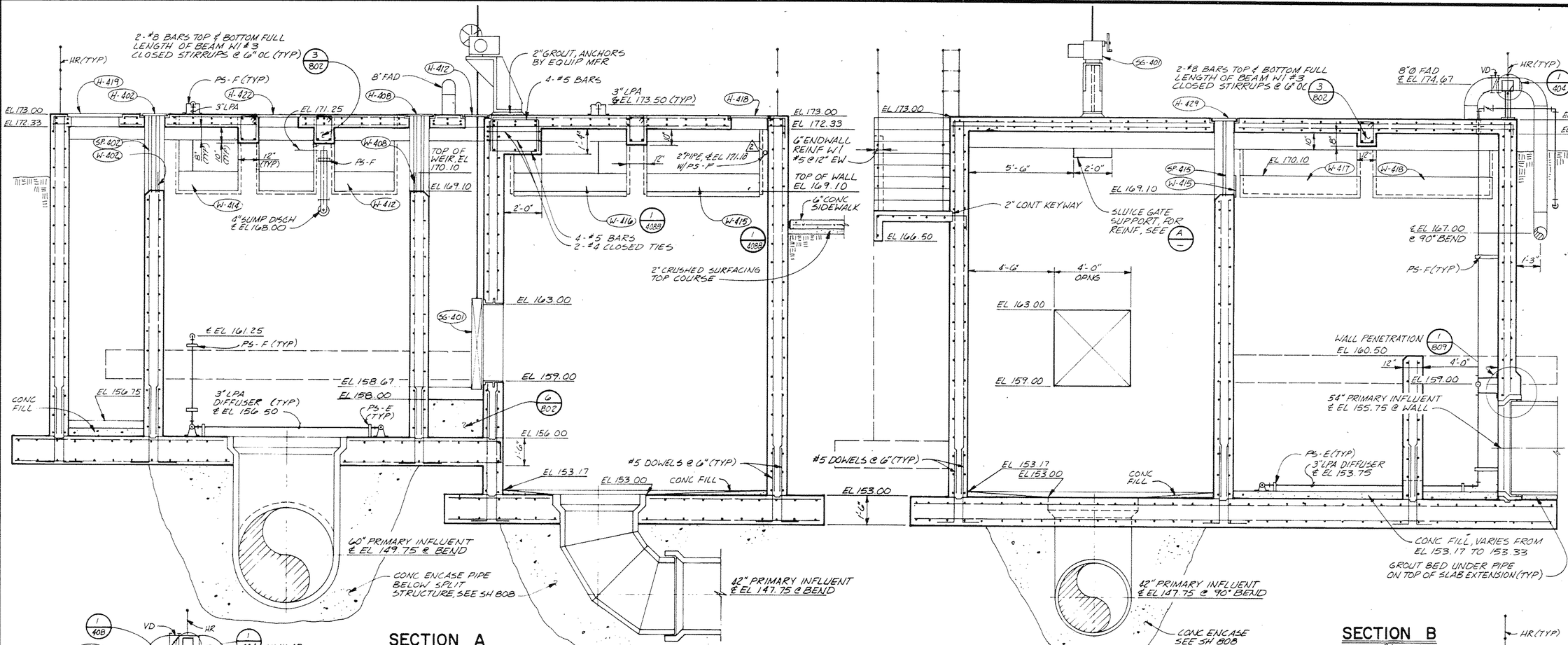
Designed: DJH
Drawn: SDS
Checked: AHR, BRW
Approved: John Eckhoff
Date: MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/1/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1986 BRUCE R. WILLEY

Sheet Number: 408



SHEET NOTES:

1. ALL REINFORCING TO BE #5 @ 12" O.C. UNLESS OTHERWISE NOTED.
2. ALL DOWELS SHALL EXTEND 2'-6" ABOVE SURFACE OF SLAB UNLESS OTHERWISE NOTED.
3. FOR LPA PIPING, SEE LPA PIPING PLAN, SH 408B.

HATCH SCHEDULE

MARK	LOCATION	ROUGH OPNG DIMN	TYPE
H-433	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-6" x 3'-0"	
H-434	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-6" x 3'-0"	
H-435	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-6" x 3'-0"	
H-436	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-6" x 3'-0"	
H-437	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-6" x 3'-0"	
H-438	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-6" x 3'-0"	
H-439	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-6" x 3'-0"	
H-440	PRIMARY INFL. FLOW SPLIT STRUCTURE	2'-6" x 2'-6"	
H-441	PRIMARY INFL. FLOW SPLIT STRUCTURE	2'-6" x 2'-6"	
H-442	PRIMARY INFL. FLOW SPLIT STRUCTURE	2'-6" x 2'-6"	

WEIR SCHEDULE

MARK	LOCATION	"A"	"B"	"C"	TYPE
W-401	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-1 1/8"	2'-3 3/8"		A
W-402	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-1 1/8"	2'-3 3/8"		A
W-403	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-1 1/8"	2'-3 3/8"		A
W-404	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-1 1/8"	2'-3 3/8"		A
W-405	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-1 1/8"	2'-3 3/8"		A
W-406	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-1 1/8"	2'-3 3/8"		A
W-407	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-1 1/8"	2'-3 3/8"		A
W-408	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-1 1/8"	2'-3 3/8"		A
W-409	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-1 1/8"	2'-3 3/8"		A
W-410	PRIMARY EFFL. FLOW SPLIT STRUCTURE	7 1/8"	4'-1 3/8"		A
W-411	PRIMARY EFFL. FLOW SPLIT STRUCTURE	7 1/8"	4'-1 3/8"		A
W-412	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-1 1/8"	2'-3 3/8"		A
W-413	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-1 1/8"	2'-3 3/8"		A
W-414	PRIMARY INFL. FLOW SPLIT STRUCTURE	1'-1 1/8"	2'-3 3/8"		A
W-415	PRIMARY INFL. FLOW SPLIT STRUCTURE	2'-6"	6'-6"		B
W-416	PRIMARY INFL. FLOW SPLIT STRUCTURE	2'-6"	6'-6"		B
W-417	PRIMARY INFL. FLOW SPLIT STRUCTURE	2'-6"	6'-6"		B
W-418	PRIMARY INFL. FLOW SPLIT STRUCTURE	2'-6"	6'-6"		B

STOP PLATE SCHEDULE

MARK	LOCATION	"E"	"F"	"G"
SP-401	PRIMARY INFL. FLOW SPLIT STRUCTURE	2'-3 3/8"	3'-4"	
SP-402	PRIMARY INFL. FLOW SPLIT STRUCTURE	2'-3 3/8"	3'-4"	
SP-403	PRIMARY INFL. FLOW SPLIT STRUCTURE	2'-3 3/8"	3'-4"	
SP-404	PRIMARY INFL. FLOW SPLIT STRUCTURE	2'-3 3/8"	3'-4"	
SP-405	PRIMARY INFL. FLOW SPLIT STRUCTURE	2'-3 3/8"	3'-4"	
SP-406	PRIMARY INFL. FLOW SPLIT STRUCTURE	2'-3 3/8"	3'-4"	
SP-410	PRIMARY EFFL. FLOW SPLIT STRUCTURE	4'-1 3/8"	3'-4"	
SP-411	PRIMARY EFFL. FLOW SPLIT STRUCTURE	4'-1 3/8"	3'-4"	
SP-414	PRIMARY INFL. FLOW SPLIT STRUCTURE	2'-1 3/8"	3'-4"	
SP-415	PRIMARY INFL. FLOW SPLIT STRUCTURE	2'-1 3/8"	3'-4"	

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PRIMARY INFLUENT FLOW SPLIT STRUCTURE - SECTIONS

Project Manager

Designed: DJH, RAV

Drawn: DRV

Checked: JEK

Project Number

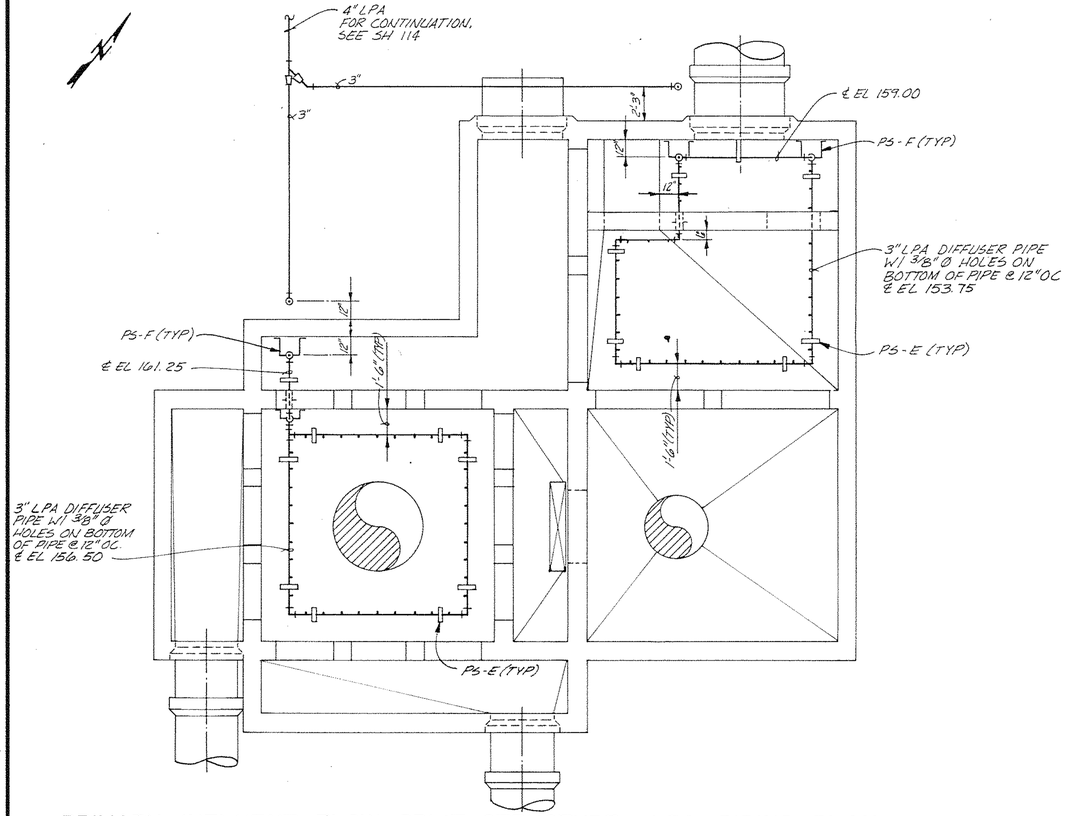
Date: OCTOBER 1989

THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE. IF NOT ONE INCH, SCALE ACCORDINGLY.

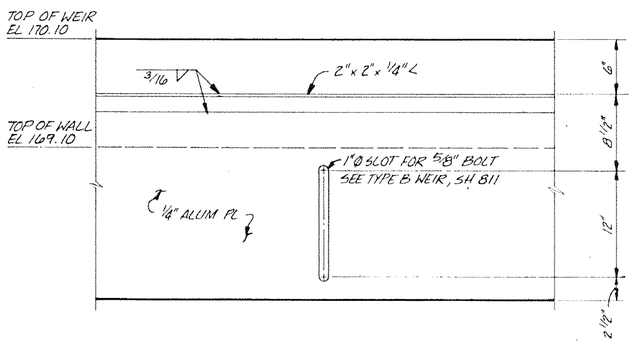
No	By	Description
	JK	SHEET REVISION 11-89
2	JEK	CHEM PHASE CTR. 122 7-14-94
3	MMK	AS RECORDED DRAWING 10-11-94

AS RECORDED DRAWINGS

Sheet Number 408A



PRIMARY INFLUENT FLOW SPLIT STRUCTURE - LPA PIPING PLAN



DETAIL 1

SCALE: 1 1/2" = 1'-0"

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY
OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PRIMARY INFLUENT FLOW SPLIT STRUCTURE - LPA PIPING PLAN

Project Manager	
Designed	DJH, JEK
Drawn	DRV
Checked	JEK
Project Number	
Date	OCTOBER, 1989

THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE. IF NOT ONE INCH, SCALE ACCORDINGLY.

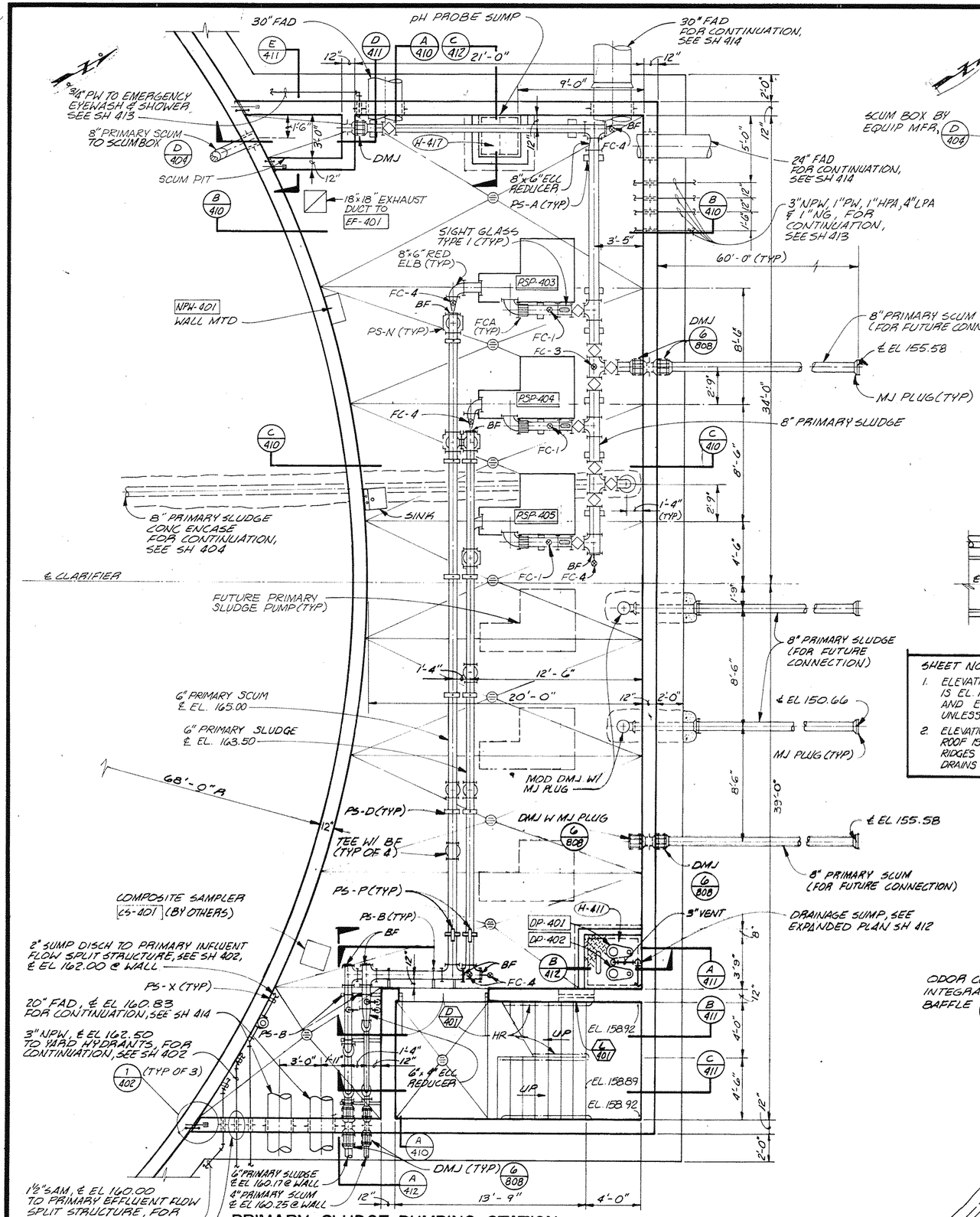
No	By	Description	
1	JK	SHEET REVISION	11-89
2	APA	AS RECORDED DRAWING	12/7/92

△2 AS RECORDED DRAWINGS

Sheet Number 408B

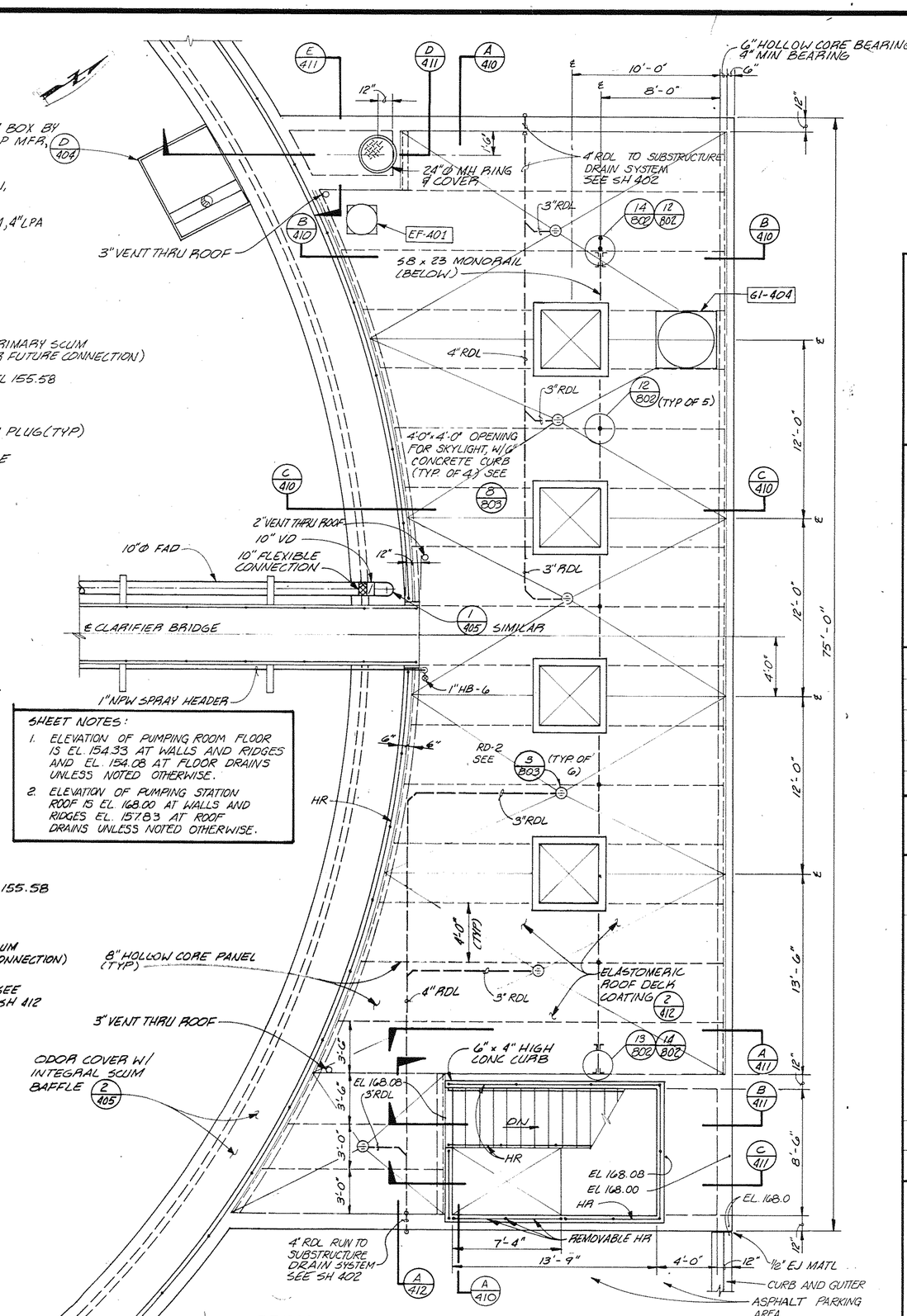
SCREEN COMP^SITE OVERLAY

SR 925



PRIMARY SLUDGE PUMPING STATION – LOWER PLAN

SCALE: 1/4" = 1'-0"



PRIMARY SLUDGE PUMPING STATION – ROOF PLAN

SCALE: 1/4" = 1'-0"

SHEET NOTES:

1. ELEVATION OF PUMPING ROOM FLOOR IS EL 154.33 AT WALLS AND RIDGES AND EL. 154.08 AT FLOOR DRAINS UNLESS NOTED OTHERWISE.
2. ELEVATION OF PUMPING STATION ROOF IS EL 168.00 AT WALLS AND RIDGES EL. 157.83 AT ROOF DRAINS UNLESS NOTED OTHERWISE.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

NEW PRIMARY SLUDGE PUMPING STATION – PLANS

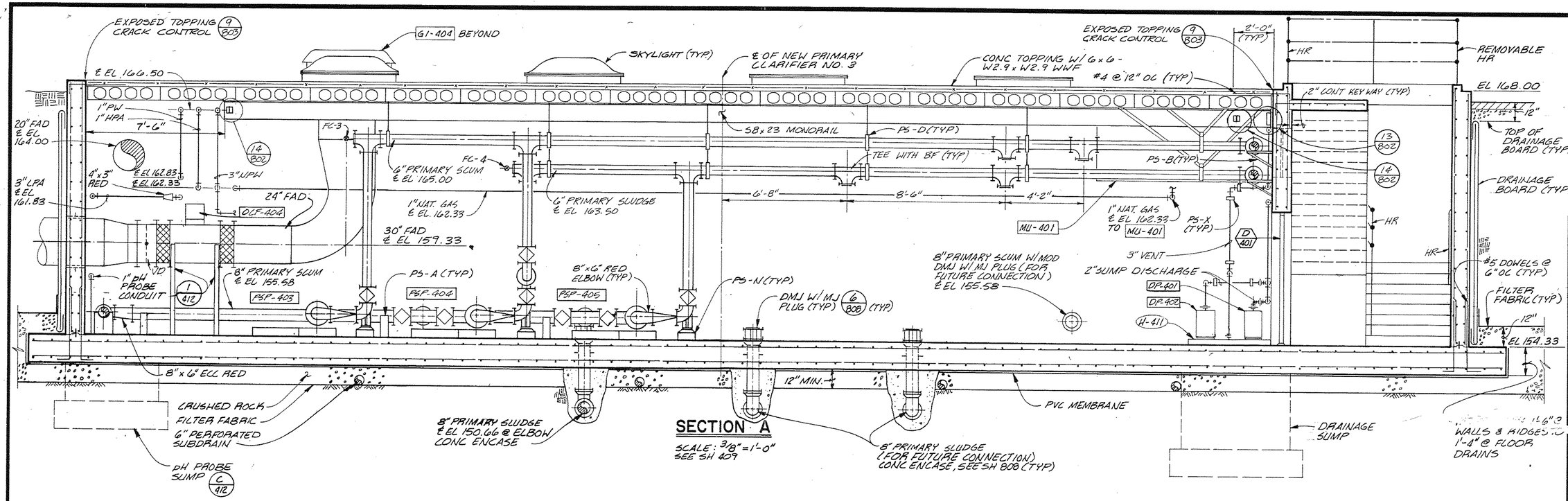
Designed: DJH
Drawn: IKD
Checked: AHK, BAW
Approved: [signature]
Date: MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/7/92

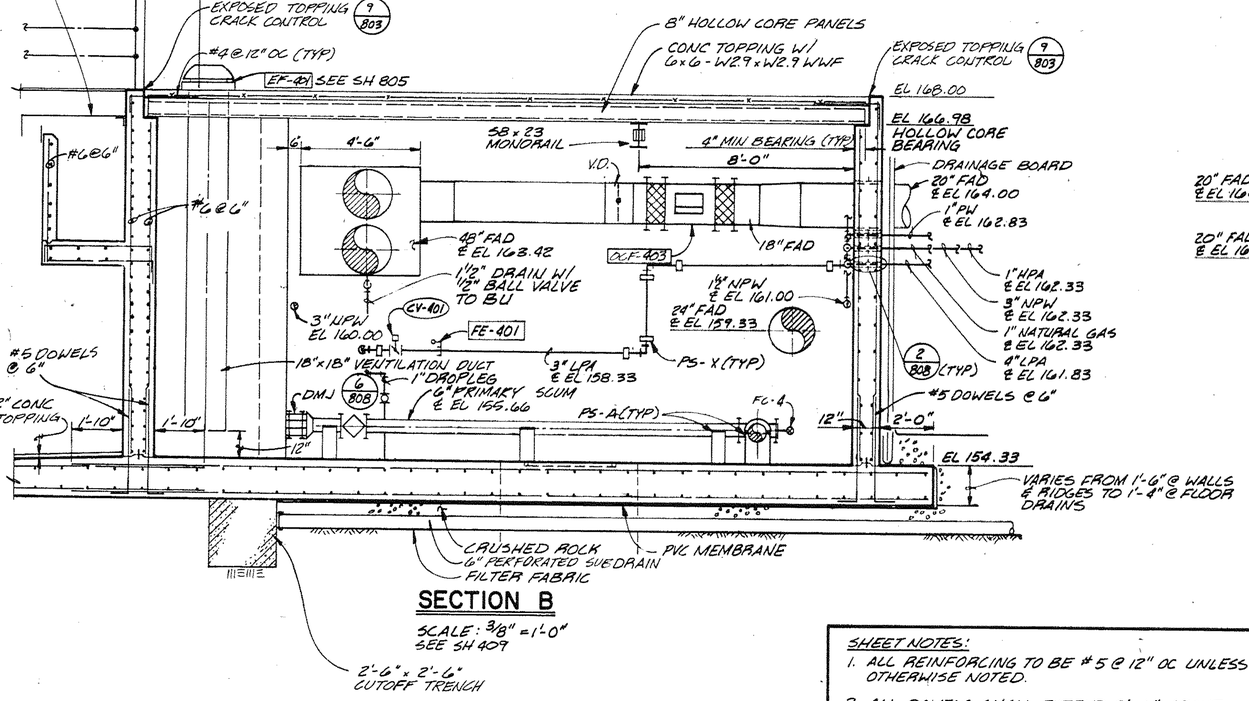
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1986 BRUCE R. WILLEY

Sheet Number: 409



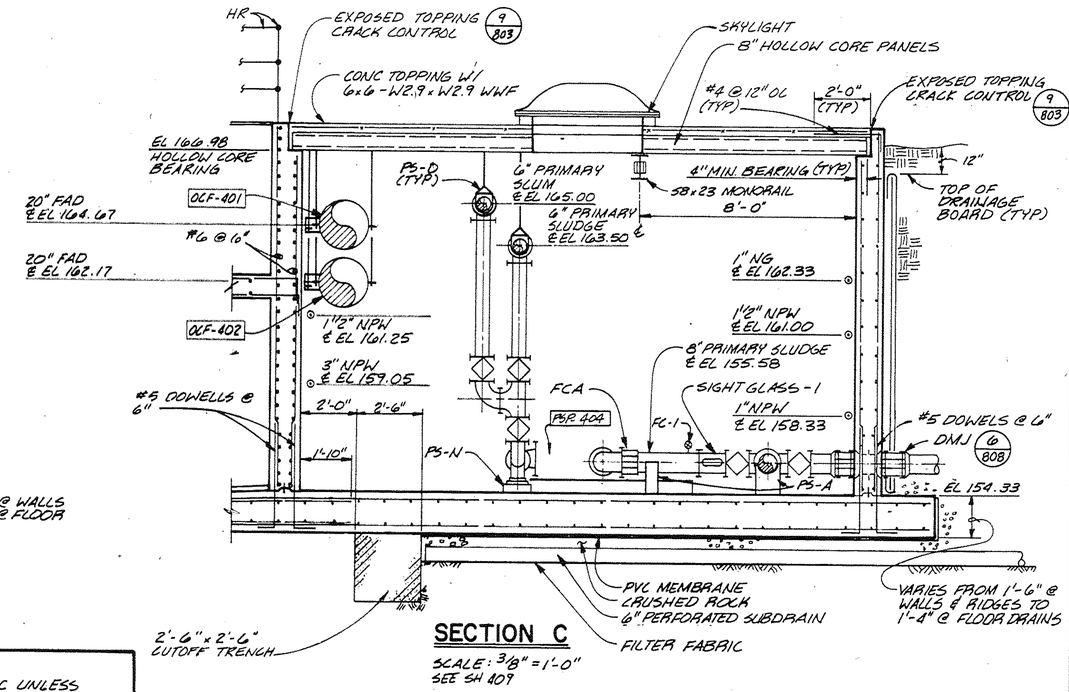
SECTION A

SCALE: 3/8" = 1'-0"
SEE SH 409



SECTION B

SCALE: 3/8" = 1'-0"
SEE SH 409



SECTION C

SCALE: 3/8" = 1'-0"
SEE SH 409

SHEET NOTES:

1. ALL REINFORCING TO BE #5 @ 12" OC UNLESS OTHERWISE NOTED.
2. ALL DOWELS SHALL EXTEND 2'-6" ABOVE SURFACE OF SLAB UNLESS OTHERWISE NOTED.
3. FOR COMPLETE INFORMATION ON ODOR CONTROL FACILITIES, SEE SH 414.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

NEW PRIMARY SLUDGE PUMPING STATION - SECTIONS

Designed: DJH, JDC
Drawn: CWA
Checked: AHK, BRW
Approved: John Schoch
Date: MAY 1989

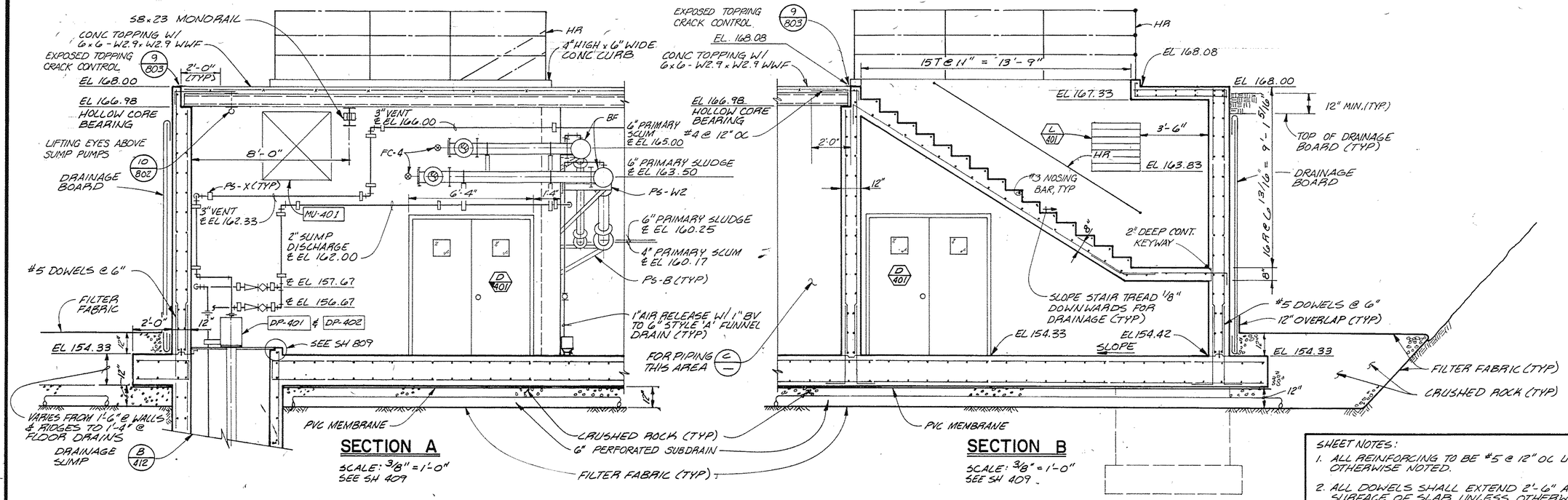
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No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/7/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1986 BRUCE R. WILLEY

Sheet Number: 410

SR 904



SECTION A

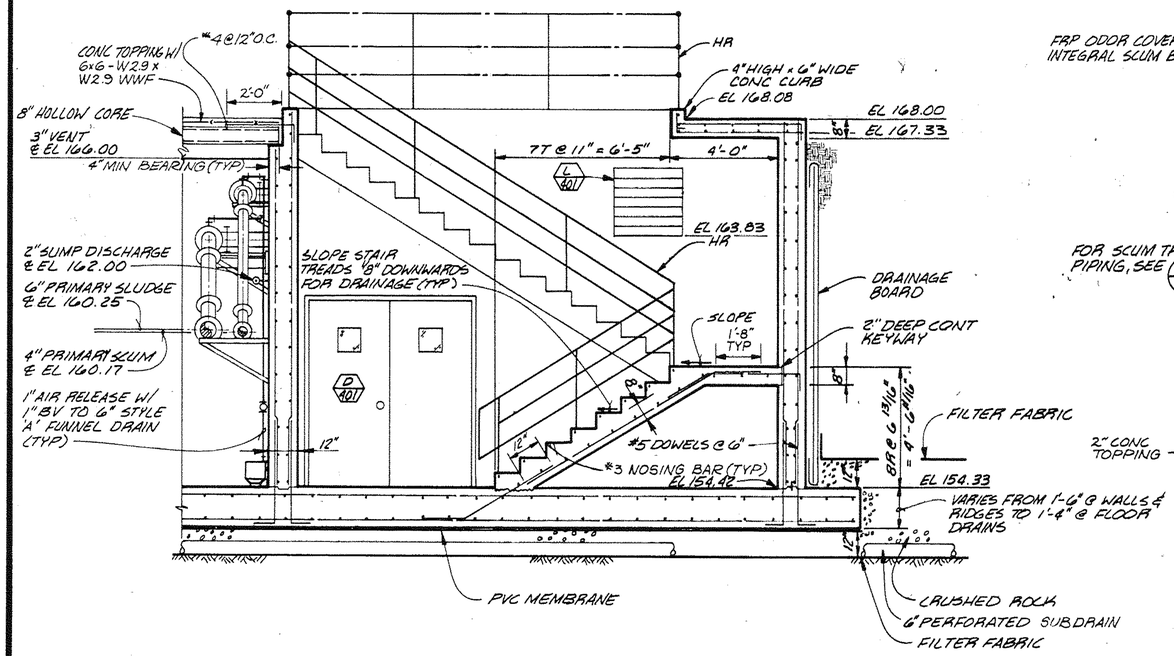
SCALE: 3/8" = 1'-0"
SEE SH 409

SECTION B

SCALE: 3/8" = 1'-0"
SEE SH 409

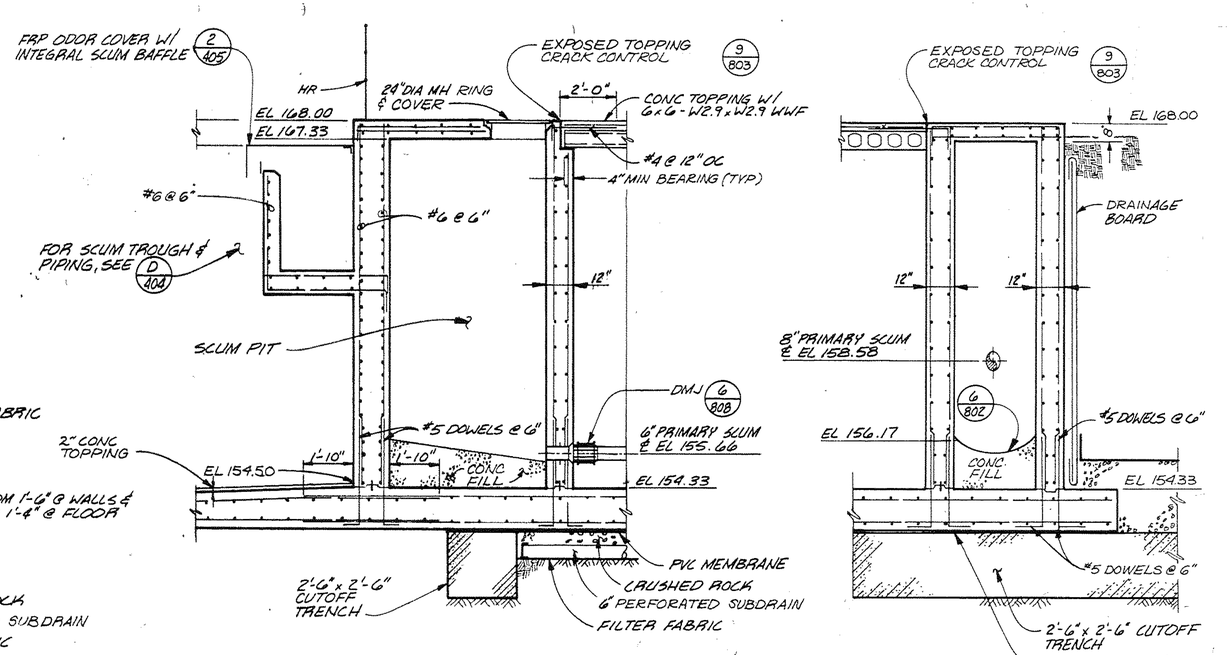
SHEET NOTES:

1. ALL REINFORCING TO BE #5 @ 12" OC UNLESS OTHERWISE NOTED.
2. ALL DOWELS SHALL EXTEND 2'-6" ABOVE SURFACE OF SLAB UNLESS OTHERWISE NOTED.



SECTION C

SCALE: 3/8" = 1'-0"
SEE SH 409



SECTION D

SCALE: 3/8" = 1'-0"
SEE SH 409

SECTION E

SCALE: 3/8" = 1'-0"
SEE SH 409

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

NEW PRIMARY SLUDGE PUMPING STATION - SECTIONS

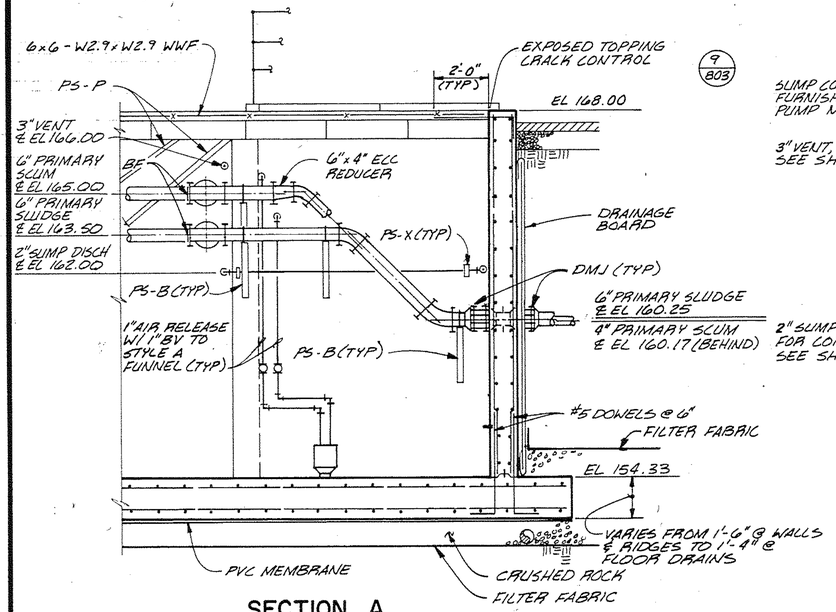
Designed: DJH, JDC
Drawn: SDS
Checked: AHK, BAW
Approved: John E Kloch
Date: MAY 1989

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1	AFA	AS RECORDED DRAWING	12/7/92

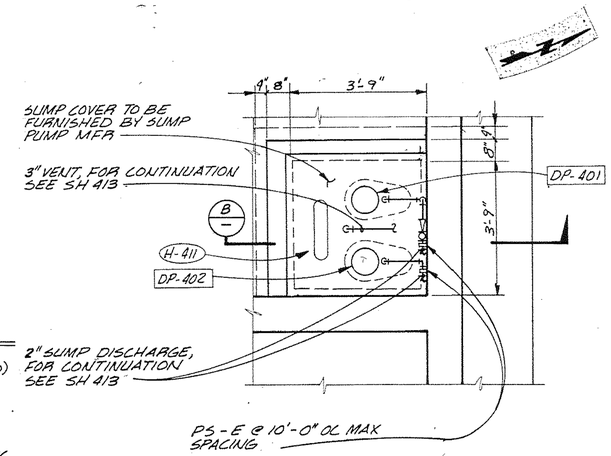
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1985 BRUCE R. WILLEY

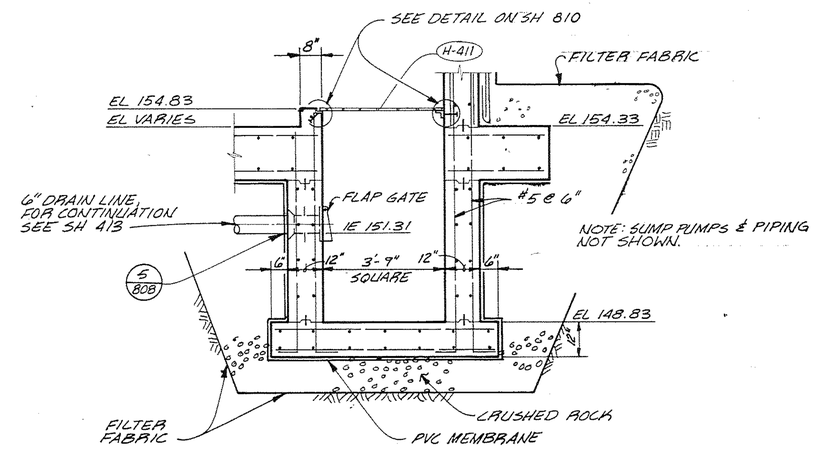
Sheet Number: 411



SECTION A

SCALE: 3/8" = 1'-0"
SEE SH 409



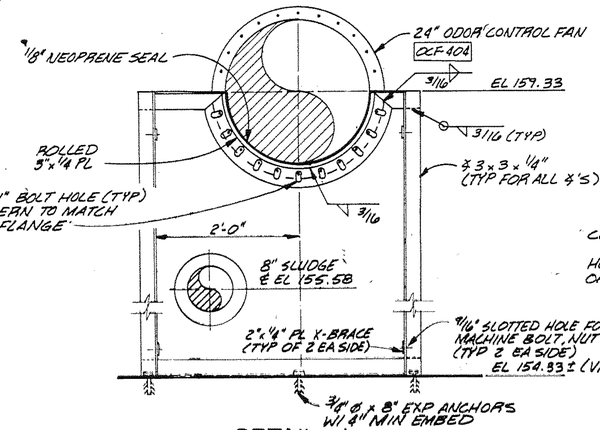


SECTION B

SCALE: 1/2" = 1'-0"
SEE SH 409

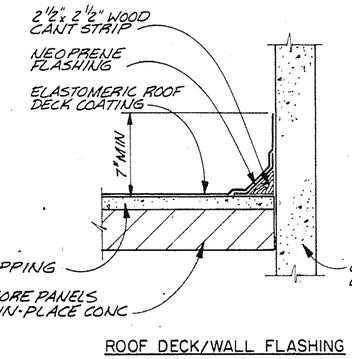
PUMPING STATION DRAINAGE SUMP PLAN

SCALE: 1/2" = 1'-0"
SEE SH 409

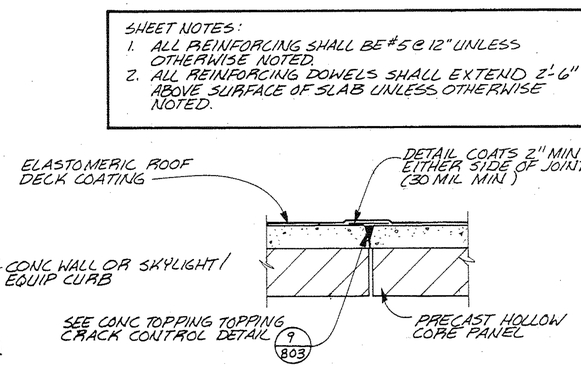


DETAIL 1

SCALE: 1" = 1'-0"
SEE SH 414



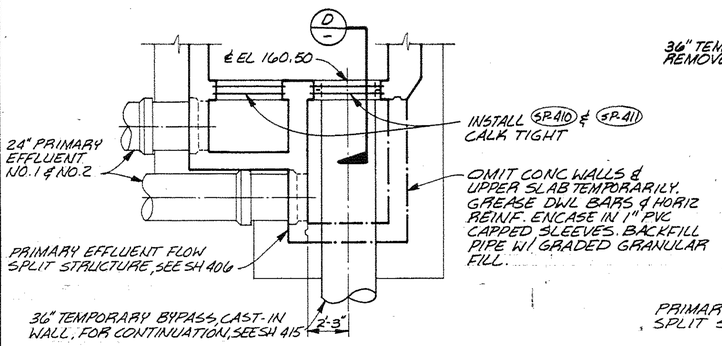
ROOF DECK/WALL FLASHING



CRACK CONTROL JOINT

SECTION C

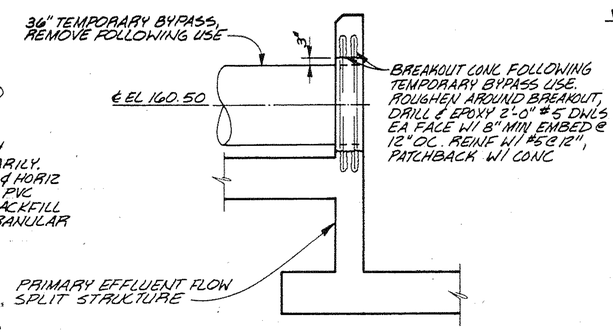
SCALE: 1/2" = 1'-0"
SEE SH 409



PLAN

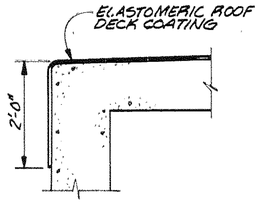
DETAIL 3

SCALE: 1/4" = 1'-0"
SEE SH 406

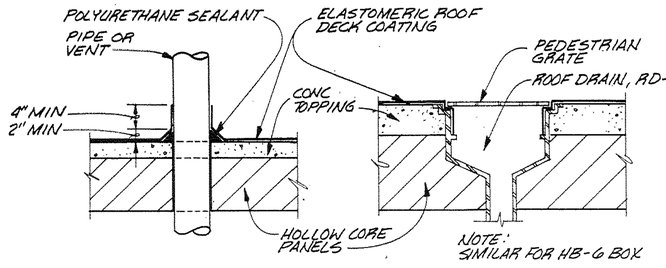


SECTION D

SCALE: 3/8" = 1'-0"



BURIED ROOF



PIPE PENETRATION ROOF DRAINS

DETAIL 2

NTS

SHEET NOTES:
1. ALL REINFORCING SHALL BE #5 @ 12" UNLESS OTHERWISE NOTED.
2. ALL REINFORCING DOWELS SHALL EXTEND 2'-6" ABOVE SURFACE OF SLAB UNLESS OTHERWISE NOTED.

△ AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

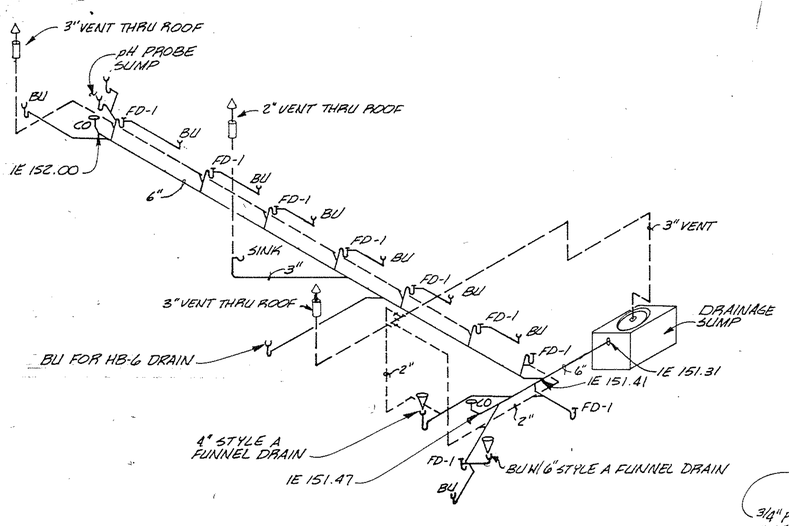
Designed: DJH, JDC
Drawn: CWA
Checked: AHK, BRW
Approved: John E Hoch
Date: MAY 1989

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No	By	Revision	Date
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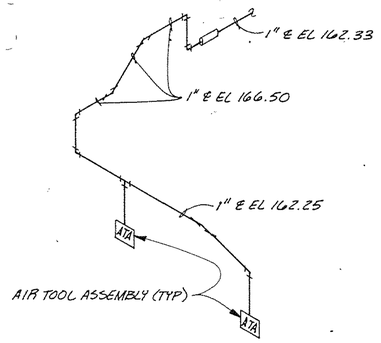
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1986 BRUCE R. WILLEY

Sheet Number 412



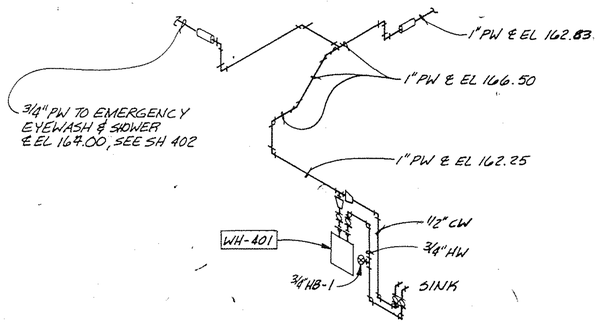
DRAINAGE SCHEMATIC

NTS



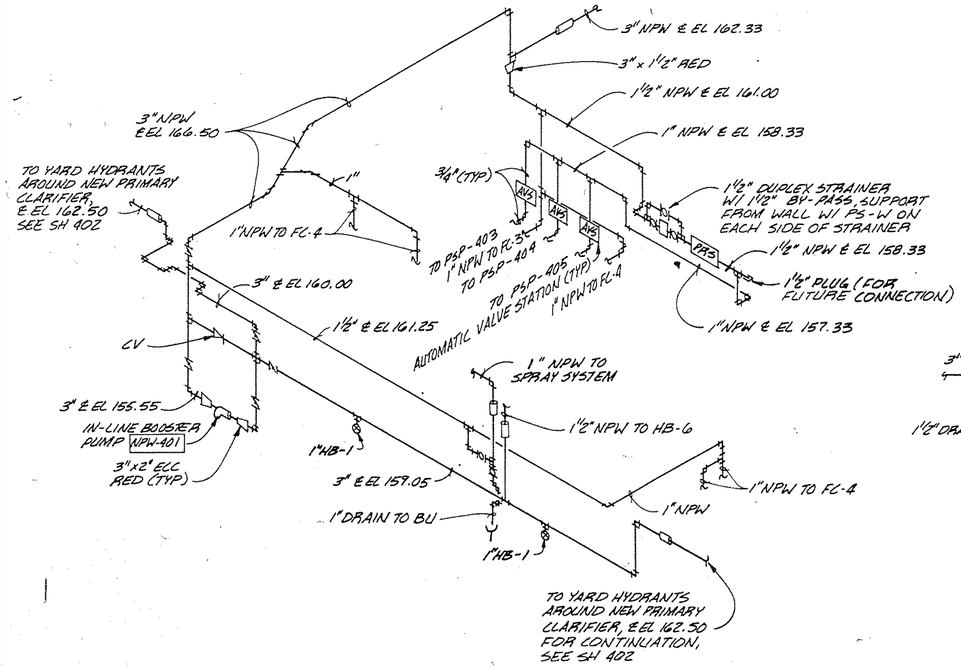
HIGH PRESSURE AIR SCHEMATIC

NTS



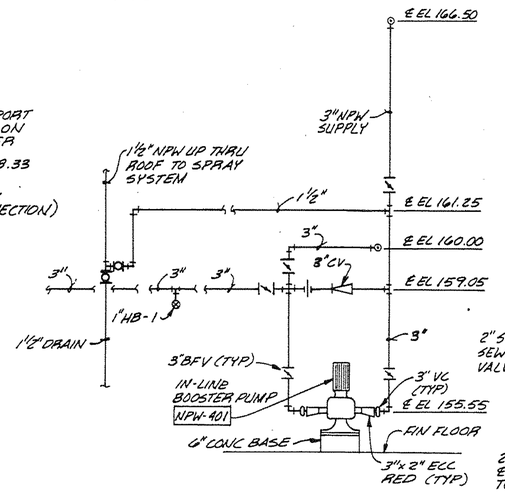
POTABLE WATER SCHEMATIC

NTS



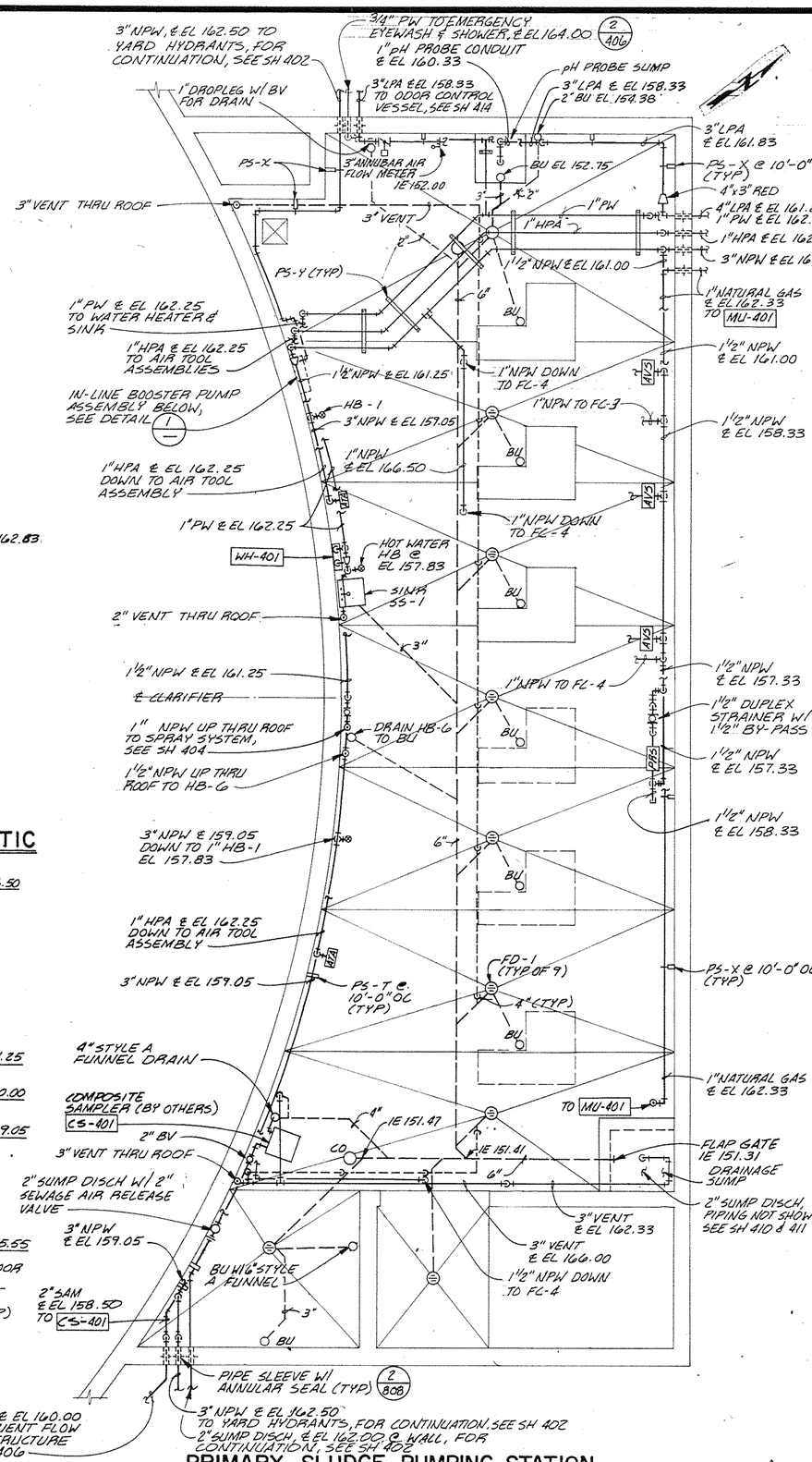
NPW SYSTEM SCHEMATIC

NTS



NPW BOOSTER PUMP PIPING DETAIL 1

SCALE: 1/2" = 1'-0"



PRIMARY SLUDGE PUMPING STATION PLUMBING PLAN

SCALE: 1/4" = 1'-0"

1 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

NEW PRIMARY CLARIFIER-PLUMBING PLAN, DETAILS AND SECTIONS

Designed	JDC
Drawn	MMK
Checked	BRW, AHK
Approved	John Estlock
Date	MAY 1989

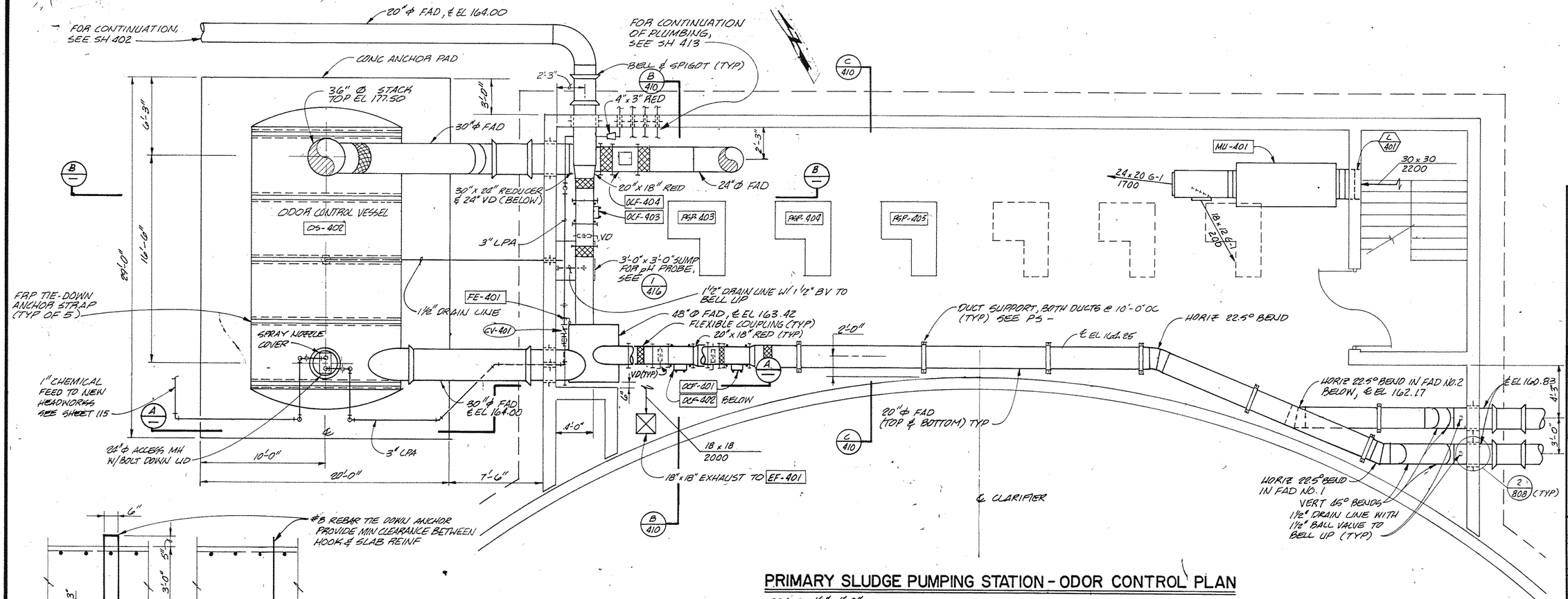
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1985 BRUCE R. WILLEY

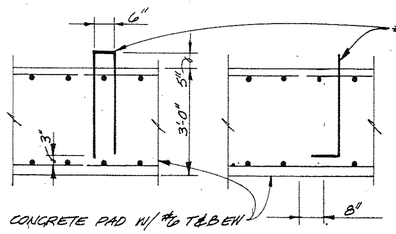
Sheet Number 413

SH 904



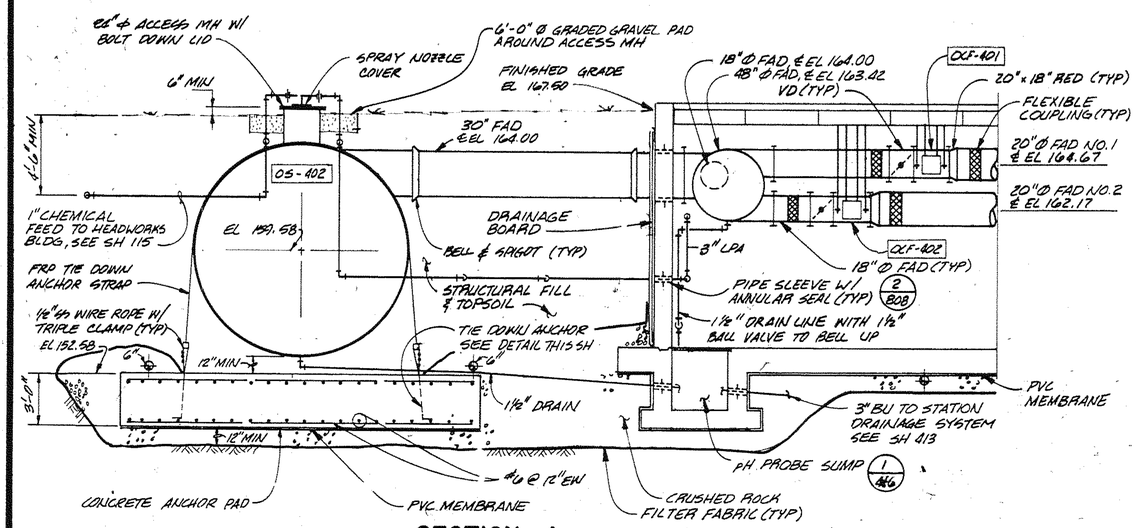
PRIMARY SLUDGE PUMPING STATION - ODOR CONTROL PLAN

SCALE: ½"=1'-0"



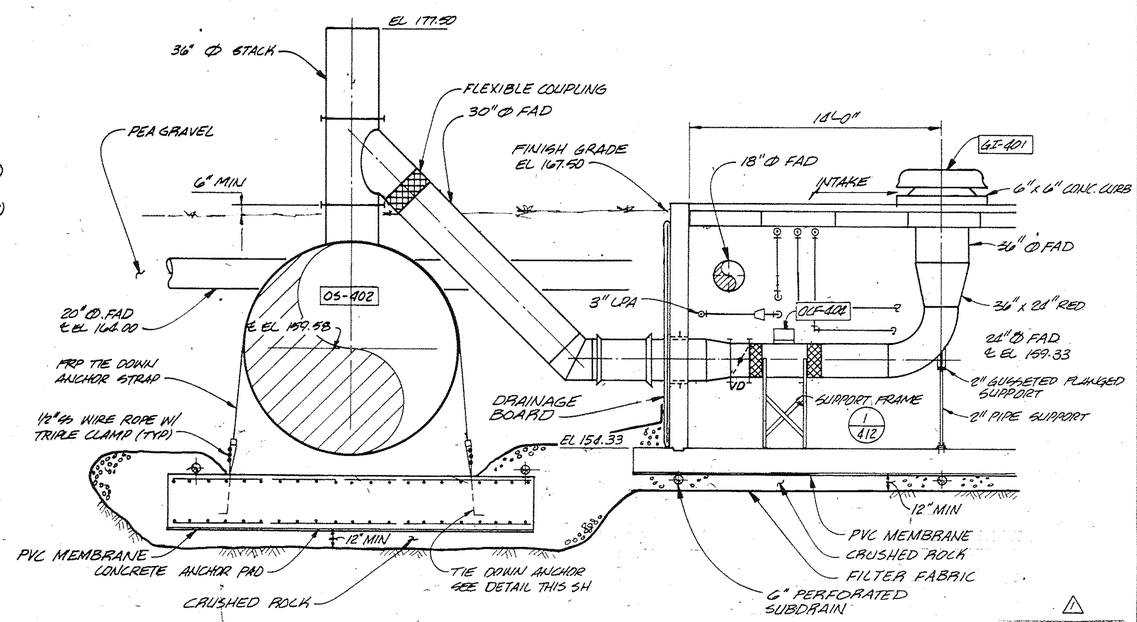
TIE DOWN ANCHOR DETAIL

SCALE: ½"=1'-0"



SECTION A

SCALE: ½"=1'-0"



SECTION B

SCALE: ½"=1'-0"

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

NEW PRIMARY SLUDGE PUMPING STATION-ODOR CONTROL, VENTILATION PLANS AND SECTIONS

Designed	JDC
Drawn	SDS
Checked	AHA, BBW
Approved	John E Koch
Date	MAY 1989

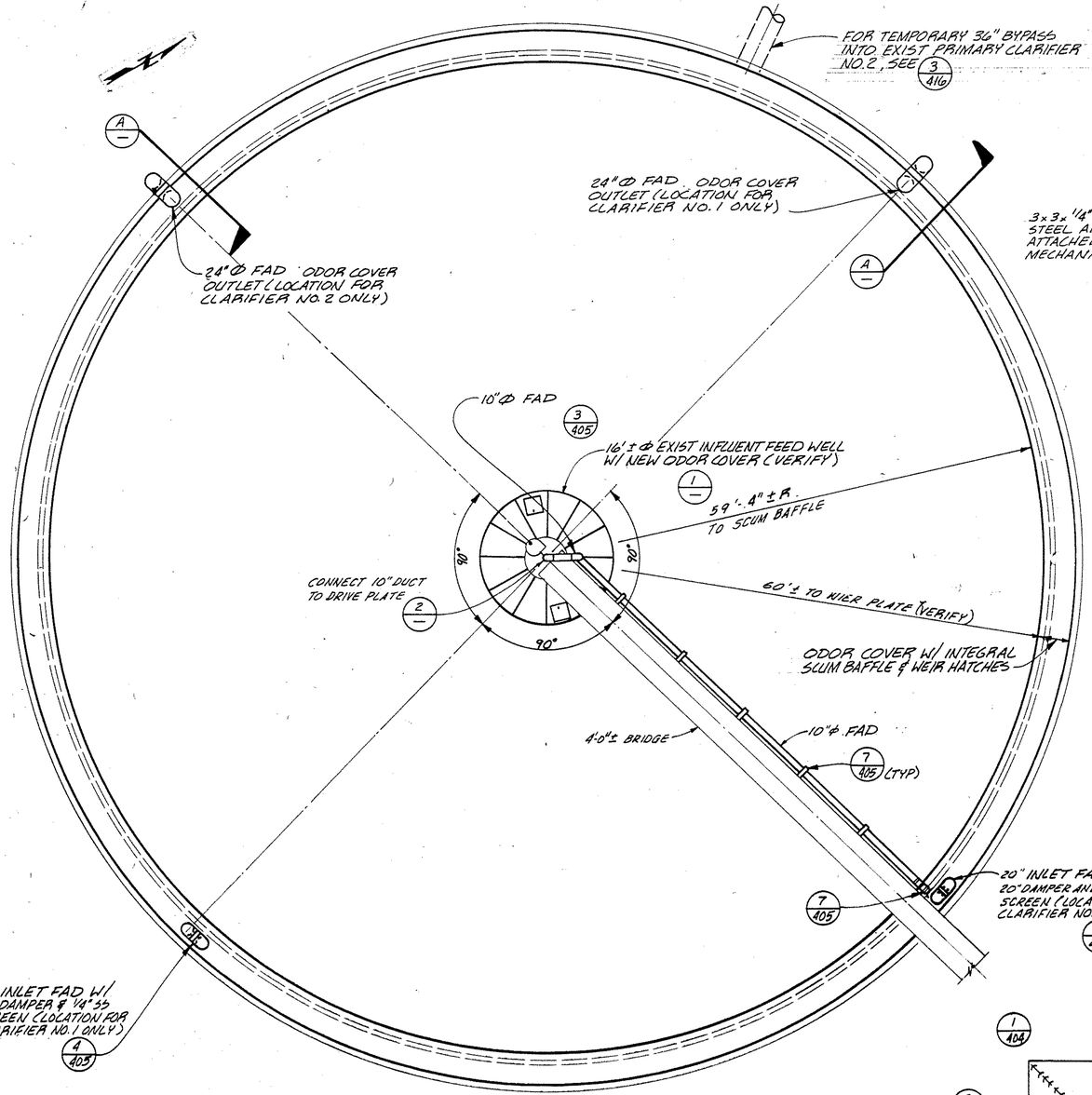
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	APA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17, 1985 BRUCE R. WILLEY

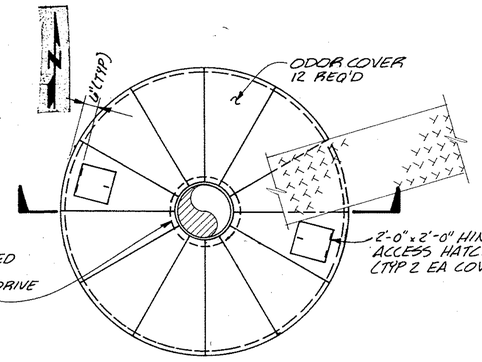
Sheet Number 414

SH 904

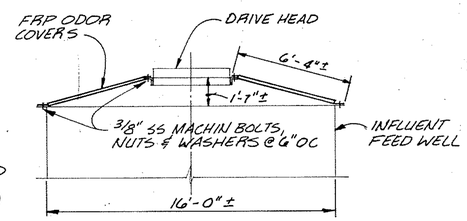


PRIMARY CLARIFIER NO. 1 - PLAN

SCALE: 1/8" = 1'-0"
NOTE: PRIMARY CLARIFIER NO. 2 SIMILAR.



PLAN

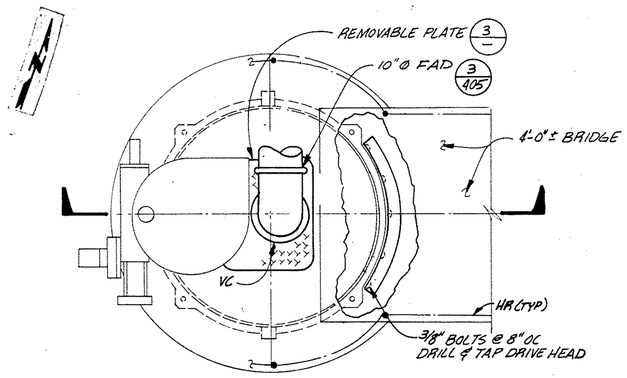


NOTE:
ALL DIMENSIONS SHALL BE VERIFIED BY CONTRACTOR.

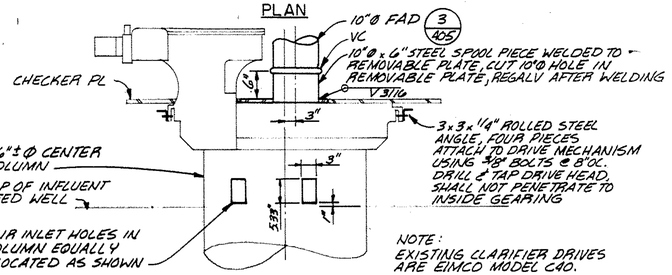
SECTION

DETAIL 1

NTS



PLAN

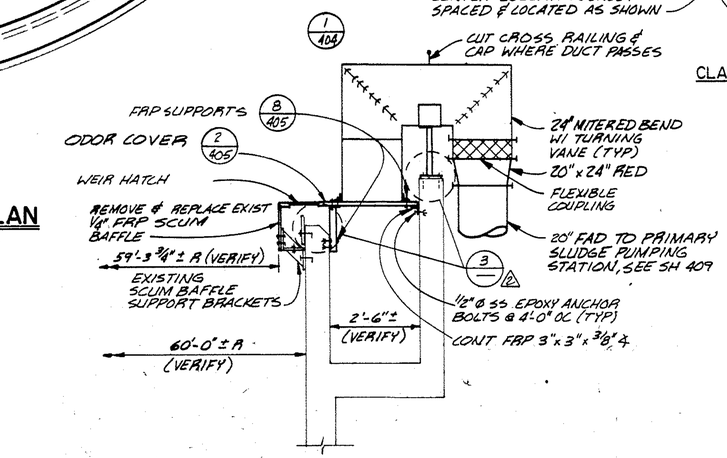


SECTION
CLARIFIER DRIVE UNIT

DETAIL 2

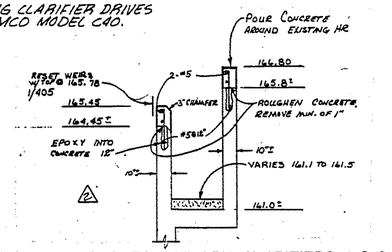
NTS

NOTE:
EXISTING CLARIFIER DRIVES ARE EIMCO MODEL C40.



SECTION A

SCALE: 1/2" = 1'-0"



MODIFICATIONS TO PRIMARY CLARIFIERS 1 & 2

DETAIL 3

NOTE:
1. SANDBLAST AND REPAINT CLARIFIER MECHANISM, BRIDGE, DECK TRUSSES AND RAILS ON PRIMARY CLARIFIERS NO. 1 AND NO. 2

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PRIMARY CLARIFIER ODOR CONTROL-EXISTING CLARIFIER MODIFICATIONS

Designed	JDC, JEK
Drawn	SDS
Checked	AHK, BRW
Approved	John E Hoad
Date	MAY 1989

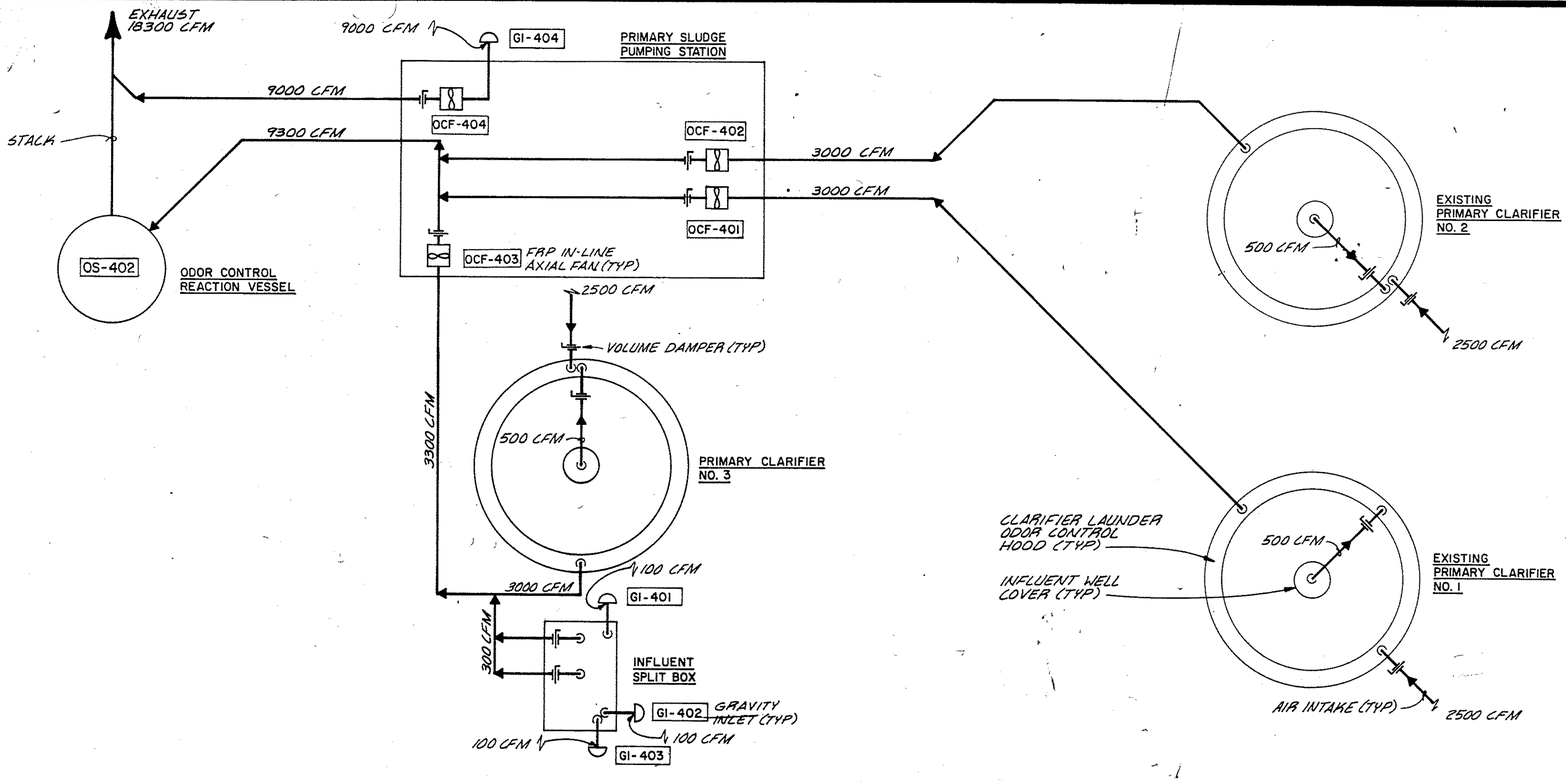
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No	By	Revision	Date
1	JEK	ADDENDUM NO.1	6-27-89
2	AFA	CPR# 24	12/9/92
3	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 13291 OREGON JULY 17, 1986 BRUCE R. WILLEY

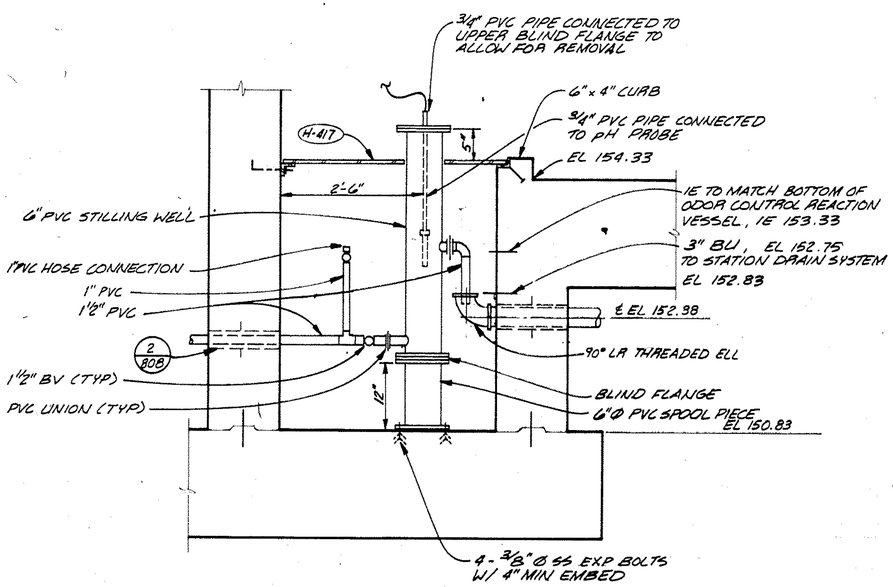
Sheet Number 415

SR 904



PRIMARY CLARIFIER ODOR CONTROL SCHEMATIC

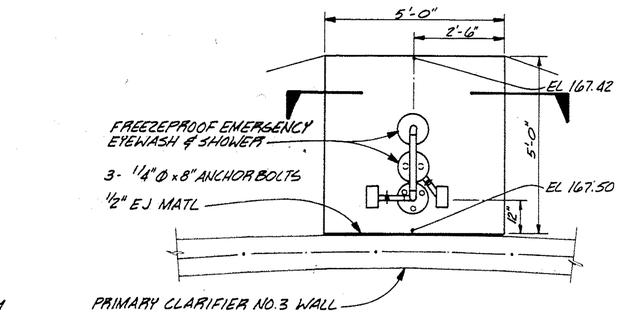
NTS



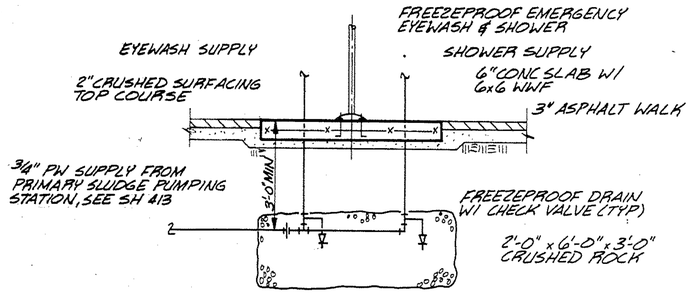
pH PROBE SUMP

DETAIL 1

SCALE: 1" = 1'-0"



PLAN

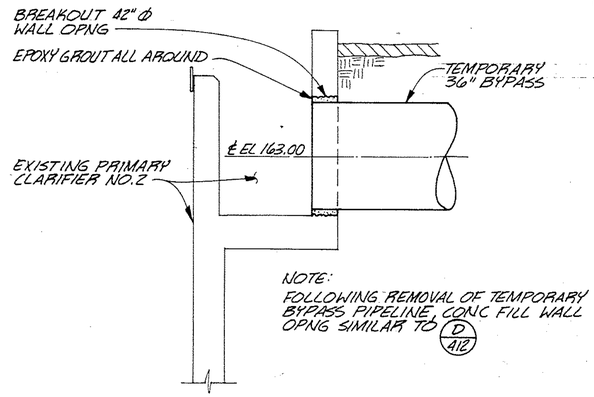


SECTION

EMERGENCY EYEWASH & SHOWER

DETAIL 2

SCALE: 1/2" = 1'-0"



36" TEMPORARY BYPASS - PRIMARY CLARIFIER NO.2 INSTALLATION

DETAIL 3

SCALE: 1/2" = 1'-0"

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY
OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PRIMARY CLARIFIER ODOR CONTROL - SCHEMATICS AND DETAILS

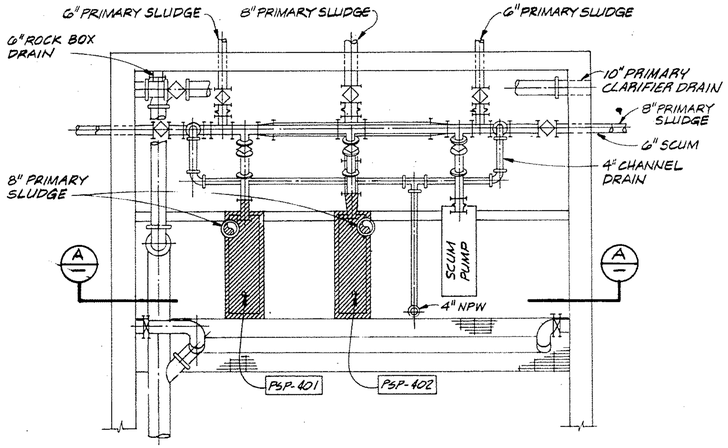
Designed: JDC, DJH
Drawn: DRV
Checked: AHK, BAW
Approved: John Eyford
Date: MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AHA	AS RECORDED DRAWING	12/9/92

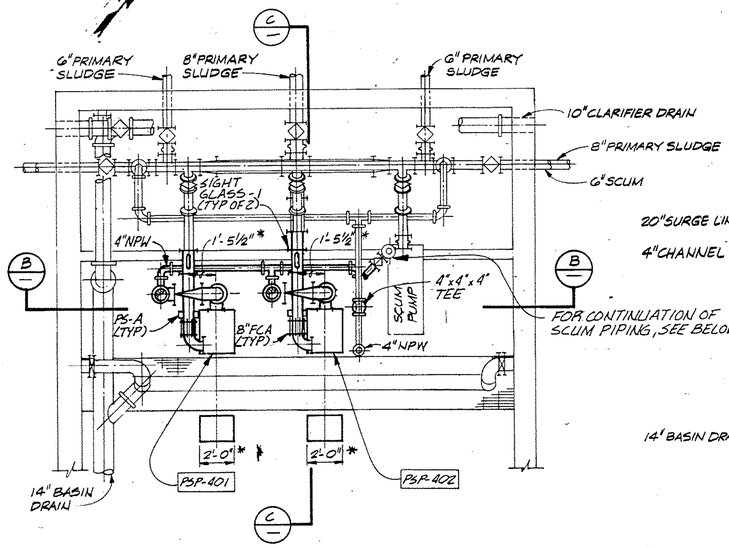
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17 1986 BRUCE R. WILLEY

Sheet Number 416



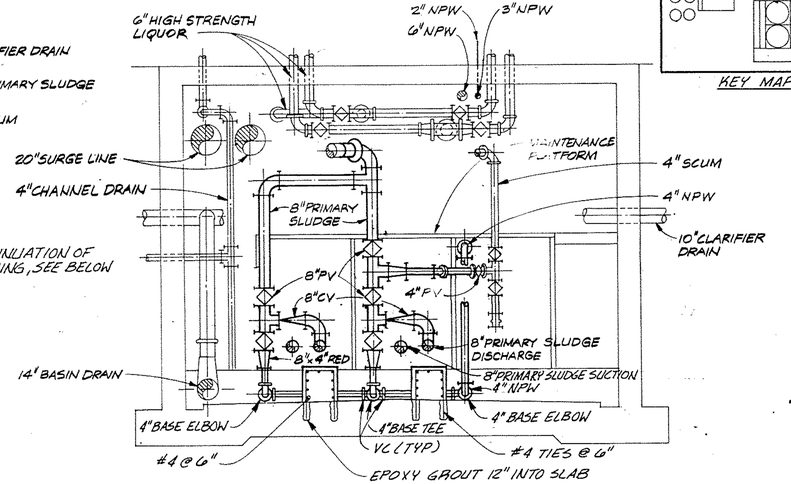
PRIMARY SLUDGE PUMP - PLAN DEMOLITION

SCALE: 1/4" = 1'-0"



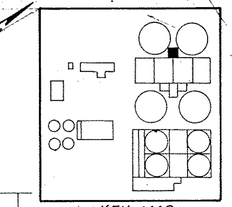
PRIMARY SLUDGE PUMP - SUCTION & DISCHARGE PIPING

SCALE: 1/4" = 1'-0"

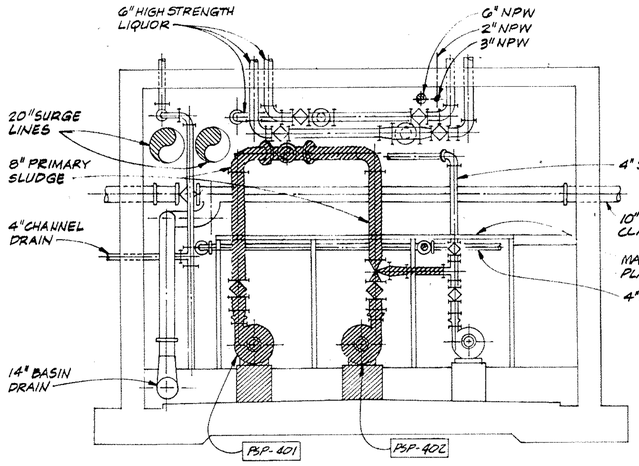


SECTION B

SCALE: 1/4" = 1'-0"

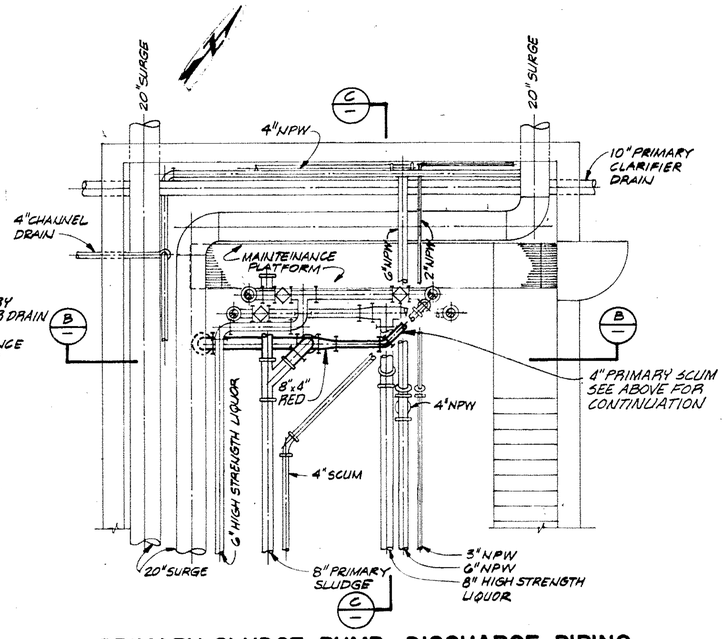


KEY MAP



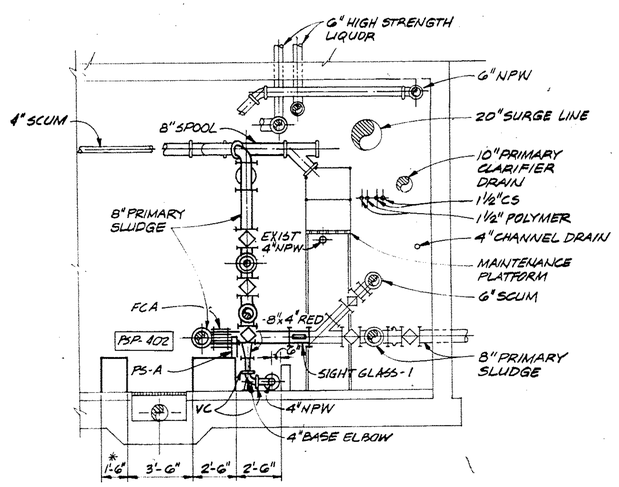
SECTION A - DEMOLITION

SCALE: 1/4" = 1'-0"



PRIMARY SLUDGE PUMP - DISCHARGE PIPING

SCALE: 1/4" = 1'-0"



SECTION C

SCALE: 1/4" = 1'-0"

NOTE:
* DIMENSIONS ARE EQUIPMENT SPECIFIC

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

EXISTING PRIMARY SLUDGE PUMPING STATION - PLAN AND SECTIONS

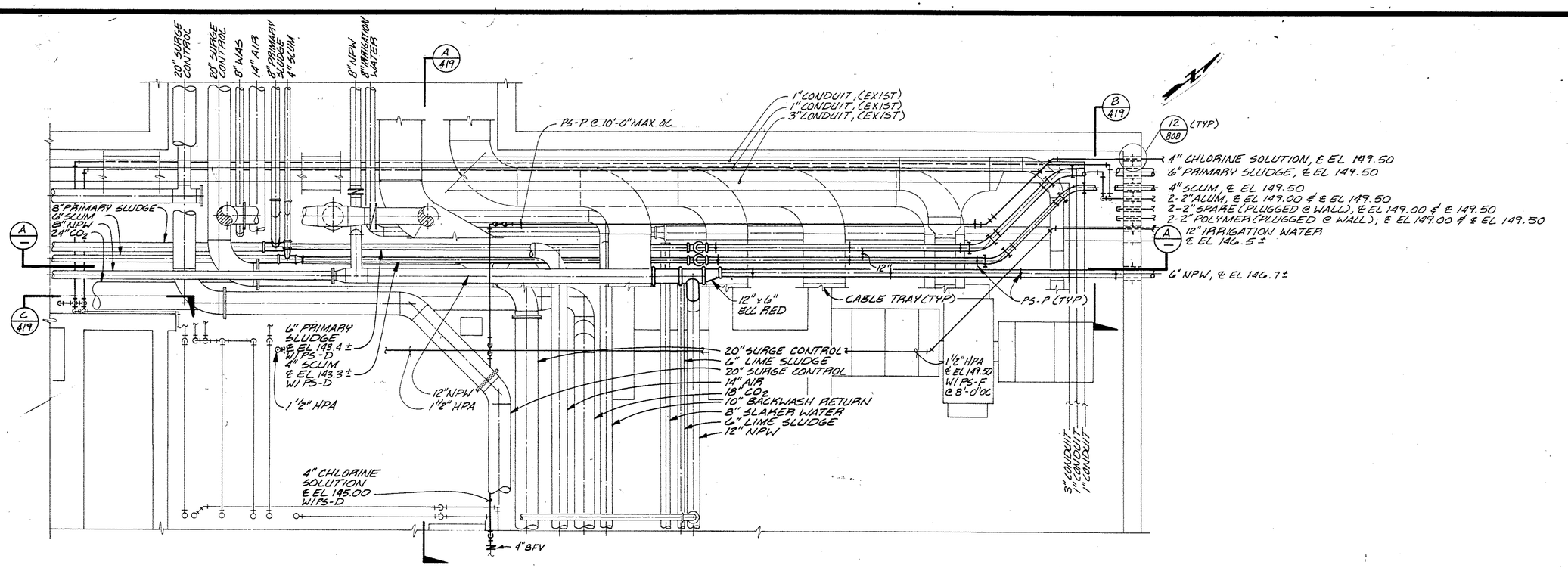
Designed JEK
Drawn RKB
Checked BRW
Approved John E. Hyock
Date MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

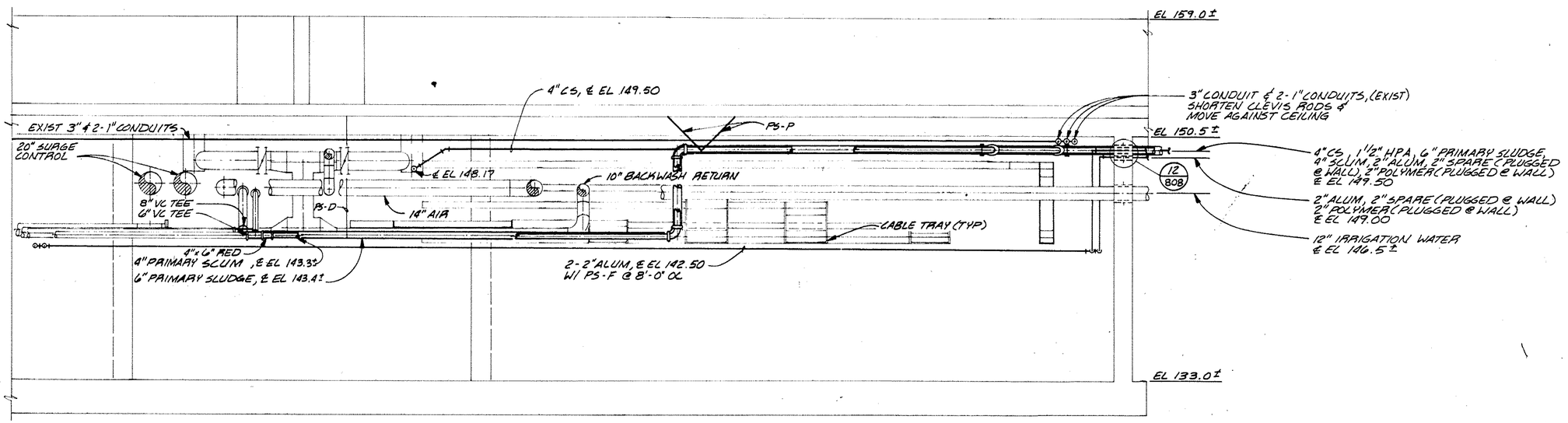
REGISTERED PROFESSIONAL ENGINEER 13331 OREGON JULY 17 1985 BRUCE A. WILLEY

Sheet Number 417



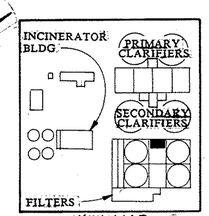
LIQUIDS CONTROL - LOWER PLAN

SCALE: 1/4" = 1'-0"



SECTION A

SCALE: 1/4" = 1'-0"



KEY MAP

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PRIMARY SLUDGE PIPING MODIFICATIONS BIOLOGICAL TUNNEL

Designed	JEK
Drawn	CWA
Checked	BAW
Approved	John E. Koch
Date	MAY 1989

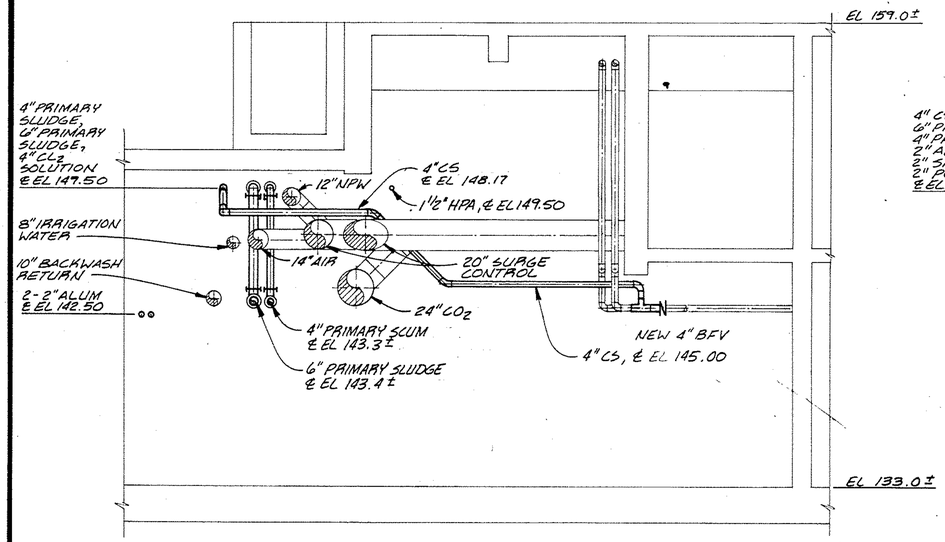
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	APA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1986 BRUCE R. WILLEY

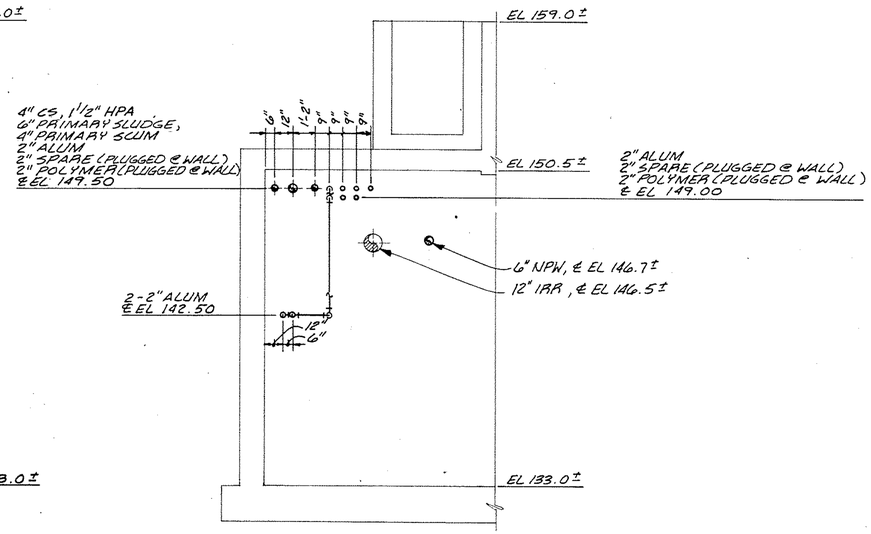
Sheet Number 418

SR 904



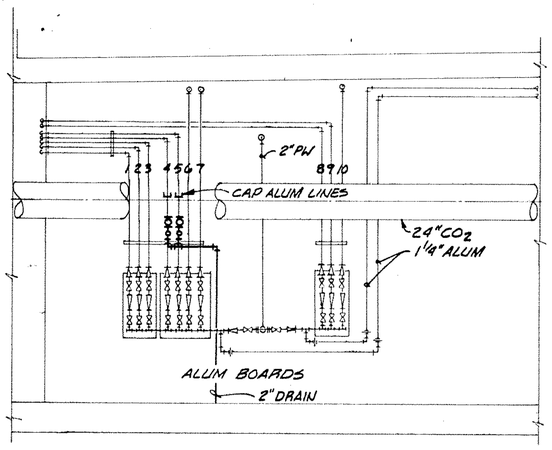
SECTION A

SCALE: 1/4" = 1'-0"



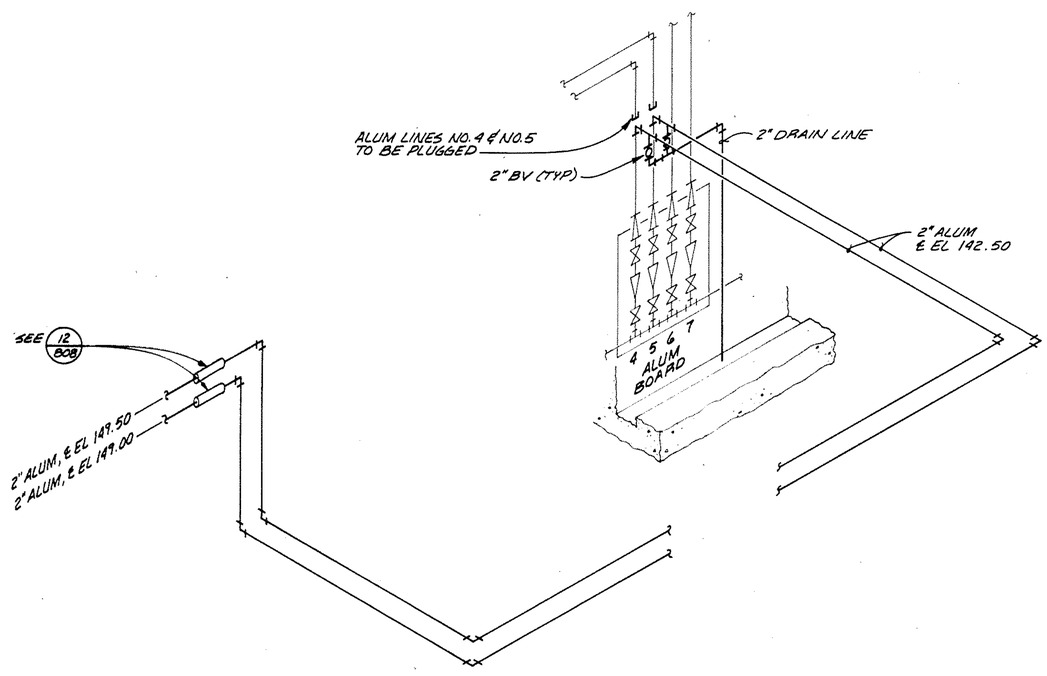
SECTION B

SCALE: 1/4" = 1'-0"



SECTION C

SCALE: 1/4" = 1'-0"



ALUM SCHEMATIC

NO SCALE

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

EXISTING PRIMARY SLUDGE PUMPING STATION- SECTIONS AND PIPING DETAILS

Designed: JEK
Drawn: CWA
Checked: BAW
Approved: John E. Koch
Date: MAY 1989

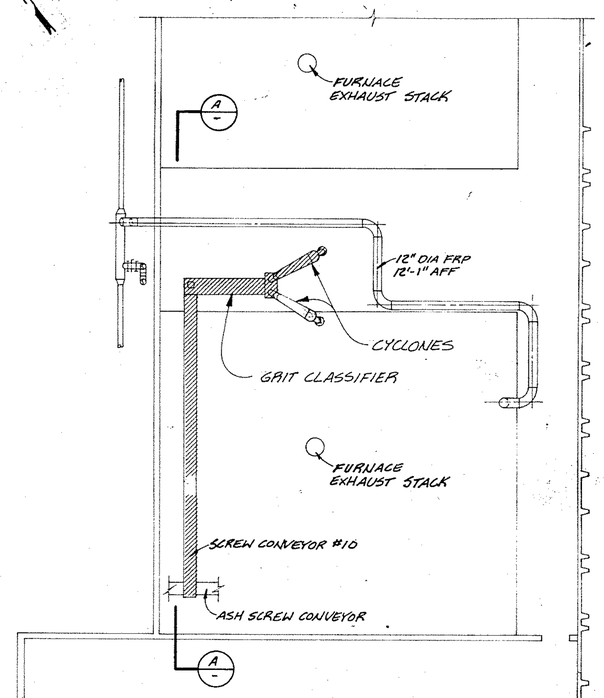
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1985 BRUCE R. WILLEY

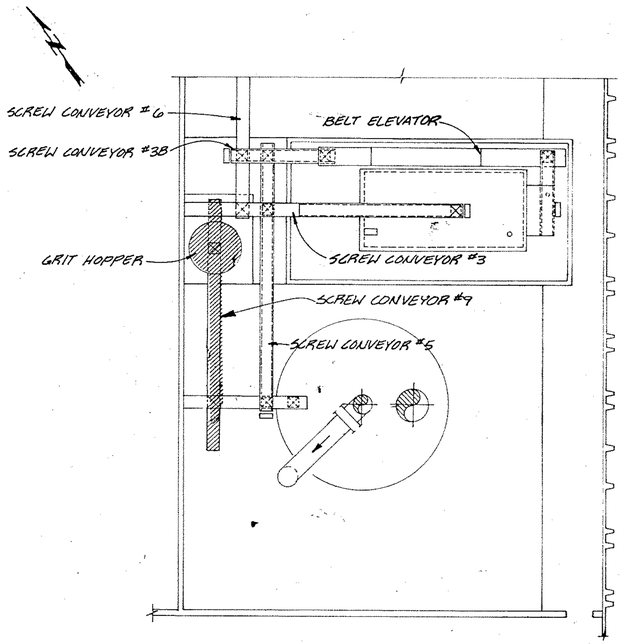
AS RECORDED DRAWINGS

Sheet Number: 419



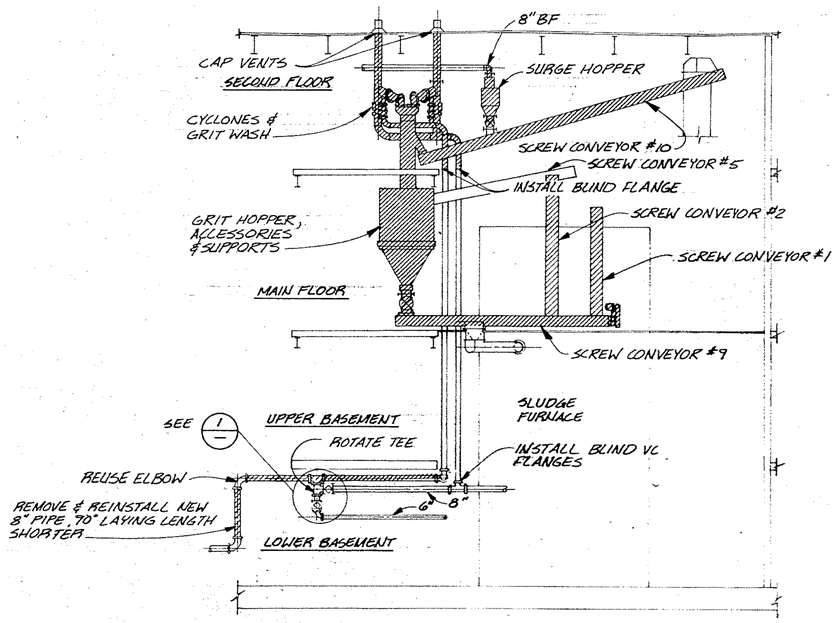
INCINERATOR BUILDING SECOND FLOOR PLAN

SCALE: 1/8" = 1'-0"



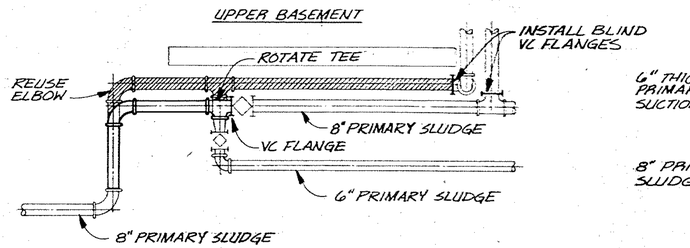
INCINERATOR BUILDING MAIN FLOOR PLAN

SCALE: 1/8" = 1'-0"



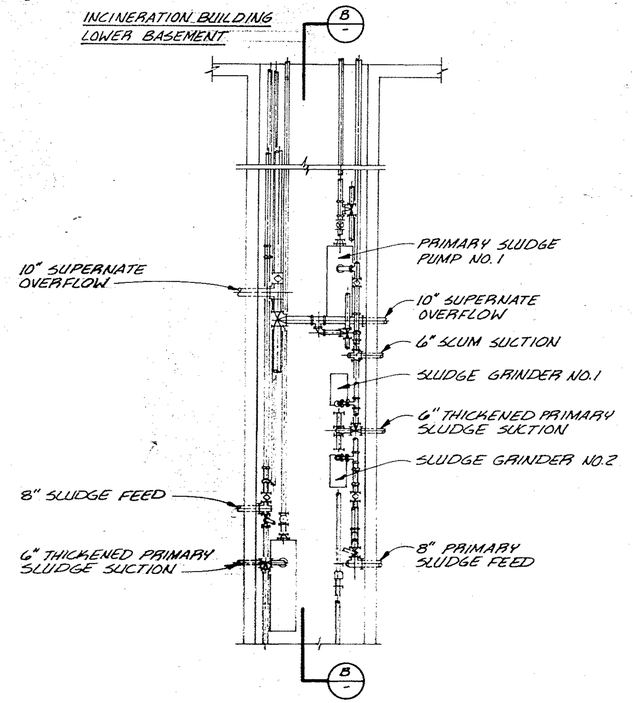
SECTION A

SCALE: 1/8" = 1'-0"



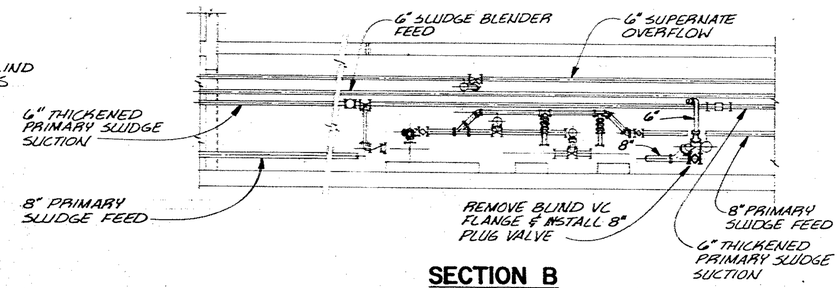
DETAIL 1

SCALE: 1/4" = 1'-0"



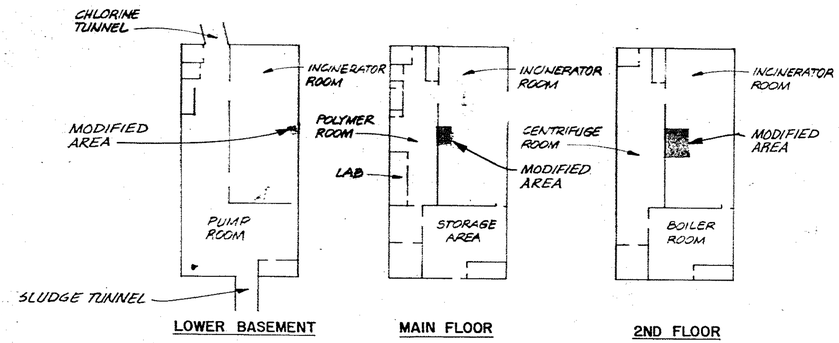
PARTIAL PLAN OF SLUDGE TUNNEL

SCALE: 1/8" = 1'-0"



SECTION B

SCALE: 1/8" = 1'-0"



KEY PLAN

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PRIMARY SLUDGE PIPING MODIFICATIONS-INCINERATION BUILDING

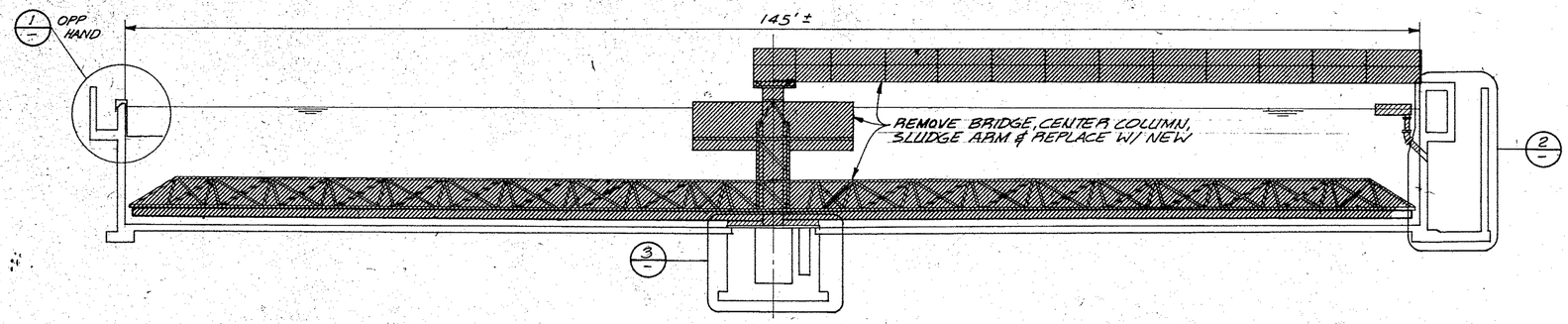
Designed JEK
Drawn RKB
Checked BRW
Approved
Date MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

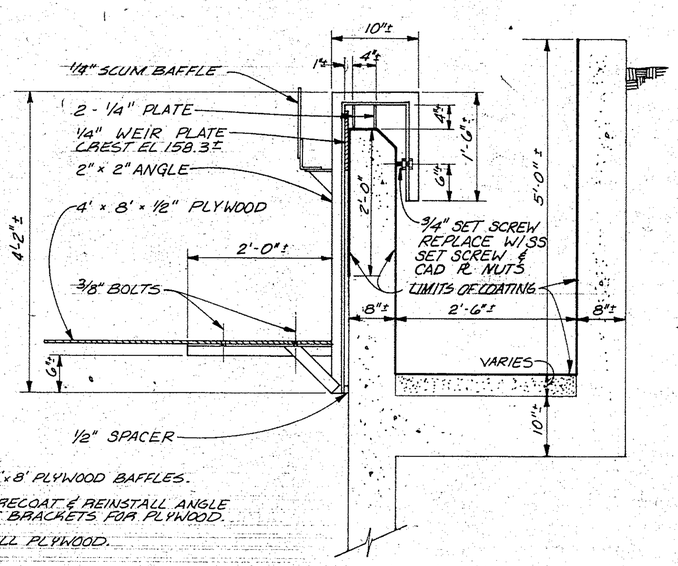
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17, 1986 BRUCE R. WILLEY

Sheet Number 420



SECONDARY CLARIFIER SECTION

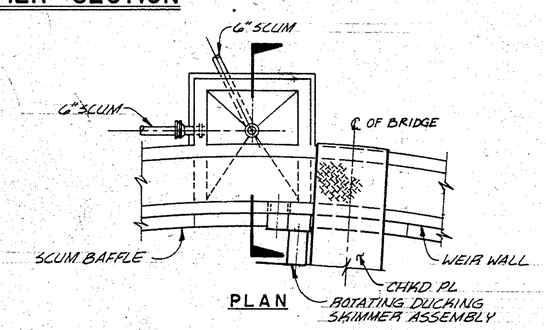
SCALE: 1/8" = 1'-0"



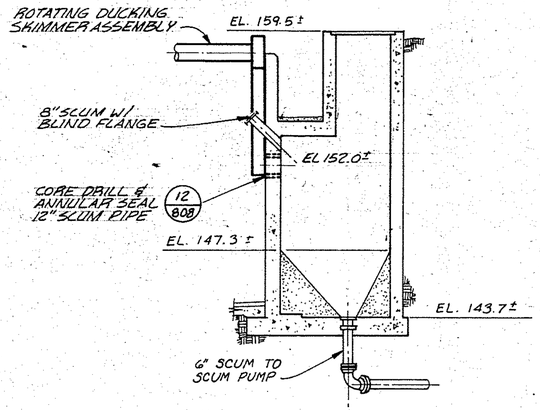
NOTES:
1. REMOVE 4'x8' PLYWOOD BAFFLES.
2. REMOVE, RECOAT & REINSTALL ANGLE SUPPORT BRACKETS FOR PLYWOOD.
3. REINSTALL PLYWOOD.

DETAIL 1

SCALE: 1" = 1'



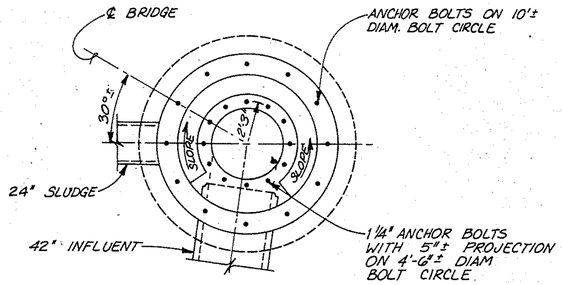
PLAN



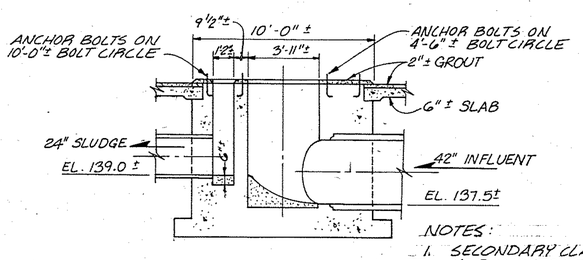
SECTION

SCUM PIT DETAIL 2

SCALE: 1/4" = 1'-0"



PLAN



NOTES:
1. SECONDARY CLARIFIER NO. 1 SHOWN, NO. 2 IS OPPOSITE HAND.
2. ALL ANCHOR BOLTS ARE EXISTING, IF BROKEN OFF DURING DEMOLITION, USE EPOXY ANCHORS.

SECTION

CENTER PIER DETAIL 3

SCALE: 1/4" = 1'-0"

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

SECONDARY CLARIFIERS-MODIFICATIONS

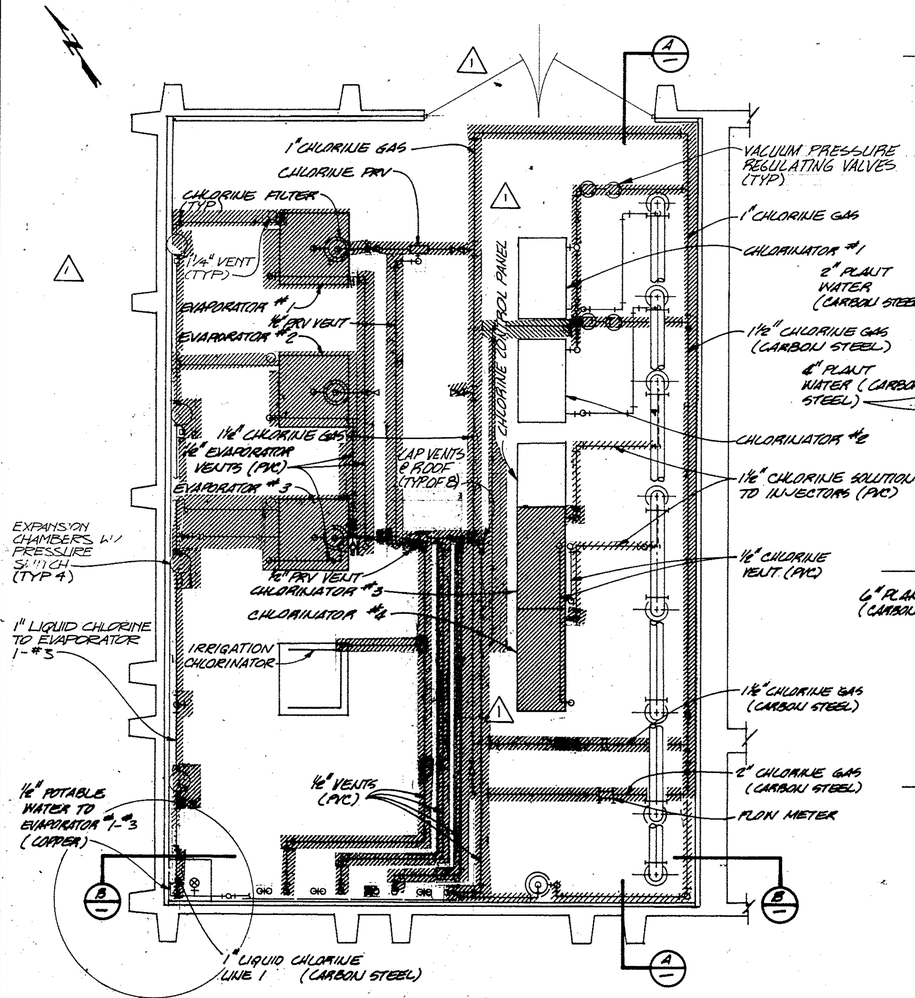
Designed: JEK
Drawn: CWA
Checked: BAW
Approved: John E. Hoch
Date: MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	APA	AS RECORDED DRAWING	12/9/92

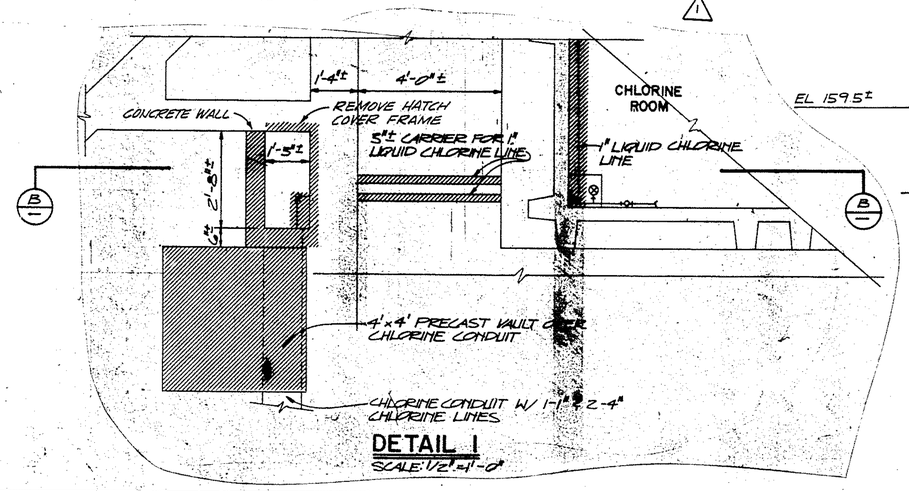
REGISTERED PROFESSIONAL ENGINEER 13591 OREGON July 17, 1985 BRUCE R. WILLEY

Sheet Number: 501



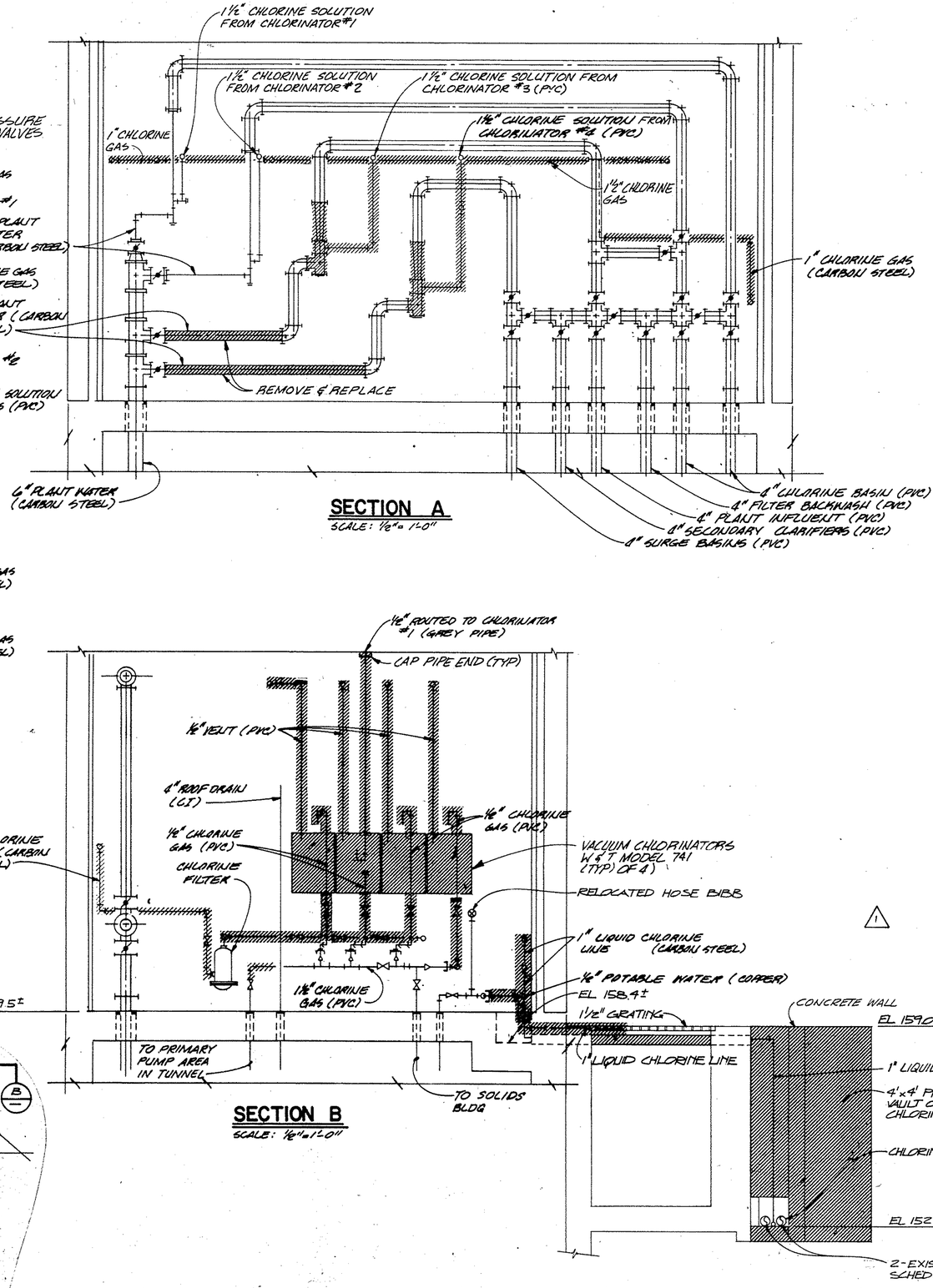
CONTROL BUILDING - CHLORINE ROOM PLAN

SCALE: 1/2"=1'-0"



DETAIL 1

SCALE: 1/2"=1'-0"



SECTION A

SCALE: 1/2"=1'-0"

SECTION B

SCALE: 1/2"=1'-0"

2 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

CHLORINATION FACILITIES - DEMOLITION

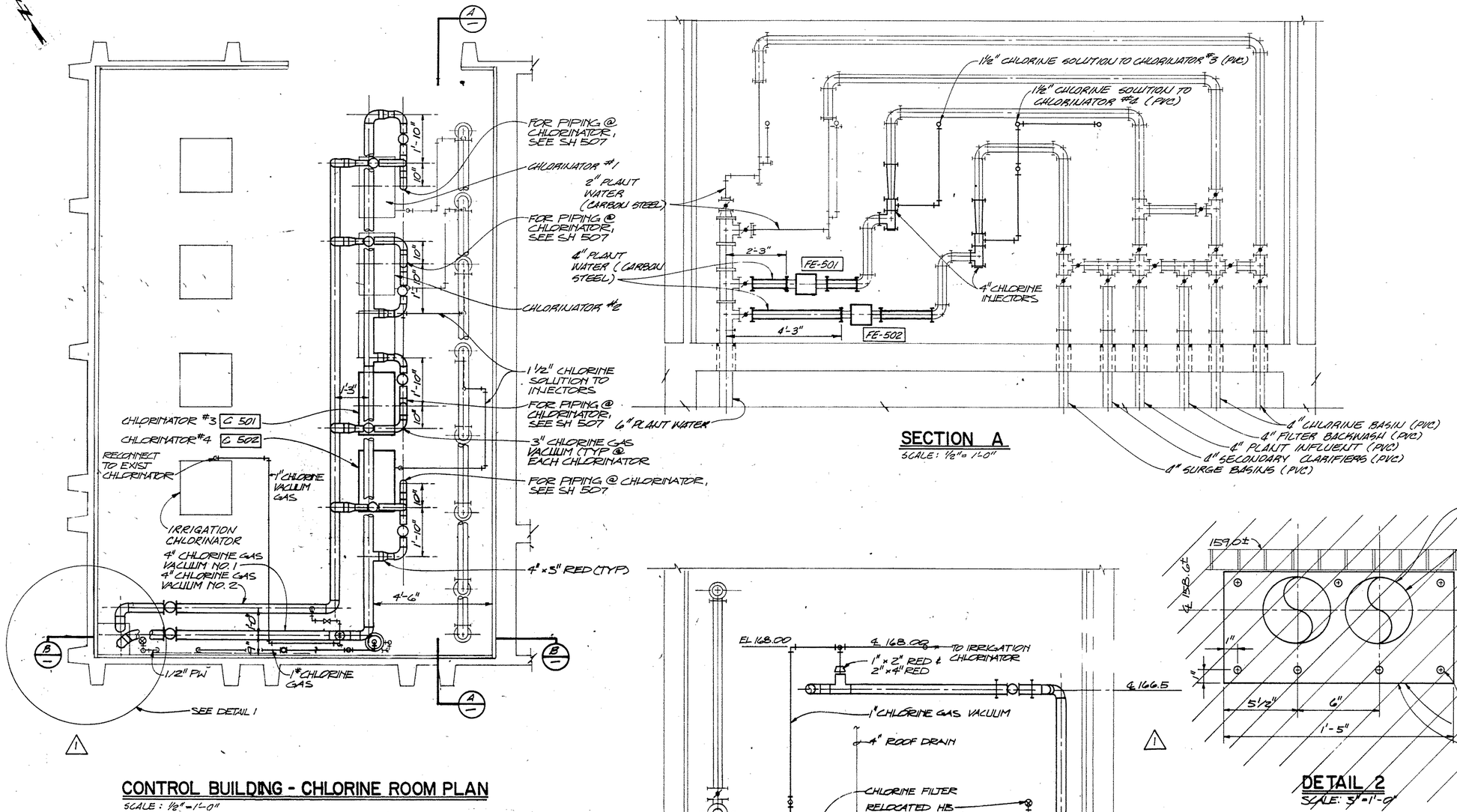
Designed	JEK
Drawn	SDB
Checked	BRW
Approved	John E Hoch
Date	MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92
2		ADDENDUM NO.1	6-27-89

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 12, 1985 BRUCE R. WALLEY

Sheet Number 502

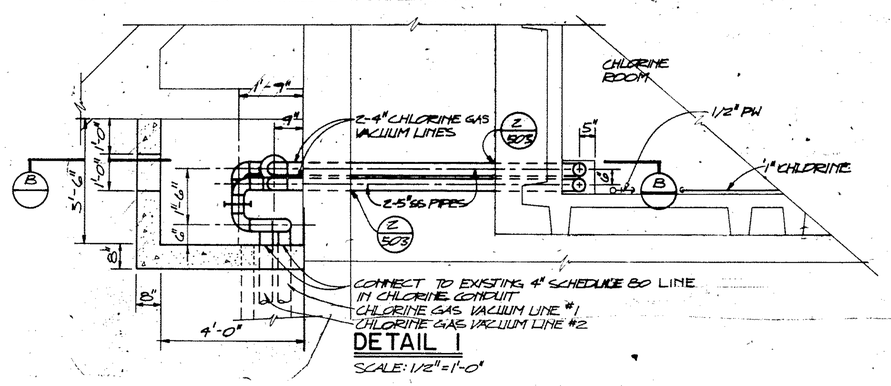


CONTROL BUILDING - CHLORINE ROOM PLAN

SCALE: 1/2"=1'-0"

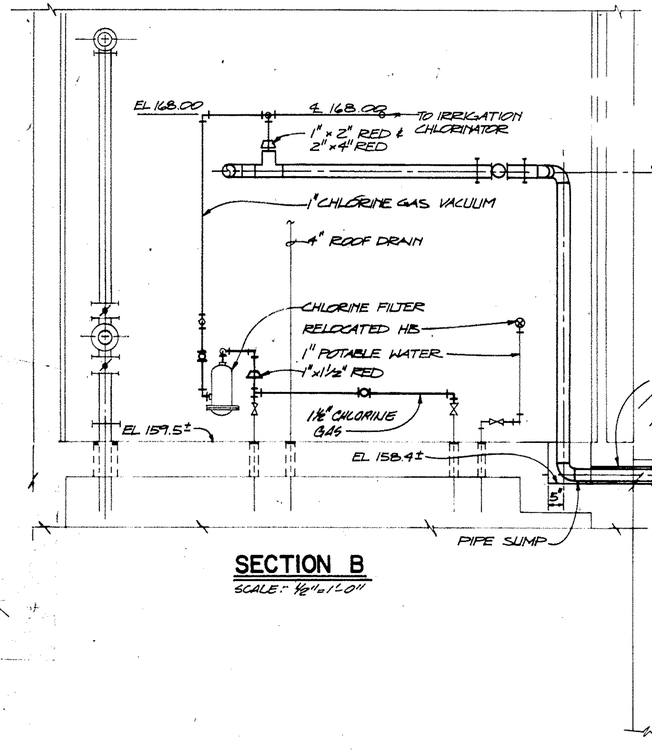
SECTION A

SCALE: 1/2"= 1'-0"



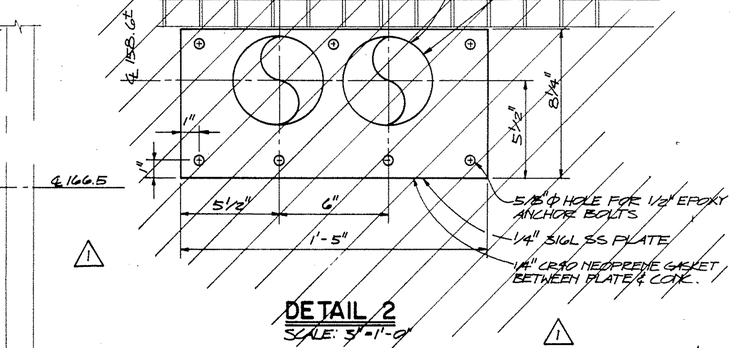
DETAIL 1

SCALE: 1/2"=1'-0"



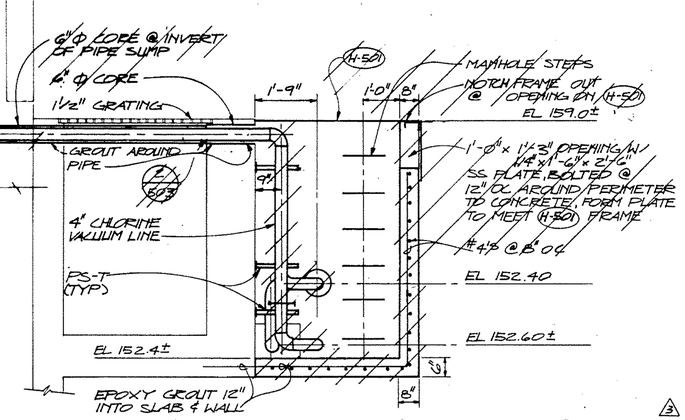
SECTION B

SCALE: 1/2"=1'-0"



DETAIL 2

SCALE: 3"=1'-0"



AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

CHLORINATION FACILITIES - IMPROVEMENTS

Designed JEK
Drawn SDS
Checked BAW
Approved John E. Kloch
Date MAY 1987

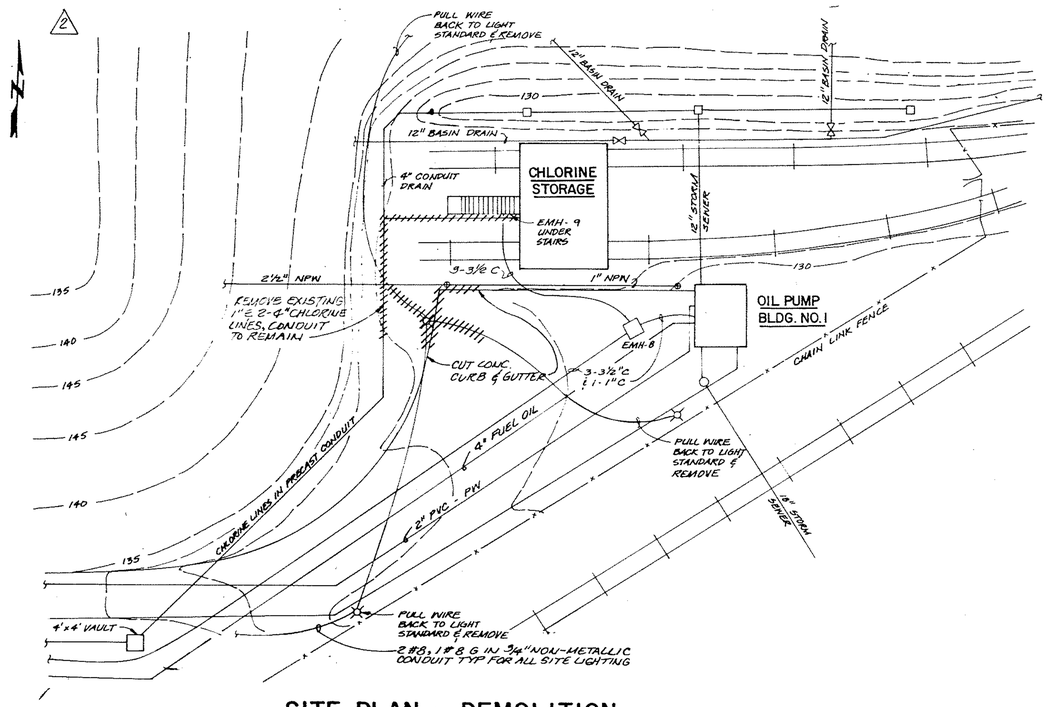
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	ADDENDUM NO.1	6-27-88
2	AFA	CORE # 72	12/11/92
3		AS RECORDED DRAWING	12/9/96

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1985 BRUCE R. WILLEY

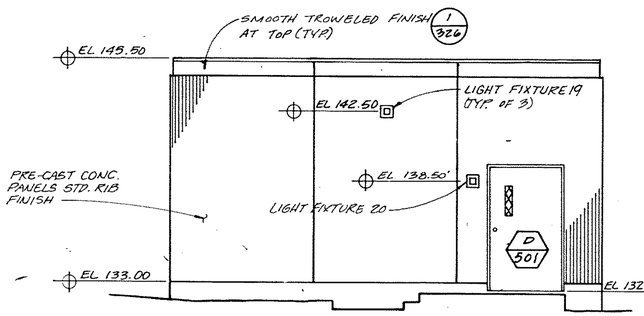
Sheet Number 503

SR 904



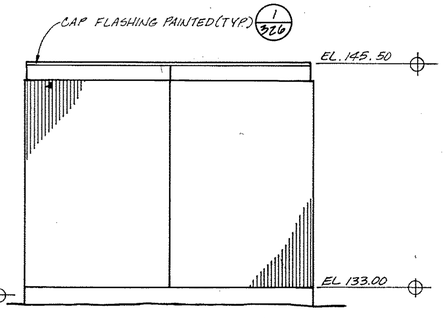
SITE PLAN - DEMOLITION

SCALE: 1" = 20'-0"



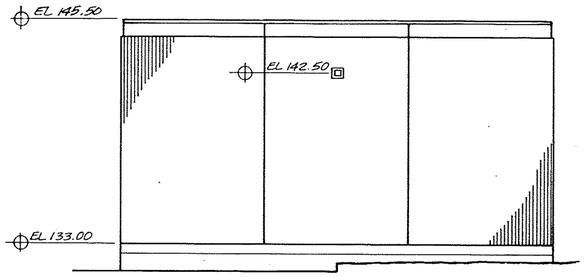
SOUTH ELEVATION

SCALE: 1/4" = 1'-0"



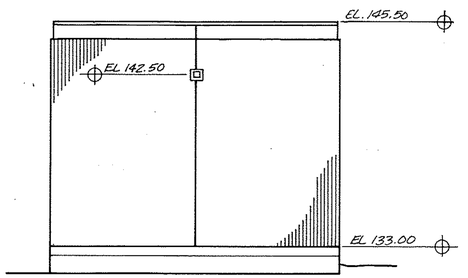
EAST ELEVATION

SCALE: 1/4" = 1'-0"



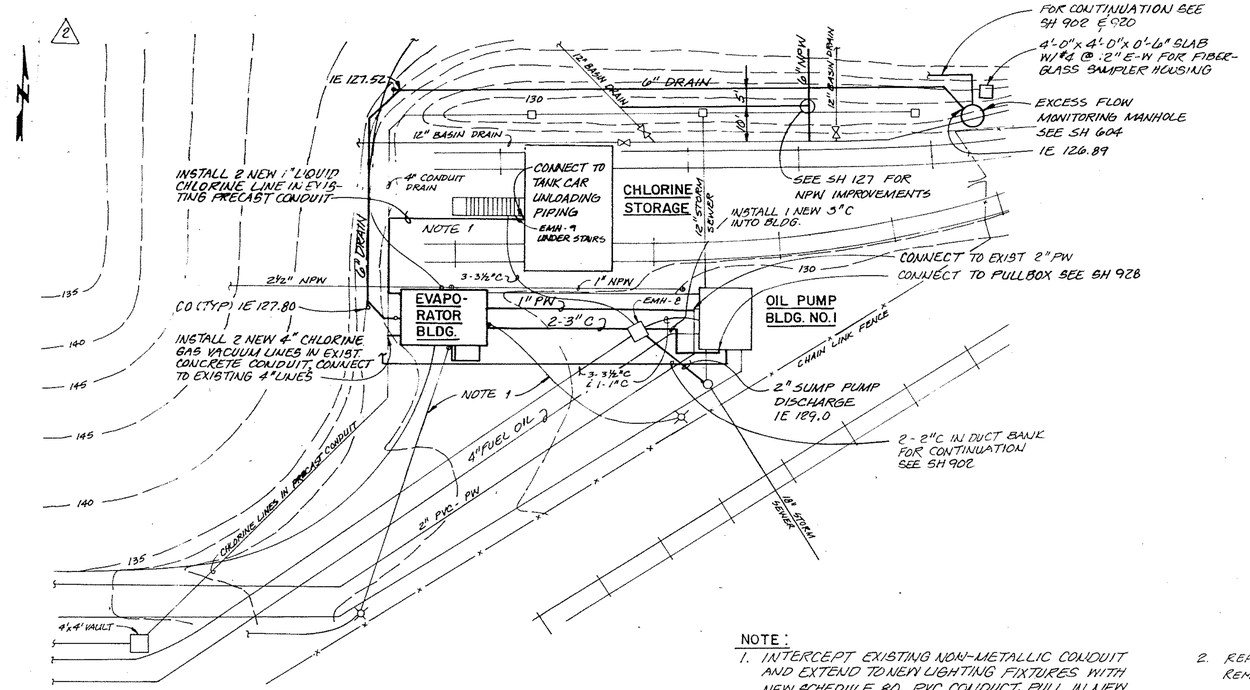
NORTH ELEVATION

SCALE: 1/4" = 1'-0"



WEST ELEVATION

SCALE: 1/4" = 1'-0"



SITE PLAN - IMPROVEMENTS

SCALE: 1" = 20'

NOTE:

1. INTERCEPT EXISTING NON-METALLIC CONDUIT AND EXTEND TO NEW LIGHTING FIXTURES WITH NEW SCHEDULE 80, PVC CONDUCT, PULL IN NEW 2#8, 1#8 G COPPER WIRE AND CONNECT TO NEW FIXTURE, SEE SHEET 928 FOR WIRING BETWEEN NEW FIXTURES.
2. REPAIR CURB AND GUTTER DAMAGED OR REMOVED TO ORIGINAL CONDITION OR BETTER.

B
AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

EVAPORATOR BLDG SITE PLANS AND ELEVATIONS

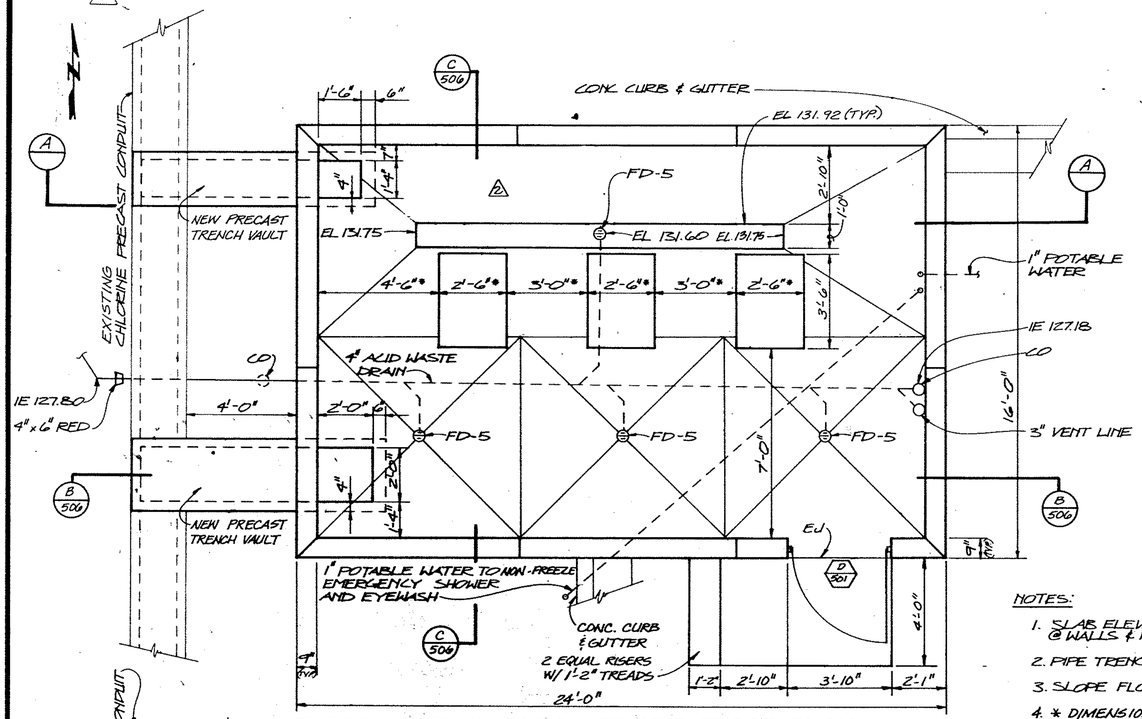
Designed JEK
Drawn LLB
Checked BRW
Approved
Date JUNE, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	JEK	ADDENDUM NO.1	6-27-89
2	JEK	ADDENDUM NO.2	6-30-89
3	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17, 1985 BRUCE R. WILLE

Sheet Number
504

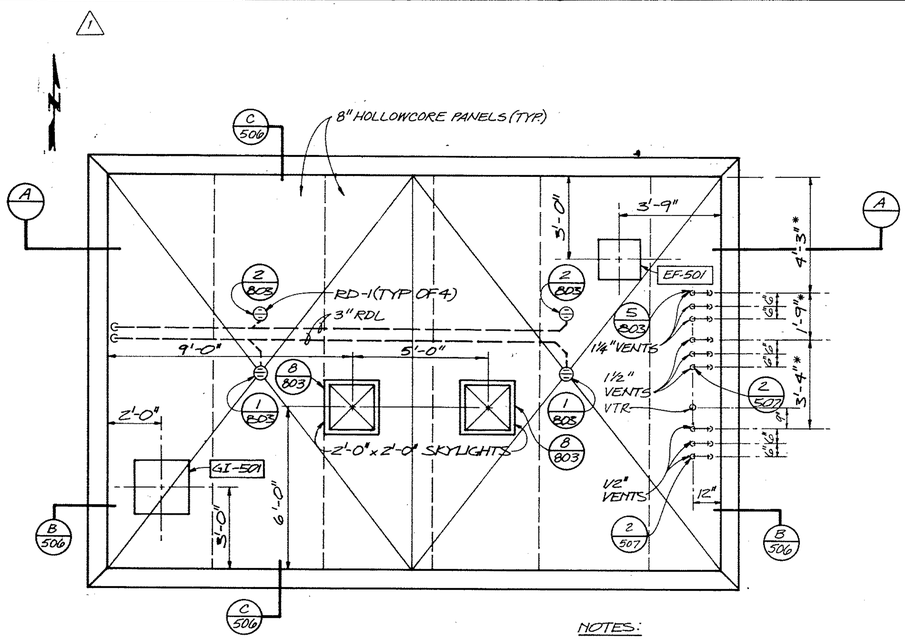


EVAPORATOR BUILDING – GROUND FLOOR PLAN

SCALE: 3/8" = 1'-0"

NOTES:

1. SLAB ELEVATION VARIES FROM 132.50 @ WALLS & RIDGES TO 132.42 @ FLOOR DRAINS
2. PIPE TRENCH ELEVATIONS AS SHOWN
3. SLOPE FLOOR DRAINS @ 1/4"/FT
4. * DIMENSIONS DETERMINED BY DIMENSIONS OF EQUIPMENT SUPPLIED.

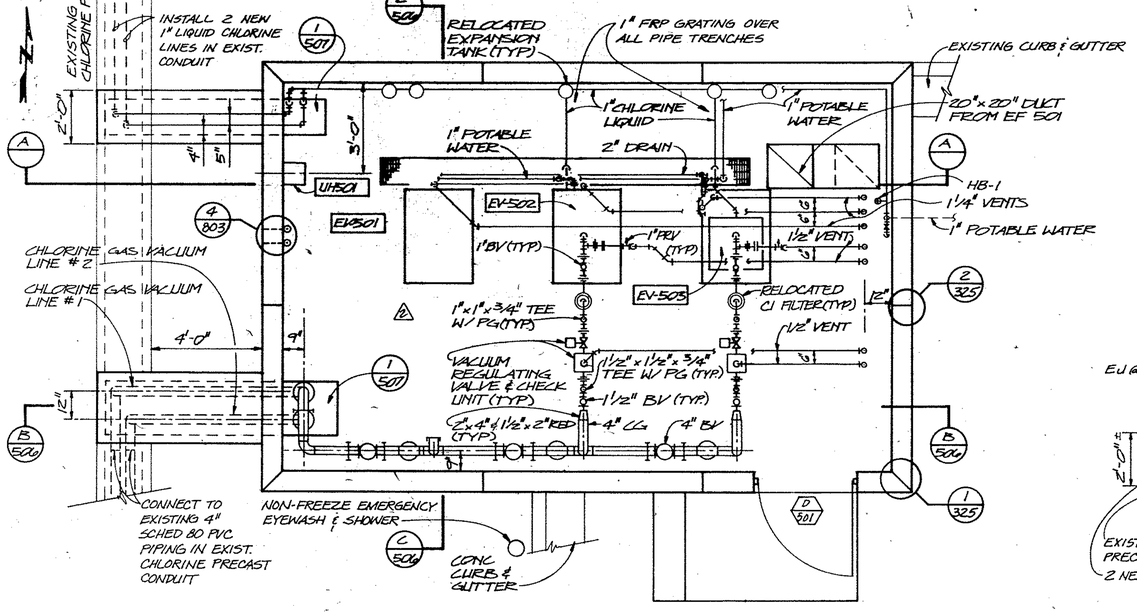


EVAPORATOR BUILDING – ROOF PLAN

SCALE: 3/8" = 1'-0"

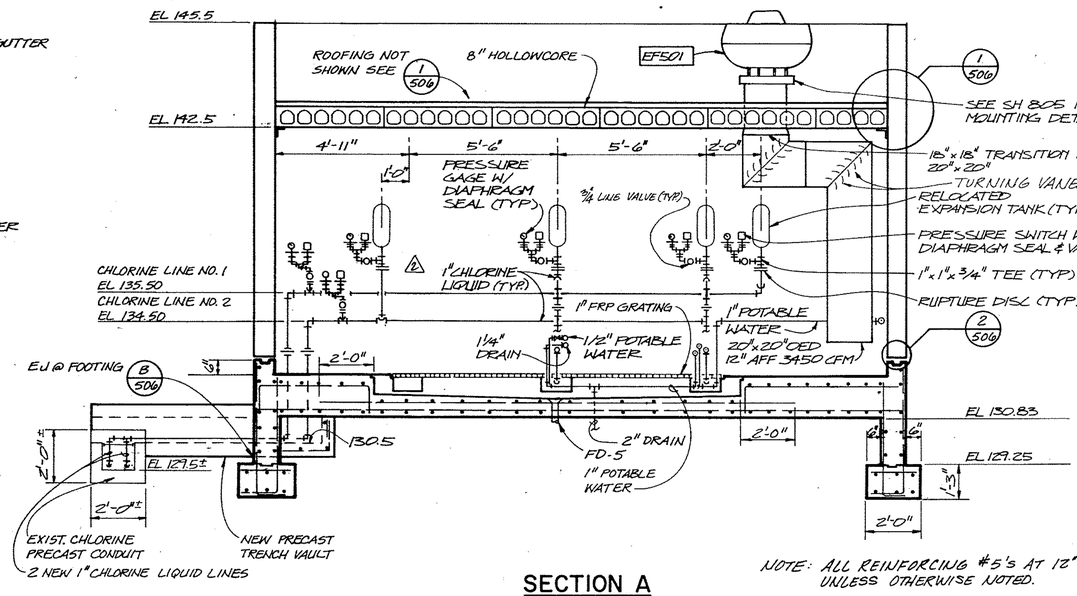
NOTES:

1. ROOF ELEVATION VARIES FROM 144.12 @ WALLS AND RIDGES TO 144.00 @ ROOF DRAINS
2. SLOPE RDL'S @ 1/4"/FT



EVAPORATOR BUILDING – PIPING AND EQUIPMENT FLOOR PLAN

SCALE: 3/8" = 1'-0"



SECTION A

SCALE: 3/8" = 1'-0"

NOTE: ALL REINFORCING #5's AT 12" UNLESS OTHERWISE NOTED.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

EVAPORATOR BLDG PLANS AND SECTIONS

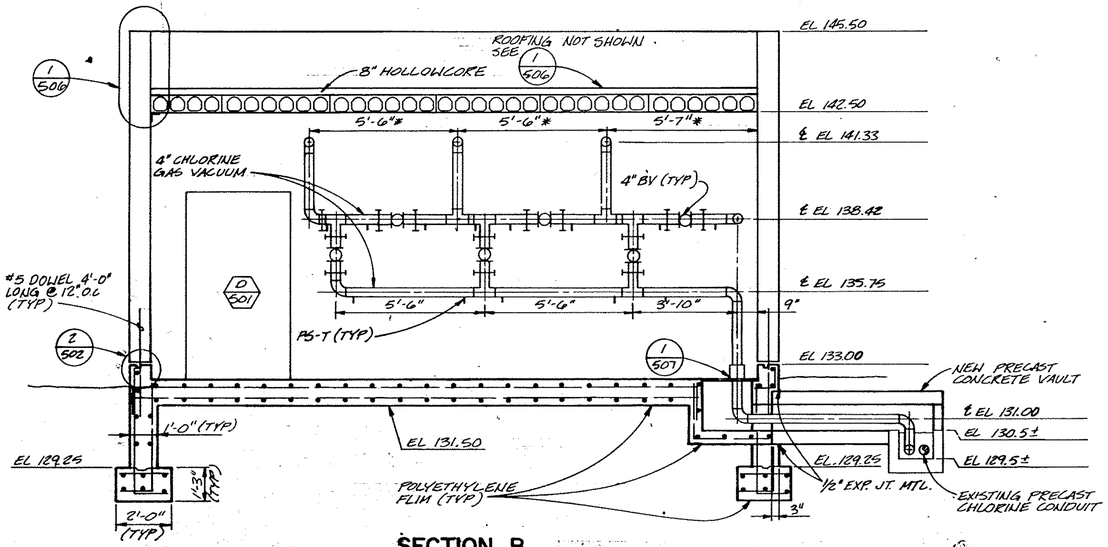
Designed: JEK
Drawn: VAP
Checked: BRW
Approved: John E. Koch
Date: JUNE 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	JEK	ADDENDUM NO.1	11/21/91
2	AFA	CPE # 66.100	12/17/92
3	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1986 BRUCE R. WILLEY

Sheet Number: 505

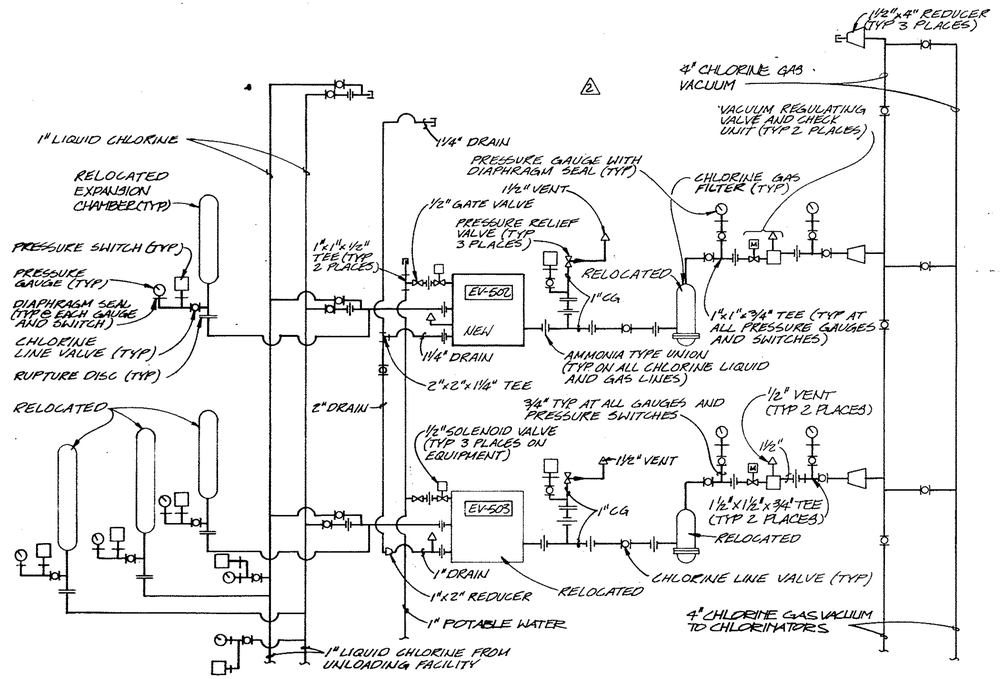


SECTION B

SCALE: 3/8" = 1'-0"

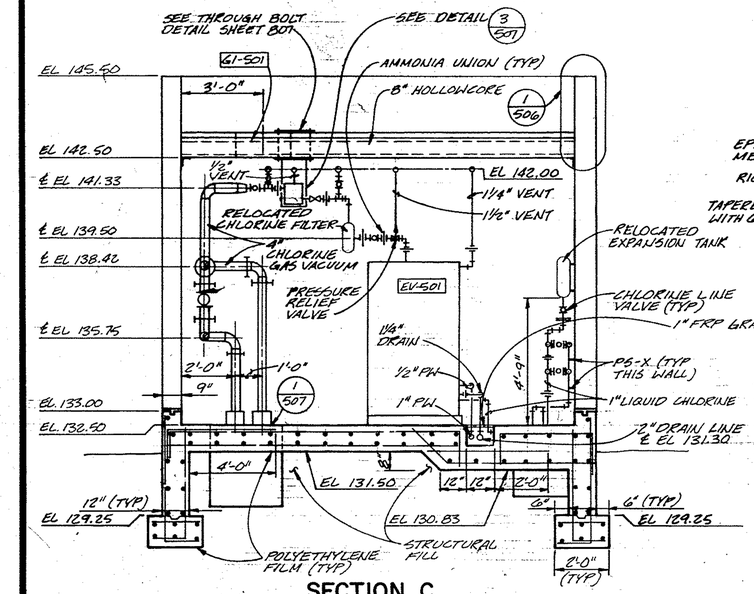
NOTES:

1. ALL REINFORCING TO BE #5 AT 12" OC EACH WAY UNLESS SHOWN OTHERWISE.
2. SLAB ELEVATION VARIES FROM 132.50 AT WALLS AND RIDGES TO 132.42 AT DRAINS.
3. ROOF ELEVATION VARIES FROM 144.12 AT WALLS AND RIDGES TO 144.00 AT DRAINS.
4. ALL REINFORCING #5's AT 12" UNLESS OTHERWISE NOTED.



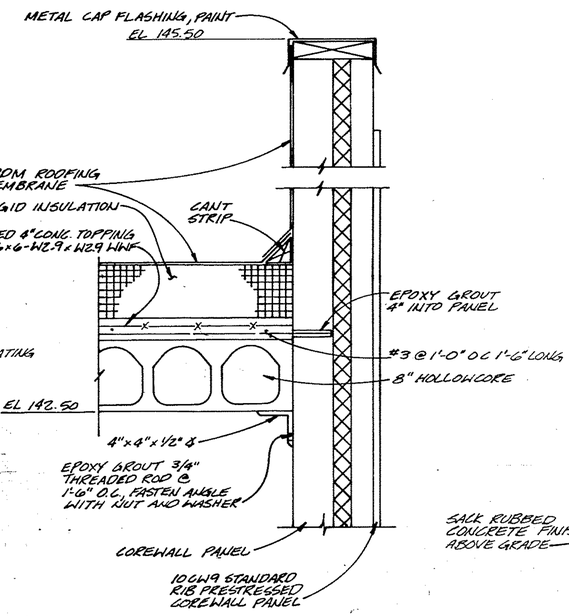
CHLORINE SCHEMATIC AT EVAPORATORS

NO SCALE



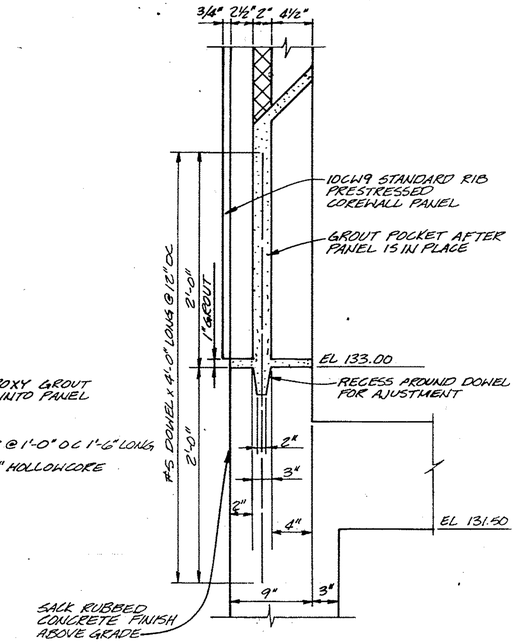
SECTION C

SCALE: 3/8" = 1'-0"



DETAIL 1

NTS



DETAIL 2

SCALE: 1½" = 1'-0"

3 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

EVAPORATOR BLDG SECTIONS AND DETAILS

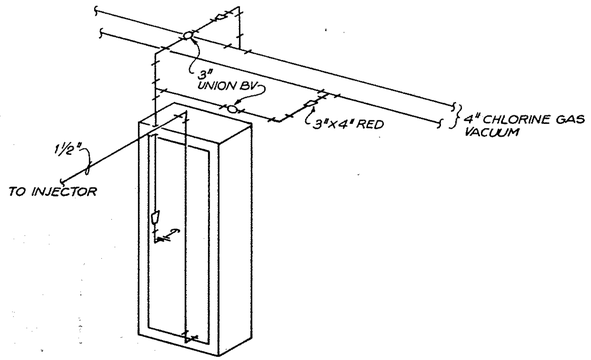
Designed	JEK
Drawn	CWA
Checked	ERW
Approved	John E. Hoch
Date	JUNE 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

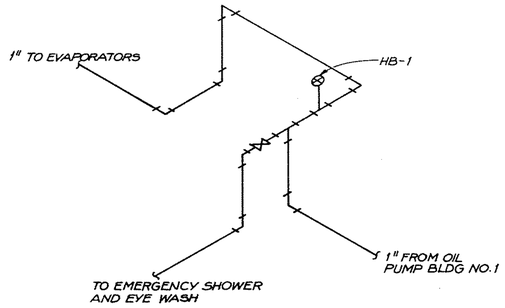
No	By	Revision	Date
1	JEK	ADDENDUM NO.1	9-27-89
2	AFA	CCR#46	8/7/92
3	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1989 BRUCE R. WILLEY

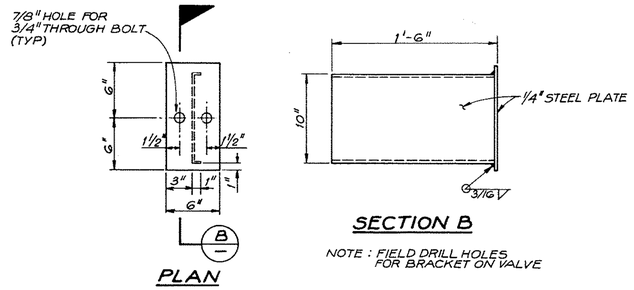
Sheet Number 506



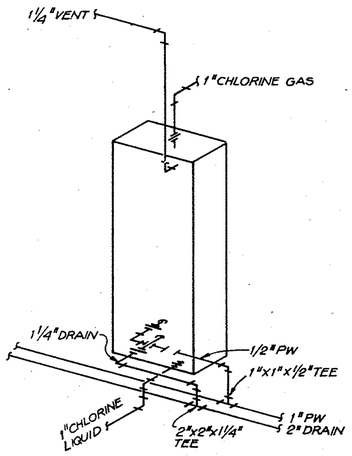
CHLORINATION PIPING SCHEMATIC



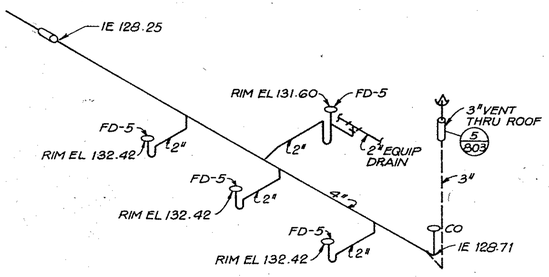
POTABLE WATER PIPING SCHEMATIC



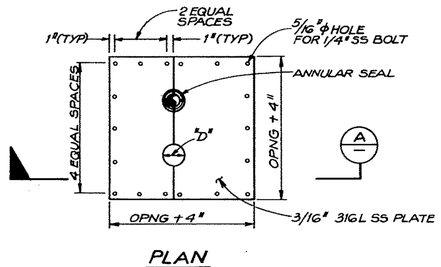
DETAIL 3
VACUUM REGULATING VALVE AND CHECKUNIT MOUNTING BRACKET
SCALE : 1½"=1'-0"



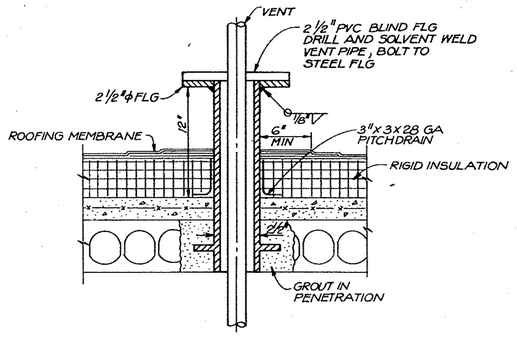
TYPICAL EVAPORATOR PIPING SCHEMATIC



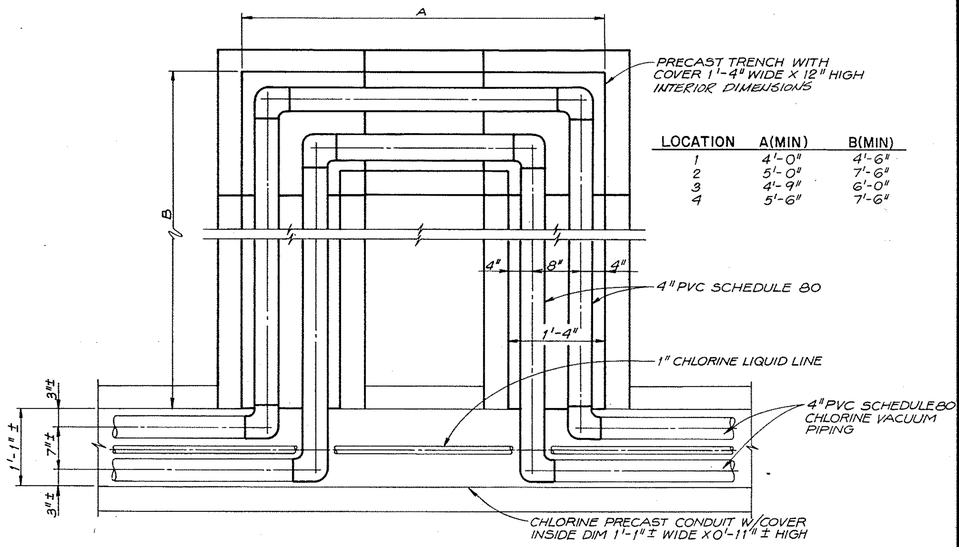
EVAPORATOR BUILDING DRAINAGE SCHEMATIC



DETAIL 1 – VAULT COVERS.
NTS



DETAIL 2 – VENT PENETRATION
NTS



DETAIL 4
EXPANSION CONNECTIONS FOR 4" CHLORINE VACUUM LINE
NTS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

EVAPORATOR BLDG DETAILS AND SCHEMATICS

Designed JEK
Drawn IKD
Checked BRW
Approved John E. Koch
Date JUNE 1989

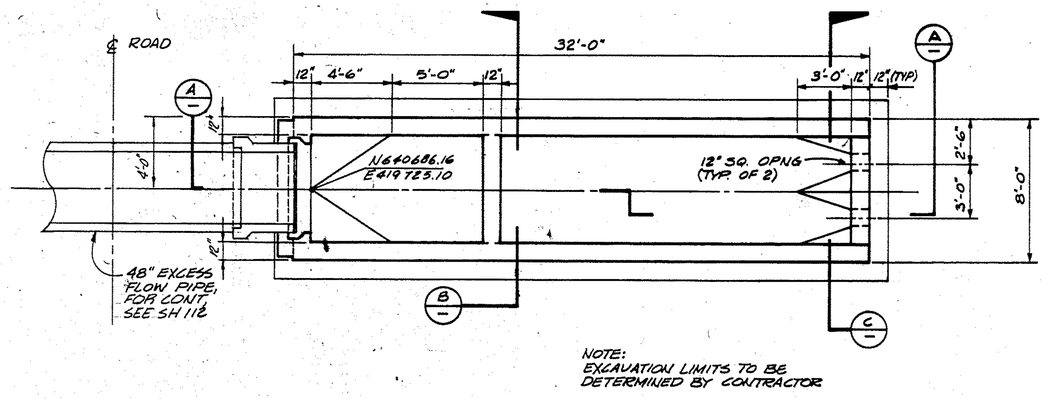
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	JEK	ADDENDUM NO.1	6-27-89
2	AFA	AS RECORDED DRAWING	12-19-92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1985 BRUCE R. WILLEY

2 AS RECORDED DRAWINGS

Sheet Number 507



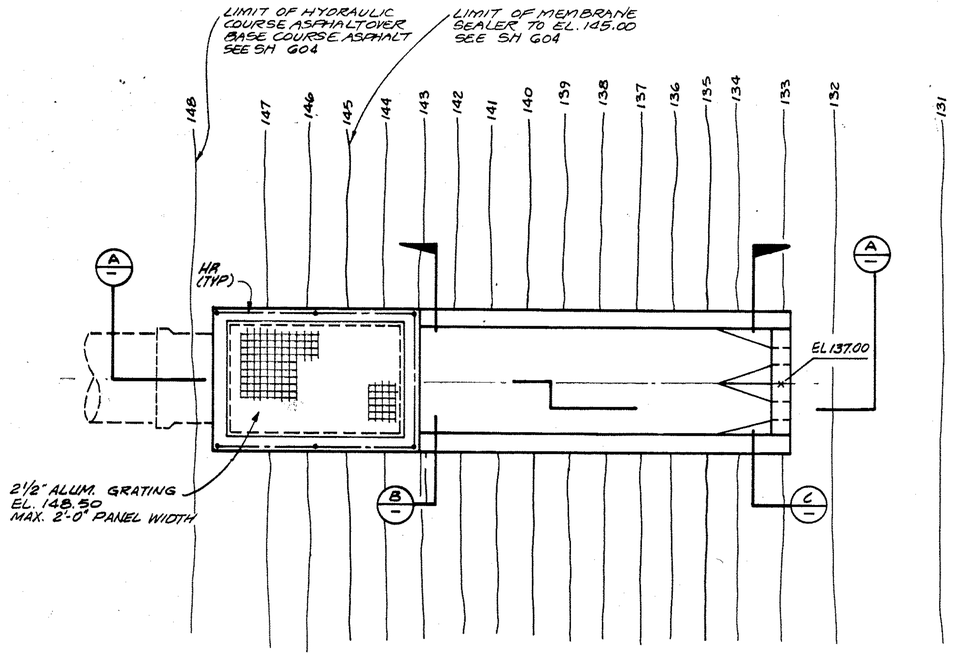
NOTE:
EXCAVATION LIMITS TO BE DETERMINED BY CONTRACTOR

SURGE BASIN INFLUENT STRUCTURE - SECTIONAL PLAN

SCALE: 1/4"=1'-0"

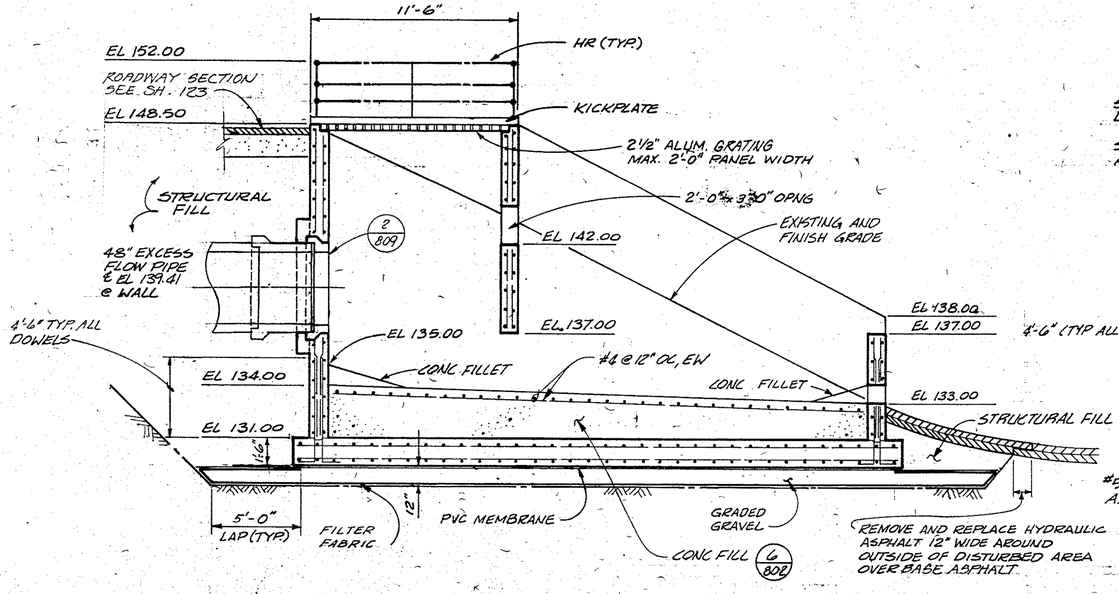
GENERAL NOTES:
ALL REINFORCING TO BE #5 @ 12" OC UNLESS OTHERWISE NOTED.

RCP WALL FITTINGS SHOWN. ACTUAL TYPE OF WALL FITTING TO BE USED WILL DEPEND ON TYPE OF PIPE SUPPLIED.



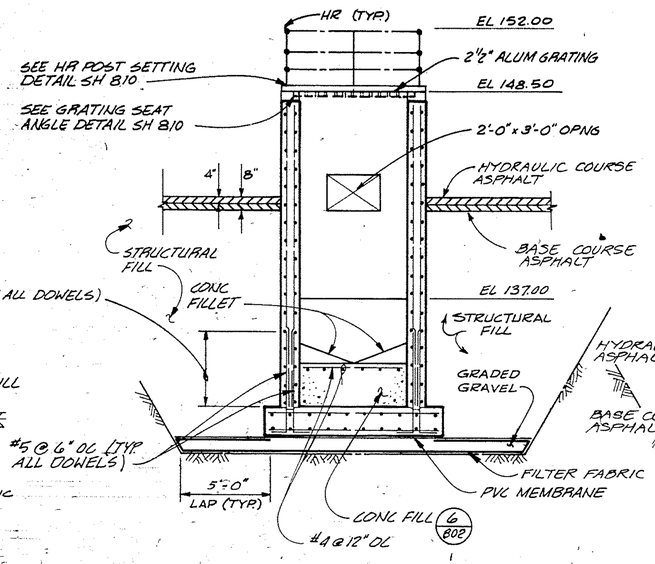
SURGE BASIN INFLUENT STRUCTURE - UPPER PLAN

SCALE: 1/4"=1'-0"



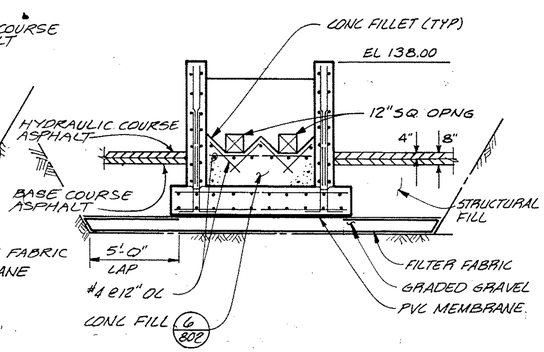
SECTION A

SCALE: 1/4"=1'-0"



SECTION B

SCALE: 1/4"=1'-0"



SECTION C

SCALE: 1/4"=1'-0"

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

SURGE BASIN-INFLUENT STRUCTURE

Designed	AHK, DKT
Drawn	CWA
Checked	BRW
Approved	John E. Hacket
Date	MAY, 1989

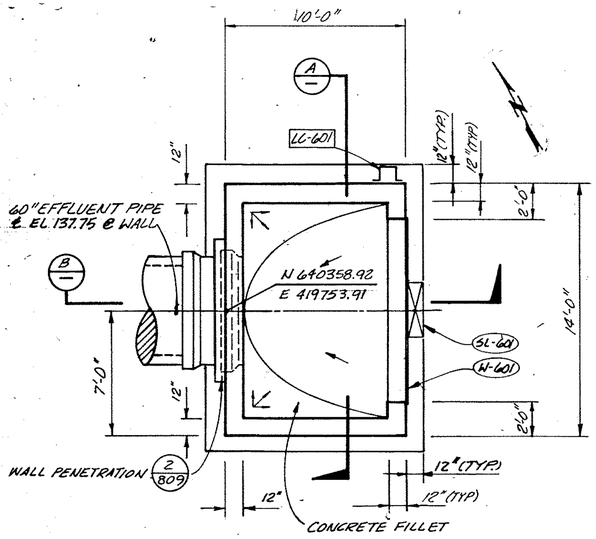
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1986 BRUCE R. WILLEY

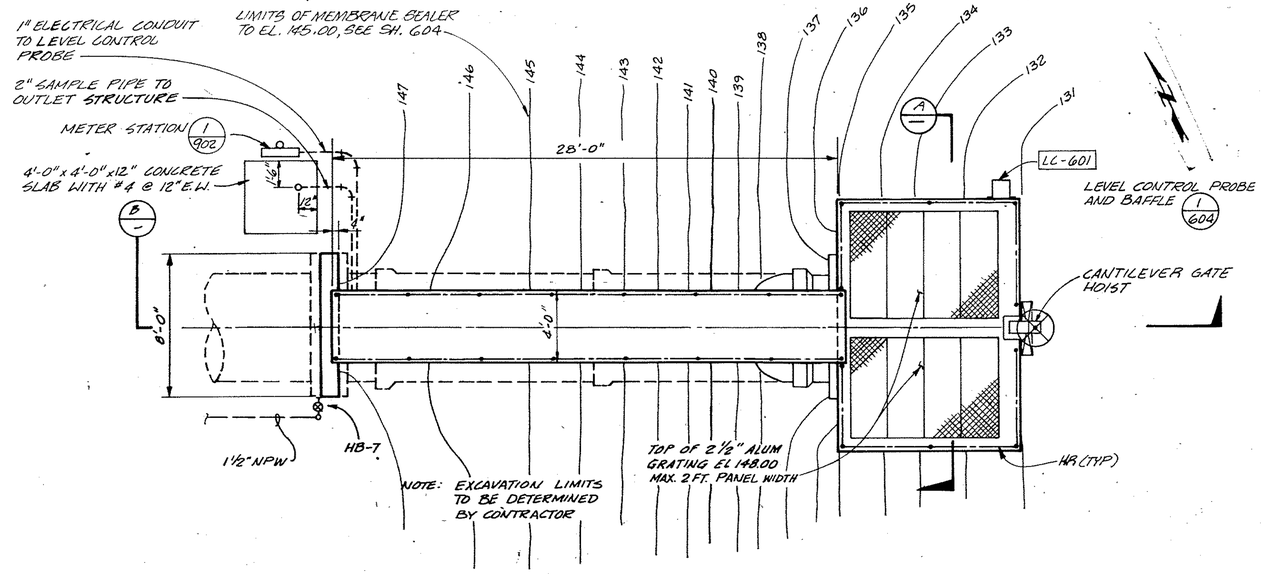
Sheet Number 601

SR 904



FLOOR PLAN

SCALE : 1/4"=1'-0"



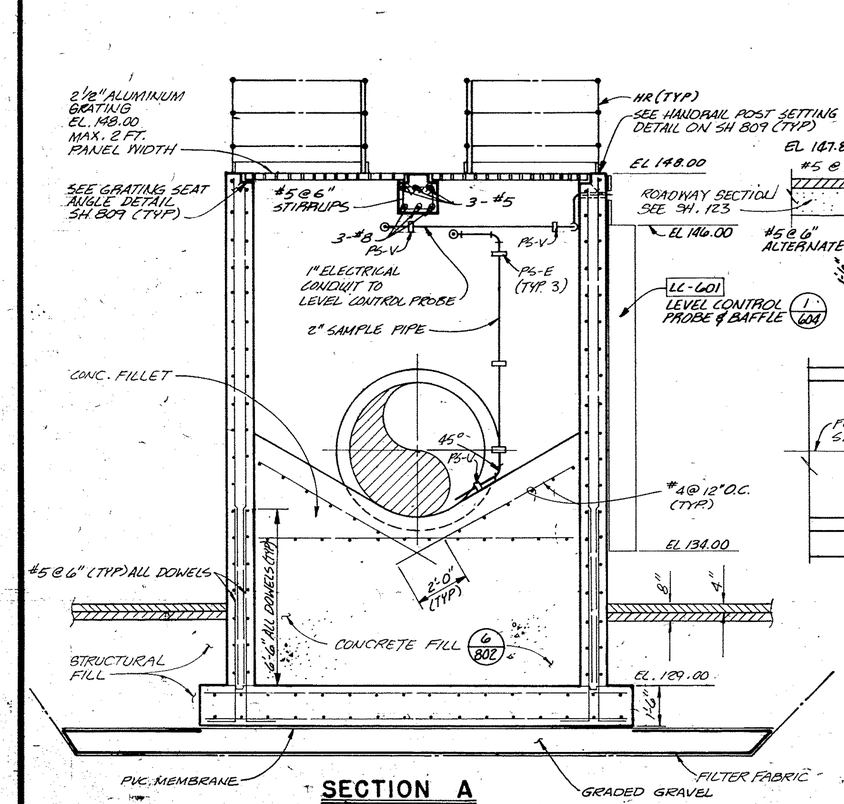
ROOF PLAN

SCALE : 1/4"=1'-0"

GENERAL NOTES:

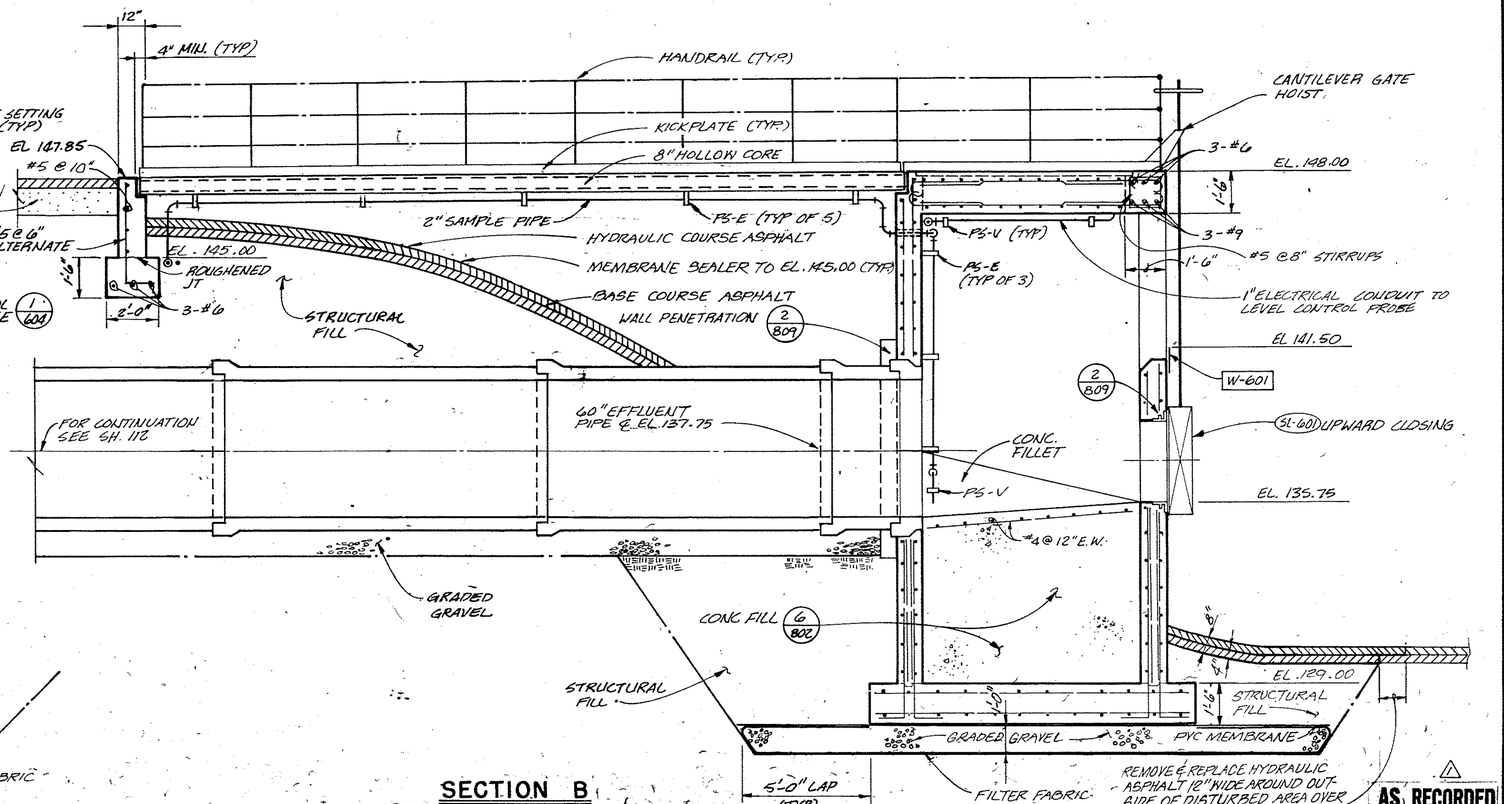
ALL REINFORCING SHALL BE #5 @ 12" OC UNLESS OTHERWISE NOTED.

RCP WALL FITTING SHOWN. ACTUAL TYPE OF WALL FITTING TO BE USED WILL DEPEND ON TYPE OF PIPE SUPPLIED.



SECTION A

SCALE : 3/8"=1'-0"



SECTION B

SCALE : 3/8"=1'-0"

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

SURGE BASIN - OUTLET STRUCTURE

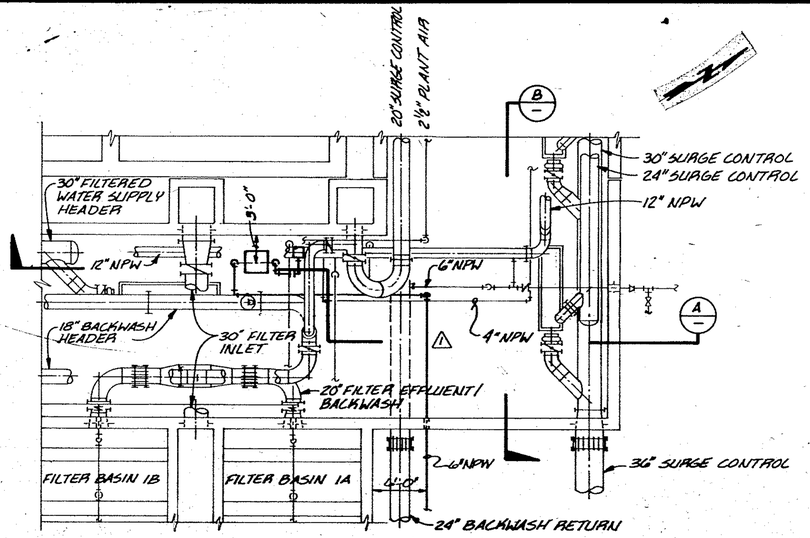
Designed: AHK, DKT
Drawn: MJ, CWA
Checked: BRW
Approved: John Ethock
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

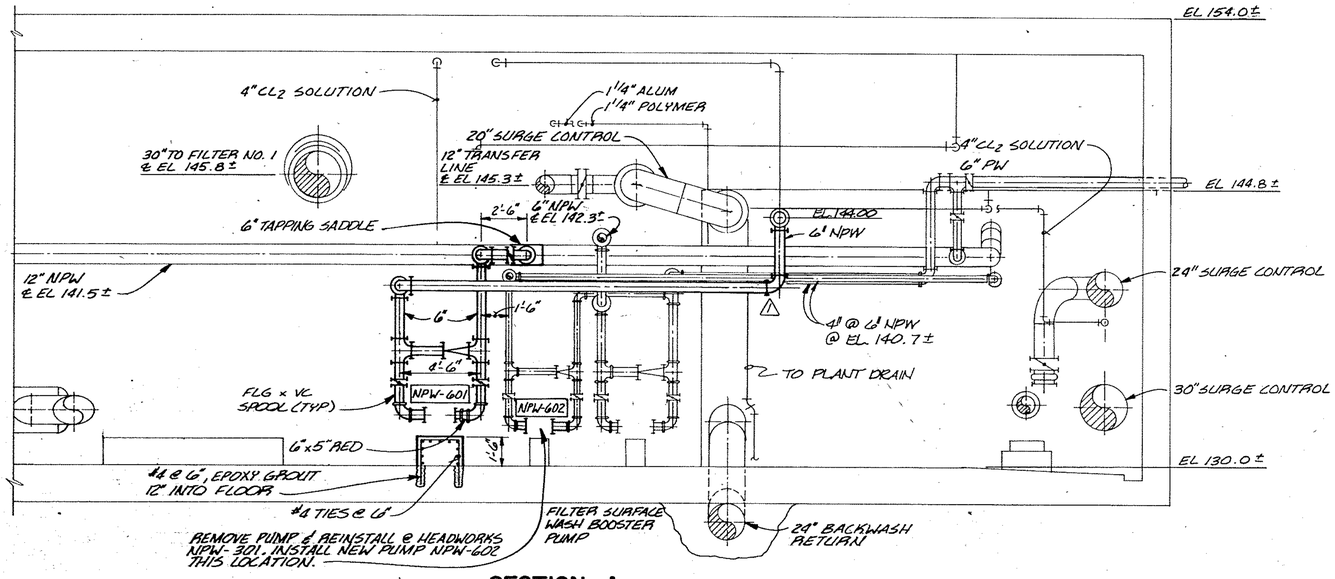
REGISTERED PROFESSIONAL ENGINEER 13291 OREGON JULY 17, 1986 BRUCE R. WILLEY

Sheet Number 602



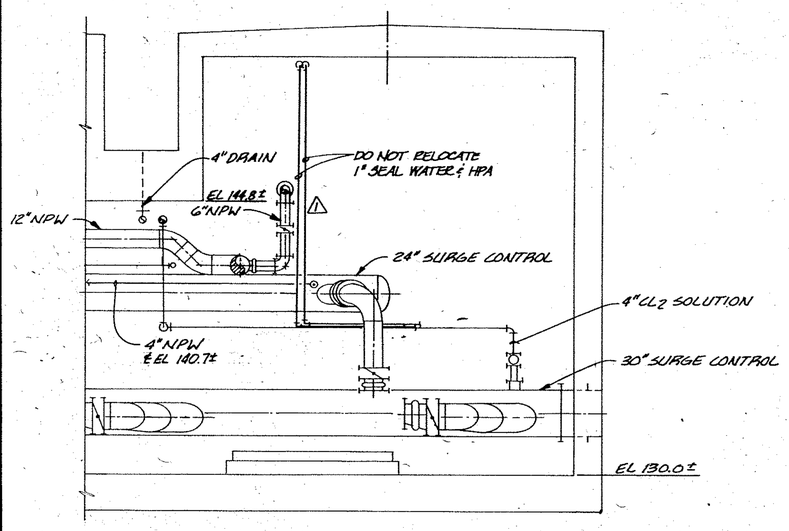
FILTER AREA TUNNEL PLAN

SCALE: 1/8" = 1'-0"



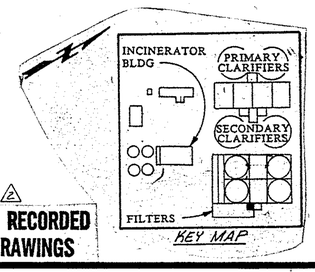
SECTION A

SCALE: 1/4" = 1'-0"



SECTION B

SCALE: 1/4" = 1'-0"



2 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

FILTER AREA TUNNEL PLAN

Designed: JEK
Drawn: CWA
Checked: BRW
Approved: John Eftock
Date: MAY 1989

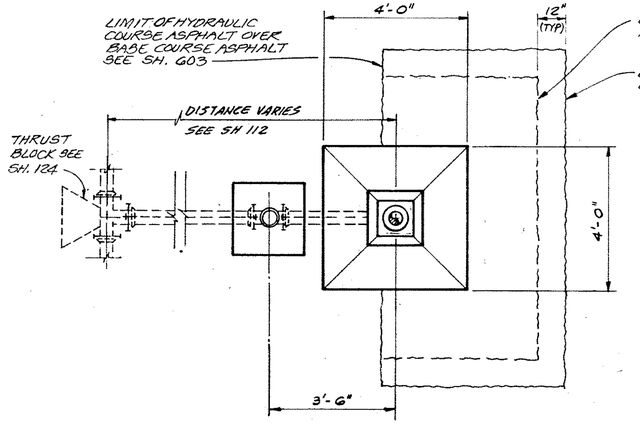
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	AFA	CPZ # 56 AS RECORDED DRAWING	12/9/92
1	AFA		12/9/92

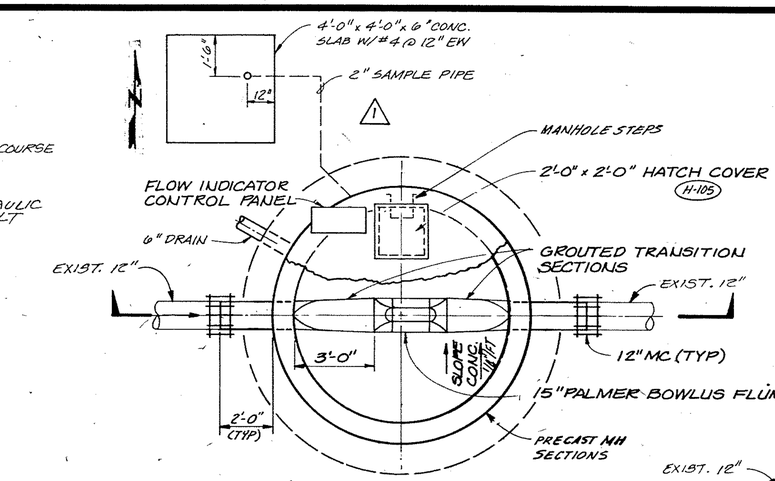
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17 1985 BRUCE R. WILLEY

Sheet Number: 603

SR 904



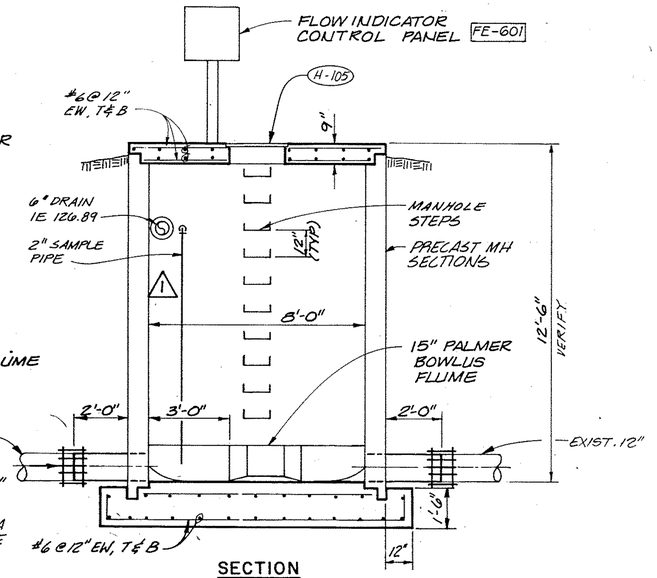
PLAN



PLAN

NOTES:
ALL REINFORCING SHALL BE #5 @ 12" OC UNLESS OTHERWISE NOTED.

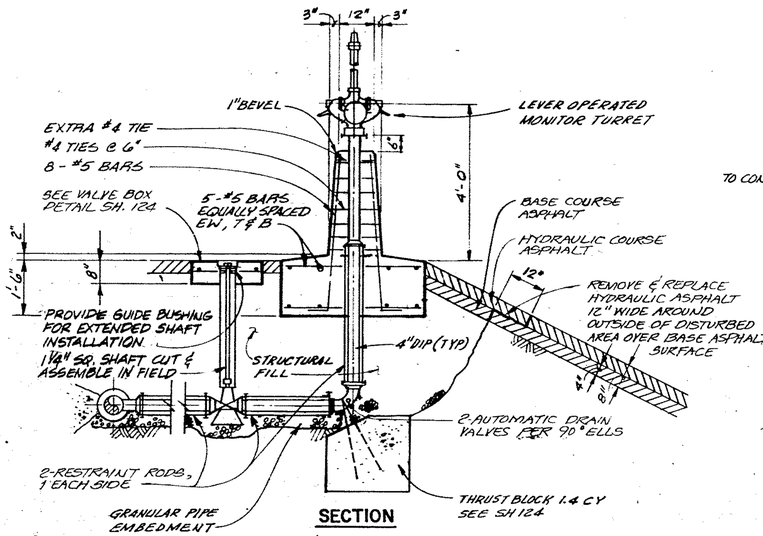
SEE DETAIL ON SH 801 FOR EXTRA REINFORCING AROUND MANHOLE OPENING IN SLAB.



SECTION

EXCESS FLOW MONITORING MANHOLE

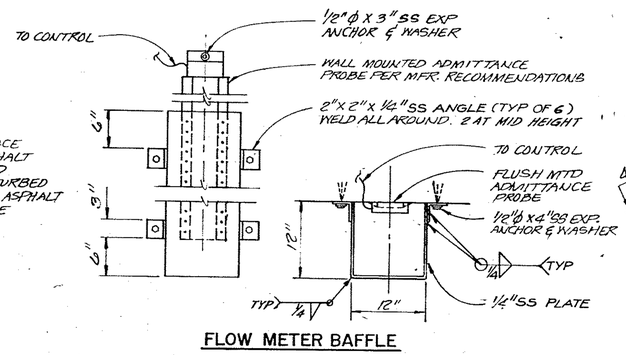
SCALE : 3/8" = 1'-0" SEE SH. 112



SECTION

WASHDOWN ASSEMBLY

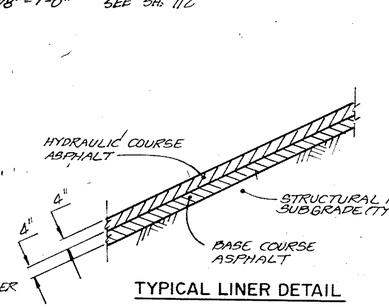
SCALE: 1/2" = 1'-0" SEE SH. 112



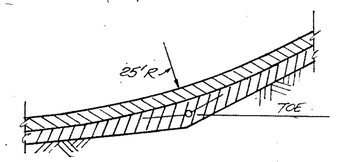
FLOW METER BAFFLE

DETAIL-1

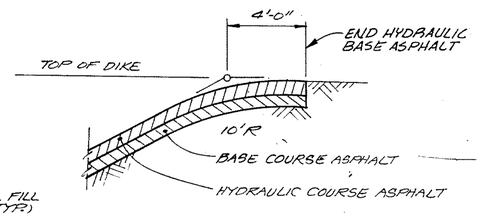
SCALE : 1" = 1'-0"



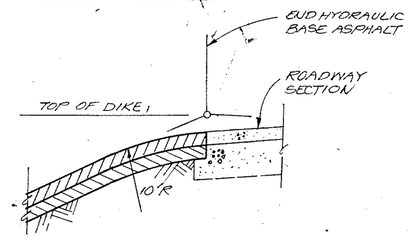
TYPICAL LINER DETAIL



TYPICAL DETAIL AT TOE



TYPICAL DETAIL AT TOP OF DIKE W/O ROADWAY



TYPICAL DETAIL AT TOP OF DIKE W/ ROADWAY

SURGE BASINS-LINER DETAILS

N.T.S.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

SURGE BASIN - DETAILS

Designed AHK, DKT
Drawn RKB
Checked BRW
Approved John E. Hoch
Date MAY, 1989

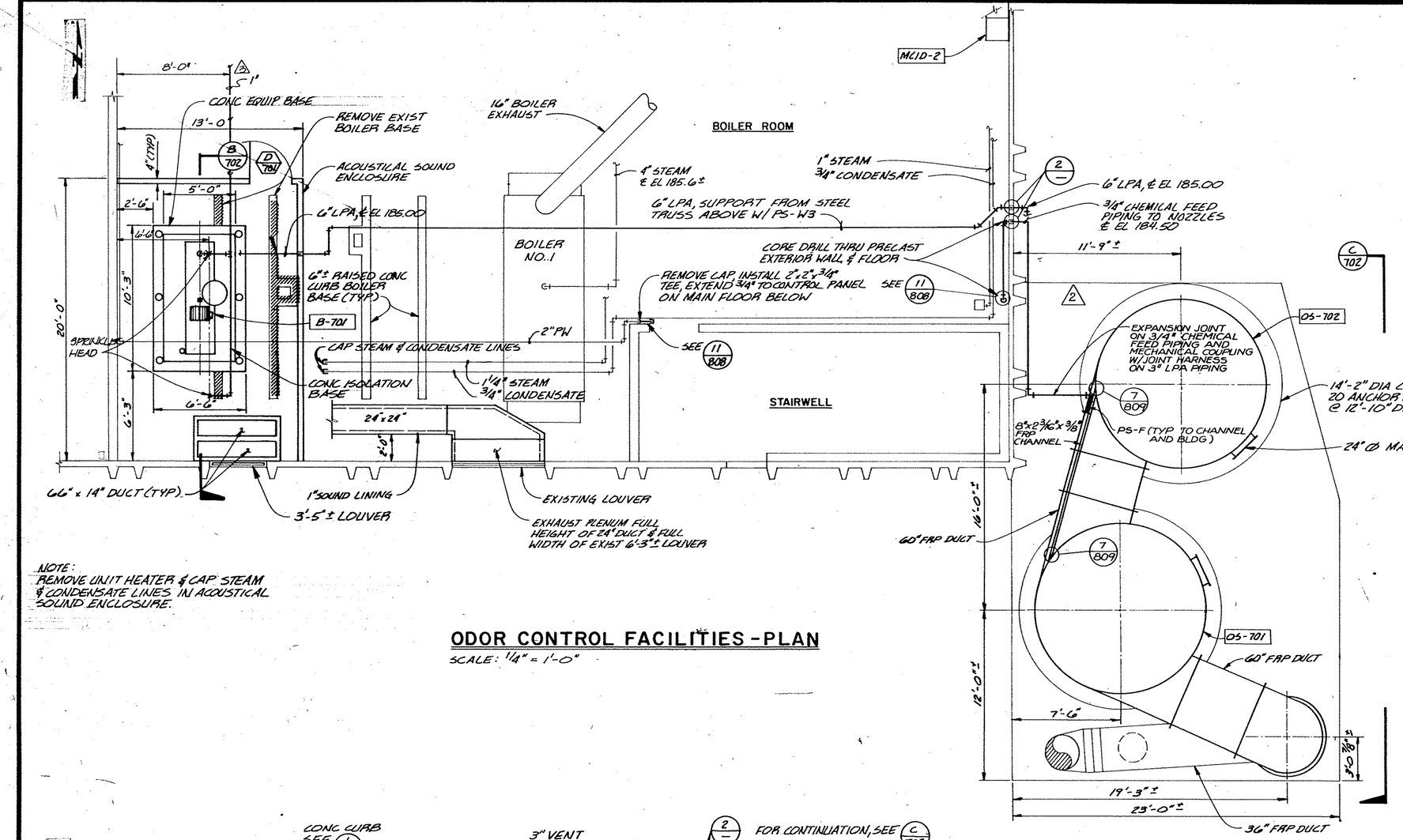
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	AFA	AS RECORDED DRAWING	12/9/92
1	JEK	ADDENDUM NO. 1	6-27-89

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON July 17, 1980 BRUCE R. WILLEY

Sheet Number 604

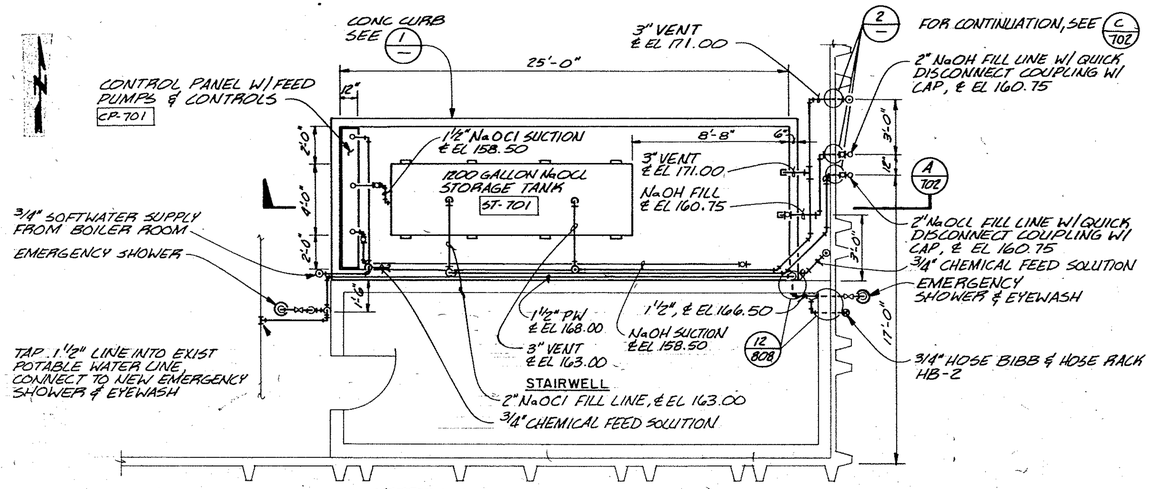
SA 904



NOTE:
REMOVE UNIT HEATER & CAP. STEAM & CONDENSATE LINES IN ACOUSTICAL SOUND ENCLOSURE.

ODOR CONTROL FACILITIES - PLAN

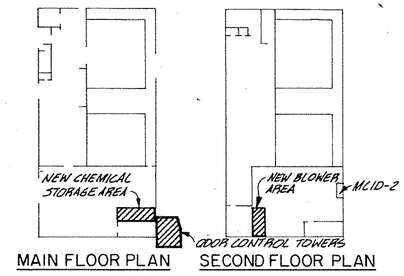
SCALE: 1/4" = 1'-0"



NOTE:
USE SS PS-E OR PS-F ON ALL CHEMICAL PIPING & FASTEN TO MASONRY WALL.

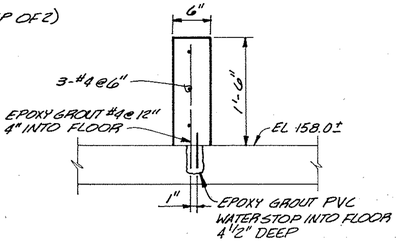
CHEMICAL FEED AND STORAGE AREA - PLAN

SCALE: 1/4" = 1'-0"



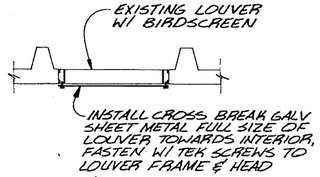
INCINERATOR BUILDING KEY PLAN

NTS



DETAIL 1

SCALE: 1" = 1'-0"

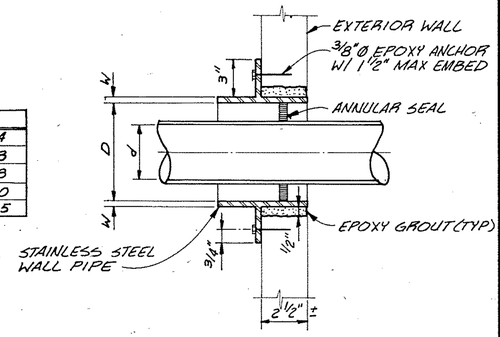


LOUVER BLANK OFF

DETAIL 3

NTS

"d"	"D"	"W"
¾"	2"	0.154
1"	2½"	0.203
3"	5"	0.258
4"	6"	0.280
6"	10"	0.365



WALL PENETRATION

DETAIL 2

SCALE: 3" = 1'-0"

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

SOLIDS HANDLING ODOR CONTROL - PLANS AND DETAILS

Designed JEK
Drawn SDB
Checked BRW
Approved John E. Block
Date MAY 1989

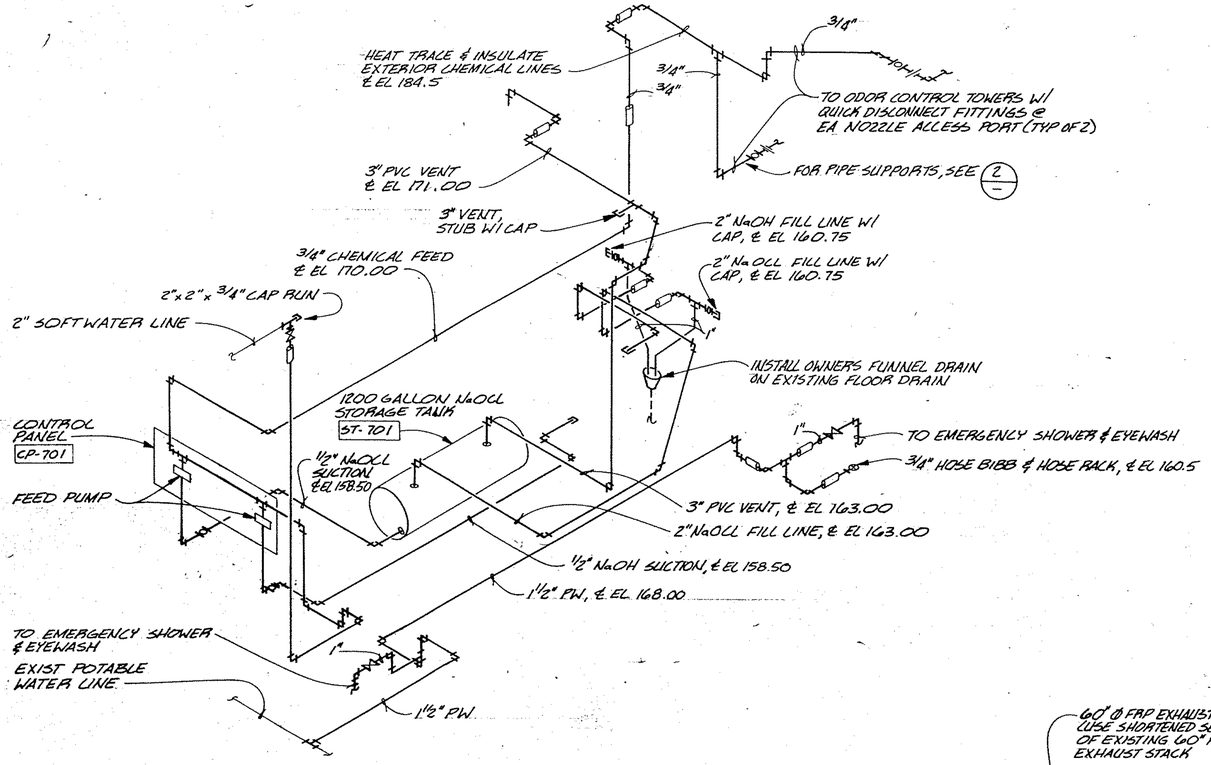
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	JEK	ADDENDUM NO 2	6-30-89
1	APA	CPE# 101	12-9-92
0	APA	AS RECORDED DRAWING	12-9-92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17, 1986 BRUCE R. WILLEY

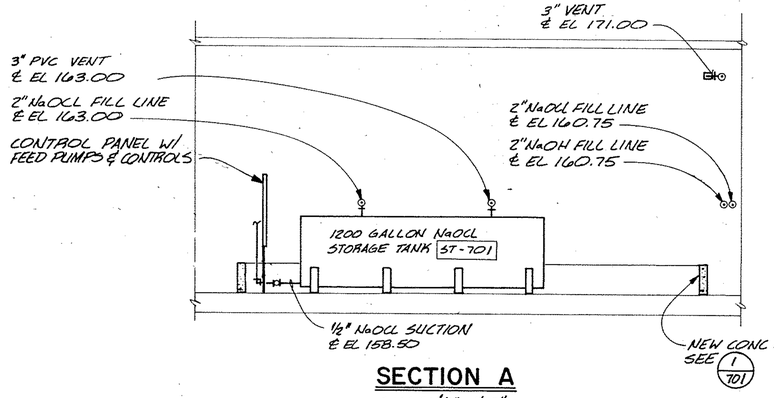
Sheet Number 701

SR 904



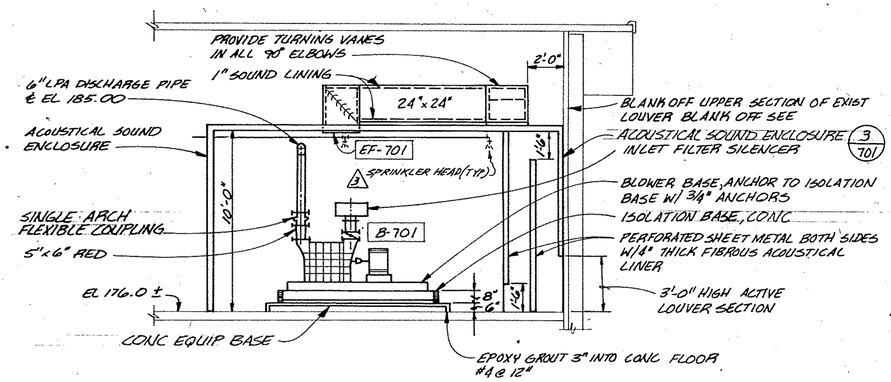
ODOR CONTROL SYSTEM - CHEMICAL SCHEMATIC

NTS



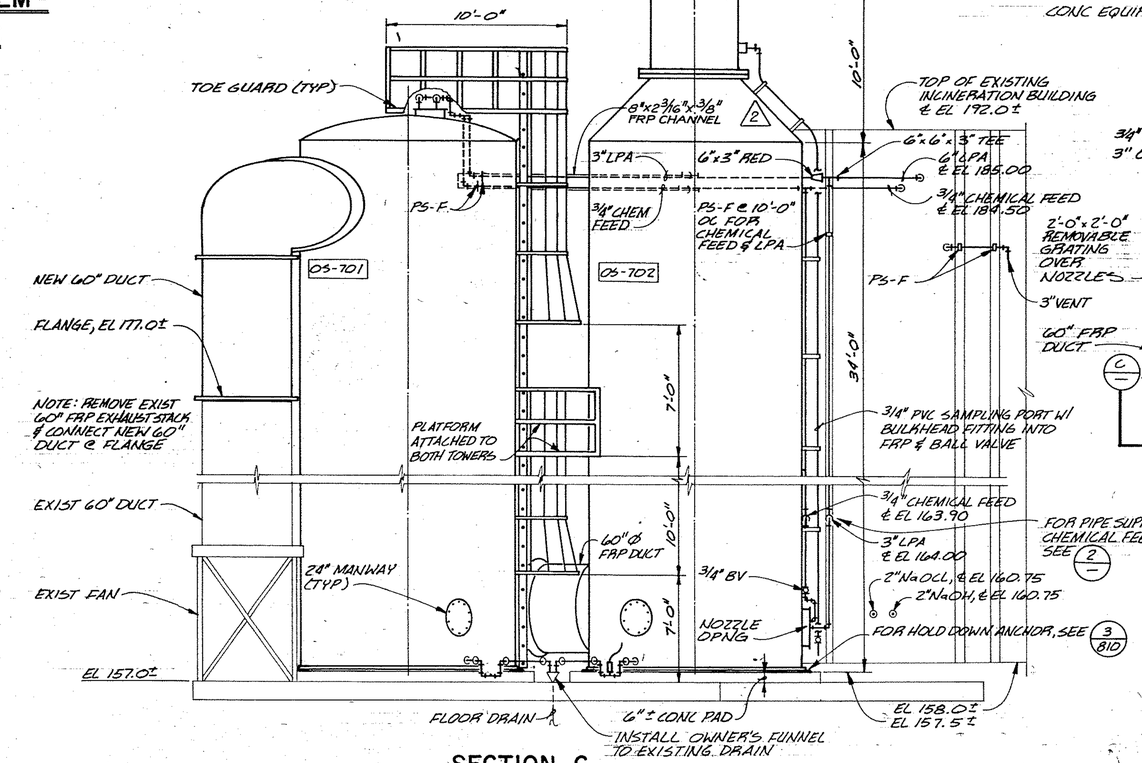
SECTION A

SCALE: 1/4" = 1'-0"



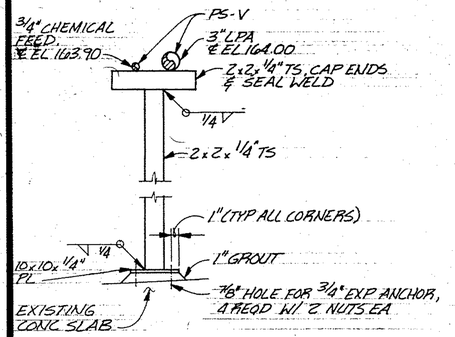
SECTION B

SCALE: 1/4" = 1'-0"



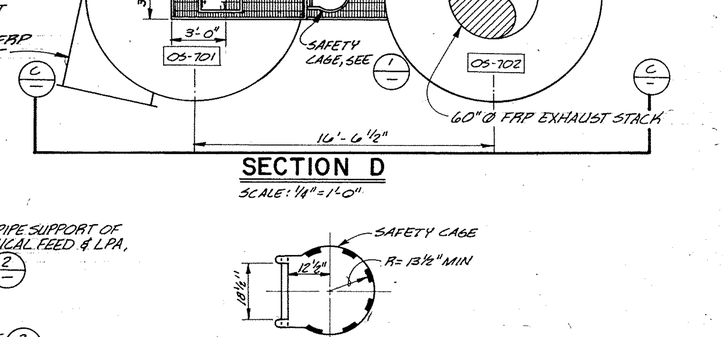
SECTION C

SCALE: 1/4" = 1'-0"



DETAIL 2

NTS



SECTION D

SCALE: 1/4" = 1'-0"

DETAIL 1

NTS

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

SOLIDS HANDLING ODOR CONTROL - SECTIONS AND DETAILS

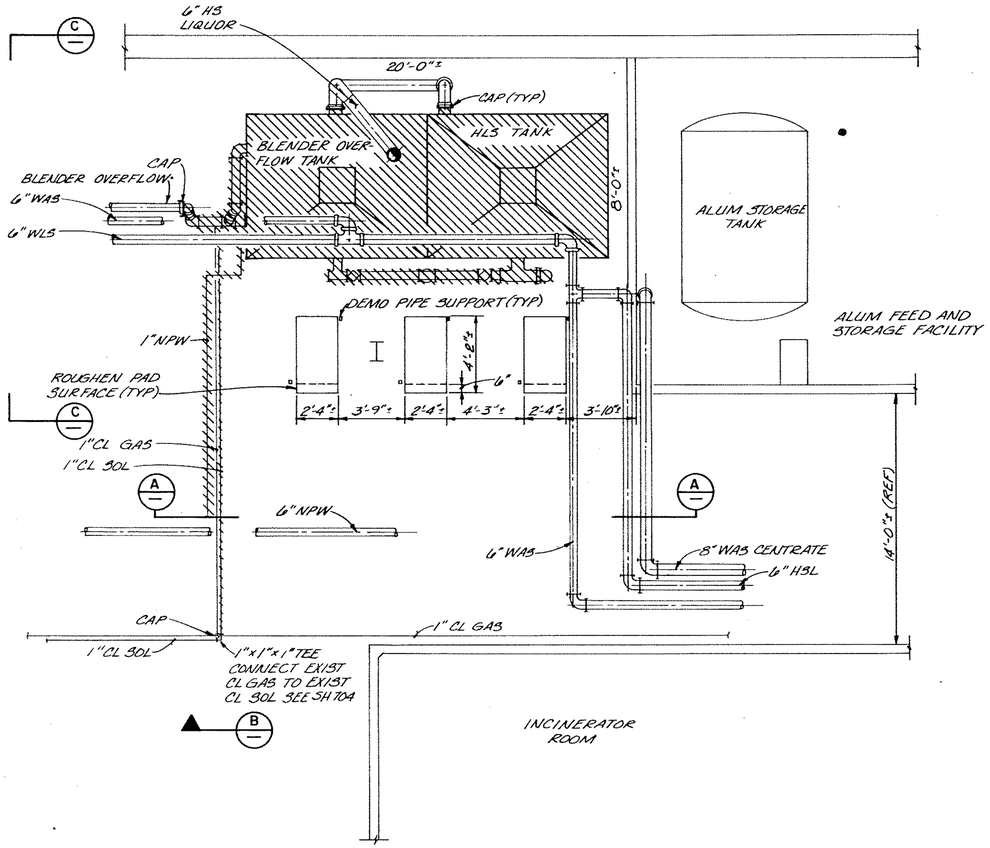
Designed JEK
Drawn SDS
Checked BRW
Approved John Estlock
Date MAY 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	JEK	ADDENDUM NO. 2	6-30-89
1	APA	CPE# 76 CPR 01	12/9/92
Δ	APA	AS RECORDED DRAWING	12/9/92

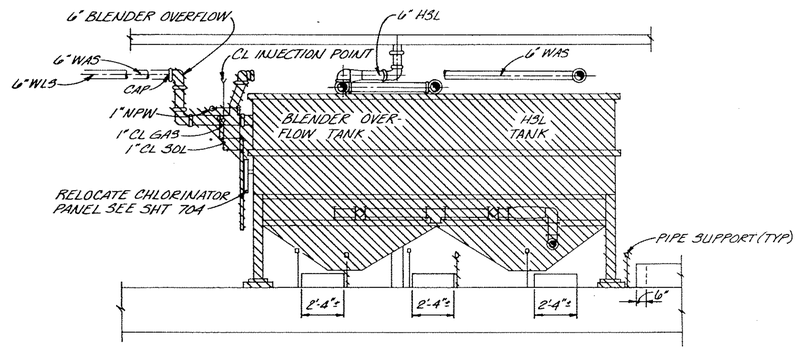
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17 1989 BRUCE R. WILLEY

Sheet Number 702



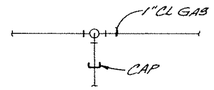
INCINERATOR BUILDING LOWER BASEMENT - DEMOLITION PLAN

SCALE: 1/4"= 1'-0"



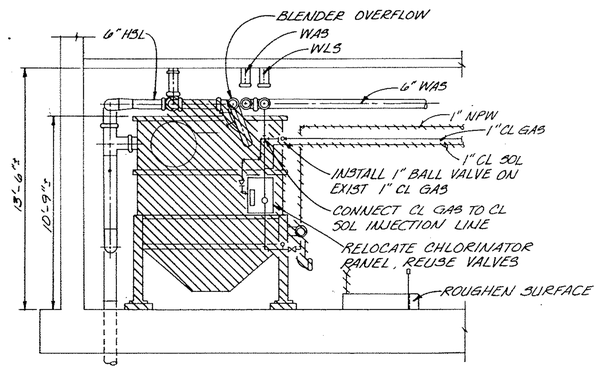
SECTION A

SCALE: 1/4"= 1'-0"



SECTION B

NTS



SECTION C

SCALE: 1/4"= 1'-0"

AS RECORDED DRAWINGS

HDR Engineering, Inc.

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP DECHLORI-NATION MODIFICATION

DEMOLITION PLAN AND SECTIONS

Project Manager	BRW
Designed	JKD
Drawn	CSM
Checked	JEK
Project Number	00039-033-002
Date	MAY 1990

THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY.

No	By	Description	Date
1	AFH	AS RECORDED DRAWING	12/19/92

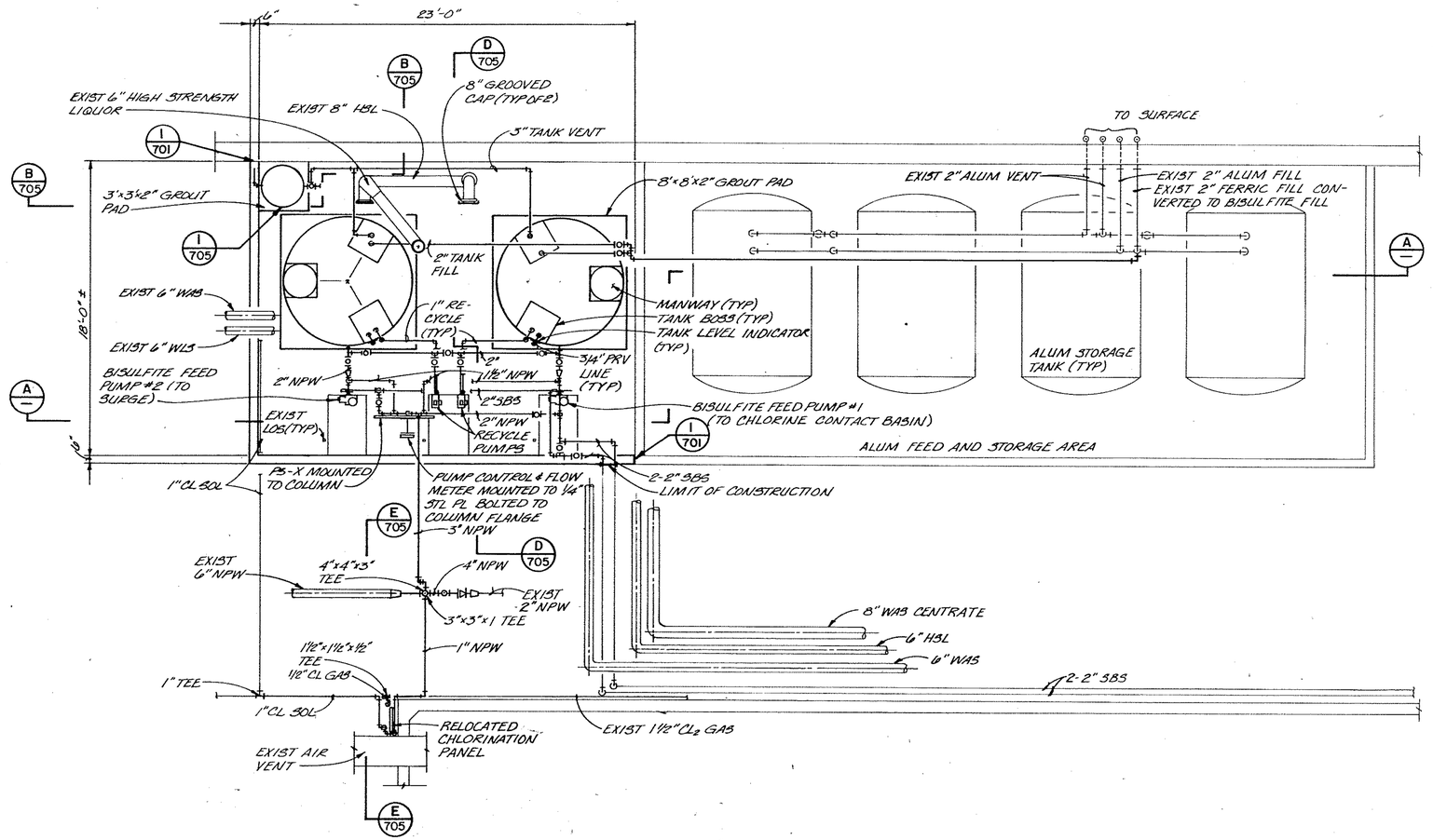
Sheet Number 703

SCREEN COMPOSIT OVERLAY

SR 8x1

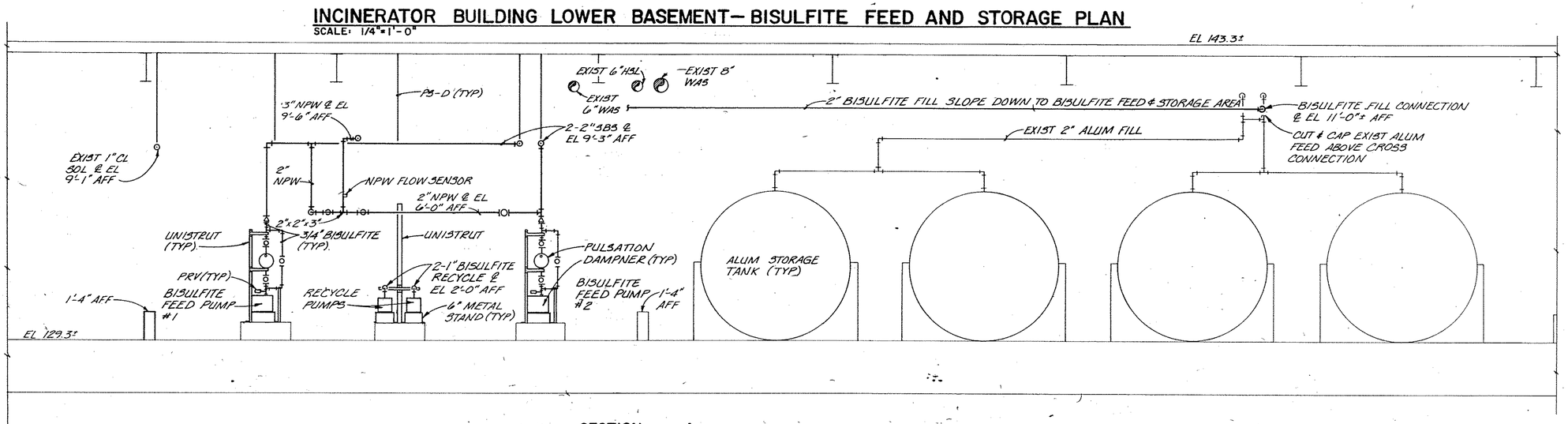
ABBREVIATIONS

CL SOL	CHLORINE SOLUTION
CL GAS	CHLORINE GAS
HSL	HIGH STRENGTH LIQUOR
LOS	LOCKOUT SWITCH
SBS	SODIUM BISULFITE SOLUTION



INCINERATOR BUILDING LOWER BASEMENT — BISULFITE FEED AND STORAGE PLAN

SCALE: 1/4"=1'-0"



SECTION A

SCALE: 3/8"= 1'-0"

HDR Engineering, Inc.

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP DECHLORINATION MODIFICATION

INCINERATOR BUILDING LOWER BASEMENT CHEMICAL AREA PLAN AND SECTION

Project Manager	BRW
Designed	SKD
Drawn	CSM
Checked	JEK
Project Number	00039-033-002
Date	MAY 1990

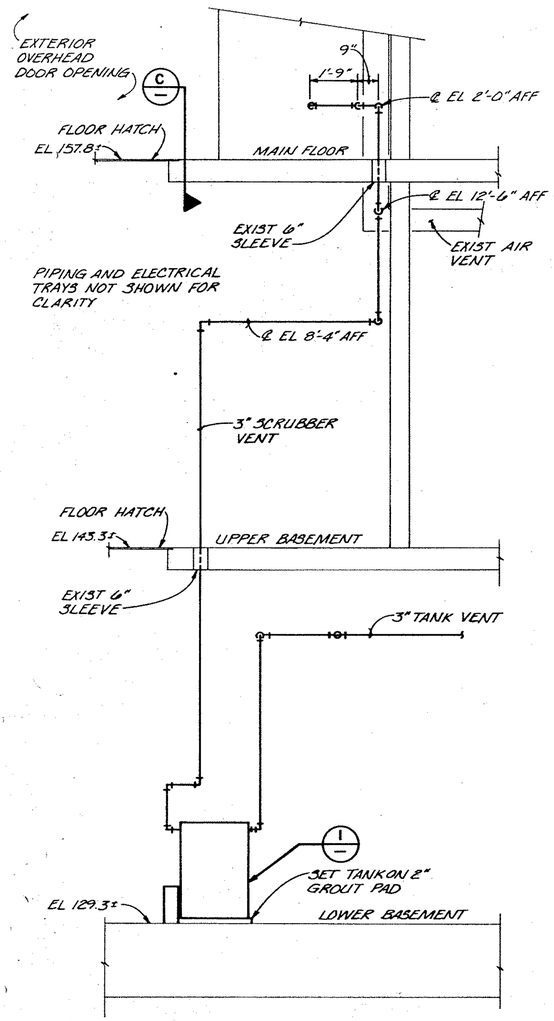
THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY.

No	By	Description	Date
1	AFA	AS RECORDED DRAWING	12/9/92

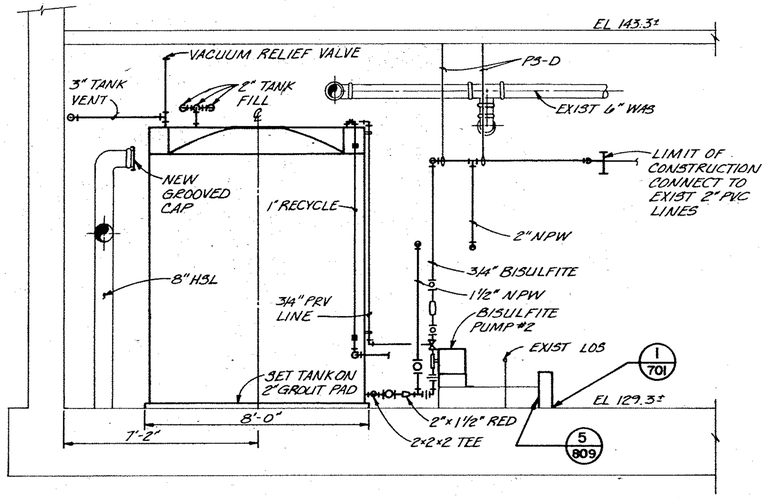
AS RECORDED DRAWINGS

Sheet Number 704

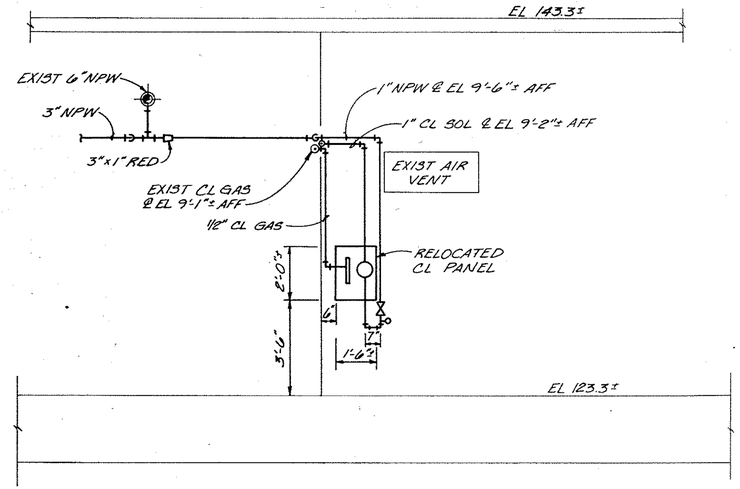
SCREEN COMPOS OVERLAY



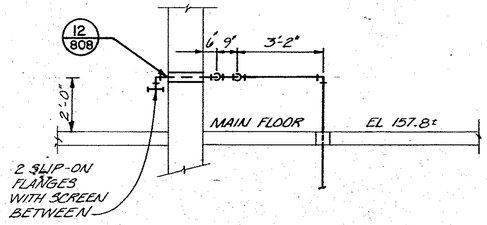
SECTION B
NTS



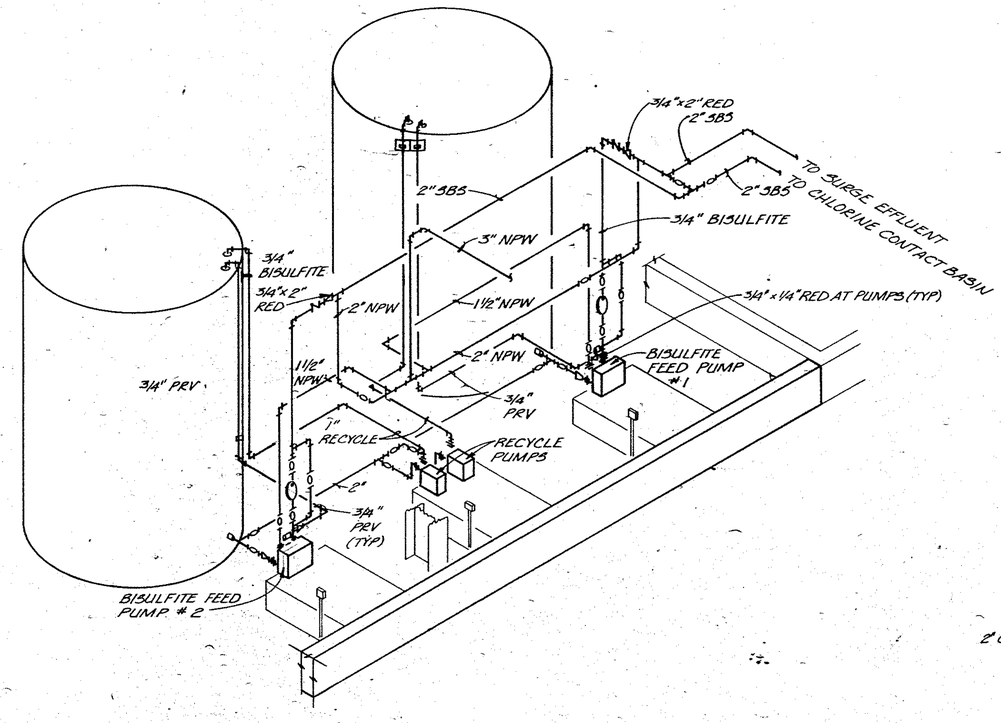
SECTION D
SCALE: 3/8" = 1'-0"



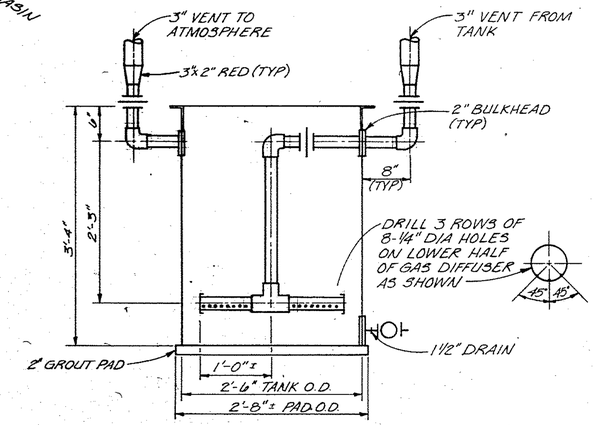
SECTION E
SCALE: 3/8" = 1'-0"



SECTION C
SCALE: 3/8" = 1'-0"



BISULFITE SCHEMATIC
NTS



DETAIL 1
NTS

AS RECORDED DRAWINGS

HDR Engineering, Inc.

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP DECHLORINATION MODIFICATION

SECTIONS AND DETAILS

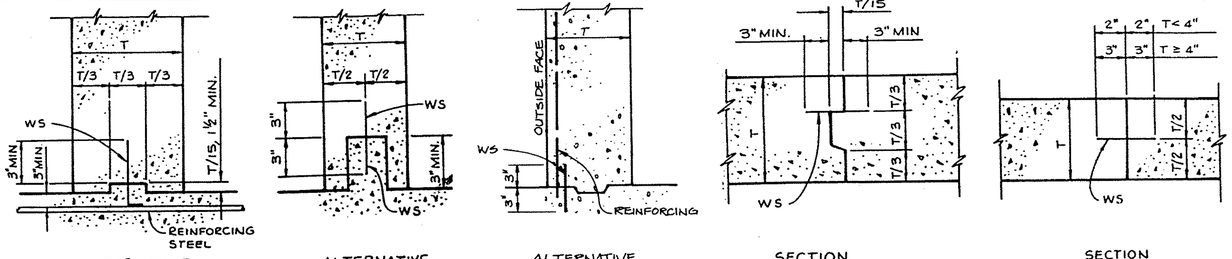
Project Manager	BRW
Designed	SKD
Drawn	CSM
Checked	JEK
Project Number	00039-033-002
Date	MAY 1990

THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE. IF NOT ONE INCH, SCALE ACCORDINGLY.

No	By	Description	Date
1	APA	AS RECORDED DRAWING	12/9/92

Sheet Number 705

SCREEN
COMPOSIT
OVERLAY



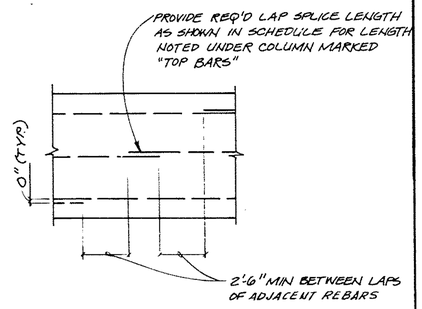
ALTERNATIVE T ≥ 12" | ALTERNATIVE T < 12" | ALTERNATIVE T ≥ 18" | SECTION T ≥ 12" | SECTION T < 12"

WALLS SLABS

TYPICAL WATERSTOP DETAILS

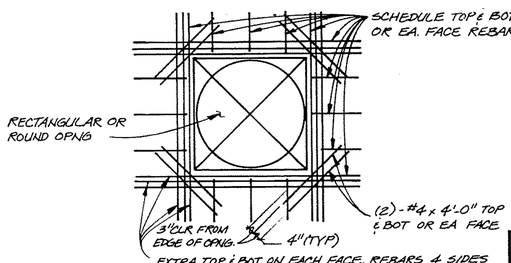
NTS

NOTE: ALL WATERSTOPS TO BE 12 GA STEEL.



BASE SLABS & CIRCULAR TANK REINF. WALL SPLICE DETAIL

NTS

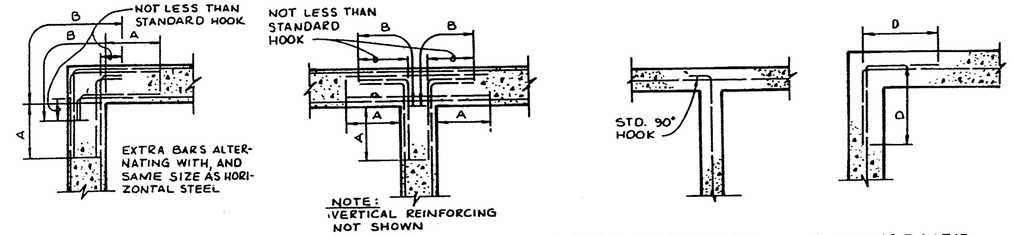


TYPICAL EXTRA REINF. AT OPENINGS

NTS

CONCRETE OPENING NOTES:

1. EVERY REBAR DISCONTINUOUS @ AN OPNG. SHALL BE REPLACED BY AN EXTRA REBAR PLACED @ THE SIDE OF THE OPNG. AS SHOWN ABOVE. EXTEND EXTRA REBARS MIN. LAP DISTANCE BEYOND EDGE OF OPNG.
2. OPENINGS 6" OR LESS IN SLABS & OPNGS. 6" OR LESS IN WALLS, NO EXTRA REBARS ARE REQ'D UNLESS SHOWN OTHERWISE. SCHEDULED REBARS SHALL BE SPREAD (NOT CUT) TO ALLOW FOR OPNGS. TO BE MADE.



A IS 1/5 THE CLEAR SPAN DISTANCE MEASURED HORIZONTALLY OR VERTICALLY, WHICHEVER IS THE SMALLER; BUT IN NO CASE LESS THAN THE REQUIRED LENGTH OF LAPPED SPLICES FOR TOP BARS AS SHOWN ON THIS SHEET.

B IS SUFFICIENT LENGTH TO PERMIT BARS TO EXTEND THROUGH THE WALL TO THE OPPOSITE FACE AND TERMINATE IN A STANDARD HOOK BUT SHALL NOT BE LESS THAN THE LENGTH REQUIRED FOR EMBEDMENT OF TOP BARS, AS SHOWN ON THIS SHEET.

D NOT LESS THAN THE REQUIRED FOR LAPPED SPLICES FOR TOP BARS, AS SHOWN ON THIS SHEET.

TYPICAL CORNER REINFORCING DETAILS

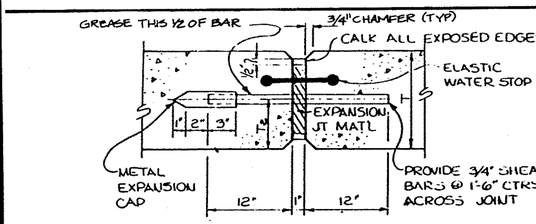
NTS

CONCRETE COVER FOR REINFORCEMENT

LOCATION	* MINIMUM COVER
Unformed surfaces adjacent to excavation	3"
Formed or top surfaces exposed to weather or saturated air, submerged or in contact with earth:	
#6 or larger bars	2"
#5 or smaller bars	1½"
Other locations:	
Bars in beams or girders, including stirrups	1½"
Column spirals or ties	1½"
Other bars #7 or larger	Bar diameter
Other bars #6 or smaller	¾"

* Cover for reinforcing steel shall not be less than the minimum given above (no minus tolerance), and shall not exceed the minimum by more than ½ inch where the concrete thickness is 24 inches or less, or more than ½ inch where the concrete thickness is more than 24 inches.

CONCRETE COVER FOR REINFORCEMENT

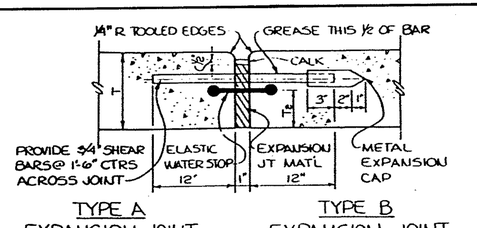


TYPE A EXPANSION JOINT WITH ELASTIC WATER STOP | TYPE B EXPANSION JOINT WITHOUT ELASTIC WATER STOP

EXPANSION JOINTS IN WALLS

NTS

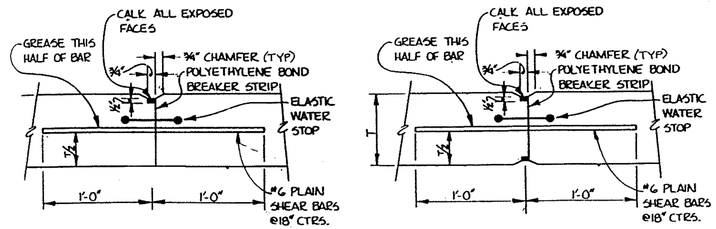
(PROVIDE JOINTS @ 60'-0" C/C MAX)



TYPE A EXPANSION JOINT WITH ELASTIC WATER STOP | TYPE B EXPANSION JOINT WITHOUT ELASTIC WATER STOP

EXPANSION JOINTS IN SLABS

NTS

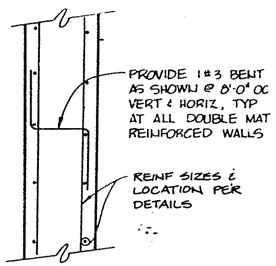


SECTION VIEW SLAB ON GRADE | PLAN VIEW WALL

(PROVIDE JOINTS @ 60'-0" C/C MAX)

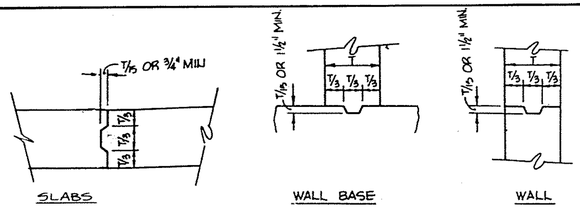
CONTRACTION JOINT

SCALE: 1½" = 1'-0"



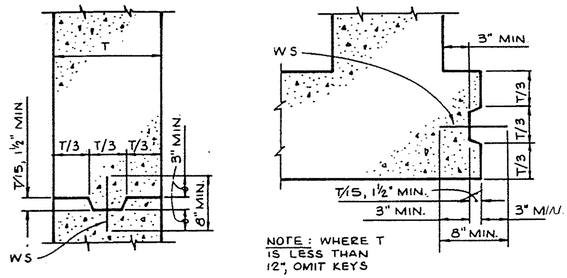
TYPICAL REINF. MAT SPACER

NTS



TYPICAL KEYED JOINT DETAILS

NTS



TYPICAL WATERTIGHT JOINTS

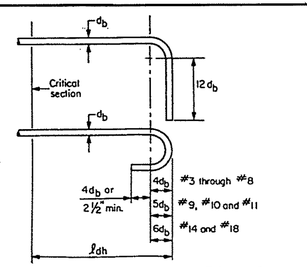
NTS

BAR SIZE	TENSION LAP SPLICE LENGTHS		TENSION EMBEDMENT LENGTHS, l_{dh}, FOR STANDARD END HOOKS (INCHES)
	TOP BARS* (INCHES)	OTHER BARS (INCHES)	
3	17	12	6
4	23	16	8
5	29	20	10
6	34	24	11
7	43	31	13
8	57	41	15
9	72	52	17
10	92	66	19
11	113	81	21

Footnotes

1. * Top bars are horizontal bars so placed that more than 12" of concrete is cast in the member below the bar. Horizontal bars in walls are to be provided with laps as required for top bars.
2. Except as otherwise indicated on the drawings, tension lap splice lengths and tension embedment lengths, l_{dh}, for standard end hooks shall be no less than (no minus tolerance) shown above.
3. Lap splices shall not be made at points of maximum stress as determined by the Engineer, and shall not be spaced closer than 6 inches on centers. If splices are staggered so that no more than 1/2 are spliced in a splice length, the splice length can be reduced to 76.5% of the lengths tabulated above, but not less than 12".

TENSION LAP SPLICE AND EMBED. LENGTHS



HOOKED BAR DETAILS

NTS

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

STANDARD CONCRETE DETAILS

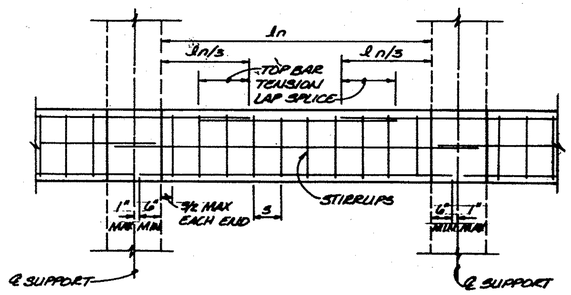
Designed JPT, JEK
Drawn CSAM
Checked BRW
Approved John E. Hoch
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
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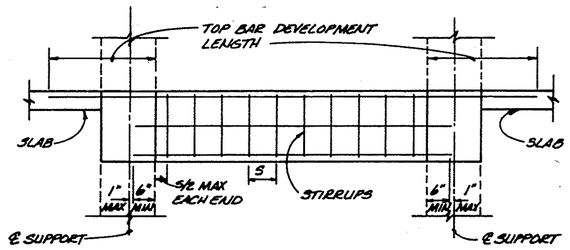
REGISTERED PROFESSIONAL ENGINEER 13599 OREGON JULY 27, 1945 BRUCE R. WILLEY

Sheet Number 801



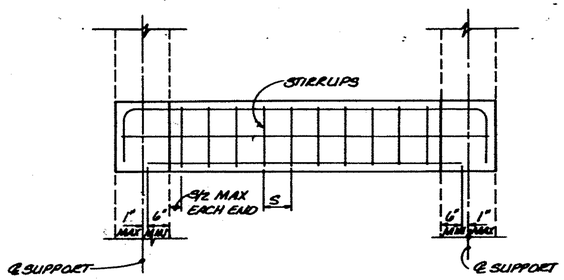
DETAIL 1-BEAM TYPE I

N.T.S.



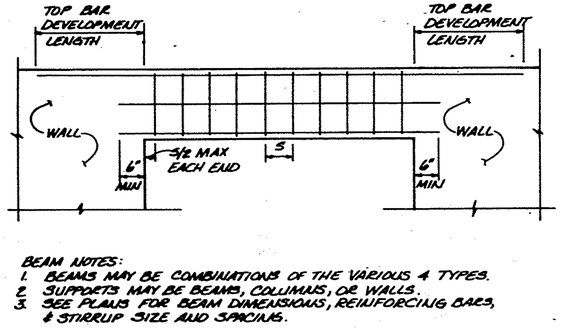
DETAIL 2-BEAM TYPE II

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DETAIL 3-BEAM TYPE III

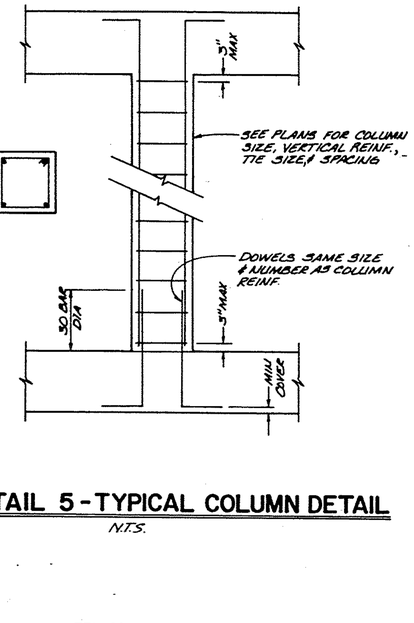
N.T.S.



BEAM NOTES:
1. BEAMS MAY BE COMBINATIONS OF THE VARIOUS 4 TYPES.
2. SUPPORTS MAY BE BEAMS, COLUMNS, OR WALLS.
3. SEE PLANS FOR BEAM DIMENSIONS, REINFORCING BARS, & STIRRUP SIZE AND SPACING.

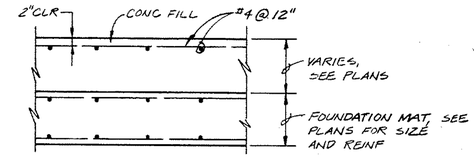
DETAIL 4-BEAM TYPE IV

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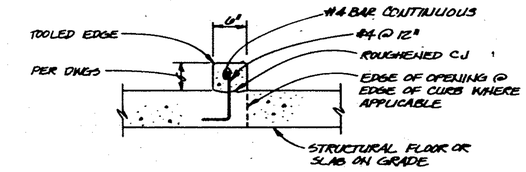
DETAIL 5 - TYPICAL COLUMN DETAIL

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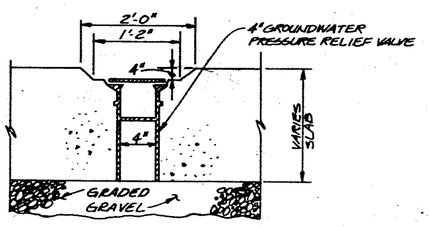
DETAIL 6- CONCRETE FILL

N.T.S.



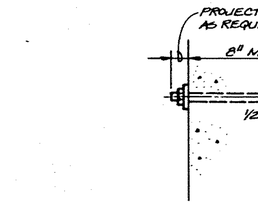
DETAIL 7- TYPICAL CONC CURB

N.T.S.



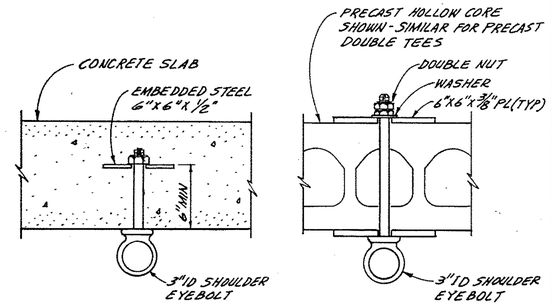
DETAIL 8 - GROUNDWATER PRESSURE RELIEF VALVE

NTS



DETAIL 9- TYPICAL ANCHOR BOLT

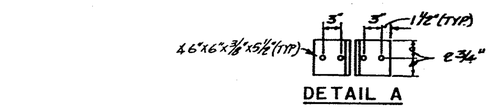
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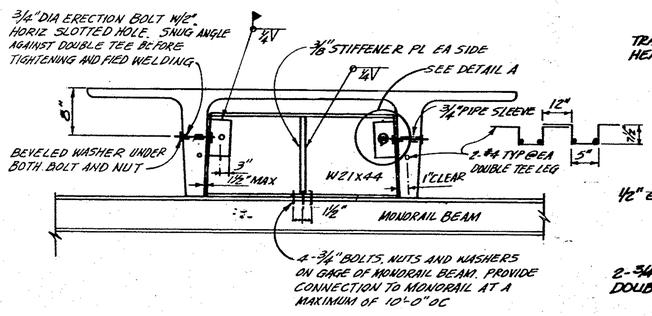
CAST-IN-PLACE PRECAST

DETAIL 10 - LIFTING EYE

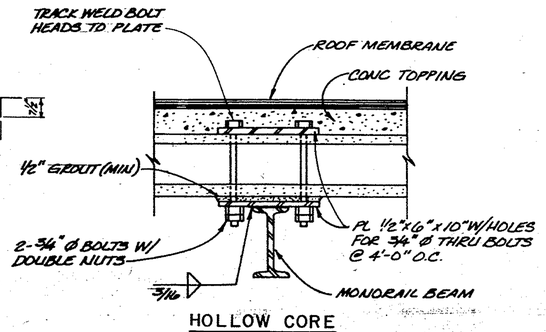
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DETAIL A



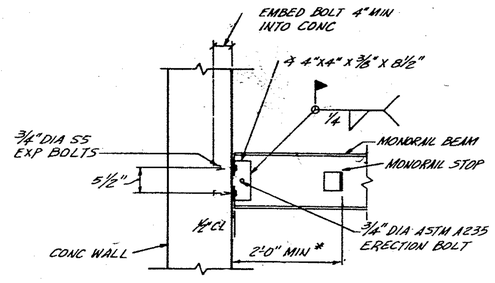
DOUBLE TEE



HOLLOW CORE

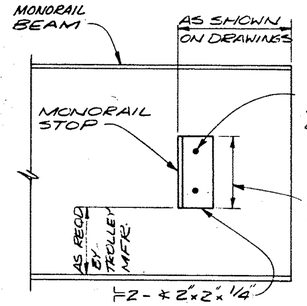
DETAIL 12 - MONORAIL CONNECTION

NTS



DETAIL 13- MONORAIL CONNECTION, CONCRETE WALL

N.T.S.



DETAIL 14- MONORAIL STOP

N.T.S.

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

STRUCTURAL DETAILS

Designed	NDC
Drawn	CSAM
Checked	BRW
Approved	John Erdrich
Date	MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

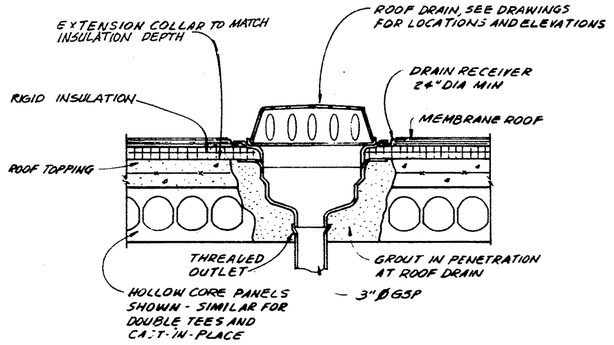
No	By	Revision	Date
△	AFH	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER — BRIAN WILLIAM ERDRICH — 13981 — STATE OF WASHINGTON

△

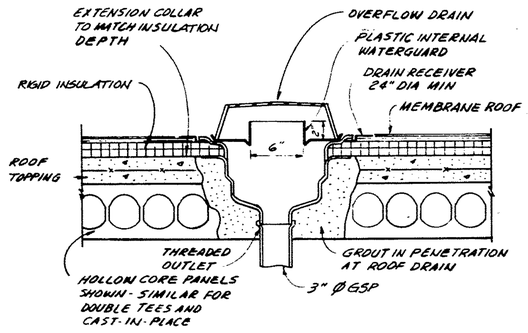
AS RECORDED DRAWINGS

Sheet Number 802



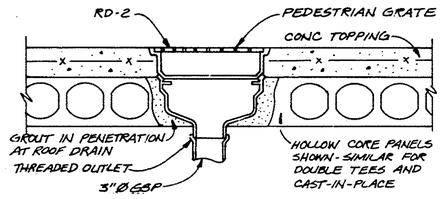
DETAIL 1 - ROOF DRAIN

SCALE: 1½" = 1'-0"



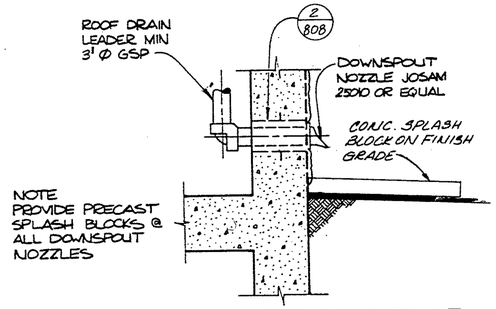
DETAIL 2 - OVERFLOW DRAIN

SCALE: 1½" = 1'-0"



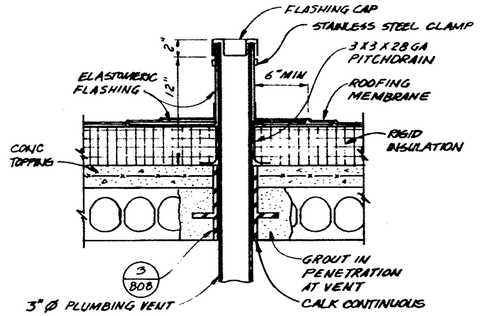
DETAIL 3 - ROOF DRAIN WITH TRAP

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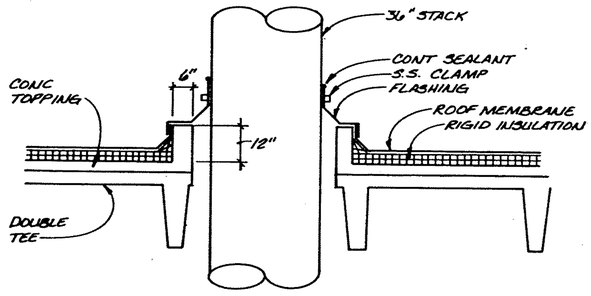
DETAIL 4 - ROOF DRAIN DOWNSPOUT

NTS



DETAIL 5 - PLUMBING VENT PENETRATION

SCALE: 1½" = 1'-0"

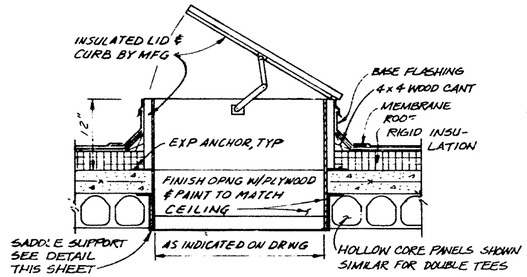


NOTE:

1. FILL VOID BETWEEN STACK & ROOF DECK W/FIRE PROOF INSULATION.

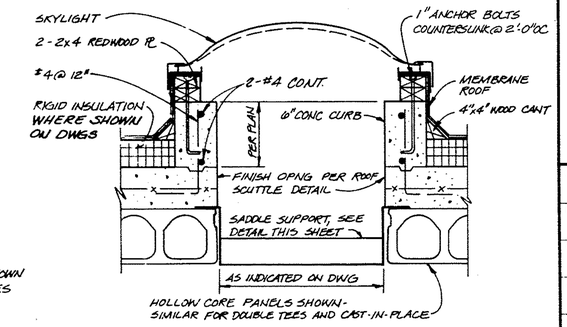
DETAIL 6 - EXHAUST STACK PENETRATION

NTS



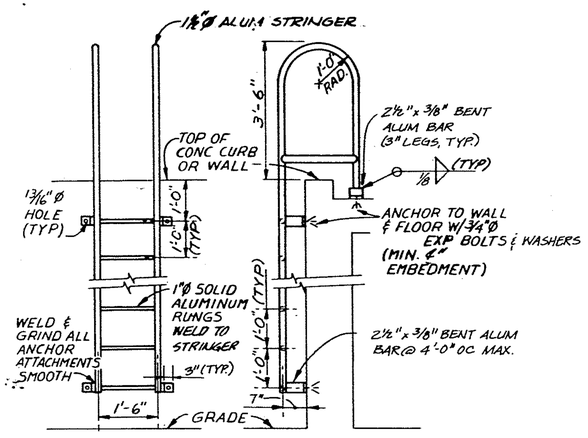
DETAIL 7 - TYPICAL ROOF SCUTTLE

NTS



DETAIL 8 - CONC CURBED SKYLIGHT

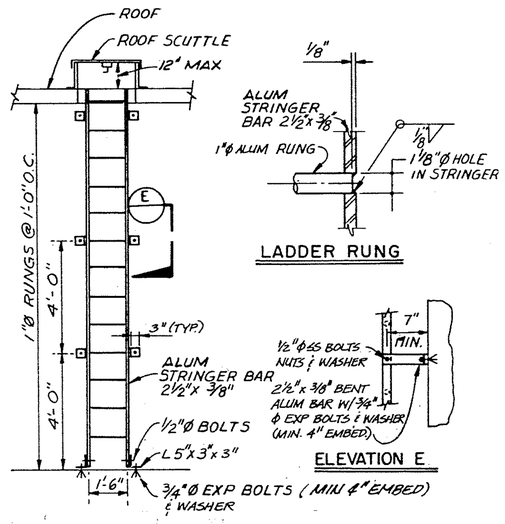
NTS



NOTE: WELD & GRIND SMOOTH

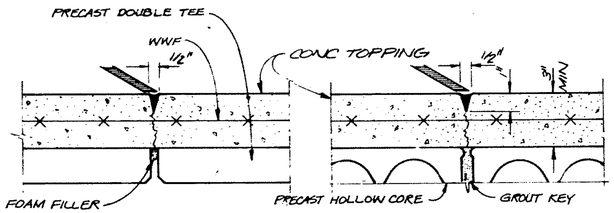
TYPE A LADDER

N.T.S.



TYPE B LADDER

N.T.S.

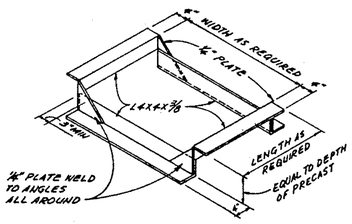


NOTES:

1) TOOL JOINT W/ GOLDBLATT GROOVER CG-314-M7 WHERE PANELS ABUT, OVER THE ENDS OF PANELS, & END OF BEAMS.

2) DRESS JOINTS W/ ABRASIVE BLADE. SAW CUT JOINTS ARE UNACCEPTABLE.

DETAIL 9 - EXPOSED TOPPING CRACK CONTROL DETAIL



SADDLE SUPPORT DETAIL

NTS

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ROOF DETAILS

Designed BDR
Drawn MMK
Checked BRW
Approved John Eckhoff
Date MAY, 1989

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No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER OREGON JULY 1, 1985 BRUCE R. WILSON

Sheet Number 803

DOOR SCHEDULE

DOOR NO.	DOOR LOCATION	DOOR WIDTH	DOOR HEIGHT	DOOR MATERIAL	DOOR TYPE	DOOR FINISH	DOOR HARDWARE	DOOR LABEL	FRAME TYPE	FRAME FINISH	FRAME LABEL	DETAIL NO.	REMARKS
301	304 TO 301	3' 0"	7' 0"	HM	B	PAINT	1	3/4HR"C"	HM	PAINT	3/4HR"C"	4	
302	304 TO 302	3' 0"	7' 0"	HM	A	PAINT	2	3/4HR"C"	HM	PAINT	3/4HR"C"	4	
303	304 TO 303	3' 0"	7' 0"	HM	A	PAINT	3	3/4HR"C"	HM	PAINT	3/4HR"C"	4	
304	304 TO EXIT	3' 0"	7' 0"	HM	C	PAINT	4		HM	PAINT		1	DOUBLE LEAF
305	307 TO 305	3' 0"	7' 0"	HM	C	PAINT	5	3/4HR"C"	HM	PAINT	3/4HR"C"	4	DOUBLE LEAF
306	307 TO EXIT	4' 0"	7' 0"	HM	C	PAINT	4		HM	PAINT		2	DOUBLE LEAF-SOUTH LEAF INACTIVE
307	S-1 TO EXIT	3' 0"	7' 0"	HM	A	PAINT	6		HM	PAINT		2	
308	308 TO S-1	3' 0"	7' 0"	HM	A	PAINT	7	1 1/2 HR"B"	HM	PAINT	1 1/2 HR"B"	4	
309	308 TO EXIT	11' 0"	14' 0"	STEEL	D	PAINT	8		STEEL	PAINT		5	ROLLING DOOR
310	308 TO EXIT	11' 0"	14' 0"	STEEL	D	PAINT	8		STEEL	PAINT		5	ROLLING DOOR
311	S-1 TO EXIT	3' 0"	7' 0"	HM	A	PAINT	9		HM	PAINT		3	
312	309 TO S-1	3' 0"	7' 0"	HM	A	PAINT	7	1 1/2 HR"B"	HM	PAINT	1 1/2 HR"B"	4	
313	310 TO EXIT	3' 6"	7' 0"	HM	C	PAINT	10		HM	PAINT		3	DOUBLE LEAF
314	311 TO EXIT	3' 0	7' 0"	HM	C	PAINT	10		HM	PAINT		3	DOUBLE LEAF
315	309 TO EXIT	3' 0"	7' 0"	HM	A	PAINT	9		HM	PAINT		3	
316	309 TO EXIT	10' 0"	14' 0"	STEEL	D	PAINT	8		STEEL	PAINT		6	ROLLING DOOR
401	401 TO EXIT	6' 0"	7' 0"	HM	E	PAINT	4		HM	PAINT		2	DOUBLE LEAF-SOUTH LEAF ACTIVE
701	BLOWER	3' 0"	7' 0"	[illegible]	[illegible]	[illegible]	11		HM	PAINT			ACCOUSTICAL DOOR
501	EVAP BLDG	3' 6"	7' 0"	HM	F	PAINT	9	1 1/2 HR"B"	HM	PAINT	1 1/2 HR"B"	3	WIRE GLASS IN WINDOW

1

TYPE A

TYPE B

TYPE C

TYPE F

TYPE D

TYPE E

ROOM FINISH SCHEDULE

ROOM NO.	ROOM NAME	FLOOR MATERIAL	FLOOR FINISH	FLOOR BASE	WALL MATERIAL	WALL FINISH	CEILING MATERIAL	CEILING FINISH	HEIGHT ABOVE FIN. FLOOR	REMARKS
301	MOTOR CONTROL CENTER	RESILIENT VINYL TILE	--	X	CONCRETE/WOOD	PAINT	ACOUSTIC TILE	--	8' - 0"	RIGID INSUL AND MEDIUM DENSITY OVERLAY PLYWOOD ON EAST WALL
302	STORAGE	CONCRETE	TROWEL	--	CONCRETE/WOOD	PAINT	ACOUSTIC TILE	--	8' - 0"	RIGID INSUL AND MEDIUM DENSITY OVERLAY PLYWOOD ON SOUTH AND EAST WALLS
303	REST ROOM	RESILIENT VINYL TILE	--	X	CONCRETE/WOOD	PAINT	ACOUSTIC TILE	--	8' - 0"	RIGID INSUL AND MEDIUM DENSITY OVERLAY PLYWOOD ON SOUTH WALL
304	CORRIDOR	CONCRETE	TROWEL	--	CONCRETE	PAINT	CONCRETE	PAINT		
305	BLOWER ROOM	CONCRETE	TROWEL	--	ACOUSTIC PANELS	--	CONCRETE	PAINT		ACOUSTIC PANELS ON ALL WALLS
306	PUMP ROOM	CONCRETE	TROWEL	--	CONCRETE	PAINT	CONCRETE	PAINT		
307	CHEMICAL FEED AREA	CONCRETE	TROWEL	--	CONCRETE	PAINT	CONCRETE	PAINT		
308	GRIT STORAGE ROOM	CONCRETE	TROWEL	--	CONCRETE	PAINT	CONCRETE	PAINT		
309	SCREEN ROOM	CONCRETE	TROWEL	--	CONCRETE	PAINT	CONCRETE	PAINT		
310	MECHANICAL ROOM	CONCRETE	TROWEL	--	CONCRETE	PAINT	CONCRETE	PAINT		
311	FAN ROOM	CONCRETE	TROWEL	--	ACOUSTIC PANELS/	--	CONCRETE	PAINT		ACOUSTIC PANELS ON ALL WALLS
S-1	STAIR NO. 1	CONCRETE	TROWEL	--	CONCRETE	PAINT	CONCRETE	PAINT		
--	PRIMARY SLUDGE PUMP ROOM	CONCRETE	TROWEL	--	CONCRETE	PAINT	CONCRETE	PAINT		
	EVAPORATOR BLDG	CONCRETE	TROWEL	--	CONCRETE	PAINT	CONCRETE	PAINT		

1

HEAD

JAMB

SILL

DETAIL 1

DETAIL 2

DETAIL 3

DETAIL 4

HEAD

JAMB

SILL

DETAIL 5

DETAIL 6

DETAIL 7

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

DOOR AND ROOM FINISH SCHEDULES

Designed DH
Drawn MMK
Checked JPT
Approved John E Hock
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	JEK	ADDENDUM NO. 1	6-27-89
2	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER OREGON JULY 27, 1988 BRUCE R. WILLCK

No. 1705, 1/77

AS RECORDED DRAWINGS

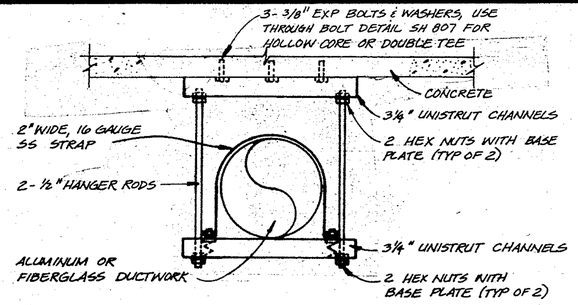
Sheet Number 804

ABBREVIATIONS

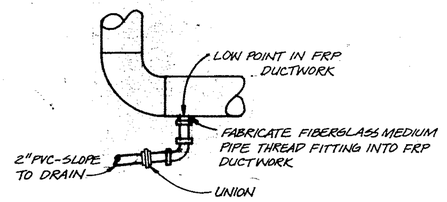
AFF	ABOVE FINISH FLOOR
BOD	BOTTOM OF DUCT
BOG	BOTTOM OF GRILLE
BOU	BOTTOM OF UNIT
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
EA	EXHAUST AIR
OA	OUTSIDE AIR
OED	OPEN END DUCT
RA	RETURN AIR
RLF	RELIEF AIR
SA	SUPPLY AIR
VTR	VENT THRU ROOF
	DOOR LOUVER - SEE DOOR SCHEDULE

SYMBOLS

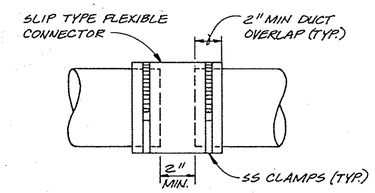
- SUPPLY AIR OR OUTSIDE AIR - ELBOW UP SHOWN FOR CLARITY.
- EXHAUST AIR OR RETURN AIR - ELBOW UP SHOWN FOR CLARITY.
- TRANSITION - DOUBLE SIDED
- TRANSITION - ONE SIDED
- TRANSITION - RECTANGULAR TO ROUND DUCT
- STANDARD BRANCH - FOR SUPPLY AIR W/ EXTRACTOR AND RETURN AIR
- ELBOW - W/ DOUBLE THICKNESS TURNING VANE
- SPLITTER DAMPER
- RECTANGULAR DUCT INCLINE - RISE OR DROP IN RESPECT TO THE AIR FLOW (R OR D)
- ROUND DUCT INCLINE - RISE OR DROP IN RESPECT TO THE AIR FLOW (R OR D)
- FLEXIBLE CONNECTION
- FLEXIBLE DUCT
- SUPPLY AIR REGISTER OR GRILLE - W/ DUCT MOUNTED EXTRACTOR SEE NOTE 1 BELOW (SIZE, TYPE, CFM)
- EXHAUST AIR OR RETURN AIR REGISTER OR GRILLE (SIZE TYPE, CFM)
- SUPPLY AIR ASSEMBLY SQUARE DIFFUSER (SIZE TYPE, CFM)
- SUPPLY AIR ASSEMBLY ROUND DIFFUSER (SIZE TYPE, CFM)
- DAMPER IN DUCT AS NOTED - BDD - BACKDRAFT DAMPER; MOD - MOTOR OPERATED DAMPER; VD - VOLUME DAMPER (PLAN, SECTION)
- ACCESS DOOR (PLAN AD, SECTION AD)
- ACCOUSTICAL LINING - DUCT DIMENSIONS FOR NET FREE AREA
- RECTANGULAR DUCT OR OPENING SIZE - FIRST NUMBER INDICATES SIZE OF SIDE SHOWN (18 x 24)
- ROUND DUCT SIZE (18" DIA)



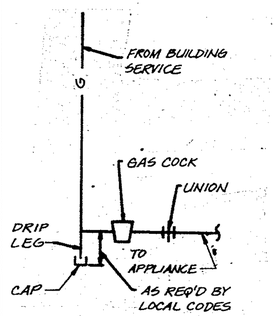
DUCTWORK TRAPEZE HANGER DETAIL
NTS



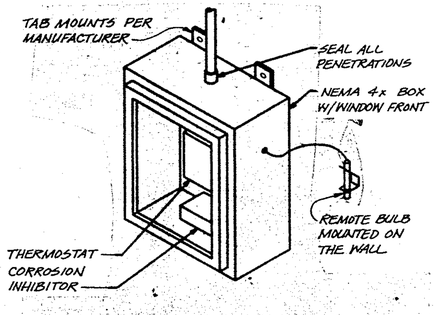
FRP DUCTWORK DRAIN DETAIL
NTS



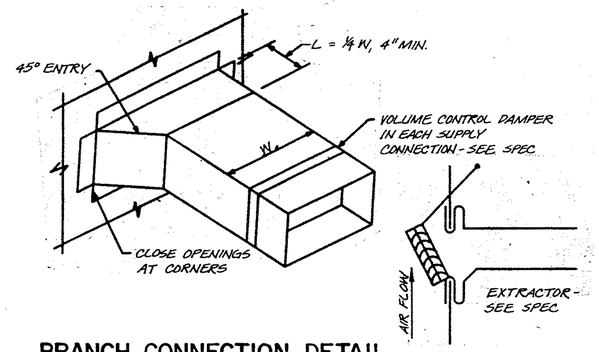
FRP FLEXIBLE CONNECTION DETAIL
NTS



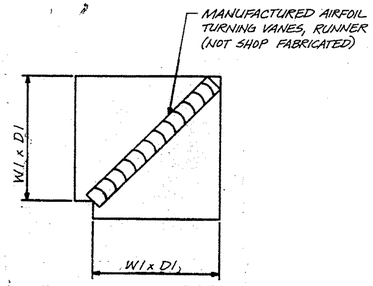
GAS APPLIANCE CONNECTOR DETAIL
NTS



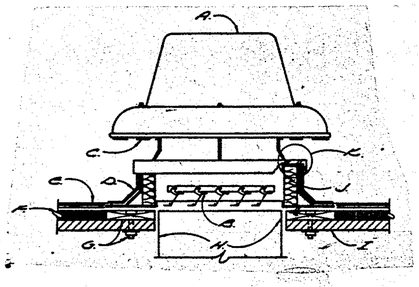
THERMOSTAT MOUNTING DETAIL
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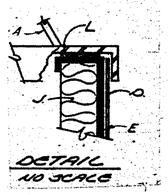


BRANCH CONNECTION DETAIL
NTS



SQUARE THROAT 90° ELBOW WHEN DUCT SIZE EQUAL
NTS

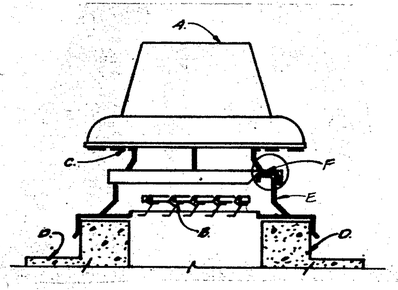




DETAIL
NO SCALE

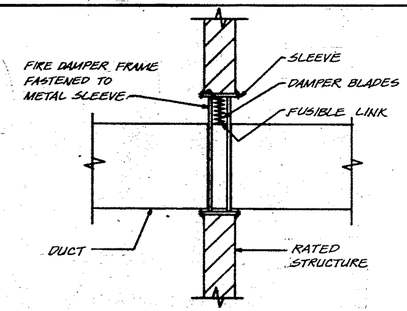
A. EXHAUST FAN
B. BACKDRAFT DAMPER
C. ½" WIRE MESH SCREEN
D. FLASHING
E. ROOFING
F. ROOF INSULATION
G. TREATED WOOD BLOCKING
H. WHEN DUCTED, SECURE TO ROOF CONSTRUCTION, CAULK ALL AROUND
I. ROOF STRUCTURE
J. ROOF CURB INSULATION
K. PREFABRICATED ROOF CURB (SEE DETAIL)
L. RUBBER PAD

EXHAUST FAN OR GRAVITY MOUNTING DETAIL
NTS

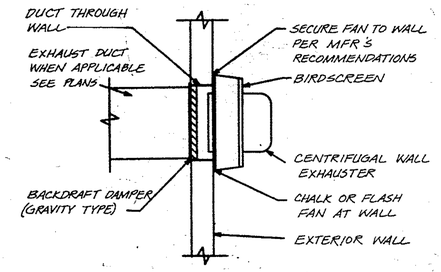


A. GRAVITY VENTILATOR
B. BACKDRAFT DAMPER
C. ½" WIRE MESH SCREEN
D. CONCRETE ROOF CURB, SEE (7/802)
E. PREFABRICATED ROOF CURB
F. RUBBER PAD

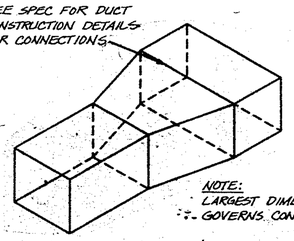
CURB MOUNTED EXHAUST FAN OR GRAVITY VENTILATOR DETAIL
NTS

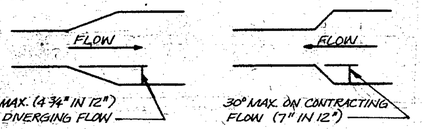


FIRE DAMPER DETAIL
NTS

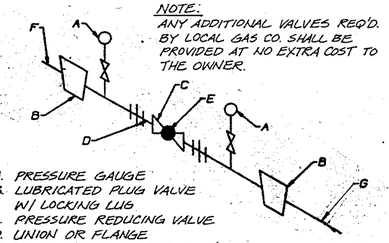


CENTRIFUGAL WALL EXHAUST DETAIL
NTS





TRANSITION DETAIL
NTS



A. PRESSURE GAUGE
B. LUBRICATED PLUG VALVE W/ LOCKING LUG
C. PRESSURE REDUCING VALVE
D. UNION OR FLANGE
E. VENT TO OUTSIDE PER MFR'S RECOMMENDATIONS.
F. HIGH PRESSURE SIDE
G. REDUCED PRESSURE SIDE

GAS PRESSURE REDUCING STATION DETAIL
NTS

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

HVAC- LEGEND, ABBREVIATIONS AND DETAILS

Designed JPT, JEK
Drawn LLB
Checked BRW
Approved John S. Eckert
Date MAY, 1989

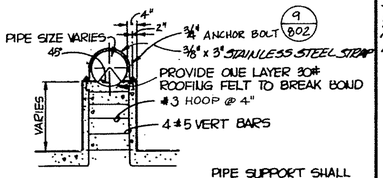
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
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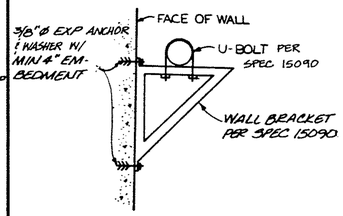
REGISTERED PROFESSIONAL ENGINEER 13351 OREGON JULY 17, 1990 BRUCE R. WILLEY

Sheet Number 805

SR 804

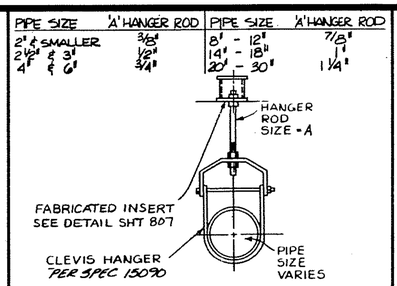


PS TYPE A
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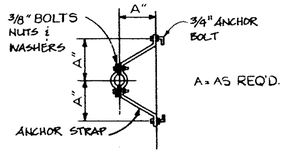
WALL BRACKET MOUNTING DETAIL

PS TYPE B

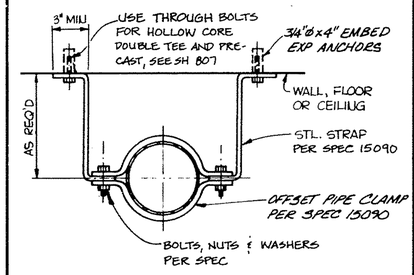


CEILING BRACKET PIPE SUPPORT DETAIL

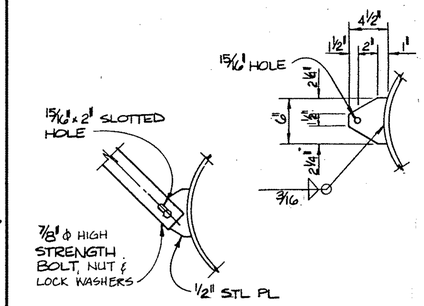
PS TYPE D
NTS



P.S. TYPE E
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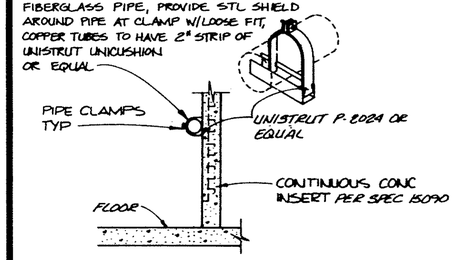


PS TYPE F
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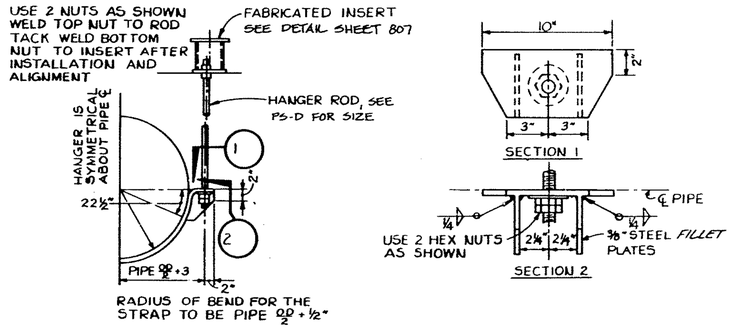
DETAIL 1
NTS

PIPE CLAMPS WHEN USED W/ PVC OR FIBERGLASS PIPE, PROVIDE STL SHIELD AROUND PIPE AT CLAMP W/LOOSE FIT, COPPER TUBES TO HAVE 2" STRIP OF UNISTRUT UNICUSHION OR EQUAL

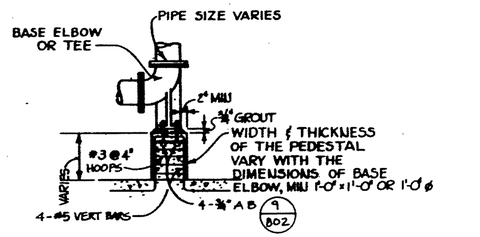


PS TYPE J
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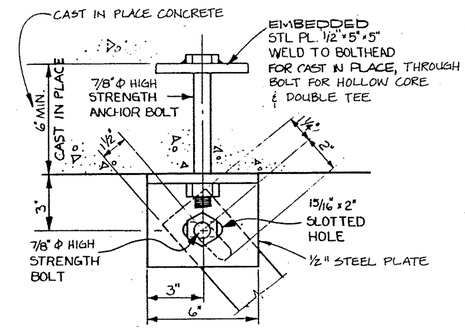
USE 2 NUTS AS SHOWN
WELD TOP NUT TO ROD
TACK WELD BOTTOM NUT TO INSERT AFTER INSTALLATION AND ALIGNMENT



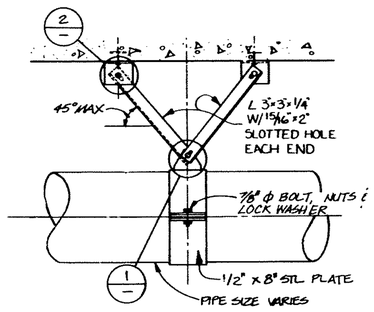
PS TYPE L
NTS



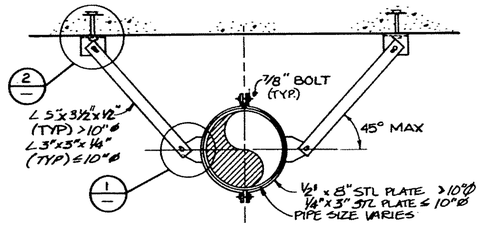
PS TYPE N
NTS



DETAIL 2
NTS



P.S. TYPE P
NTS



PS TYPE Q
NTS

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

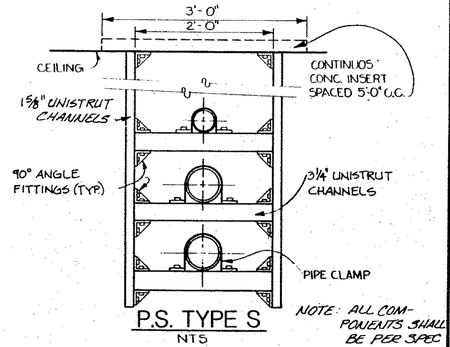
PIPE SUPPORTS

Designed BDR/BRW
Drawn MMK
Checked BRW/DJH
Approved John E. Hock
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

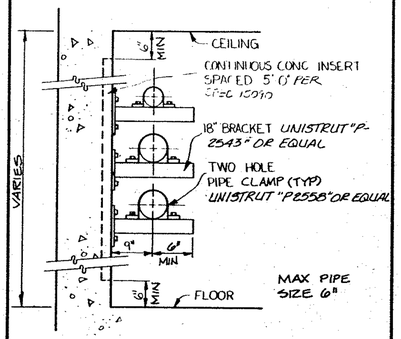
No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

Sheet Number
806

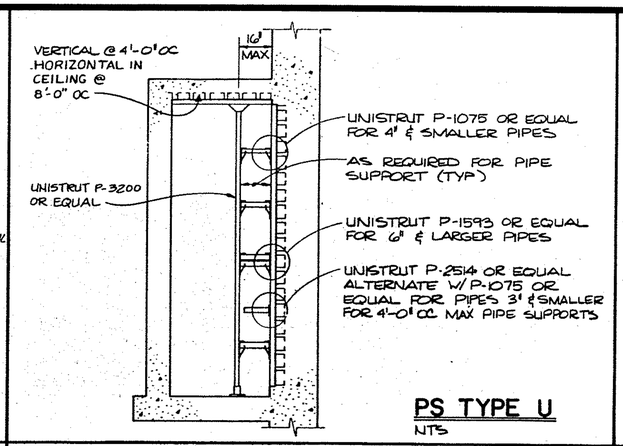


P.S. TYPE S
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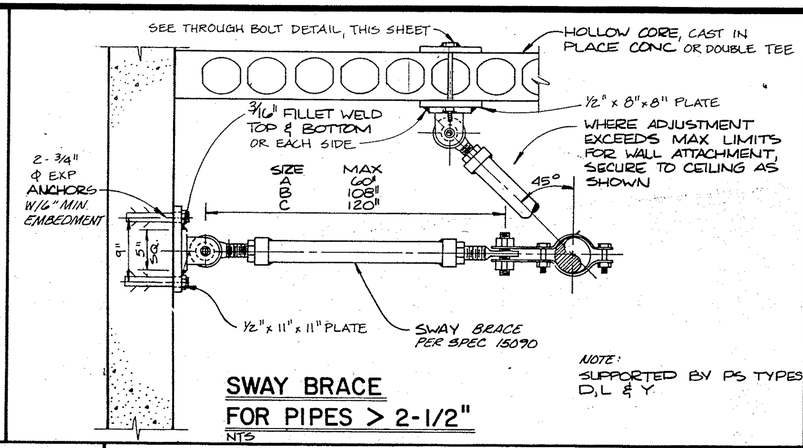
NOTE: ALL COMPONENTS SHALL BE PER SPEC 15090



PS TYPE T
NTS

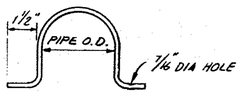


PS TYPE U
NTS



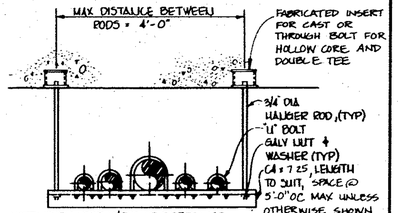
SWAY BRACE FOR PIPES > 2-1/2"
NTS

NOTE: SUPPORTED BY PS TYPES D, L & Y.



3/16" x 1 1/2", LENGTH AS REQD. ATTACH W/ 3/8" DIA EXPANSION ANCHOR W/ 4" MIN. EMBEDMENT (TYP)

PS-TYPE V
NTS

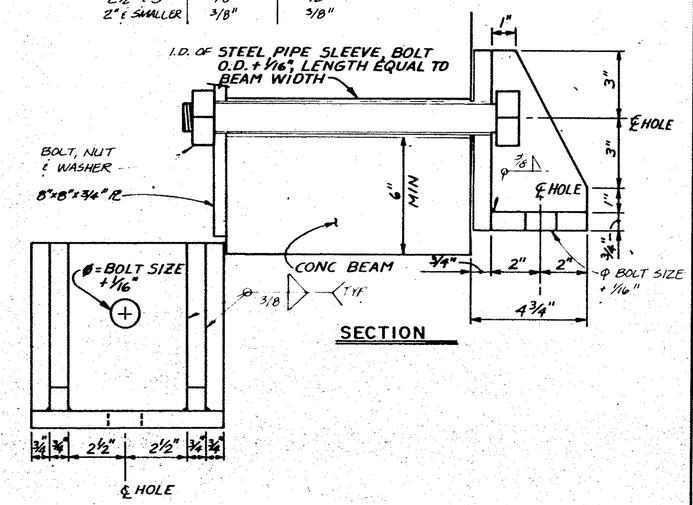


NOTE: WHEN USED W/ PVC OR FIBERGLASS PIPE, PROVIDE SHIELD AROUND PIPE AT "U" BOLT, W/ LOOSE FIT. WRAP COPPER TUBES W/ 2" STRIP OF UNISTRUT UNICUSHION OR EQUAL

PROVIDE SWAY BRACING PER SPEC 15090 @ 10'-0" OC MAX

PS TYPE Y
NTS

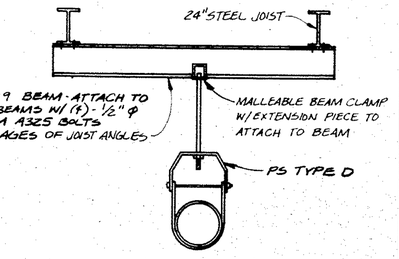
PIPE SIZE	BOLT SIZE	PS TYPE ROD SIZE
20"-30"	1"	1 1/4"
14"-18"	7/8"	1"
8"-12"	3/4"	7/8"
4" & 6"	5/8"	3/4"
2 1/2" & 3"	3/8"	1/2"
2" & SMALLER	3/8"	3/8"



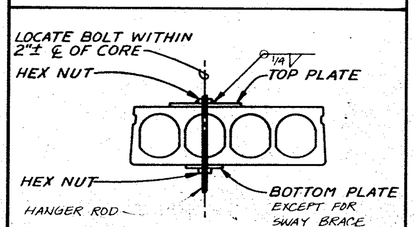
SECTION

ELEVATION

PIPE SUPPORT BRACKET AT BEAMS
PS TYPES D, L AND Y
NTS

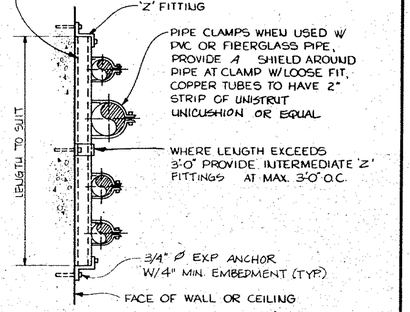


PS - W
NTS



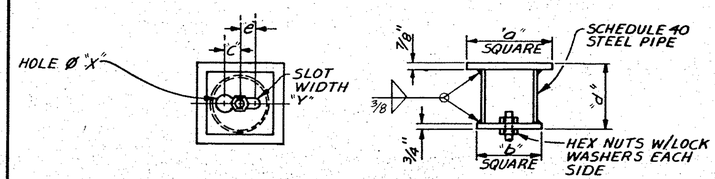
HANGER ROD SIZE	TOP PLATE SIZE	BOTTOM PLATE SIZE
3/8" - 3/4"	12"x6"x1/2"	6"x4"x3/8"
1" - 1 1/4"	18"x9"x3/4"	9"x4 1/2"x1/2"

THROUGH BOLT
NTS



FOR PIPES 1/4" TO 4"

PS TYPE X
NTS



HANGER ROD SIZE	INSERT DIMENSIONS a	b	c	d	e	x	y
3/8" - 1/2"	7"	5 1/2"	1 1/4"	5 1/2"	1 1/4"	1 1/16"	3/8"
3/4"	7"	5 1/2"	1 1/4"	5 1/2"	1 1/4"	1 1/16"	7/8"
7/8" - 1"	9"	7"	1 5/8"	7 1/2"	1 5/8"	1 5/16"	1 1/2"
1 1/4"	11"	8"	1 13/16"	9"	1 5/8"	2 1/16"	1 3/8"

FABRICATED INSERT
N.T.S.

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PIPE SUPPORTS

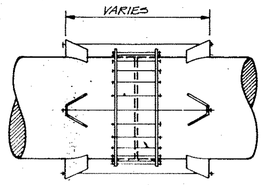
Designed CJN, BDR
Drawn LLB
Checked BRW/DJH
Approved John E. Edlund
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

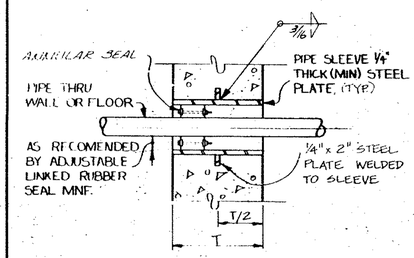
AS RECORDED DRAWINGS

Sheet Number 807

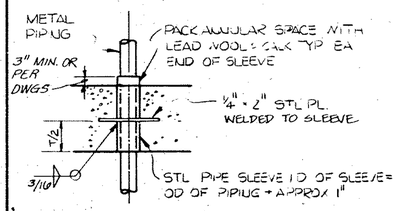


NOTES:
1. FRP WIRE COUPLING WHERE NOTED ON DRAWINGS.
2. DESIGN HARNESS IN ACCORDANCE WITH AWWA M-11 MANUAL STEEL PIPE.

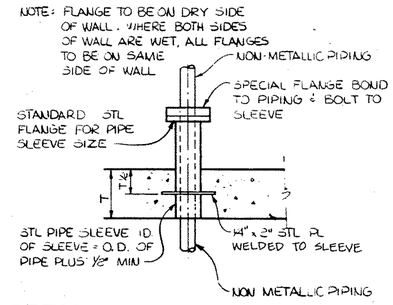
DETAIL 1 - HARNESSED MECHANICAL COUPLING
NTS



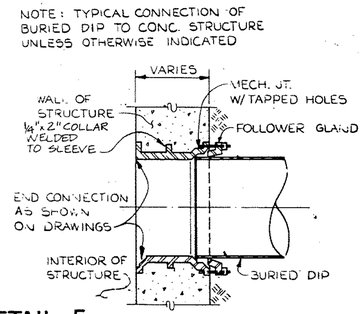
DETAIL 2- PIPE SLEEVE WITH ANNULAR SEAL
NTS



DETAIL 3- METALLIC PIPE SLEEVE
NTS



DETAIL 4 - NON-METALLIC PIPE SLEEVE
NTS



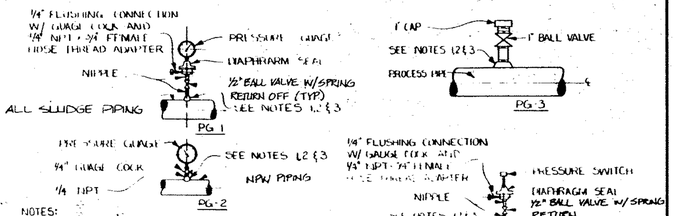
DETAIL 5 - BURIED DIP WALL CONNECTION
NTS

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Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

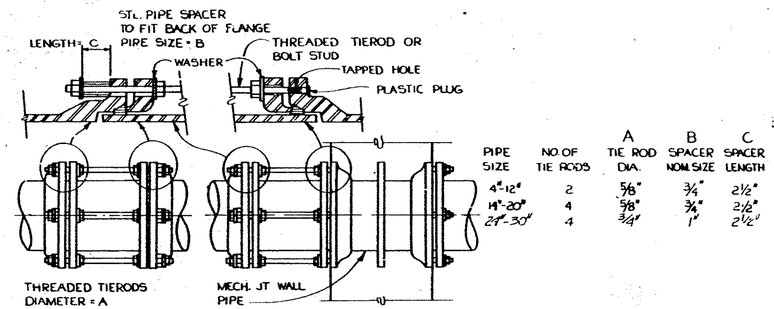
DURHAM AWWTP PHASE I EXPANSION

PIPE DETAILS



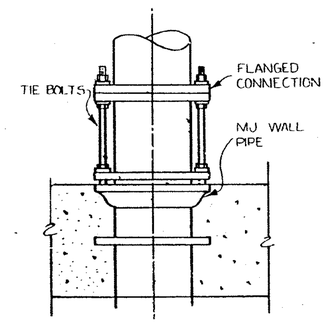
NOTES:
1. FOR STEEL 6" & P.V.C. 2 1/2" & SMALLER USE A BUSHING IN A TEE
2. FOR DUCTILE ALL SIZES USE TAP SADDLE W/ BUSHING.
3. FOR STEEL & SST PIPES 3" & LARGER & PRESSURE VESSELS USE THREADOLET OR EQUAL AS SHOWN.
4. DIAPHRAGM SEAL - PRESSURE GAGE ASSEMBLY FACTORY ASSEMBLED
5. DIAPHRAGM SEAL - PRESSURE SWITCH ASSEMBLY FACTORY ASSEMBLED

PRESSURE GAGE (PG) AND PRESSURE SWITCH (PSW) DETAILS
NTS

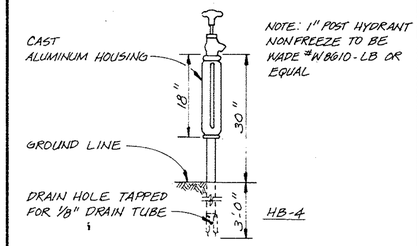


PIPE SIZE	NO OF TIE RODS	A TIE ROD DIA.	B SPACER NOM SIZE	C SPACER LENGTH
4"-12"	2	5/8"	3/4"	2 1/2"
14"-20"	4	5/8"	3/4"	2 1/2"
24"-30"	4	3/4"	1"	2 1/2"

DETAIL 6 - DOUBLE MECHANICAL JOINT
NTS



DETAIL 7 - MODIFIED DMJ
NTS

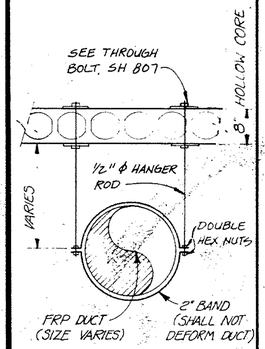


EXTERIOR HOSE BIBB DETAIL
NTS

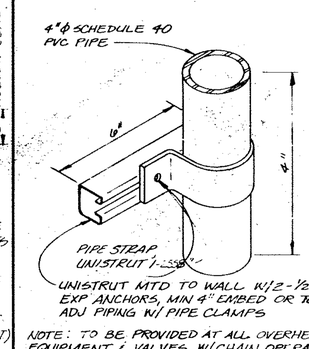
Designed	J.P.T, J.E.K
Drawn	D.R.V
Checked	B.R.W
Approved	John E. Koch
Date	MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

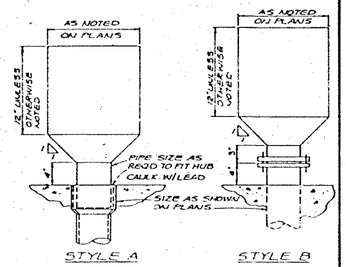


DETAIL 9 - FRP PIPE SUPPORT
NTS



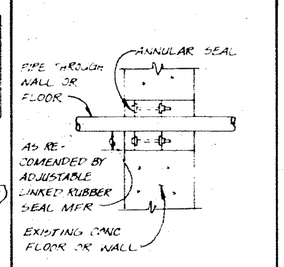
NOTE: TO BE PROVIDED AT ALL OVERHEAD EQUIPMENT & VALVES W/ CHAIN OPERATORS

DETAIL 10 - CHAIN HOLDER ASSEMBLY
NTS

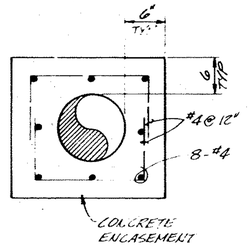


NOTES:
1. UNLESS SHOWN OTHERWISE, FABRICATE FUNNEL FROM SCHED 10 STEEL PIPE. HOT DIP GALVANIZE AFTER FABRICATION.
2. EXTEND PIPE 6" INTO FUNNEL UNLESS OTHERWISE NOTED

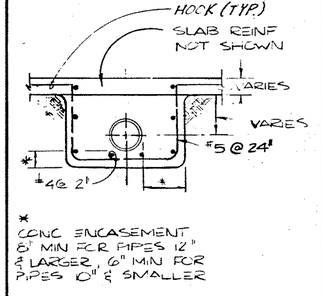
DETAIL 11 - FUNNEL DRAIN
NTS



DETAIL 12 PIPE PENETRATION W/ANNULAR SEAL
NTS

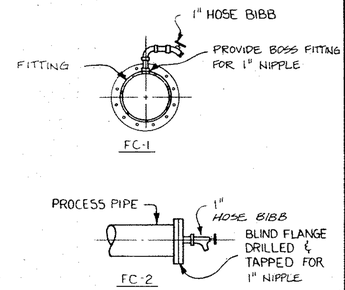


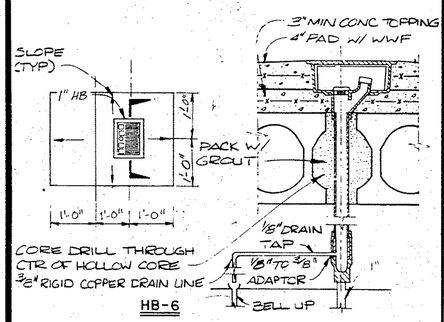
TYPICAL CONCRETE ENCASEMENT DETAIL
NTS



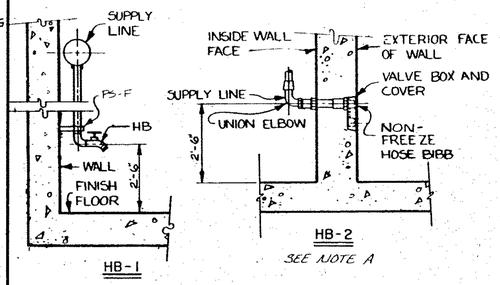
* CONC ENCASEMENT 6" MIN FOR PIPES 12" & LARGER, 6" MIN FOR PIPES 10" & SMALLER

UNDERSLAB PIPE ENCASEMENT DETAIL
NTS



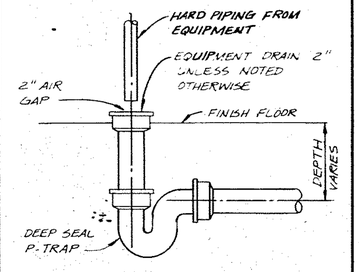


DUAL NON-FREEZE ROOF HOSE BIBB DETAIL
NTS

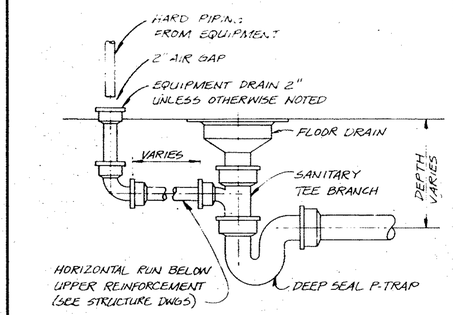


NOTE:
A. 1" WALL HYDRANT, NON FREEZE, TO BE MADE #WB609-LZ OR EQUAL W/ DRAIN HOLE PLUGGED

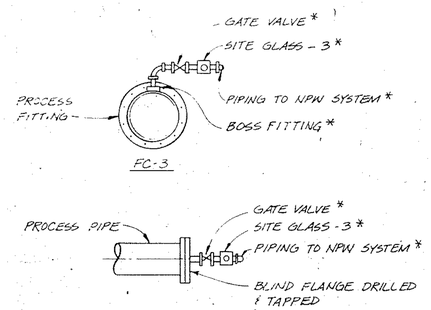
HOSE BIBB DETAILS
NTS



TRAPPED BELL-UP (BU)
NTS



NON-TRAPPED BELL UP (BU-1) TO FLOOR DRAIN DETAIL
NTS

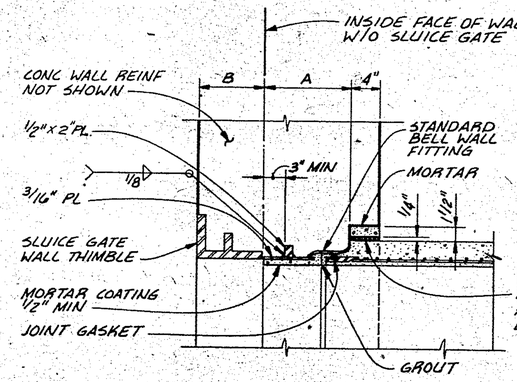


* SEE PLANS FOR PIPE SIZES

FLUSHING CONNECTIONS (FC)
NTS

AS RECORDED DRAWINGS

Sheet Number
808



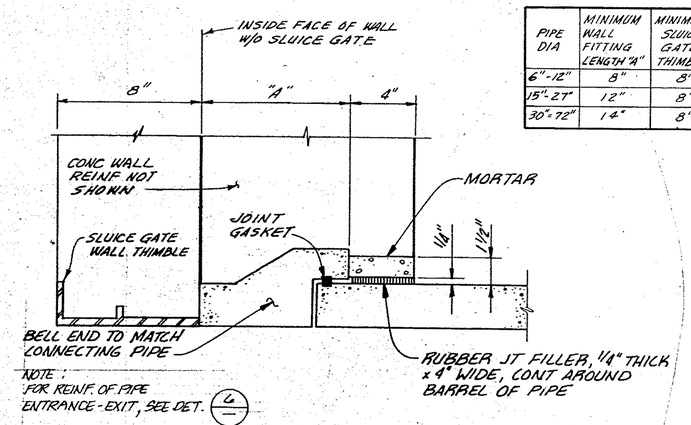
PIPE DIA.	MINIMUM WALL FITTING LENGTH	MINIMUM SLUICE GATE THIMBLE
	A	B
16"-36"	8"	8"
42"-54"	9"	8"
60"	10"	8"

NOTE: FOR REINF OF PIPE ENTRANCE-EXIT, SEE DET. 4

FOR RUBBER AND STEEL JOINT PIPE

DETAIL 1 - REINFORCED CONCRETE CYLINDER PIPE TYPICAL WALL FITTING

NTS

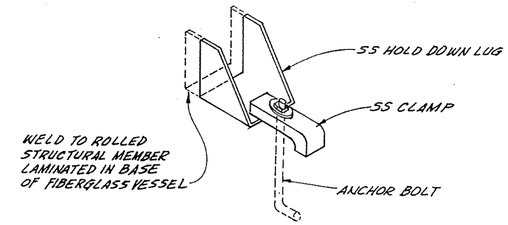


PIPE DIA	MINIMUM WALL FITTING LENGTH "A"	MINIMUM SLUICE GATE THIMBLE
6"-12"	8"	8"
15"-27"	12"	8"
30"-72"	14"	8"

NOTE: FOR REINF OF PIPE ENTRANCE-EXIT, SEE DET. 4

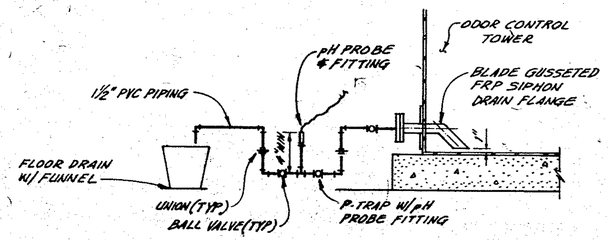
DETAIL 2 - REINFORCED CONCRETE PIPE TYPICAL WALL FITTING

NTS



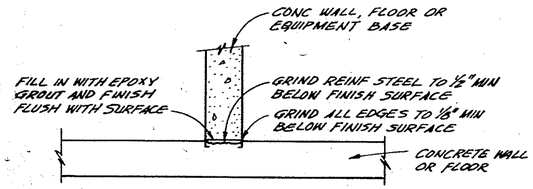
DETAIL 3 - ODOR CONTROL HOLDDOWN ASSEMBLY

NTS



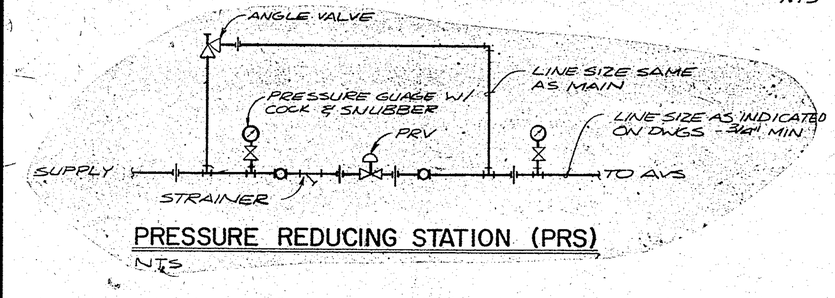
DETAIL 4 - ODOR CONTROL TOWER pH PROBE

NTS



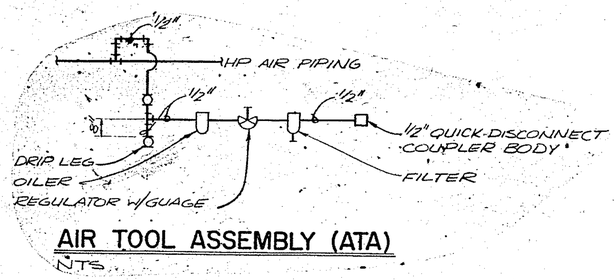
DETAIL 5 - SURFACE RESTORATION AFTER CONCRETE DEMOLITION

NTS



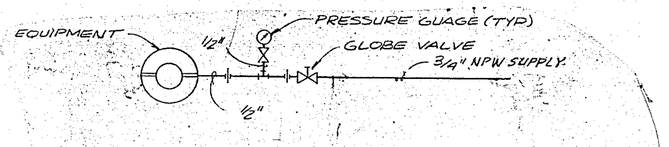
PRESSURE REDUCING STATION (PRS)

NTS



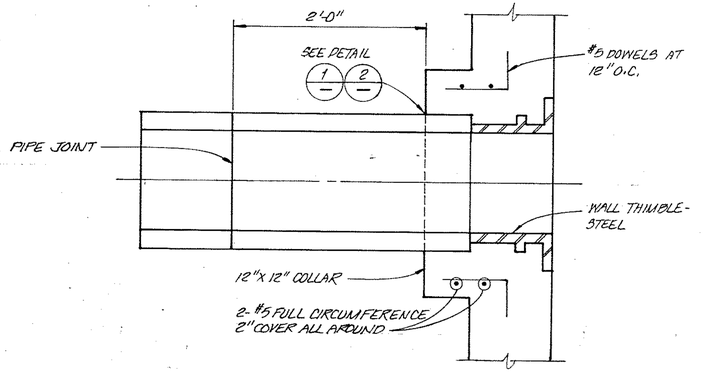
AIR TOOL ASSEMBLY (ATA)

NTS



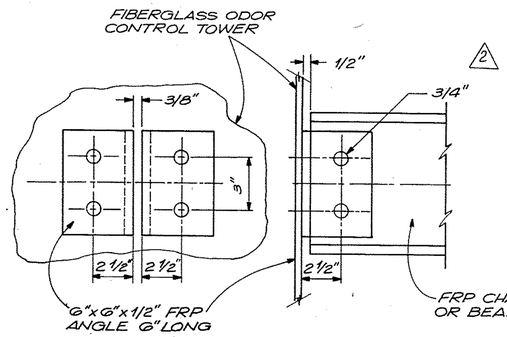
SINGLE SEAL, STANDARD EQUIPMENT AUTOMATIC VALVE STATION (AVS)

NTS



DETAIL 6 - TYPICAL ENTRANCE-EXIT REINFORCEMENT

NTS



DETAIL 7 - ATTACHMENT - FRP TANKS, CHANNELS & BEAMS

NTS

△3 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

PIPE AND MISCELLANEOUS DETAILS

Designed	JPT, JEK
Drawn	MMK
Checked	BRW
Approved	John E. Hoch
Date	MAY, 1989

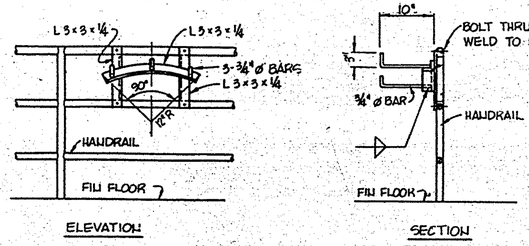
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	JEK	ADDENDUM NO. 2	6-30-89
3	AFA	AS RECORDED DRAWING	12/9/92

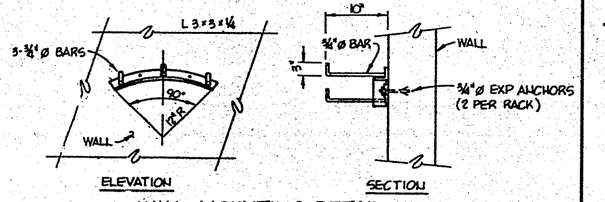
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17, 1936 BRUCE R. WILLEY

Sheet Number 809

SH 804



RAIL MOUNTING DETAIL

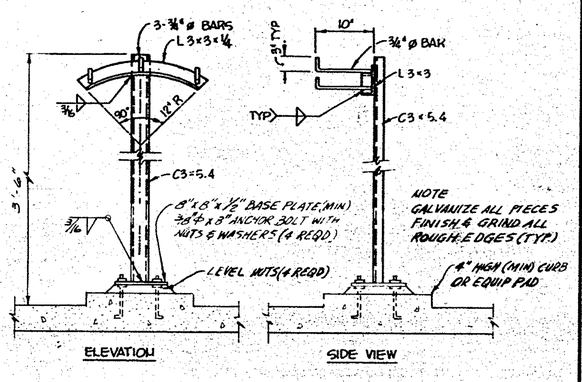


WALL MOUNTING DETAIL

NOTE: FINISH & GRIND ALL ROUGH EDGES, TYPICAL. GALVANIZE ALL PIECES AFTER FABRICATION.

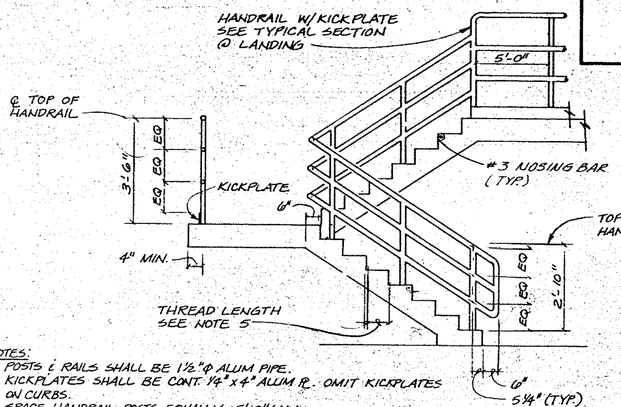
TYPICAL HOSE RACK DETAILS

NTS



HOSE RACK POST MOUNTING DETAIL

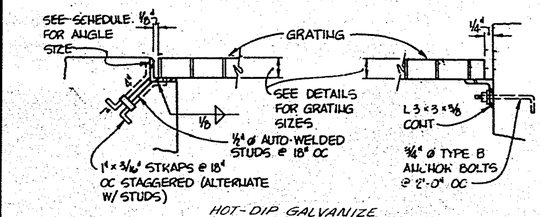
NTS



NOTES:
1. POSTS & RAILS SHALL BE 1 1/2" ø ALUM PIPE.
2. KICKPLATES SHALL BE CONT. 1/4" x 4" ALUM PL. OMIT KICKPLATES ON CURBS.
3. SPACE HANDRAIL POSTS EQUALLY - 5'-0" MAX.
4. SPACE STAIR HANDRAIL POSTS EQUALLY - 5'-0" MAX.
5. STAIR TREAD LENGTH & RISER HEIGHT VARY - SEE PLANS.
6. POST ANCHORAGE DETAILS VARY AS NOTED ON PLANS, SEE DETAILS THIS SHEET.

CONCRETE STAIRS, HANDRAIL, & STAIR HANDRAIL DETAIL

NTS

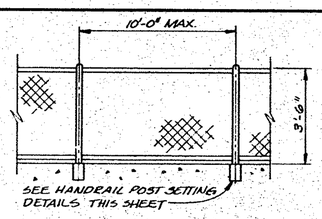


TYPICAL SEAT ANGLE DETAIL FOR GRATING

NTS

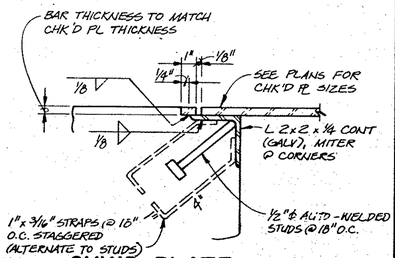
GRATING SUPPORT ANGLE SCHEDULE	
BEARING BAR DEPTH x THICKNESS	SEAT ANGLE SIZE
1 1/4" x 3/16"	L 1 1/2" x 1 1/2" x 1/4"
1 1/2" x 3/16"	* L 2" x 2" x 1/4"
1 3/4" x 3/16"	L 2" x 2" x 1/4"
2" x 3/16"	* L 2 1/2" x 2 1/2" x 1/4"
2 1/4" x 3/16"	L 2 1/2" x 2" x 1/4" (LLV)
2 1/2" x 3/16"	* L 3" x 2" x 1/4" (LLV)

* CUT VERTICAL LEGS TO MATCH TOP OF BEARING BARS



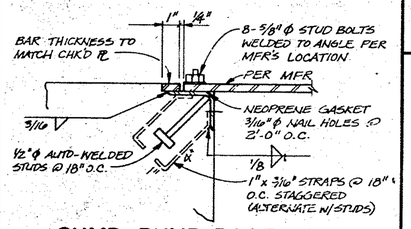
CHAIN LINK FENCE DETAIL

NTS



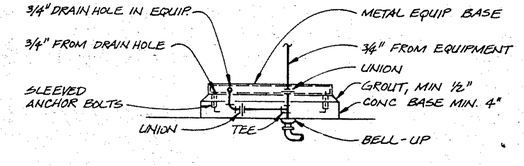
CHK'D PLATE SEAT ANGLE DETAIL (TYP.)

NTS



SUMP PUMP BASE SEAT ANGLE DETAIL (TYP.)

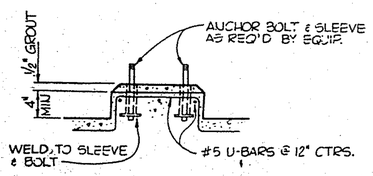
NTS



EQUIPMENT BASE DRAINAGE DETAIL

NTS

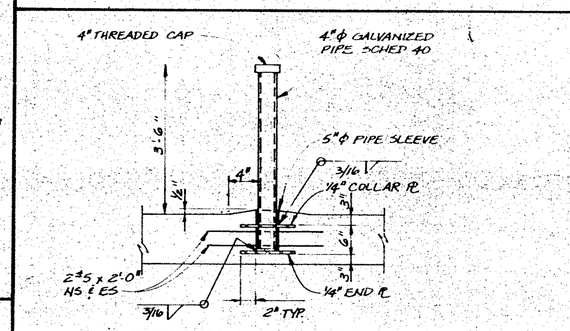
NOTE: WILSON ANCHOR SLEEVE MAY BE SUBSTITUTED FOR STEEL PIPE SLEEVES



MONOLITHIC

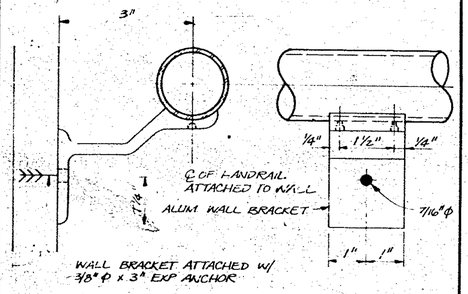
EQUIPMENT BASE DETAIL

NTS



REMOVABLE GUARD POST DETAIL

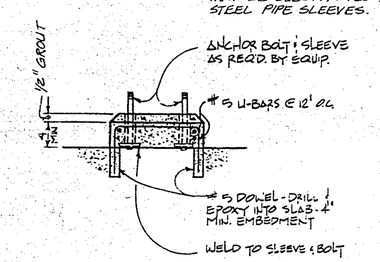
NTS



HANDRAIL WALL MOUNT BRACKET DETAIL

NTS

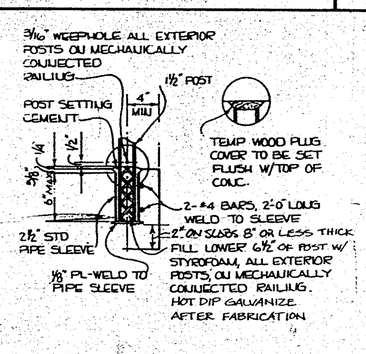
NOTE: WILSON ANCHOR SLEEVE MAY BE SUBSTITUTED FOR STEEL PIPE SLEEVES.



NON - MONOLITHIC

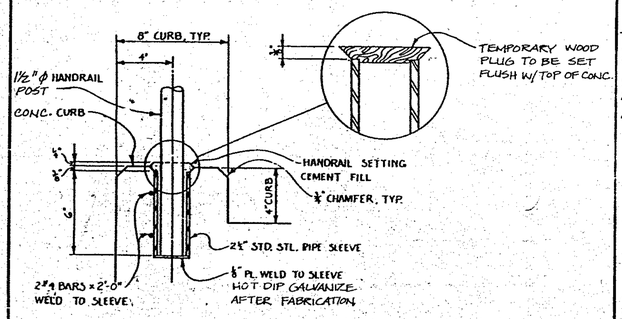
EQUIPMENT BASE DETAIL

NTS



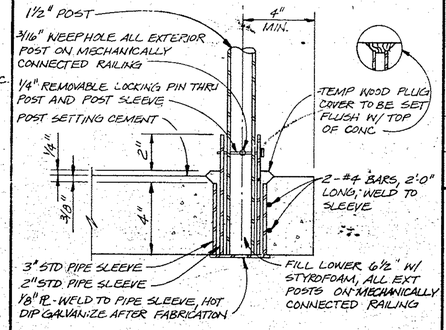
HANDRAIL POST SETTING DETAIL

NTS



HANDRAIL CURBED POST SETTING DETAIL

NTS



REMOVABLE HAND RAIL POST SETTING DETAIL

NTS

△ AS RECORDED DRAWINGS

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Edmonds, WA

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DURHAM AWWTP PHASE I EXPANSION

MISCELLANEOUS DETAILS

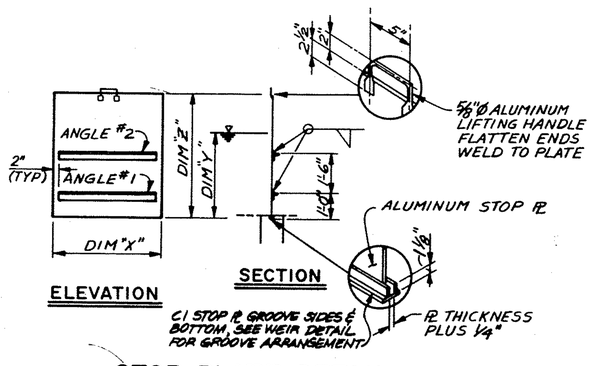
Designed BDR
Drawn CSAM
Checked BRW / DJH
Approved John E. Kirk
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY

No	By	Revision	Date
△	AFA	AS RECORDED DRAWING	12/9/92

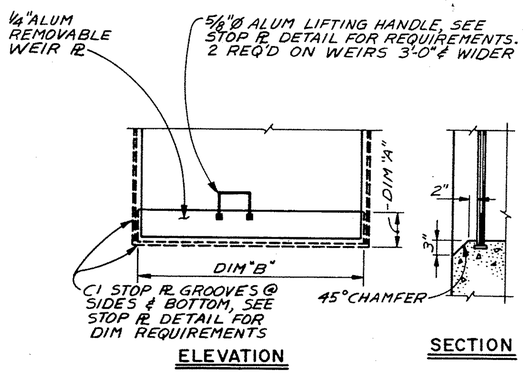
Sheet Number 810

SR 891



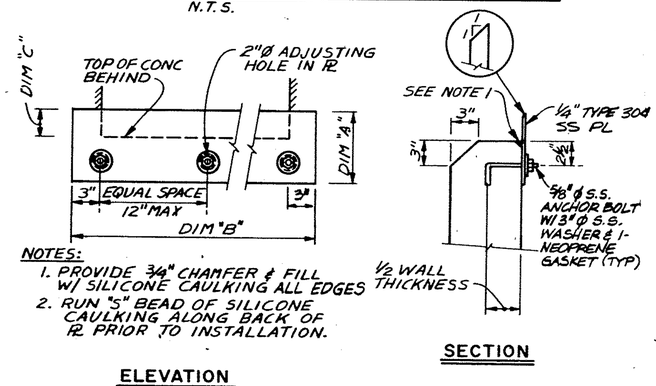
STOP PLATE DETAIL

N.T.S.



TYPE A WEIR (REMOVABLE)

N.T.S.



TYPE B WEIR (FIXED)

N.T.S.

STOP PLATE THICKNESS SCHEDULE				
DIM "Y"	DIM "X"			
	L 2'-2"	2'-3" TO 3'-2"	3'-3" TO 4'-2"	4'-3" TO 5'-2"
0'-6"	0.25"	0.3125"	0.375"	0.375"
1'-0"	0.25"	0.375"	A	A
2'-0"	0.3125"	A	B	B
3'-0"	0.375"	B	B	C
4'-0"	B	B	C	C

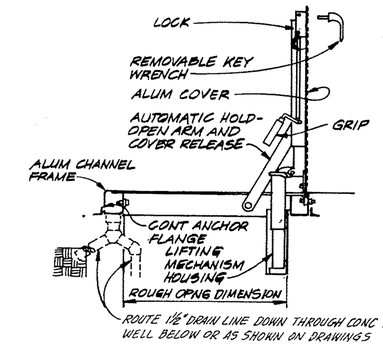
STOP PLATE REINF. SCHEDULE		
PLATE	ANGLE SIZE	
	#1	#2
A	2½x2x¼	—
B	3x2x¼	—
C	3x2x¼	3x2x¼

STOP PLATE SCHEDULE					
MARK	LOCATION	DIM "X"	DIM "Y"	DIM "Z"	REMARKS
SP-101	EXIST HEADWORKS INFL CHANNEL	3'-6"	7'-6"	10'-0"	SEE SH129 FOR DETAILS
SP-301	HEADWORKS MIX BOX	1'-7 3/4"	3'-4"	4'-10"	2'-3" HANDLE HEIGHT
SP-302	HEADWORKS MIX BOX	1'-7 3/4"	3'-4"	4'-10"	2'-3" HANDLE HEIGHT
SP-303	HEADWORKS MIX BOX	1'-7 3/4"	3'-4"	4'-10"	2'-3" HANDLE HEIGHT
SP-304	HEADWORKS MIX BOX	1'-7 3/4"	3'-4"	4'-10"	2'-3" HANDLE HEIGHT
SP-305	HEADWORKS MIX BOX	2'-1 3/4"	3'-4"	6'-1"	1'-3" HANDLE HEIGHT
SP-306	HEADWORKS MIX BOX	1'-7 3/4"	3'-4"	4'-10"	2'-3" HANDLE HEIGHT
SP-401	PRIMARY INFL. SPLIT STRUCTURE	3'-2 1/4"	1'-10"	3'-4"	
SP-402	PRIMARY INFL. SPLIT STRUCTURE	3'-2 1/4"	1'-10"	3'-4"	
SP-403	PRIMARY INFL. SPLIT STRUCTURE	3'-2 1/4"	1'-10"	3'-4"	
SP-404	PRIMARY INFL. SPLIT STRUCTURE	3'-2 1/4"	1'-10"	3'-4"	
SP-405	PRIMARY INFL. SPLIT STRUCTURE	3'-2 1/4"	1'-10"	3'-4"	
SP-406	PRIMARY INFL. SPLIT STRUCTURE	3'-2 1/4"	1'-10"	3'-4"	
SP-407	PRIMARY INFL. SPLIT STRUCTURE	3'-2 1/4"	1'-10"	3'-4"	
SP-408	PRIMARY INFL. SPLIT STRUCTURE	3'-2 1/4"	1'-10"	3'-4"	
SP-409	PRIMARY INFL. SPLIT STRUCTURE	3'-2 1/4"	1'-10"	3'-4"	
SP-410	PRIMARY EFFL. SPLIT STRUCTURE	4'-1/4"	1'-3"	3'-6"	
SP-411	PRIMARY EFFL. SPLIT STRUCTURE	4'-1/4"	1'-3"	3'-6"	

WEIR SCHEDULE					
MARK	LOCATION	DIM "A"	DIM "B"	DIM "C"	TYPE
W-401	PRIMARY INFL. FLOW SPLIT STRUCTURE	7 1/8"	3'-2 1/4"	---	A
W-402	PRIMARY INFL. FLOW SPLIT STRUCTURE	7 1/8"	3'-2 1/4"	---	A
W-403	PRIMARY INFL. FLOW SPLIT STRUCTURE	7 1/8"	3'-2 1/4"	---	A
W-404	PRIMARY INFL. FLOW SPLIT STRUCTURE	7 1/8"	3'-2 1/4"	---	A
W-405	PRIMARY INFL. FLOW SPLIT STRUCTURE	7 1/8"	3'-2 1/4"	---	A
W-406	PRIMARY INFL. FLOW SPLIT STRUCTURE	7 1/8"	3'-2 1/4"	---	A
W-407	PRIMARY INFL. FLOW SPLIT STRUCTURE	7 1/8"	3'-2 1/4"	---	A
W-408	PRIMARY INFL. FLOW SPLIT STRUCTURE	7 1/8"	3'-2 1/4"	---	A
W-409	PRIMARY INFL. FLOW SPLIT STRUCTURE	7 1/8"	3'-2 1/4"	---	A
W-410	PRIMARY EFFL. FLOW SPLIT STRUCTURE	7 1/8"	4'-1/4"	---	A
W-411	PRIMARY EFFL. FLOW SPLIT STRUCTURE	7 1/8"	4'-1/4"	---	A
W-601	SURGE BASIN EFFL. STRUCTURE	10"	10'-6"	4"	B

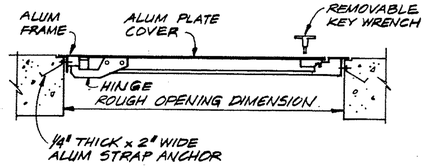
HATCH SCHEDULE				
MARK	LOCATION	ROUGH OPENING DIMENSION	TYPE	NOTES
H-101	VALVE VAULT BOX NO. 1	6'0" x 8'0"	A	DOUBLE DOOR
H-102	VALVE VAULT BOX NO. 2	6'0" x 8'0"	A	DOUBLE DOOR
H-103	VALVE VAULT BOX NO. 3	6'0" x 8'0"	A	DOUBLE DOOR
H-104	CHLORINATION VAULT BOX	2'0" x 2'0"	A	
H-105	METERING MANHOLE	2'0" x 2'0"	A	
H-106	IRRIGATION METER	3'0" x 3'0"	B	
H-301	HEADWORKS SCREEN ROOM	14'6" x 6'0"	A	DOUBLE LEAF WITH SAFETY CHAIN
H-302	HEADWORKS SCREEN ROOM	14'6" x 6'0"	A	DOUBLE LEAF WITH SAFETY CHAIN
H-303	HEADWORKS SCREEN ROOM	6'0" x 3'0"	A	SINGLE LEAF
H-311	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-312	HEADWORKS GRIT STRUCTURE	3'6" x 3'6"	A	SINGLE LEAF
H-313	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-314	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-315	HEADWORKS GRIT STRUCTURE	6'0" x 1'0"*	D	SPLIT PLATE AROUND OPERATOR
H-316	HEADWORKS GRIT STRUCTURE	1'6" x 1'6"*	C	SINGLE LEAF
H-321	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-322	HEADWORKS GRIT STRUCTURE	3'6" x 3'6"	A	SINGLE LEAF
H-323	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-324	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-325	HEADWORKS GRIT STRUCTURE	5'0" x 1'0"*	D	SPLIT PLATE AROUND OPERATOR
H-326	HEADWORKS GRIT STRUCTURE	1'6" x 1'6"*	C	SINGLE LEAF
H-331	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-332	HEADWORKS GRIT STRUCTURE	3'6" x 3'6"	A	SINGLE LEAF
H-333	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-334	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-335	HEADWORKS GRIT STRUCTURE	5'0" x 1'0"*	D	SPLIT PLATE AROUND OPERATOR
H-336	HEADWORKS GRIT STRUCTURE	1'6" x 1'6"*	C	SINGLE LEAF
H-341	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-342	HEADWORKS GRIT STRUCTURE	3'6" x 3'6"	A	SINGLE LEAF
H-343	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-344	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-345	HEADWORKS GRIT STRUCTURE	6'0" x 1'0"*	D	SPLIT PLATE AROUND OPERATOR
H-346	HEADWORKS GRIT STRUCTURE	1'6" x 1'6"*	C	SINGLE LEAF
H-351	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-352	HEADWORKS GRIT STRUCTURE	2'0" x 1'6"	C	SINGLE LEAF
H-353	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-354	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B*	SINGLE LEAF
H-361	HEADWORKS GRIT STRUCTURE	2'0" x 1'6"*	C	SINGLE LEAF
H-362	HEADWORKS GRIT STRUCTURE	10'0" x 1'0"*	D	SPLIT PLATE AROUND OPERATOR
H-363	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-364	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-365	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-371	HEADWORKS GRIT STRUCTURE	8'9" x 1'0"	C	SPLIT PLATE AROUND 2 OPERATORS
H-372	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-373	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-374	HEADWORKS GRIT STRUCTURE	2'6" x 2'6"	B	SINGLE LEAF
H-381	HEADWORKS SCREEN ROOM	2'0" x 2'0"	B	SINGLE LEAF
H-382	HEADWORKS SCREEN ROOM	2'0" x 2'0"	B	SINGLE LEAF
H-383	HEADWORKS SCREEN ROOM	2'0" x 2'0"	B	SINGLE LEAF
H-401	PRIMARY INFL. SPLIT STRUCTURE	1'0" x 3'2"	C	
H-402	PRIMARY INFL. SPLIT STRUCTURE	1'0" x 3'2"	C	
H-403	PRIMARY INFL. SPLIT STRUCTURE	1'0" x 3'2"	C	
H-404	PRIMARY INFL. SPLIT STRUCTURE	1'0" x 3'2"	C	
H-405	PRIMARY INFL. SPLIT STRUCTURE	1'0" x 3'2"	C	
H-406	PRIMARY INFL. SPLIT STRUCTURE	1'0" x 3'2"	C	
H-407	PRIMARY INFL. SPLIT STRUCTURE	1'0" x 3'2"	C	
H-408	PRIMARY INFL. SPLIT STRUCTURE	1'0" x 3'2"	C	
H-409	PRIMARY INFL. SPLIT STRUCTURE	1'0" x 3'2"	C	
H-410	PRIMARY INFL. SPLIT STRUCTURE	2'0" x 2'0"	C	
H-411	PRIMARY INFL. SPLIT STRUCTURE	---	---	BY PUMP MANUFACTURER
H-412	PRIMARY INFL. SPLIT STRUCTURE	1'0" x 5'6"	D	SPLIT AROUND OPERATOR
H-413	PRIMARY EFFL. SPLIT STRUCTURE	3'0" x 3'0"	C	
H-414	PRIMARY EFFL. SPLIT STRUCTURE	1'0" x 4'0"	C	
H-416	PRIMARY EFFL. SPLIT STRUCTURE	1'0" x 4'0"	C	ABUTTING H-415
H-417	PRIMARY SLUDGE PUMPING STATION SU	3'0" x 3'0"	C	SPLIT IH 2 SECTIONS, W/O HINGE ASSY
H-418	PRIMARY INFL. SPLIT STRUCTURE	2'0" x 2'0"	C	
H-419	PRIMARY INFL. SPLIT STRUCTURE	2'0" x 2'0"	C	
H-420	PRIMARY INFL. SPLIT STRUCTURE	2'0" x 2'0"	C	
H-421	PRIMARY EFFL. FLOW SPLIT STRUCTURE	2'0" x 2'0"	C	
H-422	PRIMARY INFL. FLOW SPLIT STRUCTURE	2'0" x 2'0"	C	
H-501	CONTROL BLDG. CHLORINE VAULT	3'6" x 4'0"	B	SINGLE LEAF REMOVABLE FRAME OVER 12" x 12" BLOCKOUT
H-107	EFFLUENT MH	2'0" x 3'0"	D	WATERTIGHT

* INDICATES HATCH SHARES COMMON FRAME/SUPPORT WITH AJOINING HATCH. SEE NOTE 5, TYPE "C" HATCH



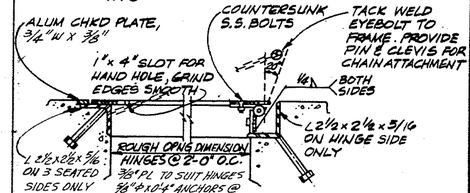
TYPE A HATCH

NTS



TYPE B HATCH

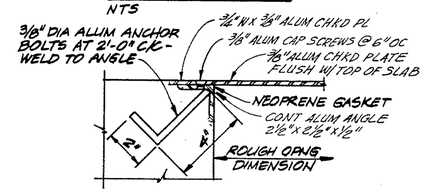
NTS



NOTES:
1. INSTALL GALVANIZED CHAIN. TACK WELD OR BOLT TO FRAME. CHAIN TO STOP PLATE AT 20° PAST VERTICAL.
2. HINGES TO BE STAINLESS STEEL FULL MORTISE BUTT HINGES W/ STAINLESS STEEL BOLTS. PROVIDE SO THAT FRAME CAN BE REMOVED.
3. ALUMINUM PLATE THICKNESS = ⅜".
4. MAXIMUM WEIGHT : 80 LBS.
5. USE L 2½" H x 3" W x 5/16" ACROSS OPENING FOR FRAME/SUPPORT COMMON TO TWO HATCHES.
6. NOTCH FRAME AND PROVIDE CLEARANCE AT SLIDE GATES AND STOP PLATES.

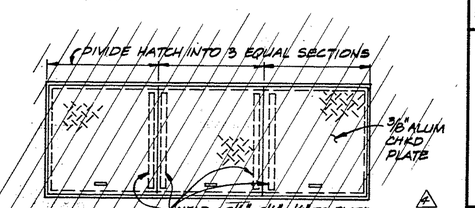
TYPE C HATCH

NTS



TYPE D HATCH

NTS



NOTES:
1. CONSTRUCT IDENTICAL TO TYPE C HATCH EXCEPT AS NOTED HERE

TYPE E HATCH

NT

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

STOP PLATES, WEIRS AND HATCHES

Designed BRW, DKT
Drawn RKB
Checked BRW
Approved John S. Hoch
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	JEK	ADDENDUM NO 1	6-27-89
2	JEK	ADDENDUM NO 2	6-30-89
3	AFA	CPR #18	12/19/92
4	AFA	AS RECORDED DRAWING	12/19/92

Sheet Number 811

CEILING MOUNTED FLUORESCENT LIGHT FIXTURE

WALL MOUNTED FLUORESCENT LIGHT FIXTURE

CEILING-MOUNTED LUMINAIRE (HID OR INCAN)

WALL MOUNTED LUMINARIE (HID OR INCAN)

POLE MOUNTED LUMINARIE (SINGLE)

STRIP LIGHTING

EMERGENCY LIGHT (BATTERY PACK)

EMERGENCY LIGHT REMOTE MOUNTED HEAD

CEILING MOUNTED EXIT LIGHT

WALL MOUNTED EXIT LIGHT

SWITCH

NUMBER DENOTES FIXTURE TYPE SEE LIGHTING FIXTURE SCHEDULE SHEET 925

NOTE: THE FOLLOWING SUBSCRIPTS ARE USED TO INDICATE VARIOUS TYPES OF SWITCHES:

SINGLE POLE SWITCH (NO SUBSCRIPTS)	
DOUBLE POLE SWITCH	2
THREE-WAY SWITCH	3
FOUR-WAY SWITCH	4
MOTOR STARTING SWITCH	MS

FLOOR MOUNTED DUPLEX RECEPTACLE

125V., 20A, SINGLE RECEPTACLE, NEMA 5-20R. OR NEMA 5-15R IF ON A 15A CIRCUIT

125V., 20A., DUPLEX RECEPTACLE, NEMA 5-20R. OR NEMA 5-15R IF ON A 15A CIRCUIT

125V., 20 A, DOUBLE DUPLEX RECEPTACLE, NEMA 5-20R. OR NEMA 5-15R IF ON A 15A CIRCUIT

SPECIAL PURPOSE RECEPTACLE

SPECIAL PURPOSE FLOOR MOUNTED RECEPTACLE, ADD SUBSCRIPT NUMBER, LETTER OR TYPE TO IDENTIFY USAGE

SMALL JUNCTION OR PULL BOX

UNDER FLOOR DUCT JUNCTION BOX

BRANCH CIRCUIT HOMERUN - USE 2-#12, 1-#12 GND., 3/4"C. MINIMUM, FOR 120/208V CIRCUITS. (ARROWHEAD OR CIRCUIT NUMBER INDICATES NUMBER OF CIRCUITS (TYP).

REFERENCE SYMBOL-WIRE AND CONDUIT SIZE AS SPECIFIED IN CIRCUIT SCHEDULE IF NOT SHOWN SEE ONE LINE DIAGRAM OR CIRCUIT IS A LIGHTING OR POWER PANEL HOMERUN

INSTRUMENTATION CIRCUIT. USE 3/4" CONDUIT MINIMUM.

CONDUIT SEAL FITTING FOR HAZARDOUS AREAS

CONTROL CIRCUIT HOMERUN, USE 3/4" CONDUIT MINIMUM

ESSENTIAL CIRCUIT HOMERUN, USE 3/4" CONDUIT MINIMUM

TELEPHONE CIRCUIT. USE 3/4" CONDUIT FOR UP TO TWO TELEPHONES

EMBEDDED CONDUIT HOMERUN

MOTOR CONTROLLER SUPPLIED WITH EQUIPMENT

MOTOR SAFETY SWITCH IS SUPPLIED WITH EQUIPMENT

MOTOR SAFETY SWITCH, NON-FUSIBLE 30A, 3 POLE UNLESS OTHERWISE INDICTED ON ONE-LINE DIAGRAM F- INDICATES FUSED TYPE

MOLDED CASE CIRCUIT BREAKER, RATING AND NO. OF POLES INDICATED. SUBSCRIPT AS NOTED.

- SS - SOLID STATE TRIP
- SE - STORED ENERGY MECHANISM, SYSTEMS TYPE
- GF - GROUND FAULT TRIP
- EO - ELECTRICALLY OPERATED
- MCP - MOTOR CIRCUIT PROTECTOR

DISCONNECT DEVICE FOR DRAWOUT EQUIPMENT

FUSE, SIZE AS REQUIRED

MOTOR, A-C INDUCTION TYPE, ENCIRCLED NUMERAL INDICATES EXPECTED HORSEPOWER IF NOT SHOWN SEE ONE-LINE DIAGRAM

SINGLE PHASE STARTER WITH OVERLOAD RELAYS

COMBINATION MAGNETIC STARTER MCP CIRCUIT BREAKER TYPE. TYPE 1 INDICATES NEMA SIZE 1, 2 INDICATES NEMA SIZE 2, ETC. USE SUBSCRIPT TO IDENTIFY STARTER TYPE

- NONE - NON-REVERSING
- REV - REVERSING
- 2S1W - TWO SPEED, ONE WINDING
- RVAT - REDUCED VOLTAGE AUTOTRANSFORMER
- RVPW - REDUCED VOLTAGE, PART WINDING
- 2S2W - TWO SPEED TWO WINDING
- SSRV - SOLID STATE REDUCED VOLTAGE

CONTROL PANEL SUPPLIED WITH EQUIPMENT. IF STARTER IS REQUIRED AND NO STARTER SYMBOL IS SHOWN, STARTER IS TO BE PROVIDED AS PART OF THE CONTROL PANEL.

9XX CONTROL DIAGRAM NUMBER, SEE SCHEMATIC DIAGRAMS SHEETS 922 & 923

CAPACITOR, SIZE AS RECOMMENDED BY MOTOR MANUFACTURER

GROUNDING ELECTRODE CONDUCTOR

POWER TRANSFORMER, TYPE AND RATING AS INDICATED

GENERATOR, SIZE AS INDICATED

CURRENT TRANSFORMER

POTENTIAL TRANSFORMER

AM AMMETER

WH WATTMETER

VM VOLTMETER

PFM POWER FACTOR METER

AS AMMETER SWTICH

VS VOLTMETER SWITCH

VFD VARIABLE SPEED DRIVE

CONTACTOR

PE PHOTO-ELECTRIC SWITCH FOR EXTERIOR LIGHTING OTHER DESIGNATIONS ARE FOR INSTRUMENTATION SWITCHES - SEE INSTRUMENTATION LEGEND

T THERMOSTAT - CONFIRM LOCATIONS ON MECHANICAL SHEETS

TELEPHONE

PB PUSH BUTTON CONTROL STATION

1 INTERCOM

2 CONTROL STATION

REFER TO CONTROL DIAGRAM FOR FUNCTIONS
IF NO CONTROL DIAGRAM SHOWN:

- LOS,S = MOMENTARY CONTACT LOCK-OUT-STOP, START PUSHBUTTONS
- LOS,F,R = MOMENTARY CONTACT LOCK-OUT-STOP, FORWARD, REVERSE PUSHBUTTONS

SYSTEM GROUND WIRE

GROUND ROD (3/4" X 10' UNLESS OTHERWISE NOTED)

GROUND ROD HANDHOLE

POWER HANDHOLE OR MANHOLE WITH COMMUNICATION/POWER SEPARATION BARRIER

PADMOUNTED TRANSFORMER

CONTROL HANDHOLE

CONTROL DUCTBANK

POWER DUCTBANK

EXOTHERMIC TYPE GROUND CONNECTION

PLC - OUTPUT PROGRAMMABLE LOGIC CONTROLLER OUTPUT NOTATION INDICATES FUNCTION

PLC - INPUT PROGRAMMABLE LOGIC CONTROLLER INPUT NOTATION INDICATES FUNCTION

SURGE SUPPRESSOR

INDICATION LIGHTS

- R - RED
- G - GREEN
- A - AMBER
- W - WHITE
- Y - YELLOW
- B - BLUE

FUSE WITH BLOWN FUSE INDICATOR

SHIELDED ISOLATION TYPE POWER TRANSFORMER

M CONTROL DEVICE

- PE - PHOTOELECTRIC CELL
- M - MOTOR STARTER CONTACTOR
- C - CONTACTOR
- S - SLOW CONTACTOR
- F - FAST CONTACTOR
- R - REVERSE CONTACTOR
- SV - SOLENOID VALVE
- CR - CONTROL RELAY
- TR - TIMING RELAY
- CM - CONTROL MODULE RELAY

NORMALLY OPEN PUSHBUTTON (MOMENTARY TYPE)

NORMALLY CLOSED PUSHBUTTON (MOMENTARY TYPE)

MAINTAINED CONTACT PUSHBUTTON

M NORMALLY OPEN CONTACT NOTATION REFERS TO CONTROL DEVICE

M NORMALLY CLOSED CONTACT NOTATION REFERS TO CONTROL DEVICE

ETM ELAPSED TIME METER

HEAT TAPE

IN RAW SEWAGE PUMP STATION AND MISCELLANEOUS BUILDING IMPROVEMENTS THICKER LINE DENOTES NEW WORK.

XO POSITION SWITCH OF INDICATED TYPE

OX

PUSH BUTTON SWITCH

LIMIT SWITCH

SWITCH OF INDICATED TYPE

TIMING RELAY

CRR CONTROL RELAY REVERSE

CRF CONTROL RELAY FORWARD

THERMOSTAT

TORQUE SWITCH

HARMONIC FILTER WITH DISCONNECT SWITCH.

CONDUIT GOING DOWN VERTICALLY

CONDUIT GOING UP VERTICALLY

2

ELECTRICAL ABBREVIATION 2

STSP	SHIELDED TWISTED SHIELDED PAIR (Multiple Circuit Instrumentation Cable)
STST	SHIELDED TWISTED SHIELDED TRIAD (Multiple Circuit Instrumentation Cable)
TSP	TWISTED SHIELDED PAIR (Single Circuit Instrumentation Cable)
TST	TWISTED SHIELDED TRIAD (Single Circuit Instrumentation Cable)
Ø	PHASE
3W	3 WIRE
4W	4 WIRE
AFF	ABOVE FINISHED FLOOR
AIC	AMP INTERRUPTING CAPABILITY
ALS	ALUMINUM TYPE
AMP	AMPERE
ANN	ANNUNCIATOR
AUX	AUXILIARY
AWG	AMERICAN WIRE GAGE
BRKR	BREAKER
C	CLOSE
CKT	CIRCUIT
CMH	COMMUNICATIONS MANHOLE
CND	CONDUIT
CONT	CONTINUED
CORR	CORRIDOR
CP	CONTROL PANEL
CS	TRIP CORD SWITCH
CT	CABLE TRAY
CU	COPPER
CV	CONTROL VALVE
EMH	ELECTRICAL MANHOLE
EMO	ELECTRIC MOTOR OPERATOR
EQUIP	EQUIPMENT
FLEX	FLEXIBLE METALLIC CONDUIT
FVNR	FULL VOLTAGE NON REVERSING
FVR	FULL VOLTAGE REVERSING
FWD	FORWARD
G	GROUND
GALV	GALVANIZED
GFI	GROUND FAULT INTERRUPTER
GND	GROUND
HF	HARMONIC FILTER
HVAC	HEATING VENTILATION AIR CONDITIONING
INSTL	INSTALL
INSTR	INSTRUMENT
I/O	INPUT OUTPUT
K	THOUSAND
KGV	KNIFE GATE VALVE
KVA	KILOVOLT AMPERE
L	LINE
LEL	LOW EXPLOSION LEVEL
LLP	LOW VOLTAGE LIGHTING PANEL
MC	METALLIC CABLE
MCC	MOTOR CONTROL CENTER
MIN	MINIMUM
MOD	MODIFICATION
MOV	MOTOR OPERATED VALVE
N	NEUTRAL
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NTS	NOT TO SCALE
O.C.	ON CENTER
OL	OVERLOAD RELAY
PEMH	POWER ELECTRIC MANHOLE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PMP	PUMP
PNL	PANEL
PVCG	PVC COATED RIGID GALVANIZE STEEL CONDUIT
REQ'D	REQUIRED
REV	REVERSERGS RIGID GALVANIZED STEEL CONDUIT
RVNR	REDUCED VOLTAGE NON REVERSING
SH	SHEET
SHLD	SHIELD
SS	SPEED SWITCH
SW	SWITCH
TB	TERMINAL BOX
TFMR	TRANSFORMER RATING
TYP	TYPICAL
VAC	VOLTS ALTERNATING CURRENT
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
W/	WITH
WP	WEATHER-PROOF
XFMR	TRANSFORMER
~~EXP~~	~~EXPANSION~~

1

3

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL - LEGEND

Designed: RJT
Drawn: CWA
Checked: TDM
Approved: Tom D. Merritt
Date: MAY, 1989

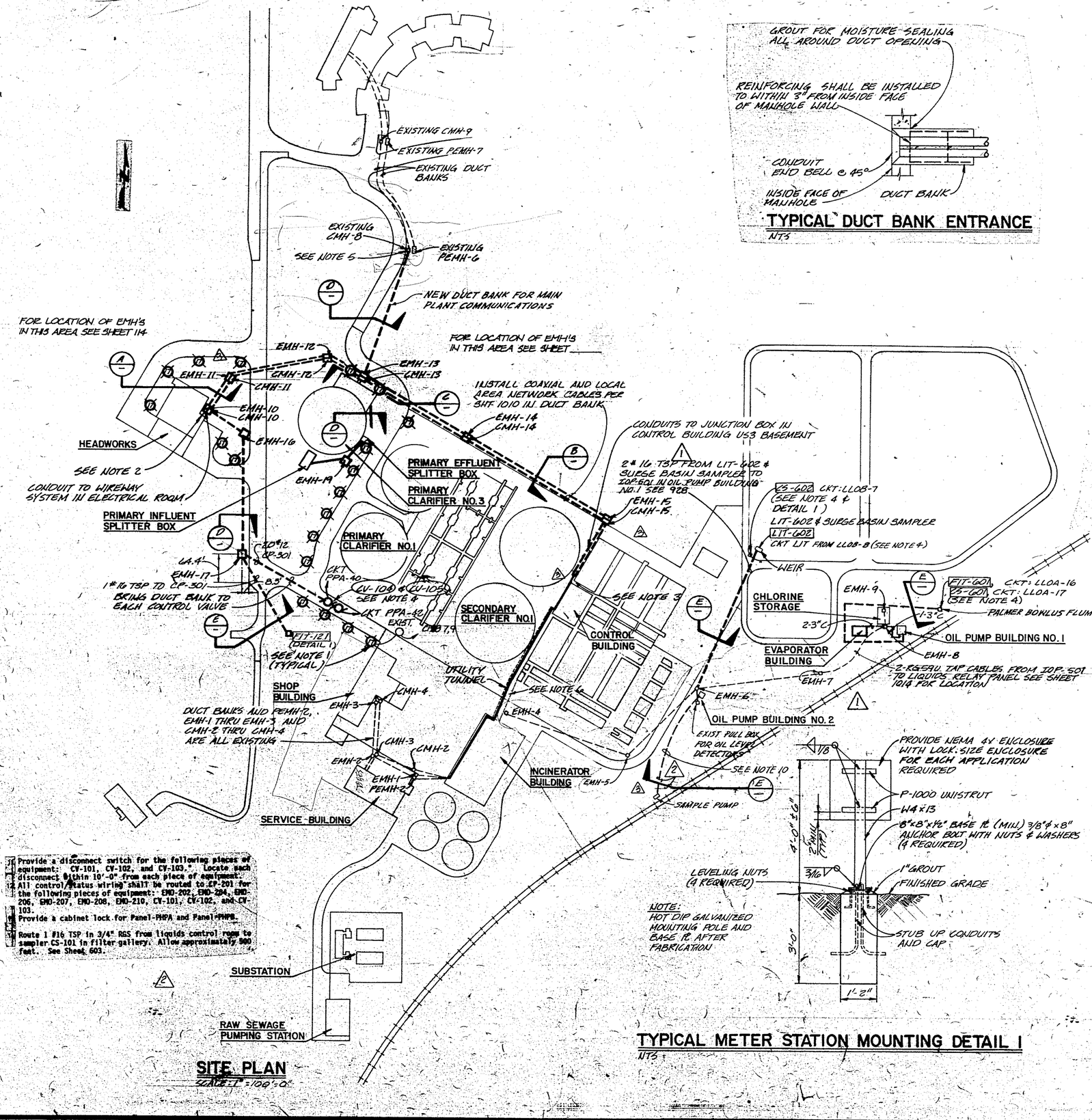
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No.	By	Revision	Date
1	RJT	ADDENDUM NO. 1	6-27-89
2	RJT	ADDENDUM NO. 2	6-30-89
3	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON WILLIAM F. ETTLICH

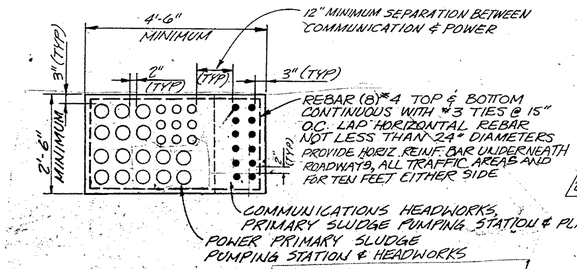
Sheet Number: 901

SR 904



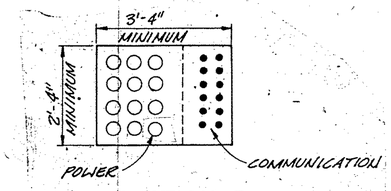
SITE PLAN
SCALE: 1" = 100'-0"

TYPICAL DUCT BANK ENTRANCE
NTS

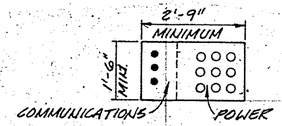


SECTION A
NTS

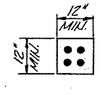
NOTE: TYPICAL DIMENSIONS SHOWN IN SECTION A DUCT BANK APPLY TO SECTIONS B, C, D, AND E



SECTION B
NTS



SECTION C
NTS



SECTION D
NTS

SECTION E
NTS

LEGEND
- 2" CONDUIT IN DUCT BANK
- 2½" CONDUIT IN DUCT BANK
- 4" CONDUIT IN DUCT BANK
- NEW DUCT BANK
- EXISTING DUCT BANK

TYPICAL METER STATION MOUNTING DETAIL 1
NTS

GENERAL NOTES:

1. PROVIDE 1" PVC EMBEDDED CONDUIT WHERE NECESSARY WITH 3#8AWG AND 1#8AWG GROUND. UTILIZE EXISTING PANELBOARDS PROVIDING CONDUIT UP TO PANEL AND 20A CIRCUIT BREAKERS WHERE NECESSARY. CONTRACTOR MAY SPLICE INTO EXISTING CIRCUITS ONLY ON APPROVAL OF ENGINEER.
2. CONTRACTOR TO PROVIDE UTILITY VAULT WHICH WILL ALLOW CONDUITS TO PENETRATE WALL ABOVE RECESSED CEILING IN HEADWORKS ELECTRICAL ROOM. RECESSED CEILING WILL BE 8'-0" FROM FINISHED FLOOR. SEAL ALL DUCT BANK ENTRANCES TO HEADWORKS ELECTRICAL ROOM.
3. SEAL ALL DUCT BANK ENTRANCES TO BUILDING SHOWN IN SECTION B.
4. USE 2#12AWG AND 1#12AWG GROUND TO EACH PIECE OF EQUIPMENT.
5. CONTRACTOR TO COORDINATE EXACT LOCATION OF DUCT BANKS WITH OTHER UNDERGROUND UTILITIES. VERIFY EXACT LOCATION OF EXISTING DUCT BANKS WHICH WILL BE CONNECTED WITH NEW DUCT BANK SYSTEM.
6. ROUTE 4-3" COMMUNICATION CONDUITS THROUGH INCINERATOR BUILDING, TUNNEL AND U53 BUILDING TO JUNCTION BOX. PROVIDE ALL NECESSARY CONDUIT, SUPPORTS, BOXES, AND MISCELLANEOUS ITEMS. PULL THE FOLLOWING CABLES FROM SERVICES BUILDING TELEPHONE/COMMUNICATION PANEL TO NEW HEADWORKS BUILDING TELEPHONE/COMMUNICATION PANEL:
   - 1 CABLE CONSISTING OF 50 TWISTED PAIR #22AWG
   - 4 CABLES CONSISTING OF 25 TWISTED PAIR #16AWG EACH

   PROVIDE SPLICE POINTS, BOXES AND MATERIALS WHERE NECESSARY AND AS REQUIRED BY NEC.
7. COORDINATE WITH OTHER DISCIPLINES FOR EXACT LOCATION OF EQUIPMENT AND FOR ANY OBSTRUCTIONS.
8. SEE SHEET 903 FOR UTILITY VAULT TYPES.
9.
10. ROUTE 3 #12, 1 #12G TO 480V MCCB OIL PUMP BUILDING NO. 2 INSTALL NEW 20A, 1 POLE BREAKER FOR SAMPLE PUMP.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL SITE PLAN

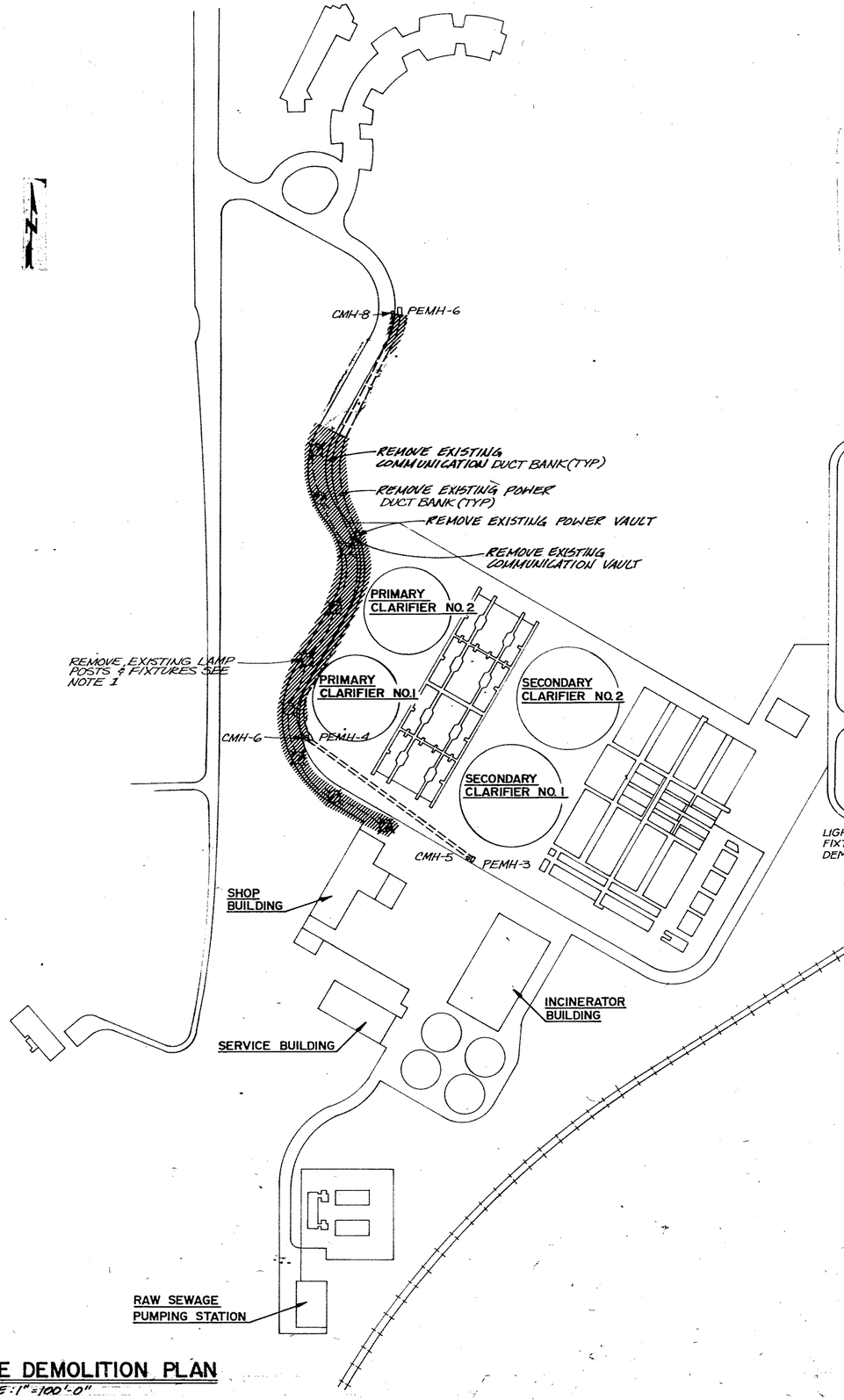
Designed	RJT
Drawn	CWA
Checked	TDM
Approved	Jon D. Bennett
Date	MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	JEK	ADDENDUM NO. 1	6-27-89
2	JEK	ADDENDUM NO. 2	6-30-89
3	AFA	CPR # 7, 8, 26, 85	12/19/85
4	AFA	AS RECORDED DRAWING	12/19/85

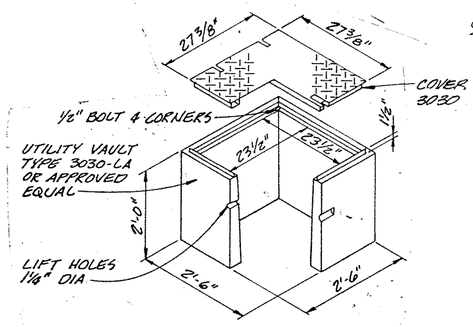
REGISTERED PROFESSIONAL ENGINEER 4894 OREGON JULY, 19 WILLIAM F. ETTLIN

Sheet Number 902



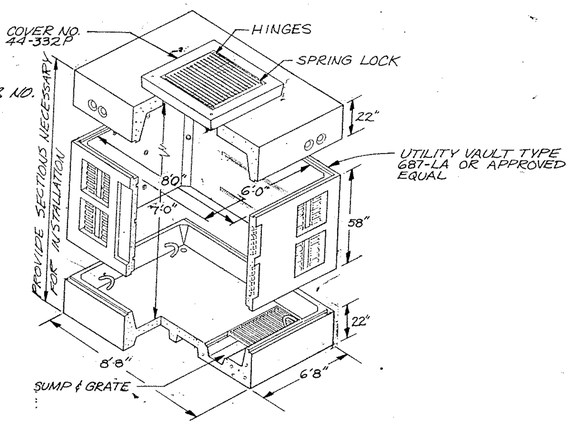
SITE DEMOLITION PLAN

SCALE: 1" = 100'-0"



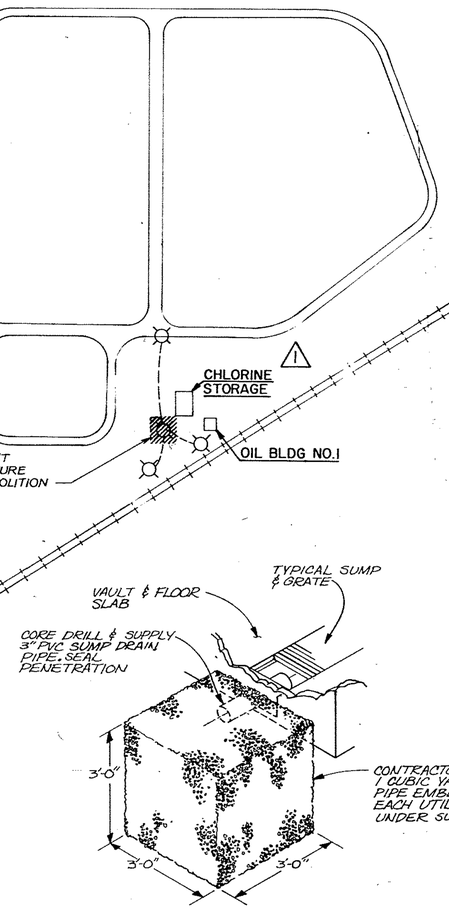
UTILITY VAULT TYPE 1

TYPICAL EMH-16 THRU EMH-19. SEE NOTE 2.

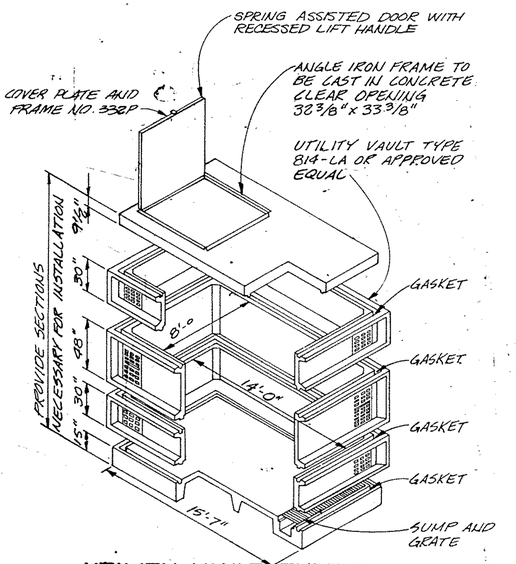


UTILITY VAULT TYPE 2

TYPICAL EMH-11 THRU EMH-15, EMH-20 & CMH-11 THRU CMH-16. SEE NOTE 2



TYPICAL UTILITY VAULT DRAIN



UTILITY VAULT TYPE 3

TYPICAL EMH-10 & CMH-10
SEE NOTE 2

GENERAL NOTES:

1. CONTRACTOR TO REMOVE AND REUSE EXISTING LAMP POSTS AND FIXTURES. REGARDLESS OF THE NUMBER OF UNITS WHICH ARE SALVAGEABLE, ALL LAMP POSTS AND FIXTURES SHOWN ON SH. 902. SITE PLAN SHALL BE PROVIDED AS A MINIMUM.
2. BARRIER BETWEEN POWER AND COMMUNICATION CONDUITS TO BE PROVIDED BY MANUFACTURER OF VAULT AND APPROVED BY ENGINEER.
3. SEE SHEET 902 FOR LOCATION OF UTILITY VAULTS.

2 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL-SITE DEMOLITION AND VAULT DETAIL

Designed RJT
Drawn CWA
Checked TDM
Approved Tom D. Meredith
Date MAY, 1989

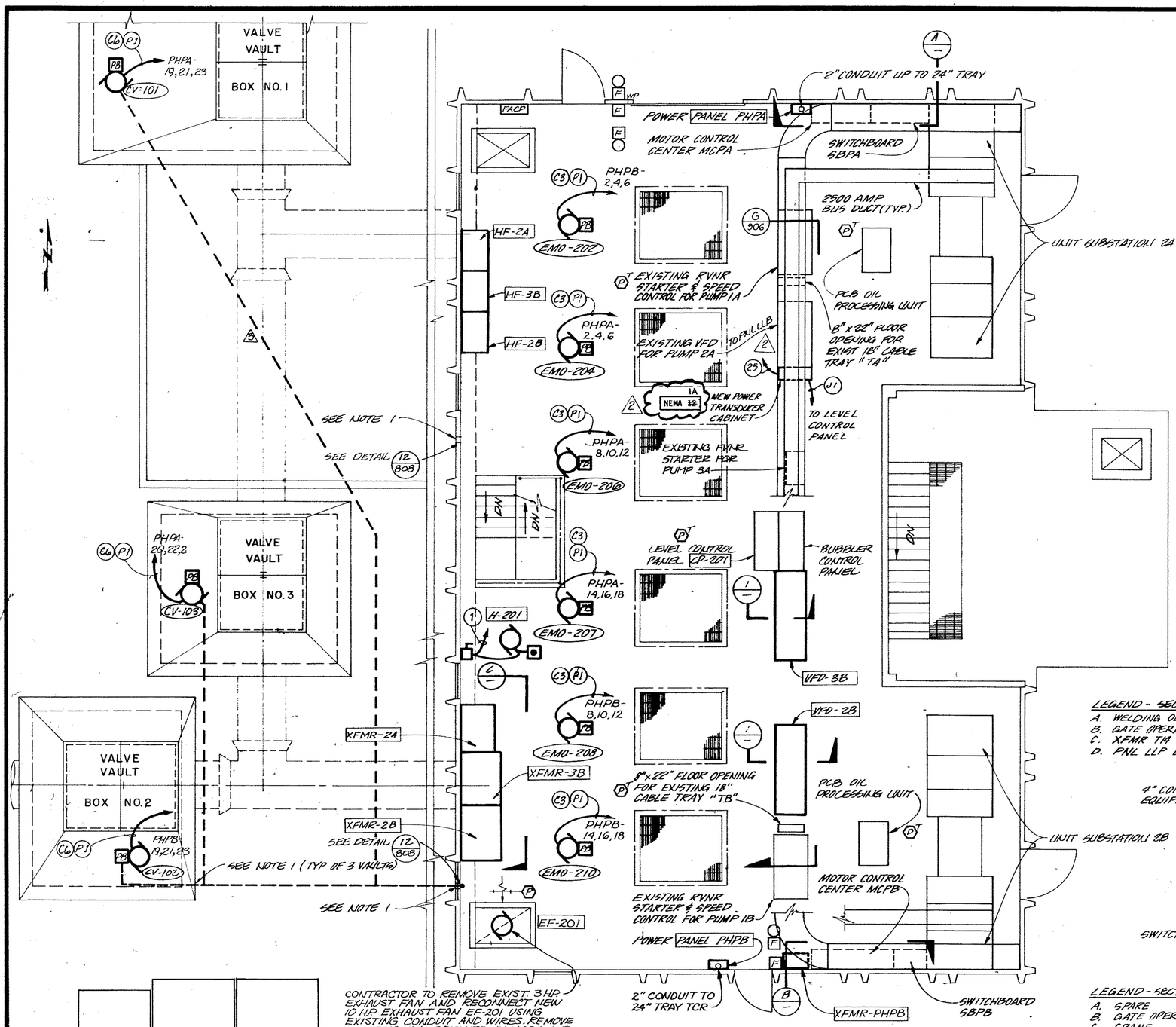
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No	By	Revision	Date
1	JTEK	ADDED LIGHTS @CHLORINE STORAGE	6-27-89
2	AFA	AS RECORDED DRAWING	12/19/92

REGISTERED PROFESSIONAL ENGINEER 4894 STATE OF OREGON JULY 9, 1987 WILLIAM F. BIRLIGH

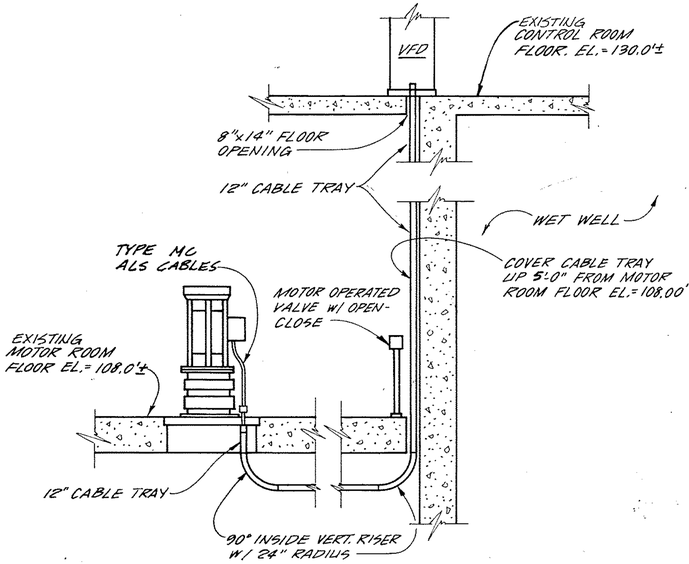
Sheet Number 903

SH 904



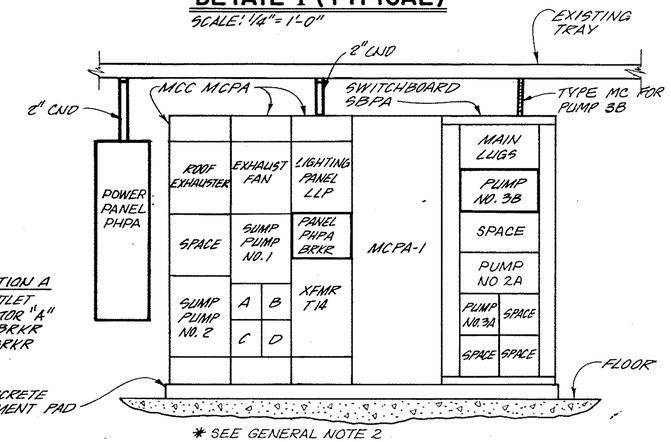
RAW SEWAGE PUMPING STATION CONTROL ROOM POWER / INSTRUMENTATION PLAN

SCALE: 1/4" = 1'-0"



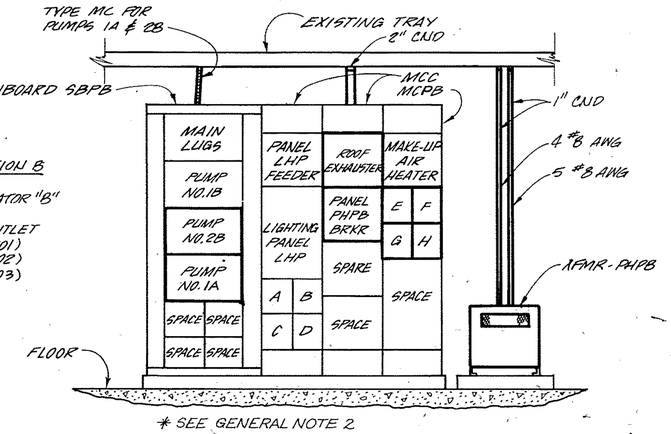
DETAIL 1 (TYPICAL)

SCALE: 1/4" = 1'-0"



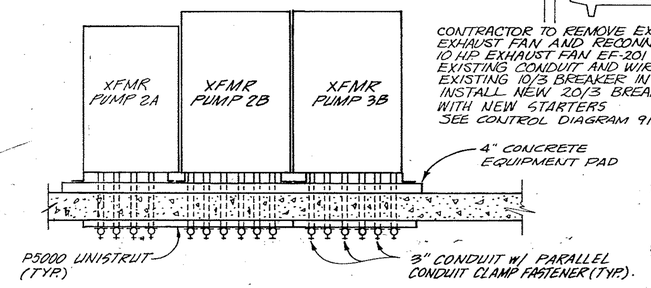
SECTION A

SCALE: 1/2" = 1'-0"



SECTION B

SCALE: 1/2" = 1'-0"



SECTION C

SCALE: 3/8" = 1'-0"

LEGEND - SECTION A
- A. WELDING OUTLET
- B. GATE OPERATOR "A"
- C. XFMR T1A BRKR
- D. PNL LLP BRKR

LEGEND - SECTION B
- A. SPARE
- B. GATE OPERATOR "B"
- C. CRANE
- D. WELDING OUTLET
- E. HOIST (H-201)
- F. HOIST (H-202)
- G. HOIST (H-203)
- H. SPARE

GENERAL NOTES:

1. CORE DRILL AND SEAL PER SPECIFICATIONS
2. EXISTING MCPA AND MCPB ARE WESTINGHOUSE TYPE W, RATED 480V, 3Ø, 3W&4W, 42,000 AIC.
3. SEE SHEET 907 FOR MCC AND SWITCHBOARD ONE LINES.
4. SEE SHEET 924 FOR ELECTRICAL PANEL SCHEDULES.
5. CONTRACTOR SHALL INVESTIGATE ACTUAL FIELD CONDITIONS AND SHALL BE RESPONSIBLE FOR ALL MODIFICATIONS NECESSARY TO AVOID INTERFERENCE PROBLEMS. ANY DEVIATIONS FROM DRAWING SHALL BE UPON CONCURRENCE OF ENGINEER.
6. ANY CABLE ROUTED THROUGH TRAY SYSTEM SHALL BE TYPE TC, UNLESS NOTED OTHERWISE.
7. **Provide a disconnect switch for the following pieces of equipment: "CV-201, CV-202, CV-203, CV-204, CV-205, CV-206, CV-207, CV-208, EMO-201, EMO-203, EMO-205, EMO-209, KGV-201, and KGV-209." Locate each disconnect within 10'-0" from each piece of equipment.**
8. **All control/status wiring shall be routed to CP-201 for the following pieces of equipment: CV-201, CV-202, CV-203, CV-204, CV-205, CV-206, CV-207, CV-208, EMO-201, EMO-203, EMO-205, EMO-209, KGV-201, and KGV-202."**

2 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL - RAW SEWAGE PUMPING STATION CONTROL ROOM POWER/ INSTRUMENTATION PLAN

Designed RJT
Drawn BDM
Checked TDM
Approved Tom A. Monnett
Date MAY, 1989

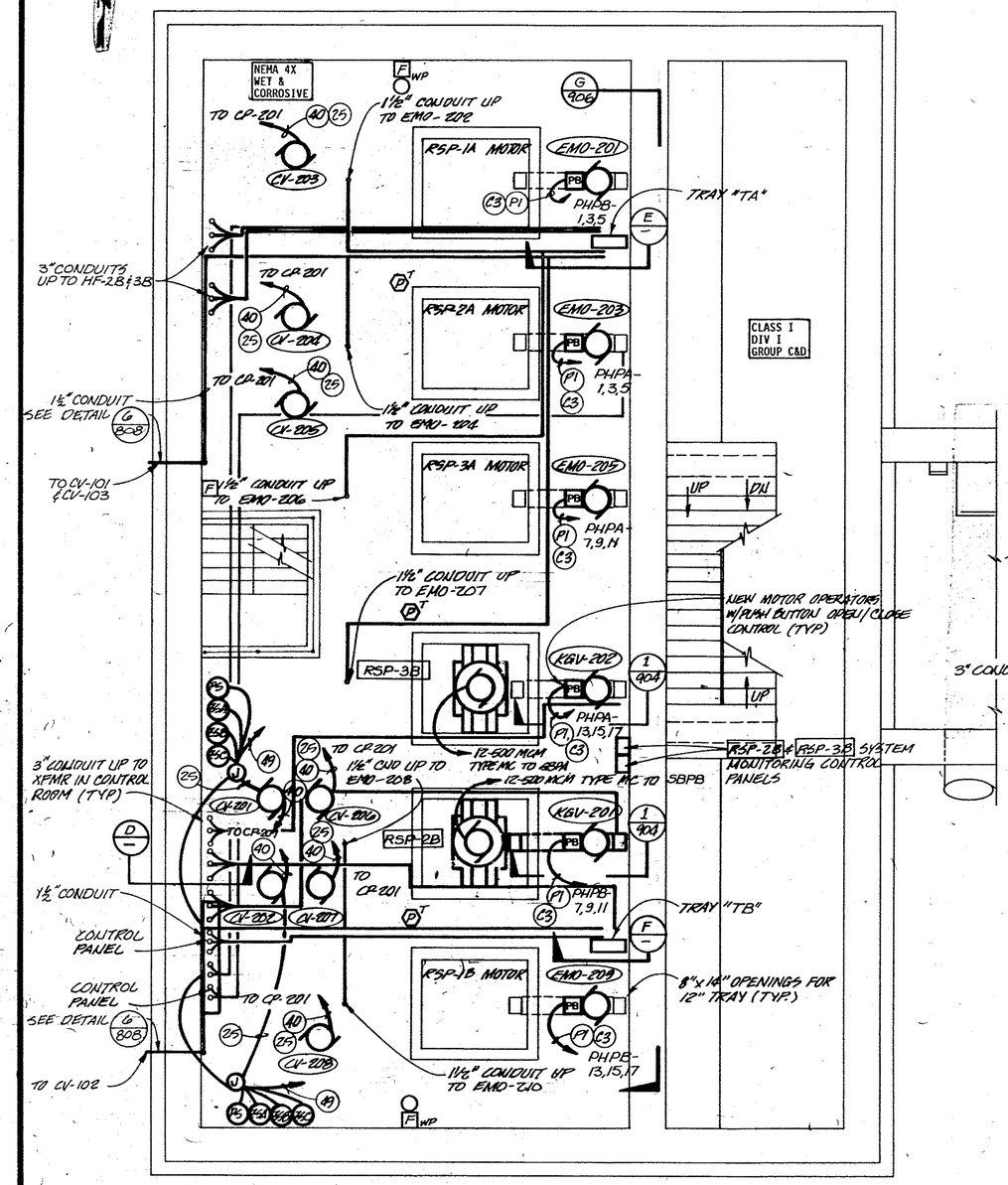
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	TEK	ADDENDUM NO 2	6-30-89
1	AFA	CPR# 35	12/9/92
	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON WILLIAM F. ETTLICH

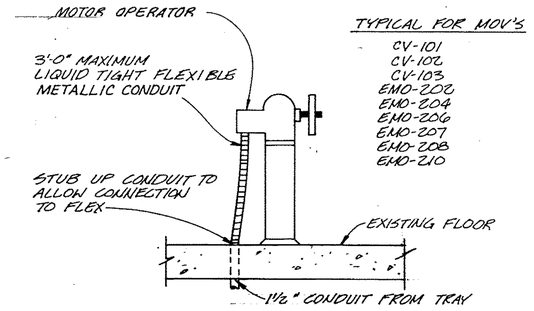
Sheet Number 904

SR 604

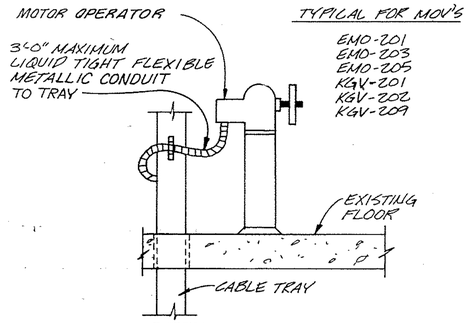


RAW SEWAGE PUMPING STATION MOTOR ROOM POWER / INSTRUMENTATION PLAN

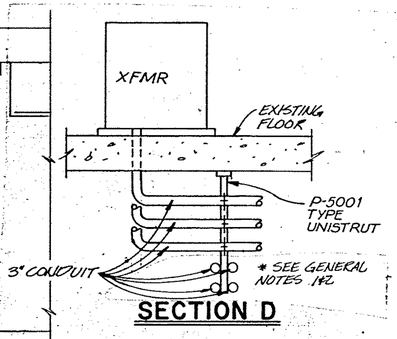
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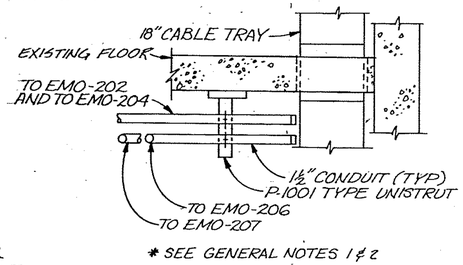
DETAIL 2



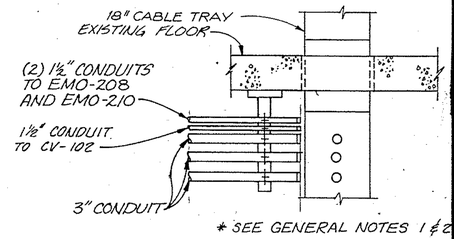
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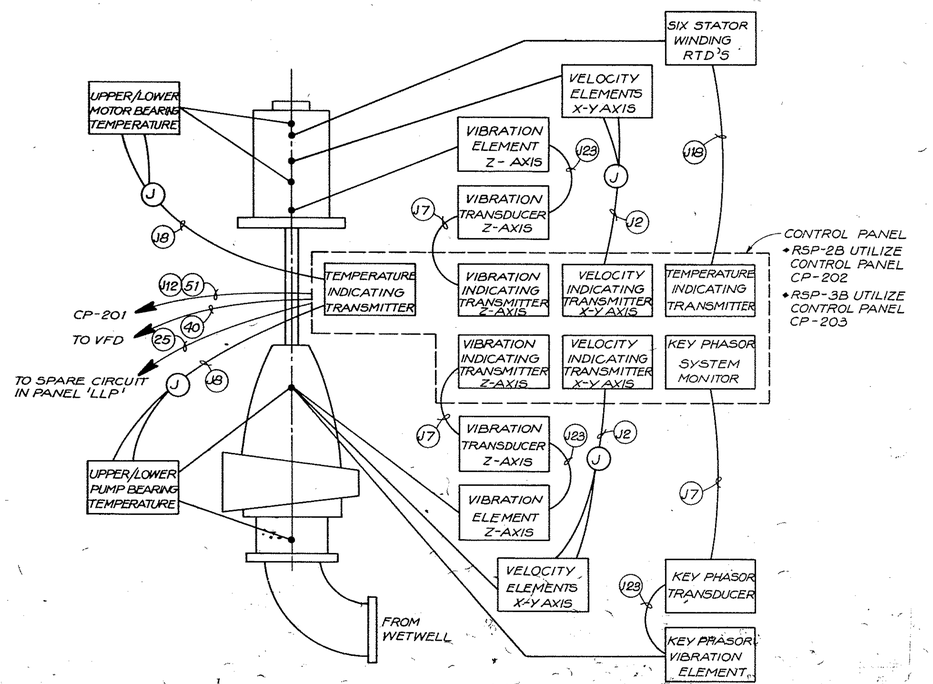
SECTION D



SECTION E



SECTION F



RSP-2B & RSP-3B MONITORING SYSTEM

△3 AS RECORDED DRAWINGS

GENERAL NOTES:

1. SEE CONDUIT SUPPORT DETAIL SHEET 926 FOR SUPPORT DETAILS.
2. MAXIMUM SUPPORT SPACING FROM TRAY IS NOT TO EXCEED 3'- 0". ALL OTHER SPACING PER SPECIFICATION AND APPLICABLE CODES.
3. SEE SHEET 907 FOR MCC AND SWITCHBOARD ONE LINES.
4. SEE SHEET 924 FOR ELECTRICAL PANEL SCHEDULES.
5. CONTRACTOR SHALL INVESTIGATE ACTUAL FIELD CONDITIONS AND SHALL BE RESPONSIBLE FOR ALL MODIFICATIONS NECESSARY TO AVOID INTERFERENCE PROBLEMS. ANY DEVIATIONS FROM DRAWING SHALL BE UPON CONCURRENCE OF ENGINEER.
6. ANY CABLE ROUTED THROUGH TRAY SYSTEM SHALL BE TYPE TC, UNLESS NOTED OTHERWISE.

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL-RAW SEWAGE PUMPING STATION MOTOR ROOM POWER/ INSTRUMENTATION PLAN

Designed RJT
Drawn CWA
Checked TDM
Approved Tom D. Monnett
Date MAY, 1989

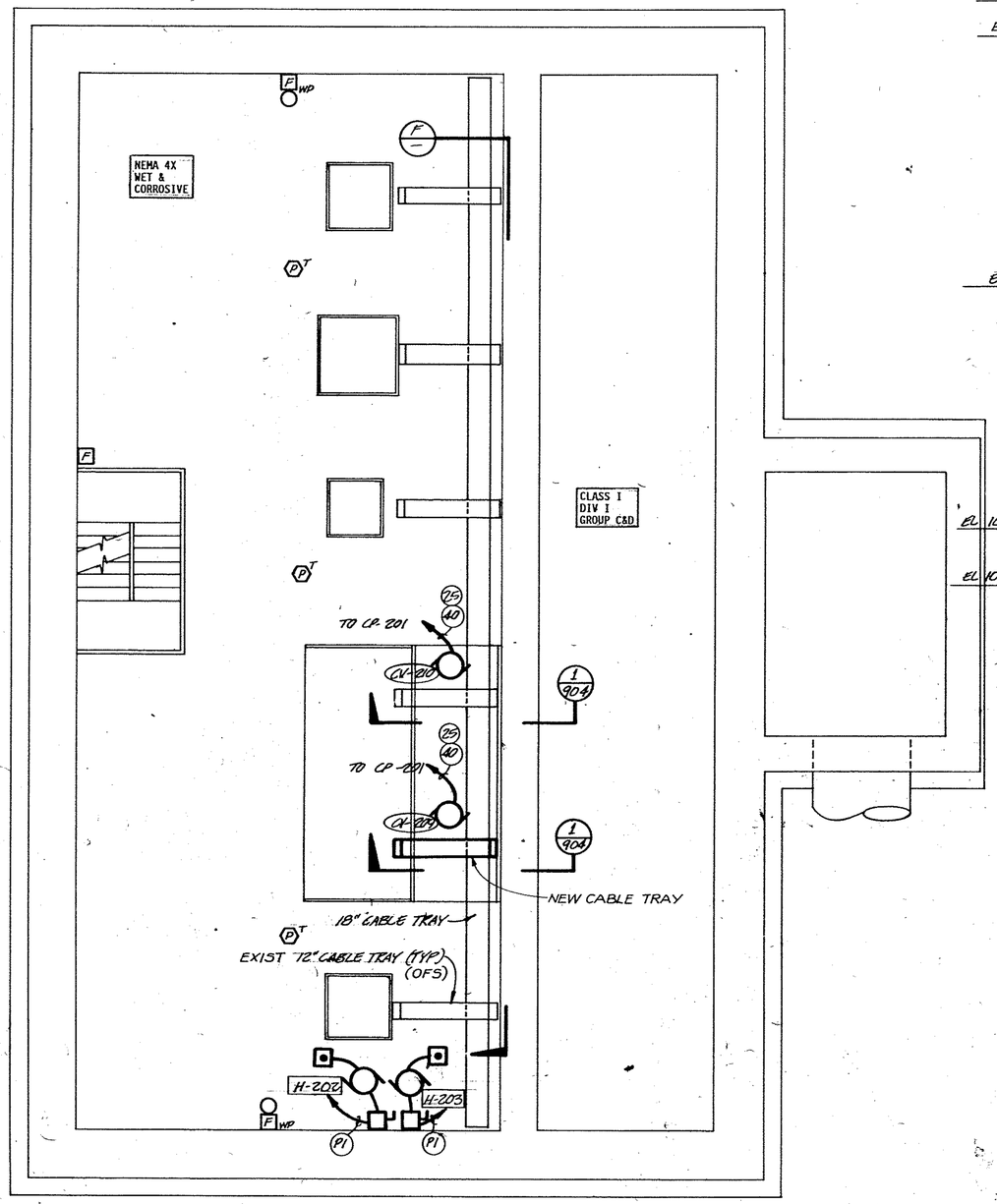
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No	By	Revision	Date
2	JEK	ADDENDUM NO 2	6-30-89
3	AFA	AS RECORDED DRAWING	12/17/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON JULY 1, 1982 WILLIAM F. ETTLICH

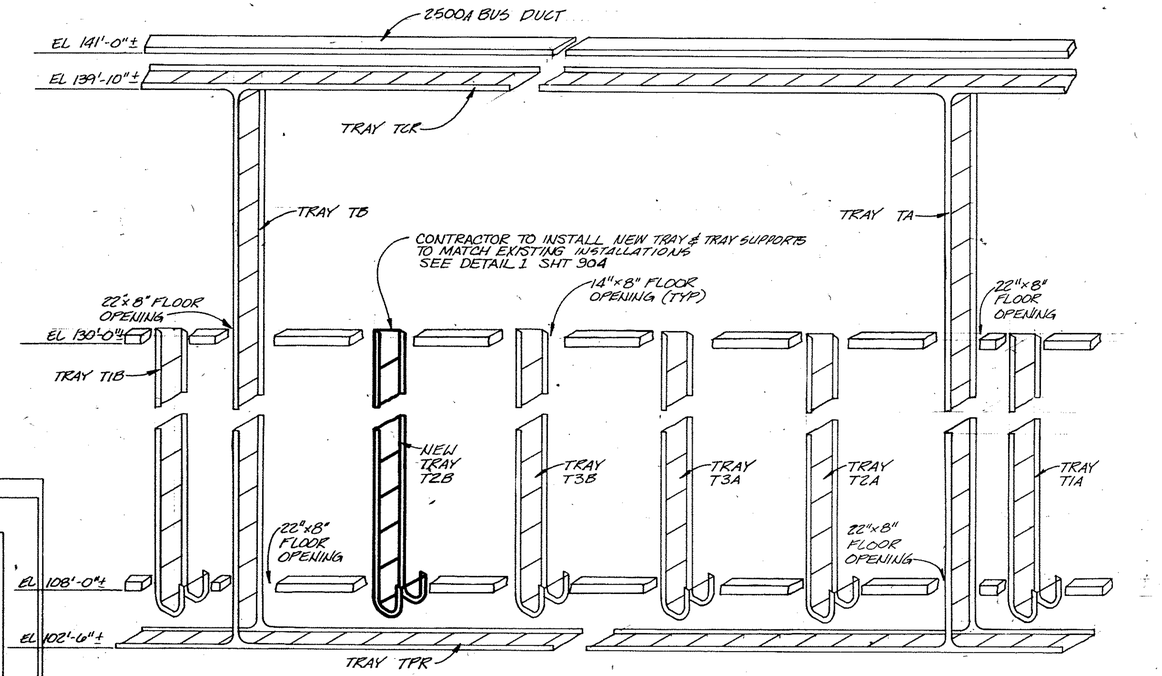
Sheet Number 905

SR 904



RAW SEWAGE PUMPING STATION PUMP ROOM POWER / INSTRUMENTATION PLAN

SCALE: 1/4" = 1'-0"



* NOTE: IN RAW SEWAGE PUMP STATION CONTRACTOR SHALL PROVIDE CABLE TRAY IDENTIFICATION. PROVIDE ON SIDES OF TRAY AT INTERVALS NOT TO EXCEED 15'0". ALL TRAY EXISTING WITH EXCEPTION NOTED.

SECTION G

CABLE ROUTING SCHEDULE

EQUIPMENT ID	CABLE ROUTING
EMO-201	PANEL PHPB UP 2" CND TO TCR, DOWN TA TO TPR, UP T1A, TO EMO-201.
EMO-202	PANEL PHPB UP 2" CND TO TCR, DOWN TA, TO 1 1/2" CND, UP TO EMO-202.
EMO-203	PANEL PHPA UP 2" CND TO TCR, DOWN TA TO TPR, UP T2A, TO EMO-203.
EMO-204	PANEL PHPA UP 2" CND TO TCR, DOWN TA, TO 1 1/2" CND, UP TO EMO-204.
EMO-205	PANEL PHPA UP 2" CND TO TCR, DOWN TA TO TPR, UP T3B, TO EMO-205.
EMO-206	PANEL PHPA UP 2" CND TO TCR, DOWN TA, TO I 1/2" CND, UP TO EMO-206.
EMO-207	PANEL PHPA UP 2" CND TO TCR, DOWN TA, TO 1 1/2" CND, UP TO EMO-207.
EMO-208	PANEL PHPB UP 2" CND TO TCR, DOWN TA, TO 1 1/2" CND, UP TO EMO-208.
EMO-209	PANEL PHPB UP 2" CND TO TCR, DOWN TB TO TPR, UP T1B, TO EMO-209.
EMO-210	PANEL PHPB UP 2" CND TO TCR, DOWN TB, TO 1 1/2" CND, UP TO EMO-210.
CV-101	PANEL PHPA UP 2" CND TO TCR, TO 1 1/2" CND, TO JUNCTION BOX TO 1 1/2" CND, TO CV-101.
CV-102	PANEL PHPB UP 2" CND TO TCR, TO 1 1/2" CND, TO CV-102.
CV-103	PANEL PHPA UP 2" CND TO TCR, TO 1 1/2" CND, TO JUNCTION BOX TO 1 1/2" CND, TO CV-103.

EQUIPMENT ID	CABLE ROUTING
VFD-2B	SBPB UP TO TCR, DOWN TB TO 3" CND TO XFMR-2B. XFMR-2B TO 3" CND, TO T2B, UP TO VFD-2B.
VFD-3B	SBPA UP TO TCR, DOWN TB TO 3" CND TO XFMR-3B. XFMR-3B TO 3" CND, UP TRAY T3B TO VFD-3B.
VFD-2A	SBPA UP TO TCR, DOWN TA TO 3" CND TO XFMR-2A. XFMR TO 3" CND, TO T2A, UP TO VFD-2A.
HF-2A	VFD-2A DOWN T2A TO TPR, UP TA TO 3" CND TO HF-2A.
RSP-2B	VFD-2B DOWN T2B TO RSP-2B MOTOR.
RSP-3B	VFD-3B DOWN T3B TO RSP-3B MOTOR.
KGV-201	PANEL PHPB UP 2" CND TO TCR, DOWN TA TO TPR, UP T2B, TO KGU-201
KGV-202	PANEL PHPA UP 2" CND TO TCR, DOWN TA TO TPR, UP T3B, TO KGU-202
H-201	MCC MCPB UP TO TCR, DOWN TB TO 1" CND TO H-201.
H-202	MCC MCPB UP TO TCR, DOWN TB TO 1" CND TO H-202.
H-203	MCC MCPB UP TO TCR, DOWN TB TO 1" CND TO H-203.
HF-2B	VFD-2B DOWN T2B TO TPR, UP TA TO 3" CND TO HF-2B.
HF-3B	VFD-3B DOWN T3B TO TPR, UP TA TO 3" CND TO HF-3B.

LEGEND

TCR: HORIZONTAL TRAY CONTROL ROOM AREA
TA: VERTICAL TRAY ON SUBSTATION A SIDE
TB: VERTICAL TRAY ON SUBSTATION B SIDE
TPR: HORIZONTAL TRAY PUMP ROOM AREA
T1A: VERTICAL TRAY FEEDING RSP-1A
T1B: VERTICAL TRAY FEEDING RSP-1B
T2A: VERTICAL TRAY FEEDING RSP-2A
T2B: VERTICAL TRAY FEEDING RSP-2B
T3A: VERTICAL TRAY FEEDING RSP-3A
T3B: VERTICAL TRAY FEEDING RSP-3B

7. Provide a disconnect switch for the following pieces of equipment: CV-209 and CV-210. Locate each disconnect within 10'-0" from each piece of equipment."

2

GENERAL NOTES:

1. SEE CONDUIT SUPPORT DETAIL SHEET 926 FOR SUPPORT DETAILS.
2. MAXIMUM SUPPORT SPACING FROM TRAY IS NOT TO EXCEED 3'- 0". ALL OTHER SPACING PER SPECIFICATION AND APPLICABLE CODES.
3. SEE SHEET 907 FOR MCC AND SWITCHBOARD ONE LINES.
4. SEE SHEET 924 FOR ELECTRICAL PANEL SCHEDULES.
5. CONTRACTOR SHALL INVESTIGATE ACTUAL FIELD CONDITIONS AND SHALL BE RESPONSIBLE FOR ALL MODIFICATIONS NECESSARY TO AVOID INTERFERENCE PROBLEMS. ANY DEVIATIONS FROM DRAWING SHALL BE UPON CONCURRENCE OF ENGINEER.
6. ANY CABLE ROUTED THROUGH TRAY SYSTEM SHALL BE TYPE TC, UNLESS NOTED OTHERWISE.

1

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL-RAW SEWAGE PUMPING STATION PUMP ROOM POWER/ INSTRUMENTATION PLAN

Designed: RJT
Drawn: CWA
Checked: TDM
Approved: Lloyd Marcotte
Date: MAY, 1989

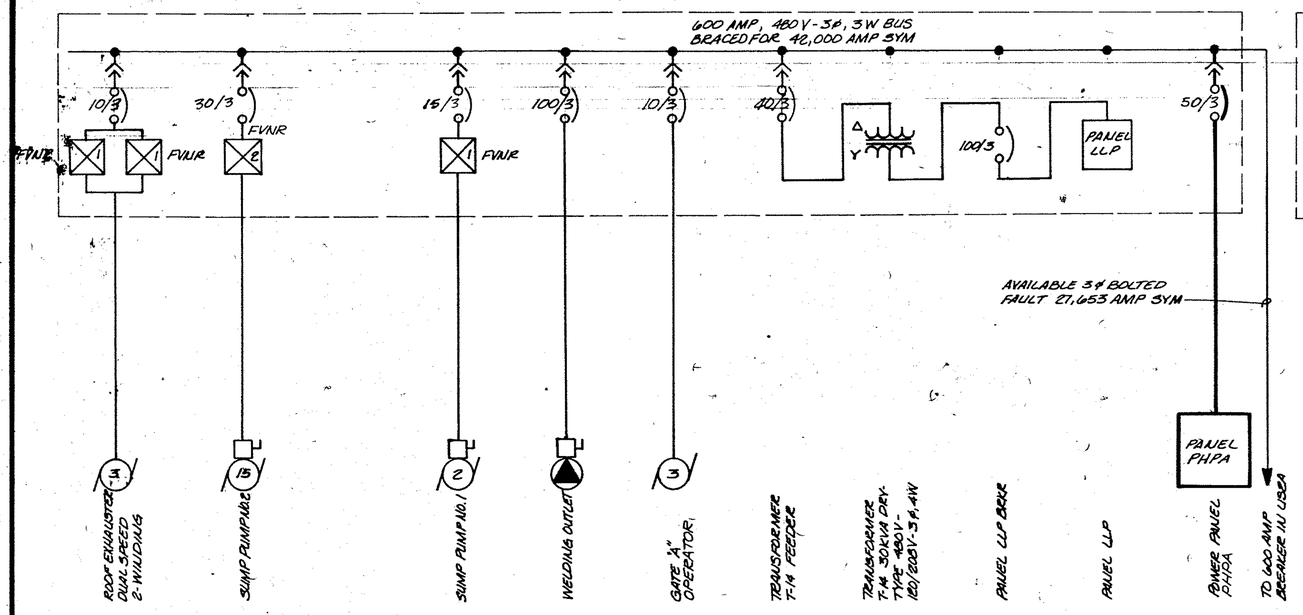
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No.	By	Revision	Date
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1	TEK	AS RECORDED DRAWINGS	6-30-89

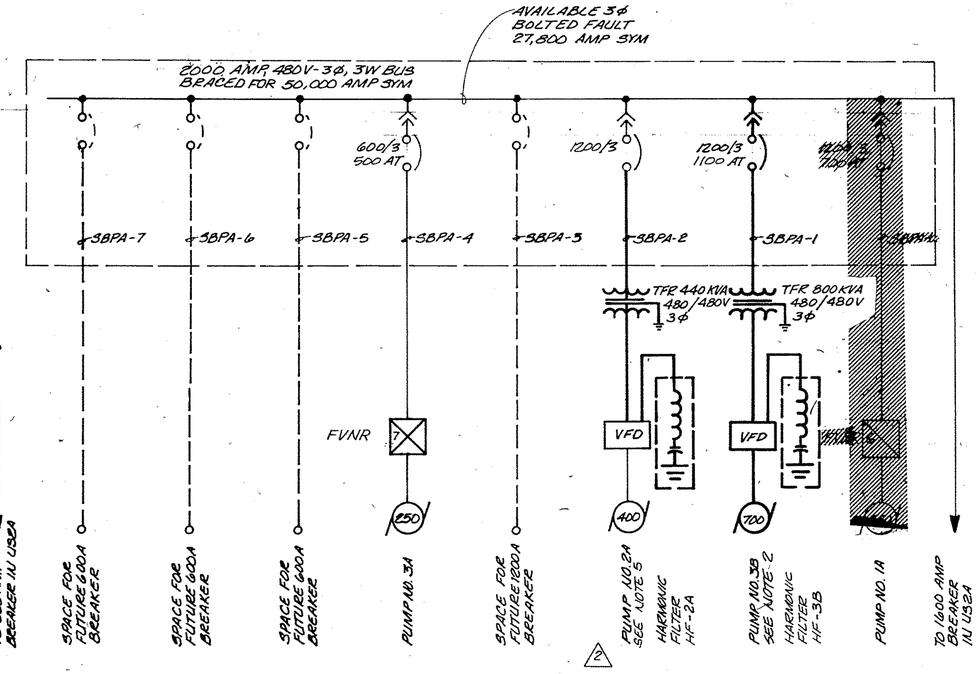
REGISTERED PROFESSIONAL ENGINEER 4804 OREGON JULY 9, 1971 WILLIAM F. ETTLICH

Sheet Number: 903

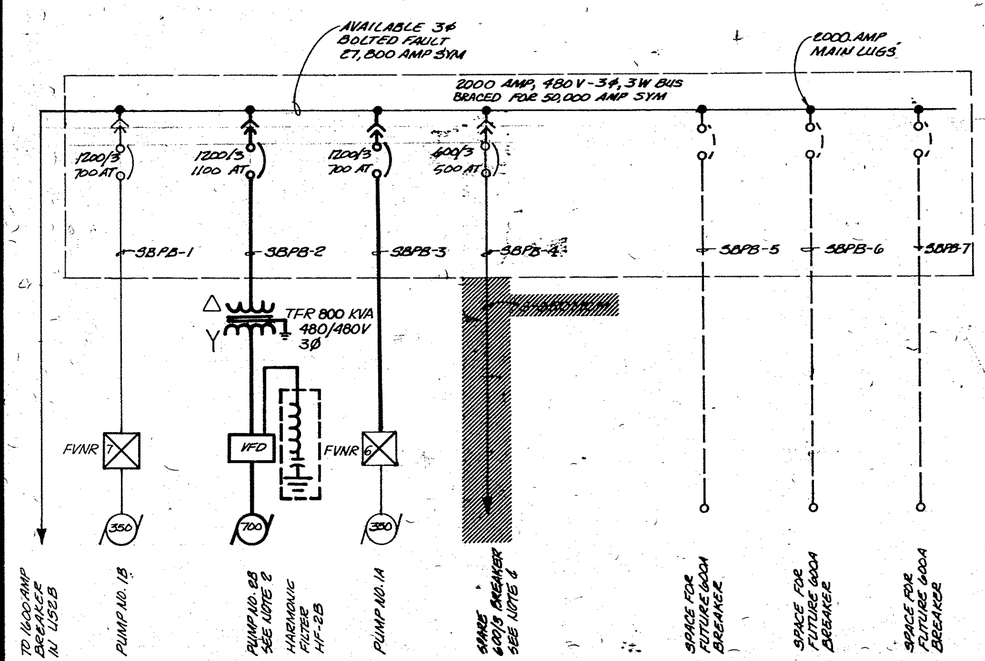
S/R 904



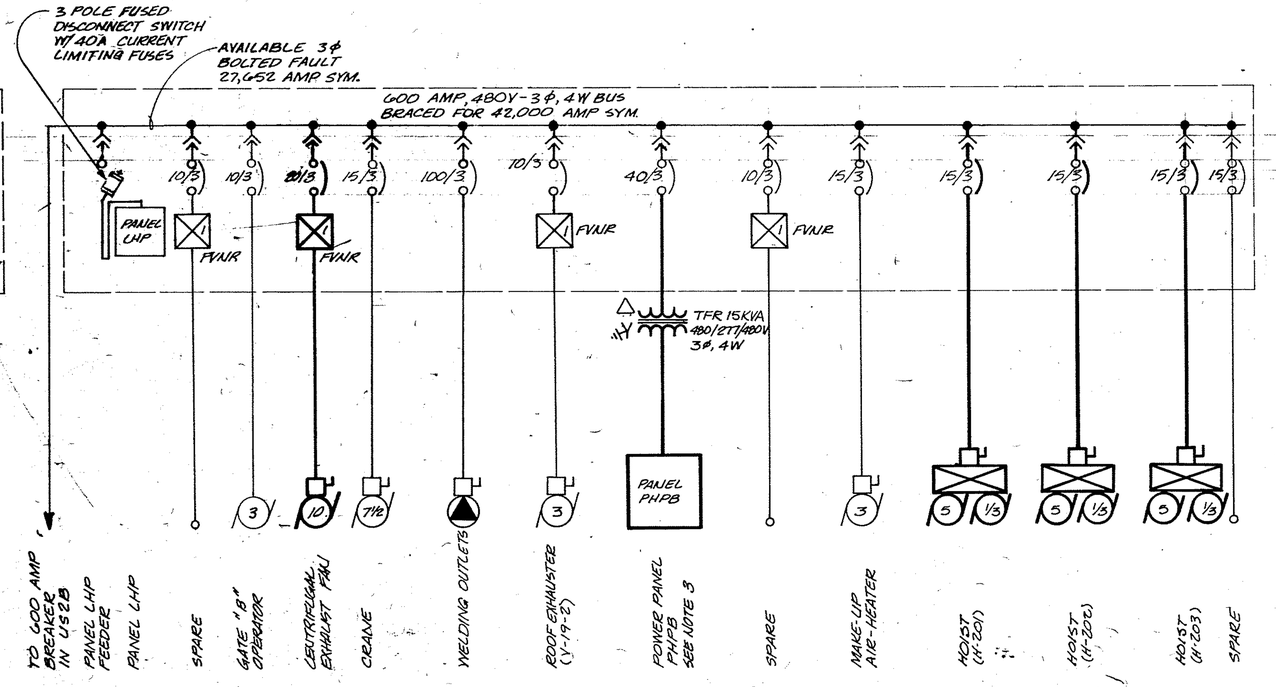
ONE LINE DIAGRAM MCC MCPA



ONE LINE DIAGRAM SBPA



ONE LINE DIAGRAM SBPB



ONE LINE DIAGRAM MCC MCPB

5. Provide 3 - 250 MCM, 3 conductor cables type MC cables to isolation transformer, VFD, and harmonic filter.

GENERAL NOTES:

1. PUMP 1A BREAKER TO BE DISCONNECTED FROM SBPA & RECONNECTED AT SBPB. INSTALL (3) 3-500MCM TYPE MC FROM SBPB TO PUMP 1A.
2. PROVIDE (3) 3-500MCM TYPE MC FROM BREAKER TO: ISOLATION TRANSFORMER, VFD, HARMONIC FILTER, AND PUMP.
3. PROVIDE 4-#8AWG CONDUCTORS FROM BREAKER TO TRANSFORMER.
4. REMOVE 3-350 MCM TYPE MC CABLE FROM EXISTING PUMP 3B.

3 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL-RAW SEWAGE PUMPING STATION MCC AND SWITCHBOARD ONE-LINES

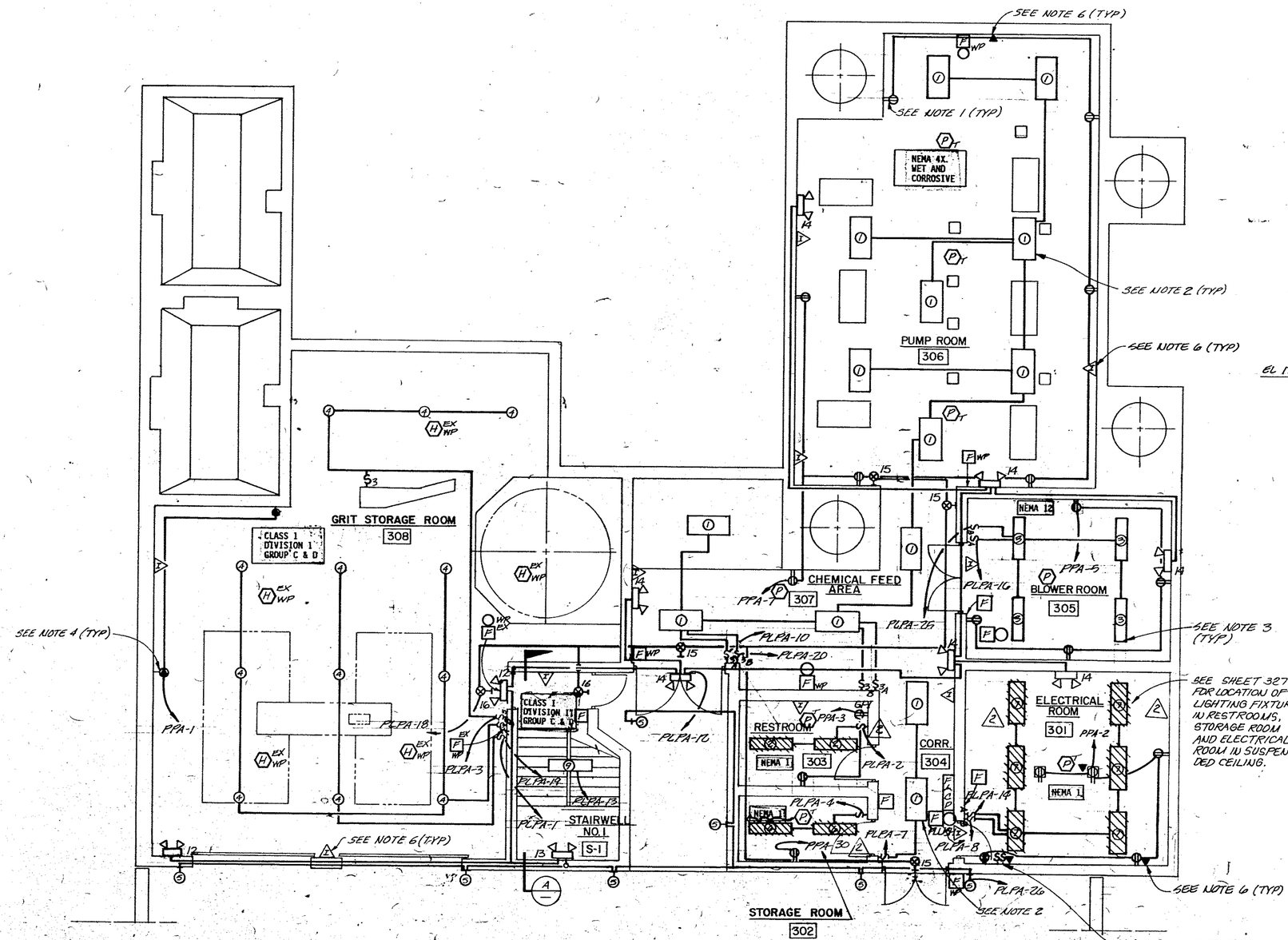
Designed	RJT
Drawn	CM
Checked	TDM
Approved	Jon D. Meredith
Date	MAY, 1989

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No	By	Revision	Date
2	JEK	ADDED UNIT NO. 2	6-30-89
3	AFA	AS RECORDED DRAWING	12/9/92

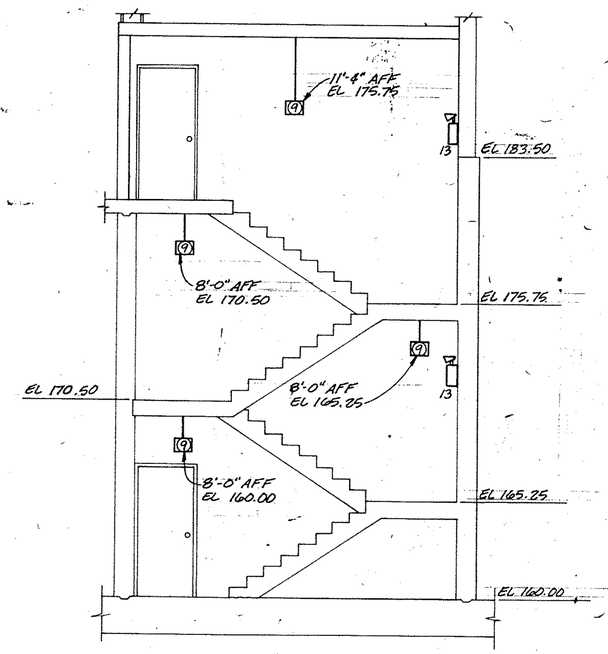
REGISTERED PROFESSIONAL ENGINEER 4894 OREGON WILLIAM F. ETTLICH

Sheet Number



HEADWORKS BUILDING - LOWER LEVEL FACILITY PLAN

SCALE: 3/16" = 1'-0"



SECTION A

NTS

GENERAL NOTES:

1. OUTLETS TO MEET NEMA 4X CRITERIA WITH ANTICORROSIVE COVERS AND ENCLOSURES.
2. PROVIDE DUAL BALLASTS TO PROVIDE 2 LEVELS OF ILLUMINATION.
3. FIXTURE TO BE SUPPLIED WITH DUAL BALLASTS TO PROVIDE 3 LEVELS OF ILLUMINATION. SWITCHING TO BE WIRED SUCH THAT SWITCH A ILLUMINATES INNER LAMP AND SWITCH B ILLUMINATES OUTER TWO LAMPS.
4. FURNISH PORTABLE 100W INCANDESCENT HANDLAMP, MATCHING PLUG AND RECEPTACLE FOR USE IN NEC CLASS I, DIV. I, GROUP C & D AREA. RECEPTACLE TO BE FURNISHED AND INSTALLED WILL BE 125 VAC-20A, 2W-3P, WP, CORROSION RESISTANT DELAYED ACTION CIRCUIT BREAKING THROUGH FEED. RECEPTACLE TO BE CROUSE HINDS CP152-211, WITH MATCHING PLUG OR EQUAL.
5. FOR LIGHTING FIXTURE SCHEDULES SEE SHEET 925.
6. AT EACH LOCATION A (1) AND ▼ IS SHOWN, PROVIDE A GANG BOX FLUSH WITH WALL. FROM ELECTRICAL ROOM TELEPHONE/INTERCOM PANEL TO EACH LOCATION PROVIDE:
   - 1" PVC RGS EMBEDDED CONDUIT
   - (1) 6-#16AWG CONDUCTORS (COIL 4' CONDUCTOR AT INTERCOM)
   - ▼ 8-#22AWG CONDUCTORS (COIL 2' CONDUCTOR AT TELEPHONE)
7. FOR PANEL SCHEDULES SEE SHEET 944.

(3) AS RECORDED DRAWINGS,

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL - HEADWORKS LOWER LEVEL FACILITY PLAN

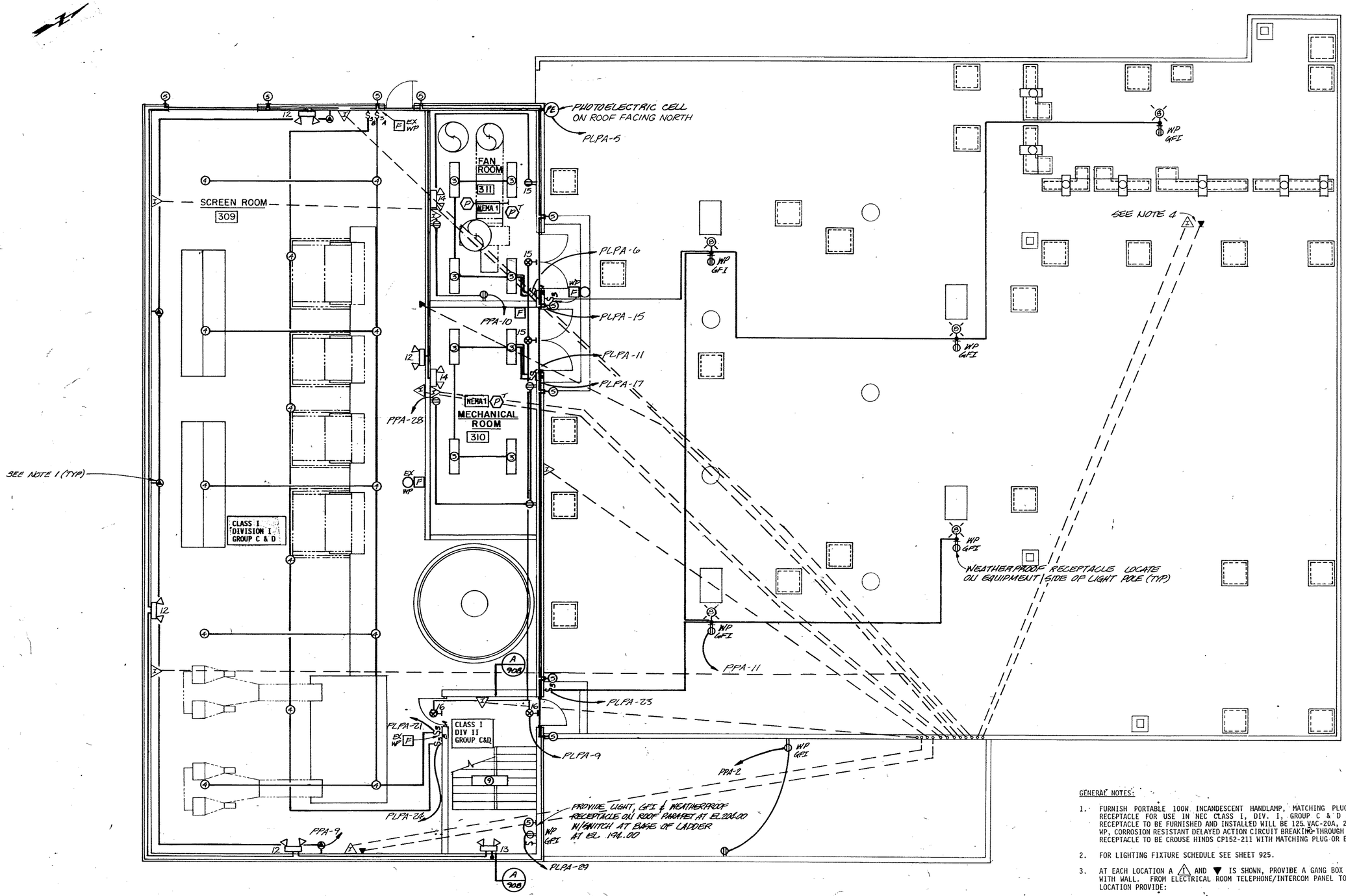
Designed RJT
Drawn CWA
Checked TDM
Approved Donald D. Monnett
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	JEK	ADDENDUM NO. 2	6-30-89
3	AFA	AS RECORDED DRAWINGS	11-14-92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON JULY 9, 1982 WILLIAM F. ETLICH

Sheet Number 903



HEADWORK BUILDING - UPPER LEVEL FACILITY PLAN

SCALE: 3/16"=1'-0"

GENERAL NOTES:

1. FURNISH PORTABLE 100W INCANDESCENT HANDLAMP, MATCHING PLUG AND RECEPTACLE FOR USE IN NEC CLASS I, DIV. I, GROUP C & D AREA. RECEPTACLE TO BE FURNISHED AND INSTALLED WILL BE 125 VAC-20A, 2W-3P, WP, CORROSION RESISTANT DELAYED ACTION CIRCUIT BREAKING-THROUGH FEED. RECEPTACLE TO BE CROUSE HINDS CP152-211 WITH MATCHING PLUG OR EQUAL.
2. FOR LIGHTING FIXTURE SCHEDULE SEE SHEET 925.
3. AT EACH LOCATION A △1 AND ▼ IS SHOWN, PROVIDE A GANG BOX FLUSH WITH WALL. FROM ELECTRICAL ROOM TELEPHONE/INTERCOM PANEL TO EACH LOCATION PROVIDE:
   - 1" PVC RGS EMBEDDED CONDUIT
   - △1 6-#16AWG CONDUCTORS (COIL 4' CONDUCTOR AT INTERCOM)
   - ▼ 8-#22AWG CONDUCTORS (COIL 2' CONDUCTOR AT TELEPHONE)
4. PROVIDE STATION MOUNTING DETAIL 1 SHOWN ON SHEET 902 TO ENCLOSE TELEPHONE AND INTERCOM AT LOCATION SHOWN.
5. FOR PANEL SCHEDULES SEE SHEET 924.

△1 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL - HEADWORKS UPPER LEVEL FACILITY PLAN

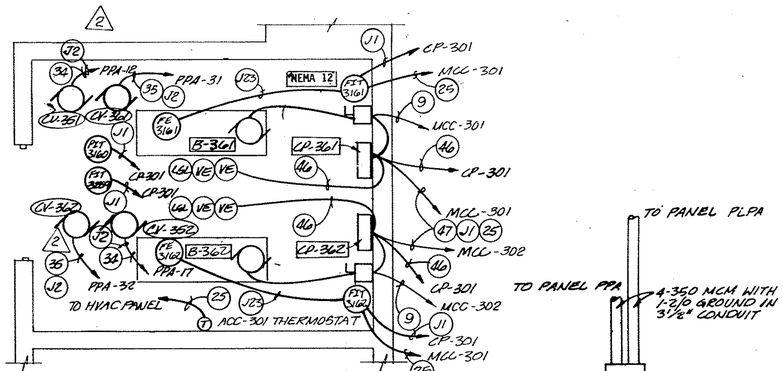
Designed: RJT
Drawn: CWA
Checked: TDM
Approved: Tom D. Merrick
Date: MAY, 1989

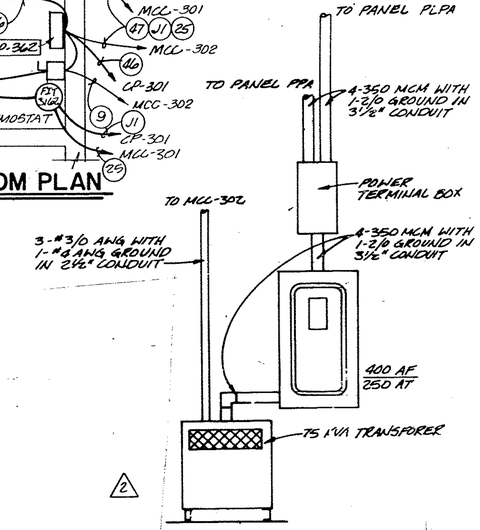
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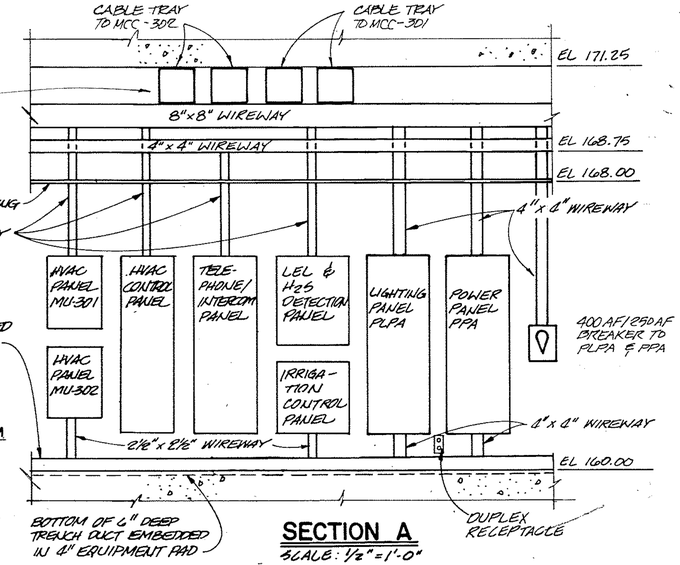
No	By	Revision	Date
△1	AFA	AS RECORDED DRAWING	11-14-92

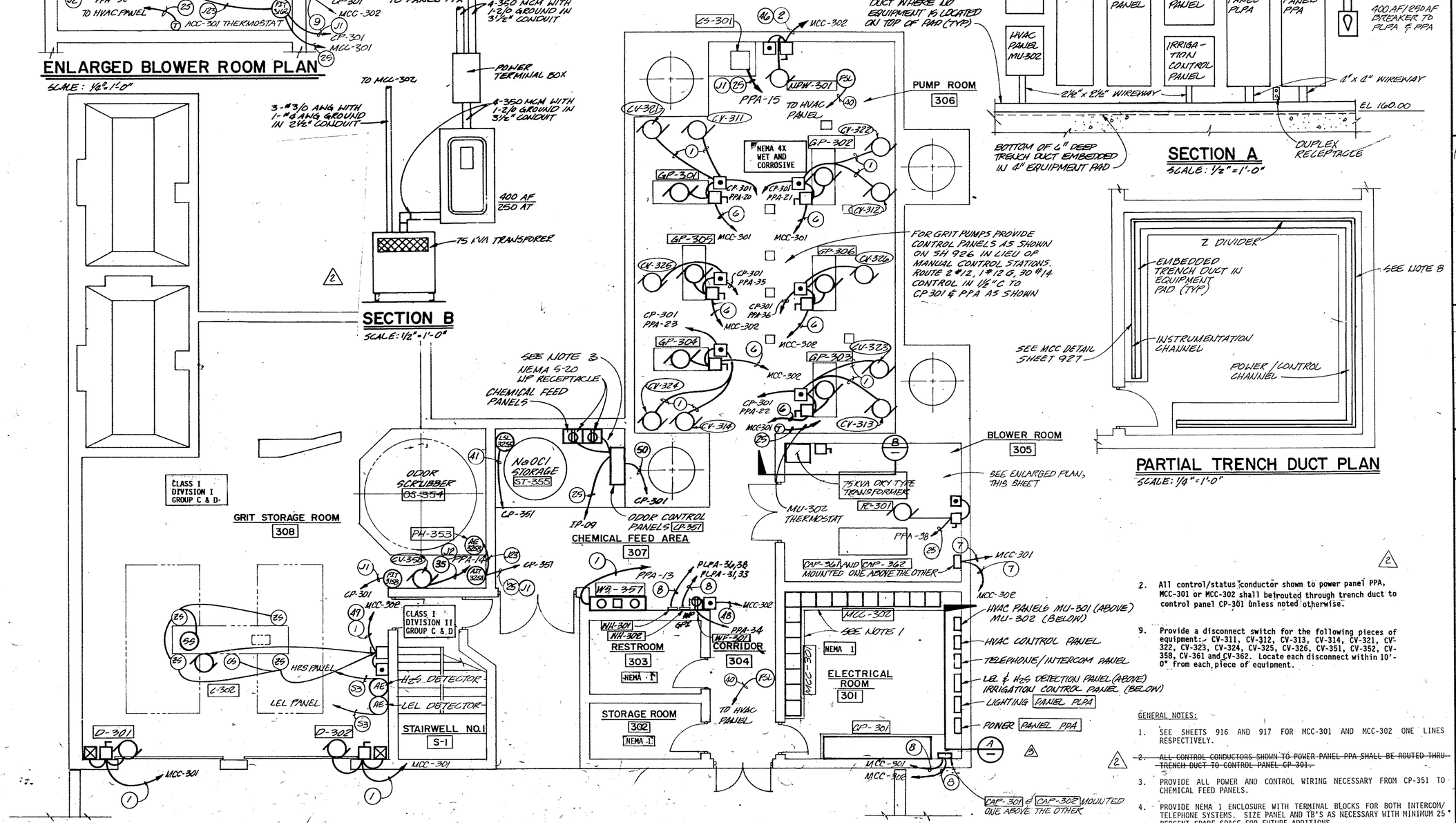
REGISTERED PROFESSIONAL ENGINEER 4404 OREGON WILLIAM F. ETLING

Sheet Number 909









HEADWORKS BUILDING - LOWER LEVEL POWER/INSTRUMENTATION PLAN

SCALE: 3/16"=1'-0"

2. All control/status conductor shown to power panel PPA, MCC-301 or MCC-302 shall be routed through trench duct to control panel CP-301 unless noted otherwise.

9. Provide a disconnect switch for the following pieces of equipment:- CV-311, CV-312, CV-313, CV-314, CV-321, CV-322, CV-323, CV-324, CV-325, CV-326, CV-351, CV-352, CV-358, CV-361 and CV-362. Locate each disconnect within 10'-0" from each piece of equipment.

GENERAL NOTES:

1. SEE SHEETS 916 AND 917 FOR MCC-301 AND MCC-302 ONE LINES RESPECTIVELY.
2. ~~ALL CONTROL CONDUCTORS SHOWN TO POWER PANEL PPA SHALL BE ROUTED THRU TRENCH DUCT TO CONTROL PANEL CP-301.~~
3. PROVIDE ALL POWER AND CONTROL WIRING NECESSARY FROM CP-351 TO CHEMICAL FEED PANELS.
4. PROVIDE NEMA 1 ENCLOSURE WITH TERMINAL BLOCKS FOR BOTH INTERCOM/TELEPHONE SYSTEMS. SIZE PANEL AND TB'S AS NECESSARY WITH MINIMUM 25 PERCENT SPARE SPACE FOR FUTURE ADDITIONS.
5. FOR HEADWORKS PRIMARY DISTRIBUTION ONE LINE SEE SHEET 915.
6. FOR HEADWORKS PANEL SCHEDULES SEE SHEET 924.
7. FOR CIRCUIT SCHEDULE SEE SHEET 925.
8. COORDINATE EMBEDMENT OF TRENCH DUCT WITH STRUCTURAL. COVER TRENCH DUCT BETWEEN MCC SECTIONS AND CONTROL PANEL.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL - HEADWORKS LOWER LEVEL POWER/ INSTRUMENTATION PLAN

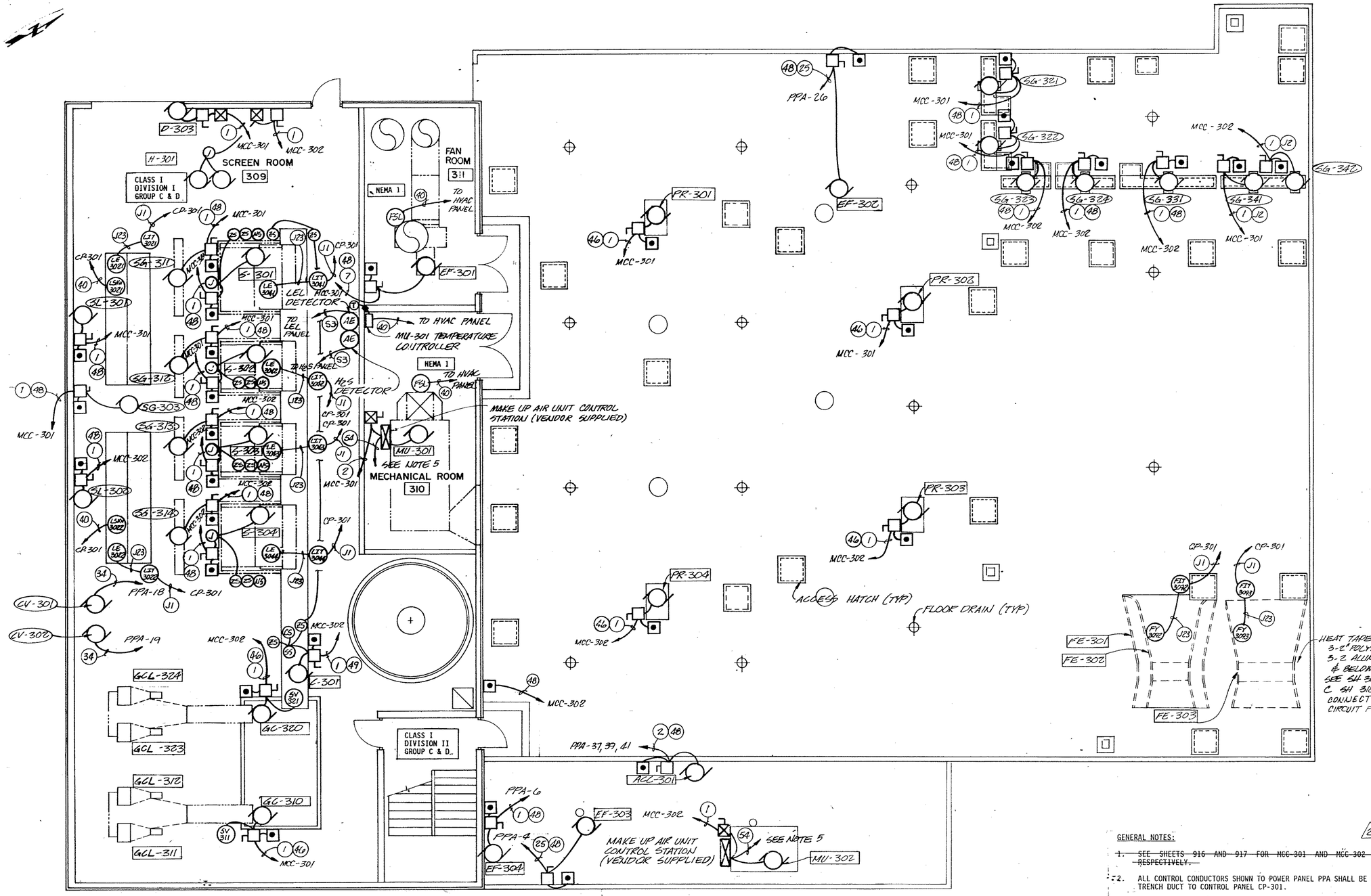
Designed RJT
Drawn CWA
Checked TDM
Approved
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	RJT	ADDENDUM NO 2	6-30-89
2	AFA	CPR # 83	12/8/92
3	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON JULY 9, 1971 WILLIAM F. ETTLICH

Sheet Number 910



GENERAL NOTES:

~~1. SEE SHEETS 916 AND 917 FOR MCC-301 AND MCC-302 ONE LINES RESPECTIVELY.~~

2. ALL CONTROL CONDUCTORS SHOWN TO POWER PANEL PPA SHALL BE ROUTED THRU TRENCH DUCT TO CONTROL PANEL CP-301.

3. FOR HEADWORKS PANEL SCHEDULES SEE SHEET 923.

4. FOR CIRCUIT SCHEDULE SEE SHEET 925.

5. TO RESPECTIVE HVAC PANEL IN ELECTRICAL ROOM.

HEADWORKS BUILDING – UPPER LEVEL POWER / INSTRUMENTATION PLAN

SCALE: 3/16"=1'-0"

1. All control/status conductors shown to power panel PPA, MCC-301 of MCC-302 shall be routed through trench duct to control panel CP-301 unless noted otherwise.

6.

AS-RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL - HEADWORKS UPPER LEVEL POWER/ INSTRUMENTATION PLAN

Designed	RJT
Drawn	CWA
Checked	TDM
Approved	Tom D. Merritt
Date	MAY, 1989

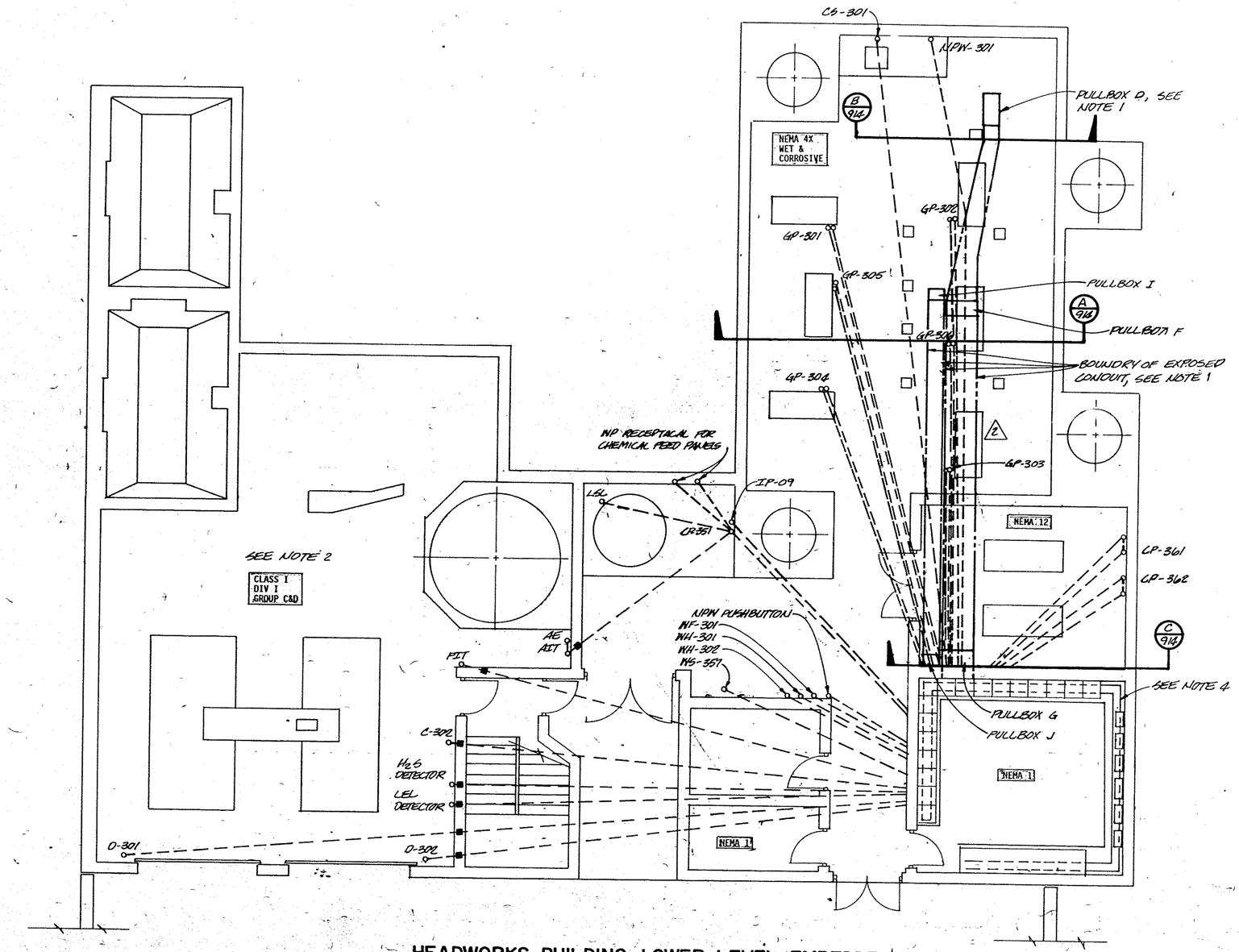
THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	TDM	ADDENDUM NO.2	12/9/92
1	AFA	AS RECORDED DRAWING	G-30-89

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON JULY 9 1945 ARTHUR F. ELLIS

Sheet Number
911

SR 904



HEADWORKS BUILDING-LOWER LEVEL EMBEDDED CONDUIT PLAN

SCALE: 3/16"=1'-0"

PULLBOX SCHEDULE				
NO.	SIZE	FUNCTION	MOUNTING	NEMA CLASS
A	36"x18"x8"	Power Distribution	Embedded	4X
B	18"x9"x8"	Instrumentation	Embedded	4X
C	36"x18"x8"	Power Distribution	Embedded	4X
D	36"x18"x8"	Power Distribution	Surface	4X
E	18"x12"x8"	Power Distribution	Embedded	4X
F	36"x24"x24"	Power Distribution	Surface	4X
G	36"x24"x24"	Power Distribution	Surface	12
H	18"x12"x8"	Instrumentation	Embedded	4X
I	18"x12"x12"	Instrumentation	Surface	4X
J	18"x12"x12"	Instrumentation	Surface	12

2

GENERAL NOTES

1. MAXIMUM ALLOWABLE WORK SPACE FOR CONDUIT RUNS. COORDINATE WITH OTHER DISCIPLINES TO AVOID POTENTIAL INTERFERENCE PROBLEMS.
2. ALL CONDUITS ENTERING/LEAVING CLASS I DIVISION I AREA SHALL BE SEALED PER SPECIFICATIONS.
3. ALL EXPOSED TRENCH DUCT SHALL HAVE A COVER.
4. CONTRACTOR SHALL PROVIDE AS-BUILTS OF ALL EMBEDDED CONDUIT.
5. ALL EMBEDDED CONDUIT SHALL FEED FROM UNDER TRENCH DUCT.
6. CONTRACTOR SHALL PROVIDE EMBEDDED CONDUIT FROM CONTROL STATION/ DISCONNECT SWITCH TO RESPECTIVE EQUIPMENT.

3 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL-HEADWORKS LOWER LEVEL EMBEDDED CONDUIT PLAN

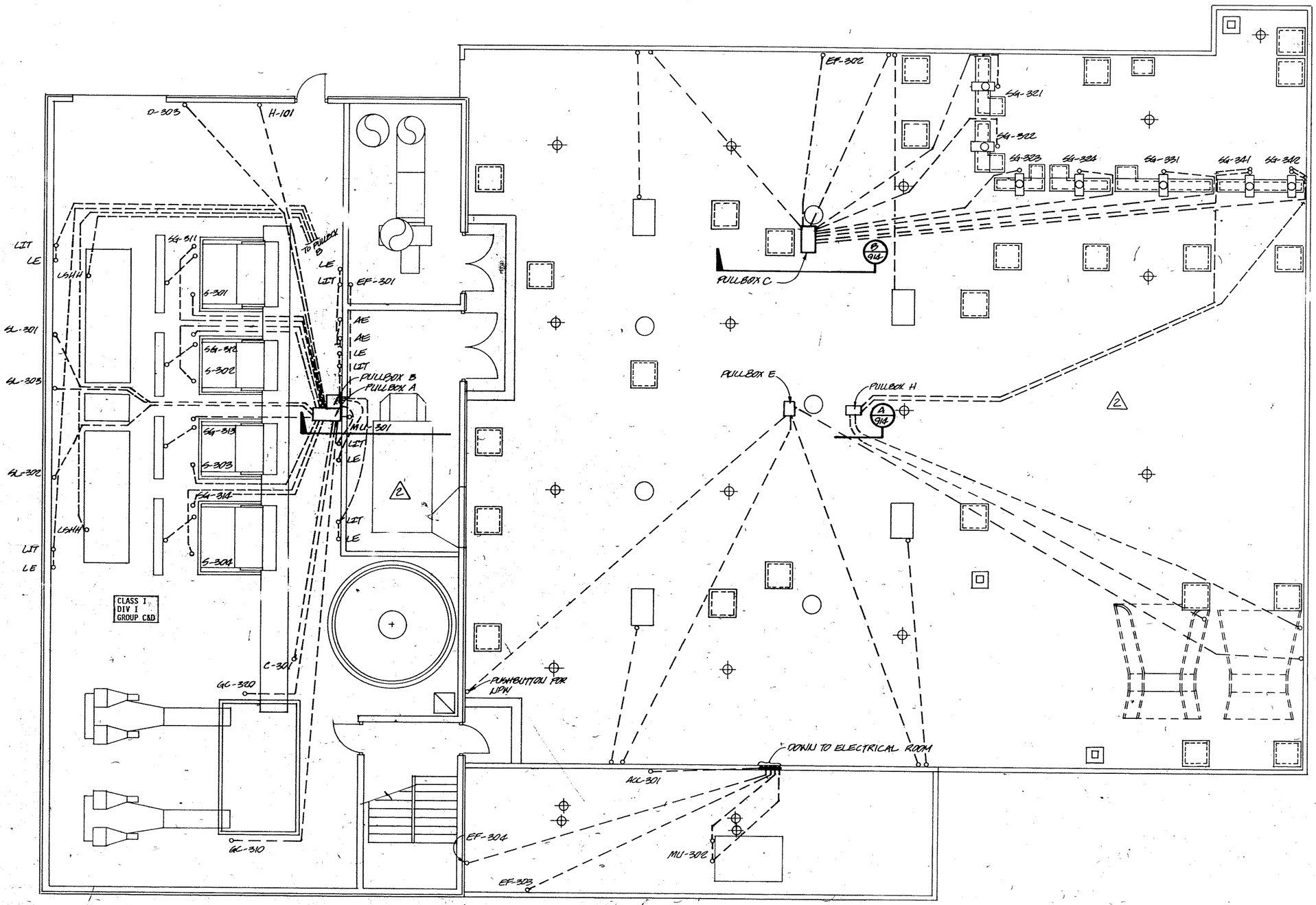
Designed: RJT
Drawn: SDS
Checked: TDM
Approved: Jon D. Monnett
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	TDM	ADDENDUM NO 2	6-30-89
3	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON JULY 9, 1982 WILLIAM F. ETTLICH

Sheet Number: 912



HEADWORKS BUILDING-UPPER LEVEL EMBEDDED CONDUIT PLAN

SCALE: 3/16"=1'-0"

GENERAL NOTES

1. ALL CONDUITS ENTERING/LEAVING CLASS I DIVISION I AREA SHALL BE SEALED PER SPECIFICATIONS.
2. CONTRACTOR SHALL PROVIDE AS-BUILTS OF ALL EMBEDDED CONDUIT.
3. CONTRACTOR SHALL PROVIDE EMBEDDED CONDUIT FROM CONTROL STATION/ DISCONNECT SWITCH TO RESPECTIVE EQUIPMENT.

△2 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL-HEADWORKS UPPER LEVEL EMBEDDED CONDUIT PLAN

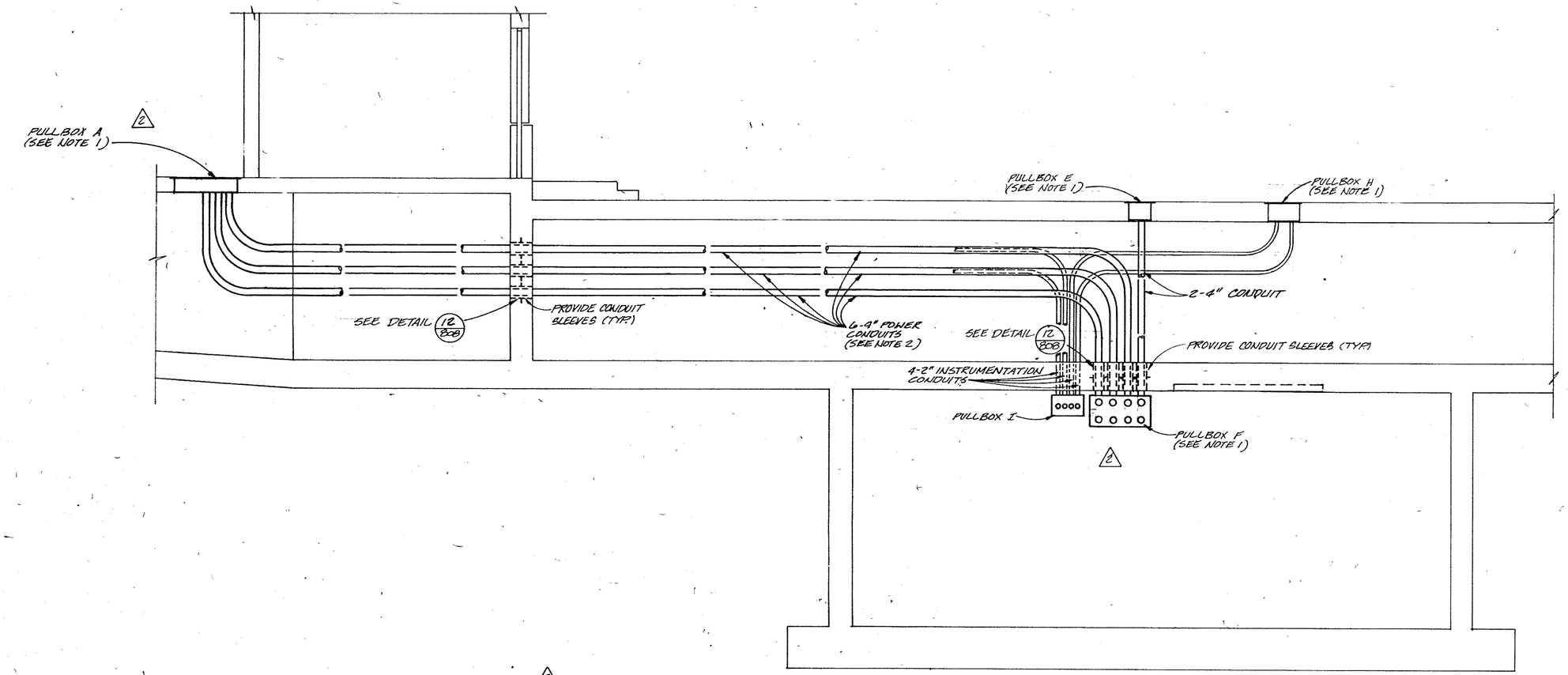
Designed: RJT
Drawn: SDS
Checked: TDM
Approved: Tom D. Meredith
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	AFA	ADDENDUM NO 2	6-30-89
△2	AFA	AS RECORDED DRAWING	11-14-92

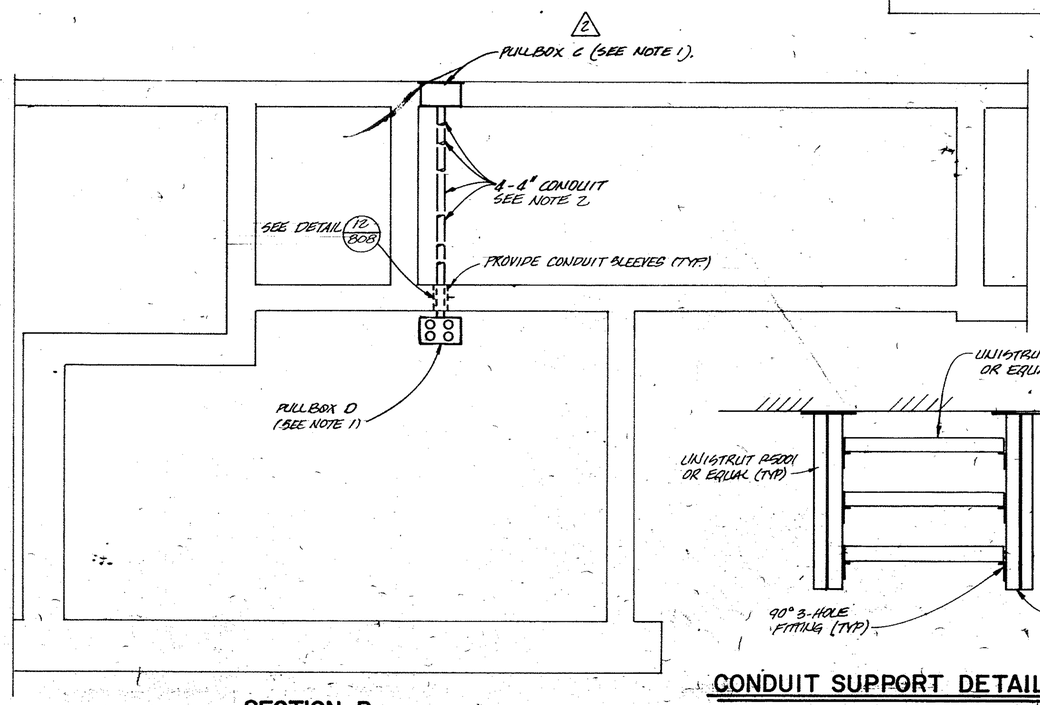
REGISTERED PROFESSIONAL ENGINEER 4894 OREGON JULY 9, 1975 WILLIAM F. ETTLICH

Sheet Number: 913



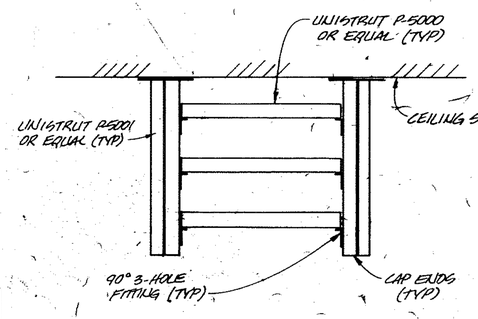
SECTION A

SCALE: 3/8"=1'-0"
SEE SH 912 & 913



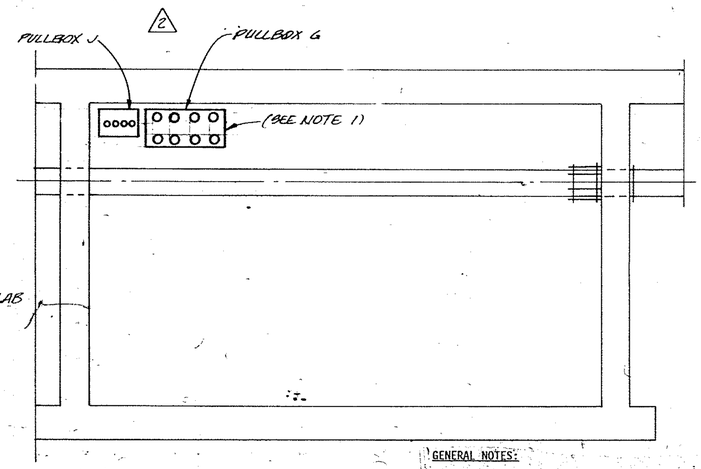
SECTION B

SCALE: 3/8"=1'-0"
SEE SH 912 & 913



CONDUIT SUPPORT DETAIL

NTS



SECTION C

SCALE: 3/8"=1'-0"
SEE SH 912

GENERAL NOTES:

1. ALL BOXES SHOWN ON THIS SHEET SHALL HAVE ALL CONDUITS ENTERING/LEAVING RESPECTIVE BOX SEALED.
2. ALL CONDUIT IN VOID AREAS SHALL BE PVCG TYPE CONDUIT.

3 AS RECORDED DRAWINGS

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Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL HEADWORKS EMBEDDED CONDUIT SECTIONS

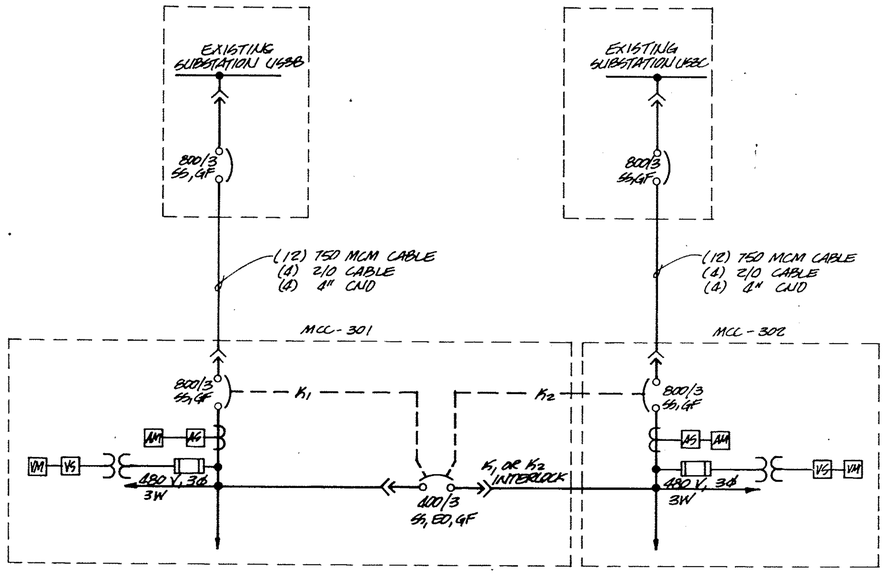
Designed	RJT
Drawn	SDS
Checked	TDM
Approved	Jon D. Monnette
Date	MAY, 1989

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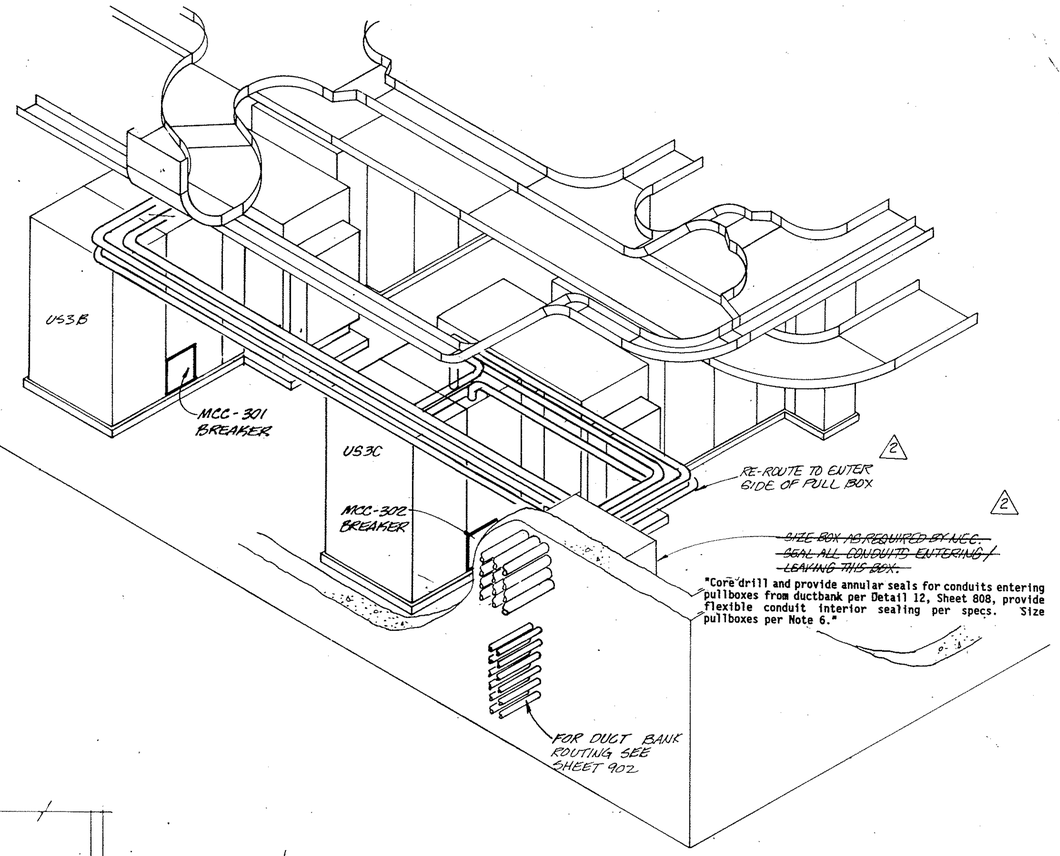
No	By	Revision	Date
2	TDM	ADDENDUM NO 2	6-30-89
3	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON JULY 1, 1972 WILLIAM F. ETTLICH

Sheet Number 914

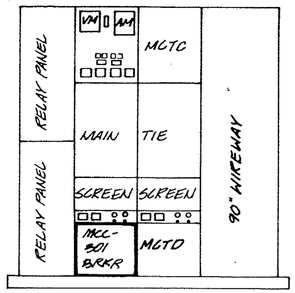


HEADWORKS FEEDER ONE-LINE

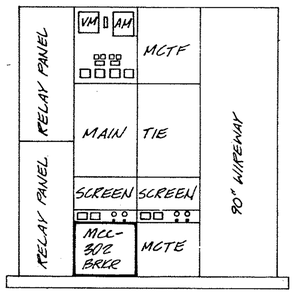


CONDUIT ROUTING ISOMETRIC

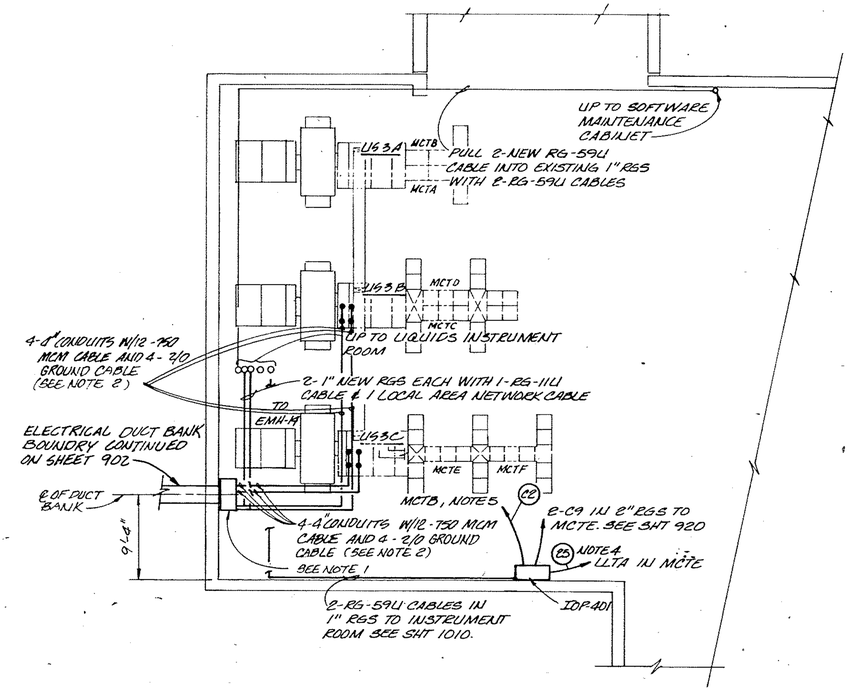
(NTS)



SUBSTATION US3B

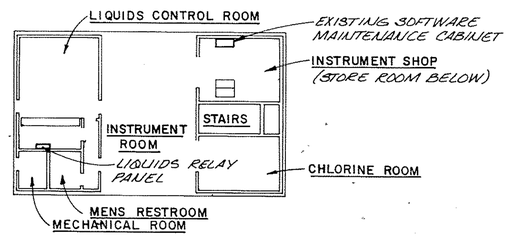


SUBSTATION US3C



CONTROL BUILDING BASEMENT PLAN

SCALE: 1/8"=1'-0"



GROUND LEVEL — CONTROL BUILDING

2

AS RECORDED DRAWINGS

GENERAL NOTES:

1. PROVIDE SEPARATION BARRIER BY MANUFACTURER OF PULL BOX FOR SEPARATION BETWEEN COMMUNICATION AND POWER CABLES/CONDUCTORS.
2. ACTUAL ROUTING OF ALL CONDUITS WILL BE GOVERNED BY FIELD CONDITIONS. CONTRACTOR TO FIELD VERIFY ACTUAL LOCATIONS. COORDINATE WITH PIPING FOR POSSIBLE INTERFERENCE.
3. SEE SHEETS 916 AND 917 FOR MCC-301 AND MCC-302 ONE-LINES.
4. UTILIZE SPARE 20A CIRCUIT BREAKER IN LLTA.
5. CONNECT TO NORMALLY OPEN STARTER AUXILIARY CONTACT AT PRIMARY SCUM PUMP STARTER IN MCTB.

2

6. Provide two NEMA 12 pullboxes sized as follows: Power Pullbox - 40" H x 48" W x 36" D Communications Pullbox - 45" H x 24" W x 29" D
7. Wall mount pullboxes utilizing fiberglass strut.

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Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL - HEADWORKS PRIMARY DISTRIBUTION

Designed: RJT
Drawn: LWA
Checked: TDM
Approved: Tom D. Marrs
Date: MAY, 1989

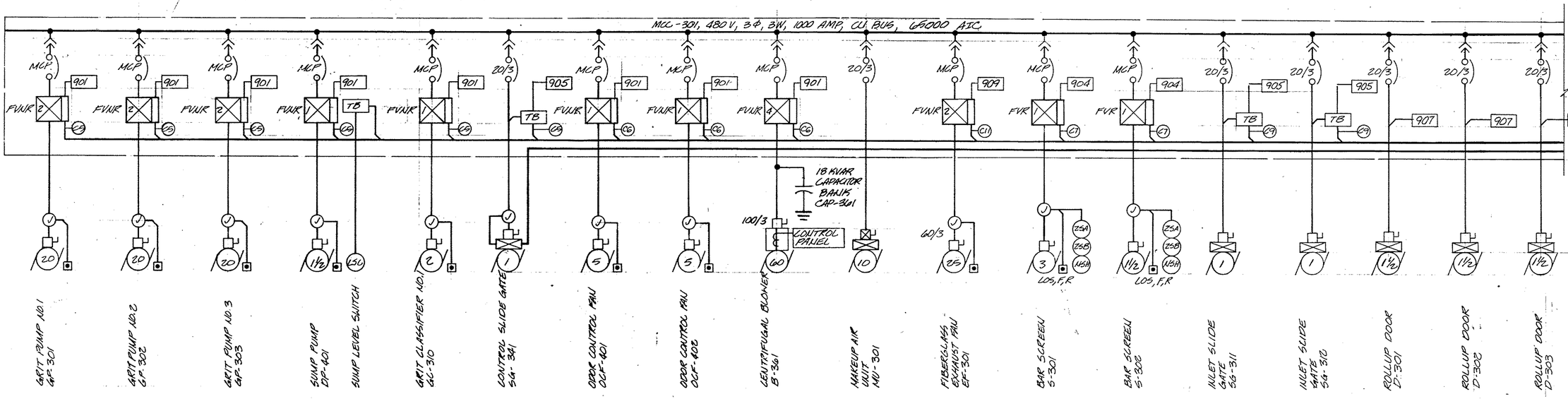
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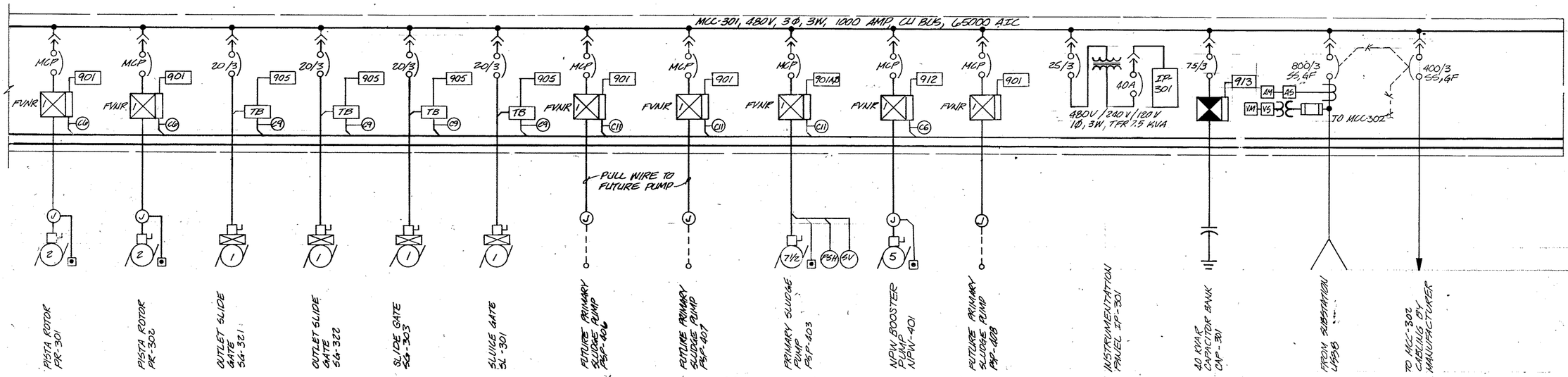
No	By	Revision	Date
2	TDM	ADDENDUM NO.2	6-30-89
1	AFH	AS RECORDED DRAWINGS	11-14-92

REGISTERED PROFESSIONAL ENGINEER 4004 OREGON JULY 9, 1982 WILLIAM F. ETTLICH

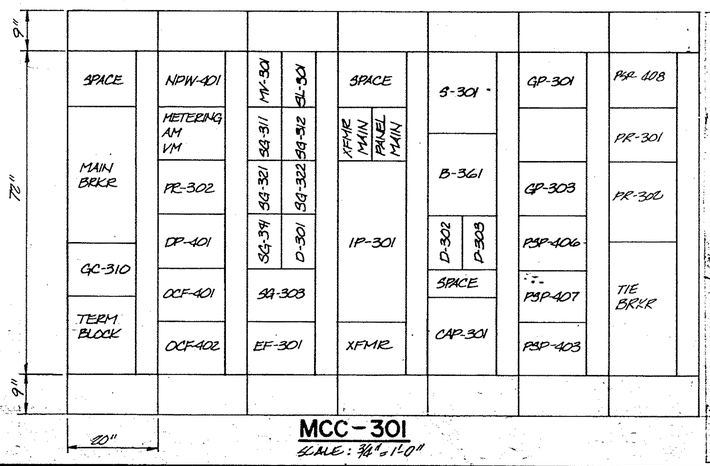
Sheet Number: 915

SR 904





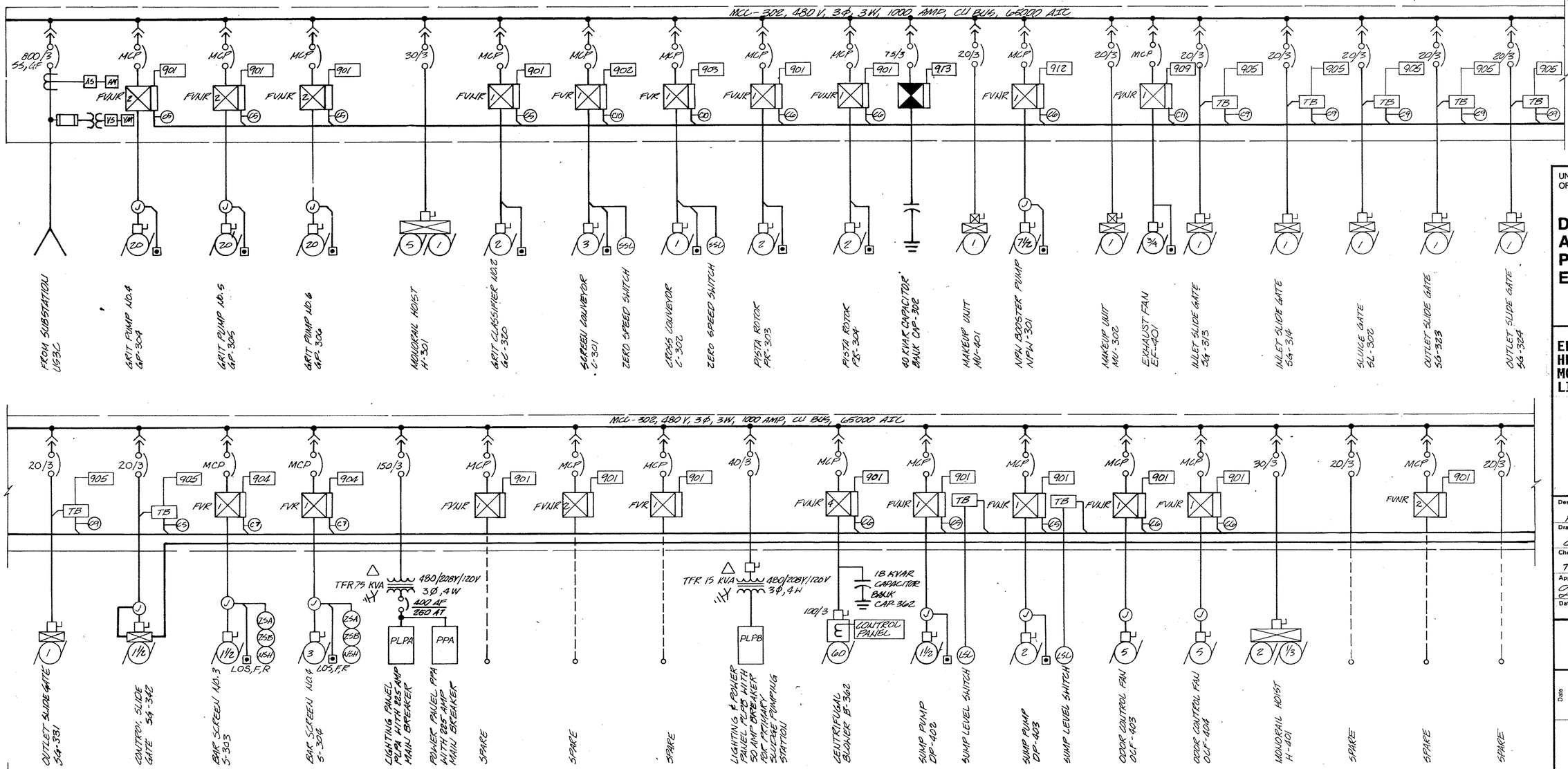
MCC-301 ONE LINE



MCC-301

SCALE: 3/4"=1'-0"

| UNIT NO. | STARTER CLASS OR DESCRIPTION | H.P. | FRAME BREAKER OR SWITCH AMPS | F.L.A. | EXTRA CONTACTS NO | NC | CONTROL DEVICES | | |



MCC-302
SCALE: 3/4" = 1'-0"

GENERAL NOTES:

1. SEE SHEETS 922 AND 923 FOR CONTROL SCHEMATICS.
2. SEE SHEET 925 FOR CIRCUIT SCHEDULES.
3. SEE SHEET 924 FOR MCC 302 CONTROL SCHEDULE

△ AS RECORDED DRAWINGS

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DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL - HEADWORKS MCC-302 ONE LINE

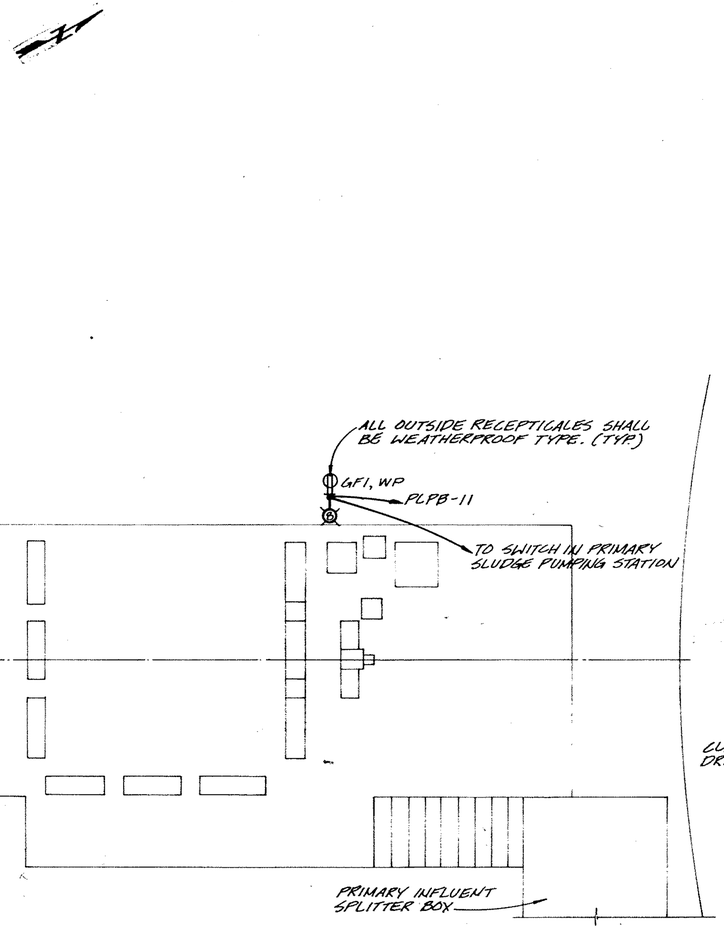
Designed: RJT
Drawn: CWA
Checked: TDM
Approved: Tom D. Merrick
Date: MAY, 1989

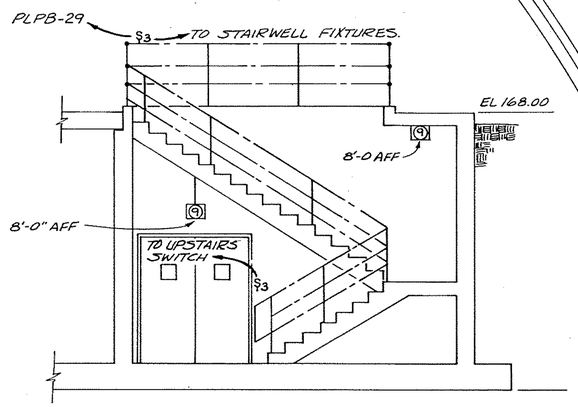
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No	Revision	By	Date
△	AS RECORDED DRAWING	AFA	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4994 OREGON JULY, 19 95 WILLIAM F. ETTLICH

Sheet Number: 917

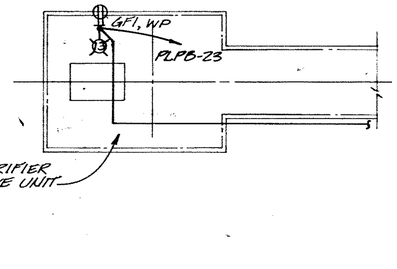


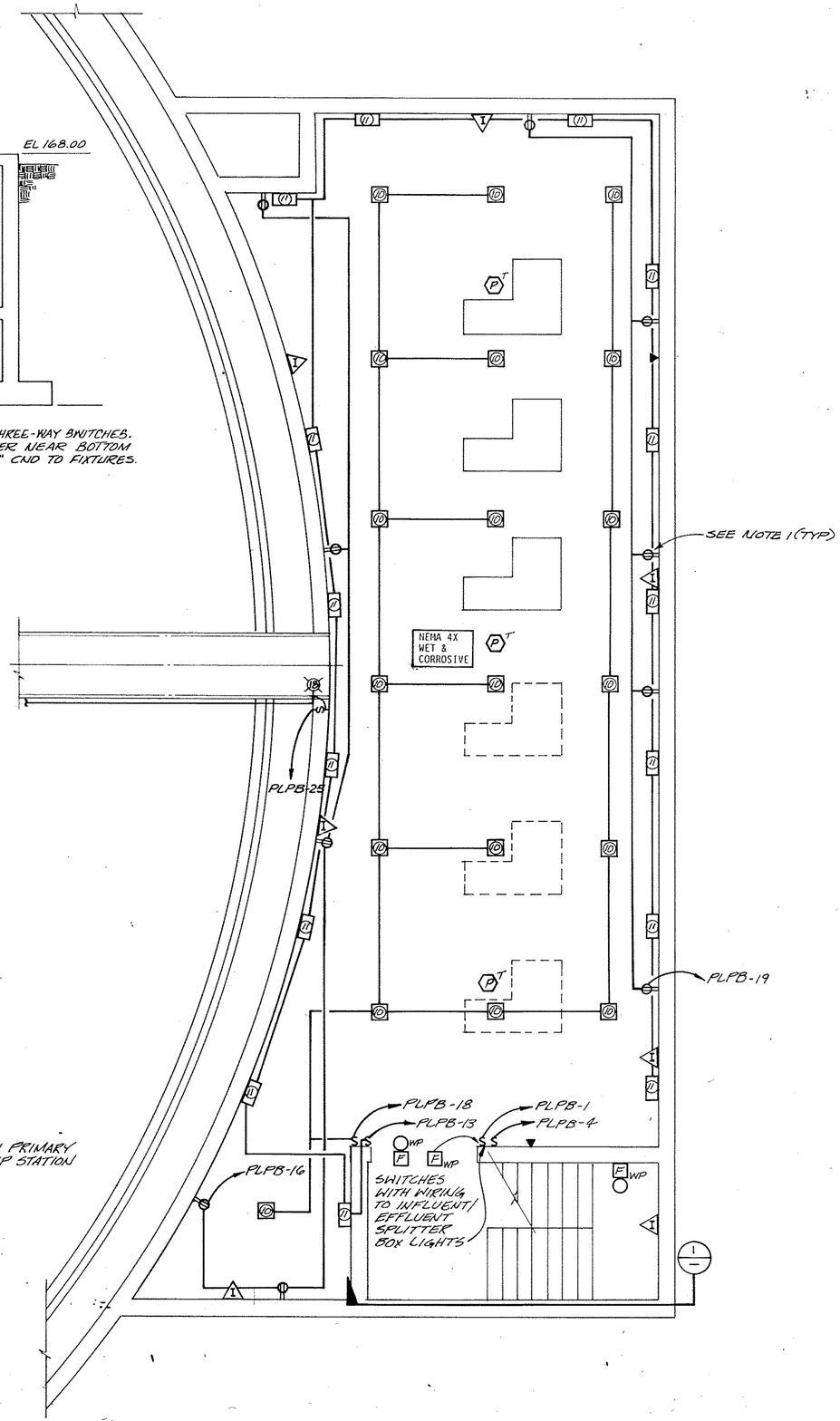


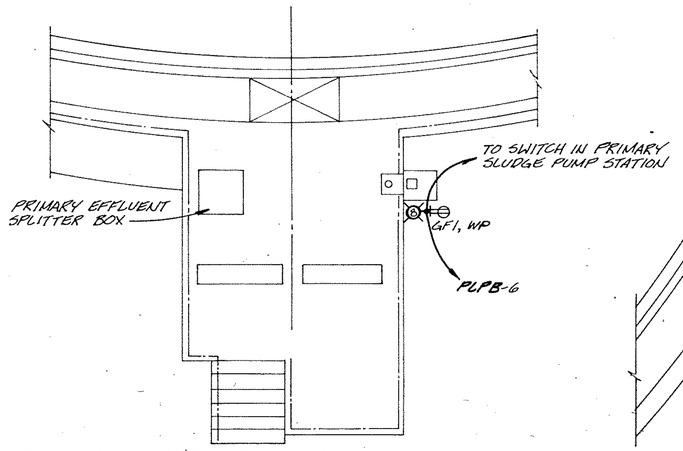
NOTE: SUPPLY WEATHERPROOF BOXES AND THREE-WAY SWITCHES. INSTALL ONE ON HANDRAIL AND OTHER NEAR BOTTOM OF STAIRWELL ON WALL. ROUTE 3/4" CND TO FIXTURES.

SECTION 1

SCALE: 1/4"=1'-0"







GENERAL NOTES:

1. OUTLETS TO MEET NEMA 4X CRITERIA WITH ANTICORROSIVE COVERS AND ENCLOSURES.
2. FOR LIGHTING FIXTURE SCHEDULE SEE SHEET 925.
3. AT EACH LOCATION A ⚠ AND ▼ IS SHOWN, PROVIDE A GANG BOX FLUSH WITH WALL. FROM ELECTRICAL ROOM TELEPHONE/INTERCOM PANEL TO EACH LOCATION PROVIDE:
   - 1" PVC RGS EMBEDDED CONDUIT
   - ⚠ 4 - #16 AWG CONDUCTORS (COIL 2' CONDUCTOR AT INTERCOM)
   - ▼ 8 - #22 AWG CONDUCTORS (COIL 2' CONDUCTOR AT TELEPHONE)
4. FOR PANEL SCHEDULES SEE SHEETS 924, 925.

PRIMARY CLARIFIER AND PRIMARY SLUDGE PUMPING STATION FACILITY PLAN

SCALE: 1/8"=1'-0"

⚠ AS RECORDED DRAWINGS

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Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL - PRIMARY CLARIFIER AND PRIMARY SLUDGE PUMPING STATION FACILITY PLAN

Designed: RJT
Drawn: CWA/SS
Checked: TDM
Approved: Tom D. Monteith
Date: MAY, 1989

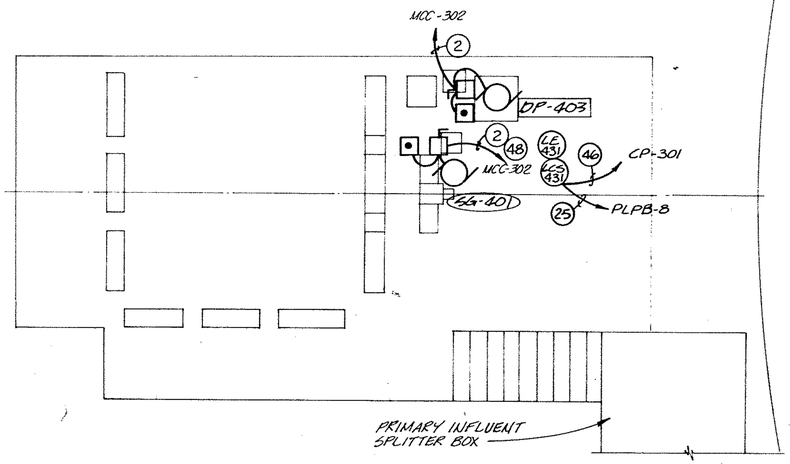
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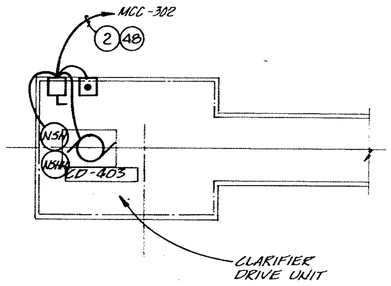
No	By	Revision	Date
⚠	AFA	AS RECORDED DRAWING	11-14-92

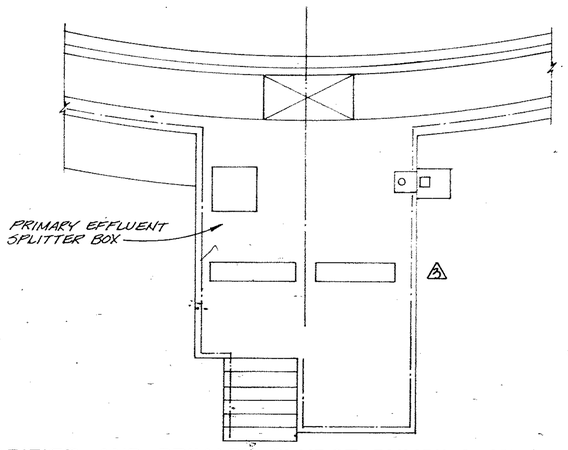
REGISTERED PROFESSIONAL ENGINEER 4894 OREGON JULY 9, 1985 WILLIAM F. ETTLICH

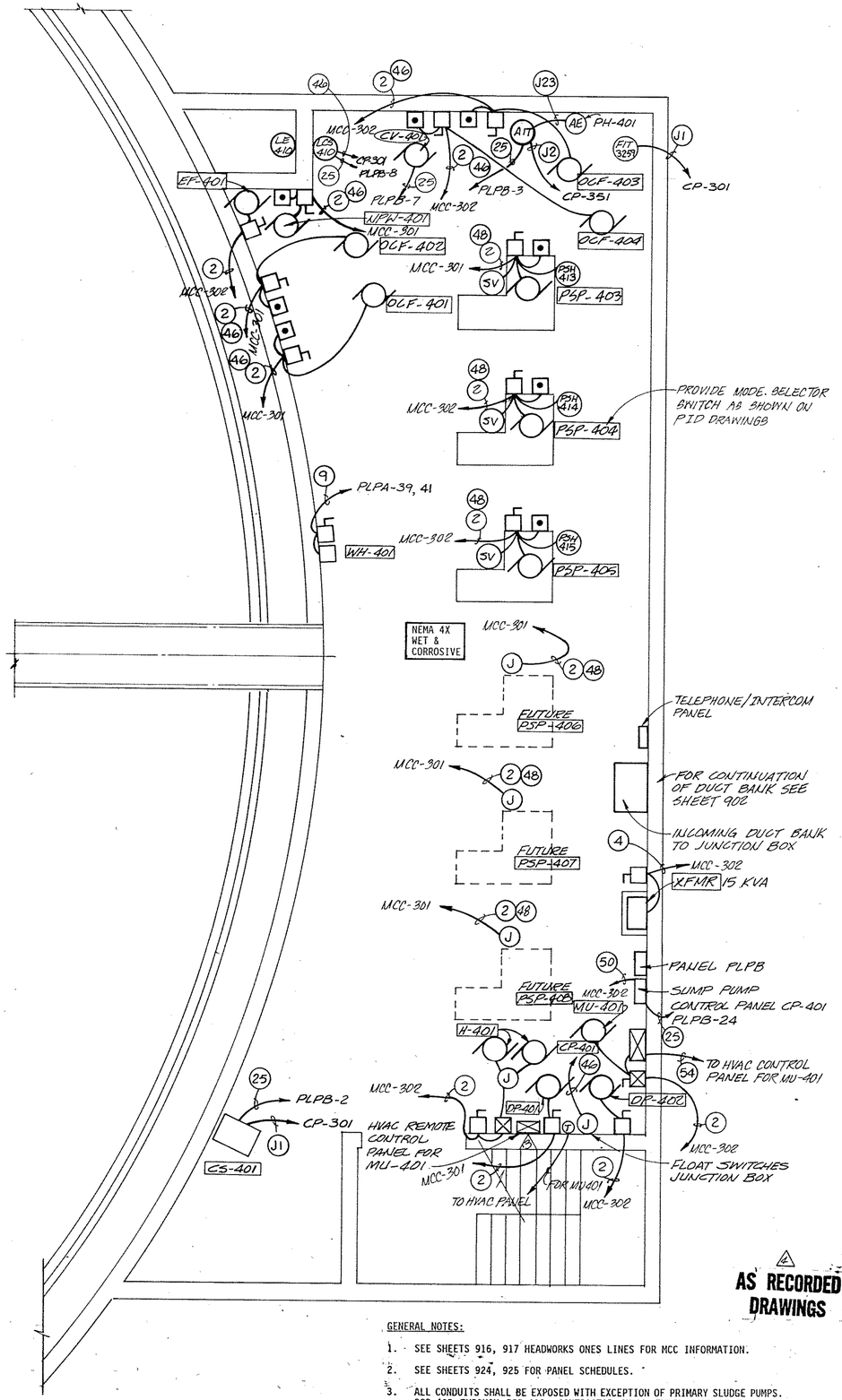
Sheet Number: 918

SR 904









PRIMARY CLARIFIER AND PRIMARY SLUDGE PUMPING STATION POWER/INSTRUMENTATION PLAN

SCALE: 1/4"=1'-0"

AS RECORDED DRAWINGS

GENERAL NOTES:

1. SEE SHEETS 916, 917 HEADWORKS ONES LINES FOR MCC INFORMATION.
2. SEE SHEETS 924, 925 FOR PANEL SCHEDULES.
3. ALL CONDUITS SHALL BE EXPOSED WITH EXCEPTION OF PRIMARY SLUDGE PUMPS. PSP-403 THROUGH PSP-408. CONTRACTOR SHALL EMBED CONDUIT TO THESE PUMPS.
4. Provide a disconnect switch for CV-401. Locate disconnect within 10'-0" from equipment." 2

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DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL - PRIMARY CLARIFIER AND PRIMARY SLUDGE PUMPING STATION POWER/ INSTRUMENTATION PLAN

Designed: RJT
Drawn: CWA
Checked: TDM
Approved: Tom D. Merritt
Date: MAY, 1989

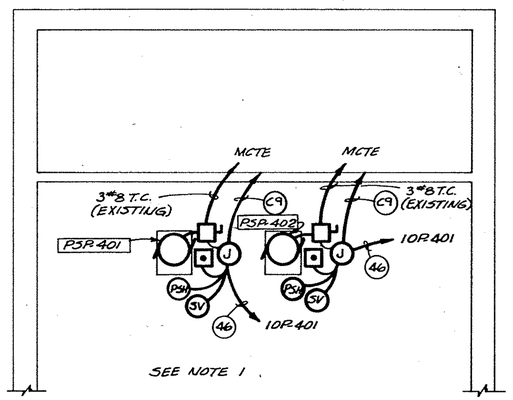
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No	By	Revision	Date
2	TDM	ADDENDUM NO. 2	6-30-89
3	AFA	OPE# 85	12/8/92
4	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4004 OREGON JULY 9, 1982 WILLIAM F. ETTLICH

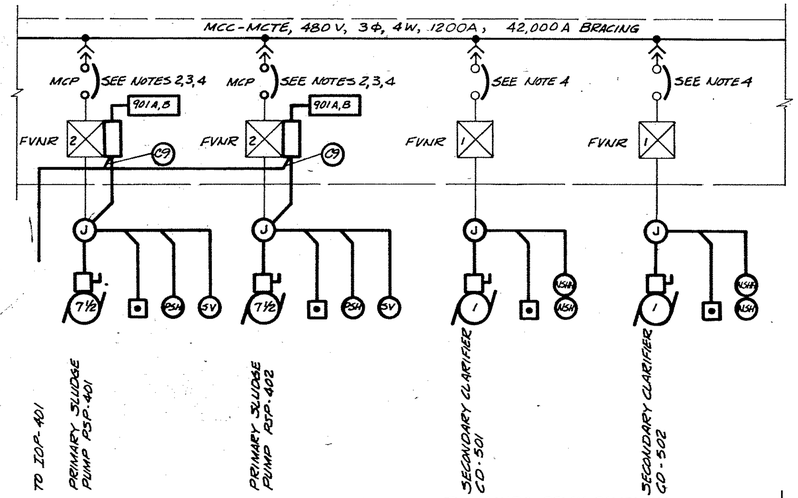
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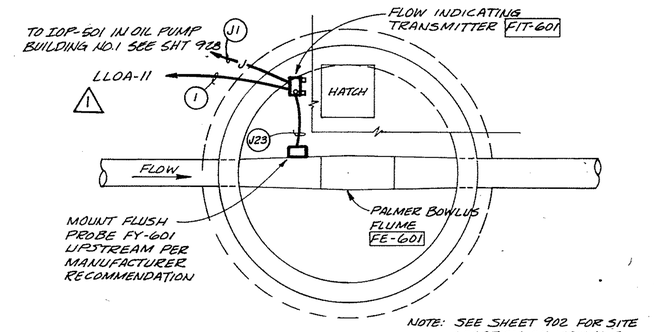
SR 904



EXISTING PRIMARY SLUDGE PUMP PLAN

NTS

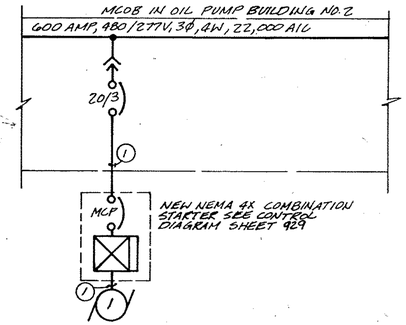




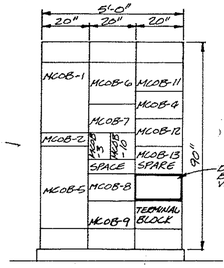
NOTE: SEE SHEET 902 FOR SITE LOCATION OF MANHOLE. COORDINATE EXACT LOCATION WITH RESPECTIVE DISCIPLINES.

EXCESS FLOW MONITORING MANHOLE PLAN

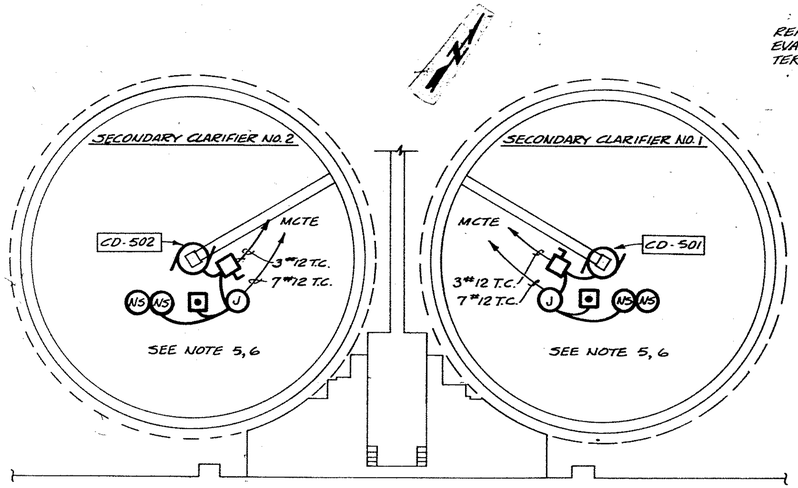
NTS



DP-101 ONE LINE DIAGRAM

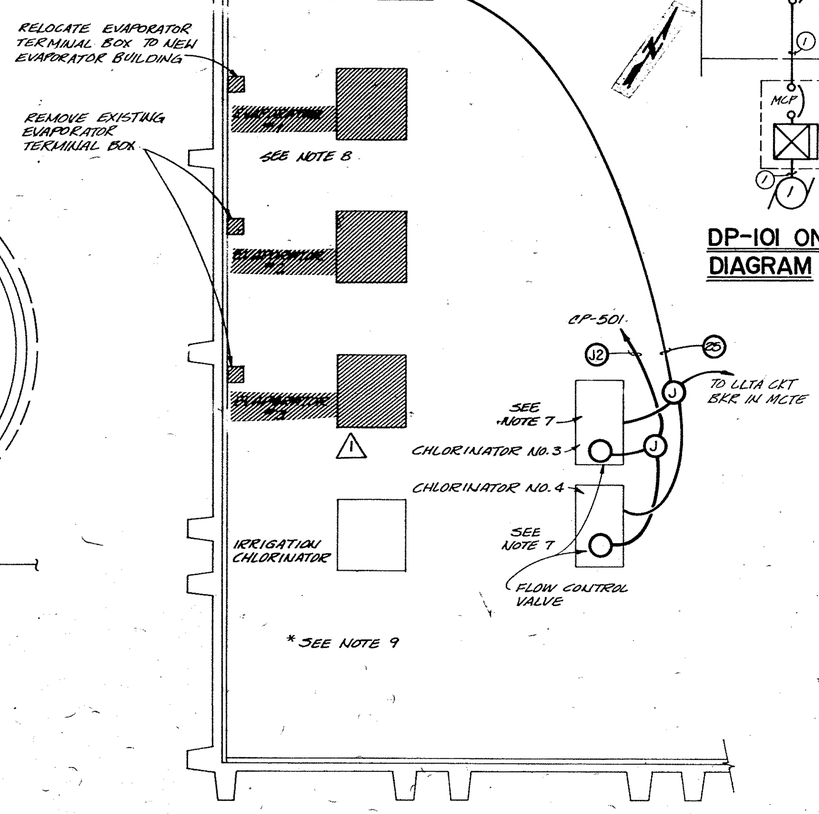


MCOB ELEVATION



SECONDARY CLARIFIER PLAN

NTS



CONTROL BUILDING - CHLORINE ROOM PARTIAL PLAN

GENERAL NOTES:

1. DISCONNECT AND REMOVE EXISTING 25 HP PRIMARY SLUDGE PUMPS AND CONTROL VALVES. INSTALL NEW 7 1/2 HP PSP-401 AND PSP-402 AND CONNECT TO EXISTING MODIFIED STARTERS IN MCTE. PROVIDE NEW CONTROL STATION AND HIGH PRESSURE SWITCH. EXTEND EXISTING POWER AND PROVIDE NEW CONTROL TRAY CABLES AS REQUIRED.
2. REPLACE EXISTING CIRCUIT BREAKER WITH 20/3 MCP, 65KAIC.
3. REVISE CONTROL CIRCUIT FOR PROGRAMMABLE CONTROLLER OPERATION.
4. REPLACE OVERLOAD ELEMENTS PER NAMEPLATE RATING OF NEW MOTOR.
5. DISCONNECT AND REMOVE EXISTING SECONDARY CLARIFIER DRIVES. INSTALL NEW DRIVES CD-501 AND CD-502, CONNECT TO EXISTING STARTERS IN MCTE. EXTEND AND REUSE EXISTING POWER AND CONTROL CABLES AS REQUIRED. RETAIN EXISTING CONTROLS.
6. INSTALL NEW LIGHT FIXTURES AND RECEPTACLE AND CONNECT TO EXISTING CIRCUITS IN PANEL LLTB. NEW LIGHTING SYSTEM TO MATCH CLARIFIER LIGHTING SHOWN ON SHEET 918.
7. DISCONNECT AND REMOVE EXISTING CHLORINATORS, RECONNECT NEW CHLORINATORS TO BRANCH CIRCUIT IN CHLORINE ROOM. PROVIDE FLOW SIGNAL CABLE TO AUTOMATIC PACING VALVE IN EACH CHLORINATOR.
8. REMOVE ALL EXPOSED RACEWAY AND WIRING ASSOCIATED WITH EVAPORATORS AND TERMINAL BOXES BACK TO MCCTD. CUT CONDUITS FLUSH WITH FLOOR AND SEAL WITH GROUT.
9. UTILIZE EXISTING CONDUIT AND EXTEND WHERE NECESSARY.
10. SEE KEY MAP SHEET 921 FOR BUILDINGS AFFECTED. EXACT LOCATION OF MOTOR CONTROL CENTERS AND PANEL BOARDS SHALL BE FIELD DETERMINED BY CONTRACTOR.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL-MISCELLANEOUS EXISTING BUILDING IMPROVEMENTS

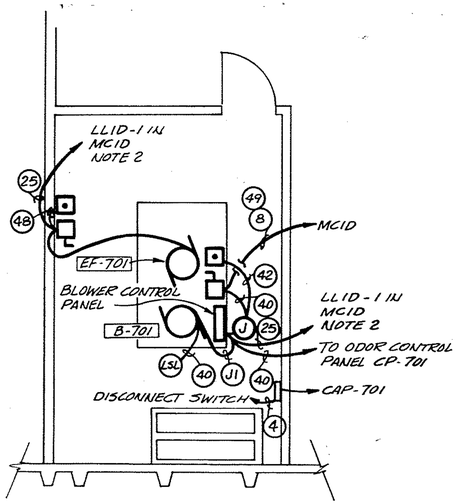
Designed: RJT
Drawn: MLJ
Checked: TDM
Approved: Thomas D. Marrs
Date: MAY, 1989

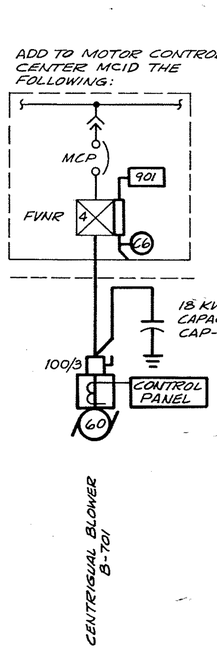
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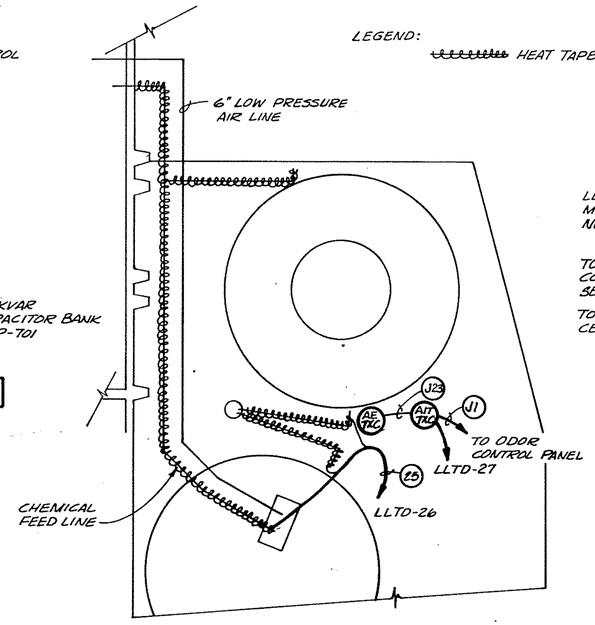
No	By	Revision	Date
1	JEK	ADDENDUM NO.1	6-27-89
2	JEK	ADDENDUM NO.2	8-30-89
3	APA	AS RECORDED DRAWING	12/8/92

REGISTERED PROFESSIONAL ENGINEER 4894 STATE OF OREGON JULY 9, 1985 WILLIAM F. ERLICH

Sheet Number: 920

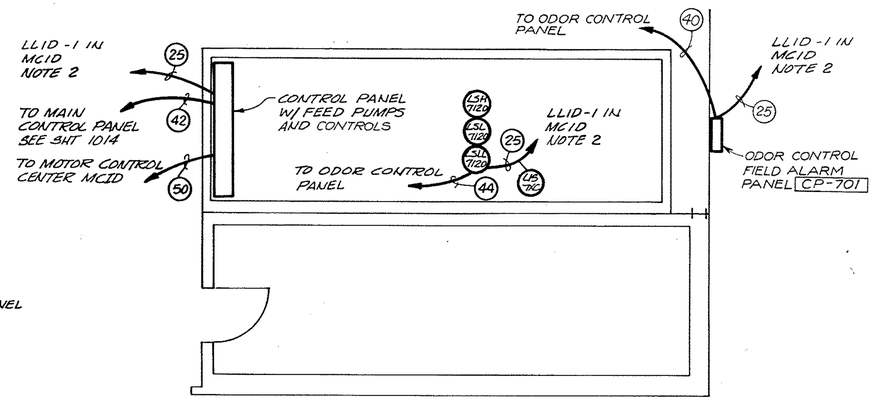






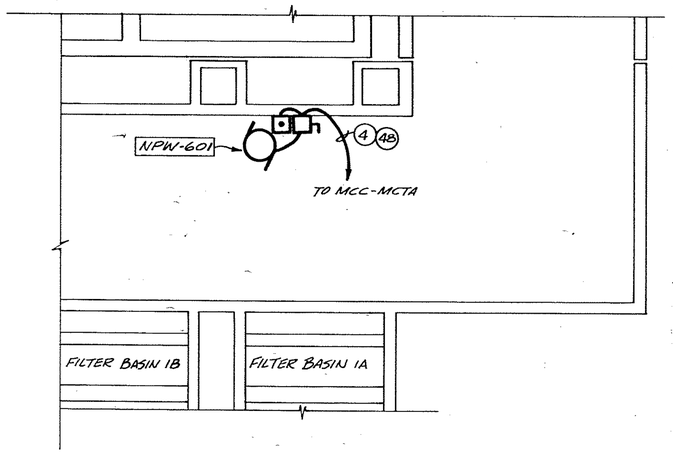
ODOR CONTROL FACILITIES PLAN

INCINERATOR BUILDING
SCALE: 1/4"=1'-0"



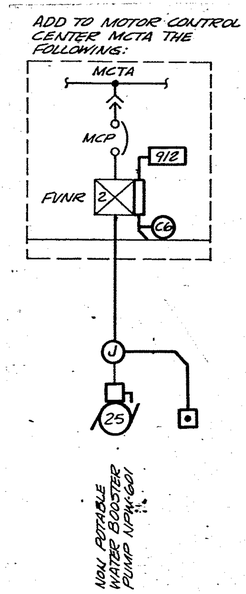
CHEMICAL FEED AND STORAGE AREA PLAN

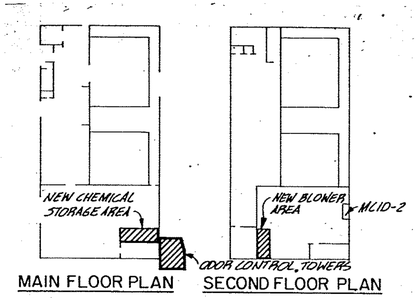
INCINERATOR BUILDING
SCALE: 1/4"=1'-0"



FILTER AREA TUNNEL PLAN

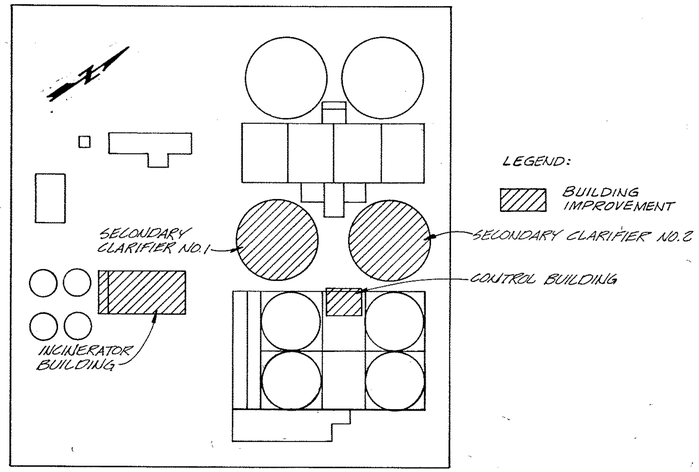
SCALE: 1/8"=1'-0"





INCINERATOR BUILDING KEY PLAN

NTS



KEY MAP

NTS

GENERAL NOTES:

1. KEY MAP REFLECTS BUILDINGS AFFECTED BY MODIFICATIONS SHOWN ON SHEETS 920 AND 921. EXACT LOCATION OF MOTOR CONTROL CENTERS AND PANEL BOARDS SHALL BE FIELD DETERMINED BY CONTRACTOR.
2. ADD 5-20A, 1P, 120V CIRCUIT BREAKERS TO EXISTING PANEL LLID-1 IN MCID.
3. SEE SHEET 915 FOR LOCATION OF MCTA.

⚠ AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL-MISCELLANEOUS EXISTING BUILDING IMPROVEMENTS

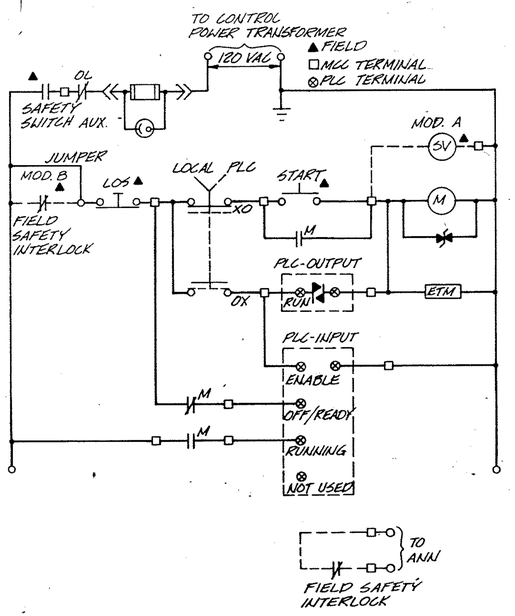
Designed: RJT
Drawn: MLJ
Checked: TDM
Approved: Tom D. Meredith
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

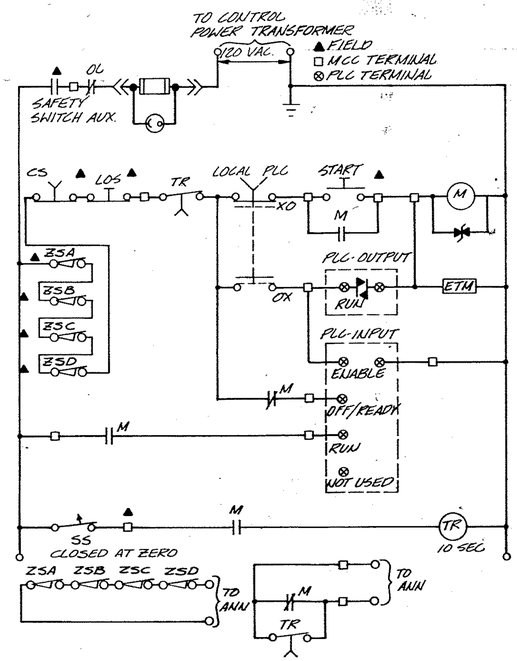
No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON JULY 9, 1982 WILLIAM F. ETTLICH

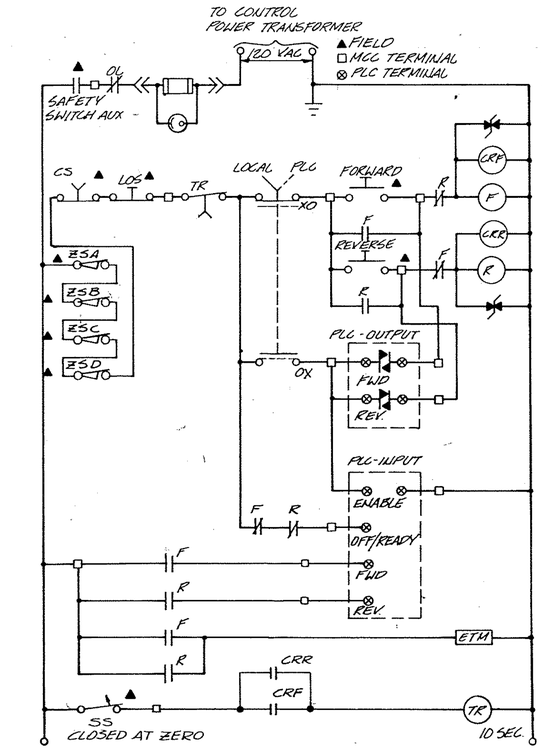
Sheet Number 921



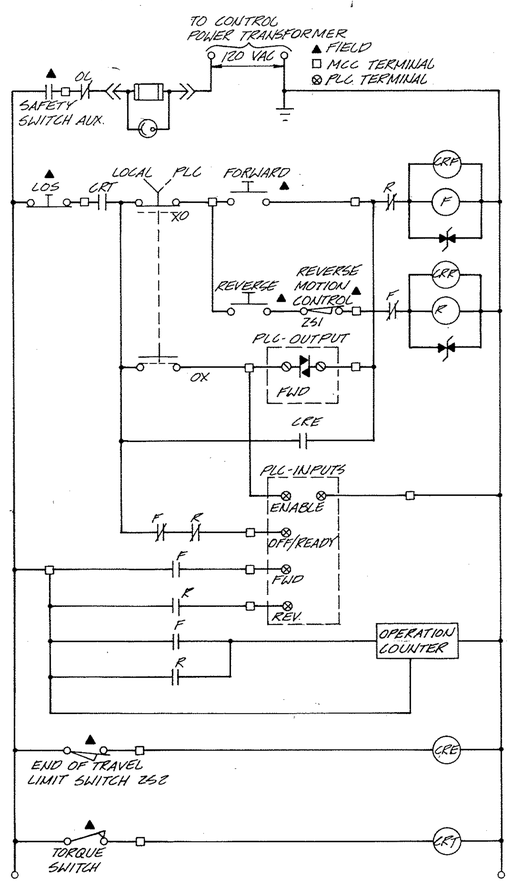
CONTROL DIAGRAM 901



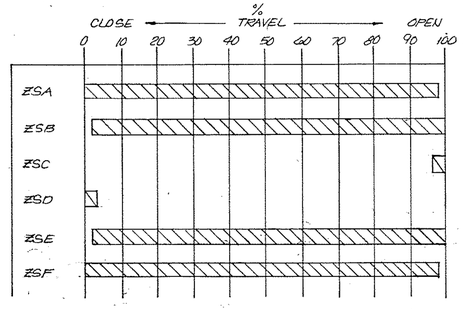
CONTROL DIAGRAM 902
SCREENINGS CONVEYOR



CONTROL DIAGRAM 903
CROSS CONVEYOR

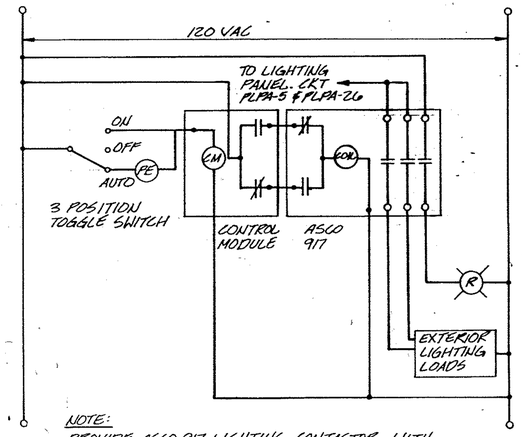


CONTROL DIAGRAM 904
BAR SCREENS



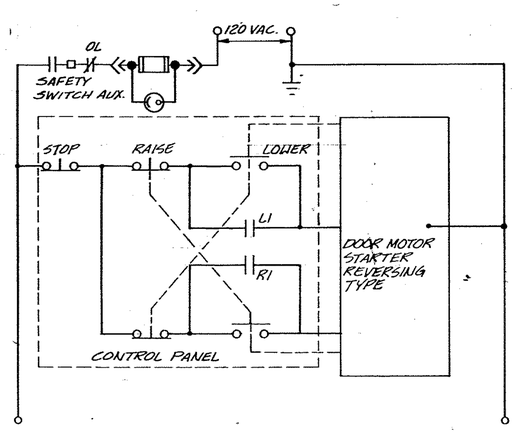
AS RECORDED DRAWINGS △

CONTROL DIAGRAM 905
LIMIT SWITCH DEVELOPMENT

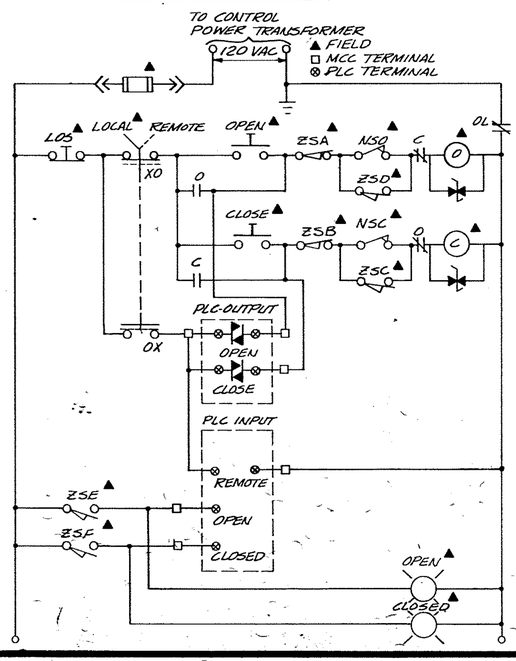


NOTE:
PROVIDE ASCO 917 LIGHTING CONTACTOR WITH ACCESSORY 47 CONTROL MODULE & ACCESSORY 126HA AUXILIARY CONTACTS OR EQUAL. PHOTOELECTRIC SWITCH/CELL SHALL BE TORK 3010 OR EQUAL

CONTROL DIAGRAM 906
OUTSIDE LIGHTING
CONTACTOR SCHEMATIC



CONTROL DIAGRAM 907
ROLL UP DOOR CONTROL WIRING



CONTROL DIAGRAM 905
SLUICE/SLIDE GATE MOTOR OPERATOR

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL-CONTROL SCHEMATICS

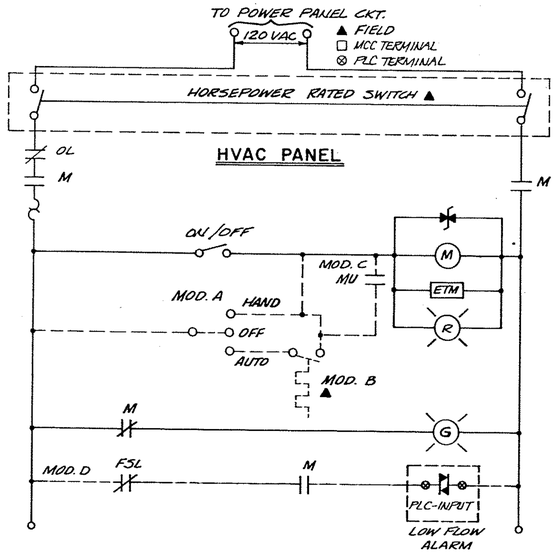
Designed: RJT
Drawn: CWA/MLJ
Checked: TDM
Approved: Jon D. Merritt
Date: MAY, 1989

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No	By	Revision	Date
△	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON JULY 9, 1974 WILLIAM F. ETTLICH

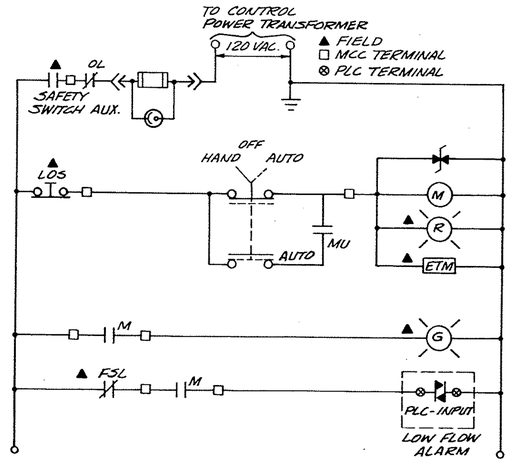
Sheet Number: 922



CONTROL DIAGRAM 908
SINGLE PHASE HVAC MOTOR

TYPICAL EF-303, EF-304, EF-701, AND FC-301
ACC-301 MODIFICATION A&B
EF-302 MODIFICATION A, C, D

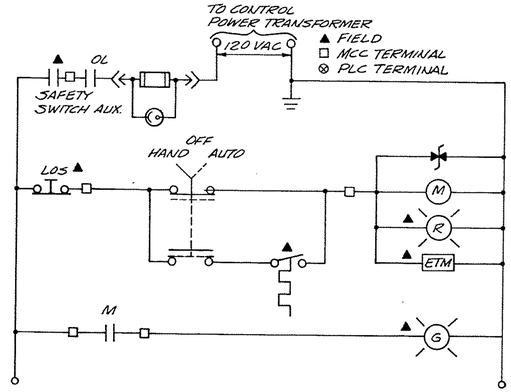
NOTE: • EF-302 SHALL BE INTERLOCKED WITH MU-302.
• ALL COMPONENTS SHALL BE LOCATED IN HVAC PANEL IN ELECTRICAL ROOM OF HEADWORKS BUILDING. WITH EXCEPTION EF-701 WHERE SEPARATE HVAC PANEL SHALL BE SUPPLIED AND FURNISHED WITH COMPONENTS LOCALLY.



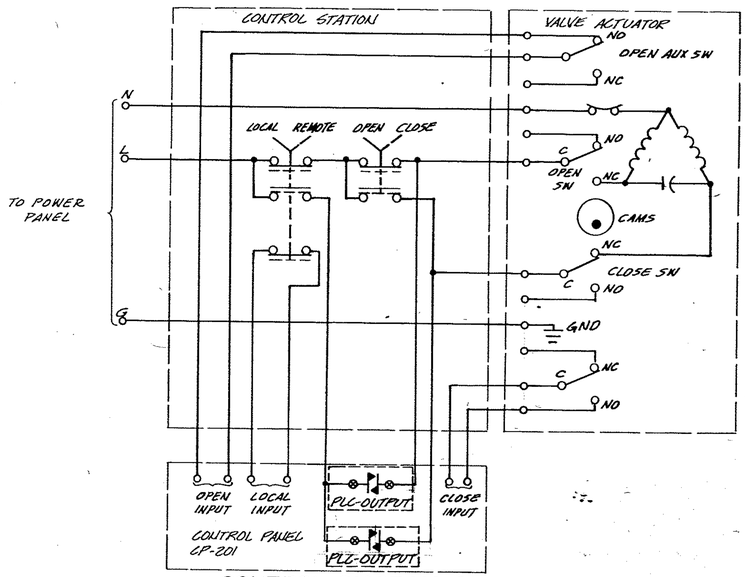
CONTROL DIAGRAM 909
EXHAUST FAN MOTOR

TYPICAL EF-301 AND EF-401

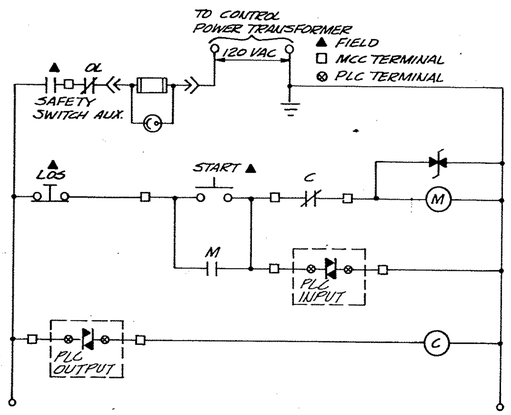
NOTE: EF-301 INTERLOCKED WITH MU-301
EF-401 INTERLOCKED WITH MU-401
FSL: FLOW SWITCH



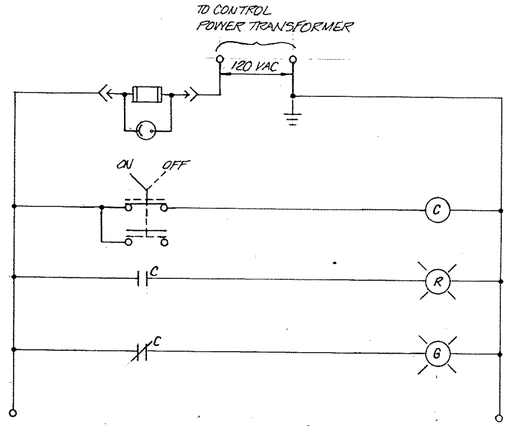
CONTROL DIAGRAM 910



CONTROL DIAGRAM 911
BALL VALVE ACTUATOR



CONTROL DIAGRAM 912
NPW BOOSTER PUMP



CONTROL DIAGRAM 913
CAPACITOR POWER FACTOR CORRECTION

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL-CONTROL SCHEMATICS

Designed RJT
Drawn MLJ
Checked TDM
Approved Tom D. Monnich
Date MAY, 1989

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No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4804 MAY 9, 1989 WILLIAM F. ETTER

Sheet Number 923

△1 AS RECORDED DRAWINGS

SR 904

PANEL SCHEDULE

PANEL NO.: PHPA | ENTRANCE: TOP | MOUNTING: SURFACE
SERVICE: 480 VOLTS 3 PHASE 3 WIRE | SERVICE ENTRANCE LABEL: NONE
MAIN DEVICE: 100 AMP M.L.O. NOTE: MAIN BUS BRACED FOR 42,000 AMP SYMETRICAL
FEEDER SOURCE: MCPA | FEEDER SIZE: 3-#8AWG • 1-#8AWG GND

CKT. NO.	CIRCUIT IDENTIFICATION	C. B. AMPS	WATTS PER PHASE A	B	C	C. B. AMPS	CIRCUIT IDENTIFICATION	CKT. NO.
1			942.2/942.2					2
3	EMO-203	20		942.2/942.2		20	EMO-204	4
5					942.2/942.2			6
7			942.2/942.2					8
9	EMO-205	20		942.2/942.2		20	EMO-206	10
11					942.2/942.2			12
13			942.2/942.2					14
15	KGV-202	20		942.2/942.2		20	EMO-207	16
17					942.2/942.2			18
19			942.2/942.2					20
21	CV-102	20		942.2/942.2		20	CV-103	22
23					942.2/942.2			24
25								26
27	SPARE	20				20	SPARE	28
29								30
31	SPACE						SPACE	32
33	SPACE						SPACE	34
35	SPACE						SPACE	36
37	SPACE						SPACE	38
39	SPACE						SPACE	40
41	SPACE						SPACE	42
TOTAL WATTS/PHASE:			7537.6	7537.6	7537.6			

PANEL SCHEDULE

PANEL NO.: PLPA | ENTRANCE: TOP | MOUNTING: SURFACE
SERVICE: 120/208Y VOLTS 3 PHASE 4 WIRE 100% NEUTRAL | SERVICE ENTRANCE LABEL: NONE
MAIN DEVICE: 225 AMP CIRCUIT BREAKER 3 POLE 42,000 AIC INTERRUPTING RATING
FEEDER SOURCE: MCC-302 | FEEDER SIZE: 4-#350MCM 1-2/0 GND

CKT. NO.	CIRCUIT IDENTIFICATION	C. B. AMPS	WATTS PER PHASE A	B	C	C. B. AMPS	CIRCUIT IDENTIFICATION	CKT. NO.
1	GRIT STORAGE ROOM PIPE CHASE	20	450/160			20	STORAGE ROOM LIGHTS	2
3	STAIRWELL EMERG LTS	20		450/160		20	RESTROOM LIGHTS	4
5	EXTERIOR WALL LIGHTS UPPER LEVEL	20			450/160	20	FAN ROOM LIGHTS	6
7	CORRIDOR 304 LIGHTS	20	160/480			20	ELECTRICAL ROOM LIGHTS	8
9	EXIT LTS-FAN & MECH. RM	20		160/480		20	PUMP ROOM LIGHTS	10
11	SPARE	20			160/480	20	EMERGENCY LIGHTS	12
13	STAIRWELL S-1 LIGHTS	20	320/240			20	SPARE	14
15	SPARE	20		320/240		20	BLOWER ROOM LIGHTS	16
17	MECHANICAL ROOM LIGHTS	20			320/240	20	EXIT LIGHTS LOWER & UPPER LEVEL	18
19	GRIT STORAGE ROOM LIGHTS	20	900/480			20	SPARE	20
21	SCREEN ROOM LIGHTS	20		1500		20	SPARE	22
23	OUTSIDE YARD LIGHTS	20			500/600	20	SCREEN ROOM LIGHTS	24
25	SPARE	20	120			20	SPARE	26
27	PIPE HEAT TRACE	20		1,000		20	SPARE	28
29	SPARE	20			400/350	20	EXTERIOR WALL LIGHTS LOWER LEVEL	30
31	SPARE					20	SPARE	32
33	WH-301	100	18,000			20	SPARE	34
35		20						36
37	SPARE	20		18,000		100	WH-302	38
39						20	SPARE	40
41	WH-401	100			18,000	20	SPARE	42
TOTAL WATTS/PHASE:			21,310.0	22,310.0	21,660.0			

PANEL SCHEDULE

PANEL NO.: IP-301 | ENTRANCE: MCC | MOUNTING: MOTOR CONTROL CENTER
SERVICE: 120/240 VOLTS 1 PHASE 3 WIRE 100% NEUTRAL | SERVICE ENTRANCE LABEL: NONE
MAIN DEVICE: 100 AMP M.L.O. 2 POLE 22,000 AIC INTERRUPTING RATING
FEEDER SOURCE: MCC-301 | FEEDER SIZE: BY MCC MANUFACTURER

CKT. NO.	CIRCUIT IDENTIFICATION	C. B. AMPS	WATTS PER PHASE A	B	C. B. AMPS	CIRCUIT IDENTIFICATION	CKT. NO.
1	MAIN CONTROL PANEL CP-301	30			15	SPARE BUBBLER PANEL	2
3	FUTURE CRISP TERMINAL	15			15	H2S & EXPLOSIVE MONITORING PANEL	4
5	~~LCS-420~~ SPARE	15			15	LCS-410	6
7	BLOWER, B-361, CP-361 ALARM PANEL	15			15	BLOWER, B-362, CP-362, ALARM PANEL	8
9	ODOR CONTROL PANEL, CP-351	15			15	FIT-121	10
11	SCRN CONV, ZERO SPD SW, SSL-3201	15			15	CROSS CONV, ZERO SPD SW, SSL-3202	12
13	NaOCL TANK, LSL-3255	15			15	IRRIGATION PANEL	14
15	~~SPARE~~ HEADWORKS FIRE ALARM PANEL	15			15	~~SPARE~~ PRIMARY SLUDGE STATION FIRE ALARM PANEL	16
17	~~SPARE~~ FIT 3161	15			15	~~SPARE~~ FIT 3162	18
19	~~SPARE~~ FSC 3221,3222 (2)	15			15	~~SPARE~~ FSC 3223,3224 (2)	20
21	SPARE	15			15	SPARE	22
23	SPARE	15			15	SPARE	24
25	SPACE					SPACE	26
27	SPACE					SPACE	28
29	SPACE					SPACE	30
31							32
33							34
35							36
37							38
39							40
41							42

HEADWORKS SCHEDULE

(2)

EQUIPMENT AND MOTOR CONTROL CENTER LOCATIONS - TABLE 924

MCC or Equip Designation	Location in Building	Bldg. Floor Elevation	Connection to Other Equip. Shall be: Duct Tunnels	Duct Tray Cable	Buried Duct Exist	Buried Duct New	MCC or Equipment	Comments on Routing
MCPA & MCPB	Raw Sewage/ Pump Station	130	---	---	---	---	---	---
MCIA	W Wall I UB	143	---	---	---	---	---	---
MCIB	W Wall I UB	143	---	---	---	---	---	---
MCIC	SE COR I UB	143	---	---	---	---	---	---
MCID-1	SE COR I UB	143	---	---	---	---	---	---
MCID-2	SE COR I SF	176	---	---	---	---	---	---
MCIE	SE COR I UB	143	---	---	---	---	---	---
MCIF	SE COR I UB	143	---	---	---	---	---	---
MCIG	SE COR I UB	143	---	---	---	---	---	---
MCTA	Basement C	133	---	---	---	---	---	---
MCTB	Basement C	133	---	---	---	---	---	---
MCTC	Basement C	133	---	---	---	---	---	---
MCTD	Basement C	133	---	---	---	---	---	---
MCTE	Basement C	133	---	---	---	---	---	---
MCTF	Basement C	133	---	---	---	---	---	---
MCOA	O #1	131	X	---	---	X	PLC 1	EMH-8 to ST
MCOB	O #2	147	---	---	---	X	MCOA	EMH-6 to 8
USJA	CT	133	---	---	---	---	---	---
USJB	CT	133	---	---	---	---	---	---
USJC	CT	133	---	---	---	---	---	---
LLOA	O #1	131	---	---	---	X	MCOB	---
LLOB	O #2	143	---	---	---	X	MCOA	---
PLPA	H	159	---	---	---	---	---	---
PPA	H	159	---	---	---	---	---	---
PLPB	PSP	154	---	---	---	---	---	---
PLC 1	NE C	159	X	X	---	---	PLC 2	ST via LB
PLC 2	Central I UB	143	---	---	---	---	---	---
PLC 3	H	159	X	---	---	X	PLC 1	New Duct Bank
CP-301	H	159	X	---	---	X	PLC 1	New Duct Bank
CP-302	H	159	X	---	---	X	PLC 1	New Duct Bank
CP-401	PSP	154	---	---	---	X	PLC 3	New Duct Bank
NPW-601	Filter Tunnel	133	X	X	---	---	MCT	Filter Tunnel
PSP-401 & PSP-402	Screen PC 1 & PC 2	130	X	X	---	---	MCTE	Liquids Tunnel
B-701	W COR I SF	176	---	---	---	---	MCID-2	Conduit
CP-701	SE COR I MF	158	---	---	---	---	IOP-701	Conduit
IOP-701	W I UB	143	X	X	---	---	PLC 1	ST & Conduit
CD-501 & CD-502	Secondary Clarifiers	159	X	X	---	---	MCTE	Liquids Tunnel

FLOOR ELEVATION

Designation	
Solids Tunnel Between C & I	130
Liquids Tunnel Between PSP401 & C	133
Filter Tunnel Between NPW401 & C	133
Incinerator Lower Basement	120
Incinerator Upper Basement	143
Incinerator Main Floor	154
Incinerator Second Floor	176

LEGEND

C	:	Control Bldg.
COR	:	Corner
H	:	Headworks
I	:	Incineration Bldg
LB	:	Lower Basement
MF	:	Main Floor
NE	:	Northeast
PC	:	Primary Clarifier
O	:	Oil Pump Bldg
PSP	:	Primary Sludge Pumping Station
RSPS	:	Raw Sewage Pumping Station
SE	:	Southeast
SF	:	Second Floor
ST	:	Sludge Tunnel
T	:	Tunnel
UB	:	Upper Basement
W	:	West

PANEL SCHEDULE

PANEL NO.: PHPB | ENTRANCE: TOP | MOUNTING: SURFACE
SERVICE: 277/480Y VOLTS 3 PHASE 4 WIRE 100% NEUTRAL | SERVICE ENTRANCE LABEL: NONE
MAIN DEVICE: 25 AMP CIRCUIT BREAKER 3 POLE 22,000 AIC INTERRUPTING RATING
FEEDER SOURCE: MCPB | FEEDER SIZE: 4-#8AWG 1-#8AWG GND

CKT. NO.	CIRCUIT IDENTIFICATION	C. B. AMPS	WATTS PER PHASE A	B	C	C. B. AMPS	CIRCUIT IDENTIFICATION	CKT. NO.
1			942.2/942.2					2
3	EMO-201	20		942.2/942.2		20	EMO-202	4
5					942.2/942.2			6
7			942.2/942.2					8
9	KGV-201	20		942.2/942.2		20	EMO-208	10
11					942.2/942.2			12
13			942.2/942.2					14
15	EMO-209	20		942.2/942.2		20	EMO-210	16
17					942.2/942.2			18
19			942.2					20
21	CV-101	20		942.2		20	SPARE	22
23					942.2			24
25	SPACE						SPACE	26
27	SPACE						SPACE	28
29	SPACE						SPACE	30
31	SPACE						SPACE	32
33	SPACE						SPACE	34
35	SPACE						SPACE	36
37								38
39								40
41								42
TOTAL WATTS/PHASE:			6595.4	6595.4	6595.4			

PANEL SCHEDULE

PANEL NO.: PPA | ENTRANCE: TOP | MOUNTING: SURFACE
SERVICE: 120/208Y VOLTS 3 PHASE 4 WIRE 100% NEUTRAL | SERVICE ENTRANCE LABEL: NONE
MAIN DEVICE: 225 AMP CIRCUIT BREAKER 3 POLE 42,000 AIC INTERRUPTING RATING
FEEDER SOURCE: MCC-302 | FEEDER SIZE: 4-#350MCM 1-2/0 GND

CKT. NO.	CIRCUIT IDENTIFICATION	C. B. AMPS	WATTS PER PHASE A	B	C	C. B. AMPS	CIRCUIT IDENTIFICATION	CKT. NO.
1	GRIT STORAGE ROOM RECEPTACLE	20	360/360			20	ROOF RECEPTACLES	2
3	RESTROOM RECEPTACLE	20		360/540		20	EF-303 SEE NOTE 1	4
5	BLOWER ROOM RECEPTACLES	20			360/540	20	EF-304 SEE NOTE 1	6
7	PUMP ROOM RECEPTACLES	20	1260			20	SPARE	8
9	SCREEN ROOM RECEPTACLES	20		720/540		20	FAN ROOM RECEPTACLE	10
11	OUTSIDE YARD RECEPTACLES	20			900/100	20	CV-351	12
13	WS-357	20	250/875			20	CV-358	14
15	CS-301 SAMPLE STATION - PH	20		250		20	~~SPARE~~ FC-302	16
17	CV-352	20			100/875	20	CV-301	18
19	CV-302	20	875/180			15	CV-311 & CV-321	20
21	CV-312 & CV-322	15		180/160		15	CV-313 & CV-323	22
23	CV-314 & CV-324	15			180	20	~~SPARE~~ ACC-302 CONTROL CKT	24
25	~~SPARE~~ ACC-301 CONTROL CKT	20				20	EF-302, FSL SEE NOTE 2	26
27	~~SPARE~~ ACC-302	20		540		20	MECHANICAL ROOM RECEPTACLES	28
29	~~SPARE~~ ACC-302	20			180	20	STORAGE ROOM RECEPTACLES	30
31	~~CV-361~~ ACC-302	20	100/100			20	CV-362	32
33	CV-361	20		875/200		20	WC-301 RECEPTACLE	34
35	CV-325	15			90/90	15	CV-326	36
37			4611/864			20	FC-301 SEE NOTE 1	38
39	ACC-301 SEE NOTE 1	30		4611/120		20	CV-104	40
41					4611/120	20	CV-105	42
TOTAL WATTS/PHASE:			9,835.0	9,116.0	8,146.0			

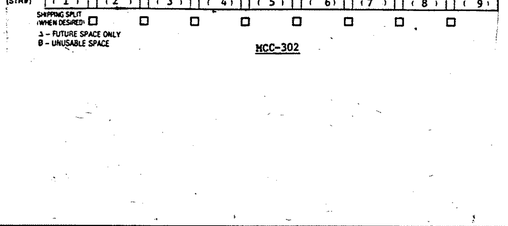
RAW SEWAGE PUMPING STATION SCHEDULES

MCC-302 CONTROL SCHEDULE

UNIT NO.	STARTER CLASS OR DESCRIPTION	SIZE	HMCP FEEDER BREAKER OR SWITCH AMPS	H.P.	EXTRA INTLKS. NO	NC	CONTROL DEVICES: PUSHBUTTONS SELECTOR SWITCHES (Start Stop, Fwd Rev Stop, Fwd Rev Jog, Hand Off Auto, On Off, Local PLC, Local Off Remote, Run Fault Ind., Auto Rev Start, Push To Test, Transformer Fuse, Blown Fuse Ind., On Overload Ind., Under Voltage Ind.) HOA LIGHTS (Run Light, Fault Light) METERS (Ammeter)	120 Volt Fuse Voltage CPT	55556 Surge Suppressor	Wiring Diagram	NAMEPLATE IDENTIFICATIONS
1C	A205	3	75		2	2		1	1	913 CAP-302
1F	A206	4	150	60	2	2		1	1	1 901 R-362
1H	Dual Bkr		40/150							PLPB/PIPA & PPA
1K	A206	2	50	20	2	2		1	1	1 901 GP-305
1M	MLO		600							TIE
2B	A206	2	50	20				1	1	1 901 GP-306
2D	A206	2	50	25	2	2		1	1	1 901 Spare
2F	A206	2	50	25	2	2		1	1	1 901 Spare
2H	A206	1	7	2	2	2		1	1	1 901 DP-403
2K	A206	1	15	5	2	2		1	1	1 901 OCF-403
2M	A206	1	15	5	2	2		1	1	1 901 OCF-404
3B	A206	1	15	7½	2	2		1	1	1 901AB PSP-404
3D	Space									
3F	A206	1	15	7½	2	2		1	1	1 901AB PSP-405
3H	A206	1	30	10	2	2		1	1	1 901 Spare
3K	A206	1	30	10	2	2		1	1	1 901 Spare
3M	Dual Bkr		20/20							MU-401/Spare
4B	Space									
4D	Dual Bkr		30/20							H-301/MV-302
4F	Dual Bkr		20/20							SG-313/SG-314
4H	A206	1	7	2	2	2		1	1	1 901 GC-320
4K	A206	1	7	2	2	2		1	1	1 901 PR-303
4M	A206	1	7	2	2	2		1	1	1 901 PR-304

HEADWORKS SCHEDULES

UNIT NO.	STARTER CLASS OR DESCRIPTION	SIZE	HMCP FEEDER BREAKER OR SWITCH AMPS	H.P.	EXTRA INTLKS. NO	NC	CONTROL DEVICES: PUSHBUTTONS SELECTOR SWITCHES (Start Stop, Fwd Rev Stop, Fwd Rev Jog, Hand Off Auto, On Off, Local PLC, Fault Off Reset, Green Energized, Red Run Fwd Light, Red Run Rev Light, Amber Light, Push To Test, Transformer Fuse, Blown Fuse Ind., Ammeter, Elapsed Time) HOA LIGHTS (Run Light, Fault Light) METERS (Ammeter)	120 Volt Fuse Voltage CPT	55556 Surge Suppressor	Wiring Diagram	NAMEPLATE IDENTIFICATIONS
5B	Dual Bkr		20/20							SL-302/SG-323
5D	Dual Bkr		20/20							SG-324/SG-331
5F	Dual Bkr		20/30							SG-342/H-401
5H	Dual Bkr		20/30							Spare
5K	Dual Bkr		20/20							SG-401/SL-402
5M	Dual Bkr		20/20							Spare
6C	A206	1	7	3			1	1	1 902	C-301
6F	A216	1	3	1			1	1	2 903	C-302
6J	A216	1	7	1½			1	1	2 904	S-303
6M	A216	1	7	3			1	1	2 904	S-304
7B	A206	1	15	7½	2	2		1	1 1 912	NPW-301
7D	TO Data Plus II									
7F	A206	1	3	3/4	2	2	1	1	1 909	EF-401
7H	A206	1	7	1½	2	2	1	1	1 901	CD-403
7K	A206	2	50	20	2	2	1	1	1 901	GP-304
7M	A206	1	7	1½	2	2		1	1 CP401	DP-402
8B	Pull Space									
8C	Incoming EHCCCA3800									Main
8K	A216	1	30	10	2	2	1	1	2 903	Spare
8M	Space									
9B	Space									
9D	Space									
9F	Space									
9J	Space									
9M	Space									



EQUIPMENT MOTOR CONTROL SCHEDULE

GENERAL NOTES:

1. SEE CONTROL DIAGRAM 908, SHEET 923.
2. SEE CONTROL DIAGRAM 909, SHEET 923.

(3) AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL-HEADWORKS AND RAW SEWAGE PUMPING STATION PANEL SCHEDULES

Designed: RJT
Drawn: SDS/CWA
Checked: TDM
Approved: Tom D. Merrick
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	RJT	ADDENDUM NO. 2	6-30-89
3	AFA	AS RECORDED DRAWING	11-14-92

REGISTERED PROFESSIONAL ENGINEER 4694 OREGON JULY 9, 1982 WILLIAM F. ETTLIN

Sheet Number: 924

SR 904

LIGHTING FIXTURE SCHEDULE

FIXT. NO.	MANUFACTURER TYPE	CATALOG NUMBER	LAMPS NO. LAMPS/WATTS EA. FLOUR.	H.I.D.	MOUNTING WALL	PEND.	CEIL.	POLE	RECESS	HEIGHT
1	GUTH LIGHTING PLASCOLUME	ACS-6762-120-EG-ESB-P (SUPPLY DUAL BALLASTS)	2/40W			X				8'-0"
2	COLUMBIA LIGHTING	4PS2G-20-142-ESB-120	2/40W						X	8'-0"
3	DAY-BRITE CFI-10	40311W-4-ESB-(2)7124	3/40W			X				9'-6"
4	HOLOPHANE PETROLUME	PETM-15BHP-12-SYPD-PETMSY	1/150W			X				17'-0"
5	GUTH LIGHTING HPS GLOBE	WO-50-1-FF-TP		1/50W	X					7'-0"
6	COLUMBIA LIGHTING	4PS2G-52-142-ESB-120	2/40W						X	8'-0"
7	COLUMBIA LIGHTING	P4-243G-43363-3-ESB-120	3/40W						X	8'-0"
8	DEVINE	PII3-100HPS-120V BOA-LX1		1/100W				X		8'-0"
9	APPLETON VRS	VRS-240-118-ESB	2/40W			X				6'-0"
10	GUTH LIGHTING HPS	B17-625/120		1/100W			X			12'-6"
11	LIGHTOLIER	LUMIQUAD 6581	1/13W		X					8'-0"
12	CHLORIDE	IXN-30-HZ12-2		2/12W	X					
13	CHLORIDE	D2MF125-IQ2-TD			X					
14	CHLORIDE	NTMF-50-1K-2		2/25W	X					
15	CHLORIDE	NAC-RW	2/15W		X					
16	CHLORIDE	RW-2XPE12 EXL-2XPE12		1/12W		X				
17	DEVINE	PII6-175MH-277V BOA-PC6-		1/175W				X		14'-0"
18	HOLOPHANE	PARK-100HP-MT-HA-BZ-AS-PARKF-1-PARKWS-BZ POLE: CSZSQ-10-J-1A		1/100W				X		10'-0"
19	DEVINE	PARK-070HP-27-CE-AS W/EXTERNAL SHIELD PARK SD SUITABLE FOR VERTICAL WALL MOUNT		1/70W	X					10'-0"
20	APPLETON	VPOBW100 W/VPGL-2REPL		100W	X					6"-0"

1

TRANSFORMER SCHEDULE

TAG #	TYPE	EQUIPMENT SERVED	LOCATION	KVA RATING	ø	PRIMARY VOLTS	SECONDARY VOLTS	O.C. PROTECTION PRIMARY	O.C. PROTECTION SECONDARY
XFMR-2B	ISOLATION	VFD-2B	RSPS	550	3	480	480Y	800/3	VFD
XFMR-3B	ISOLATION	VFD-3B	RSPS	550	3	480	480Y	800/3	VFD
XFMR-PHPB	GEN. PURPOSE	POWER PANEL PHPB	RSPS	15	3	480	277/480Y	40/3	25/3
XFMR-PA	GEN. PURPOSE	PANELS: PPA & PLPA	HER	75	3	480	120/208Y	150/3	250/3
XFMR-PLPB	ENCAPSULATED NEMA 4X	PLPB	PSPS	15	3	480	120/208Y	40/3	50/3
XFMR-2A	ISOLATION	VFD-2A	RSPS	440	3	480	480Y	800/3	VFD

2

RSPS: RAW SEWAGE PUMP STATION
HER: HEADWORKS ELECTRICAL ROOM
PSPS: PRIMARY SLUDGE PUMP STATION

MISCELLANEOUS SCHEDULES

PANEL SCHEDULE

PANEL NO.: PLPB — ENTRANCE: TOP — MOUNTING: SURFACE
SERVICE: 120/208Y VOLTS 3 PHASE 4 WIRE 100% NEUTRAL — SERVICE ENTRANCE LABEL: NONE
MAIN DEVICE: 50 AMP CIRCUIT BREAKER 3 POLE 22,000 AIC INTERRUPTING RATING
FEEDER SOURCE: MCC-302 — FEEDER SIZE: 4-#6AWG 1-#8AWG GND

CKT. NO.	CIRCUIT IDENTIFICATION	C. B. AMPS	WATTS PER PHASE A	B	C	C. B. AMPS	CIRCUIT IDENTIFICATION	CKT. NO.
1	EFFLUENT SPLITTER BOX REC., LIGHTS	20	100/250			20	CS-401	2
3	SPARE	20		50/100		20	INFLUENT SPLITTER BOX LIGHT	4
5	FSL's	20			180	20	EFFLUENT SPLITTER BOX RECEP.	6
7	CV-401	20	942/50			20	LCS-410 & LCS-431	8
9	INFLUENT SPLIT BOX	20		942		20	SPARE PH METER	10
11	SPARE	20				20	SPARE PH METER	12
13	SECONDARY LIGHTING PSPS	20	195				SPACE	14
15	SPACE			900		20	RECEPTACLES	16
17	SPACE				1,900	20	MAIN LIGHT PSPS	18
19	RECEPTACLES	20	900				SPACE	20
21	SPARE	20		180		20	SPARE	22
23	CLARIFIER LIGHT & RECEPT.	20	280/250			20	SUMP PUMP CONTROL PANEL	24
25	CLARIFIER LIGHTS	20		200		20	LCS-431	26
27	SPARE	20				20	SPARE	28
29	PSPS STAIR WAY LIGHTS	20			80	20	SPARE	30
31	SPARE	20				20	MAIN LTS PSPS	32
33	SPARE	20				20	SPARE	34
35	SPACE						SPACE	36
37	SPACE						SPACE	38
39	SPACE						SPACE	40
41	SPACE						SPACE	42
TOTAL WATTS/PHASE:			2,967.0	2,372.2	2,160.0			

PRIMARY SLUDGE PUMP STATION SCHEDULES

POWER CIRCUITS

NO.	POWER CONDUCTORS	GROUND CONDUCTORS	CND SIZE	NO.	POWER CONDUCTORS	GROUND CONDUCTORS	CND SIZE
1	3#12	1#12	3/4"	20	3#350	1# 2	3"
2	3#10	1#10	3/4"	21	4#350	1# 2	3 1/2"
3	4#10	1#10	3/4"	22	3#500	1# 0	3 1/2"
4	3# 8	1#10	1"	23	4#500	1# 0	4"
5	4# 8	1#10	1"	24	6# 12	1#12	1"
6	3# 6	1# 8	1 1/2"	25	2# 12	1#12	3/4"
7	3# 4	1# 8	1 1/2"	26	5# 12	1#12	1"
8	3# 2	1# 6	1 1/2"	27	2# 10	1#12	3/4"
9	3# 1	1# 6	2"	28	4# 6	1# 8	1 1/2"
10	3#1/0	1# 4	2"	29	3# 12	1#12	3/4"
11	4#1/0	1# 4	2 1/2"	30	2# 6	1# 8	1"
12	3#2/0	1# 4	2 1/2"	31	2-3#2/0	1# 2	2-2 1/2"
13	4#2/0	1# 4	2 1/2"	32	2-3#3/0	1# 2	2-2 1/2"
14	3#3/0	1# 4	2 1/2"	33	4# 1	1# 6	2"
15	4#3/0	1# 4	2 1/2"	34	2# 12 PWR	1#12	1"
16	3#4/0	1# 2	2 1/2"		10# 14 CTL		
17	4#4/0	1# 2	3"	35	2# 12 PWR	1#12	1"
18	3#250	1# 2	3"		4# 14 CTL		
19	4#250	1# 2	3"				

INSTRUMENTATION CABLES (NOTE 7)

NO.	CABLE	CND SIZE	NO.	2 CABLE	CND SIZE
J 1	1#16 TSP	3/4"	J13	8#18 STSP	1"
J 2	2#16 TSP	3/4"	J14	12#18 STSP	1 1/2"
J 3	3#16 TSP	1"	J15	24#18 STSP	2"
J 4	4#16 TSP	1"	J16	36#18 STSP	2"
J 5	5#16 TSP	1"	J17	4#18 STST	1"
J 6	6#16 TSP	1 1/2"	J18	6#18 STST	1 1/2"
J 7	1#16 TST	3/4"	J19	8#18 STST	1 1/2"
J 8	2#16 TST	3/4"	J20	12#18 STST	1 1/2"
J 9	3#16 TST	1"	J21	42#18 STST	2"
J10	4#16 TST	1"	J22	36#18 STST	2 1/2"
J11	4#18 STSP	3/4"	J23	VENDOR CABLE	3/4"
J12	6#18 STSP	1"			

POWER TRAY CABLES

NO.	CABLE	CND SIZE W/O C	CND SIZE W/C
P1	3#12, 1#12 G	3/4"	1 1/2"
P2	2#14, 1#14 G	3/4"	1 1/2"
P3	3# 2, 1# 6 G	2"	
P4	3# 4, 1# 8 G	2"	

NOTE: W/OC—WITHOUT CONTROL WIRES AND W/C—WITH CONTROL WIRES

2

CONDUIT SCHEDULES

CONTROL WIRING

NO.	CONDUCTORS	CND SIZE	NO.	CONDUCTORS	CND SIZE
40	2#14	3/4"	49	12# 14	3/4"
41	3#14	3/4"	50	16# 14	1"
42	4#14	3/4"	51	24# 14	1"
43	5#14	3/4"	52	36# 14	1 1/2"
44	6#14	3/4"	53	42# 14	1 1/2"
45	7#14	3/4"	54	COORDINATE NO. OF WIRES & CONDUIT WITH VENDOR SUPPLIED EQUIPMENT	
46	8#14	3/4"			
47	9#14	3/4"			
48	10#14	3/4"			

UNSHIELDED CONTROL CABLES

NO.	CABLE	CND SIZE	NO.	CABLE	CND SIZE
C 1	2#14 TC	3/4"	C16	36#14 TC	2"
C 2	3#14 TC	3/4"	C17	2#12 TC	3/4"
C 3	4#14 TC	3/4"	C18	3#12 TC	3/4"
C 4	5#14 TC	1"	C19	5#12 TC	1"
C 5	6#14 TC	1"	C20	7#12 TC	1"
C 6	7#14 TC	1"	C21	9#12 TC	1"
C 7	8#14 TC	1"	C22	2#16 TC	3/4"
C 8	9#14 TC	1"	C23	3#16 TC	3/4"
C 9	10#14 TC	1 1/2"	C24	5#16 TC	3/4"
C10	12#14 TC	1 1/2"	C25	7#16 TC	3/4"
C11	14#14 TC	1 1/2"	C26	9#16 TC	1"
C12	16#14 TC	1 1/2"			
C13	20#14 TC	1 1/2"			
C14	24#14 TC	1 1/2"			
C15	30#14 TC	1 1/2"			

SHIELDED CONTROL CABLES

NO.	CABLE	CND SIZE	NO.	CABLE	CND SIZE
S 1	2#16 SHLD	3/4"	S13	12#14 SHLD	1"
S 2	3#16 SHLD	3/4"	S14	19#14 SHLD	1 1/2"
S 3	5#16 SHLD	3/4"	S15	2#12 SHLD	3/4"
S 4	7#16 SHLD	3/4"	S16	3#12 SHLD	3/4"
S 5	9#16 SHLD	3/4"	S17	5#12 SHLD	1"
S 6	12#16 SHLD	1"	S18	7#12 SHLD	1"
S 7	19#16 SHLD	1"	S19	9#12 SHLD	1 1/2"
S 8	2#14 SHLD	3/4"	S20	12#12 SHLD	1 1/2"
S 9	3#14 SHLD	3/4"	S21	19#12 SHLD	1 1/2"
S10	5#14 SHLD	3/4"			
S11	7#14 SHLD	3/4"			
S12	9#14 SHLD	1"			

CONDUIT SCHEDULES

GENERAL NOTES:

1. ROUTE CONTROL CONDUCTORS IN SAME CONDUIT WITH POWER CONDUCTORS OR CABLE WHERE THE POWER CONDUCTORS ARE LESS THAN OR EQUAL TO #8 AWG.
2. MAXIMUM NUMBER OF CONTROL CONDUCTORS OR CABLE POWER CONDUIT IS 10.
3. WHERE CONTROL WIRING MARK APPEARS ALONE, PROVIDE CONDUIT.
4. ANY CIRCUIT NOT IDENTIFIED WITH MARK NUMBER OR DESCRIPTIVE NOTE IS A BRANCH CIRCUIT REQUIRING 2 OR 3#12, 1#12 GND., 3/4" C. 480 V CIRCUITS IDENTIFIED ON ONE-LINE DIAGRAMS.
2 5. UTILIZE THWN/XHHW FOR CIRCUITS WITH POWER CONDUCTORS SIZE NO. 8 OR SMALLER, AND ~~THW WITH EPR INSULATION AND HYPALON JACKET~~ FOR CIRCUITS WITH POWER CONDUCTORS SIZE NO. 6 AND LARGER UNLESS NOTED OTHERWISE. GROUND CONDUCTOR TO HAVE SAME INSULATION CLASS. CONDUIT SIZES BASED ON ABOVE CONDUCTORS.
6. THIS IS A STANDARD SCHEDULE. SOME MARK NUMBERS MAY NOT BE USED.
7. MARK NUMBERS J1-J10 INDICATE ONE OR MORE SINGLE CIRCUIT INSTRUMENTATION CABLES IN ONE CONDUIT. MARK NUMBERS J11-J22 INDICATE ONE MULTIPLE CIRCUIT INSTRUMENTATION CABLE IN ONE CONDUIT."

2

3 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA.

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL-MISCELLANEOUS SCHEDULES

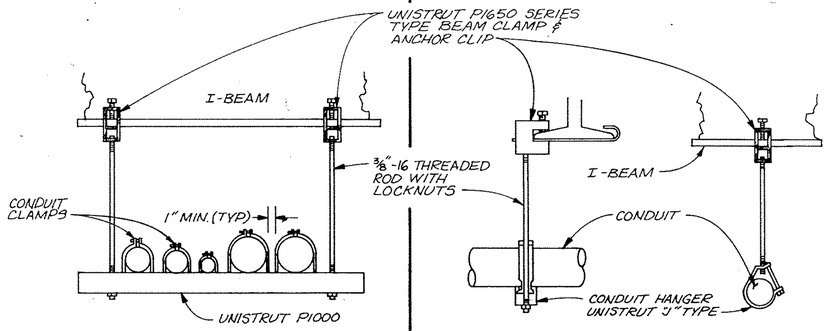
Designed RJT
Drawn SDS/CWA
Checked TDM
Approved Jon D. Monnett
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	TDM	ADDENDUM NO.1	6-27-89
2	TDM	ADDENDUM NO.2	8-30-89
3	MFA	AS RECORDED DRAWING	11-14-92

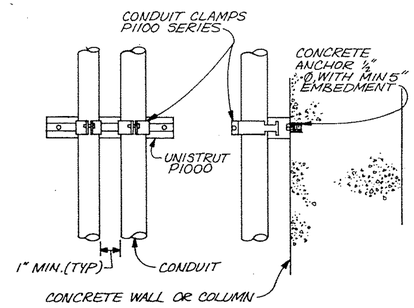
REGISTERED PROFESSIONAL ENGINEER 4694 OREGON JULY 9, 1981 WILLIAM F. ETTLIN

Sheet Number 925

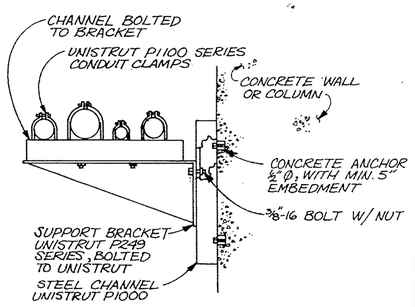


SUPPORT 1
(NTS)

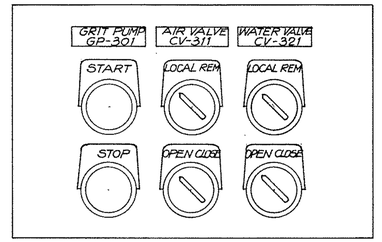
SUPPORT 2
(NTS)



SUPPORT 3
(NTS)

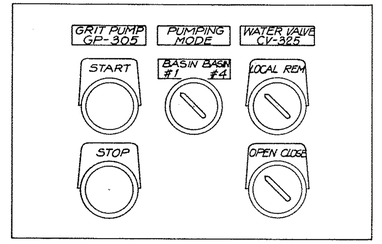


SUPPORT 4
(NTS)



GRIT PUMP, GP-301 SHOWN.
GRIT PUMPS GP-302, GP-303 & GP-304 SIMILAR.

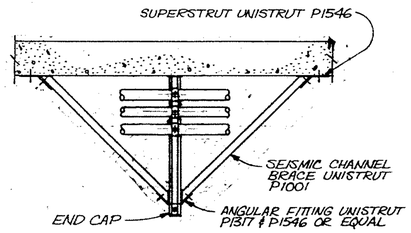
CONTROL PANEL FOR GRIT PUMPS GP-301-GP-304



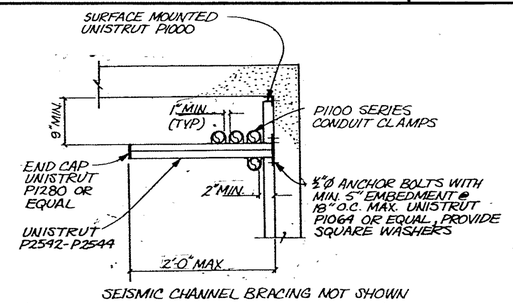
GRIT PUMP GP-305 SHOWN.
GRIT PUMP GP-306 SIMILAR.

CONTROL PANEL FOR GRIT PUMPS GP-305 & GP-306

NOTES: 1. PROVIDE NEMA 4X STAINLESS STEEL SWITCH ENCLOSURE.
2. ATTACH NAMEPLATES WITH STAINLESS STEEL SCREWS.

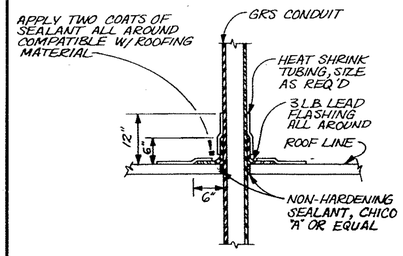


SUPPORT 5
(NTS)

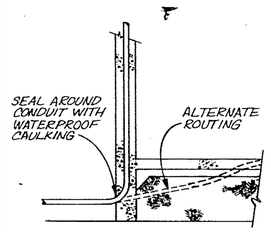


SEISMIC CHANNEL BRACING NOT SHOWN

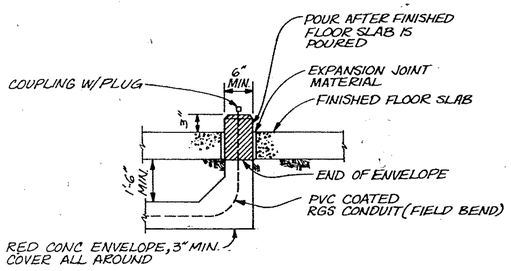
SUPPORT 6
(NTS)



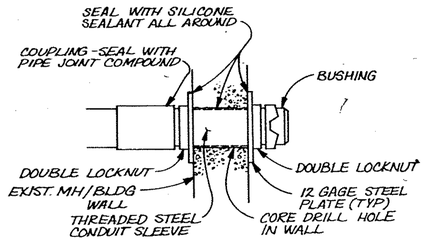
ROOF PENETRATION
(NTS)



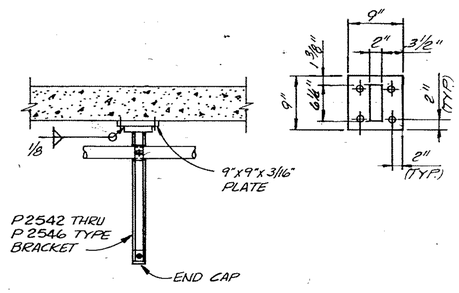
BUILDING ENTRY
(NTS)



CONDUIT STUB UP
(NTS)



BUILDING PENETRATION
(NTS)



SUPPORT 7
(NTS)

GENERAL NOTES:

1. UNLESS NOTED OTHERWISE, LENGTH OF RODS, SIZES OF CLAMPS, AND ANY OTHER MISCELLANEOUS HARDWARE TO COMPLETE CONDUIT SUPPORTS WILL BE DETERMINED BY FIELD CONDITIONS.
2. CONDUIT SUPPORTS TO BE SPACED AT MAXIMUM OF 10'- 0" ON CENTER.
3. HARDWARE SHALL BE HOT DIP GALVANIZED AFTER FABRICATION EXCEPT FITTINGS WHICH MAY BE ZINC PLATED.
4. MAXIMUM UNIFORMLY DISTRIBUTED LOAD (CONDUIT AND FILL) PER UNIT TO BE 1000 LBS. CONTRACTOR TO PROVIDE CALCULATIONS WHEN ANY CONDUIT IS OVER 2" IN SIZE OR IF CONDUIT IS INSTALLED ON TOP AND BOTTOM OF RACK.
5. SEISMIC CHANNEL BRACING REQUIRED AT INTERVALS OF 60' - 0" MAXIMUM.
6. IN LOCATIONS REQUIRING PVC COATED CONDUIT PER SPECIFICATION AND/OR DRAWING, FURNISH AND INSTALL FIBERGLASS STRUTS AND UTILIZE STAINLESS STEEL HARDWARE.

1 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL-TYPICAL DETAILS

Designed: RJT
Drawn: CWA / MLJ
Checked: TDM
Approved: Tom D. Marquitt
Date: MAY, 1989

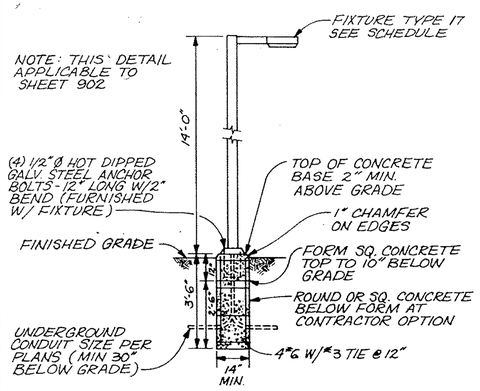
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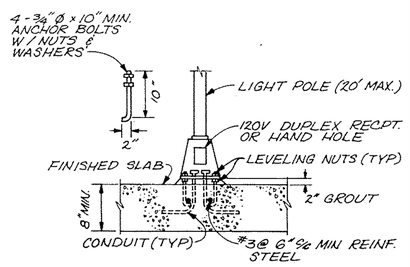
REGISTERED PROFESSIONAL ENGINEER 4894 OREGON WILLIAM F. ETTLICH

Sheet Number: 926

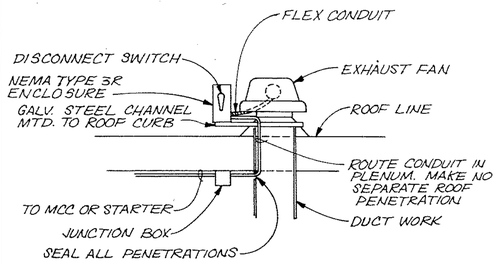
SA 904



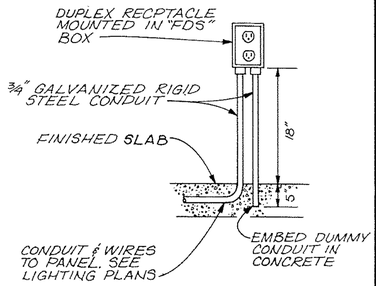
LAMP POST DETAIL
(NTS)



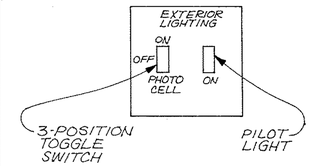
LIGHTING POLE DETAIL
(NTS)



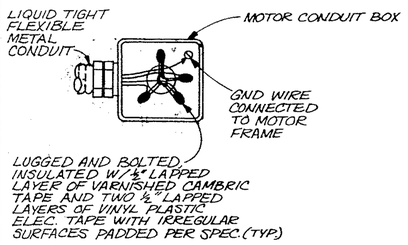
ROOF EXHAUST FAN DETAIL
(NTS)



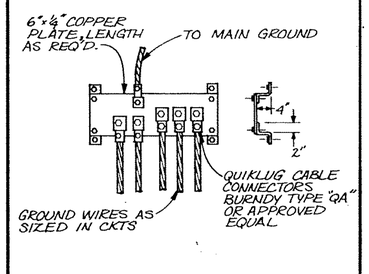
RECEPTACLE DETAIL
(NTS)



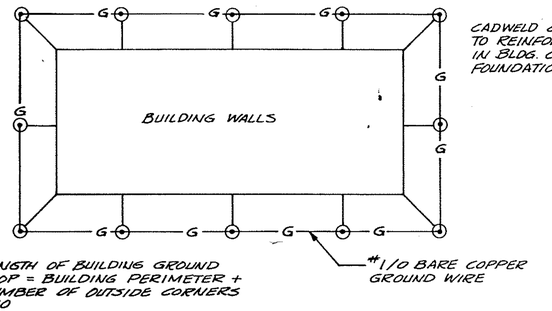
EXTERIOR LIGHTING CONTROL SWITCH WALL PLATE DETAIL
(NTS)



MOTOR MAKE-UP DETAIL
(NTS)



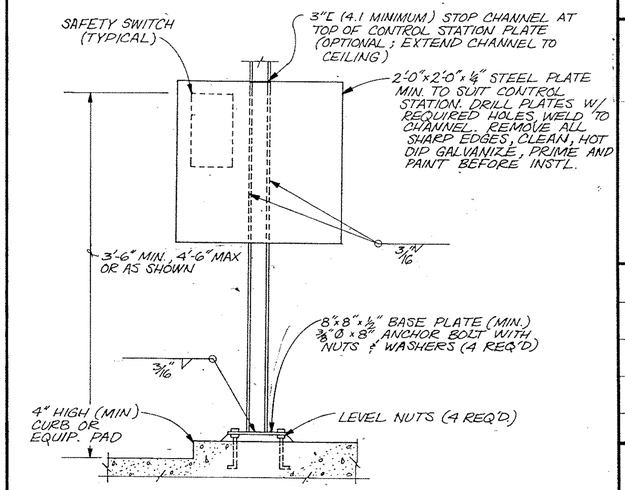
MULTIPLE CONNECTION GROUNDING PLATE DETAIL
(NTS)



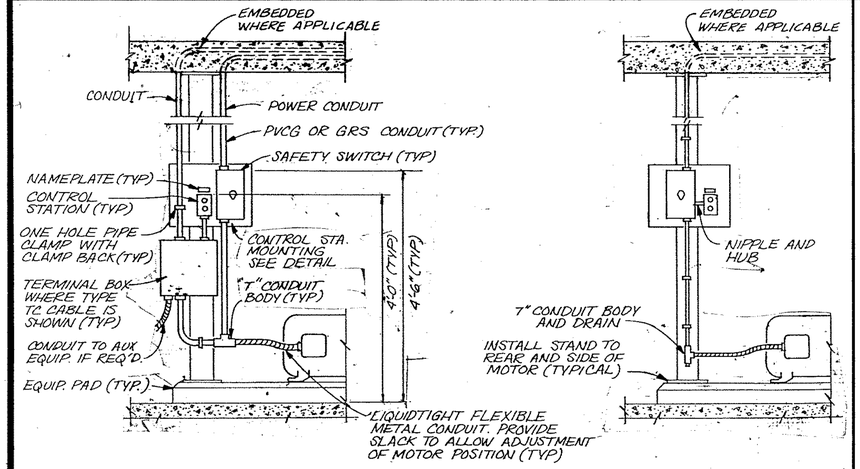
LENGTH OF BUILDING GROUND LOOP = BUILDING PERIMETER + NUMBER OF OUTSIDE CORNERS x 20

RUN STRANDED BARE COPPER GROUND WIRE AROUND PERIMETER OF BUILDING, 30'-0" FROM WALLS, 3'-0" BELOW FINISHED GRADE. DRIVE 3/4" x 10' COPPERWELD GROUND RODS EVERY 30'-0" MAX. EACH OUTSIDE CORNER OF BUILDING SHALL HAVE A CORRESPONDING GROUND ROD. THERMOWELD GROUND CABLE TO GROUND RODS. PROVIDE THERMOWELDED CONNECTION BETWEEN EACH EXPOSED METAL COLUMN AND THE GROUND CABLE. PROVIDE THERMOWELDED CONNECTION BETWEEN METAL ENCLOSURE OF ELECTRICAL PANELS, MOTOR BASES AND THE GROUND CABLE.

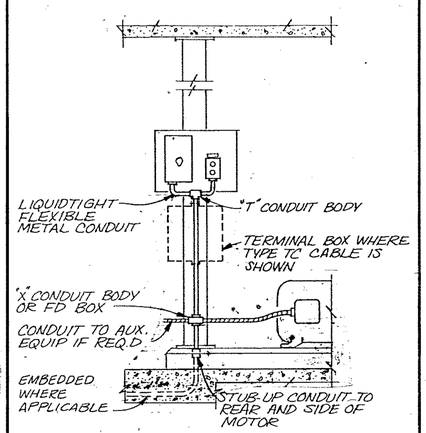
TYPICAL BUILDING GROUND LOOP DETAIL
(NTS)



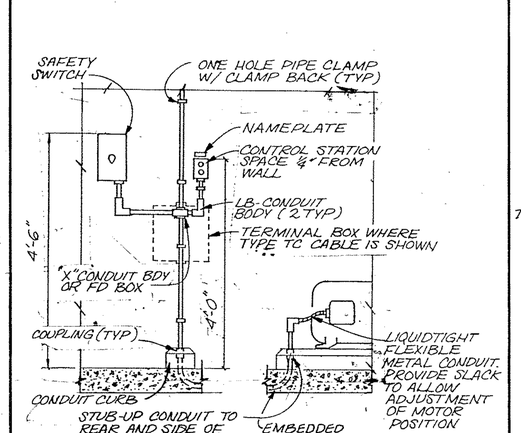
CONTROL STATION MOUNTING STAND DETAIL
(NTS)



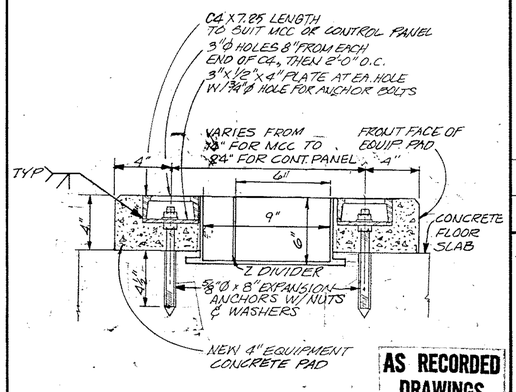
MOTOR FEED FROM OVERHEAD DETAIL
(NTS)



MOTOR FEED FROM BELOW DETAIL
(NTS)



CONTROL STATION MOUNTED ON WALL DETAIL
(NTS)



AS RECORDED DRAWINGS

MCC & CONTROL PANEL MOUNTING DETAIL
(NTS)

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

ELECTRICAL - TYPICAL DETAILS

Designed: RJT
Drawn: CWA, MLJ
Checked: TDM
Approved: Tom D. Merritt
Date: MAY, 1989

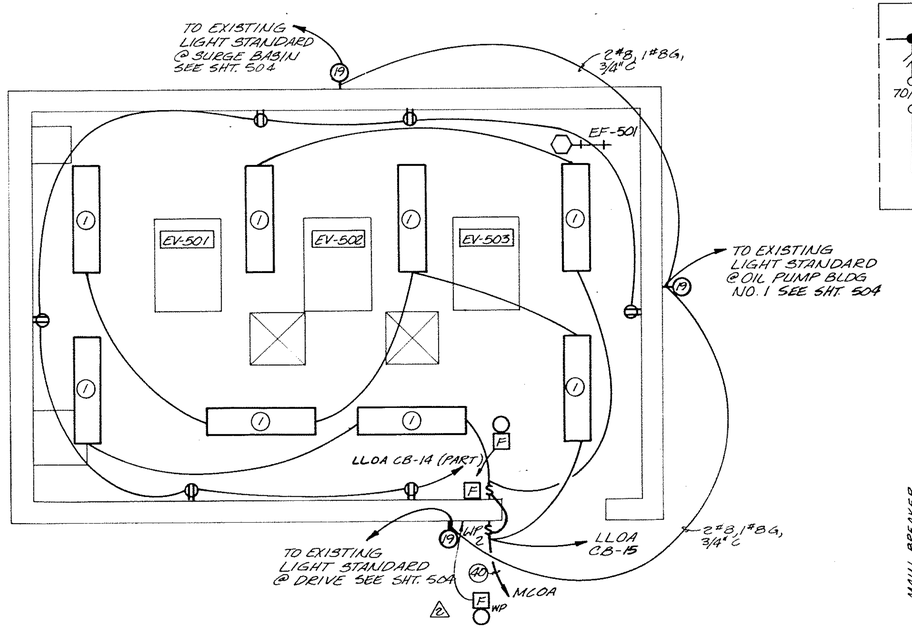
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No	By	Revision	Date
2	TDM	ADDENDUM NO. 2	6-30-89
3	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4842 OREGON JULY 9, 1985 WILLIAM F. ETLICH

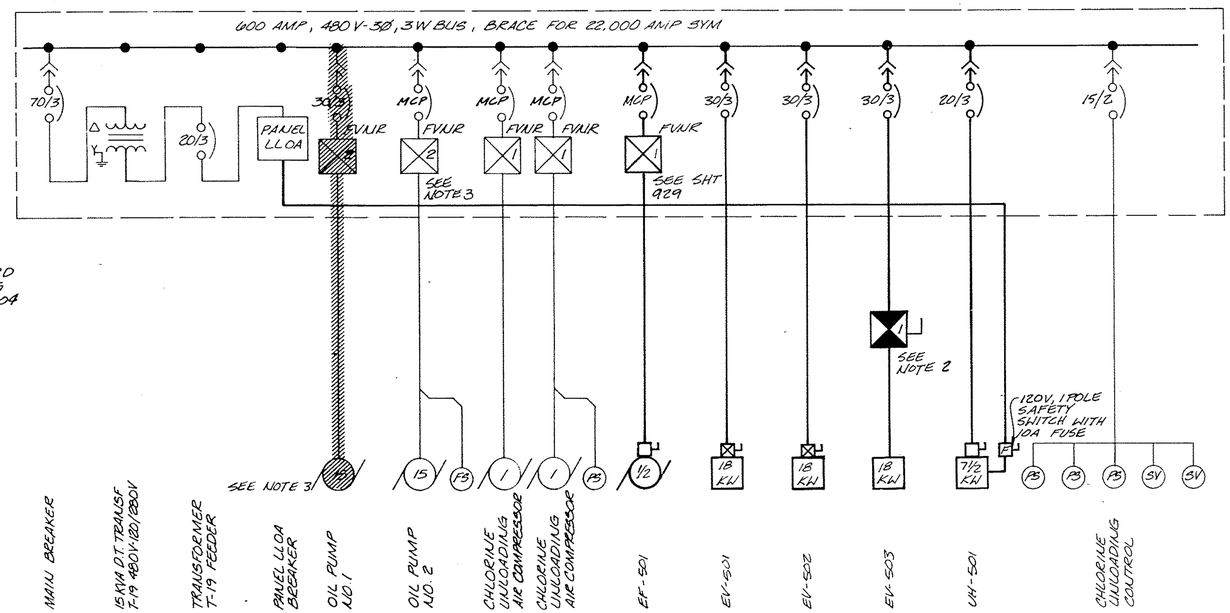
Sheet Number: 927

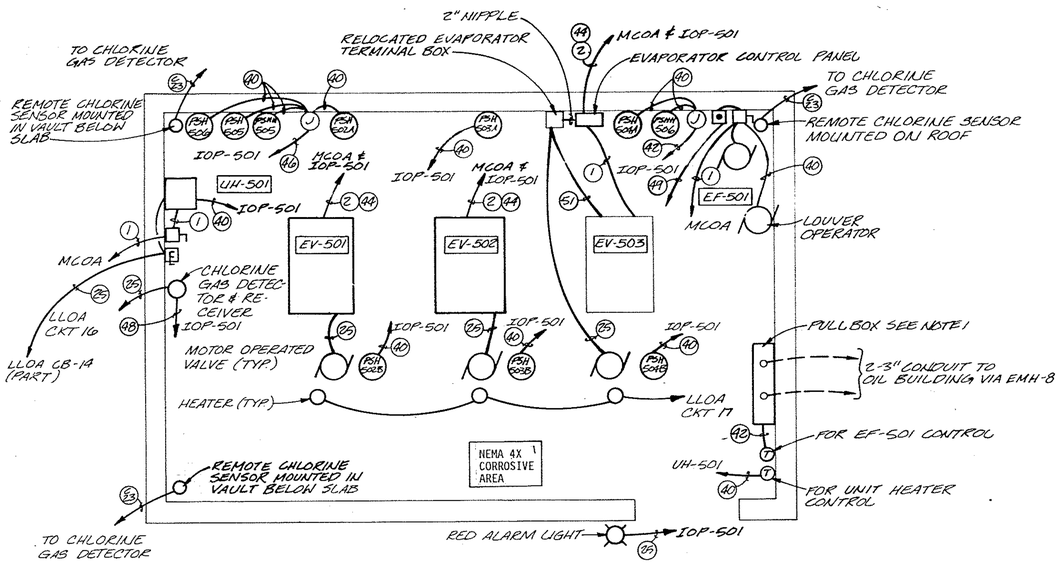
SR 904



EVAPORATOR BUILDING FACILITY PLAN

SCALE: 3/8"=1'-0"



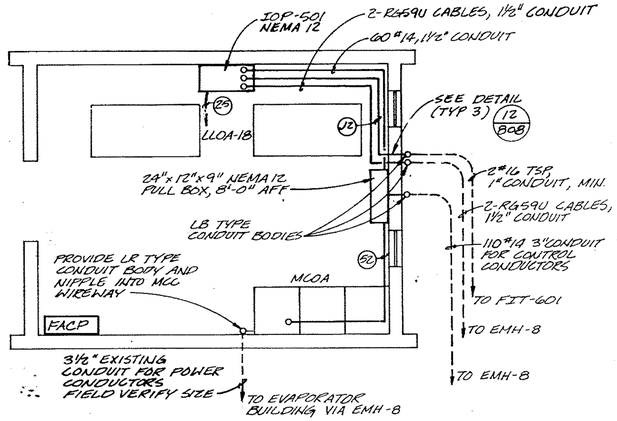


EVAPORATOR BUILDING POWER/INSTRUMENTATION PLAN

SCALE: 3/8"=1'-0"

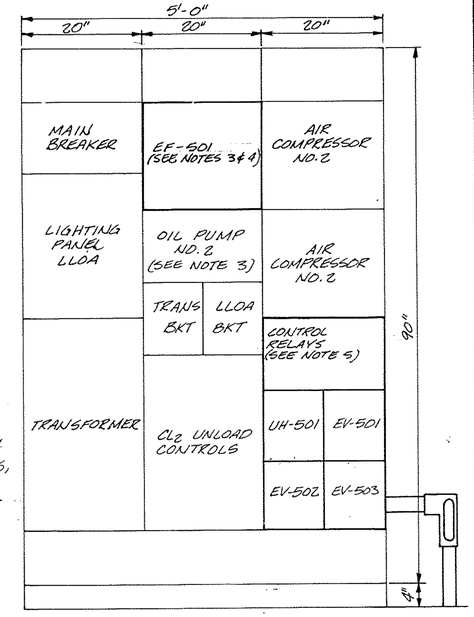
NOTES:

1. PROVIDE 36" W X 24" H X 12" D NEMA 4X SST PULLBOX @ 6'-0" ABOVE FINISHED FLOOR FOR POWER AND CONTROL CONDUCTORS. ROUTE ALL POWER TO OIL BUILDING IN 1-3" CONDUIT AND ALL CONTROL IN 1-3" CONDUIT.
2. NEMA SIZE 1 CONTACTOR WITH 30A DISCONNECT SWITCH. SEE SHEET 929.
3. REMOVE EXISTING STARTER FOR OIL PUMP NO. 1. REVISE CONTROLS FOR OIL PUMP NO. 2 AS SHOWN ON SCHEMATIC SHEET 929.
4. INSTALL EF-501 STARTER IN SPACE PRESENTLY USED FOR OIL PUMP NO. 1 STARTER.
5. PROVIDE CONTROL RELAYS FOR OIL PUMP NO. 2 PER SCHEMATICS SHEET 929.



OIL PUMP BUILDING NO.1

SCALE: 3/8"=1'-0"



MCC-MCOA

SCALE: 3/4"=1'-0"

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

EVAPORATOR BLDG ELECTRICAL SITE PLAN AND DETAILS

Designed: TOM
Drawn: CM/CWA
Checked: JEK
Approved: Tom Merritt
Date: JUNE, 1989

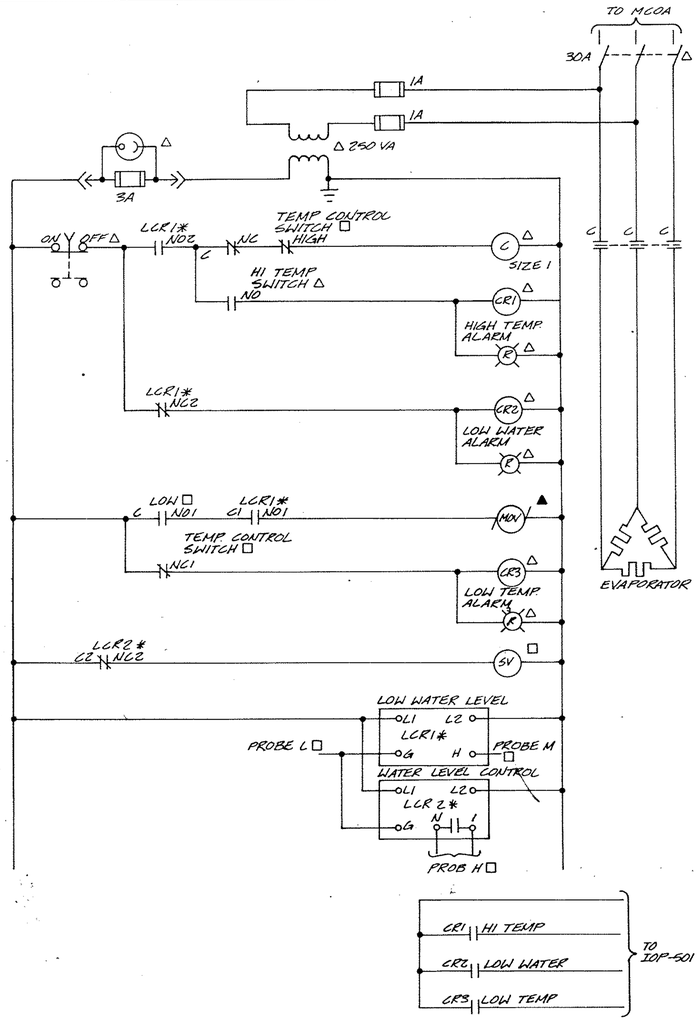
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No	By	Revision	Date
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2	AFA	CPE# 71	11-14-90
3	AFA	AS RECORDED DRAWING	12-9-92

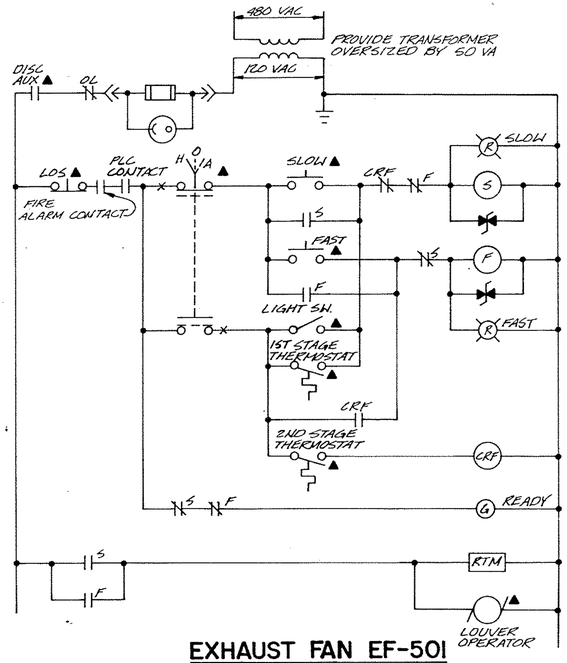
REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17, 1985 BRUCE R. WILLEY

3 AS RECORDED DRAWINGS

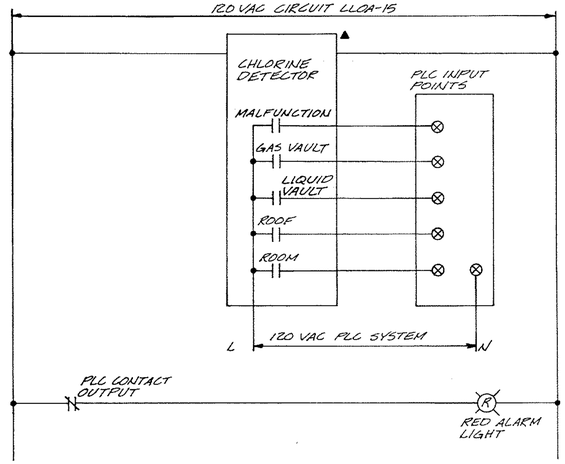
Sheet Number: 928



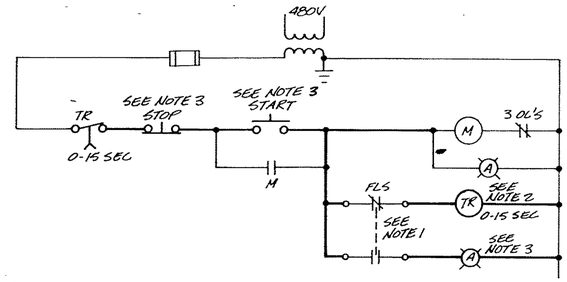
EV-503 CONTROL DIAGRAM



EXHAUST FAN EF-501



CHLORINE ALARM CONTROL DIAGRAM



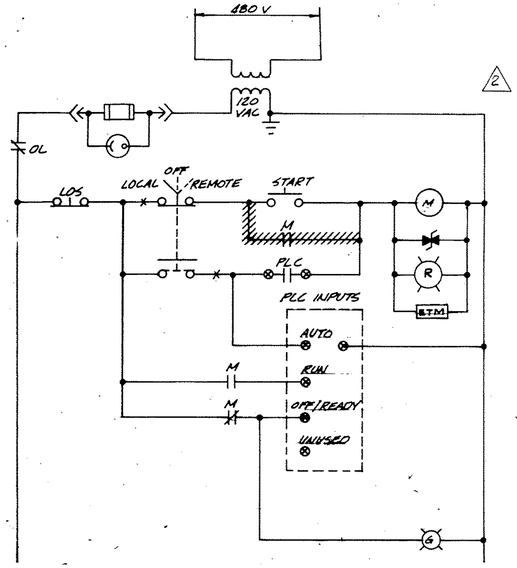
NOTES:

1. FLOW SWITCHES FLS ARE LOCATED IN OIL PUMP BUILDING NO. 2 AND WIRED TO TERMINAL BLOCK IN MCOA. DISCONNECT EXISTING WIRING FROM OIL PUMP NO. 1 AND CONNECT NEW WIRING. SWITCHES ARE SHOWN IN NO FLOW CONDITION.
2. INSTALL NEW TIMING RELAY IN CONTROL RELAY SPACE IN MCOA.
3. INSTALL NEW STOP AND START PUSHBUTTONS AND INDICATING LIGHT ON DOOR OF OIL PUMP NO. 2 STARTER.

OIL PUMP NO.2 CONTROL REVISIONS

△ AT EVAPORATOR CONTACTOR PANEL
* AT EVAPORATOR JUNCTION PANEL
□ AT EVAPORATOR
▲ FIELD

SCHEMATIC DIAGRAM LOCATION KEY



CONTROL DIAGRAM FOR DP-101

PANEL SCHEDULE

PANEL: EXISTING PANEL LLOA	ENTRANCE:	MOUNTING:
SERVICE:120/208 VOLTS , 3 PHASE, 4 WIRE,		SERVICE ENTRANCE LABEL:
MAIN DEVICE: AMP M.L.O., 100 AMP CIRCUIT BREAKER, 3 POLE, KAIC INTERRUPTING RATING		
FEEDER SOURCE: EXITING TRANSFORMER	FEEDER SIZE: 4 #8	

CKT. NO.	CIRCUIT IDENTIFICATION	CB AMPS	WATTS PER PHASE A	B	C	CB AMPS	CIRCUIT IDENTIFICATION	CKT NO.	
1	OIL PUMP BLDG CTS	15				20	CL2 UNLOADING LTS	2	
3	FIT-601 , CS-601	20				20	CL2 DETECTOR	4	
5	FACP	15				15	AFTER COOLER	6	
7	AIR DRYER	15				15	BLDG RECEPTS	8	
9	CL2 RECEPTS	20				20	PIPE HEATER	10	
11	EVAP-BLDG	20				20	IOP-801	12	△
13	CL2 DETECTOR	20				20	RECEPTACLES EVAP. BUILDING	14	*
15	LIGHTING EVAP. BUILDING	20				20	RAD HEATER .	16	*
17	CL2 ALARM LT	20				20	RAD HEATER	18	*

* INSTALL NEW CIRCUIT BREAKER
△ USE EXISTING SPARE CIRCUIT BREAKER
□ RELOCATE BREAKER FROM POSTION 17 TO ITS CORRECT LOCTION AT POSITION 13

CWC-HDR, Inc.

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

CHLORINE BUILDING SCHEMATICS

Designed TDM
Drawn CWA
Checked JEK
Approved by Ivan D. Merritt
Date JUNE, 1989

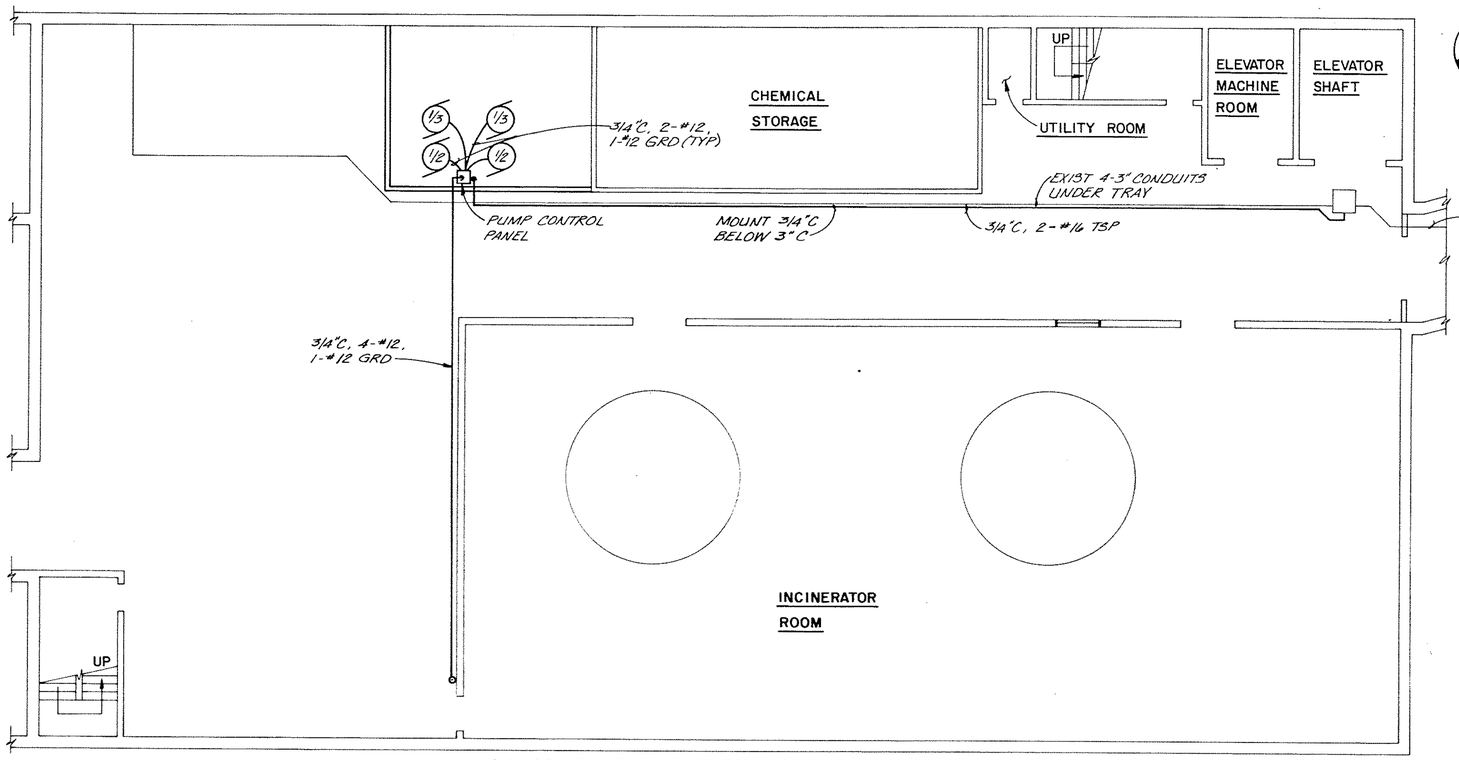
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No	By	Description	
1	TDM	ADDENDUM NO.1	6-27-89
2	TDM	ADDENDUM NO.2	6-30-89
3	APA	AS RECORDED DRAWING	12/1/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17, 1985 BRUCE R. WILLEY

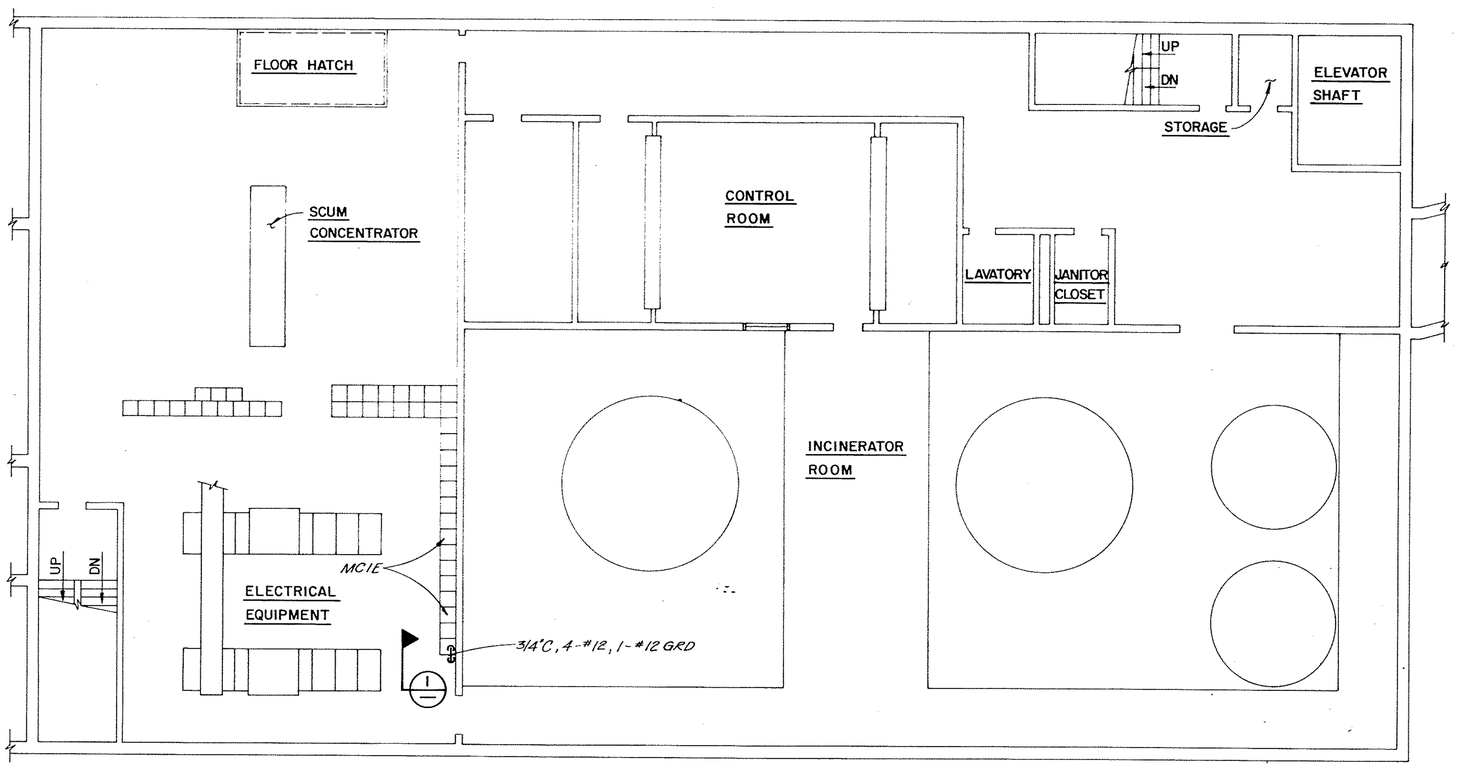
△3 AS RECORDED DRAWINGS

Sheet Number 929



LOWER BASEMENT ELECTRICAL PLAN

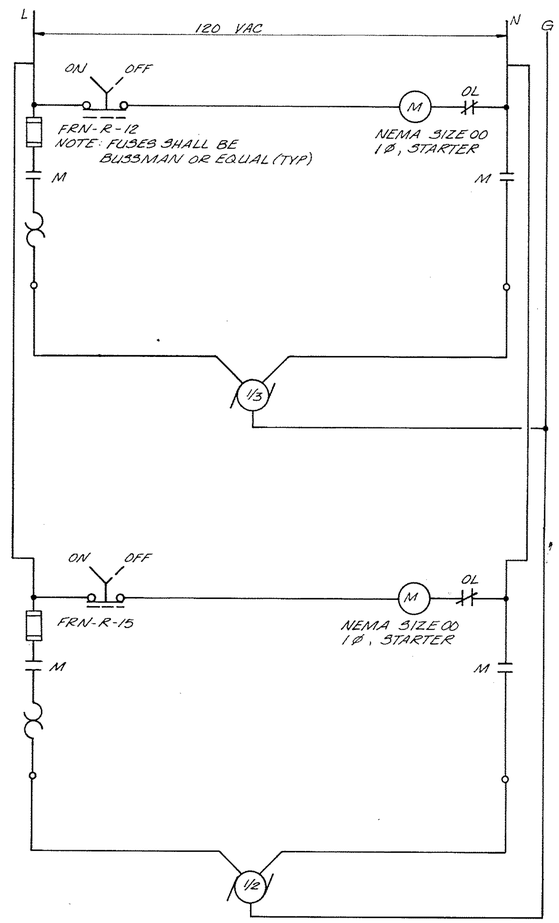
SCALE: 1/8" = 1'-0"

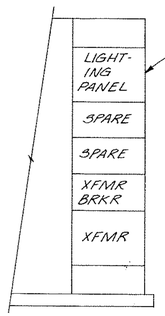


UPPER BASEMENT ELECTRICAL PLAN

SCALE: 1/8" = 1'-0"

CIRCUIT 8 & CIRCUIT 10





INSTALL 2 NEW 20 AMP SINGLE POLE CIRCUIT BREAKERS IN LIGHTING PANEL

DETAIL 1 - PARTIAL ELEVATION MCIE

NTS

AS RECORDED DRAWINGS

CWC-HDR, Inc.

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP DECHLORINATION MODIFICATION

ELECTRICAL PLAN AND DETAILS

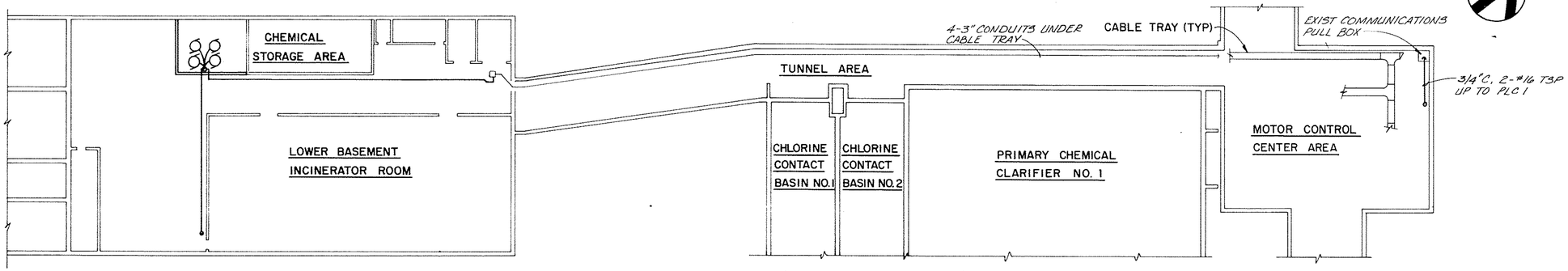
Project Manager: BRW
Designed: SKD
Drawn: CSM
Checked: JEK & TDM
Project Number: 00039-033-002
Date: MAY 1990

THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY.

No	By	Description	Date
1	AFA	AS RECORDED DRAWING	12/19/92

Sheet Number: 930

COMPOSITE OVERLAY

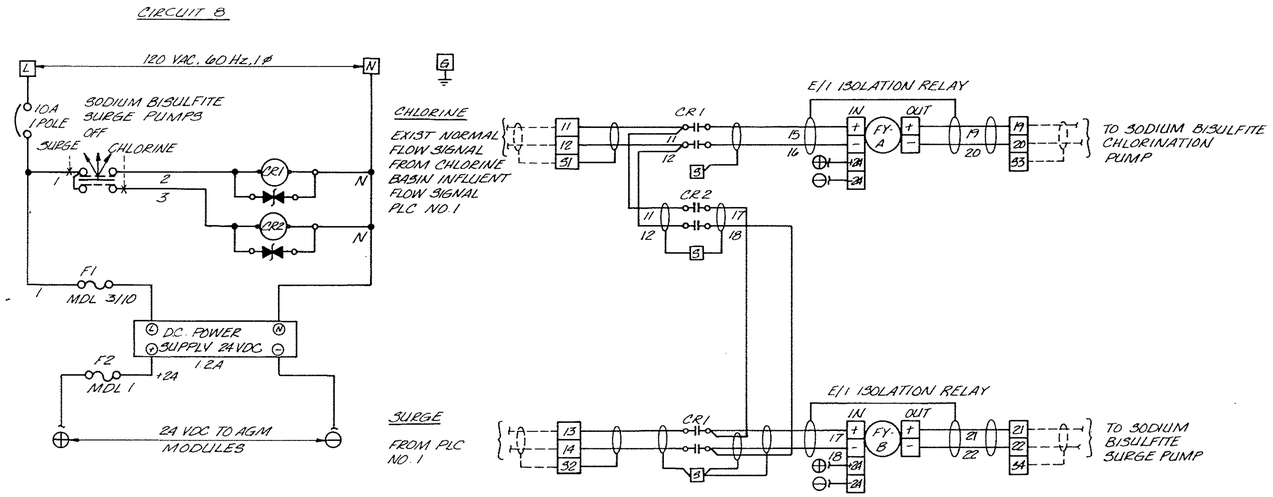


LOWER BASEMENT - INCINERATOR BUILDING

BASEMENT LEVEL - CONTROL BUILDING

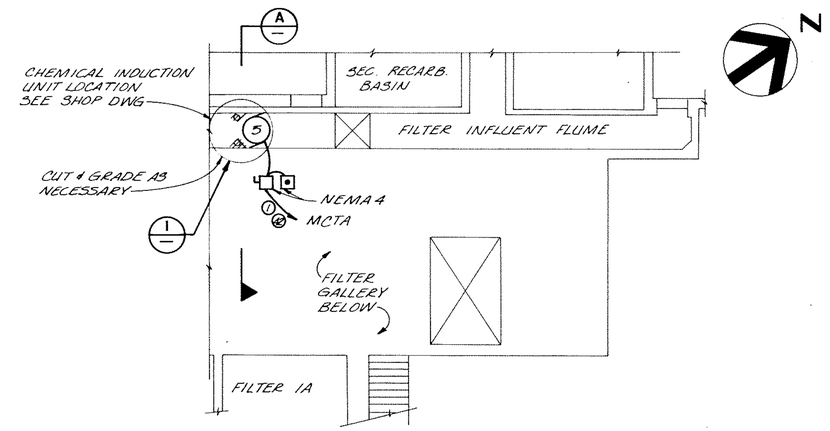
INSTRUMENTATION CONNECTION ROUTE

SCALE: 1" = 20'-0"



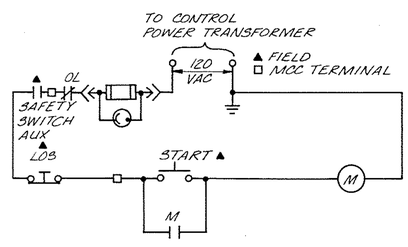
PUMP CONTROL FLOW SELECTOR PANEL SIGNAL WIRING DIAGRAM

NTS



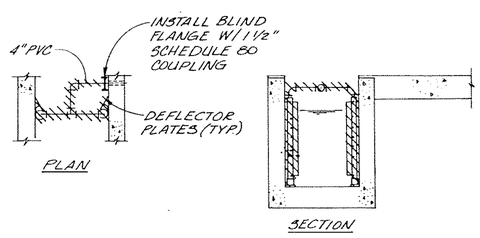
PARTIAL PLAN OF FILTER AREA

SCALE: 1/8"= 1'-0"



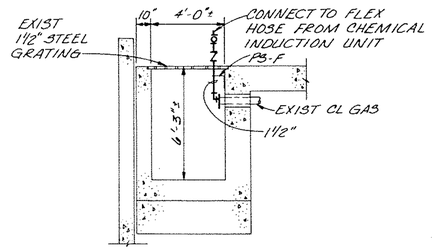
CONTROL DIAGRAM FOR CHEMICAL INDUCTION UNIT

NTS



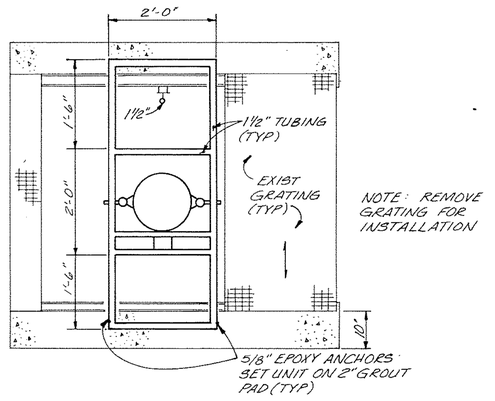
DEMOLITION DETAIL 1

SCALE: 1/4"= 1'-0"



SECTION A

SCALE: 1/4"= 1'-0"



INSTALLATION PLAN

SCALE: 3/4"= 1'-0"

AS RECORDED DRAWINGS

CWC-HDR, Inc.

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP DECHLORINATION MODIFICATION

WATER CHAMP INSTALLATION DETAILS, CABLE ROUTING PLAN, AND DETAILS

Project Manager	BRW
Designed	SKD
Drawn	CSM
Checked	JEK & TDM
Project Number	00039-033-002
Date	MAY 1990

THIS LINE IS ONE INCH WHEN DRAWING IS FULL SIZE, IF NOT ONE INCH, SCALE ACCORDINGLY.

No	By	Description	Date
1	AFA	AS RECORDED DRAWINGS	12/9/92

Sheet Number 931

COMPOSITE OVERLAY

SR 9/1

Instrumentation Symbols

- CONNECTION TO PROCESS, OR MECHANICAL LINK, OR INSTRUMENT SUPPLY
- PNEUMATIC SIGNAL OR UNDEFINED SIGNAL FOR PROCESS FLOW LINE
- ELECTRIC SIGNAL, DISCRETE
- ELECTRIC SIGNAL ANALOG
- ELECTRIC POWER
- INTERNAL SYSTEM LINK (SOFTWARE OR FIRMWARE)
- HYDRAULIC SIGNAL
- ELECTRO MAGNETIC OR SONIC SIGNAL
- FIELD MOUNTED
- MOUNTED ON PANEL FACE SUBSCRIPT INDICATES PANEL
- MOUNTED BEHIND PANEL SUBSCRIPT INDICATES PANEL
- MOUNTED ON AUXILIARY PANEL SUBSCRIPT INDICATES PANEL
- MOUNTED BEHIND AUXILIARY PANEL SUBSCRIPT INDICATES PANEL
- INDICATOR LIGHT SUBSCRIPT INDICATES PANEL
- MULTI-FUNCTION INSTRUMENT. SUBSCRIPT INDICATES PANEL
- UNDEFINED INTERLOCK LOGIC
- INTERFACE TO ANOTHER SHEET (A) (B) A = SHEET NO. B = INTERFACE NO.
- PRIMARY ELEMENT (TURBINE OR PROPELLER) (FE)
- LEVEL SWITCH (LS)
- LIMIT SWITCH (ZS)
- TEMPERATURE ELEMENT W/THERMOWELL (TE)
- PROGRAMMABLE LOGIC CONTROLLER SUBSCRIPT INDICATES PLC NUMBER (SEE DEVICE LOCATION SCHEDULE)
- ROTARY LOBE COMPRESSOR
- CENTRIFUGAL PUMP
- ANNUBAR (FT)
- BLOWER
- MOTOR OPERATED VALVE (E)
- ROTARY FILTER
- SCREW CONVEYOR
- BELT CONVEYOR
- BIN
- PARSHALL FLUME
- MIXER
- SOLENOID VALVE (S)
- MOTOR (M)
- FILTER
- PROGRESSIVE CAVITY PUMP
- AIR DIAPHRAGM PUMP

Explanatory Notations

SIGNAL CONVERTERS

(XY) Z\Z

NOTE X: PROCESS OR INITIATING VARIABLE
Y: OUTPUT FUNCTION
Z/Z:
- E = VOLTAGE
- I = CURRENT
- P = PNEUMATIC
- PF = PULSE FREQUENCY
- PD = PULSE DURATION
- R = RESISTANCE
- ISO = ISOLATION
- RAMP = RAMP GENERATOR

SEE ISA STANDARD S5.1 TABLE 2 FOR FUNCTION DESIGNATIONS FOR RELAYS

HAND SWITCHES

FOR HLS TYPE DETAILS SEE SHT. 1007

(HS) XXX — SELECTOR SWITCH (MAINTAINED CONTACTS)

NOTE XXX:
- AM = AUTO/MANUAL
- AO = AUTO/OFF
- LR = LOCAL/REMOTE
- OO = ON/OFF
- HO = HAND/OFF
- O/C = OPEN/CLOSE
- OOS = OUT OF SERVICE
- OSC = OPEN/STOP/CLOSE
- FR = FORWARD/REVERSE
- FOR = FORWARD/OFF/REVERSE
- FS = FAST/SLOW
- FOS = FAST/OFF/SLOW
- JOG = JOG
- LL = LEAD/LAG

"A" INDICATES "AUTO" i.e. HOA = HAND/OFF/AUTO
"R" INDICATES "REMOTE" i.e. OOR = ON/OFF/REMOTE

IF NO DESIGNATION IS SHOWN, CONFORM CONTROL LOOP DESCRIPTION AND CONTROL PANEL LAYOUT

(HS) XXX — CONTROL PUSHBUTTONS (MOMENTARY CONTACTS)

NOTE XXX:
- OC = OPEN/CLOSE
- SS = START/STOP
- MFS = MODULATE FASTER/SLOWER
- MOC = MODULATE OPEN/CLOSE

(4LS) TX

CMC TYPE SWITCH
TX = TYPE NUMBER
(SEE SH 1013)

ANALYSIS INSTRUMENTS

(AE) XXX

NOTE XXX:
- CL = CHLORINE
- PH = pH
- H2S = HYDROGEN SULFIDES
- TUR = TURBIDITY
- LEL = LOW EXPLOSION LIMIT
- ORP = OXYGEN REDUCTION POTENTIAL

INDICATOR LIGHTS

(YL) XXX

NOTE XXX:
- R/R = RUN, READY
- REM = REMOTE
- RUN = RUN
- RDY = READY
- FLD = FIELD
- OPN = OPEN
- CLS = CLOSED
- A = AUTO
- H = HAND
- OFF = OFF
- O/C = OPEN/CLOSED

Instrument Identification

(AAA △ / XYYYB / XA)

- AAA. INSTRUMENT FUNCTIONAL IDENTIFICATION SEE TABLE
- X LOCATION OF LOOP
  - 2 = RAW SEWAGE PUMP STATION
  - 3 = HEADWORKS 1
  - 4 = PRIMARY CLARIFIER AND PRIMARY SLUDGE PUMPING
  - 5 = SECONDARY CLARIFIER AND CHLORINATION FACILITIES
  - 6 = SURGE BASIN
  - 7 = INCINERATOR BUILDING
- YYY TWO OR THREE DIGITS IDENTIFYING SERIAL LOOP NUMBER W/IN BUILDING
- B SUFFIX UTILIZED WHEN TWO OR MORE INSTRUMENTS WITHIN LOOP HAVE SAME FUNCTIONAL IDENTIFICATION, E.G. A FOR FIRST, B FOR SECOND, ETC.
- △ INDICATES ITEMS SUPPLIED BY EQUIPMENT MANUFACTURER.
- XA LOCATION OF INSTRUMENT (SEE DEVICE LOCATION SCHEDULE)

Equipment Identification

- NEW EQUIPMENT
- EXISTING EQUIPMENT

Miscellaneous Abbreviations

AI	ANALOG IN
AO	ANALOG OUTPUT
AP	ALARM PANEL
BI	BINARY CODED DECIMAL INPUT
BO	BINARY CODED DECIMAL OUTPUT
CL	CONTROL LOOP
CO	CONTACT OUTPUT
CP	CONTROL PANEL
CPU	CENTRAL PROCESSING UNIT
CRT	CATHODE RAY TUBE (OPERATOR WORKSTATION)
DDM	DATA DISPLAY MODULE
DPDT	DOUBLE POLE DOUBLE THROW
DI	DISCRETE INPUT
DO	DISCRETE OUTPUT
EA	POWER FAILURE ALARM
EDY	VOLTAGE DIFFERENTIAL RELAY
EIA	ELECTRONIC INDUSTRY OF AMERICA
ES	ELECTRICAL SUPPLY
HIK	MANUAL CONTROL STATION
HLS	HAND LIGHT SWITCH (MICROSWITCH CMC)
H2S	HYDROGEN SULFIDE
INTLK	INTERLOCK
I/O	INPUT OUTPUT
LAM	LOOP ACCESS MODULE
M	MOTOR
MA	MILLI AMPERE
MX	MOTOR STARTER
PI	PULSE INPUT
PLC	PROGRAMMABLE LOGIC CONTROLLER
POT	POTENTIOMETER
RAM	REGISTER ACCESS MODULE
RI	RTD INPUT
RTD	RESISTANCE TEMPERATURE DETECTOR
SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
2SPDT	TWO SINGLE POLE DOUBLE THROW CONTACTS
SI	SERIAL INPUT
SZ	VARIABLE FREQUENCY DRIVE
TI	THERMOCOUPLE INPUT
UPS	UNINTERRUPTIBLE POWER SUPPLY
VAC	VOLTS ALTERNATING CURRENT
VDC	VOLTS DIRECT CURRENT
WSS	WASTE SECONDARY SLUDGE
XI	ISOLATED INPUT
XO	ISOLATED OUTPUT
YA	TORQUE ALARM, PLC ALARM, FIRE ALARM, VFD FAILURE
YL	PILOT LIGHT

DEVICE LOCATION SCHEDULE

SUBSCRIPT	PANEL NO.	DESCRIPTION	NEMA CLASS
2A	CP-201	RSPS LEVEL CONTROL PANEL (EXIST)	12
2B	CP-201	PLC 2, CH 1, BASE 2 (EXIST)	-
2C	CP-202 △	RSP-2B VIBRATION & TEMP., MONITORING PANEL	12
2D	CP-203 △	RSP-3B VIBRATION & TEMP., MONITORING PANEL	12
3A	CP-301	HEADWORKS CONTROL PANEL	1A
3B	MCC-301	HEADWORKS MCC 301	1A
3C	MCC-302	HEADWORKS MCC 302	1A
3D	CP-301	PLC 3, CH 1, BASES 0 - 7	-
3E	CP-302 △	HEADWORKS ODOR CONTROL PANEL	4X
4A	CP-401	PRIMARY SLUDGE PUMP STA. SUMP PUMP CONTROL PANEL	4X
4B	IOP-402	PLC 3, CH 1, BASE 8	12
5A	CP-501	CHLORINATOR SELECTOR PANEL (FIBERGLASS NOT SST)	4X
7A	NONE	INCINERATOR BUILDING MAIN CONTROL PANEL (EXISTING)	-
7B	CP-701 △	INCINERATOR BUILDING ODOR CONTROL PANEL	12*
7C	IOP-701	PLC 2, CH 1, BASE 0 (EXIST IN INCINERATOR BUILDING INSTR. ROOM)	-
7D		SODIUM HYPOCHLORITE FILL ALARM PANEL	4X
LRP		LIQUIDS RELAY PANEL (SEE NOTE 7)	1
5B	10P-501	PLC3,CH3,BASE 0	12

*STAINLESS STEEL

(2)

Instrument Identification Table (1)

FIRST-LETTER (1) (5)		SUCCEEDING-LETTERS (1) (4)		
MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A ANALYSIS		ALARM		
B BURNER, COMBUSTION				
CS CHLORINE			CONTROL	
D NOT USED	DIFFERENTIAL (3)			
E VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F FLOW RATE	RATION (FRACTION) (5)			
G NOT USED		GLASS, VIEWING DEVICE		
H HAND				HIGH (8)
I CURRENT (ELECTRICAL)		INDICATE		
J POWER	SCAN			
K TIME, TIME SCHEDULE	TIME RATE OF CHANGE (5)		CONTROL STATION	
L LEVEL				LOW (8)
M MOTOR	MOMENTARY (5)		MIDDLE IMTERMEDIATE (8)	
N TORQUE		NOT USED	STARTER	NOT USED
O OXYGEN		ORIFICE, RESTRICTION POINT (TEST) CONNECTION		
P PRESSURE VACUUM				
Q QUANTITY	INTEGRATE, TOTALIZE (4)			
R RADIATION		RECORD		
S SPEED FREQUENCY	SAFETY		SWITCH	
T TEMPERATURE			TRANSMIT	
U MULTIVARIABLE (6)		NOT USED	NOT USED	NOT USED
V VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER LOUVER	
W WEIGHT, FORCE		WELL		
X UNCLASSIFIED	X AXIS	NOT USED	STARTER	NOT USED
Y EVENT, STATE OR PRESENCE (3)	Y AXIS		RELAY, COMPUTE, CONVERT (7)	
Z POSITION, DIMENSION	Z AXIS		DRIVER,ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

Instrumentation Identification Table Notes

1. THE INSTRUMENT IDENTIFICATION TAG CONSISTS OF ONE FIRST LETTER FROM THE ABOVE TABLE SELECTED IN ACCORDANCE WITH THE ABOVE TABLE ASSIGNED ACCORDING TO FUNCTION AND ONE OR MORE READOUT AND/OR OUTPUT FUNCTIONS.
2. ANALYSIS TYPE IDENTIFIED BY NOTATION OUTSIDE OF BUBBLE. SEE CONTROL LOOP DESCRIPTION AND ABBREVIATION LIST.
3. THE FIRST LETTER Y IS USED FOR NUMEROUS EVENT FUNCTIONS. SEE CONTROL LOOP DESCRIPTION AND ABBREVIATION LIST.
4. THE GRAMMATICAL FORM OF THE SUCCEEDING LETTER MEANINGS ARE MODIFIED AS REQUIRED. FOR EXAMPLE, "INDICATE" MAY BE APPLIED AS "INDICATOR" OR "INDICATING."
5. ANY FIRST LETTER IF USED IN COMBINATION WITH MODIFYING LETTERS D (DIFFERENTIAL), F (RATIO), M (MOMENTARY), K (TIME RATE OF CHANGE), Q (INTEGRATE OR TOTALIZE) OR ANY COMBINATION REPRESENTS A NEW AND SEPARATE MEASURED VARIABLE, AND THE COMBINATION IS TREATED AS A FIRST LETTER ENTRY.
6. USED FOR MULTI-VARIABLE ALARM. SEE CONTROL LOOP DESCRIPTION.
7. USAGE IDENTIFIED BY NOTATION OUTSIDE OF BUBBLE. SEE CONTROL LOOP DESCRIPTIONS AND ABBREVIATIONS.
8. UTILIZATION OF A DOUBLE HIGH OR LOW MODIFIER, E.G. LAHH OR LALL, INDICATES A VERY HIGH OR VERY LOW CONDITION. IF BOTH MODIFIERS OR USED, E.G. LAHL, THEN THE HIGH AND LOW ALARMS HAVE BEEN COMBINED.

GENERAL NOTES:

1. THIS IS A GENERAL INSTRUMENTATION SHEET. SOME SYMBOLS OR NOTATIONS MAY NOT BE USED ON THIS PROJECT.
2. SEE SHEETS 920-922 FOR MOTOR CONTROL DIAGRAMS.
3. SEE ELECTRICAL AND MECHANICAL DRAWINGS FOR EQUIPMENT LOCATIONS.
4. SEE ELECTRICAL DRAWINGS FOR LOCATION OF MOTOR STARTERS AND VARIABLE FREQUENCY DRIVES.
5. INPUT/OUTPUT POINTS SHOWN ARE NOT ALL INCLUSIVE. REFER TO SHEET 1010 FOR PLC CONFIGURATION, AND I/O MODULES REQUIRED.
6. ABBREVIATION LIST IS NOT ALL INCLUSIVE. INSTRUMENT IDENTIFICATION TAGS ARE SHOWN FOR THOSE TAGS THAT ARE NOT CLEARLY DEFINED BY THE INSTRUMENT IDENTIFICATION TABLE. OTHER TAGS SHALL BE IN ACCORDANCE WITH TABLE.
7. PROVIDE NEW LIQUIDS RELAY PANEL TO HOUSE ISOLATION AND OTHER RELAYS REQUIRED TO INTERFACE WITH PLC-1. PROVIDE NEW 24VDC POWER SUPPLY IN PANEL. INSTALL PANEL IN ACCESS SPACE BEHIND MAIN LIQUIDS PANEL. FIELD LOCATE 120VAC CIRCUIT AND VERIFY WITH ENGINEER.
8. FOR VALVES NOT SHOWN, REFER TO GENERAL ABBREVIATIONS AND SYMBOLS SHEET 3.

(3)

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

INSTRUMENTATION LEGEND

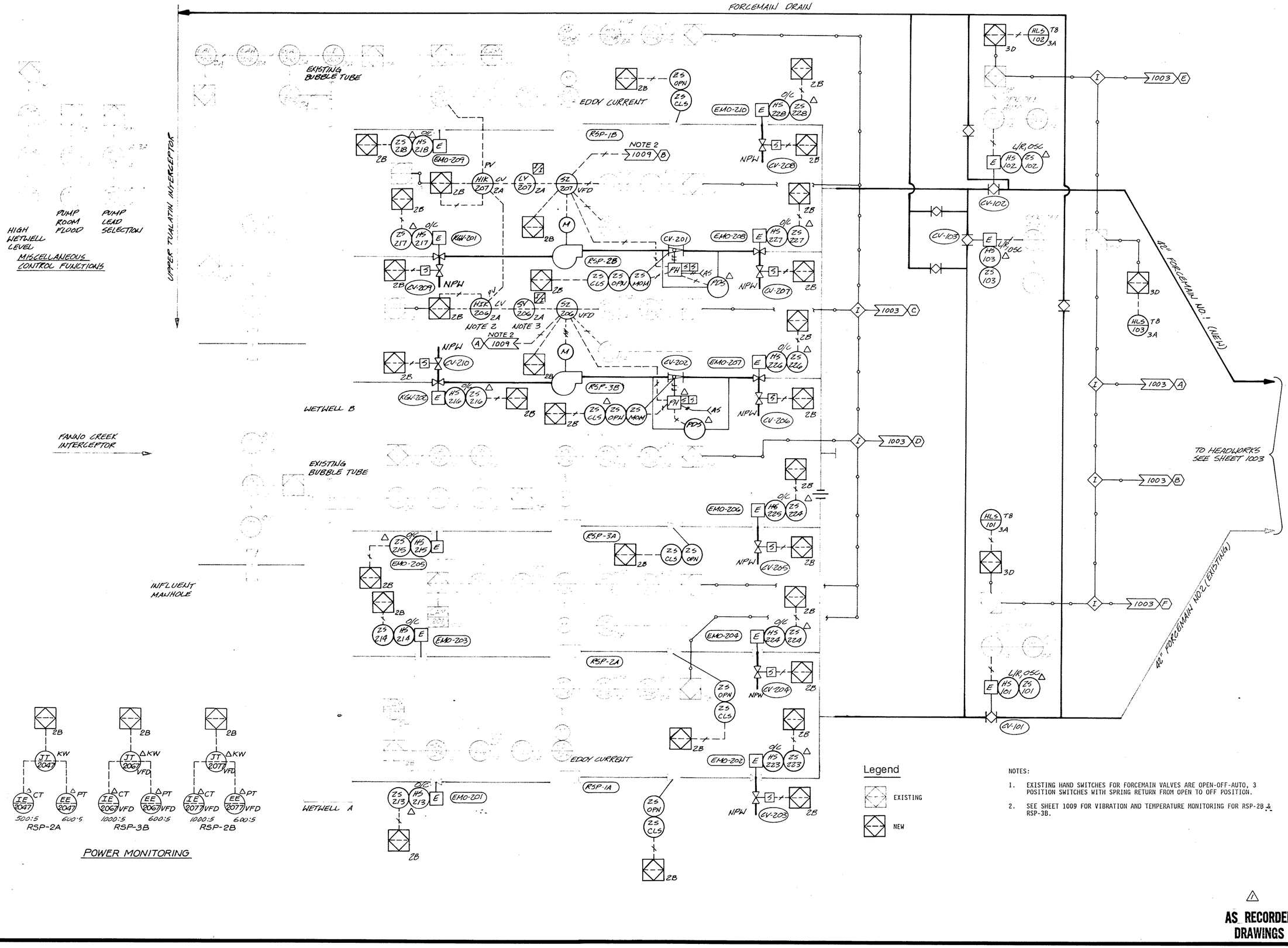
Designed: TDM
Drawn: CWA
Checked: WFE
Approved: Tom D. Merritt
Date: MAY, 1989

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No.	By	Revision	Date
2	TDM	ADDENDUM NO.2	6-30-89
3	MFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER — William F. Ellis — 9076 — OREGON — 12-31-92

Sheet Number: 1001



NOTES:

1. EXISTING HAND SWITCHES FOR FORCEMAIN VALVES ARE OPEN-OFF-AUTO, 3 POSITION SWITCHES WITH SPRING RETURN FROM OPEN TO OFF POSITION.
2. SEE SHEET 1009 FOR VIBRATION AND TEMPERATURE MONITORING FOR RSP-2B & RSP-3B.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

INSTRUMENTATION-RAW SEWAGE PUMPING STATION PID

Designed: JDM
Drawn: CWA
Checked: NPE
Approved: Tom D. Merritt
Date: MAY, 1989

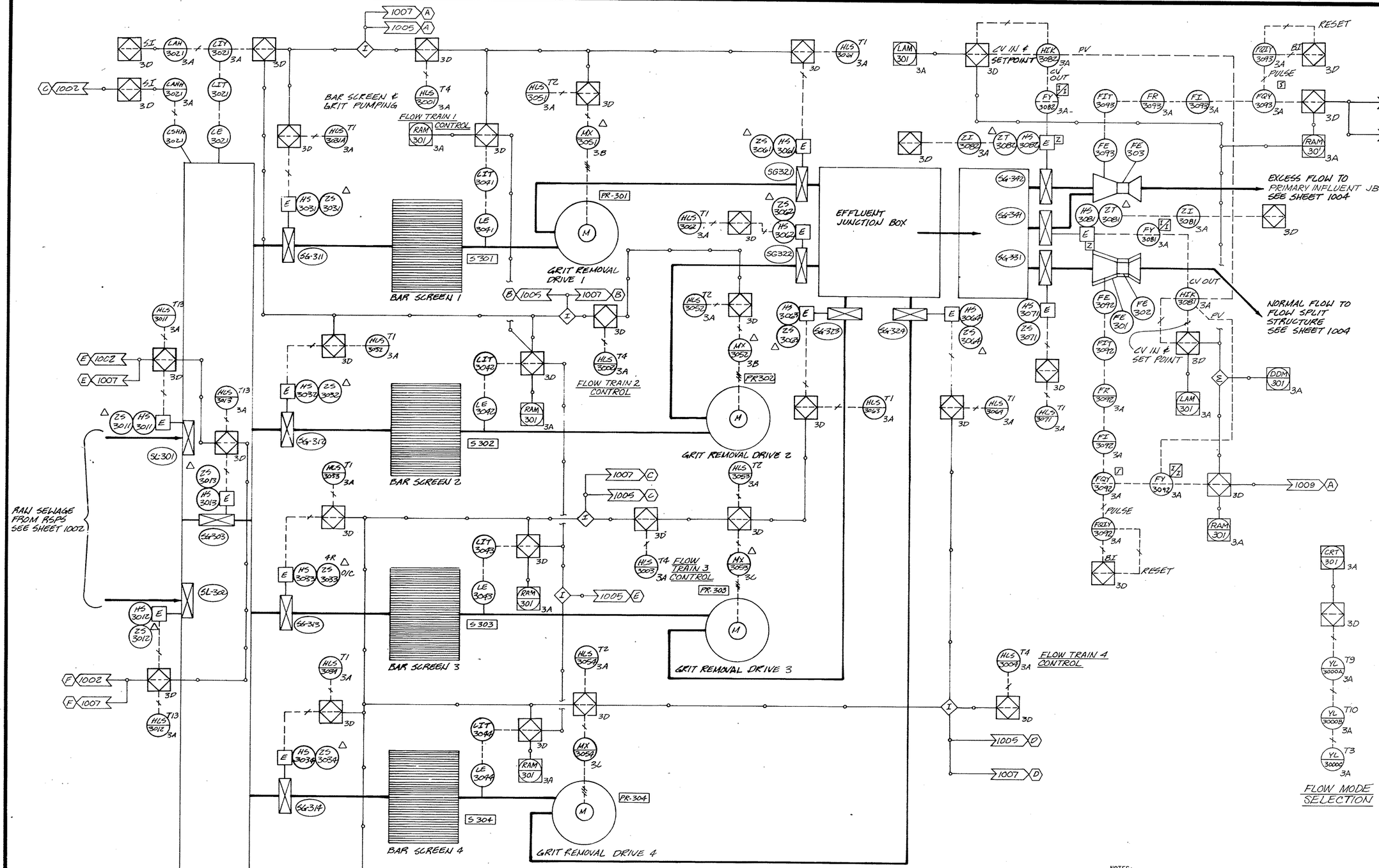
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No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON

Sheet Number: 1002

AUDIT 1003 OVERLAY 1003



NOTES:

1. ALL ACTUATOR THIS SHEET ARE EQUIPPED WITH LOCAL PUSHBUTTON CONTROL STATIONS CONSISTING OF A KEY OPERATED LOCAL/ REMOTE SWITCH, OPEN, CLOSE & STOP PUSH-BUTTONS AND INDICATION LIGHTS. ALSO PROVIDED ARE POSITION SWITCHES OR POSITION TRANSMITTERS AS SHOWN.

△3 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

INSTRUMENTATION-HEADWORKS PID

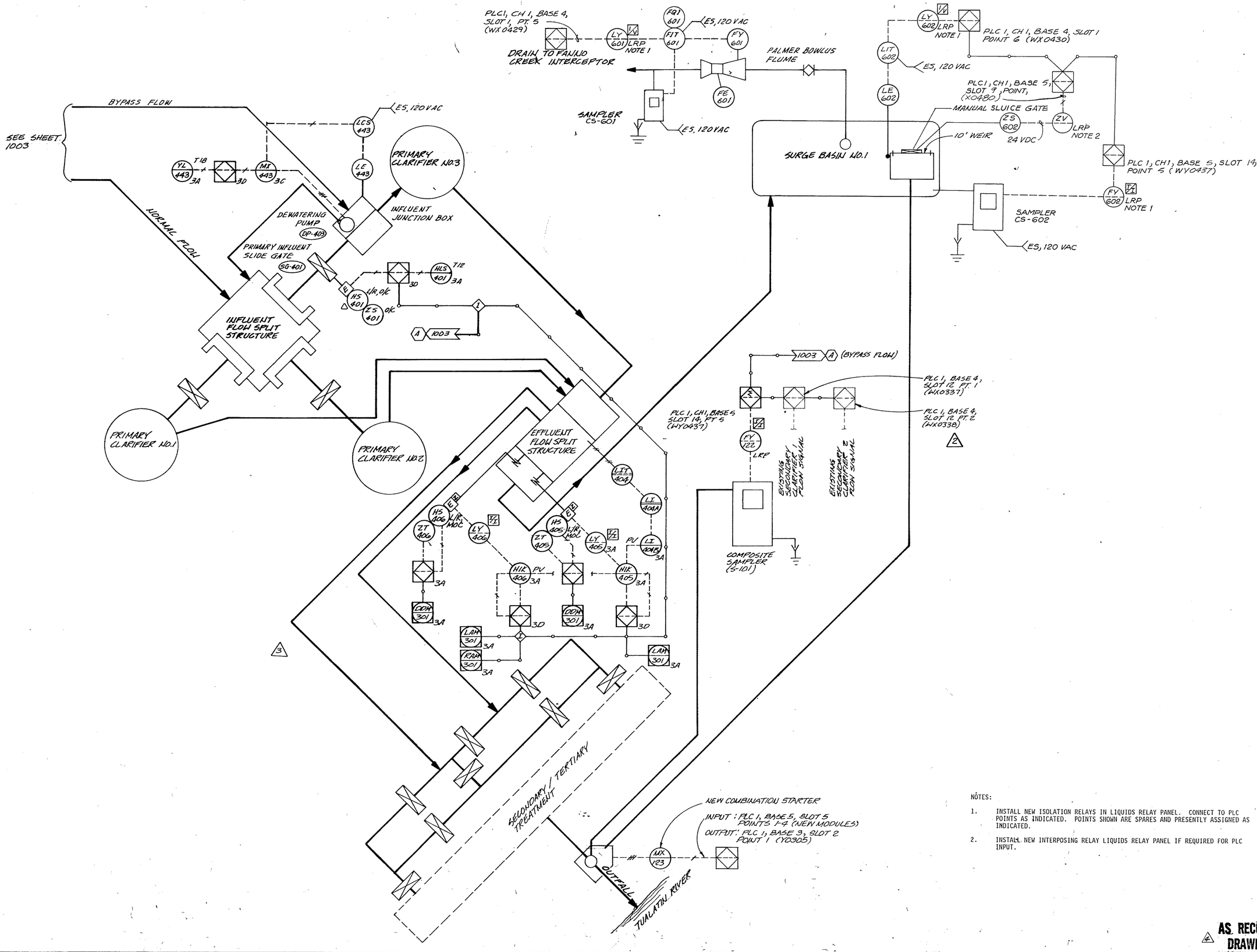
Designed: TDM
Drawn: CWA
Checked: WFE
Approved: Tom D. Merrill
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No.	By	Revision	Date
1	TDM	ADDENDUM NO.1	6-27-89
△2	TDM	ADDENDUM NO.1	6-30-89
△3	AFH	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4884 OREGON JULY 1, 19[illegible] WILLIAM F. HEITSCH

Sheet Number 1003



NOTES:

1. INSTALL NEW ISOLATION RELAYS IN LIQUIDS RELAY PANEL. CONNECT TO PLC POINTS AS INDICATED. POINTS SHOWN ARE SPARES AND PRESENTLY ASSIGNED AS INDICATED.
2. INSTALL NEW INTERPOSING RELAY LIQUIDS RELAY PANEL IF REQUIRED FOR PLC INPUT.

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

INSTRUMENTATION-PRIMARY CLARIFIER AND EXCESS FLOW PID

Designed	TDM
Drawn	CMA
Checked	WFE
Approved	Tom D. Meredith
Date	MAY, 1989

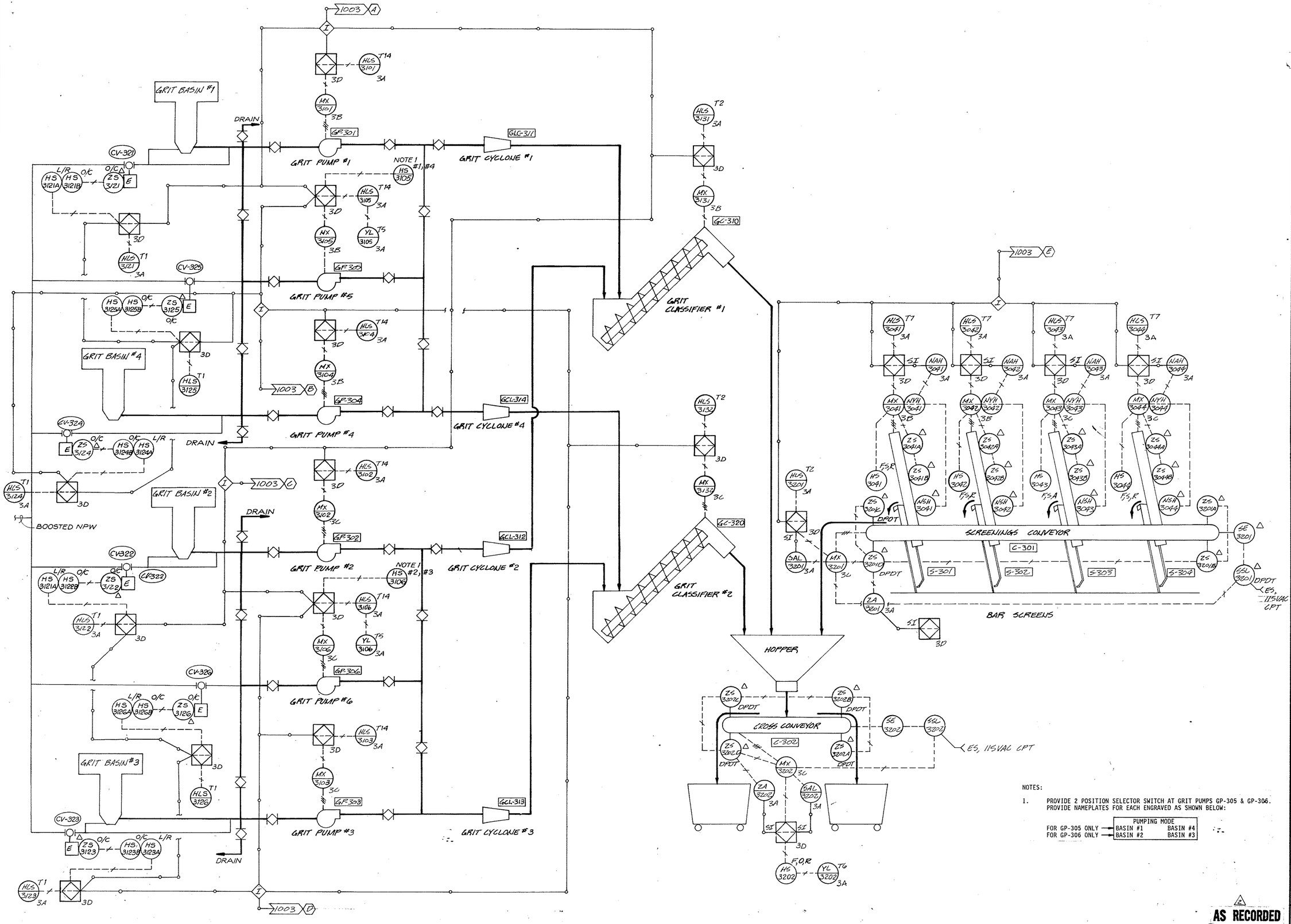
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No	By	Revision	Date
2	TDM	ADDENDUM NO.2	6-30-89
3		CPE NO. 30 83	12/9/92
4	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON JULY 12 WILLIAM F. ETTLICH

Sheet Number 1004

SR 904



NOTES:

1. PROVIDE 2 POSITION SELECTOR SWITCH AT GRIT PUMPS GP-305 & GP-306. PROVIDE NAMEPLATES FOR EACH ENGRAVED AS SHOWN BELOW:

PUMPING MODE	
FOR GP-305 ONLY →	BASIN #1 BASIN #4
FOR GP-306 ONLY →	BASIN #2 BASIN #3

2 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

INSTRUMENTATION - GRIT AND SCREENINGS SYSTEM PID

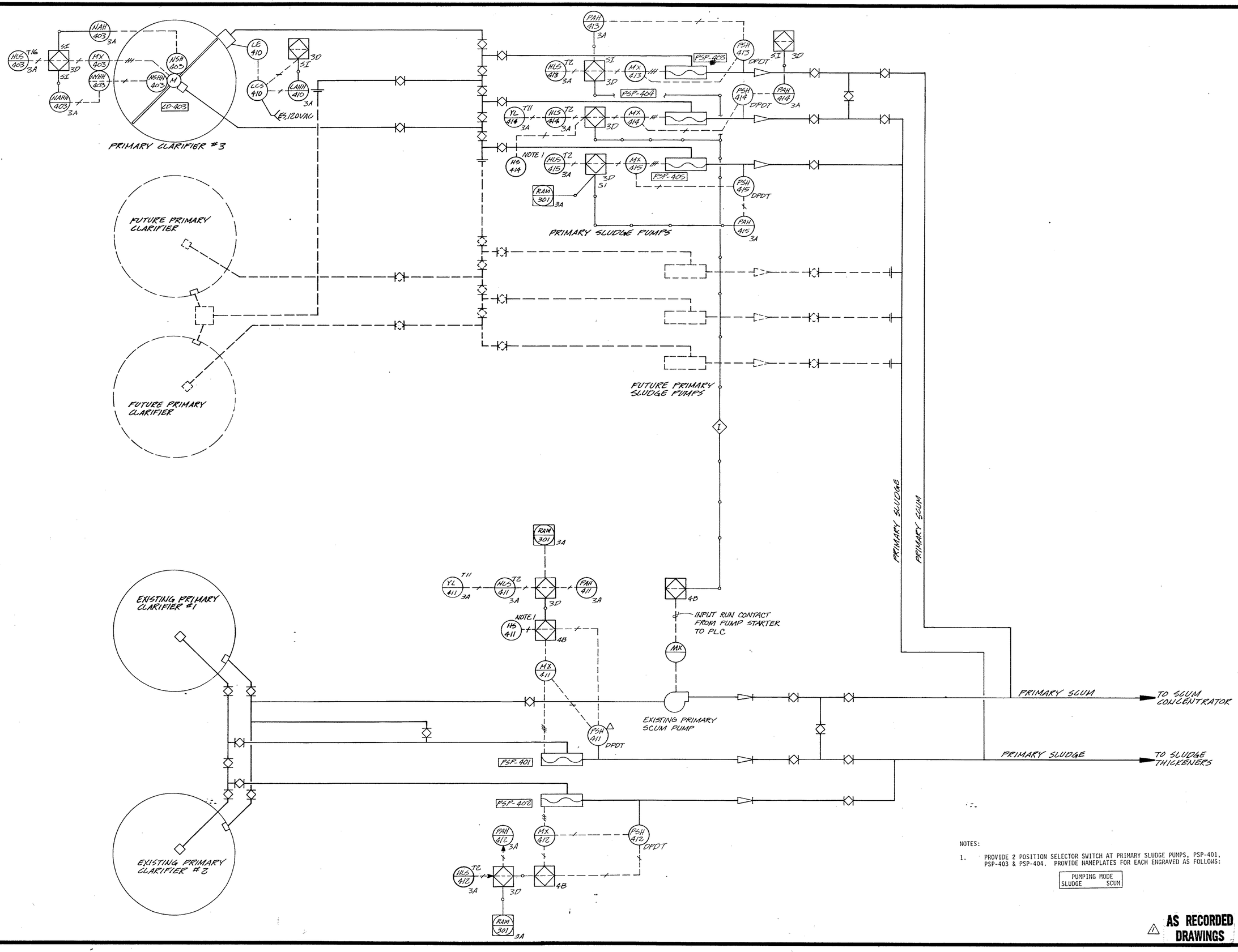
Designed: TDM
Drawn: CWA
Checked: WFE
Approved: Tom D. Marriott
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	AFA	CPC #83	12/9/92
2	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON JULY, 19 WILLIAM F. ETTLICH

Sheet Number: 1005



NOTES:

1. PROVIDE 2 POSITION SELECTOR SWITCH AT PRIMARY SLUDGE PUMPS, PSP-401, PSP-403 & PSP-404. PROVIDE NAMEPLATES FOR EACH ENGRAVED AS FOLLOWS:

PUMPING MODE	
SLUDGE	SCUM

AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

INSTRUMENTATION-PRIMARY SLUDGE PUMPING PID

Designed: TDM
Drawn: CWA
Checked: WFE
Approved: Lee D. Merritt
Date: MAY, 1989

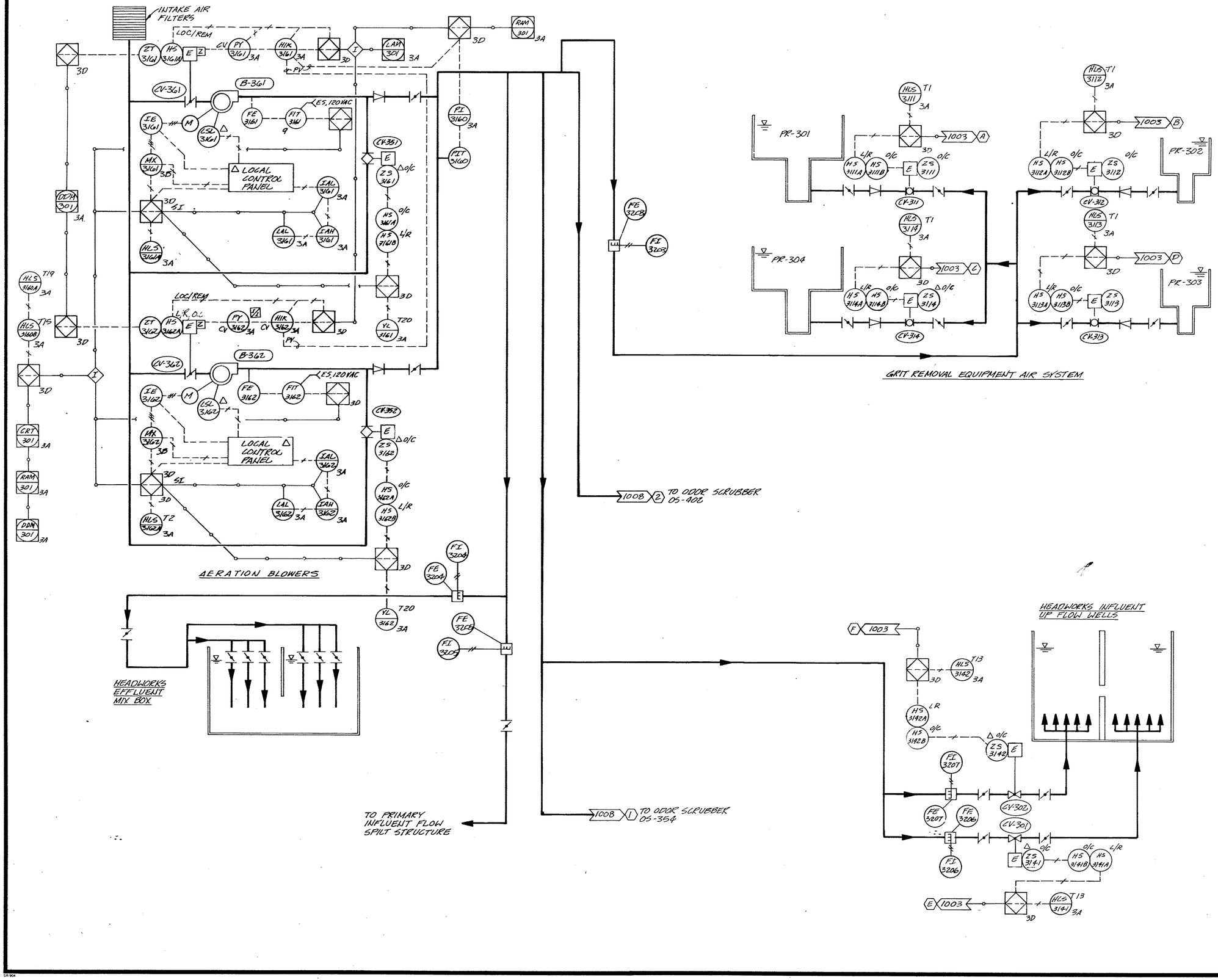
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No	By	Revision	Date
1	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4994 OREGON JULY 9, 1974 WILLIAM F. ETTLICH

Sheet Number: 1006

SR 904



CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

INSTRUMENTATION-LOW PRESSURE AIR PID

Designed RJT / TDM
Drawn CWA
Checked WFE
Approved Jon D. Meredith
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

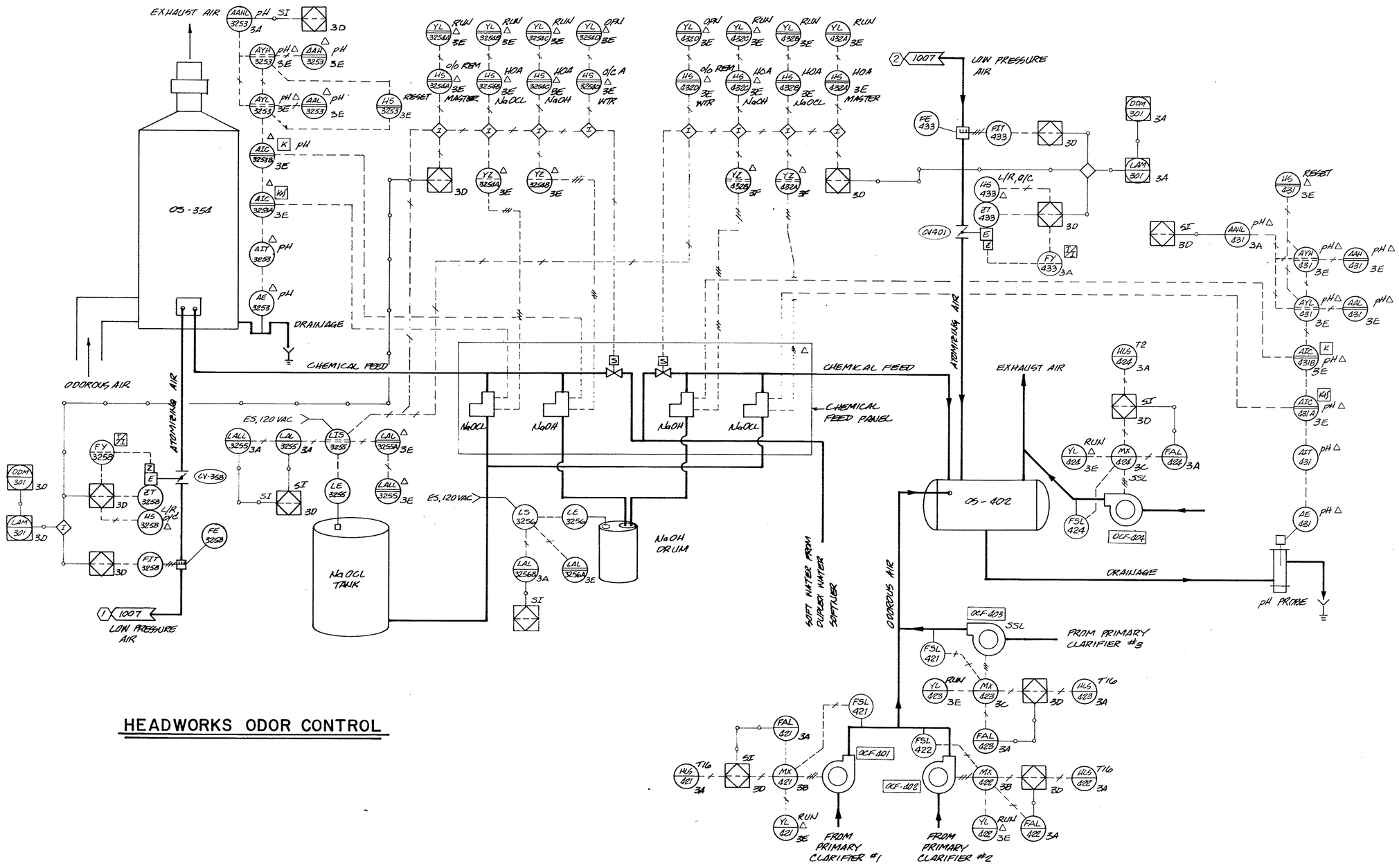
No	By	Revision	Date
1	AFM	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON JULY 9, 1976 WILLIAM F. ETLING

Sheet Number 1007

1 AS RECORDED DRAWINGS

SR 904



HEADWORKS ODOR CONTROL

PRIMARY CLARIFIER ODOR CONTROL

△2 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

INSTRUMENTATION-HEADWORKS AND PRIMARY CLARIFIER ODOR CONTROL PID

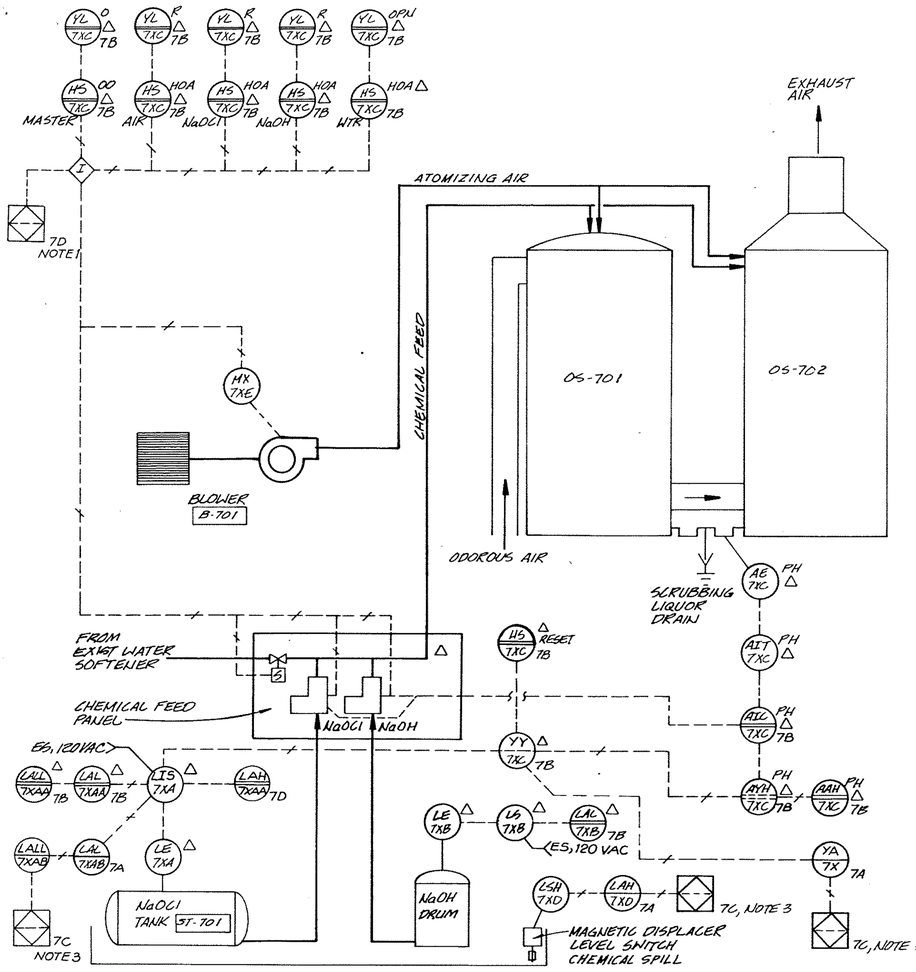
Designed TDM
Drawn CMA
Checked WFE
Approved Tom de Marrais
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

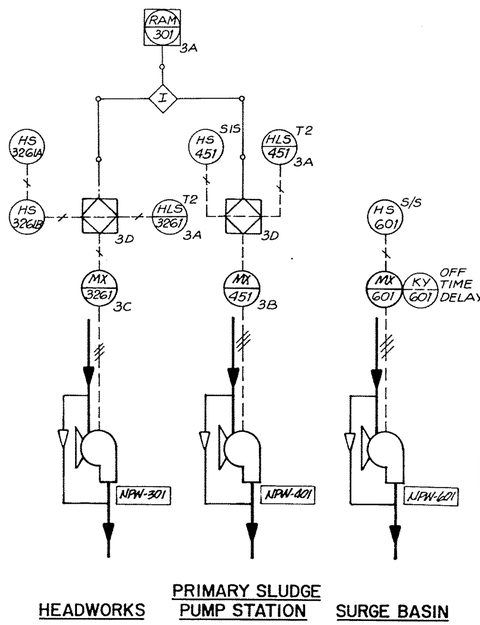
No	By	Revision	Date
1	AFA	CPR # 83	12/9/92
2	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON WILLIAM F. FELTON

Sheet Number 1008



SOLIDS HANDLING BUILDING ODOR CONTROL

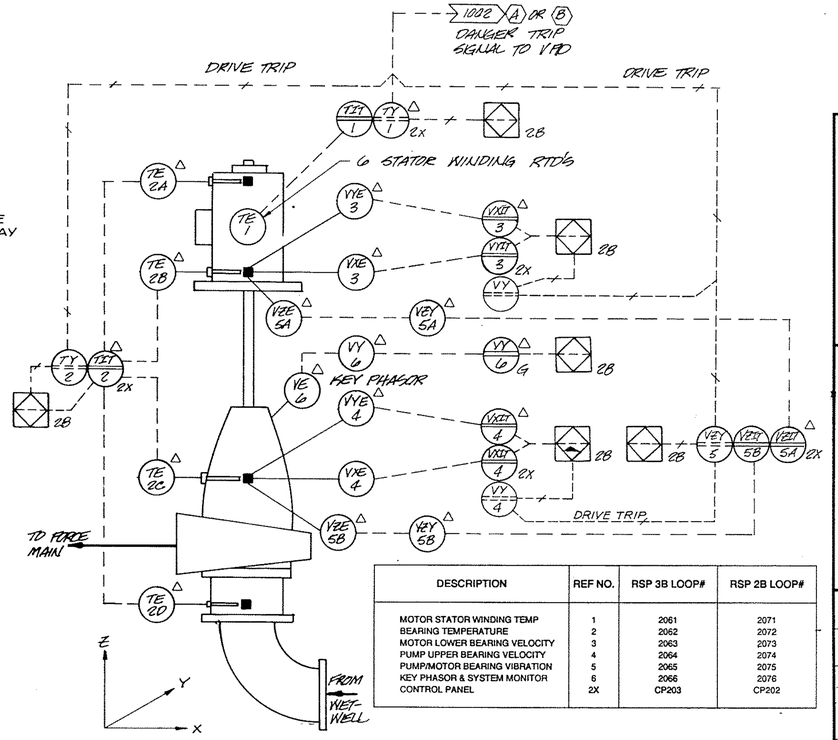


NON-POTABLE WATER SYSTEM

NOTES:

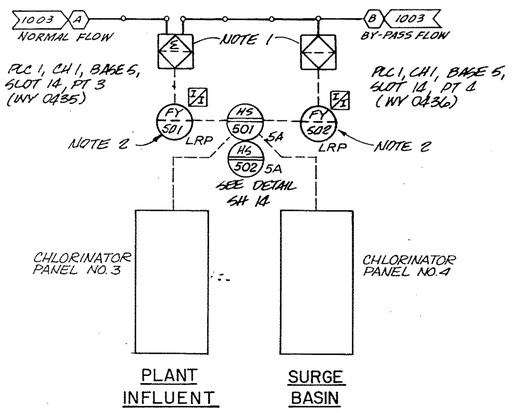
1. UTILIZE EXISTING SPARE OUTPUT POINTS AT PLC 1 AS SHOWN. PLC 1 IS LOCATED BEHIND LIQUIDS CONTROL PANEL IN LIQUIDS CONTROL BLDG.
2. INSTALL NEW ISOLATION RELAYS IN ACCESS SPACE BEHIND LIQUIDS CONTROL PANEL.
3. INPUT POINTS TO NEW TYPE 3 MODULE INSTALLED ON EXISTING PLC 2, CH. 1, BASE 0, LOCATED IN INCINERATOR BUILDING INSTRUMENT ROOM.
4. PROVIDE 3 POSITION SELECTOR SWITCH ADJACENT TO CS-401 WITH NAMEPLATE ENGRAVED AS FOLLOWS:-

CS-401	PACING	SIGNAL
NORMAL	OFF	BYPASS
FLOW		FLOW

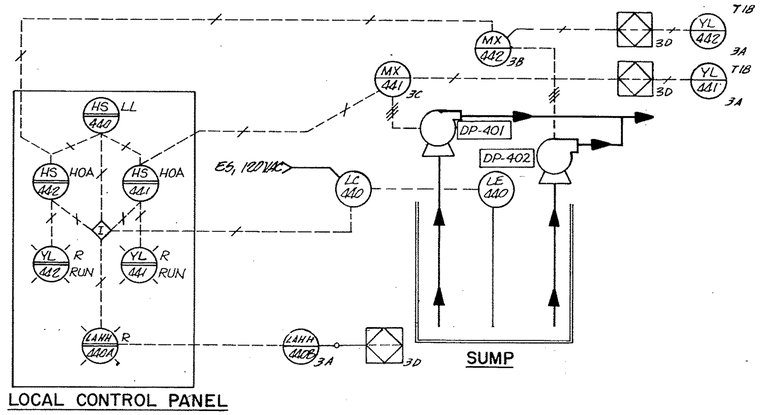


DESCRIPTION	REF NO.	RSP 3B LOOP#	RSP 2B LOOP#
MOTOR STATOR WINDING TEMP	1	2061	2071
BEARING TEMPERATURE	2	2062	2072
MOTOR LOWER BEARING VELOCITY	3	2063	2073
PUMP UPPER BEARING VELOCITY	4	2064	2074
PUMP/MOTOR BEARING VIBRATION	5	2065	2075
KEY PHASOR & SYSTEM MONITOR	6	2066	2076
CONTROL PANEL	2X	CP203	CP202

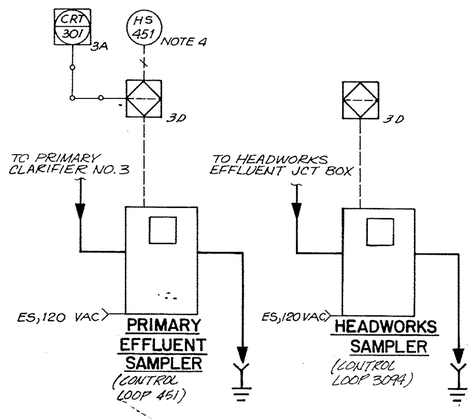
RSP 2B AND RSP 3B VIBRATION AND TEMPERATURE MONITORING



CHLORINATOR SYSTEM



PRIMARY SLUDGE PUMP STATION SUMP PUMPS



SAMPLER SYSTEM

△2 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

INSTRUMENTATION-MISCELLANEOUS P&ID

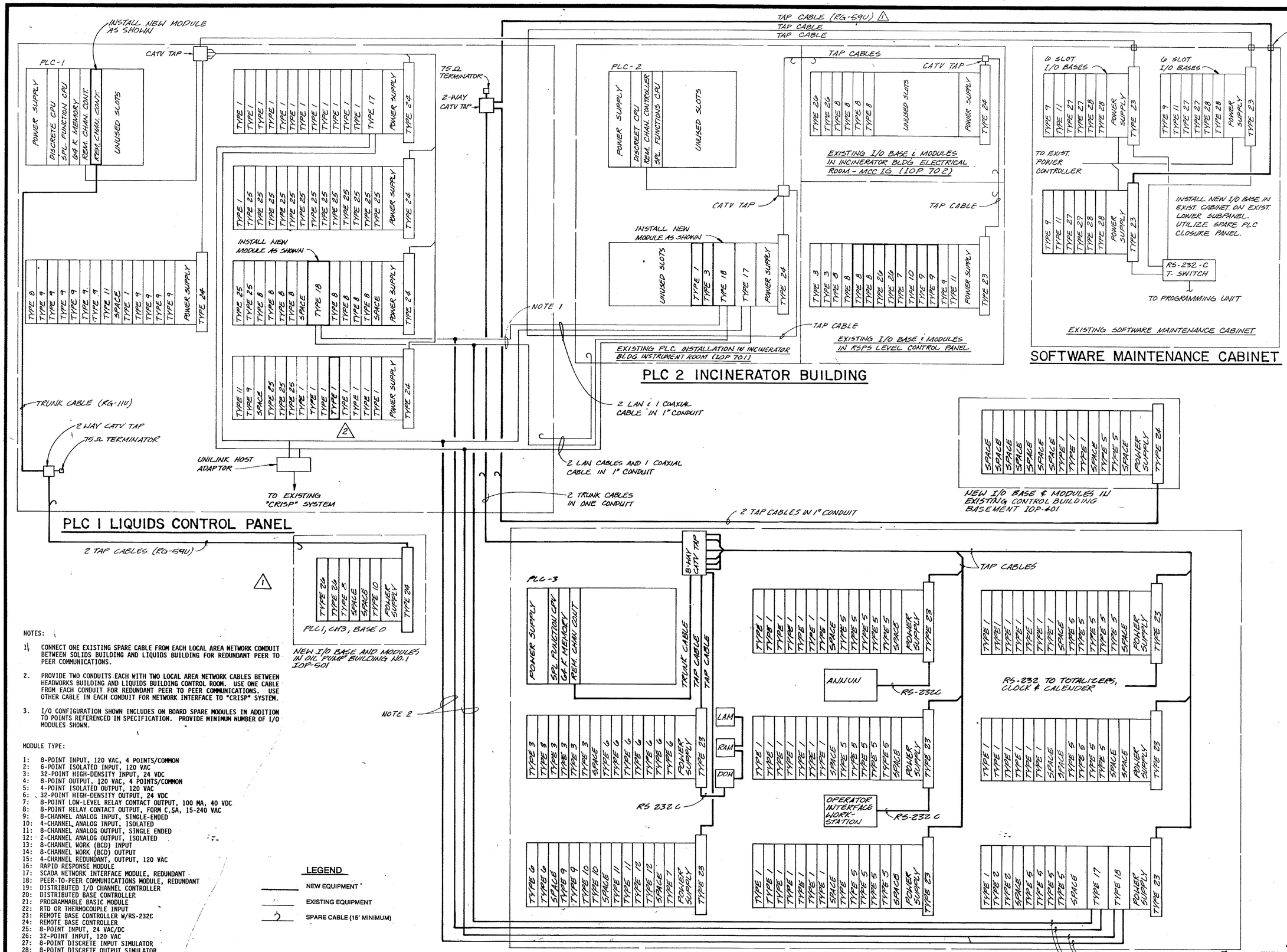
Designed RJT / TDM
Drawn CWA
Checked NEE
Approved Jon D. Merritt
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	AFA	CPE #83 AS RECORDED DRAWING	12/9/92
1	AFA		12/9/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON JULY 1, 1975 WILLIAM F. ETTLICH

Sheet Number 1009



NOTES:

1. CONNECT ONE EXISTING SPARE CABLE FROM EACH LOCAL AREA NETWORK CONDUIT BETWEEN SOLIDS BUILDING AND LIQUIDS BUILDING FOR REDUNDANT PEER TO PEER COMMUNICATIONS.
2. PROVIDE TWO CONDUITS EACH WITH TWO LOCAL AREA NETWORK CABLES BETWEEN HEADWORKS BUILDING AND LIQUIDS BUILDING CONTROL ROOM. USE ONE CABLE FROM EACH CONDUIT FOR REDUNDANT PEER TO PEER COMMUNICATIONS. USE OTHER CABLE IN EACH CONDUIT FOR NETWORK INTERFACE TO "CRISP" SYSTEM.
3. I/O CONFIGURATION SHOWN INCLUDES ON BOARD SPARE MODULES IN ADDITION TO POINTS REFERENCED IN SPECIFICATION. PROVIDE MINIMUM NUMBER OF I/O MODULES SHOWN.

MODULE TYPE:

1: 8-POINT INPUT, 120 VAC, 4 POINTS/COMMON
2: 6-POINT ISOLATED INPUT, 120 VAC
3: 32-POINT HIGH-DENSITY INPUT, 24 VDC
4: 8-POINT OUTPUT, 120 VAC, 4 POINTS/COMMON
5: 4-POINT ISOLATED OUTPUT, 120 VAC
6: 32-POINT HIGH-DENSITY OUTPUT, 24 VDC
7: 8-POINT LOW-LEVEL RELAY CONTACT OUTPUT, 100 MA, 40 VDC
8: 8-POINT RELAY CONTACT OUTPUT, FORM C,5A, 15-240 VAC
9: 8-CHANNEL ANALOG INPUT, SINGLE-ENDED
10: 4-CHANNEL ANALOG INPUT, ISOLATED
11: 8-CHANNEL ANALOG OUTPUT, SINGLE ENDED
12: 2-CHANNEL ANALOG OUTPUT, ISOLATED
13: 8-CHANNEL WORK (BCD) INPUT
14: 8-CHANNEL WORK (BCD) OUTPUT
15: 4-CHANNEL REDUNDANT, OUTPUT, 120 VAC
16: RAPID RESPONSE MODULE
17: SCADA NETWORK INTERFACE MODULE, REDUNDANT
18: PEER-TO-PEER COMMUNICATIONS MODULE, REDUNDANT
19: DISTRIBUTED I/O CHANNEL CONTROLLER
20: DISTRIBUTED BASE CONTROLLER
21: PROGRAMMABLE BASIC MODULE
22: RTD OR THERMOCOUPLE INPUT
23: REMOTE BASE CONTROLLER W/RS-232C
24: REMOTE BASE CONTROLLER
25: 8-POINT INPUT, 24 VAC/DC
26: 32-POINT INPUT, 120 VAC
27: 8-POINT DISCRETE INPUT SIMULATOR
28: 8-POINT DISCRETE OUTPUT SIMULATOR

LEGEND

- NEW EQUIPMENT
- EXISTING EQUIPMENT
- SPARE CABLE (15' MINIMUM)

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

INSTRUMENTATION-PLC CONFIGURATION

Designed	TDM
Drawn	CWA
Checked	WFE
Approved	Jon D. Monteith
Date	MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

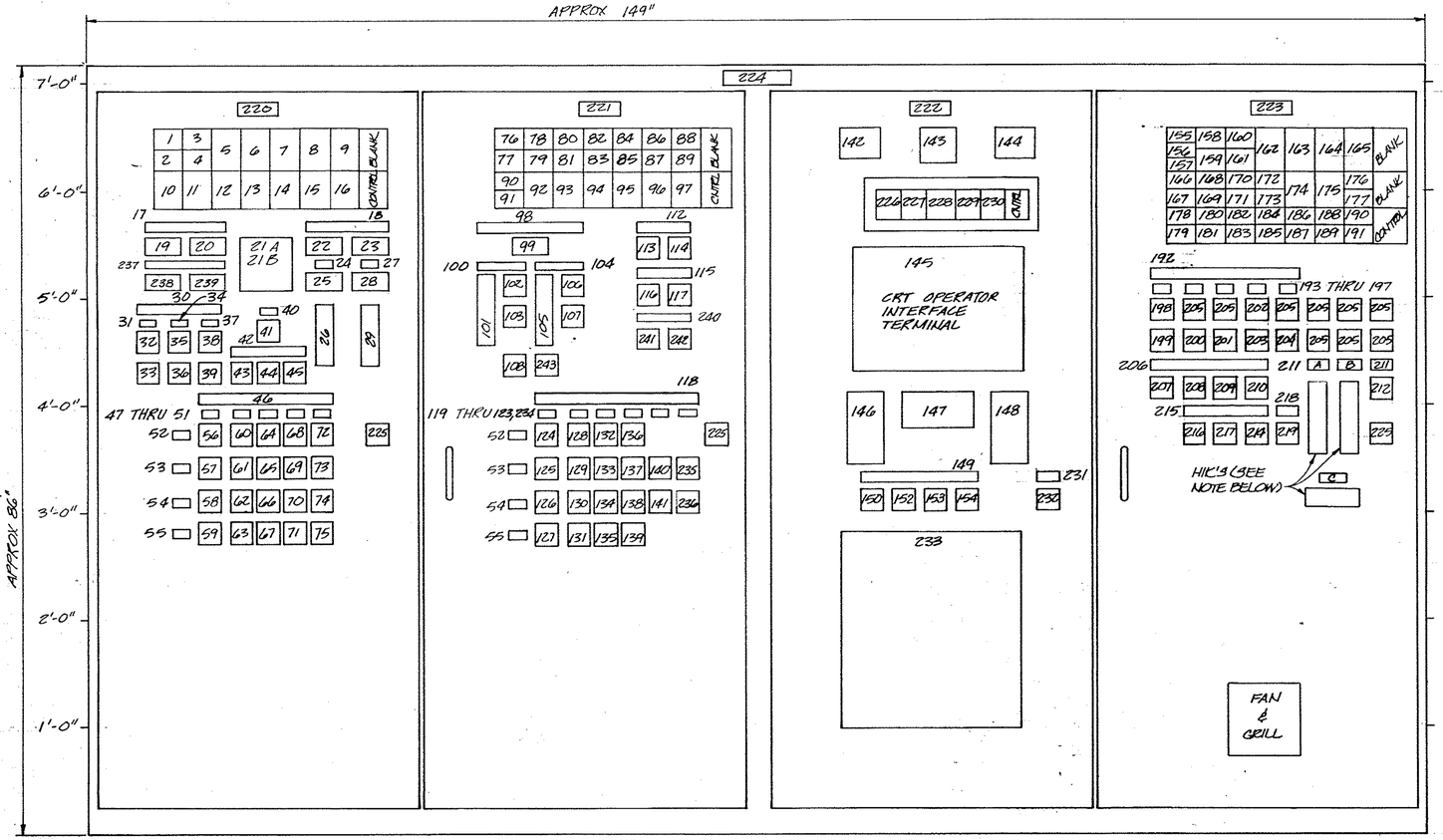
No	By	Revision	Date
1		ADDENDUM NO. 1	6-27-89
2	AFA	ADDENDUM NO. 2	6-30-89
3		AS RECORDED DRAWING	12/19/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON WILLIAM F. ETTRICH

3 AS RECORDED DRAWINGS

Sheet Number 1010

SR 904

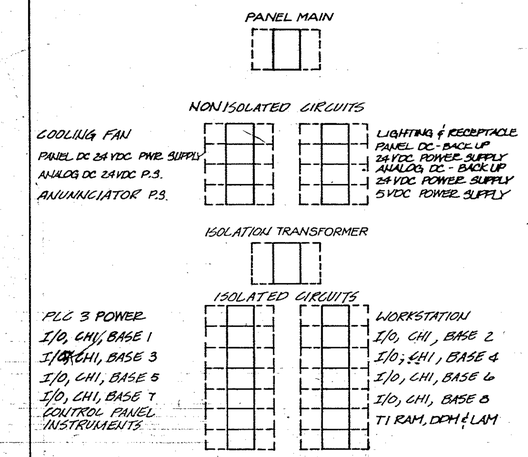


CP-301 HEADWORKS CONTROL PANEL

36" DEPTH

NOTE:
A = HIC W/NAMEPLATE - EXCESS FLOW VALVE CV-401
B = HIC W/NAMEPLATE - EXCESS FLOW VALVE CV-402
C = INDICATOR W/NAMEPLATE - PRIMARY EFFLUENT SPLITTER BOX LEVEL

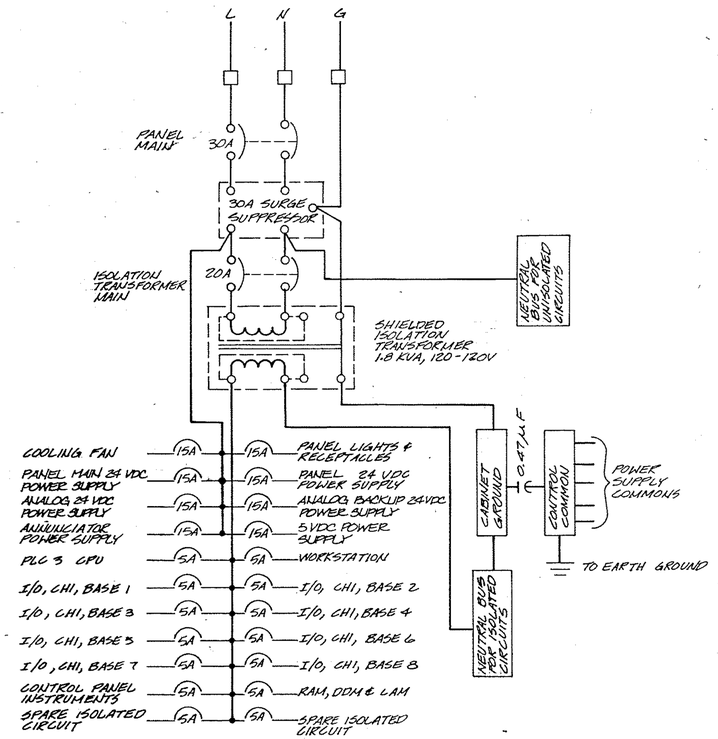
120VAC POWER DISTRIBUTION



ITEM 233 POWER DISTRIBUTION PANEL

NOTES FOR ITEM 233:

1. DESIGN BASED ON POTTER BRUMFIELD W91 BREAKERS.
2. MOUNT CIRCUIT BREAKERS ON DOOR OF ENCLOSURE USING COUNTERSUNK HOLES WITH FLATHEAD 6-32 SCREWS.
3. PROVIDE NAMEPLATE ENGRAVED AS SHOWN.
4. INSTALL NON-METALLIC INSULATING PANEL OVER STUDS OF CIRCUIT BREAKERS. MOUNT PANEL ON NYLON STANDOFFS.



CP-301 POWER DISTRIBUTION

NOTES:

1. SEE SHT 1012 FOR CONTROL PANEL SCHEDULE.
2. PROVIDE NAMEPLATES FOR ALL DEVICES AS SHOWN ON SCHEDULE. LOCATE NAME PLATES FOR ALL DEVICES BELOW INSTRUMENT.
3. PROVIDE 10" 560 CFM COOLING FAN AND FILTER ON BOTTOM OF RIGHT SIDE PANEL OF ENCLOSURE WITH EXHAUST GRILL AND FILTER AT UPPER LEFT SIDE PANEL. HOFFMAN ENGINEERING COOLING FAN AND FILTER A-PA10AXFN WITH EXHAUST GRILL AND FILTER A-EXGRID OR EQUAL.
4. PROVIDE THERMOSTAT (HOFFMAN D-TEMA) MOUNTED IN TOP OF ENCLOSURE IN SECTION C. ALSO PROVIDE FAN CONTROL SWITCH AS SHOWN. FAN SHALL OPERATE CONTINUOUSLY IN HAND MODE, BE OFF IN OFF MODE AND OPERATE AS CALLED BY THERMOSTAT IN AUTO.
5. UTILIZE SWING OUT SUBPANELS AS REQUIRED FOR MOUNTING EQUIPMENT.

△2 AS RECORDED DRAWINGS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

INSTRUMENTATION-CONTROL PANEL 301

Designed: TDM
Drawn: CWA
Checked: WPE
Approved: Thos D. Merrill
Date: MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
2	APA	AS RECORDED DRAWING CPR NO. 30	12/18/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON JULY 1, 1975 WILLIAM F. ETLICH

Sheet Number: 1011

SH 804

CP - 301

ITEM	TAG NO.	DESCRIPTION	LEGEND PLATE	NAME PLATE	SCALE/RANGE
1	LAH-3021	ALARM-YELLOW LENS	UPFLOW WELL 1/HI LEVEL		
2	LAHH-3021	ALARM-RED LENS	UPFLOW WELL 1/VERY HI LEVEL		
3	LAH-3022	ALARM-YELLOW LENS	UPFLOW WELL 2/HI LEVEL		
4	LAHH-3022	ALARM-RED LENS	UPFLOW WELL 2/VERY HI LEVEL		
5	NAH-3041	ALARM-WHITE LENS	BAR SCREEN S-301/OVERLOAD		
6	NAH-3042	ALARM-WHITE LENS	BAR SCREEN S-302/OVERLOAD		
7	NAH-3043	ALARM-WHITE LENS	BAR SCREEN S-303/OVERLOAD		
8	NAH-3044	ALARM-WHITE LENS	BAR SCREEN S-304/OVERLOAD		
9	SPARE	ALARM-WHITE LENS			
10	SPARE	ALARM-WHITE LENS			
11	SPARE	ALARM-WHITE LENS			
12	SPARE	ALARM-WHITE LENS			
13	SPARE	ALARM-WHITE LENS			
14	SPARE	ALARM-WHITE LENS			
15	SPARE	ALARM-WHITE LENS			
16	SPARE	ALARM-WHITE LENS			
17		NAMEPLATE		NORMAL FLOW	
18		NAMEPLATE		BYPASS FLOW	
19	FI-3092	PROCESS INDICATOR	MGD	FI-3092	0-50 MGD
20	FQI-3092	TOTALIZER	KGAL	FQI-3092	0-999,999 KGAL
21A	FR-3092	2 PEN RECORDER	MGD	FR-3092/NORMAL FLOW	0-50 MGD
21B	FR-3093	2 PEN RECORDER	MGD	FR-3092/BYPASS FLOW	0-90 MGD
22	FI-3093	PROCESS INDICATOR	MGD	FI-3093	0-90 MGD
23	FQI-3093	TOTALIZER	KGAL	FQI-3093	0-999,999 KGAL
24		NAMEPLATE		CONTROL SLIDE GATE/SG-341	
25	ZI-3081	PROCESS INDICATOR	% OPN	ZI-3081/SG-341 POSITION	0-100%
26	HIK-3081	MANUAL CONTROL STATION	PV:MGD/CV: %	HIK-3081/SG-341 MANUAL CTRL STATION	PV:0-50/CV:0-100
27		NAMEPLATE		CONTROL SLIDE GATE/SG-342	
28	ZI-3082	PROCESS INDICATOR	% OPN	ZI-3082/SG-342 POSITION	0-100 %
29	HIK-3082	MANUAL CONTROL STATION	PV: MGD/CV: %	HIK-3082/SG-342 MANUAL CTRL STATION	PV: 0-50/CV: 0-100
30		NAMEPLATE		FORCE MAINS & UPFLOW WELLS	
31		NAMEPLATE		FORCEMAIN & WELL #1	
32	HLS-101	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	CONTROL VALVE/CV-101	
33	HLS-3011	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	SLUICE GATE/SL-301	
34		NAMEPLATE		INTERCONNECTING VALVE & GATE	
35	HLS-103	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	CONTROL VALVE/CV-103	
36	HLS-3013	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	SLUICE GATE/SL-303	
37		NAMEPLATE		FORCE MAIN & WELL #2	
38	HLS-102	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	CONTROL VALVE/CV-102	
39	HLS-3012	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	SLUICE GATE/SL-302	
40		NAMEPLATE		NORMAL FLOW CHANNEL	
41	HLS-3071	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	SLIDE GATE/SG-331	
42		NAMEPLATE		FLOW CONTROL MODE	
43	YL-3000A	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT		
44	YL-3000B	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT		
45	YL-3000C	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT		
46		NAMEPLATE		FLOW CHANNEL LIQUID CONTROL SWITCHES	
47		NAMEPLATE		MASTER CONTROL SWITCHES	
48		NAMEPLATE		INLET SLIDE GATES	
49		NAMEPLATE		BAR SCREENS	
50		NAMEPLATE		PISTA ROTORS	
51		NAMEPLATE		OUTLET SLIDE GATE	
52		NAMEPLATE		FLOW CHANNEL 1	
53		NAMEPLATE		FLOW CHANNEL 2	
54		NAMEPLATE		FLOW CHANNEL 3	
55		NAMEPLATE		FLOW CHANNEL 4	
56	HLS-3051	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT		
57	HLS-3052	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT		
58	HLS-3053	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT		
59	HLS-3054	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT		
60	HLS-3031	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	SLIDE GATE/SG-311	
61	HLS-3032	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	SLIDE GATE/SG-312	
62	HLS-3033	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	SLIDE GATE/SG-313	
63	HLS-3034	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	SLIDE GATE/SG-314	
64	HLS-3041	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	BAR SCREEN/S-301	
65	HLS-3042	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	BAR SCREEN/S-302	
66	HLS-3043	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	BAR SCREEN/S-303	
67	HLS-3044	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	BAR SCREEN/S-304	
68	HLS-3051	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	PISTA ROTOR/PR-301	
69	HLS-3052	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	PISTA ROTOR/PR-302	
70	HLS-3053	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	PISTA ROTOR/PR-303	
71	HLS-3054	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	PISTA ROTOR/PR-304	
72	HLS-3061	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	SLIDE GATE/SG-321	
73	HLS-3062	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	SLIDE GATE/SG-322	
74	HLS-3063	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	SLIDE GATE/SG-323	
75	HLS-3064	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	SLIDE GATE/SG-324	
76	IAL-3161	ALARM-RED LENS	LPA BLOWER B-361/OVERLOAD		
77	IAH-3161	ALARM-RED LENS	LPA BLOWER B-361/OVERLOAD		
78	VAH-3161	ALARM-YELLOW LENS	LPA BLOWER B-361 VIBR ALERT		
79	VAHH-3161	ALARM-RED LENS	LPA BLOWER B-361 VIBR DANGER		
80	LAL-3161	ALARM-RED LENS	LPA BLOWER B-361 LOW OIL LVL		
81	LAL-3162	ALARM-RED LENS	LPA BLOWER B-362 LOW OIL LVL		
82	IAL-3162	ALARM-RED LENS	LPA BLOWER B-362 SURGE		
83	IAH-3162	ALARM-RED LENS	LPA BLOWER B-362 OVERLOAD		
84	VAH-3162	ALARM-YELLOW LENS	LPA BLOWER B-362 VIBR ALERT		
85	VAHH-3162	ALARM-RED LENS	LPA BLOWER B-362 VIBR DANGER		
86	SAL-3201	ALARM-RED LENS	SCREENINGS CONVEYOR ZERO SPD		
87	ZA-3201	ALARM-RED LENS	SCREENINGS CONVEYOR MISALIGNMENT		
88	SAL-3202	ALARM-RED LENS	CROSS CONVEYOR ZERO SPD		
89	ZA-3202	ALARM-RED LENS	CROSS CONVEYOR MISALIGNMENT		
90	LAL-3255	ALARM-YELLOW LENS	NaOCl TANK LEVEL LOW		
91	LALL-3255	ALARM-RED LENS	NaOCl TANK LEVEL VERY LOW		
92	LAL-3256	ALARM-WHITE LENS	NaOH DRUM LEVEL LOW		
93	AAHL-3253	ALARM-YELLOW LENS	ODOR SCRUBBER OS-354 PH OUT OF LIMITS		
94	AAHL-431	ALARM-YELLOW LENS	ODOR SCRUBBER OS-402 PH OUT OF LIMITS		
95	AAH-3210	ALARM-RED LENS	H2S DANGER		
96	AAH-3211	ALARM-RED LENS	HI EXP DANGER		
97	SPARE	ALARM-WHITE LENS			
98		NAMEPLATE		LOW PRESSURE AIR SYSTEM	
99	PI-3160	PROCESS INDICATOR	PSI	PI-3160/LPA HDR PRESSURE	0-10 PSI
100		NAMEPLATE		LPA BLOWER/B-361	
101	HIK-3161	MANUAL CONTROL STATION	PV:0-10 PSI/CV:0-100%	HIK-3161/SUCTION VALVE CV-361/ MANUAL CONTROL STATION	PV:0-10/CV:0-100
102	HLS-3161A	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	LPA BLOWER/B-361	
103	HLS-3161B	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	BYPASS VALVE/CV-351	
104		NAMEPLATE		LPA BLOWER/B-362	
105	HIK-3162	MANUAL CONTROL STATION	PV:0-10 PSI/CV:0-100%	HIK-3162/SUCTION VALVE CV-362 MANUAL CONTROL STATION	PV:0-10/CV:0-100
106	HLS-3162A	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	LPA BLOWER/B-362	
107	HLS-3162B	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	BYPASS VALVE/CV-352	
108	HLS-3160	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT		
109		NOT USED			
110		NOT USED			
111		NOT USED			
112		NAMEPLATE		NON POTABLE WATER PUMPS	
113	HLS-3260	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	HEADWORKS NPW PUMP/NPW-301	
114	YL-450	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	PRIMARY SLUDGE PUMP STATION/NPW-401	
115		NAMEPLATE		CONVEYORS	
116	HLS-3201	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	SCREENINGS CONVEYOR/C-301	
117	YL-3202	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	CROSS CONVEYOR/C-302	
118		NAMEPLATE		FLOW CHANNEL GRIT SYSTEM CTRL SWITCHES	
119		NAMEPLATE		AIR SCOUR CONTROL VALVES	
120		NAMEPLATE		WATER SCOUR CONTROL VALVES	
121		NAMEPLATE		NORMAL GRIT PUMPS	
122		NAMEPLATE		STANDBY GRIT PUMPS	
128		NAMEPLATE		STANDBY GRIT PUMPS/WATER FLUSH VALVES	

CP-301 (CONT)

ITEM	TAG NO.	DESCRIPTION	LEGEND PLATE	NAME PLATE	SCALE/RANGE
124	HLS-3111	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	AIR SCOUR CONTROL VALVE/CV-311	
125	HLS-3112	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	AIR SCOUR CONTROL VALVE/CV-312	
126	HLS-3113	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	AIR SCOUR CONTROL VALVE/CV-313	
127	HLS-3114	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	AIR SCOUR CONTROL VALVE/CV-314	
128	HLS-3121	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	WATER SCOUR CONTROL VALVE/CV-321	
129	HLS-3122	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	WATER SCOUR CONTROL VALVE/CV-322	
130	HLS-3123	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	WATER SCOUR CONTROL VALVE/CV-323	
131	HLS-3124	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	WATER SCOUR CONTROL VALVE/CV-324	
132	HLS-3101	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	GRIT PUMP/GP-301	
133	HLS-3102	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	GRIT PUMP/GP-302	
134	HLS-3103	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	GRIT PUMP/GP-303	
135	HLS-3104	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	GRIT PUMP/GP-304	
136	YL-3105	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	GRIT PUMP/GP-305	
137	HLS-3105	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	GRIT PUMP/GP-305	
138	YL-3106	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	GRIT PUMP/GP-306	
139	HLS-3106	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	GRIT PUMP/GP-306	
140	HLS-3125	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	WATER FLUSH VALVE/CV-325	
141	HLS-3126	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	WATER FLUSH VALVE/CV-326	
142		REMOTE CALENDAR DISPLAY	MONTH/DAY	DATE	00/00
143		ANNUNCIATOR HORN			
144		REMOTE 24 HR CLOCK DISPLAY	HR/MIN/SEC	TIME	00:00:00
145		CRT OPERATOR INTERFACE WORKSTATION			
146	LAM-301	PLC LOOP ACCESS MODULE		LAM-301/LOOP ACCESS MODULE	
147	DDM-301	PLC DATA DISPLAY MODULE		DDM-301/DATA DISPLAY MODULE	
148	RAM-301	PLC REGISTER ACCESS MODULE		RAM-301/REGISTER ACCESS MODULE	
149		NAMEPLATE		ANNUNCIATOR CONTROL SWITCHES	
150		MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT (TYPE 19)	ACKNOWLEDGE MODE	
151		NOT USED			
152		MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT (TYPE 21)	ALARM ACKNOWLEDGE	
153		MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT (TYPE 22)	ALARM RESET	
154		MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT (TYPE 23)	ANNUNCIATOR & LAMP TEST	
155	NAH-403	ALARM-YELLOW LENS	PRI CLAR #3/HI TORQUE		
156	NAHH-403	ALARM-RED LENS	PRI CLAR #3/VERY HI TORQUE		
157	LAHH-410	ALARM-RED LENS	PRI CLAR #3/SCUM PIT VERY HI LVL		
158	FUTURE	ALARM-YELLOW LENS			
159	FUTURE	ALARM-RED LENS			
160	FUTURE	ALARM-YELLOW LENS			
161	FUTURE	ALARM-RED LENS			
162	FUTURE	ALARM-RED LENS			
163	SPARE	ALARM-WHITE LENS			
164	SPARE	ALARM-WHITE LENS			
165	SPARE	ALARM-WHITE LENS			
166	PAH-411	ALARM-RED LENS	PRI SLDG PMP/P-401/HI DISCH PRES		
167	PAH-412	ALARM-RED LENS	PRI SLDG PMP/P-402/HI DISCH PRES		
168	PAH-413	ALARM-RED LENS	PRI SLDG PMP/P-403/HI DISCH PRES		
169	PAH-414	ALARM-RED LENS	PRI SLDG PMP/P-404/HI DISCH PRES		
170	PAH-415	ALARM-RED LENS	PRI SLDG PMP/P-405/HI DISCH PRES		
171	FUTURE	ALARM-RED LENS			
172	FUTURE	ALARM-RED LENS			
173	FUTURE	ALARM-RED LENS			
174	LAHH-440B	ALARM-RED LENS	PRI SLDG PMP STA/VERY HI SUMP LVL		
175	SPARE	ALARM-WHITE LENS			
176	SPARE	ALARM-WHITE LENS			
177	SPARE	ALARM-WHITE LENS			
178	FAL-421	ALARM-RED LENS	ODOR CTRL FAN/OCF-401/LO AIR FLOW		
179	FAL-422	ALARM-YELLOW LENS	ODOR CTRL FAN/OCF-402/LO AIR FLOW		
180	FAL-423	ALARM-YELLOW LENS	ODOR CTRL FAN/OCF-403/LO AIR FLOW		
181	FAL-424	ALARM-YELLOW LENS	ODOR CTRL FAN/OCF-404/LO AIR FLOW		
182	SPARE	ALARM-WHITE LENS			
183	SPARE	ALARM-WHITE LENS			
184	SPARE	ALARM-WHITE LENS			
185	SPARE	ALARM-WHITE LENS			
186	SPARE	ALARM-WHITE LENS			
187	SPARE	ALARM-WHITE LENS			
188	SPARE	ALARM-WHITE LENS			
189	SPARE	ALARM-WHITE LENS			
190	SPARE	ALARM-WHITE LENS			
191	SPARE	ALARM-WHITE LENS			
192		NAMEPLATE		PRIMARY SLUDGE PUMPS	
193		NAMEPLATE		PRIMARY SLUDGE PUMP/PSP-401	
194		NAMEPLATE		PRIMARY SLUDGE PUMP/PSP-402	
195		NAMEPLATE		PRIMARY SLUDGE PUMP/PSP-403	
196		NAMEPLATE		PRIMARY SLUDGE PUMP/PSP-404	
197		NAMEPLATE		PRIMARY SLUDGE PUMP/PSP-405	
198	YL-411	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT		
199	HLS-411	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT		
200	HLS-412	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT		
201	HLS-413	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT		
202	YL-414	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT		
203	HLS-414	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT		
204	HLS-415	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT		
205		CUTOUT WITH COVER PLATE			
206		NAMEPLATE		ODOR CONTROL FANS	
207	HLS-421	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	ODOR CONTROL FAN/OCF-401	
208	HLS-422	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	ODOR CONTROL FAN/OCF-402	
209	HLS-423	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	ODOR CONTROL FAN/OCF-403	
210	HLS-424	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	ODOR CONTROL FAN/OCF-404	
211		NAMEPLATE		EXCESS FLOW CONTROL	
212	HLS-401	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	PRIMARY INFLUENT SLIDE GATE/SG-401	
213	HLS-402	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	PRIMARY EFFLUENT SLIDE GATE/SG-402	
214	YL-443	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	DEWATERING PUMP/DP-403	
215		NAMEPLATE		PRIMARY SLUDGE PUMP STATION SUMP	
216	YL-441	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	DEWATERING PUMP/DP-401	
217	YL-442	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	DEWATERING PUMP/DP-402	
219	HLS-403	MULTI-FUNCTION SWITCH INDICATOR		HEADWORKS-LIQUID STREAM	
220		NAMEPLATE			
221		NAMEPLATE		HEADWORKS-SCREENINGS, GRIT, LPA & ODOR CONTROL	
222		NAMEPLATE		OPERATOR INTERFACE DEVICES & GENERAL	
223		NAMEPLATE		PRIMARY CLARIFICATION & SLUDGE	
224		NAMEPLATE		CP-301	
225		MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT (TYPE 24)		
226		ALARM-YELLOW LENS		PLC TROUBLE	
227		ALARM-RED LENS		MCC-301 POWER FAILURE	
228		ALARM-RED LENS		MCC-302 POWER FAILURE	
229		ALARM-WHITE LENS		BUS TIE CKT BKR CLOSED	
230	SPARE	ALARM-WHITE LENS			
231		NAMEPLATE		PANEL COOLING FAN	
232		MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT (TYPE 2)		
233		POWER DISTRIBUTION PANEL		SEE DETAIL	
234		NAMEPLATE		GRIT CLASSIFIERS	
235	HLS-3131	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	GRIT CLASSIFIER/GC-301	
236	HLS-3132	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	GRIT CLASSIFIER/GC-302	
237		NAMEPLATE		UPFLOW WELL LEVELS	
238	LIY-3021	PROCESS INDICATOR WITH RELAY		LIY-3021/UPFLOW WELL 1 LEVEL	
239	LIY-3022	PROCESS INDICATOR WITH RELAY		LIY-3022/UPFLOW WELL 2 LEVEL	
240		NAMEPLATE		UPFLOW WELL AERATION	
241	HLS-3141	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	CONTROL VALVE CV-301	
242	HLS-3142	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT	CONTROL VALVE CV-302	
243	HLS-3160B	MULTI-FUNCTION SWITCH INDICATOR	SEE LAYOUT		

SR 904

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DURHAM AWWTP PHASE I EXPANSION

INSTRUMENTATION-CONTROL PANEL 301 SCHEDULES

Designed: TDM
Drawn: SDS
Checked: WFE
Approved: Tom D. Merritt
Date: MAY, 1989

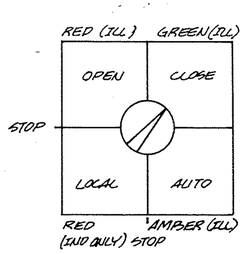
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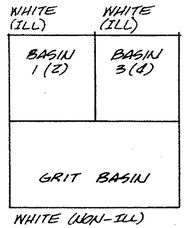
REGISTERED PROFESSIONAL ENGINEER 4994 OREGON WILLIAM F. ETTER

Sheet Number: 1012

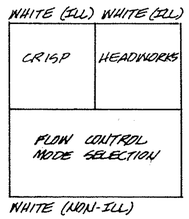
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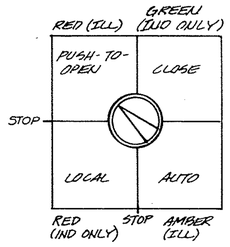
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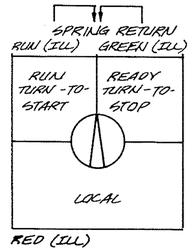
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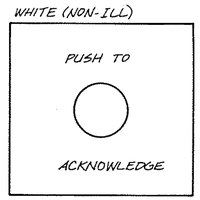
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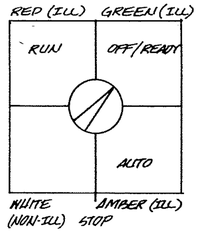
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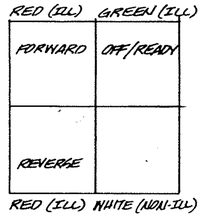
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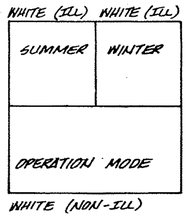
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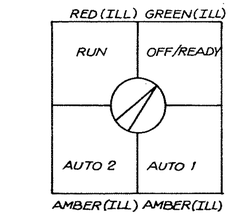
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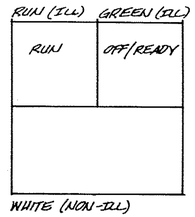
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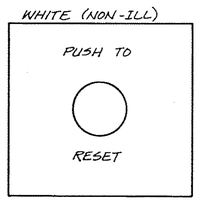
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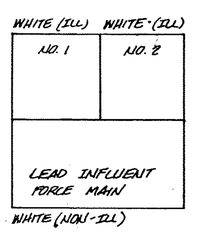
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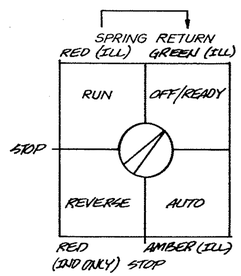
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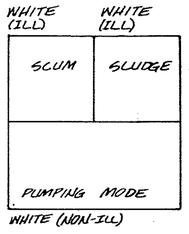
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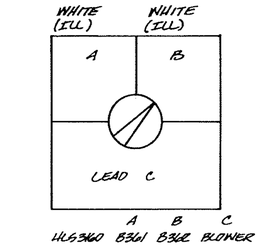
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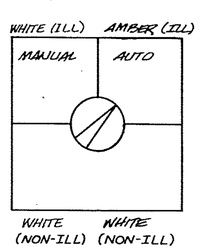
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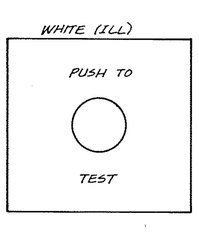
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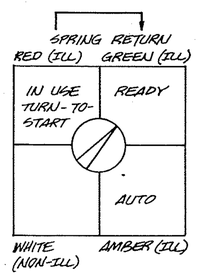
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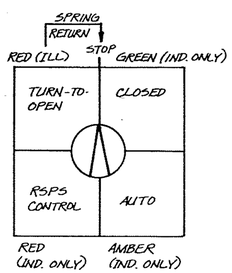
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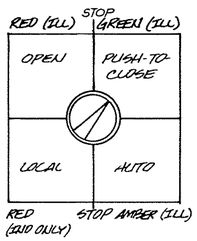
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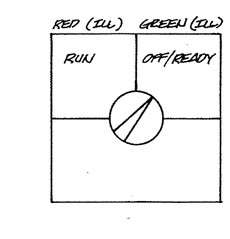
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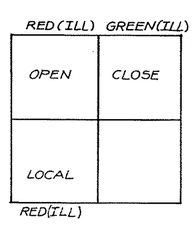
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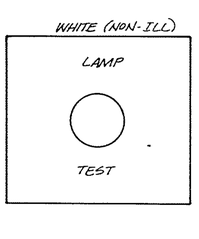
TYPE 12



TYPE 16



TYPE 20



TYPE 24

⚠ AS RECORDED DRAWINGS

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DURHAM AWWTP PHASE I EXPANSION

INSTRUMENTATION-DETAILS

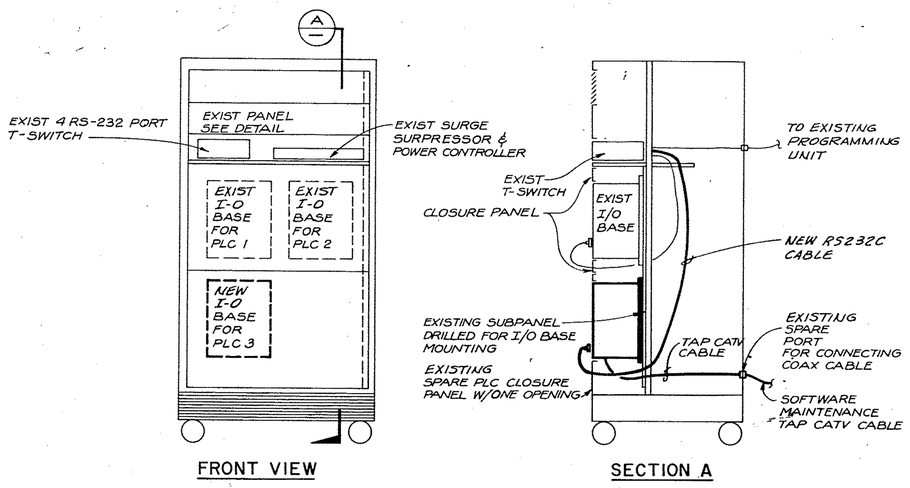
Designed TDM
Drawn SDS
Checked WFE
Approved Tom McMinnis
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

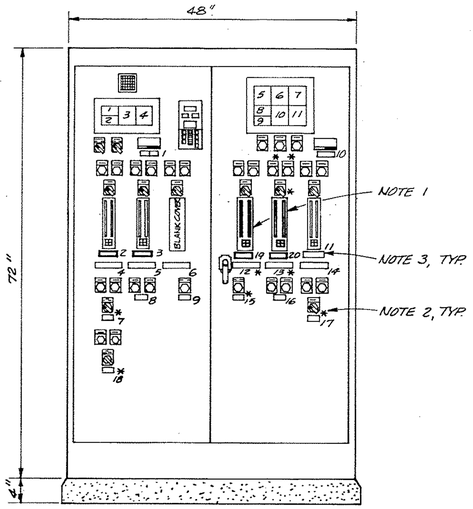
No	By	Revision	Date
⚠	AFA	AS RECORDED DRAWING	12/9/92

REGISTERED PROFESSIONAL ENGINEER 4894 OREGON WILLIAM F. EITLISH

Sheet Number 1013



SOFTWARE MAINTENANCE CABINET MODIFICATIONS



REVISIONS TO EXISTING LEVEL CONTROL PANEL, CP-201

ANNUNCIATOR SCHEDULE INCINERATOR BUILDING		
DEVICE NO.	TAG NO.	ENGRAVING
11	LAL-7XAB	LOW NaCOI LEVEL
12	LLAL-7XAB	VERY LOW NaOCL LEVEL
13	YA-7XC	ODOR CONTROL SYSTEM FAILURE
14	LAH-7XD	ODOR CONTROL SYSTEM CHEMICAL SPILL

CP-201 ANNUNCIATOR SCHEDULE			
NO.	LINE-1	LINE-2	LINE-3
1	WET WELL - A	HIGH LEVEL	
2	WET WELL - A	LOW LEVEL	
3	RS PUMP 2A	VFD	FAILED
4			
5	VERY HIGH	WET WELL	LEVEL
6	PUMP ROOM	FLOOD	
7			
8	WET WELL - B	HIGH LEVEL	
9	WET WELL - B	LOW LEVEL	
10	RS PUMP 3B	VFD	FAILED
11	RS PUMP 2B	VFD	FAILED

CP-201 NAMEPLATE SCHEDULE					
NO.	LINE - 1	LINE - 2	SIZE	LETTERS	REMARKS
1	WET WELL - A	LEVEL	1 X 3	3/16"	
2	MANUAL CONTROL STATION	HIK-303	1 X 3	3/16"	REPLACE, SEE NOTE 3
3	MANUAL CONTROL STATION	HIK-304	1 X 3	3/16"	REPLACE, SEE NOTE 3
4	PUMP 1A VFD		1 X 3	3/16"	
5	PUMP 2A VFD		1 X 3	3/16"	
6	PUMP 1A		1 X 3	3/16"	
7	FORCE MAIN - A	VALVE CONTROL	1 X 3	3/16"	
8	INFLUENT GATE - A		1 X 3	3/16"	
9	LEAD PUMP	SELECT	1 X 3	3/16"	
10	WET WELL - B	LEVEL	1 X 3	3/16"	
11	MANUAL CONTROL STATION	HIK-306	1 X 3	3/16"	REPLACE, SEE NOTE 3
12	PUMP 3B VFD		1 X 3	3/16"	
13	PUMP 2B VFD		1 X 3	3/16"	
14	PUMP 1B VFD		1 X 3	3/16"	
15	LEAD PUMP	SELECT	1 X 3	3/16"	
16	INFLUENT GATE - B		1 X 3	3/16"	
17	FORCE MAIN - B	VALVE CONTROL	1 X 3	3/16"	
18	FORCE MAIN TIE	VALVE CONTROL	1 X 3	3/16"	
19	MANUAL CONTROL STATION	HIK-206	1 X 3	3/16"	NEW
20	MANUAL CONTROL STATION	HIK-207	1 X 3	3/16"	NEW

CP-201 NOTES:

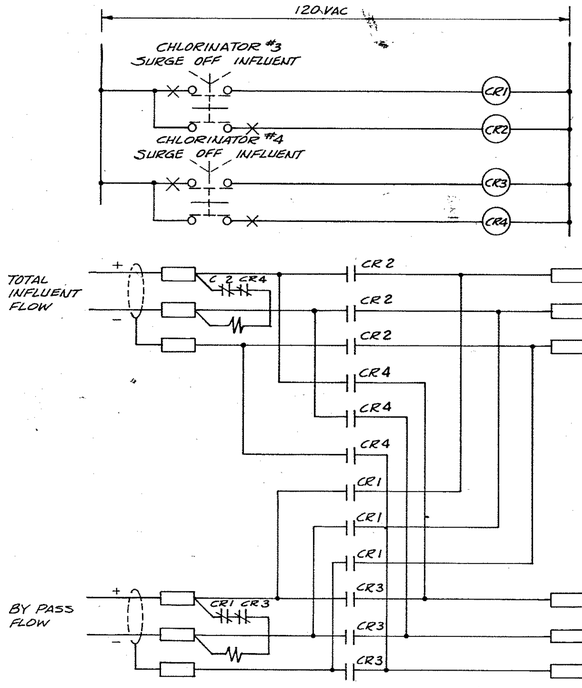
1. INSTALL NEW MANUAL CONTROL STATIONS IN EXISTING PANEL CUTOUTS AT RSP-2B & RSP-3B. LEAVE BLANK COVERS IN INTERIOR OF PANEL.
2. LEGEND PLATES AND NAMEPLATES DESIGNATED WITH AN ASTERISK (*) HAVE BEEN INSTALLED REVERSED. REMOVE AND REINSTALL WITH INSCRIPTION FACING OUT.
3. REMOVE ALL NAMEPLATES FOR THE MANUAL CONTROL STATIONS. PROVIDE NEW 1"X 3" NAMEPLATE WITH 3/16" LETTERING INSCRIBED AS FOLLOWS:

PUMP	NO.	NAMEPLATE
RSP1A	4	MANUAL CONTROL STATION/HIK-203
RSP2A	5	MANUAL CONTROL STATION/HIK-204
RSP1B	11	MANUAL CONTROL STATION/HIK-208

4. RELABEL INSTRUMENTS IN INTERIOR OF PANEL AS FOLLOWS:

EXISTING	REVISED
LT-300	LT-201
LT-301	LT-202
ISR-302	LYHH-200
LY-304	LY-204
LSHL-300	LSHL-201
LSHL-301	LSHL-202
LY-303	LY-203
LY-306	LY-206

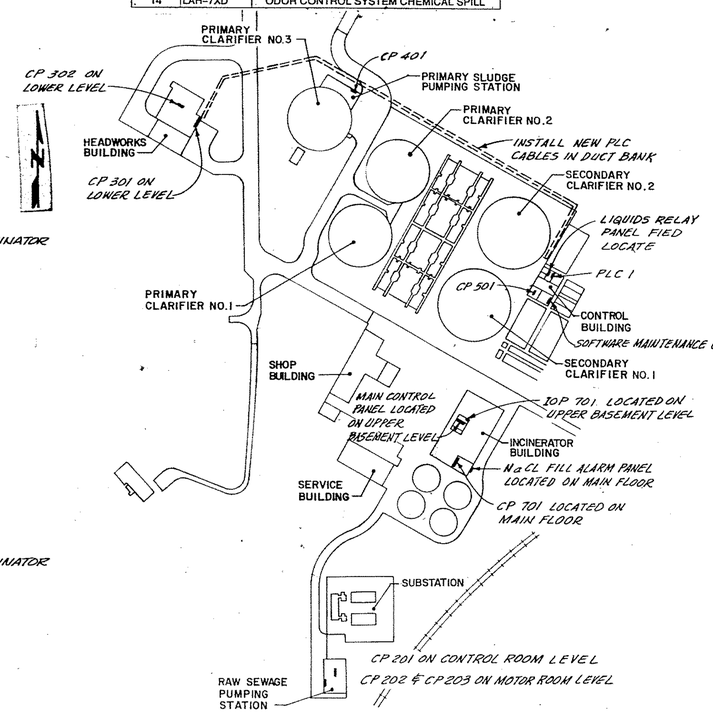
5. INSTALL ADDITIONAL TERMINAL BLOCKS AS REQUIRED ON SIDE PANELS TO ACCOMODATE NEW FIELD WIRING.
6. KEY PLAN SHOWS APPROXIMATE LOCATIONS OF CONTROL PANELS. SEE ELECTRICAL PLANS FOR EXACT LOCATIONS.



CHLORINATOR CONTROL PANEL CP-501 SCHEMATIC

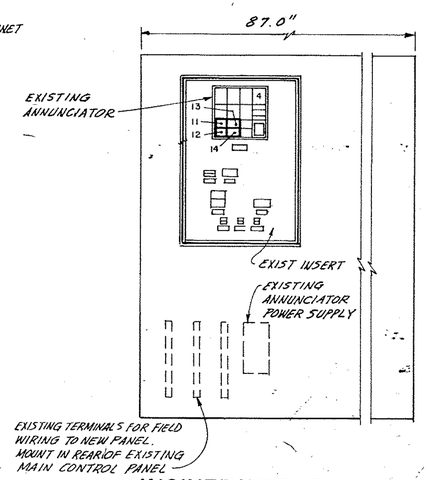
NOTES:

1. RELAYS SHALL BE OF THE PLASTIC ENCASED TYPE AND SHALL HAVE LOW VOLTAGE GOLD FLASHED CONTACTS.
2. CP-501 SHALL BE NEMA 4X FIBERGLASS REINFORCED PLASTIC, NOT STAINLESS STEEL.



KEY PLAN

NO SCALE
SEE CP-201 NOTE 6



INCINERATOR BUILDING MAIN CONTROL PANEL

AS RECORDED DRAWINGS

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Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

INSTRUMENTATION-DETAILS

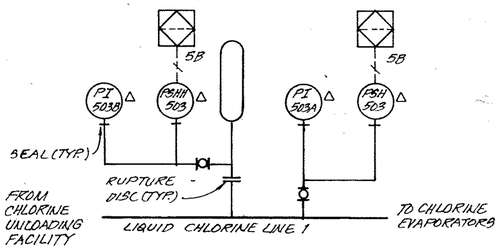
Designed TOM
Drawn IKO/MLW
Checked WFE
Approved Tom D'Amerita
Date MAY, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

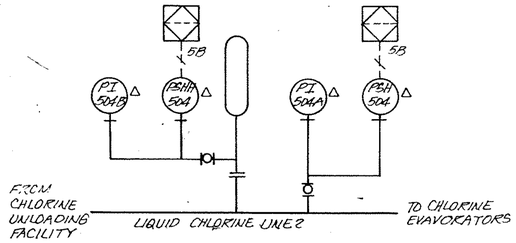
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1	AFA	AS RECORDED DRAWING	12/19/92

REGISTERED PROFESSIONAL ENGINEER 3894 OREGON JULY 1, 19 WILLIAM F. ETLICH

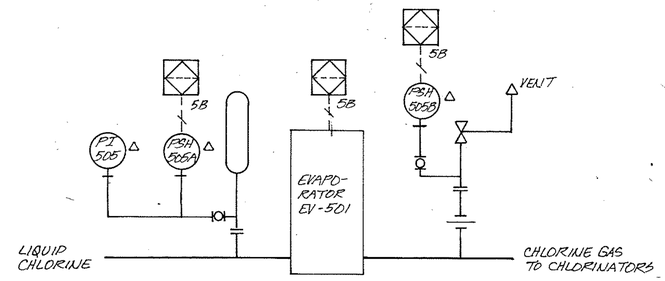
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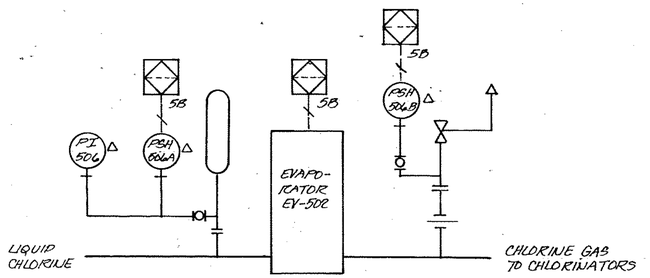
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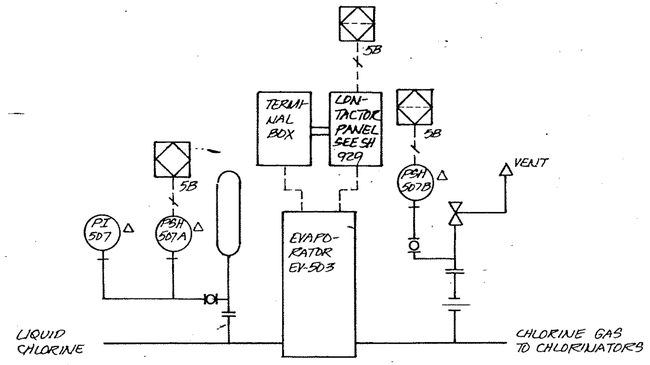
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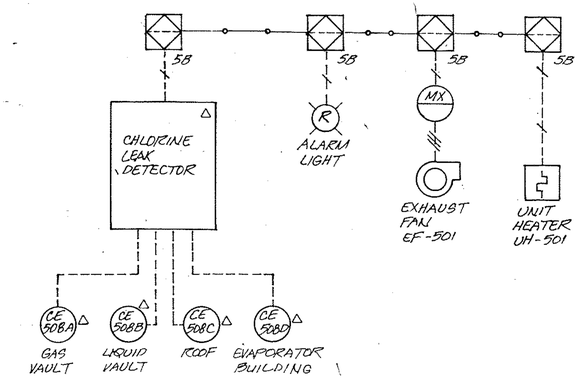
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EVAPORATOR EV-501



CONTROL LOOP NO. 506
EVAPORATOR EV-502



CONTROL LOOP NO. 507
EVAPORATOR EV-503



CONTROL LOOP NO. 506
CHLORINE ALARMS & INTERLOCKS

CWC-HDR, Inc.
Edmonds, WA

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

DURHAM AWWTP PHASE I EXPANSION

EVAPORATOR P&ID

Designed TDM
Drawn NCB
Checked JEK
Approved Tom Merrill
Date JUNE, 1989

THIS LINE IS 1 INCH WHEN DRAWING IS FULL SIZE. IF NOT 1 INCH, SCALE ACCORDINGLY.

No	By	Revision	Date
1	TDM	ADDENDUM NO.1	6-27-89
2	AFJ	AS RECORDED DRAWING	12/19/92

REGISTERED PROFESSIONAL ENGINEER 13391 OREGON JULY 17, 1986 BRUCE R. WILLEY

2 AS RECORDED DRAWINGS

Sheet Number 1015

DURHAM ADVANCED WASTEWATER TREATMENT FACILITY
PHASE 5B1 HEADWORKS IMPROVEMENTS

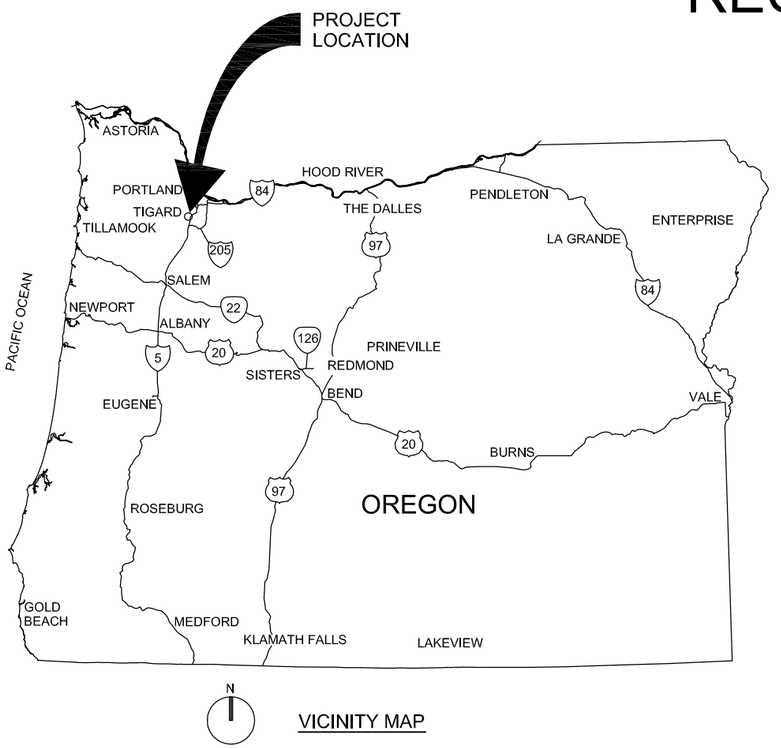
PROJECT 6410
CLEAN WATER SERVICES
TIGARD, OREGON

RECORD DRAWINGS

RECORD DRAWINGS

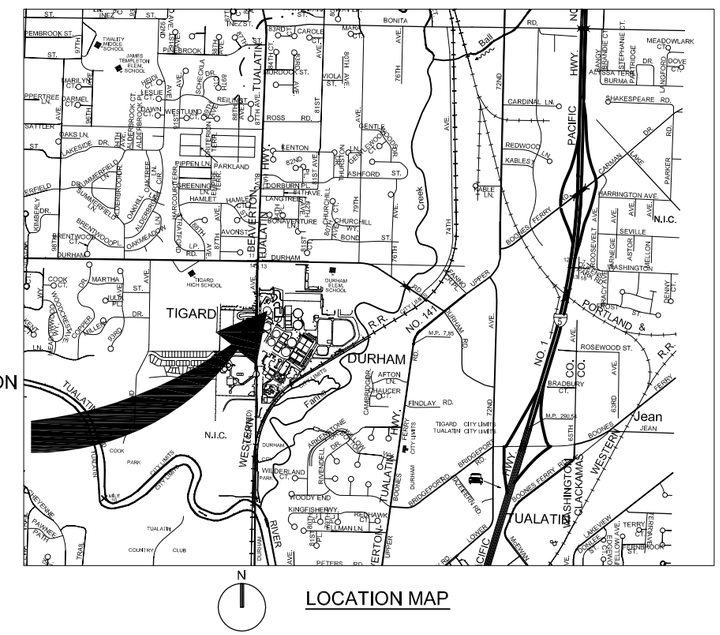
Revisions Drawn By E.R. BROWN Date JAN 2012

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.



VICINITY MAP

PROJECT LOCATION
DURHAM FACILITY
16060 AND 16850
SW 85TH AVE
TIGARD, OR 97224



LOCATION MAP

DRN: PMH	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.					Clean Water Services Our commitment is clear	CH2MHILL	PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS
DSN: GVT	DWG #: 001-G-001						2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379		SHEET TITLE: GENERAL LOCATION AND VICINITY MAP
CHK: JEG	CAD FILE #:								SHEET: 1 OF: D24
APPD: LEC	SCALE: NONE								PLOT DATE: JUNE 2010
									PLC #:
									CWS PROJ #: 6410
		REV #	DATE	DRN	APPD	DESCRIPTION			DWG #: 001-G-001

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 001-G-001_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:06:27 PM

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4	001-G-004	ABBREVIATIONS SHEET 2
5	001-G-005	CIVIL LEGEND AND GENERAL NOTES
6	001-G-006	INSTRUMENTATION AND CONTROL LEGEND SHEET 1
7	001-G-007	INSTRUMENTATION AND CONTROL LEGEND SHEET 2
8	001-G-008	ARCHITECTURAL GENERAL LEGENDS
9	001-G-009	ARCHITECTURAL CODE COMPLIANCE SUMMARY
10	001-G-010	STRUCTURAL NOTES SHEET 1
11	001-G-011	STRUCTURAL NOTES SHEET 2 AND ABBREVIATIONS
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47	008-I-005	ODOR CONTROL P&ID
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SHT NO.	DWG NO.	TITLE
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135	571-E-601	ONE-LINE DIAGRAM AND MCC ELEVATION
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* D2	DD-002	DESIGN DETAILS
* D3	DD-003	DESIGN DETAILS
* D4	DD-004	DESIGN DETAILS
* D5	DD-005	DESIGN DETAILS
* D6	DD-006	DESIGN DETAILS
* D7	DD-007	DESIGN DETAILS
* D8	DD-008	DESIGN DETAILS
* D9	DD-009	DESIGN DETAILS
* D10	DD-010	DESIGN DETAILS
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* D12	DD-012	DESIGN DETAILS
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* D15	DD-015	DESIGN DETAILS
* D16	DD-016	DESIGN DETAILS
* D17	DD-017	DESIGN DETAILS
* D18	DD-018	DESIGN DETAILS
* D19	DD-019	DESIGN DETAILS
* D20	DD-020	DESIGN DETAILS
* D21	DD-021	DESIGN DETAILS
* D22	DD-022	DESIGN DETAILS
* D23	DD-023	DESIGN DETAILS
* D24	DD-024	DESIGN DETAILS

* ADDED DURING RECORD DRAWING PROCESS.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:06:37 PM
PLOT DATE: 05-26-2012
FILENAME: 001-G-002_391538.DWG

DRN: PMH	ORIG DATE: FEB 2010		
DSN: PMH	DWG #: 001-G-002		
CHK: JEG	CAD FILE #:		
APPD: LEC	SCALE: NONE		

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REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
3	07/10	ALF	LEC	BLDG DEPT. REQUESTED REVISION
2	06/10	GVT	LEC	ADDENDUM NO. 2
1	06/10	GVT	LEC	ADDENDUM NO. 1

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
GENERAL
INDEX TO DRAWINGS

SHEET: 2 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #:
001-G-002

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

A	AMMETER, AMPERES, AWNINGS
AB	ANCHOR BOLT, ABOVE
ABDN	ABANDON
AC	ACOUSTICAL, ACOUSTICAL CEILING
AC	ALTERNATING CURRENT
AC	ASPHALTIC CONCRETE
ACFL	ACCESS FLOORING
ACI	AMERICAN CONCRETE INSTITUTE
ACMU	ACOUSTICAL CONCRETE MASONRY UNIT, ACOUSTICAL CMU
ACP	ACOUSTICAL PANELS
ACST	ACOUSTICAL
ACT	ACOUSTICAL TILE
AD	AREA DRAIN
ADDL	ADDITIONAL
ADJ	ADJACENT
ADW	DRY WEATHER AVERAGE
AFD	ADJUSTABLE FREQUENCY DRIVE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AG	ACOUSTICAL, ACOUSTICAL GLASS
AGGR	AGGREGATE
AHR	ANCHOR
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AJ	ADJUSTABLE
AL	ALUMINUM
ALKY	ALKALINITY
ALTN	ALTERNATE
AM	AUTO-MANUAL
AMRD	ACOUSTICAL METAL ROOF DECKING
ANDZ	ANODIZE
APPROX	APPROXIMATE
APVD	APPROVED
ARCH	ARCHITECTURAL
AR	ANALOG RELAY
AS	AS SELECTED
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AVG	AVERAGE
AWW	WET WEATHER AVERAGE
@	AT
B	BELL
BAL	BALANCE
BC	BOTTOM OF CURB
BETW	BETWEEN
BF	BLIND FLANGE, BOTTOM FACE
BFV	BUTTERFLY VALVE
BL	BASELINE
BFP	BACKFLOW PREVENTER
BLDG	BUILDING
BLK	BLOCK
BM	BEAM, BENCHMARK
BO	BOTTOM OF
B.O.B.	BOTTOM OF BEAM
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BOT	BOTTOM
BRG	BEARING
BRK	BRICK
BRKR	BREAKER
BSP	BLACK STEEL PIPE
BV	BALL VALVE, BLOCK VENT
BVC	BEGINNING OF VERTICAL CURVE
BW	BOTTOM OF WALL
C	CONDUIT, CASEMENT
°C	DEGREE CELSIUS
C TO C	CENTER TO CENTER
CAB	CABINET
CB	CATCH BASIN, CIRCUIT BREAKER
CC	CENTER OF CIRCLE
CC	CONTROL CABLE
CCP	CENTRAL CONTROL PANEL
CCS	CENTRAL CONTROL SYSTEM
CDF	CONTROLLED DENSITY FILL
CE	CONSTRUCTION ENTRANCE
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CHEM	CHEMICAL
CHKD	CHECKERED
CI	CAST IRON
CIP	CAST IRON PIPE, CAST IN PLACE
CIP	CULVERT INLET PROTECTION
CISP	CAST IRON SOIL PIPE
CJ	CONSTRUCTION JOINT
CKT	CIRCUIT
CL	CENTERLINE
CLDI	CEMENT LINED DUCTILE IRON
CLG	CEILING
CLR	CLEAR, CLEARANCE
CLFS	CONTROLLED LOW STRENGTH FILL
CMP	CENTRAL MONITORING PANEL
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CNTR	COUNTER
CO	CLEANOUT, CARBON MONOXIDE
COL	COLUMN, COLOR
CONC	CONCRETE
COND	CONDENSATE
CONDTN	CONDITIONED
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUED, CONTINUOUS, CONTINUATION
CONTR	CONTRACTOR
COORD	COORDINATE
COP	COPPER
CP	CENTER PIVOT
CP-X	CONTROL PANEL NO. X
CPLG	COUPLING
CPRSR	COMPRESSOR
CPT	CONTROL POWER TRANFORMER, CARPET
CPVC	CHLORINATED PVC
CR	CONTROL RELAY
CRS	COLD ROLLED STEEL
CRS	CONSTRUCTION ROAD STABILIZATION
CT	CERAMIC TILE
CT	CURRENT TRANSFORMER
CTC	COMPUTER TERMINAL CABINET
CTR	CENTER
CTRD	CENTERED
CTSK	COUNTERSUNK
CU	CUBIC
CU FT	CUBIC FOOT
CU IN	CUBIC INCH
CUH	COPPER TUBING, HARD DRAWN
CV	CHECK VALVE
CWR	CABINET DOOR MOUNTED WASTE RECEPTACLE
CY, CU YD	CUBIC YARD
CWS	CLEAN WATER SERVICES
D	DEEP, DRAIN
d	PENNY NAIL SIZE
DA	DUAL ACTION
DAS	DATA ACQUISTION SYSTEM
DBA	DEFORMED BAR ANCHOR
DBL	DOUBLE
DC	DIRECT CURRENT
DEG	DEGREE
DET	DETAIL
DF	DOUGLAS FIR, DRINKING FOUNTAIN
DDI	DROP INLET
DH	DOUBLE HUNG
DI	DUCTILE IRON
DIA	DIAMETER
DIAG	DIAGONAL
DIP	DUCTILE IRON PIPE
DIR	DIRECTION
DISCH	DISCHARGE
DN	DOWN
DO	DISSOLVED OXYGEN
DOL	DIRECT-ON-LINE
DP, DPNL	DISTRIBUTION PANEL
DR	DOOR
DS	DOWNSPOUT
DWG	DRAWING
DWL	DOWEL
△	DELTA
E	EAST, EMPTY
EA	EACH, EXHAUST AIR
EB, EBCT	EMPTY BED CONTACT TIME
ECC	ECCENTRIC
EE	EMERGENCY EYEWASH
EF	EACH FACE, EXHAUST FAN
EFF	EFFICIENCY, EFFICIENT
EFL	EFFLUENT
EIFS	EXTERIOR INSULATION AND FINISH SYSTEM
EL	ELEVATION
ELB	ELBOW
ELC	ELECTRICAL LOAD CENTER
ELEC	ELECTRIC, ELECTRICAL
ENGR	ENGINEER
EOP	EDGE OF PAVEMENT
ESC	EROSION AND SEDIMENT CONTROL
EP	EXPLOSION PROOF, EDGE OF PAVING
EQL	EQUAL
EQL SP	EQUALLY SPACED
EQPT	EQUIPMENT
ESC	EROSION AND SEDIMENT CONTROL
ETM	ELAPSED TIME METER
EVC	END OF VERTICAL CURVE
EW	EACH WAY
EWC	ELECTRIC WATER COOLER
EXH	EXHAUST
EXP	EXPANSION, EXPOSED
EXP AB	EXPANSION ANCHOR BOLT
EXP JT	EXPANSION JOINT
EXST, EXIST	EXISTING
EXT	EXTERIOR
°F	DEGREE FAHRENHEIT
FA	FOUL AIR
FB	FLAT BAR
F, FU	FUSE
F, FX	FIXED
FAP	FIRE ALARM PANEL
FC	FLEXIBLE CONDUIT
FCA	FLANGED COUPLING ADAPTER
FCL2	FREE CHLORINE RESIDUAL
FCO	FLOOR CLEANOUT
FCTY	FACTORY
FD	FLOOR DRAIN
FDN	FOUNDATION
FDR	FEEDER
FEXT	FIRE EXTINGUISHER
FF	FINISHED FLOOR
FG	FINISH GRADE, FLOAT GLASS
FH	FLAT HEAD
FHY	FIRE HYDRANT
FIG	FIGURE
FL	FLOW LINE
FLG	FLANGE
FL	FLOOR
FLEX	FLEXIBLE
FLH	FLAT HEAD
FLTR	FILTER
FLUOR	FLUORESCENT
FNSH	FINISH
FOB	FLAT ON BOTTOM
FOT	FLAT ON TOP
FP	FIELD PANEL
FPM	FEET PER MINUTE
FR	FORWARD REVERSE
FRP	FIBERGLASS REINFORCED PLASTIC
FSHS	FOLDING SHOWER SEAT
FT	FOOT OR FEET
FTG	FOOTING
FU	FIXTURE UNIT
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
FWD	FORWARD
G, GND	GROUND
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GB	GYPSUM BOARD
GC	GROOVED COUPLING
GCMU	GLAZED CONCRETE MASONRY UNITS
GFA	GROOVED FLANGE ADAPTER
GFI	GROUND FAULT INTERRUPTER
GFR	GROUND FAULT RELAY
GH	GREENHOUSE
GL	GLASS
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GPS	GLOBAL POSITION SYSTEM
GRTG	GRATING
GSB	GYPSUM SOFFIT BOARD
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
GVL	GRAVEL
GWB	GYPSUM WALLBOARD
GYP	GYPSUM
H	HIGH, HORN OR HOWLER
H2S	HYDROGEN SULFIDE
H.A.S.	HEADED ANCHOR STUD
HC	HOLLOW CORE WOOD
HCL	HYDROCHLORIC ACID
HDNR	HARDENER
HDNS	HARDNESS
HDR	HEADER
HDW	HARDWARE
HGL	HYDRAULIC GRADE LINE
HK	HOOK
HGT	HEIGHT
HH	HANDHOLE
HID	HIGH INTENSITY DISCHARGE
HK	HOOK
HM	HOLLOW METAL
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPT	HIGH POINT
HPU	HYDRAULIC POWER UNIT
HR	HOSE RACK, HANDRAIL
HV	HOSE VALVE
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HWL	HIGH WATER LEVEL
IC	INTERRUPTING CAPACITY
ID	INDUCED DRAFT, INSIDE DIAMETER
IE	INVERT ELEVATION
I.F.	INSIDE FACE
IG	INSULATING, INSULATING GLASS
IN	INCH
INCAND	INCANDESCENT
INFL	INFLUENT
INJS	INJECTIONS
INST	INSTANTANEOUS
INSTM	INSTRUMENT, INSTRUMENTATION
INSUL	INSULATION
INVT	INVERT
IP	INLET PROTECTION, INSTRUMENTATION PANEL
IRRIG	IRRIGATION
ITG	INSULATED TEMPERED GLASS
ITX	ISOLATION TRANSFORMER
IU	INTAKE UNIT
IW	IRRIGATION WELL
J	JALOUSIE
JA	JAL-AWNING
JB	JUNCTION BOX
JAN	JANITOR
JCT	JUNCTION
JT	JOINT
K	KEY GROUP, KEY INTERLOCK
KIP	THOUSAND POUNDS
KIT	KITCHEN
K-PL	KICKPLATE
KSK	KITCHEN SINK
KV	KILOVOLTS
KVA	KILOVOLT AMPERES
KVAR	KILOVOLT AMPERES REACTIVE
KW	KILOWATT

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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   PLUMBING AND HVAC 001-G-017
   ELECTRICAL 001-G-018, 001-G-019, 001-G-020

PLOT TIME: 1:06:52 PM
PLOT DATE: 05-26-2012
FILENAME: 001-G-003_391538.DWG

DRN: PMH	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: PMH	DWG #: 001-G-003		
CHK: JEG	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
GENERAL
ABBREVIATIONS
SHEET 1

SHEET: 3 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-003

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

L	ANGLE, LENGTH
LA	LIGHTNING ARRESTER
LAB	LABORATORY
LAM	LAMINATE
LAT	LATITUDE
LB	POUND
LC	LIGHTING CONTACTOR
LD	COMBINATION LOUVER/DAMPER
LDG	LOADING DOCK
LEL	LOWER EXPLOSIVE LIMIT
LF	LINEAR FEET
LG	LONG
LH	LEFT HAND
LHR	LEFT HAND REVERSE
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LNTL	LINTEL
LONG	LONGITUDINAL
LOS	LOCK-OUT STOP PUSHBUTTON
LP	LIGHT POLE, LIGHTING PANEL
LPT	LOW POINT
LR	LATCHING RELAY
LR	LOCAL-REMOTE
LR	LONG RADIUS
LS	LABORATORY SINK
LT	LEFT
LTG, LTS	LIGHTS OR LIGHTING
LTX	LIGHTING TRANSFORMER
LWL	LOW WATER LEVEL
MA	MANUAL-AUTO
MAS	MASONRY
MATL	MATERIAL
MAX	MAXIMUM
MB	MACHINE BOLT
MC	MASONRY CLEARANCE
MC	MODULATE-CLOSE
MCC	MOTOR CONTROL CENTER
MDO	MEDIUM DENSITY OVERLAY
MECH	MECHANICAL
MFD	MANUFACTURED
MFR	MANUFACTURER
MGD	MILLION GALLONS PER DAY
MH	MANHOLE, MOUNTING HEIGHT
MIN	MINUMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MLO	MAIN LUGS ONLY
MMDW	DRY WEATHER MAXIMUM MONTH
MMP	MECHANICAL MOUNTING PANEL
MMWW	WET WEATHER MAXIMUM MONTH
MO	MANUAL OPERABLE, MASONRY OPENING
MP	METAL PANEL
MPU	MULTIPURPOSE UNIT
MS	MANUFACTURER'S STANDARD
MSC	MANUFACTURER SUPPLIED CABLE
MSR	GROUPED MOTOR CONTROL
MT	MOUNT
MTD	MOUNTED
MTG	MOUNTING
MTS	MANUAL TRANSFER SWITCH
MTS	MILL TYPE STEEL PIPE
MU	MULCHING
MV	MERCURY VAPOR
MWS	MAXIMUM WATER SURFACE
N	NORTH, NEUTRAL
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NEUT	NEUTRAL
NA	NON-AUTOMATIC

NG	NATURAL GAS
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
NO., #	NUMBER
NOM	NOMINAL
NP	NON-PROTECTED
NPT	NATIONAL PIPE THREADS
NPW	NON-POTABLE WATER
NS	NON-SHRINK
NTS	NOT TO SCALE
O2	OXYGEN
O TO O	OUT TO OUT
OA	OVERALL, ODOROUS AIR
OC	ON CENTER
OC	OPEN-CLOSE (O)
OCA	OPEN-CLOSE-AUTO
OCR	OPEN-CLOSE-REMOTE
OD	OUTSIDE DIAMETER, OVERFLOW DRAIN
O.F.	OUTSIDE FACE
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
OG	OBSCURE
OL	OVERLOAD RELAY
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
OP	OPAQUE PANEL, OUTLET PROTECTION
OPER	OPERATOR
OPNG	OPENING
OPP	OPPOSITE
OSA	OUTSIDE AIR
OSC	OPEN-STOP-CLOSE
OSD	OPEN SITE DRAIN
OWSJ	OPEN WEB STEEL JOIST
OZ	OUNCE
P	PROJECTED
P	PILASTER, PIPE
PAVT	PAVER TILE
PB	PUSHBUTTON SWITCH
PC	POINT OF CURVE, PHOTOCELL
PC	PRECAST CONCRETE PANEL
PCCP	PRECAST CONCRETE CYLINDER PIPE
PCV	PRESSURE CONTROL VALVE
PE	PLAIN END
PED	PEDESTAL, PEDESTRIAN
PEP	POLYETHYLENE PIPE
PEN.	PENETRATION
PFC	POUNDS PER CUBIC FOOT
PH	PENTHOUSE
pH	HYDROGEN ION CONCENTRATION
PH	PHASE
PI	POINT OF INTERSECTION
PIT	PILOT TUBE TEST STATION
PJF	PREMOULDED JOINT FILLER
PL	PLATE (STEEL)
PL	PROPERTY LINE
PLAM	PLASTIC LAMINATE
PLAS	PLASTER, PLASTIC
PLC	PROGRAMMABLE LOGIC CONTROLLER

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLYWD	PLYWOOD
PNL	PANEL
PP	POWER POLE
P-P	PUSH-PULL
PPL	POLYPROPYLENE LINED
PR	PAIR
PRC	POINT OF REVERSE CURVE
PRCST	PRECAST
PREFAB	PREFABRICATION
PRES	PRESSURE
PRI	PRIMARY
PRM	PERMANENT REFERENCED MARKER
PROJ	PROJECTION
PROP	PROPERTY
PS	PLASTIC SHEET, POLYCARBONATE SHEET
PS	PAINT SYSTEM
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH, GAUGE
PT	POINT OF TANGENCY
PT	POTENTIAL TRANSFORMER
PT	PRESSURE TREATED
PTD	PAPER TOWEL DISPENSER
PTN	PARTITION
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
PVT	POINT OF VERTICAL TANGENCY
QAA	AVERAGE FLOW
QMM	MAXIMUM 30 DAY FLOW
QPI	PEAK INSTANTANEOUS FLOW
QPP	PEAK PUMPING FLOW
QT	QUARRY TILE
R	RISER
R OR RAD	RADIUS
RA	RETURN AIR
RC	REINFORCED CONCRETE
RCP	REINFORCED CONCRETE PIPE
RCPT	RECEPTACLE
RD	ROAD, ROOF DRAIN
RDCR	REDUCER
RDW	REDWOOD
RECIR	RECIRCULATION
REF	REFER OR REFERENCE
REFR	REFRIGERATE, REFRIGERANT
REINF	REINFORCED, REINFORCING, REINFORCE
REQD	REQUIRED
RESIL	RESILIENT
RFS	ROLL-UP FIRE SHUTTER
RG	REFLECTIVE
RH	RIGHT HAND
RH	RODHOLE
RHR	RIGHT HAND REVERSE
RL	RAIN LEADER
RLS	RUBBER LINED STEEL
RM	ROOM
RO	ROUGH OPENING
ROL	RAISE-OFF-LOWER
RPM	REVOLUTIONS PER MINUTE
RR	RIPRAP
RRUB	RADIAL RUBBER
RS	RIGID STEEL
RST	REINFORCING STEEL
RT	RIGHT
RTN	RETURN
RTO	REGENERATIVE THERMAL OXIDIZER
RUB	RUBBER
RUBC	RUBBER CUSHIONED FLOORING
RUBS	RUBBER ESD CONTROL FLOORING
R/W	RIGHT OF WAY

S	I-BEAM
S	SLOPE, SOUTH, SWITCH
SA	SUPPLY AIR
SATC	SUSPENDED ACCUSTICAL TILE CEILING
SB	SEDIMENT BASIN
SC	SHOWER CURTAIN, SOLID CORE WOOD
SCC	SOLID CORE
SCFM	STANDARD CUBIC FEED PER MINUTE
SCHED	SCHEDULE
SD	STORM DRAIN
SDP	SUB-DISTRIBUTION PANEL
SDP	SUB-DISTRIBUTION PANEL
SDWK	SIDEWALK
SEC	SECONDARY
SECT	SECTION
SED	SEDIMENTATION
SEW	SEWAGE
SG	LAMINATED SAFETY GLASS, SAFETY
SGWB	SUSPENDED GYPSUM WALL BOARD
SH	SHEET
SHA	SURFACE HARDENING AGENT
SHS	SOLIDS HANDLING SYSTEM
SIM	SIMILAR
SK	SINK
SLR	SEALER
SMLS	SEAMLESS EPOXY
SOI	SPRAY- ON INSULATION
SOLN	SOLUTION
SP	SPACE OR SPACES, SPANDREL PANEL, STORMPROOF
SPEC, SPECS	SPECIFICATIONS
SPD	SUMP PUMP DISCHARGE
SPG	SPACING
SPLY	SUPPLY
SQ	SQUARE
SQ FT	SQUARE FOOT, FEET
SQ IN	SQUARE INCH
SR	SHORT RADIUS
SS	START-STOP
SST	STAINLESS STEEL
SSC	SUPERVISORY SET POINT CONTROL
ST	STRAIGHT
STA	STATUS, STATION
STD	STANDARD
STIF	STIFFENER
STIRR	STIRRUP
STL	STEEL
STRL	STRUCTUAL
STRUCT	STRUCTURE
SUBFL	SUBFLOOR
SUSP	SUSPENDED
SV	SOLENOID VALVE
SVIN	SHEET VINYL
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYMM	SYMMETRICAL
T	THERMOSTAT, TREAD
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
TA	TRANSFER AIR
TAN	TANGENT
TB	TERMINAL BOARD
TBG	TUBING
TC	TIME TO CLOSE
TC	TOP OF CURB
TC	TURBIDITY CURTAIN
TCAD	TIME CLOSE AFTER DE-ENERGIATION
TCAE	TIME CLOSE AFTER ENERGIZATION
TDH	TOTAL DYNAMIC HEAD
TDR	TIME DELAY RELAY
TECH	TECHNICAL
TEL	TELEPHONE
TEMP	TEMPORARY, TEMPERATURE
TF	TOP FACE
TFG	TEMPERED FLOAT GLASS
TG	TEMPERED
TH	TOP-HINGED
THD	THREAD
THK	THICKNESS
THRU	THROUGH
TJB	TERMINAL JUNCTION BOX

TL	TEFLON LINED PIPE
T.O.	TIME TO OPEN, TOP OF
TOAE	TIME OPEN AFTER ENERGIZATION
TOC	TOP OF CONCRETE
TOC	TOP OF CURB
TOD	TIME ON DELAY, TOP OF DUCT TOTAL OXYGEN DEMAND
TOF	TOP OF FOOTING
TOG	TOP OF GROUT, TOP OF GRATE
T.O.P.	TOP OF PARAPET
TOS	TOP OF SLAB
TOW	TOP OF WALL
TP	TURNING POINT
TR	TRANSOM, TRUSS
TRANS	TRANSFORMER, TRANSITION
TRANSV	TRANSVERSE
TRD	TREAD
TS	TEMPORARY SEEDING, TUBE STEEL
TSHT	THRESHOLD
TSS	TOTAL SUSPENSION SOLIDS
TST	TOP OF STEEL
TTC	TELEPHONE TERMINAL CABINET
TTD	TOILET TISSUE DISPENSER
TU-X	TREATMENT UNIT NO. X
TURB	TURBIDITY
TW	TOP OF WALL
TWP	TRANSLUCENT WALL PANEL
TX	TRANSFORMER
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
USB	UNIT SUBSTATION
UVR	UNDER VOLTAGE RELAY
V	VENT, VALVE
V	VOLTMETER, VOLTS
VB	VAPOR BARRIER (RETARDER)
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VCT	VINYL COMPOSITION TILE
VEL	VELOCITY
VERT	VERTICAL
VHC	VOLATILE HYDROCARBONS
VIB	VIBRATION
VIF	VERIFY IN FIELD
VIN	VINYL
VINT, VT	VINYL TILE
VP	VERTICAL PIVOTED
VPS	VENEER PLASTER SYSTEM
VPC	POINT OF VERTICAL CURVATURE
VPI	POINT OF VERTICAL INTERSECTION
vpt	POINT OF VERTICAL TANGENT
VS	VERTICAL SLIDE
VTR	VENT THRU ROOF
VWC	VINYL WALL COVERING
W	WEST
W/	WITH
WEASTRIP	WEATHERSTRIP
WG	WIRE, WIRE GLASS
WH	WATTHOUR METER
WHD	WATTHOUR DEMAND METER
WP	WATERPROOF, WEATHERPROOF, WORKPOINT
WR	WASTE RECEPTACLE
WRB	WATER RESISTANT GWB
WS	WATER SURFACE, WATERSTOP, WELDED STEEL
WWF	WELDED WIRE FABRIC
WWPH	WET WEATHER PEAK HOUR

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   PLUMBING AND HVAC 001-G-017
   ELECTRICAL 001-G-018, 001-G-019, 001-G-020

PLOT TIME: 1:07:03 PM
PLOT DATE: 05-26-2012
FILENAME: 001-G-004_391538.DWG

DRN: PMH	ORIG DATE: FEB 2010		
DSN: PMH	DWG #: 001-G-004		
CHK: JEG	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
GENERAL
ABBREVIATIONS
SHEET 2

SHEET: 4	OF: D24
PLOT DATE:	JUNE 2010
PLC #:	
CWS PROJ #:	6410

DWG #: 001-G-004

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

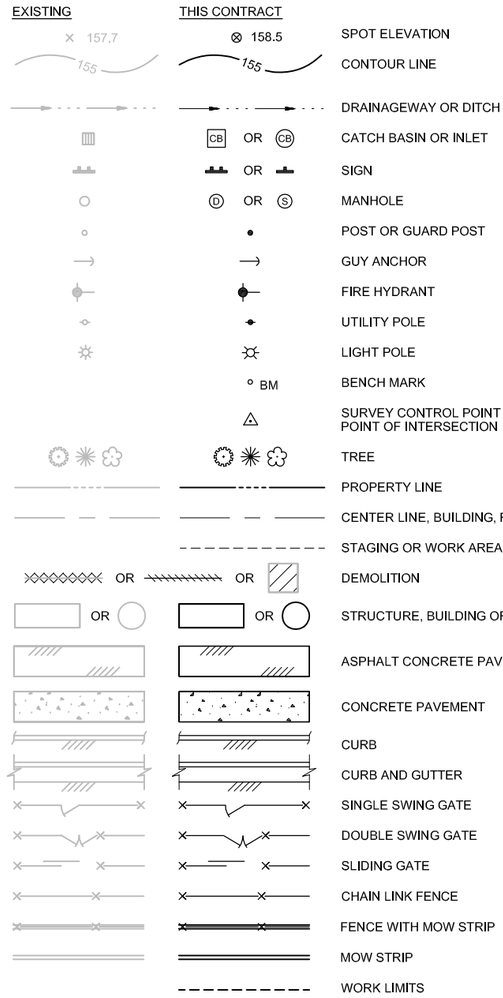
GENERAL SITE NOTES:

1. SOURCE OF TOPOGRAPHY SHOWN ON THE CIVIL PLANS ARE BASE MAPS PROVIDED BY WEST LAKE CONSULTANTS, INC. ADDITIONAL MAPPING HAS BEEN ADDED FROM AS-BUILT DATA FROM CLEAN WATER SERVICES. EXISTING CONDITIONS MAY VARY FROM THOSE SHOWN ON THESE PLANS. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND ADJUST WORK PLAN ACCORDINGLY PRIOR TO BEGINNING CONSTRUCTION.
2. EXISTING TOPOGRAPHY, STRUCTURES, AND SITE FEATURES ARE SHOWN SCREENED AND/OR LIGHT-LINED. NEW FINISH GRADE, STRUCTURES, AND SITE FEATURES ARE SHOWN HEAVY-LINED.
3. HORIZONTAL DATUM: OREGON STATE PLANE, NAD 83, SEE DWG 005-C-100 FOR BENCHMARKS.
4. VERTICAL DATUM: NGVD 29.
5. MAINTAIN, RELOCATE, OR REPLACE EXISTING SURVEY MONUMENTS, CONTROL POINTS, AND STAKES WHICH ARE DISTURBED OR DESTROYED. PERFORM THE WORK TO PRODUCE THE SAME LEVEL OF ACCURACY AS THE ORIGINAL MONUMENT(S) IN A TIMELY MANNER, AND AT THE CONTRACTOR'S EXPENSE.
7. COORDINATES AND DIMENSIONS SHOWN FOR ROADWAY IMPROVEMENTS ARE TO FACE OF CURB OR EDGE OF PAVEMENT.
8. STAGING AREA SHALL BE FOR CONTRACTOR'S EMPLOYEE PARKING, CONTRACTOR'S TRAILERS AND ON-SITE STORAGE OF MATERIALS.
9. PROVIDE TEMPORARY FENCING AS NECESSARY TO MAINTAIN SECURITY AT ALL TIMES.
10. ELEVATIONS GIVEN ARE TO FINISH GRADE UNLESS OTHERWISE SHOWN.
11. SLOPE UNIFORMLY BETWEEN CONTOURS AND SPOT ELEVATIONS SHOWN.
12. ALL DISTURBED AREAS NOT RECEIVING A HARD SURFACE SHALL RECEIVE TOPSOIL AND BE GRADED TO 2" BELOW ADJACENT HARDSCAPE ELEVATIONS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION CONTROL DEVICES DURING CONSTRUCTION.

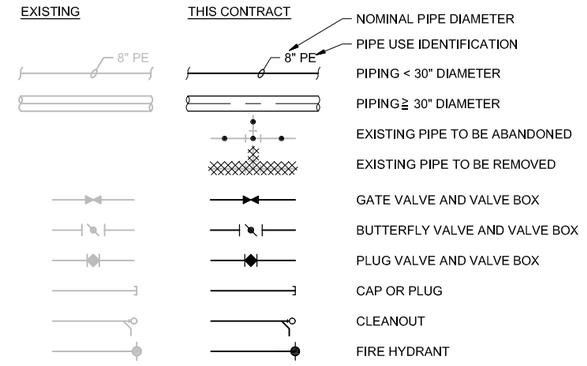
GENERAL YARD PIPING AND UTILITIES NOTES:

1. EXISTING UNDERGROUND UTILITIES OBTAINED FROM AS-BUILTS AND FROM FIELD SURVEY. CONTRACTOR SHALL FIELD VERIFY DEPTH AND LOCATION PRIOR TO EXCAVATION. PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION.
2. EXISTING PIPING AND EQUIPMENT ARE SHOWN SCREENED AND/OR LIGHT-LINED. NEW PIPING AND EQUIPMENT ARE SHOWN HEAVY-LINED.
3. UNLESS OTHERWISE SHOWN ALL PIPING SHALL HAVE A MINIMUM OF 3' COVER.
4. ALL PIPES SHALL HAVE A CONSTANT SLOPE BETWEEN INVERT ELEVATIONS UNLESS A FITTING IS SHOWN.
5. FOR TRENCHING AND BACKFILL, SEE (2310).
6. FOR SURFACE RESTORATION, SEE (2320).
7. MINIMUM ALLOWABLE CLEARANCE BETWEEN PIPES AT CROSSINGS SHALL BE 3". CONTROLLED LOW STRENGTH MATERIAL SUPPORT IS REQUIRED AS SHOWN ON (2335).

CIVIL LEGEND



YARD PIPING LEGEND



GENERAL NOTE:

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RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 001-G-005_3911538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:07:15 PM

DRN: ARH	ORIG. DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JAB	DWG #: 001-G-005		
CHK: WBW	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services — Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: GENERAL — CIVIL LEGEND AND GENERAL NOTES

SHEET: 5 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

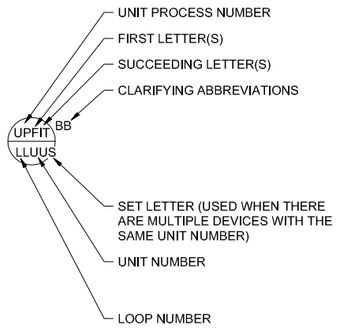
DWG #: 001-G-005

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

INSTRUMENT IDENTIFICATION

EXAMPLE SYMBOLS



INSTRUMENT IDENTIFICATION LETTERS TABLE

LETTER	FIRST-LETTER		SUCCEEDING-LETTERS		
	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS (+)		ALARM		
B	BURNER, COMBUSTION		USER'S CHOICE(*)	USER'S CHOICE(*)	USER'S CHOICE(*)
C	USER'S CHOICE(*)			CONTROL	
D	DENSITY (S.G)	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT, SENSOR		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE(*)		GLASS, GAUGE VIEWING DEVICE	GATE	
H	HAND (MANUAL)				HIGH
!	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOTION	MOMENTARY			MIDDLE, INTERMEDIATE
N	TORQUE		USER'S CHOICE(*)	USER'S CHOICE(*)	USER'S CHOICE(*)
O	USER'S CHOICE(*)		ORIFICE, RESTRICTION		
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD OR PRINT		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED (+)	X AXIS	UNCLASSIFIED (+)	UNCLASSIFIED (+)	UNCLASSIFIED (+)
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION	Z AXIS		DRIVE, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

TABLE BASED ON THE INSTRUMENTATION, SYSTEMS, AND AUTOMATION SOCIETY (ISA) STANDARD.

(+) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL. SEE ABBREVIATIONS AND LETTER SYMBOLS.

(*) WHEN USED, DEFINE THE MEANING HERE FOR THE PROJECT

DIGITAL SYSTEM INTERFACES

- ▲ ANALOG INPUT
- ▼ ANALOG OUTPUT
- △x DISCRETE INPUT
- ▽x DISCRETE OUTPUT

WHERE X=
A = ALARM
H = MAINTAINED
M = MOMENTARY
S = STATUS

GENERAL INSTRUMENT OR FUNCTIONAL SYMBOLS

- FIELD MOUNTED
- REAR-OF-PANEL MOUNTED (OPERATOR INACCESSIBLE)
- PANEL MOUNTED (OPERATOR ACCESSIBLE)
- MCC MOUNTED
- COMPUTER FUNCTION
- PLC FUNCTION
- SHARED DISPLAY, SHARED CONTROL

SPECIAL CASES

YL OO — ON AND OFF EVENT LIGHTS

HS OO — ON-OFF HAND SWITCH. MAINTAINED CONTACT SWITCH (CONTROLLED DEVICE WILL RESTART ON RETURN OF POWER AFTER POWER FAILURE).

HS SS — STOP-START HAND SWITCH MOMENTARY CONTACT SWITCHES (CONTROLLED DEVICE WILL NOT RESTART ON RETURN OF POWER AFTER POWER FAILURE).

TRANSDUCERS

- A ANALOG
- D DIGITAL
- E VOLTAGE
- F FREQUENCY
- H HYDRAULIC
- I CURRENT
- P PNEUMATIC
- PF PULSE FREQUENCY
- PD PULSE DURATION
- R RESISTANCE

EXAMPLE:

FY I/P — CURRENT TO PNEUMATIC TRANSDUCER (BACK OF PANEL, IN A FLOW LOOP)

ACCESSORY DEVICES

EXAMPLE: TRANSMITTER AS AN ACCESSORY TO A FLOW ELEMENT

FT / T

- A = ALARM
- C = CONTROLLER
- I = INDICATOR
- R = RECORDER
- S = SWITCH
- T = TRANSMITTER
- X = UNCLASSIFIED

LINE LEGEND

- PROCESS (CLOSED CONDUIT, DASHED LINE INDICATES ALTERNATE FLOW STREAM)
- PROCESS (OPEN CHANNEL)
- ANALOG SIGNAL (4 TO 20 mAdc, ETC.)
- DISCRETE SIGNAL (ON/OFF, ETC.)
- PNEUMATIC SIGNAL
- X X X FILLED SYSTEM SIGNAL
- HYDRAULIC SYSTEM SIGNAL
- DATA LINK
- BUILDING OR FACILITY BOUNDARY
- PACKAGE SYSTEM EQUIPMENT

PARALLELING LINES

(2) (A) 3(2) (B)

(A) TOTAL OF 2 SIGNALS

(B) 3 TYPICAL SETS OF 2 SIGNALS EACH, TOTAL OF 6 SIGNALS.

- CONNECTING LINES
- NON-CONNECTING LINES

INTERFACE SYMBOLS

S WA — WA D

= PROCESS INTERFACE

= SIGNAL INTERFACE

W = SOURCE UNIT PROCESS NO. (1 OR 2 DIGITS)

A = INTERFACE NO. (2 DIGITS)

D = DESTINATION DRAWING NO.

S = SOURCE DRAWING NO.

N — PROCESS OR SIGNAL LINE CONTINUATION N=1,2,3,ETC — N

INTERFACE TO OR FROM PROCESS EXTERNAL TO PROJECT

ABBREVIATIONS & LETTER SYMBOLS

AC	ALTERNATING CURRENT
AM	AUTO-MANUAL
CAM	COMPUTER-AUTO-MANUAL
CCS	CENTRAL CONTROL SYSTEM
CL_2 etc.	CHLORINE (TYPICAL: USE STANDARD CHEMICAL ELEMENT ABBREVIATION)
CM^2	COMPUTER-MANUAL
COD	CHEMICAL OXYGEN DEMAND
CP-X	CONTROL PANEL NO. X
DC	DIRECT CURRENT
DCS	DISTRIBUTED CONTROL SYSTEM
DCU	DISTRIBUTED CONTROL UNIT
DO	DISSOLVED OXYGEN
FCL_2	FREE CHLORINE RESIDUAL
FOS	FAST-OFF-SLOW
FOSA	FAST-OFF-SLOW-AUTO
FOSR	FAST-OFF-SLOW-REMOTE
FP-W-X	FIELD PANEL NO. WX (W = UNIT PROCESS NUMBER X = PANEL NUMBER)
FR	FORWARD-REVERSE
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
!SR	INTRINSICALLY SAFE RELAY
LEL	LOWER EXPLOSIVE LIMIT
LOS	LOCKOUT STOP
LR	LOCAL-REMOTE
MA	MANUAL-AUTO
MC	MODULATE-CLOSE
MCC-X	MOTOR CONTROL CENTER NO. X
MSC	MANUFACTURER SUPPLIED CABLE
OC	OPEN-CLOSE (D)
OCR	OPEN-CLOSE-REMOTE
OCA	OPEN-CLOSE-AUTO
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
ORP	OXIDATION REDUCTION POTENTIAL
OSC	OPEN-STOP-CLOSE
pH	HYDROGEN ION CONCENTRATION
PLC	PROGRAMMABLE LOGIC CONTROLLER
RIO	REMOTE I/O UNIT
RM-X	REMOTE MULTIPLEXING MODULE NO. X
RTU-X	REMOTE TELEMETRY UNIT NO. X
SF	SLOWER-FASTER
SS	START-STOP
SSC	SUPERVISORY SET POINT CONTROL
TCL_2	TOTAL CHLORINE RESIDUAL
TOC	TOTAL ORGANIC CARBON
TOD	TOTAL OXYGEN DEMAND
TURB	TURBIDITY
VHC	VOLATILE HYDROCARBONS
VIB	VIBRATION
Δ	DIFFERENCE
Σ	SUM
X	MULTIPLY
÷	DIVIDE
f(x)	CHARACTERIZED
X^n	RAISE TO THE Nth POWER
√‾	SQUARE ROOT
AVG	AVERAGE
1:1	REPEAT OR BOOST
>	SELECT HIGHEST SIGNAL
<	SELECT LOWEST SIGNAL
}	BIAS
%	GAIN OR ATTENUATE

SELF CONTAINED VALVE & EQUIPMENT TAG NUMBERS

W-D-X-Y

W = UNIT PROCESS NUMBER

D:
- ARV = AIR RELEASE VALVE
- AVRV = AIR AND VACUUM RELEASE VALVE
- E = EJECTOR
- G = GATE
- M = MECHANICAL EQUIPMENT
- P = PUMP
- T = TANK

X = LOOP NUMBER

Y = UNIT NUMBER

GENERAL NOTES

1. COMPONENTS AND PANELS SHOWN WITH A SINGLE ASTERISK(*) ARE TO BE PROVIDED AS PART OF A PACKAGE SYSTEM.
2. COMPONENTS AND PANELS SHOWN WITH A DOUBLE ASTERISK(**) ARE TO BE PROVIDED UNDER DIVISION 16, ELECTRICAL.
3. THIS IS A STANDARD LEGEND. THEREFORE, NOT ALL OF THIS INFORMATION MAY BE USED ON THIS PROJECT.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PLOT TIME: 1:07:25 PM
PLOT DATE: 05-26-2012
FILENAME: 001-G-006_391538.DWG

DRN: PMH	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JDK	DWG #: 001-G-006		
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REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services — Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: GENERAL INSTRUMENTATION AND CONTROL LEGEND SHEET 1

SHEET: 6 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-006

VALVE SYMBOLS

GATE
KNIFE GATE
BUTTERFLY
GLOBE
BALL
VEE- BALL
PLUG
SEAT PORT ECCENTRIC PLUG
DIAPHRAGM
PINCH
NEEDLE
SWING CHECK
BALL CHECK
BACKFLOW PREVENTER
ROTARY

PRESSURE RELIEF
AIR AND/OR VACUUM RELEASE
REGULATED SIDE PRESSURE CONTROL
MULTI-PORT VALVES (GATE VALVE SHOWN. FOR OTHER VALVE TYPES, APPROPRIATE VALVE SYMBOL SHOWN.) SEAT PORTS ARE IMPLIED BY INDICATED FLOW PATTERN.
ANGLE GATE
TELESCOPE
SAMPLE
MUD
PRESSURE REGULATING (CLAY-TYPE)

GATE SYMBOLS

SLUICE
BUTTERFLY
FABRICATED SLIDE
FLAP
STOP LOG

ACTUATOR SYMBOLS

PNEUMATIC DIAPHRAM SPRING-OPPOSED, SINGLE OR DOUBLE ACTING
PNEUMATIC CYLINDER SINGLE OR DOUBLE ACTING ACTUATED BY ONE INPUT
ELECTRIC MOTOR
SOLENOID
HYDRAULIC

VALVE POSITIONER
MANUAL
ELECTROHYDRAULIC
DIAPHRAGM, DIFFERENTIAL PRESSURE

NOTE:
ON LOSS OF PRIMARY POWER (PNEUMATIC, ELECTRICAL OR HYDRAULIC)
XX: FO =FAIL OPEN
FC =FAIL CLOSED
FLP=FAIL TO LAST POSITION

PRIMARY ELEMENT SYMBOLS

PARSHALL FLUME
WEIR
ORFICE PLATE
FLOW TUBE
PITOT-STATIC
VORTEX METER
LEVEL (SUBMERSIBLE PRESSURE)

ULTRASONIC FLOWMETER
ELECTROMAGNETIC FLOWMETER
PROPELLER OR TURBINE METER
THERMAL FLOWMETER
ROTAMETER

DENSITY METER
GENERIC
LEVEL (ULTRASONIC)
LEVEL (BUBBLER TUBE)
LEVEL (FLOAT)

MISCELLANEOUS SYMBOLS

DIAPHRAGM SEAL
BLIND FLANGE
AIR GAP
VENT TO ATMOSPHERE
AERATOR
PLUG
RECEPTACLE
SELF CONTAINED AIR SUPPLY
COMPOSITE SAMPLER (DIPPER TYPE)
COMPOSITE SAMPLER (SUCTION TYPE)
TV CAMERA
OR
INTERLOCK. SEE CONTROL DIAGRAMS
PURGE SET X: W = WATER A = AIR SEE
AIR SET XX= SUPPLY PRESSURE IN PSIG.
FILTER/ REGULATOR/ GAUGE SET
FLEXIBLE CONNECTOR
PULSATION DAMPENER
FILTER
DRIP TRAP
FLAME TRAP
STRAINER
HORN/STROBE
INTRINSICALLY SAFE BARRIER

120 VOLT, 60 HZ POWER
480 VOLT, 60 HZ POWER
ANNULAR DIAPHRAGM SEAL
RUPTURE DISK (PRESSURE)
RUPTURE DISK (VACUUM)
PIG INSERT POINT
PIG CATCH POINT
MIXER
ELECTRIC MOTOR
TV MONITOR
LOGIC ELEMENT: IF A AND NOT B THEN C
LOGIC ELEMENT: IF A OR B THEN C
FLUSHING CONNECTION
HOSE ADAPTOR
SEAL WATER SET
SIGHT GLASS
PANEL CONTINUED ON SAME OR OTHER DRAWING
PANEL OUTLINE
PANEL NAME
SKIMMING MECHANISM
SCREW
SCREW CONVEYOR
INLINE SILENCER
PIPE CAP
CALIBRATION COLUMN
INTRINSICALLY SAFE RELAY

PUMP AND COMPRESSOR SYMBOLS

NOTE: XX: AS ADJUSTABLE SPEED
CS-1 CONSTANT SPEED (SINGLE SPEED)
CS-2 CONSTANT SPEED (TWO SPEED)

CENTRIFUGAL PUMP (DRY PIT)
CENTRIFUGAL WET PIT PUMP OR TURBINE PUMP
RECIPROCATING OR METERING PUMP (POSITIVE DISPLACEMENT)
DIAPHRAGM PUMP
GEAR PUMP OR BLOWER (POSITIVE DISPLACEMENT)
PISTON PUMP

PROGRESSIVE CAVITY PUMP
COMPRESSOR (CENTRIFUGAL)
COMPRESSOR (PISTON)
BLOWER OR FAN (CENTRIFUGAL)
EJECTOR

SUBMERSIBLE SUMP PUMP
VACUUM PUMP
ROTARY PUMP
SCREW PUMP

FLOW STREAM IDENTIFICATION

ARD	ACID RESISTANT DRAIN
CW	CITY WATER (NON-POTABLE)
CWH	CITY WATER (NON-POTABLE), HOT
COND	CONDENSATE DRAIN
D	DRAIN (PROCESS)
FA	FOUL AIR
GRIT	GRIT
GRIT/OF	GRIT OVERFLOW
HPA	HIGH PRESSURE AIR
IRR	IRRIGATION
LPA	LOW PRESSURE AIR
NAOCL	SODIUM HYPOCHLORITE
NAOH	SODIUM HYDROXIDE
NG	NATUARAL GAS
NPW	NON-POTABLE WATER
OD	OVERFLOW DRAIN
OF	OVERFLOW
OSA	OUTSIDE SUPPLY AIR
PW	POTABLE WATER
RD	ROOF DRAIN
RS	RAW SEWAGE
SA	SUPPLY AIR
SAN	SANITARY SEWER
SD	STORM DRAIN
V	VENT

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 001-G-007_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:07:36 PM

DRN: PMH	ORIG DATE: FEB 2010		
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REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
GENERAL
INSTRUMENTATION AND CONTROL LEGEND SHEET 2

SHEET: 7 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-007

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

GENERAL ARCHITECTURAL NOTES

1. UNLESS OTHERWISE INDICATED, PLAN DIMENSIONS ARE TO COLUMN GRID ON CENTERLINES, NOMINAL SURFACE OF MASONRY, AND FACE OF CONCRETE WALLS.
2. "FLOOR LINE" REFERS TO TOP OF CONCRETE SLABS.

   REPETITIVE FEATURES ARE NOT DRAWN IN THEIR ENTIRETY AND SHALL BE COMPLETELY PROVIDED AS IF DRAWN IN FULL.
3. LINE OF EXISTING GRADES, AS SHOWN ON THE BUILDING ELEVATIONS AND SECTIONS ARE APPROXIMATE. SEE CIVIL DRAWINGS FOR ALL GRADES.
4. REFER TO ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL AND OTHER CATEGORIES OR DRAWINGS FOR ADDITIONAL NOTES.
5. VERIFY SIZE AND LOCATION OF, AND PROVIDE: REQUIRED OPENINGS THROUGH FLOORS AND WALLS, ACCESS DOORS, FURRING, CURBS, ANCHORS AND INSERTS. PROVIDE ALL BASES AND BLOCKING REQUIRED FOR ACCESSORIES, MECHANICAL, ELECTRICAL AND OTHER EQUIPMENT.
6. FOR CODE ANALYSIS, SEE CODE COMPLIANCE SUMMARY DRAWING.
7. FOR DOOR AND HARDWARE DESCRIPTIONS SEE SPECIFICATION SECTION 08710.
8. FOR FINISH SCHEDULES SEE SPECIFICATION SECTION 09000.
9. FOR GUARD POST LOCATIONS, SEE CIVIL DRAWINGS.

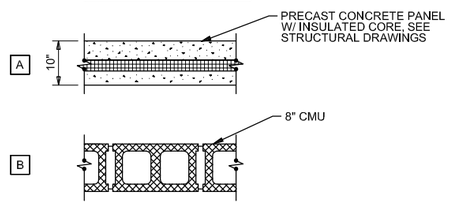
ARCH/STRUCT MATERIAL SYMBOLS

SYMBOL	LEGEND
	GRATING, SPAN DIRECTION INDICATED
	CHECKERED PLATE
	GROUT
	GRANULAR FILL
	EARTH OR FINISH GRADE
	CONCRETE
	CMU WALL (PLAN)
	CMU WALL (SECTION)
	MASONRY WALL
	METAL STUD WALL (PLAN)
	WOOD STUD WALL (PLAN)
	RIGID INSULATION
	BATT INSULATION
	STEEL
	ALUMINUM
	PLYWOOD
	GYPSUM WALLBOARD
	ACOUSTICAL TILE
	WOOD, ROUGH CONTINUOUS
	WOOD, ROUGH NON-CONTINUOUS
	WOOD, FINISHED

ARCHITECTURAL/STRUCTURAL LEGEND

SYMBOL	LEGEND
A	GRID / COLUMN INDICATOR
ROOM NAME XX101 OR ROOM NAME 101	ROOM IDENTIFIER
"XX" = FACILITY INDICATOR (IF SHOWN); XX101A: DOOR LETTER, ROOM NUMBER	DOOR IDENTIFIER
XXW-1 OR W-1	WINDOW IDENTIFIER
XXR-1 OR R-1	RELIGHT IDENTIFIER
XXL-1 OR L-1	LOUVER IDENTIFIER
A	WALL TYPE INDICATOR
S-1	SIGNAGE IDENTIFIER
A, B, C, D, E; 1; XX-A-301; QUANTITY AND DIRECTION OF POINTERS AS REQUIRED	INTERIOR ELEVATION INDICATOR
⊗ 110.50	SPOT ELEVATION INDICATOR (IN FEET)
XXXX EL XX.XX	ELEVATION DATUM (IN FEET)
	DIRECTION OF SLOPE DOWN
HINGE SIDE	HATCH SWING INDICATOR
ACTIVE, INACTIVE, XX101A	INDICATES PAIR OF DOORS (DOOR # ON ACTIVE)
F.EXT-X (IN CABINET); F.EXT-X (ON BRACKET)	FIRE EXTINGUISHER "X" = NUMBER IN SPECIFICATIONS
CJ	CONTROL JOINT
X" EJ	EXPANSION JOINT X" = DIMENSION
POST	RAILINGS
P-1	PRECAST PANEL IDENTIFIER
S-X	SLAB INDICATOR
X	COLUMN INDICATOR
W-X	WALL INDICATOR
B-X	BEAM INDICATOR

WALL TYPES



RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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DRN: SDB	ORIG. DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
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APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services — Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: GENERAL ARCHITECTURAL GENERAL LEGENDS

SHEET: 8 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-008

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 001-G-008_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:07:45 PM

BUILDING CODE DATA TABLE

OREGON STRUCTURAL SPECIALTY CODE 2007

FACILITY NAME:
HEADWORKS BUILDING - FACILITY 200

PROJECT DESCRIPTION:
ADDITION TO EXISTING HEADWORKS BUILDING:
NEW PRECAST CONCRETE ADDITION HOUSING THE COMPACTOR AND ELECTRICAL ROOMS

OCCUPANCY GROUP [OSSC CHAPTER 3]	**OCCUPANCY**	
	HEADWORKS BUILDING - EXISTING BUILDING	F-2
	COMPACTOR ROOM - NEW ADDITION	F-2
	ELECTRICAL ROOM - NEW ADDITION	F-2
CONSTRUCTION TYPE [OSSC CHAPTER 6]		TYPE II-B

GENERAL BUILDING LIMITATIONS [OSSC TABLE 503]		
MAXIMUM STORIES/HEIGHT ALLOWED		
EXISTING BUILDING	F-2	3 STORIES/55 FT
COMPACTOR ROOM	F-2	3 STORIES/55 FT
ELECTRICAL ROOM	F-2	3 STORIES/55 FT
MAXIMUM AREA ALLOWED PER FLOOR		
	F-2	23,000 SF
ACTUAL NUMBER OF STORIES/HEIGHT ABOVE GROUND PLANE		
EXISTING BUILDING	F-2	2 STORIES/44 FT
COMPACTOR ROOM	F-2	1 STORY/29 FEET
ELECTRICAL ROOM	F-2	1 STORY/18 FEET
ACTUAL AREA PER FLOOR		
EXISTING FACILITY	F-2	3,500 SF
COMPACTOR ROOM	F-2	1,548 SF
ELECTRICAL ROOM	F-2	504 SF
TOTAL		5,552 SF

FIRE RESISTANCE OF BUILDING ELEMENTS [OSSC TABLE 601]		
REQUIRED RATINGS	UNRATED FOR CONSTRUCTION TYPE II-B	
EXTERIOR OPENING PROTECTION [OSSC TABLE 602]		
OPENING PROTECTION	1-HR IF LESS THAN 10-FEET	
	0-HR IF EQUAL TO OR GREATER THAN 10-FEET	
ACTUAL OPENING PROTECTION		NONE: ALL SIDES GREATER THAN 10-FEET
ROOF COVERING [OSSC TABLE 1506.1		CLASS C REQUIRED

MEANS OF EGRESS [OSSC CHAPTER 10]		
OCCUPANT LOAD FACTOR [OSSC TABLE 1004.1.1]		
EXISTING BUILDING		3,500/100 SF (GROSS) = 35
COMPACTOR ROOM		1,548/100 SF (GROSS) = 16
ELECTRICAL ROOM		504/100 SF (GROSS) = 5
TOTAL		56
ACTUAL NUMBER OF OCCUPANTS		NOT NORMALLY OCCUPIED
ALLOWABLE TRAVEL DISTANCE [OSSC TABLE 1016.1]		
EXISTING BUILDING	F-2	300 FEET
COMPACTOR ROOM	F-2	300 FEET
ELECTRICAL ROOM	F-2	300 FEET
EXITS REQUIRED [OSSC TABLE 1019.2]		
EXISTING BUILDING	3,500 SF / 100 = 35 (LESS THAN 50)	1 EXIT REQUIRED
COMPACTOR ROOM	1,548 SF / 100 = 15 (LESS THAN 50)	1 EXIT REQUIRED
ELECTRICAL ROOM	504 SF / 100 = 5 (LESS THAN 50)	1 EXIT REQUIRED
EXITS PROVIDED		
EXISTING BUILDING		2 EXITS
COMPACTOR ROOM		2 EXITS
ELECTRICAL ROOM		2 EXITS

RECORD DRAWINGS

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APPD: LEC	SCALE: NONE		

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Clean Water Services
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2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
GENERAL
ARCHITECTURAL
CODE COMPLIANCE SUMMARY

SHEET: 9 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #:
001-G-009

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

DESIGN CRITERIA

1. APPLICABLE CODE: 2006 INTERNATIONAL BUILDING CODE (IBC), AS AMENDED BY THE STATE OF OREGON AND ALL OTHER APPLICABLE LOCAL AGENCIES.

2. REFER TO THE DRAWINGS FOR ADDITIONAL AND SPECIFIC STRUCTURE LOADINGS AND REQUIREMENTS.

3. ROOF LOADS:
   GROUND SNOW LOAD, Pg = 25 PSF
   I = 1.1

   EXPOSURE CATEGORY - PARTIALLY EXPOSED
   Ce = 1.0

   LIVE LOAD = 20 PSF

   STRUCTURES HAVE BEEN DESIGNED FOR REDUCED ROOF LIVE LOADS IN ACCORDANCE WITH THE IBC.

   DEFLECTION CRITERIA FOR ROOF FRAMING MEMBERS:
   TOTAL LOAD L/180
   LIVE LOAD L/240

   WHERE L IS THE MEMBER'S SPAN LENGTH

4. FLOOR LIVE LOADS:
   ELECTRICAL ROOM 300 PSF
   MECHANICAL ROOM 200 PSF
   CORRIDORS, EXITS, STAIRS 100 PSF
   WALKWAYS AND ELEVATED PLATFORMS 60 PSF

5. WIND LOAD:
   BASIC WIND SPEED (3-SECOND GUST) = 94.5 MPH
   EXPOSURE = C
   OCCUPANCY CATEGORY = 111
   I = 1.15

   COMPONENTS AND CLADDING DESIGNED FOR WIND PRESSURE IN ACCORDANCE WITH ASCE 7-05. SEE DRAWINGS FOR DESIGN WIND PRESSURES FOR EXTERIOR COMPONENT AND CLADDING MATERIALS.

6. SEISMIC LOAD:
   MAPPED SPECTRAL RESPONSE ACCELERATIONS
   S_S = 0.93 g
   S_1 = 0.34 g
   SITE CLASS = D
   OCCUPANCY CATEGORY = III
   SEISMIC DESIGN CATEGORY = D
   I = 1.25

7. LATERAL FORCE-RESISTING SYSTEMS:
   CANTILEVERED COLUMN SYSTEM DETAILED TO CONFORM WITH THE REQUIREMENTS OF A SPECIAL REINFORCED CONCRETE MOMENT FRAME, R = 2.5.

8. SOIL DESIGN PARAMETERS:
   A. NET ALLOWABLE SOIL BEARING PRESSURES:
   2500 PSF

9. FROST DEPTH: 18 IN

GENERAL INFORMATION

1. FOR ABBREVIATIONS NOT LISTED, SEE ASME Y14.38 "ABBREVIATIONS AND ACRONYMS: PUBLICATION AS DISTRIBUTED BY THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).

2. DESIGN DETAILS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR SITUATIONS OCCURRING THROUGHOUT THE PROJECT, WHETHER OR NOT THEY ARE INDIVIDUALLY CALLED OUT.

3. DETAILING AND DIMENSIONS OF EXISTING STRUCTURES SHOWN ARE BASED ON AS-BUILT DESIGN DRAWINGS, AND DO NOT NECESSARILY REPRESENT THE AS-CONSTRUCTED CONDITIONS. THE CONTRACTOR SHALL FIELD VERIFY DIMENSIONS AND DETAILING OF THE EXISTING STRUCTURES PRIOR TO FABRICATION OF ADJACENT FRAMING OR CONNECTIONS OR SUPPORTS THAT ARE AFFECTED BY THE EXISTING STRUCTURE.

4. VERIFY FINAL OPENING DIMENSIONS IN WALLS, SLABS, AND DECKS WITH OTHER DISCIPLINE DRAWINGS PRIOR TO CONSTRUCTION OF THESE ELEMENTS.

5. FOR NUMBER, TYPE, SIZE, ARRANGEMENT, AND/OR LOCATION OF EQUIPMENT PADS SEE OTHER DISCIPLINE DRAWINGS. COORDINATE WITH EQUIPMENT SUPPLIER PRIOR TO PLACING SLABS, WALLS AND FOUNDATIONS. COORDINATE PIPING OPENINGS WITH OTHER DISCIPLINE DRAWINGS.

6. STRUCTURAL MEMBERS SHALL NOT BE CUT OR MODIFIED FOR PIPES, DUCTS, ETC, UNLESS SPECIFICALLY DETAILED OR APPROVED IN WRITING BY THE ENGINEER.

7. VISITS TO THE JOB SITE BY THE ENGINEER TO OBSERVE THE CONSTRUCTION DO NOT IN ANY WAY MEAN THAT ENGINEER IS GUARANTOR OF CONSTRUCTOR'S WORK, NOR RESPONSIBLE FOR THE COMPREHENSIVE OR SPECIAL INSPECTIONS, COORDINATION, SUPERVISION, OR SAFETY AT THE JOB SITE.

SPECIAL INSPECTION, OBSERVATIONS AND TESTING

1. SPECIAL INSPECTION (OWNER FURNISHED) IS REQUIRED IN ACCORDANCE WITH IBC SECTIONS 109 AND 1704 AS INDICATED IN THE STATEMENT OF SPECIAL INSPECTIONS PLAN.

2. SPECIFIED CONCRETE AND MASONRY TESTING DURING CONSTRUCTION WILL BE OWNER FURNISHED. SPECIFIED LABORATORY TEST MIXES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

3. STRUCTURAL OBSERVATIONS (OWNER FURNISHED) IS REQUIRED IN ACCORDANCE WITH IBC SECTION 1709 AS INDICATED IN THE STATEMENT OF SPECIAL INSPECTION PLAN.

FOUNDATIONS

1. EXCAVATIONS SHALL BE SHORED TO PREVENT SUBSIDENCE OR DAMAGE TO ADJACENT EXISTING STRUCTURES, STREETS, UTILITIES, ETC.

2. ALL FOUNDATION BEARING SURFACES SHALL BE OBSERVED BY A GEOTECHNICAL ENGINEER OR HIS DESIGNEE PRIOR TO PLACEMENT OF FORMING OR REINFORCING STEEL THE OBSERVATION SHALL VERIFY THAT THE ACTUAL EXPOSED SUBGRADE IS AS ANTICIPATED BY THE SITE SPECIFIC BORINGS, TEST PITS, TESTING AND DATA REPORTS.

3. NO BACKFILL SHALL BE PLACED BEHIND WALLS UNTIL THE WALLS HAVE ATTAINED 100 PERCENT OF IT'S SPECIFIED COMPRESSIVE STRENGTH AND TOP SUPPORTING SLAB'S CONCRETE HAVE ATTAINED 80 PERCENT OF THEIR SPECIFIED COMPRESSIVE STRENGTH, OR UNTIL TOP-OF-WALL FRAMING SYSTEMS, INCLUDING STEEL OR WOOD DIAPHRAGMS, HAVE BEEN COMPLETED.

4. NO BACKFILL SHALL BE PLACED BEHIND CANTILEVERED, FREE TOP WALLS UNTIL THE CONCRETE HAS ATTAINED100 PERCENT OF ITS SPECIFIED COMPRESSIVE STRENGTH.

FORMWORK, SHORING AND BRACING

1. STRUCTURES SHOWN ON THE DRAWINGS HAVE BEEN DESIGNED FOR STABILITY UNDER FINAL CONDITIONS ONLY. DESIGN SHOWN DOES NOT INCLUDE NECESSARY COMPONENTS OR EQUIPMENT FOR STABILITY OF THE STRUCTURES DURING CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR ALL WORK RELATING TO CONSTRUCTION ERECTION METHODS, BRACING, SHORING, RIGGING, GUYS, SCAFFOLDING, FORMWORK, AND OTHER WORK AIDS REQUIRED TO SAFELY PERFORM THE WORK SHOWN.

2. TEMPORARY SHORING SHALL REMAIN IN PLACE UNTIL ELEVATED CONCRETE FLOOR OR SLABS HAVE REACHED 80 PERCENT OF THE 28 DAY DESIGN STRENGTH AS DETERMINED BY CYLINDER BREAKS.

CONCRETE REINFORCING

1. MINIMUM REINFORCING FOR ALL CONCRETE WALLS AND SLABS SHALL BE AS FOLLOWS:

WALL THICKNESS	REINF EACH WAY	LOCATION
6"	#4@12"	CENTERED
8"	#5@12"	CENTERED
10"	#4@12"	EACH FACE
12"	#5@12"	EACH FACE

   PROVIDE LARGER SIZES AND MORE REINFORCING IN SECTIONS OF CONCRETE WHERE REQUIRED BY THE DETAILS ON THE DRAWINGS OR BY THE SPECIFICATIONS.

2. CLEARANCE FOR REINFORCEMENT BARS, UNLESS SHOWN OTHERWISE, SHALL BE:
   WHEN PLACED ON GROUND: 3"
   INTERIOR, DRY, HUMIDITY CONTROLLED AREAS:
   WALLS, SLABS AND JOISTS 3/4"
   BEAM STIRRUPS AND COLUMN TIES 11/2"
   ALL OTHER CONCRETE SURFACES 2"

3. 90 DEGREE BENDS, UNLESS OTHERWISE SHOWN, SHALL BE ACI 318 STANDARD HOOKS.

4. WALL CORNER AND WALL INTERSECTION REINFORCEMENT BARS SHALL BE CONTINUOUS AROUND CORNERS AND THROUGH COLUMNS OR PILASTERS. REINFORCEMENT SHALL BE EXTENDED INTO CONNECTING WALLS AND LAPPED ON THE OPPOSITE FACE OF THE CONNECTING WALLS.

5. LAP VERTICAL WALL BARS WITH DOWELS FROM BASE SLABS AND EXTEND INTO TOP FACE OF ROOF SLABS AND LAP WITH TOP SLAB REINFORCEMENT. PROVIDE A MINIMUM OF FOUR FULL HEIGHT VERTICAL BARS WITH MATCHING DOWELS AT WALL ENDS, CORNERS AND INTERSECTIONS WITH SIZE TO MATCH TYPICAL VERTICAL REINFORCING STEEL SHOWN OR REQUIRED BY NOTES ABOVE.

6. REINFORCEMENT BENDS AND LAPS, UNLESS OTHERWISE NOTED, SHALL SATISFY THE FOLLOWING MINIMUM REQUIREMENTS:

CONCRETE DESIGN STRENGTH = 4,000 PSI ★★		GRADE 60 REINFORCING STEEL								
BAR SIZE		#3	#4	#5	#6	#7	#8	#9	#10	#11
LAP SPLICE LENGTH										
SPACING<6"	TOP BAR ★	1'-4"	2'-0"	3'-0"	4'-0"	5'-10"	6'-8"	7'-7"	8'-6"	9'-5"
	OTHER BAR	1'-4"	1'-7"	2'-4"	3'-1"	4'-6"	5'-2"	5'-10"	6'-7"	7'-3"
SPACING≥6"	TOP BAR ★	1'-4"	1'-6"	2'-0"	2'-5"	3'-6"	4'-0"	5'-0"	6'-2"	7'-5"
	OTHER BAR	1'-4"	1'-4"	1'-7"	1'-10"	2'-9"	3'-1"	3'-10"	4'-9"	5'-8"
EMBEDMENT LENGTH										
SPACING<6"	TOP BAR ★	1'-0"	1'-7"	2'-4"	3'-1"	4'-6"	5'-2"	5'-10"	6'-7"	7'-3"
	OTHER BAR	1'-0"	1'-3"	1'-9"	2'-5"	3'-6"	4'-0"	4'-6"	5'-1"	5'-7"
SPACING≥6"	TOP BAR ★	1'-0"	1'-3"	1'-7"	1'-10"	2'-9"		3'-10"	4'-9"	5'-8"
	OTHER BAR	1'-0"	1'-0"	1'-3"	1'-5"	2'-1"	2'-5"	3'-0"	3'-8"	4'-5"

★ TOP BARS SHALL BE DEFINED AS ANY HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12 INCHES OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR IN ANY SINGLE POUR. HORIZONTAL WALL BARS ARE CONSIDERED TOP BARS.

★★ WHERE 3000 PSI CONCRETE IS USED, INCREASE ABOVE LENGTHS BY 16 PERCENT

CONCRETE

1. 28-DAY CAST-IN-PLACE CONCRETE STRENGTHS:
   TYPICAL: 4000 PSI
   CONCRETE FILL: 2500 PSI
   CURBS AND SIDEWALKS: 3000 PSI
   CONDUIT ENCASEMENTS: 3000 PSI
   PIPE ENCASEMENTS NOT INTEGRAL WITH FOUNDATIONS: 3000 PSI
   PRESTRESSED TEES: 5000 PSI

2. REINFORCING STEEL:
   TYPICAL: ASTM A615, GRADE 60
   WELDED: ASTM A706, GRADE 60

3. FABRICATION AND PLACEMENT OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH CRSI MSP-1 "MANUAL OF STANDARD PRACTICE" AND ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE".

4. CONSTRUCTION JOINTS INDICATED ARE SUGGESTED LOCATIONS. CONTRACTOR MAY REVISE LOCATION OF JOINTS, SUBJECT TO SPECIFIED REQUIREMENTS. ADDITIONAL CONSTRUCTION JOINT LOCATIONS, INCLUDING ADDITIONAL REQUIRED FOR CONSTRUCTION, SHALL BE SUBMITTED FOR REVIEW BY ENGINEER.

5. ROUGHEN AND CLEAN CONSTRUCTION JOINTS IN WALLS AND SLABS AS SPECIFIED PRIOR TO PLACING ADJACENT CONCRETE.

6. THE CONTRACTOR SHALL COORDINATE PLACEMENT OF OPENINGS, CURBS, DOWELS, SLEEVES, CONDUITS, BOLTS AND INSERTS PRIOR TO PLACEMENT OF CONCRETE.

7. NO ALUMINUM CONDUIT OR PRODUCTS CONTAINING ALUMINUM OR ANY OTHER MATERIAL INJURIOUS TO THE CONCRETE SHALL BE EMBEDDED IN THE CONCRETE.

8. CONDUIT SHALL NOT BE PLACED PARALLEL WITH BEAM OR COLUMN REINFORCEMENT UNLESS SPECIFICALLY INDICATED IN DRAWINGS.

PRECAST CONCRETE

1. PRECAST AND PRESTRESSED ELEMENTS SHALL BE DESIGNED FOR THE LOADING INDICATED HEREIN AND IN THE SPECIFICATIONS.

2. DESIGN OF EMBEDMENT ITEMS FOR CONNECTION TO THE STRUCTURE ARE THE RESPONSIBILITY OF THE PRECAST / PRESTRESSED MANUFACTURER. MAXIMUM LOAD AT EACH CONNECTION IS INDICATED ON THE DRAWINGS.

MASONRY

1. MORTAR: ASTM C270, TYPE S. MASONRY CEMENT SHALL NOT BE USED.

2. GROUT: ASTM C476 COARSE GROUT. 2000 PSI MINIMUM 28 DAY COMPRESSIVE STRENGTH.

3. CONCRETE MASONRY UNITS: ASTM C90, GRADE N, MEDIUM WEIGHT, NET 1900 PSI COMPRESSIVE MASONRY STRENGTH. LINEAR SHRINKAGE SHALL NOT EXCEED .065 PERCENT.

4. REINFORCING STEEL: ASTM A615, GRADE 60.

5. DESIGN f'm OF THE FINISHED ASSEMBLY SHALL BE 1500 PSI.

6. PLACE COURSES IN RUNNING BOND PATTERN, UNLESS SPECIFICALLY INDICATED OTHERWISE.

7. GROUTING:
   A. SOLID GROUT CMU WALLS.

8. LAP VERTICAL REINFORCING 48 BAR DIAMETERS WITH DOWELS AT BUILDING WALLS. LAP ALL OTHER VERTICAL BARS 72 BAR DIAMETERS. LAP VERTICAL BARS IN CANTILEVER WALLS 72 BAR DIAMETERS. STAGGER ADJACENT LAP SPLICES BY 24 INCHES, WHEN SEPARATED BY 3 INCHES OR LESS.

9. PROVIDE TWO FULL HEIGHT TYPICAL VERTICAL BARS AT EDGES OF OPENINGS AND FULL HEIGHT TYPICAL VERTICAL BARS IN 3 CELLS AT CORNERS. PROVIDE MATCHING DOWELS FOR VERTICAL BARS. PROVIDE REINFORCED LINTELS ABOVE AND REINFORCED BOND BEAMS BELOW OPENINGS. PROVIDE HORIZONTAL CORNER BARS WITH MINIMUM 2'-0" LEGS AT CORNERS. SEE DETAILS 0422-001 THROUGH 0422-006.

10. MASONRY UNIT AND GROUT TESTING SHALL BE IN CONFORMANCE WITH 2006 IBC, "UNIT STRENGTH METHOD". TESTING WILL BE OWNER FURNISHED. OTHER IBC TEST METHODS MAY BE SUBMITTED AS AN ALTERNATIVE.

11. THE MINIMUM REINFORCING FOR REINFORCED CONCRETE BLOCK WALLS SHALL BE AS FOLLOWS:

WALL THICKNESS	VERTICAL REINFORCING	HORIZONTAL REINFORCING	LOCATION
8""	#6@48"	#5@48"	CENTERED

12. PLACE NO CONDUIT IN CELLS CONTAINING REINFORCEMENT.

WELDING

1. WELDS SHALL CONFORM TO AMERICAN WELDING SOCIETY (AWS), LATEST EDITION:
   D1.1, STRUCTURAL WELDING CODE – STEEL
   D1.2, STRUCTURAL WELDING CODE – ALUMINUM
   D1.3, STRUCTURAL WELDING CODE – SHEET STEEL
   D1.4, STRUCTURAL WELDING CODE – REINFORCING STEEL
   D1.6, STRUCTURAL WELDING CODE – STAINLESS STEEL

2. REPAIR WELDS FOUND DEFECTIVE IN ACCORDANCE WITH AWS D1.1 SECTION 5.26.

3. USE INTERMITTENT WELDS AT FIELD WELDS OF EMBED PLATES AND ANGLES TO AVOID SPALLING OR CRACKING OF THE EXISTING CONCRETE.

4. BUTT JOINT WELDS SHALL BE COMPLETE JOINT PENETRATION (CJP) UNLESS INDICATED OTHERWISE.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

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PLOT DATE: 05-26-2012
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DRN: GTM | ORIG DATE: FEB 2010
DSN: ALF | DWG #: 001-G-010
CHK: BSH | CAD FILE #:
APPD: LEC | SCALE: NONE

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: GENERAL STRUCTURAL NOTES SHEET 1

SHEET: 10 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-010

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

DEFERRED SUBMITTALS

1. DEFERRED SUBMITTALS ARE THOSE PORTIONS OF THE DESIGN WHICH ARE NOT SUBMITTED AT THE TIME OF PERMIT APPLICATION AND WHICH ARE TO BE SUBMITTED TO THE PERMITTING AGENCY FOR ACCEPTANCE PRIOR TO INSTALLATION OF THAT PORTION OF THE WORK.

2. THE FOLLOWING IS A LIST OF DEFERRED SUBMITTALS PER IBC SECTION 106.3.4.2 THAT ARE EXPECTED TO CONTAIN STRUCTURAL CALCULATIONS OR SAFETY RELATED SYSTEM INFORMATION FOR REVIEW TO MEET BUILDING PERMITTING REQUIREMENTS FOR DESIGNED SYSTEMS. PRIOR TO INSTALLATION OF THE INDICATED STRUCTURAL ELEMENT, EQUIPMENT, DISTRIBUTION SYSTEM, OR COMPONENT OR ITS ANCHORAGE, THE CONTRACTOR SHALL SUBMIT THE REQUIRED CALCULATIONS AND SUPPORTING DATA AND DRAWINGS FOR REVIEW AND ACCEPTANCE BY THE ENGINEER. ADDITIONALLY, ACCEPTANCE INDICATED ON THE ENGINEER'S COMMENT FORM, ALONG WITH THE COMPLETED, FINAL SUBMITTAL SHALL THEN BE FILED BY THE CONTRACTOR AND ACKNOWLEDGED AS ACCEPTED BY THE PERMITTING AGENCY PRIOR TO INSTALLATION OF THESE ITEMS.

SPECIFICATION SECTION	ITEM
01612	SEISMIC ANCHORAGE AND BRACING
03400	PRECAST CONCRETE
05520	METAL RAILINGS
15060	PIPING SUPPORT SYSTEMS
OTHER	ANY EQUIPMENT OR COMPONENT IN WHICH A TECHNICAL SPECIFICATION REQUIRES SUBMITTAL OF EQUIPMENT OR ANCHORAGE SYSTEM CALCULATIONS

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

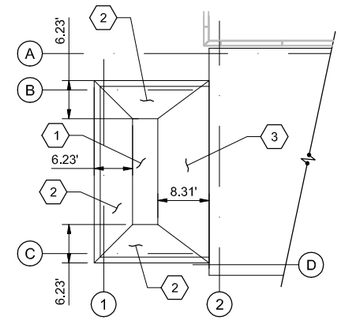
STRUCTURAL ABBREVIATIONS

@	AT
AB	ANCHOR BOLT
ACI	AMERICAN CONCRETE INSTITUTION
ADDL	ADDITIONAL
ADJ	ADJACENT
AFF	ABOVE FINISH FLOOR
AHR	ANCHOR
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AL	ALUMINUM
ALLOW	ALLOWABLE
ALTN	ALTERNATE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPROX	APPROXIMATE
APVD	APPROVED
ARCH.	ARCHITECTURAL
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWS	AMERICAN WELDING SOCIETY
BETW	BETWEEN
BF	BOTTOM FACE
BLDG	BUILDING
BM	BEAM
BO	BOTTOM OF
BOT	BOTTOM
BRG	BEARING
C	CHANNEL OR C-SHAPE
C TO C	CENTER TO CENTER
CHKD PL	CHECKERED PLATE
CIPC	CAST-IN-PLACE CONCRETE
CJ	CONSTRUCTION JOINT
CJP	COMPLETE JOINT PENETRATION (WELD)
CL	CENTERLINE
CLR	CLEARANCE, CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
COORD	COORDINATE
CRSI	CONCERTE REINFORCING STEEL INSTITUTE
CTLJ	CONTROL JOINT
CTR	CENTER
CTRD	CENTERED
CU	CUBIC
d	PENNY (NAIL SIZE)
DBA	DEFORMED BAR ANCHOR
DBL	DOUBLE
DEG	DEGREE
DET	DETAIL
DF	DOUGLAS FIR
DIA	DIAMETER
DIAG	DIAGONAL
DIM.	DIMENSION
DIR	DIRECTION
DL	DEAD LOAD
DO	DITTO
DTI	DIRECT TENSION INDICATOR
DWG	DRAWING
DWL	DOWEL
EA	EACH
EF	EACH FACE
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
EMBED	EMBEDMENT, EMBED
ENGR	ENGINEER
EQL	EQUAL
EQL SP	EQUALLY SPACED
EQPT	EQUIPMENT
EQUIV	EQUIVALENT
EW	EACH WAY
EXP JT	EXPANSION JOINT
EXST	EXISTING
EXT	EXTERIOR
FAB	FABRICATE, FABRICATION
FB	FLAT BAR
FD	FLOOR DRAIN
FDN	FDN
FF	FINISH FLOOR
FG	FINISH GRADE
FL	FLOOR
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FEET, FOOT
FTG	FOOTING
FV	FIELD VERIFY
GA	GAUGE, GAGE
GALV	GALVANIZED (HOT DIP)
GLB	GLUE LAMINATED BEAM
GRTG	GRATING
GVL	GRAVEL
H.A.S.	HEADED ANCHOR STUD
HDR	HEADER
HORIZ	HORIZONTAL
HPT	HIGH POINT
HSS	HOLLOW STRUCTURAL SECTION
HVAC	HEATING , VENTILATION, AND AIR CONDITIONING
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
I.F.	INSIDE FACE
IN.	INCH(ES)
INSUL	INSULATION
INTMD	INTERMEDIATE
INTR	INTERIOR
J	JOIST
JB	JOIST BEARING
JT	JOINT
KIP(S)	THOUSAND POUNDS
KSF	KIPS PER SQUARE FOOT
KSI	KIPS PER SQUARE INCH
L	ANGLE OR L-SHAPE
LB(S)	POUND(S) FORCE
LF	LINEAR FEET
LIW	LOAD INDICATING WASHER
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LNTL	LINTEL
LONG.	LONGITUDINAL
LPT	LOW POINT
LSL	LONG SLOTTED HOLE
MATL	MATERIAL
MAX	MAXIMUM
MB	MACHINE BOLT
MECH	MECHANICAL
MET.	METAL
MFD	MANUFACTURED
MFR(S)	MANUFACTURER (MANUFACTURER'S)
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO.	NUMBER
NTS	NOT TO SCALE
O TO O	OUT TO OUT
OC	ON CENTER
OD	OUTSIDE DIAMETER
O.F.	OUTSIDE FACE
OPNG(S)	OPENING(S)
OPP	OPPOSITE
P	PILASTER
PERIM	PERIMETER
PJF	PREMOLDED JOINT FILLER
PJP	PARTIAL JOINT PENETRATION (WELD)
PKG	PACKAGE
PL	PLATE
PLCS	PLACES
PLF	POUNDS FORCE PER LINEAR FOOT
PLYWD	PLYWOOD
PNL	PANEL
PRCST	PRECAST
PREFAB	PREFABRICATE(D)
PRELIM	PRELIMINARY
PRI	PRIMARY
PSF	POUNDS FORCE PER SQUARE FOOT
PSI	OPUNDS FORCE PER SQUARE INCH
PT	PRESSURE TREATED
PVC	POLYVINYL CHLORIDE
R	RADIUS, RISER
RAD	RADIUS
RC	REINFORCED CONCRETE
RDAA	REBAR DOWEL ADHESIVE ANCHOR
RDW	REDWOOD
RECT	RECTANGULAR, RECTANGLE
REF	REFERENCE
REINF	REINFORCE, REINFORCING
REQD	REQUIRED
RST	REINFORCING STEEL
S	I-BEAM
SC	SLIP CRITICAL (BOLTS)
SCHED	SCHEDULE
SECT.	SECTION
SH	SHEET
SIM	SIMILAR
SOG	SLAB ON GRADE
SP	SPACE
SPEC(S)	SPECIFICATION(S)
SPECD	SPECIFIED
SPG	SPACING
SQ	SQUARE
SSL	SHORT SLOTTED HOLE
SST	STAINLESS STEEL
STD	STANDARD
STIF	STIFFENER
STIR.	STIRRUP
STL	STEEL
STR	STRAIGHT
STRL	STRUCTURAL
STRUCT	STRUCTURE
SYMM	SYMMETRICAL
T	TREAD
T&B	TOP AND BOTTOM
TAS	THREADED ANCHOR STUD
TC	TOP OF CONCRETE, TOP OF CURB
TEMP	TEMPERATURE
TF	TOP OF FOOTING, TOP FACE
THK	THICK
THKNS	THICKNESS
THRU	THROUGH
TM	TOP OF MASONRY
T.O.	TOP OF
TRANSV	TRANSVERSE
TST	TOP OF STEEL
TW	TOP OF WALL
TYP	TYPICAL
UBC	UNIFORM BUILDING CODE
UNIF	UNIFORM, UNIFORMLY
UON	UNLESS OTHERWISE NOTED
VERT	VERTICAL
W	WIDE FLANGE BEAM
W/	WITH
W/O	WITHOUT
WD	WOOD
WP	WORKING POINT
WS	WATERSTOP, WATER SURFACE
WT	WEIGHT
WWF	WELDED WIRE FABRIC

FOR ABBREVIATIONS NOT LISTED, SEE GENERAL ABBREVIATIONS AND ASME Y14.38 - "ABBREVIATIONS AND ACRONYMS FOR USE ON DRAWINGS AND RELATED DOCUMENTS" AS DISTRIBUTED BY THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).

ROOF SNOW DRIFT DIAGRAM

LOWER ROOF

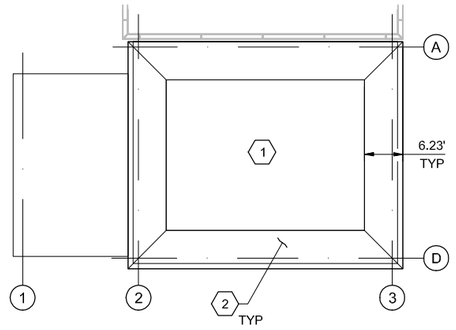


(1) 25 POUNDS PER SQUARE FOOT

(2) 35.8 POUNDS PER SQUAR FOOT

(3) 26.9 POUNDS PER SQUARE FOOT

UPPER ROOF



(1) 25 POUNDS PER SQUARE FOOT

(2) 26.9 POUNDS PER SQUARE FOOT

PLOT TIME: 1:08:51 PM
PLOT DATE: 05-26-2012
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			01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: GENERAL STRUCTURAL NOTES SHEET 2 AND ABBREVIATIONS

SHEET: 11 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-011

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

STATEMENT OF SPECIAL INSPECTIONS:

GENERAL NOTES

1. THE STATEMENT OF SPECIAL INSPECTIONS DRAWINGS PROVIDE PROJECT COMPLIANCE WITH THE PROVISIONS OF THE INTERNATIONAL BUILDING CODE (IBC) CHAPTER 17 FOR SPECIAL INSPECTION, STRUCTURAL OBSERVATION, AND TESTING FOR WIND AND SEISMIC RESISTANCE AS APPLICABLE. EXCEPT WHERE OTHERWISE NOTED, THIS INSPECTION IS OWNER FURNISHED.

2. STANDARD SPECIAL INSPECTION REQUIREMENTS FOR NONSTRUCTURAL COMPONENTS ARE CONTAINED IN TABLE 1.

3. STANDARD SPECIAL INSPECTION REQUIREMENTS FOR STRUCTURAL COMPONENTS, REGARDLESS OF WIND OR SEISMIC DESIGN CATEGORIES, ARE CONTAINED IN TABLE 2. STANDARD TESTING REQUIREMENTS FOR STRUCTURAL COMPONENTS ARE CONTAINED IN TABLE 3.

4. PROJECT SPECIFIC REQUIREMENTS FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORIES C, D, E, OR F ARE CONTAINED IN TABLE 4. ADDITIONAL TESTING REQUIREMENTS FOR STRUCTURAL RESISTANCE ARE CONTAINED IN TABLE 6.

5. FOR ADDITIONAL REQUIREMENTS, REFER TO SPECIFICATIONS, SPECIAL INSPECTION, OBSERVATION AND TESTING. THESE INCLUDE:
   A. CONTRACTOR'S REQUIREMENTS TO PROVIDE ACCESS TO THE WORK FOR REQUIRED INSPECTIONS, AND TO PROVIDE NOTICE OF REQUIRED INSPECTIONS AND STRUCTURAL OBSERVATION.
   B. CONTRACTOR'S STATEMENT OF RESPONSIBILITY FOR WORK TO BE PERFORMED ON SYSTEMS DESIGNATED UNDER THE STATEMENT OF SPECIAL INSPECTIONS PLAN FOR WIND OR SEISMIC RESISTANCE.
   C. DEFINITIONS AND TERMINOLOGY USED IN THIS STATEMENT OF SPECIAL INSPECTIONS.

SPECIAL INSPECTION

1. SPECIAL INSPECTION WILL BE IN ACCORDANCE WITH IBC SECTION 1704 TOGETHER WITH LOCAL AND STATE AMENDMENTS. REFER TO THE TABLES CONTAINED ON THESE GENERAL SHEETS FOR PROJECT SPECIFIC INSPECTION TYPES AND FREQUENCIES.

2. SPECIAL INSPECTIONS WILL BE PROVIDED BY A CERTIFIED OR QUALIFIED INSPECTOR AND ASSOCIATED TESTING WILL BE PERFORMED BY AN APPROVED ACCREDITED INDEPENDENT AGENCY. THE OWNER WILL SECURE AND PAY FOR THE SERVICES OF THE AGENCY TO PERFORM ALL SPECIAL INSPECTION AND ASSOCIATED TESTS. INSPECTORS FOR EACH SYSTEM AND MATERIAL WILL BE INTERNATIONAL CODE COUNCIL (ICC) CERTIFIED OR OTHERWISE APPROVED BY THE BUILDING OFFICIAL.

3. THE SPECIAL INSPECTOR WILL OBSERVE THE INDICATED WORK FOR COMPLIANCE WITH THE APPROVED CONTRACT DOCUMENTS AND SUBMIT RECORDS OF INSPECTION. ALL DISCREPANCIES WILL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION.

4. SPECIAL INSPECTION AND ASSOCIATED TESTING REPORTS WILL BE SUBMITTED TO THE ENGINEER, CONTRACTOR, BUILDING OFFICAL, AND OWNER WITHIN ONE WEEK OF INSPECTION OR WITHIN ONE WEEK OF TEST COMPLETION. INSPECTIONS FOR WHICH REPORTING WILL BE REQUIRED ARE NOTED IN THE TABLES CONTAINED ON THIS STATEMENT OF SPECIAL INSPECTIONS.

5. AT THE CONCLUSION OF CONSTRUCTION, A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS AND CORRECTION OF PREVIOUSLY NOTED DISCREPANCIES WILL BE SUBMITTED.

STRUCTURAL OBSERVATION

1. STRUCTURAL OBSERVATION WILL BE IN ACCORDANCE WITH IBC SECTION 1710 TOGETHER WITH LOCAL AND STATE AMENDMENTS. REFER TO PROJECT SPECIFIC NOTES ON THIS SHEET.

2. ONSITE STRUCTURAL OBSERVATION WILL BE PERFORMED FOR EACH IDENTIFIED SEISMIC FORCE-RESISTING SYSTEM, INCLUDING FOUNDATIONS AND CONNECTIONS. REFER TO THE GENERAL STRUCTURAL NOTES, DRAWING FOR THE BASIC SEISMIC- AND WIND-RESISTING SYSTEMS FOR THE STRUCTURES INCLUDED IN THE WORK.

3. STRUCTURAL OBSERVATION WILL BE PERFORMED BY A REGISTERED PROJECT DESIGN PROFESSIONAL FOR GENERAL CONFORMANCE TO THE APPROVED CONSTRUCTION DOCUMENTS. STRUCTURAL OBSERVATION DOES NOT INCLUDE OR WAIVE THE RESPONSIBILITY FOR ANY REQUIRED SPECIAL INSPECTIONS OR INSPECTIONS BY THE BUILDING OFFICIAL.

4. STRUCTURAL OBSERVATION REPORTS, NOTING ANY DEFICIENCIES IN OBSERVED CONSTRUCTION, WILL BE DELIVERED TO THE CONTRACTOR, BUILDING OFFICIAL, AND OWNER FOLLOWING EACH OBSERVATION. THE CONTRACTOR WILL BE NOTIFIED ON-SITE OR BY PHONE OR EMAIL WITHIN 24 HOURS UPON FINDING DEFICIENCIES.

5. AT THE CONCLUSION OF CONSTRUCTION, A WRITTEN STATEMENT WILL BE PROVIDED TO VERIFY THAT THE STRUCTURAL OBSERVATION SITE VISITS WERE MADE AND WHETHER THERE REMAIN ANY STRUCTURAL DEFICIENCIES THAT HAVE NOT BEEN RESOLVED.

6. STRUCTURAL OBSERVATION WILL INCLUDE VISUAL OBSERVATION OF THE STRUCTURAL SYSTEM AT SIGNIFICANT CONSTRUCTION STAGES AND AT COMPLETION OF THE STRUCTURAL SYSTEM FOR EACH STRUCTURE CONTAINED IN THE WORK. THE CONTRACTOR SHALL SCHEDULE AND FACILITATE STRUCTURAL OBSERVATION INCLUDING THE FOLLOWING:

	SYSTEM FOR HEADWORKS ADDITION	STAGE	ITEMS	COMMENTS
1.	FOUNDATION SLAB OF STRUCTURE	PRIOR TO FIRST CONCRETE PLACEMENT OF FIRST SECTION WHEN ITEMS CAN STILL BE REVISED	REINFORCING STEEL, CONCRETE AND MASONRY WALL DOWELS, EMBEDS, AND SIMILAR ITEMS	NOTE 1
2.	WALL AND COLUMN TO FOUNDATION CONNECTIONS PRIOR TO FORM CLOSURE	PRIOR TO FIRST CONCRETE PLACEMENT OF FIRST SECTION WHEN ITEMS CAN STILL BE REVISED	REINFORCING STEEL, WALL DOWELS, EMBEDS AND SIMILAR ITEMS	NOTE 1
3.	ELEVATED CONCRETE SLABS, BEAMS, AND COLUMNS PRIOR TO CONCRETE PLACEMENT	PRIOR TO FIRST CONCRETE PLACEMENT OF FIRST SECTION WHEN ITEMS CAN STILL BE REVISED	REINFORCING STEEL, EMBEDS, COURSE PREPARATION AND SIMILAR ITEMS	NOTE 1
4.	MASONRY WALL REINFORCING STEEL	PRIOR TO GROUTING AND PRIOR TO CLOSING OF CLEANOUTS		NOTE 1
5.	PRECAST CONNECTION EMBEDS	PRIOR TO GROUT OR CONCRETE PLACEMENT		NOTE 1
6.	AT END OF STRUCTURAL WORK OF EACH ITEM, OR IF VISIBLE, AT END OF ALL STRUCTURAL WORK FOR DETERMINATION OF FINAL CONDITION OF STRUCTURE			N OTE 1

NOTES:
1. STRUCTURAL OBSERVER TO DISCUSS ITEMS AND SITE SPECIFIC CONDITIONS WITH SPECIAL INSPECTOR AND FIELD INSPECTION STAFF DURING OBSERVATION.

SPECIAL INSPECTION FOR SEISMIC RESISTANCE

1. SPECIAL INSPECTIONS REQUIREMENTS FOR SEISMIC RESISTANCE WILL BE IN ACCORDANCE WITH IBC SECTION 1705.3 TOGETHER WITH LOCAL AND STATE AMENDMENTS.

2. SPECIAL INSPECTIONS REQUIREMENTS FOR SEISMIC RESISTANCE SHALL APPLY TO THE SYSTEMS AND COMPONENTS LISTED IN TABLE 4.

3. MAIN SYSTEMS REQUIRED TO BE COVERED UNDER PROJECT SPECIAL INSPECTION REQUIREMENTS INCLUDE THE FOLLOWING TOGETHER WITH THEIR CONNECTIONS. REFER TO SPECIFICATIONS.

TABLE 1
REQUIRED NON-STRUCTURAL SPECIAL INSPECTION

SYSTEM OR MATERIAL	2009 IBC CODE REFERENCE	REFERENCED STANDARD	PERIODIC OWNER FURNISHED SPECIAL INSPECTION (SEE NOTE 1)	CONTINUOUS OWNER FURNISHED SPECIAL INSPECTION	REQUIRED REPORTING BY SPECIAL INSPECTOR TO DESIGNATED DISTRIBUTION LIST	COMMENTS	TESTING FOR SPECIAL INSPECTION
GEOTECHNICAL							
1. SOILS:							
A. VERIFY MATERIALS BELOW FOOTINGS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY	1704.7, 1803.5, 1803.6		X		X	PROFESSIONAL OBSERVATION BY GEOTECHNICAL ENGINEER	
B. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL	1704.7		X		X	PROFESSIONAL OBSERVATION BY GEOTECHNICAL ENGINEER	
C. PERFORM CLASSIFICATION AND TESTING OF CONTROLLED FILL MATERIALS	1704.7		X		X		SEE TABLE 3 FOR GRADATION TEST REQUIREMENTS
D.VERIFY USE OF PROPER MATERIALS, DENSITIES, AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL	1704.7			X	X		SEE TABLE 3 FOR DENSITY TEST REQUIREMENTS
E. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY	1704.7		X		X	PROFESSIONAL OBSERVATION BY GEOTECHNICAL ENGINEER	SEE TABLE 3 FOR DENSITY TEST REQUIREMENTS
GENERAL							
1. INSTALLATION OF MATERIALS THAT REQUIRE ADDITIONAL MANUFACTURER'S INSTRUCTIONS BEYOND CODE REQUIREMENTS	1703.4.2, 1704.15 ITEM 3	ICC-ES EVALUATION REPORTS		X	X		
STRUCTURAL							
SEE TABLE 2							

NOTES:
1. PERIODIC INSPECTION IS DEFINED AS INSPECTION BY THE SPECIAL INSPECTOR OF ALL MATERIALS AND SYSTEMS, IN SOME CASES PERFORMED DURING THEIR PLACEMENT AND IN ALL CASES PERFORMED UPON COMPLETION OF THEIR PLACEMENT. THE COMPLETION INSPECTION SHALL BE PERFORMED SO THAT WORK CAN BE CORRECTED PRIOR TO OTHER RELATED WORK PROCEEDING

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 001-G-012_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:09:01 PM

DRN: GTM	ORIG DATE: FEB 2010		
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PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
GENERAL
STRUCTURAL
SPECIAL INSPECTION NOTES AND TABLES SHEET 1

SHEET: 12 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-012

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

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TABLE 2
REQUIRED STRUCTURAL SPECIAL INSPECTION

SYSTEM	2009 IBC CODE REFERENCE	REFERENCED STANDARD	PERIODIC OWNER FURNISHED SPECIAL INSPECTION (SEE NOTE 1)	CONTINUOUS OWNER FURNISHED SPECIAL INSPECTION	REQUIRED REPORTING BY SPECIAL INSPECTOR TO DESIGNATED DISTRIBUTION LIST	COMMENTS	TESTING FOR SPECIAL INSPECTION
CONCRETE							
1. INSPECTION OF REINFORCING STEEL	1704.4, 1903.1, 1907.1, 1907.7, 1913.4	ACI 318: 3.5, 7.1-7.7	X		X		
2. INSPECT BOLTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRET	1704.4, 1911.5	ACI 318: 8.1.3, 21.2.8		X	X		
3. INSPECTION OF ANCHORS INSTALLED IN HARDENED CONCRETE.	1912.1	ACI 318: 3.8.6, 8.1.3, 21.2.8	X		X		
4. VERIFY USE OF REQUIRED DESIGN MIX	1704.4, 1904.2.2, 1905.2-1905.4, 1913.2, 1913.3	ACI 318: Ch. 4, 5.2-5.4	X		X		
5. AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE	1704.4, 1905.6, 1913.10	ASTM C 172, ASTM C 31, ACI 318: 5.6, 5.8		X	X		SEE TABLE 3 FOR CONCRETE TEST REQUIREMENTS
6. INSPECTION OF CONCRETE PLACEMENT FOR PROPER APPLICATION	1704.4, 1905.9, 1905.10, 1913.6, 1913.7, 1913.8	ACI 318: 5.9, 5.10		X	X		
7. INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND	1704.4, 1905.11-1905.13, 1913.9	ACI 318: 5.11-5.13	X		X		
8. ERECTION OF PRECAST CONCRETE MEMBERS	1704.4	ACI 318: Ch. 16	X		X		
9. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED	1704.4, 1906.1	ACI 318: 6.1.1	X		X		
MASONRY LEVEL 1							
1. VERIFY COMPLIANCE WITH INSPECTION PROVISIONS OF CONSTRUCTION DOCUMENTS AND APPROVED SUBMITTALS	1704.5.2	ACI 530.1: Art. 1.5	X		X		
2. VERIFICATION OF f'_m AND f'_{AAC} PRIOR TO CONSTRUCTION EXCEPT WHERE SPECIFICALLY EXCEMPTED BY CODE	1704.5.2	ACI 530.1: Art. 1.4B	X		X		
3. FOR SELF-CONSOLIDATING GROUT: VERIFICATION OF SLUMP FLOW AND VSI AS DELIVERED TO THE SITE.	1704.5.2	ACI 530.1: Art. 1.5B.1.b.3		X	X		

TABLE 2
REQUIRED STRUCTURAL SPECIAL INSPECTION

SYSTEM	2009 IBC CODE REFERENCE	REFERENCED STANDARD	PERIODIC OWNER FURNISHED SPECIAL INSPECTION (SEE NOTE 1)	CONTINUOUS OWNER FURNISHED SPECIAL INSPECTION	REQUIRED REPORTING BY SPECIAL INSPECTOR TO DESIGNATED DISTRIBUTION LIST	COMMENTS	TESTING FOR SPECIAL INSPECTION
MASONRY LEVEL 1							
4. AS MASONRY CONSTRUCTION BEGINS, THE FOLLOWING SHALL BE VERIFIED TO ENSURE COMPLIANCE:							
A. PROPORTIONS OF SITE-PREPARED MORTAR	1704.5.2	ACI 530.1: Art. 2.6A	X		X		
B. CONSTRUCTION OF MORTAR JOINTS	1704.5.2	ACI 530.1: Art. 3.3B	X		X		
C. LOCATION OF REINFORCEMENT AND CONNECTORS	1704.5.2	ACI 530.1: Art. 3.4, 3.6A	X		X		
5. THE INSPECTION PROGRAM SHALL VERIFY:							
A. SIZE AND LOCATION OF STRUCTURAL ELEMENTS	1704.5.2	ACI 530.1: Art. 3.3F	X		X		
B. TYPE, SIZE AND LOCATION OF ANCHORS, INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS, FRAMES, OR OTHER CONSTRUCTION	1704.5.2	ACI 530: Sec. 1.2.2(e), 1.16.1	X		X		
C. SPECIFIED SIZE, GRADE AND TYPE OF REINFORCEMENT, ANCHOR BOLTS, AND ANCHORAGES	1704.5.2	ACI 530: Sec. 1.15 ACI 530.1: Art. 2.4, 3.4	X		X		
D. PREPARATION, CONSTRUCTION, AND PROTECTION OF MASONRY DURING COLD WEATHER (TEMP. BELOW 40 DEGREES F) OR HOT WEATHER (TEMP. ABOVE 90 DEGREES F)	1704.5.2, 2104.3, 2104.4	ACI 530.1: Art. 1.8C, 1.8D	X		X		
6. PRIOR TO GROUTING, THE FOLLOWING SHALL BE VERIFIED TO ENSURE COMPLIANCE:							
A. GROUT SPACE IS CLEAN	1704.5.2	ACI 530.1: Art. 3.2D	X		X		
B. PLACEMENT OF REINFORCEMENT AND CONNECTORS, AND ANCHORAGES	1704.5.2	ACI 530: Sec. 1.13 ACI 530.1: Art. 3.4	X		X		
C. PROPORTIONS OF SITE-PREPARED GROUT	1704.5.2	ACI 530.1: Art. 2.6B	X		X		
D. CONSTRUCTION OF MORTAR JOINTS	1704.5.2	ACI 530.1: Art. 3.3B	X		X		
7. GROUT PLACEMENT SHALL BE VERIFIED TO ENSURE COMPLIANCE	1704.5.2	ACI 530.1: Art. 3.5		X	X		
8. PREPARATION OF ANY REQUIRED GROUT SPECIMENS, MORTAR SPECIMENS, AND/OR PRISMS SHALL BE OBSERVED	1704.5.2, 2105.2.2, 2105.3	ACI 530.1: Art. 1.4		X	X		SEE TABLE 3 FOR UNIT STRENGTH TESTS (PRISM TEST) FOR MASONRY

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: GENERAL STRUCTURAL SPECIAL INSPECTION TABLES SHEET 2

SHEET: 13 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

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FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

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TABLE 2
REQUIRED STRUCTURAL SPECIAL INSPECTION

SYSTEM	2009 IBC CODE REFERENCE	REFERENCED STANDARD	PERIODIC OWNER FURNISHED SPECIAL INSPECTION (SEE NOTE 1)	CONTINUOUS OWNER FURNISHED SPECIAL INSPECTION	REQUIRED REPORTING BY SPECIAL INSPECTOR TO DESIGNATED DISTRIBUTION LIST	COMMENTS	TESTING FOR SPECIAL INSPECTION
[redacted]			STEEL				
F HIGH- TS, NUTS,							
TION ASTM PECIFIED VED N	1704.3	Applicable ASTM Material Specifications; AISC 360: Sec. A3.3	X		X		
RER'S OF REQUIRED	1704.3		X		X		
OF HIGH- TING:							
JOINTS	1704.3.3	AISC 360: Sec. M2.5	X		X		
F TEEL:							
TURAL FICATION AISC 360	1704.3, 1708.3, 2203.1	AISC 360: Sec. M5.5	X		X		
STEEL, N ASTM PECIFIED VED	1704.3, 1708.3, 2203.1	APPLICABLE ASTM MATERIAL STANDARDS	X		X		
URER'S ST	1704.3		X				
F WELD LS:							
TION NFORM NS IN THE N	1704.3	AISC 360: Sec. A3.5 AND APPLICABLE AWS A5 DOCUMENTS	X		X		
RER'S OF REQUIRED	1704.3		X		X		
OF CTURAL D- DECK:							
AND TRATION DS	1704.3.1	AWS D1.1		X	X		
FILLET	1704.3.1	AWS D1.1		X	X		
S FILLET	1704.3.1	AWS D1.1		X	X		
LOT	1704.3.1	AWS D.1		X			
S FILLET	1704.3.1	AWS D1.1	X		X		

PECTION IS DEFINED AS INSPECTION BY THE SPECIAL INSPECTOR OF ALL MATERIALS AND SYSTEMS, IN SOME CASES
RING THEIR PLACEMENT AND IN ALL CASES PERFORMED UPON COMPLETION OF THEIR PLACEMENT. THE
SPECTION SHALL BE PERFORMED SO THAT WORK CAN BE CORRECTED PRIOR TO OTHER RELATED WORK PROCEEDING

TABLE 3
TESTING FOR REQUIRED SPECIAL INSPECTION

MATERIAL	TYPE OR SCOPE	STANDARD	2009 IBC CODE REFERENCE	FREQUENCY	BY WHOM	REQUIRED REPORTING TO DESIGNATED DISTRIBUTION LIST	COMMENTS
GEOTECHNICAL							
CONTROLLED FILL	GRADATION	ASTM D422	1704.7	SECTION 31 23 23, FILL AND BACKFILL	OWNER'S APPROVED TESTING AGENCY	X	
CONTROLLED FILL	DENSITY	ASTM D1556, D2922	1704.7	SECTION 31 23 23, FILL AND BACKFILL	OWNER'S APPROVED TESTING AGENCY	X	
PREPARED SUBGRADE	DENSITY	ASTM D1556, D2922	1704.7	SECTION 31 23 13, SUBGRADE PREPARATION	OWNER'S APPROVED TESTING AGENCY	X	
CONCRETE							
CONCRETE	STRENGTH	ASTM C39	1704.4, 1905.6	ONCE EACH DAY, BUT NOT LESS THAN ONE SAMPLE FOR EACH 150 CUBIC YARDS OR 5,000 SFT OF WALLS OR SLABS PLACED	OWNER'S TESTING AGENCY	X	
CONCRETE	SLUMP	ASTM C143, C94	1704.4	ONE SAMPLE PER STRENGTH TEST	OWNER'S TESTING AGENCY	X	
CONCRETE	AIR CONTENT	ASTM C231, C94	1704.4	ONE SAMPLE PER STRENGTH TEST	OWNER'S TESTING AGENCY	X	
CONCRETE	TEMPERATURE	ASTM C1064	1704.4	ONE SAMPLE PER STRENGTH TEST	OWNER'S TESTING AGENCY	X	
MASONRY							
CONCRETE MASONRY	UNIT STRENGTH	ASTM C140	2105.2.2.1.2	TEST 6 UNITS PER EVERY 50,000 OR FRACTION THEREOF PRIOR TO CONSTRUCTION	OWNER'S TESTING AGENCY	X	
MASONRY	COMPRESSIVE STRENGTH OF GROUT	ASTM C1019	2105.2.2.1	THREE SAMPLES PRIOR TO CONSTRUCTION	OWNER'S TESTING AGENCY	X	
STEEL							
STRUCTURAL STEEL	ULTRASONIC OR RADIOGRAPHIC NONDESTRUCTIVE TESTING	AWS D1.1	1704.3.1	SECTION 05 05 23, WELDING	CONTRACTOR'S APPROVED TESTING AGENCY	X	SPECIAL INSPECTOR SHALL MONITOR PROCEDURES AND RESULTS OF TESTING PERFORMED ON GROOVE AND BUTT JOINT WELDS

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: GENERAL STRUCTURAL SPECIAL INSPECTION TABLES SHEET 3

SHEET: 14 OF: D24
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FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

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TABLE 4

REQUIRED SPECIAL INSPECTION FOR SEISMIC RESISTANCE FOR STRUCTURAL SYSTEMS
REFER TO TABLE 2 FOR STANDARD STRUCTURAL SPECIAL INSPECTION REQUIREMENTS

THE SEISMIC DESIGN CATEGORY (SDC) FOR THIS PROJECT IS D

SYSTEM	INSPECTION REQUIRED FOR FOLLOWING SEISMIC DESIGN CATEGORIES	2009 IBC CODE REFERENCE	STANDARD OR CODE	PERIODIC OWNER FURNISHED SPECIAL INSPECTION (SEE NOTE 1)	CONTINUOUS OWNER FURNISHED SPECIAL INSPECTION	REQUIRED REPORTING BY SPECIAL INSPECTOR TO DESIGNATED DISTRIBUTION LIST	COMMENTS FOR DETAILS, REFER TO SPECIFICATION SECTION 01 45 33	TESTING FOR SPECIAL INSPECTION
				ELECTRICAL				
INSTALLATION OF OTHER SEISMIC SUPPORTS FOR DESIGNATED ELECTRICAL SYSTEMS AND THEIR COMPONENTS	"D" AND ABOVE	1707.1 ITEM 2		X		X	NOTES 2 & 3	
				PROCESS MECHANICAL				
INSTALLATION OF OTHER SEISMIC SUPPORTS FOR DESIGNATED MECHANICAL SYSTEMS AND THEIR COMPONENTS	"D" AND ABOVE	1707.1 ITEM 2		X		X	NOTES 2 & 3	
				BUILDING MECHANICAL				
INSTALLATION OF FIRE PROTECTION SPRINKLER SYSTEM	"D" AND ABOVE	1707.1 ITEM 2		X		X		
INSTALLATION OF OTHER SEISMIC SUPPORTS FOR DESIGNATED MECHANICAL SYSTEMS AND THEIR COMPONENTS	"D" AND ABOVE	1707.1 ITEM 2		X		X	NOTES 2 & 3	
				STRUCTURAL				
SEISMIC-FORCE-RESISTING SYSTEMS	"C" AND ABOVE	1707.1 ITEM 1			X	X		

NOTES:
1. PERIODIC INSPECTION IS DEFINED AS INSPECTION BY THE SPECIAL INSPECTOR OF ALL MATERIALS AND SYSTEMS, IN SOME CASES PERFORMED DURING THEIR PLACEMENT AND IN ALL CASES PERFORMED UPON COMPLETION OF THEIR PLACEMENT. THE COMPLETION INSPECTION SHALL BE PERFORMED SO THAT WORK CAN BE CORRECTED PRIOR TO OTHER RELATED WORK PROCEEDING AND COVERING THE INSPECTED WORK
2. TESTING OF SYSTEMS AND THEIR ANCHORAGE SHALL BE IN CONFORMANCE WITH 2006 IBC SECTION 1708.4
3. CERTIFICATION OF SYSTEMS AND THEIR ANCHORAGE SHALL BE IN CONFORMANCE WITH 2006 IBC SECTION 1708.4

TABLE 6

TESTING FOR SEISMIC RESISTANCE

MATERIAL	TYPE OR SCOPE	STANDARD	2009 IBC CODE REFERENCE	FREQUENCY	BY WHOM	REQUIRED REPORTING TO DESIGNATED DISTRIBUTION LIST	COMMENTS
			REINFORCING STEEL				
ASTM A615 REINFORCING STEEL USED TO RESIST FLEXURAL AND AXIAL FORCES IN SPECIAL MOMENT FRAMES	MEET TESTING REQUIREMENTS AND PROVIDE CERTIFIED MILL TEST REPORTS	ACI 318: Sec. 21.1.5.2	1708.2	EACH SHIPMENT	MANUFACTURER	X	REQUIRED FOR STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY B, C, D, E, OR F

NOTES:
1. TESTING AND QUALIFICATION FOR SEISMIC RESISTANCE ARE REQUIRED FOR SEISMIC-FORCE-RESISTING SYSTEMS IN STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY C, D, E, OR F, UNLESS OTHERWISE NOTED

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

FILENAME: 001-G-015_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:09:43 PM

DRN: GTM	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: ALF	DWG #: 001-G-015		
CHK: BSH	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
GENERAL
STRUCTURAL
SPECIAL INSPECTION
TABLES SHEET 4

SHEET: 15 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-015

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PIPE AND FITTING SYMBOLS

DOUBLE LINE	SINGLE LINE	
		EXISTING PIPE
		NEW PIPE
		EXISTING PIPE TO BE ABANDONED
		EXISTING PIPE TO BE REMOVED
		WELDED JOINT
		GROOVED END JOINT
		FLANGED JOINT
		MECHANICAL JOINT & PROPRIETARY RESTRAINED JOINT
		BELL & SPIGOT JOINT (LEADED)
		HUB & SPIGOT JOINT (RUBBER GASKET)
		BALL JOINT
		ADAPTER SIDE GROOVED END ADAPTER FLANGE
		FLANGED COUPLING ADAPTER
		FLEXIBLE COUPLING
		METAL BELLOWS EXP JOINT
		ELASTOMER BELLOWS EXP JOINT
		ELBOW UP
		ELBOW DOWN
		TEE UP
		TEE DOWN
		LATERAL UP
		LATERAL DOWN
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER

DOUBLE LINE	SINGLE LINE	
		REDUCING BUSHING
		UNION
		CAP
		ANCHOR
		ELBOW, 90 DEGREE
		CROSS
		TEE
		ELBOW, 45 DEGREE
		LATERAL

NOTES:

1. ONLY FLANGED END CONNECTIONS ARE SHOWN HERE FOR DOUBLE LINE FITTINGS. FITTINGS WITH OTHER END PATTERNS ARE SHOWN SIMILARLY ON THE CONSTRUCTION DRAWINGS. ALSO SEE PIPING SPECIFICATIONS.
2. SYMBOLS SHOWN HERE FOR SINGLE LINE FITTINGS ARE GENERIC ONLY. REFER TO PIPING SPECIFICATIONS FOR SPECIFIC END CONNECTIONS FOR SINGLE LINE PIPE AND FITTINGS.
3. EXISTING PIPE AND EQUIPMENT IS SHOWN LIGHT-LINED AND/OR SCREENED AND IS NOTED AS EXISTING. NEW PIPING AND EQUIPMENT IS SHOWN HEAVY-LINED.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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VALVE SYMBOLS

SINGLE LINE	DOUBLE LINE
GATE	
KNIFE GATE	OR
BUTTERFLY	OR
GLOBE	OR
BALL	OR
SEATING PORT	
ECCENTRIC PLUG	OR
PLUG OR COCK	OR
NEEDLE	OR
DIAPHRAGM	OR
PINCH	OR
SWING CHECK	OR
BALL CHECK	OR

HOSE VALVE (HV- X) OR (V-X)
X = NO. IN SPECS

SAMPLE

MUD

PRESSURE RELIEF

AIR AND/OR VACUUM RELEASE

REGULATED SIDE
PRESSURE CONTROL (INTERNAL PILOT)

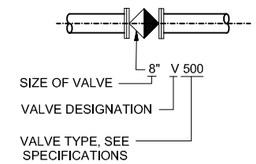
REGULATED SIDE
PRESSURE CONTROL (EXTERNAL PILOT)

MULTI-PORT VALVE,
ARROWS INDICATE FLOW PATTERN.
SEATING PORTS ARE IMPLIED BY
INDICATED FLOW PATTERN.

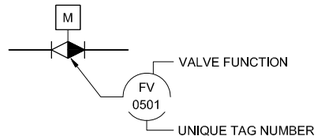
TELESCOPING SCUM VALVE

VALVE DESIGNATIONS

MANUAL VALVES AND CHECK VALVES

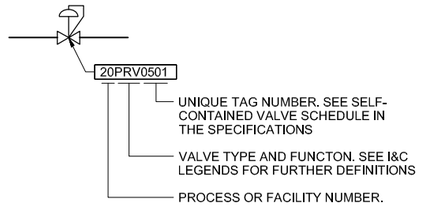


CONTROL VALVES



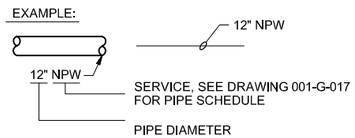
NOTE:
SEE I&C LEGENDS FOR FURTHER DEFINITIONS AND ACTUATOR TYPES.

SELF-CONTAINED REGULATING VALVES



PIPING DESIGNATION

EXAMPLE:



GATE SYMBOLS

ELEVATION VIEW	PLAN VIEW	
		SLUICE
		BUTTERFLY
		FLAP
		SHEAR
		FABRICATED SLIDE
		STOP LOG

ACTUATOR SYMBOLS

PNEUMATIC DIAPHRAGM	HYDRAULIC
PNEUMATIC CYLINDER	MANUAL
ELECTRIC MOTOR	SOLENOID
	ELECTRO HYDRAULIC

MECHANICAL LEGEND AND NOTES

GENERIC PIPING NOTES

1. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS.
2. SIZE OF FITTINGS SHOWN ON DRAWINGS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED. TYPE OF JOINT AND FITTING MATERIAL SHALL BE THE SAME AS SHOWN FOR ADJACENT STRAIGHT RUN OF PIPE.
3. LOCATION AND NUMBER OF PIPE HANGERS AND PIPE SUPPORTS SHOWN IS ONLY APPROXIMATE. CONTRACTOR SHALL DESIGN SUPPORTS AS SPECIFIED.
4. ALL JOINTS SHALL BE WATERTIGHT. WALL PIPES SHALL BE USED WHEREVER PIPING PASSES FROM A STRUCTURE TO BACKFILL.
5. ALL FLEXIBLE CONNECTORS AND COUPLING ADAPTERS SHALL BE PROVIDED WITH THRUST PROTECTION AS SPECIFIED, UNLESS OTHERWISE NOTED. THRUST PROTECTION SHALL BE ADEQUATE FOR TEST PRESSURES SPECIFIED.
6. SYMBOLS, LEGENDS, AND PIPE USE IDENTIFICATIONS SHOWN SHALL BE FOLLOWED THROUGHOUT THE DRAWINGS, WHEREVER APPLICABLE. NOT ALL OF THE VARIOUS PIPING COMPONENTS ARE NECESSARILY USED IN THE PROJECT.
7. ALL BURIED PIPING SYSTEMS THAT ARE REQUIRED TO BE PRESSURE TESTED PER THE PIPING SCHEDULE IN THE DRAWINGS, SHALL BE INSTALLED WITH EVERY JOINT RESTRAINED. FLANGED, WELDED AND SCREWED JOINTS ARE SELF-RESTRAINED JOINTS AND REQUIRE NO FURTHER RESTRAINT SYSTEM. BURIED DUCTILE IRON PIPING THAT IS REQUIRED TO BE RESTRAINED SHALL BE PROVIDED WITH RESTRAINED MECHANICAL JOINTS OR PROPRIETARY RESTRAINED JOINTS AS SPECIFIED. ALL OTHER ITEMS SUCH AS COUPLINGS AND VALVES SHALL BE PROVIDED WITH A RESTRAINT SYSTEM. THRUST BLOCKS ARE NOT ALLOWED.
8. NUMBER AND LOCATION OF UNIONS SHOWN ON DRAWINGS IS ONLY APPROXIMATE. PROVIDE ALL UNIONS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.
9. WHERE A GROOVED END COUPLING IS SHOWN, IT SHALL BE THE RIGID JOINT TYPE, UNLESS OTHERWISE SPECIFIED. WHERE A FLANGED COUPLING ADAPTER IS SHOWN, A STANDARD FLANGE SHALL BE JOINED TO THE COUPLING ADAPTER.

PLOT TIME: 1:09:53 PM
PLOT DATE: 05-26-2012
FILENAME: 001-G-016_391538.DWG

DRN: ERB	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: GMM	DWG #: 001-G-016		
CHK: KGC	CAD FILE #:		
APPD: LEC	SCALE: NONE		

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
GENERAL
MECHANICAL LEGEND

SHEET: 16 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-016

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PIPING SCHEDULE

FLOWSTREAM (NOTE 1)	SERVICE	SIZE(S) (NOTE 2)	INSTALLATION (NOTE 3)	MATERIAL (NOTE 4)	LINING / COATING (NOTE 5)	Color of Pipe (Tnemec No.)	Band Color	Label Color	TEST PRESSURE (PSIG)	TEST TYPE (NOTE 6)	SPECIFICATION SECTION	REMARKS
ARD	ACID-RESISTANT DRAIN	ALL	ALL	PP	BARE/BARE	GRAY (BJ45)	WHITE	WHITE	G	G	15200-23	
COND	CONDENSATE DRAIN	ALL	ALL	CU	BARE / NO.10 AND NO.4	GRAY (BJ45)	WHITE	WHITE	G	G	15200-13	
CW	CITY WATER	ALL	ALL	CU	BARE / NO.10 AND NO.5	GRAY (BJ45)	BLACK	BLACK	150	H	15200-13	
CWH	CITY WATER HOT	ALL	ALL	CU	BARE / NO.10 AND NO.6	GRAY (BJ45)	BLACK	BLACK	150	H	15200-13	PIPING SHALL BE INSULATED PER SECTION 15085.
D	DRAIN (PROCESS)	ALL	BUR, EXP	PVC	BARE/BARE	BARE	WHITE	WHITE	15	H	15200-10	WHEN INDICATED ON THE DRAWINGS.
			BUR	CLDI	CEMENT / POLY	-	-	-	15	H	15200-01	
			EMB		CEMENT / NO.7							
			EXP		CEMENT / NO.4	GRAY (BJ45)	WHITE	WHITE				
			SUB		CEMENT / NO.2	-	-	-				
FA	FOUL AIR	ALL	EXP (INDOORS)	AL, SSC, SSD	BARE / BARE	NONE	RED	RED	0.5	P	15890 or 15892	MATERIAL SELECTION CONTRACTORS CHOICE.
			BUR, EXP (OUTDOORS)	FRP	SEE SPEC	WHITE (AA90)	RED	RED	0.5	P	15892	
GRIT, GRIT/OF	GRIT, GRIT/OF	ALL	BUR	CLDI	CEMENT / POLY	-	-	-	75	H	15200-01	"GRIT" FLOW STREAM SHALL USE LONG RADIUS ELBOWS. THIS REQUIREMENT IS NOT APPLICABLE TO "GRIT/OF". BAND COLOR AND LABELING SHALL BE BLACK FOR "GRIT" AND BLUE FOR "GRIT/OF"
			EMB		CEMENT / NO.7							
			EXP		CEMENT / NO.4	BROWN (AG12)	BLACK/BLUE	BLACK/BLUE				
			SUB		CEMENT / NO.2	-	-	-				
HPA	HIGH PRESSURE AIR	ALL	EXP	STL	BARE / NO.4	SAFETY ORANGE (CA26)	BLUE	BLUE	190	P	15200-03	
IRR	IRRIGATION	ALL	BUR	PVC	BARE/BARE	-	-	-	100	H	15200-10	SCH 40
LPA	LOW PRESSURE AIR	ALL	EXP	SST	BARE / BARE	NONE	BLACK	BLACK	30	P	15200-03	
NG	NATURAL GAS	ALL	BUR	PE	BARE / BARE	-	-	-	10	P	15200-19	SDR 13.5
			EXP	STL	BARE / NO.4	SAFETY BLUE (BR18)	RED	RED			15200-03	
NPW	NON-POTABLE WATER	<4"	EXP	SST	BARE/BARE	NONE	BLACK	BLACK	150	H	15200-08	AS INDICATED ON THE DRAWINGS.
			ALL	CU	BARE / NO.10	-	-	-			15200-13	UNLESS OTHERWISE INDICATED, USE COPPER. FOR BURIED COPPER, WRAP WITH TAPE WRAP, TAPECOAT, TEK-RAP, OR EQUAL.
		>=4"	BUR	CLDI	CEMENT / POLY	-	-	-			15200-01	
			EMB		CEMENT / NO.7							
			EXP		CEMENT / NO.4	GRAY (BJ45)	BLACK	BLACK				
			SUB		CEMENT / NO.2	-	-	-				
OD	OVERFLOW DRAIN	ALL	EXP	CISP	BARE / NO.4	BROWN (AG12)	BLUE	BLUE	PC	PC	15200-04	
PW	POTABLE WATER	ALL	ALL	CU	BARE / NO.10 AND NO.4	-	-	-	150	H	15200-13	
RS	RAW SEWAGE	ALL	BUR	CLDI	CEMENT / POLY	-	-	-	75	H	15200-01	
			EMB		CEMENT / NO.7							
			EXP		CEMENT / NO.4	Brown (AG12)	BLACK	BLACK				
			SUB		CEMENT / NO.2	-	-	-				
RD	ROOF DRAIN	ALL	BUR	PVC	BARE / BARE	-	-	-	PC	PC	02632	
			EXP	CISP	BARE/NO.4	GRAY (BJ45)	WHITE	WHITE			15200-04	
SA	SUPPLY AIR	ALL	EMB, BUR	HDPE	COAL TAR / COAL TAR	-	-	-	-	TAB	15200-19	OUTDOOR PLENUM CONNECTION, AS INDICATED ON THE DRAWINGS.
SAN	SANITARY SEWER	>=10"	BUR	RCP	BARE / BARE	-	-	-	PC	PC	02632	EITHER PIPE MATERIAL IS ACCEPTABLE.
		ALL		PVC								
SD	STORM DRAIN	>=10"	BUR	RCP	BARE/ BARE	-	-	-	G	G	02632	EITHER PIPE MATERIAL IS ACCEPTABLE.
		ALL		PVC								
XX/V	VENT	XX=PRIMARY SERVICE (NOTE 1)										

NOTES:

1. WHERE PIPING CARRIES TWO OR MORE SERVICE DESIGNATIONS, THE PIPING MATERIAL SHALL CONFORM TO THE MATERIAL OF THE FIRST SERVICE LISTED, I.E. GRIT/V REFERS TO GRIT VENT CONSTRUCTED OF CLDI.

2. SIZES MEASURED IN INCHES
   "ALL" REFERS TO ALL SIZES
   ">" GREATER THAN
   "<" LESS THAN
   "<=" LESS THAN OR EQUAL TO
   ">=" GREATER THAN OR EQUAL TO

3. ALL: REFERS TO ALL INSTALLATIONS
   BUR: BURIED
   EMB: EMBEDDED (IN CLSM OR CONCRETE)
   EXP: EXPOSED (INDOORS OR OUTDOORS)
   SUB: SUBMERGED

4. AL: ALUMINUM
   CISP: CAST IRON SOIL PIPE
   CLDI: CEMENT LINED DUCTILE IRON
   CU: COPPER
   FRP: FIBERGLASS REINFORCED PLASTIC
   HDPE: HIGH-DENSITY POLYETHYLENE
   PVC: POLYVINYL CHLORIDE
   PP: POLYPROPYLENE
   PWPE: PROFILE-WALL POLYETHYLENE
   RCP: REINFORCED CONCRETE PIPE
   SSC: STAINLESS STEEL COATED DUCT
   SSD: STAINLESS STEEL DUCTWORK, TYPE 316/316L UNLESS OTHERWISE NOTED
   SST: STAINLESS STEEL, TYPE 304/304L UNLESS OTHERWISE NOTED
   STL: STEEL (MILL TYPE)

5. SYSTEM NO.. IN ACCORDANCE WITH PAINTING AND PROTECTIVE COATINGS SPECIFICATION
   CEMENT (CLDI): AWWA C104 MORTAR LINING
   POLY: POLYETHYLENE WRAP
   TAPE: TAPE WRAP

6. PRESSURE MEASURED IN PSI
   G: GRAVITY TEST TO HIGHEST LIQUID LEVEL THAT PIPE WILL BE SUBJECTED TO
   H: HYDROSTATIC TEST TO INDICATED PRESSURE
   P: PNEUMATIC TEST TO INDICATED PRESSURE
   PC: TEST PER CURRENT UNIFORM PLUMBING CODE
   TAB: TEST PER TEST AND BALANCE REQUIREMENTS SET FORTH IN SPECIFICATION SECTION 15950

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ENGR STAMP:

DRN: ERB	ORIG DATE: MAY 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: GMM	DWG #: 001-G-017		
CHK: KGC	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	06/10	GVT	LEC	ADDENDUM NO. 2

Clean Water Services — Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: GENERAL — PIPE SCHEDULE

SHEET: 17 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-017

FILENAME: 001-G-017_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:10:03 PM

PIPE AND FITTING SYMBOLS

DOUBLE LINE	SINGLE LINE	
		EXISTING PIPE (SCREENED)
		NEW PIPE
		EXISTING PIPE TO BE ABANDONED
		EXISTING PIPE TO BE REMOVED
		FLANGED JOINT
		FLEXIBLE COUPLING
		METAL BELLOWS EXP JOINT
		ELBOW UP
		ELBOW DOWN
		TEE UP
		TEE DOWN
		LATERAL UP
		LATERAL DOWN
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		UNION
	FS	FLOW SWITCH
		THERMOMETER
		GAUGE GLASS WITH COCKS
		FLEXIBLE PIPE CONNECTION
		METAL BELLOWS EXPANSION JOINT
		STRAINER
		SIGHT GLASS
	PS H	PRESSURE SWITCH
	H	PRESSURE GAUGE WITH COCK
		HOSE RACK (TYPE AS INDICATED)
		EYEWASH
	S	SAFETY SHOWER
	S	SAFETY SHOWER\EYEWASH COMBINATION UNIT
	PDI	PRESSURE DIFFERENTIAL INDICATOR
	PS	ENTHALPY SENSOR

PIPE AND FITTING SYMBOLS (CONT)

SINGLE LINE

HOSE VALVE

Z" YCO-X — Z = OUTLET SIZE IN INCHES; Y = F - FLOOR CLEANOUT, W - WALL CLEANOUT; X = NO. IN SPECIFICATION

Z" HD-XY — HUB DRAIN; Z = OUTLET SIZE IN INCHES; X = NO. IN SPECIFICATION; Y = T WITH TRAP, Y = P WITH PRIMED TRAP

Z" FD-XY — FLOOR DRAIN; Z = OUTLET SIZE IN INCHES; X = NO. IN SPECIFICATION; Y = T WITH TRAP, Y = P WITH PRIMED TRAP

Z" RD-X — ROOF DRAIN; Z = OUTLET SIZE IN INCHES; X = NO. IN SPECIFICATION

Z" OD-X — OVERFLOW ROOF DRAIN; Z = OUTLET SIZE IN INCHES; X = NO. IN SPECIFICATION

NOTES:

1. ONLY FLANGED FITTINGS ARE SHOWN FOR DOUBLE LINE PIPING. FITTINGS WITH OTER END PATTERNS ARE SIMILAR.
2. EXISTING PIPING AND EQUIPMENT IS SHOWN LIGHT LINED AND/OR SCREENED AND IS NOTED AS EXISTING. NEW PIPING AND EQUIPMENT IS SHOWN HEAVY-LINED.-

VALVE SYMBOLS

SINGLE LINE	DOUBLE LINE
GATE	
BUTTERFLY	OR
GLOBE	OR
BALL	OR
SEATING PORT	
ECCENTRIC PLUG	OR
PLUG OR COCK	OR
SWING CHECK	OR
BALL CHECK	OR
PRESSURE RELIEF	
AIR VENT (AUTO)	
AIR VENT (MANUAL)	
REGULATED SIDE PRESSURE CONTROL	
S — SOLENOID VALVE	
T — TO TEMPERATURE SENSOR_	
TEMPERATURE SENSING VALVE	

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VALVE DESIGNATIONS

MANUAL VALVES AND CHECK VALVES

3" - V 400
- 3" — SIZE OF VALVE
- V — VALVE DESIGNATION
- 400 — VALVE TYPE, SEE SPECIFICATIONS

HEATING, VENTILATING, AND AIR CONDITIONING SYMBOLS

	WALL REGISTER OR GRILLE (SUPPLY)
	CEILING DIFFUSER OR REGISTER (SUPPLY)
	CEILING REGISTER OR GRILLE (RETURN AND EXHAUST)
	WALL REGISTER OR GRILLE (RETURN AND EXHAUST)
	TURNING VANES
	45 DEGREE ENTRY
SD	SMOKE DAMPER
FD	FIRE DAMPER
	MANUAL OPPOSED-BLADE DAMPER
	MANUAL BUTTERFLY DAMPER
M	MOTORIZED DAMPER
	INTERNAL INSULATION/SOUND ATTENUATED DUCT
	FLEXIBLE CONNECTION
	FLEXIBLE DUCTWORK
R	INCLINED RISE IN DUCT
D	INCLINED DROP IN DUCT
	SUPPLY DUCT (SECTION)
	INTAKE, RETURN, OR EXHAUST DUCT (SECTION)
T	ROOM TEMPERATURE SENSOR
ECP	ENVIRONMENTAL CONTROL PANEL
(200)	200 SCFM
M	MOTORIZED VALVE - 2 WAY

EQUIPMENT IDENTIFICATION

ACCU	AIR-COOLED CONDENSING UNIT	HWP	HEATING WATER PUMP
ACU	AIR CONDITIONING UNIT	HX	HEAT EXCHANGER
AHU	AIR HANDLING UNIT	MD	MOTORIZED DAMPER
BD	BUTTERFLY DAMPER	OD	OVERFLOW ROOF DRAIN
BFP	BACKFLOW PREVENTER	ON	OVERFLOW NOZZLE
CP	CIRCULATION PUMP	P	PUMP
DN	DOWNSPOUT NOZZLE	RD	ROOF DRAIN
ECP	ENVIRONMENTAL CONTROL PANEL	RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
EF	EXHAUST FAN	SF	SUPPLY FAN
ET	EXPANSION TANK	TP	TRAP PRIMER ASSEMBLY
ETP	ELECTRONIC TRAP PRIMER	UH	UNIT HEATER
EUH	ELECTRIC UNIT HEATER	WG	WALL GRILLE
FD	FIRE DAMPER	WHA	WATER HAMMER ARRESTOR
HCG	HIGH-CAPACITY GRILLE	WR	WALL REGISTER
HCSG	HIGH-CAPACITY SUPPLY GRILLE	WSHP	WATER SOURCE HEAT PUMP
HTP	HEAT PUMP		

GENERAL DRAWING NOTES

1. THIS IS A STANDARD LEGEND SHEET. SOME SYMBOLS OR ABBREVIATIONS ON THIS SHEET MAY NOT APPEAR ON THE PLANS.
2. FOR FLOW STREAM IDENTIFICATIONS OF OTHER DIVISIONS SEE OTHER LEGENDS SUCH AS GENERAL, INSTRUMENTATION AND CONTROL, HVAC, MECHANICAL, FIRE PROTECTION, STRUCTURAL AND ARCHITECTURAL LEGENDS.

PLUMBING FIXTURE IDENTIFICATION

LEGEND	FIXTURE
EE	EMERGENCY EYE WASH
ES	EMERGENCY SAFETY SHOWER
S	SINK
SSH	SAFETY SHOWER\EYEWASH COMBINATION
SSK	SERVICE SINK
HV	HOSE VALVE OR HYDRANT
YH	YARD HYDRANT

EXAMPLE CALLOUT: SSH - 1
- SSH — FIXTURE LEGEND
- 1 — NO. IN SPECIFICATIONS

PLOT TIME: 1:10:18 PM
PLOT DATE: 05-26-2012
FILENAME: 001-G-018_391538.DWG

DRN: JSW	ORIG DATE: MAY 2010		
DSN: SCC	DWG #: 001-G-018		
CHK: CJS	CAD FILE #:		
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REV #	DATE	DRN	APPD	DESCRIPTION
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CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: GENERAL HVAC/PLUMBING LEGEND AND ABBREVIATIONS

SHEET: 18 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-018

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

ONE LINE DIAGRAMS-1

SYMBOL	DESCRIPTION
400	CIRCUIT BREAKER, THERMAL MAGNETIC TRIP SHOWN, 3 POLE, UNO
AS or AT AF AF	CIRCUIT BREAKER, STATIC TRIP UNIT, SENSOR AMP TRIP AND FRAME RATINGS SHOWN, 3 POLE, UNO
100/M	CIRCUIT BREAKER, MAGNETIC TRIP ONLY, TRIP RATING SHOWN, 3 POLE, UNO
400 225	FUSED SWITCH, SWITCH AND FUSE CURRENT RATING INDICATED, 3 POLE, UNO
100	SWITCH, CURRENT RATING INDICATED, 3 POLE, UNO
60 (3)	FUSE, CURRENT RATING AND QUANTITY INDICATED
1	MAGNETIC STARTER WITH OVERLOAD, NEMA SIZE INDICATED, FVNR UNO
AFD	ELECTRONIC STARTER/SPEED CONTROL RVSS = REDUCED VOLTAGE SOFT STARTER AFD = AC ADJUSTABLE FREQUENCY DRIVE DC = DC ADJUSTABLE SPEED DRIVE
	CABLE OR BUS CONNECTION POINT
K	KEY INTERLOCK
	SURGE ARRESTER (GAP TYPE)
M	MOTOR, SQUIRREL CAGE INDUCTION - HORSEPOWER INDICATED
VS V 0-600V	ANALOG METER WITH SWITCH - SCALE RANGE SHOWN V = VOLTAGE A = AMPERAGE PF = POWER FACTOR KW = KILOWATTS KVAR = KILOVARS
DPM	DIGITAL POWER METER (MULTIFUNCTION)
	GROUND
15 KVA 480-120/240V 1 PH	TRANSFORMER, SIZE, VOLTAGE RATINGS, AND PHASE INDICATED
	SHIELDED ISOLATION TRANSFORMER
480-120V (3)	POTENTIAL TRANSFORMER, VOLTAGE RATING AND QUANTITY INDICATED
100:5 (3)	CURRENT TRANSFORMER, RATIO(100:5) AND QUANTITY INDICATED (3)
	CONNECTION POINT TO EQUIPMENT SPECIFIED IN OTHER DIVISIONS. RACEWAY, CONDUCTOR AND CONNECTION IN THIS DIVISION

ONE LINE DIAGRAMS-2

SYMBOL	DESCRIPTION
	NON DRAWOUT FUSED SWITCH, MEDIUM VOLTAGE
	MEDIUM VOLTAGE CABLE STRESS CONE TYPE TERMINATION, OPEN TERMINATOR OR ELBOW
	TERMINAL BLOCK LUG
	DELTA CONNECTION
	WYE GROUNDED CONNECTION, SOLID GROUND
800/1200:5 (3)	BUSHING CURRENT TRANSFORMER, MULTI-RATIO AND QUANTITY INDICATED

CONTROL DIAGRAMS-1

SYMBOL	DESCRIPTION
	PUSH-BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY OPEN
	PUSH-BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY CLOSED
HAND OFF REMOTE XOO OOX	SELECTOR SWITCH - MAINTAINED CONTACT - CHART IDENTIFIES OPERATION WHEN NEEDED FOR CLARITY:

	POSITION		
CKT	HAND	OFF	REMOTE
1	X	O	O
2	O	O	X

X - CLOSED CONTACT
O - OPEN CONTACT

SYMBOL	DESCRIPTION
	TOGGLE SWITCH, ON-OFF TYPE
ON OFF	SELECTOR SWITCH, ON-OFF TYPE
	MUSHROOM HEAD SWITCH
A	INDICATING LIGHT, PUSH-TO-TEST, LED TYPE, LETTER INDICATES COLOR A - AMBER G - GREEN S - STROBE B - BLUE R - RED C - CLEAR W - WHITE
ETM	ELAPSED TIME METER
M	MOTOR STARTER CONTACTOR COIL
CRX	CONTROL RELAY, X INDICATES NUMERICAL ORDER IN CIRCUIT
TDR X	TIME DELAY RELAY, X INDICATES NUMERICAL ORDER IN CIRCUIT
	CONTACT - NORMALLY OPEN
	CONTACT - NORMALLY CLOSED

NOTES:

1. THESE ARE STANDARD LEGEND SHEETS. SOME SYMBOLS AND ABBREVIATIONS MAY APPEAR ON THE LEGEND AND NOT ON THE DRAWINGS.
2. FOR ADDITIONAL ABBREVIATIONS OF OTHER DIVISIONS (HVAC, MECHANICAL, AND STRUCTURAL/ARCHITECTURAL) SEE OTHER LEGENDS.

CONTROL DIAGRAMS-2

SYMBOL	DESCRIPTION
	REMOTE DEVICE
	TIME DELAY RELAY CONTACT, NORMALLY OPEN, CLOSES WHEN ENERGIZED AND TIMED OUT
	TIME DELAY RELAY CONTACT, NORMALLY CLOSED, OPENS WHEN ENERGIZED AND TIMED OUT
	TIME DELAY RELAY CONTACT, CLOSES WHEN ENERGIZED, OPENS WHEN DE-ENERGIZED AND TIMED OUT
	TIME DELAY RELAY CONTACT, OPENS WHEN ENERGIZED, CLOSES WHEN DE-ENERGIZED AND TIMED OUT
	MOTOR SPACE HEATER
	TERMINAL BLOCK, REMOTE
	TERMINAL BLOCK, INTERNAL
	FUSE, RATING INDICATED
CPT 120V	TRANSFORMER, CONTROL POWER

GROUND SYSTEM PLAN

SYMBOL	DESCRIPTION
	GROUND ROD
	GROUND ROD IN TEST WELL
G	GROUNDING CONDUCTOR, SIZE AS INDICATED
GT	GROUND ROD TO CABLE
	FLEXIBLE GROUND STRAP
GR	CABLE TO TOP OF GROUND ROD
	PIGTAIL FOR CONNECTION TO EQUIPMENT CABINET OR FRAME
G	EQUIPMENT GROUND BUS
N	EQUIPMENT NEUTRAL BUS

ABBREVIATIONS

ABBREVIATION	DESCRIPTION
A	AMPERE, AUTOMATIC
AC	ALTERNATING CURRENT
AFD	ADJUSTABLE FREQUENCY DRIVE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
ATS	AUTOMATIC TRANSFER SWITCH
BFG	BELOW FINISHED GRADE
BKR	BREAKER
C	CONDUIT, CONTACTOR, CONDUCTOR, CLOSE
CAP.	CAPACITOR
CB	CIRCUIT BREAKER
CLE	CURRENT LIMITING FUSE
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CT	CURRENT TRANSFORMER, CABLE TRAY
DC	DIRECT CURRENT
DWG	DRAWING
E	EMPTY
EX, EXST	EXISTING
F, FU	FUSE
FREQ	FREQUENCY
G	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
HH	HANDHOLE
HOA	HAND-OFF-AUTO
HP	HORSEPOWER
HS	HAND SWITCH
HZ	HERTZ
IC	INTERRUPTING CAPACITY
J, JB	JUNCTION BOX
KA	KILOAMPERES
KV	KILOVOLT
KVA	KILOVOLT AMPERES
KVAR	KILOVOLT AMPERES-REACTIVE
KW	KILOWATTS
LP	LIGHTING (INSTRUMENTATION) PANELBOARD
M	MAGNETIC CONTACTOR COIL, MOTOR, MANUAL
MCC	MOTOR CONTROL CENTER
MH	MANHOLE, METAL HALIDE, MOUNTING HEIGHT
MIN	MINIMUM
MSC	MANUFACTURER SUPPLIED CABLE
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
NTS	NOT TO SCALE
OL	OVERLOAD RELAY
PB	PULL BOX
PP	POWER PANELBOARD
RGS	RIGID GALVANIZED STEEL CONDUIT
SPD	SURGE PROTECTIVE DEVICE
SS	START/STOP
SSMS	SOFT-START MOTOR STARTER
SST	STAINLESS STEEL (TYPE 316)
SV	SOLENOID VALVE
SWGR	SWITCHGEAR
TC	TRAY CABLE
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VOLTAGE, VOLTS
VFD	VARIABLE FREQUENCY DRIVE
W	WATTS
WP	WEATHERPROOF
XFMR	TRANSFORMER

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:10:29 PM
PLOT DATE: 05-26-2012
FILENAME: 001-G-019_391538.DWG

DRN: MLW	ORIG DATE: FEB 2010		
DSN: JLH	DWG #: 001-G-019		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
GENERAL
ELECTRICAL
LEGEND SHEET 1

SHEET: 19 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-019

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

SYMBOL	DESCRIPTION

POWER SYSTEM PLAN-1

	CONNECTION POINT TO EQUIPMENT SPECIFIED. RACEWAY, CONDUCTOR,TERMINATION AND CONNECTION IN THIS DIVISION.
MCC-A	MAJOR ELECTRICAL COMPONENT OR DEVICE - NAME OR IDENTIFYING SYMBOL AS SHOWN.
	PANELBOARD - SURFACE MOUNTED
LPXXA	PANELBOARD LETTER OR NUMBER FACILITY NUMBER LP - LOW VOLTAGE PANEL DP - DISTRIBUTION PANEL
	PANELBOARD - FLUSH MOUNTED
	TERMINAL JUNCTION BOX
M	MOTOR, SQUIRREL CAGE INDUCTION
LPXXA	HOME RUN - DESTINATION SHOWN
or G	EXPOSED CONDUIT AND CONDUCTORS*

NOTE:
ALL UNMARKED CONDUIT RUNS CONSIST OF TWO NO. 12, ONE NO. 12 GROUND CONDUCTORS IN 3/4" CONDUIT. RUNS MARKED WITH CROSSHATCHES INDICATE NUMBER OF NO. 12 CONDUCTORS. CROSSHATCH WITH SUBSCRIPT "G" INDICATES GREEN GROUND WIRE.

G	CROSSHATCHES WITH BAR INDICATE NO.10 CONDUCTOR. SIZE CONDUIT ACCORDING TO SPECIFICATIONS AND APPLICABLE CODE.
[A1]	CONDUIT AND CONDUCTOR CALLOUT, SEE LEGEND.
	CONDUIT DOWN
	CONDUIT UP
	CONDUIT, STUBBED AND CAPPED
	CONDUIT TERMINATION AT CABLE TRAY
EX	EXISTING CONDUIT/ DUCT BANK
CE	CONCRETE ENCASED CONDUIT
DB	DIRECT BURIED CONDUIT
CABLE TRAY 1	
T	TRANSFORMER
J or HH	GENERAL CONTROL OR WIRING DEVICE. LETTER SYMBOLS OR ABBREVIATIONS INDICATE TYPE OF DEVICE
CS	CONTROL STATION, SEE CONTROL DIAGRAMS FOR CONTROL DEVICE(S) REQUIRED.
30	NONFUSED DISCONNECT SWITCH, CURRENT RATING INDICATED, 3 POLE
60/40	FUSED DISCONNECT SWITCH, CURRENT RATING INDICATED (60/40, 60=SWITCH RATING / 40=FUSE RATING) 3 POLE
2	COMBINATION CIRCUIT BREAKER AND MAGNETIC STARTER, NEMA SIZE INDICATED

SYMBOL	DESCRIPTION

POWER SYSTEM PLAN-2

XX 2	CONVENIENCE RECEPTACLE - DUPLEX UNLESS NOTED OTHERWISE WP- WEATHERPROOF C- CLOCK HANGER TL- TWIST LOCK CRE- CORROSION RESISTANT GFCI- GROUND FAULT CIRCUIT INTERRUPTER SUBSCRIPT NUMBER AT RECEPTACLE INDICATES CIRCUIT
L20R 20	RECEPTACLE, SPECIAL PURPOSE-NEMA CONFIGURATION AND AMPERAGE INDICATED
	SCADA NETWORK CONNECTION
	TELEPHONE OUTLET

LIGHTING SYSTEM PLAN

1 or 1	LUMINAIRE, SEE SCHEDULE
1	LUMINAIRE, SEE SCHEDULE
1	LUMINAIRE WITH INTERNAL BATTERY BACKUP, SEE SCHEDULE
4 or 4	LUMINAIRE AND POLE, SEE SCHEDULE
5 or 5	WALL MOUNTED LUMINAIRE, SEE SCHEDULE
1	FLOOD LIGHTS - AIM IN THE DIRECTION SHOWN
	STANDBY LIGHTING UNIT, SURFACE MOUNTED, SEE SCHEDULE
XX or	EXIT LIGHTS - FILLED SECTION INDICATES LIGHTED FACE, ARROW INDICATES EGRESS DIRECTIONAL INDICATORS, XX = FIXTURE NUMBER, SEE SCHEDULE
Sa or 2a	SMALL LETTER SUBSCRIPT AT SWITCH AND LUMINAIRE INDICATES SWITCHING. SUBSCRIPT NUMBER AT LUMINAIRE INDICATES CIRCUIT
$	WALL SWITCH: 2- DOUBLE POLE P- PILOT LIGHT 3- THREE WAY K- KEY OPERATED 4- FOUR WAY D- DIMMER WP- WEATHERPROOF CRE- CORROSION RESISTANT EX- EXPLOSIONPROOF L- MOMENTARY 3-WAY M- MOTOR RATED MS- MANUAL STARTER WITH OVERLOADS
PC	PHOTOCELL
LC	LIGHTING CONTACTOR
	EMERGENCY HORN (HAZARDOUS GAS)

CIRCUIT AND RACEWAY

GENERAL CIRCUIT CONDUCTOR AND CONDUIT IDENTIFICATION

POWER CIRCUIT CALLOUTS			
[P1]	[1/2"FLEX, 2#12,#12G]	[P23]	[1"C,3#8,2#14,1#10G]
[P2]	[3/4"C,2#12,1#12G]	[P24]	[1"C,3#8,3#14,1#10G]
[P3]	[3/4"C,3#12,1#12G]	[P25]	[1"C,3#8,4#14,1#10G]
[P4]	[3/4"C,4#12,1#12G]	[P26]	[1"C,3#8,5#14,1#10G]
[P5]	[3/4"C,5#12,1#12G]	[P27]	[1"C,2#6, 1#10G]
[P6]	[3/4"C,6#12,1#12G]	[P28]	[1"C,3#6, 1#10G]
[P7]	[3/4"C,6#12,2#12G]	[P28A]	[1"C,3#6, 1#8G]
[P8]	[3/4"C,8#12,1#12G]	[P29]	[1"C,3#6, 2#14,1#10G]
[P9]	[3/4"C,3#12,2#14,1#12G]	[P30]	[1"C,3#6, 3#14,1#10G]
[P10]	[3/4"C,3#12,3#14,1#12G]	[P31]	[1"C,3#6, 4#14,1#10G]
[P11]	[3/4"C,3#12,4#14,1#12G]	[P32]	[1"C,3#6, 5#14,1#10G]
[P12]	[3/4"C,3#12,5#14,1#12G]	[P33]	[1"C,3#4,1#8G]
[P13]	[3/4"C,3#12,6#14,1#12G]	[P34]	[1 1/4"C,3#4,3#14,1#8G]
[P14]	[3/4"C,3#12,7#14,1#12G]	[P35]	[1 1/4"C,3#4,5#14,1#8G]
[P15]	[3/4"C,2#10,1#10G]	[P36]	[1 1/4"C,3#3, 1#8G]
[P16]	[3/4"C,3#10,1#10G]	[P37]	[1 1/4"C,3#3, 3#14,1#8G]
[P16A]	[3/4"C,4#10,1#10G]	[P38]	[1 1/4"C,3#2, 1#6G]
[P17]	[3/4"C,#10,2#14,1#10G]	[P39]	[1 1/4"C,3#1, 1#6G]
[P18]	[3/4"C,3#10,3#14,1#10G]	[P39A]	[1 1/2"C,4#1, 1#6G]
[P19]	[3/4"C,3#10,4#14,1#10G]	[P40]	[1 1/2"C,3#1, 3#14,1#6G]
[P20]	[3/4"C,3#10,5#14,1#10G]	[P41]	[1 1/2"C,3#2/0, 1#6G]
[P21]	[1"C,2#8,1#10G]	[P42]	[2"C,3#3/0, 1#4G]
[P22]	[1"C,3#8,1#10G]	[P43]	[2"C,3#4/0, 1#4G]

ANALOG CIRCUIT CALLOUTS		CONTROL CIRCUIT CALLOUTS	
[A1]	[3/4"C,1 TYPE 3]	[C1]	[3/4"C,MSC]
[A2]	[1"C,2 TYPE 3]	[C2]	[3/4"C,2#14,1#14G]
[A3]	[1"C,3 TYPE 3]	[C3]	[3/4"C,3#14,1#14G]
[A4]	[1"C,4 TYPE 3]	[C4]	[3/4"C,4#14,1#14G]
[A5]	[1 1/4"C,5 TYPE 3]	[C5]	[3/4"C,5#14,1#14G]
[A6]	[1 1/4"C,6 TYPE 3]	[C6]	[3/4"C,6#14,1#14G]
[A7]	[1 1/2"C,7 TYPE 3]	[C7]	[3/4"C,7#14,1#14G]
[A8]	[1 1/2"C,8 TYPE 3]	[C8]	[3/4"C,8#14,1#14G]
[A9]	[1 1/2"C,9 TYPE 3]	[C9]	[3/4"C,9#14,1#14G]
[A10]	[2"C,10 TYPE 3]	[C10]	[3/4"C,10#14,1#14G]
[A11]	[2"C,11 TYPE 3]	[C11]	[3/4"C,11#14,1#14G]
[A12]	[2"C,12 TYPE 3]	[C12]	[3/4"C,12#14,1#14G]
[A13]	[2"C,13 TYPE 3]	[C13]	[3/4"C,13#14,1#14G]
[A14]	[2"C,14 TYPE 3]	[C14]	[3/4"C,14#14,1#14G]
[A15]	[3/4"C,1 TYPE 4]	[C15]	[3/4"C,15#14,1#14G]
[A16]	[3/4"C,2 TYPE 4]	[C16]	[3/4"C,16#14,1#14G]
[A17]	[1"C,3 TYPE 4]	[C17]	[3/4"C,17#14,1#14G]
[A18]	[1 1/4"C,4 TYPE 4]	[C18]	[3/4"C,18#14,1#14G]
[A19]	[1 1/4"C,5 TYPE 4]	[C19]	[3/4"C,19#14,1#14G]
[A20]	[1 1/4"C,6 TYPE 4]	[C20]	[1"C,20#14,1#14G]
[A21]	[1 1/2"C,7 TYPE 4]	[C21]	[1"C,21#14,1#14G]
[A22]	[1 1/2"C,8 TYPE 4]	[C22]	[1"C,22#14,1#14G]
[A23]	[2"C,9 TYPE 4]	[C23]	[1"C,23#14,1#14G]
[A24]	[3/4"C,1-4 pr. TYPE 5]	[C24]	[1"C,24#14,1#14G]
[A25]	[1"C,2-4 pr. TYPE 5]	[C25]	[1"C,25#14,1#14G]

COMMUNICATIONS CIRCUIT CALLOUTS	
[E1]	[1"C,1-CAT 6]
[E2]	[1 1/4"C,2-CAT 6]

EMPTY CONDUIT	
[CE-1]	[3/4"C,WITH PULL STRING]
[CE-2]	[1"C,WITH PULL STRING]
[CE-3]	[1 1/4"C,WITH PULL STRING]
[CE-4]	[1 1/2"C,WITH PULL STRING]
[CE-5]	[2"C,WITH PULL STRING]
[CE-6]	[3"C,WITH PULL STRING]
[CE-7]	[4"C,WITH PULL STRING]
[CE-8]	[5"C,WITH PULL STRING]

POWER CABLE CIRCUIT CALLOUTS	
[PC1]	[3/4"C,1 (3C#12,1#12G) TYPE 2]
[PC2]	[3/4"C,1 (3C#10,1#12G) TYPE 2]
[PC3]	[1"C,1 (3C#8,1#10G) TYPE2]
[PC4]	[1 1/4"C,2 (3C#12,1#12G) TYPE 2]
[PC5]	[1 1/2"C,2 (3C#10,1#12G) TYPE 2]
[PC1A]	[3/4"C,1 (2C#12,1#12G) TYPE 2]
[PC2A]	[3/4"C,1 (2C#10,1#12G) TYPE 2]

CONTROL CABLE CIRCUIT CALLOUTS	
[CC3]	[3/4"C,1-3C TYPE 1]
[CC4]	[3/4"C,1-4C TYPE 1]
[CC5]	[3/4"C,1-5C TYPE 1]
[CC6]	[3/4"C,1-6C TYPE 1]
[CC7]	[3/4"C,1-7C TYPE 1]
[CC8]	[1"C,1-8C TYPE 1]
[CC9]	[1"C,1-9C TYPE 1]
[CC10]	[1"C,1-10C TYPE 1]
[CC11]	[1"C,1-11C TYPE 1]
[CC12]	[1"C,1-12C TYPE 1]
[CC13]	[1 1/4"C,1-13C TYPE 1]
[CC19]	[1 1/2"C,1-19C TYPE 1]
[CC23]	[1 1/2"C,1-23C TYPE 1]
[CC25]	[1 1/2"C,1-25C TYPE 1]
[CC41]	[2"C,1-41C TYPE 1]

1

NOTES:
1. FOR CABLE TYPES, SEE SPECIFICATIONS.
2. WHERE CIRCUITS ARE UNDERGROUND, DIRECT BURIED OR CONCRETE ENCASED, MINIMUM CONDUIT SIZE SHALL BE 1".

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:10:39 PM
PLOT DATE: 05-26-2012
FILENAME: 001-G-020_391538.DWG

DRN: MLW	ORIG DATE: FEB 2010		
DSN: JLH	DWG #: 001-G-020		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	01/11	JB	RSH	CCR #17

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
GENERAL
ELECTRICAL
LEGEND SHEET 2 AND CONDUIT/ CONDUCTOR SCHEDULE

SHEET: 20 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-020

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

HEADWORKS BYPASS (FUTURE)

TO EXISTING PRIMARY CLARIFIERS

EMERGENCY OUTLET (REMOVABLE PLATE)

FROM NPW

200V0501

200FV 0501

200V0502

INFLUENT PUMP STATION

120FE 0101

120FE 0102

54"

42"

HEADWORKS INFLUENT UPWELLS

FROM NPW

200G0501

200G0502

200G0503

200G0504

MECHANICAL SCREENS

200SCR0501

200SCR0502

200SCR0503

200SCR0504

SEPTAGE RECEIVING

SLUICE

200V0503

GR-301

GR-302

GR-303

GR-304

GRIT BASINS

200G0505

200G0506

200G0507

200G0508

GRIT BASIN EFFLUENT JUNCTION BOX

TO EXISTING PRIMARY CLARIFIERS

GP-301

GP-302

GP-305

GP-306

GP-303

GP-304

GRIT PUMPS

571STR4601 NPW STRAINER

NPW

NPWP-9001

NPWP-9002

CS 571P4603

NON-POTABLE WATER PUMPS

NPW/CWH

200G 0509

200SCRW0501

DUMPSTER

OF

WASHER COMPACTORS

NPW/CWH

200G 0510

200SCRW0502

OF

GRIT CYCLONES

200GRTC0601

200GRTC0602

200GRTC0603

200GRTC0604

GRIT CLASSIFIERS

200GRT0602

200GRT0602

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 001-G-021_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:10:50 PM

DRN: PMH	ORIG. DATE: NOV 2009				
DSN: GVT	DWG #: 001-G-021				
CHK: JEG	CAD FILE #:				
APPD: LEC	SCALE: NONE				

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	06/10	GVT	LEC	ADDENDUM NO. 1

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

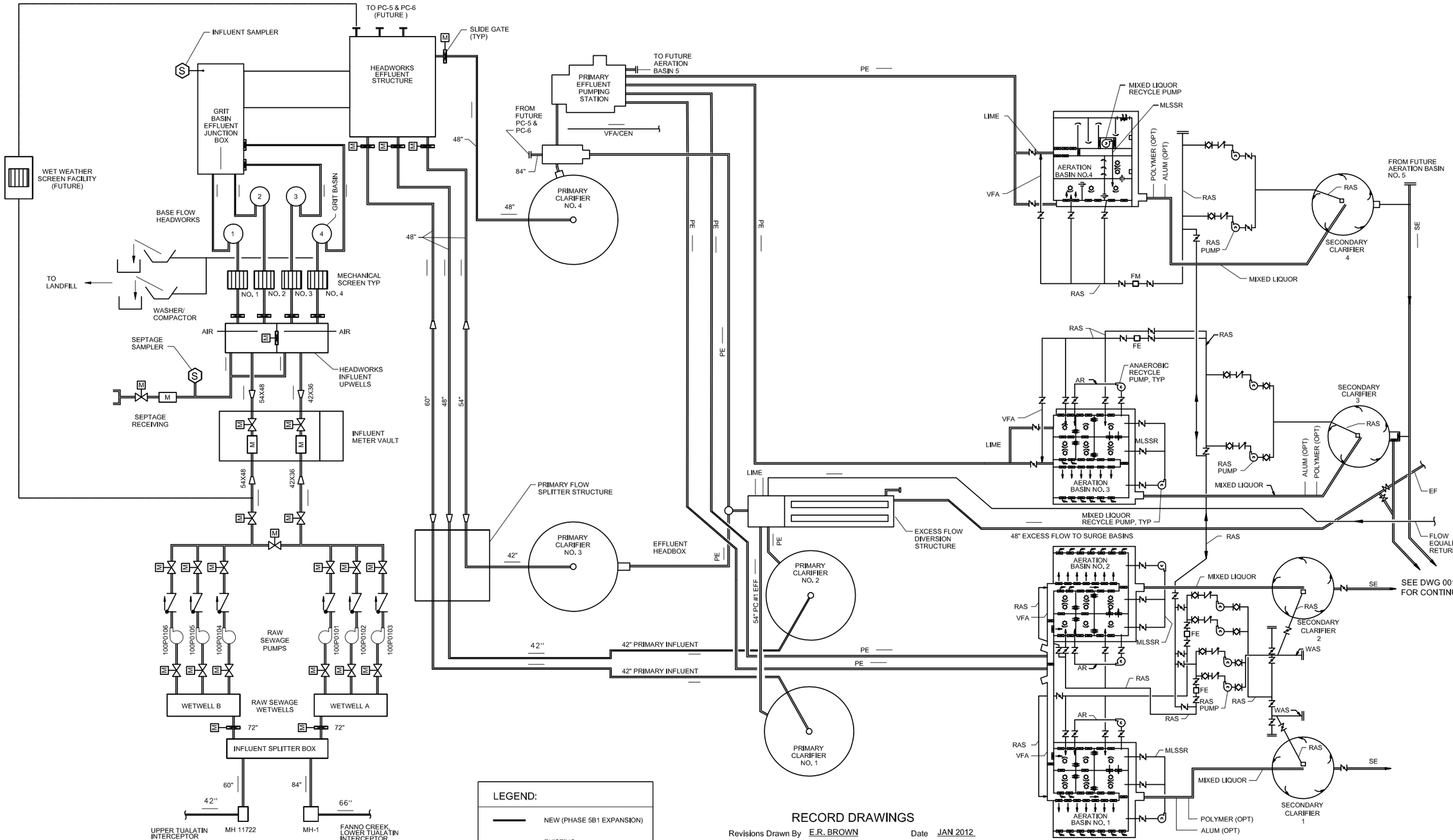
SHEET TITLE:
GENERAL
PROCESS FLOW DIAGRAM

SHEET: 21 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-021

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



LEGEND:

- NEW (PHASE 5B1 EXPANSION)
- EXISTING
- SAMPLER LOCATIONS

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

FILENAME: 001-G-022_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:10:59 PM

DRN: GTM	ORIG DATE: APRIL 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: GVT	DWG #: 001-G-022		
CHK: JEG	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services — Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

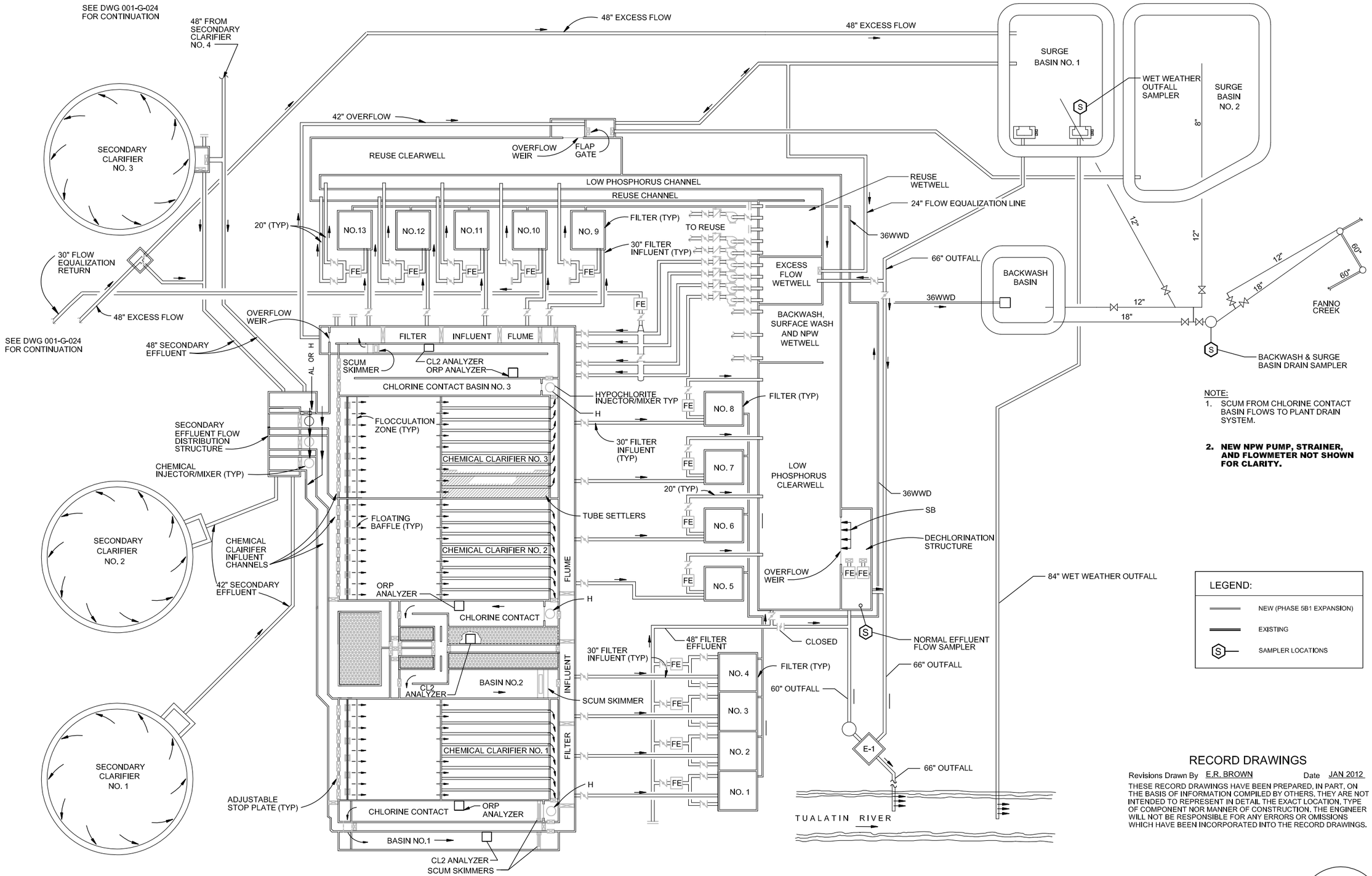
SHEET TITLE: GENERAL — LIQUID PROCESS SCHEMATIC SHEET 1

SHEET: 22 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-022

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



NOTE:

1. SCUM FROM CHLORINE CONTACT BASIN FLOWS TO PLANT DRAIN SYSTEM.

2. NEW NPW PUMP, STRAINER, AND FLOWMETER NOT SHOWN FOR CLARITY.

LEGEND:

- NEW (PHASE 5B1 EXPANSION)
- EXISTING
- (S) SAMPLER LOCATIONS

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 001-G-023_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:11:08 PM

DRN: GTM	ORIG DATE: MAY 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: GVT	DWG #: 001-G-023		
CHK: JEG	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: GENERAL — LIQUID PROCESS SCHEMATIC SHEET 2

SHEET: 23 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-023

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

EXISTING AND PROJECTED DURHAM INFLUENT FLOWS AND LOADS

	Population	Flow (mgd)	CBOD (lb/d)	TSS (lb/d)	Ammonia (lb/d)	TKN (lb/d)	TP (lb/d)
YEAR 2000 - 2005							
Residential	162,400	16.3	34,700	35,700	3,600	6,900	950
Industrial		0.6	1,800				30
Total BWF		16.9	36,500	35,700	3,600	6,900	980
DRY WEATHER							
ADW		17.9	36,200	35,000	3,500	6,900	970
MMDW		25.5	47,900	51,300	4,800	9,600	1,670
MWDW		31.4	54,200	70,200	5,300	11,000	2,610
MDDW		44.4	64,700	92,000	7,600	13,600	4,050
WET WEATHER							
AWW		25.3	35,800	37,100	4,000	7,300	1,170
MMWW		37	43,900	54,300	5,500	10,500	1,720
MWWW		54	53,300	63,100	6,000	10,500	2,120
MDWW		86	67,600	91,100	7,400	10,600	3,050
MHWW		108					
YEAR 2025							
Residential	208,500	23	43,800	43,800	4,400	9,000	1,170
Industrial		1	6,000				75
Total BWF		24	49,800	43,800	4,400	9,000	1,245
DRY WEATHER							
ADW		25	49,800	43,800	4,400	9,000	1,245
MMDW		37	62,800	60,500	5,700	11,600	1,600
MWDW		45	80,800	77,000	6,100	12,400	1,720
MDDW		64	86,000	111,300	9,200	18,800	2,600
WET WEATHER							
AWW		36	49,200	46,500	5,000	10,200	1,410
MMWW		50	60,400	59,600	5,900	12,100	1,680
MWWW		70	75,800	73,800	7,100	14,600	2,010
MDWW		109	93,000	125,900	12,000	24,600	3,400
MHWW		137					
BUILDOUT							
Residential	368,000	37	77,300	77,300	7,700	15,800	2,060
Industrial		2	12,000				150
Total BWF		39	89,300	77,300	7,700	15,800	2,210
DRY WEATHER							
ADW		41	89,300	77,300	7,700	15,800	2,210
MMDW		59	112,700	106,800	9,900	20,400	2,850
MWDW		72	144,900	135,900	10,600	21,800	3,050
MDDW		102	154,200	196,400	16,100	33,000	4,610
WET WEATHER							
AWW		58	88,200	82,100	8,700	17,900	2,500
MMWW		74	108,300	105,100	10,400	21,300	2,980
MWWW		103	135,900	130,300	12,500	25,600	3,570
MDWW		156	166,800	222,100	21,100	43,200	6,040
MHWW		195					

NOTE: PER NOVEMBER 2008 DURHAM AWWTF FACILITIES PLAN.

BWF - BASE WASTEWATER FLOW

ADW - AVERAGE DRY WEATHER

MMDW - MAXIMUM MONTH DRY WEATHER

MWDW - MAXIMUM WEEK DRY WEATHER

MDDW - MAXIMUM DAY DRY WEATHER

AWW - AVERAGE WET WEATHER

MMWW - MAXIMUM MONTH WET WEATHER

MWWW - MAXIMUM WEEK WET WEATHER

MDWW - MAXIMUM DAY WET WEATHER

MHWW - MAXIMUM HOUR WET WEATHER

CBOD - CARBONACEOUS BIOLOGICAL OXYGEN DEMAND

TSS - TOTAL SUSPENDED SOLIDS

TKN - TOTAL KJELDAHL NITROGEN

TP - TOTAL PHOSPHOROUS

WATER QUALITY CRITERIA

TUALATIN RIVER DISCHARGE — AVERAGES

LOW FLOW PERIOD CRITERIA [A]	MONTHLY	WEEKLY	DAILY	NOTES
CBOD5 (LBS/DAY)	830	1300	1900	[C, D & E]
TSS (LBS/DAY)	830	1300	1900	[C, D & E]
TOTAL PHOSPHORUS (MEDIAN MG/L)	0.11	N/A	N/A	
AMMONIA - NITROGEN (LBS/DAY)	N/A	[F]	N/A	
E. COLI (#/100 ML)	126	N/A	406	
TOTAL RESIDUAL CHLORINE (MG/L)	N/A	N/A	0.026	[G]
DISSOLVED OXYGEN (MG/L)	N/A	N/A	N/A	[I]
PH	6.0 - 9.0	N/A	N/A	[H]
TEMPERATURE (°F)	N/A	N/A	< 77	
THERMAL LOAD (KCAL/DAY)	N/A	N/A	2.0×10^7	

HIGH FLOW PERIOD CRITERIA [B]	MONTHLY	WEEKLY	DAILY	NOTES
CBOD5 (LBS/DAY)	3500	5300	7000	[C, D & E]
TSS (LBS/DAY)	3500	5300	7000	[C, D & E]
TOTAL PHOSPHORUS (LBS/DAY)	N/A	N/A	N/A	
AMMONIA - NITROGEN (LBS/DAY)	N/A	N/A	N/A	
E. COLI (#/100 ML)	126	N/A	406	
TOTAL RESIDUAL CHLORINE (MG/L)	N/A	N/A	0.026	[G]
DISSOLVED OXYGEN (MG/L)	N/A	N/A	N/A	
PH	6.0 - 9.0	N/A	N/A	[H]
TEMPERATURE (°F)	N/A	N/A	< 77	
THERMAL LOAD (KCAL/DAY)	N/A	N/A	2.0×10^7	

REUSE

TOTAL COLIFORM - [J] — 7-DAY MEDIAN OF 2.2 ORGANISMS/100 ML. MAXIMUM OF 23 ORGANISMS/100 ML.

TURBIDITY - [J] — 24-HOUR MEAN OF 2 NTU WITH NOT MORE THAN 5 NTU DURING 5% OF A 24-HOUR PERIOD.

GENERAL NOTES

A. LOW FLOW PERIOD BEGINS THE EARLIER OF A) THE FIRST DAY AFTER APRIL 30 WHEN THE SEVEN-CONSECUTIVE-DAY MEDIAN OF DAILY MEAN FLOW MEASURED AT THE FARMINGTON GAUGE IS LESS THAN 250 CFS OR B) JULY 1.

B. HIGH FLOW PERIOD LIMITS APPLY BEGINNING THE EARLIER OF A) THE FIRST DAY AFTER SEPTEMBER 30 WHEN THE SEVEN-CONSECUTIVE-DAY MEDIAN OF DAILY MEAN FLOW AT THE FARMINGTON GUAGE IS AT LEAST 350 CFS OR B) NOVEMBER 15.

C. CBOD AND TSS VALUES ASSUME NO INCREASE IN CURRENT MASS LIMITS.

D. DAILY MAXIMUM MASS LIMIT FOR CBOD AND TSS IS SUSPENDED WHEN FLOW EXCEEDS TWICE THE DESIGN ADWF OF 22.6 MGD.

E. CBOD5 AND TSS REMOVAL EFFICIENCY SHALL NOT BE LESS THAN 85% MONTHLY AVERAGE.

F. THE WEEKLY MEDIAN MAXIMUM AMMONIA LOAD LIMITATION IS DEPENDENT ON RIVER FLOW, RIVER DISSOLVED OXYGEN AND THE TIME PERIOD BETWEEN MAY 1 AND NOVEMBER 15. SEE NPDES PERMIT FOR CALCULATION.

G. TOTAL RESIDUAL CHLORINE SHALL NOT EXCEED 0.038 MG/L FOR MORE THAN 60 CONTINUOUS MINUTES ON ANY GIVEN DAY.

H. PH VALUES SHALL NOT BE OUTSIDE THE RANGE OF 6.0 – 9.0 FOR MORE THAN A TOTAL OF 8 HOURS IN ANY CALENDER MONTH AND NO INDIVIDUAL EXCURSION FROM THIS RANGE SHALL EXCEED 60 MINUTES.

I. DISSOLVED OXYGEN SHALL NOT BE LESS THAN 5.2 MG/L FOLLOWING THE CHLORINE CONTACT CHAMBER.

J. BASED ON OREGON LEVEL IV RECLAIMED WATER STANDARDS.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 001-G-024_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:11:17 PM

DRN: GTM | ORIG DATE: APRIL 2010
DSN: GVT | DWG #: 001-G-024
CHK: JEG | CAD FILE #:
APPD: LEC | SCALE: NONE

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services — Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: GENERAL DESIGN CRITERIA FLOWS AND LOADINGS

SHEET: 24 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-024

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

DESIGN CRITERIA - LIQUID PROCESS

PRELIMINARY TREATMENT

RAW SEWAGE PUMPING	
VARIABLE FREQUENCY DRIVE PUMPS	
TYPE	VAR. SPD. VERT. CENTRIFUGAL NON-CLOG
NUMBER	6
HP	4 @ 700; 2 @ 1000
CAPACITY, EACH , MGD	4 @ 25; 2 @ 40
TOTAL FIRM CAPACITY MGD	140
WETWELL	DUPLEX SELF-CLEANING TRENCH TYPE
ODOR CONTROL BIOFILTER	
FLOWRATE	6,000 CFM
SURFACE AREA	3,000 SQ FT
MEDIA TYPE	INORGANIC
SURFACE IRRIGATION, HUMIDIFICATION NOZZLES	
ODOR CONTROL MIST TOWER	
ODOR CONTROL SOURCE	**SCREEN ROOM**
AIR FLOW	**12,000 CFM**
AIR CHANGES PER HOUR	**>12 ACH**
ODOR CONTROL SOURCE	**EXISTING BIN ROOM**
AIR FLOW	**8,000 CFM**
AIR CHANGES PER HOUR	**>15 ACH**
ODOR CONTROL SOURCE	**NEW WASHER COMPACTOR ROOM**
AIR FLOW	**10,000 CFM**
AIR CHANGES PER HOUR	**>15 ACH**
ODOR CONTROL SOURCE	**GRIT TANKS**
AIR FLOW	**12,000 CFM**
AIR CHANGES PER HOUR	**>12 ACH**
SEPTAGE RECEIVING FACILITY	
TYPE	PACKAGED SYSTEM
PIPE DIAMETER	6 IN GRAVITY FLOW
MOTORIZED SHUTOFF VALVE	
pH PROBE, CARD I.D. SYSTEM	
MECHANICAL BAR SCREENS	
NUMBER	**4**
WIDTH FEET	**2 @ 5; 2 @ 6.5**
TYPE	**MULTIPLE RAKE BAR SCREEN**
SCREENINGS WASHER COMPACTOR	
NUMBER	**2**
TYPE	**SCREW**
SCREENINGS CAPACITY, CFH	**200**
HYDRAULIC CAPACITY, GPM	**200**
GRIT BASINS (EXISTING)	
NUMBER	4
CAPACITY, EACH , MGD	2 @ 30; 2 @ 40
TYPE	INDUCED VORTEX

PRIMARY TREATMENT

		180 MGD	240 MGD
PRIMARY CLARIFIERS			
PRIMARY CLARIFIERS 1 & 2 (EXISTING)			
DIAMETER, FT	120		
SIDEWATER DEPTH, FT	12		
SURFACE AREA, EACH, SQ FT	11,310		
VOLUME, EACH, 1000 GAL	1015		
OVERFLOW RATE, GPD/SQ FT (B)			
ADWF	450		
AWWF	590		
PEAK FLOW	1520	3663	3172
DETENTION TIME, HR (B)			
ADWF	4.8		
AWWF	3.7		
PEAK FLOW	1.4	0.59	0.68
PRIMARY CLARIFIER 3 (EXISTING)			
DIAMETER, FT	130		
SIDEWATER DEPTH, FT	12		
SURFACE AREA, SQ FT	13,270		
VOLUME, 1000 GAL	1190		
OVERFLOW RATE, GPD/SQ FT (C)			
ADWF	450		
AWWF	580		
PEAK FLOW	1500	3663	3172
DETENTION TIME, HR (C)			
ADWF	4.8		
AWWF	3.7		
PEAK FLOW	1.4	0.59	0.68
PRIMARY CLARIFIER 4 (EXISTING)			
DIAMETER, FT	130		
SIDEWATER DEPTH, FT	12		
SURFACE AREA, SQ FT	13,270		
VOLUME, 1000 GAL	1190		
OVERFLOW RATE, GPD/SQ FT (D)			
ADWF	410		
AWWF	530		
PEAK FLOW	4090	3663	3172
DETENTION TIME, HR (D)			
ADWF	5.3		
AWWF	4.1		
PEAK FLOW	0.5	0.59	0.68

PRIMARY TREATMENT CONT.

		180 MGD	240 MGD
PRIMARY CLARIFIER 5 (FUTURE)			
DIAMETER, FT	130		
SIDEWATER DEPTH, FT	12		
SURFACE AREA, SQ FT	13,267		
VOLUME, 1000 GAL	1190		
OVERFLOW RATE, GPD/SQ FT (D)			
PEAK FLOW	–	–	3172
DETENTION TIME, HR (D)			
PEAK FLOW	–	–	0.68
PRIMARY CLARIFIER 6 (FUTURE)			
DIAMETER, FT	130		
SURFACE AREA, SQ FT	13,267		
OVERFLOW RATE, GPD/SQ FT (D)			
PEAK FLOW	–	–	3172
DETENTION TIME, HR (D)			
PEAK FLOW	–	–	0.68
PRIMARY EFFLUENT PUMPS			
NUMBER		6	
TYPE		PROPELLER	
CAPACITY			
4 EACH, MGD		33	
TDH FT		20	
HP EACH		200	
2 EACH, MGD		10	
TDH FT		22	
HP EACH		50	
DRIVE TYPE		VARIABLE FREQUENCY	
TOTAL FIRM CAPACITY		119 MGD	

SECONDARY TREATMENT (E)

AERATION BASINS	
BASINS 1 & 2 (EXISTING)	
LENGTH, FT	144
WIDTH, FT	100
SIDEWATER DEPTH, FT	20
ACTIVE VOLUME, EACH, 1000 GAL	2,120
BASIN 3 (EXISTING)	
LENGTH, FT	143
WIDTH, FT	100
SIDEWATER DEPTH, FT	20
ACTIVE VOLUME, EACH, 1000 GAL	2,090
BASINS 4 (NEW) & 5 (FUTURE - PHASE 5)	
LENGTH, FT	143
WIDTH, FT	100
SIDEWATER DEPTH, FT	20
ACTIVE VOLUME, EACH, 1000 GAL	2,090
BIOLOGICAL NUTRIENT REMOVAL MODE	
ANAEROBIC ZONE	
NUMBER OF CELLS PER BASIN (E)	2
TOTAL VOLUME (EACH TRAIN), 1000 GAL	215
DETENTION TIME, HR	
ADWF	0.9
MDDWF	0.5
ANAERBIC RECYCLE PUMPS	
NUMBER PER BASIN	1
TYPE	AXIAL FLOW
CAPACITY, MGD	9.5
HP, EACH	30
ANOXIC ZONE	
NUMBER OF CELLS PER BASIN (E, F)	2
TOTAL VOLUME, 1000 GAL (TRAINS 1, 2)	347
TOTAL VOLUME, 1000 GAL (TRAINS 3, 4, 5)	340
DETENTION TIME, HR	
ADWF	1.5
MDDWF	0.8
MIXED LIQUOR RECYCLE PUMPS	
NUMBER PER BASIN	1
TYPE	PROPELLER
CAPACITY, EACH, MGD	18.7
HP, EACH	50
AEROBIC ZONE	
NO. OF CELLS / BASIN (TRAINS 1, 2, 3) (F,G)	3
NO. OF CELLS / BASIN (TRAINS 4,5)	2
TOTAL VOLUME, 1000 GAL (TRAINS 1, 2)	1,558
TOTAL VOLUME, 1000 GAL (TRAINS 3,4, 5)	1,535
DETENTION TIME, HR (H)	
ADWF	6.7
MDDWF	3.7
OXYGEN UPTAKE RATE, MG/L/HR	
ADWF	33
MDDWF	56
PLUG FLOW ACTIVATED SLUDGE MODE	
DETENTION TIME, HR (H)	
AWWF	7.1
MDWWF	2.9
OXYGEN UPTAKE RATE, MG/L/HR	
ADWF	13
MDDWF	38

SECONDARY TREATMENT (E) CONT.

BLOWERS	
EXISTING	
NUMBER	8
TYPE	CENTRIFUGAL
CAPACITY, EACH, CFM	
BLOWERS 1-4	4,375
BLOWERS 5-8	5,000
HP, EACH	250-350
FUTURE	
NUMBER	2
TYPE	CENTRIFUGAL
CAPACITY, EACH, CFM	5,000
HP, EACH	350
SECONDARY CLARIFIERS	
SECONDARY CLARIFIERS 1 & 2 (EXISTING)	
DIAMETER, FT	145
SIDEWATER DEPTH, FT	14
SURFACE AREA, EACH, SQ FT	16,510
VOLUME, EACH, 1000 GAL	1,740
OVERFLOW RATE, GPD/SQ FT	
ADWF	329
AWWF	426
MDWWF	1,054
DETENTION TIME, HR (I+C111)	
ADWF	5.5
AWWF	4.3
MDWWF	1.7
SECONDARY CLARIFIERS 3 & 4 EXISTING	
DIAMETER, FT	145
SIDEWATER DEPTH, FT	20
SURFACE AREA, EACH, SQ FT	16,510
VOLUME, EACH, 1000 GAL	2,470
OVERFLOW RATE, GPD/SQ FT	
ADWF	329
AWWF	426
MDWWF	1,054
DETENTION TIME, HR (I)	
ADWF	7.8
AWWF	6.0
MDWWF	2.4
RAS PUMPS	
EXISTING (TRAINS 1, 2, 3)	
NUMBER	6
TYPE	HELICAL SCREW CENTRIFUGAL
CAPACITY, EACH, MGD	7.5
DRIVE	VFD
HP	50
NEW (TRAIN 4) AND FUTURE (TRAIN 5 - PHASE 5)	
NUMBER	4
TYPE	NON CLOG CENTRIFUGAL
CAPACITY, EACH, MGD	7,5
DRIVE	VFD
HP	50

TERTIARY TREATMENT

CHEMICAL CLARIFIERS	
RAPID MIX BASINS (EXISTING)	
NUMBER	3
VOLUME, EACH, 1000 GAL	6.7
DETENTION TIME, MIN	
ADWF	1.1
MDDWF	0.6
MIXERS	
NUMBER	3
TYPE	INDUCTION MIXER
HP	5
CLARIFIERS (EXISTING)	
NUMBER	3
STAGES PER CLARIFIER	2
LENGTH PER STAGE, FT	100
WIDTH, FT	100
AVE. SIDEWATER DEPTH	
STAGE 1	
CLARIFIER 1 & 2	13.2
CLARIFIER 3	16.4
STAGE 2	
CLARIFIER 1 & 2	16.2
CLARIFIER 3	16.4
STAGE 2 SURFACE AREA, EACH, SQ FT	10,000
TOTAL VOLUME, 1000 GAL	
CLARIFIER 1 & 2	2200
CLARIFIER 3	2450
OVERFLOW RATE, GPD/SQ FT	
ENTIRE CLARIFIER	
ADWF	453
MDDWF	813
STAGE 2 ONLY	
ADWF	907
MDDWF	1627
TOTAL DETENTION TIME, HR	
CLARIFIER 1 & 2	
ADWF	5.9
MDDWF	3.2
CLARIFIER 3	
ADWF	6.5
MDDWF	3.6

TERTIARY TREATMENT CONT.

DISINFECTION AND DECHLORINATION	
BASE FLOW CHLORINATION/DECHLORINATION (EXISTING)	
CHLORINE CONTACT BASINS	
NUMBER, NORMAL FLOW	3
BASIN NO. 1	
VOLUME, 1000 GAL	1,030
DETENTION TIME, MIN	
AWWF	165
MDWWF	51
BASIN NO. 2	
VOLUME, 1000 GAL	787
DETENTION TIME, MIN	
AWWF	126
MDWWF	39
BASIN NO. 3	
VOLUME, 1000 GAL	812
DETENTION TIME, MIN	
AWWF	130
MDWWF	40
EACH BASIN HAS CHLORINE RESIDUAL- AND A ORP ANALYZER	
HYPOCHLORITE MIXERS	
NUMBER	4
TYPE	INDUCTION MIXER
HP	5
DECHLORINATION STRUCTURE	
VOLUME, 1000 GAL	35
DETENTION TIME, MIN	
DETENTION TIME, MIN	
AWWF	6
MDWWF	2
MIXER TYPE	DIFFUSER
NEAT HYPOCHLORITE PUMPS	
NUMBER	2
TYPE	PERISTALTIC
CAPACITY EACH GPH	900
HYPOCHLORITE FEED TO CL2 BASINS	
NUMBER	4
TYPE	PERISTALTIC
CAPACITY, EACH, GPH	100
SODIUM BISULFITE PUMPS (EFFLUENT)	
NUMBER	2
TYPE	PERISTALTIC
CAPACITY, EACH, GPH	40
SODIUM BISULFITE PUMPS EXCESS FLOW	
NUMBER	2
TYPE	PERISTALTIC
CAPACITY, EACH, GPH	40

TERTIARY TREATMENT CONT.

EFFLUENT FILTERS (EXISTING)	
MEDIA	MIXED
SURFACE AREA, EACH, SQ FT	
FILTERS NO. 1 - 4	900
FILTERS NO. 5 - 13	980
OVERFLOW RATE, GPM/SF (J)	
ADWF	1.8
MDDWF	3.3
AWWF	2.3
MDWWF	5.8
BACKWASH PUMPS	
NUMBER	2
TYPE	END SUCTION CENTRIFUGAL
CAPACITY, EACH, MGD	28.2
DRIVE	CONSTANT SPEED
HP	400
BACKWASH BASIN	
VOLUME, MILLION GAL	1.0
CLEARWELLS (EXISTING)	
NUMBER	2
VOLUME, 1000 GAL	
LOW PHOSPHOROUS	390
REUSE	566
REUSE PUMPS (EXISTING)	
NUMBER	3
TYPE	SPLIT CASE
CAPACITY, EACH, GPM	2 @ 1,650 ; 1 @ 575
DRIVE	CONSTANT SPEED
HP	2 @ 125 ; 1 @ 50
NON-POTABLE WATER PUMPS (2 EXISTING)	
NUMBER (1 NEW)	**3**
TYPE	**SPLIT CASE**
CAPACITY, EACH, GPM	**1300**
DRIVE	**CONSTANT SPEED**
HP	**100**
SURGE BASIN NO. 1 (EXISTING)	
VOLUME, MILLION GAL	4.51
SURGE BASIN NO. 2 (EXISTING)	
VOLUME, MILLION GAL	9
EFFLUENT FLOW MEASUREMENT	
BASE FLOW	
NUMBER	2
TYPE	PROPELLER
FLOW RANGE, MGD	1 @ 3 - 40; 1 @ 8 - 90
STORM FLOW	
NUMBER	1
TYPE	PARSHALL FLUME
FLOW RANGE, MGD	5 - 225
TUALATIN RIVER OUTFALL (EXISTING)	
TYPE	RCCP
DIAMETER	66"
LENGTH	2,630È
DIFFUSER (EXISTING)	
TYPE	66" RCCP
LENGTH	96'
NO. OF PORTS	12 @ 8' SPACING
PORT SIZE	20"
MIN. SUBMERGENCE	12-13'È

MISCELLANEOUS INFORMATION

PLANT RELIABILITY	
STANDARD	CLASS 1
SECONDARY POWER	
SOURCE TO THE PLANT	ROSEMOUNT SUBSTATION
OPERATION AND MAINTENANCE MANUAL	VOL. 1 LIQUID SYSTEMS VOL. 2 CHEMICAL/SOLIDS VOL. 3 SUPPORT SYSTEMS (3 RING BINDERS)
SAMPLERS	FLOW PACED
PLANT CRITICAL ALARM SYSTEM	

PLC TO SCADA AND RADIO SYSTEM (ZETRON)

ZETRON TRANSMITS TO "BELT" RADIOS OF ON-SITE STAFF AND PAGER OF ON-CALL PERSONNEL

GENERAL NOTES

CAPACITY OF PROCESSES AT CONCLUSION OF PROJECT.

BOLD INCLUDED IN THIS PROJECT.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PLOT TIME: 1:11:28 PM
PLOT DATE: 05-26-2012
FILENAME: 001-G-025_391538.DWG

DRN: GTM	ORIG DATE: APRIL 2010		
DSN: GVT	DWG #: 001-G-025		
CHK: JEG	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
GENERAL
DESIGN CRITERIA
LIQUID PROCESS

SHEET: 25 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-025

DESIGN CRITERIA - SOLIDS PROCESS

THICKENING

PRIMARY SLUDGE THICKENING / FERMENTATION
- PRIMARY SLUDGE AND SCUM PUMPS
  - NUMBER
    - EXISTING: 6
    - NEW: 5
  - TYPE: PROGRESSIVE CAVITY
  - CAPACITY, EACH, GPM: 200
  - DRIVE: CONSTANT SPEED
  - HP
    - EXISTING: 30
    - NEW: 25
- GRAVITY THICKENERS / FERMENTERS
  - NUMBER: 3
  - DIAMETER, FT: 50
  - SIDEWATER DEPTH, FT: 14
  - SURFACE AREA, EACH, SQ FT: 1960
  - VOLUME, EACH, 1000 GAL: 206
  - OVERFLOW RATE, GPD/SQ FT: 750
  - SOLIDS LOADING RATE, LBS/SQ FT/DAY: 24
- VFA DISCHARGE PUMPS
  - NUMBER: 2
  - TYPE: HORIZONTAL NON-CLOG
  - CAPACITY, EACH, GPM: 950 @ 50' TDH
  - DRIVE: VFD
  - HP: 20
- THICKENED PRIMARY SLUDGE PUMPS
  - NUMBER: 3
  - TYPE: PROGRESSIVE CAVITY
  - CAPACITY, EACH, GPM: 300
  - DRIVE: VFD
  - HP
- SLUDGE GRINDERS
  - NUMBER
    - EXISTING: 1
    - NEW: 2
  - TYPE: IN-LINE
- VFA RECIRCULATION PUMPS
  - NUMBER: 2
  - TYPE: HORIZONTAL NON-CLOG
  - CAPACITY, EACH, GPM: 860 @ 41' TDH
  - DRIVE: VFD
  - HP: 15

WAS / CHEMICAL SLUDGE THICKENING
- WAS PUMPS
  - NO. 1 - 4
    - TYPE: CENTRIFUGAL
    - CAPACITY, EACH, GPM: 300
    - DRIVE: VARIABLE SPEED
    - HP: 5
  - NO. 5 & 6
    - TYPE: HELICAL SCREW CENTRIFUGAL
    - CAPACITY, EACH, GPM: 200
    - DRIVE: VARIABLE SPEED
    - HP: 5
  - NO. 7 - 8
    - TYPE: PROGRESSIVE CAVITY
    - CAPACITY, EACH, GPM: 150
    - DRIVE: VARIABLE SPEED
    - HP: 10
- CHEMICAL SLUDGE PUMPS
  - NUMBER: 9
  - TYPE: HELICAL SCREW CENTRIFUGAL
  - CAPACITY, EACH, GPM: 140
  - DRIVE: CONSTANT SPEED
  - HP: 5
- DILUTE WAS STORAGE
  - VOLUME, 1000 GAL: 235
  - HOLDING CAPACITY, HOURS
    - MWDWF: 6 - 10
- THICKENING CENTRIFUGE FEED PUMPS
  - NUMBER: 3
  - TYPE: PROGRESSIVE CAVITY
  - CAPACITY, EACH, GPM: 360 @ 50' TDH
  - DRIVE: VFD
  - HP: 7.5
- THICKENING CENTRIFUGES
  - NUMBER: 3
  - CAPACITY, EACH, GPM: 275
  - HP, TOTAL: 263
- THICKENED WAS PUMPS
  - NUMBER: 2
  - TYPE: PROGRESSIVE CAVITY
  - CAPACITY, EACH, GPM: 75
  - DRIVE: VFD
  - HP: 15

DIGESTION

DIGESTER FEED TANK
- NUMBER: 2
- VOLUME, EA, 1000 GAL: 14.15
- DETENTION TIME, HR: 4
- MIXING
  - NUMBER PER TANK: 1
  - TYPE: AXIAL, RADIAL, TOP ENTERING
  - HP: 2

DIGESTER FEED PUMPS
- NUMBER: 3
- TYPE: 2-STAGE PROGRESSIVE CAVITY
- CAPACITY, EACH, GPM: 300
- DRIVE: VFD
- HP, EACH: 20

ANAEROBIC DIGESTERS
- DIGESTERS 1 - 3
  - DIAMETER (EQUIVALENT), FT: 63.4
  - SIDEWATER DEPTH, FT: 30
  - VOLUME, EACH, 1000 GAL: 707
  - COVER
    - TYPE: FIXED FLAT REINFORCED CONCRETE
  - MIXING
    - TYPE: AXIAL/RADIAL, TOP ENTERING
    - HP: 30
  - RECIRCULATION PUMPS
    - NUMBER: 4
    - TYPE: HELICAL SCREW CENTRIFUGAL
    - CAPACITY,EACH, GPM: 300
    - DRIVE: VFD
    - HP: 15
- DIGESTER 4
  - DIAMETER, FT: 80
  - SIDEWATER DEPTH, FT: 35
  - VOLUME, EACH, 1000 GAL: 1,300
  - COVER
    - TYPE: FIXED SUBMERGED DOME REINFORCED CONCRETE
  - MIXING
    - TYPE: AXIAL/RADIAL, TOP ENTERING
    - HP: 60
  - RECIRCULATION PUMPS
    - NUMBER: 2
    - TYPE: HELICAL SCREW CENTRIFUGAL
    - CAPACITY,EACH, GPM: 650 @ 35' TDH
    - DRIVE: CONSTANT SPEED
    - HP: 10
- DIGESTION DETENTION TIME, DAYS (K, M)
  - MAXIMUM MONTH: 21
  - MAXIMUM WEEK: 17

DIGESTED SLUDGE STORAGE
- STORAGE TANK 1
  - DIAMETER (EQUIVALENT), FT: 63,4
  - SIDEWATER DEPTH, FT: 30
  - VOLUME AVAILABLE, EACH, 1000 GAL: 640
  - COVER
    - TYPE: FIXED FLAT REINFORCED CONCRETE
  - MIXING
    - TYPE: AXIAL/RADIAL, TOP ENTERING
    - HP: 30
- STORAGE TANK 2
  - DIAMETER, FT: 80
  - SIDEWATER DEPTH, FT: 35
  - VOLUME, EACH, 1000 GAL: 1,300
  - COVER
    - TYPE: FIXED SUBMERGED DOME REINFORCED CONCRETE
  - MIXING
    - TYPE: AXIAL/RADIAL, TOP ENTERING
    - HP: 60
- DETENTION TIME, DAYS (L, M+)
  - MAXIMUM (WET) MONTH: 13

DIGESTED SLUDGE PUMPS
- NUMBER: 2
- TYPE: PROGRESSIVE CAVITY
- CAPACITY, EACH, GPM: 300
- DRIVE: VFD
- HP: 20
- 1

DIGESTER FEED GRINDERS (COMPLEX 2)
- NUMBER: 2
- TYPE: IN-LINE

DEWATERING

DEWATERING CENTRIFUGE FEED PUMPS
- NUMBER: 2
- TYPE: PROGRESSIVE CAVITY
- DRIVE: VFD
- CAPACITY, EACH, GPM: 300
- HP: 15

DEWATERING CENTRIFUGES
- NUMBER: 2
- CAPACITY, EACH, GPM: 300
- HP, TOTAL: 350

SLUDGE CAKE CONVEYANCE
- NUMBER: 9
- TYPE: INCLINED, HORIZONTAL AND VERTICAL SCREW
- CAPACITY, EACH, TON/HR: 12.2

CENTRATE PUMPS
- NUMBER: 2
- TYPE: NON-CLOG CENTRIFUGAL
- DRIVE: VFD
- CAPACITY, EACH, GPM: 450
- HP: 10

CENTRATE STORAGE
- NUMBER: 2
- VOLUME, EACH, 1000 GAL: 290
- MIXING
  - NUMBER PER TANK: 1
  - TYPE: AXIAL, RADIAL, TOP ENTERING
  - HP: 7.5

DEWATERED SLUDGE STORAGE
- NUMBER OF HOPPERS: 2
- VOLUME, EACH, CU FT: 2740
- TOTAL DETENTION TIME, DAYS
  - MMDWF: 2

DEWATERED CENTRIFUGE FEED GRINDER
- NUMBER: 1
- TYPE: IN-LINE

GENERAL NOTES

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 001-G-026_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:11:40 PM

DRN: GTM	ORIG DATE: APRIL 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: GVT	DWG #: 001-G-026		
CHK: JEG	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services — Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

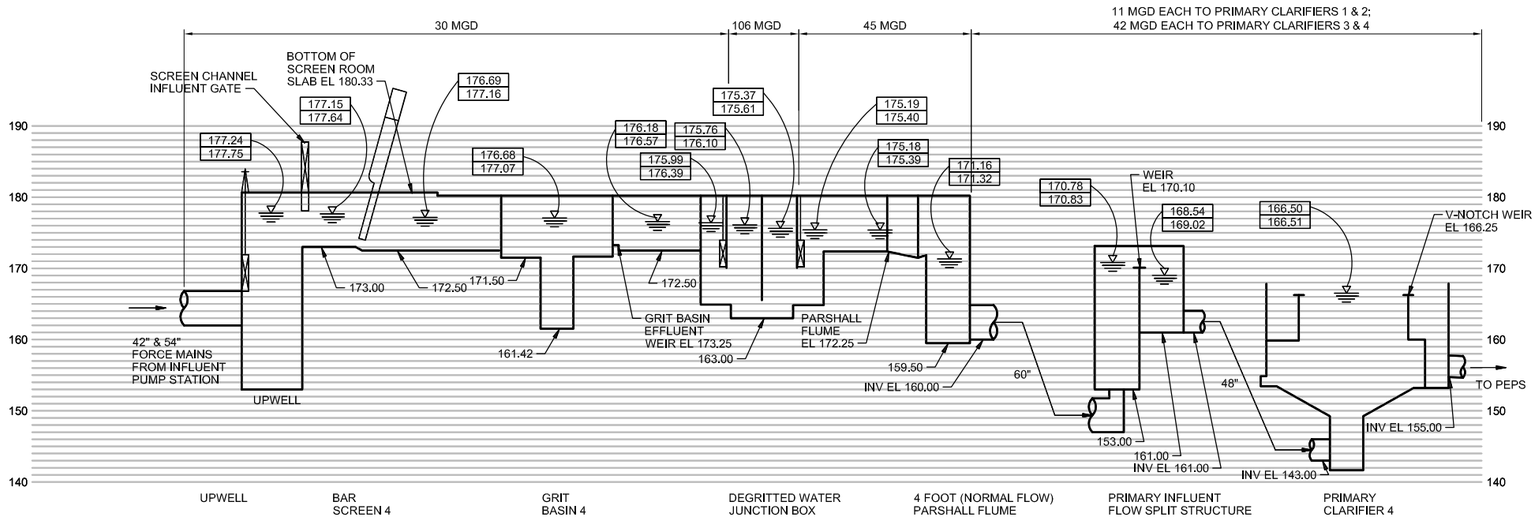
SHEET TITLE: GENERAL DESIGN CRITERIA SOLIDS PROCESS

SHEET: 26 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-026

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



HYDRAULIC PROFILE - EXISTING - 106 MGD

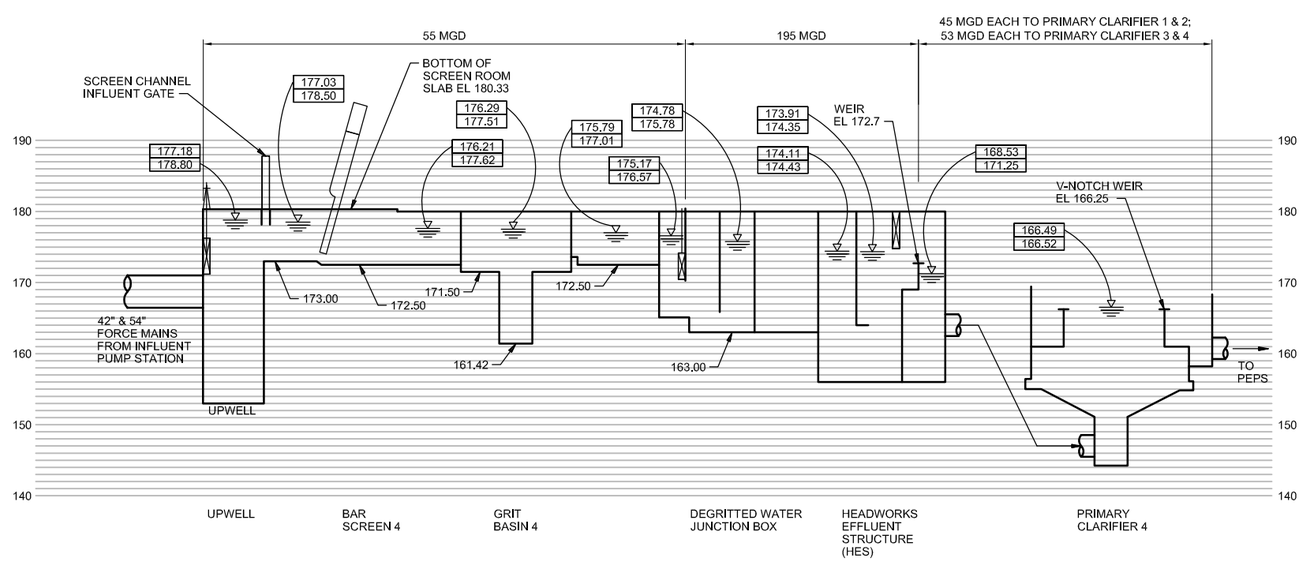
NOTES:
1. THIS PROFILE TAKEN FROM DURHAM FACILITY PHASE 4 EXPANSION PROJECT, DRAWING 14.

WATER SURFACE LEGEND:

XXX.XX
XXX.XX

2009/ 106 MGD WATER SURFACE ELEVATIONS BASED ON ALL TRAINS IN-SERVICE, FOUR PRIMARY CLARIFIERS IN-SERVICE. SCREEN LOSSES BASED ON 3/8 INCH BAR OPENINGS AND 35% SCREEN BLOCKAGE.

2015 / 117 MGD WATER SURFACE ELEVATIONS BASED ON ALL TRAINS IN-SERVICE, FOUR PRIMARY CLARIFIERS IN-SERVICE. SCREEN LOSSES BASED ON 3/8 INCH BAR OPENINGS AND 35% SCREEN BLOCKAGE.



HYDRAULIC PROFILE - HES EXPANSION (FUTURE) - 195 MGD

NOTES:
1. INDICATES PROPORTIONAL FLOW SPLIT TO PRIMARY CLARIFIERS SURFACE OVERFLOW RATES.
2. INDICATES WATER SURFACE ELEVATIONS IN HES BOX FEEDING PRIMARY CLARIFIERS.

WATER SURFACE LEGEND: HES EXPANSION (FUTURE)

XXX.XX
XXX.XX

2025/137MGD: WATER SURFACE ELEVATIONS BASED ON ALL TRAINS IN SERVICE, FOUR PRIMARY CLARIFIERS IN SERVICE. SCREEN LOSSES BASED ON 3/8 INCH BAR OPENINGS AND 35% BLOCKAGE.

BUILDOUT/195MGD: WATER SURFACE ELEVATIONS BASED ON ALL TRAINS IN SERVICE, FOUR PRIMARY CLARIFIERS IN SERVICE. SCREEN LOSSES BASED ON 3/8 INCH BAR OPENINGS AND 35% BLOCKAGE.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 001-G-027_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:11:51 PM

DRN: ARH	ORIG DATE: MAY 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: DJG	DWG #: 001-G-027		
CHK: LEC	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services — Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: GENERAL — HYDRAULIC PROFILE

SHEET: 27 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 001-G-027

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

N

0 100 200 300

Scale In Feet

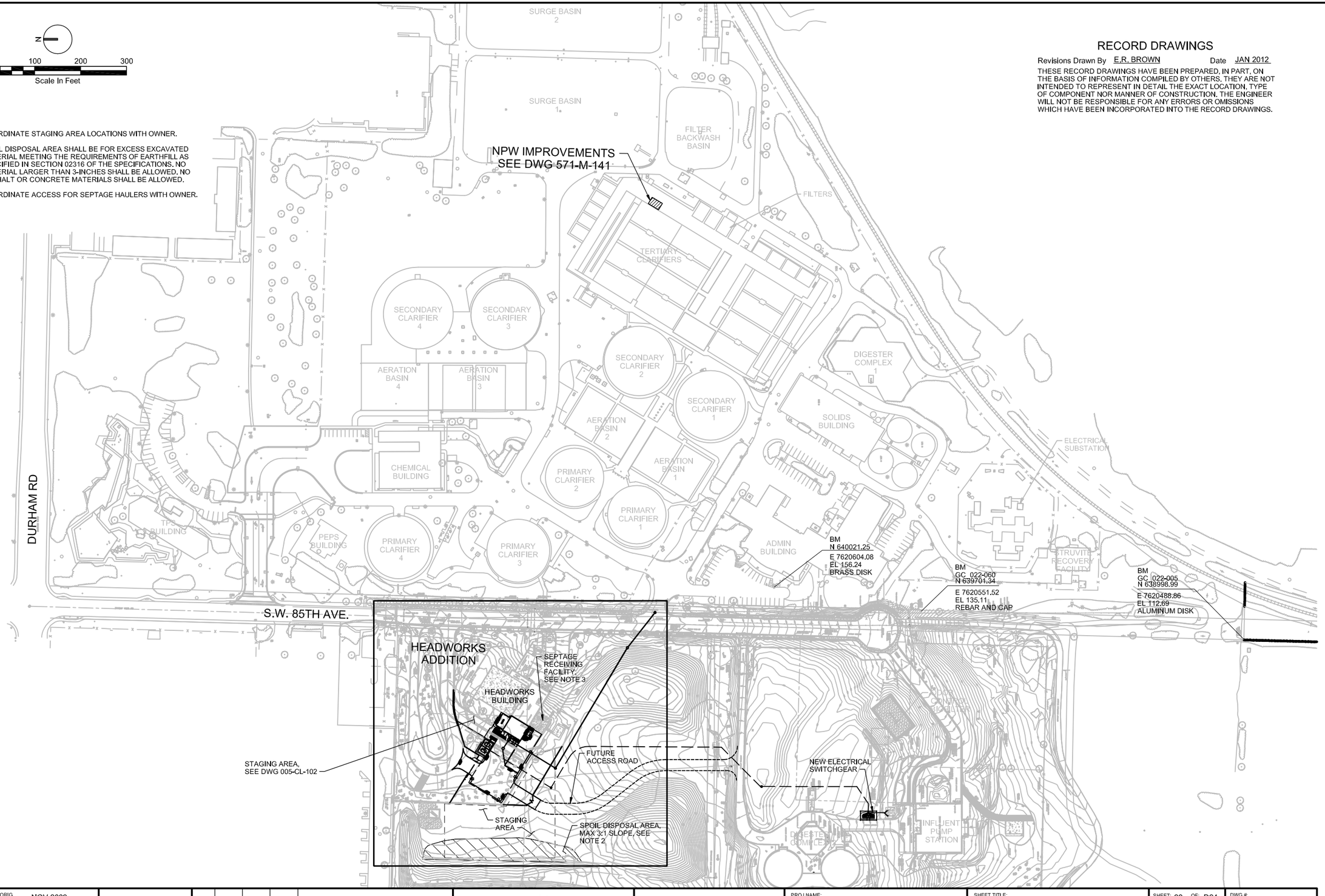
NOTES:

1. COORDINATE STAGING AREA LOCATIONS WITH OWNER.
2. SPOIL DISPOSAL AREA SHALL BE FOR EXCESS EXCAVATED MATERIAL MEETING THE REQUIREMENTS OF EARTHFILL AS SPECIFIED IN SECTION 02316 OF THE SPECIFICATIONS. NO MATERIAL LARGER THAN 3-INCHES SHALL BE ALLOWED. NO ASPHALT OR CONCRETE MATERIALS SHALL BE ALLOWED.
3. COORDINATE ACCESS FOR SEPTAGE HAULERS WITH OWNER.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 005-C-100_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:12:08 PM

DRN: ARH	ORIG DATE: NOV 2009		
DSN: JAB	DWG #: 005-C-100		
CHK: WBW	CAD FILE #:		
APPD: LEC	SCALE: 1"=100'		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
SITE DEVELOPMENT
CIVIL
OVERALL PLAN

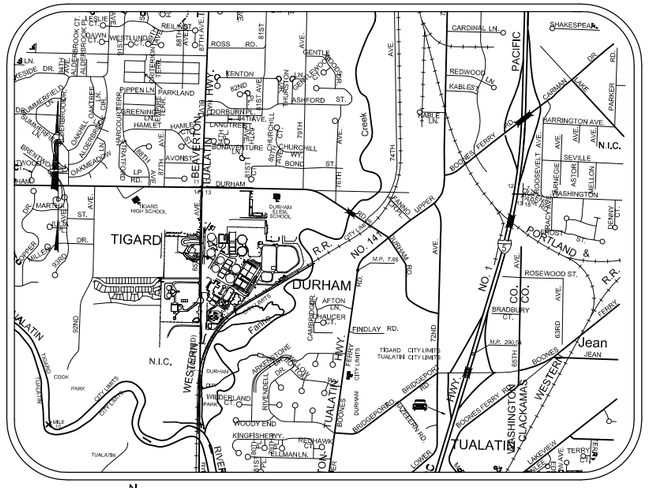
SHEET: 28 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 005-C-100

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

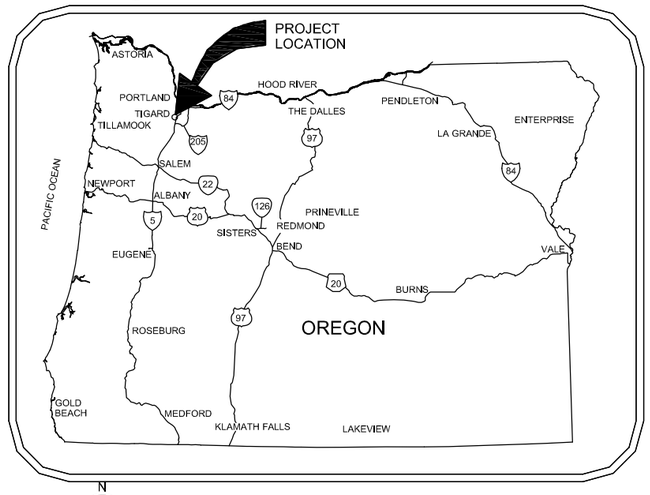
EROSION AND SEDIMENT CONTROL PLANS



N

SITE MAP

NOT TO SCALE



N

VICINITY MAP

NOT TO SCALE

PROJECT LOCATION:

16850 SW 85TH AVE
TIGARD
WASHINGTON
COUNTY, OREGON
LATITUDE = 45°24', LONGITUDE = 122°45'

PROPERTY DESCRIPTION:

TAX LOTS 25113B000600
LOCATED IN THE
NORTHWEST 1/4 OF SECTION 13, TOWNSHIP 2 SOUTH,
RANGE 1 WEST, WILLAMETTE MERIDIAN, WASHINGTON
COUNTY, OREGON

ATTENTION EXCAVATORS:

OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING 503-232-1987. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CENTER. YOU MUST NOTIFY THE CENTER AT LEAST TWO BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL 503-246-6699.

ENGINEERING FIRM

CH2M HILL
2020 S.W. 4th AVENUE
3RD FLOOR
PORTLAND, OR 97201-4958
PHONE: (503) 235.5000
FAX: (503) 223.1492

NARRATIVE DESCRIPTIONS

EXISTING SITE CONDITIONS:

CLEAN WATER SERVICES
DURHAM ADVANCED WASTEWATER TREATMENT PLANT WITH CURRENT HEADWORKS FACILITY

DEVELOPED CONDITIONS:

DURHAM ADVANCED WASTEWATER TREATMENT PLANT WITH EXPANDED HEADWORKS FACILITY

NATURE OF CONSTRUCTION ACTIVITY AND ESTIMATED TIME TABLE

* CLEARING
* MASS GRADING
* UTILITY INSTALLATION
*HEADWORKS ADDITION CONSTRUCTION
* PAVEMENT AND FENCE CONSTRUCTION
* FINAL STABILIZATION

TOTAL SITE AREA = 71.5 ACRES

TOTAL DISTURBED AREA = 1.5 ACRES

SITE SOIL CLASSIFICATION:

ALOHA SILT LOAM, HILLSBORO LOAM, AND HUBERLY SILT LOAM, 2 TO 7 PERCENT SLOPES

RECEIVING WATER BODIES: DURHAM AWWTF

PERMITTEE'S SITE INSPECTOR:

COMPANY/AGENCY: _____
PHONE: _____
FAX: _____
E-MAIL: _____
DESCRIPTION OF EXPERIENCE: _____

INSPECTION FREQUENCY:

- ONCE PER WEEK ON ACTIVE SITES.
- ONCE EVERY TWO WEEKS ON INACTIVE SITES.
- WITHIN 24 HRS. OF A 0.5" RAIN EVENT.
- DAILY WHEN STORMWATER RUNOFF IS OCCURING.

HOLD A PRE-CON MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE EC INSPECTOR. ALL INSPECTIONS MUST BE MADE IN ACCORDANCE WITH DEQ 1200 C PERMIT REQUIREMENTS.

INSPECTION LOGS MUST BE KEPT IN ACCORDANCE WITH DEQ'S 1200 C PERMIT REQUIREMENTS.

CHANGES TO THE APPROVED ESC PLAN MUST BE SUBMITTED TO DEQ IN THE FORM OF AN ACTION PLAN.

THE PERMITTEE IS REQUIRED TO MEET ALL THE CONDITIONS OF THE 1200C PERMIT. THIS ESCP AND GENERAL CONDITIONS HAVE BEEN DEVELOPED TO FACILITATE COMPLIANCE WITH THE 1200C PERMIT REQUIREMENTS. IN CASES OF DISCREPANCIES OR OMISSIONS, THE 1200C PERMIT REQUIREMENTS SUPERCEDE REQUIREMENTS OF THIS PLAN.

STANDARD EROSION AND SEDIMENT CONTROL PLAN DRAWING NOTES:

1. APPLY TEMPORARY AND PERMANENT SOIL STABILIZATION MEASURES ON ALL DISTURBED AREAS AS GRADING PROGRESSES. (SCH A.5.b.ll.6.)
2. CONSTRUCTION ACTIVITIES MUST AVOID OR MINIMIZE EXCAVATION AND CREATION OF BARE GROUND FROM OCTOBER 1 THROUGH MAY 31 EACH YEAR. (SCH A.7.a.i.)
3. DURING WET WEATHER PERIODS TEMPORARY STABILIZATION OF THE SITE MUST OCCUR AT THE END OF EACH WORK DAY IF RAINFALL IS FORECAST IN THE NEXT 24 HOURS. (SCH A.7.a.ll.)
4. ALL EROSION AND SEDIMENT CONTROLS NOT IN THE DIRECT PATH OF WORK MUST BE INSTALLED PRIOR TO ANY LAND DISTURBANCE. (SCH A.7.c.ll.)
5. PRESERVE EXISTING VEGETATION AND RE-VEGETATE OPEN AREAS WHEN PRACTICABLE BEFORE AND AFTER GRADING OR CONSTRUCTION (SCHA.7.c.iii.1)
6. ALL TEMPORARY SEDIMENT CONTROLS MUST REMAIN IN PLACE UNTIL PERMANENT VEGETATION OR OTHER PERMANENT COVERING OF EXPOSED SOIL IS ESTABLISHED. (SCH A.7.c.lll.3.)
7. SEDIMENT CONTROLS MUST BE INSTALLED AND MAINTAINED ON ALL DOWN GRADIENT SIDES OF THE CONSTRUCTION SITE AT ALL TIMES DURING CONSTRUCTION. (SCH A.7.d.l.(1))
8. ALL ACTIVE CATCH BASINS MUST HAVE SEDIMENT CONTROLS INSTALLED AND MAINTAINED AT ALL TIMES DURING CONSTRUCTION. (SCH A.7.d.i.(2))
9. WATER-TIGHT TRUCKS MUST BE USED TO TRANSPORT SATURATED SOILS FROM THE CONSTRUCTION SITE, AN APPROVED EQUIVALENT IS TO DRAIN THE SOIL ON-SITE AT A DESIGNATED LOCATION USING APPROPRIATE BMP's; SOIL MUST BE DRAINED SUFFICIENTLY FOR MINIMAL SPILLAGE. (SCH A.7.d.lll.3)
10. TEMPORARY STABILIZATION OR COVERING OF SOIL STOCKPILES MUST OCCUR AT THE END OF EACH WORK DAY OR OTHER BMP's MUST BE IMPLEMENTED TO PREVENT TURBID DISCHARGES TO SURFACE WATERS. (SCH A.7.e.ii.2.)
11. DEVELOP AND MAINTAIN ONSITE A WRITTEN SPILL PREVENTION AND RESPONSE PROCEDURE. (SCH A.7.e.iii.3)
12. ANY USE OF TOXIC OR OTHER HAZARDOUS MATERIALS MUST INCLUDE PROPER STORAGE, APPLICATION, AND DISPOSAL. (SCH A.7.e.iii.(2))
13. THE PERMITTEE MUST PROPERLY PREVENT AND MANAGE HAZARDOUS WASTE, USED OILS, CONTAMINATED SOILS, CONCRETE WASTE, SANITARY WASTE, LIQUID WASTE, OR OTHER TOXIC SUBSTANCES DISCOVERED OR GENERATED DURING CONSTRUCTION. (SCH A.7.e.i.1 AND SCH A.7.e.iii.4)
14. SIGNIFICANT AMOUNTS OF SEDIMENT WHICH LEAVE THE SITE MUST BE CLEANED UP WITHIN 24 HOURS AND PLACED BACK ON THE SITE AND STABILIZED OR PROPERLY DISPOSED. THE CAUSE OF THE SEDIMENT RELEASE MUST BE FOUND AND PREVENTED FROM CAUSING A REOCCURRENCE OF THE DISCHARGED WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEAN UP OF SEDIMENT SHALL BE PERFORMED ACCORDING TO THE OREGON DIVISION OF STATE LANDS REQUIRED TIME FRAME. (SCH A.7.f.1.1)
15. SEDIMENT MUST NOT BE INTENTIONALLY WASHED INTO STORM SEWERS, DRAINAGE WAYS, OR WATERBODIES. DRY SWEEPING MUST BE USED TO CLEAN UP RELEASED SEDIMENTS. (SCH A.7.f.i.2)
16. THE APPLICATION RATE OF FERTILIZERS USED TO REESTABLISH VEGETATION MUST FOLLOW THE MANUFACTURER'S RECOMMENDATIONS. NUTRIENT RELEASES FROM FERTILIZERS TO SURFACE WATERS MUST BE MINIMIZED, TIME RELEASE FERTILIZERS SHOULD BE USED AND CARE SHOULD BE TAKEN IN THE APPLICATION OF FERTILIZERS WITHIN ANY WATER WAY RIPARIAN ZONE. (SCH A.7.f.i.3.)
17. SEDIMENT MUST BE REMOVED FROM BEHIND SEDIMENT FENCE WHEN IT HAS REACHED A HEIGHT OF $\frac{1}{3}$ THE HEIGHT OF THE FENCE ABOVE THE GROUND, AND BEFORE FENCE REMOVAL. (SCH A.7.f.ii.1.)
18. SEDIMENT MUST BE REMOVED FROM BEHIND BIO BAGS AND OTHER BARRIERS WHEN IT HAS REACHED A HEIGHT OF TWO (2) INCHES AND BEFORE BMP REMOVAL. (SCH A.7.f.ll.2.)
19. CLEANING OF TRAPPED CATCH BASINS MUST OCCUR WHEN THE SEDIMENT RETENTION CAPACITY HAS BEEN REDUCED BY FIFTY (50) PERCENT, AND AT COMPLETION OF PROJECT. (SCH A.7.f.ll.3.)
20. REMOVAL OF TRAPPED SEDIMENT IN A SEDIMENT BASIN OR SEDIMENT TRAP MUST OCCUR WHEN THE SEDIMENT RETENTION CAPACITY HAS BEEN REDUCED BY FIFTY (50) PERCENT, AND AT COMPLETION OF PROJECT. (SCH A.7.f.§.3&4)
21. DEQ MUST APPROVE OF ANY TREATMENT SYSTEM AND OPERATIONAL PLAN THAT MAY BE NECESSARY TO TREAT CONTAMINATED CONSTRUCTION DEWATERING OR SEDIMENT AND TURBIDITY IN STORMWATER RUNOFF. (SCH A.7.f.lll.)
22. SHOULD ALL CONSTRUCTION ACTIVITIES CEASE FOR THIRTY (30) DAYS OR MORE, THE ENTIRE SITE MUST BE TEMPORARILY STABILIZED USING VEGETATION OR A HEAVY MULCH LAYER, TEMPORARY SEEDING, OR OTHER METHOD. (SCH A.8.a.)
23. SHOULD CONSTRUCTION ACTIVITIES CEASE FOR FIFTEEN (15) DAYS OR MORE ON ANY SIGNIFICANT PORTION OF A CONSTRUCTION SITE, TEMPORARY STABILIZATION IS REQUIRED FOR THAT PORTION OF THE SITE WITH STRAW, COMPOST, OR OTHER TACKIFIED COVERING THAT WILL PREVENT SOIL OR WIND EROSION UNTIL WORK RESUMES ON THAT PORTION OF THE SITE. (SCH A.8.b.)

LOCAL AGENCY-SPECIFIC EROSION CONTROL NOTES:

1. OWNER OR DESIGNATED PERSON SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES, IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.
2. PRIOR TO ANY LAND DISTURBING ACTIVITIES, THE BOUNDARIES OF THE CLEARING LIMITS, VEGETATED BUFFERS, AND ANY SENSITIVE AREAS SHOWN ON THIS PLAN SHALL BE CLEARLY DELINEATED IN THE FIELD. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE IS PERMITTED BEYOND THE CLEARING LIMITS, THE OWNER/PERMITTEE MUST MAINTAIN THE DELINEATION FOR THE DURATION OF THE PROJECT. NOTE: VEGETATED CORRIDORS TO BE DELINEATED WITH ORANGE CONSTRUCTION FENCE OR APPROVED EQUAL.
3. PRIOR TO ANY LAND DISTURBING ACTIVITIES, THE BMP's THAT MUST BE INSTALLED ARE A GRAVEL CONSTRUCTION ENTRANCE, PERIMETER SEDIMENT CONTROL, AND INLET PROTECTION. THESE BMP's MUST BE MAINTAINED FOR THE DURATION OF THE PROJECT.
4. IF VEGETATIVE SEED MIXES ARE SPECIFIED, SEEDING MUST TAKE PLACE NO LATER THAT SEPTEMBER 1; THE TYPE AND PERCENTAGES OF SEED IN THE MIX MUST BE IDENTIFIED ON THE PLANS.
5. ALL PUMPING OF SEDIMENT LADEN WATER SHALL BE DISCHARGED OVER AN UNDISTURBED, PREFERABLY VEGETATED AREA, AND THROUGH A SEDIMENT CONTROL BMP I.e. (FILTER BAG).
6. THE ESC PLAN MUST BE KEPT ON SITE. ALL MEASURES SHOWN ON THE PLAN MUST BE INSTALLED PROPERLY TO ENSURE THAT SEDIMENT OR SEDIMENT LADEN WATER DOES NOT ENTER A SURFACE WATER SYSTEM, ROADWAY, OR OTHER PROPERTIES.
7. THE ESC MEASURES SHOWN ON THIS PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE MEASURES SHALL BE UPGRADED AS NEEDED TO COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL EROSION CONTROL REGULATIONS. CHANGES TO THE APPROVED ESC PLAN MUST BE SUBMITTED IN THE FORM OF AN ACTION PLAN TO DEQ PER THE 1200 C PERMIT.
8. IN AREAS SUBJECT TO WIND EROSION, APPROPRIATE BMP's MUST BE USED WHICH MAY INCLUDE THE APPLICATION OF FINE WATER SPRAYING, PLASTIC SHEETING, MULCHING, OR OTHER APPROVED MEASURES.
9. ALL EXPOSED SOILS MUST BE COVERED DURING THE WET WEATHER PERIOD.

BMP MATRIX FOR CONSTRUCTION PHASES

REFER TO DEQ GUIDANCE MANUAL FOR A COMPREHENSIVE LIST OF AVAILABLE BMP'S.

	CLEARING	MASS GRADING	UTILITY INSTALLATION	FINAL STABILIZATION	WET WEATHER (OCT. 1 - MAY 31ST)
EROSION PREVENTION					
PRESERVE NATURAL VEGETATION	**X	X	X	X	X
GROUND COVER				X	X
HYDRAULIC APPLICATIONS				X	
PLASTIC SHEETING		X			X
MATTING					
DUST CONTROL	X	X	X	X	X
TEMPORARY/ PERMANENT SEEDING		X	X	X	X
BUFFER ZONE					
OTHER:					
SEDIMENT CONTROL					
SEDIMENT FENCE (PERIMETER)	**X	X	X	X	X
SEDIMENT FENCE (INTERIOR)					
STRAW WATTLES					
FILTER BERM					
INLET PROTECTION	**X	X	X	X	X
DEWATERING			X		
SEDIMENT TRAP					
OTHER:					
RUN OFF CONTROL					
CONSTRUCTION ENTRANCE	**X	X	X	X	
PIPE SLOPE DRAIN					
OUTLET PROTECTION					
SURFACE ROUGHENING					
CHECK DAMS					
OTHER:					
POLLUTION PREVENTION					
PROPER SIGNAGE	X	X	X	X	X
HAZ WASTE MGMT	X	X	X	X	X
SPILL KIT ON-SITE	X	X	X	X	X
CONCRETE WASHOUT AREA					
OTHER:					

** SIGNIFIES BMP THAT WILL BE INSTALLED PRIOR TO ANY GROUND DISTURBING ACTIVITY.

RATIONALE STATEMENT

A COMPREHENSIVE LIST OF AVAILABLE BEST MANAGEMENT PRACTICES (BMP) OPTIONS BASED ON DEQ's GUIDANCE MANUAL HAS BEEN REVIEWED TO COMPLETE THIS EROSION AND SEDIMENT CONTROL PLAN. SOME OF THE ABOVE LISTED BMP's WERE NOT CHOSEN BECAUSE THEY WERE DETERMINED TO NOT EFFECTIVELY MANAGE EROSION PREVENTION AND SEDIMENT CONTROL FOR THIS PROJECT BASED ON SPECIFIC SITE CONDITIONS, INCLUDING SOIL CONDITIONS TOPOGRAPHIC CONSTRAINTS, ACCESSIBILITY TO THE SITE, AND OTHER RELATED CONDITIONS, AS THE PROJECT PROGRESSES AND THERE IS A NEED TO REVISE THE ESC PLAN, AN ACTION PLAN WILL BE SUBMITTED.

_____
INITIAL

SHEET INDEX

EROSION CONTROL PLANS

005-CE-100	EROSION AND SEDIMENT CONTROL COVER SHEET
005-CE-101	EROSION AND SEDIMENT CONTROL PLAN
005-CE-501	EROSION AND SEDIMENT CONTROL DETAILS

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

PLOT TIME: 1:40:19 PM
PLOT DATE: 05-26-2012
FILENAME: 005-CE-100_3915538.DWG

DRN: ARH	ORIG DATE: APR 2009	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JAB	DWG #: 005-CE-100		
CHK: WBW	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: SITE DEVELOPMENT CIVIL EROSION AND SEDIMENT CONTROL COVER SHEET

SHEET: 29 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 005-CE-100

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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N

0 60 120 180
Scale In Feet

EROSION CONTROL LEGEND

CONSTRUCTION ENTRANCE

SEDIMENT FENCE

BIOFILTER BAG INLET BARRIER

HEADWORKS ADDITION

NOTES:

1. FOR PLASTIC SHEETING, SEE 810 005-CE-501

BIOFILTER BAG INLET BARRIER, TYP. 1 005-CE-501

SW 85TH AVE

HEADWORKS BUILDING

HEADWORKS ADDITION

EXISTING SEPTAGE RECEIVING FACILITY

2" SAN

20'

26'

855 005-CE-501 CONSTRUCTION ENTRANCE

SEDIMENT FENCE 875 005-CE-501

ELECTRICAL CONDUITS

PROTECT EXST TREES DURING CONSTRUCTION

BIOFILTER BAG INLET BARRIER 1 005-CE-501

PROVIDE SEDIMENT FENCE AROUND LIMITS OF STOCKPILE AREA

ELECTRICAL SWITCHGEAR

DIGESTER COMPLEX

INFLUENT PUMP HOUSE

ASPHALT DRIVEWAY

WHALEY DRIVE (UNIMPROVED)

PLOT TIME: 1:12:52 PM
PLOT DATE: 05-26-2012
FILENAME: 005-CE-101_391538.DWG

DRN: ARH	ORIG DATE: NOV 2009				
DSN: JAB	DWG #: 005-CE-101				
CHK: WBW	CAD FILE #:				
APPD: LEC	SCALE: 1"=60'				

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
SITE DEVELOPMENT
CIVIL
EROSION AND SEDIMENT CONTROL PLAN

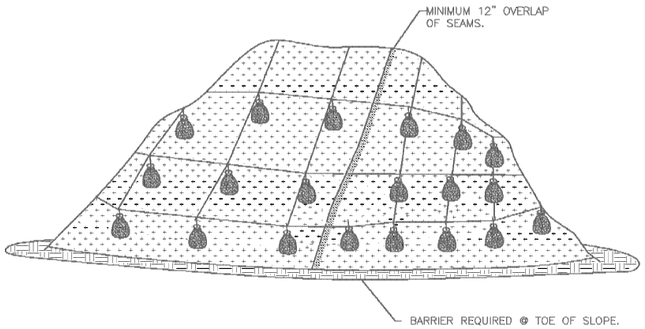
SHEET: 30 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 005-CE-101

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.



PLASTIC SHEETING

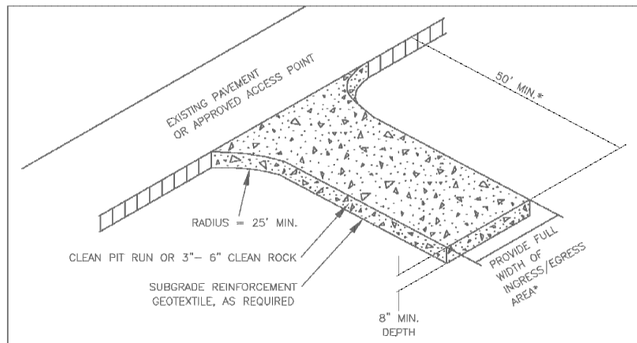
NOTES:

1. MINIMUM 12" OVERLAP OF ALL SEAMS REQUIRED.
2. BARRIER REQUIRED @ TOE OF STOCK PILE.
3. COVERING MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS OR TIRES ON ROPES WITH A MAXIMUM 10' GRID SPACING IN ALL DIRECTIONS.

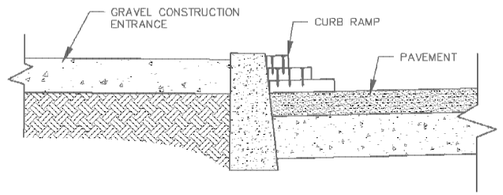
PLASTIC SHEETING

DRAWING NO. 810 REVISED 12-06

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*20' MIN. FOR SINGLE FAMILY AND DUPLEX RESIDENTIAL



NOTES:

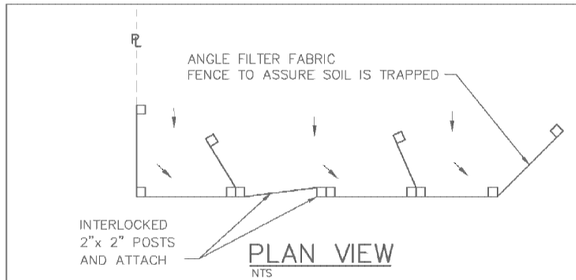
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF- WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. WHERE RUNOFF CONTAINING SEDIMENT LADEN WATER IS LEAVING THE SITE VIA THE CONSTRUCTION ENTRANCE, OTHER MEASURES SHALL BE IMPLEMENTED TO DIVERT RUNOFF THROUGH AN APPROVED FILTERING SYSTEM.
5. DIMENSIONS
   SINGLE FAMILY
   20' LONG BY 20' WIDE 8" DEEP OF ¾" MINUS CLEAN ROCK.
   COMMERCIAL
   50' LONG BY 20' WIDE 3-6" CLEAN ROCK, GOVERNING AUTHORITY MAY REQUIRE GEOTEXTILE FABRIC TO PREVENT SUB-SOIL PUMPING.

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

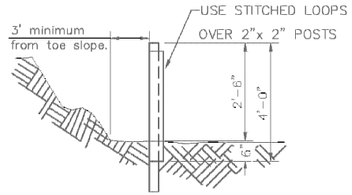
CONSTRUCTION ENTRANCE

Detail Drawing 855 REVISED 12-06

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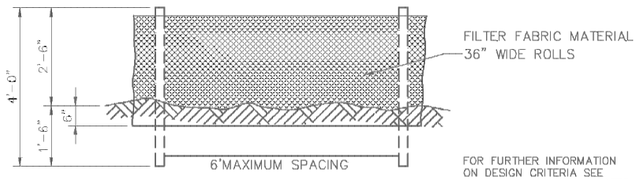
PLAN VIEW
NTS



PROFILE
NTS

NOTES:

1. BURY BOTTOM OF FILTER FABRIC 6" VERTICALLY BELOW FINISHED GRADE.
2. 2"x 2" FIR, PINE OR STEEL FENCE POSTS.
3. POSTS TO BE INSTALLED ON UPHILL SIDE OF SLOPE.
4. COMPACT BOTH SIDES OF FILTER FABRIC TRENCH.
5. PANELS MUST BE PLACED ACCORDING TO SPACING ON DETAIL NO.940



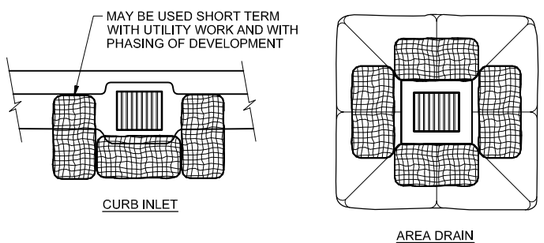
FRONT VIEW
NTS

FOR FURTHER INFORMATION ON DESIGN CRITERIA SEE CHAPTER 4 OF CLEAN WATER SERVICES EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL.

SEDIMENT FENCE

DRAWING NO. 875 REVISED 12-06

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CURB INLET

AREA DRAIN

1 BIOFILTER BAG INLET BARRIER
NTS
005-CE-101

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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DRN: ARH	ORIG DATE: APR 2009				
DSN: JAB	DWG #: 005-EC-501				
CHK: WBW	CAD FILE #:				
APPD: LEC	SCALE: NONE				

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

CleanWater Services
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
SITE DEVELOPMENT
CIVIL
EROSION AND SEDIMENT CONTROL DETAILS

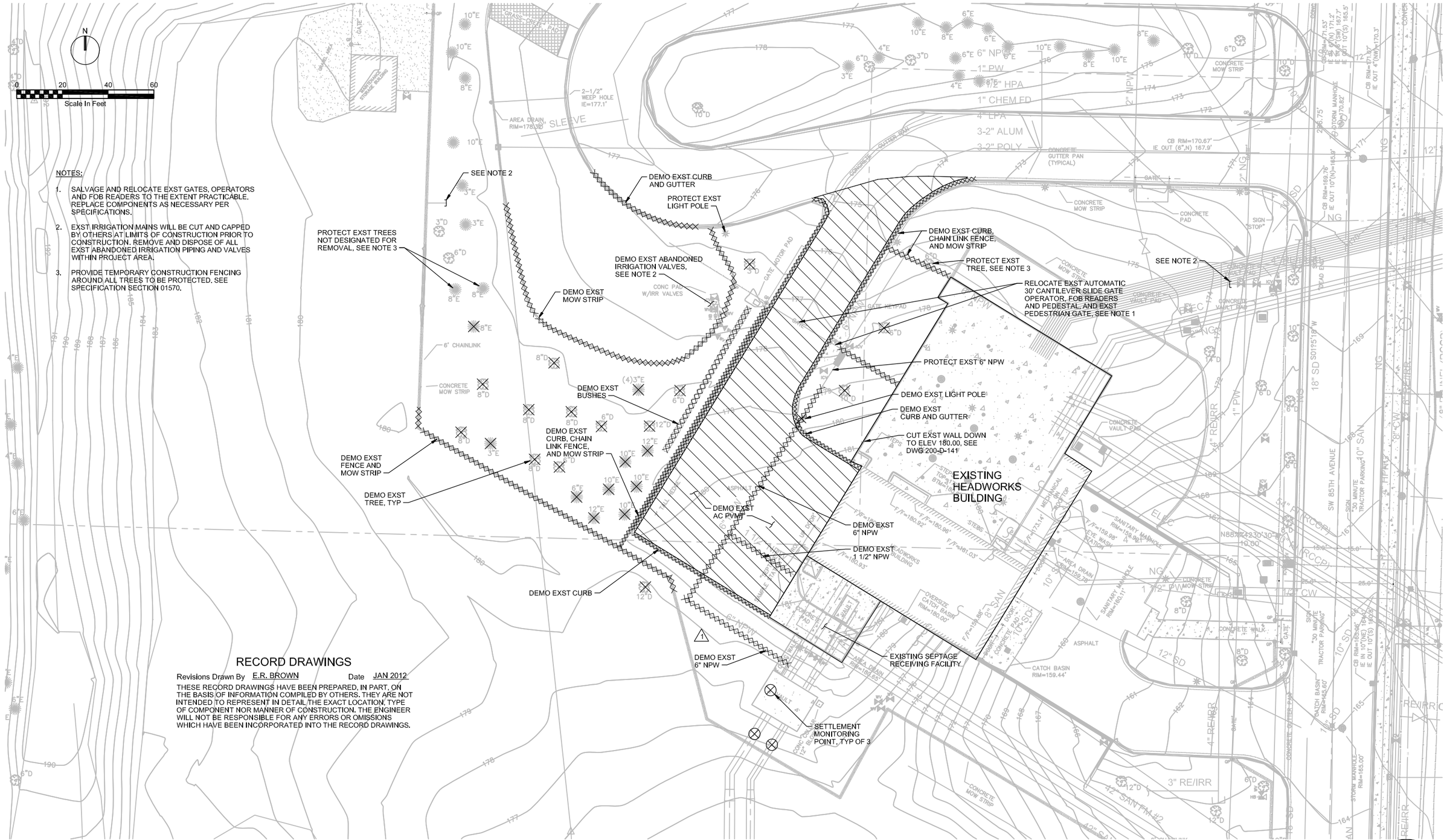
SHEET: 31 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 005-CE-501

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 005-CE-501_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:13:05 PM



FILENAME: 005-CD-101_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:12:23 PM

DRN: ARH	ORIG DATE: NOV 2009	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JAB	DWG #: 005-CD-101		
CHK: WBW	CAD FILE #:		
APPD: LEC	SCALE: 1"=20'		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	06/10	JAB	LEC	ADDENDUM NO. 2

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
SITE DEVELOPMENT
CIVIL
DEMOLITION
PLAN

SHEET: 32 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #: 005-CD-101

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

N

0 20 40 60

Scale In Feet

COORDINATE TABLE

POINT NO.	DESCRIPTION	NORTHING	EASTING
1	START CONCRETE CURB, CONNECT TO EXST	N 640722.55	E 7620206.54
2	PI, R=20' CONCRETE CURB (1)	N 640711.80	E 7620214.06
3	PI, R=10' CONCRETE CURB	N 640674.00	E 7620190.85
4	PI, CONCRETE CURB	N 640681.85	E 7620178.07
5	PI, CONCRETE CURB	N 640616.75	E 7620138.09
6	FACE OF WALL	N 640568.96	E 7620277.50
7	PI, CONCRETE CURB	N 640527.32	E 7620283.72
8	FACE OF WALL	N 640543.41	E 7620293.60
9	FACE/CORNER OF WALL	N 640557.58	E 7620270.52
10	FACE/CORNER OF WALL	N 640607.11	E 7620215.37
11	CENTER OF CURB CUT/DITCH FLOWLINE	N 640629.09	E 7620263.98
12	PI, R=10', CONCRETE CURB	N 640658.30	E 7620216.41
13	PI, R=20', CONCRETE CURB	N 640698.26	E 7620240.95
14	END CONCRETE CURB, CONNECT TO EXST	N 640698.06	E 7620252.36
15	BEGIN CHAIN LINK FENCE, CONNECT TO EXST	N 640726.90	E 7620134.81
16	END CHAIN LINK FENCE (1)	N 640687.68	E 7620198.66
17	BEGIN CHAIN LINK FENCE	N 640668.58	E 7620229.77
18	PI, CHAIN LINK FENCE	N 640663.53	E 7620237.99
19	PI, CHAIN LINK FENCE	N 640694.57	E 7620257.05
20	START CONCRETE CURB AND GUTTER, CONNECT TO EXST	N 640709.67	E 7620302.69
21	PI, R=100' CONCRETE CURB AND GUTTER	N 640719.76	E 7620336.70
22	END CONCRETE CURB AND GUTTER, CONNECT TO EXST	N 640718.75	E 7620380.32
23	BEGIN CHAIN LINK FENCE, CONNECT TO EXST	N 640610.44	E 7620130.62
24	PI, CHAIN LINK FENCE (1)	N 640559.84	E 7620128.76
25	GATE POST	N 640559.07	E 7620130.04
26	END CHAIN LINK FENCE, CONNECT TO EXST	N 640483.23	E 7620256.77
27	EDGE OF SIDEWALK	N 640626.38	E 7620269.35
28	EDGE OF SIDEWALK	N 640639.81	E 7620277.59
29	EDGE OF SIDEWALK	N 640626.72	E 7620298.90
30	EDGE OF SIDEWALK	N 640617.81	E 7620298.12
31	NOT USED		
32	NOT USED		
33	END CHAIN LINK FENCE, CONNECT TO EXST	N 640717.66	E 7620374.53
34	CORNER OF CONCRETE PAD	N 640614.53	E 7620289.13
35	CORNER OF CONCRETE PAD	N 640612.34	E 7620292.70
36	CORNER OF CONCRETE PAD	N 640555.51	E 7620280.89
37	CORNER OF CONCRETE PAD	N 640551.41	E 7620287.56
38	PI, R=10' CONCRETE CURB	N 640604.25	E 7620158.44
39	PI, R=10' CONCRETE CURB (1)	N 640591.69	E 7620178.89
40	END CONCRETE CURB	N 640542.04	E 7620120.15
41	END CONCRETE CURB	N 640529.45	E 7620140.58

NOTES:

1. GUARD POSTS SHALL BE LOCATED 2' FROM ADJACENT CORNER OF PAD OR STRUCTURE UNLESS SHOWN OTHERWISE.
2. FOR ELECTRICAL, SEE 005-E-100.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:13:59 PM
PLOT DATE: 05-26-2012
FILENAME: 005-CL-101_391538.DWG

DRN: ARH	ORIG DATE: NOV 2009	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JAB	DWG #: 005-CL-101		
CHK: WBW	CAD FILE #:		
APPD: LEC	SCALE: 1" = 20'		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	03/11	JAB	SR	ENTRY AND EXIT / HEADWORKS SITE

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2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: SITE DEVELOPMENT CIVIL HEADWORKS LOCATION PLAN

SHEET: 33 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 005-CL-101

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

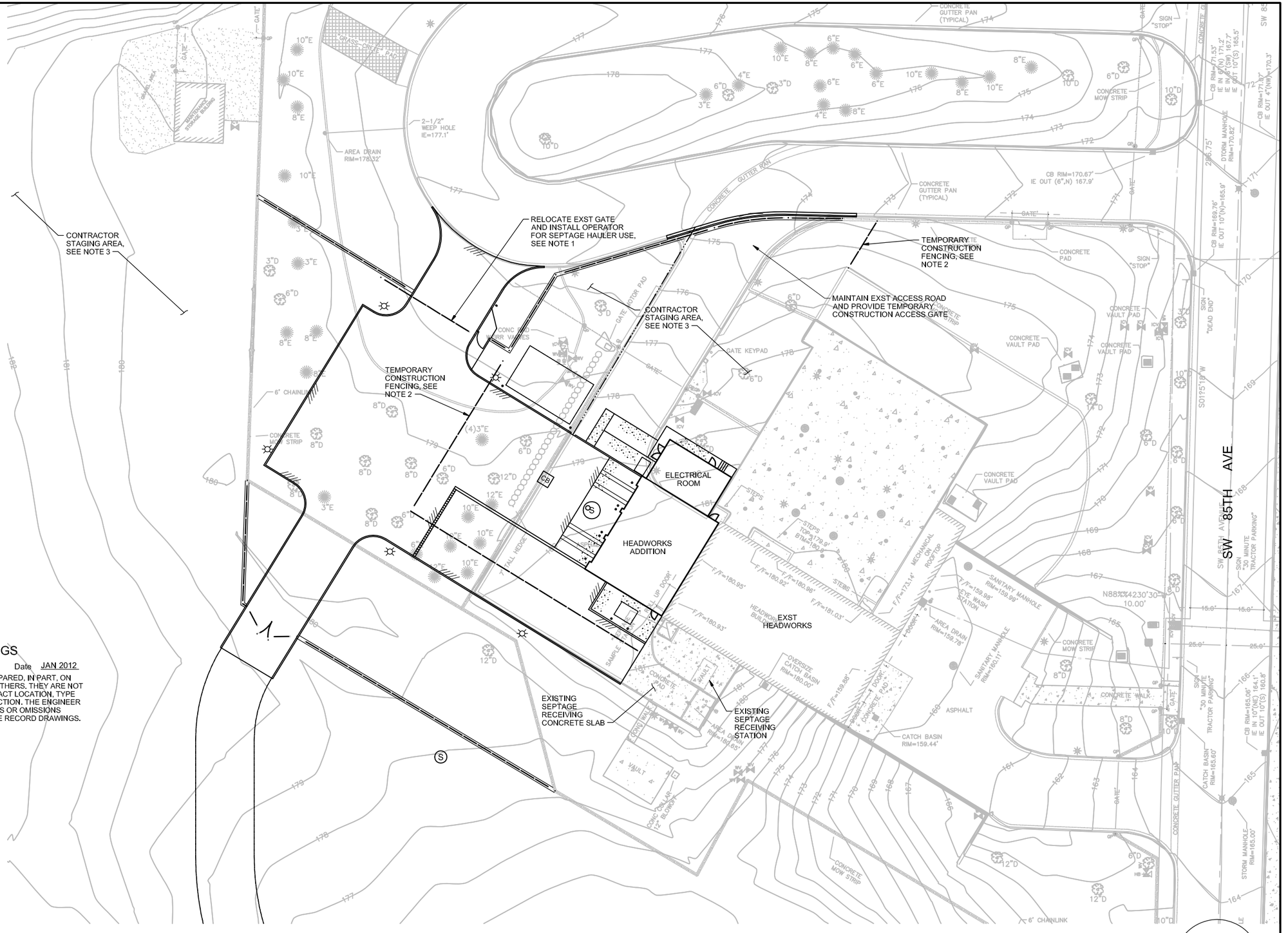
N

0 20 40 60

Scale In Feet

NOTES:

1. RELOCATE EXST GATE AND OPERATOR FOR USE BY SEPTAGE HAULERS DURING CONSTRUCTION. INSTALL PUSH BUTTON EXIT ON GATE FOR USE PRIOR TO FINAL PAVING AND EXIT LOOP INSTALLATION.
2. INSTALL TEMPORARY CONSTRUCTION FENCING TO MAINTAIN PLANT SECURITY WHILE PROVIDING ACCESS FOR SEPTAGE HAULERS DURING CONSTRUCTION.
3. AT COMPLETION OF CONSTRUCTION, CONTRACTOR SHALL RESTORE STAGING AREAS BY REMOVING ALL ROCK AND MATERIAL GREATER THAN 3/4-INCHES, AS WELL AS ALL NAILS AND CONSTRUCTION DEBRIS.



RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

FILENAME: 005-CL-102_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:14:12 PM

DRN: ARH	ORIG DATE: APR 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JAB	DWG #: 005-CL-102		
CHK: WBW	CAD FILE #:		
APPD: LEC	SCALE: 1" = 20'		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

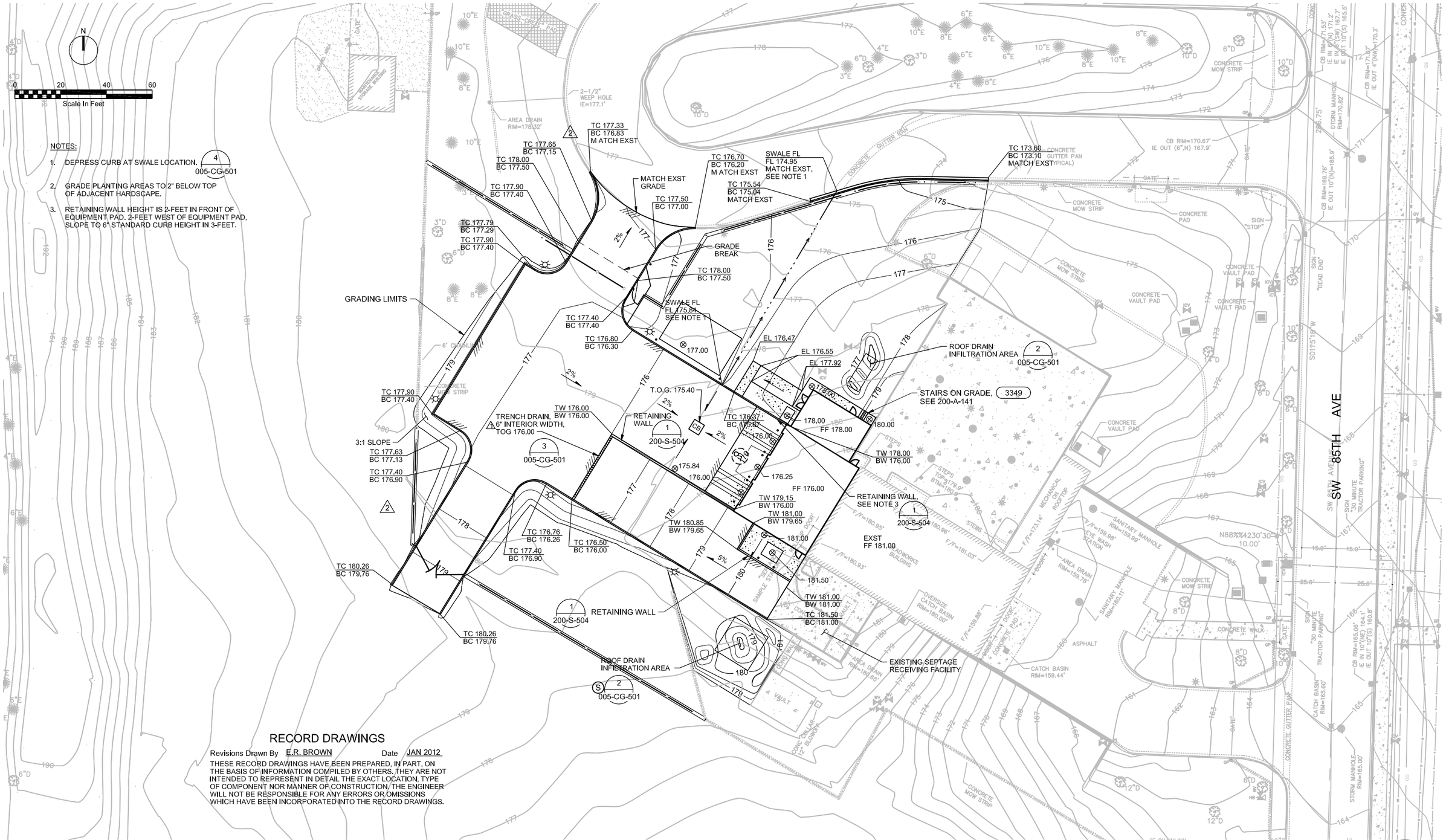
SHEET TITLE:
SITE DEVELOPMENT
CIVIL
TEMPORARY CONSTRUCTION FENCING PLAN

SHEET: 34 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 005-CL-102

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 005-CG-101_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:13:34 PM

DRN: ARH	ORIG DATE: NOV 2009		
DSN: JAB	DWG #: 005-CG-101		
CHK: WBW	CAD FILE #:		
APPD: LEC	SCALE: 1" = 20'		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
2	03/11	JAB	SR	ENTRY AND EXIT / HEADWORKS SITE
1	06/10	JAB	LEC	ADDENDUM NO. 2

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

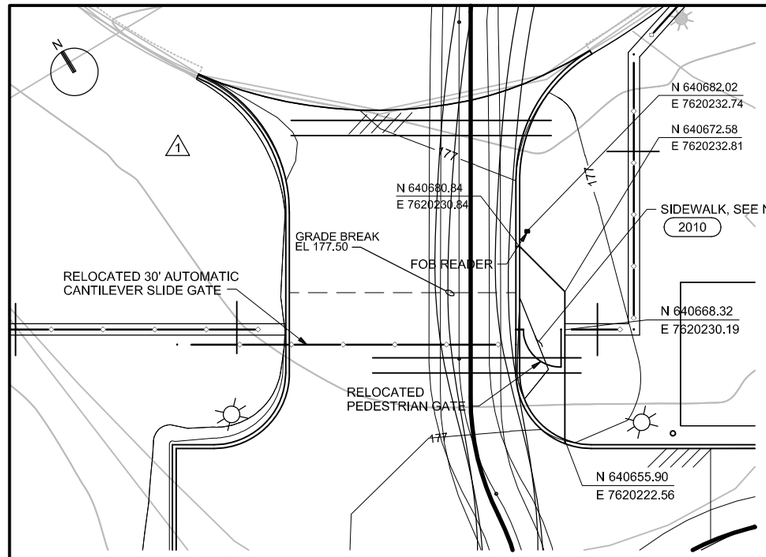
SHEET TITLE:
SITE DEVELOPMENT
CIVIL
HEADWORKS GRADING AND DRAINAGE PLAN

SHEET: 35 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #: 005-CG-101

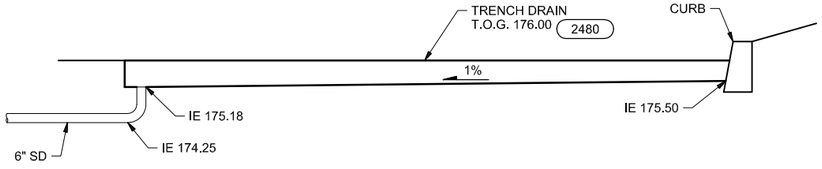
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

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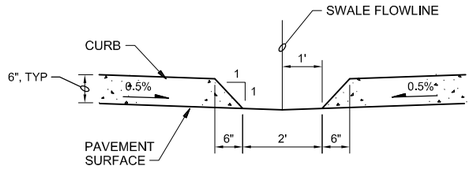


NOTE:
DEPRESS CURB ALONG SIDEWALK TO MATCH ROAD GRADE.

1 ENTRY GATE AREA
1"=10"
005-CL-101



3 TRENCH DRAIN
NTS
005-CG-101

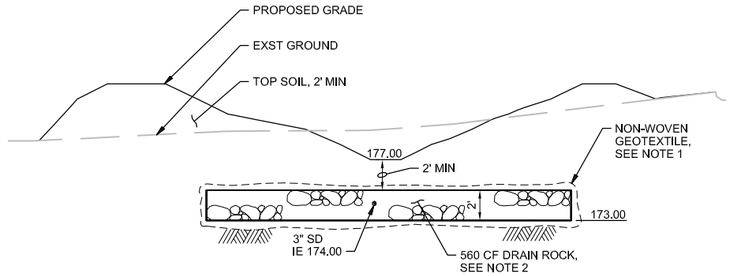


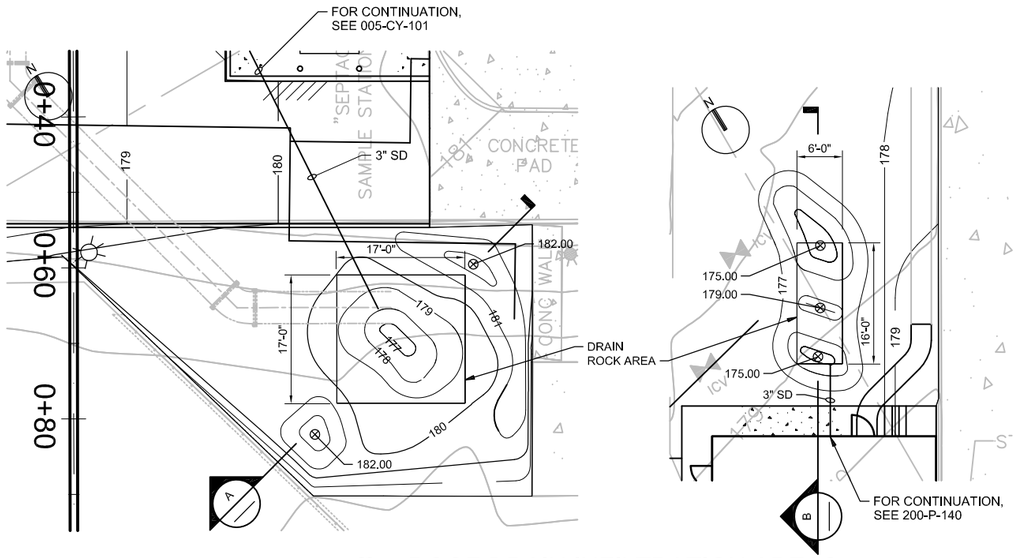
4 CURB CUT
NTS
005-CG-101

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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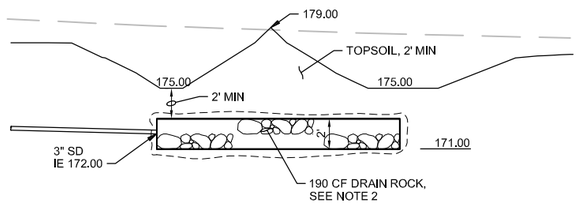
2 ROOF DRAIN INFILTRATION AREAS
1"=10'
005-CG-101

NOTES:

1. NON-WOVEN GEOTEXTILE SHALL HAVE A NOMINAL WEIGHT PER SQUARE YARD OF 8 PER ASTM D5261. IT SHALL ALSO HAVE A MINIMUM GRAB TENSILE STRENGTH OF 200 LB/IN, GRAB ELONGATION OF 50 PERCENT, PUNCTURE STRENGTH OF 90 LB, AND TRAPEZOID TEAR STRENGTH OF 60 LB.
2. DRAINROCK SHALL BE CRUSHED ROCK OR GRAVEL, DURABLE AND FREE FROM SLAKING OR DECOMPOSITION UNDER THE ACTION OF ALTERNATE WETTING OR DRYING. THE MATERIAL SHALL BE UNIFORMLY GRADED AND SHALL MEET THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE SIZE	PERCENTAGE PASSING
2-INCH	100
1-1/2 INCH	90 - 100
1-INCH	20 - 55
3/4-INCH	1 - 15
NO. 200	0 - 3

A SECTION
1"=5'



B SECTION
1"=5'

FILENAME: 005-CG-501_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:13:46 PM

DRN: ARH	ORIG DATE: APR 2009	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JAB	DWG #: 005-CG-501		
CHK: DJP	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	03/11	JAB	SR	ENTRY AND EXIT / HEAWORKS SITE

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
SITE DEVELOPMENT
CIVIL
SITE / GRADING
DETAILS

SHEET: 36 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 005-CG-501

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

N

0 20 40 60

Scale In Feet

NOTES:

1. IRRIGATION SLEEVES SHALL BE C-900 PVC, MIN 18" COVER.
2. IRR PIPING SHALL HAVE MIN 24" COVER.
3. PROVIDE "T" ON OUTLET PIPE PER CWS DETAIL NO. 240. DETAIL APPLIES TO "T" ONLY.

FIELD LOCATE AND CONNECT TO EXST TEE

10' TYP

2-4" SLEEVES FOR IRRIGATION, 2 PLACES, SEE NOTE 1

4" SLEEVE FOR IRRIGATION BENEATH MOW STRIP, TYP OF 5, SEE NOTE 1

MH-1 (1) AND (2) 005-CY-501 005-CY-501

CONNECT TO EXST 6" NPW (1)

DAYLIGHT IN ROOF DRAIN INFILTRATION AREA
N 640626.97
E 7620322.13
IE 172.00

PROTECT EXST 6" NPW

32" FA, CONNECT TO EXST FA DUCT

30" FA, FOR CONTINUATION SEE 200-H-131

CB (2460)
N 640610.87
E 7620252.88
IE OUT 8" SD 171.50
IE IN 6" SD 171.90
SEE NOTE 3

TRENCH DRAIN IE 175.18

6" SD

TRENCH DRAIN IE 175.50

6" SD IE 174.25

8" SD

12" SAN

1-1/2" NPW

CONNECT TO EXST 1 1/2" NPW

3" SD DAYLIGHT IN ROOF DRAIN INFILTRATION AREA
N 640521.28
E 7620272.00
IE 174.00

6" NPW

CONNECT TO EXST 6" NPW

TEE STUB WITH 2" CAP

MH 2

4" IRR, SEE NOTE 2

FIELD LOCATE AND CONNECT TO EXST TEE

12" SAN

EXST FORCE MAINS

FOR 12" SAN PROFILE, SEE 005-CY-201

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 005-CY-101_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:14:27 PM

DRN: ARH	ORIG DATE: NOV 2009	PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS	SHEET TITLE: SITE DEVELOPMENT CIVIL HEADWORKS YARD PIPING PLAN
DSN: JAB	DWG #: 005-CY-101		
CHK: WBW	CAD FILE #:		
APPD: LEC	SCALE: 1"=20'		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	06/10	JAB	LEC	ADDENDUM NO. 2

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

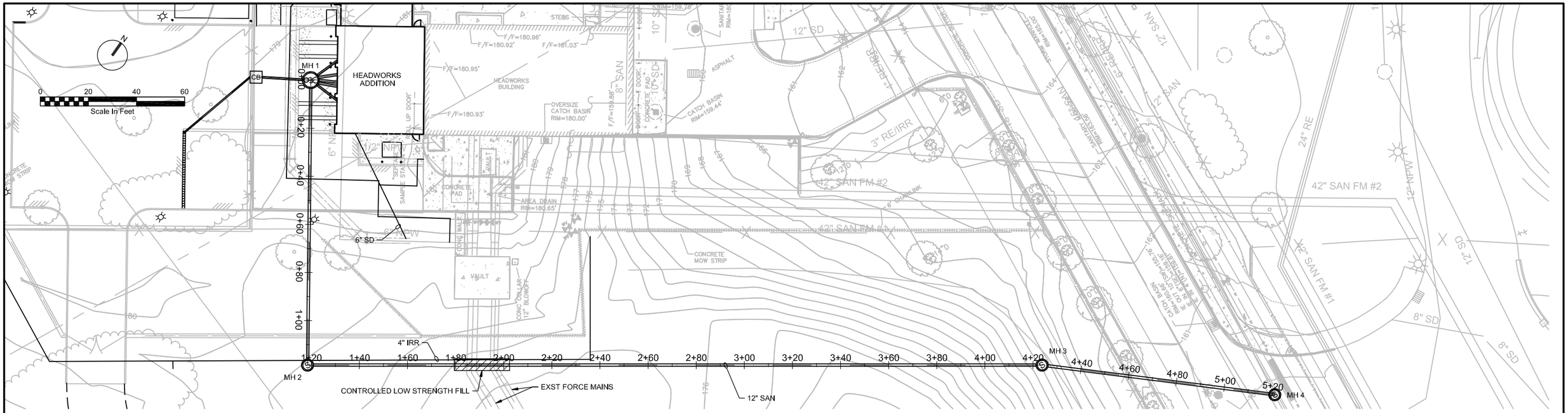
CH2MHILL

SHEET: 37 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

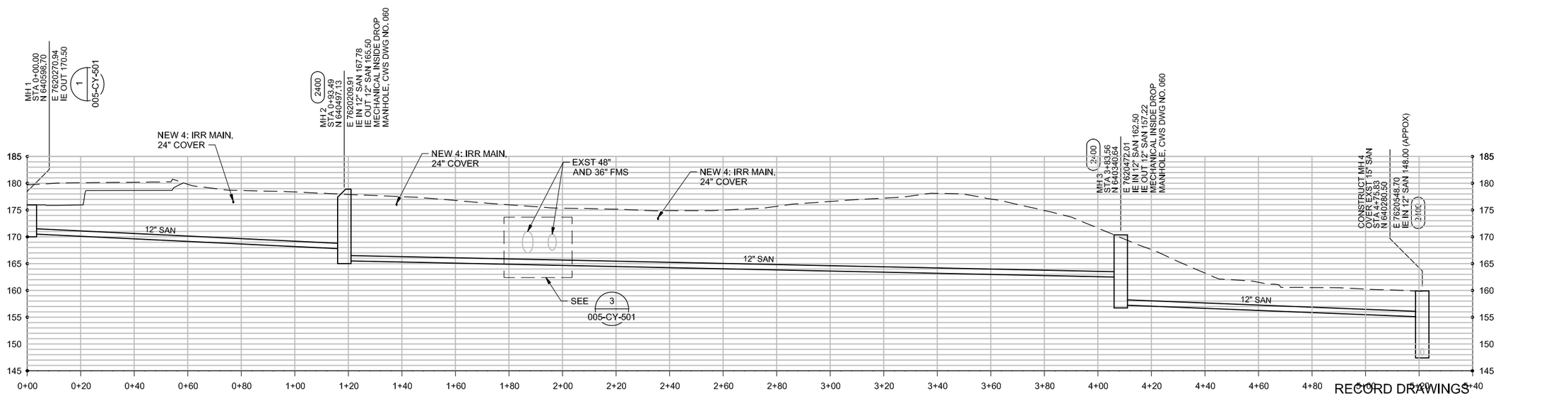
DWG #: 005-CY-101

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



PLAN
1"=20'



PROFILE
1"=20' HORIZ
1"=10' VERT

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 005-CY-201_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:14:39 PM

DRN: ARH	ORIG DATE: NOV 2009	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JAB	DWG #: 005-CY-201		
CHK: WBW	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

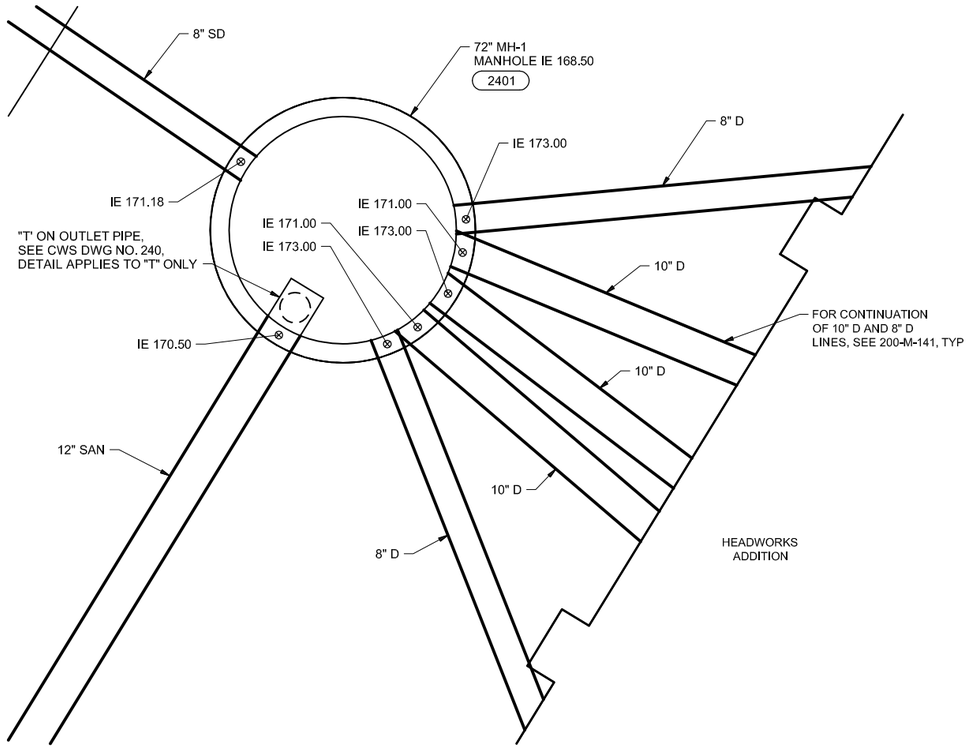
SHEET TITLE:
SITE DEVELOPMENT
CIVIL
SANITARY SEWER
PROFILE

SHEET: 38 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 005-CY-201

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

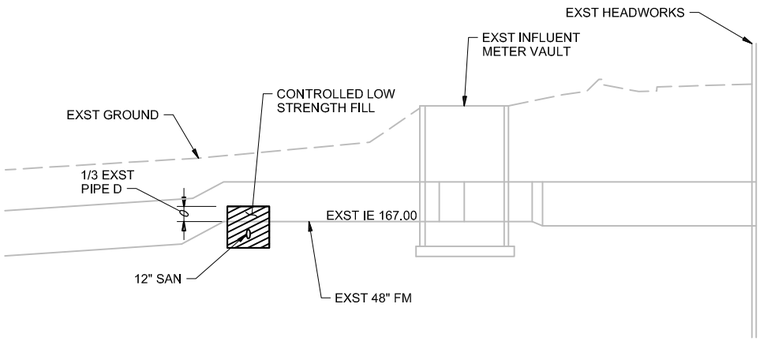


N

1 MH-1 LOWER PLAN

1"=5"

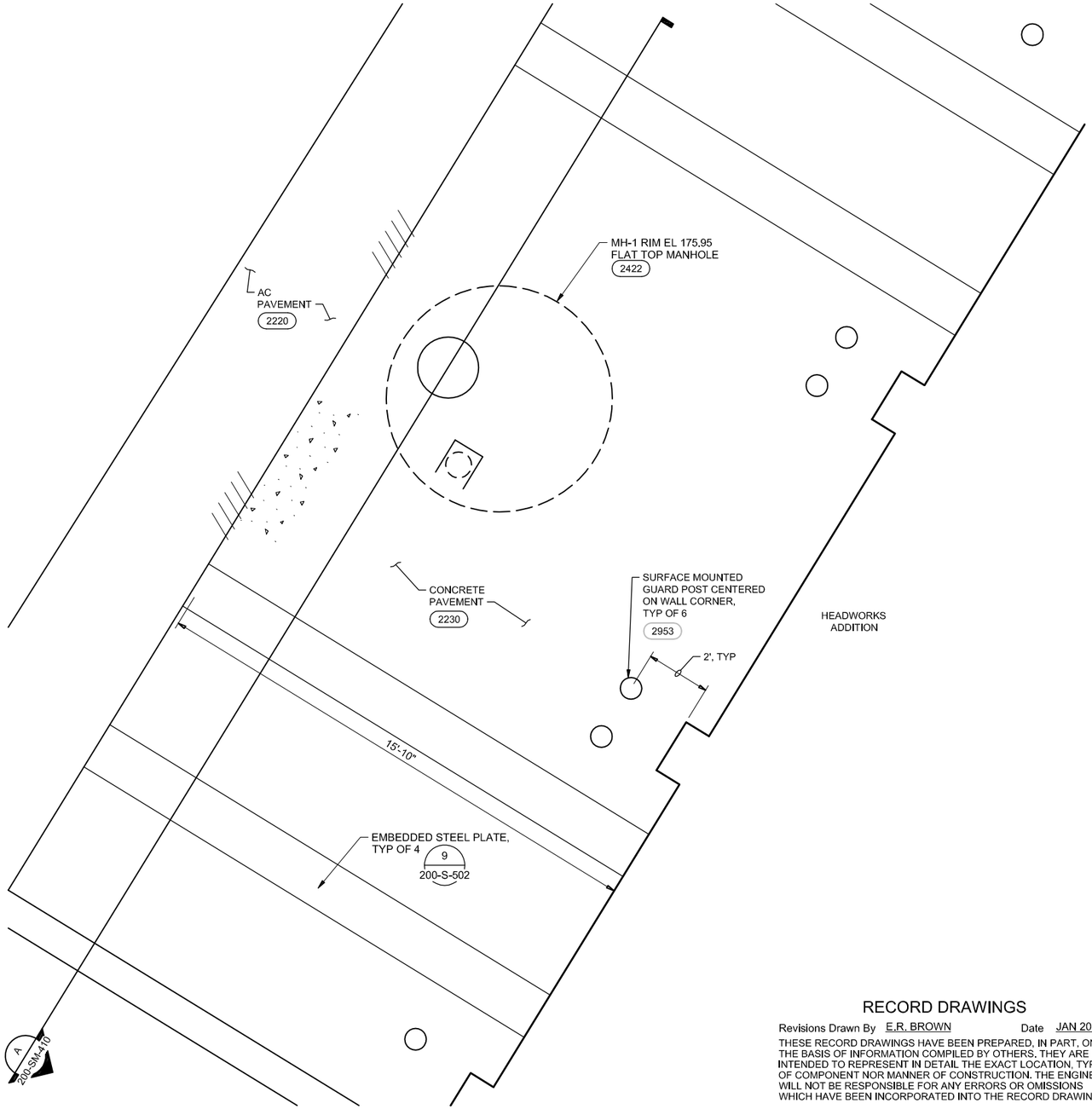
005-CY-101



3 12" SAN CROSSING EXST FORCE MAINS

NTS

005-CY-201



N

2 MH-1 UPPER PLAN

1"=5"

005-CY-101

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 005-CY-501_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:14:50 PM

DRN: ARH	ORIG DATE: APR 2009	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JAB	DWG #: 005-CY-501		
CHK: WBW	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
SITE DEVELOPMENT
CIVIL
YARD PIPING
DETAILS

SHEET: 39 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 005-CY-501

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

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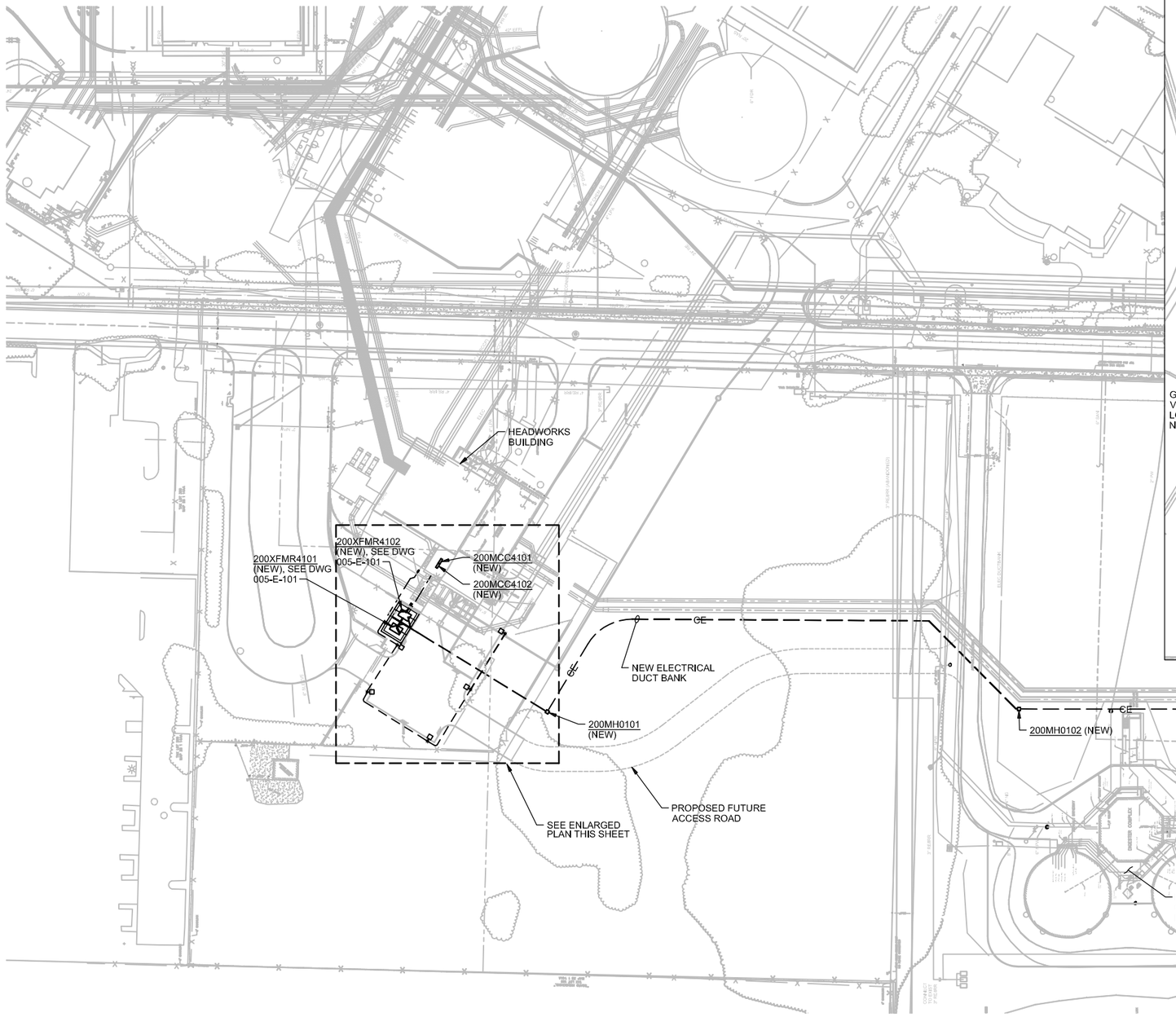
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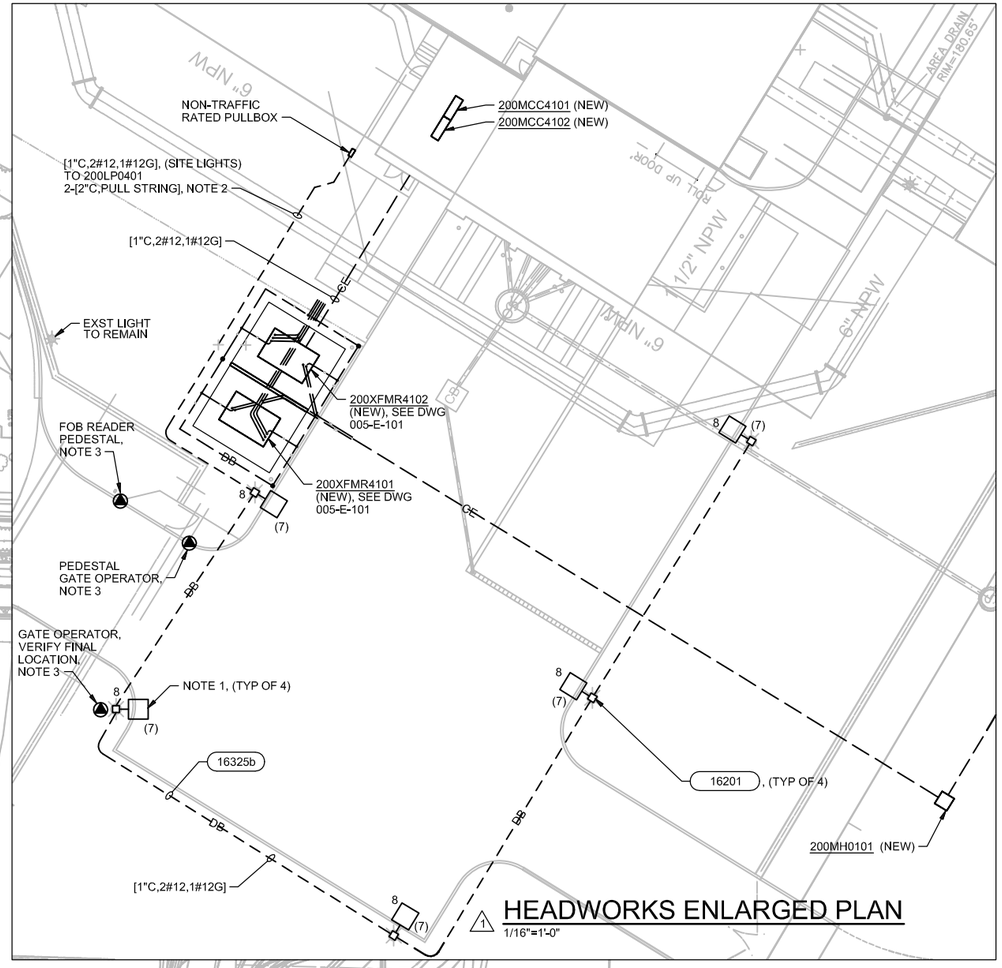
Scale In Feet

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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NOTES:

1. ALL SITE LIGHTING ON THE DRAWING SHALL BE POWERED FROM PANEL 200LP0401.
2. STUB UP AND CAP CONDUIT AT FREE SPACE NEAR WALL IN ELECTRICAL ROOM. VERIFY FINAL LOCATION WITH OWNER.
3. EXISTING VEHICLE GATE, PEDESTRIAN GATE, AND FOB READER PEDESTAL TO BE RE-USED, SEE CIVIL PLANS. LOCATE EXISTING GATE POWER, CONTROL, AND SECURITY CONDUITS AND CIRCUITS AND EXTEND TO RELOCATED EQUIPMENT AS REQUIRED TO PROVIDE A COMPLETE AND FUNTIONAL GATE SYSTEM.

MANHOLE SCHEDULE

MANHOLE NUMBER	MINIMUM INSIDE DIMENSIONS (H, L, W)	MANUFACTURER & CATALOG NUMBER (OR EQUAL)
200MH0101	6'-0", 6'-8", 4'-2"	UTILITY VAULT #577-LA
200MH0102	6'-0", 6'-8", 4'-2"	UTILITY VAULT #577-LA
100MH0101	6'-0", 6'-8", 4'-2"	UTILITY VAULT #577-LA

PLOT TIME: 1:15:16 PM
PLOT DATE: 05-26-2012
FILENAME: 005-E-100_391538.DWG

DRN: MLW	ORIG DATE: FEBRUARY 2010			
DSN: JLH	DWG #: 005-E-101			
CHK: MSM	CAD FILE #:			
APPD: LEC	SCALE: AS SHOWN			

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
1	01/12	ERB	LEC	RECORD DRAWING
	06/10	RH	LEC	ADDENDUM NO. 1

Clean Water Services
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

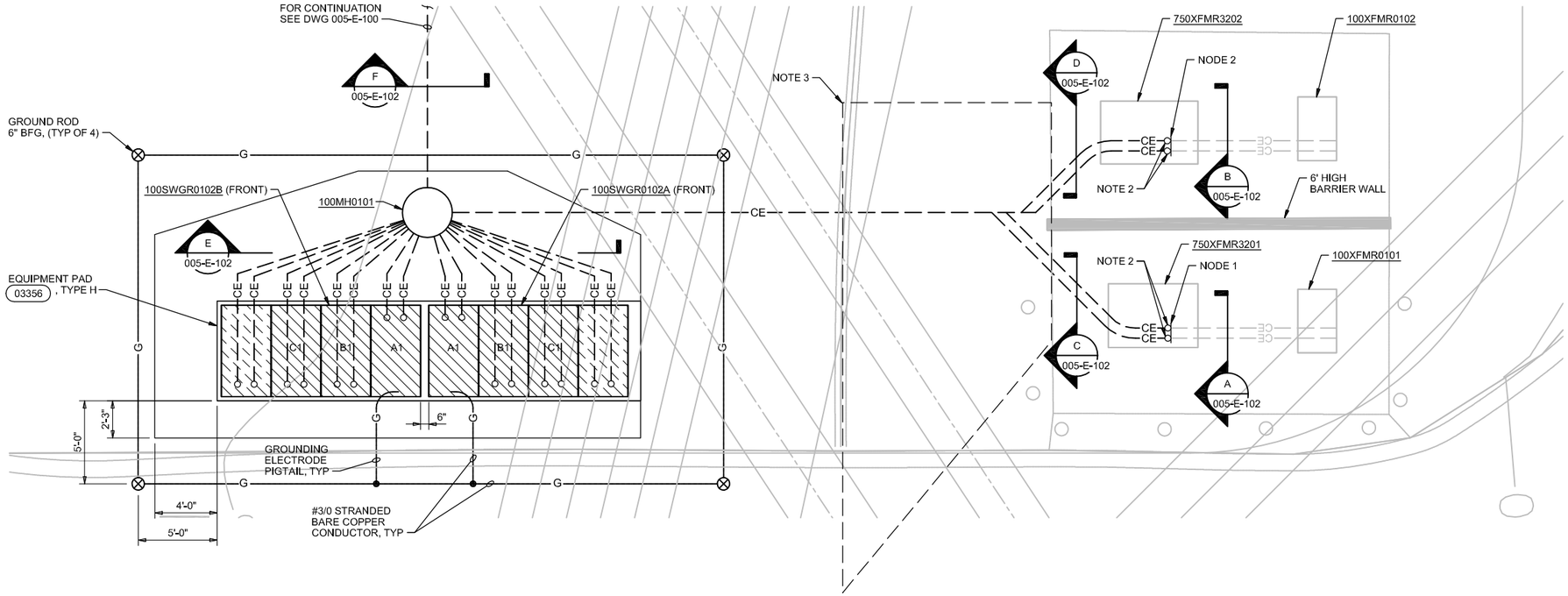
SHEET TITLE:
SITE DEVELOPMENT
ELECTRICAL
OVERALL SITE PLAN

SHEET: 40	OF: D24
PLOT DATE:	AUG 2010
PLC #:	
CWS PROJ #:	6410

DWG #: 005-E-100

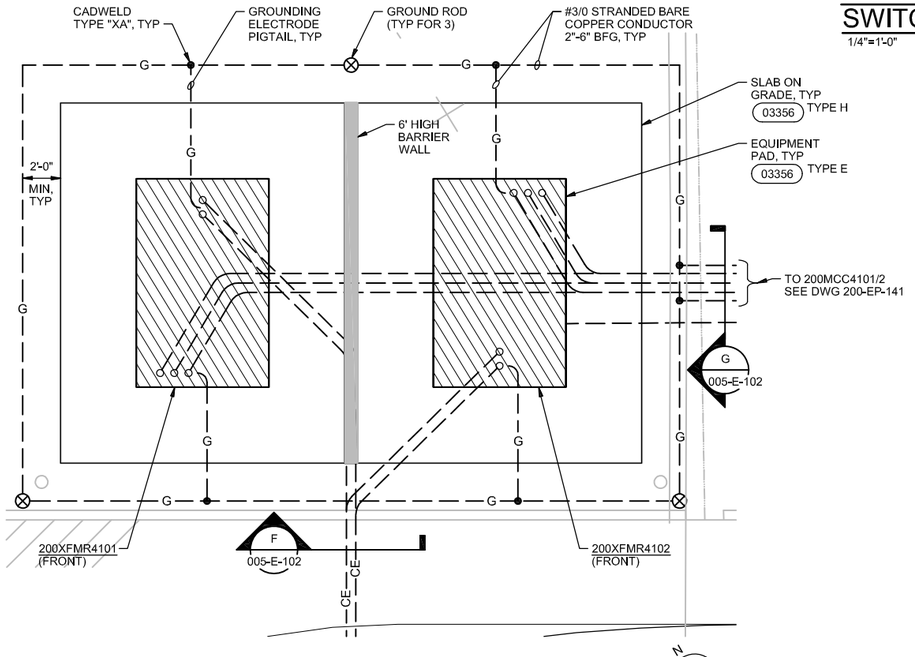
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



IPS OUTDOOR TRANSFORMERS/ SWITCHGEAR PLAN WITH REVISIONS

1/4"=1'-0"



HEADWORKS OUTDOOR TRANSFORMERS PLAN

1/4"=1'-0"

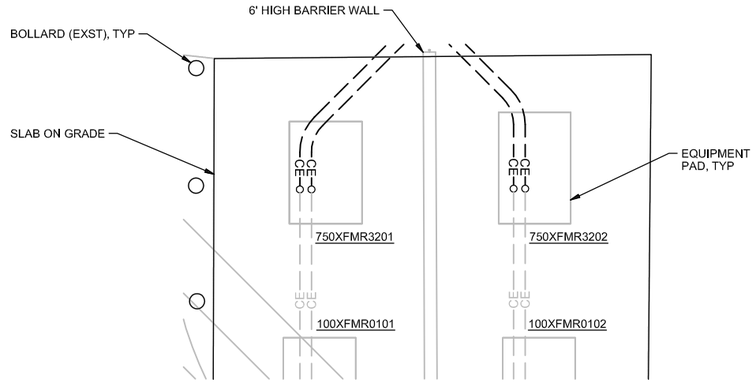
RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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NOTES:

1. REFER TO NOTES ON DWG 005-E-102.
2. INTERCEPT EXISTING VERTICAL PORTION OF CONDUIT STUBBING UP INTO TRANSFORMER. PROVIDE 90 DEGREE BEND AND ROUTE NEW CONDUIT TO NEW MANHOLE.
3. FIELD LOCATE AND PROTECT SECONDARY FEEDERS FROM TRANSFORMERS TO DIGESTER COMPLEX.



IPS EXST OUTDOOR TRANSFORMERS PLAN

1/4"=1'-0"

DRN: MLW	ORIG DATE: APRIL 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JLH	DWG #: 005-E-101		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: 1/4" = 1'-0"		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
SITE DEVELOPMENT
ELECTRICAL
OUTDOOR TRANSFORMERS/
SWITCHGEAR PLANS

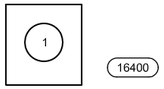
SHEET: 41 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 005-E-101

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 005-E-101_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:15:34 PM



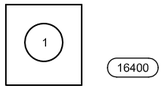
SECTION A (EXST)

CONDUIT NO.	CONDUIT SIZE	WIRE FILL	FROM	TO	REMARKS
1	4"	3#2, 1#2G (15KV)	100SWGR0101	750XFMR3201	EXST

SECTION A (NEW)

CONDUIT NO.	CONDUIT SIZE	WIRE FILL	FROM	TO	REMARKS
1	3"	3#2(15KV), 1#2G (600V)	100SWGR0101	100SWGR0102A SECTION A1 VIA 100MH0101	NEW

A SECTION
NTS
05-E-101



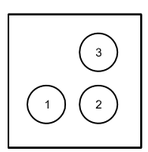
SECTION B (EXST)

CONDUIT NO.	CONDUIT SIZE	WIRE FILL	FROM	TO	REMARKS
1	4"	3#2, 1#2G (15KV)	100SWGR0101	750XFMR3202	EXST

SECTION B (NEW)

CONDUIT NO.	CONDUIT SIZE	WIRE FILL	FROM	TO	REMARKS
1	3"	3#2(15KV), 1#2G (600V)	100SWGR0101	100SWGR0102B SECTION A1 VIA 100MH0101	NEW

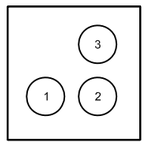
B SECTION
NTS
05-E-101



SECTION C

CONDUIT NO.	CONDUIT SIZE	WIRE FILL	FROM	TO	REMARKS
1	4"	PULLCORD	100SWGR0101	100SWGR0102A SECTION A1 VIA 100MH0101	NEW
2	4"	3#2(15KV), 1#2G (600V)	100SWGR0101	100SWGR0102A SECTION A1 VIA 100MH0101	NEW
3	3"	3#2(15KV), 1#2G (600V)	100SWGR0102A SECTION B1 VIA 100MH0101	750XFMR3201	NEW

C SECTION
NTS
05-E-101

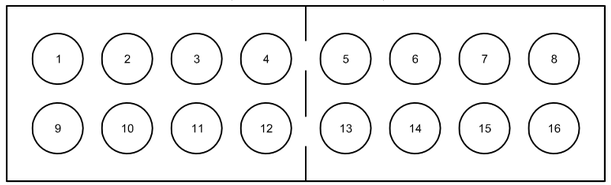


SECTION D

CONDUIT NO.	CONDUIT SIZE	WIRE FILL	FROM	TO	REMARKS
1	4"	PULLCORD	100SWGR0101	100SWGR0102B SECTION A1 VIA 100MH0101	NEW
2	4"	3#2(15KV), 1#2G (600V)	100SWGR0101	100SWGR0102B SECTION A1 VIA 100MH0101	NEW
3	3"	3#2(15KV), 1#2G (600V)	100SWGR0102B SECTION B1 VIA 100MH0101	750XFMR3202	NEW

D SECTION
NTS
05-E-101

(VIEW FROM INSIDE VAULT)

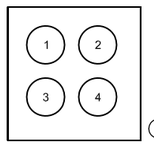


16400

SECTION E

CONDUIT NO.	CONDUIT SIZE	WIRE FILL	FROM	TO	REMARKS
1	4"	PULLCORD	100SWGR0102A (F) COGEN STUB-UP	100MH0101	NEW
2	4"	PULLCORD	100SWGR0102A SECTION C1	200XFMR4101 VIA 100MH0101	NEW
3	4"	PULLCORD	100SWGR0102A SECTION B1	750XFMR3201 VIA 100MH0101	NEW
4	4"	PULLCORD	100SWGR0102A SECTION A1	100SWGR0101 VIA 100MH0101	NEW
5	4"	PULLCORD	100SWGR0102B SECTION A1	100SWGR0101 VIA 100MH0101	NEW
6	4"	PULLCORD	100SWGR0102B SECTION B1	750XFMR3202 VIA 100MH0101	NEW
7	4"	PULLCORD	100SWGR0102B SECTION C1	200XFMR4102 VIA 100MH0101	NEW
8	4"	PULLCORD	100SWGR0102B (F) COGEN STUB-UP	100MH0101	NEW
9	4"	PULLCORD	100SWGR0102A (F) COGEN STUB-UP	100MH0101	NEW
10	4"	3#2(15KV), 1#2G (600V)	100SWGR0102A SECTION C1	200XFMR4101 VIA 100MH0101	NEW
11	4"	3#2(15KV), 1#2G (600V)	100SWGR0102A SECTION B1	750XFMR3201 VIA 100MH0101	NEW
12	4"	3#2(15KV), 1#2G (600V)	100SWGR0102A SECTION A1	100SWGR0101 VIA 100MH0101	NEW
13	4"	3#2(15KV), 1#2G (600V)	100SWGR0102B SECTION A1	100SWGR0101 VIA 100MH0101	NEW
14	4"	3#2(15KV), 1#2G (600V)	100SWGR0102B SECTION B1	750XFMR3202 VIA 100MH0101	NEW
15	4"	3#2(15KV), 1#2G (600V)	100SWGR0102B SECTION C1	200XFMR4102 VIA 100MH0101	NEW
16	4"	PULLCORD	100SWGR0102B (F) COGEN STUB-UP	100MH0101	NEW

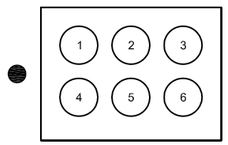
E SECTION
NTS
05-E-101



SECTION F

CONDUIT NO.	CONDUIT SIZE	WIRE FILL	FROM	TO	REMARKS
1	4"	PULLCORD	100SWGR0102A VIA 100MH0101	200XFMR4101	NEW
2	4"	3#2(15KV), 1#2G (600V)	100SWGR0102A VIA 100MH0101	200XFMR4101	NEW
3	4"	PULLCORD	100SWGR0102B VIA 100MH0101	200XFMR4102	NEW
4	4"	3#2(15KV), 1#2G (600V)	100SWGR0102B VIA 100MH0101	200XFMR4102	NEW

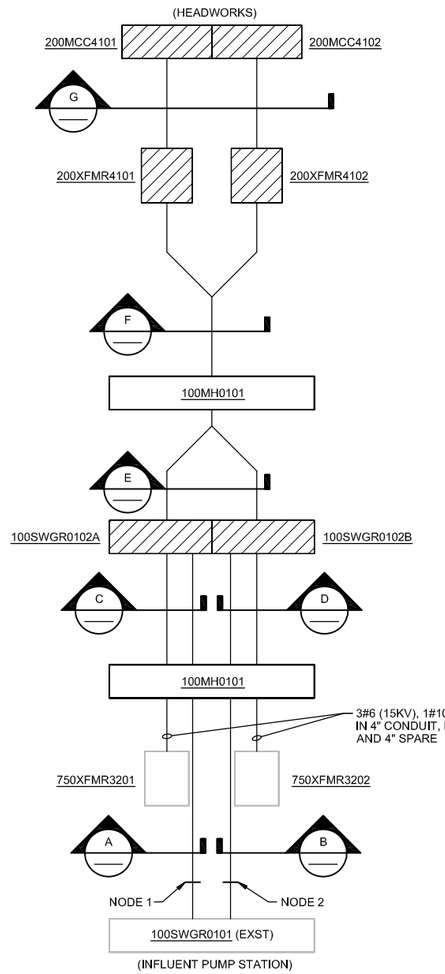
F SECTION
NTS
05-E-101



SECTION G

CONDUIT NO.	CONDUIT SIZE	WIRE FILL	FROM	TO	REMARKS
1	3"	PULLCORD	200XFMR4101	200MCC4101	NEW
2	3"	3#350, 1#2/0G	200XFMR4101	200MCC4101	NEW
3	3"	3#350, 1#2/0G	200XFMR4101	200MCC4101	NEW
4	3"	3#350, 1#2/0G	200XFMR4102	200MCC4102	NEW
5	3"	3#350, 1#2/0G	200XFMR4102	200MCC4102	NEW
6	3"	PULLCORD	200XFMR4102	200MCC4102	NEW

G SECTION
NTS
05-E-101



SITE CABLE BLOCK DIAGRAM
NTS

1

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:15:42 PM
PLOT DATE: 05-26-2012
FILENAME: 005-E-102_391538.DWG

DRN: MLW	ORIG DATE: APRIL 2010		
DSN: JLH	DWG #: 005-E-102		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	06/10	RH	LEC	ADDENDUM NO. 1

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
SITE DEVELOPMENT
ELECTRICAL
SITE CABLE BLOCK DIAGRAM
SECTIONS AND NOTES

SHEET: 42 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #: 005-E-102

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

SCADA

INFLUENT UPWELL 2: LEVEL PV 0510; HI-HI LEVEL HH 0502
INFLUENT UPWELL 1: HI-HI LEVEL HH 0501; LEVEL PV 0509

CHANNEL 1 INLET GATE: FULLY CLOSED CL 0501; FULLY OPEN OP 0501; IN REMOTE RE 0501; OPEN CMD OPW 0501; CLOSE CMD CLW 0501

BAR SCREEN 1: ONLINE FAST OLFW 0501; ONLINE NORMAL OLNW 0501; STANDBY SBYW 0501; ONLINE FAST OLF 0501; ONLINE NORMAL OLN 0501; STANDBY SBY 0501; IN REMOTE RE 0501; ON FAST ONF 0501A; ON SLOW ONS 0501B; FAULT FLT 0501A; PLC FAIL FAIL 0501B; RUN ENABLE EAW 0501; AUTO READY AURW 0501; UP STREAM LEVEL PV 0501; DOWN STREAM LEVEL PV 0501

BAR SCREEN SPRAY VALVE: OPEN OPW 0501

SLUICE HIGH LEVEL: HIGH LEVEL HI 0501; RESET RST 0501

SLUICE FLUSH WATER FLOW VALVE: FULLY OPEN OP 0501; FULLY CLOSED CL 0501; IN REMOTE RE 0501; CLOSE CMD CLW 0501A; OPEN CMD OPW 0501B

200LCP0505 (PLC-15)

ISB, ISR, ISR, ISB

120V → R

ISR

TJB, TJB

200G0501/05-LCS
CHANNEL 1
INLET/OUTLET GATES
LORR/OC HS 0501
SEE DWG 008-H008 FOR CONTINUATION

480V

200LCP0501*
BAR SCREEN 1 LOCAL CP
DLIT 0501; HMI 0501; PWR ON YL 0501; TIMER KHK 0501; PLC 0501; VFD

(11), (4)

200SCR0501-LCS*
BAR SCREEN 1 LOCAL CONTROL STATION
ESTOP HS 0501A; LORRJ HS 0501B; FR HS 0501C; DUTY HIGH YL 0501B; DUTY NORMAL YL 0501C; STANDBY YL 0501D
JOG HS 0501D; RESET HS 0501E; JAM YL 0501A; DUTY HIGH HS 0501F; DUTY NORMAL HS 0501G; STANDBY HS 0501H

"MSC"*, TJB*, "MSC"*, LE 0501

(2), "REMOTE", "OPEN", "CLOSE"

OC, ZS 0501, LR/OSC, HS 0501, M, (2), RS, 480V

M AS "POWER" S SV 0501*

"MSC"*

200LSH0501-LCS
HIGH LEVEL RESET HS 0501

TJB, TJB

SLUICE TROUGH → 101 | 008-I-003 TO WASHER/ COMPACTOR

"MSC"*, LE 0502*

200SCR0501 BAR SCREEN 1

BARSCREEN SLUICE TROUGH

LE/T 0509

RS FROM METERING VAULT

200G0501 CHANNEL 1 INLET GATE

EFFLUENT CHANNEL 1 → RS → TO GRIT BASIN 1

(TYPICAL OF 4)

INFLUENT UPWELL 1

LSHH 0501

200G0502 CHANNEL 2 INLET GATE

INSTRUMENTS: 200LE0503, 200LE0504, 200SV0502
PANELS: 200G0502/06-LCS, 200LCP0502, 200SCR0502-LCS

200SCR0502 BAR SCREEN 2

EFFLUENT CHANNEL 2 → RS → TO GRIT BASIN 2

(SIMILAR TO ABOVE)

LSH 0501

200PRV 0501 → 200V0502 → NPW FROM NON-POTABLE WATER DISTRIBUTION

INFLUENT UPWELL 2

LSHH 0502

200G0503 CHANNEL 3 INLET GATE

INSTRUMENTS: 200LE0505, 200LE0506, 200SV0503
PANELS: 200G0503/07-LCS, 200LCP0503, 200SCR0503-LCS

200SCR0503 BAR SCREEN 3

EFFLUENT CHANNEL 3 → RS → TO GRIT BASIN 3

(SIMILAR TO ABOVE)

OC, ZS 0501, LR/OSC, HS 0501, M, 480V

GRIT/OF → 401 | 008-I-004 FROM GRIT CYCLONES

200V0501

FV 0501

RS FROM METERING VAULT

LE/T 0510

200G0504 CHANNEL 4 INLET GATE

INSTRUMENTS: 200LE0507, 200LE0508, 200SV0504
PANELS: 200G0504/08-LCS, 200LCP0504, 200SCR0504-LCS

200SCR0504 BAR SCREEN 4

EFFLUENT CHANNEL 4 → RS → TO GRIT BASIN 4

(SIMILAR TO ABOVE)

D

120V, 120V

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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NPW → 102 | 008-I-003 TO WASHER/ COMPACTOR

200PRV 0502 → NPW FROM NON-POTABLE WATER DISTRIBUTION

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PLOT TIME: 1:15:52 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-001_391538.DWG

DRN: PMH	ORIG DATE: NOV 2009	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JDK	DWG #: 008-I-001		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services — Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: INSTRUMENTATION AND CONTROL — BAR SCREEN P&ID

SHEET: 43 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-001

SCADA

HOT WATER GENERATION SYSTEM

FAILURE FAIL 4601

ON ON 4601

200LCP0505
(PLC-15)

FAIL 4601

ON 4601

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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CW

FROM
CITY WATER SUPPLY

PI 4601

200T4601
HOT WATER TANK

TSH/L 4601

(2)

CWH

EXPANSION TANK

TI 4601

CWH

D

V

TET 4603

TET 4602

"POWER"

TET 4601

CWH

200HX4601
HOT WATER GENERATOR

LSL 4601

M

NG

FROM
UTILITY

120V

CS

200P4601
HOT WATER RECIRCULATION PUMP

200SYS4601
* HOT WATER GENERATION SYSTEM (SKID)

D

PLOT TIME: 1:16:02 PM

PLOT DATE: 05-26-2012

FILENAME: 008-I-002_391538.DWG

DRN: PMH	ORIG DATE: NOV 2009	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.				
DSN: JDK	DWG #: 008-I-002					
CHK: MSM	CAD FILE #:					
APPD: LEC	SCALE: NONE					
		REV #	DATE	DRN	APPD	DESCRIPTION
			01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
INSTRUMENTATION AND CONTROL
HOT WATER GENERATION SYSTEM P&ID

SHEET: 44 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #:
008-I-002

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

SCADA

SCREENINGS WASHER #1 ISOLATION GATE

WASHER COMPACTOR 1

PRESSURE PV 0701

FULLY OPEN OP 0701 | FULLY CLOSED CL 0701 | IN REMOTE RE 0701 | CLOSE CMD CLW 0701 | OPEN CMD OPW 0701

LEVEL PV 0701 | HIGH LEVEL HIW 0701

ONLINE CTS OLCW 0701 | ONLINE INT OLIW 0701 | ONLINE BATCH OLBW 0701 | STANDBY SBYW 0701 | ONLINE CTS OLC 0701 | ONLINE INT OLI 0701 | ONLINE BATCH OLB 0701 | STANDBY SBY 0701 | IN REMOTE RE 0701 | RUNNING ON 0701A | COMMON FAIL FAIL 0701B | BATCHING BCH 0701 | AUTO READY AURW 0701 | RUN ENABLE EAW 0701

200LCP0505
(PLC-15)

PIT 0701

OP 0701 | CL 0701 | RE 0701 | CLW 0701 | OPW 0701

PV 0701 | HIW 0701

OLCW 0701 | OLIW 0701 | OLBW 0701 | SBYW 0701 | OLC 0701 | OLI 0701 | OLB 0701 | SBY 0701 | RE 0701 | ON 0701A | FAIL 0701B | BCH 0701 | AURW 0701 | EAW 0701

200LCP0701*
WASHER/COMPACTOR 1
LOCAL CONTROL PANEL

PWR ON YL 0701 E | PLC 0701 | HMI 0701

480V

(11)

SOLENOID OPEN (4)

LIGHTS (5)

MSC

TJB

LIT 0701

120V

200SCRW0701-LCS*
WASHER COMPACTOR 1 LOCAL CONTROL STATION

ESTOP HS 0701 A | LORRJ HS 0701 B | FR HS 0701 C

JOG HS 0701 D | HOT WATER HS 0701 E | RESET HS 0701 F | JAM YL 0701 A

ONLINE CTS HS 0701 G | ONLINE INT HS 0701 H | ONLINE BATCH HS 0701 I | STANDBY HS 0701 J

ONLINE CTS YL 0701 B | ONLINE INT YL 0701 C | ONLINE BATCH YL 0701 D | STANDBY YL 0701 E

"POWER"

"MSC"

"OPEN"

"OPEN"

008-I-001 | 101
FROM BAR SCREENS

SLUICE TROUGH

PIT 0701

NPW

FROM NON-POTABLE WATER SYSTEM

200V0503

200V0701

200V0702

LR/OC

480V

HS 0701*

OC

ZS 0701*

200G0701
WASHER/
COMPACTOR 1
ISOLATION GATE

SV 0702*

SV 0703*

FC

FC

FC

SV 0704*

SV 0701*

LE 0701

OF

CS-2

D

D

200SCRW0701*
WASHER/
COMPACTOR 1

DUMPSTER (NOT IN CONTRACT)

008-I-002 | 201
FROM HOT WATER GENERATION SYSTEM

CWH

(TYPICAL OF 2)

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PANELS:
200LCP0702
200SCRW0702-LCS

INSTRUMENTS:
200LIT0702
200LE0702

VALVES:
200V0703
200V0704
200SV0705
200SV0706
200SV0707
200SV0708

200SCRW0702
WASHER/
COMPACTOR 2

EQUIPMENT:
200G0702
200ZS0704

(SIMILAR TO ABOVE)

PLOT TIME: 1:16:10 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-003_391538.DWG

DRN: PMH	ORIG DATE: NOV 2009	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.				
DSN: JDK	DWG #: 008-I-003					
CHK: MSM	CAD FILE #:					
APPD: LEC	SCALE: NONE					
		REV #	DATE	DRN	APPD	DESCRIPTION
			01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
INSTRUMENTATION AND CONTROL
WASHER/COMPACTOR
P&ID

SHEET: 45 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-003

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

SCADA

CP-301
(PLC-3)

GRIT CLASSIFIER 2

REMOTE	RUNNING	OFF/READY	RUN CMD
RE .0601	ON .0602	OFF .0602	RUNW .0602
RE .0601	ON .0602	OFF .0602	RUNW .0602

GRIT CLASSIFIER 1

REMOTE	RUNNING	OFF/READY	RUN CMD
RE .0601	ON .0601	OFF .0601	RUNW .0601
RE .0601	ON .0601	OFF .0601	RUNW .0601

GRIT SYSTEM

RUN RQST	RUN RQST	RUN RQST	RUN RQST
RUN .0604	RUN .0603	RUN .0602	RUN .0601
RUN .0604	RUN .0603	RUN .0602	RUN .0601

"CHANNEL 1"
"CHANNEL 2"
"CHANNEL 3"
"CHANNEL 4"

PLC-15

RUN CMD	RUN CMD	RUN CMD	RUN CMD
RUNW .0601	RUNW .0602	RUNW .0603	RUNW .0604

200LCP0505

RUNW .0601	RUNW .0602	RUNW .0603	RUNW .0604

GRIT
FROM GRIT PUMP 1 & 5

GRIT
FROM GRIT PUMP 2 & 6

TO EXISTING PARSHALL FLUME

D
TO UPWELL 2

D
TO UPWELL 1

008-I-001 | 401
GRIT/OF
TO SCREENINGS SLUICE TROUGH

GRIT
FROM GRIT PUMP 3 & 6

GRIT
FROM GRIT PUMP 4, 5

200GRT0602-LCS
START HS 0602B
STOP HS 0602C

200GRT0601-LCS
START HS 0601B
STOP HS 0601C

PE 0604
PI 0604
PE 0603
PI 0603
PE 0602
PI 0602
PE 0601
PI 0601

MCC
"OPEN"
LOCAL/PLC
HS 0602
HS 0601

200GRTC0604
GRIT
CYCLONE 4

200GRTC0603
GRIT
CYCLONE 3

200GRTC0602
GRIT
CYCLONE 2

200GRTC0601
GRIT
CYCLONE 1

NPW
"POWER"
M
CS

200GRT0602
GRIT
CLASSIFIER 2

200GRT0601
GRIT
CLASSIFIER 1

HOPPER

LEVEL SCREW CONVEYOR
CROSS CONVEYOR
DUMPSTER

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:16:19 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-004_391538.DWG

DRN: PMH	ORIG DATE: NOV 2009					
DSN: JDK	DWG #: 008-I-004					
CHK: MSM	CAD FILE #:					
APPD: LEC	SCALE: NONE					

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

CleanWater Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
INSTRUMENTATION AND CONTROL
GRIT CYCLONES AND CLASSIFIERS P&ID

SHEET: 46 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-004

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

SCADA

ODOR CONTROL FAN

OVERLOAD OL 4101

RUNNING ON 4101

LOW CURRENT LO 4101

DIFF. PRESSURE PV 4101

AIR CONDITIONING UNIT

COMMON ALARM ALM 0401

200LCP0505
(PLC-15)

OL .4101

ON .4101

LO .4101

PV .4101

ALM .0401

480V

200ACU0401
HEADWORKS ELECTRICAL ROOM AIR CONDITIONING UNIT

I

MCC

OO HS 4101A **

OO YL 4101A **

OVERLOAD YL 4101B **

LOW CURRENT ISL 4101 **

YL 4101C **

"POWER"

DPIT 4101

M

CS

S

FA
FROM HEADWORKS BUILDING

200EF4101
ODOR CONTROL FAN 1

LPA
FROM LOW PRESSURE AIR SYSTEM

1

FIT 3258

FE 3258

M

ZT 3258

HS 3258

LR/OC

CV 358

INDUCED FLOW STACK

200OS4101
ODOR SCRUBBER

2

PH AIT 3253

120V

PH AE 3253

NAOH
FROM NAOH FEED PUMPS

NAOCL
FROM NAOCL FEED PUMPS

PLC-3

LOW PRESSURE AIR FLOW PV 3258

ODOR SCRUBBER PH PV 4101

CP-301

PV .3258

PV .4101

1

2

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:16:28 PM

PLOT DATE: 05-26-2012

FILENAME: 008-I-005_391538.DWG

DRN: PMH	ORIG DATE: NOV 2009	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JDK	DWG #: 008-I-005		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

CleanWater Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
INSTRUMENTATION AND CONTROL

ODOR CONTROL
P&ID

SHEET: 47 OF: D24

PLOT DATE: JUNE 2010

PLC #:

CWS PROJ #: 6410

DWG #:
008-I-005

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

SCADA

HEADWORKS BUILDING MAKEUP AIR UNIT
FAILURE: FAIL .5001
RUNNING: ON .5001

SMOKE ALARM: ALM .5001

COMPACTOR ROOM: H2S PV .0701; LEL PV .0702
GRIT STORAGE ROOM: H2S PV .0703; LEL PV .0704
SCREENINGS ROOM: H2S PV .0705; LEL PV .0706

200LCP0505
(PLC-15)

FAIL .5001 | ON .5001 | ALM .5001 | PV .0701 | PV .0702 | PV .0703 | PV .0704 | PV .0705 | PV .0706

"ODOR CONTROL FAN 1 LOW CURRENT"
008-I-005 501

"BLOWER"

480V

200LCP5001*
PWR ON YL 5001A
FAIL YL 5001B
BURNER OO YL 5001C
BLOWER OO YL 5001D
SAFETY LOCKOUT YL 5001E
DIRTY FILTER YL 5001F
SMOKE ALARM YL 5001G
OO HS 5001A

120V

200LCP0703
SILENCE HS 0703

"MAU FAILURE"

"SMOKE ALARM"

"ACTIVATE"

"GAS ALARM"

H2S/LEL AIC 0701

120V

"MSC" "MSC" "MSC" "MSC" "MSC"

200CS8501**
GO YL 8501A
NO-GO YL 8501B
(TYPICAL OF 5)

HORN/ ** STROBE
(TYPICAL OF 3)

"POWER"

"LOW FLOW"

"POWER"

SMOKE ASH 5001 *

OSA
FROM OUTSIDE

SA
TO HEADWORKS BUILDING

200MAU5001
HEADWORKS BUILDING MAKEUP AIR UNIT 1

MAU SKID*

H2S AIT 0701 T "MSC" — H2S AE 0701 — COMPACTOR ROOM
LEL AIT 0702 T "MSC" — LEL AE 0702 — COMPACTOR ROOM
H2S AIT 0703 T "MSC" — H2S AE 0703 — GRIT STORAGE ROOM
LEL AIT 0704 T "MSC" — LEL AE 0704 — GRIT STORAGE ROOM
H2S AIT 0705 T "MSC" — H2S AE 0705 — SCREENINGS ROOM
LEL AIT 0706 T "MSC" — LEL AE 0706 — SCREENINGS ROOM

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 008-I-006_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:16:36 PM

DRN: PMH	ORIG. DATE: NOV 2009					
DSN: JDK	DWG #: 008-I-006					
CHK: MSM	CAD FILE #:					
APPD: LEC	SCALE: NONE					

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

CleanWater Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
INSTRUMENTATION AND CONTROL
MAKEUP AIR AND GAS DETECTION P&ID

SHEET: 48 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-006

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

SCADA

NPW PUMP 3

REMOTE RE 4603 | FAIL FAIL 4603 | RUNNING ON 4603 | RUN CMD RUNW 4603

FLOW PV 4601

PRESSURE PV 9526

NPW STRAINER

HI-HI PRESSURE HI-HI 4601 | RUNNING ON 4601 | OVERLOAD OL 4601

CP-9015
(PLC-1)

RE 4603 | FAIL 4603 | ON 4603 | RUNW 4603

PV 4601

PV 9526

HI-HI 4601 | ON 4601 | OL 4601

571LCP4601*

HOA HS 4601A | CYCLE START HS 4601B | RUNNING YL 4601A | PWR ON YL 4601B | HIGH-HIGH PRESSURE YL 4601C

480V

"HIGH"

"HI-HI"

"LOW"

"OPEN"

"CLOSE"

(3)

"POWER"

571P4603-LCS
NPW PUMP 3
LCS

LORR HS 4603A | SS HS 4603B

(4)

I

MCC

"POWER"

"HIGH"

120V

FIT 4601

"MSC"

M

FE 4601

V

DPIT 9526

NPW

FROM REUSE WETWELL/ BACKWASH WETWELL

K

NPWP-9001
NON-POTABLE WATER PUMP 1

K

NPWP-9002
NON-POTABLE WATER PUMP 2

K

TSH 4603 *

M *

CS

571CV4603

571V4603

M *

CS

M * M *

DPS 4601 *

FV 4601 *

NPW

TO NON-POTABLE WATER DISTRIBUTION

NPW/D

TO EXISTING STRAINER BACKWASH DRAIN

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 008-I-007_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:16:45 PM

DRN: PMH	ORIG DATE: NOV 2009					
DSN: JDK	DWG #: 008-I-007					
CHK: MSM	CAD FILE #:					
APPD: LEC	SCALE: NONE					
THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.		REV #	DATE	DRN	APPD	DESCRIPTION
			01/12	ERB	LEC	RECORD DRAWING

CleanWater Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
INSTRUMENTATION AND CONTROL

NON-POTABLE WATER
P&ID

SHEET: 49 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

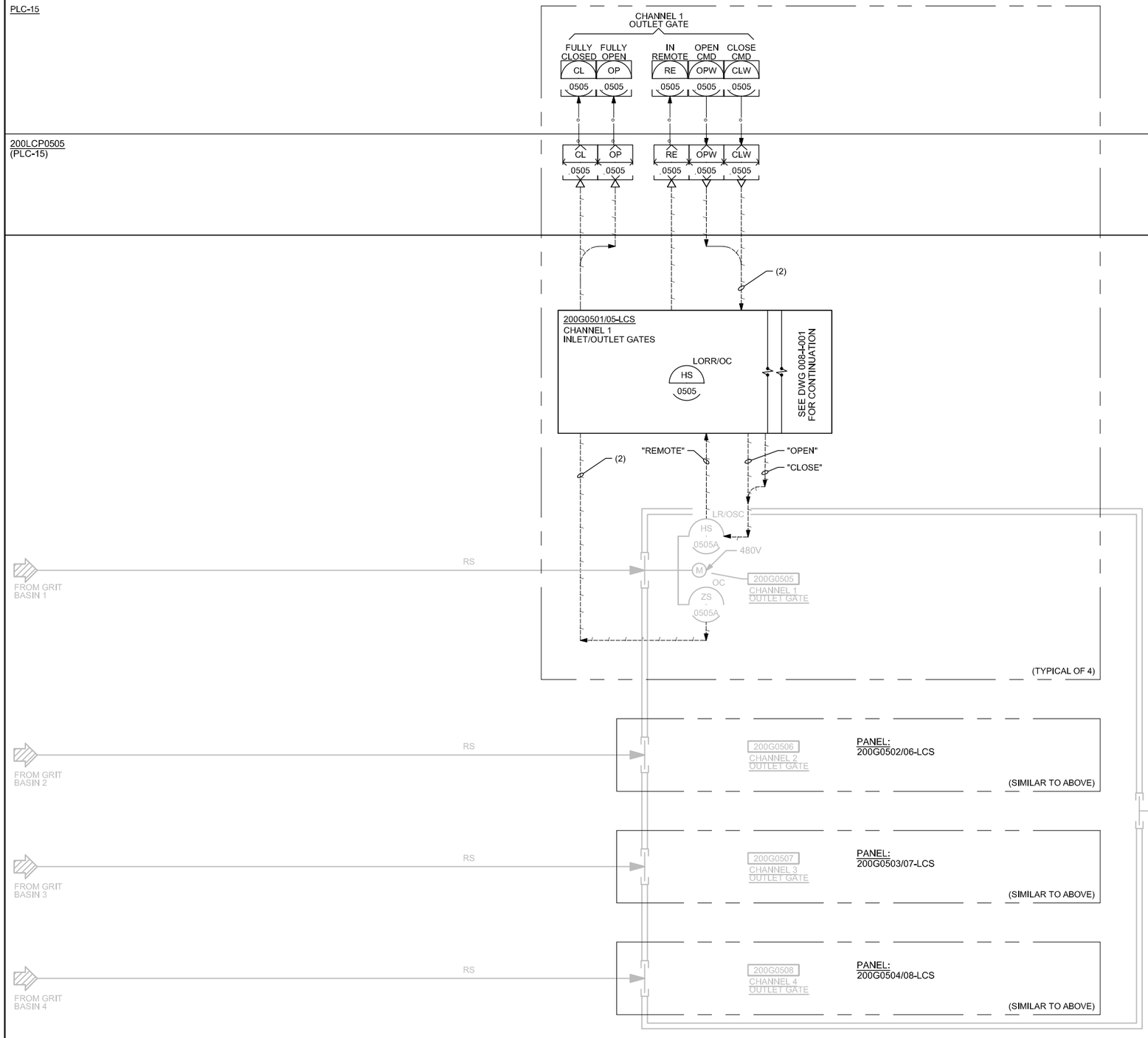
DWG #: 008-I-007

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PLC-15

200LCP0505
(PLC-15)



RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:16:52 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-008_391538.DWG

DRN: BRP	ORIG DATE: NOV 2009					
DSN: JDK	DWG #: 008-I-008					
CHK: MSM	CAD FILE #:					
APPD: LEC	SCALE: NONE					
		01/12	ERB	LEC	RECORD DRAWING	
		REV #	DATE	DRN	APPD	DESCRIPTION

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

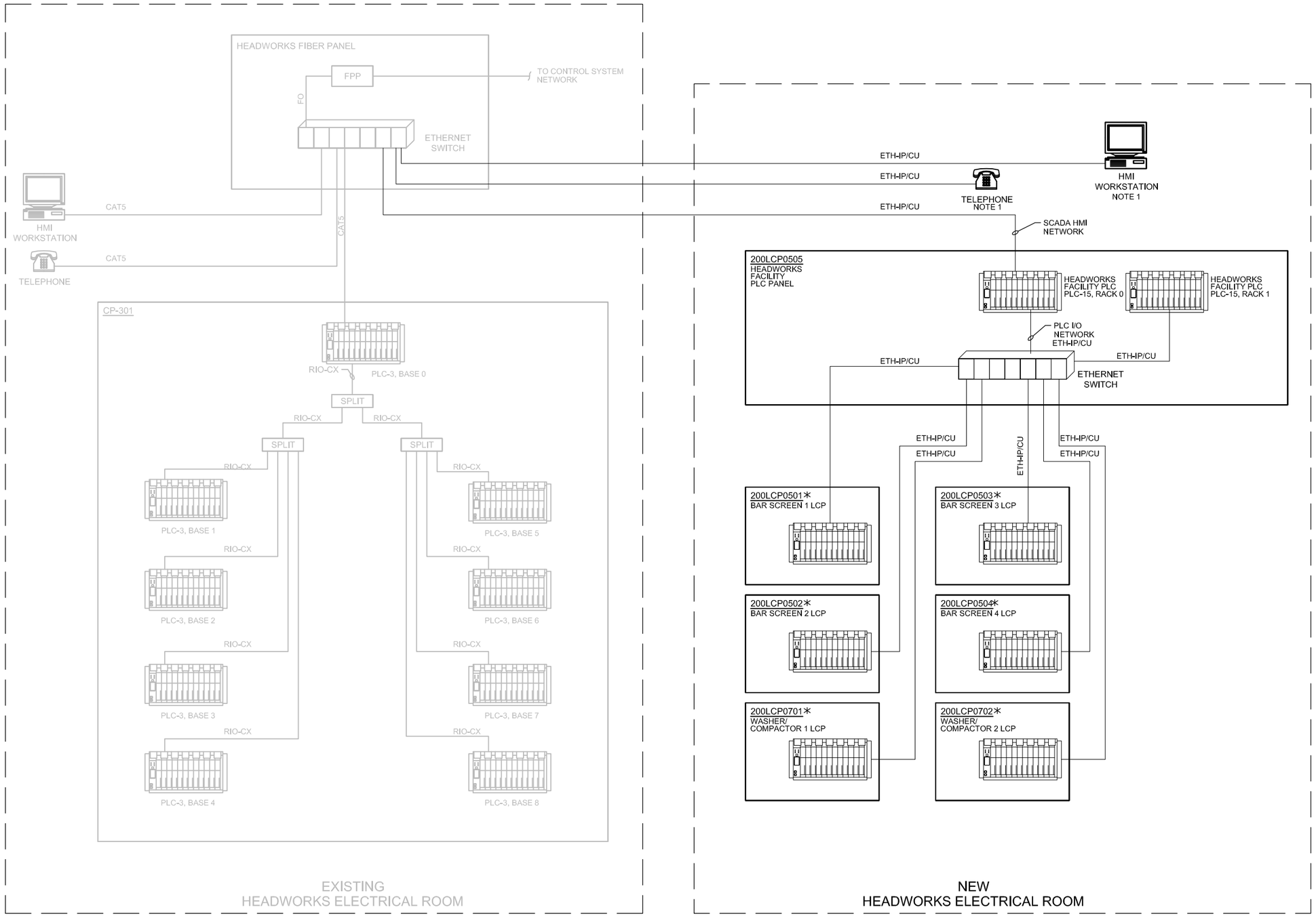
SHEET TITLE:
INSTRUMENTATION AND CONTROL
SCREENINGS CHANNEL
OUTLET GATES
P&ID

SHEET: 50 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-008

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



NOTES:
1. OWNER-FURNISHED EQUIPMENT

LEGEND:

FO	FIBER OPTIC CABLE
FPP	FIBER PATCH PANEL
RIO-CX	REMOTE IO (COAXIAL)
ETH-IP/CU	ETHERNET IP (COPPER MEDIA-CAT6 CABLE)
CAT 5	CATEGORY 5 ETHERNET CABLE

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 008-I-100_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:17:01 PM

DRN: MEN	ORIG DATE: NOV 2009					
DSN: JDK	DWG #: 008-I-100					
CHK: MSM	CAD FILE #:					
APPD: LEC	SCALE: NONE					

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

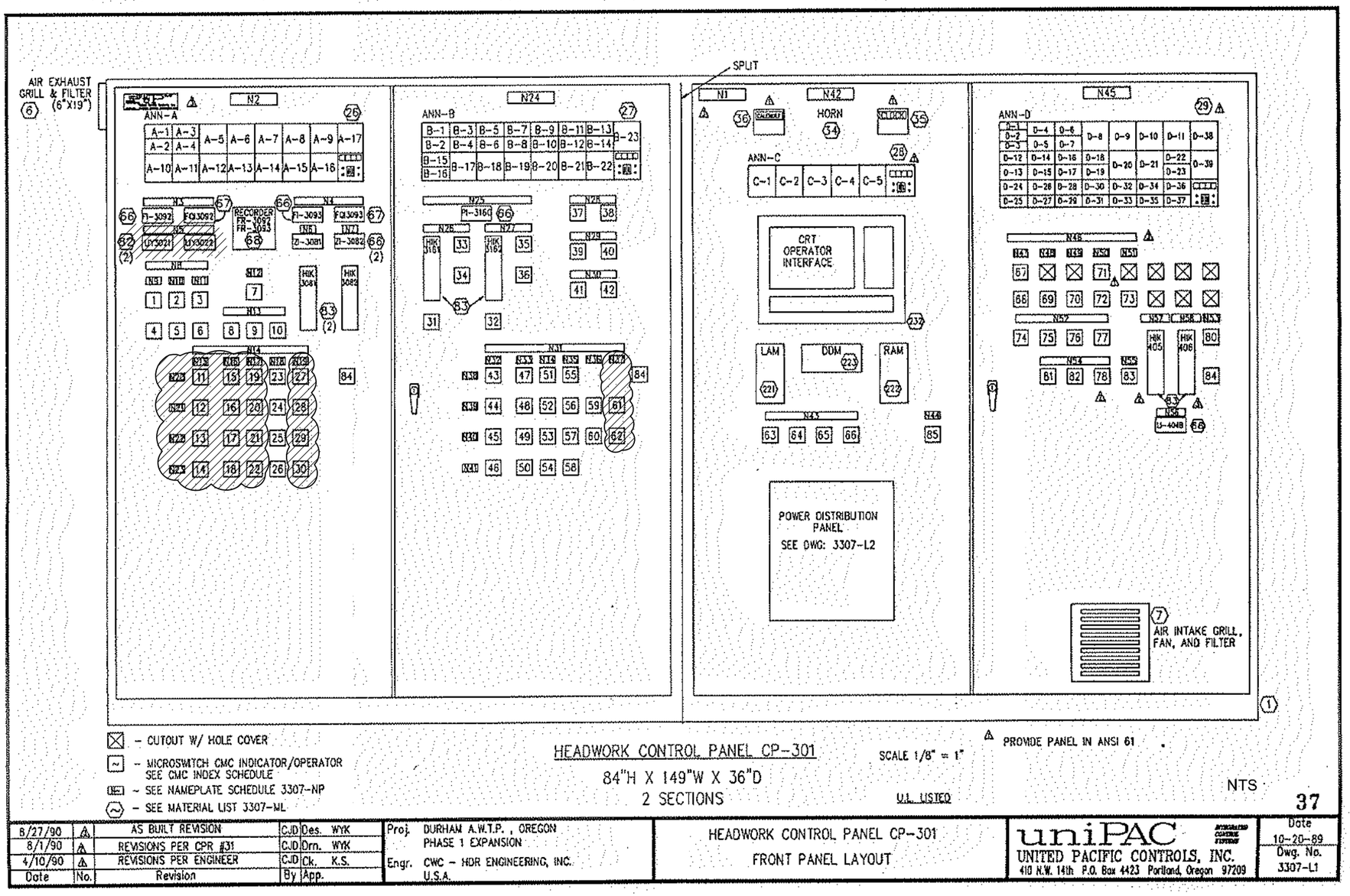
SHEET TITLE:
INSTRUMENTATION AND CONTROL
HEADWORKS BUILDING CONTROL SYSTEM BLOCK DIAGRAM

SHEET: 51 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-100

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



NOTES:

1. SEE CP-301 COMPONENT LIST, DWG 008-I-802.
2. ALL WORK WITHIN EXISTING CONTROL PANELS WILL REQUIRE CLOSE COORDINATION WITH BOTH THE ENGINEER AND OWNER. NO WORK IN EXISTING CONTROL PANELS CAN BEGIN WITHOUT APPROVAL BY ENGINEER AND OWNER.
3. CLOUDED CROSS-HATCHING IDENTIFIES EXISTING CP-301 FACE-MOUNTED DEVICES TO BE REMOVED AS PART OF THIS PROJECT. CONTRACTOR SHALL REMOVE ASSOCIATED PANEL WIRING, PANEL DEVICES, AND FIELD WIRING. COORDINATE WITH ELECTRICAL CONTRACTOR.
4. CONTRACTOR SHALL SUBMIT MARKED-UP COPIES OF THE EXISTING CONTROL PANEL WIRING DIAGRAMS USING CLOUDS AND CROSS-HATCHING TO SHOW WIRING TO BE REMOVED. 8-1/2" x11" COPIES OF EXISTING CP-301 WIRING SCHEMATIC DRAWINGS WILL BE PROVIDED BY THE OWNER. REFER TO SECTION 13400 FOR WIRING DIAGRAM SUBMITTAL REQUIREMENTS ASSOCIATED WITH EXISTING PLC-3 I/O TO BE REMOVED AS PART OF THIS PROJECT.
5. CONTRACTOR TO FILL HOLES WIHT COVERS PAINTED SIMILAR COLOR AS EXISTING PANEL FACE.

Date	No.	Revision	By	App.
8/27/90	4	AS BUILT REVISION	CJD	Des. WYK
8/1/90	3	REVISIONS PER CPR #31	CJD	Drn. WYK
4/10/90	2	REVISIONS PER ENGINEER	CJD	Ck. K.S.

Proj. DURHAM A.W.T.P., OREGON PHASE 1 EXPANSION
Engr. CWC - HDR ENGINEERING, INC. U.S.A.

HEADWORK CONTROL PANEL CP-301
FRONT PANEL LAYOUT

uniPAC INTEGRATED CONTROL SYSTEMS
UNITED PACIFIC CONTROLS, INC.
410 N.W. 14th P.O. Box 4423 Portland, Oregon 97209

Date 10-20-89
Dwg. No. 3307-L1

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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DRN: PMH	ORIG DATE: APRIL 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JDK	DWG #: 008-I-401		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services — Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: INSTRUMENTATION AND CONTROL DEMOLITION EXISTING CP-301 ELEVATION

SHEET: 52 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-401

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 008-I-401_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:17:09 PM

PANEL SECTION	PANEL DEVICE ID	EQUIPMENT DESCRIPTION	DEVICE TYPE
1	ANNUNCIATOR	----**ITEM HAS BEEN REMOVED**----	--N/A--
1	FI-3092	NORMAL FLOW	INDICATOR
1	FQI3092	NORMAL FLOW TOTAL	INDICATOR
1	LIY-3021	UPFLOW WELL 1 LEVEL	INDICATOR
1	LIY-3022	UPFLOW WELL 2 LEVEL	INDICATOR
1	RECORDER FR-3092, FR-3093	----**ITEM HAS BEEN REMOVED**----	--N/A--
1	FI-3093	BYPASS FLOW	INDICATOR
1	FQI3093	BYPASS FLOW TOTAL	INDICATOR
1	ZI-3081	CONTROL SLIDE GATE SG-341 POSITION	INDICATOR
1	ZI-3082	CONTROL SLIDE GATE SG-342 POSITION	INDICATOR
1	1	FORCEMAIN AND WELL #1 CONTROL VALVE CV-101	SELECTOR/INDICATOR (OPEN / CLOSED / AUTO / RSPS CONTROL)
1	2	INTERCONNECTING VALVE AND GATE (CONTROL VALVE CV-103)	SELECTOR/INDICATOR (OPEN / CLOSED / AUTO / RSPS CONTROL)
1	3	FORCEMAIN AND WELL #2 CONTROL VALVE CV-102	SELECTOR/INDICATOR (OPEN / CLOSED / AUTO / RSPS CONTROL)
1	4	SLUICE GATE SL-301	SELECTOR/INDICATOR (CLOSE / OPEN / AUTO / LOCAL)
1	5	SLIDE GATE SG-303	SELECTOR/INDICATOR (CLOSE / OPEN / AUTO / LOCAL)
1	6	SLUICE GATE SL-302	SELECTOR/INDICATOR (CLOSE / OPEN / AUTO / LOCAL)
1	7	NORMAL FLOW CHANNEL SLIDE GATE SG-331	SELECTOR/INDICATOR (CLOSE / OPEN / AUTO / LOCAL)
1	8	FLOW CONTROL MODE SELECTION	SELECTOR/INDICATOR (CRISP / HEADWORKS)
1	9	FLOW CONTROL OPERATION MODE	SELECTOR/INDICATOR (SUMMER / WINTER)
1	10	FLOW CONTROL LEAD INFLUENT FORCE MAIN	SELECTOR/INDICATOR (NO 1 / NO 2)
1	HIK3081	SG-341 MANUAL CONTROL STATION	CONTROLLER
1	HIK3082	SG-342 MANUAL CONTROL STATION	CONTROLLER
1	11	FLOW CHANNEL 1 MASTER CONTROL SWITCH	SELECTOR/INDICATOR (IN USE / READY / AUTO)
1	12	FLOW CHANNEL 2 MASTER CONTROL SWITCH	SELECTOR/INDICATOR (IN USE / READY / AUTO)
1	13	FLOW CHANNEL 3 MASTER CONTROL SWITCH	SELECTOR/INDICATOR (IN USE / READY / AUTO)
1	14	FLOW CHANNEL 4 MASTER CONTROL SWITCH	SELECTOR/INDICATOR (IN USE / READY / AUTO)
1	15	INLET SLIDE GATE SG-311	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
1	16	INLET SLIDE GATE SG-312	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
1	17	INLET SLIDE GATE SG-313	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
1	18	INLET SLIDE GATE SG-314	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
1	19	BAR SCREEN S-301	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO / REVERSE)
1	20	BAR SCREEN S-302	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO / REVERSE)
1	21	BAR SCREEN S-303	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO / REVERSE)
1	22	BAR SCREEN S-304	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO / REVERSE)
1	23	PISTA ROTOR PR-301	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
1	24	PISTA ROTOR PR-302	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
1	25	PISTA ROTOR PR-303	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
1	26	PISTA ROTOR PR-304	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
1	27	OUTLET SLIDE GATE SG-321	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
1	28	OUTLET SLIDE GATE SG-322	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
1	29	OUTLET SLIDE GATE SG-323	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
1	30	OUTLET SLIDE GATE SG-324	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
1	84	LAMP TEST	PUSHBUTTON
2	ANNUNCIATOR	----**ITEM HAS BEEN REMOVED**----	--N/A--
2	PI-3160		
2	HIK3161	SUCTION VALVE CV-361 MAN CTRL STATION	CONTROLLER
2	31	SUCTION VALVE CV-361 MAN CTRL STATION MODE	SELECTOR / INDICATOR (MANUAL / AUTO)
2	33	LPA BLOWER B-361	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
2	34	BYPASS VALVE CV-351	SELECTOR / INDICATOR (OPEN / CLOSE / LOCAL)
2	HIK3162	SUCTION VALVE CV-362 MAN CTRL STATION	CONTROLLER
2	32	SUCTION VALVE CV-362 MAN CTRL STATION MODE	SELECTOR / INDICATOR (MANUAL / AUTO)
2	35	LPA BLOWER B-362	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
2	36	BYPASS VALVE CV-352	SELECTOR / INDICATOR (OPEN / CLOSE / LOCAL)
2	37	HEADWORKS NPW PUMP NPW-301	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
2	38	PRIMARY SLUDGE PUMP STATION NPW-401	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
2	39	SCREENINGS CONVEYOR C-301	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
2	40	----**ITEM HAS BEEN REMOVED**----	--N/A--
2	41	UPFLOW WELL AERATION CONTROL VALVE CV-301	SELECTOR / INDICATOR (CLOSE / OPEN / AUTO / LOCAL)
2	42	UPFLOW WELL AERATION CONTROL VALVE CV-302	SELECTOR / INDICATOR (CLOSE / OPEN / AUTO / LOCAL)
2	43	AIR SCOUR CONTROL VALVE CV-311	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
2	44	AIR SCOUR CONTROL VALVE CV-312	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
2	45	AIR SCOUR CONTROL VALVE CV-313	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
2	46	AIR SCOUR CONTROL VALVE CV-314	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
2	47	WATER SCOUR CONTROL VALVE CV-321	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
2	48	WATER SCOUR CONTROL VALVE CV-322	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
2	49	WATER SCOUR CONTROL VALVE CV-323	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
2	50	WATER SCOUR CONTROL VALVE CV-324	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
2	51	NORMAL GRIT PUMP GP-301	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO1 / AUTO2)
2	52	NORMAL GRIT PUMP GP-302	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO1 / AUTO2)
2	53	NORMAL GRIT PUMP GP-303	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO1 / AUTO2)
2	54	NORMAL GRIT PUMP GP-304	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO1 / AUTO2)
2	55	STANDBY GRIT PUMP GP-305 GRIT BASIN	SELECTOR / INDICATOR (BASIN 1 / BASIN 4)
2	56	STANDBY GRIT PUMP GP-305	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO1 / AUTO2)
2	57	STANDBY GRIT PUMP GP-306 GRIT BASIN	SELECTOR / INDICATOR (BASIN 2 / BASIN 3)
2	58	STANDBY GRIT PUMP GP-306	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO1 / AUTO2)
2	59	STANDBY GRIT PUMP WATER FLUSH VALVE CV-325	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
2	60	STANDBY GRIT PUMP WATER FLUSH VALVE CV-326	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
2	61	GRIT CLASSIFIER GC-310	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
2	62	GRIT CLASSIFIER GC-320	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
2	64	LAMP TEST	PUSHBUTTON
3	CALENDAR	CLOCK	
3	HORN	HORN	
3	CLOCK	CALENDAR	
3	ANNUNCIATOR	----**ITEM HAS BEEN REMOVED**----	--N/A--
3	CRT OPERATOR INTERFACE	----**ITEM HAS BEEN REPLACED DUMPSTER LEVEL SWITCHES----	LEVEL SWITCHES
3	LAM		
3	DDM		
3	RAM		
3	63	ANNUNCIATOR CONTROL SWITCH	SELECTOR / INDICATOR (MANUAL / AUTO / HEADWORKS / CRISP)
3	64	ANNUNCIATOR ACKNOWLEDGE	PUSHBUTTON
3	65	ANNUNCIATOR RESET	PUSHBUTTON
3	66	ANNUNCIATOR TEST	PUSHBUTTON
3	85	PANEL COOLING FAN	SELECTOR / INDICATOR (RUN / OFF / AUTO)
4	ANNUNCIATOR	----**ITEM HAS BEEN REMOVED**----	--N/A--
4	67	----**ITEM HAS BEEN REMOVED**----	--N/A--
4	68	PRIMARY SLUDGE PUMP PSP-4001	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
4	69	PRIMARY SLUDGE PUMP PSP-4002	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
4	70	PRIMARY SLUDGE PUMP PSP-4003	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
4	71	----**ITEM HAS BEEN REMOVED**----	--N/A--
4	72	PRIMARY SLUDGE PUMP PSP-4004	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
4	73	PRIMARY SLUDGE PUMP PSP-4005	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
4	74	ODOR CONTROL FAN OCF-401	SELECTOR / INDICATOR (RUN / OFF-READY)
4	75	ODOR CONTROL FAN OCF-402	SELECTOR / INDICATOR (RUN / OFF-READY)
4	76	ODOR CONTROL FAN OCF-403	SELECTOR / INDICATOR (RUN / OFF-READY)
4	77	ODOR CONTROL FAN OCF-404	SELECTOR / INDICATOR (RUN / OFF-READY / AUTO)
4	81	PRIMARY SLUDGE PUMP STATION DEWATERING PUMP DP-401	SELECTOR / INDICATOR (RUN / OFF-READY)
4	82	PRIMARY SLUDGE PUMP STATION DEWATERING PUMP DP-402	SELECTOR / INDICATOR (RUN / OFF-READY)
4	78	PRIMARY SLUDGE PS PRIMARY INFLUENT SLIDE GATE SG-401	SELECTOR / INDICATOR (OPEN / CLOSE / AUTO / LOCAL)
4	83	----**ITEM HAS BEEN REMOVED**----	--N/A--
4	HIK405	EXCESS FLOW VALVE CV-401	CONTROLLER
4	HIK406	EXCESS FLOW VALVE CV-402	CONTROLLER
4	80	EXCESS FLOW CONTROL	SELECTOR / INDICATOR (RUN / OFF-READY)
4	84	LAMP TEST	PUSHBUTTON
4	LI-404B	PRIMARY EFFLUENT SPLITTER BOX LEVEL	INDICATOR

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

PLOT TIME: 1:17:27 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-402_391538.DWG

DRN: PMH	ORIG DATE: APRIL 2010		
DSN: JDK	DWG #: 008-I-402		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

CleanWater Services
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

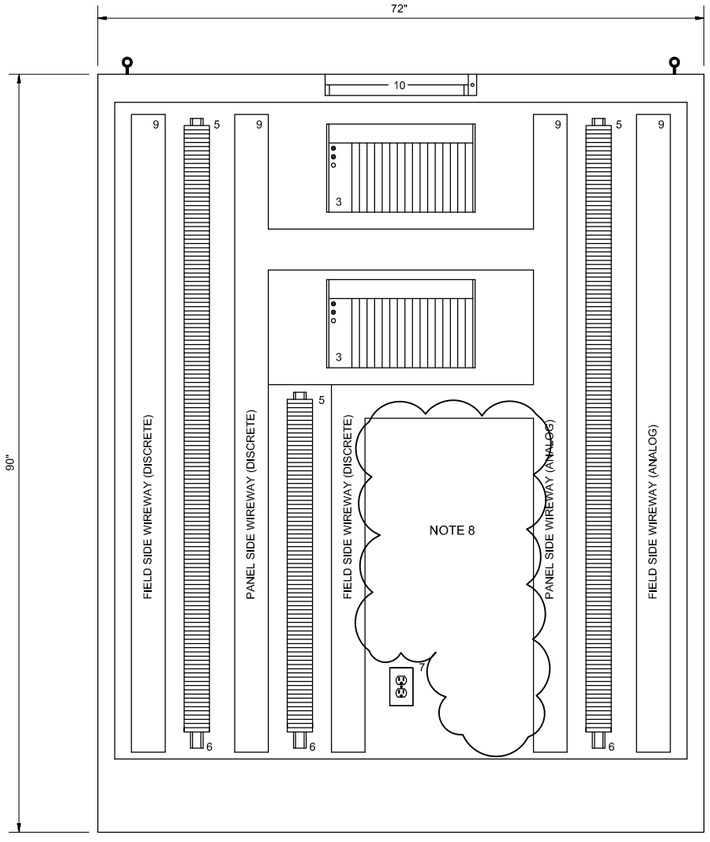
SHEET TITLE:
INSTRUMENTATION AND CONTROL
DEMOLITION
EXISTING CP-301
COMPONENT LIST

SHEET: 53 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-402

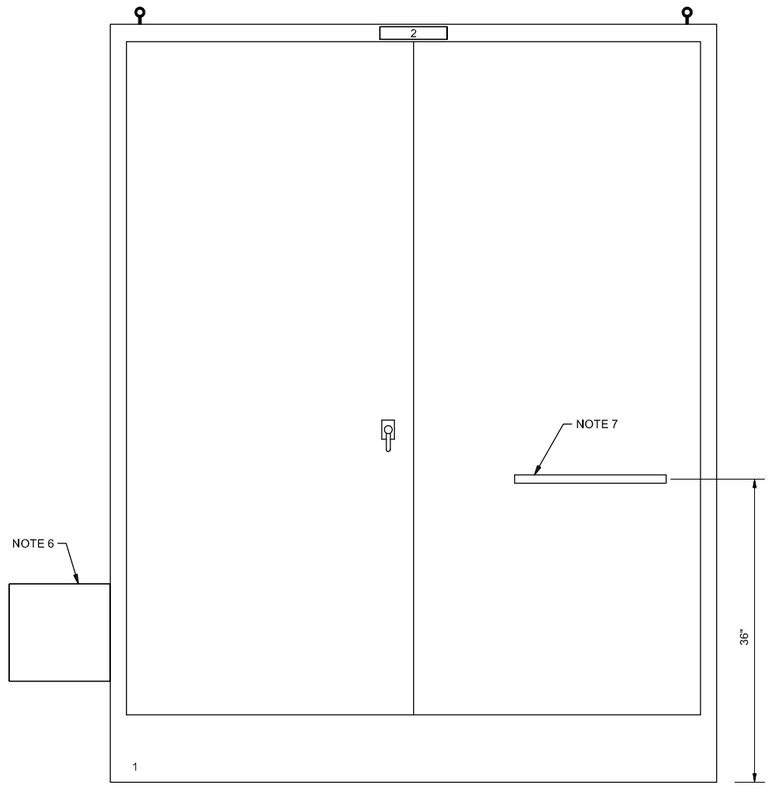
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



CONTROL PANEL INTERIOR

1 1/2"=1'-0"



CONTROL PANEL EXTERIOR

1 1/2"=1'-0"

60LP01 PANEL SCHEDULE		
ITEM NO.	ITEM	DESCRIPTION
1	PANEL ENCLOSURE	NEMA 12, 90" HIGH x 72" WIDE x 20" DEEP
2	LABEL	"200LCP0505 - HEADWORKS PLC PANEL"
3	PLC RACK	PLC-15, RACK-0
4		
5	TERMINAL BLOCKS	
6	TYPE 3 DIN RAIL	
7	120 SERVICE OUTLET	
8	ISOLATION TRANSFORMER	2400 WATTS
9	WIREWAY	4" WIDE X 3" DEEP
10	FLOURESCENT LIGHT FIXTURE	

NOTES:

1. WIRE ALL SPARE I/O POINTS TO TERMINAL STRIP.
2. MOUNT DOOR LIMIT SWITCH ON LAST DOOR TO CLOSE.
3. FURNISH AND INSTALL GROUND BUSHINGS.
4. INSTALL A SINGLE GROUND WIRE FROM THE ISOLATED GROUND BUS TO THE MAIN PANEL GROUND.
5. PROVIDE PHYSICAL BARRIER TO PROTECT INTRINSICALLY SAFE CIRCUITS.
6. MOUNT ISOLATION TRANSFORMER ON PANEL EXTERIOR TO CONSERVE PANEL SPACE. PROVIDE ENCLOSURE STIFFENERS TO ACCOMMODATE ISOLATION TRANSFORMER.
7. PROVIDE A DOOR-MOUNTED LAPTOP TABLE 3 FEET FROM THE PANEL FLOOR.
8. SPACE RESERVED FOR INTRINSICALLY SAFE BARRIERS, RELAYS AND POWER SUPPLIES. MAINTAIN CLEARANCES REQUIRED BY NEC AND INTRINSIC SAFETY COMPONENT MANUFACTURER.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 008-I-501_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:17:40 PM

DRN: PMH	ORIG DATE: FEB 2010				
DSN: JDK	DWG #: 008-I-501				
CHK: MSM	CAD FILE #:				
APPD: LEC	SCALE: 1 1/2" = 1'				

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

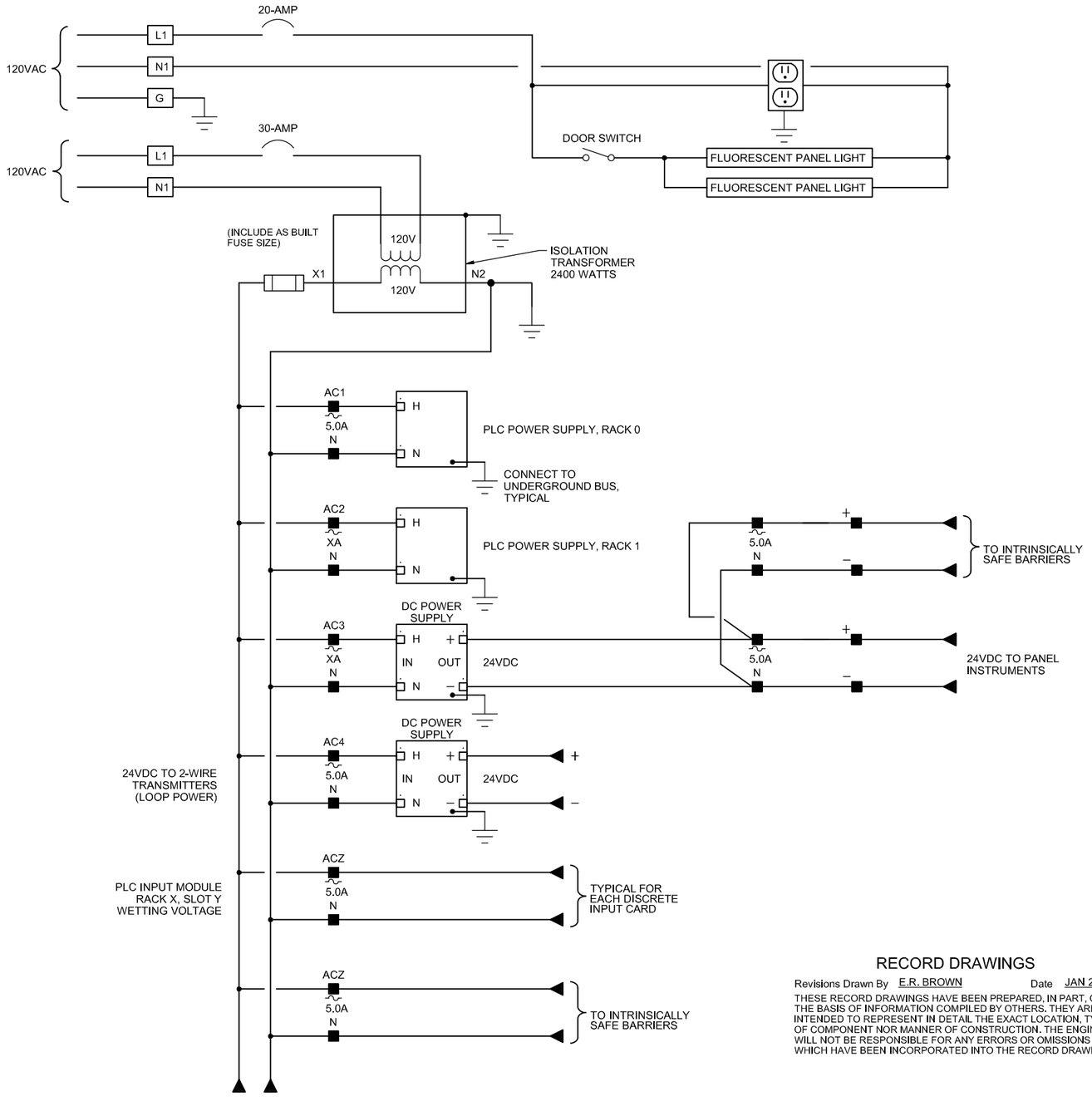
SHEET TITLE:
INSTRUMENTATION AND CONTROL
CONTROL PANEL
LAYOUT CONCEPTS

SHEET: 54 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-501

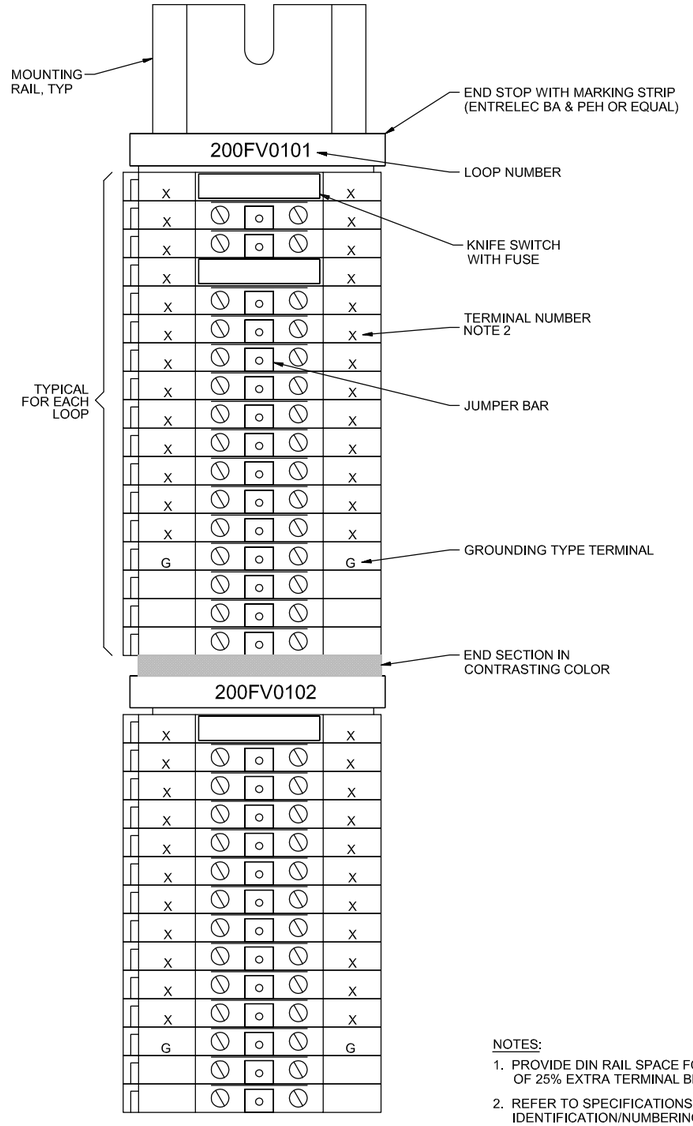
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



TYPICAL PANEL POWER DISTRIBUTION

NTS



NOTES:

1. PROVIDE DIN RAIL SPACE FOR A MINIMUM OF 25% EXTRA TERMINAL BLOCKS.
2. REFER TO SPECIFICATIONS FOR TERMINAL IDENTIFICATION/NUMBERING CONCEPTS.

TYPICAL TERMINAL BLOCK MARKING

NTS

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 008-I-502_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:17:49 PM

DRN: MEN	ORIG DATE: FEB 2010	PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS	SHEET TITLE: INSTRUMENTATION AND CONTROL TYPICAL TERMINAL BLOCK MARKING AND PANEL POWER
DSN: JDK	DWG #: 008-I-502		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services — Our commitment is clear
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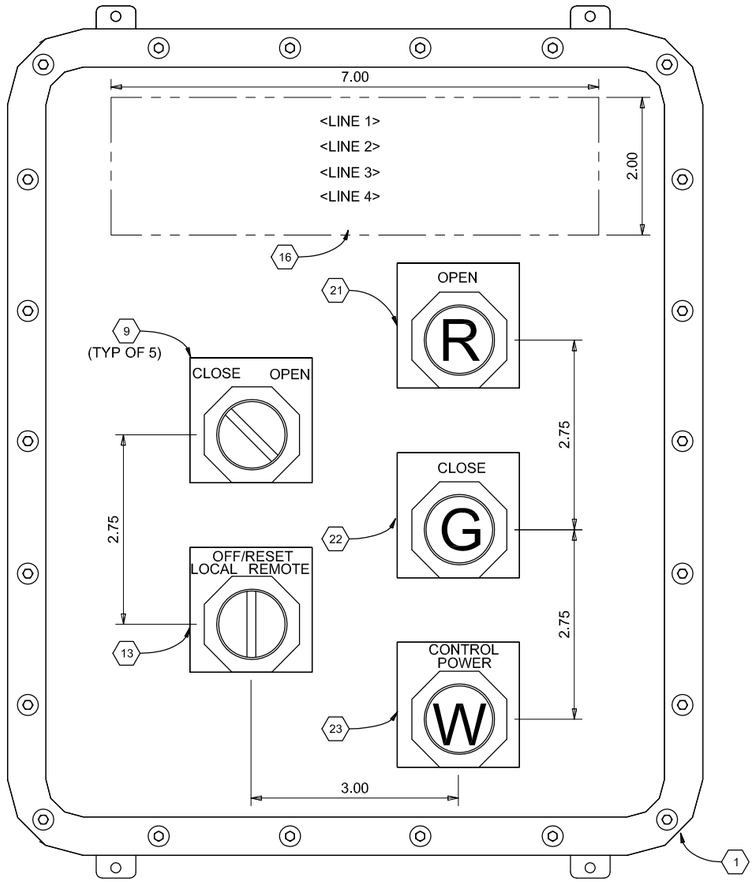
CH2MHILL

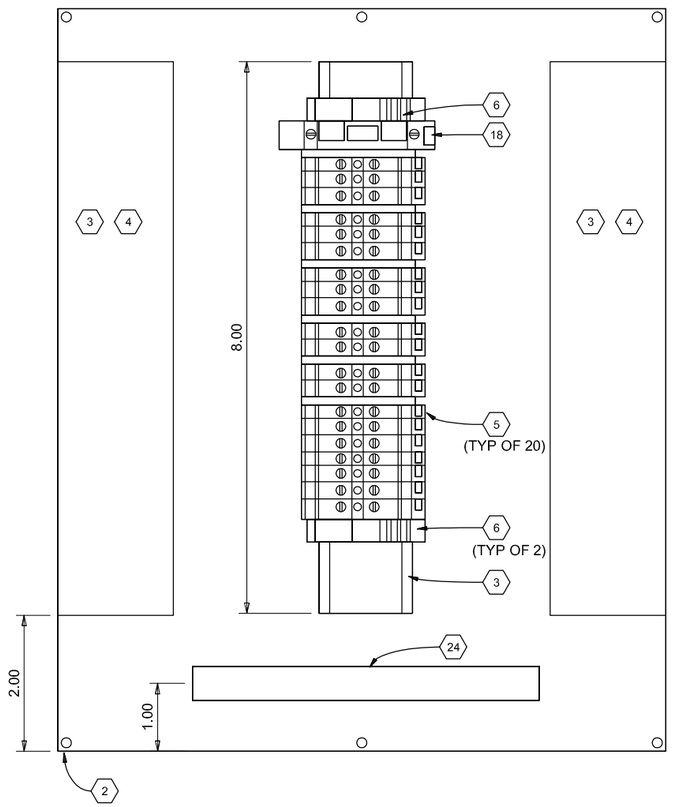
SHEET: 55 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

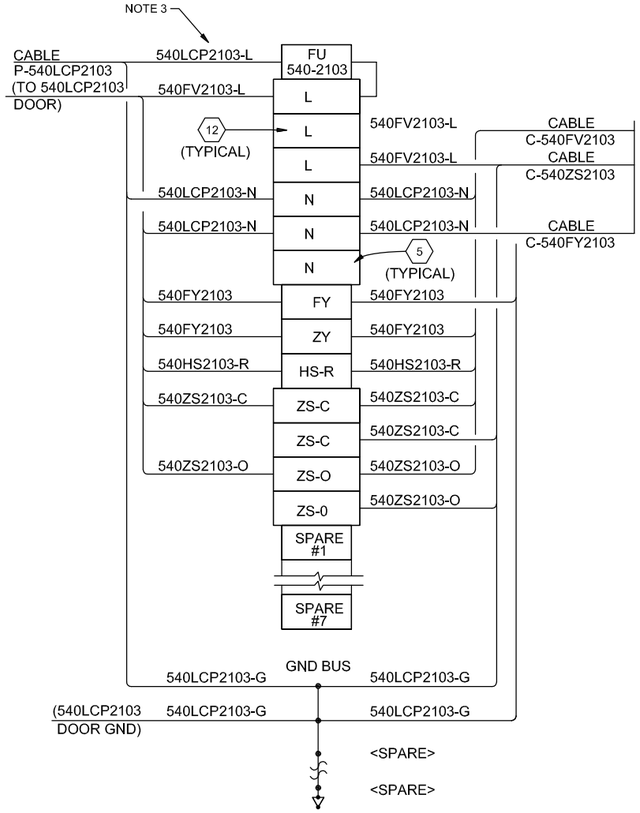
DWG #: 008-I-502

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:







LCP FRONT ELEVATION

NTS

PART LIST #	QUANTITY	MANUFACTURER	DESCRIPTION
1	1	WIEGMAN	NEMA 9 12X10 ENCLOSURE
2	1	WIEGMAN	12X10 BACKPANEL
3	1	ALLEN BRADLEY	1492-DR5 AL DIN RAIL
4	2	ALLEN BRADLEY	1492-EA35 END ANCHOR
5	18	ALLEN BRADLEY	1492-W4 TERMINAL
6	2	ALLEN BRADLEY	1492-WG4 GND TERMINAL
7	2	ALLEN BRADLEY	1492-EB3 END BARRIER
8	3	ALLEN BRADLEY	800H-W100 BLANK LEGEND PLATE
9	1	SQUARE D	9001-SKS 12B 2 POS SELECTOR SWITCH
10	-	-	NOT USED
11	1	SQUARE D	9001-KA53 HERMETICALLY SEALED NO CONTACT
12	3	SQUARE D	9001-KA52 HERMETICALLY SEALED NO CONTACT
13	1	SQUARE D	9001-SKS 12B 3 POS SELECTOR SWITCH
14	1	PANDUIT	C-1, 5WH6 COVER
15	1	PANDUIT	E-1, 5X1, 5WH6 WIREWAY
16	1	LHM	PHENOLIC LABEL
17	1	ALLEN BRADLEY	1492-WKD3 TERMINAL BLOCK WITH BLADE SWITCH
18	1	ALLEN BRADLEY	1492-WFB4250 NEON FUSED TERMINAL
19	1	BUS	2 AMP FUSE
20	1	HOFFMAN	A-CHI1DV CORROSION INHIBITORS

LCP BACKPANEL ELEVATION

NTS

PART LIST #	QUANTITY	MANUFACTURER	DESCRIPTION
21	1	SQUARE D	INDICATING LIGHT, RED
22	1	SQUARE D	INDICATING LIGHT, GREEN
23	1	SQUARE D	INDICATING LIGHT, WHITE
24	1		GROUND BUS

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FV LOCAL CONTROL STATION (LCP)

LCP INTERCONNECT DETAIL

NTS

LEGEND

(N) PARTS LIST ITEM NUMBER.

NOTE:

1. THIS DRAWING SHOWS TYPICAL LAYOUT AND WIRING CONCEPTS. CONTRACTOR SHALL ARRANGE PANEL FACE-MOUNTED DEVICES SYMETRICALLY.
2. LCP'S SHALL BE PREFABRICATED ANSI/UL-508 LISTED UNITS.
3. SAMPLE ONLY. ASSIGN WIRE IDENTIFICATION BASED ON CLEAN WATER SERVICES STANDARDS.

LCP LABEL LEGEND				
LCP TAG	LINE 1	LINE 2	LINE 3	LINE 4
540LCP2103	FILTER NO. 1	AIR SCOUR ISOLATION VALVE	540FV2103	540CP2103
540LCP2109	FILTER NO. 2	AIR SCOUR ISOLATION VALVE	540FV2109	540CP2109
540LCP2115	FILTER NO. 3	AIR SCOUR ISOLATION VALVE	540FV2115	540CP2115
540LCP2121	FILTER NO. 4	AIR SCOUR ISOLATION VALVE	540FV2121	540CP2121

FILENAME: 008-I-503_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:17:58 PM

DRN: MEN	ORIG DATE: FEB 2010		
DSN: JDK	DWG #: 008-I-503		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

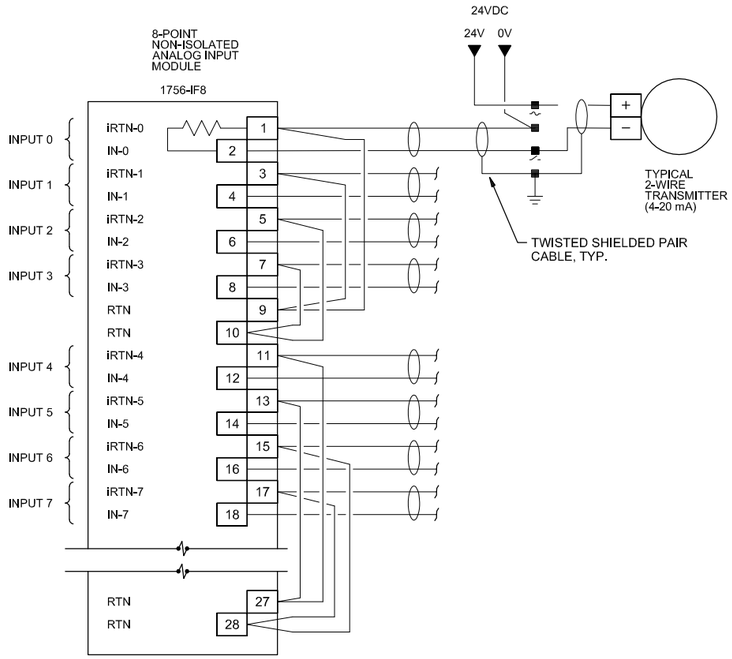
SHEET TITLE:
INSTRUMENTATION AND CONTROL
TYPICAL LOCAL CONTROL STATION LAYOUT CONCEPTS

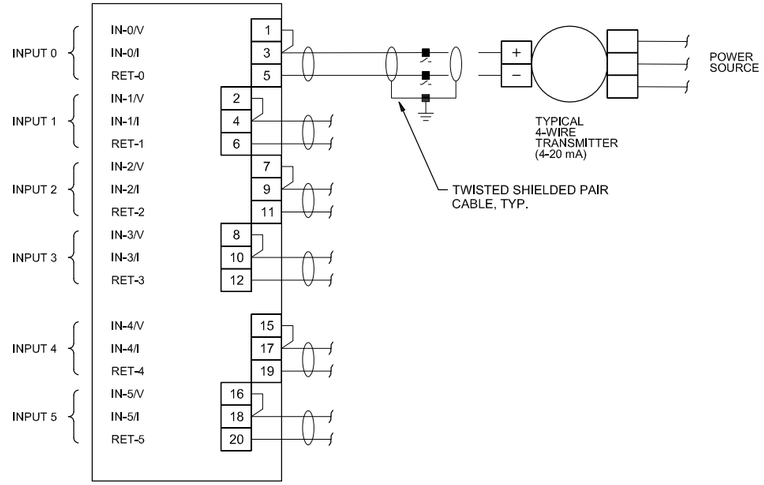
SHEET: 56 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

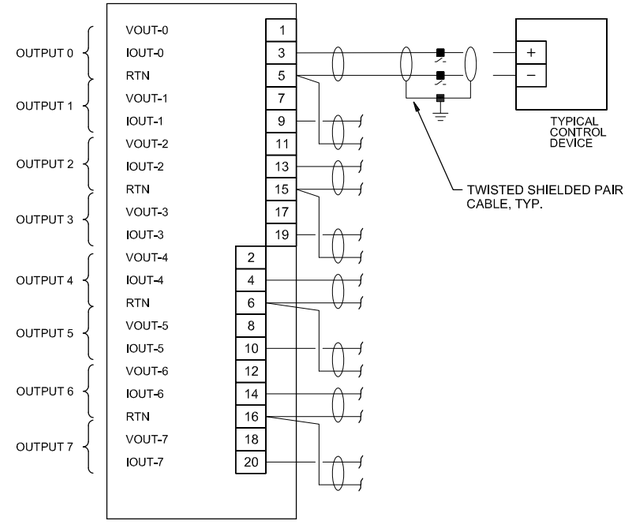
DWG #: 008-I-503

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:







NOTES:

1. PROVIDE INDIVIDUAL FUSING FOR EACH INPUT MODULE. SEE PANEL POWER DRAWING.
2. PROVIDE DISCONNECT-TYPE TERMINAL BLOCKS FOR EACH RELAY OUTPUT MODULE.
3. WIRING SHOWN IS TYPICAL ONLY. PROVIDE ADDITIONAL WIRING AS SHOWN ON THE WIRING DIAGRAMS AND AS REQUIRED FOR A COMPLETE FUNCTIONAL SYSTEM.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 008-I-504_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:18:08 PM

DRN: MEN	ORIG DATE: APR 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JDK	DWG #: 008-I-504		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

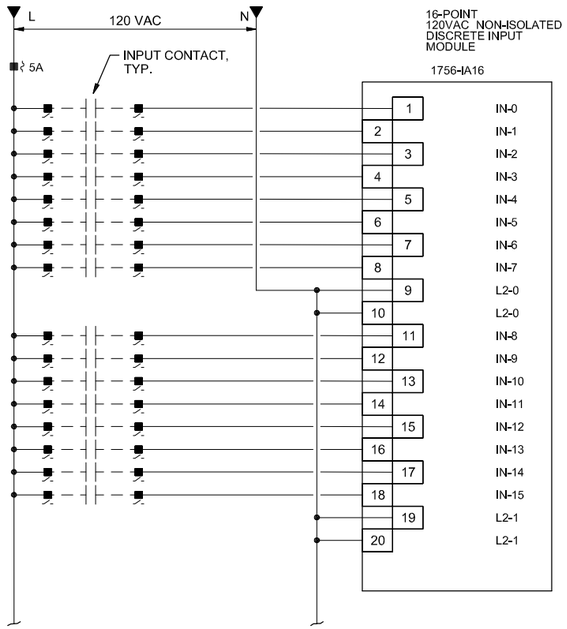
SHEET TITLE:
INSTRUMENTATION AND CONTROL
TYPICAL PLC I/O
MODULE WIRING
ANALOG

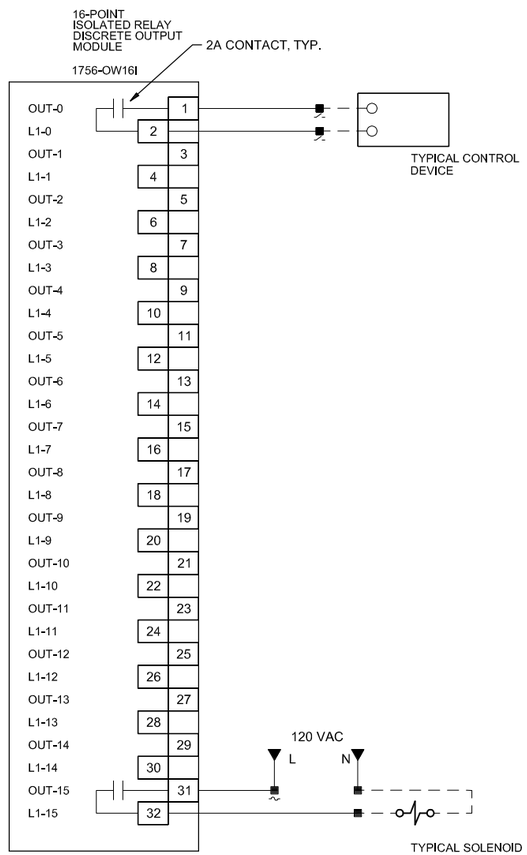
SHEET: 57 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-504

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:





NOTES:

1. PROVIDE INDIVIDUAL FUSING FOR EACH INPUT MODULE. SEE PANEL POWER DRAWING.
2. PROVIDE DISCONNECT-TYPE TERMINAL BLOCKS FOR EACH RELAY OUTPUT MODULE.
3. WIRING SHOWN IS TYPICAL ONLY. PROVIDE ADDITIONAL WIRING AS SHOWN ON THE WIRING DIAGRAMS AND AS REQUIRED FOR A COMPLETE FUNCTIONAL SYSTEM.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:18:16 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-505_391538.DWG

DRN: MEN	ORIG DATE: APR 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JDK	DWG #: 008-I-505		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
INSTRUMENTATION AND CONTROL
TYPICAL PLC I/O
MODULE WIRING
DISCRETE

SHEET: 58 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-505

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

SYMBOL	DESCRIPTION
CR X	RELAY COIL
CR	CONTACT, NORMALLY OPEN
CR	CONTACT , NORMALLY CLOSED
	PUSHBUTTON SWITCH, MOMENTARY CONTACT, NORMALLY OPEN
	PUSHBUTTON SWITCH, MOMENTARY CONTACT, NORMALLY CLOSED
H O A XOO OOX OOX	SELECTOR SWITCH
C NO	LIMIT SWITCH
CR-ANN	ANNUNCIATOR RELAY CONTACT FOLLOWS ANNUNCIATOR INPUT
	FLOW SWITCH
	TEMPERATURE SWITCH
	LEVEL SWITCH
	PRESSURE SWITCH
TDR 5 SEC 2	TIME DELAY SWITCH, NORMALLY CLOSED WITH TIME DELAY CLOSING
TDR 10 SEC 2	TIME DELAY SWITCH, NORMALLY CLOSED WITH TIME DELAY OPENING
TDR 30 SEC 2	TIME DELAY SWITCH, NORMALLY OPEN WITH TIME DELAY CLOSING
TDR 180 SEC 2	TIME DELAY SWITCH, NORMALLY OPEN WITH TIME DELAY OPENING
TDR X 30 SEC RANGE	TIME DELAY RELAY

SYMBOL	DESCRIPTION
QA R	INDICATING LIGHT, LETTER INDICATES COLOR: A = AMBER R = RED B = BLUE W = WHITE C = CLEAR Y = YELLOW G = GREEN
QA G	INDICATING LIGHT, PUSH-TO-TEST LETTER INDICATES COLOR
	SOLENOID VALVE
QA	HORN, BEEPER
QA	BELL
	GROUND
ETM	ELAPSED TIME METER
OPEN	DCS INPUT
ON	DCS OUTPUT NORMALLY OPEN
STOP	DCS OUTPUT NORMALLY CLOSED
120VAC	TRANSFORMER, SECONDARY VOLTAGE INDICATED
	CIRCUIT BREAKER
	FUSE
	FUSE
UPCPLLLPP L UL	LATCHING RELAY

SYMBOL	DESCRIPTION
	TERMINAL BLOCK
	TERMINAL BLOCK, FUSED
	TERMINAL BLOCK, KNIFE SWITCH WITH FUSE
	FIELD DEVICE(S)
	DISTRIBUTED CONTROL SYSTEM (DCS)
	CONTROL PANEL DEVICE(S)
	MOTOR CONTROL CENTER DEVICE(S)

(INSTRUMENT, PANEL, RELAY) TAG NUMBERS

NUMBERS

UPXXLLLPP WHERE

UP = FACILITY CODE
XX = EQUIPMENT OR ISA TAG
LLL = LOOP NUMBER
PP = COMPONENT NUMBER

SEE LOOP LIST FOR TAG NUMBERS.

ABBREVIATIONS

ABBREVIATIONS	DESCRIPTION
A	AUTO
B	BASE
C	CLOSE
CR	CONTROL RELAY
CS	CURRENT SWITCH (4-20mA)
DEC	DECREASE
F	FORWARD
H	HAND
INC	INCREASE
J	JOG
L	LOCAL
LOS	LOCKOUT STOP
M	MOTOR RELAY/CONTACT
MAN	MANUAL
O	OFF, ON, OPEN
OR	OFF/RESET
PWR	POWER
R	REVERSE
REM	REMOTE
S	SLOT
SEC	SECONDS
TDOD	TIME DELAY ON DE-ENERGIZATION
TDOE	TIME DELAY ON ENERGIZATION
TDR	TIME DELAY RELAY
ZS-C	CLOSED END LIMIT SWITCH
ZS-O	OPEN END LIMIT SWITCH

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

ANALOG SYMBOLS

FIELD + - FLOAT — 2-WIRE TRANSMITTER

FIELD + - FLOAT L N G — 4-WIRE TRANSMITTER

I+ I- O+ O- L N G — SIGNAL CONVERSION

+ - C — ANALOG I/O

XXX — FUSED TERMINAL BLOCK

XXX — SWITCHING TERMINAL BLOCK

XXX — GROUNDED TERMINAL BLOCK

PLOT TIME: 1:18:24 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-600_391538.DWG

DRN: PMH	ORIG DATE:	FEB 2010	
DSN: JDK	DWG #:	008-I-600	
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE:	NONE	

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: WIRING DIAGRAM LEGEND

SHEET: 59 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

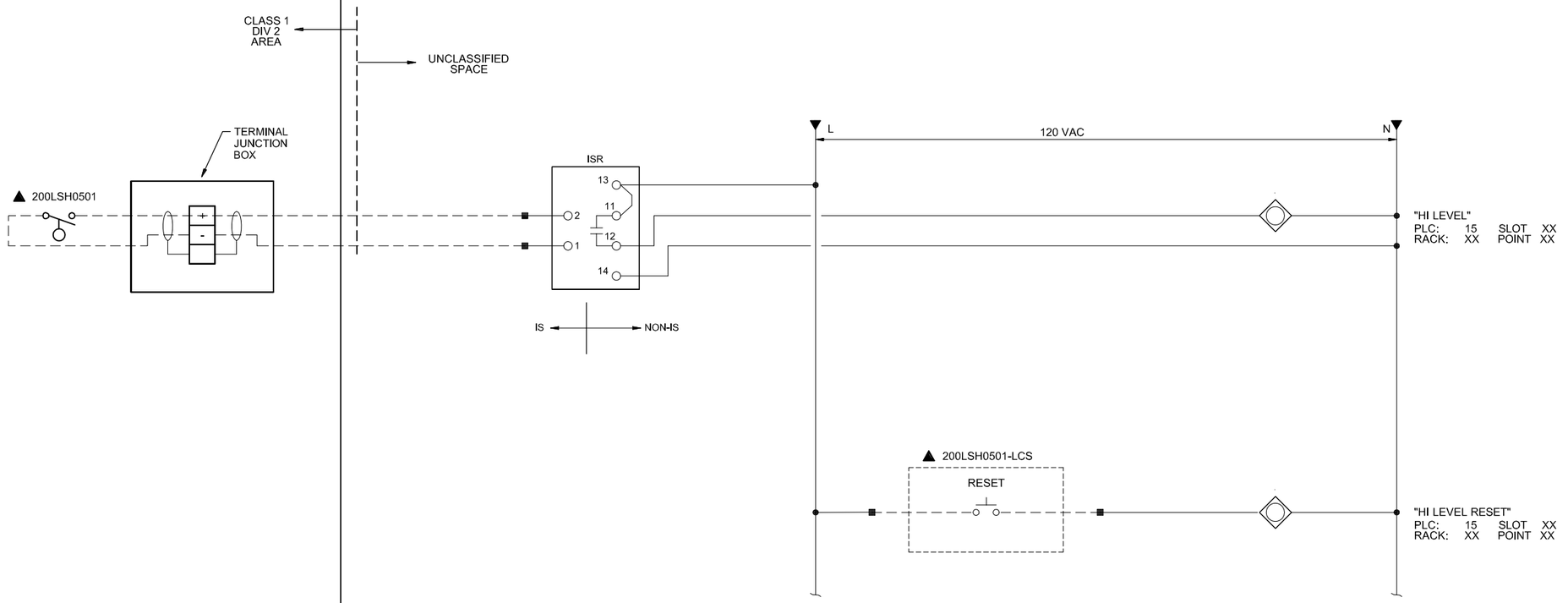
DWG #: 008-I-600

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FIELD

PANEL



TAG	LOOP DESCRIPTION	PANEL	DRAWING VARIANCE NOTES
200LSH0501	SLUICE TROUGH HI LEVEL SWITCH	200LCP0505	N/A
200LSHH0501	INFLUENT UPWELL 1 HI-HI LEVEL SWITCH	200LCP0505	LSHH INSTEAD OF LSH, NO RESET HANDSWITCH
200LSHH0502	INFLUENT UPWELL 2 HI-HI LEVEL SWITCH	200LCP0505	LSHH INSTEAD OF LSH, NO RESET HANDSWITCH

RECORD DRAWINGS

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FILENAME: 008-I-601_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:18:33 PM

DRN: MEN	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JDK	DWG #: 008-I-601		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: TYPICAL WIRING DIAGRAM DISCRETE LEVEL SWITCH WITH ISR

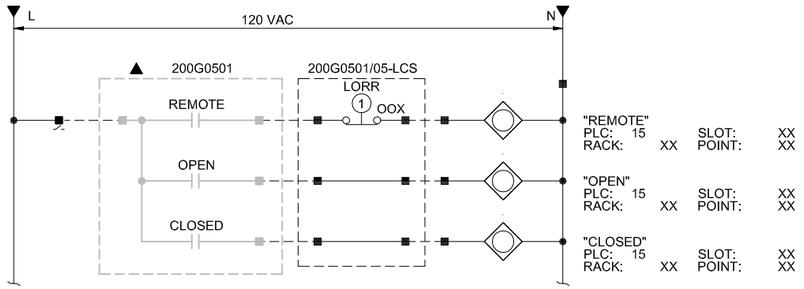
SHEET: 60 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-601

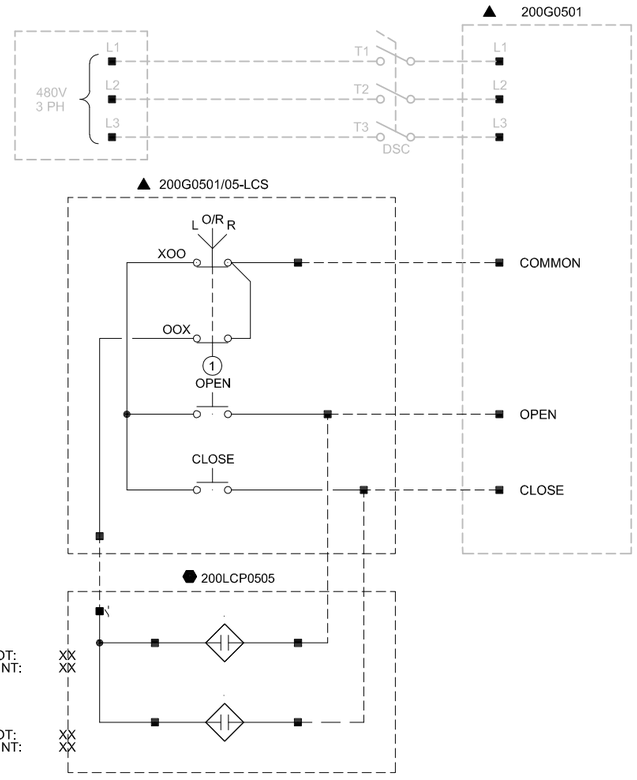
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PANEL



FIELD



TAG	LOOP DESCRIPTION	PANEL	480V PANEL	LCS
200G0501	CHANNEL 1 INLET GATE	200LCP0505	TBD	200G0501/05-LCS
200G0502	CHANNEL 2 INLET GATE	200LCP0505	TBD	200G0502/06-LCS
200G0503	CHANNEL 3 INLET GATE	200LCP0505	TBD	200G0503/07-LCS
200G0504	CHANNEL 4 INLET GATE	200LCP0505	TBD	200G0504/08-LCS
200G0505	CHANNEL 1 OUTLET GATE	200LCP0505	TBD	200G0501/05-LCS
200G0506	CHANNEL 2 OUTLET GATE	200LCP0505	TBD	200G0502/06-LCS
200G0507	CHANNEL 3 OUTLET GATE	200LCP0505	TBD	200G0503/07-LCS
200G0508	CHANNEL 4 OUTLET GATE	200LCP0505	TBD	200G0504/08-LCS

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 008-I-602_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:18:42 PM

DRN: BRP	ORIG. DATE: FEB 2010		
DSN: JDK	DWG #: 008-I-602		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
DISCRETE
EXISTING OPEN/CLOSE
GATES

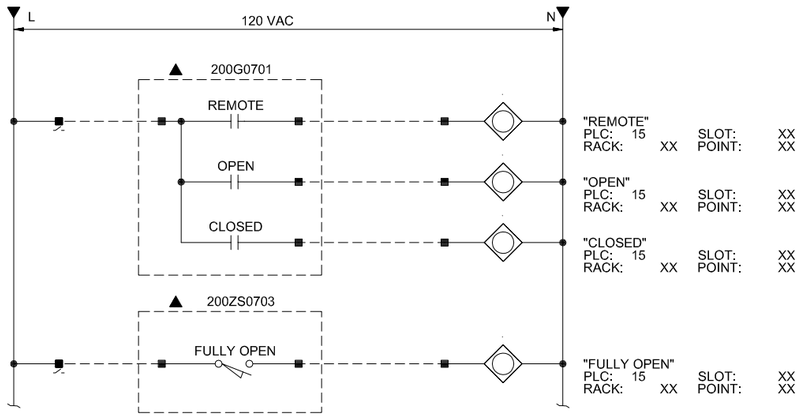
SHEET: 61 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-602

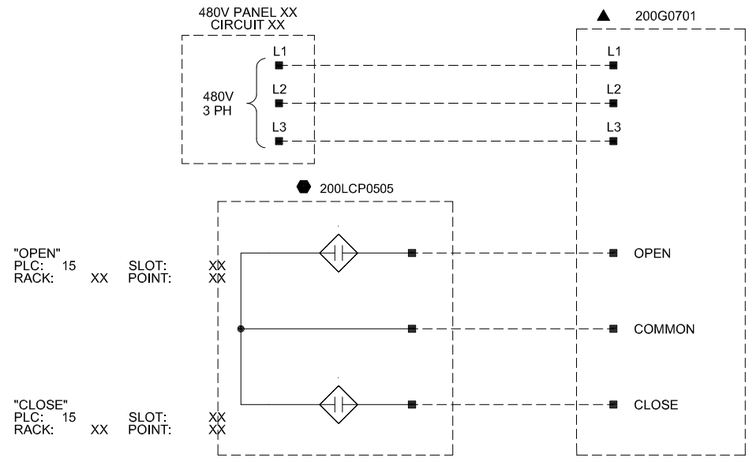
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PANEL



FIELD



TAG	LOOP DESCRIPTION	PANEL	POSITION SWITCH	480V PANEL
200G0701	WASHER / COMPACTOR 1 ISOLATION GATE	200LCP0505	200ZS0703	TBD
200G0702	WASHER / COMPACTOR 2 ISOLATION GATE	200LCP0505	200ZS0704	TBD

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:18:50 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-603_391538.DWG

DRN: MEN	ORIG DATE: FEB 2010		
DSN: JDK	DWG #: 008-I-603		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
DISCRETE
WASHER COMPACTOR
ISOLATION GATES

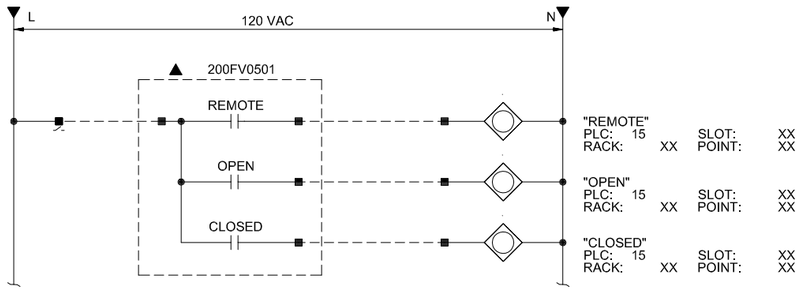
SHEET: 62 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-603

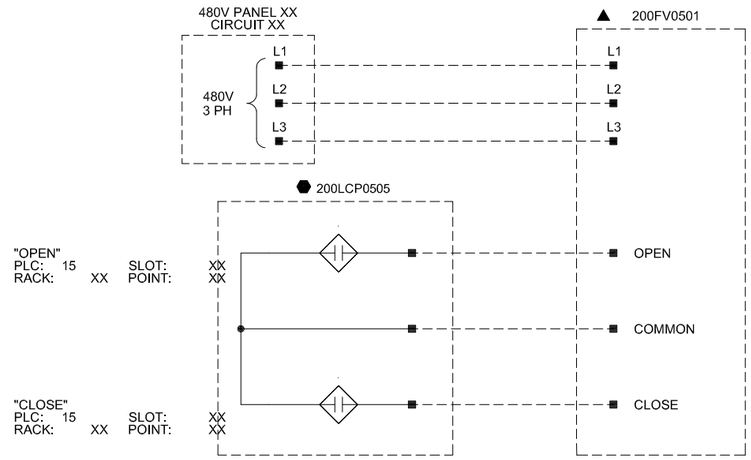
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PANEL



FIELD



TAG	LOOP DESCRIPTION	PANEL	480V PANEL
200FV0501	SLUICE FLUSH WATER FLOW VALVE	200LCP0505	TBD

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:18:58 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-604_391538.DWG

DRN: MEN	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JDK	DWG #: 008-I-604		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
DISCRETE
OPEN/CLOSE VALVES

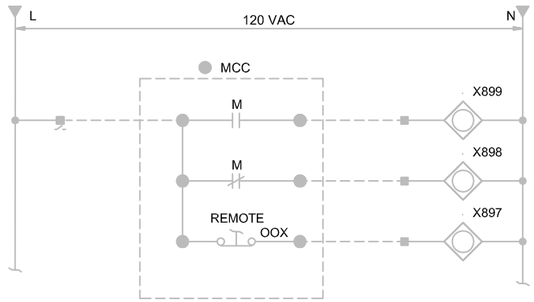
SHEET: 63 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-604

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PANEL



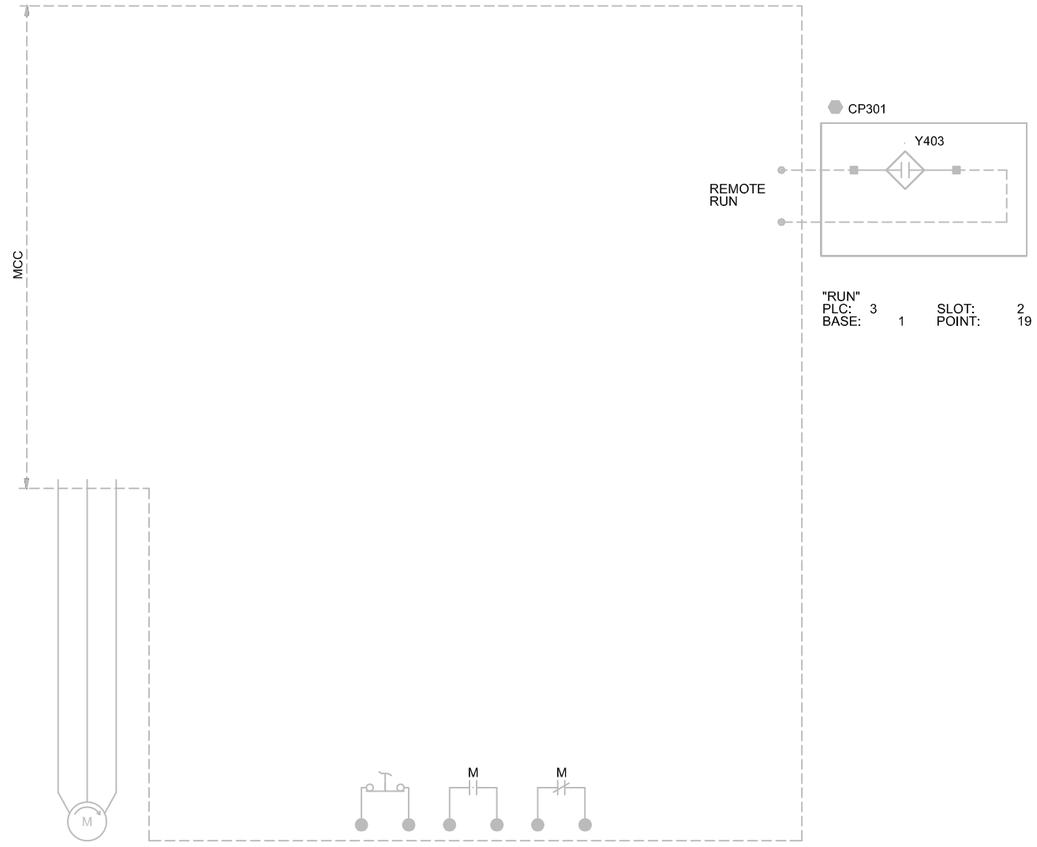
"RUNNING"
PLC: 3 SLOT: 9
BASE: 5 POINT: 3

"OFF / READY"
PLC: 3 SLOT: 9
BASE: 5 POINT: 2

"REMOTE"
PLC: 3 SLOT: 9
BASE: 5 POINT: 1

TAG	LOOP DESCRIPTION	PANEL
200GRT0601	GRIT CLASSIFIER 1	CP301
200GRT0602	GRIT CLASSIFIER 2	CP301

MCC



"RUN"
PLC: 3 SLOT: 2
BASE: 1 POINT: 19

REMOTE RUNNING OFF / READY

TO CP301

GRIT CLASSIFIER
200GRT0602

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FILENAME: 008-I-605_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:19:06 PM

DRN: MEN	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JDK	DWG #: 008-I-605		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
DISCRETE
GRIT CLASSIFIERS

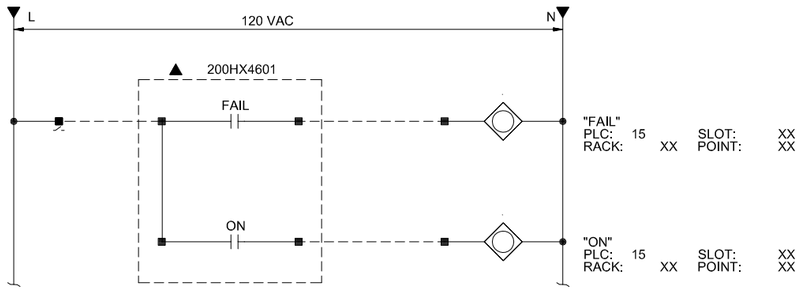
SHEET: 64 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-605

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PANEL



FIELD

TAG	LOOP DESCRIPTION	PANEL
200HX4601	HOT WATER GENERATOR SYSTEM	200LCP0505

RECORD DRAWINGS

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FILENAME: 008-I-606_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:19:14 PM

DRN: MEN	ORIG DATE: FEB 2010		
DSN: JDK	DWG #: 008-I-606		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
DISCRETE
HOT WATER
GENERATOR SYSTEM LCP

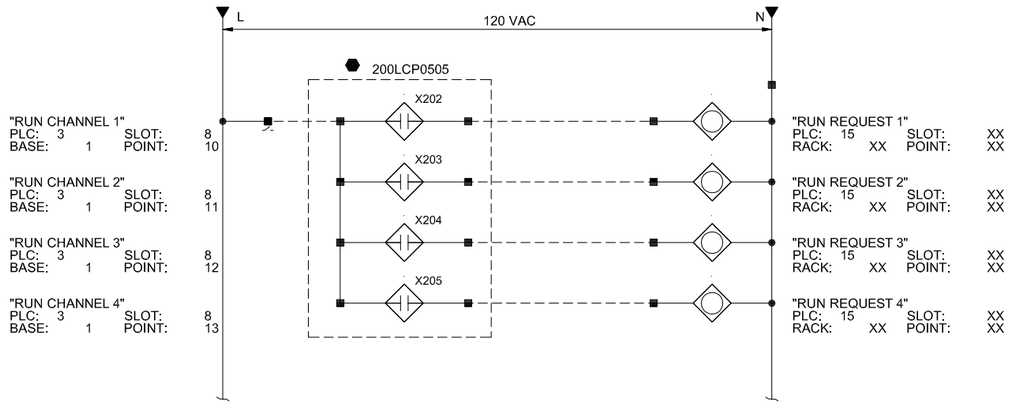
SHEET: 65 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-606

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PANEL
CP301



FIELD

RECORD DRAWINGS

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FILENAME: 008-I-607_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:19:22 PM

DRN: MEN	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JDK	DWG #: 008-I-607		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
DISCRETE
PEER PLC
HARDWIRED I/O

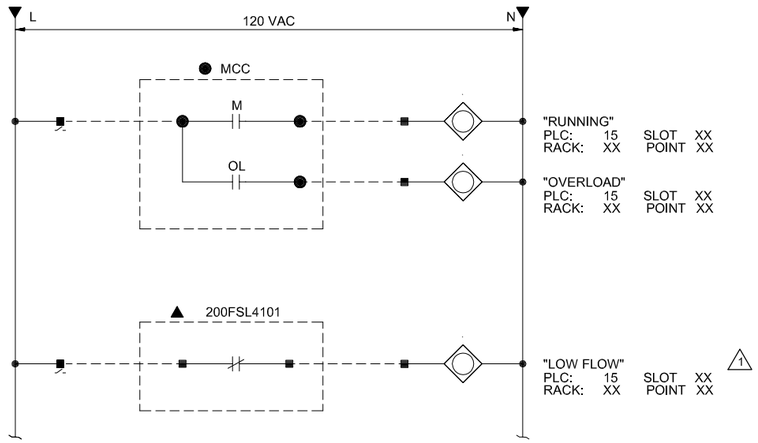
SHEET: 66 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #:
008-I-607

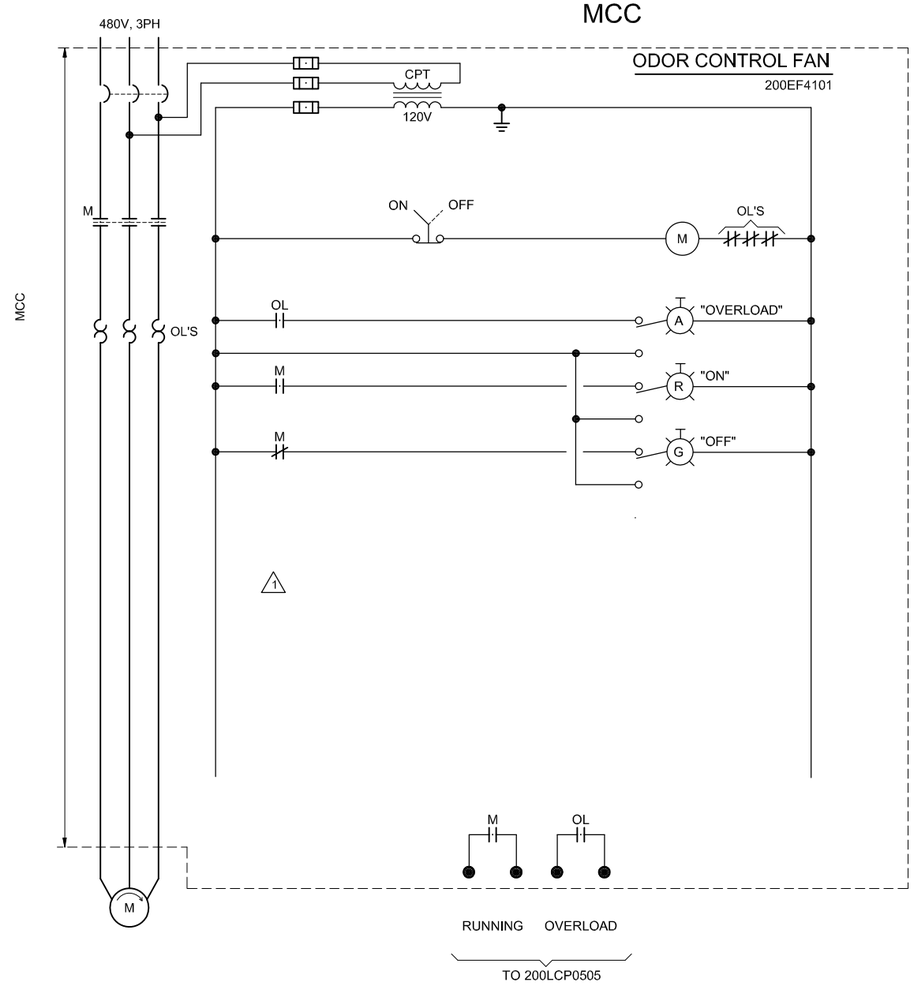
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

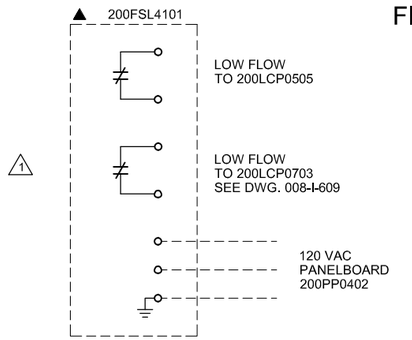
PANEL



MCC



FIELD



TAG	LOOP DESCRIPTION	PANEL
200EF4101	ODOR CONTROL FAN	200LCP0505

RECORD DRAWINGS

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REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	01/11	RH	LEC	WCD #2.1/CCR #5

DRN: MEN | ORIG DATE: FEB 2010
DSN: JDK | DWG #: 008-I-608
CHK: MSM | CAD FILE #:
APPD: LEC | SCALE: NONE

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
DISCRETE
ODOR CONTROL FAN

SHEET: 67 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

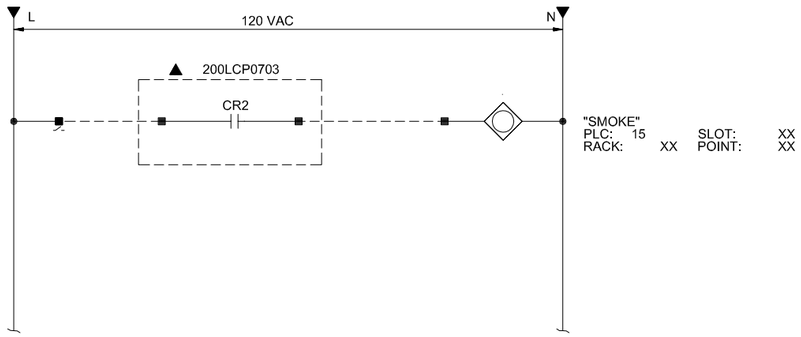
DWG #: 008-I-608

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

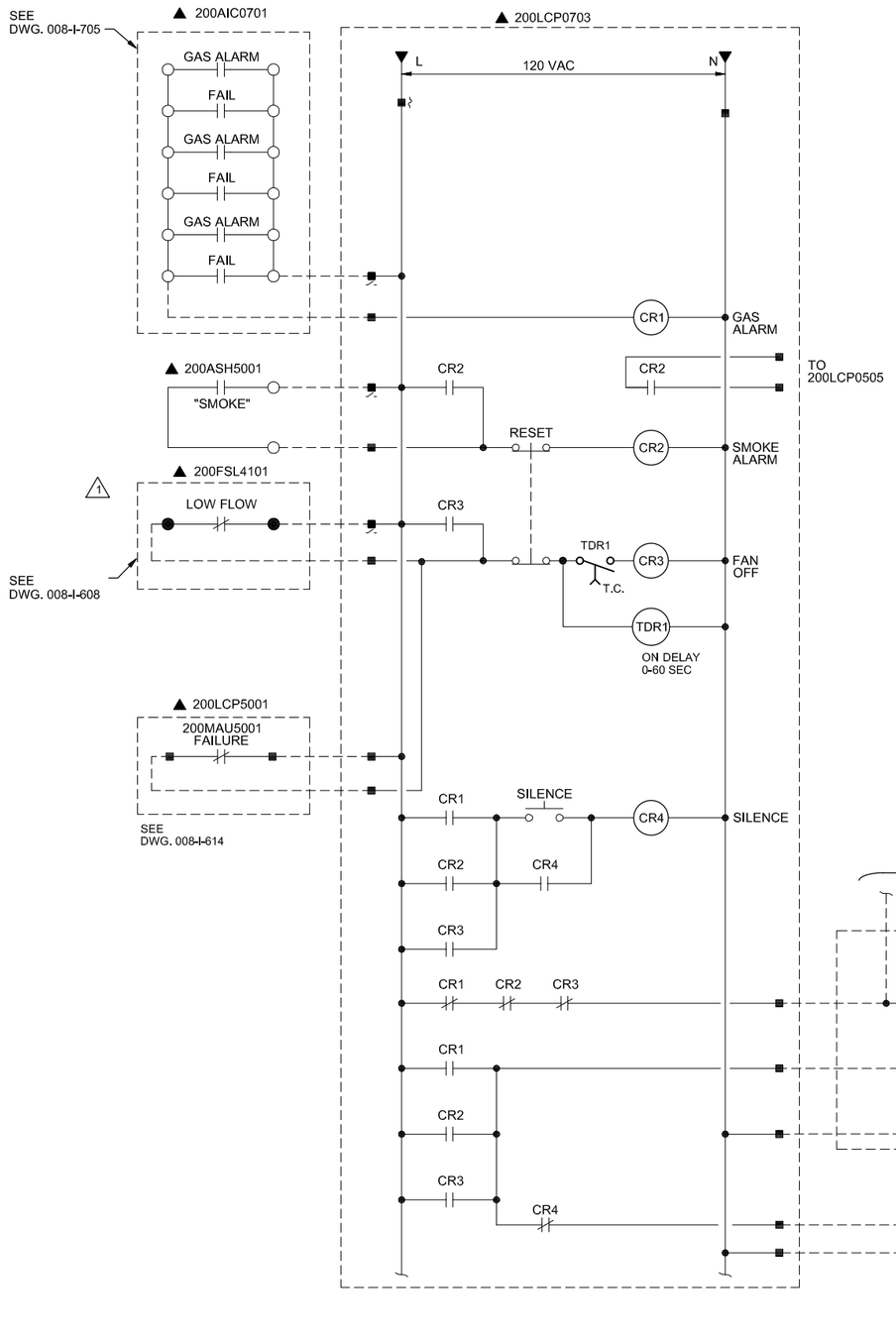
ENGR STAMP:

FILENAME: 008-I-608_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:19:30 PM

PANEL



FIELD



TAG	LOOP DESCRIPTION
200CS8501	GO / NO-GO STATION 1
200CS8502	GO / NO-GO STATION 2
200CS8503	GO / NO-GO STATION 3
200CS8504	GO / NO-GO STATION 4

RECORD DRAWINGS

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PLOT TIME: 1:19:38 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-609_391538.DWG

DRN: MEN	ORIG DATE: FEB 2010		
DSN: JDK	DWG #: 008-I-609		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	01/11	RH	LEC	WCD #2.1/CCR #5

Clean Water Services
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2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
DISCRETE
ENVIRONMENTAL SYSTEM
GO/NO-GO STATIONS

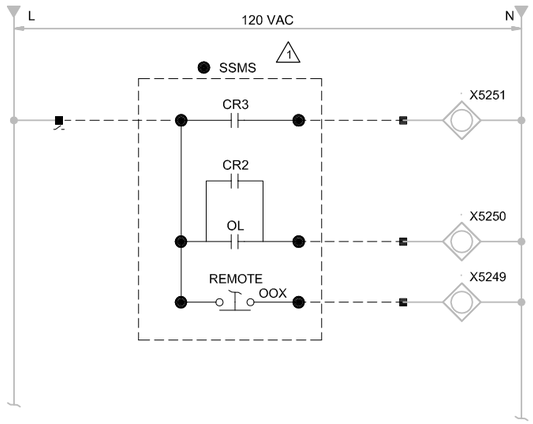
SHEET: 68 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-609

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PANEL



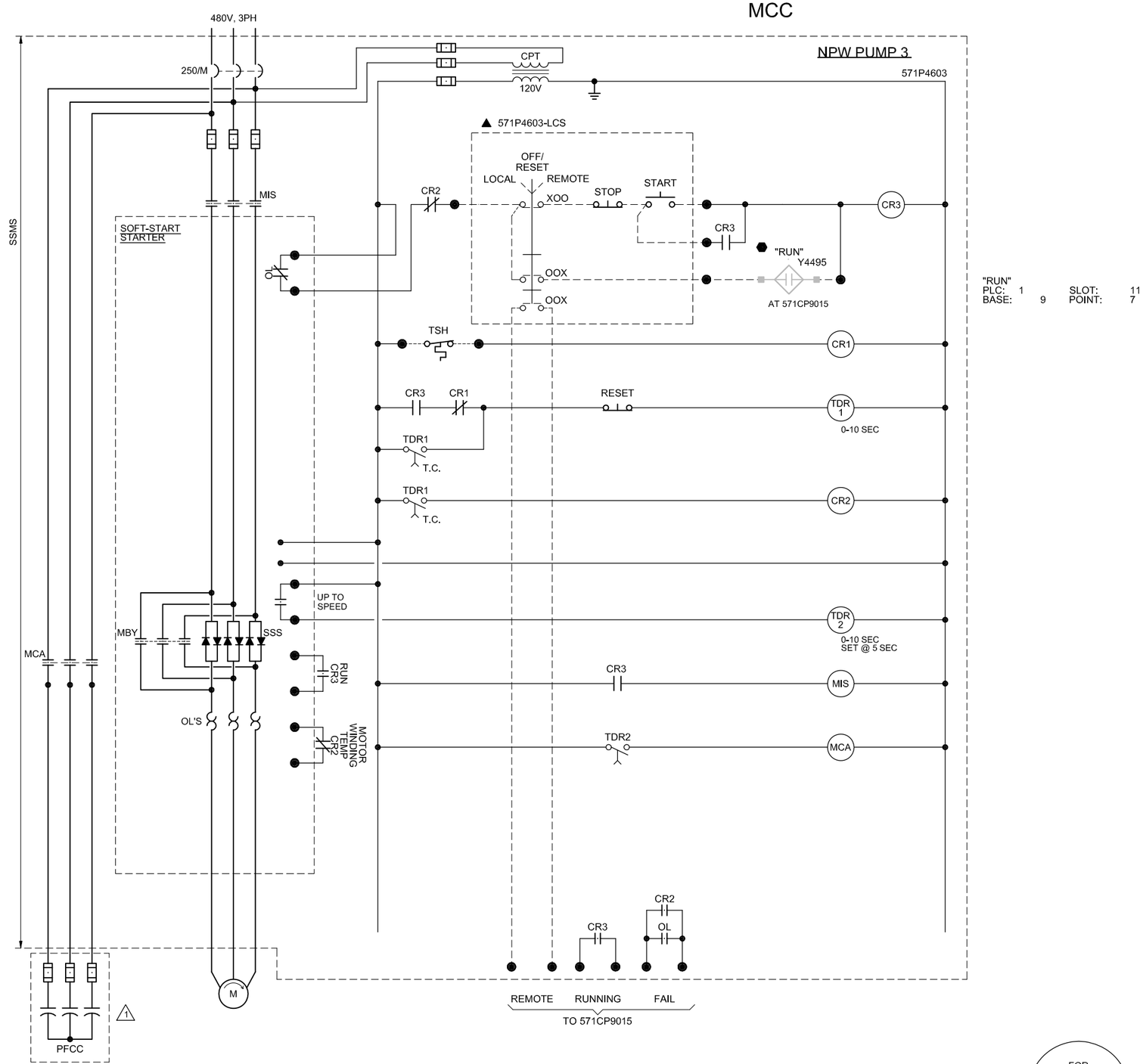
TAG	LOOP DESCRIPTION	PANEL
571P4603	NPW PUMP 3	571CP9015

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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MCC



PLOT TIME: 1:19:47 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-610_391538.DWG

DRN: MEN	ORIG. DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JDK	DWG #: 008-I-610		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	06/10	JDK	LEC	ADDENDUM NO. 1

Clean Water Services
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2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
DISCRETE
NPW PUMP

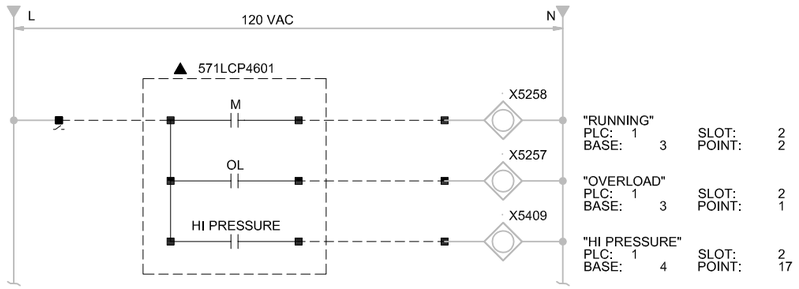
SHEET: 69 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-610

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PANEL



"RUNNING"
PLC: 1 SLOT: 2
BASE: 3 POINT: 2

"OVERLOAD"
PLC: 1 SLOT: 2
BASE: 3 POINT: 1

"HI PRESSURE"
PLC: 1 SLOT: 2
BASE: 4 POINT: 17

FIELD

TAG	LOOP DESCRIPTION	PANEL
571LCP4601	REUSE CLEARWELL NPW STRAINER	571CP9015

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 008-I-611_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:19:55 PM

DRN: MEN	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JDK	DWG #: 008-I-611		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
DISCRETE
NON-POTABLE
WATER STRAINER

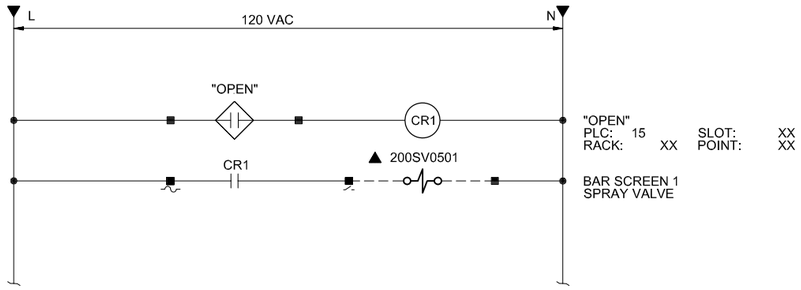
SHEET: 70 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-611

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PANEL



RECORD DRAWINGS

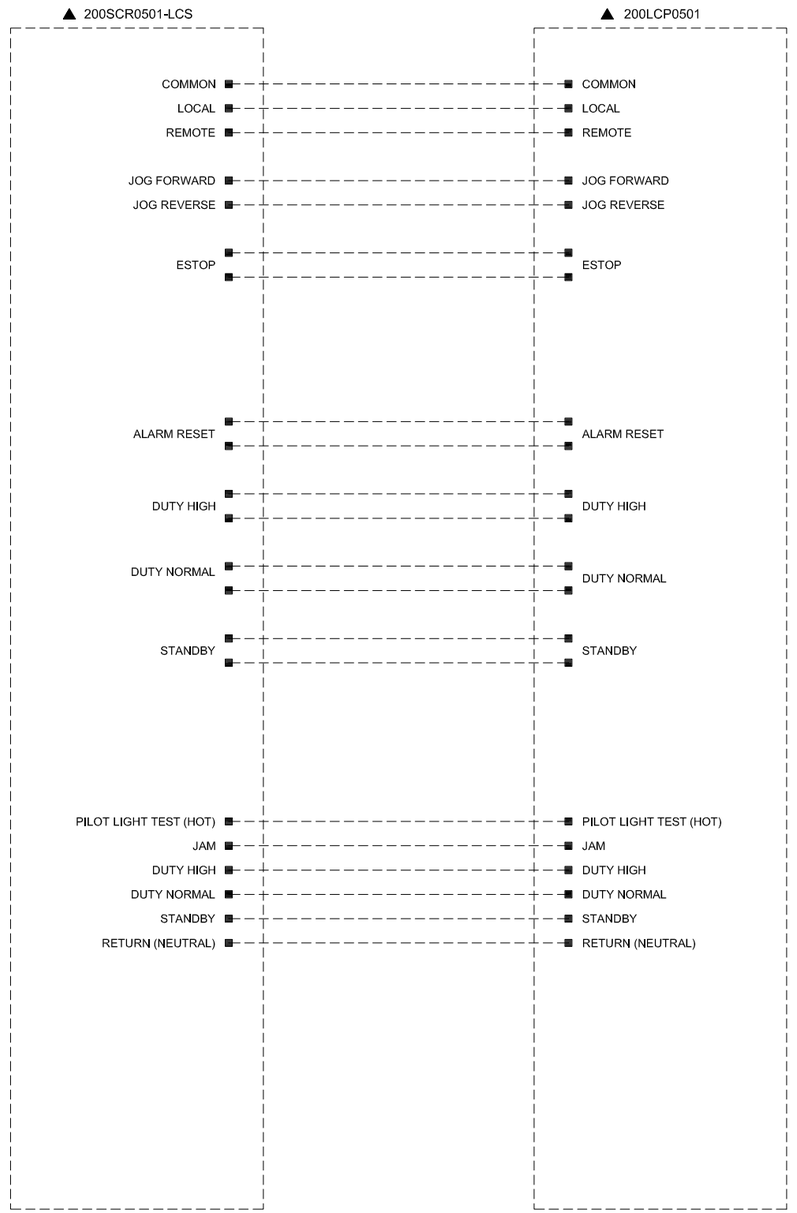
Revisions Drawn By E.R. BROWN Date JAN 2012

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TAG	LOOP DESCRIPTION	PANEL	RELAY
200SV0501	BAR SCREEN 1 SPRAY VALVE	200LCP0505	CR1
200SV0502	BAR SCREEN 2 SPRAY VALVE	200LCP0505	CR2
200SV0503	BAR SCREEN 3 SPRAY VALVE	200LCP0505	CR3
200SV0504	BAR SCREEN 4 SPRAY VALVE	200LCP0505	CR4

TAG	LOOP DESCRIPTION	LCS
200LCP0501	BAR SCREEN 1 CONTROL PANEL	200SCR0501-LCS
200LCP0502	BAR SCREEN 2 CONTROL PANEL	200SCR0502-LCS
200LCP0503	BAR SCREEN 3 CONTROL PANEL	200SCR0503-LCS
200LCP0504	BAR SCREEN 4 CONTROL PANEL	200SCR0504-LCS

FIELD



PLOT TIME: 1:20:03 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-612_391538.DWG

DRN: MEN	ORIG. DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JDK	DWG #: 008-I-612		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
DISCRETE
BAR SCREEN
CONTROL PANELS

SHEET: 71 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-612

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PANEL

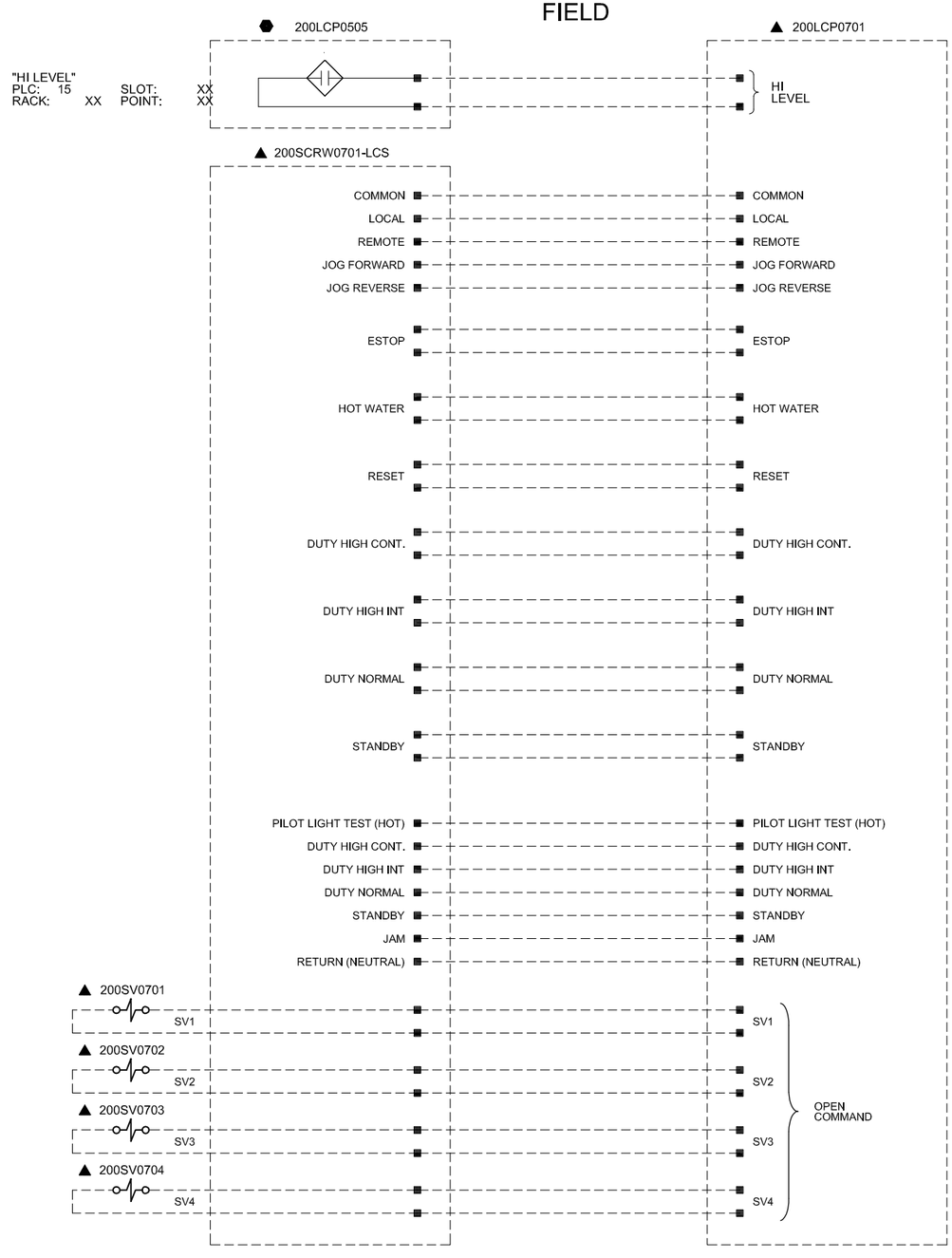
RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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TAG	LOOP DESCRIPTION	PANEL	LCS	SOLENOID VALVES
200LCP0701	WASHER / COMPACTOR 1 LCP	200LCP0505	200SCRW0701-LCS	200SV0701, -0702, -0703, -0704
200LCP0702	WASHER / COMPACTOR 2 LCP	200LCP0505	200SCRW0702-LCS	200SV0705, -0706, -0707, -0708

FIELD



PLOT TIME: 1:20:11 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-613_391538.DWG

DRN: MEN	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.			
DSN: JDK	DWG #: 008-I-613				
CHK: MSM	CAD FILE #:				
APPD: LEC	SCALE: NONE				
		REV #	DATE	DRN	APPD	DESCRIPTION
			01/12	ERB	LEC	RECORD DRAWING

CleanWater Services
Our commitment is clear
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
DISCRETE
WASHER/COMPACTOR
CONTROL PANELS

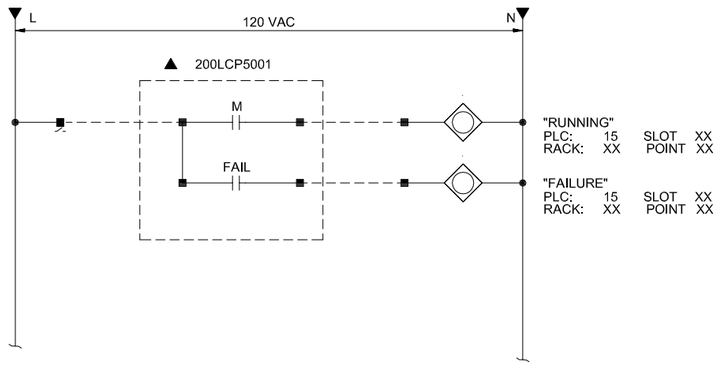
SHEET: 72 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-613

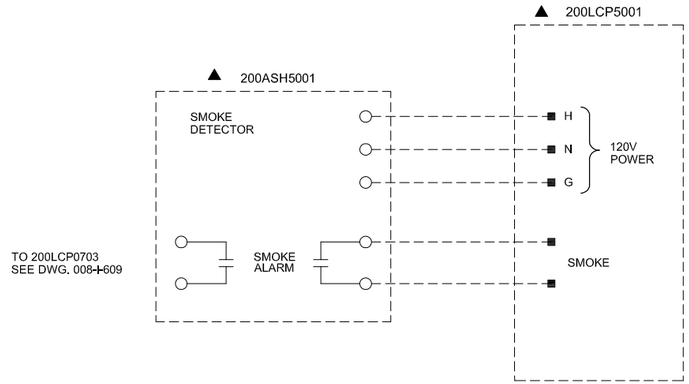
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PANEL



FIELD



TAG	LOOP DESCRIPTION	PANEL	DRAWING VARIANCE NOTES
200LCP5001	HEADWORKS BLDG. MAKEUP AIR UNIT 1	200LCP0505	N/A

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:20:20 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-614_391538.DWG

DRN: MEN	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JDK	DWG #: 008-I-614		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
DISCRETE
MAKEUP AIR UNIT

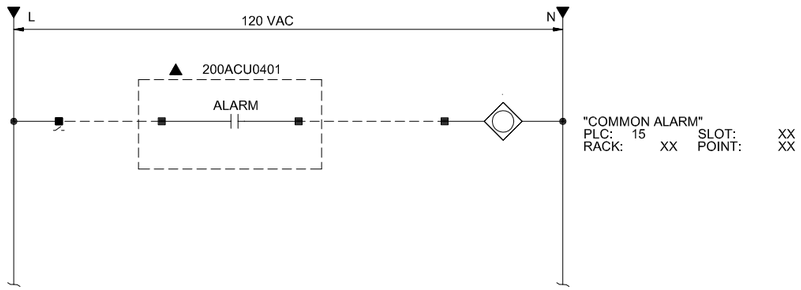
SHEET: 73 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-614

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PANEL



FIELD

TAG	LOOP DESCRIPTION	PANEL
200ACU0401	ELECTRICAL ROOM AIR CONDITIONING UNIT	200LCP0505

RECORD DRAWINGS

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FILENAME: 008-I-615_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:20:27 PM

DRN: MEN	ORIG DATE: FEB 2010		
DSN: JDK	DWG #: 008-I-615		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
DISCRETE
AIR CONDITIONING
UNIT

SHEET: 74 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

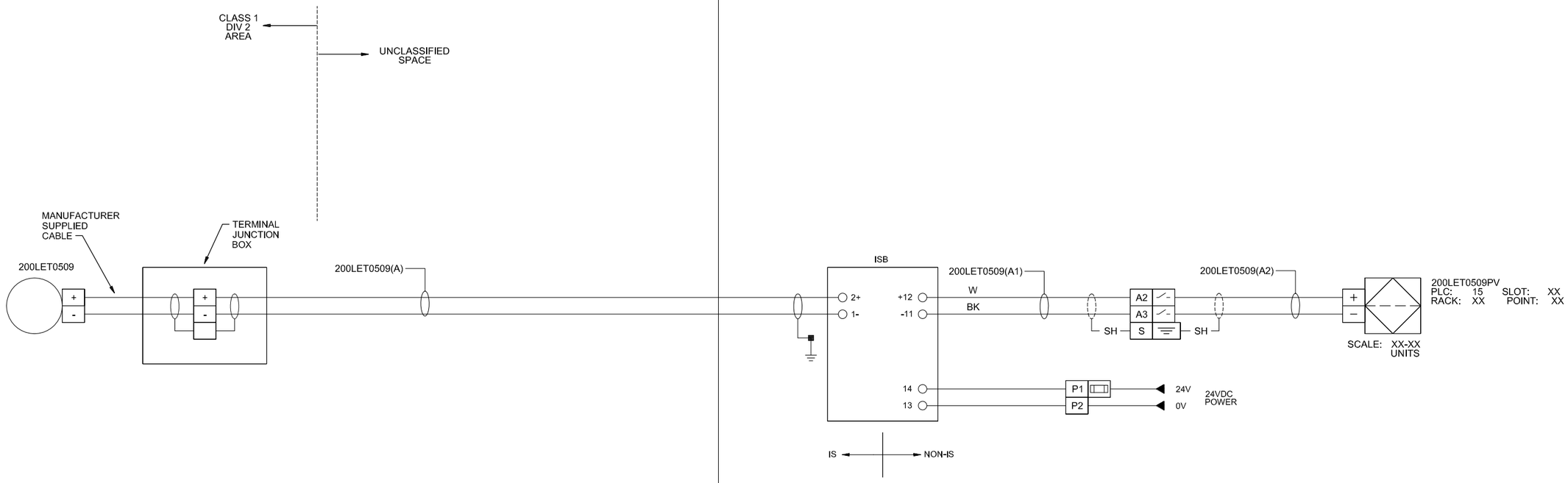
DWG #:
008-I-615

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FIELD

PANEL



TAG	LOOP DESCRIPTION	PANEL
200LET0509	INFLUENT UPWELL 1 LEVEL	200LCP0505
200LET0510	INFLUENT UPWELL 2 LEVEL	200LCP0505

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 008-I-701_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:20:36 PM

DRN: MEN	ORIG DATE: FEB 2010		
DSN: JDK	DWG #: 008-I-701		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
ANALOG
SUBMERSIBLE
LEVEL INSTRUMENTS

SHEET: 75 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

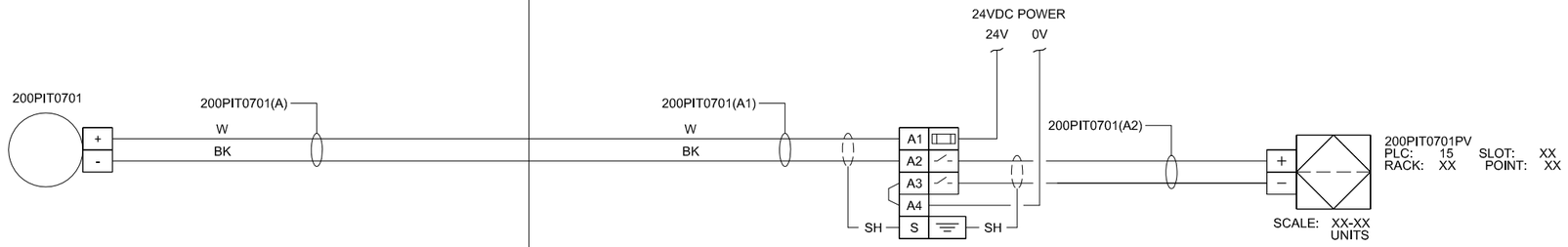
DWG #: 008-I-701

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FIELD

PANEL



TAG	LOOP DESCRIPTION	PANEL
200PIT0701	WASHER/COMPACTOR SPRAY WATER PRESSURE	200LCP0505
200DPIT4101	ODOR CONTROL FAN 1 DIFFERENTIAL PRESSURE	200LCP0505

RECORD DRAWINGS

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FILENAME: 008-I-702_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:20:43 PM

DRN: MEN	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JDK	DWG #: 008-I-702		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
ANALOG
PRESSURE INSTRUMENTS

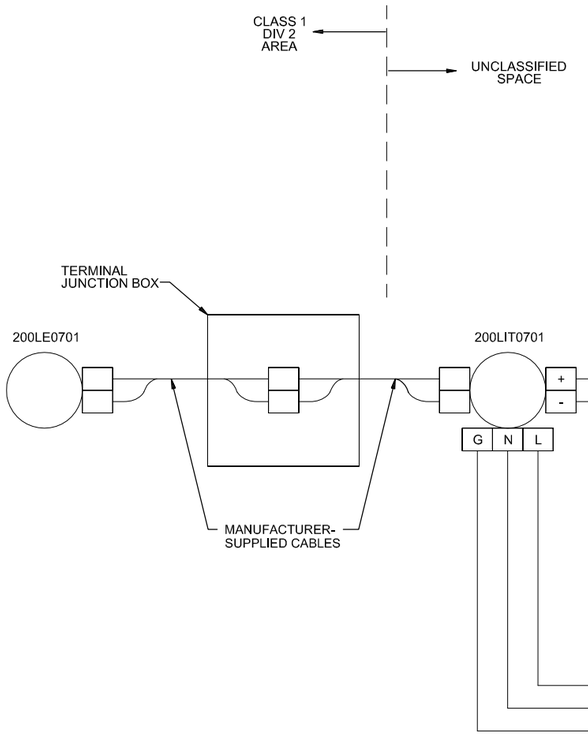
SHEET: 76 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-702

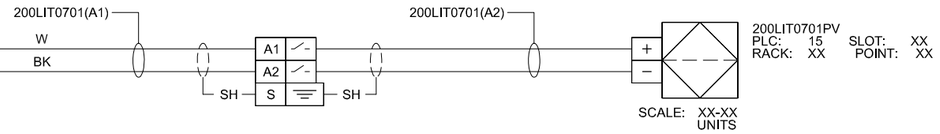
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FIELD



PANEL



PANELBOARD

LOOP	LOOP DESCRIPTION	PANEL	PANELBOARD	DAWING VARIANCE NOTES
200LIT0701	WASHER / COMPACTOR 1 LEVEL	200LCP0505	XXX	N/A
200LIT0702	WASHER / COMPACTOR 2 LEVEL	200LCP0505	XXX	N/A
200LE0501	BAR SCREEN 1 UPSTREAM LEVEL	200LCP0501	N/A	DLIT & POWER SOURCE IN LCP, ONE DLIT FOR 2 LE'S
200LE0502	BAR SCREEN 1 DOWNSTREAM LEVEL	200LCP0501	N/A	DLIT & POWER SOURCE IN LCP, ONE DLIT FOR 2 LE'S
200LE0503	BAR SCREEN 2 UPSTREAM LEVEL	200LCP0501	N/A	DLIT & POWER SOURCE IN LCP, ONE DLIT FOR 2 LE'S
200LE0504	BAR SCREEN 2 DOWNSTREAM LEVEL	200LCP0501	N/A	DLIT & POWER SOURCE IN LCP, ONE DLIT FOR 2 LE'S
200LE0505	BAR SCREEN 3 UPSTREAM LEVEL	200LCP0501	N/A	DLIT & POWER SOURCE IN LCP, ONE DLIT FOR 2 LE'S
200LE0506	BAR SCREEN 3 DOWNSTREAM LEVEL	200LCP0501	N/A	DLIT & POWER SOURCE IN LCP, ONE DLIT FOR 2 LE'S
200LE0507	BAR SCREEN 4 UPSTREAM LEVEL	200LCP0501	N/A	DLIT & POWER SOURCE IN LCP, ONE DLIT FOR 2 LE'S
200LE0508	BAR SCREEN 4 DOWNSTREAM LEVEL	200LCP0501	N/A	DLIT & POWER SOURCE IN LCP, ONE DLIT FOR 2 LE'S

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:20:52 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-703_391538.DWG

DRN: MEN	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	01/12	ERB	LEC	RECORD DRAWING
DSN: JDK	DWG #: 008-I-703		REV #	DATE	DRN	APPD	DESCRIPTION
CHK: MSM	CAD FILE #:						
APPD: LEC	SCALE: NONE						

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
ANALOG
ULTRASONIC LEVEL

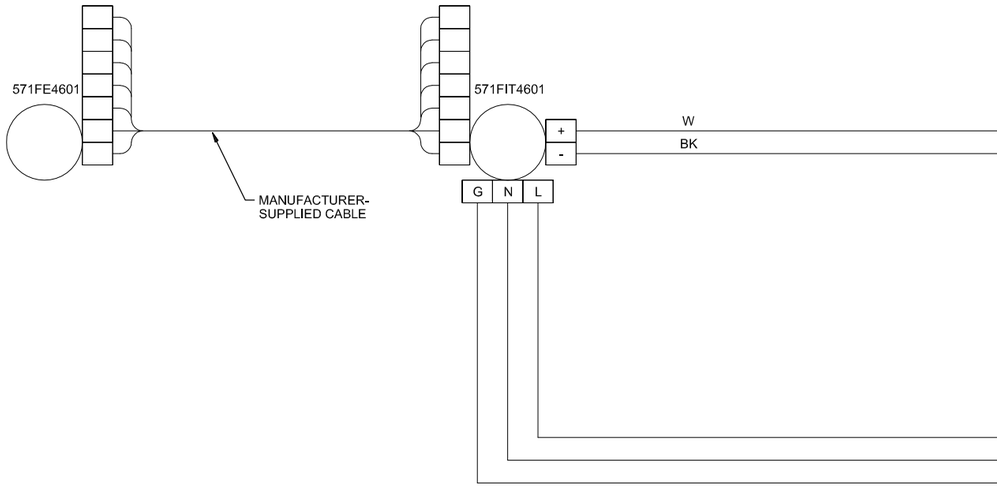
SHEET: 77 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #:
008-I-703

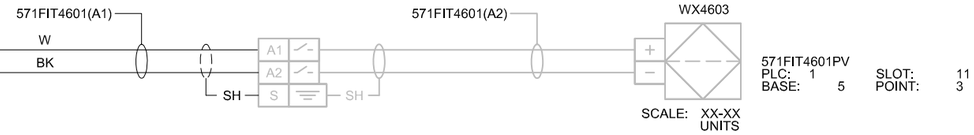
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

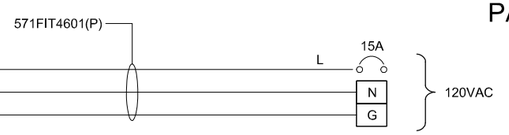
FIELD



PANEL



PANELBOARD



LOOP	LOOP DESCRIPTION	PANEL	PANELBOARD
571FIT4601	NON-POTABLE WATER FLOW RATE	571CP9015	XXX

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:21:00 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-704_391538.DWG

DRN: MEN	ORIG DATE: FEB 2010				
DSN: JDK	DWG #: 008-I-704				
CHK: MSM	CAD FILE #:				
APPD: LEC	SCALE: NONE				

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
TYPICAL WIRING DIAGRAM
ANALOG
ELECTROMAGNETIC
FLOW METER

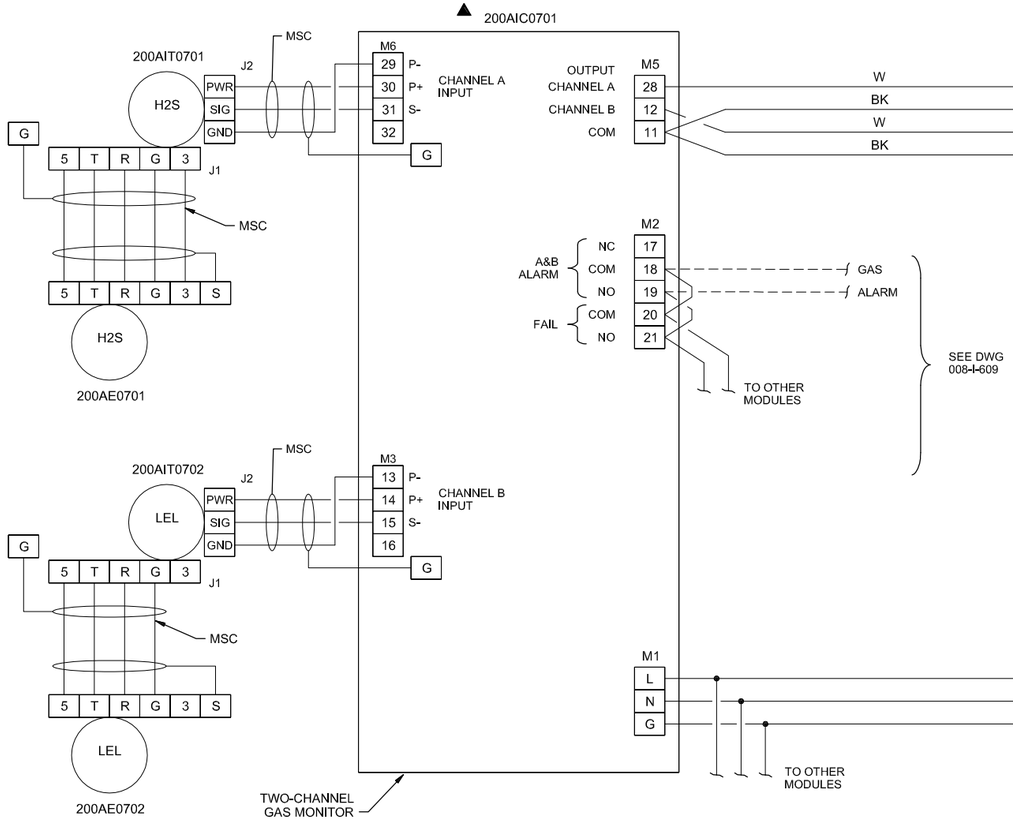
SHEET: 78 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-704

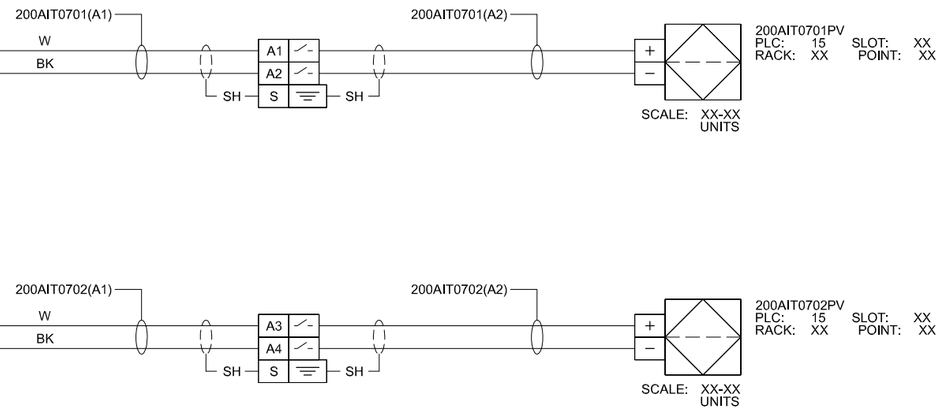
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

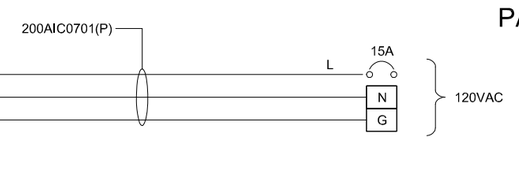
FIELD



PANEL



PANELBOARD



TAG	LOOP DESCRIPTION	MODULE / CHANNEL	PANEL
200AIT0701	COMPACTOR ROOM H2S	1/A	200LCP0505
200AIT0702	COMPACTOR ROOM LEL	1/B	200LCP0505
200AIT0703	GRIT STORAGE ROOM H2S	2/A	200LCP0505
200AIT0704	GRIT STORAGE ROOM LEL	2/B	200LCP0505
200AIT0705	SCREENINGS ROOM H2S	3/A	200LCP0505
200AIT0706	SCREENINGS ROOM LEL	3/B	200LCP0505

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:21:08 PM
PLOT DATE: 05-26-2012
FILENAME: 008-I-705_391538.DWG

DRN: MEN	ORIG DATE: FEB 2010		
DSN: JDK	DWG #: 008-I-705		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

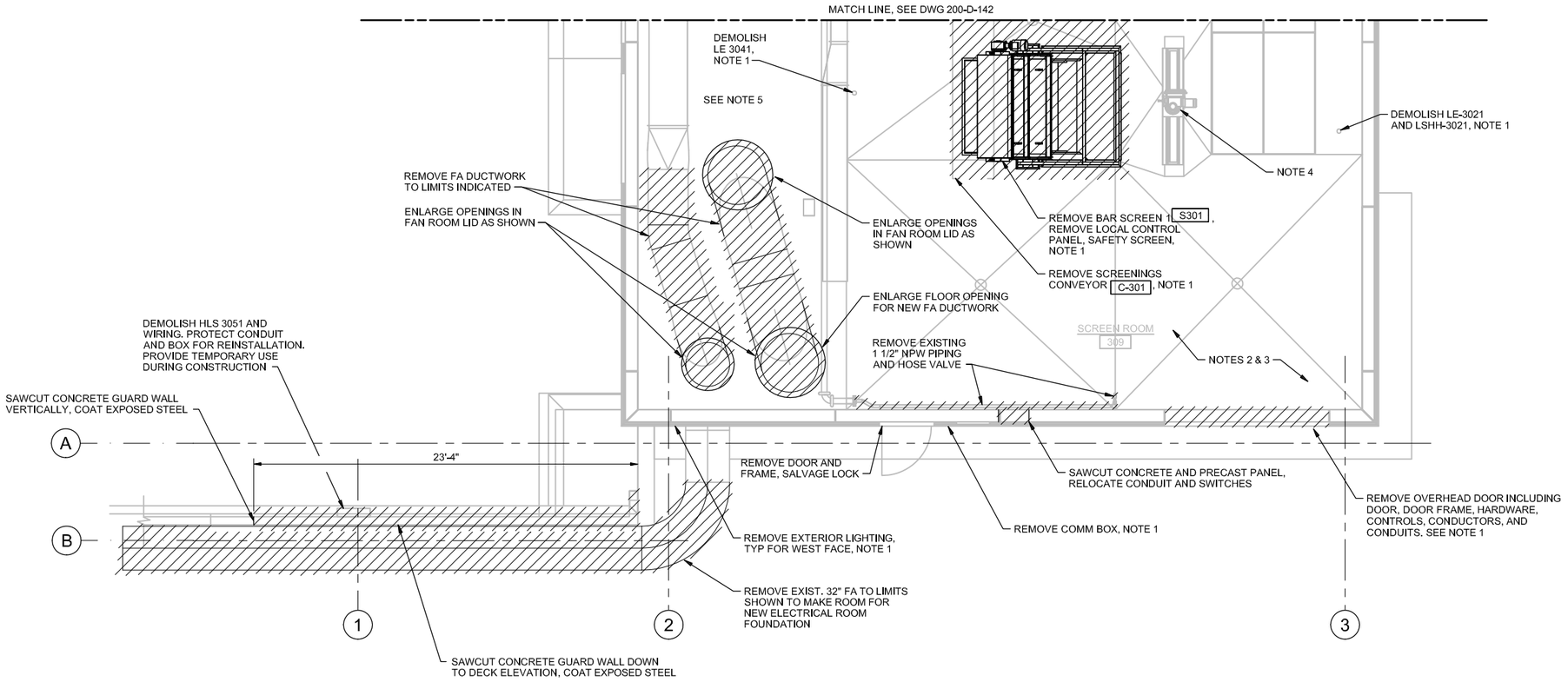
SHEET TITLE:
TYPICAL WIRING DIAGRAM
ANALOG
GAS DETECTION

SHEET: 79 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 008-I-705

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



WEST PLAN

1/4"=1'-0"

NOTES:

1. DEMOLISH ALL WIRING AND EXPOSED CONDUIT TO INDICATED EQUIPMENT BACK TO SOURCE. REMOVE ANY ASSOCIATED CONTROLS AND DISCONNECTS ASSOCIATED WITH EQUIPMENT BEING DEMOLISHED. CUT CONDUIT FLUSH WHERE CONCEALED AND GROUT FULL.
2. DEMOLISH ALL EXISTING INTERIOR LIGHTING IN SCREEN ROOM. ALL EMERGENCY "BUG EYE" AND EXIT SIGNS SHALL REMAIN, EXCEPT THOSE LOCATED ON WEST WALL. SEE NOTE 1.
3. ALL RECEPTACLES IN SCREEN ROOM SHALL REMAIN, EXCEPT THOSE LOCATED ON WEST INTERIOR AND EXTERIOR WALLS SHALL BE DEMOLISHED. SEE NOTE 1.
4. PROTECT ELECTRICAL POWER CONNECTION AT GATE TO REMAIN. DEMOLISH CONTROL WIRING CONDUIT. SEE NOTE 1.
5. REMOVE ODOR CONTROL FAN, INTAKE DUCTWORK, DISCHARGE DUCTWORK, AND POWER WIRING AND CONDUIT BACK TO SOURCE, SEE 200-H-401 FOR DETAILS.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-D-141_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:22:01 PM

DRN: ERB	ORIG DATE: MAY 2010					
DSN: GVT	DWG #: 200-D-141					
CHK: JEG	CAD FILE #:					
APPD: LEC	SCALE: 1/4"=1'-0"					
		REV #	DATE	DRN	APPD	DESCRIPTION
			01/12	ERB	LEC	RECORD DRAWING

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
DEMOLITION
WEST PLAN

SHEET: 80 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

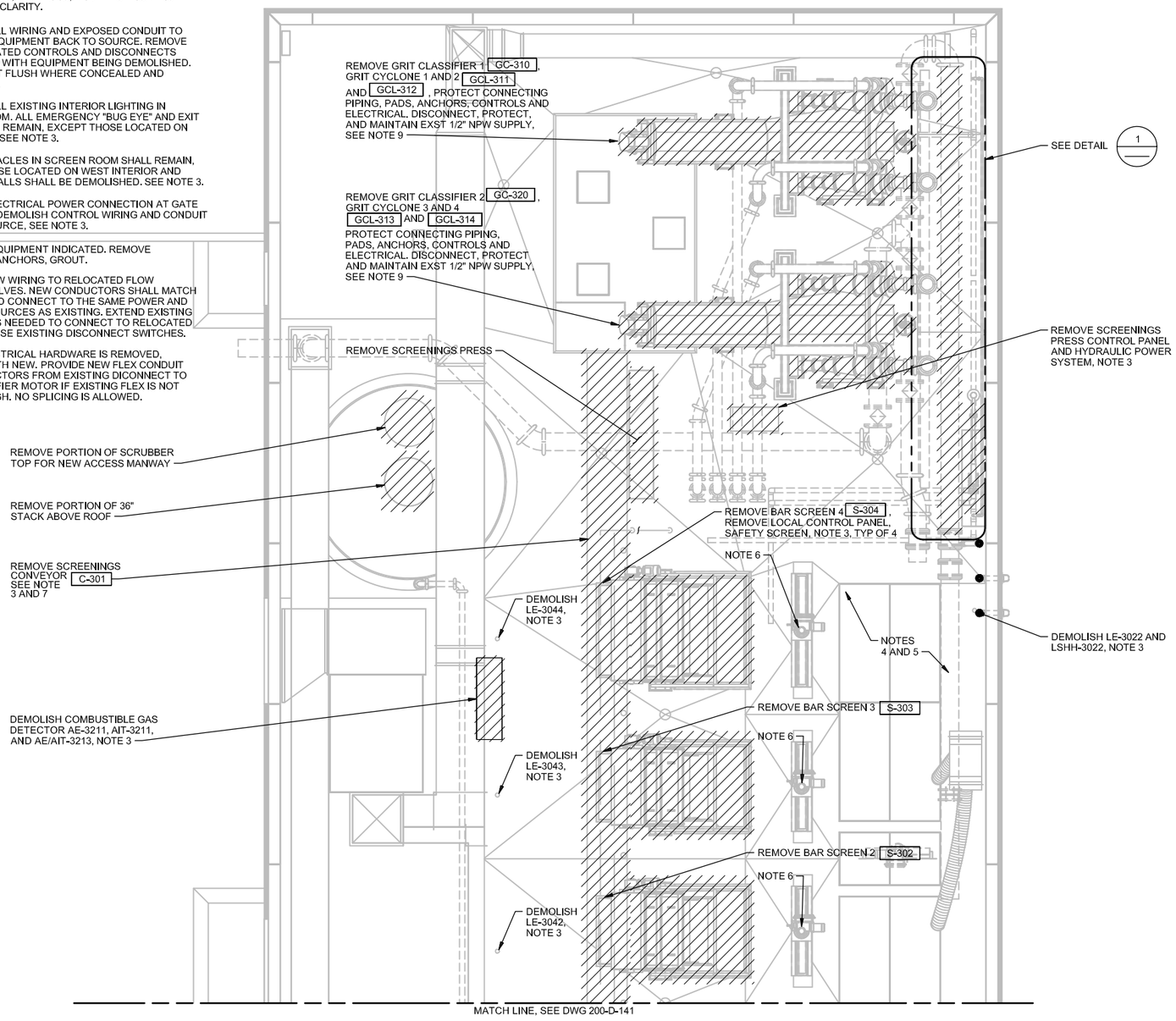
DWG #: 200-D-141

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

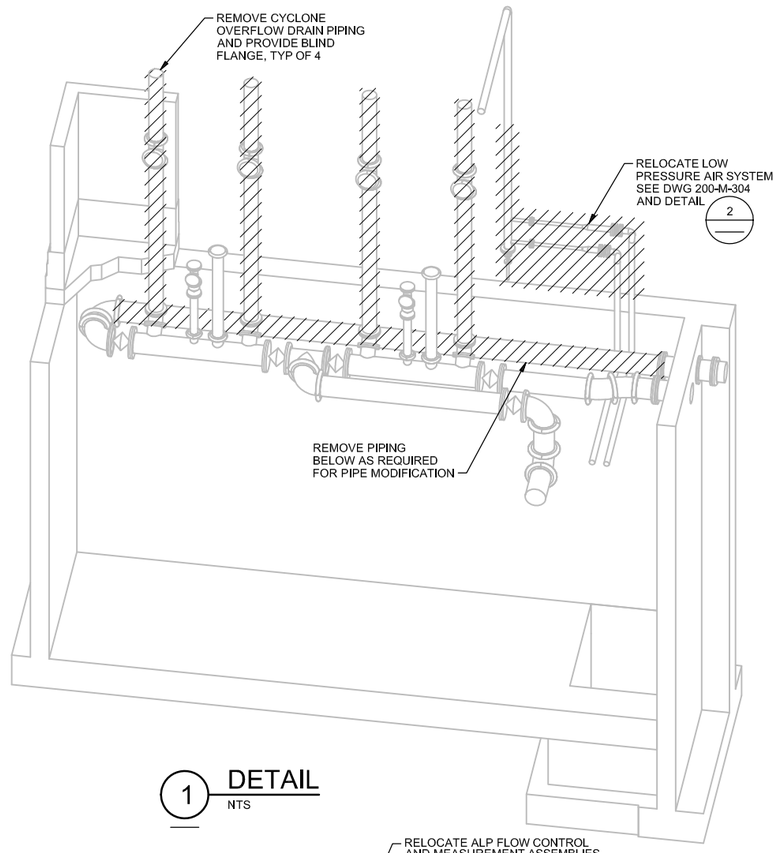
ENGR STAMP:

NOTES:

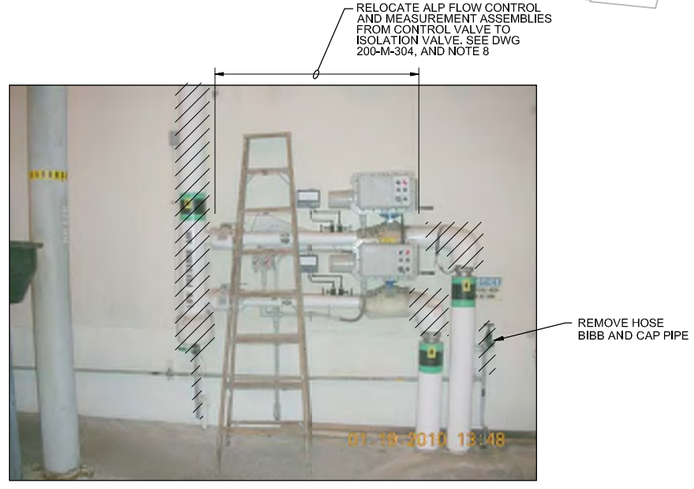
1. STRUCTURAL FLOOR AND WALLS SHOWN CUT AWAY FOR CLARITY.
2. EXISTING HVAC, PLUMBING, AND ELECTRICAL NOT SHOWN FOR CLARITY.
3. DEMOLISH ALL WIRING AND EXPOSED CONDUIT TO INDICATED EQUIPMENT BACK TO SOURCE. REMOVE ANY ASSOCIATED CONTROLS AND DISCONNECTS ASSOCIATED WITH EQUIPMENT BEING DEMOLISHED. CUT CONDUIT FLUSH WHERE CONCEALED AND GROUT FULL.
4. DEMOLISH ALL EXISTING INTERIOR LIGHTING IN SCREEN ROOM. ALL EMERGENCY "BUG EYE" AND EXIT SIGNS SHALL REMAIN, EXCEPT THOSE LOCATED ON WEST WALL. SEE NOTE 3.
5. ALL RECEPTACLES IN SCREEN ROOM SHALL REMAIN, EXCEPT THOSE LOCATED ON WEST INTERIOR AND EXTERIOR WALLS SHALL BE DEMOLISHED. SEE NOTE 3.
6. PROTECT ELECTRICAL POWER CONNECTION AT GATE TO REMAIN. DEMOLISH CONTROL WIRING AND CONDUIT BACK TO SOURCE, SEE NOTE 3.
7. DEMOLISH EQUIPMENT INDICATED. REMOVE SUPPORTS, ANCHORS, GROUT.
8. PROVIDE NEW WIRING TO RELOCATED FLOW CONTROL VALVES. NEW CONDUCTORS SHALL MATCH EXISTING AND CONNECT TO THE SAME POWER AND CONTROL SOURCES AS EXISTING. EXTEND EXISTING CONDUITS AS NEEDED TO CONNECT TO RELOCATED VALVES. REUSE EXISTING DISCONNECT SWITCHES.
9. WHERE ELECTRICAL HARDWARE IS REMOVED, REPLACE WITH NEW. PROVIDE NEW FLEX CONDUIT AND CONDUCTORS FROM EXISTING DICONNECT TO NEW CLASSIFIER MOTOR IF EXISTING FLEX IS NOT LONG ENOUGH. NO SPLICING IS ALLOWED.



EAST PLAN
1/4"=1'-0"



1 DETAIL
NTS



2 DETAIL
NTS

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-D-142_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:22:13 PM

DRN: BRL	ORIG DATE: MAY 2010		
DSN: GVT	DWG #: 200-D-142		
CHK: JEG	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

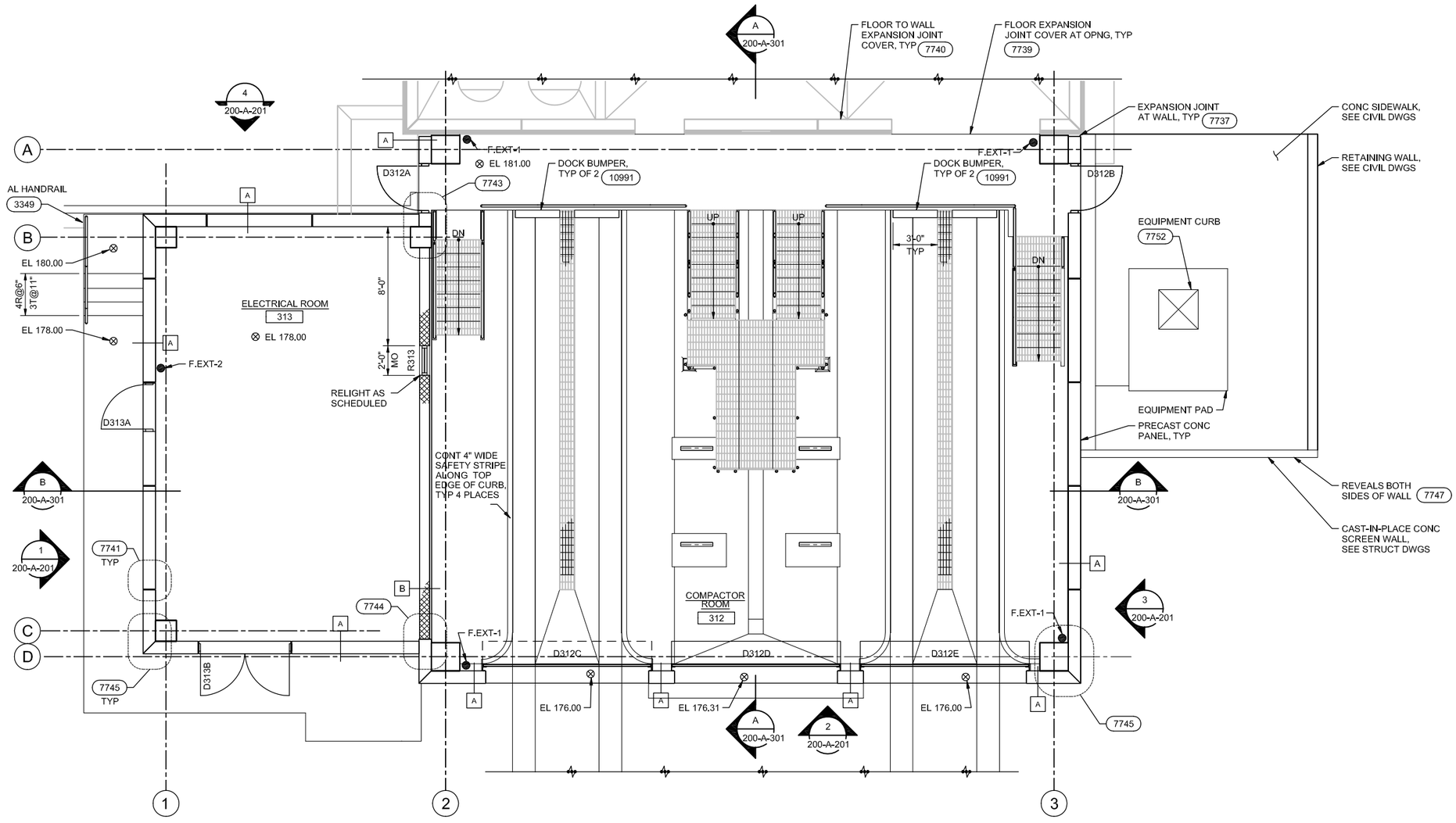
SHEET TITLE:
HEADWORKS
DEMOLITION
EAST PLAN

SHEET: 81 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-D-142

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



FLOOR PLAN

1/4"=1'-0"

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-A-141_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:21:18 PM

DRN: SDB	ORIG DATE: MAY 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: BPT	DWG #: 200-A-141		
CHK: JEC	CAD FILE #:		
APPD: LEC	SCALE: 1/4" = 1'-0'		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

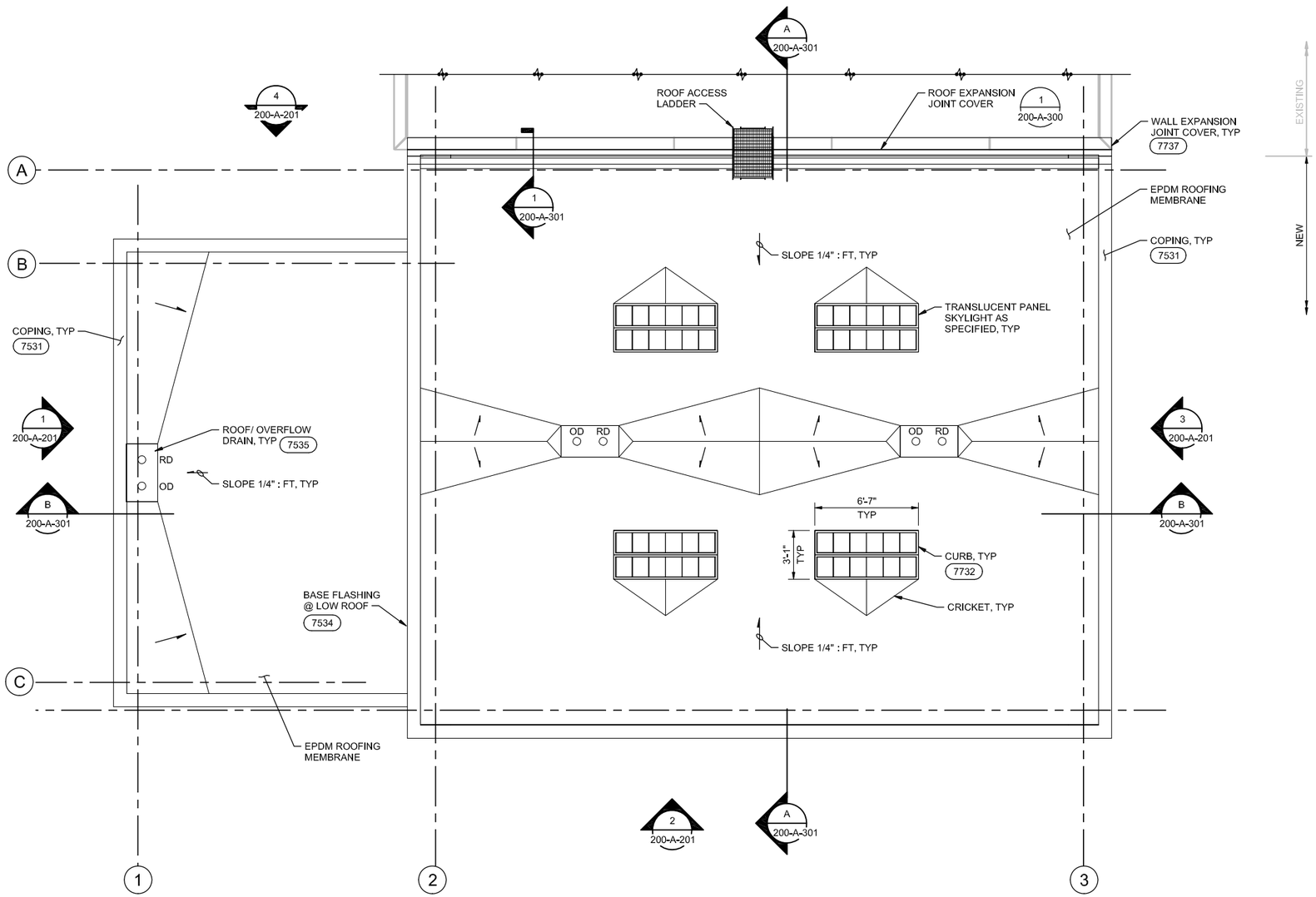
SHEET TITLE: HEADWORKS ARCHITECTURAL FLOOR PLAN WEST

SHEET: 82 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-A-141

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



ROOF PLAN

1/4"=1'-0"

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-A-151_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:21:29 PM

DRN: SDB	ORIG DATE: MAY 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: BPT	DWG #: 200-A-151		
CHK: JEC	CAD FILE #:		
APPD: LEC	SCALE: 1/4" = 1'-0"		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services — Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

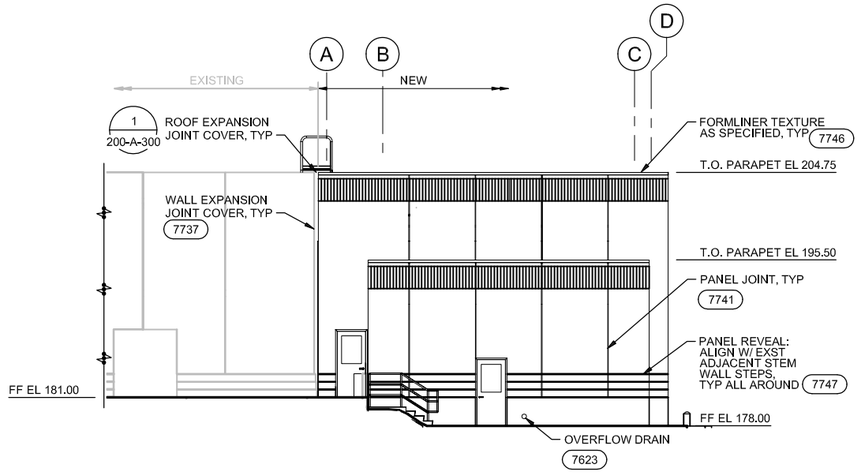
SHEET TITLE: HEADWORKS ARCHITECTURAL ROOF PLAN

SHEET: 83 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-A-151

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

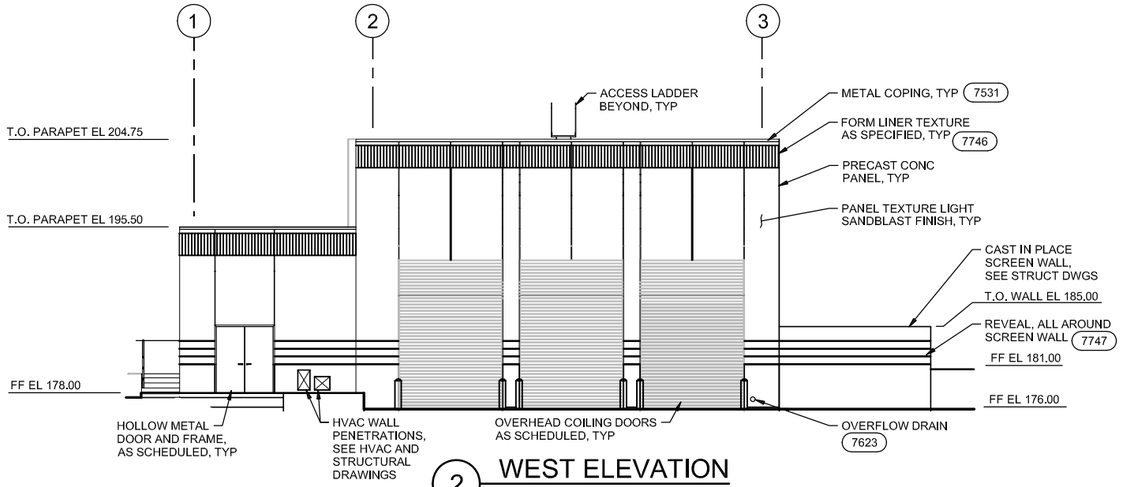
ENGR STAMP:



1 PARTIAL NORTH ELEVATION

1/8"=1'-0"

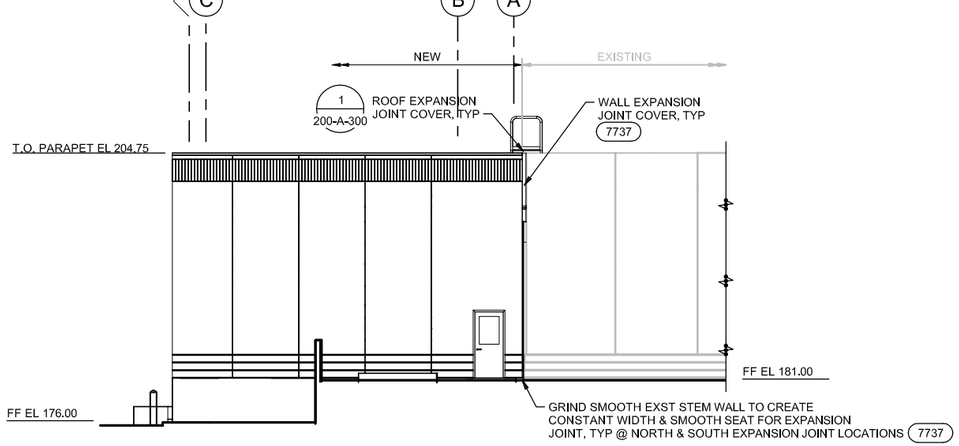
200-A-141
200-A-151



2 WEST ELEVATION

1/8"=1'-0"

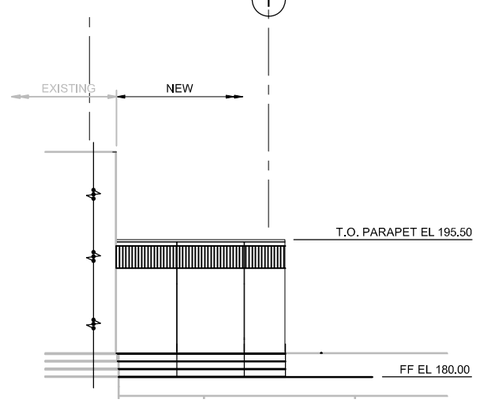
200-A-141
200-A-151



3 PARTIAL SOUTH ELEVATION

1/8"=1'-0"

200-A-141
200-A-151



4 PARTIAL EAST ELEVATION

1/8"=1'-0"

200-A-141
200-A-151

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-A-201_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:21:39 PM

DRN: SDB	ORIG DATE: XXX 2009	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: BPT	DWG #: 200-A-201		
CHK: JEC	CAD FILE #:		
APPD: LEC	SCALE: 1/8" = 1'-0'		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services — Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

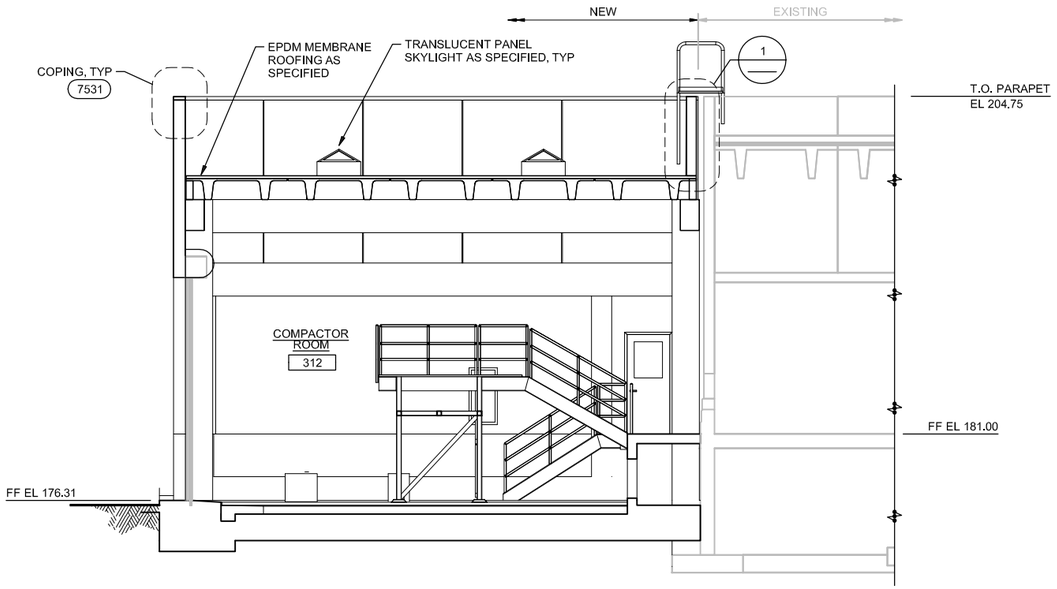
SHEET TITLE: HEADWORKS ARCHITECTURAL EXTERIOR ELEVATIONS

SHEET: 84 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

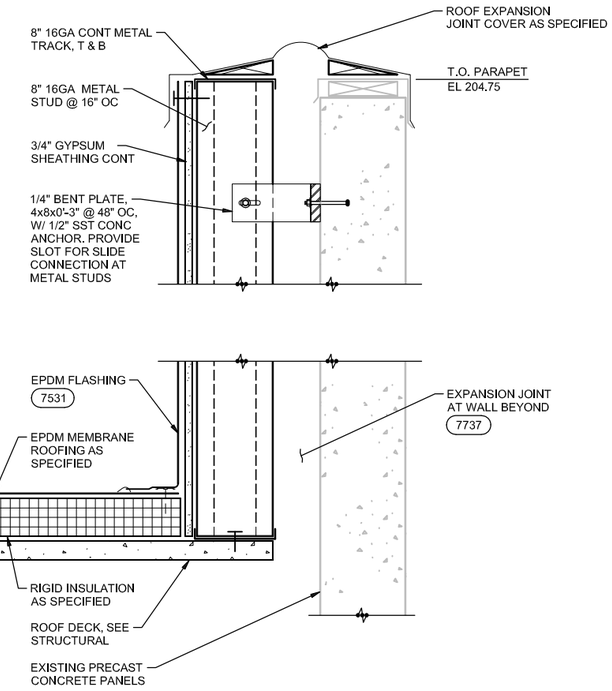
DWG #: 200-A-201

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

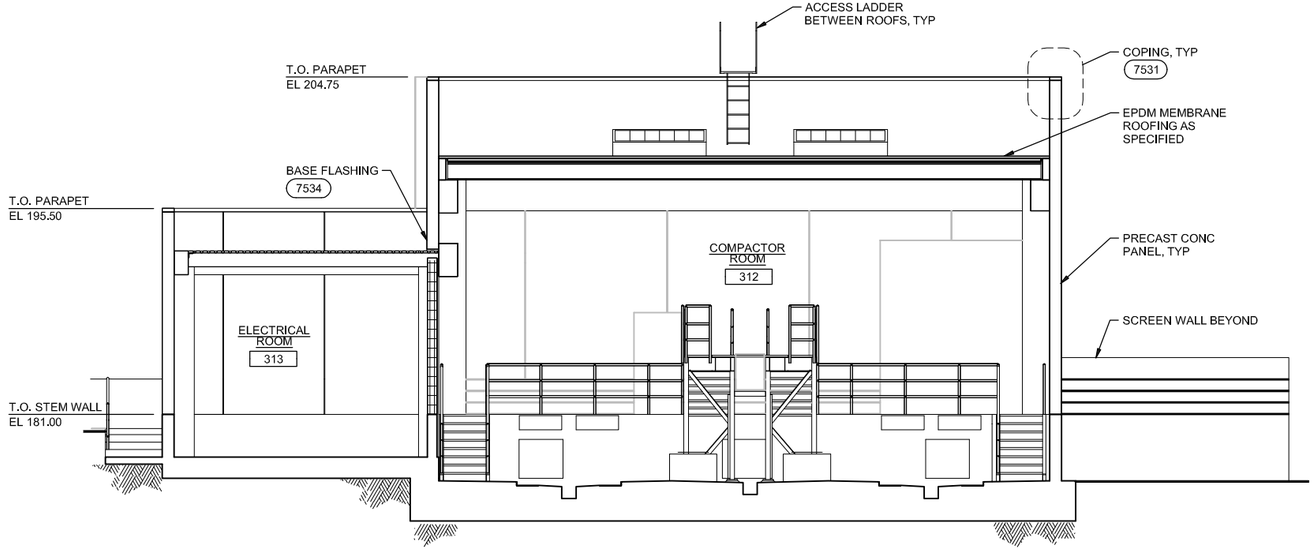
ENGR STAMP:



A SECTION
3/16"=1'-0"
200-A-141
200-A-151



1 SECTION AT PARAPET
1 1/2"=1'-0"
200-A-151



B SECTION
3/16"=1'-0"
200-A-141
200-A-151

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-A-301_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:21:50 PM

DRN: SDB	ORIG DATE: MAY 2010		
DSN: BPT	DWG #: 200-A-300		
CHK: JEC	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

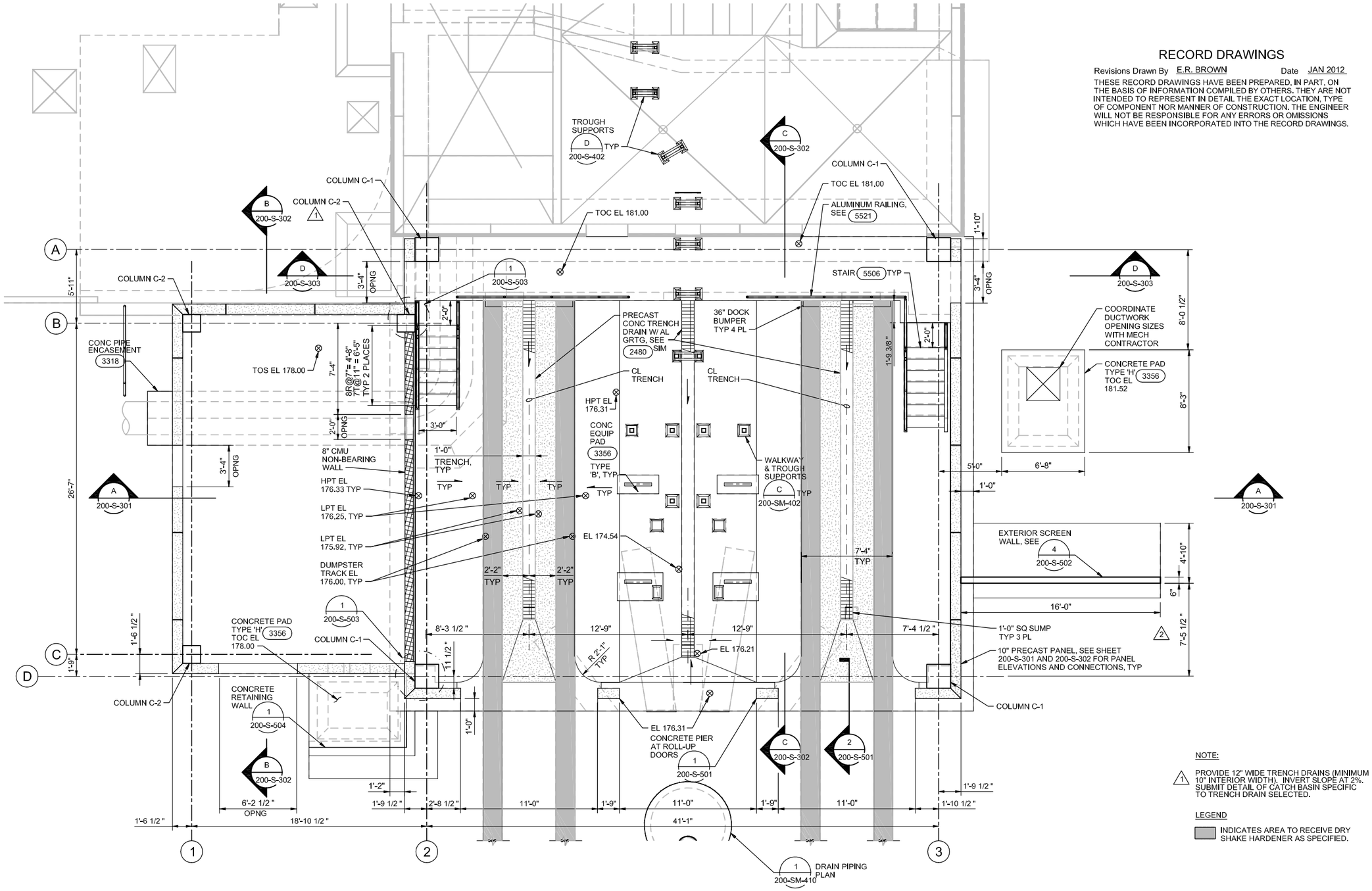
SHEET TITLE:
HEADWORKS
ARCHITECTURAL
SECTIONS

SHEET: 85 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-A-301

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



MAIN FLOOR PLAN

1/4"=1'-0"

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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NOTE:

1 PROVIDE 12" WIDE TRENCH DRAINS (MINIMUM 10" INTERIOR WIDTH). INVERT SLOPE AT 2%. SUBMIT DETAIL OF CATCH BASIN SPECIFIC TO TRENCH DRAIN SELECTED.

LEGEND

INDICATES AREA TO RECEIVE DRY SHAKE HARDENER AS SPECIFIED.

PLOT TIME: 1:28:34 PM
PLOT DATE: 05-26-2012
FILENAME: 200-S-140_391538.DWG

DRN: MLR	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: ALF	DWG #: 200-S-140		
CHK: BSH	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
2	10/10	HFJ	ALF	MODIFICATIONS FROM RFI #18
1	06/10	ALF	LEC	ADDENDUM NO. 2

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CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: HEADWORKS STRUCTURAL MAIN FLOOR PLAN

SHEET: 86 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-S-140

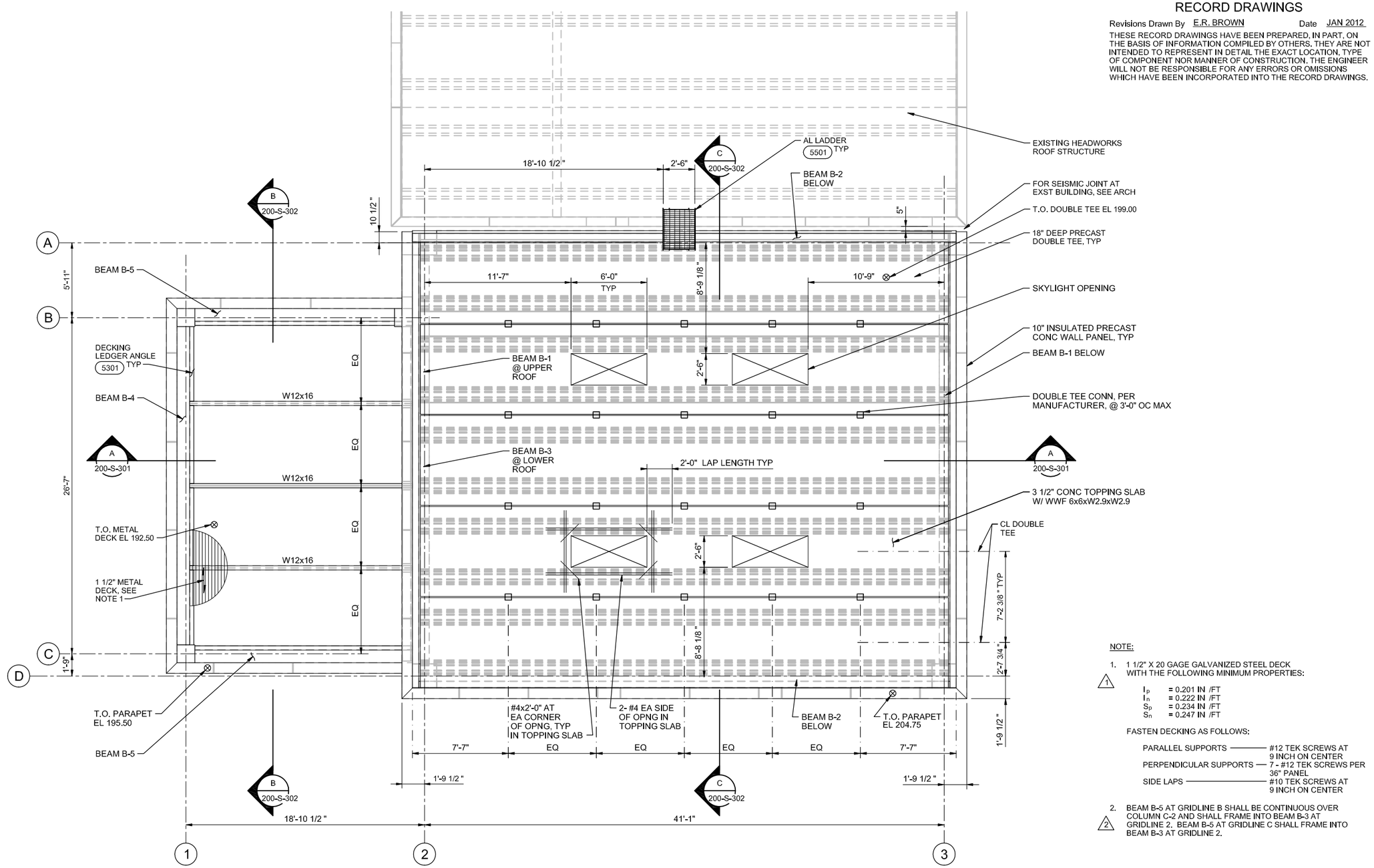
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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NOTE:

1. 1 1/2" X 20 GAGE GALVANIZED STEEL DECK WITH THE FOLLOWING MINIMUM PROPERTIES:

   1

   I_p = 0.201 IN /FT
   I_n = 0.222 IN /FT
   S_p = 0.234 IN /FT
   S_n = 0.247 IN /FT

   FASTEN DECKING AS FOLLOWS:

   PARALLEL SUPPORTS — #12 TEK SCREWS AT 9 INCH ON CENTER
   PERPENDICULAR SUPPORTS — 7 - #12 TEK SCREWS PER 36" PANEL
   SIDE LAPS — #10 TEK SCREWS AT 9 INCH ON CENTER

2. BEAM B-5 AT GRIDLINE B SHALL BE CONTINUOUS OVER COLUMN C-2 AND SHALL FRAME INTO BEAM B-3 AT GRIDLINE 2. BEAM B-5 AT GRIDLINE C SHALL FRAME INTO BEAM B-3 AT GRIDLINE 2.

ROOF PLAN

1/4"=1'-0"

PLOT TIME: 1:28:44 PM
PLOT DATE: 05-26-2012
FILENAME: 200-S-150_391538.DWG

DRN: MLR	ORIG DATE: FEB 2010	PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS	SHEET TITLE: HEADWORKS STRUCTURAL ROOF PLAN
DSN: AF	DWG #: 200-S-150		
CHK: BH	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
2	06/10	ALF	LEC	ADDENDUM NO. 2
1	06/10	ALF	LEC	ADDENDUM NO. 1

Clean Water Services — Our commitment is clear
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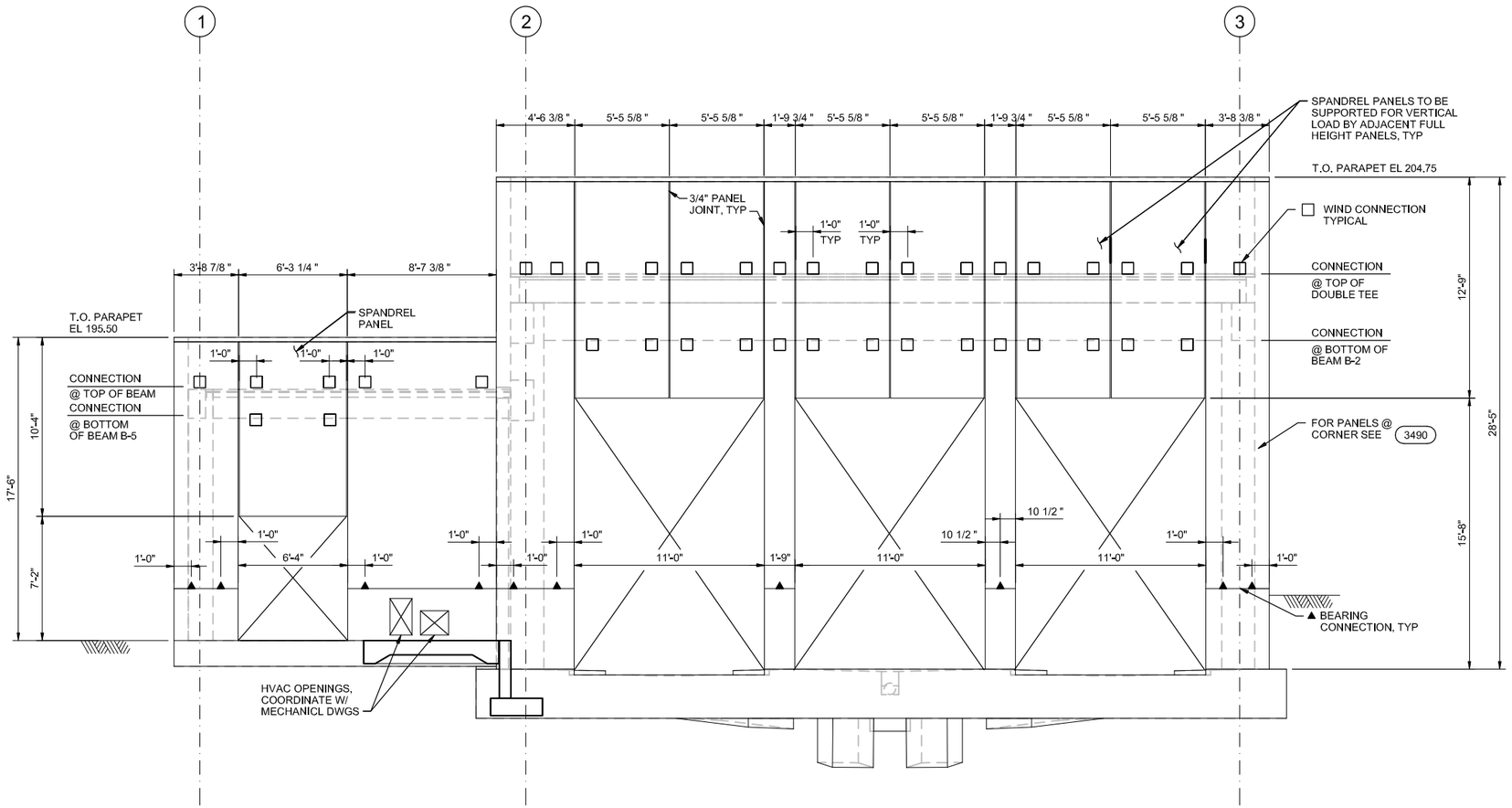
CH2MHILL

SHEET: 87 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-S-150

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



NOTE :

FOR PANEL CONNECTIONS SEE 200-S-501.

A PRECAST PANEL WEST ELEVATION AT GRID LINE D

1/4"=1'-0""

1 200-S-140
200-S-150

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-S-201_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:28:52 PM

DRN: MLR	ORIG DATE: FEB 2010		
DSN: AF	DWG #: 200-S-201		
CHK: BH	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	7/19/10	MLR	LEC	BLDG. DEPT. REQUESTED REVISION

Clean Water Services
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
STRUCTURAL
PANEL ELEVATION

SHEET: 88 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-S-201

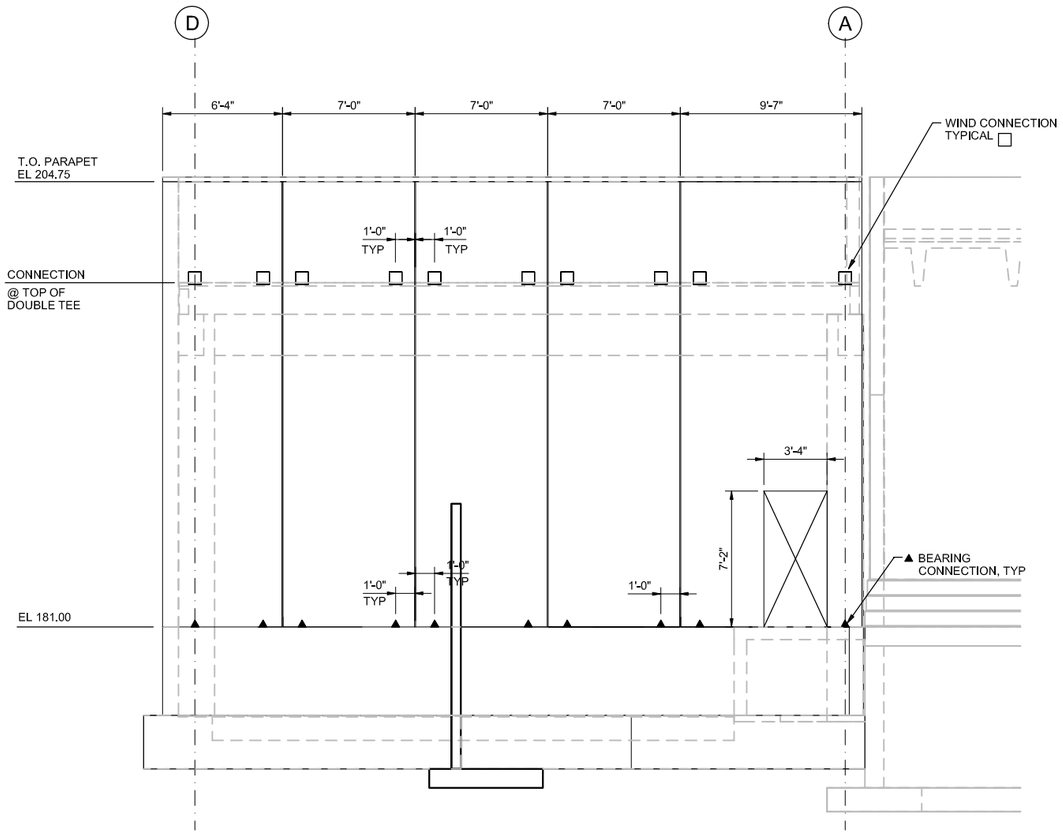
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

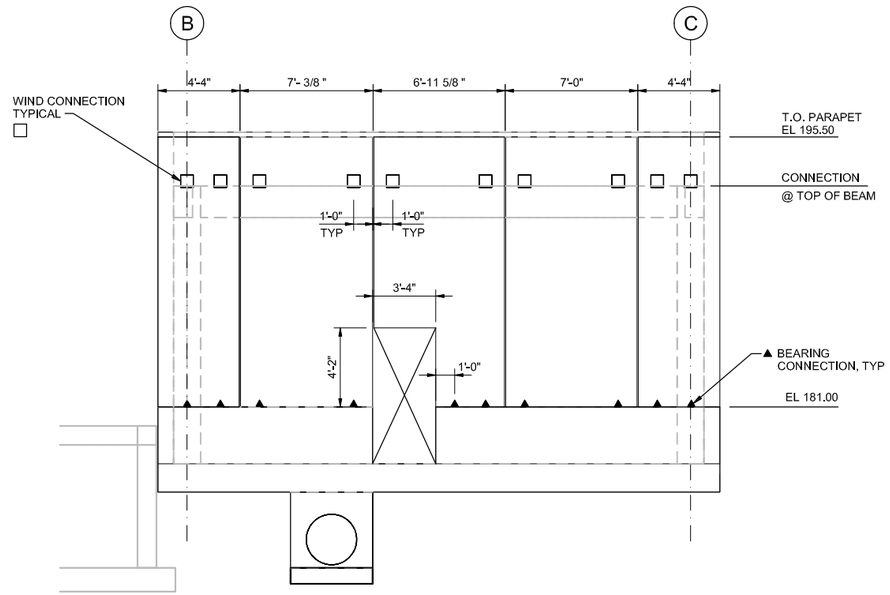
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B PRECAST PANEL SOUTH ELEVATION @ GRID LINE 3

1/4"=1'-0""

1 200-S-140 200-S-150



C PRECAST PANEL NORTH ELEVATION @ GRID LINE 1

1/4"=1'-0""

1 200-S-140 200-S-150

NOTE :

FOR PANEL CONNECTIONS SEE 200-S-501.

	01/12	ERB	LEC	RECORD DRAWING
1	7/19/10	MLR	LEC	BLDG. DEPT. REQUESTED REVISION
REV #	DATE	DRN	APPD	DESCRIPTION

DRN: MLR ORIG DATE: FEB 2010
DSN: AF DWG #: 200-S-202
CHK: BH CAD FILE #:
APPD: LEC SCALE: AS SHOWN

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
STRUCTURAL
PANEL ELEVATIONS

SHEET: 89 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-S-202

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

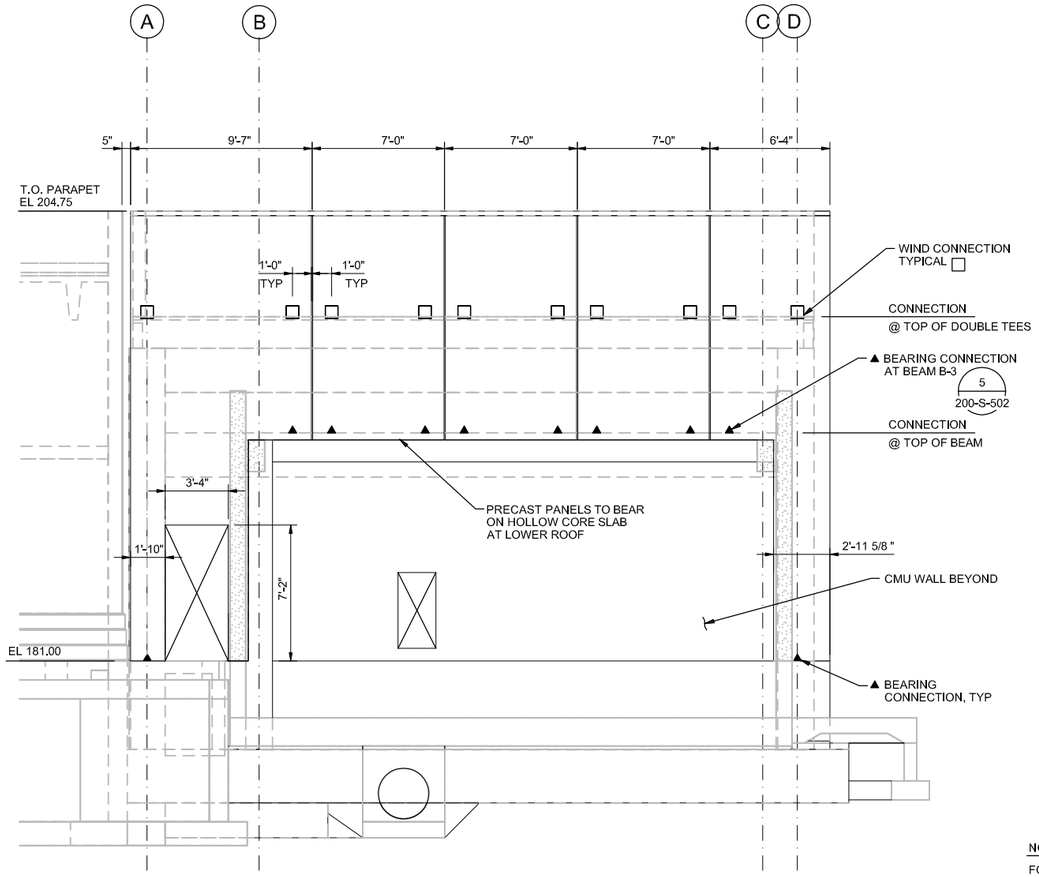
ENGR STAMP:

FILENAME: 200-S-202_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:29:01 PM

RECORD DRAWINGS

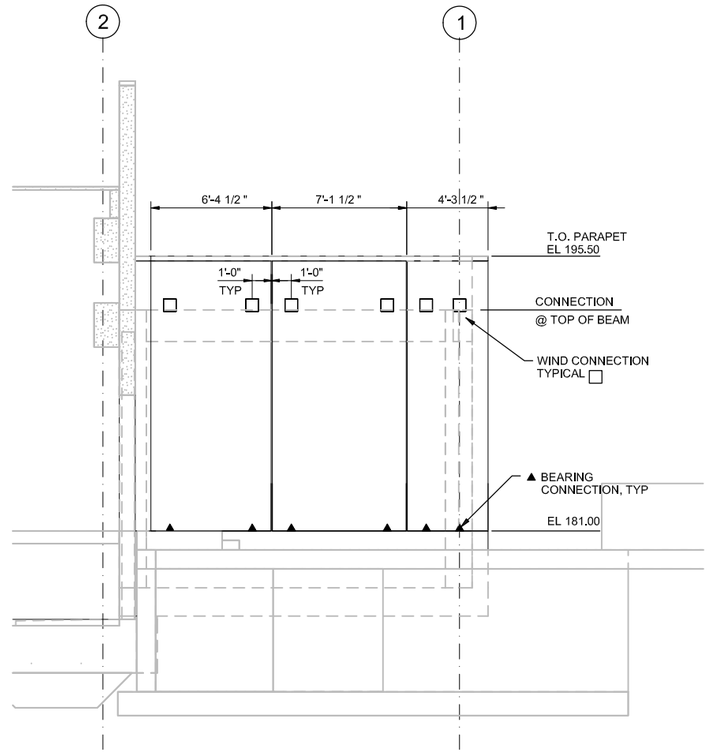
Revisions Drawn By E.R. BROWN Date JAN 2012

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NOTE :

FOR PANEL CONNECTIONS SEE 200-S-501.



D PRECAST PANEL NORTH ELEVATION @ GRID LINE 2

1/4"=1'-0""

1 200-S-140 200-S-150

E PRECAST PANEL EAST ELEVATION @ GRID LINE B

1/4"=1'-0""

1 200-S-140 200-S-150

FILENAME: 200-S-203_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:29:08 PM

DRN: MLR	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: AF	DWG #: 200-S-202		
CHK: BH	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	7/19/10	MLR	LEC	BLDG. DEPT. REQUESTED REVISION

Clean Water Services
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

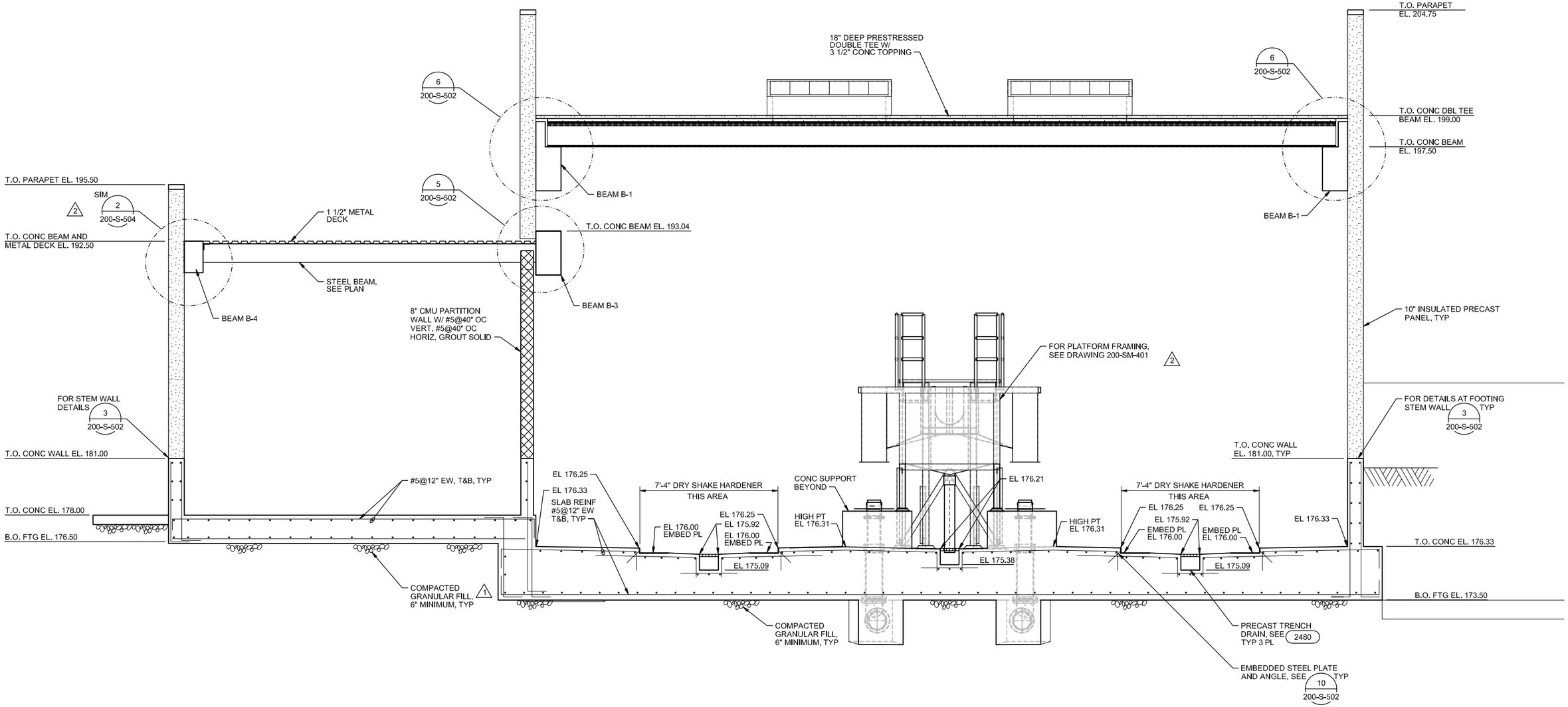
SHEET TITLE:
HEADWORKS
STRUCTURAL
PANEL ELEVATIONS

SHEET: 90 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-S-203

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



A SECTION
3/8"=1'-0""

2 200-S-140
200-S-150

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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	01/12	ERB	LEC	RECORD DRAWING
2	07/10	ALF	LEC	BLDG. DEPT. REQUESTED REVISION
1	06/10	ALF	LEC	ADDENDUM NO. 2
REV #	DATE	DRN	APPD	DESCRIPTION

DRN: MLR | ORIG DATE: FEB 2010
DSN: ALF | DWG #: 200-S-301
CHK: BSH | CAD FILE #:
APPD: LEC | SCALE: AS SHOWN

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
STRUCTURAL
SECTION

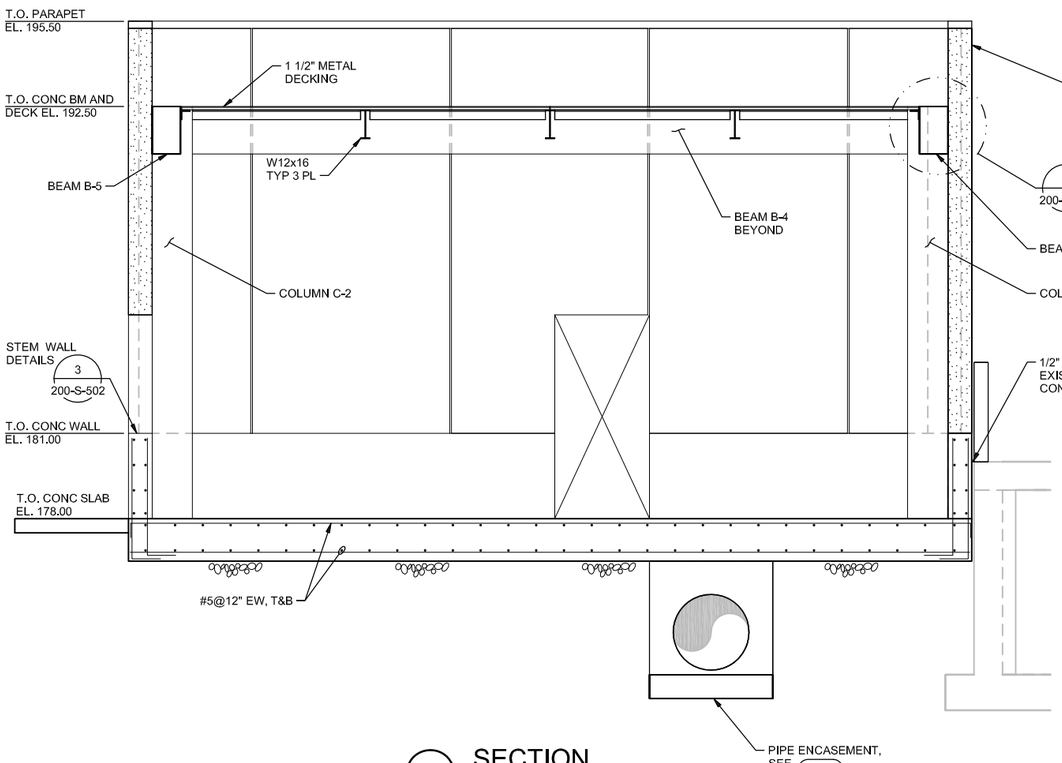
SHEET: 91 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-S-301

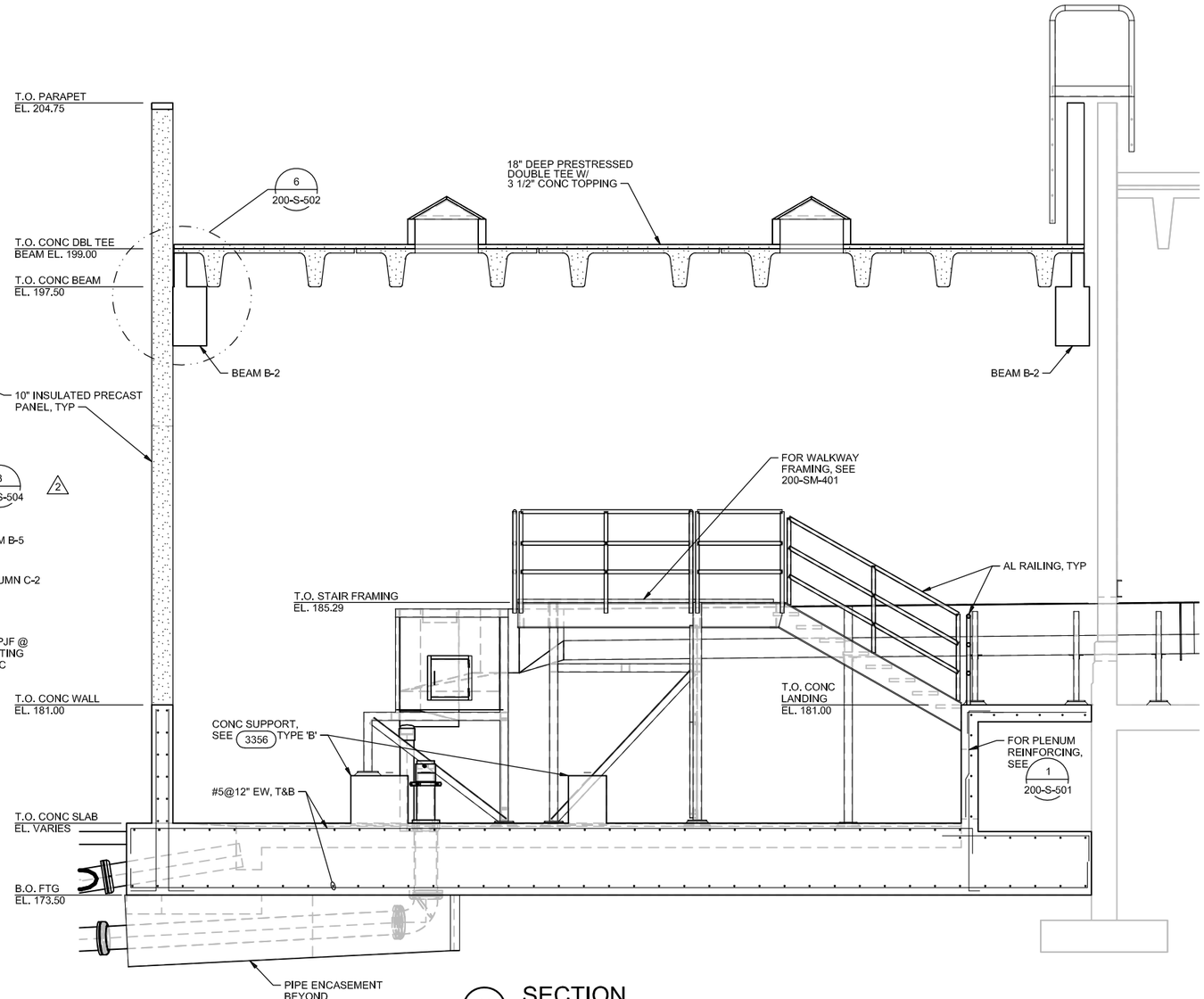
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 200-S-301_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:29:19 PM



B SECTION
3/8"=1'-0"
200-S-140
200-S-150



C SECTION
3/8"=1'-0"
200-S-140
200-S-150

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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DRN: MLR	ORIG DATE: FEB 2010		
DSN: ALF	DWG #: 200-S-302		
CHK: BSH	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
2	07/10	ALF	LEC	BLDG. DEPT. REQUESTED REVISION
1	06/10	ALF	LEC	ADDENDUM NO. 1

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
STRUCTURAL
SECTIONS

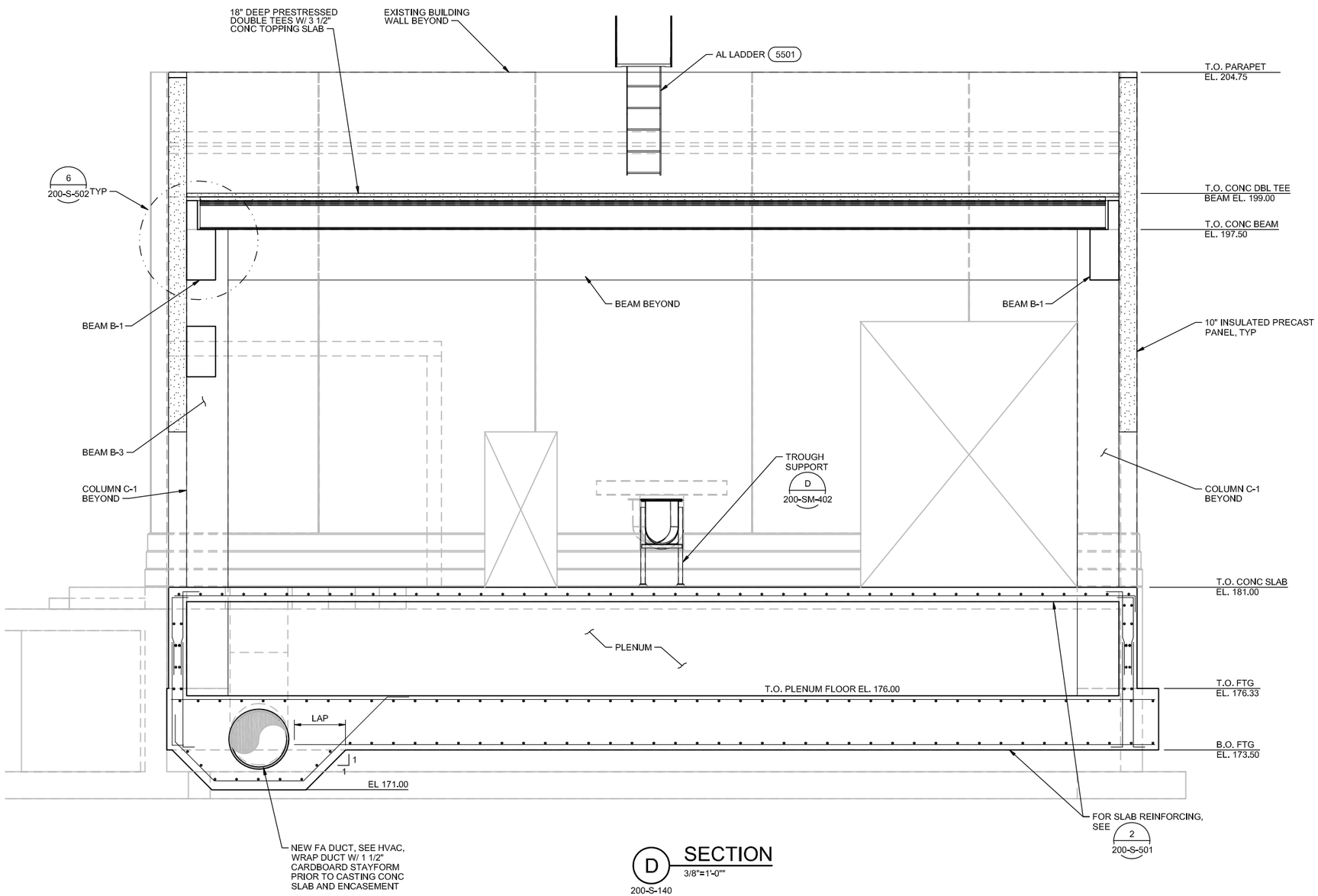
SHEET: 92 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-S-302

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 200-S-302_3915138.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:29:29 PM



D SECTION
3/8"=1'-0""
200-S-140
200-S-150

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-S-303_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:29:41 PM

DRN: MLR	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: ALF	DWG #: 200-S-303		
CHK: BSH	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

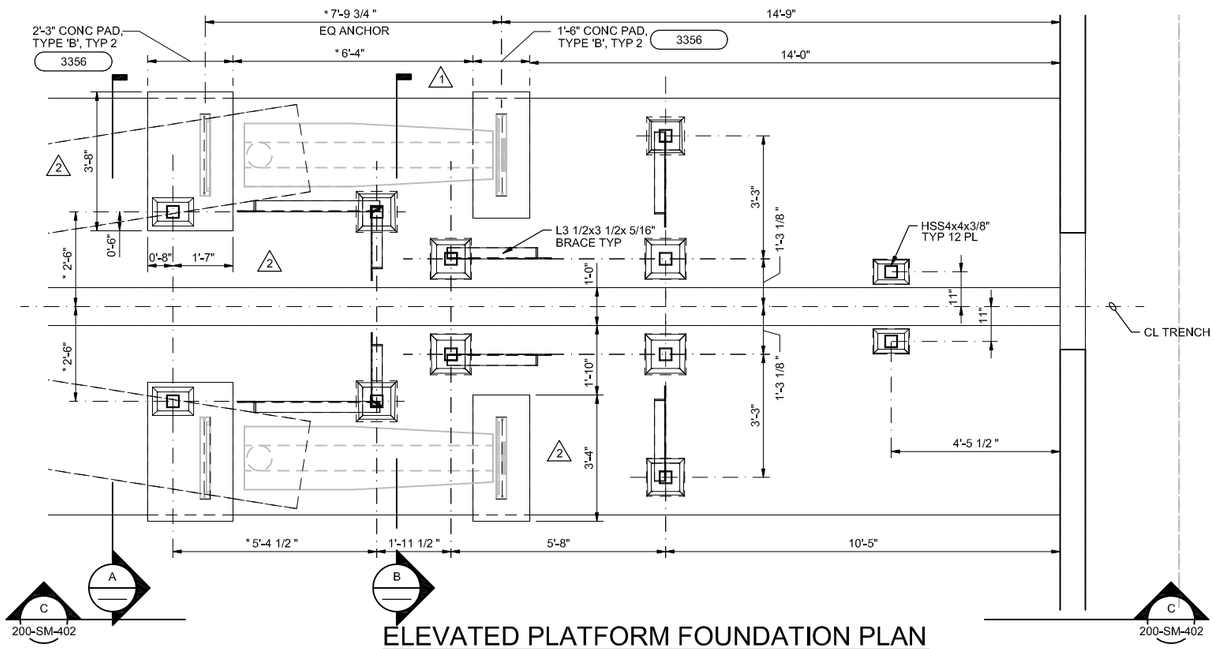
SHEET TITLE: HEADWORKS STRUCTURAL SECTION

SHEET: 93 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-S-303

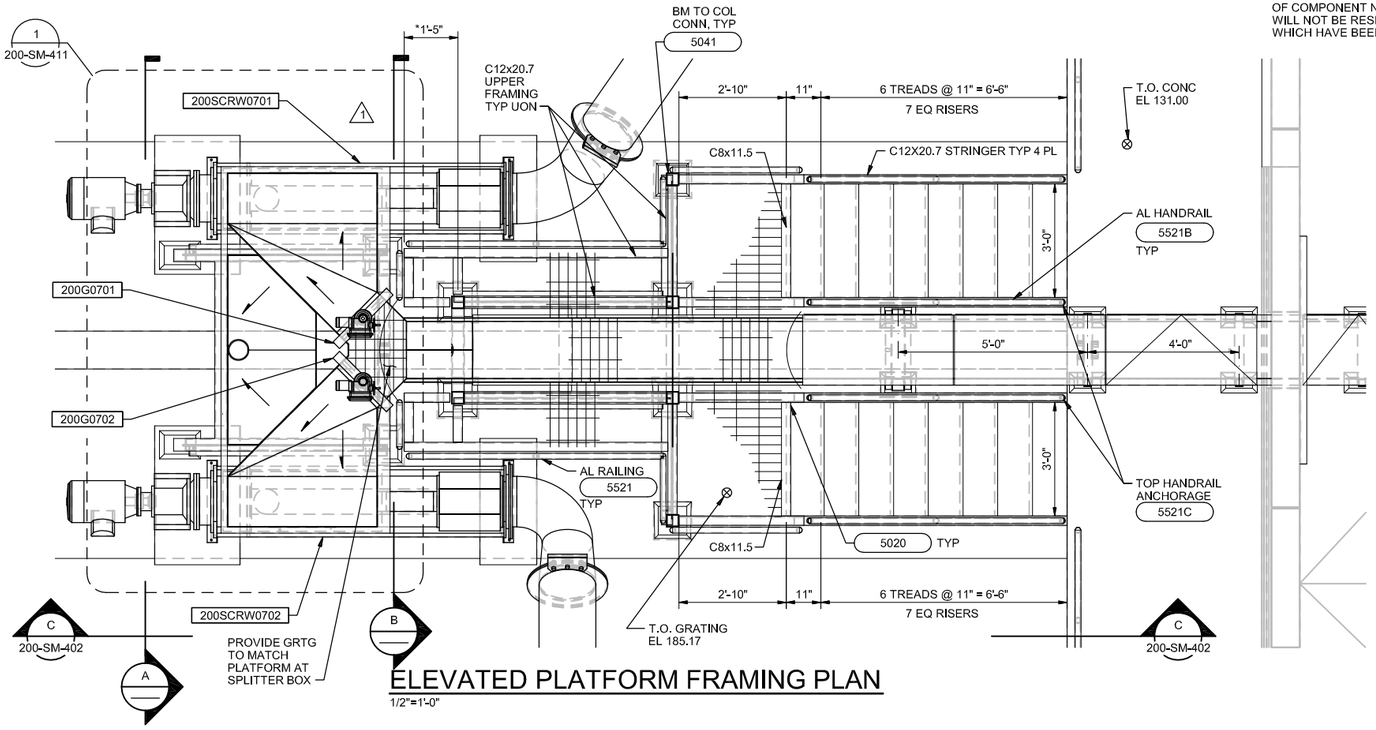
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



ELEVATED PLATFORM FOUNDATION PLAN

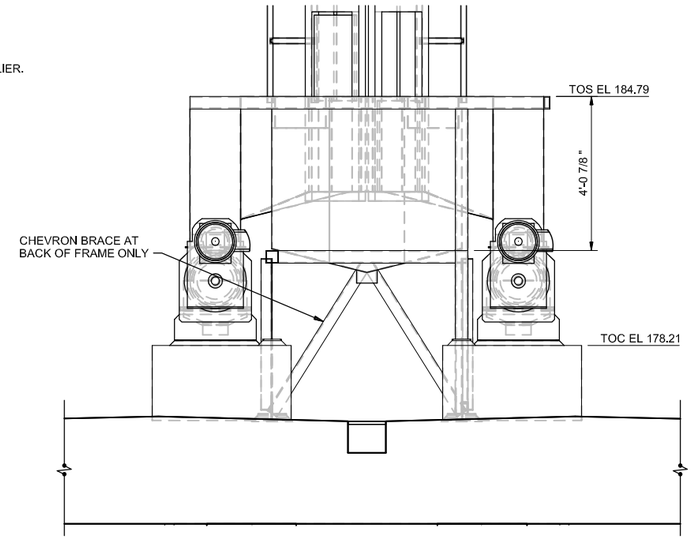
1/2"=1'-0"



ELEVATED PLATFORM FRAMING PLAN

1/2"=1'-0"

NOTE:
* VERIFY DIMENSIONS WITH WASHER/COMPACTOR SUPPLIER.



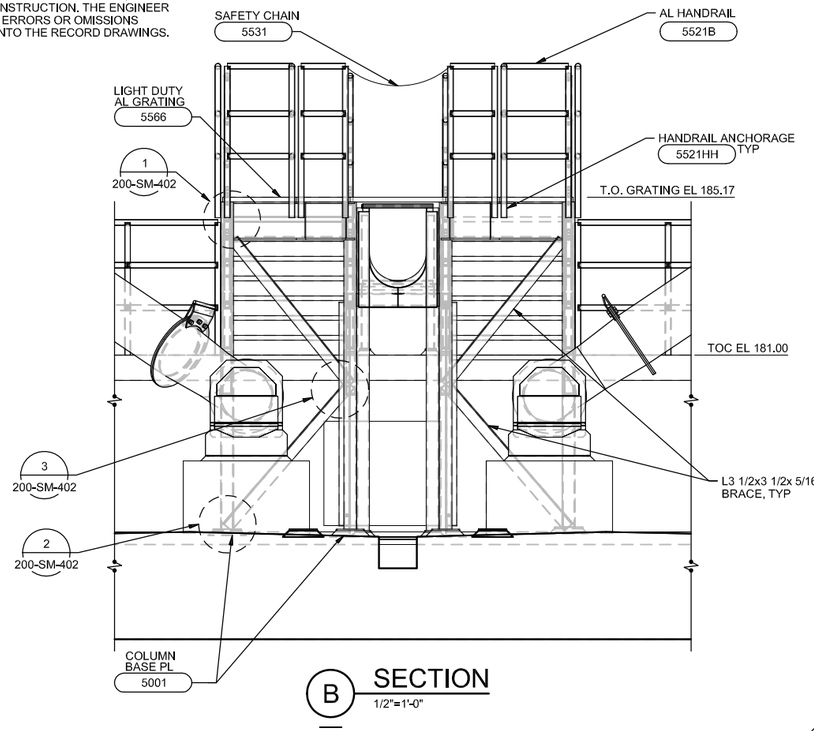
A SECTION

1/2"=1'-0"

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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B SECTION

1/2"=1'-0"

FILENAME: 200-SM-401_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:30:28 PM

DRN: MLR	ORIG. DATE: FEB 2010		
DSN: ALF	DWG #: 200-SM-401		
CHK: BSH	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
2	11/10	ALF	LEC	DCN #1
1	06/10	ALF	LEC	ADDENDUM NO. 1

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

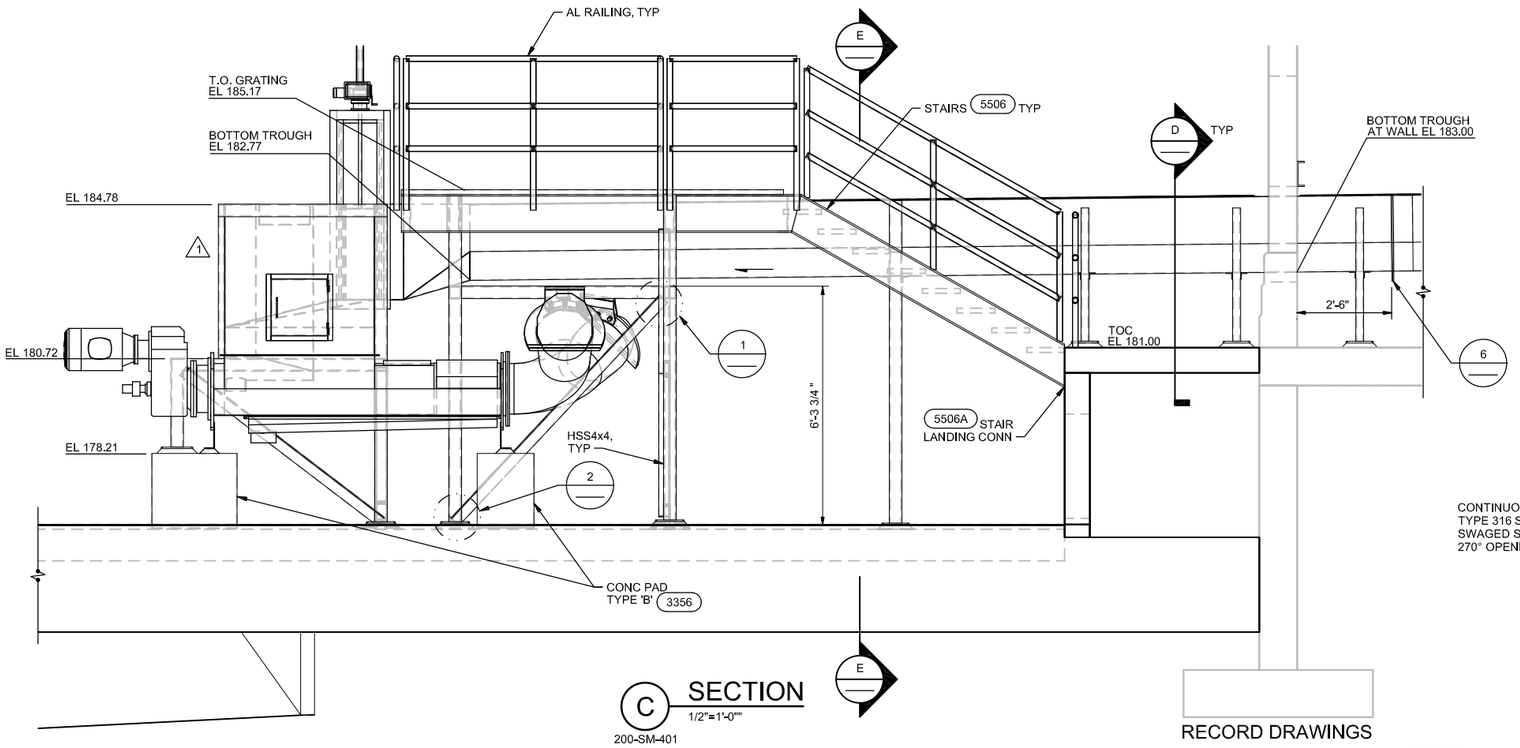
SHEET TITLE:
HEADWORKS
STRUCTURAL/MECHANICAL
PLATFORM PLANS
AND SECTIONS

SHEET: 94	OF: D24
PLOT DATE: AUG 2010	
PLC #:	
CWS PROJ #: 6410	

DWG #: 200-SM-401

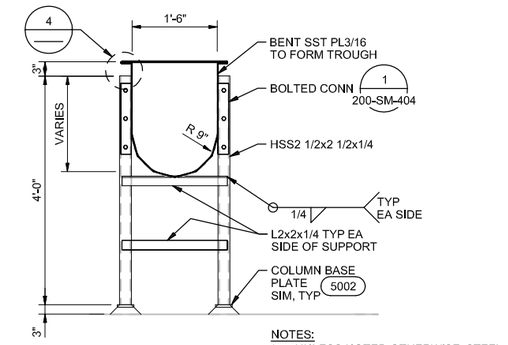
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



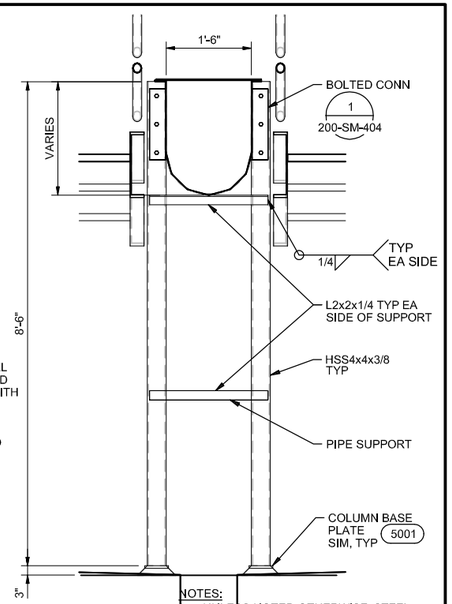
C SECTION
1/2"=1'-0""

200-SM-401



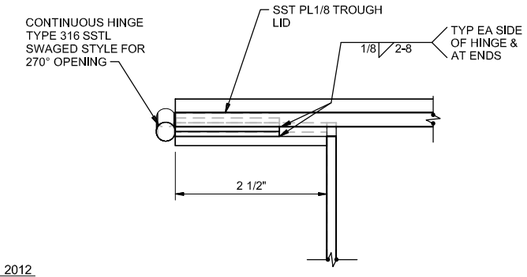
D SECTION
1/2"=1'-0""

NOTES:
1. UNLESS NOTED OTHERWISE, STEEL SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION AND PAINT WITH SYSTEM 10 AND 4 AS NOTED IN SECTION 09900 PAINTING.
2. WATER/COMPACTOR SUPPLIER TO PROVIDE SUPPORTS.



NOTES:
1. UNLESS NOTED OTHERWISE, STEEL SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION AND PAINT WITH SYSTEM 10 AND 4 AS NOTED IN SECTION 09900 PAINTING.
2. WATER/COMPACTOR SUPPLIER TO PROVIDE SUPPORTS.

E SECTION
1/2"=1'-0""

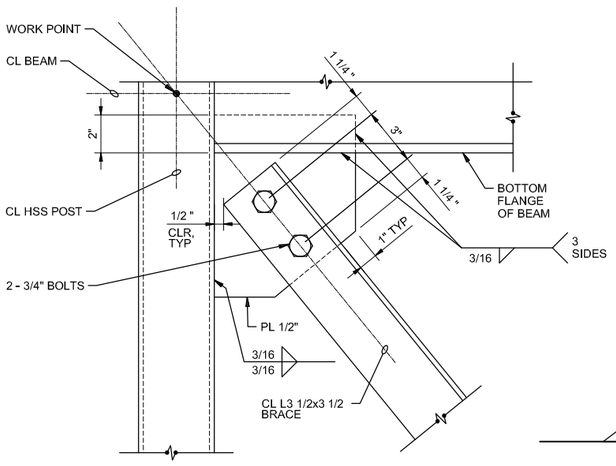


4 DETAIL
6"=1'-0"

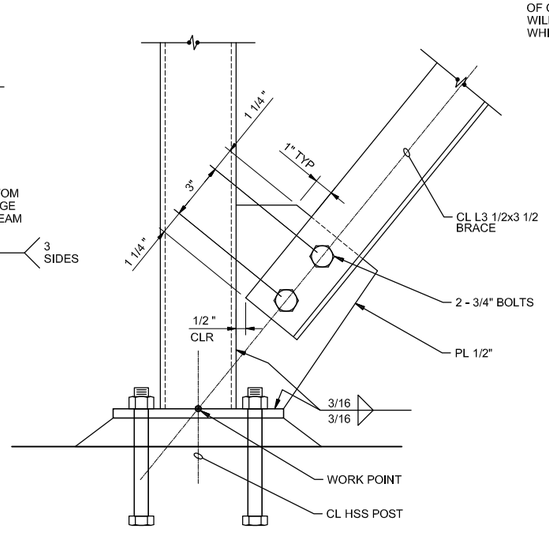
RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

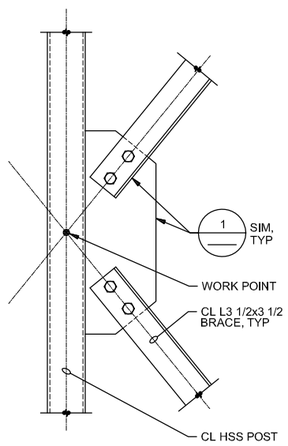
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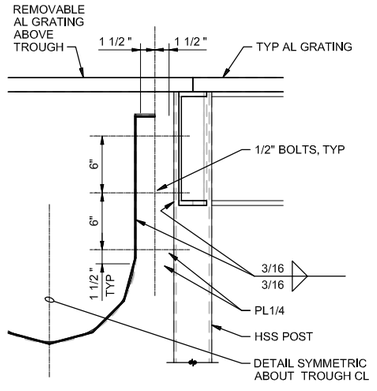
1 DETAIL
3"=1'-0"



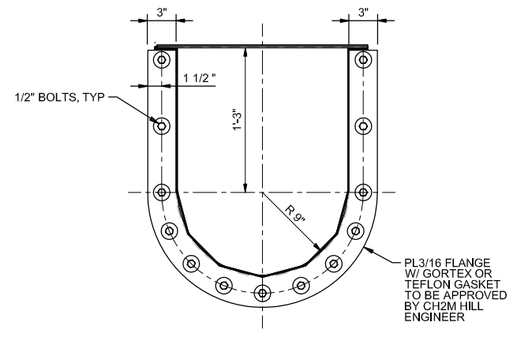
2 DETAIL
3"=1'-0"



3 DETAIL
1 1/2"=1'-0"



5 DETAIL
NTS



6 DETAIL
NTS

DRN: MLR	ORIG DATE: FEB 2010				
DSN: ALF	DWG #: 200-SM-402				
CHK: BSH	CAD FILE #:				
APPD: LEC	SCALE: AS SHOWN				

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	06/10	ALF	LEC	ADDENDUM NO. 1

Clean Water Services
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
STRUCTURAL/MECHANICAL
PLATFORM SECTIONS
AND DETAILS

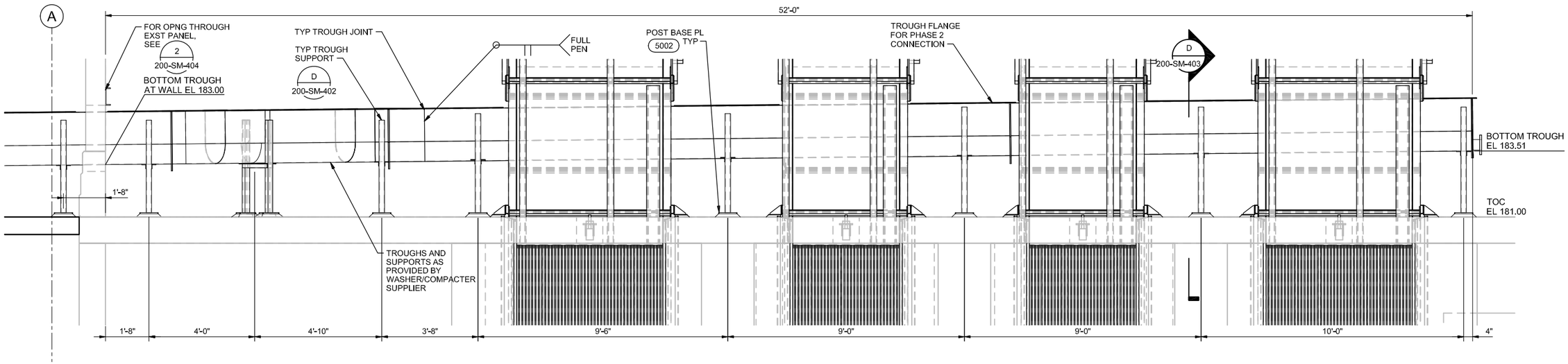
SHEET: 95 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #:
200-SM-402

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 200-SM-402_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:30:41 PM

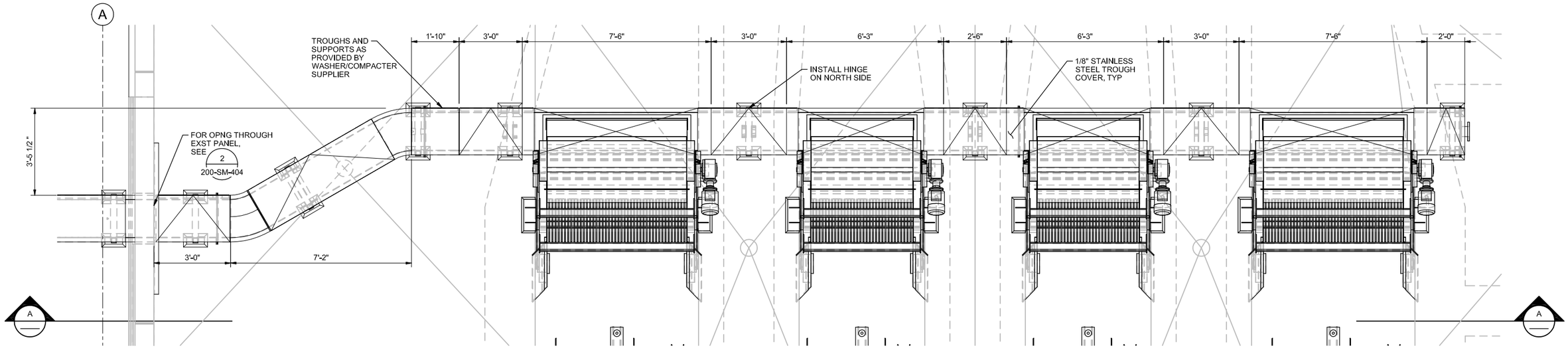


A SECTION
1/2"=1'-0""

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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TROUGH PLAN
1/2"=1'-0"

N

	01/12	ERB	LEC	RECORD DRAWING	
REV #	DATE	DRN	APPD	DESCRIPTION	

DRN: MLR | ORIG DATE: FEB 2010
DSN: ALF | DWG #: 200-SM-403
CHK: BSH | CAD FILE #:
APPD: LEC | SCALE: AS SHOWN

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
STRUCTURAL/MECHANICAL
TROUGH PLAN AND SECTION

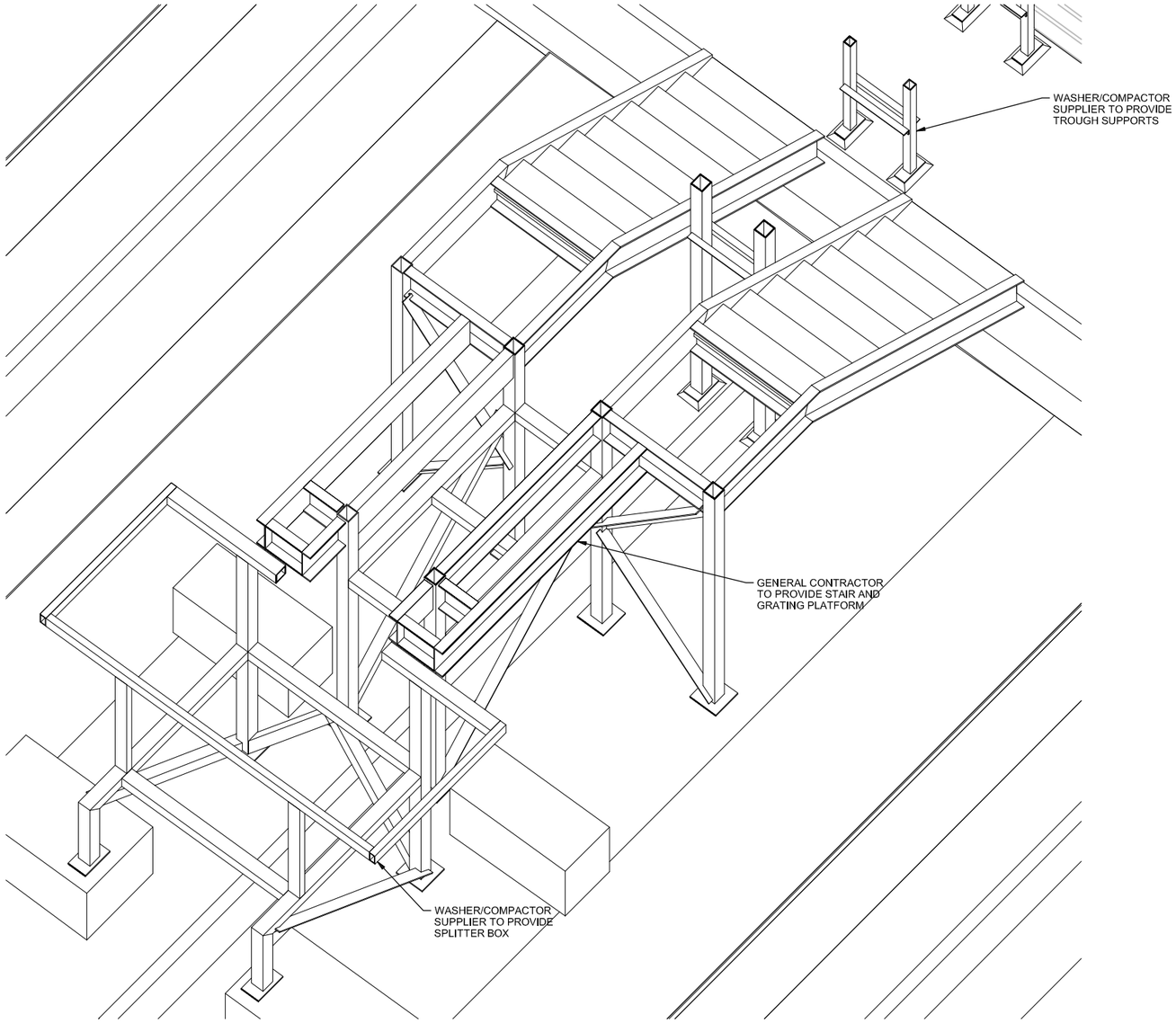
SHEET: 96 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-SM-403

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

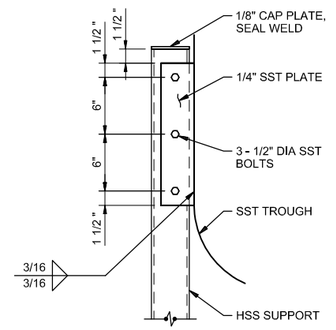
ENGR STAMP:

FILENAME: 200-SM-403_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:30:51 PM



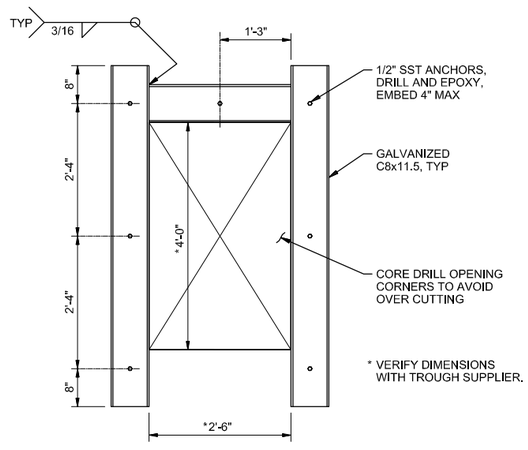
FULL PLATFORM/BOX FRAMING VIEW

NTS



1 TROUGH SUPPORT CONNECTION

1 1/2"=1'-0"



2 TROUGH OPENING THROUGH PANEL

3/4"=1'-0"

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-SM-404_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:31:00 PM

DRN: MLR	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: ALF	DWG #: 200-S-404		
CHK: BSH	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

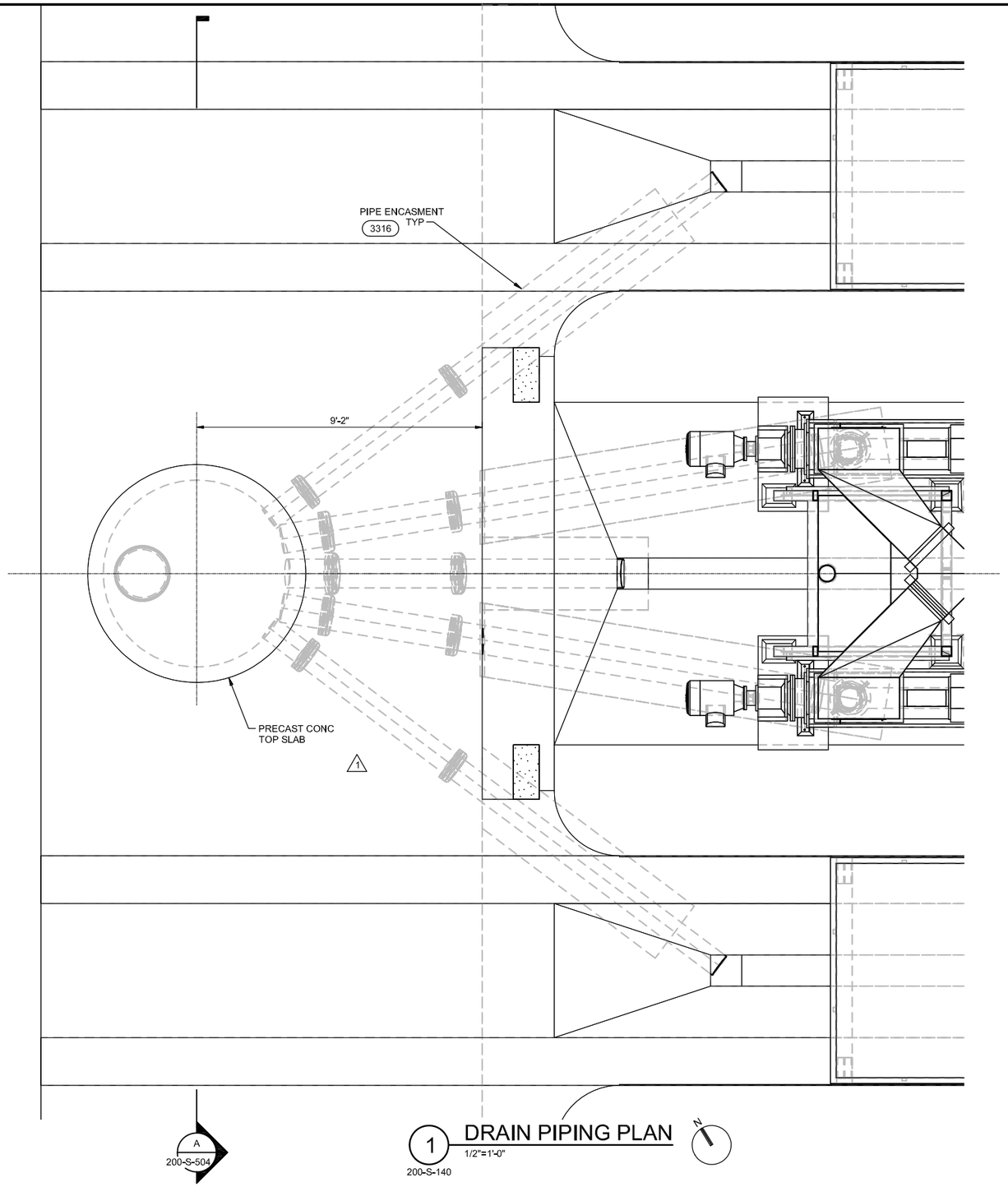
SHEET TITLE:
HEADWORKS
STRUCTURAL/MECHANICAL ISOMETRIC FRAMING VIEW AND DETAILS

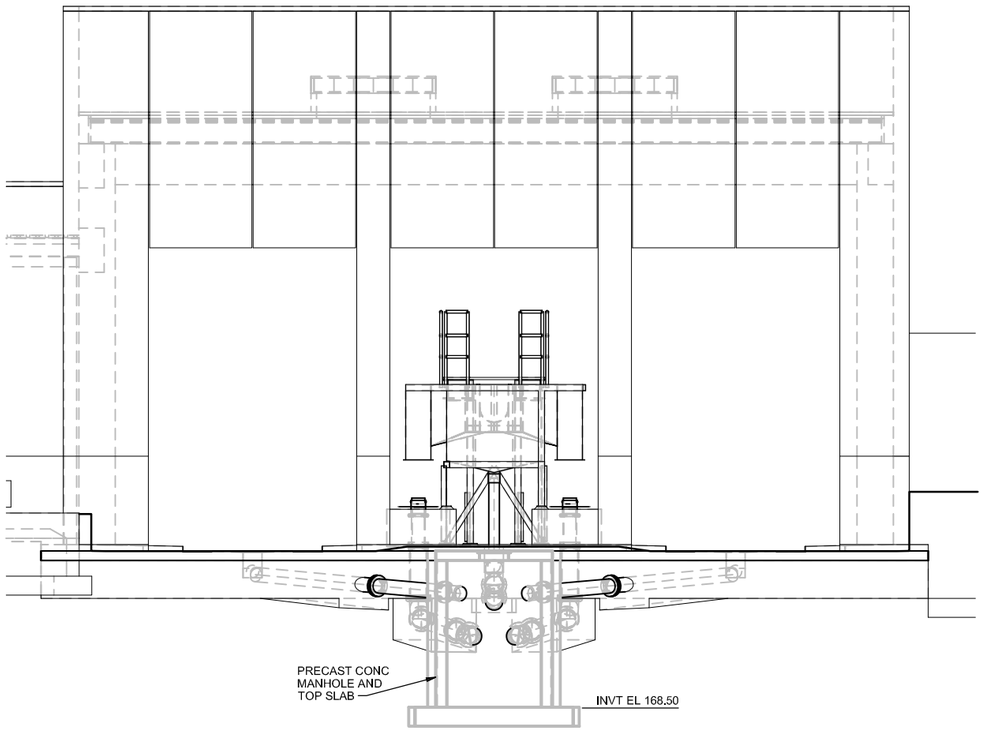
SHEET: 97 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-SM-404

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:





A
200-S-504

1 DRAIN PIPING PLAN
1/2"=1'-0"
200-S-140

N

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-SM-410_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:31:09 PM

DRN: MLR	ORIG DATE: FEB 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: ALF	DWG #: 200-SM-410		
CHK: BSH	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	7/19/10	MLR	LEC	BLDG. DEPT. REQUESTED REVISION

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

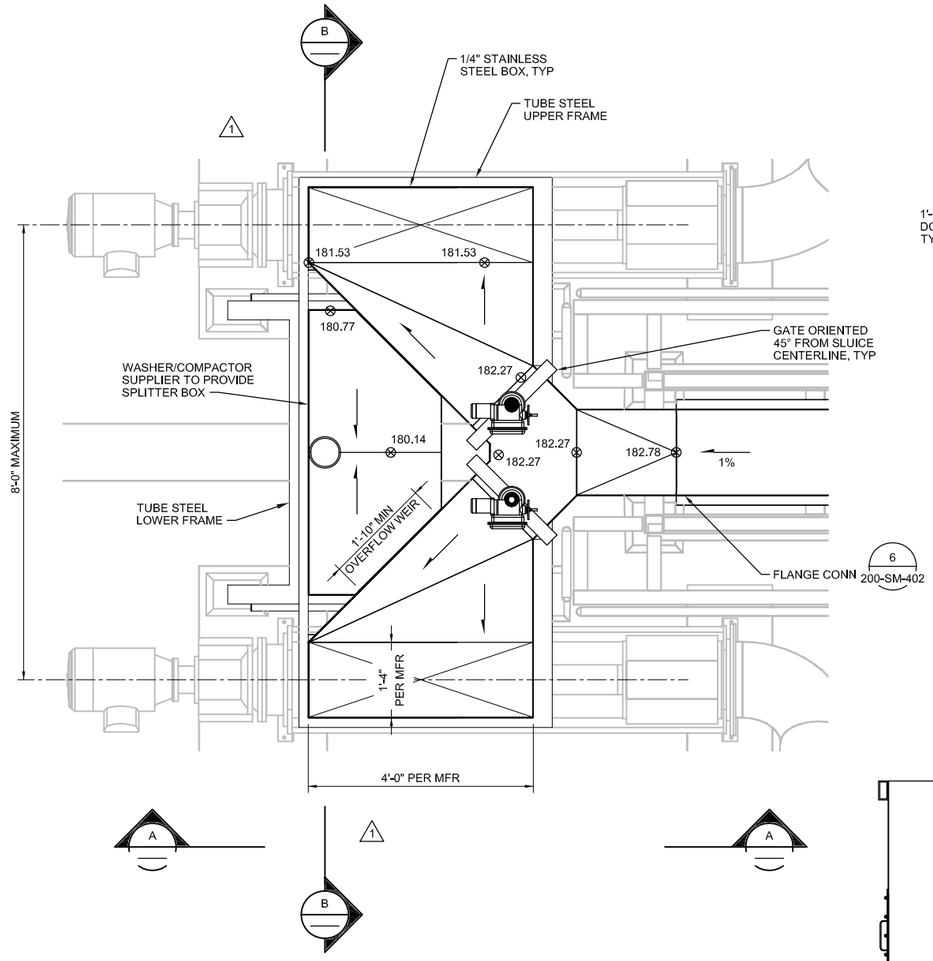
SHEET TITLE:
HEADWORKS
STRUCTURAL/MECHANICAL
ENLARGED PLAN

SHEET: 98 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

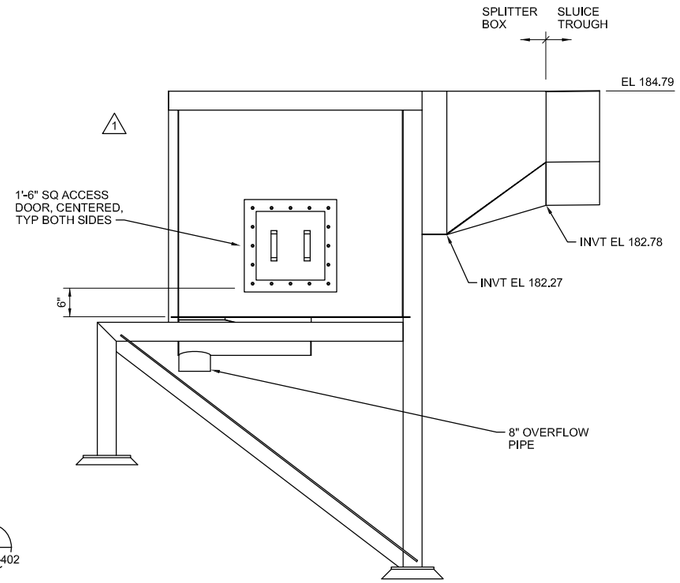
DWG #: 200-SM-410

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

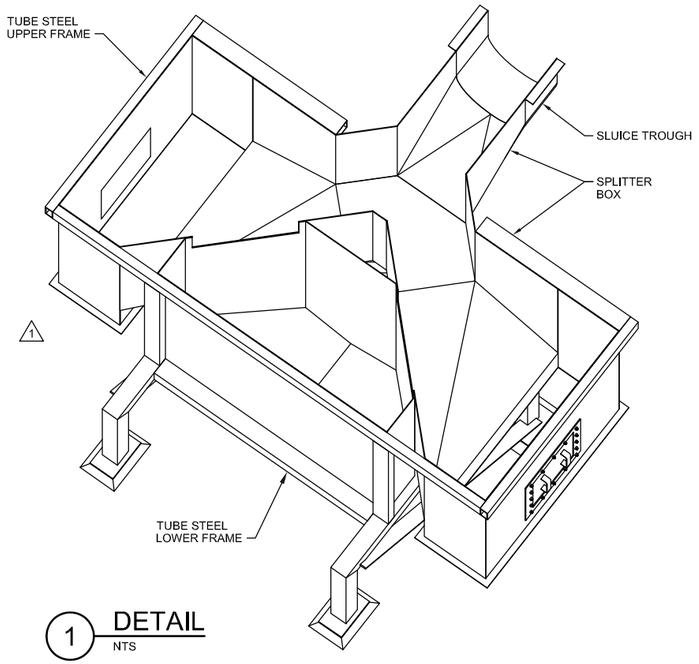
ENGR STAMP:



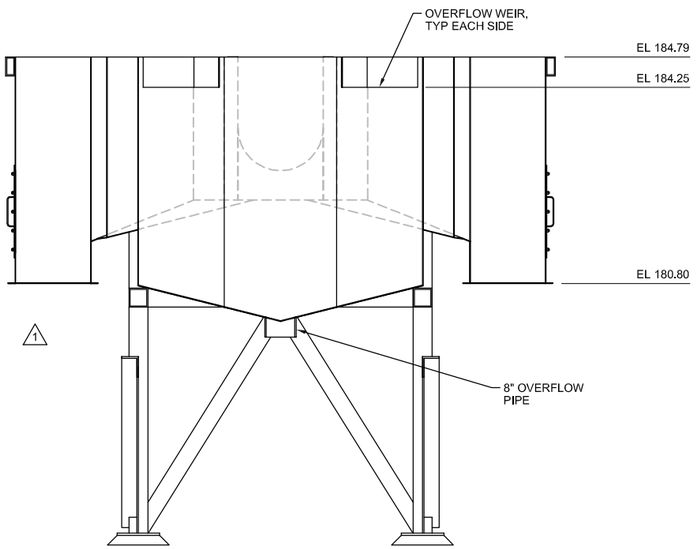
1 ENLARGED PLAN
3/4"=1'-0"
200-SM-401



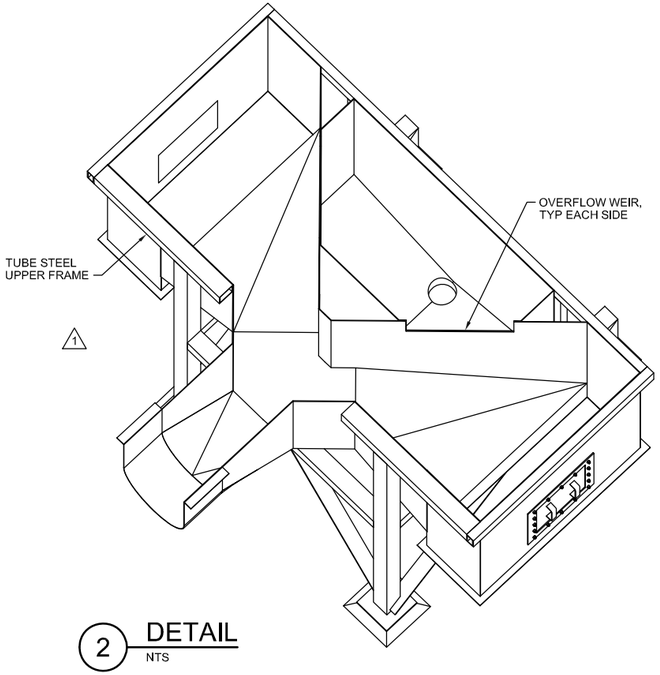
A SECTION
3/4"=1'-0"



1 DETAIL
NTS



B SECTION
3/4"=1'-0"



2 DETAIL
NTS

NOTES:

1. PIPING NOT SHOWN IN PLAN FOR CLARITY.
2. PIPING, GATES, EQUIPMENT, AND EQUIPMENT PADS NOT SHOWN IN SECTIONS AND DETAILS FOR CLARITY.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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	01/12	ERB	LEC	RECORD DRAWING
1	06/10	GVT	LEC	ADDENDUM NO. 1
REV #	DATE	DRN	APPD	DESCRIPTION

DRN: MLR | ORIG DATE: FEB 2010
DSN: ALF | DWG #: 200-SM-411
CHK: BSH | CAD FILE #:
APPD: LEC | SCALE: AS SHOWN

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
STRUCTURAL/MECHANICAL
ENLARGED PLAN,
SECTIONS, AND DETAILS

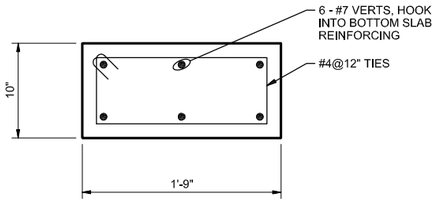
SHEET: 99 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-SM-411

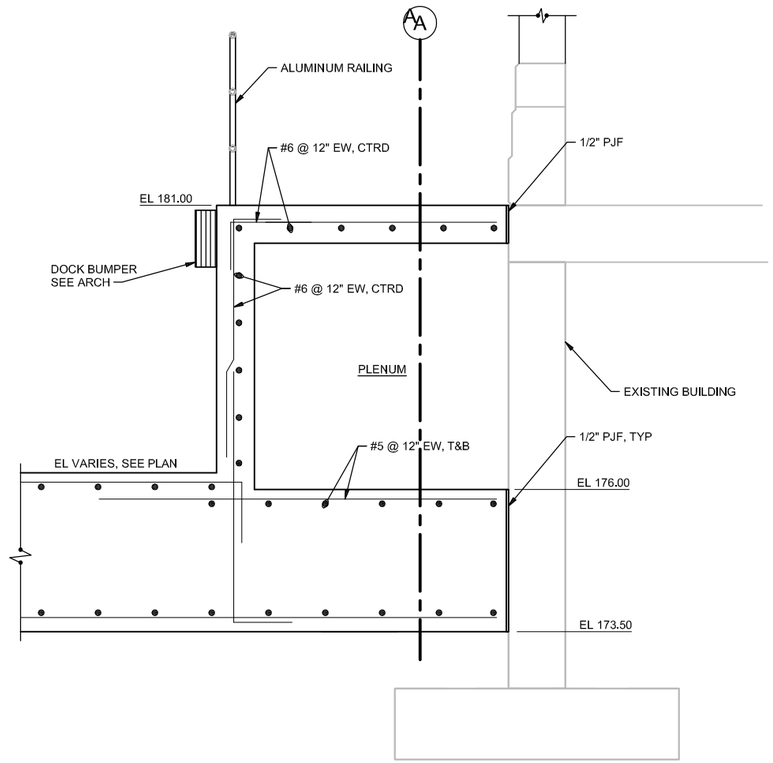
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

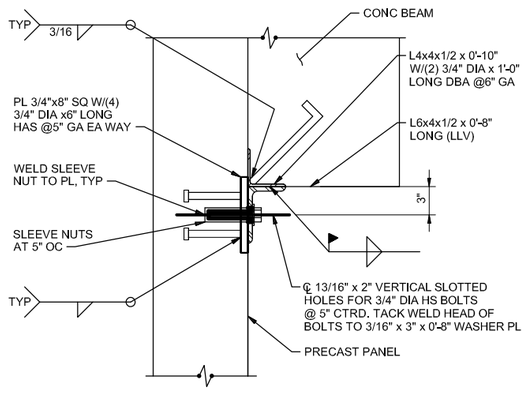
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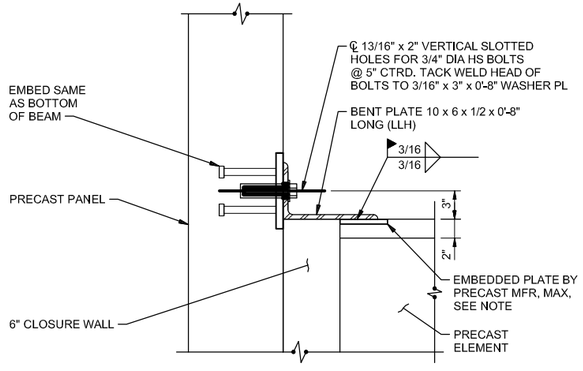
1 WIND PIER
1 1/2"=1'-0"



2 INDOOR PLENUM
3/4"=1'-0"



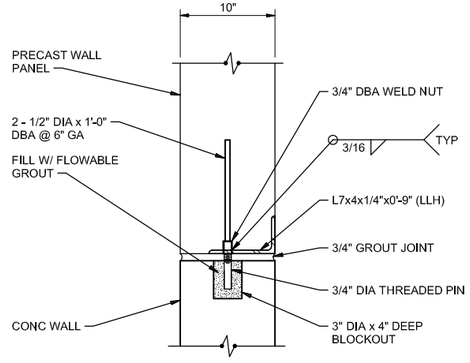
SECTION AT BOT. OF BEAM



SECTION AT TOP OF DBL TEE OR HOLLOW CORE

NOTE:
HORIZONTAL LOAD:
WIND = ± 2,195 LB (SERVICE)
SEISMIC = ± 941 LB, BODY OF CONNECTION (SERVICE),
±1,228 LB, CONC ANCHORS (SERVICE)

3 WIND CONNNECTION - TYPE 'A'
1 1/2"=1'-0"



4 BASE CONNECTION - TYPE 'C'
1 1/2"=1'-0"

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-S-501_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:29:49 PM

DRN: MLR	ORIG DATE: FEB 2010		
DSN: AF	DWG #: 200-S-501		
CHK: BH	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

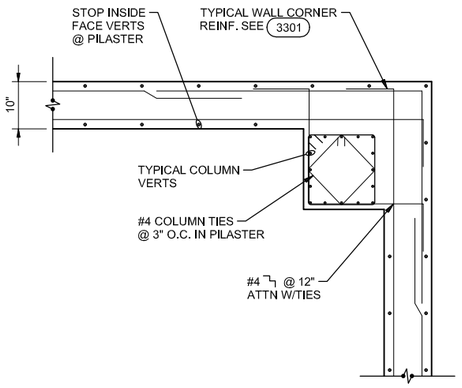
SHEET TITLE:
HEADWORKS
STRUCTURAL DETAILS

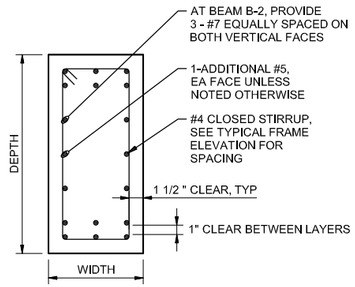
SHEET: 100 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

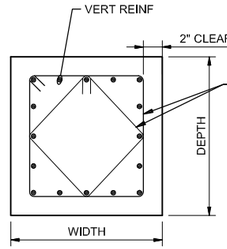
DWG #: 200-S-501

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

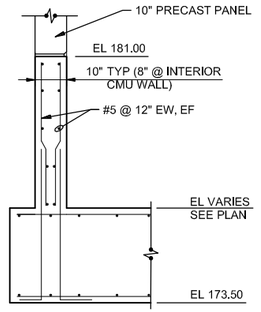
ENGR STAMP:

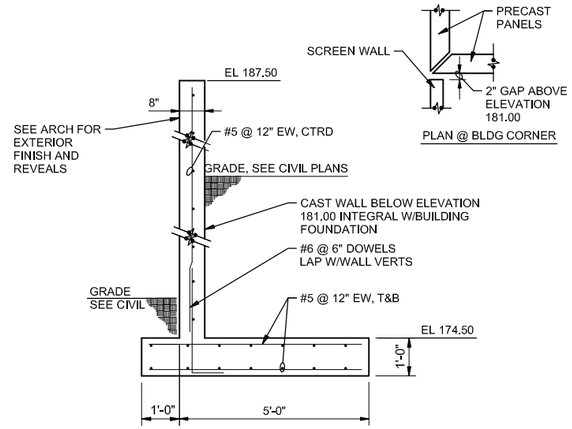






COLUMN	WIDTH	DEPTH	VERT REINF
C-1	23"	23"	16 - #8
C-2	17"	17"	12 - #7

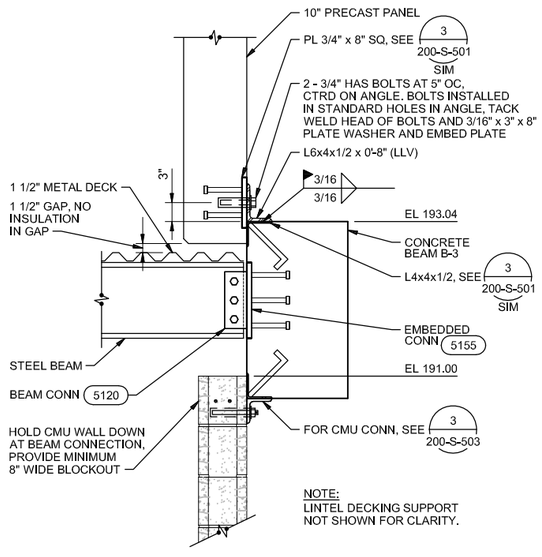




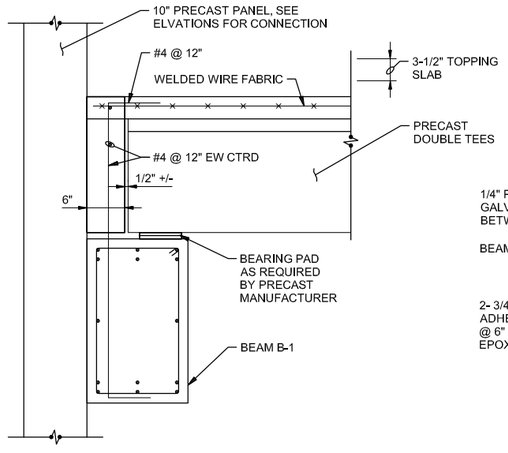
BEAM	WIDTH	DEPTH	TOP REINF	BOTTOM REINF	SHEAR REINFORCING							
					SIZE	START GRID	ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	END GRID
B-1	16"	28"	6 - #8	6 - #8	#4	GRID A	9 @ 6"	9 @ 3"	17 @ 6"	17 @ 3"	30 @ 6"	GRID D
B-2	16"	28"	5 - #8	5 - #8	#4	GRID 2	21 @ 3"	12 @ 6"	17 @ 3"	4 @ 6"	38 @ 3"	GRID 3
B-3	16"	28"	6 - #8	6 - #8	#4	GRID A	7 @ 6"	17 @ 3"	15 @ 6"	17 @ 3"	30 @ 6"	GRID D
B-4	12"	20"	3 - #8	3 - #8	#4	GRID B	25 @ 3"	1 @ 6"	17 @ 3"	12 @ 6"	21 @ 3"	GRID C
B-5	12"	20"	3 - #8	3 - #8	#4	GRID 1	74 @ 3"	-	-	-	-	GRID 2

NOTE:
1. PLACE FIRST STIRRUP 2" FROM FACE OF SUPPORT, TYPICAL.
2. PROVIDE STIRRUPS AT 3" SPACING AT LONGITUDINAL REINFORCING LAPS, FULL LENGTH OF LAP.

1 PILASTER
3/4"=1'-0"

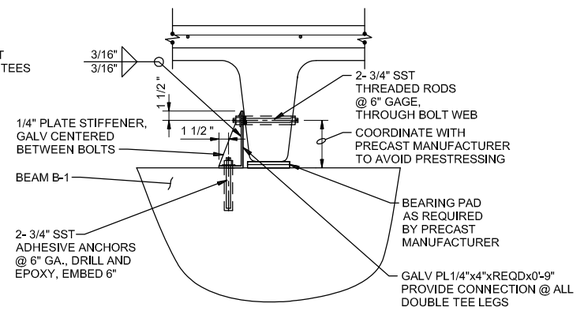


2 BEAM AND COLUMN REINFORCING
1 1/2"=1'-0"

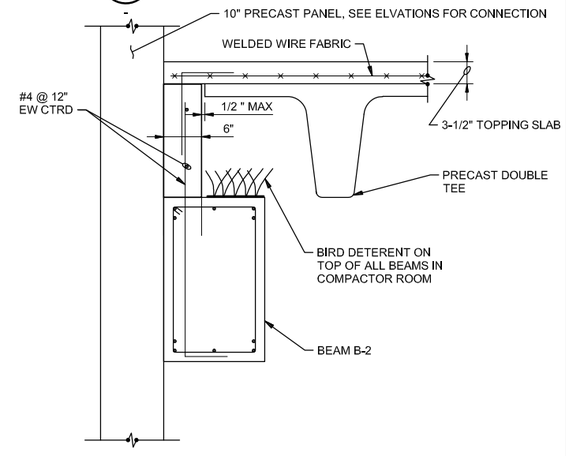


3 TYPICAL WALL FOOTING
1/2"=1'-0"

200-S-301
200-S-302
200-S-303



4 EXTERIOR SCREEN WALL
1/2"=1'-0"

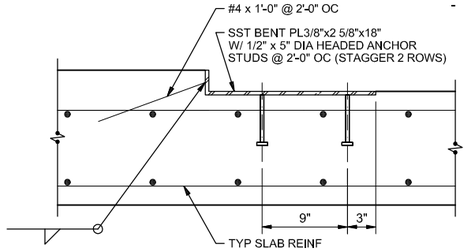


5 PRECAST CONNECTION AT GRID 2
1"=1'-0"

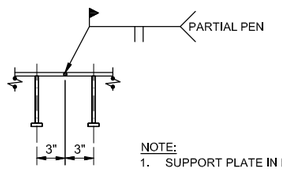
200-S-301
200-S-302
200-S-303

6 PRECAST SLAB
1"=1'-0"

200-S-301
200-S-302
200-S-303



7 DOUBLE TEE BEARING CONNECTION
1"=1'-0"



NOTE:
1. SUPPORT PLATE IN POSITION AND CONSOLIDATE CONCRETE BENEATH PLATE.
2. FOR STEEL PLATE AT EXTERIOR APRON, ONLY FLAT PORTION OF PLATE TO BE INSTALLED.

8 DOUBLE TEE EDGE CONNECTION
1"=1'-0"

10 EMBEDDED STEEL PLATE AND ANGLE
1 1/2"=1'-0"

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:29:59 PM
PLOT DATE: 05-26-2012
FILENAME: 200-S-502_391538.DWG

DRN: MLR	ORIG DATE: FEB 2010		
DSN: AF	DWG #: 200-S-501		
CHK: BH	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME:
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DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

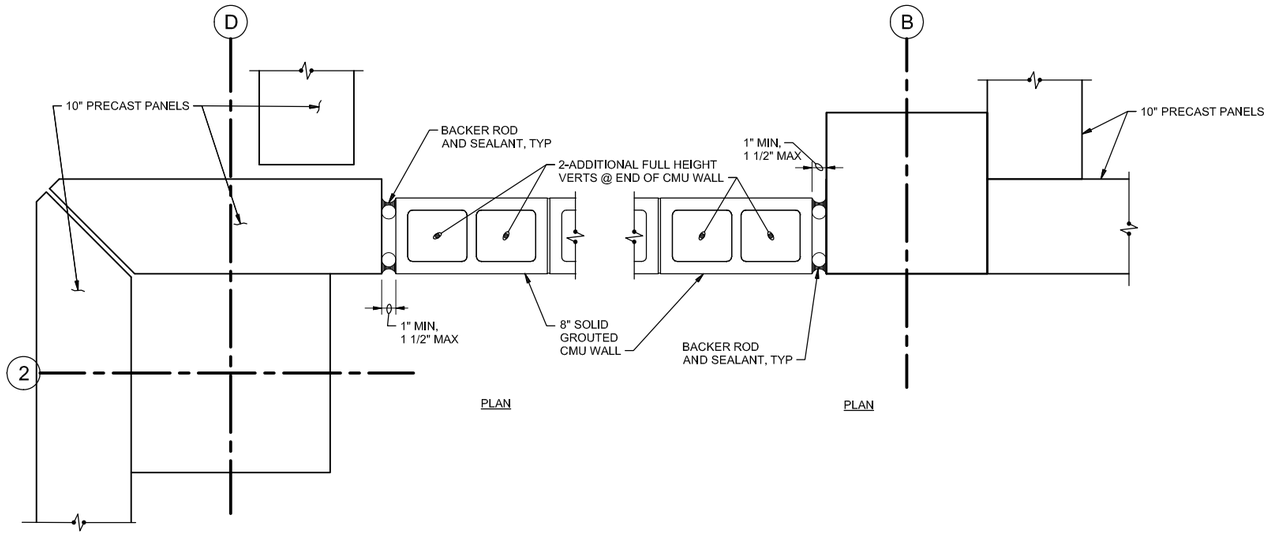
SHEET TITLE:
HEADWORKS
STRUCTURAL DETAILS

SHEET: 101 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-S-502

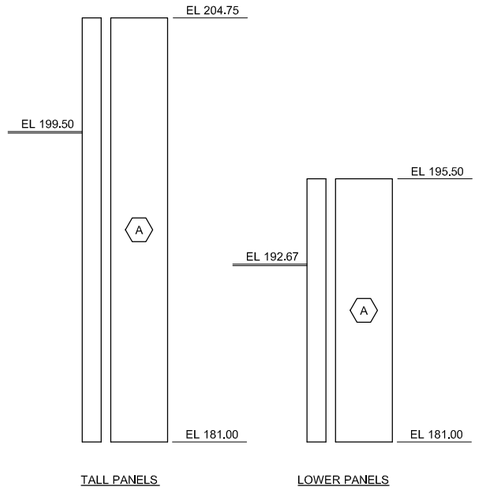
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



1 CMU WALL END CONNECTION

1 1/2"=1'-0"



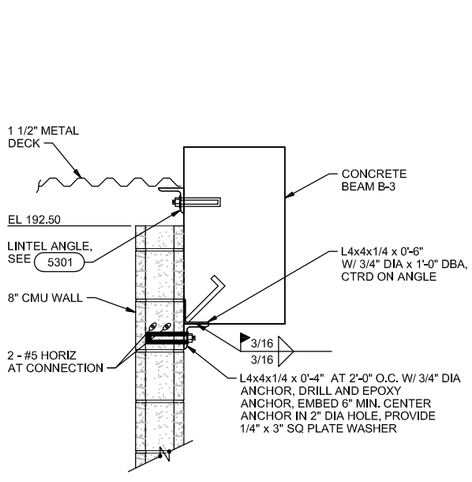
ZONE	PRESSURE AWAY FROM DISCONTINUITY	PRESSURE AT DISCONTINUITY	SEISMIC
A	+ 8.76 PSF - 23.50 PSF	+ 8.76 PSF - 31.58 PSF	± 13.60 PSF

NOTES:
1. LOADS INDICATED ARE SERVICE LEVEL.

2. PANELS MUST BE DESIGNED TO TAKE WIND REACTIONS FROM DOORS

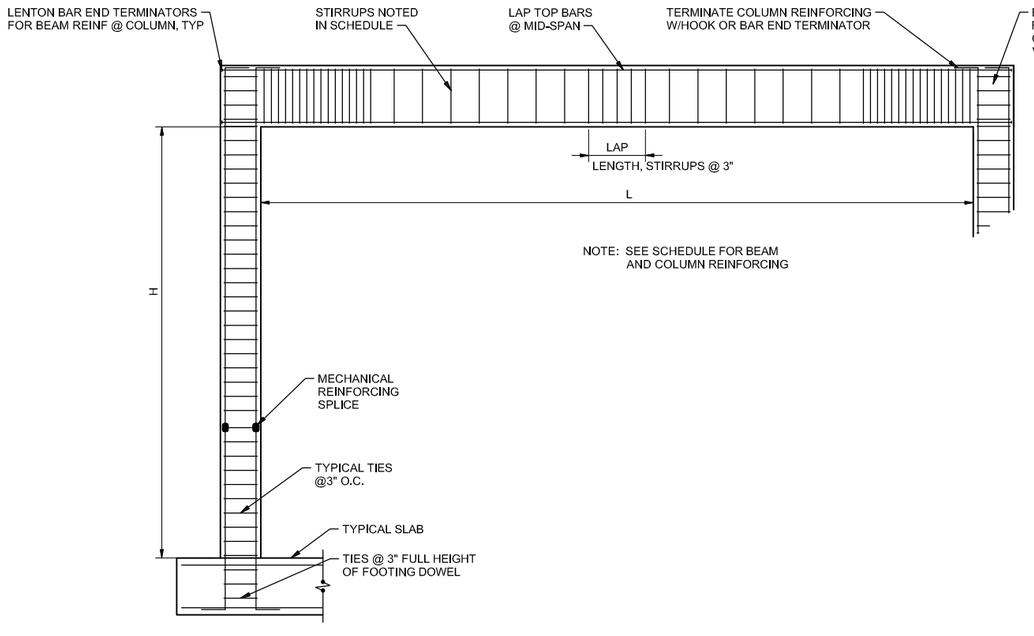
2 PRECAST PANEL WIND LOAD DIAGRAM

3/4"=1'-0"



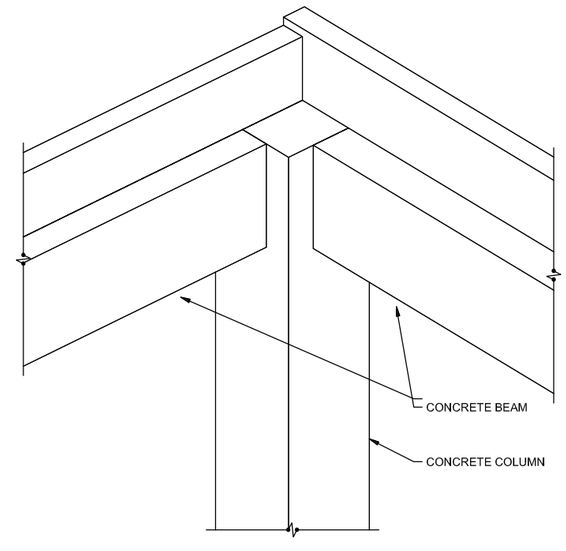
3 TOP OF CMU WALL CONNECTION

1"=1'-0"



4 TYPICAL BUILDING FRAME

3/8"=1'-0"



5 ISOMETRIC - BEAM/COLUMN CONNECTION

NTS

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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DRN: MLR	ORIG DATE: FEB 2010			
DSN: AF	DWG #: 200-S-501			
CHK: BH	CAD FILE #:			
APPD: LEC	SCALE: AS SHOWN			

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
STRUCTURAL
DETAILS

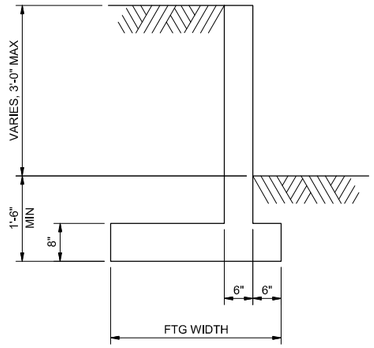
SHEET: 102 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-S-503

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

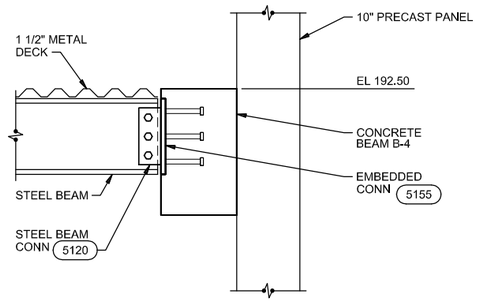
FILENAME: 200-S-503_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:30:09 PM



HEIGHT	FOOTING WIDTH
3'-0"	3'-0"
1'-0" OR LESS	1'-6"

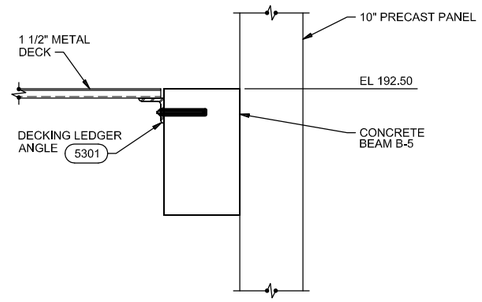
NOTE:
VARY FOOTING WIDTH LINEARLY BETWEEN 3'-0" AND 1'-0" HEIGHT.

1 EXTERIOR RETAINING WALL
3/4"=1'-0"



NOTE:
DECKING LINTEL ANGLE NOT SHOWN FOR CLARITY.

2 BEAM CONNECTION AT GRID 1
1"=1'-0"



3 DECK CONNECTION AT BEAM B-5
1"=1'-0"

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-S-504_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:30:19 PM

DRN: MLR	ORIG DATE: FEB 2010		
DSN: AF	DWG #: 200-S-501		
CHK: BH	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

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REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

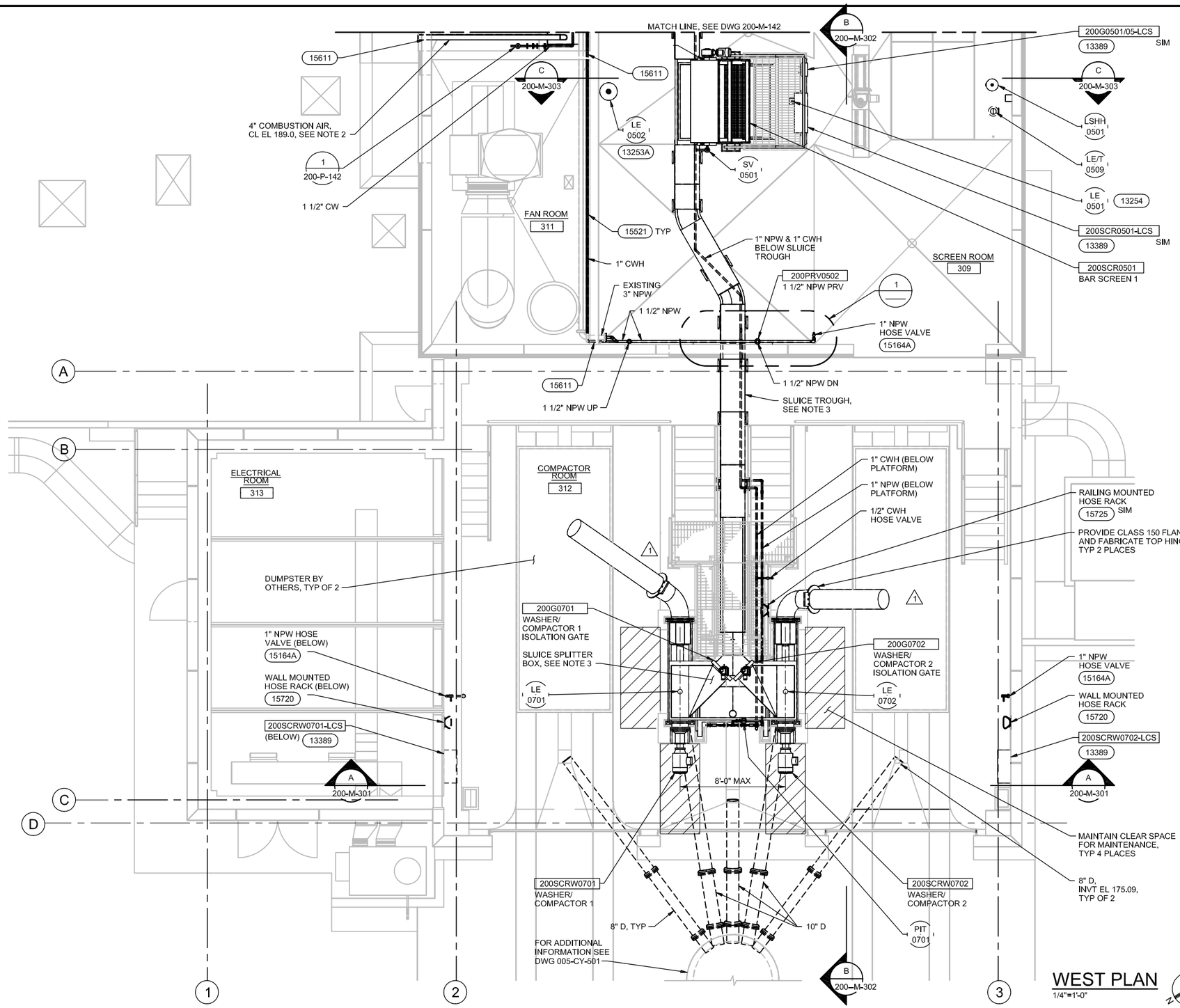
SHEET TITLE:
HEADWORKS
STRUCTURAL DETAILS

SHEET: 103 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

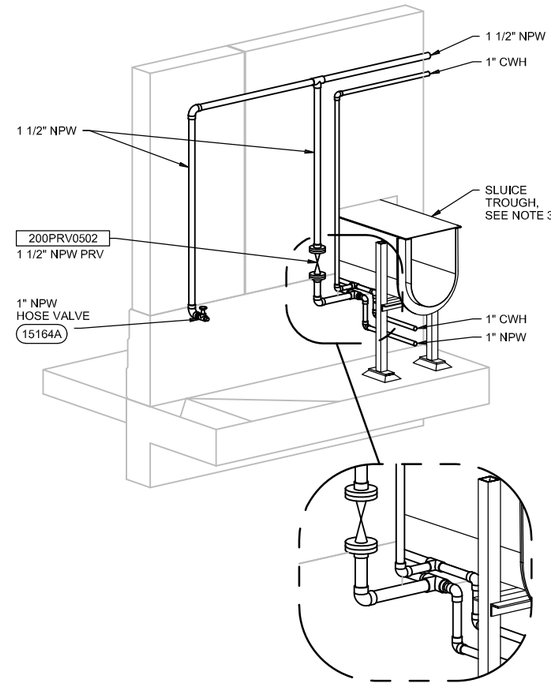
DWG #:
200-S-504

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



WEST PLAN
1/4"=1'-0"



1 DETAIL
NTS

RECORD DRAWINGS

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NOTES:

1. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR WATER HEATER FLUE MATERIAL AND INSTALLATION.
2. TERMINATE COMBUSTION AIR INTAKE WITH MANUFACTURER'S WALL TERMINAL KIT.
3. FOR SLUICE SPLITTER BOX AND SLUICE TROUGH DETAILS SEE DRAWINGS 200-SM-401, 200-SM-402, 200-SM-403, AND 200-SM-404.

DRN: ERB	ORIG DATE: JAN 2010	PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS	SHEET: 104 OF: D24
DSN: GVT	DWG #: 200-M-141	SHEET TITLE: HEADWORKS MECHANICAL WEST PLAN AND DETAIL	PLOT DATE: AUG 2010
CHK: JEG	CAD FILE #:		PLC #:
APPD: LEC	SCALE: 1/4"=1'-0"		CWS PROJ #: 6410

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	06/10	GVT	LEC	ADDENDUM NO. 1

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CH2MHILL

DWG #: 200-M-141

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

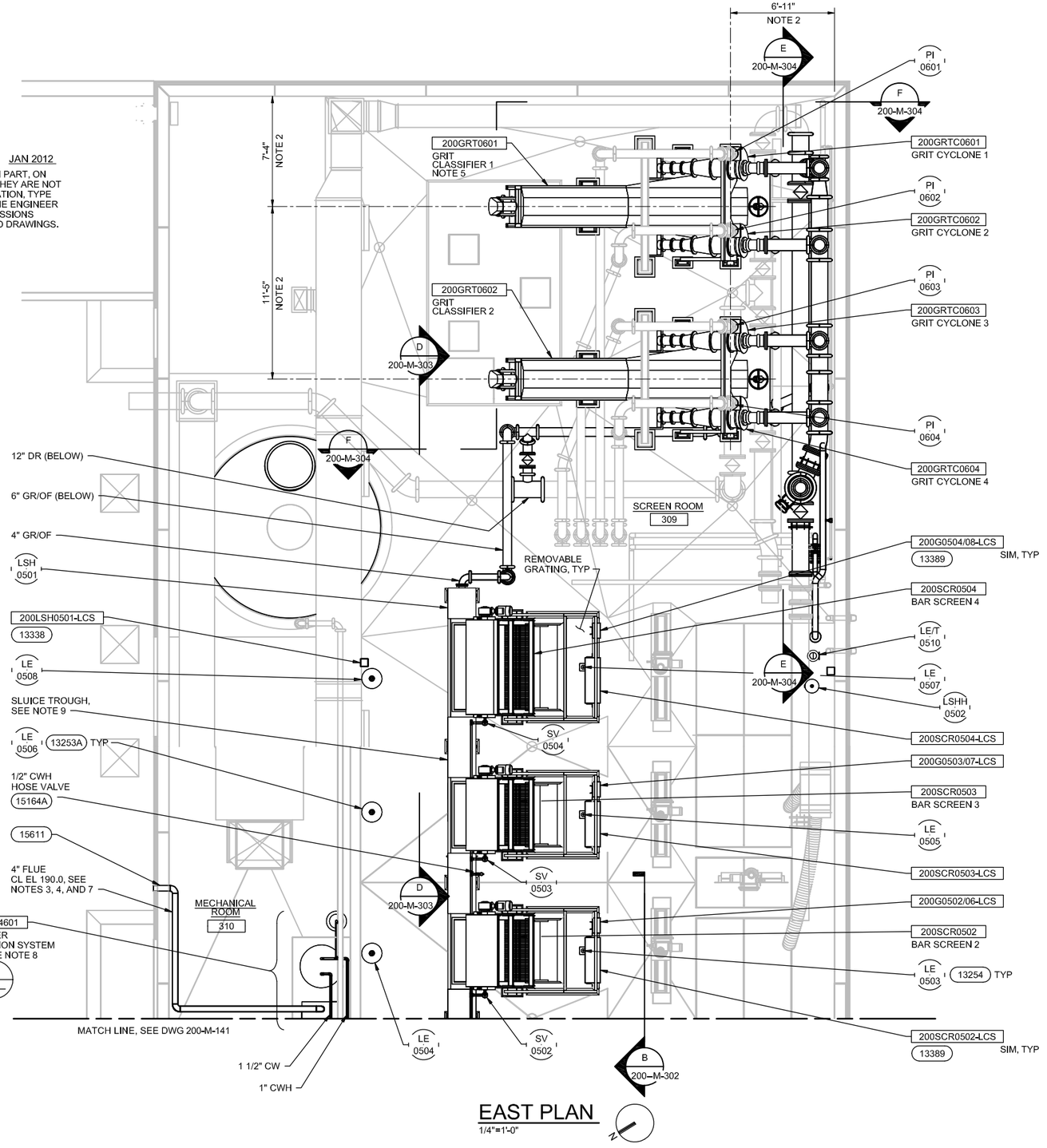
ENGR STAMP:

FILENAME: 200-M-141_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:26:48 PM

RECORD DRAWINGS

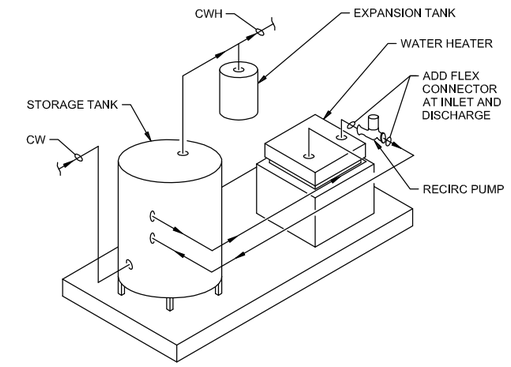
Revisions Drawn By E.R. BROWN Date JAN 2012

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EAST PLAN

1/4"=1'-0"



2 HOT WATER GENERATOR SYSTEM PIPING SCHEMATIC

NTS

HOT WATER GENERATOR SYSTEM 200HX4601 SEQUENCE OF OPERATION:

1. THE HOT WATER GENERATOR SYSTEM (HWS) PROVIDES HEATED WATER TO THE SLUICES IN THE COMPACTOR ROOM.
2. THE HWS IS CONTROLLED BY THE VENDOR-PROVIDED CONTROL SYSTEM. AN ON-OFF REMOTE SELECTOR ON THE FACE OF THE VENDOR-PROVIDED CONTROL PANEL DETERMINES HOW THE SYSTEM OPERATES. WHEN OPERATING IN REMOTE MODE. A RUN SIGNAL FROM SCADA INITIATES THE SYSTEM TO RUN.
3. THE VENDOR-PROVIDE CONTROL PANEL MODULATES THE GAS-FIRED HEATER AND RECIRCULATION PUMP TO MAINTAIN THE SUPPLY WATER TEMPERATURE SET POINT OF 180 DEGREES F (ADJUSTABLE).
4. THE VENDOR-PROVIDED CONTROL PANEL INITIATES A COMMON ALARM SIGNAL TO SCADA IF THE HWS CONTROL SYSTEM GENERATES AN ALARM OR FAILURE CONDITION.

NOTES:

1. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS, ELEVATIONS AND DIMENSIONS.
2. APPROXIMATE DIMENSION - CONTRACTOR SHALL ALIGN NEW GRIT CLASSIFIERS WITH EXISTING CLASSIFIER FLOOR DRAINS.
3. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR WATER HEATER FLUE MATERIAL AND INSTALLATION.
4. MAINTAIN MINIMUM 10'-0" CLEAR BETWEEN EDGE OF MAU INTAKE LOUVER AND OD OF FLUE. ALSO MAINTAIN MINIMUM 4'-0" CLEARANCE BETWEEN EDGE OF DOOR AND OD OF FLUE.
5. RECONNECT EXISTING 1/2" NPW TO SLUICE WATER CONNECTION ON THE GRIT CLASSIFIER.
6. REFER TO 200-H-601 FOR HOT WATER GENERATOR SYSTEM SEQUENCE OF OPERATION.
7. TERMINATE FLUE VENT DUCT WITH MANUFACTURER'S WALL VENT TERMINAL KIT.
8. HOT WATER GENERATOR SYSTEM SKID DIMENSIONS APPROXIMATELY 80"L x 48"W x 84"H
9. FOR SLUICE SPLITTER BOX AND SLUICE TROUGH DETAILS SEE DRAWINGS 200-SM-401, 200-SM-402, 200-SM-403, AND 200-SM-404.

PLOT TIME: 1:27:01 PM
PLOT DATE: 05-26-2012
FILENAME: 200-M-142_391538.DWG

DRN: ERB	ORIG DATE: JAN 2010	PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS	SHEET TITLE: HEADWORKS MECHANICAL EAST PLAN AND DETAIL
DSN: GVT	DWG #: 200-M-142		
CHK: JEG	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

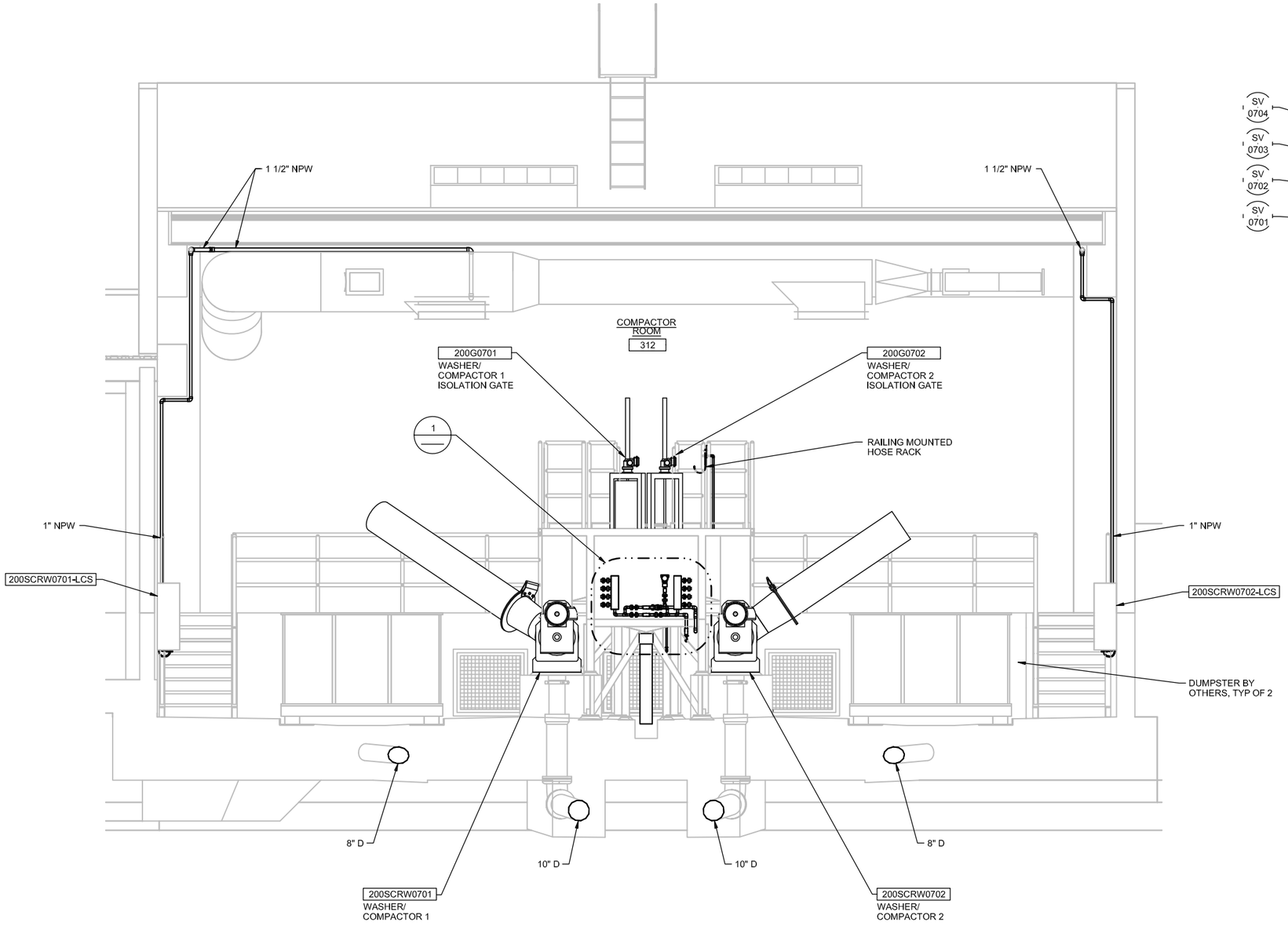
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CH2MHILL

SHEET: 105 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410
DWG #: 200-M-142

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

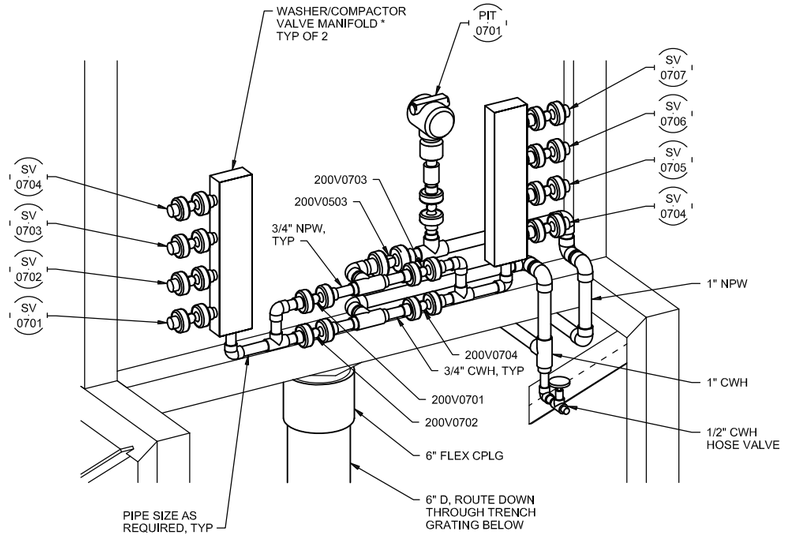


RECORD DRAWINGS

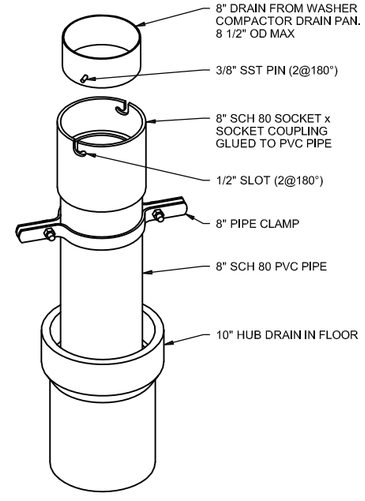
Revisions Drawn By E.R. BROWN Date JAN 2012

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A SECTION
3/8"=1'-0"
200-M-141



1 DETAIL
NTS



2 COMPACTOR DRAIN COUPLING
1 1/2"=1'-0"
200-M-302

DRN: ERB	ORIG DATE: JAN 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.					
DSN: GVT	DWG #: 200-M-301						
CHK: JEG	CAD FILE #:						
APPD: LEC	SCALE: AS SHOWN		01/12	ERB	LEC	RECORD DRAWING	
		REV #	DATE	DRN	APPD	DESCRIPTION	

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CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: HEADWORKS MECHANICAL SECTION AND DETAILS

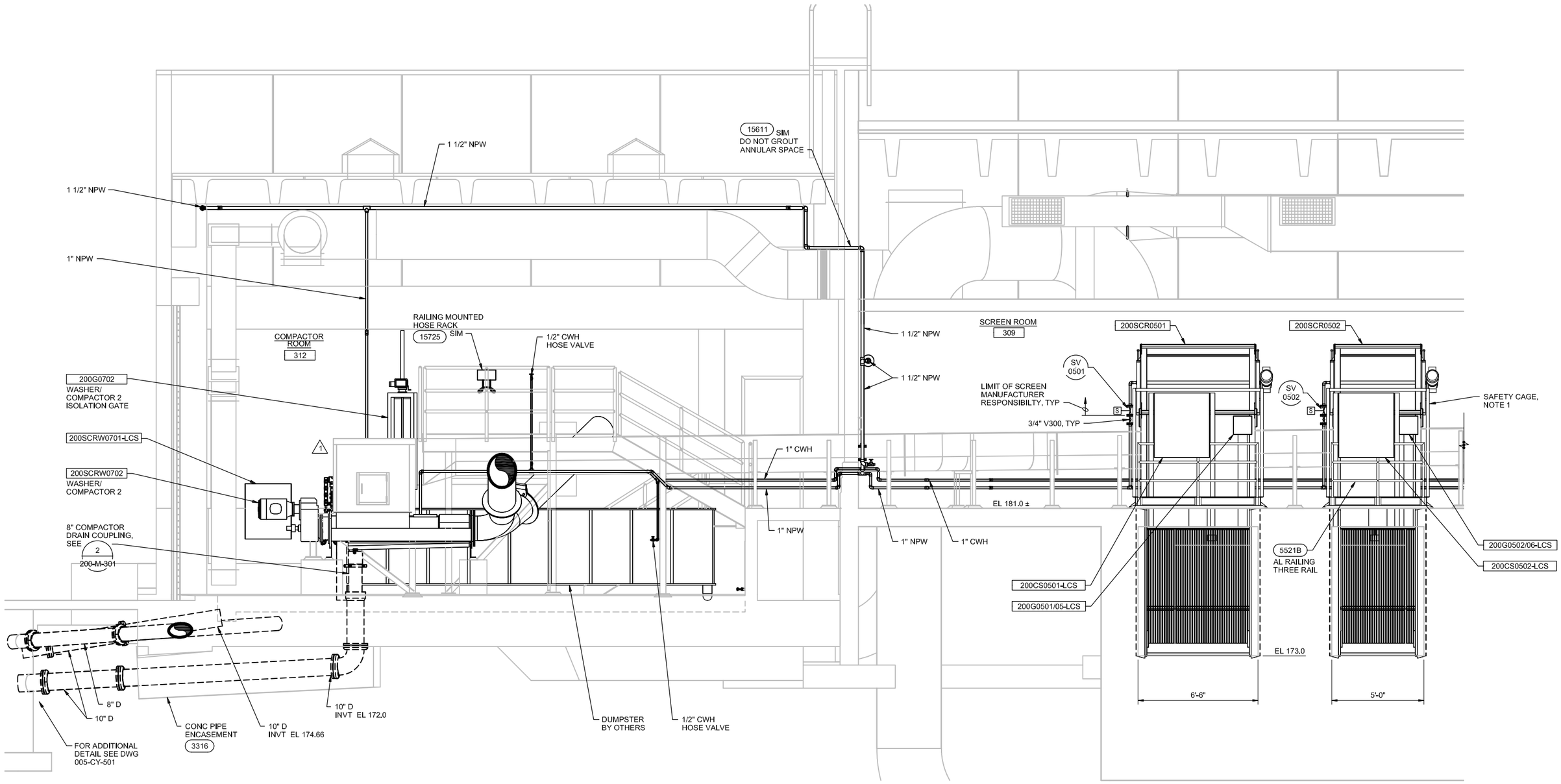
SHEET: 106 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-M-301

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 200-M-301_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:27:14 PM



RECORD DRAWINGS

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B SECTION 3/8"=1'-0"

200-M-141
200-M-142

NOTES:

1. CONTRACTOR AND EQUIPMENT MANUFACTURER TO FIELD VERIFY EXISTING CONDITIONS, ELEVATIONS AND DIMENSIONS.

	01/12	ERB	LEC	RECORD DRAWING	
1	06/10	GVT	LEC	ADDENDUM NO. 1	
REV #	DATE	DRN	APPD	DESCRIPTION	

DRN: ERB | ORIG DATE: JAN 2010
DSN: GVT | DWG #: 200-M-302
CHK: JEG | CAD FILE #:
APPD: LEC | SCALE: 3/8"=1'-0"

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
MECHANICAL
SECTION

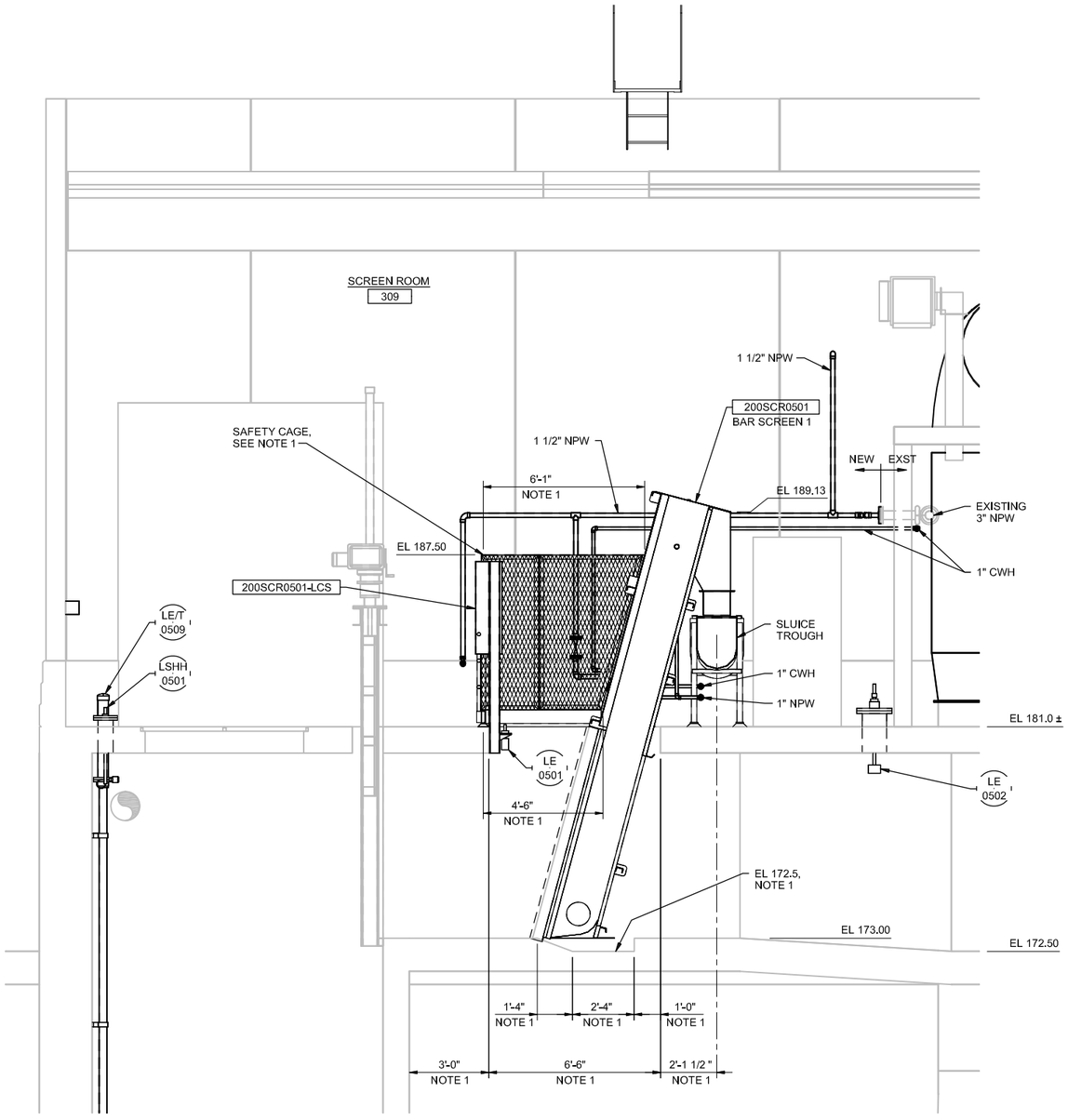
SHEET: 107 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-M-302

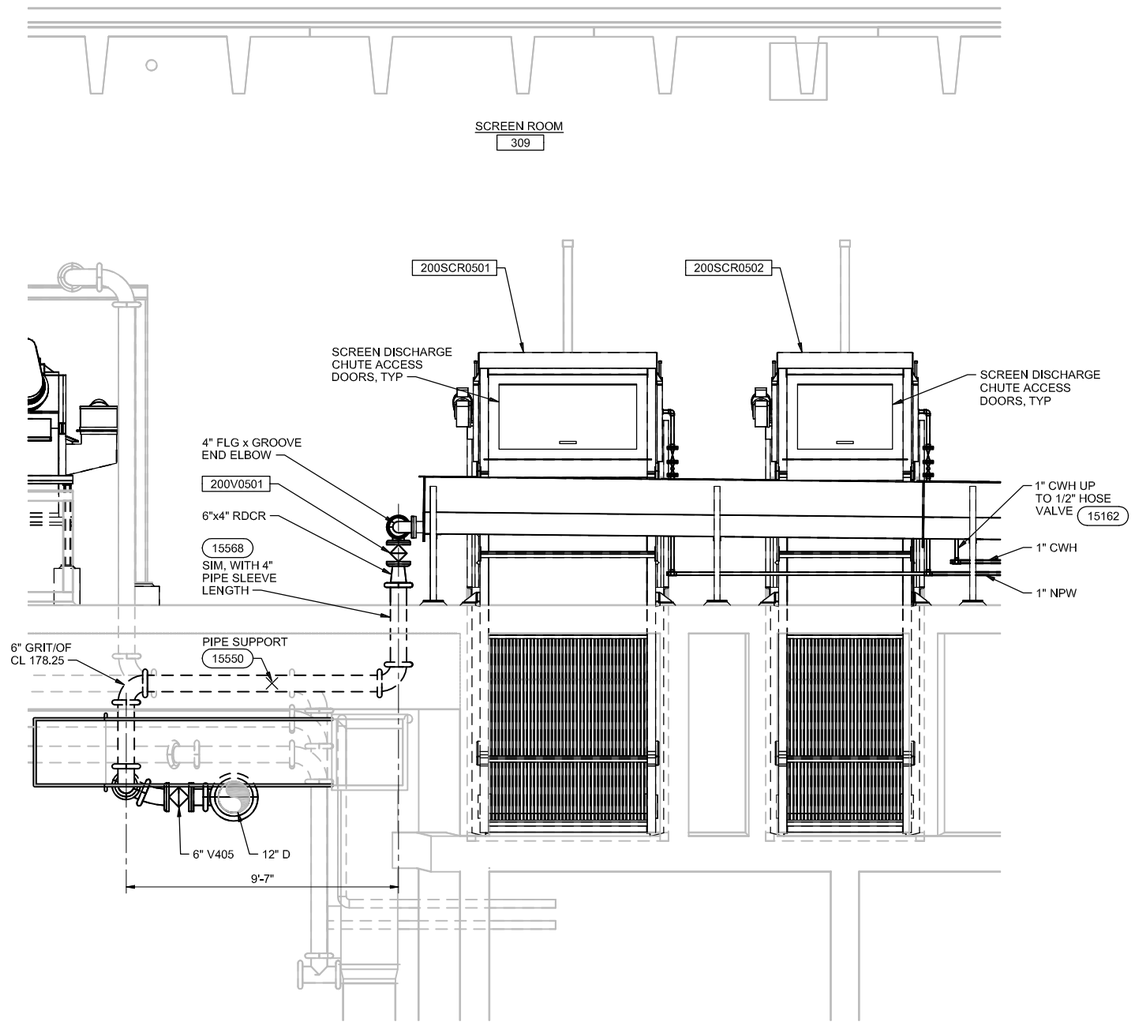
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 200-M-302_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:27:26 PM



C SECTION
3/8"=1'-0"
200-M-142



D SECTION
3/8"=1'-0"
200-M-142

NOTES:

1. CONTRACTOR AND EQUIPMENT MANUFACTURER TO FIELD VERIFY EXISTING CONDITIONS, ELEVATIONS, AND DIMENSIONS.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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DRN: ERB	ORIG DATE: JAN 2010		
DSN: GVT	DWG #: 200-M-303		
CHK: JEG	CAD FILE #:		
APPD: LEC	SCALE: 3/8"=1'-0"		

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REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
MECHANICAL SECTIONS

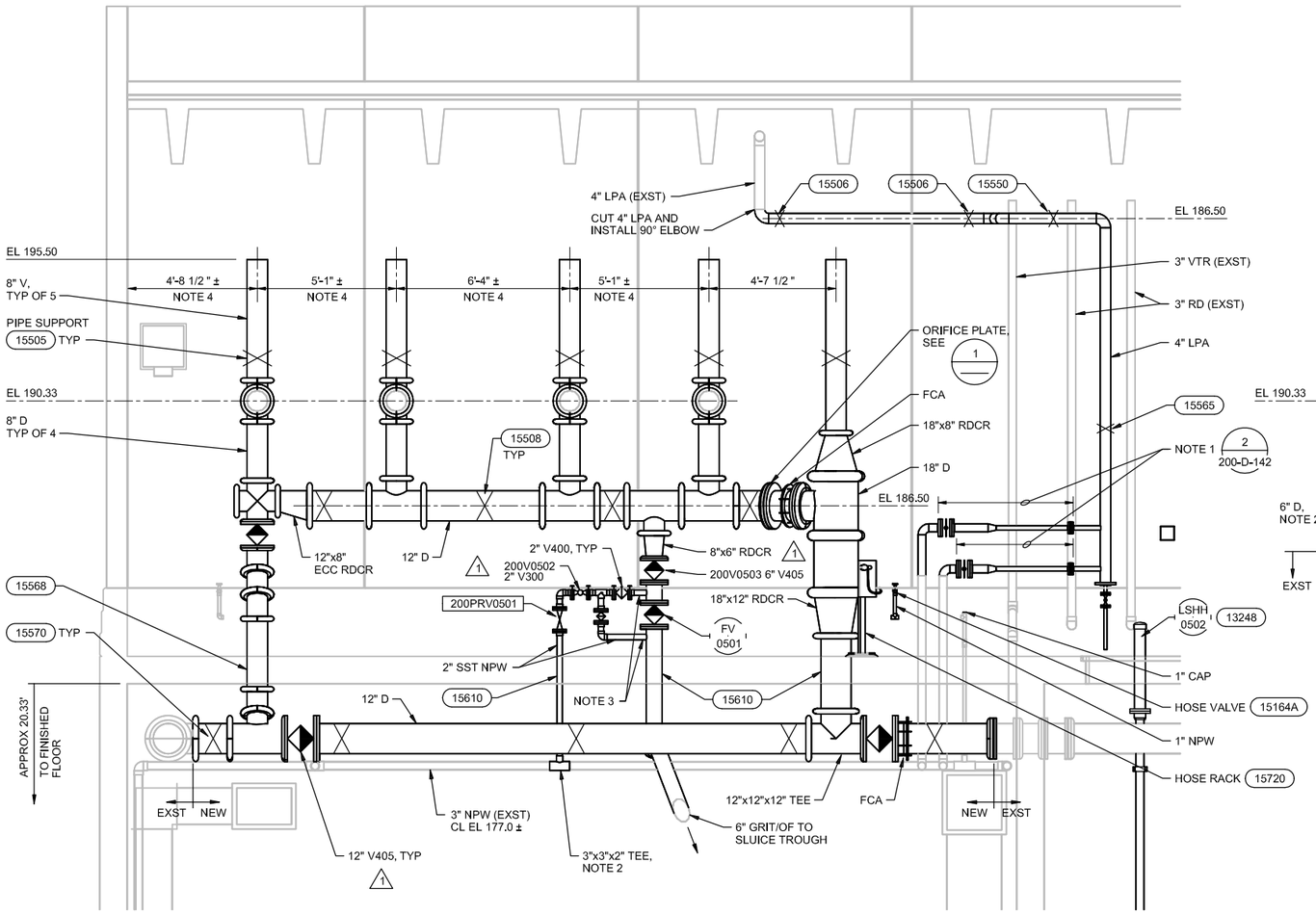
SHEET: 108 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

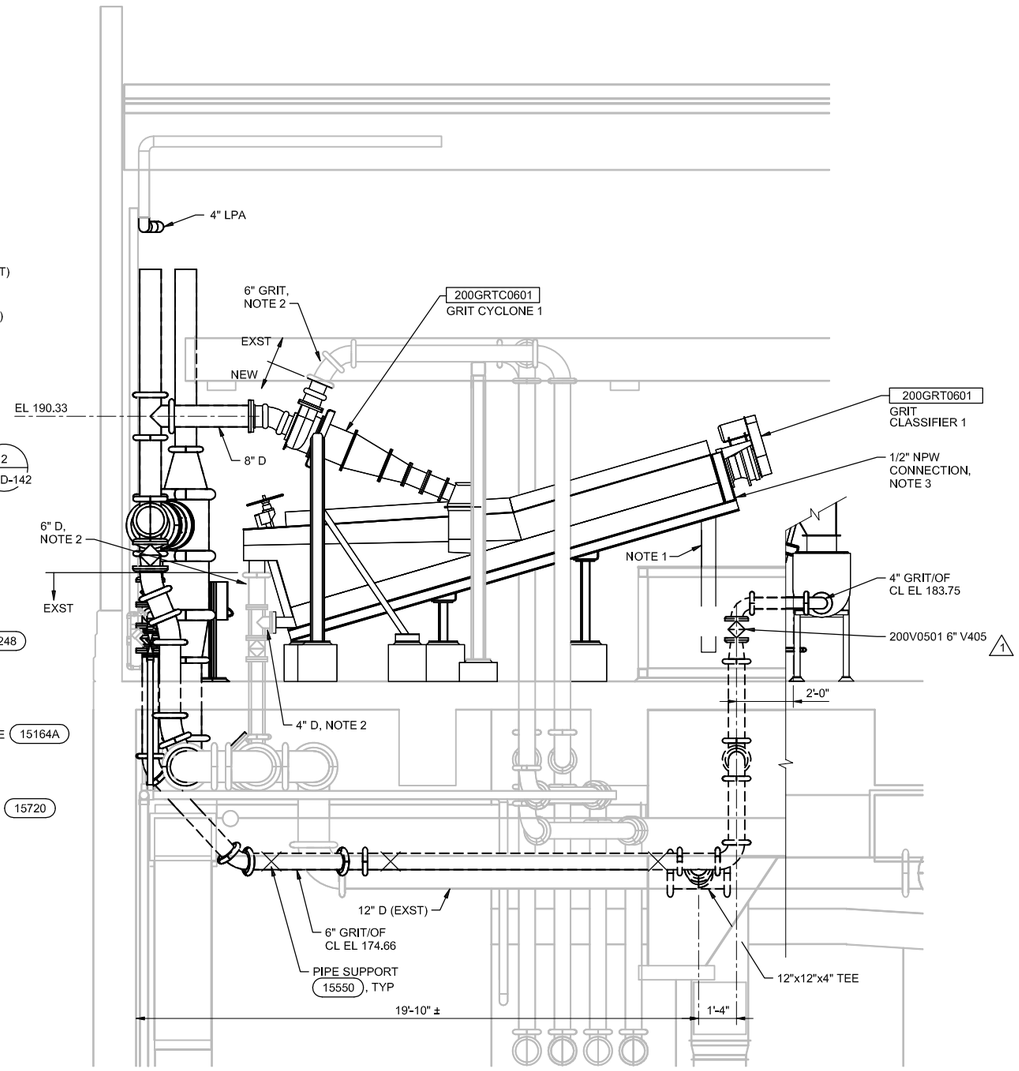
DWG #: 200-M-303

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 200-M-303_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:27:38 PM





NOTES:

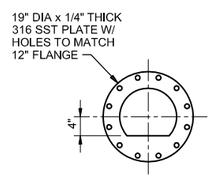
1. CONTRACTOR SHALL RELOCATE EXISTING LPA CONTROL AND MEASUREMENT ASSEMBLY AND RECONNECT TO EXISTING 3" LPA RISERS.
2. CONTRACTOR TO MATCH EXISTING 3" NPW PIPE MATERIAL AND PROVIDE FLANGE CONNECTION FOR 2" SST PIPE.
3. DOUBLE STRAP SADDLE FOR DI PIPE TO SST PIPE CONNECTION.
4. APPROXIMATE DIMENSION. CONTRACTOR SHALL ALIGN VENT PIPE BASED ON CYCLONE EFFLUENT.

RECORD DRAWINGS

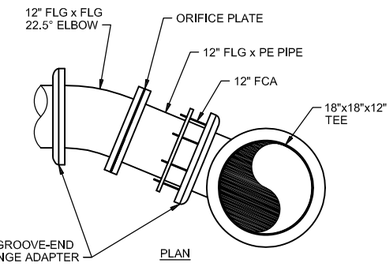
Revisions Drawn By E.R. BROWN Date JAN 2012

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E SECTION
3/8"=1'-0"
200-M-142



ORIFICE PLATE



PLAN

1 DETAIL
3/4"=1'-0"

NOTES:

1. CONTRACTOR SHALL DESIGN AND FABRICATE STAINLESS STEEL GRIT CHUTE WITH CONNECTION TO CLASSIFIER OUTLET FLANGE AND EXTENDING 3 FEET INTO EXISTING HOPPER, SIZE TO MATCH EXISTING.
2. ADJUST EXISTING GRIT AND DRAIN PIPING AS REQUIRED TO INSTALL NEW CLASSIFIER AND CYCLONES.
3. EXISTING 1/2" NPW PIPE AND VALVES TO SUPPLY CLASSIFIER SLUICE WATER NOT SHOWN FOR CLARITY.

F SECTION
3/8"=1'-0"
200-M-142

				01/12	ERB	LEC	RECORD DRAWING
				1	06/10	GVT	LEC	ADDENDUM NO. 1
				REV #	DATE	DRN	APPD	DESCRIPTION

DRN: ERB | ORIG DATE: JAN 2010
DSN: GVT | DWG #: 200-M-304
CHK: JEG | CAD FILE #:
APPD: LEC | SCALE: 3/8"=1'-0"

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
MECHANICAL
SECTIONS AND DETAIL

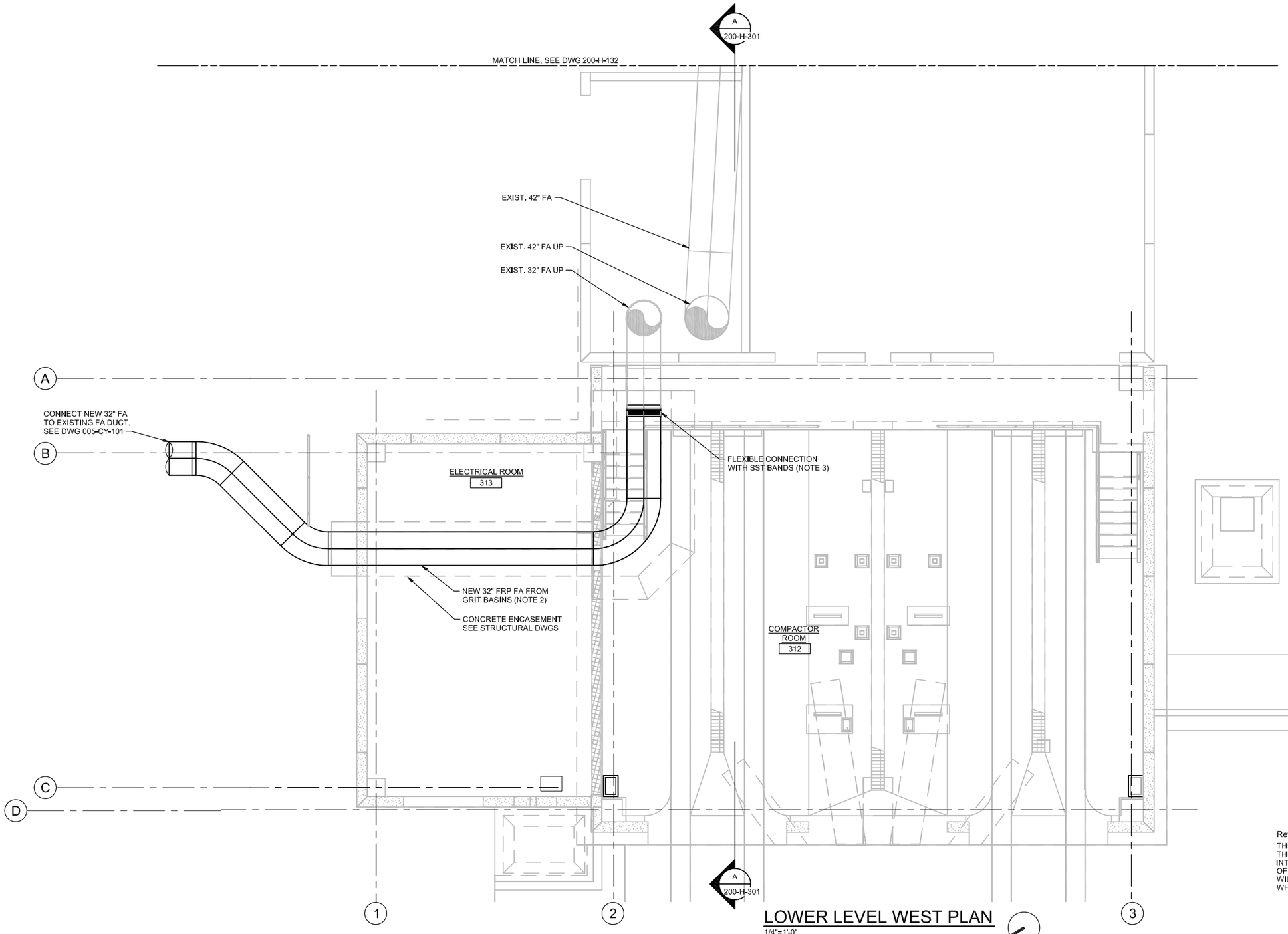
SHEET: 109 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-M-304

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 200-M-304_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:27:50 PM



LOWER LEVEL WEST PLAN

1/4"=1'-0"

NOTES:

1. REBALANCE VENTILATION SYSTEMS TO VALUES INDICATED HEREIN.
2. MAINTAIN EXISTING SLOPE FOR RELOCATED FA DUCT. DO NOT CREATE LOW SPOTS IN DUCT.
3. MIN 3/8 INCH THICK FABRIC - REINFORCED HYPALON. SLIP-ON TYPE EXPANSION JOINT AS SPECIFIED IN 15892 EXCEPT FOR THICKNESS. MIN. 12" LNG. PROVIDE 4" GAP BETWEEN EXIST AND NEW DUCT. MIN. FOUR TYPE 316 SS WORM SCREW ADJUSTABLE CLAMPS, 2 EACH SIDE

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-H-131_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:24:11 PM

DRN: JSW	ORIG DATE: MAY 2010		
DSN: SCC	DWG #: 200-H-131		
CHK: CJS	CAD FILE #:		
APPD: LEC	SCALE: 1/4" = 1'-0"		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

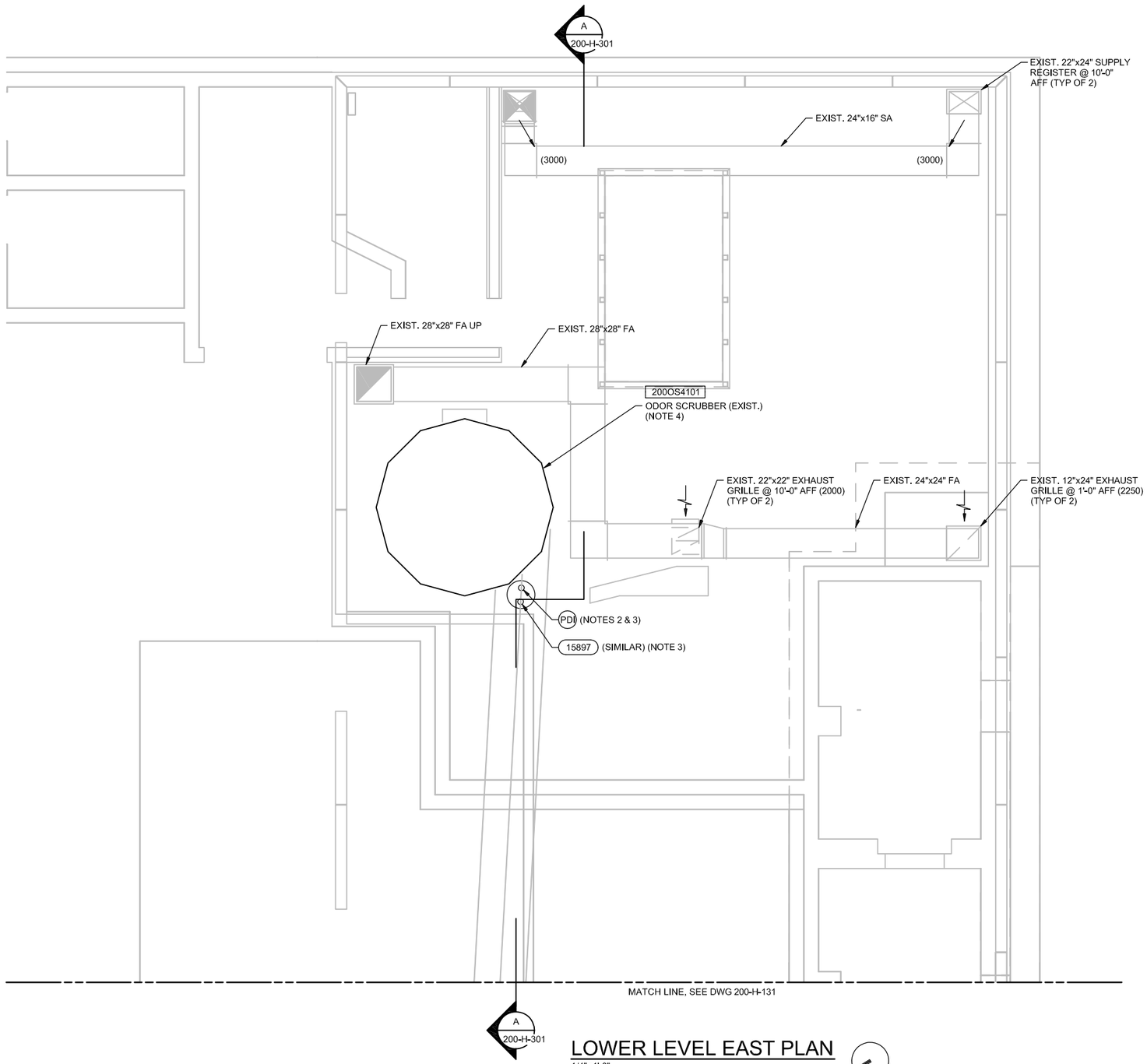
SHEET TITLE:
HEADWORKS
HVAC
LOWER LEVEL WEST PLAN

SHEET: 110 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-H-131

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

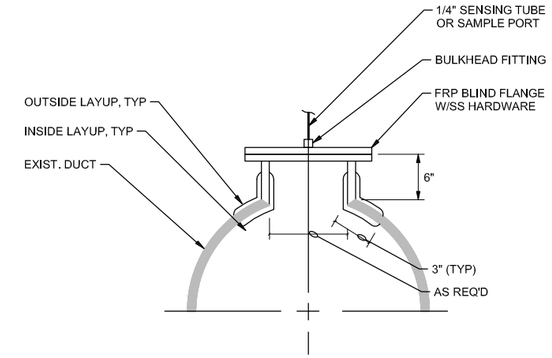


LOWER LEVEL EAST PLAN

1/4"=1'-0"

NOTES:

1. REBALANCE VENTILATION SYSTEMS TO VALUES INDICATED HEREIN.
2. INSTALL DWYER MAGNEHELIC SERIES 2004 DIFFERENTIAL PRESSURE GAUGE MOUNT ON PEDENSTAL PER (16158A) (SIMILAR). INSTALL 1/4" PRESSURE PORTS WITH V330 BALL VALVES IN EXISTING ODOR SCRUBBER INLET DUCT AND NEW ODOR SCRUBBER DISCHARGE DUCT, ROUTE 1/4" SENSING TUBE TO GAUGE. MOUNT GAUGE IN ACCESSIBLE LOCATION. PROVIDE RETAINING CLIPS TO PREVENT SAGGING OF TUBE. TUBE SHALL BE SUPPORTED TO PREVENT LOW PTS. OR EXCESSIVE BENDS TO SATISFACTION OF ENGINEER.
3. AT CONNECTIONS TO EXIST DUCTWORK, PROVIDE OVERSIZED FLANGED NOZZLES TO ALLOW INSIDE OVERLAY. ALL HARDWARE TYPE 316 SS AT PDIT PROVIDE BULKHEAD FITTING @ BLIND FLANGE. SEE DETAIL (1) THIS SHEET.
4. REMOVE BUILD-UP OF SODIUM HYPOCHLORITE ON THE CORROSION LINING INSIDE THE SCRUBBER. BUILD-UP STARTS @ AROUND THE 8' TO 10' LEVEL AND EXTENDS TO TOP OF TANK AND STACK. UPON REMOVAL OF BUILD-UP, PREP SURFACE AND INSTALL NEW DOUBLE VEIL (CORROSION) LAYER AND TOP COAT.



1 DETAIL

NTS

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-H-132_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:24:22 PM

DRN: JSW	ORIG DATE: MAY 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	REV #	DATE	DRN	APPD	DESCRIPTION
DSN: SCC	DWG #: 200-H-132						
CHK: CJS	CAD FILE #:						
APPD: LEC	SCALE: 1/4" = 1'-0"			01/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: HEADWORKS HVAC LOWER LEVEL EAST PLAN

SHEET: 111 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

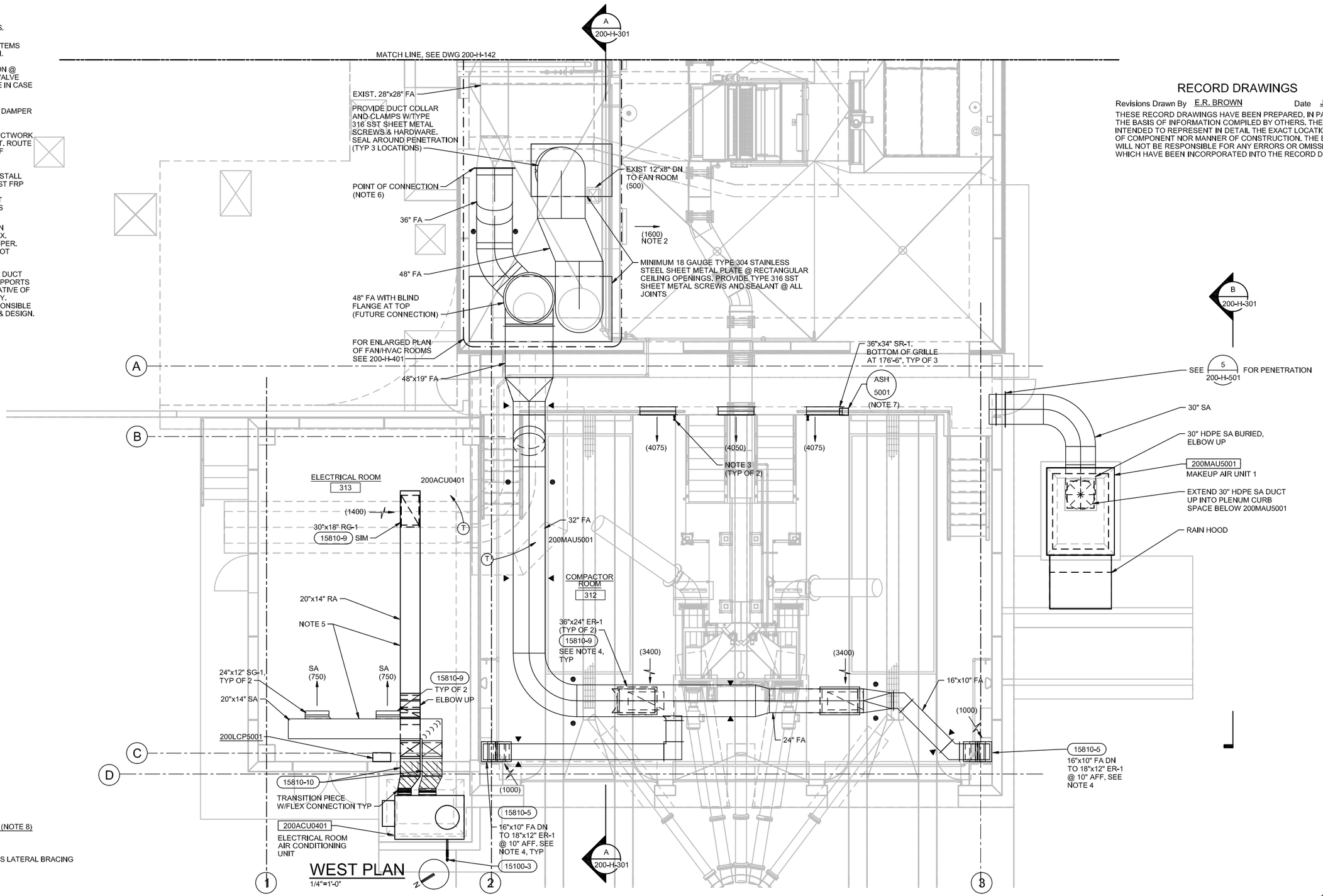
DWG #: 200-H-132

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

NOTES:

1. PROVIDE TURNING VANES IN RECTANGULAR DUCT FITTINGS.
2. REBALANCE VENTILATION SYSTEMS TO VALUES INDICATED HEREIN.
3. PROVIDE 1" DRAIN CONNECTION @ BOTTOM OF PLENUM W/BALL VALVE FOR DRAINING PLENUM SPACE IN CASE OF FLOODING.
4. PROVIDE MANUAL BALANCING DAMPER PER STANDARD DETAILS.
5. DO NOT ROUTE OVERHEAD DUCTWORK OVER ELECTRICAL EQUIPMENT. ROUTE TIGHT TO UNDERSIDE OF ROOF STRUCTURE.
6. AT SS TO FRP CONNECTION INSTALL FLANGED CONNECTION @ EXIST FRP DUCT END. PROVIDE FLANGES COMPATIBLE IN SIZE AND BOLT PATTERN. PROVIDE GASKET AS SPECIFIED IN 15892.
7. MOUNT JUST ABOVE GRILLE ON UPSTREAM CORNER @ APPROX. 4'-0" AFF. JUST NORTH OF BUMPER. LOCATE TO ENSURE BIN CANNOT CRUSH UNIT.
8. SEE SPEC SECTION 15892 FOR DUCT SUPPORT REQUIREMENTS. SUPPORTS INDICATED HEREIN ARE INDICATIVE OF MINIMUM REQUIREMENTS ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL SUPPORT LAYOUT & DESIGN.



WEST PLAN
1/4"=1'-0"

DUCT SUPPORT LEGEND (NOTE 8)

● = DUCT HANGARS

▲ = DUCT HANGARS PLUS LATERAL BRACING

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:24:33 PM
PLOT DATE: 05-26-2012
FILENAME: 200-H-141_391538.DWG

DRN: JSW	ORIG DATE: MAY 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: SCC	DWG #: 200-H-141		
CHK: CJS	CAD FILE #:		
APPD: LEC	SCALE: 1/4" = 1'-0"		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services — Our commitment is clear
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CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

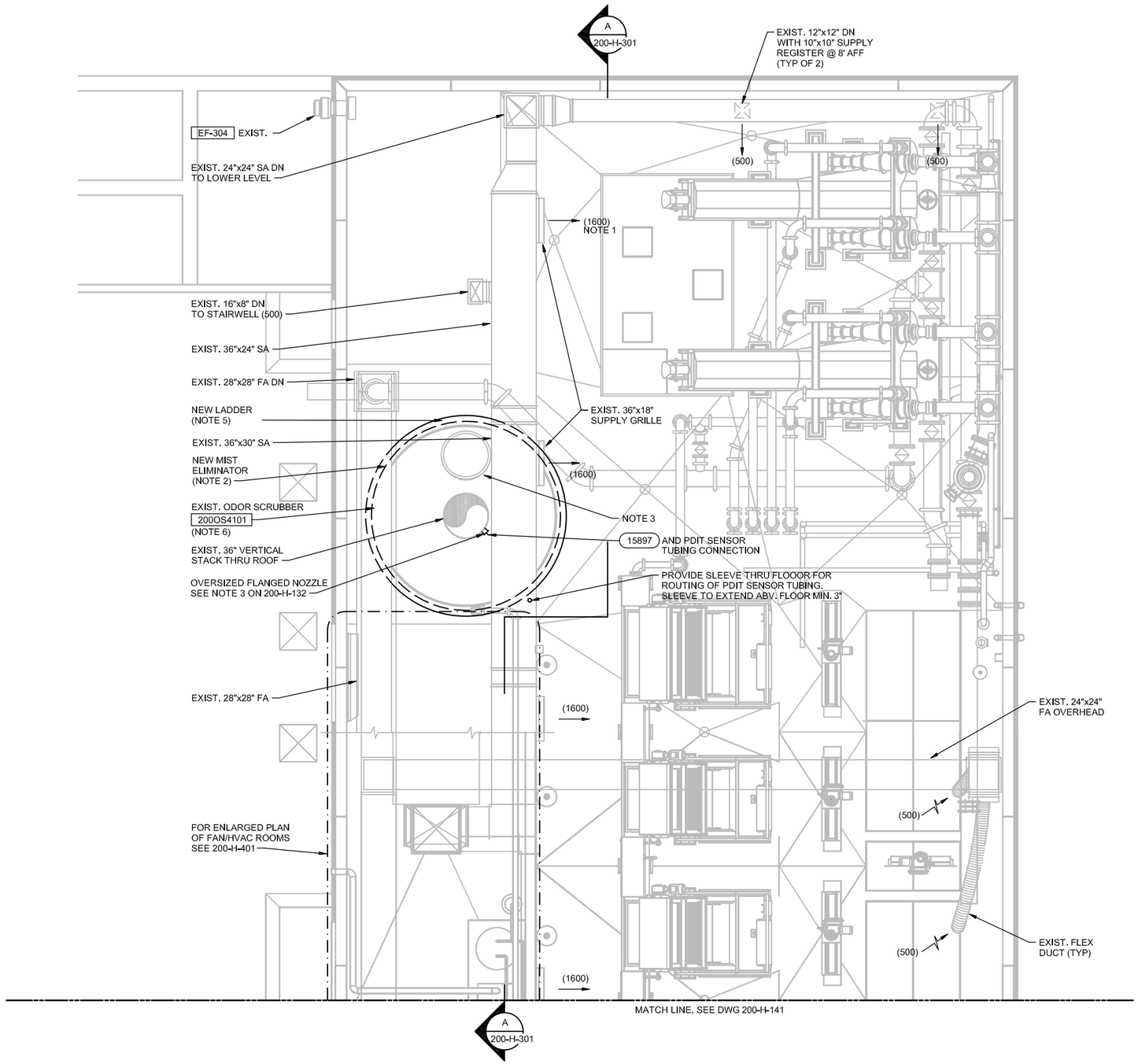
SHEET TITLE: HEADWORKS HVAC WEST PLAN

SHEET: 112 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-H-141

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



EAST PLAN

1/4"=1'-0"

NOTES:

1. REBALANCE VENTILATION SYSTEMS TO VALUES INDICATED HEREIN.
2. INSTALL NEW MIST ELIMINATOR IN ODOR SCRUBBER. SEE DWG 200-H-501 FOR DETAILS.
3. INSTALL NEW 36" DIA MANWAY IN TOP HEAD OF ODOR SCRUBBER. SEE DETAIL 4 ON 200-H-501.
4. MOUNT 12"Wx8"H MINIMUM SIGN ON TOP OF ODOR SCRUBBER AT MANWAY. SIGN TO READ:

   "CAUTION: MIST ELIMINATOR AND BLANK-OFF PLATES AND ASSOCIATED SUPPORTS ARE NOT DESIGNED AS A WORK SURFACE. DO NOT STAND ON OR USE ANY PART FOR SUPPORT."

   SIGN TO HAVE BLACK LETTERS AND YELLOW BACKGROUND.
5. PROVIDE NEW LADDER DESIGNED TO MEET ALL LOCAL AND NATIONAL CODE REQUIREMENTS. CONSTRUCT OUT OF FRP. ATTACH TO SCRUBBER USING FRP CLIPS HAND LAYUP TO VESSEL WALL USING COMPATIBLE VINYLE ESTER RESIN. DO NOT PROVIDE BOLTED CONNECTION OR PENETRATE SCRUBBER WALL WITH ATTACHMENTS. SUPPORT LADDER BY FLOOR NOT BY TANK WALL. ISOPHTHALIC RESIN USED FOR LADDER SYSTEM. TANKINETICS OR EQUAL.
6. SEE NOTE 4 ON 200-H-132.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-H-142_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:24:46 PM

DRN: JSW	ORIG DATE: MAY 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: SCC	DWG #: 200-H-142		
CHK: CJS	CAD FILE #:		
APPD: LEC	SCALE: 1/4" = 1'-0"		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

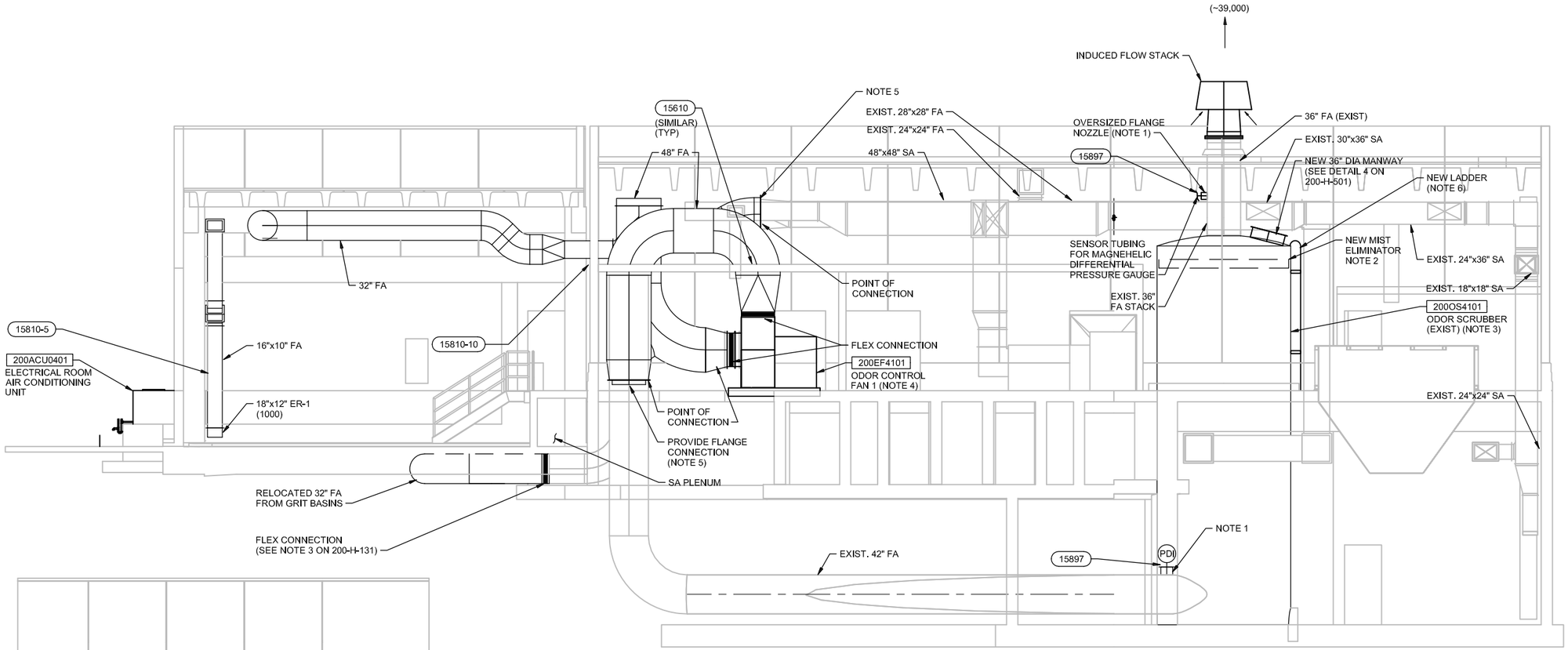
SHEET TITLE: HEADWORKS HVAC EAST PLAN

SHEET: 113 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

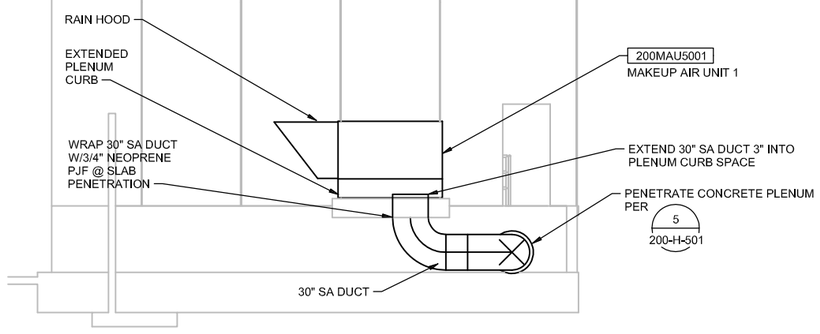
DWG #: 200-H-142

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



A SECTION
3/16"=1'-0"
200-H-131
200-H-141
200-H-142
200-H-201



B SECTION
3/16"=1'-0"
200-H-141

NOTES:

1. SEE NOTE 3 ON 200-H-132
2. REFER TO 200-H-501 FOR MIST ELIMINATOR DETAILS.
3. SEE NOTE 4 ON 200-H-132
4. INSTALLLATION OF FAN WITHIN FAN ROOM WILL REQUIRE SOME EQUIPMENT DISSASSEMBLY AND REASSEMBLY DUE TO LIMITED ACCESS OPENING TO SPACE. DOUBLE DOORS ARE APPROX. 6'-0" WIDE. CONTRACTOR TO VERIFY ALL DIMENSIONS.
5. SEE NOTE 6 ON 200-H-141.
6. SEE NOTE 5 ON 200-H-142.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:24:58 PM
PLOT DATE: 05-26-2012
FILENAME: 200-H-301_391538.DWG

DRN: JSW	ORIG DATE: MAY 2010				
DSN: SCC	DWG #: 200-H-301				
CHK: CJS	CAD FILE #:				
APPD: LEC	SCALE: 3/16" = 1'-0"				

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

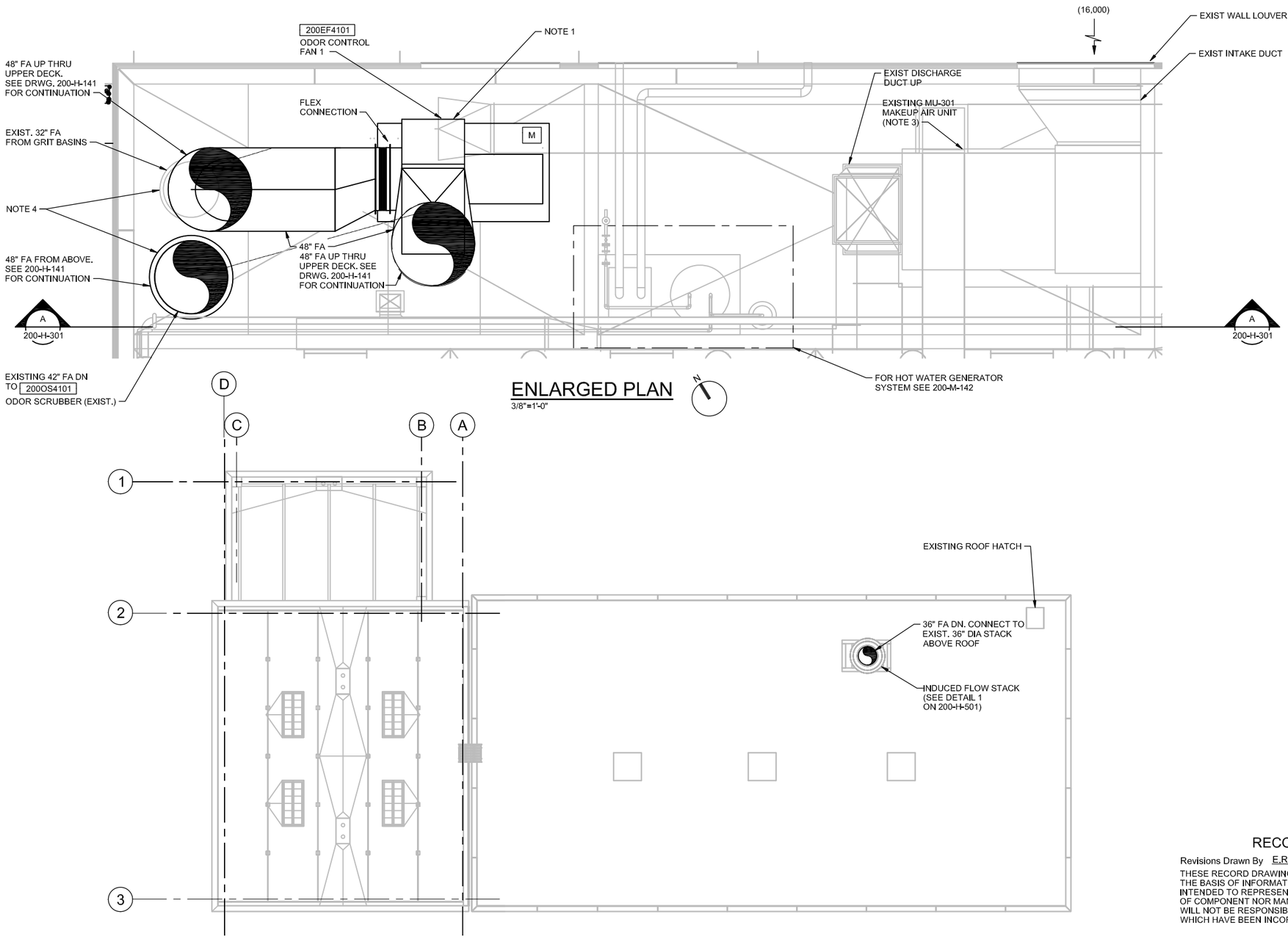
SHEET TITLE:
HEADWORKS
HVAC
SECTIONS

SHEET: 114 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-H-301

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



ENLARGED PLAN
3/8"=1'-0"

ROOF PLAN
1/8"=1'-0"

NOTES:

1. SEE NOTE 4 ON 200-H-301
2. FOR OVERALL PLAN, SEE 200-H-141.
3. REBALANCE UNIT TO FLOWS INDICATED HEREIN.
4. SEE NOTE 6 ON 200-H-141.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-H-401_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:25:09 PM

DRN: JSW	ORIG. DATE: MAY 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: SCC	DWG #: 200-H-401		
CHK: CJS	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
HVAC
PARTIAL PLANS

SHEET: 115 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-H-401

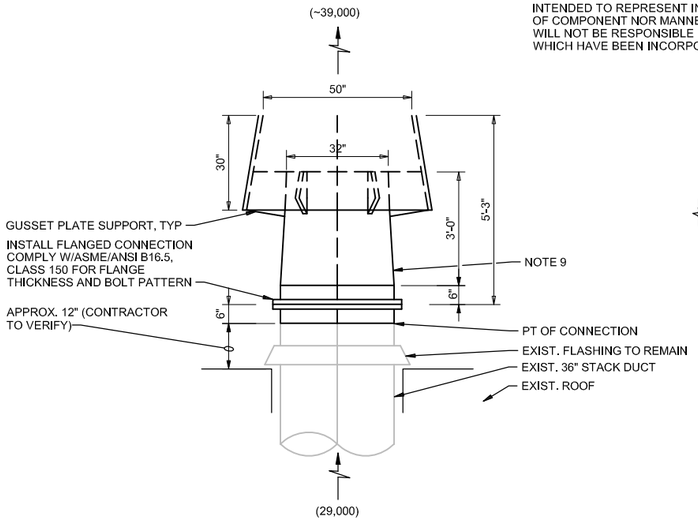
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

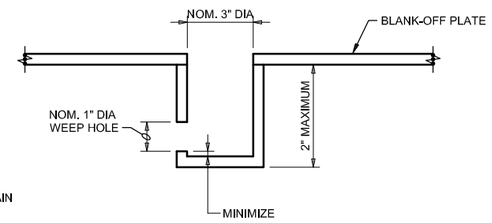
RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

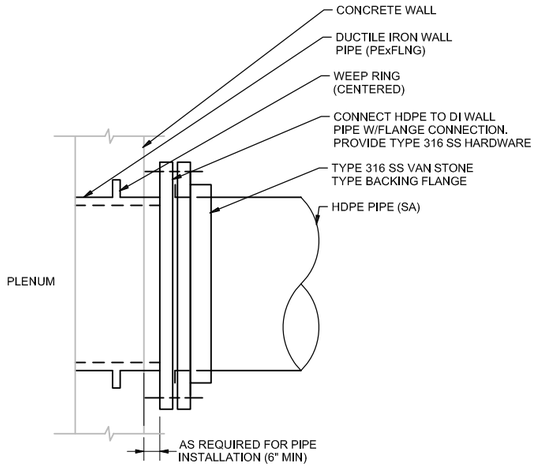
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1 INDUCED AIR STACK
1/2"=1'-0"
200-H-201



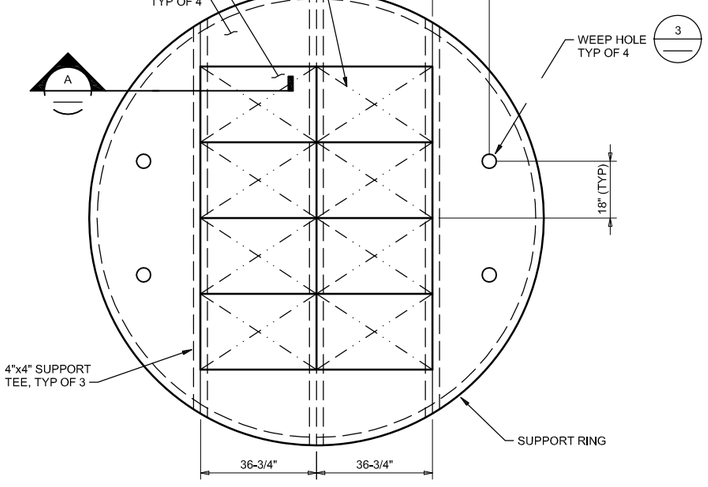
3 WEEP HOLE
NTS



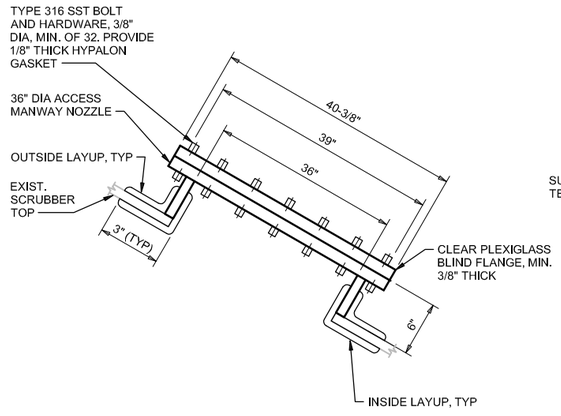
5 PLENUM/DUCT CONNECTION DETAIL
NTS

NOTES:

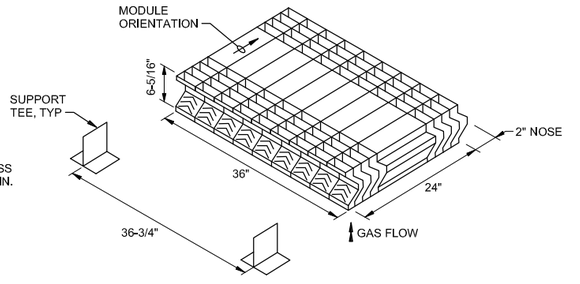
1. MUNTERS VERTICAL FLOW T-271 POLYPROPYLENE MIST ELIMINATOR. EACH MODULE 24"x36"x6-5/16" HIGH. TOTAL OF EIGHT MODULES REQUIRED. MAXIMUM OF 0.25 INCHES WC PRESSURE DROP @ 29,000 CFM. PERFORMANCE TO BE 99.9%REMOVAL OF 30 MICRON DROPLETS & LARGER.
2. BLANK-OFF PLATE.
3. INSTALL SUPPORTS, BLANK-OFF PLATES AND MIST ELIMINATOR MODULES LEVEL AND PLUMB.
4. ALL WETTED HARDWARE TO BE 316 STAINLESS STEEL.
5. ATTACH SUPPORT RING TO INSIDE WALL OF EXISTING SCRUBBER. LAMINATE TO TANK WALL AS REQUIRED TO PROVIDE 50 LBS / LIN. FT SUPPORT CAPACITY (MINIMUM). DO NOT BOLT TO WALL. RESIN TO BE COMPATIBLE WITH EXISTING.
6. SCRUBBER RESIN IS HETRON 922 WITH 10 MIL SURFACING VEIL, FILAMENT WOUND STRUCTURAL LAYER, AND 0.10 IN TOTAL LINER THICKNESS. REFER TO ORIGINAL CALVERT DOCUMENTS AND DESIGN FOR ADDITIONAL INFORMATION.
7. PROVIDE A MINIMUM OF TWO BOLTS AND HARDWARE COMPONENTS ON EACH SIDE OF BLANK-OFF FOR ATTACHMENT TO SUPPORT RING OR SUPPORT TEE.
8. ANGLE SUPPORT RING, BLANK-OFF PLATE, SPACER PLATE, AND SUPPORT TEE TO BE MADE OF FRP COMPATIBLE WITH EXISTING ODOR SCRUBBER FRP.
9. VENTURI STACK TO BE DESIGNED TO ACCOMODATE ALL LOADINGS INDICATED ON STRUCTURAL DRAWINGS. PROVIDE GUY WIRES IF NECESSARY. WEIGHT OF STACK ASSEMBLY SHALL NOT EXCEED LOAD BEARING WEIGHT LIMIT OF EXIST STACK OR SCRUBBER EXIT NOZZLE AND VESSEL HEAD. FOR FRP REQUIREMENTS SEE 15892.
10. NEW RESIN SHALL BE COMPATIBLE WITH EXISTING. CONTRACTOR TO VERIFY RESIN TYPE.
11. PROVIDE STRUCTURAL CALCULATIONS VERIFYING THAT NEW ACCESS MANWAY WILL NOT COMPROMISE TANK STRUCTURAL INTEGRITY. CALCS SHALL BE STAMPED BY STRUCTURAL OR CIVIL ENGINEER IN THE STATE OF OREGON.
12. CONTRACTOR PERFORMING MODIFICATIONS TO ODOR CONTROL SCRUBBER TO HAVE A MINIMUM OF 5 YEARS EXPERIENCE IN THE DESIGN, MANUFACTURE, AND REPAIR OF FRP VESSELS OF SIMILAR DESIGN. DUCT WORK FABRICATORS WILL NOT BE ALLOWED.



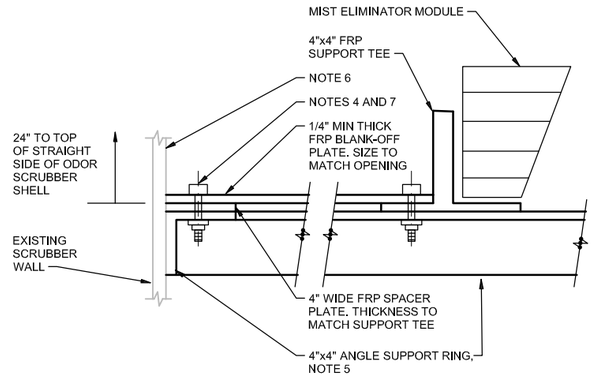
2 MIST ELIMINATOR
NTS
200-H-201



4 ACCESS MANWAY (NOTES 10, 11 AND 12)
NTS



6 TYPICAL T-271 MODULE UNCUT
NTS



A SECTION (NOTES 3, 8, 10 AND 12)
NTS

PLOT DATE: 05-26-2012 PLOT TIME: 1:25:19 PM
FILENAME: 200-H-501_391538.DWG

DRN: JSW	ORIG DATE: MAY 2010		
DSN: SCC	DWG #: 200-H-501		
CHK: CJS	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: HEADWORKS HVAC DETAILS AND SECTION

SHEET: 116 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-H-501

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

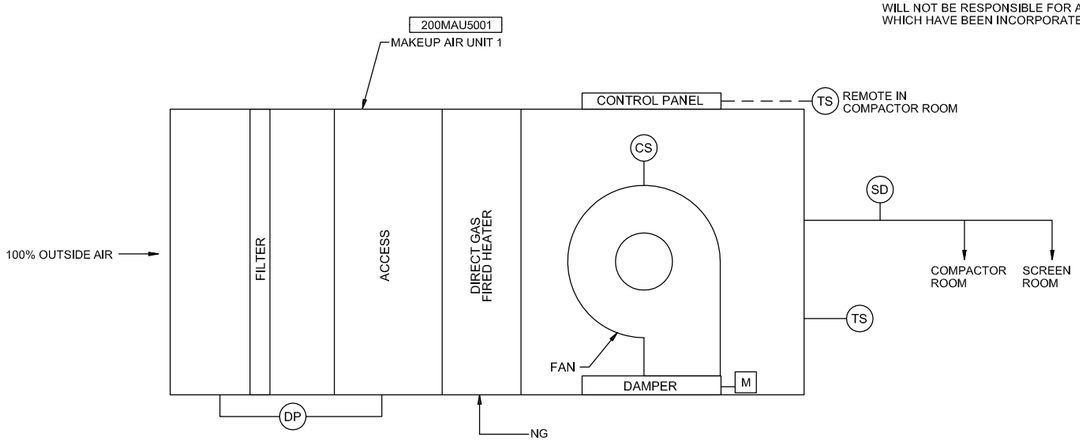
ENGR STAMP:

NOTES:
1. ALL HVAC UNIT CONTROLS MAY NOT BE SHOWN IN SCHEMATIC FOR PACKAGED UNITS.

RECORD DRAWINGS

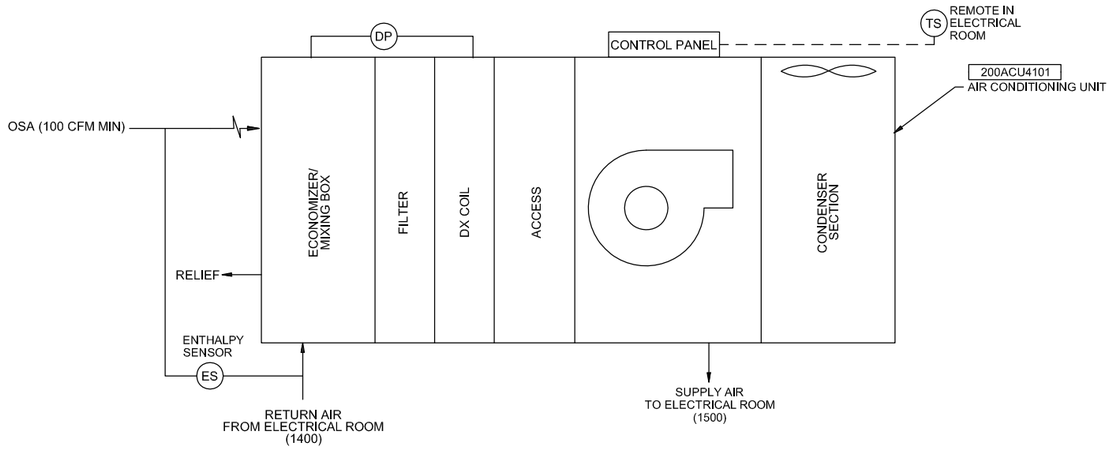
Revisions Drawn By E.R. BROWN Date JAN 2012

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COMPACTOR ROOM MAKE-UP AIR UNIT AIR FLOW SCHEMATIC (NOTE 1)

NTS



ELECTRICAL ROOM AIR CONDITIONING UNIT AIR FLOW SCHEMATIC (NOTE 1)

NTS

SEQUENCE OF OPERATIONS:

A. MAKE-UP AIR UNIT 200MAU5001

1. MAKE-UP AIR UNIT (MAU) 200MAU5001 SERVES THE NEW COMPACTOR ROOM AND ALSO PROVIDES VENTILATION AIR TO THE EXISTING SCREENING ROOM. THE MAU OPERATES CONTINUOUSLY TO PROVIDE A MINIMUM VENTILATION RATE OF 15 AIR CHANGES PER HOUR (ACH) TO THE COMPACTOR ROOM. THE MAU IS A NATURAL GAS, DIRECT-FIRED UNIT PROVIDING VENTILATION AIR AND HEAT FOR THE SPACES.

2. THE MAU IS CONTROLLED BY THE VENDOR-PROVIDED CONTROL SYSTEM. A START SIGNAL FROM THE LOCAL CONTROL PANEL ON-OFF SWITCH INITIATES THE UNIT TO RUN IF THE LOCAL ON-OFF SWITCH IS IN THE ON POSITION. THE MAU NORMALLY RUNS AT ANY TIME THE ODOR CONTROL FAN OPERATES. THE MAU WILL NEED TO BE RESET AT THE LOCAL CONTROL PANEL UPON ACTIVATION OF THE SMOKE DETECTION OR BURNER FAILURE.

3. THE VENDOR-PROVIDED LOCAL CONTROL SYSTEM INITIATES AND CONTROLS THE MAU GAS-FIRED BURNER TO MAINTAIN THE SPACE TEMPERATURE AS MEASURED BY THE VENDOR-PROVIDED DISCHARGE AIR TEMPERATURE CONTROLLER AND THE VENDOR-PROVIDED REMOTE THERMOSTAT. THE THERMOSTAT HAS AN INITIAL TEMPERATURE SET POINT (ADJUSTABLE) OF 50 DEGREES F. THE DISCHARGE AIR TEMPERATURE CONTROLLER HAS AN INITIAL TEMPERATURE SET POINT (ADJUSTABLE) OF 55 DEGREES F. THE REMOTE THERMOSTAT OVER-RIDES THE DISCHARGE AIR TEMPERATURE SET POINT IF THE ROOM TEMPERATURE IS LOWER THAN THE DISCHARGE AIR SET POINT.

4. THE MAU HAS A VENDOR-PROVIDED SMOKE DETECTOR INSTALLED IN THE DISCHARGE AIR PLENUM. THE DETECTOR INITIATES AN ALARM SIGNAL TO BOTH THE LOCAL CONTROL PANEL & LIFE SAFETY PANEL UPON DETECTION OF SMOKE. THE LOCAL CONTROL PANEL SHUTS DOWN THE MAU UPON DETECTION OF SMOKE.

5. THE MAU HAS A DIFFERENTIAL PRESSURE GAUGE TO INDICATE THE DIFFERENTIAL PRESSURE ACROSS THE MAU FILTERS. THE GAUGE DOES NOT INITIATE A SIGNAL ON HIGH DIFFERENTIAL PRESSURE.

6. THE MAU HAS A VENDOR-PROVIDED DISCHARGE AIR DAMPER THAT CLOSES WHEN THE UNIT IS OFF.

7. FOLLOWING POWER RESTORATION, THE MAU WILL RE-START AUTOMATICALLY IF IN THE ON POSITION.

8. THE VENDOR-PROVIDED LOCAL CONTROL PANEL INITIATES A COMMON ALARM SIGNAL TO SCADA IF THE MAU CONTROL SYSTEM GENERATES AN ALARM OR FAILURE CONDITION. THE VENDOR-PROVIDED LOCAL CONTROL PANEL ALSO SENDS A RUN SIGNAL TO SCADA. THE RUN SIGNAL IS PROVED VIA INTERVAL AIR FLOW SWITCH.

9. THE MAU HAS A VENDOR-PROVIDED AIR FLOW SWITCH THAT PROVES RUN STATUS. IF FLOW SWITCH INDICATES LOW FLOW OR NO FLOW, VENDOR-PROVIDED LOCAL CONTROL PANEL SENDS LOW FLOW ALARM SIGNAL TO LIFE SAFETY PANEL.

10. FOLLOWING POWER RESTORATION AND AS PART OF ITS STARTING SEQUENCE, DISCHARGE DAMPER SHALL OPEN AND A PURGE CYCLE WILL COMMENCE PRIOR TO INITIATING BURNER.

B. AIR CONDITIONING UNIT 200ACU0401

1. AIR CONDITIONING UNIT (ACU) 200ACU0401 SERVES THE NEW ELECTRICAL ROOM. THE ACU PROVIDES ONLY COOLING TO THE SPACE.

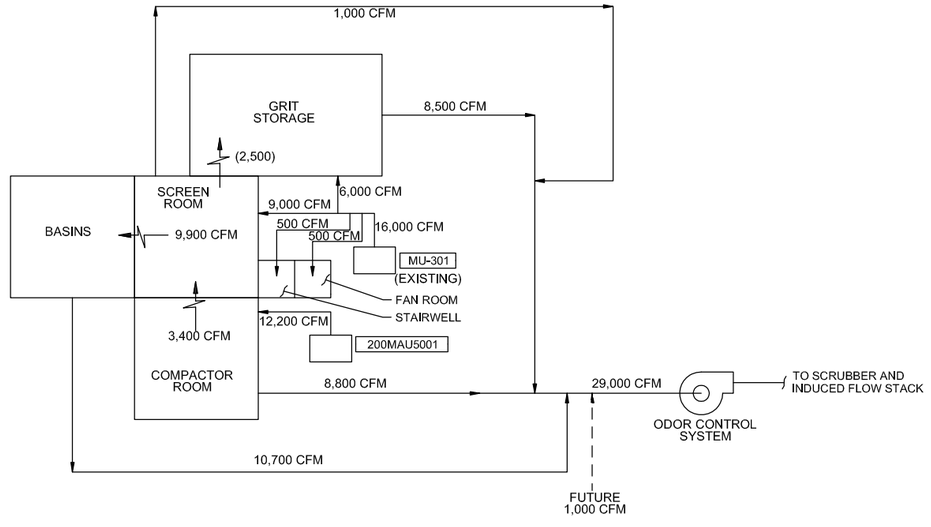
2. THE ACU IS CONTROLLED BY THE VENDOR-PROVIDED CONTROL SYSTEM. THE ACU OPERATES WHEN THE SPACE TEMPERATURE IS ABOVE THE SET POINT AS MEASURED BY THE VENDOR-PROVIDED REMOTE THERMOSTAT. THE THERMOSTAT HAS AN INITIAL TEMPERATURE SET POINT (ADJUSTABLE) OF 80 DEGREES F.

3. THE ACU IS PROVIDED WITH AN AIR-SIDE ECONOMIZER. THE ECONOMIZER OPERATES BASED ON THE ENTHALPY DIFFERENCE BETWEEN THE RETURN AIR AND THE OUTSIDE AIR. THE ENTHALPY IS MEASURED BY THE VENDOR-PROVIDED ENTHALPY SENSOR. OUTSIDE AIR AND RETURN AIR DAMPERS WITHIN THE ACU MODULATE AS REQUIRED TO MAINTAIN THE ELECTRICAL ROOM TEMPERATURE SET POINT. THE ECONOMIZER MODULATES FROM THE MINIMUM OSA FLOW TO MAXIMUM PERMITTED BY THE ENTHALPY CONTROL.

4. WHEN THE OUTSIDE AIR IS UNABLE TO MAINTAIN THE ROOM TEMPERATURE SET POINT, THE VENDOR-PROVIDED CONTROLS INITIATE THE SYSTEM MECHANICAL COOLING. THE VENDOR-PROVIDED CONTROLS MODULATE THE COMPRESSORS AS REQUIRED TO MAINTAIN THE ROOM TEMPERATURE SET POINT.

5. THE ACU HAS A DIFFERENTIAL PRESSURE GAUGE TO INDICATE THE DIFFERENTIAL PRESSURE ACROSS THE ACU FILTERS. THE GAUGE DOES NOT INITIATE A SIGNAL ON HIGH DIFFERENTIAL PRESSURE.

6. THE VENDOR-PROVIDED CONTROL PANEL INITIATES A COMMON ALARM SIGNAL TO SCADA IF THE ACU CONTROL SYSTEM GENERATES AN ALARM OR FAILURE CONDITION.



HEADWORKS FACILITY PARTIAL AIR AND FOUL AIR FLOW SCHEMATIC

NTS

PLOT DATE: 05-26-2012 PLOT TIME: 1:25:29 PM

FILENAME: 200-H-601_391538.DWG

DRN: JSW	ORIG DATE: MAY 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: SCC	DWG #: 200-H-601		
CHK: CJS	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: HEADWORKS HVAC AIR FLOW SCHEMATICS

SHEET: 117 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-H-601

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

PACKAGED AC UNIT

TAG NUMBER	EQUIPMENT TYPE	LOCATION / SERVICE	SUPPLY AIRFLOW (ACFM)	MIN OSA (ACFM)	ESP (IN WC)	FAN SPEED (RPM)	COOLING CAPACITY (TONS)	SENSIBLE CAPACITY (MBH)	SEER	EAT (FDB/FWB)	LAT (FDB/FWB)	MOTOR (HP)	MOTOR (BHP)	DRIVE (CS/AS)	MOTOR ENCL.	VOLTAGE (V)	PHASE	FLA (AMPS)	MOCP (AMPS)	WEIGHT (LBS)	SOUND (dB)	SIZE LxWxH (IN)	(IN)	(IN)	BASIS OF DESIGN MFR	BASIS OF DESIGN MODEL	CONTROL PANEL	ACCESSORIES	COMMENTS
200ACU4101	AIR CONDITIONING UNIT	HEADWORKS / ELECTRICAL ROOM (OUTSIDE, GROUND)	1500	0	0.5		4	37.1	15.0	80/65	57/55	0.75	0.6	CS	ODP	460	3	12.0	15	780	72	90	54	46	TRANE	TSC048E	SEE SPECS	ECONOMIZER, NO HEAT	NOTE 1

NOTES:
1. MAXIMUM UNIT DIMENSIONS SHALL NOT EXCEED 70-INCHES (LONG SIDE W/SUPPLY AND RETURN CONNECTIONS) DUE TO SITE SPACE RESTRICTIONS)

HVAC MAKEUP AIR UNIT

TAG NUMBER	EQUIPMENT TYPE	LOCATION / SERVICE	SUPPLY AIR FLOW (ACFM)	ESP (IN WC)	TSP (IN WC)	FAN SPEED (RPM)	HEATING SOURCE	NAT. GAS PRESSURE IN WC	HEATING CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	EAT (DEG F)	LAT (DEG F)	MOTOR (HP)	MOTOR (BHP)	DRIVE (CS/AS)	MOTOR ENCL.	VOLTAGE (V)	PHASE	WEIGHT (LBS)	SOUND (dB)	SIZE LxWxH (IN)	(IN)	(IN)	BASIS OF DESIGN MFR	BASIS OF DESIGN MODEL	CONTROL PANEL	ACCESSORIES
200MAU5001	MAKEUP AIR UNIT 1	HEADWORKS COMPACTOR ROOM / HEADWORKS (OUTSIDE)	12,200	0.5	1.2		NAT. GAS	7	450	450	17	50	15	10.3	CS	ODP	460	3	2500		88	70	52	REZNOR	RDF-2-120	SEE SPECS	SEE SPECS

FAN SCHEDULE

TAG NUMBER	EQUIPMENT TYPE	LOCATION / SERVICE	FAN TYPE	INLET AIR FLOW (CFM)	TOTAL AIR FLOW (CFM)	ESP (IN WC)	FAN SPEED (RPM)	MAX SAFE FAN (RPM)	MOTOR (HP)	MOTOR (BHP)	DRIVE (CS/AS)	MOTOR ENCLOSURE	VOLTAGE (V)	PHASE	WEIGHT (SEE NOTE 3) (LBS)	SOUND (SEE NOTE 1) (dB)	SIZE (IN)	BASIS OF DESIGN MFR	BASIS OF DESIGN MODEL	ACCESSORIES	COMMENTS
200EF4101	ODOR CONTROL FAN 1	EXIST FAN ROOM	CENTRIFUGAL	29,000	29,000	8.3	1529	1661	75	56	CS	TEFC, CLASS 1, DIV 2	460	3	3000	89	SEE DWGS	HARTZELL	A41-9-403FA-66	NOTE 2	NOTE 3

NOTES:
1. AT 5 FEET, RADIATED FROM HOUSING
2. FOR LIST OF ALL FAN ACCESSORIES SEE SPECIFICATION.
3. FAN WILL HAVE TO BE PARTIALLY DISASSEMBLED TO ALLOW PLACEMENT IN EXIST. FAN ROOM DUE TO LIMITED ACCESS OPENING SIZE. FAN WILL BE REASSEMBLED INSIDE FAN ROOM AND SHAFT RE-ALIGNED AS NECESSARY. CONTRACTOR TO VERIFY ALL DIMENSIONS AND BRING UP ANY CONSTRUCTABILITY ISSUES TO ENGINEER IN ADVANCE.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-H-602_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:26:29 PM

DRN: JSW | ORIG DATE: MAY 2010
DSN: SCC | DWG #: 200-H-602
CHK: CJS | CAD FILE #:
APPD: LEC | SCALE: NONE

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

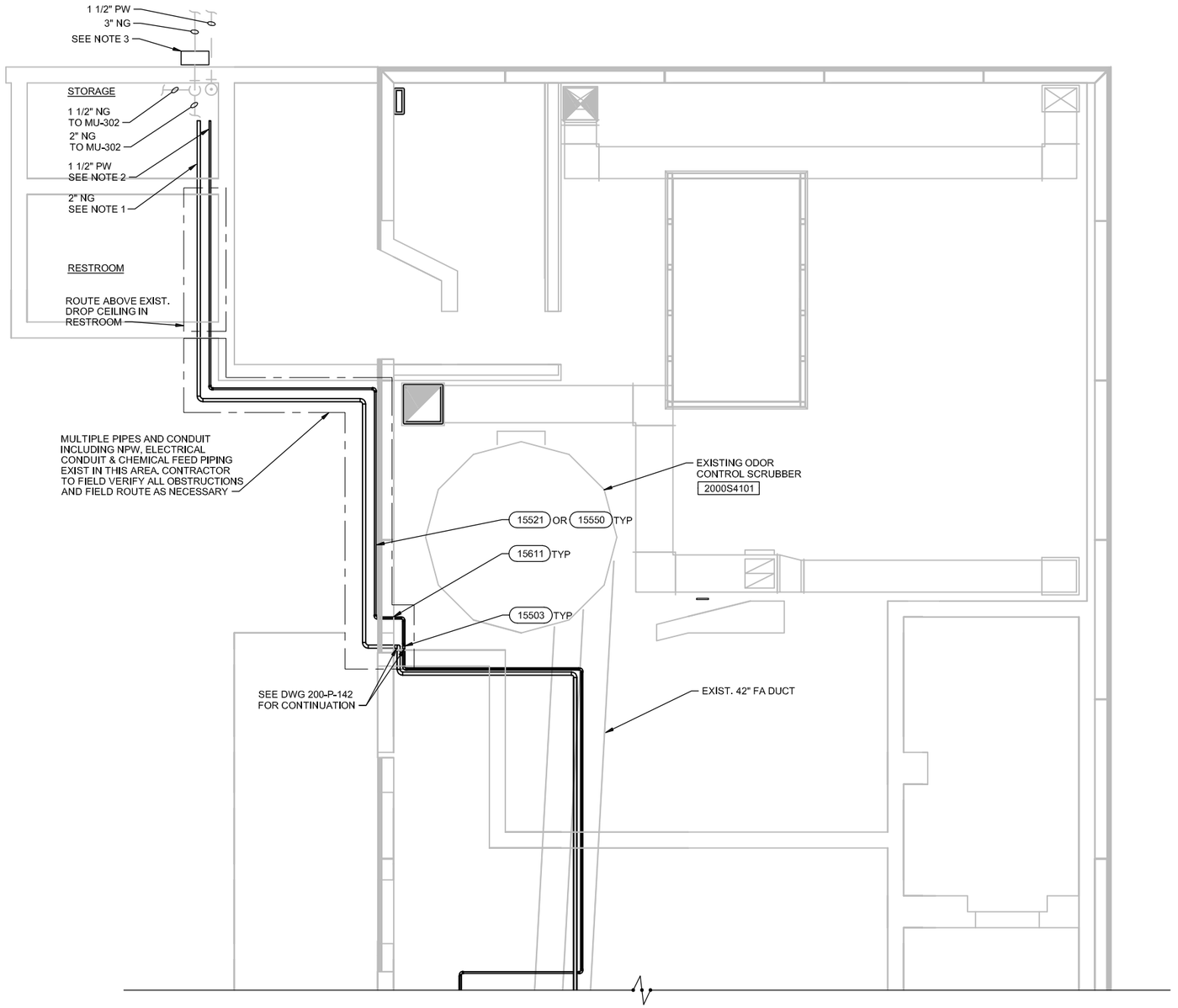
SHEET TITLE:
HEADWORKS
HVAC
EQUIPMENT SCHEDULES

SHEET: 118 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #:
200-H-602

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



NOTES:

1. TIE INTO EXISTING 3" NG INSIDE STORAGE ROOM BEFORE ANY TEE TO REMOTE EQUIPMENT. ROUTE NEW 2" NG TO MECHANICAL ROOM 310. FOLLOW ROUTE WHERE POSSIBLE FOR NG TO MU-301. CONTRACTOR TO FIELD VERIFY ROUTING.
2. TIE INTO EXISTING 1 1/2" PW INSIDE STORAGE ROOM BEFORE ANY TEE TO REMOTE EQUIPMENT. ROUTE NEW 1 1/2" PW TO MECHANICAL ROOM 310. FOLLOW ROUTE WHERE POSSIBLE FOR NG TO MU-301. CONTRACTOR TO FIELD VERIFY ROUTING. DO NOT ROUTE PW OVER ELECTRICAL PANELS.
3. EXISTING NATURAL GAS METER AND GAS REGULATOR ARE UNDERSIZED BASED ON NEW GAS LOADS. NW NATURAL GAS TO PROVIDE AND INSTALL NEW GAS METER AND REGULATOR. CONTRACTOR SHALL COORDINATE. CONTACT PERSON AT NW NATURAL GAS IS RANDY WILLIAMS AT (503)806-7354. NEW LOAD IS 3,000 CFH. 1

LOWER LEVEL EAST PLAN

1/4"=1'-0"

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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DRN: BRK	ORIG DATE: MAY 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.		
DSN: SCC	DWG #: 200-P-132			
CHK: CJS	CAD FILE #:			
APPD: LEC	SCALE: 1/4" = 1'-0"			

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	6/10	SCC	LEC	ADDENDUM NO. 1

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PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
PLUMBING
LOWER LEVEL EAST PLAN

SHEET: 119 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-P-132

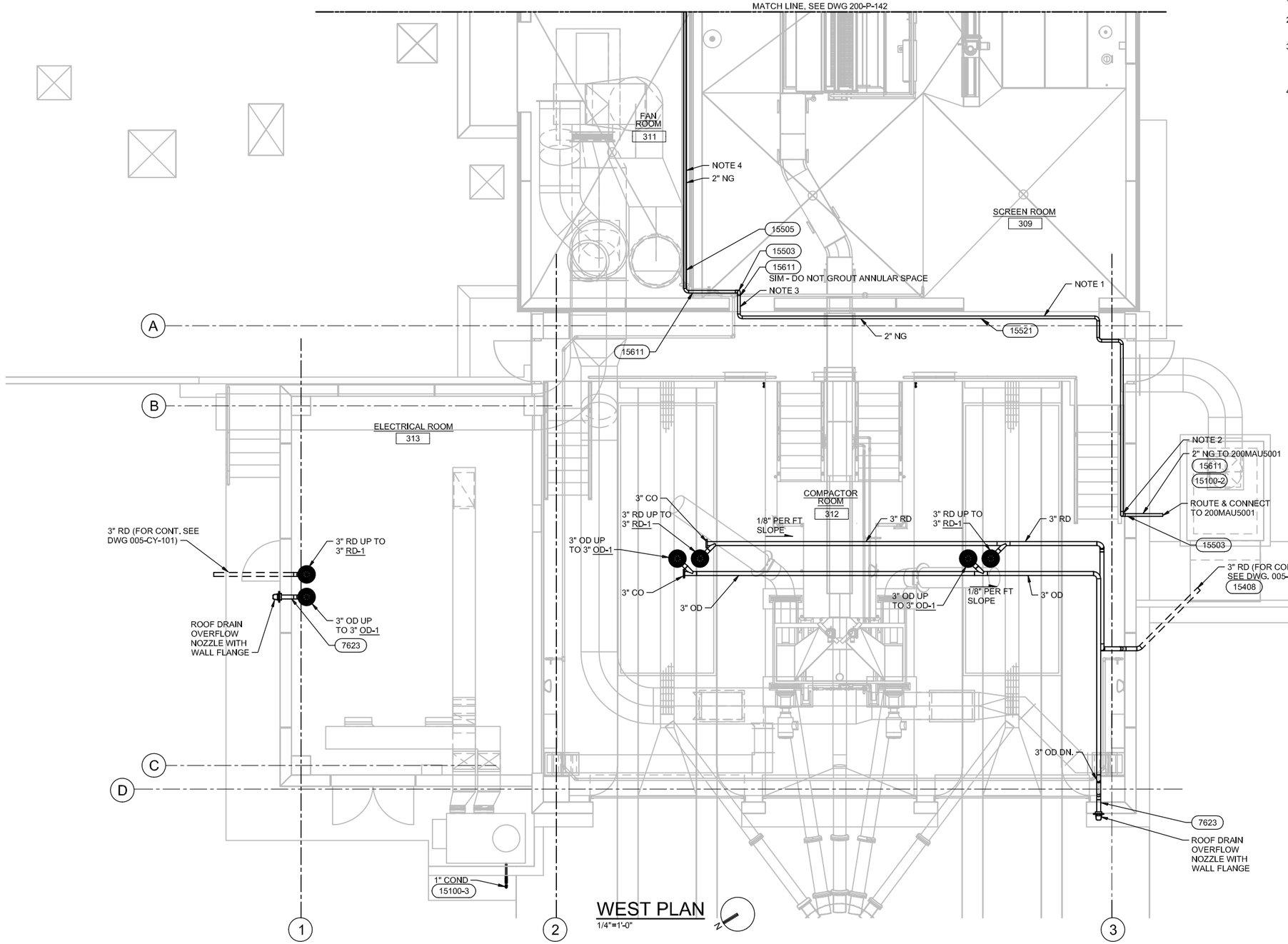
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 200-P-132_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:28:01 PM

NOTES:

1. ROUTE NG ABOVE OVERHEAD DOOR.
2. ROUTE NG DOWN INSIDE FACE OF WALL AND MAINTAIN STAIRWAY CLEARANCE.
3. PROVIDE FLEXIBLE CONNECTION IN PIPING SPANNING BETWEEN EXISTING PORTION AND NEW ADDITION. SEE PLUMBING SPECIALTIES SPECIFICATIONS.
4. CONTRACTOR TO FIELD VERIFY ROUTING.



WEST PLAN
1/4"=1'-0"

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-P-141_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:28:12 PM

DRN: BRK	ORIG DATE: MAY 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: SCC	DWG #: 200-P-141		
CHK: CJS	CAD FILE #:		
APPD: LEC	SCALE: 1/4" = 1'-0"		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

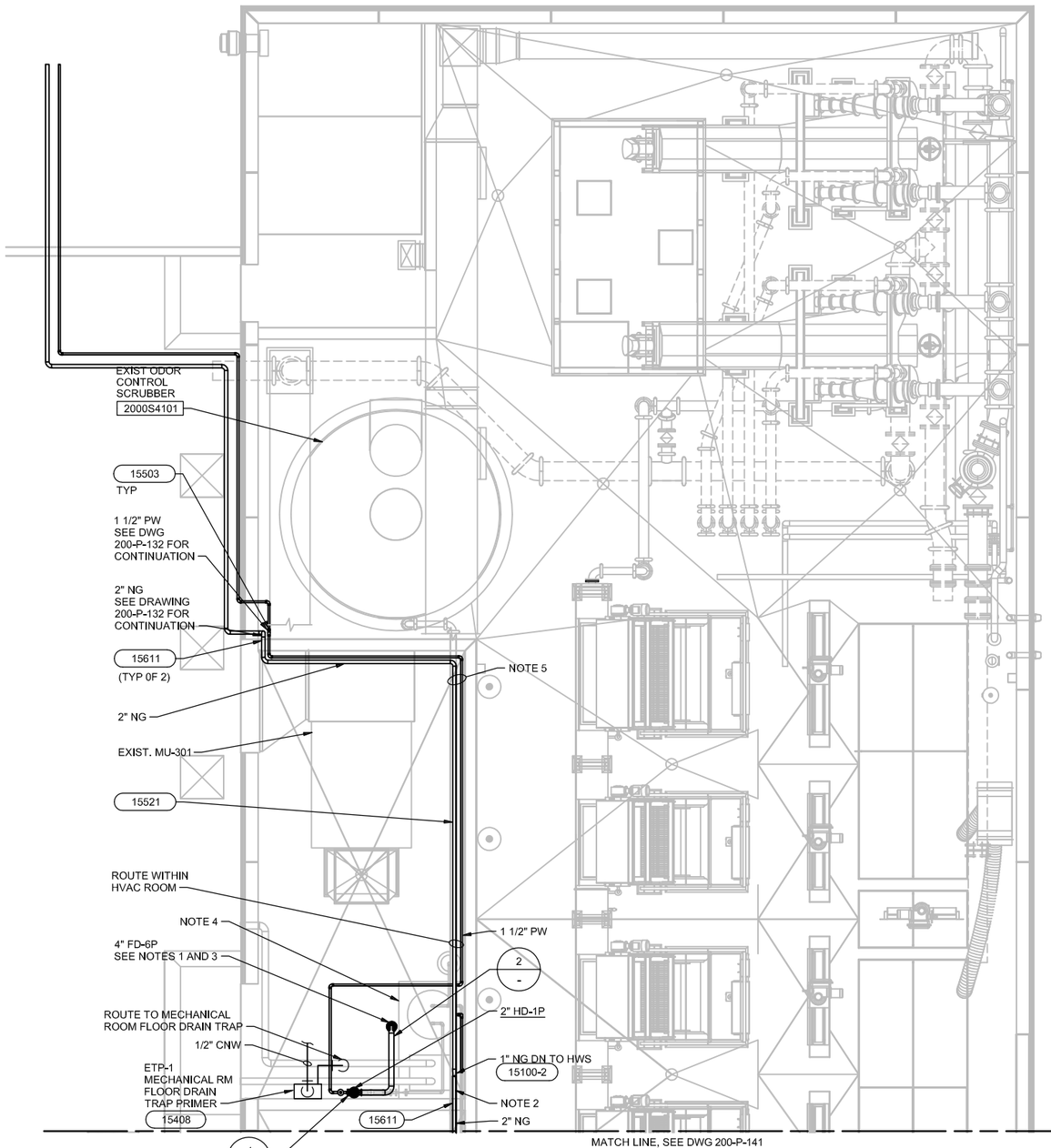
SHEET TITLE:
HEADWORKS
PLUMBING
WEST PLAN

SHEET: 120 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-P-141

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

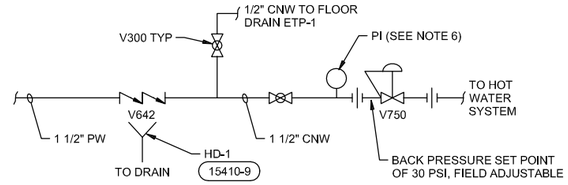
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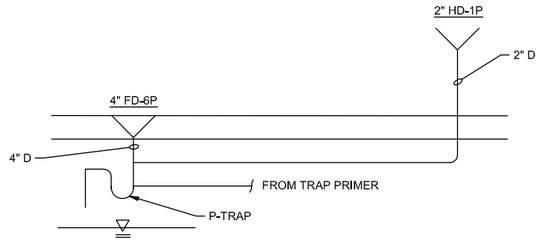
EAST PLAN
1/4"=1'-0"

NOTES:

1. ROUTE ARD FROM FLOOR DRAIN DIRECTLY TO BASIN BELOW. DO NOT EXTEND STANDPIPE BELOW MAXIMUM LIQUID SURFACE. ROUTE TRAP PRIMER FROM ETP-1 TO TRAP. SEE 2 / -
2. ROUTE LINE SIZE CONDENSATE DRAIN AND PRESSURE RELIEF FROM HOT WATER SYSTEM WATER HEATER TO FLOOR DRAIN.
3. LOCATE FLOOR DRAIN OUTER EDGE APPROX. 4" AWAY FROM HOT WATER HEATER SYSTEM SKID.
4. REFER TO 200-M-142 FOR HOT WATER SYSTEM PIPING.
5. CONTRACTOR TO FIELD VERIFY ROUTING.
6. 0-160 PSI RANGE



1 PW TO CNW SCHEMATIC
NTS



2 HD & FD SCHEMATIC
NTS

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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DRN: BRK	ORIG DATE: MAY 2010		
DSN: SCC	DWG #: 200-P-142		
CHK: CJS	CAD FILE #:		
APPD: LEC	SCALE: AS SHOWN		

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REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: HEADWORKS PLUMBING EAST PLAN

SHEET: 121 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-P-142

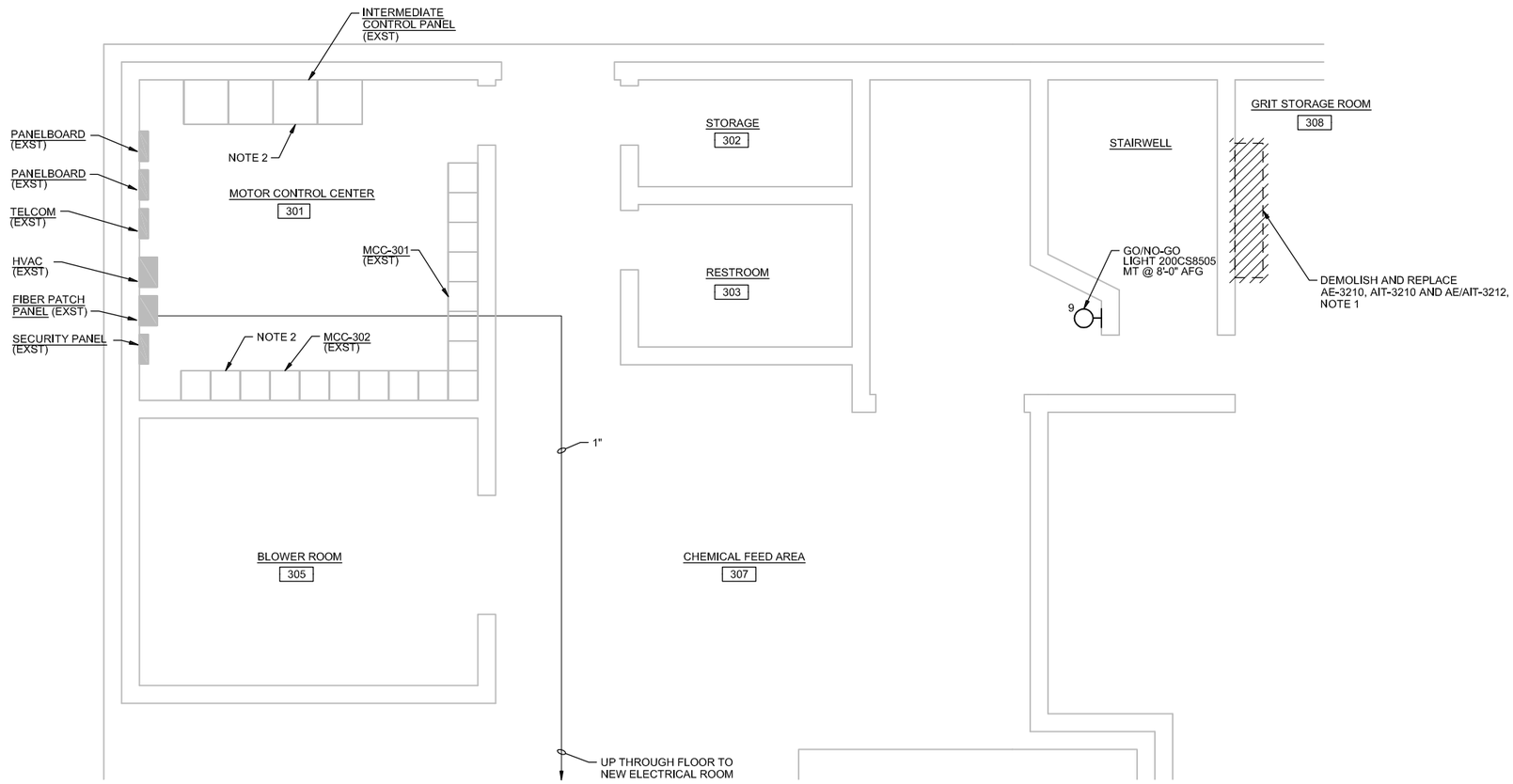
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 200-P-142_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:28:23 PM

NOTES:

1. DEMOLISH ALL WIRING AND EXPOSED CONDUIT TO INDICATED EQUIPMENT BACK TO SOURCE. REMOVE ANY ASSOCIATED CONTROLS AND DISCONNECTS ASSOCIATED WITH EQUIPMENT BEING DEMOLISHED. CUT CONDUIT FLUSH WHERE CONCEALED AND GROUT FULL.
2. DEMOLISH CONTROL WIRING BETWEEN THE EXISTING MCC AND INTERMEDIATE CONTROL PANEL AND ABANDON MCC BUCKETS (WHEN APPLICABLE) FOR THE FOLLOWING EQUIPMENT, SEE NOTE 1:
   - (4) BAR SCREEN
   - (1) SCREENINGS CONVEYOR



N

PROCESS / DEMOLITION PLAN

1/4"=1'-0"

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:23:25 PM
PLOT DATE: 05-26-2012
FILENAME: 200-EP-131_391538.DWG

DRN: MLW	ORIG DATE: APRIL 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: RSH	DWG #: 200-EP-131		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: 1/4" = 1'-0"		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
ELECTRICAL
LOWER LEVEL
PROCESS / DEMOLITION PLAN

SHEET: 122 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-EP-131

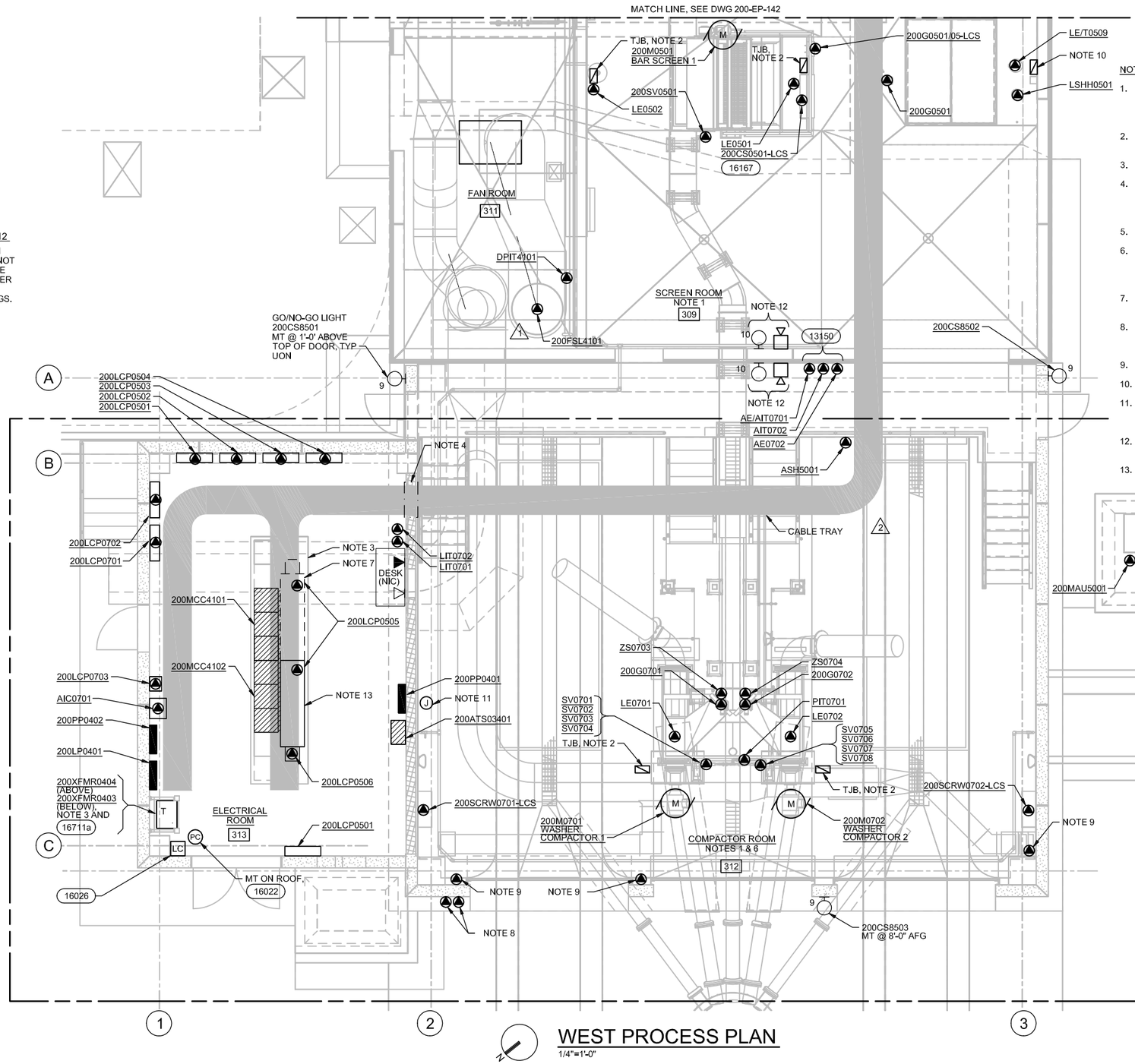
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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WEST PROCESS PLAN

1/4"=1'-0"

NOTES:

1. THE SCREEN ROOM AND COMPACTOR ROOM ARE CLASS I DIVISION 2 GROUP D HAZARDOUS, WET, AND CORROSIVE AREAS. FURNISH AND INSTALL ELECTRICAL EQUIPMENT AND MATERIAL IN THIS AREA PER SPECIFICATION SECTION 16010, ELECTRICAL WORK GENERAL.
2. TJB FURNISHED WITH INSTRUMENT, MOUNTING BY ELECTRICAL SUB-CONTRACTOR. SEE CABLE BLOCK DIAGRAMS.
3. PROVIDE TYPE E HOUSEKEEPING PAD, SEE STRUCTURAL DETAILS.
4. PROVIDE AIRTIGHT SEAL AT WALL PENETRATION. UTILIZE CROUSE-HINDS TW SERIES THRU-WALL BARRIER OR APPROVED EQUAL. PROVIDE WALL BLOCKOUT WITH ROOM FOR FUTURE EXPANSION AND PROVIDE TWO SPARE SEALING BLOCKS, SIZED PER OWNER'S DIRECTION.
5. NOT USED
6. CONDUITS CONNECTING TO EQUIPMENT OR DEVICES IN THE COMPACTOR ROOM SHALL BE ROUTED UNDER THE FLOOR SLAB. OBTAIN SPECIFIC EXCEPTION FROM ENGINEER TO ROUTE CONDUITS OTHERWISE, SEE NOTE 12.
7. FUTURE PLC CABINET SHOWN. PROVIDE TWO 3/4" CONDUITS STUB-UPS ROUTED BACK TO PANEL 200LP0402 FOR FUTURE POWER CIRCUITS.
8. KEYPAD/CARD READERS (TWO) FOR NORTH AND SOUTH ROLL-UP DOORS. FOR WIRING TO ROLL-UP DOOR OPERATOR, REFER TO CABLE BLOCK DIAGRAMS.
9. PUSHBUTTON OPERATOR FOR ROLL-UP DOOR.
10. TJB PROVIDED BY ELECTRICAL SUBCONTRACTOR.
11. LOCATE JUNCTION BOX ON WALL AT 48" AFF. ROUTE POWER CONDUCTORS FOR COMPACTORS VIA THIS BOX AS SHOWN ON CABLE BLOCK DIAGRAMS.
12. MOUNT EMERGENCY HORN AND STROBE AT 8'-0" AFF AND PROVIDE WIRING AS SHOWN ON CABLE BLOCK DIAGRAMS.
13. EXTEND 4-4" AND 2-1 1/2" CONDUITS FROM TOP OF CABINET TO CABLE TRAY.

FILENAME: 200-EP-141_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:23:48 PM

DRN: MLW	ORIG DATE: FEBRUARY 2009	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JLH	DWG #: 200-EP-141		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: 1/4" = 1'-0"		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
2	01/11	JB	RSH	CCR #17
1	01/11	RH	LEC	WCD #2.1/CCR #5

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CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

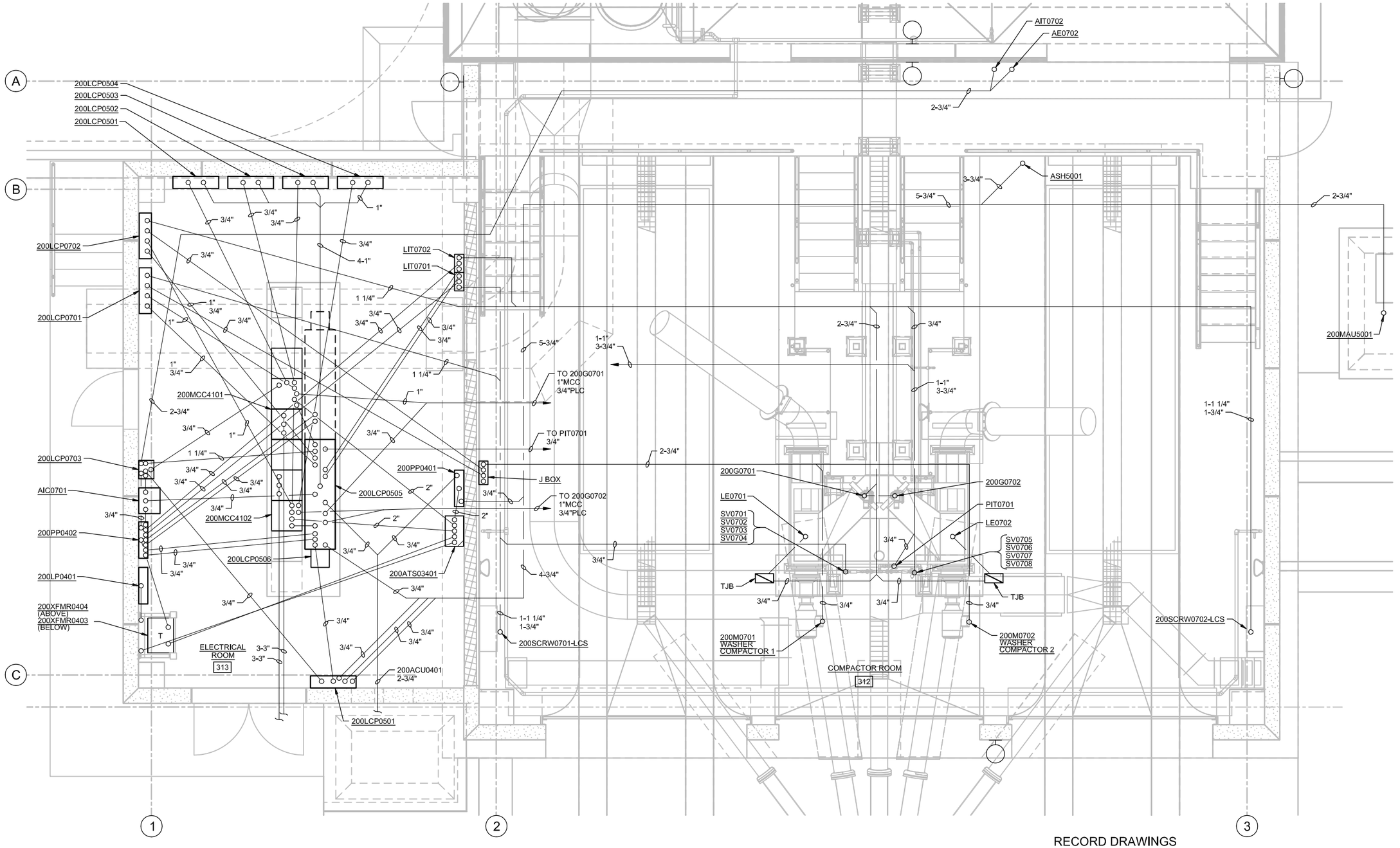
SHEET TITLE: HEADWORKS ELECTRICAL WEST PROCESS PLAN

SHEET: 123 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-EP-141

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



WEST UNDERGROUND CONDUIT ENLARGED PLAN

3/8"=1'-0"

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

FILENAME: 200-EP-141A_3911538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:23:36 PM

DRN: MLW	ORIG DATE: FEBRUARY 2009	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JLH	DWG #: 200-EP-141A		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: 1/4" = 1'-0"		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
2	01/11	JB	RSH	CCR #17
1	01/11	RH	LEC	WCD #2.1/CCR #5

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CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

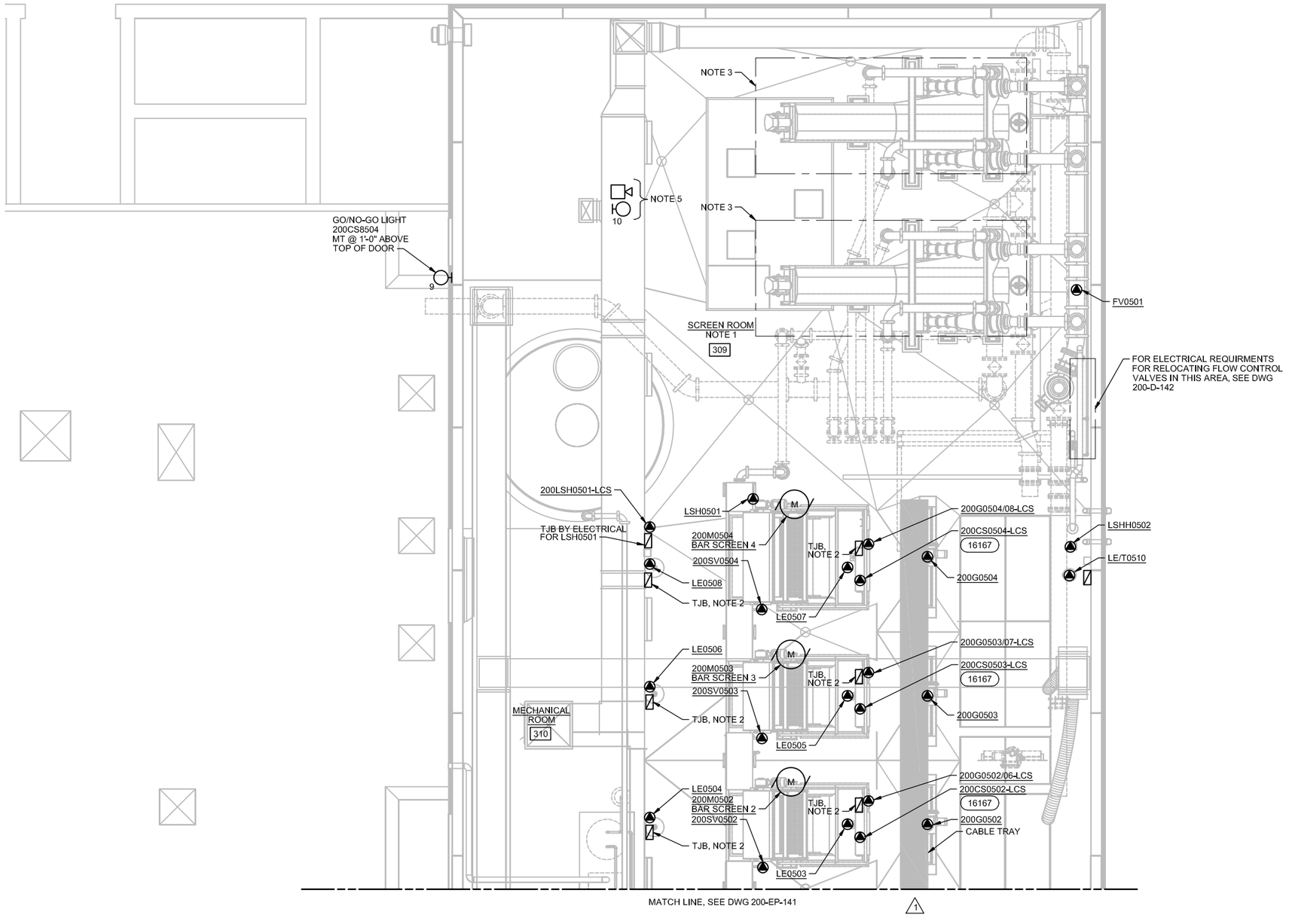
SHEET TITLE: HEADWORKS ELECTRICAL WEST UNDERGROUND CONDUIT ENLARGED PLAN

SHEET: 123A OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-EP-141A

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



NOTES:

1. THE SCREEN ROOM AND COMPACTOR ROOM ARE CLASS I DIVISION 2 GROUP D HAZARDOUS, WET, AND CORROSIVE AREAS. FURNISH AND INSTALL ELECTRICAL EQUIPMENT AND MATERIAL IN THIS AREA PER SPECIFICATION SECTION 16010, ELECTRICAL WORK GENERAL.
2. TJB FURNISHED WITH INSTRUMENT, MOUNTING BY ELECTRICAL SUB-CONTRACTOR, SEE CABLE BLOCK DIAGRAMS.
3. RECONNECT EXISTING POWER AND CONTROL WIRING TO NEW GRIT CLASSIFIERS, REFER TO DWG 200-D-142.
4. RIGHT-OF-WAY AREA SHOWN IS RESERVED FOR ELECTRICAL CONDUIT ROUTING. LOCATE CONDUITS AS HIGH AS POSSIBLE AGAINST UNDERSIDE OF ROOF STRUCTURE.
5. MOUNT EMERGENCY HORN AND STROBE AT 8'-0" AFF AND PROVIDE WIRING AS SHOWN ON CABLE BLOCK DIAGRAMS.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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EAST PROCESS PLAN

1/4"=1'-0"

FILENAME: 200-EP-142_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:24:00 PM

DRN: MLW	ORIG DATE: FEBRUARY 2009	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JLH	DWG #: 200-EP-142		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: 1/4" = 1'		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	01/11	JB	RSH	CCR #17

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
ELECTRICAL
EAST PROCESS PLAN

SHEET: 124 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-EP-142

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

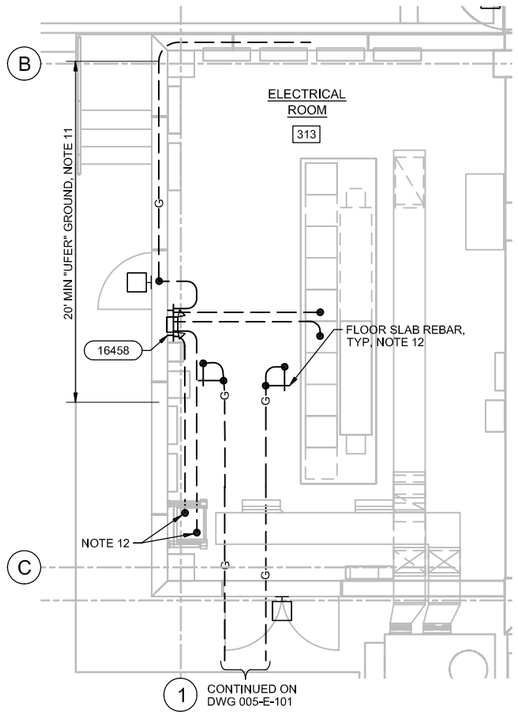
NOTES:

1. THE SCREEN ROOM AND COMPACTOR ROOM ARE CLASS I DIVISION 2 GROUP D HAZARDOUS, WET, AND CORROSIVE AREAS. FURNISH AND INSTALL ELECTRICAL EQUIPMENT AND MATERIAL IN THIS AREA PER SPECIFICATION SECTION 16010, ELECTRICAL WORK GENERAL.
2. ONE GROUND CONNECTION FOR UPPER TRANSFORMER, ONE GROUND CONNECTION FOR LOWER TRANSFORMER.
3. ALL LIGHTS ON THIS DRAWING SHALL BE POWERED FROM PANEL 200LP0401.
4. PENDANT MOUNT TYPE 3 LUMINAIRES 15'-0", AFF TYP.
5. WALL MOUNT LUMINAIRES 10'-0" AFF,TYP, UON.
6. WALL MOUNT LUMINAIRES 12'-0" AFF, TYP, UON.
7. WALL MOUNT LUMINAIRES ABOVE ROLL-UP DOORS, TYP.
8. WALL MOUNT TYPE 4 LUMINAIRES 1'-0" ABOVE MAN DOORS AND ROLL-UP DOORS, TYP.
9. PENDANT MOUNT LUMINAIRES IN THIS ROOM 10'-0" AFF.
10. UNLESS SHOWN OTHERWISE, NUMBERS IN PARENTHESIS, (N), ADJACENT TO LIGHTS AND RECEPTACLES DENOTE CIRCUIT NUMBER IN PANEL 200LP0401 (LIGHTS) OR 200PP0402 (RECEPTACLES). SIZE AND PROVIDE NO. 12 CONDUCTORS FOR 20A OR 15A CIRCUITS LESS THAN 75 FEET. PROVIDE NO. 10 CONDUCTORS WITH NO. 10 GROUND FOR CIRCUITS GREATER THAN 75 FEET.
11. FURNISH AND INSTALL A #3/0 STRANDED BARE COPPER CONDUCTOR "UFER" GROUND (20' LONG SECTION OF CONDUCTOR) IN THE BUILDING PERIMETER FOUNDATION FOOTING PER OAR 918-305-0160(4) WHERE SHOWN. PROVIDE A MINIMUM OF 3 INCHES OF CONCRETE COVER.
12. FURNISH, INSTALL, AND CONNECT A #3/0 GROUND CONDUCTOR IN THE FLOOR SLAB FROM EACH MCC. CADWELD THE CONDUCTOR TO STRUCTURAL REBAR IN THE FLOOR SLAB AS SHOWN. GROUND ALL ELECTRICAL EQUIPMENT AS REQUIRED BY NEC.
13. THE AREA WITHIN 3 FEET OF THE FAN ENCLOSURE IS CLASS I, DIVISION 2, GROUP D HAZARDOUS, WET, AND CORROSIVE AREA. FURNISH AND INSTALL ELECTRICAL EQUIPMENT AND MATERIALS IN THIS AREA PER SPECIFICATION SECTION 16010, ELECTRICAL WORK, GENERAL.

RECORD DRAWINGS

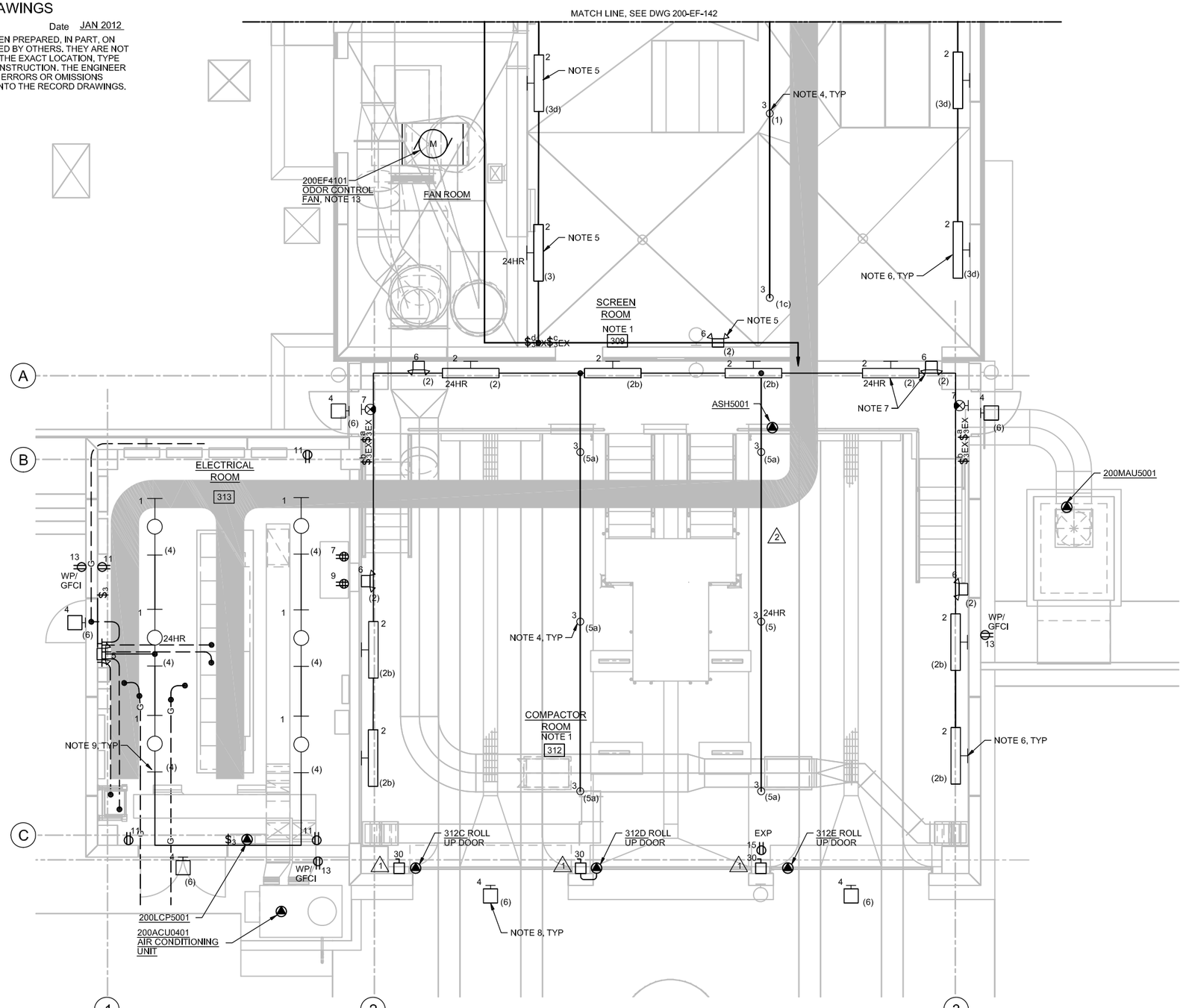
Revisions Drawn By E.R. BROWN Date JAN 2012

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GROUNDING PLAN

1/4"=1'-0"



WEST FACILITY PLAN

1/4"=1'-0"

DRN: MLW	ORIG DATE: FEBRUARY 2010			
DSN: JLH	DWG #: 200-EF-141			
CHK: MSM	CAD FILE #:			
APPD: LEC	SCALE: 1/4" = 1'-0"			

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
2	01/11	JB	RSH	CCR #17
1	06/10	RH	LEC	ADDENDUM NO. 1

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CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: HEADWORKS ELECTRICAL WEST FACILITY PLAN

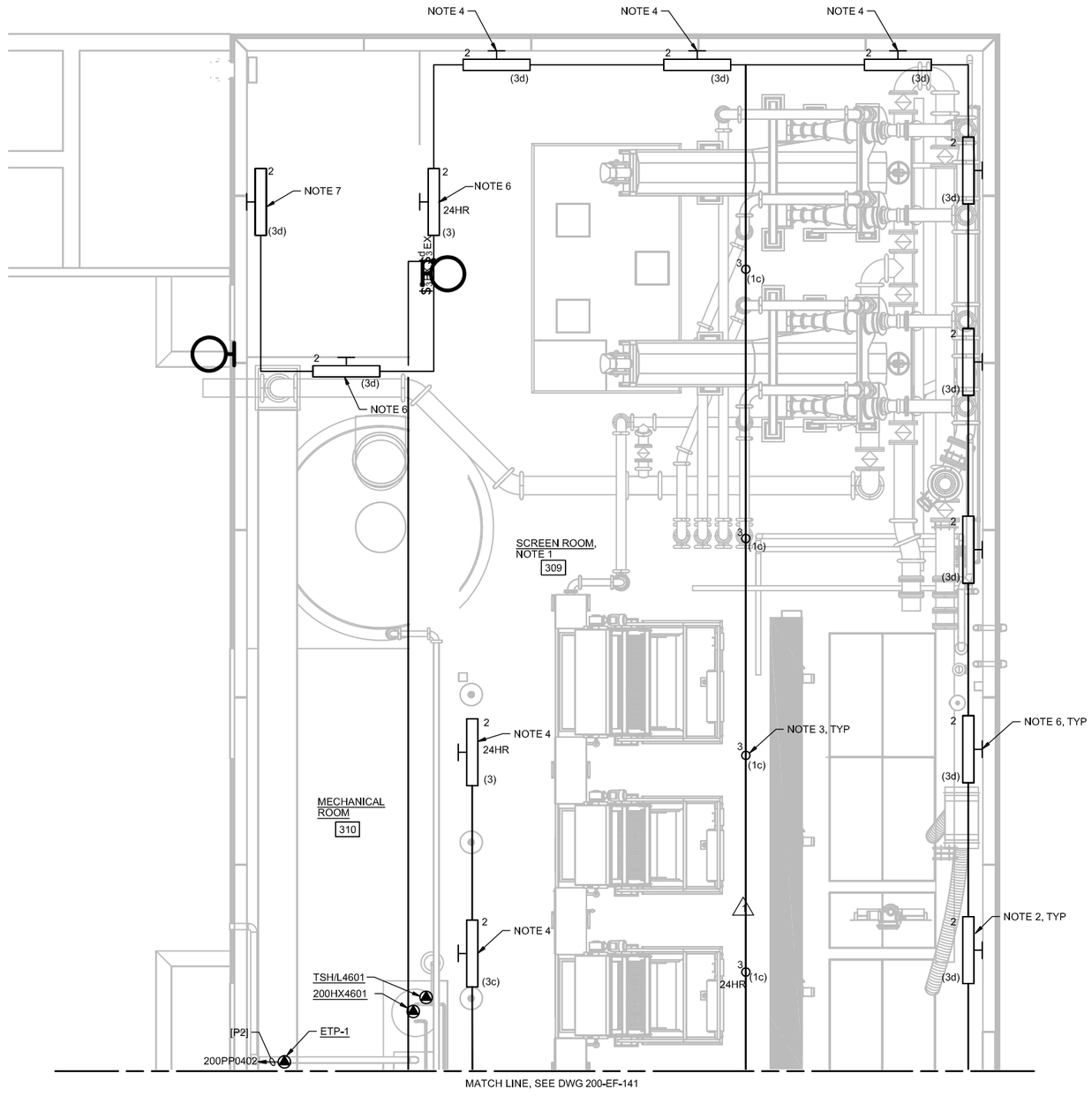
SHEET: 125 OF: D24
PLOT DATE: AUG 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-EF-141

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 200-EF-141_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:23:02 PM



NOTES:

1. THE SCREEN ROOM AND COMPACTOR ROOM ARE CLASS I DIVISION 2 GROUP D HAZARDOUS, WET, AND CORROSIVE AREAS. FURNISH AND INSTALL ELECTRICAL EQUIPMENT AND MATERIAL IN THIS AREA PER SPECIFICATION SECTION 16010, ELECTRICAL WORK GENERAL.
2. ALL LIGHTS ON THIS DRAWING SHALL BE POWERED FROM PANEL 200LP0401.
3. PENDANT MOUNT TYPE 3 LUMINAIRES 15'-0", AFF TYP.
4. WALL MOUNT LUMINAIRES 10'-0" AFF,TYP.
5. WALL MOUNT LUMINAIRES 12'-0" AFF, TYP, UON.
6. WALL MOUNT LUMINAIRES 8'-6" AFF, TYP.
7. WALL MOUNT LUMINAIRES 8'-6" ABOVE ROOM.
8. UNLESS SHOWN OTHERWISE, NUMBERS IN PARENTHESIS, (N), ADJACENT TO LIGHTS AND RECEPTACLES DENOTE CIRCUIT NUMBER IN PANEL 200LP0401 (LIGHTS) OR 200PP0402 (RECEPTACLES). SIZE AND PROVIDE NO. 12 CONDUCTORS FOR 20A OR 15A CIRCUITS LESS THAN 75 FEET. PROVIDE NO. 10 CONDUCTORS WITH NO. 10 GROUND FOR CIRCUITS GREATER THAN 75 FEET.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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EAST FACILITY PLAN

1/4"=1'-0"

FILENAME: 200-EF-142_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:23:15 PM

DRN: MLW	ORIG. DATE: FEBRUARY 2010		
DSN: JLH	DWG #: 200-EF-142		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: 1/4" = 1'-0"		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	01/11	JB	RSH	CCR #17

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CH2MHILL

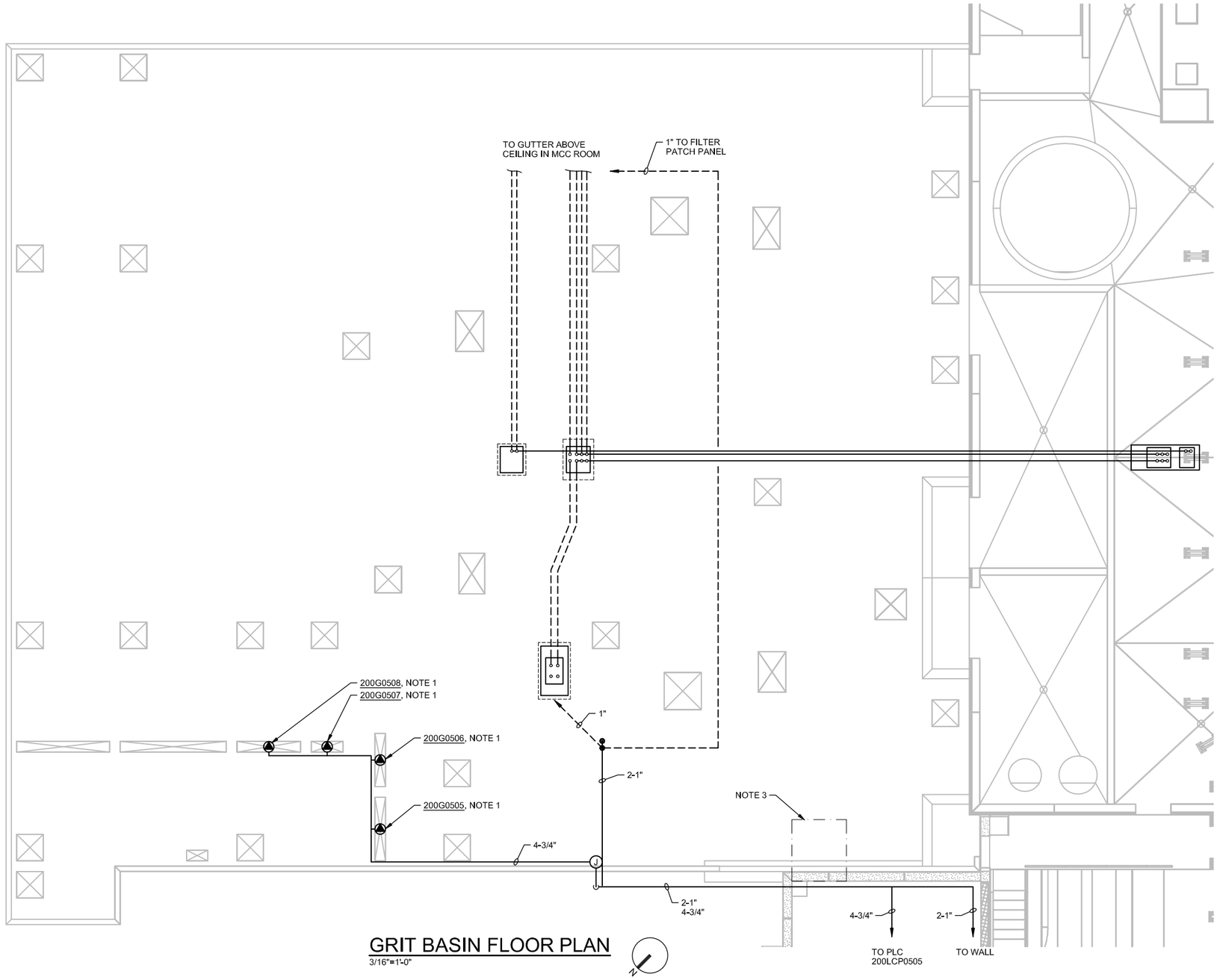
PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
ELECTRICAL
EAST FACILITY PLAN

SHEET: 126 OF: D24	DWG #: 200-EF-142
PLOT DATE: JUNE 2010	
PLC #:	
CWS PROJ #: 6410	

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



GRIT BASIN FLOOR PLAN

3/16"=1'-0"

NOTES:

1. POWER CIRCUIT CONNECTION TO EFFLUENT GATE SHALL REMAIN AS IS. DEMOLISH EXISTING CONTROL WIRING FROM GATE BACK TO INTERMEDIATE CONTROL PANEL CP-301, SEE NOTE 2. PROVIDE NEW CONTROL WIRING AS SHOWN ON CABLE BLOCK DIAGRAMS. PORTIONS OF EXISTING CONTROL CIRCUIT CONDUIT MAY BE REUSED WITH APPROVAL BY THE ENGINEER.
2. DEMOLISH ALL WIRING AND EXPOSED CONDUIT TO INDICATED EQUIPMENT BACK TO SOURCE. REMOVE ANY ASSOCIATED CONTROLS AND DISCONNECTS ASSOCIATED WITH EQUIPMENT BEING DEMOLISHED. CUT CONDUIT FLUSH WHERE CONCEALED AND GROUT FULL.
3. RELOCATE EXISTING DISCONNECT SWITCH FROM EXISTING RETAINING WALL TO NEW RETAINING WALL. RECONNECT ALL WIRING TO NEW LOCATION. PROVIDE NEW WIRING BACK TO SOURCE AS NECESSARY, NO SPLICING ALLOWED. FIELD VERIFY EXISTING AND NEW LOCATION.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-E-401_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:22:25 PM

DRN: MLW	ORIG DATE: APRIL 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JLH	DWG #: 200-E-401		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: 3/16" = 1'-0"		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

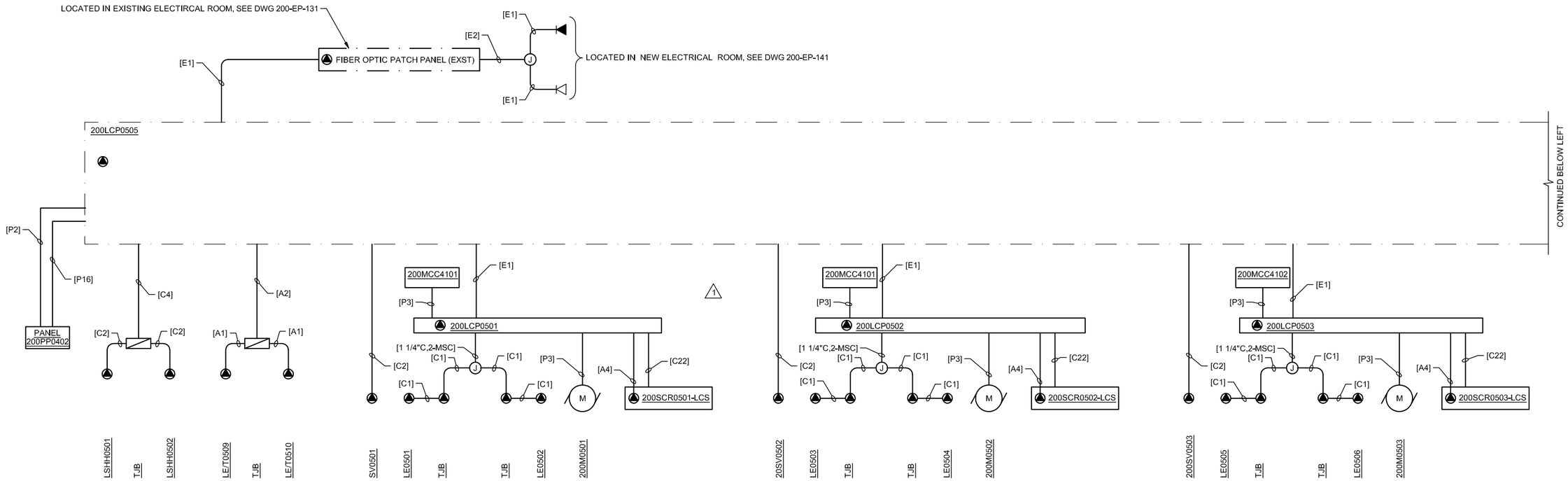
SHEET TITLE: HEADWORKS ELECTRICAL GRIT BASIN MODIFICATION PLAN

SHEET: 127 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-E-401

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



NOTES:

1. SEE CONDUIT/CONDUCTOR SCHEDULE ON DWG 001-G-020.
2. IDENTIFY FOUR OF EIGHT CONDUCTORS AS SPARE AND COIL 3 FEET IN JUNCTION BOX AND IN VENDOR SUPPLIED LCP. JUNCTION BOX INDICATED IS THE LARGE BOX NEAR THE ROOF SHOWN ON DWG 200-EP-141.
3. INDICATES CABLES TO BE ROUTED IN CABLE TRAY.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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DRN: GTM	ORIG DATE: APRIL 2010		
DSN: JZ	DWG #: 200-E-601		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	01/11	JB	RSH	CCR #17

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PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
HEADWORKS
ELECTRICAL
CABLE BLOCK DIAGRAMS

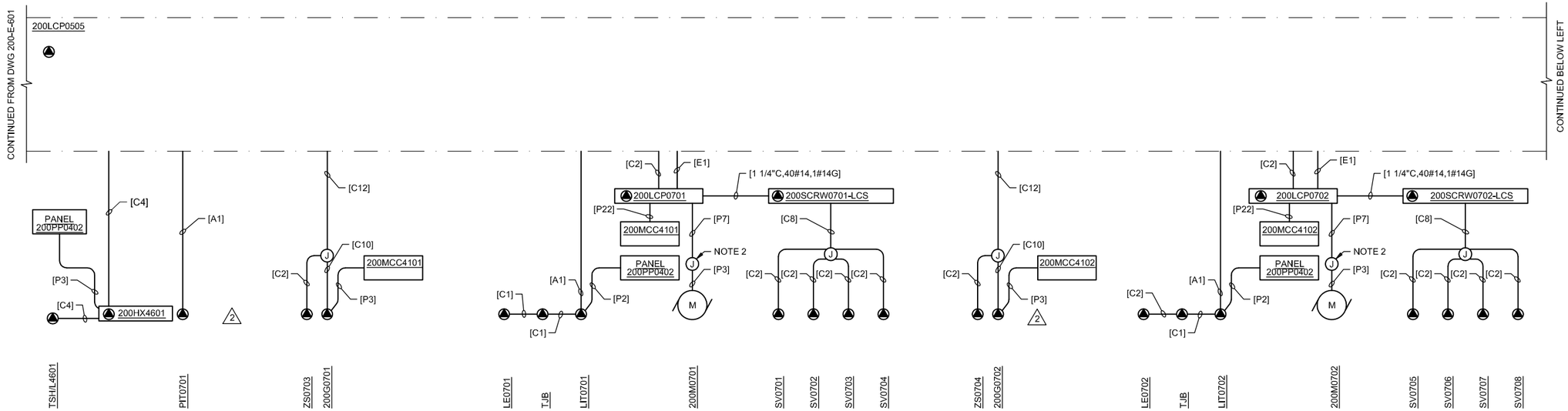
SHEET: 128 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-E-601

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 200-E-601_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:22:34 PM

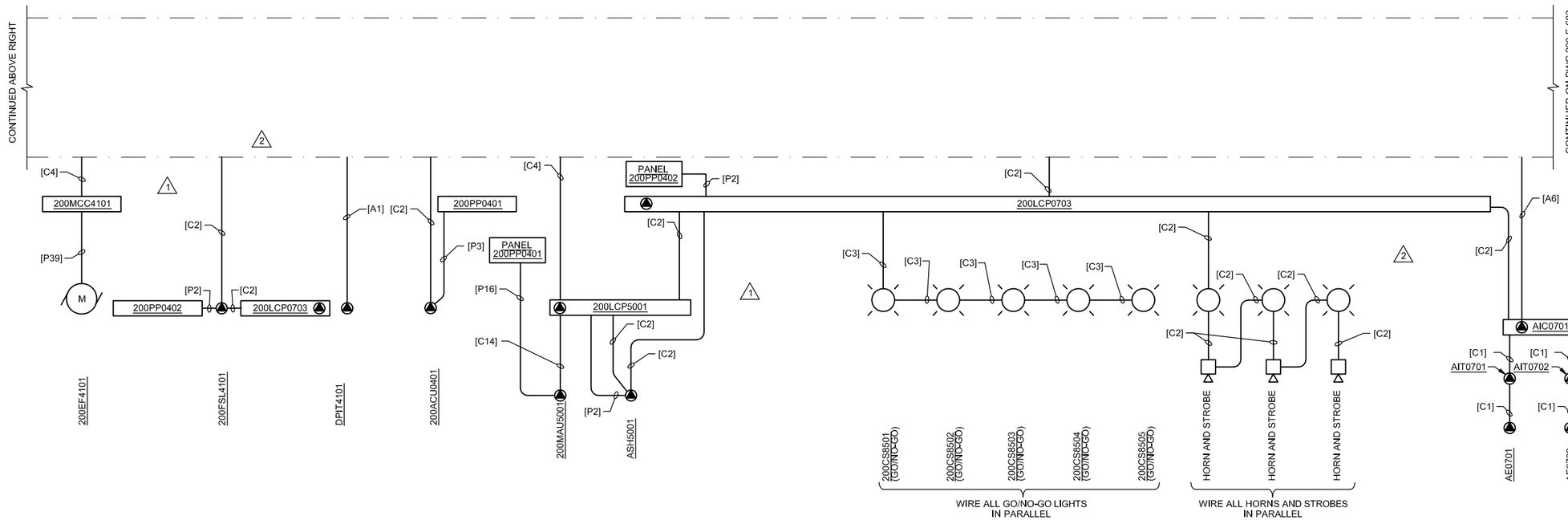


HOT WATER GENERATOR | ISOLATION GATE 1 | WASHER/COMPACTER 1 | ISOLATION GATE 2 | WASHER/COMPACTER 2

NOTES:

1. SEE CONDUIT/CONDUCTOR SCHEDULE ON DWG 001-G-020.
2. IDENTIFY FOUR OF EIGHT CONDUCTORS AS SPARE AND COIL 3 FEET IN JUNCTION BOX AND IN VENDOR SUPPLIED LCP.

2



ODOR CONTROL FAN | AIR CONDITIONER | MAKEUP AIR UNIT 1 | GAS DETECTION AND ALARMING

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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DRN: GTM	ORIG DATE: APRIL 2010			
DSN: JZ	DWG #: 200-E-602			
CHK: MSM	CAD FILE #:			
APPD: LEC	SCALE: NONE			

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
2	01/11	JB	RSH	CCR #17
1	01/11	RH	LEC	WCD #2.1/CCR #5

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CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: HEADWORKS ELECTRICAL CABLE BLOCK DIAGRAMS

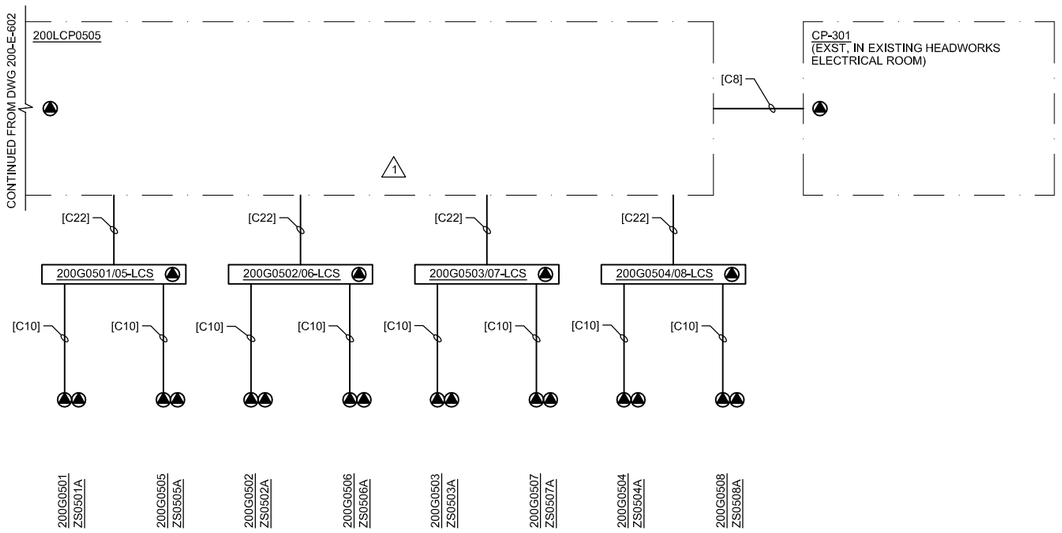
SHEET: 129 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-E-602

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 200-E-602_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:22:43 PM



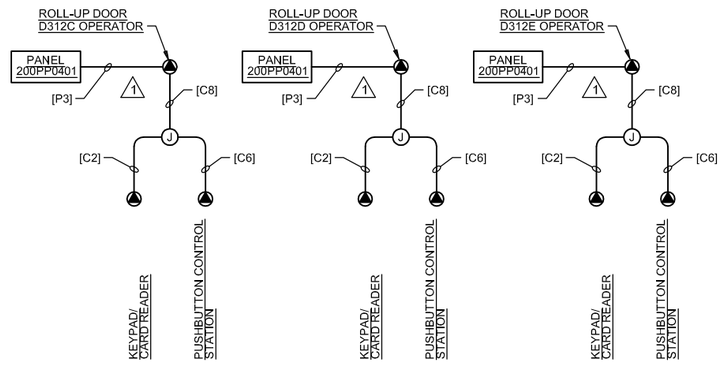
CHANNEL 1 INFLUENT/ EFFLUENT GATES

CHANNEL 2 INFLUENT/ EFFLUENT GATES

CHANNEL 3 INFLUENT/ EFFLUENT GATES

CHANNEL 4 INFLUENT/ EFFLUENT GATES

GRIT SYSTEM CONTROL



ROLL-UP DOORS

NOTES:

1. SEE BAR SCREEN CABLE BLOCK DIAGRAMS FOR WIRING REQUIREMENTS.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 200-E-603_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:22:52 PM

DRN: GTM	ORIG DATE: APRIL 2010		
DSN: JZ	DWG #: 200-E-603		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	01/11	JB	RSH	CCR #17

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

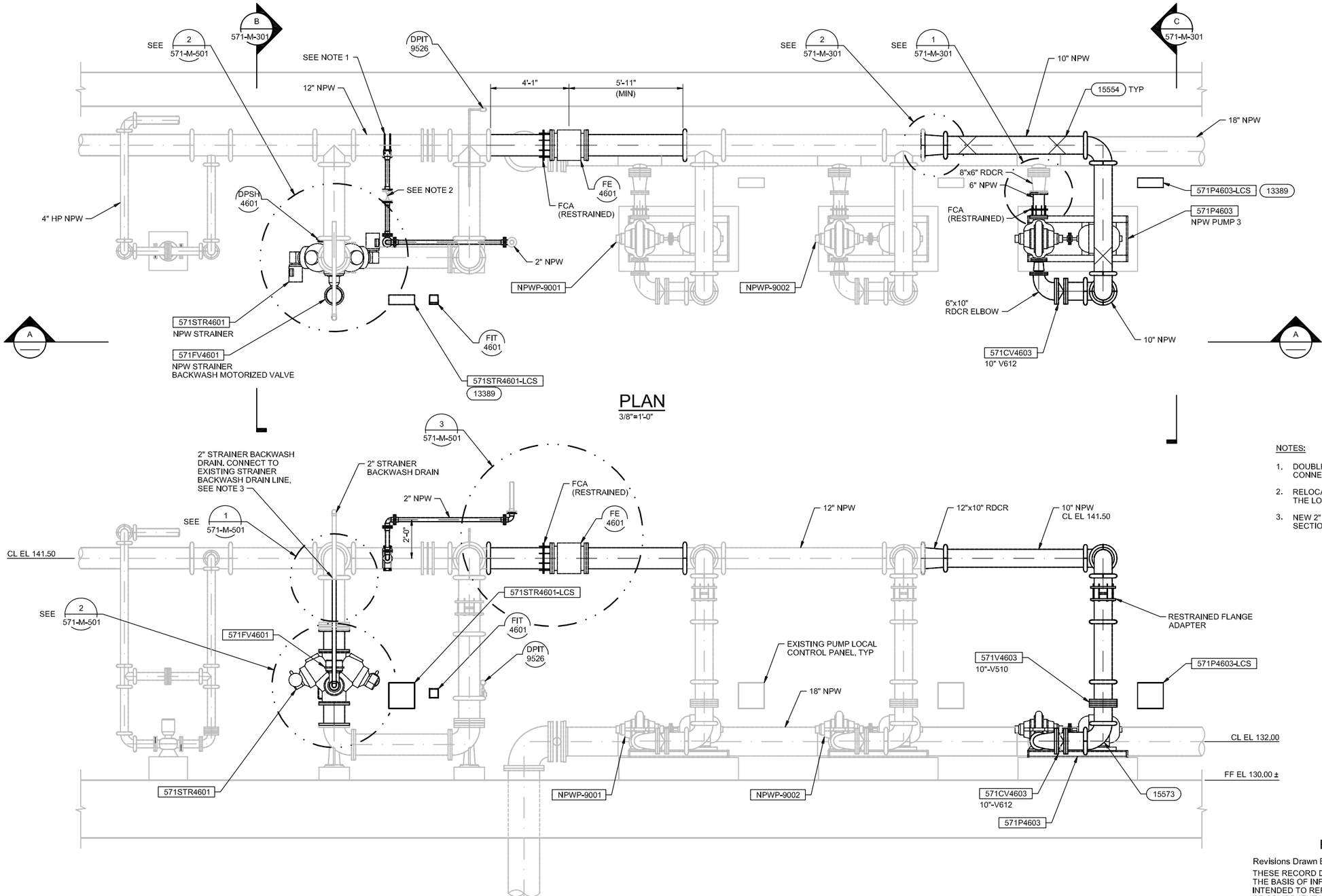
SHEET TITLE:
HEADWORKS
ELECTRICAL
CABLE BLOCK DIAGRAMS

SHEET: 130 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 200-E-603

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



A SECTON
3/8"=1'-0"

NOTES:

1. DOUBLE-STRAP SERVICE SADDLE SHALL BE USED FOR CONNECTION OF NEW 2" NPW TO EXISTING 12" NPW.
2. RELOCATE EXISTING PRESSURE REDUCING VALVE TO THE LOCATION SHOWN ON THE NEW SECTION OF 2" NPW.
3. NEW 2" STRAINER BACKWASH DRAIN SHALL BE PVC PER SECTION 15200-10, PVC PIPE AND FITTINGS.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 571-M-141_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:31:52 PM

DRN: ERB	ORIG DATE: APRIL 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: GMM	DWG #: 571-M-141		
CHK: KGC	CAD FILE #:		
APPD: LEC	SCALE: 3/8" = 1'-0"		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

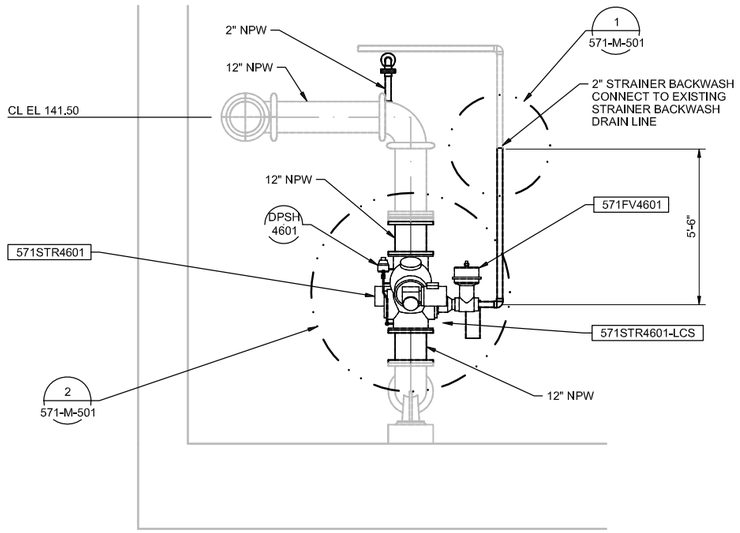
SHEET TITLE:
NON-POTABLE WATER
MECHANICAL
PLAN AND SECTION

SHEET: 131 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

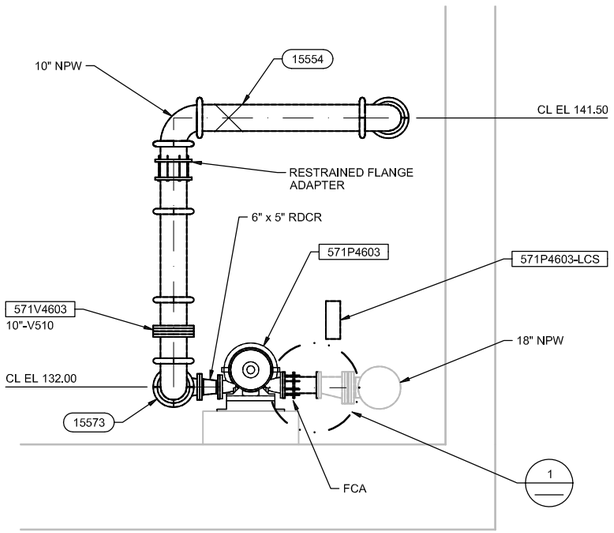
DWG #: 571-M-141

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



B SECTON
3/8"=1'-0"
571-M-141



C SECTON
3/8"=1'-0"
571-M-141



1 DETAIL
NTS
571-M-141



2 DETAIL
NTS
571-M-141

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

NOTES:

1. DEMOLISH ALL WIRING AND EXPOSED CONDUIT TO INDICATED EQUIPMENT BACK TO SOURCE. REMOVE ANY ASSOCIATED CONTROLS AND DISCONNECTS ASSOCIATED WITH EQUIPMENT BEING DEMOLISHED. CUT CONDUIT FLUSH WHERE CONCEALED AND GROUT FULL.

FILENAME: 571-M-301_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:32:05 PM

DRN: ERB	ORIG DATE: APRIL 2010					
DSN: GMM	DWG #: 571-M-301					
CHK: KGC	CAD FILE #:					
APPD: LEC	SCALE: AS SHOWN					

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

CleanWater Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
NON-POTABLE WATER
MECHANICAL
SECTIONS AND DETAILS

SHEET: 132 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 571-M-301

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



EXISTING 2" STRAINER BACKWASH DRAIN

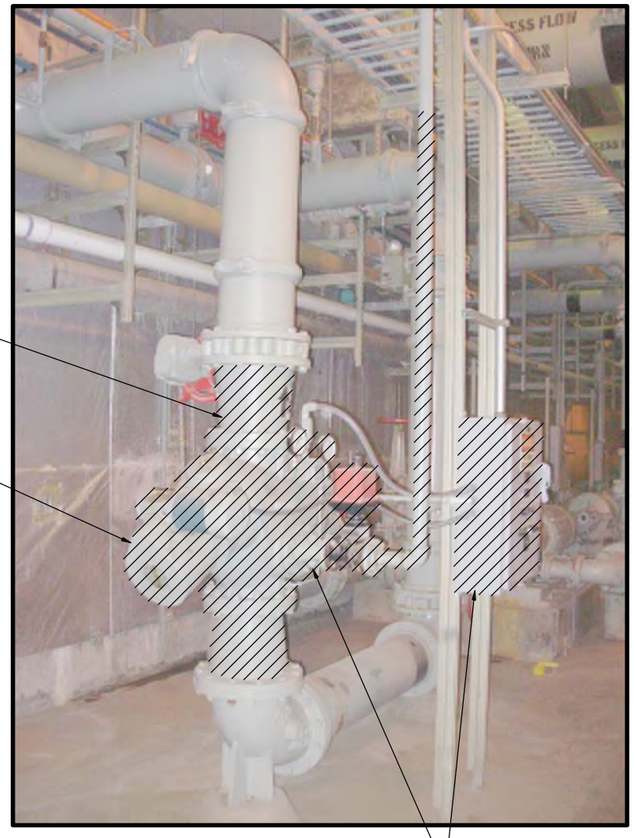
REPLACE EXISTING 12"x10" REDUCERS WITH SHORT, FLANGED 12" SPOOL PIECE (TYP OF 2)

EXISTING 10" AUTOMATIC STRAINER TO BE REPLACED WITH NEW 12" AUTOMATIC STRAINER

EXISTING 2" STRAINER BACKWASH DRAIN TO BE DEMOLISHED BELOW THIS POINT AND REPLACED WITH NEW 2" STRAINER BACKWASH DRAIN COMING FROM NEW NPW STRAINER

HATCHED PIPING TO BE DEMOLISHED

1 DETAIL
NTS
571-M-301



HATCHED PIPING, EQUIPMENT, AND PANELS TO BE DEMOLISHED. SEE NOTE 1 FOR WIRING DEMOLITION REQUIREMENTS FOR EXISTING STRAINER AND CONTROL PANEL

2 DETAIL
NTS
571-M-141
571-M-301

2" NPW

GROOVE END COUPLING

CONNECT NEW 2" NPW PIPE INTO VERTICAL SECTION OF EXISTING 2" NPW 2'-0" ABOVE 12" NPW. RELOCATE EXISTING PRESSURE SUSTAINING VALVE AS SHOWN ON DWG 571-M-141



HATCHED PIPING AND EQUIPMENT TO BE DEMOLISHED

EXISTING FLOWMETER SHALL BE DEMOLISHED (SEE NOTE 1) ALONG WITH IDENTIFIED SECTION OF 12" NPW PIPING AS SHOWN ON DWG 571-M-141 TO ACCOMODATE THE NEW FLOWMETER FE 4601

3 DETAIL
NTS
571-M-141

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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NOTES:

1. DEMOLISH ALL WIRING AND EXPOSED CONDUIT TO INDICATED EQUIPMENT BACK TO SOURCE. REMOVE ANY ASSOCIATED CONTROLS AND DISCONNECTS ASSOCIATED WITH EQUIPMENT BEING DEMOLISHED. CUT CONDUIT FLUSH WHERE CONCEALED AND GROUT FULL.

DRN: ERB	ORIG DATE: APRIL 2010				
DSN: GMM	DWG #: 571-M-501				
CHK: KGC	CAD FILE #:				
APPD: LEC	SCALE: AS SHOWN				

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
NON-POTABLE WATER
MECHANICAL
DETAILS

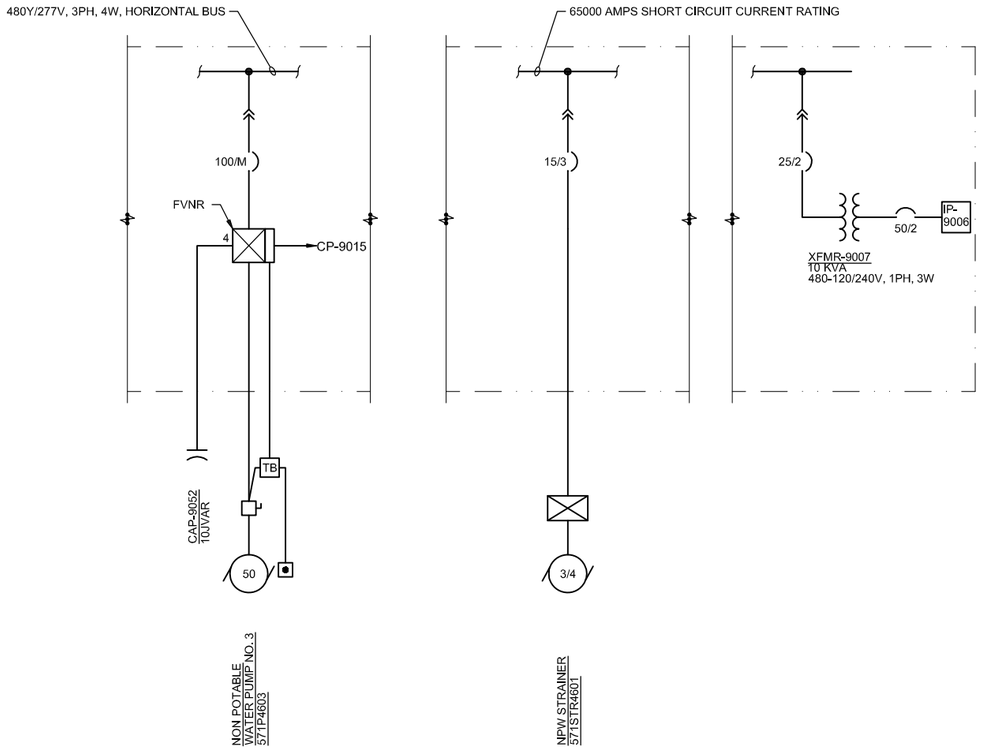
SHEET: 133 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 571-M-501

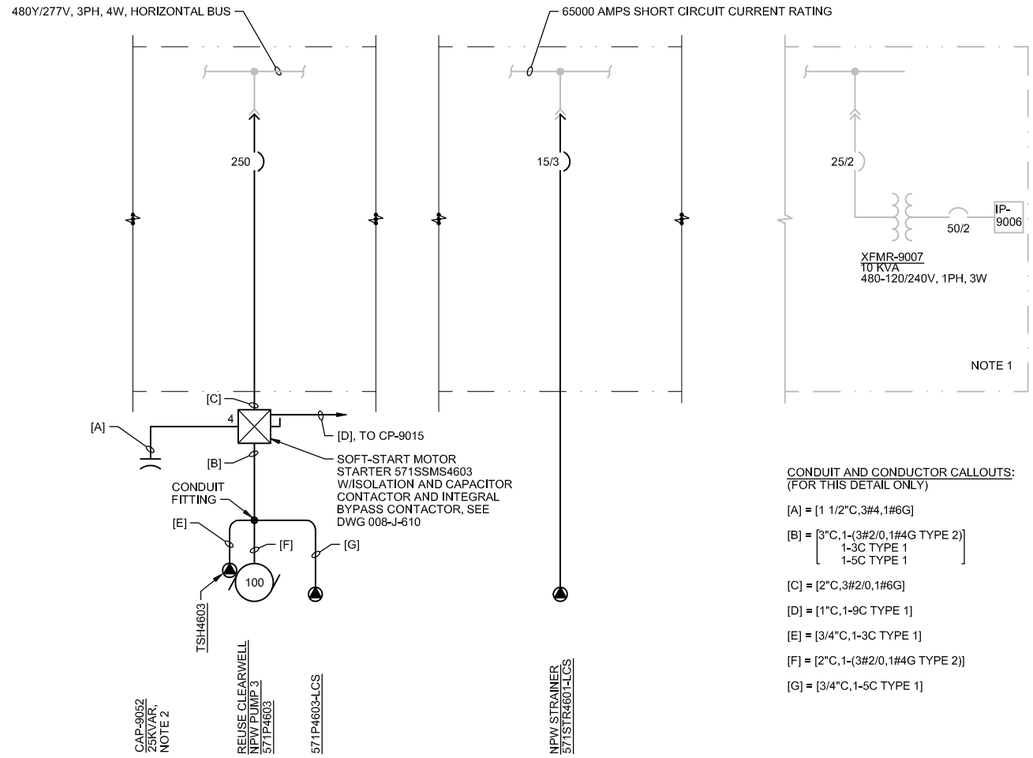
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

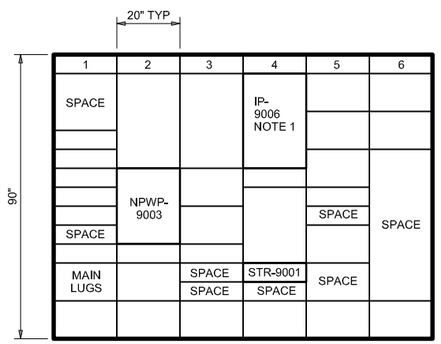
FILENAME: 571-M-501_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:32:18 PM



MCC-9001 PARTIAL ONE-LINE DIAGRAM (EXST)



MCC-9001 PARTIAL ONE-LINE DIAGRAM WITH REVISIONS PROVIDED UNDER THIS CONTRACT



MCC-9001 ELEVATION (EXST)

NTS

NOTES:

1. LOCATE EXISTING INSTRUMENTATION PANELBOARD "IP-9006" IN "MCC-9001" VERIFY A 15 AMP / 1-POLE "SPARE" CIRCUIT BREAKER IS AT BRANCH CIRCUIT NO. 23. FURNISH, INSTALL, AND CONNECT POWER CONDUITS / CONDUCTORS BETWEEN FIT 4601 AND IP-9006 BRANCH CIRCUIT NO. 23. CHANGE THE BRANCH CIRCUIT NO. 23 CIRCUIT IDENTIFICATION LABEL TO "FIT4601" FROM "SPARE"
2. VERIFY POWER FACTOR CORRECTION CAPACITOR SIZE WITH MOTOR SUPPLIER. CAPACITOR SHALL BE FURNISHED, INSTALLED, AND CONNECTED UNDER THIS CONTRACT AND SHALL NOT EXCEED MAXIMUM KVAR RATING RECOMMENDED BY MOTOR MANUFACTURER.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 571-E-601_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:31:30 PM

DRN: MLW	ORIG DATE: APRIL 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JLH	DWG #: 571-E-601		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services — Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

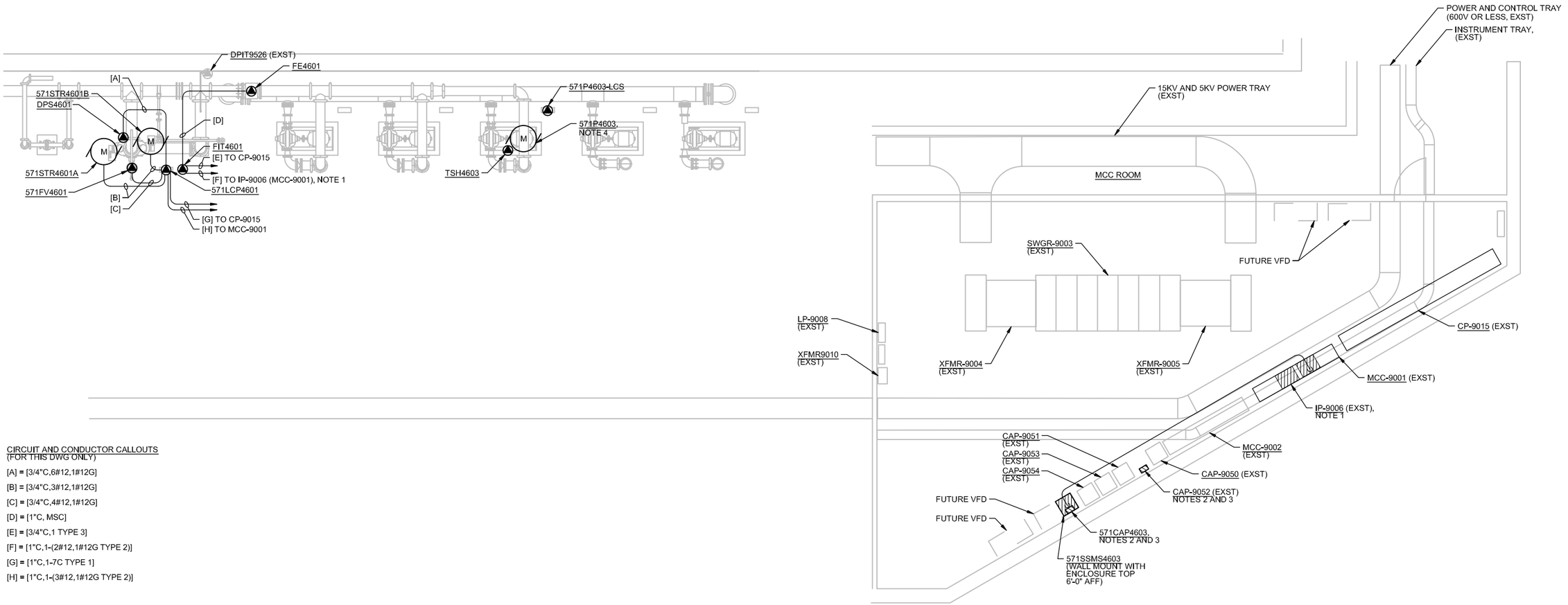
SHEET TITLE: NON-POTABLE WATER ELECTRICAL ONE-LINE DIAGRAM AND MCC ELEVATION

SHEET: 135 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 571-E-601

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:



CIRCUIT AND CONDUCTOR CALLOUTS
(FOR THIS DWG ONLY)

[A] = [3/4"C,6#12,1#12G]

[B] = [3/4"C,3#12,1#12G]

[C] = [3/4"C,4#12,1#12G]

[D] = [1"C, MSC]

[E] = [3/4"C,1 TYPE 3]

[F] = [1"C,1-(2#12,1#12G TYPE 2)]

[G] = [1"C,1-7C TYPE 1]

[H] = [1"C,1-(3#12,1#12G TYPE 2)]

NOTES:

1. SEE DWG 571-E-600 NOTE 1.
2. DEENERGIZE, DISCONNECT, REMOVE, AND DISPOSE OF OFF SITE EXISTING 10 KVAR POWER FACTOR CORRECTION CAPACITOR "CAP-9052". FURNISH, WALL-MOUNT NEW 571SSMS4603, AND CONNECT NEW 25 KVAR POWER FACTOR CORRECTION CAPACITOR "CAP-4603". USE WALL BRACKETS FURNISHED WITH THE CAPACITOR AND INSTALL PER MANUFACTURER'S INSTRUCTIONS WITH BLOWN FUSE INDICATORS VISIBLE FROM THE FRONT.
3. DEENERGIZE, DISCONNECT, REMOVE, AND DISPOSE OF OFF SITE EXISTING CONDUITS AND CONDUCTORS BETWEEN "CAP-9052"AND MCC-9001. FURNISH, INSTALL, CONNECT, AND TEST NEW CONDUITS/CONDUCTORS BETWEEN "CAP-4603"AND 571SSMS4603.
4. FOR CONDUIT/CONDUCTOR CALLOUTS, SEE DWG 571-E-601.
5. CIRCUIT CONDUCOTRS BETWEEN FIELD EQUIPMENT/DEVICES AND 571SSMS4603, MCC-9006, CP-9015 MAY BE ROUTED FROM RGS TO CABLE TRAY (EXISTING).

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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NON-POTABLE WATER LOWER LEVEL PROCESS PLAN

3/16"=1'-0"

FILENAME: 571-EP-141_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:31:41 PM

DRN: MLW	ORIG. DATE: FEBRUARY 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JLH	DWG #: 571-EP-141		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: 3/16" = 1'		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

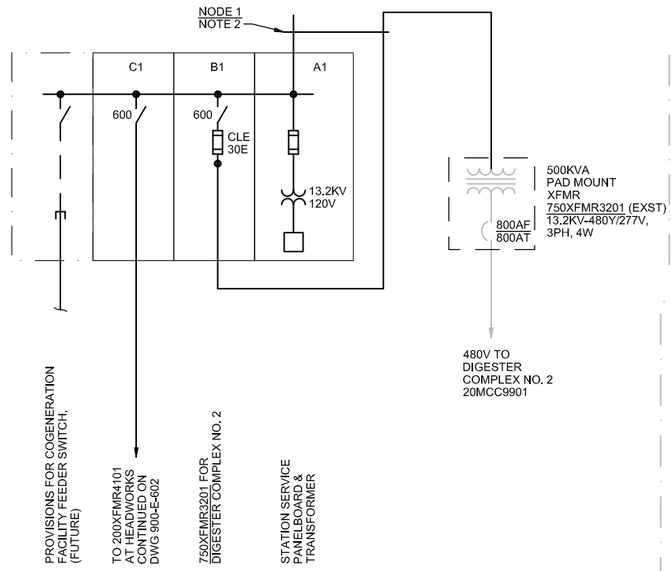
SHEET TITLE:
NON-POTABLE WATER
ELCTRICAL
PROCESS PLAN

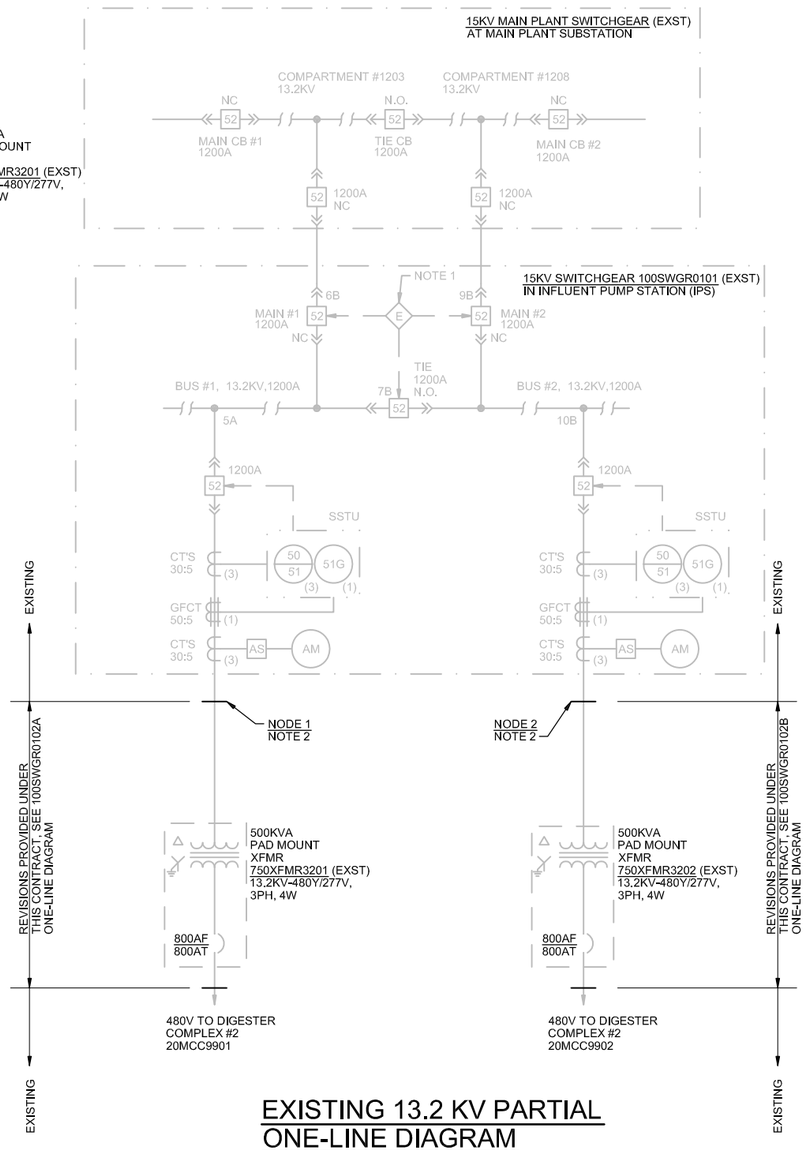
SHEET: 134 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

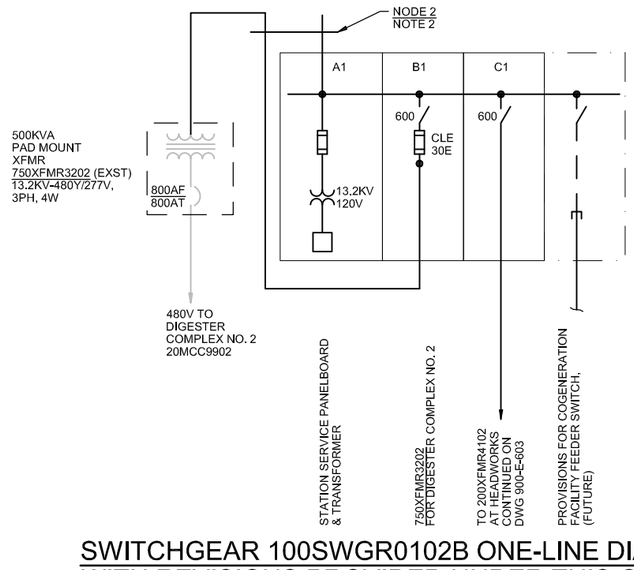
DWG #: 571-EP-141

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:







SWITCHGEAR 100SWGR0102A ONE-LINE DIAGRAM WITH REVISIONS PROVIDED UNDER THIS CONTRACT

SWITCHGEAR 100SWGR0102A ELEVATION

EXISTING 13.2 KV PARTIAL ONE-LINE DIAGRAM

NOTES:

1. ELECTRICAL INTERLOCK TO ALLOW 2 OF THE 3 BREAKERS TO BE CLOSED SIMULTANEOUSLY.
2. FOR CONSTRUCTION SEQUENCING NOTES REGARDING WORK SHOWN ON THIS DRAWING, SEE SPECIFICATION SECTION 01140, WORK RESTRICTIONS.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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SWITCHGEAR 100SWGR0102B ONE-LINE DIAGRAM WITH REVISIONS PROVIDED UNDER THIS CONTRACT

SWITCHGEAR 100SWGR0102B ELEVATION

DRN: MLW	ORIG DATE:	FEBRUARY 2010	
DSN: JLH	DWG #:	900-E-601	
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE:	NONE	

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
ELECTRICAL
OVERALL PARTIAL
ONE-LINE DIAGRAM
AND ELEVATIONS

SHEET: 136 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 900-E-601

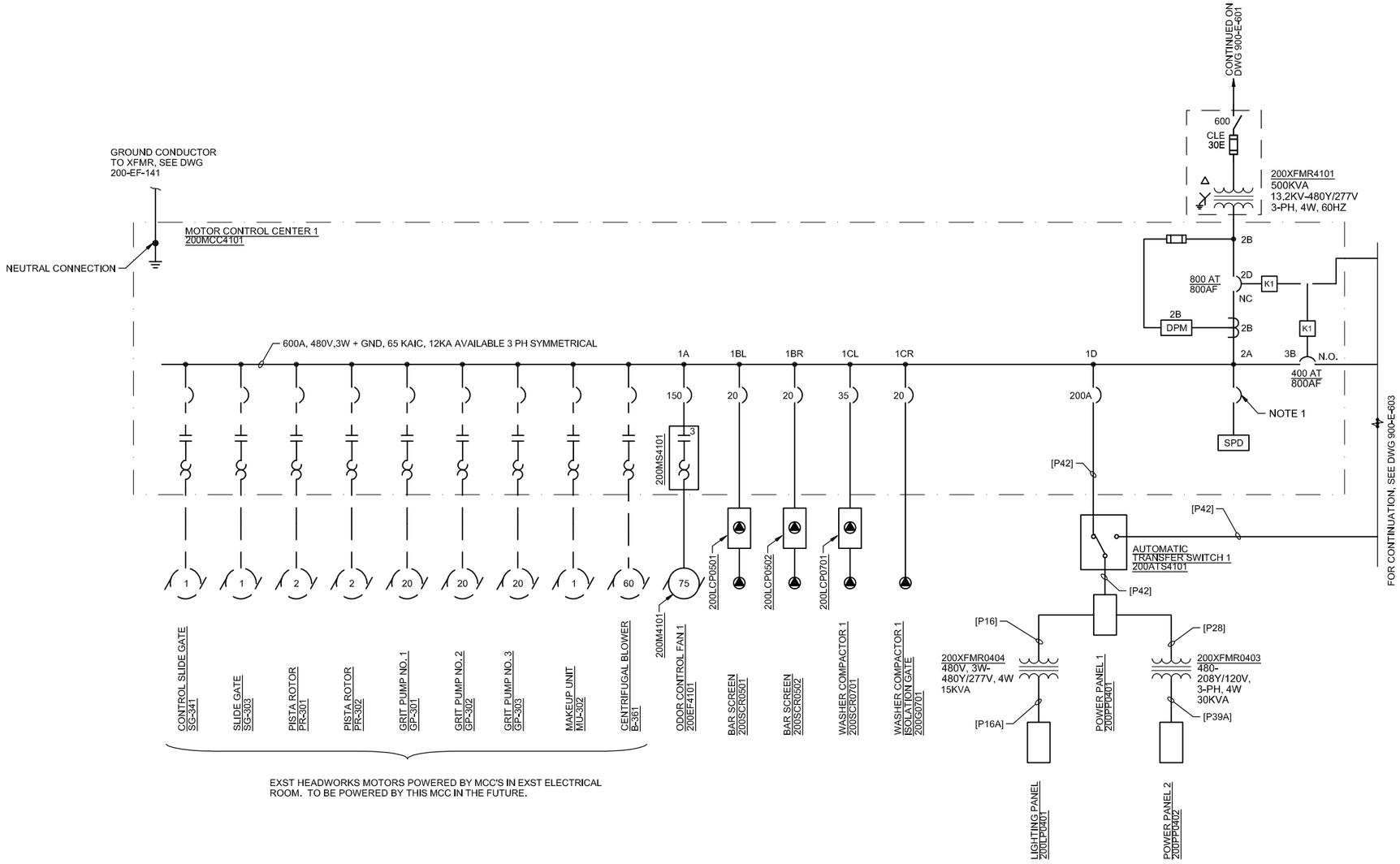
FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

FILENAME: 900-E-601_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:32:28 PM

NOTES:

1. SIZE BREAKER PER MANUFACTURER'S RECOMMENDATION.



EXST HEADWORKS MOTORS POWERED BY MCC'S IN EXST ELECTRICAL ROOM. TO BE POWERED BY THIS MCC IN THE FUTURE.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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HEADWORKS NEW MCC ONE-LINE DIAGRAM

PLOT TIME: 1:32:37 PM
PLOT DATE: 05-26-2012
FILENAME: 900-E-602_391538.DWG

DRN: MLW	ORIG DATE: FEBRUARY 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: JLH	DWG #: 900-E-602		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

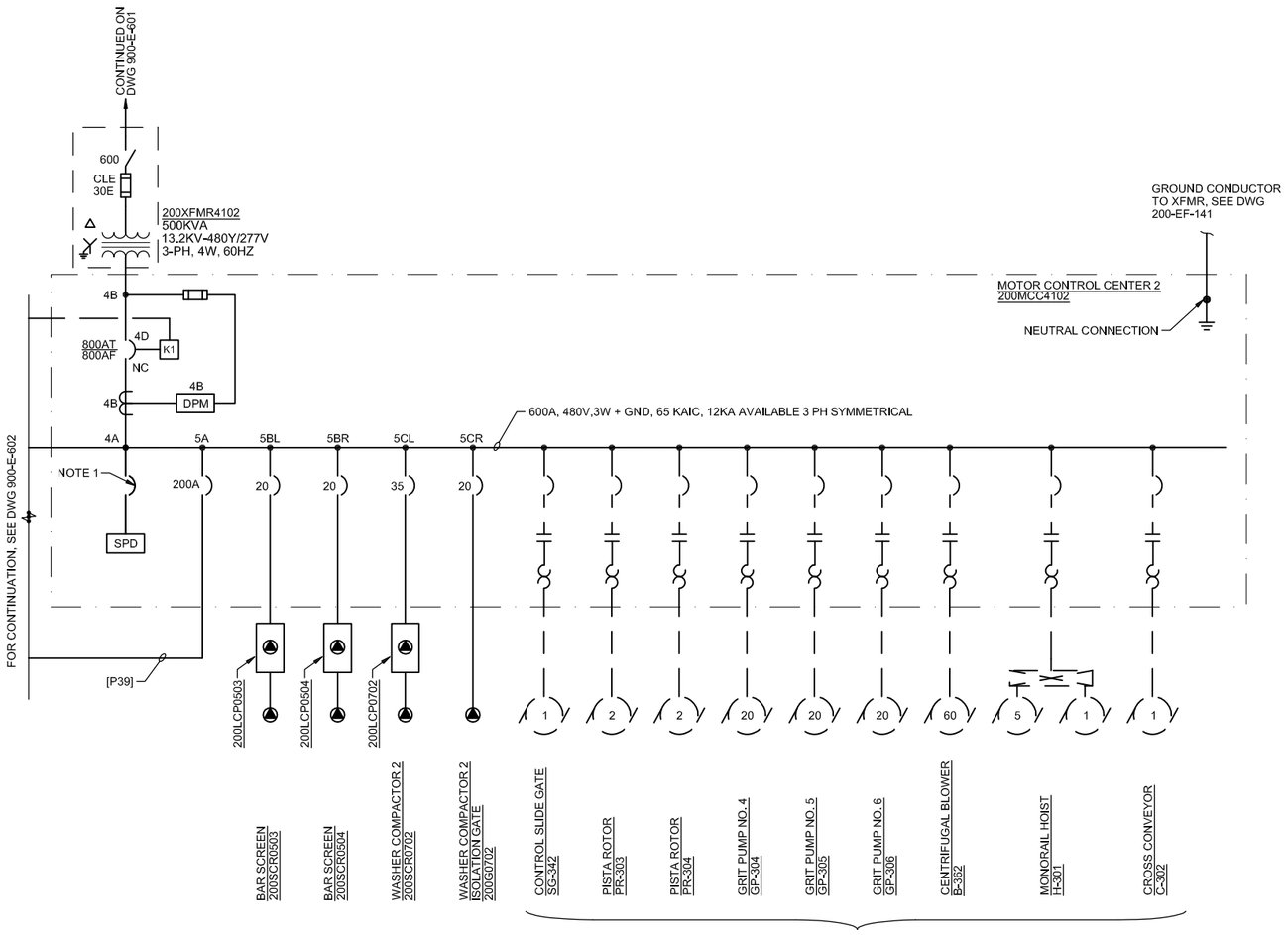
SHEET TITLE: ELECTRICAL — HEADWORKS MCC ONE-LINE DIAGRAM

SHEET: 137 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 900-E-602

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

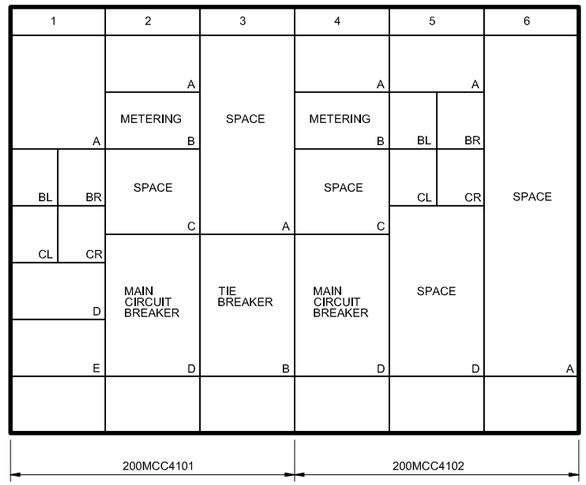


EXST HEADWORKS MOTORS POWERED BY MCC'S IN EXST ELECTRICAL ROOM. TO BE POWERED BY THIS MCC IN THE FUTURE.

HEADWORKS NEW MCC ONE-LINE DIAGRAM

NOTES:

1. SIZE BREAKER PER MANUFACTURER'S RECOMMENDATION.



200MCC4101 AND 200MCC402 ELEVATION

NTS

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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PLOT TIME: 1:32:47 PM
PLOT DATE: 05-26-2012
FILENAME: 900-E-603_391538.DWG

DRN: MLW	ORIG DATE:				
DSN: JLH	DWG #: 900-E-603				
CHK: MSM	CAD FILE #:				
APPD: LEC	SCALE: NONE				

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: ELECTRICAL HEADWORKS MCC ONE-LINE DIAGRAM

SHEET: 138 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 900-E-603

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

LUMINAIRE SCHEDULE

SYMBOL	TYPE	VOLTAGE	INPUT WATTS	DESCRIPTION	MANUFACTURER AND CATALOG NO.	LAMPS	MOUNTING
	FLUOR	277	112	4' SMALL PROFILE INDUSTRIAL. EXTRUDED ALUMINUM HOUSING WITH INTEGRAL BALLAST HEAT-SINK. CLEAR ANODIZED FINISH.	THE LIGHT EDGE RAP2	(2). 54T5HO 4100k	SUSPENDED
	FLUOR	277	109	4' ENCLOSED AND GASKETED INDUSTRIAL POLYCARBONATE HOUSING, STAINLESS STEEL HARDWARE, DUAL PARABOLIC REFLECTOR RATED FOR USE IN A CLASS I DIVISION 2 AREA.	BEGHELLI ILLUMINA HZ100	(2). 54T5HO 4100k	WALL 45 DEGREE MOUNTING BRACKET
	INDUCTION	277	165	ALUMINUM HOUSING, BAKED EPOXY POLYESTER POWDER PAINT FINISH. LIGHTWEIGHT CORROSION RESISTANT POLYESTER REINFORCED FIBERGLASS REFLECTOR. GLOBE AND GUARD PROVIDED RATED FOR USE IN A CLASS I DIVISION 2 AREA.	HUBBELL/KILLARK CERTELITE V SERIES	(1). 165W INDUCTION	PENDANT
	INDUCTION	277	88	9" X 18" WALL PACK. INDUCTION LAMP FOR LONG LAMP LIFE. DIE CAST ALUMINUM CASING WITH POWDER COAT CARBON GRAY FINISH. PRISMATIC GLASS LENS.	US LIGHTING TECH DIAMOND WALL PACK	(1). 80W INDUCTION 5000k	WALL
	HALOGEN	277	44	INDUSTRIAL EMERGENCY LIGHTING UNIT. NEMA 4X RATED. NICKEL CADMIUM BATTERY. MINIMUM 90 MINUTES OF ILLUMINATION.	LITHONIA INDX1236-W-PREM	(2). 12W HALOGEN	WALL
	HALOGEN	277	44	INDUSTRIAL EMERGENCY LIGHTING UNIT. NEMA 4X RATED. NICKEL CADMIUM BATTERY. MINIMUM 90 MINUTES OF ILLUMINATION RATED FOR USE IN A CLASS I DIVISION 2 AREA.	HOLOPHANE DESOTO M70	(2). 12W HALOGEN	WALL
	LED	277	10	HAZARDOUS LOCATION EXIT LIGHT FIBERGLASS REINFORCED POLYESTER HOUSING. GRAY FINISH WITH STAINLESS STEEL HARDWARE. LONG LASTING, HIGH OUTPUT, DIRECT VIEW LED'S. SEALED NICKEL CADMIUM BATTERY. RATED FOR USE IN A CLASS I DIVISION 2 AREA.	HOLOPHANE DELEON HD	LED	WALL
	INDUCTION	277	110	24" SQUARE SHOEBOX STYLE LUMINAIRE DIE CAST ALUMINUM HOUSING, POWDER COATED BRONZE FINISH. TEMPERED GLASS LENS, ANODIZED ALUMINUM REFLECTOR. LONG LIFE INDUCTION SYSTEM. 100,000 HOUR RATED. SQUARE 15'-0" ALUMINUM POLE, BRONZE FINISH	US LIGHTING TECH PARKER AREA LIGHT	(1). 100W INDUCTION 5000k	POLE
	LED	120	20	"GO/NO-GO", RED/GREEN STATUS LIGHT. LED LIGHT SOURCE, STACKABLE LIGHTS IN VERTICAL CYLINDRICAL CONFIGURATION, NEMA 4X, UL LISTED. PROVIDE WALL MOUNT BRACKET TO MOUNT IN VERTICAL CONFIGURATION.	FEDERAL SIGNAL MICROSTAT MSL2-120GR WITH OPTIONS MSLBRCKT MSLED	(2) LED	WALL
10 HO	LED	120	25	EMERGENCY STROBE, CLEAR FRESNEL INNER LENS, CLEAR POLYCARBONATE OUTDER DOME LED LAMP, NEMA 4X RATED ENCLOSURE. UL LISTED FOR USE IN A CLASS I DIVISION 2 AREA..	FEDERAL SIGNAL 225XL-120V	LED	WALL MOUNTED ON 1/2" PIPE

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 900-E-604_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:34:03 PM

DRN: MLW	ORIG DATE: FEBRUARY 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: RSH	DWG #: 900-E-604		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: ELECTRICAL LUMINAIRE SCHEDULE

SHEET: 139 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 900-E-604

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

ELECTRICAL PANELBOARD SCHEDULE

PANEL: 200PP0401
VOLTAGE: 480V, 3Ph, 3W
BUS SIZE: 200A
MAINS: 200A Main Breaker
Isc: 14 KA

LOCATION: ELECTRICAL / CONTROL ROOM
MOUNTING: WALL MOUNTED (SURFACE)
FED FROM: 200MCC4101 AND 200MCC4102 VIA 200ATS4101

CIRCUIT TITLE	BREAKER CKT NO.	AMP	POLE	LOAD, VA PHASE A	PHASE B	PHASE C	LOAD, VA PHASE A	PHASE B	PHASE C	BREAKER POLE	AMP	CKT NO.	CIRCUIT TITLE
MAKEUP AIR UNIT	1	50	3	5,810			3,348			3	20	2	ELEC ROOM AIR CONDITIONING UNIT
200MAUS001	3	"	"		5,810			3,348		"	"	4	200ACU0401
(15HP)	5	"	"			5,810			3,348	"	"	6	(12.1 FLA)
SPARE	7	20	3				581			3	20	8	ROLL UP DOOR 312C
"-------"	9	"	"					581		"	"	10	"-------"
"-------"	11	"	"						581	"	"	12	"-------"
200PP0402 VIA 200XFMR0403	13	60	3	3,580			581			3	20	14	ROLL UP DOOR 312D
"-------"	15	"	"		940			581		"	"	16	"-------"
"-------"	17	"	"			1920			581	"	"	18	"-------"
200LP0401 VIA 200XFMR0404	19	30	3	2,800			581			3	20	20	ROLL UP DOOR 312E
"-------"	21	"	"		2,800			581		"	"	22	"-------"
"-------"	23	"	"			1850			581	"	"	24	"-------"
SPACE	25						150			3	20	26	FV0501
SPACE	27							150		"	"	28	"-------"
SPACE	29								150	"	"	30	"-------"
SPACE	31											32	SPACE
SPACE	33											34	SPACE
SPACE	35											36	SPACE
SPACE	37											38	SPACE
SPACE	39											40	SPACE
SPACE	41											42	SPACE
TOTAL LOAD				12150	9550	9580	5241	5241	5241				

PHASE A LOAD (VA) 17,431
PHASE B LOAD (VA) 14,791
PHASE C LOAD (VA) 14,821
TOTAL LOAD (VA)= 47,043

ELECTRICAL PANELBOARD SCHEDULE

PANEL: 200LP0401
VOLTAGE: 480/277V, 3Ph, 4W.
BUS SIZE: 100A
MAINS: 100A Main Breaker
Isc: 14 KA

LOCATION: ELECTRICAL / CONTROL ROOM
MOUNTING: WALL MOUNTED (SURFACE)
FED FROM: 200PP0403 VIA 200XFMR0405

CIRCUIT TITLE	BREAKER CKT NO.	AMP	POLE	LOAD, VA PHASE A	PHASE B	PHASE C	LOAD, VA PHASE A	PHASE B	PHASE C	BREAKER POLE	AMP	CKT NO	CIRCUIT TITLE
LTS - EXST SCREEN RM PENDANT MT	1	20	1	1,200			1,050			1	20	2	LTS - COMPACTOR ROOM WALL MT
LTS - EXST SCREEN RM WALL MT	3	20	1		2,000			800		1	20	4	LTS - ELEC/CONTROL RM
LTS - COMPACTOR RM	5	20	1			1200			850	1	20	6	LTS - BLDG EXTERIOR
LTS - EXTERIOR POLE MT	7	20	1	550								8	SPACE
SPACE	9											10	SPACE
SPACE	11											12	SPACE
SPACE	13											14	SPACE
SPACE	15											16	SPACE
SPACE	17											18	SPACE
SPACE	19											20	SPACE
SPACE	21											22	SPACE
SPACE	23											24	SPACE
SPACE	25											26	SPACE
SPACE	27											28	SPACE
SPACE	29											30	SPACE
TOTAL LOAD				1750	2000	1200	1050	800	650				

PHASE A LOAD (VA) 2,800
PHASE B LOAD (VA) 2,800
PHASE C LOAD (VA) 1,850
TOTAL LOAD (VA)= 7,450

ELECTRICAL PANELBOARD SCHEDULE

PANEL: 200PP0402
VOLTAGE: 208/120V, 3Ph, 4W.
BUS SIZE: 100A
MAINS: 100A Main Breaker
Isc: 10 KA

LOCATION: ELECTRICAL / CONTROL ROOM
MOUNTING: WALL MOUNTED (SURFACE)
FED FROM: 200PP0403 VIA 200XFMR0403

CIRCUIT TITLE	BREAKER CKT NO.	AMP	POLE	LOAD, VA PHASE A	PHASE B	PHASE C	LOAD, VA PHASE A	PHASE B	PHASE C	BREAKER POLE	AMP	CKT NO	CIRCUIT TITLE
SPARE	1	20	1				50			1	20	2	ELECTRIC TRAP PRIMER, ETP-1
SPARE	3	20	1					200		1	20	4	200LCP0703 (GAS ALARM PNL)
HOT WATER GEN 200HX4601	5	20	1			500			500	1	20	6	200LCP0505 (PLC)
RCPT- ELECT. ROOM WORKSTATION	7	20	1	360			2,400			1	30	8	200LCP0505 (PLC)
RCPT- ELECT. ROOM WORKSTATION	9	20	1		360			200		1	20	10	AIC0701 (GAS DETECTOR CONTROLLER)
RCPT- ELECT. ROOM	11	20	1			720			200	1	20	12	LIT0701, LIT0702
RCPT-EXTERIOR	13	20	1	720			50			1	20	14	200FSL4101
RCPT-COMPACTOR ROOM*	15	20*	1		180							16	SPACE
SPACE	17											18	SPACE
SPACE	19											20	SPACE
SPACE	21											22	SPACE
SPACE	23											24	SPACE
SPACE	25											26	SPACE
SPACE	27											28	SPACE
SPACE	29											30	SPACE
SPACE	31											32	SPACE
SPACE	33											34	SPACE
SPACE	35											36	SPACE
SPACE	37											38	SPACE
SPACE	39											40	SPACE
SPACE	41											42	SPACE
TOTAL LOAD				1080	540	1220	2500	400	700				

1

*INDICATES GFCI BREAKER

PHASE A LOAD (VA) 3,580
PHASE B LOAD (VA) 940
PHASE C LOAD (VA) 1,920
TOTAL LOAD (VA)= 6,440

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date JAN 2012

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FILENAME: 900-E-605_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:35:04 PM

DRN: MLW	ORIG DATE: FEBRUARY 2010		
DSN: RSH	DWG #: 900-E-605		
CHK: MSM	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	01/12	ERB	LEC	RECORD DRAWING
1	01/11	RH	LEC	WCD #2.1/CCR #5

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PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: ELECTRICAL PANELBOARD SCHEDULE

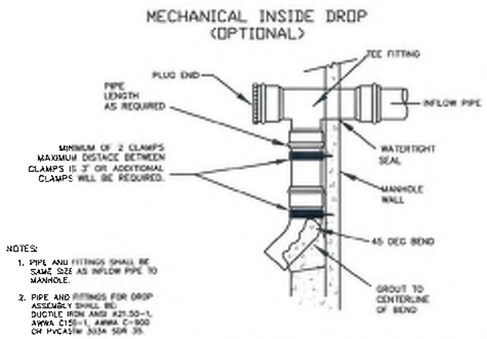
SHEET: 140 OF: D24
PLOT DATE: JUNE 2010
PLC #:
CWS PROJ #: 6410

DWG #: 900-E-605

FOR SIGNATURES AND SEALS REFER TO ORIGINAL DRAWINGS DATED JUNE 2010

ENGR STAMP:

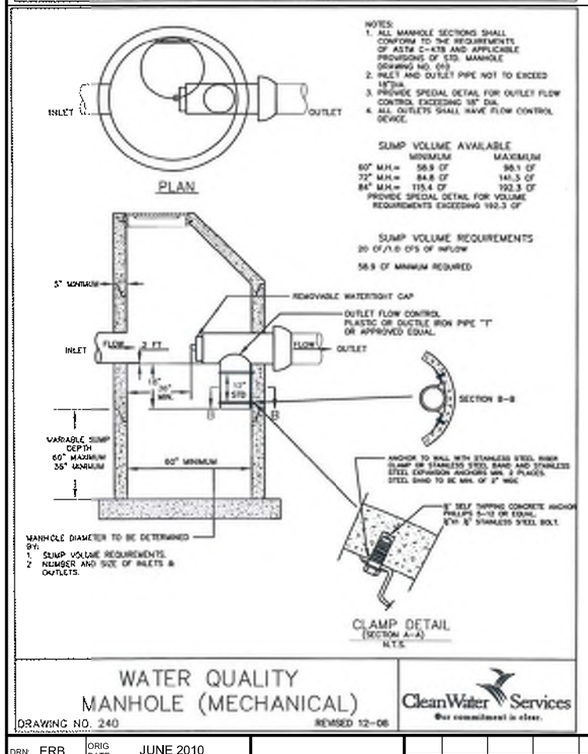




MECHANICAL INSIDE DROP MANHOLE

DRAWING NO. 260 REVISED 12-06

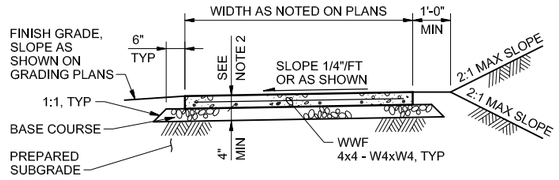
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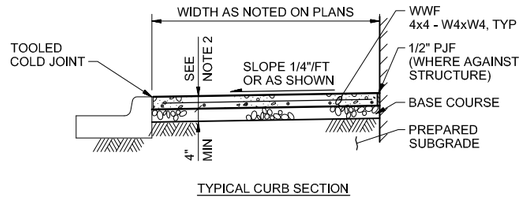


WATER QUALITY MANHOLE (MECHANICAL)

DRAWING NO. 240 REVISED 12-06

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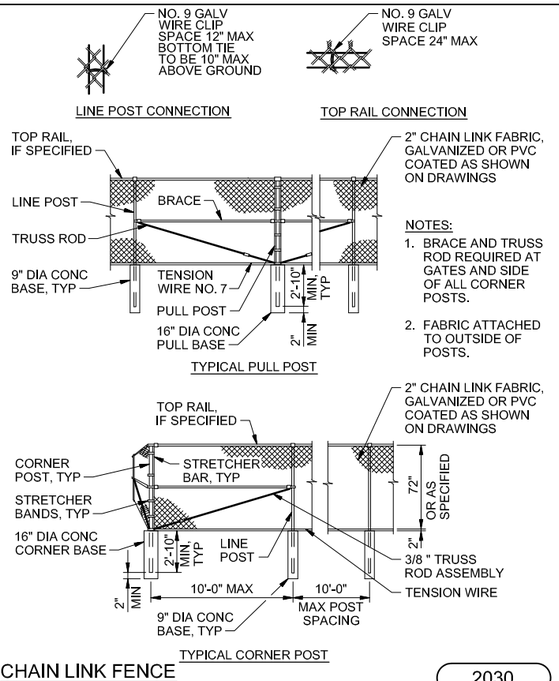
NOTES:

1. SIDEWALKS 8 FEET AND WIDER SHALL HAVE A LONGITUDINAL CONTRACTION JOINT AT THE MIDPOINT.
2. CONCRETE DEPTH FOR STANDARD SIDEWALKS SHALL BE NOMINAL 4" MINIMUM.
3. PROVIDE CONTRACTION JOINTS AT 5' SPACING.

CONCRETE SIDEWALK

NTS

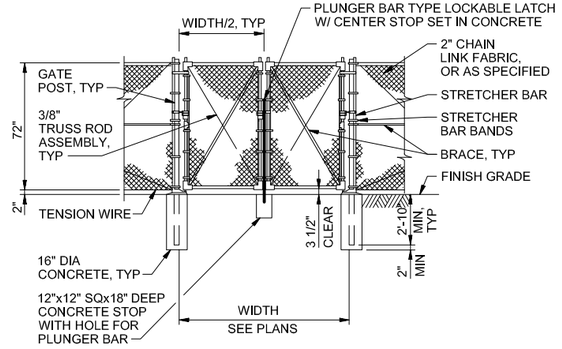
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CHAIN LINK FENCE

NTS

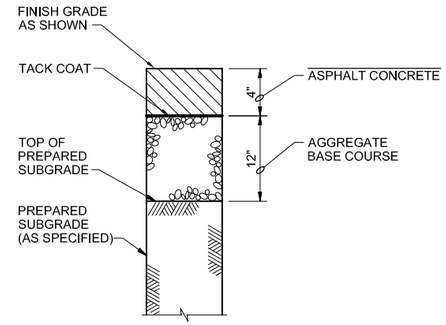
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DOUBLE SWING GATE

NTS

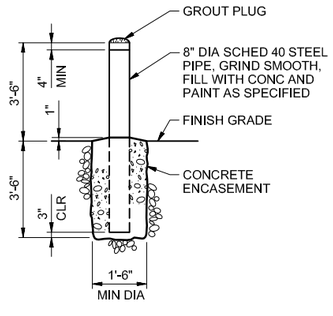
2032



ASPHALT CONCRETE PAVEMENT

NTS

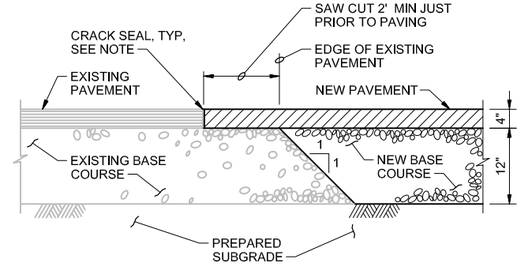
2220



GUARD POST - EXTERIOR

NTS

2080



RECORD DRAWINGS

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NOTE:

PAINT EDGE OF EXISTING ASPHALT WITH TACK COAT PRIOR TO PAVING. CRACK SEAL JOINT AFTER PAVING OPERATION HAS BEEN COMPLETED. PER ASTM D3406

PAVEMENT CONNECTION

NTS

2221

DRN: ERB	ORIG DATE: JUNE 2010				
DSN: GVT	DWG #: DD-001				
CHK: SBR	CAD FILE #:				
APPD: LEC	SCALE: NONE				

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

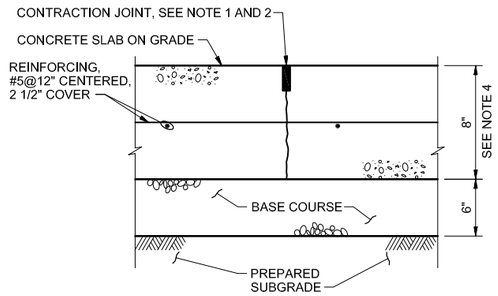
SHEET TITLE:
DETAILS
DESIGN DETAILS

SHEET: D1 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #: DD-001

ENGR STAMP:

FILENAME: DD-001_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:35:20 PM



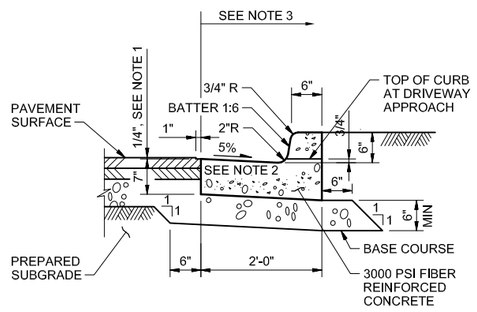
NOTES:

1. CONTRACTION JOINT SHALL BE MADE, CLEANED WITH COMPRESSED AIR, AND FILLED WITH SEALANT AS SPECIFIED.
2. CONCRETE JOINT SPACING: 12' x 12' OR AS SHOWN.
3. INSTALL 1/2" PREMOLDED JOINT FILLER FULL DEPTH WHERE CONCRETE PAVEMENT ABUTS CONCRETE CURB, BUILDING OR ANY RIGID STRUCTURE.
4. PROVIDE A 12" THICK BY 18" WIDE THICKENED EDGE AROUND PERIMETER OF SLAB. TRANSITION THICKENED EDGE TO NORMAL 8" THICKNESS IN 18".
5. CONCRETE SHALL BE 4000 PSI CONCRETE AS SPECIFIED IN SECTION 03300, CAST-IN-PLACE CONCRETE.

CONCRETE PAVEMENT

NTS

2230



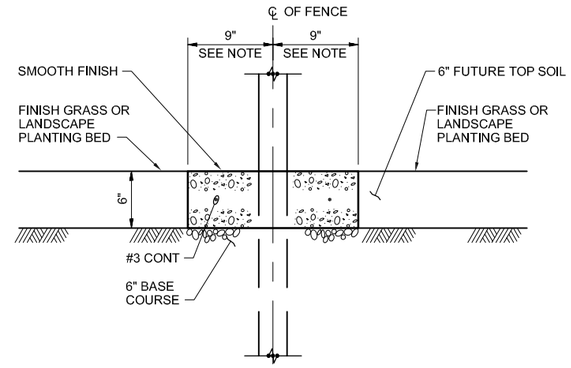
NOTE:

1. 1/4" PAVEMENT LIP ON LOW SIDE GUTTERS ONLY.
2. WHEN USED ON THE HIGH SIDE OF ROADWAYS, THE CROSS SLOPE OF THE GUTTER SHALL MATCH THE SLOPE OF THE ADJACENT PAVEMENT, UNLESS OTHERWISE DETAILED ON THE PLANS.
3. WHERE PLACED ADJACENT TO EXISTING PAVEMENT, LIMIT OF WORK SHALL BE AT EDGE OF GUTTER. DO NOT UNDERMINE EXISTING PAVEMENT.

CONCRETE CURB AND GUTTER

NTS

2250



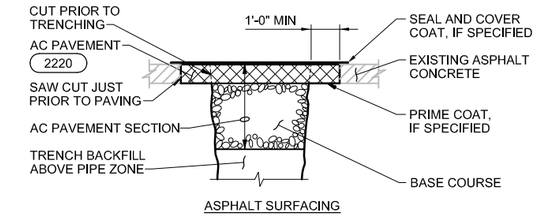
NOTE:

1. IF FENCE/MOWING STRIP IS NEXT TO CURB. SET FENCE POST 6" FROM EDGE OF CURB. ADJUST OTHER SIDE TO 1'-0".
2. CONCRETE SHALL BE 3000 PSI MAXIMUM.
3. MOWSTRIPS SHALL HAVE EXPANSION JOINTS EVERY 20 LINEAR FEET AND SCORE JOINTS EVERY 5' WITH SMOOTH FINISH.

FENCE / MOWING STRIP

NTS

2271



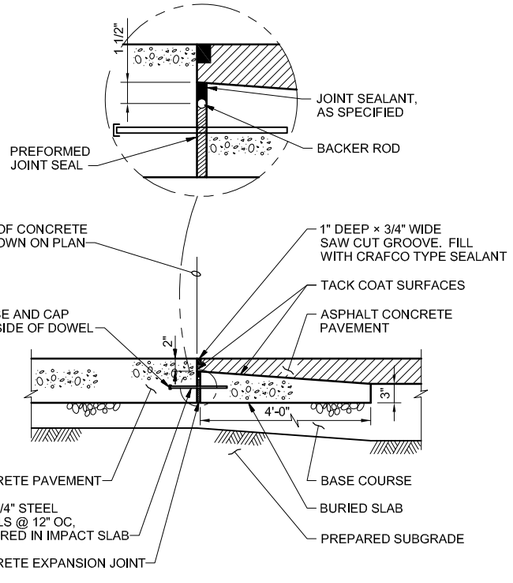
NOTES:

1. IF LOCATION OF TRENCH SAW CUT IS WITHIN 2 FEET OF AN EXISTING JOINT OR EDGE OF CONCRETE, REPLACE ENTIRE CONCRETE TO THE JOINT OR EDGE.

SURFACE RESTORATION

NTS

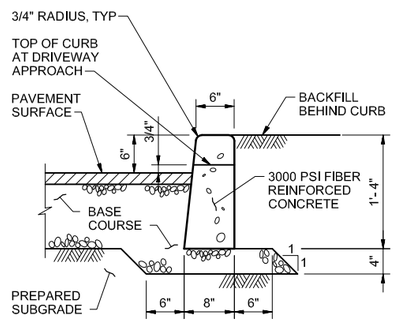
2320



CONCRETE TO ASPHALT TRANSITION

NTS

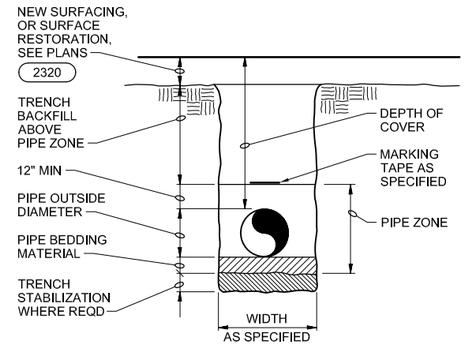
2234



CONCRETE CURB

NTS

2251



RECORD DRAWINGS

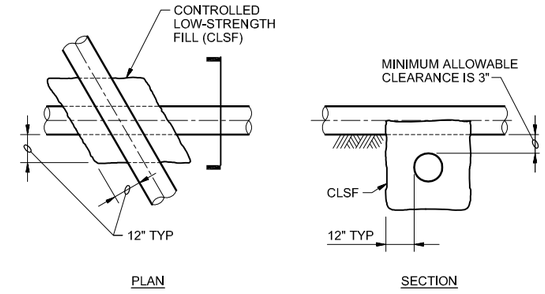
Revisions Drawn By E.R. BROWN Date APR 2012

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TYPICAL TRENCH

NTS

2310



NOTES:

CLSF SUPPORT IS REQUIRED:

1. WHEN BOTH PIPELINES ARE NEW AND CLEARANCE BETWEEN THEM IS LESS THAN 12".
2. WHEN A NEW PIPELINE IS CROSSING OVER AN EXISTING PIPELINE AND THE CLEARANCE BETWEEN THEM IS LESS THAN 12".
3. AT ALL PIPE CROSSINGS WHERE A NEW PIPELINE IS CROSSING UNDER AN EXISTING PIPELINE.
4. REFER TO SPECIFICATION SECTION 02320 FOR CLSF REQUIREMENTS.

TRENCH PIPE CROSSING

NTS

2335

PLOT TIME: 1:35:27 PM
PLOT DATE: 05-26-2012
FILENAME: DD-002_391538.DWG

DRN: ERB	ORIG DATE: JUNE 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: GVT	DWG #: DD-002		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

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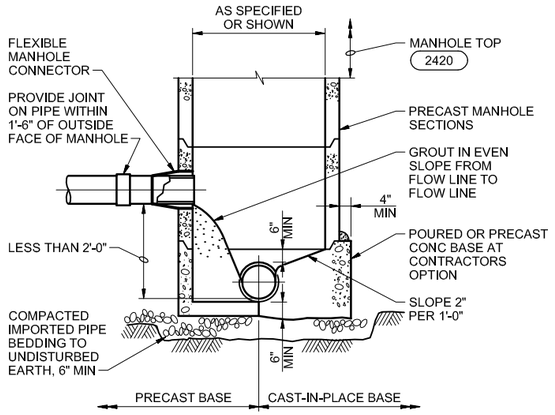
PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: DETAILS — DESIGN DETAILS

SHEET: D2 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #: DD-002

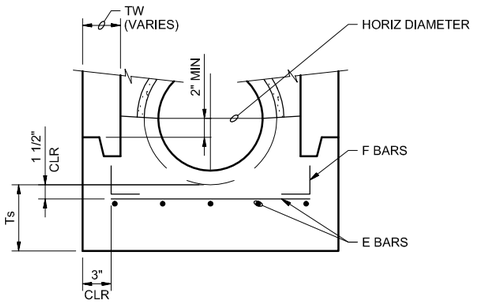
ENGR STAMP:



MANHOLE BASE SECTION - 6" TO 24" PIPE

NTS

2400



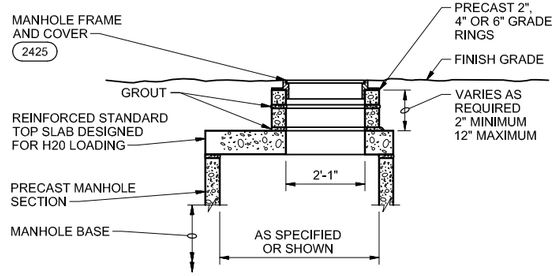
BASE I.D.		60"		72"		84"		96"	
TYPE	DEPTH*	0' - 15'	15' - 30'	0' - 15'	15' - 30'	0' - 15'	15' - 30'	0' - 15'	15' - 30'
CAST IN PLACE	Ts	7.0"	9.0"	7.0"	9.0"	8.0"	10.0"	9.0"	11.0"
	E BARS	#4@12"	#4@9"	#4@9"	#4@6"	#4@8"	#4@9"	#4@7"	#5@8"
	F BARS	#4@12"	#4@9"	#4@9"	#4@6"	#4@8"	#4@9"	#4@7"	#5@8"

* DEPTH FROM LOWEST INVERT TO FINISH GRADE

CAST-IN-PLACE MANHOLE BASE

NTS

2402



RECORD DRAWINGS

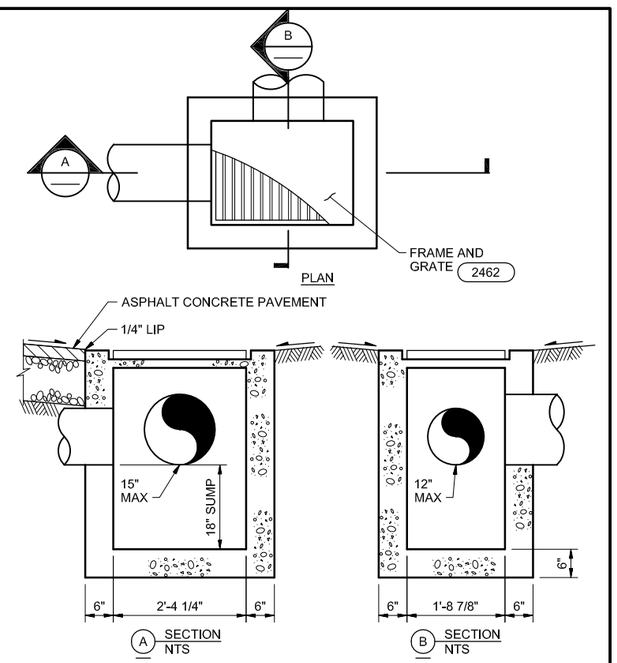
Revisions Drawn By E.R. BROWN Date APR 2012

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FLAT TOP MANHOLE

NTS

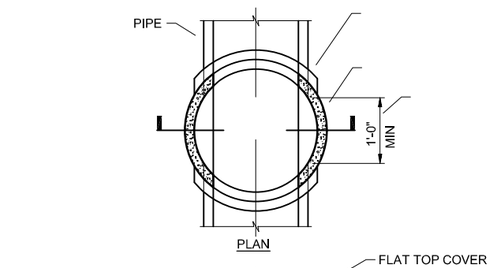
2422



CATCH BASIN

NTS

2460



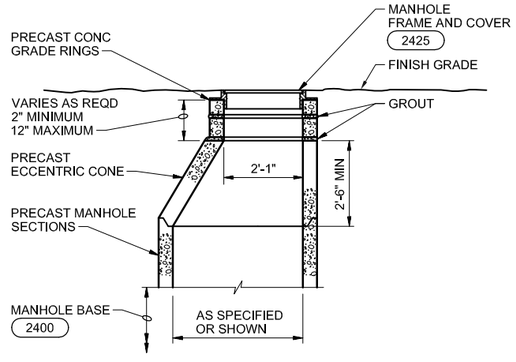
NOTES:

1. MANHOLES MAY HAVE EITHER PRECAST OR CAST-IN-PLACE BASES.
2. MANHOLE AND BASE SHALL BE MANUFACTURED IN ACCORDANCE WITH C478.

MANHOLE BASE SECTION - 27" TO 72" PIPE

NTS

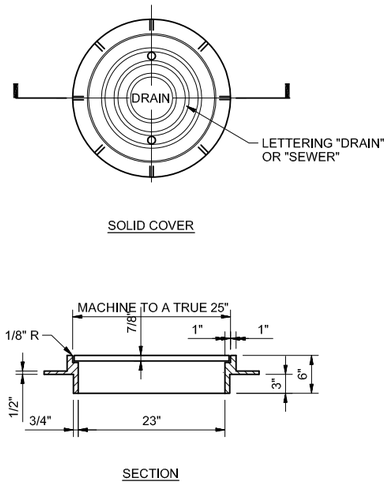
2401



ECCENTRIC MANHOLE TOP SECTION

NTS

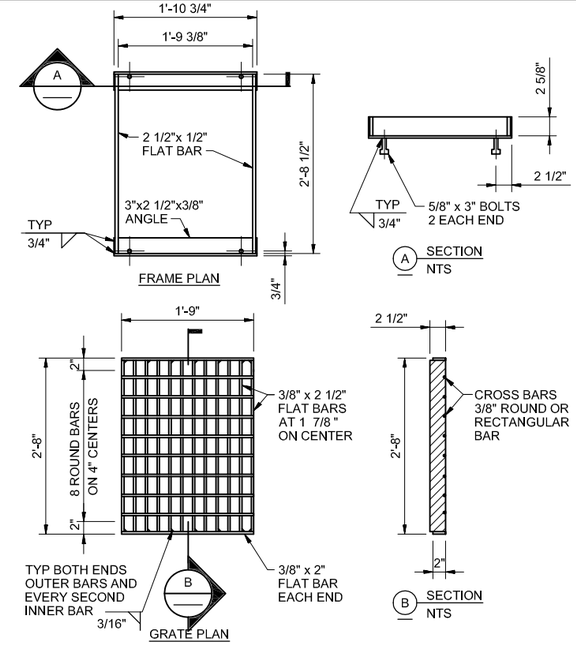
2420



MANHOLE FRAME AND COVER

NTS

2425



CATCH BASIN FRAME AND GRATE

NTS

2462

PLOT TIME: 1:35:37 PM
PLOT DATE: 05-26-2012
FILENAME: DD-003_391538.DWG

DRN: ERB	ORIG DATE: JUNE 2010	PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS	SHEET TITLE: DETAILS / DESIGN DETAILS
DSN: GVT	DWG #: DD-003		SHEET: D3 OF: D24
CHK: SBR	CAD FILE #:		PLOT DATE: APRIL 2012
APPD: LEC	SCALE: NONE		PLC #:
			CWS PROJ #: 6410
			DWG #: DD-003

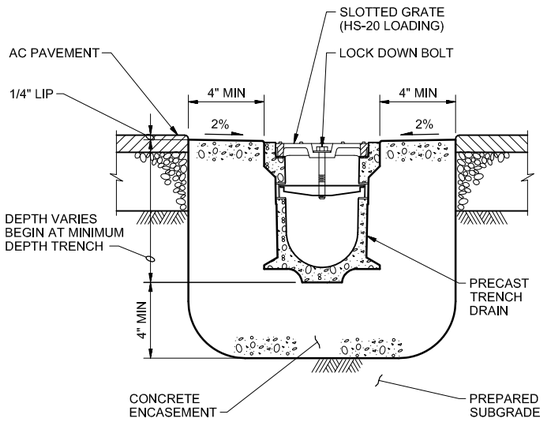
THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

ENGR STAMP:



NOTES: 1

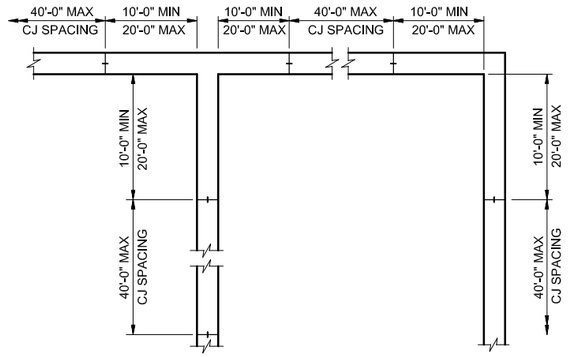
1. PRECAST TRENCH DRAIN SHALL BE ABT, INC. POLYDRAIN PDX TRENCH FORMING SYSTEM OR EQUAL, SIZE AS SHOWN ON DRAWINGS.

PRECAST TRENCH DRAIN - CONFORMED

NTS

2480

REVISION 1 06/10 JAB LEC ADDENDUM NO. 2



PLAN

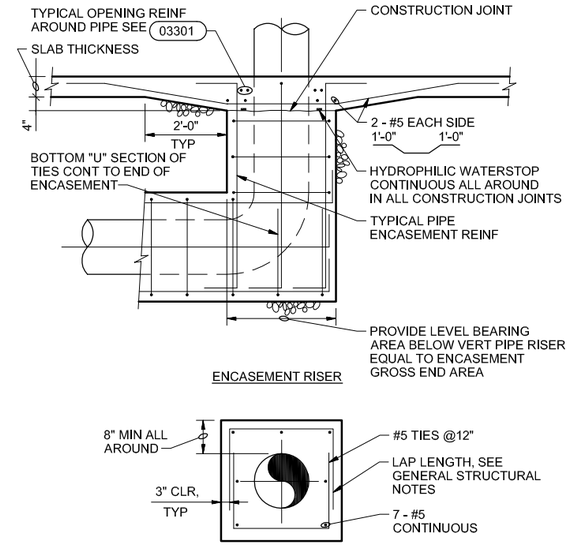
NOTES:

1. COORDINATE CONSTRUCTION JOINT LOCATIONS AND TIME BETWEEN CONCRETE POURS WITH SPECIFICATION 033000.
2. LOCATE WALL CONSTRUCTION JOINTS AS SHOWN, UNLESS INDICATED OTHERWISE.

WALL CONSTRUCTION JOINT SPACING

NTS

3131



NOTES:

1. SECTION APPLIES TO PIPES W/ DIAMETERS 18" AND SMALLER. FOR 20" DIAMETER PIPES AND LARGER, SEE 03317

PIPE ENCASEMENT

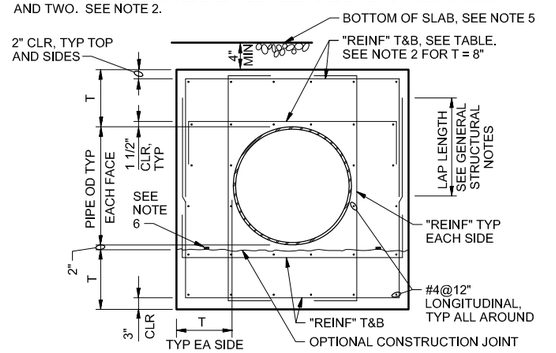
NTS

3316

PIPE DIA (IN.)	H=10 FEET		H=20 FEET		H=30 FEET		H=40 FEET	
	T (in)	REINF	T (in)	REINF	T (in)	REINF	T (in)	REINF
20 THRU 30	8	#5@12"	10	#5@12"	10	#5@12"	10	#6@12"
36 THRU 42	10	#5@12"	10	#6@12"	10	#7@12"	10	#6@6"
48 THRU 54	10	#6@12"	10	#7@12"	10	#7@6"	12	#7@6"
UP TO 60	10	#6@12"	10	#6@6"	14	#7@6"	14	#7@6"

PIPE ENCASEMENT TABLE

HEAVY DARK LINE INDICATES BREAK BETWEEN ONE LAYER OF REINFORCING AND TWO. SEE NOTE 2.



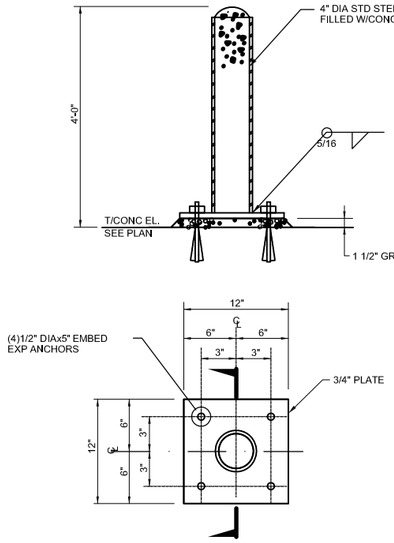
NOTES:

1. 03316
2. FOR T=8" REINFORCING SHALL BE ONE LAYER AND CENTERED IN SLABS OR WALLS. SIM 03316
3. FOR ENCASEMENT AT PIPE RISER, SEE 03316
4. "H" IS FILL HEIGHT OR WATER DEPTH OR COMBINATION ABOVE PIPE.
5. HYDROPHILIC WATERSTOP CONTINUOUS ALL AROUND IN ALL CONSTRUCTION JOINTS.

PIPE ENCASEMENT

NTS

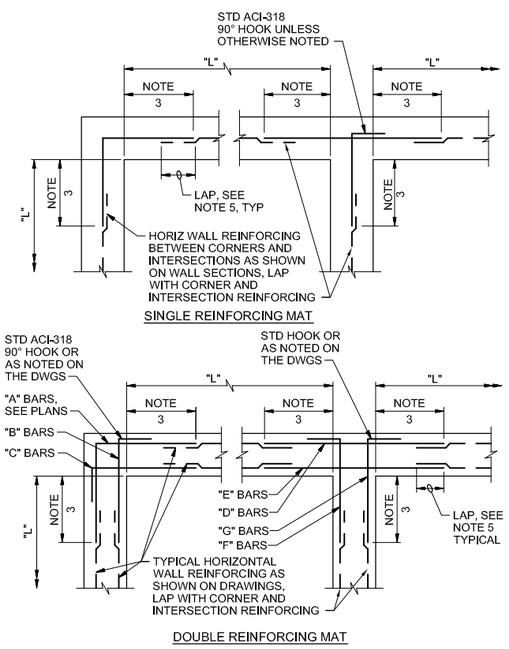
3317



SURFACE MOUNTED GUARD POST

NTS

2953



TYPICAL WALL, CORNER AND INTERSECTION REINFORCING

NTS

3303

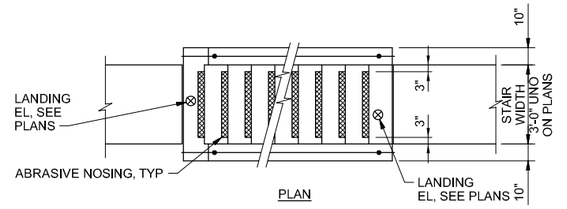
NOTES:

1. TYPICAL HORIZONTAL WALL CORNER AND INTERSECTION REINFORCING LAYOUT IS SHOWN TO AVOID CONGESTION AND PERMIT PROPER PLACEMENT, FOR SIZE AND SPACING SEE PLANS. ALL HORIZONTAL REINFORCING AT CORNERS AND INTERSECTIONS SHALL BE FABRICATED AND INSTALLED WITH SPLICES LOCATED WHERE SHOWN REGARDLESS OF BAR SIZE AND SPACING.
2. WHERE THE CORNER OR INTERSECTION REINFORCING SIZE AND SPACING IS NOT SHOWN, NOTED OR TABULATED ON THE PLANS, THE SIZE AND SPACING SHALL BE THE SAME AS THE WALL HORIZONTAL REINFORCING SHOWN ON THE WALL SECTIONS OR AS NOTED FOR THE REINFORCING BETWEEN THE CORNERS OR INTERSECTIONS.
3. EXCEPT WHERE OTHERWISE SHOWN ON THE DRAWINGS, THE LENGTH INDICATED AS "NOTE 3" SHALL BE THE LESSER OF L/4, 10 FEET, OR 1.0 TIMES THE HEIGHT OF THE WALL, EXCEPT THAT IN NO CASE SHALL IT BE LESS THAN 2 FEET.
4. L = LENGTH OF WALL PARALLEL TO THE BAR LENGTH IN QUESTION.
5. EXCEPT WHERE OTHERWISE SHOWN ON THE DRAWINGS, THE LENGTH INDICATED AS "NOTE 5" SHALL BE EQUAL TO ONE "LAP LENGTH" AS REQUIRED BY THE GENERAL STRUCTURAL NOTES. USE THE LAP LENGTH AS REQUIRED FOR THE SMALLER OF THE TWO REINFORCING BARS BEING SPLICED.
6. UNLESS OTHERWISE NOTED, "B" AND "C" BARS ARE THE SAME SIZE AND SPACING AND, "F" AND "G" BARS ARE THE SAME SIZE AND SPACING.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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CONCRETE STAIR - ON GRADE

NTS

3349

DRN: ERB	ORIG DATE: JUNE 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.			
DSN: GVT	DWG #: DD-004				
CHK: SBR	CAD FILE #:				
APPD: LEC	SCALE: NONE				
		REV #	DATE	DRN	APPD	DESCRIPTION
			03/12	ERB	LEC	RECORD DRAWING

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2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

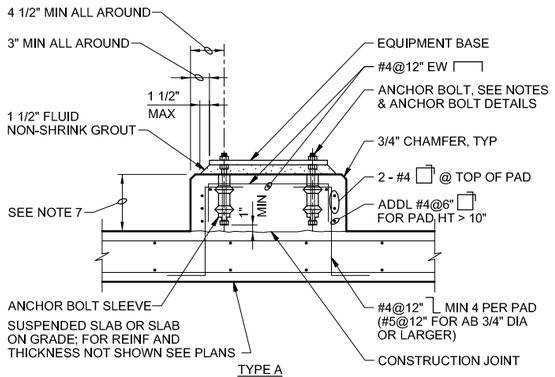
SHEET TITLE: DETAILS — DESIGN DETAILS

SHEET: D4 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

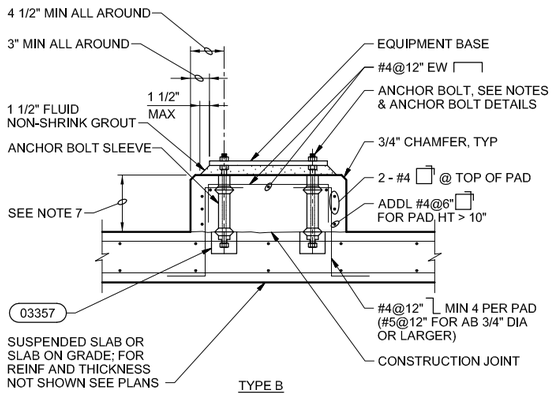
DWG #: DD-004

ENGR STAMP:

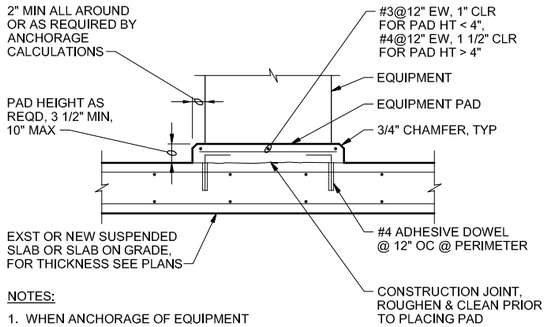
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TYPE A



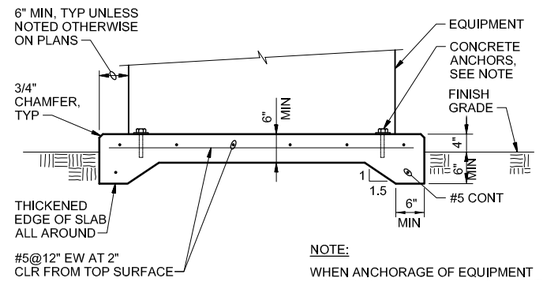
TYPE B



NOTES:

1. WHEN ANCHORAGE OF EQUIPMENT TO PAD IS REQUIRED, USE CONCRETE ANCHORS SPECIFIED.
2. CONCRETE PADS FOR ELECTRICAL EQUIPMENT SHALL BE 3 1/2" HIGH, UNLESS NOTED OTHERWISE.

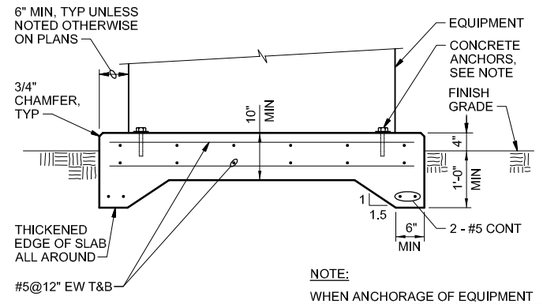
TYPE E



NOTE:

WHEN ANCHORAGE OF EQUIPMENT TO PAD IS REQUIRED, USE CONCRETE ANCHORS SPECIFIED.

TYPE G



NOTE:

WHEN ANCHORAGE OF EQUIPMENT TO PAD IS REQUIRED, USE CONCRETE ANCHORS SPECIFIED.

TYPE H

NOTES:

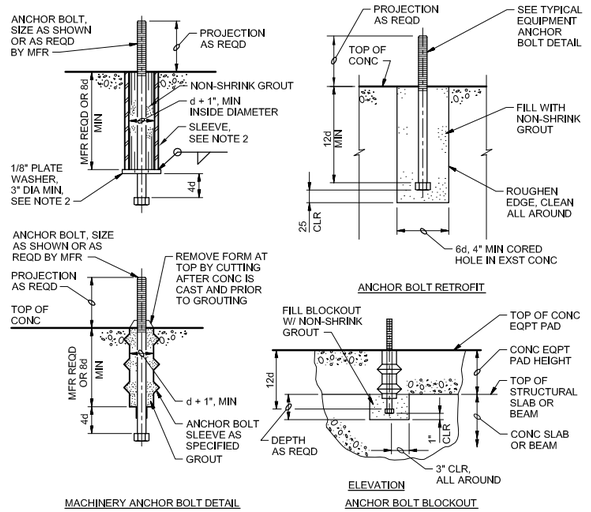
1. PAD SIZE SHALL BE MINIMUM INDICATED OR AS SHOWN ON THE PLANS OR AS INDICATED BY THE MANUFACTURER AND APPROVED BY THE ENGINEER.
2. THE SIZE, NUMBER, TYPE, LOCATION, AND THREAD PROJECTION OF THE ANCHOR BOLTS SHALL BE DETERMINED BY THE EQUIPMENT MANUFACTURER AND AS APPROVED BY THE ENGINEER. ANCHOR BOLTS SHALL BE HELD IN POSITION WITH A TEMPLATE OR OTHER ACCEPTABLE MEANS, MATCHING THE BASE PLATE, WHILE PAD IS BEING PLACED.
3. ANCHOR BOLT SLEEVES SHALL BE USED TO PROVIDE MINIMUM ANCHOR BOLT MOVEMENT OF 1/2" IN ALL HORIZONTAL DIRECTIONS. THE MINIMUM SLEEVE LENGTH SHALL BE 8 TIMES THE BOLT DIAMETER.
4. ANCHOR BOLT SLEEVES SHALL HAVE A MINIMUM INTERNAL DIAMETER 1" GREATER THAN BOLT DIAMETER AND A MAXIMUM INTERNAL DIAMETER 3" GREATER THAN ANCHOR BOLT DIAMETER. SLEEVES SHALL BE FILLED WITH NON-SHRINK GROUT AFTER BOLTS ARE ALIGNED. SEE (03357).
5. EQUIPMENT BASES SHALL BE INSTALLED LEVEL UNLESS INDICATED OTHERWISE.
6. WEDGES, SHIMS, OR LEVELING NUTS SHALL BE USED TO SUPPORT THE BASE WHILE THE NON-SHRINK GROUT IS PLACED. WEDGES OR SHIMS THAT ARE LEFT IN PLACE SHALL NOT BE EXPOSED TO VIEW.
7. HEIGHT OF PADS SHALL BE MINIMUM REQUIRED FOR ANCHOR BOLT CLEARANCE TO KEEP ANCHOR BOLT ABOVE SUPPORTING SLAB (SEE TABLE BELOW). WHERE EQUIPMENT OR PIPING ELEVATION REQUIRE A PAD HEIGHT LESS THAN THE MINIMUM SHOWN, USE TYPE "B" EQUIPMENT PAD WITH BLOCKOUT.
8. TYPE "D" PAD SHALL BE USED ONLY WHERE SPECIFICALLY INDICATED. PLACE THE SURROUNDING FLOOR SLAB AFTER THE EQUIPMENT PAD.
9. AT CONTRACTOR'S OPTION, CONCRETE ANCHORS MAY BE USED IN LIEU OF CAST-IN-PLACE ANCHOR BOLTS FOR EQUIPMENT ANCHOR BOLTS LESS THAN 3/4" DIAMETER WHEN APPROVED BY THE EQUIPMENT MANUFACTURER AND APPROVED BY THE ENGINEER. ANCHORS SHALL BE INSTALLED WITH 4" MINIMUM EDGE DISTANCE IN EACH DIRECTION.

AB DIA (IN.)	1/2	5/8	3/4	7/8	1	1 1/4	1 3/8	1 1/2	1 3/4	2
MIN PAD HT (IN.)	7	8 1/2	10	11	12 1/2	15	16 1/2	18	21	24

CONCRETE EQUIPMENT PADS

NTS

3356



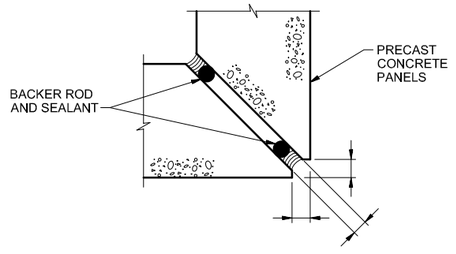
NOTES:

1. FOR CONCRETE EQUIPMENT PAD DETAILS AND NOTES NOT SHOWN SEE (3356).
2. MATERIAL TO MATCH BOLT.

ANCHOR BOLT DETAILS

NTS

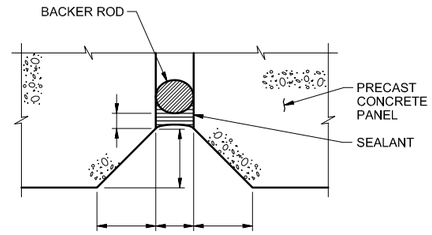
3357



TYPICAL CORNER DETAIL

NTS

3490



TYPICAL JOINT DETAIL

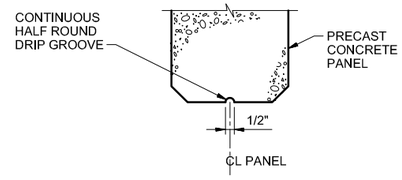
NTS

3491

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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DRIP DETAIL

NTS

3492

PLOT TIME: 1:35:57 PM
PLOT DATE: 05-26-2012
FILENAME: DD-005_391538.DWG

DRN: ERB	ORIG DATE: JUNE 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: GVT	DWG #: DD-005		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

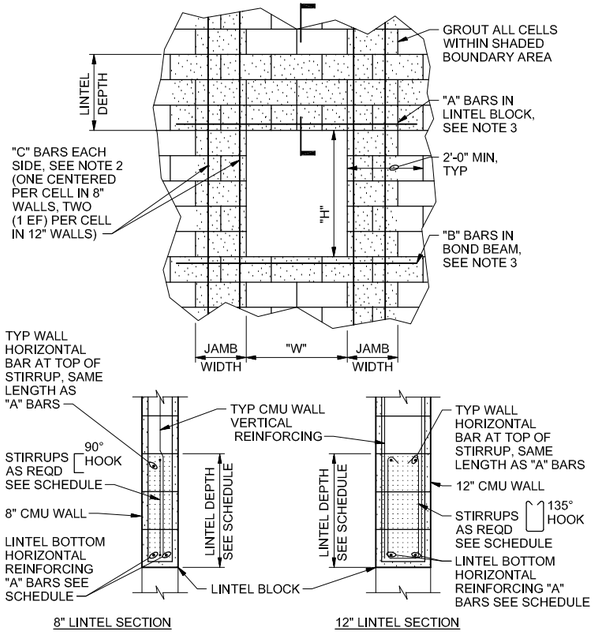
SHEET TITLE: DETAILS — DESIGN DETAILS

SHEET: D5 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #: DD-005

ENGR STAMP:

CMU OPENING REINF SCHEDULE						
8" WALLS						
W	LINTEL DEPTH	STIRRUP SIZE, SPG	"A" BARS	"B" BARS	"C" BARS	JAMB WIDTH
≤2'-8"	8"	-	1	1	1	8"
>2'-8"≤4'-0"	16"	-	2	1	1	8"
>4'-0"≤6'-0"	24"	#3@8"	2	1	2	16"
>6'-0"≤8'-0"	32"	#3@16"	2	2	3	24"
>8'-0"≤10'-0"	48"	#3@24"	2	2	3	24"
12" WALLS						
W	LINTEL DEPTH	STIRRUP SIZE, SPG	"A" BARS	"B" BARS	"C" BARS	JAMB WIDTH
≤2'-8"	8"	-	2	2	2	8"
>2'-8"≤4'-0"	16"	-	2	2	2	8"
>4'-0"≤6'-0"	24"	#3@8"	2	2	4	16"
>6'-0"≤8'-0"	32"	#3@16"	2	2	6	24"
>8'-0"≤10'-0"	48"	#3@24"	2	2	6	24"



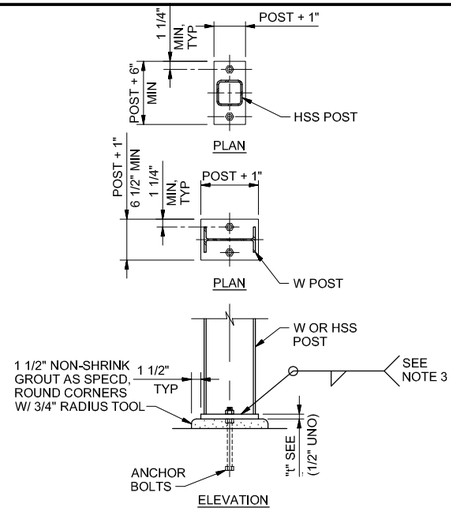
NOTES:

1. USE BAR QUANTITIES AND SIZES GIVEN IN LINTEL SCHEDULE UNLESS OTHERWISE NOTED ON THE DRAWINGS.
2. EXTEND "C" BARS 48 BAR DIAMETERS OR 2'-0" MINIMUM BEYOND TOP AND BOTTOM OF OPENING EXCEPT THAT WHEN "H" OR "W" EXCEEDS 2'-0", "C" BARS SHALL EXTEND FULL HEIGHT. WHERE THERE IS LESS THAN 8'-0" BETWEEN ADJACENT OPENINGS, EXTEND REINFORCING CONTINUOUS TO 2'-8" BEYOND FURTHEST OPENING.
3. "A" AND "B" BARS SHALL EXTEND 48 BAR DIAMETERS OR 2'-0" MINIMUM EACH SIDE OF THE OPENINGS.
4. FOR BAR SIZES, MATCH TYPICAL WALL REINFORCING AS SHOWN ON THE BUILDING WALL SECTIONS.

CMU OPENING REINFORCING

NTS

4002



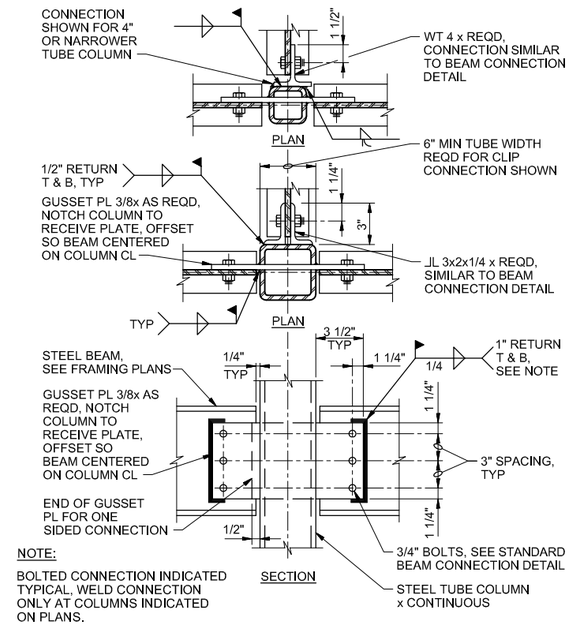
NOTES:

1. UNLESS OTHERWISE NOTED, ANCHOR BOLTS SHALL BE 3/4" DIA x REQUIRED WITH LEVELING NUTS AND 1'-0" MINIMUM EMBED AND BASEPLATES SHALL BE CENETERED ON POSTS.
2. USE OF 2 - BOLT STEEL POST BASEPLATE ANCHORAGE DETAIL SHOWN SHALL BE LIMITED TO STEEL SUPPORT MEMBERS WEIGHING LESS THAN 300 LBS IN ACCORDANCE WITH OSHA STANDARDS.
3. WELD SIZE SHALL BE DETERMINED BY THE THICKEST MEMBER JOINED; MINIMUM WELD SIZE SHALL BE 3/16" FILLET FOR MATERIAL THICKNESSES UP TO AND INCLUDING 1/2", 1/4" FILLET FOR THICKNESSES OVER 1/2" TO 3/4", AND 5/16" FILLET FOR MATERIAL THICKNESSES OVER 3/4". ALL WELDS SHALL BE SINGLE-PASS WELDS.

POST BASE - STEEL

NTS

5002



NOTE:

BOLTED CONNECTION INDICATED TYPICAL, WELD CONNECTION ONLY AT COLUMNS INDICATED ON PLANS.

CONTINUOUS TUBE COLUMN BEAM CONNECTION - STEEL

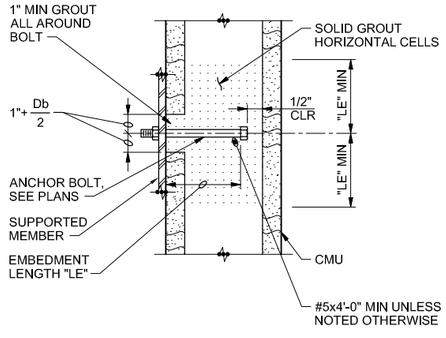
NTS

5041

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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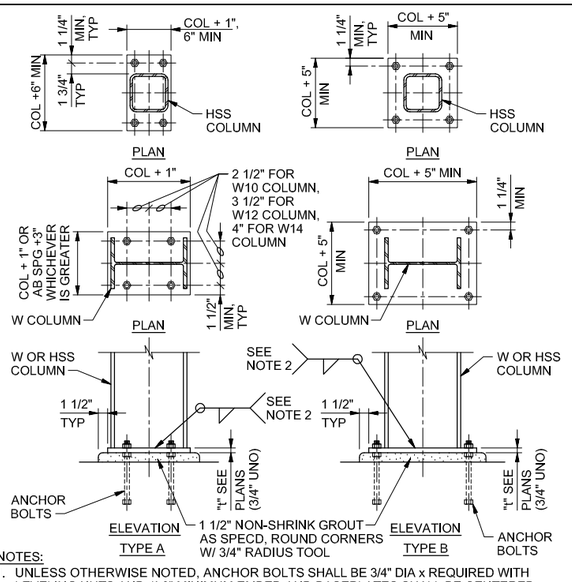
NOTE:

Db = DIAMETER OF BOLT

MASONRY ANCHOR BOLT

NTS

4046



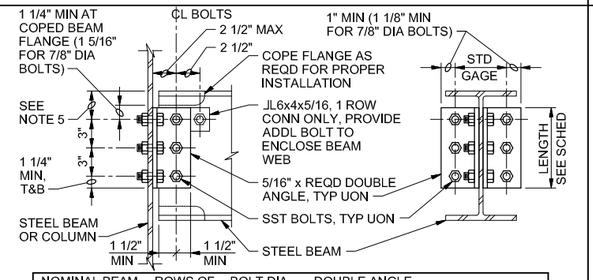
NOTES:

1. UNLESS OTHERWISE NOTED, ANCHOR BOLTS SHALL BE 3/4" DIA x REQUIRED WITH LEVELING NUTS AND 1'-0" MINIMUM EMBED AND BASEPLATES SHALL BE CENTERED ON COLUMN.
2. WELD SIZE SHALL BE DETERMINED BY THE THICKEST MEMBER JOINED; MINIMUM WELD SIZE SHALL BE 3/16" FILLET FOR MATERIAL THICKNESSES UP TO AND INCLUDING 1/2", 1/4" FILLET FOR THICKNESSES OVER 1/2" TO 3/4", AND 5/16" FILLET FOR MATERIAL THICKNESSES OVER 3/4". ALL WELDS SHALL BE SINGLE-PASS WELDS.

COLUMN BASE - STAINLESS STEEL

NTS

5001



NOMINAL BEAM DEPTH, INCHES	ROWS OF BOLTS	BOLT DIA, INCHES	DOUBLE ANGLE, LENGTH, INCHES	COMMENTS
36	10	7/8"	2'-6"	ANGLE THK = 3/8"
33	9	7/8"	2'-3"	ANGLE THK = 3/8"
30	8	7/8"	2'-0"	ANGLE THK = 3/8"
27	7	3/4"	1'-8 1/2"	-
24	6	3/4"	1'-5 1/2"	-
21	5	3/4"	1'-2 1/2"	-
16-18	4	3/4"	0'-11 1/2"	-
12-15	3	3/4"	0'-8 1/2"	-
8-10	2	3/4"	0'-5 1/2"	-
6	1	3/4"	0'-3"	SEE NOTE 3
4	1	3/4"	0'-2 1/2"	SEE NOTE 3

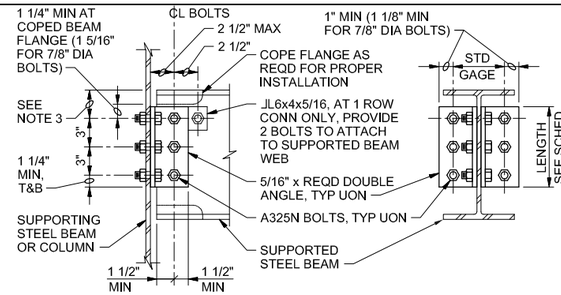
NOTES:

1. UNLESS OTHERWISE NOTED, NUMBER OF ROWS IS EQUAL TO NUMBER OF BOLTS TO ENCLOSE BEAM WEB.
2. ALL BEAM FRAMING CONNECTIONS SHALL CONFORM TO THIS DETAIL UNLESS SPECIFICALLY NOTED OTHERWISE OR APPROVED IN WRITING BY THE ENGINEER.
3. FOR NOMINAL BEAM DEPTHS LESS THAN 8", EXTEND LONG LEG OF DOUBLE ANGLE ALONG BEAM WEB AND PROVIDE ADDITIONAL BOLT TO ENCLOSE BEAM WEB AS SHOWN.
4. PROVIDE ADDITIONAL 1 1/2" LENGTH TO DOUBLE ANGLE FOR STAGGERED BOLT CONNECTIONS WHEN REQUIRED OR USED.
5. DIMENSION SHALL BE 3" UNLESS OTHERWISE REQUIRED FOR PROPER FABRICATION.

TYPICAL BEAM CONNECTION - STEEL

NTS

5020



NOMINAL BEAM DEPTH, INCHES	ROWS OF BOLTS	BOLT DIA, INCHES	DOUBLE ANGLE, LENGTH, INCHES	COMMENTS
36	10	7/8"	2'-6"	ANGLE THK = 3/8"
33	9	7/8"	2'-3"	ANGLE THK = 3/8"
30	8	7/8"	2'-0"	ANGLE THK = 3/8"
27	7	3/4"	1'-8 1/2"	-
24	6	3/4"	1'-5 1/2"	-
21	5	3/4"	1'-2 1/2"	-
16-18	4	3/4"	0'-11 1/2"	-
12-15	3	3/4"	0'-8 1/2"	-
8-10	2	3/4"	0'-5 1/2"	-
6	1	3/4"	0'-3"	JL6"x4"x5/16"
4	1	3/4"	0'-2 1/2"	JL6"x4"x5/16"

NOTES:

1. ALL BEAM FRAMING CONNECTIONS SHALL CONFORM TO THIS DETAIL UNLESS SPECIFICALLY NOTED OTHERWISE OR APPROVED IN WRITING BY THE ENGINEER.
2. PROVIDE ADDITIONAL 1 1/2" LENGTH TO DOUBLE ANGLE FOR STAGGERED BOLT CONNECTIONS WHEN REQUIRED OR USED.
3. DIMENSION SHALL BE 3" UNLESS OTHERWISE REQUIRED FOR PROPER FABRICATION.

TYPICAL BEAM CONNECTION - STEEL

NTS

5120

FILENAME: DD-006_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:36:08 PM

DRN: ERB	ORIG DATE: JUNE 2010		
DSN: GVT	DWG #: DD-006		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

Clean Water Services — Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

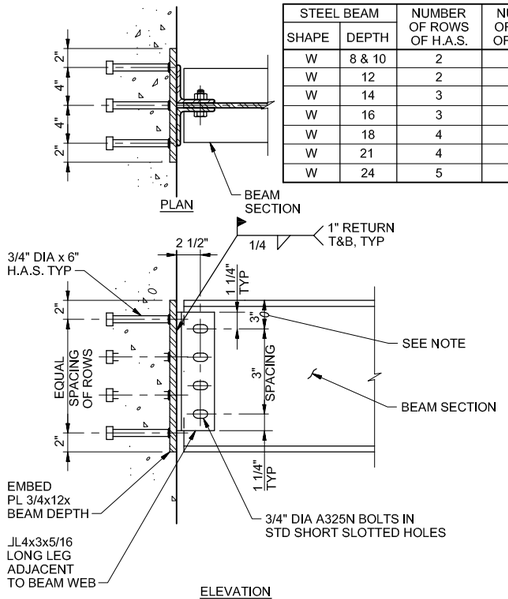
SHEET TITLE: DETAILS — DESIGN DETAILS

SHEET: D6 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #: DD-006

ENGR STAMP:

STEEL BEAM		NUMBER OF ROWS OF H.A.S.	NUMBER OF ROWS OF BOLTS
SHAPE	DEPTH		
W	8 & 10	2	2
W	12	2	3
W	14	3	3
W	16	3	4
W	18	4	5
W	21	4	5
W	24	5	6



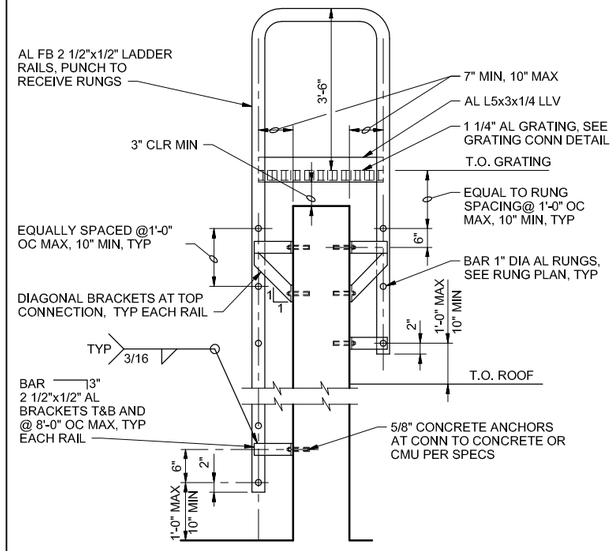
NOTE:

2 1/2" FOR 8" BEAM DEPTH.

EMBEDDED CONNECTION - STEEL

NTS

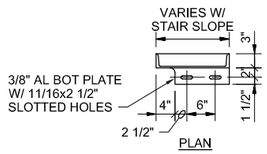
5155

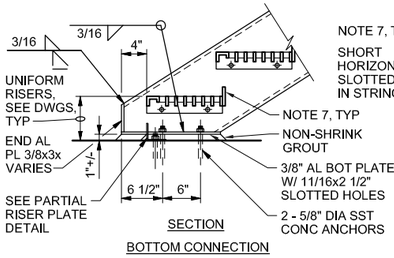


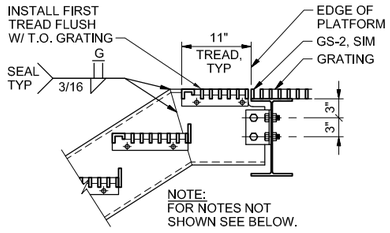
FLAT BAR LADDER UP AND OVER

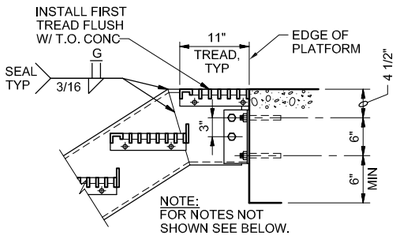
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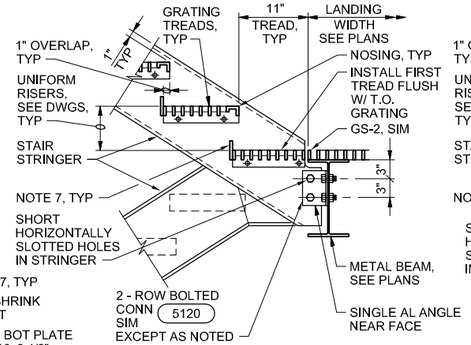
1. PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE AS SPECIFIED.
2. AMERICAN STANDARD C12x7.41 ALUMINUM STRINGERS TYPICAL EXCEPT WHERE OTHERWISE NOTED ON PLANS.
3. STAIR HANDRAIL NOT SHOWN.
4. STAIR MANUFACTURER TO COORDINATE BOLTED TREADS AND HANDRAIL CONNECTIONS.
5. ALL FASTENERS SHALL BE STAINLESS STEEL.
6. FIELD VERIFY DIMENSIONS AND ELEVATIONS PRIOR TO FABRICATION.
7. FOR RISER PLATE SEE PARTIAL RISER PLATE DETAIL UNLESS NOTED OTHERWISE. CLEARANCE BETWEEN TOP OF RISER PLATE AND BOTTOM OF TREAD TO BE 3 3/4" MAX. FOR STAIRS WITH PICKET HANDRAIL EXTEND RISER PLATE PER FULL RISER PLATE DETAIL.

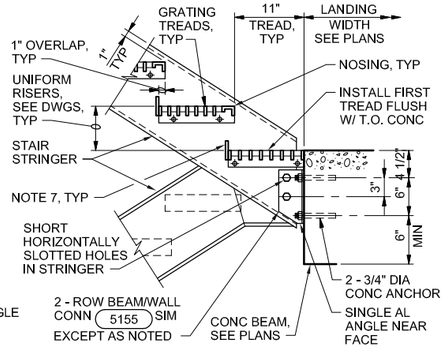




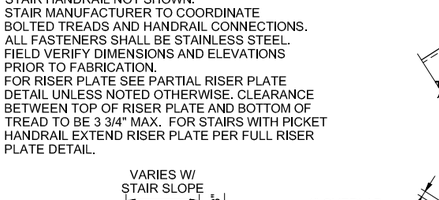


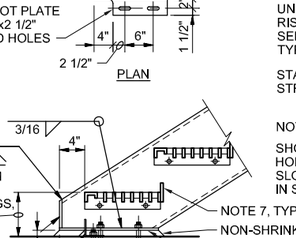


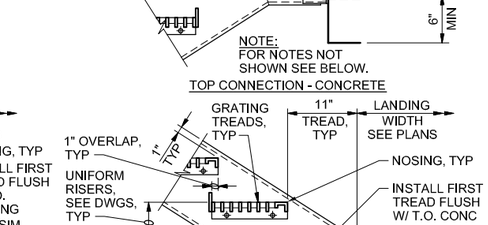




STAIRWAY WIDTH	TREAD BEARING BARS ALUMINUM TREAD
2'-3" OR LESS	1" x 3/16"
2'-9" OR LESS	1 1/4" x 3/16"
3'-3" OR LESS	1 1/2" x 3/16"
4'-7" OR LESS	1 3/4" x 3/16"



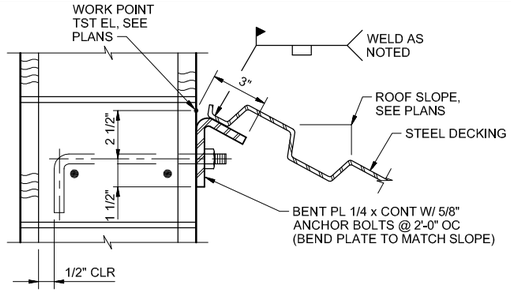


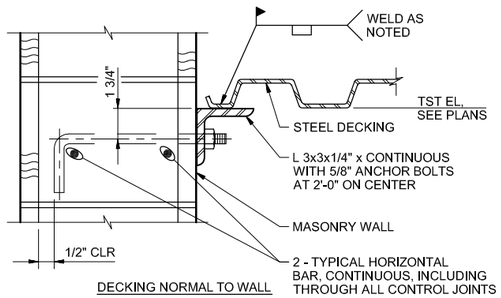


RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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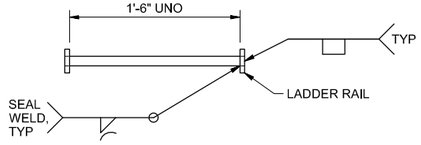


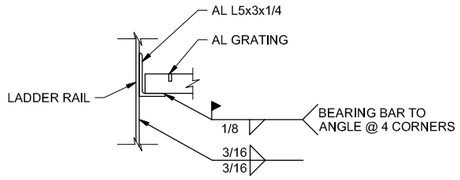


DECKING LEDGER SUPPORT ANGLE

NTS

5301





NOTE:

1. PROVIDE PROTECTION FOR ALUMINUM IN CONTACT WITH CONCRETE AS SPECIFIED.

FLAT BAR LADDER - ALUMINUM

NTS

5501

STAIR DETAILS - ALUMINUM

NTS

5506

PLOT DATE: 05-26-2012 PLOT TIME: 1:36:19 PM

FILENAME: DD-007_391538.DWG

DRN: ERB	ORIG DATE: JUNE 2010		
DSN: GVT	DWG #: DD-007		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

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2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

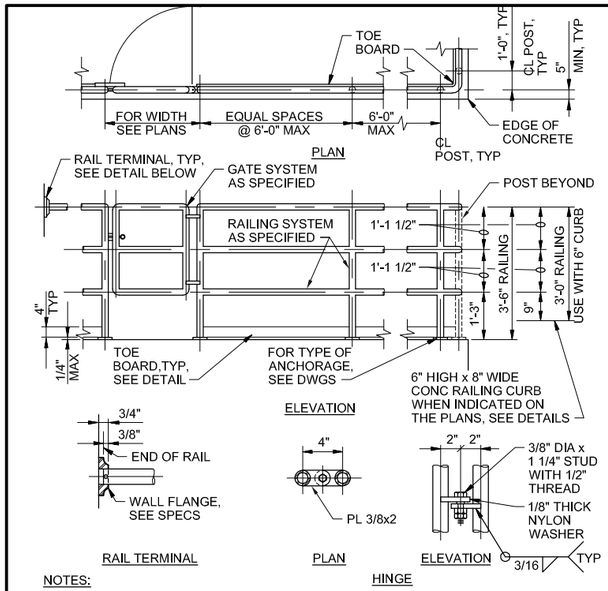
PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: DETAILS — DESIGN DETAILS

SHEET: D7 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #: DD-007

ENGR STAMP:



NOTES:

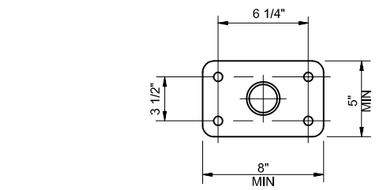
1. FASTEN RAIL TO WALL FLANGE PER MANUFACTURERS RECOMMENDATIONS.
2. WALL FLANGE TO BE MOUNTED TO WALL WITH (2) 3/8" DIA SST WEDGE ANCHORS.
3. AT CONTRACTOR'S OPTION FABRICATE HINGES OR PROVIDE OTHER HINGES AS SPECIFIED. ANODIZE FINISH AFTER ALL WELDING AS SPECIFIED.

RAILING - THREE RAIL - ALUMINUM

NTS

5521

DETAIL 1 OF 5



TYPE "A"

NOTE:

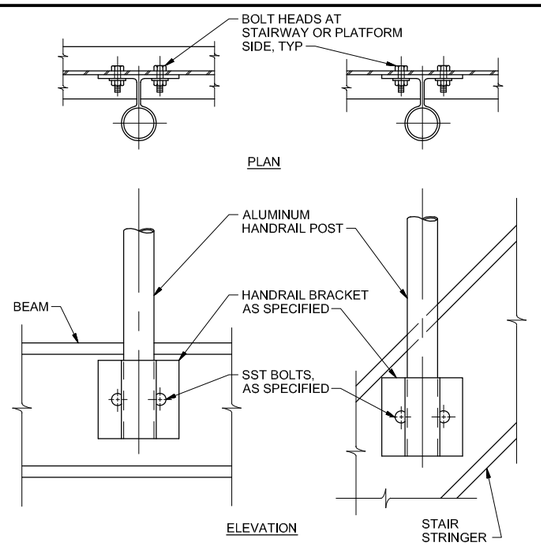
PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE PER SPECIFICATIONS.

RAILING POST ANCHORAGE
TYPE A - ALUMINUM

NTS

5521

DETAIL 3 OF 5



TYPE "H"

NOTE:

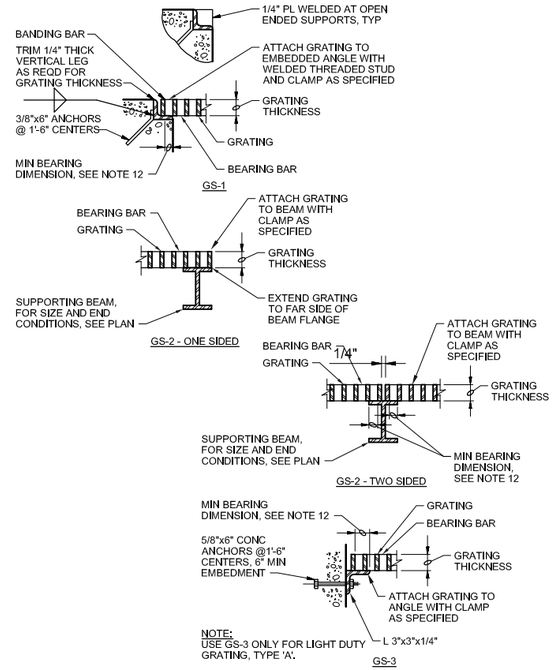
PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE PER SPECIFICATIONS.

RAILING POST ANCHORAGE
TYPE H - ALUMINUM

NTS

5521

DETAIL 5 OF 5



LIGHT DUTY GRATING TYPE 'A' (100 PSF)	
GRATING THICKNESS TABLE	
MAXIMUM SPAN	ALUMINUM
3'-6"	1 1/4"
4'-0"	1 1/2"
4'-6"	1 3/4"
5'-0"	1 3/4"
5'-6"	2"
6'-0"	2 1/4"
6'-6"	2 1/4"
7'-0"	2 1/2"

HEAVY DUTY GRATING TYPE 'C' (H 20 WHEEL LOAD)		
GRATING THICKNESS TABLE		
MAXIMUM SPAN	GALVANIZED STEEL	ALUMINUM
1'-0"	2"x3/16"	DO NOT USE ALUMINUM GRATING
1'-8"	2 1/2"x1/4"	
2'-0"	2 1/2"x3/8" OR 3"x1/4"	
2'-6"	3"x3/8" OR 4"x1/4"	
3'-3"	3 1/2"x3/8"	
4'-0"	4"x3/8"	
5'-0"	4 1/2"x3/8"	

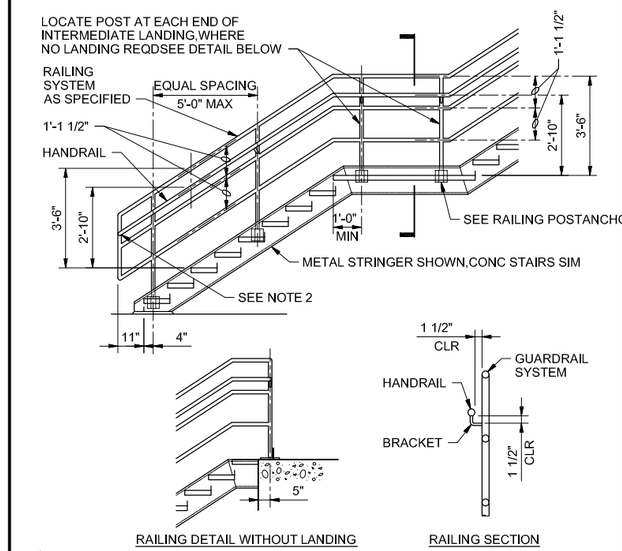
GENERAL NOTES:

1. GRATING SHALL BE LIGHT DUTY GRATING UNLESS OTHERWISE NOTED ON DRAWINGS.
2. GRATING SPAN SEE PLAN.
3. INDIVIDUAL GRATING SECTIONS SHALL NOT EXCEED 3'-0" IN WIDTH OR WEIGH MORE THAN 150 POUNDS, UNLESS INDICATED OTHERWISE. FOR TYPE 'A' GRATING. TYPE 'C' GRATING SHALL HAVE A MINIMUM WIDTH OF 2'-0" REGARDLESS OF WEIGHT.
4. SHOP DRAWINGS BASED ON FIELD DIMENSIONS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO FABRICATION.
5. MATERIAL FOR SUPPORTS OF GRATING SHALL BE TYPE 316 STAINLESS STEEL.
6. UNLESS NOTED OTHERWISE ON PLANS, GRATING THICKNESS SHALL BE AS TABULATED IN "GRATING THICKNESS TABLE" FOR APPLICABLE GRATING TYPE.
7. FOR SERRATED BEARING BARS, INCREASE GRATING THICKNESSES SHOWN IN TABLES BY 1/4".
8. BEARING BAR THICKNESS FOR GRATING TO BE 3/16" MINIMUM. SEE SPECIFICATIONS FOR SPACING OF BEARING AND CROSS BARS.
9. BAND ALL EDGES. MATCH DEPTH OF BEARING BAR.
10. TYPE OF MATERIAL USED SHALL BE AS SHOWN ON PLANS OR AS SPECIFIED. THIS STANDARD DETAIL INCLUDES 2 TYPES, ALTHOUGH BOTH MAY NOT BE INCLUDED IN PROJECT.
11. THE HORIZONTAL CLEARANCE BETWEEN THE GRATING AND GRATING SUPPORTS SHALL NOT BE LESS THAN 1/4" NOR GREATER THAN 1/2" AND AS SPECIFIED.
12. FOR TYPE 'A' MIN BEARING HORIZONTAL DIMENSION = 1" FOR GRATING DEPTH 2 1/4" OR LESS; MIN BEARING HORIZONTAL = 2" FOR GRATING DEPTH GREATER THAN 2 1/4"

STANDARD GRATING

NTS

5566



NOTES:

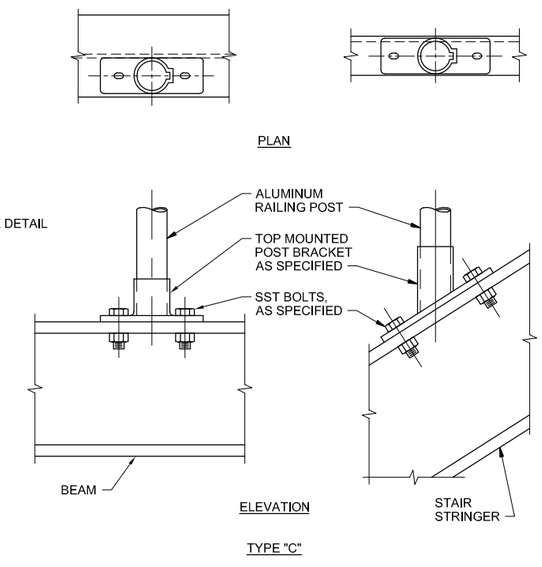
1. PROVIDE TOE BOARD AT LANDING WHERE REQUIRED.
2. RETURN END OF HANDRAIL TO GUARDRAIL AT BOTH ENDS.

RAILING
THREE RAIL STAIR - ALUMINUM (IBC)

NTS

5521

DETAIL 2 OF 5



TYPE "C"

NOTE:

PROVIDE PROTECTION FOR DISSIMILAR METALS AND CONCRETE PER SPECIFICATIONS.

RAILING POST ANCHORAGE
TYPE C - ALUMINUM

NTS

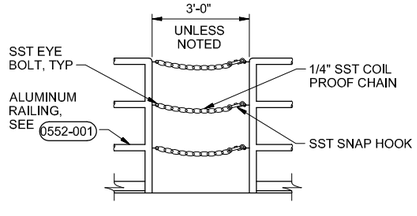
5521

DETAIL 4 OF 5

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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SAFETY CHAIN

NTS

5531

PLOT DATE: 05-26-2012 PLOT TIME: 1:36:29 PM

FILENAME: DD-008_391538.DWG

DRN: ERB	ORIG DATE: JUNE 2010		
DSN: GVT	DWG #: DD-008		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

CleanWater Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

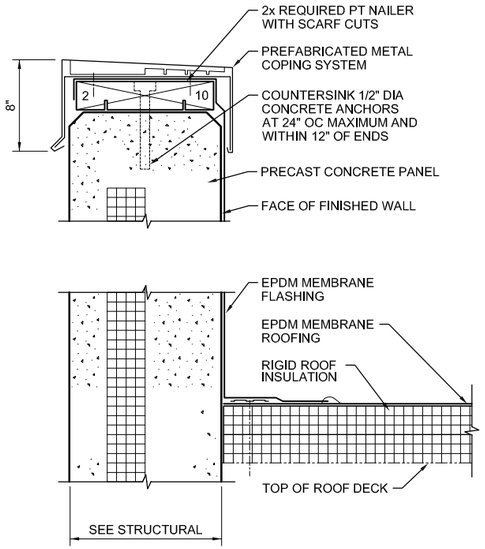
PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
DETAILS
DESIGN DETAILS

SHEET: D8 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

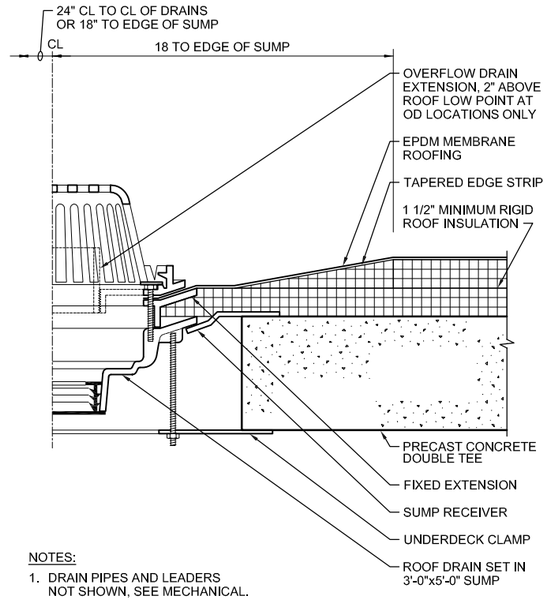
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DD-008

ENGR STAMP:



COPING
NTS

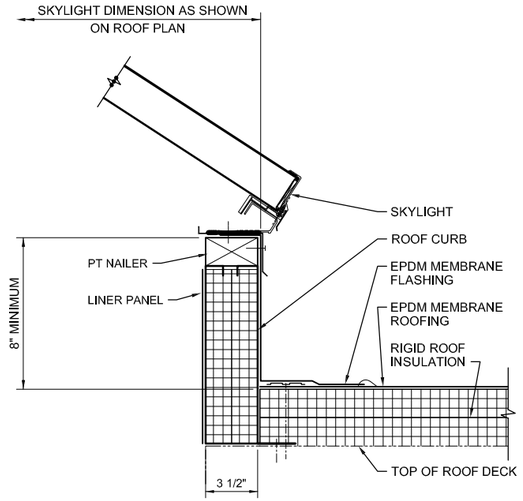
7531



NOTES:
1. DRAIN PIPES AND LEADERS NOT SHOWN, SEE MECHANICAL.

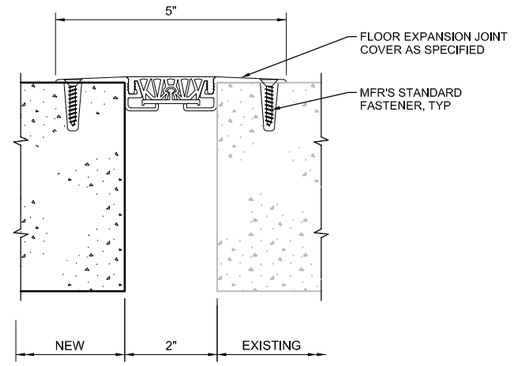
ROOF / OVERFLOW DRAIN (CONCRETE DECK)
NTS

7535



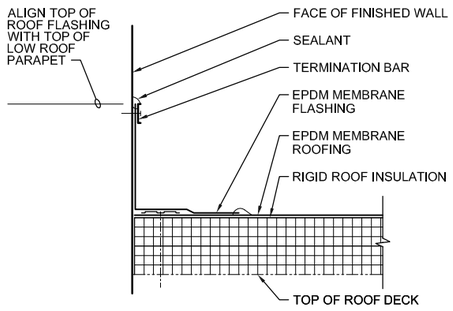
SKYLIGHT
NTS

7732



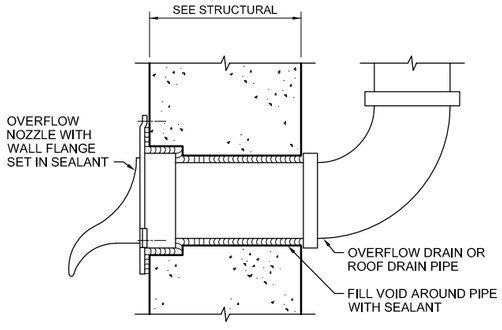
EXPANSION JOINT AT FLOOR
NTS

7739



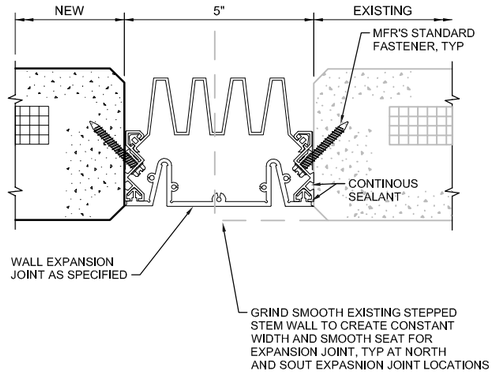
BASE FLASHING
NTS

7534



OVERFLOW / ROOF DRAIN NOZZLE
NTS

7623



EXPANSION JOINT AT WALL
NTS

7737

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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PLOT TIME: 1:36:40 PM
PLOT DATE: 05-26-2012
FILENAME: DD-009_391538.DWG

DRN: ERB	ORIG DATE: JUNE 2010		
DSN: GVT	DWG #: DD-009		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

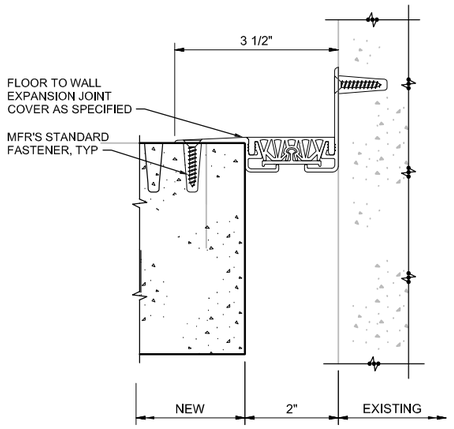
PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
DETAILS
DESIGN DETAILS

SHEET: D9 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #: DD-009

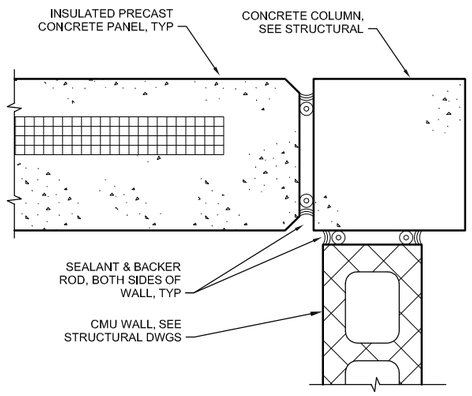
ENGR STAMP:



EXPANSION JOINT AT WALL

NTS

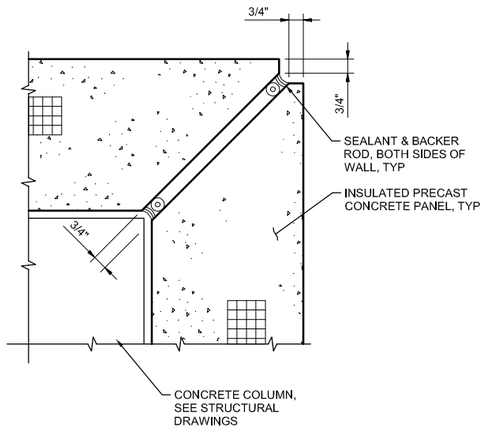
7740



INSIDE CORNER AT CMU WALL

NTS

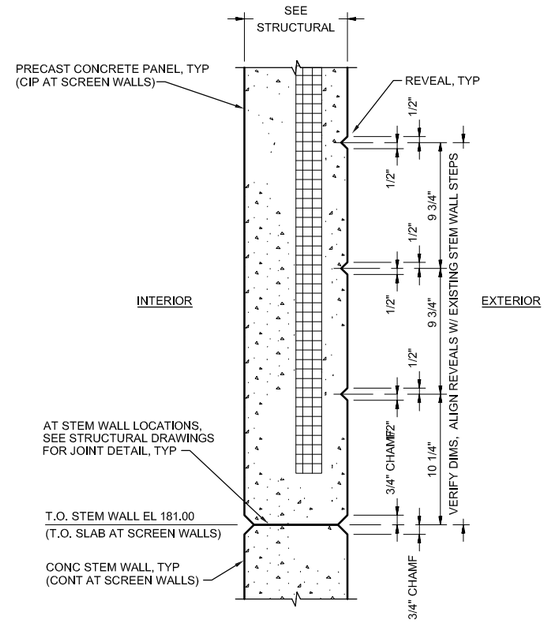
7743



OUTSIDE CORNER

NTS

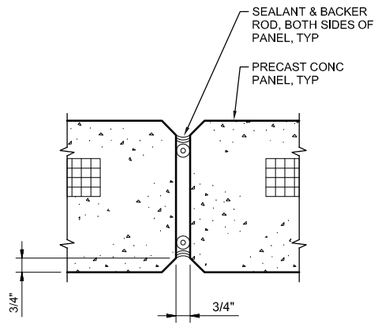
7745



REVEAL PATTERN

NTS

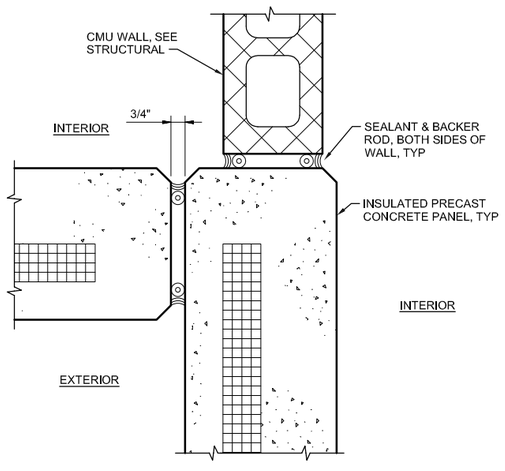
7447



PRECAST CONCRETE PANEL JOINT

NTS

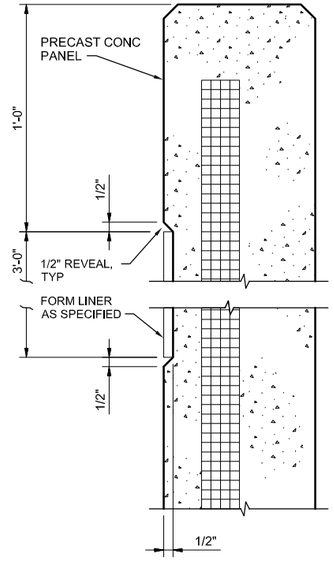
7741



INSIDE CORNER

NTS

7744



WALL PATTERN

NTS

7746

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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FILENAME: DD-010_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:36:48 PM

DRN: ERB	ORIG DATE: JUNE 2010		
DSN: GVT	DWG #: DD-010		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

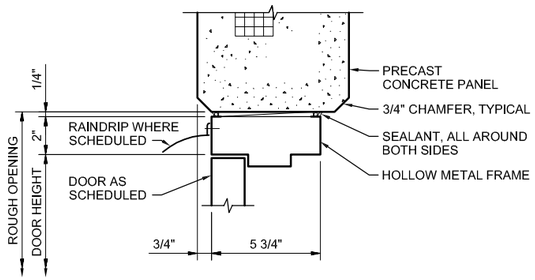
PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
DETAILS
DESIGN DETAILS

SHEET: D10 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

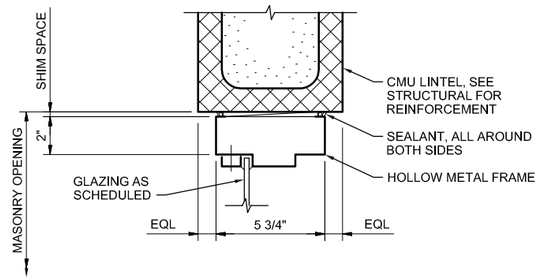
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ENGR STAMP:



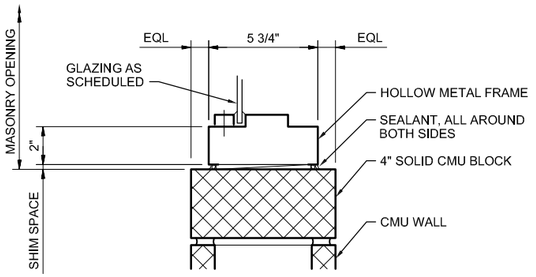
DOOR HEAD
NTS

8101



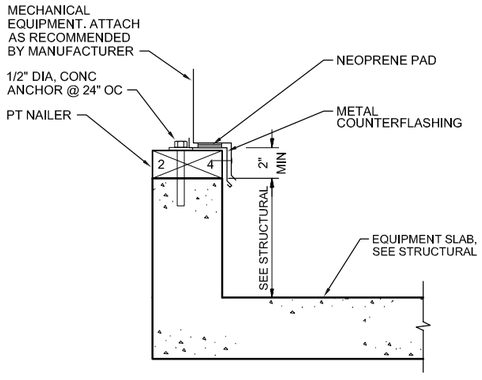
RELIGHT HEAD
NTS

8107



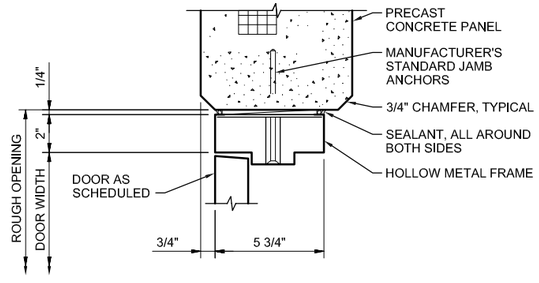
RELIGHT SILL
NTS

8112



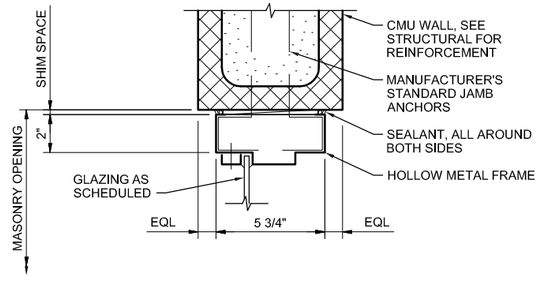
EQUIPMENT CURB
NTS

7752



DOOR JAMB
NTS

8102



RELIGHT JAMB
NTS

8111

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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PLOT TIME: 1:36:57 PM
PLOT DATE: 05-26-2012
FILENAME: DD-011_391538.DWG

DRN: ERB	ORIG DATE: JUNE 2010		
DSN: GVT	DWG #: DD-011		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

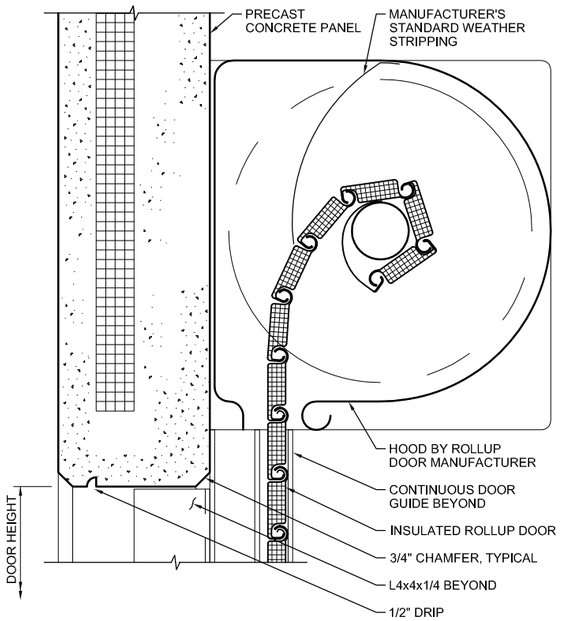
PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
DETAILS
DESIGN DETAILS

SHEET: D11 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

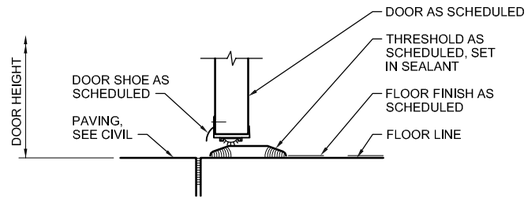
DWG #: DD-011

ENGR STAMP:



OVERHEAD
COILING DOOR HEAD (INSULATED)
NTS

8303



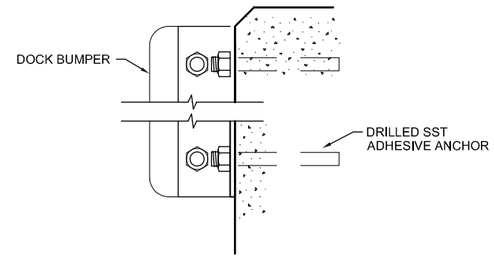
DOOR SILL
NTS

8701



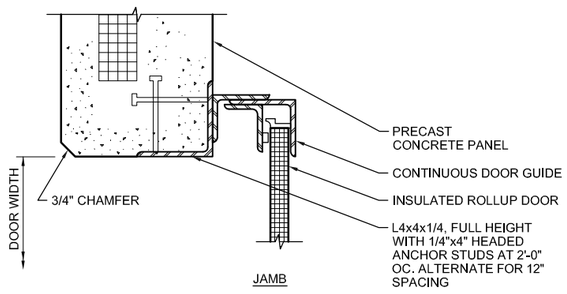
CAUTION SIGN
NTS

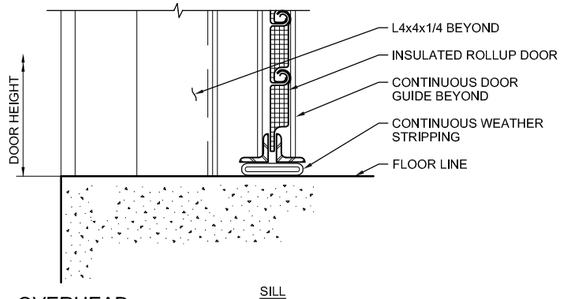
10402



DOCK BUMPER
NTS

10991





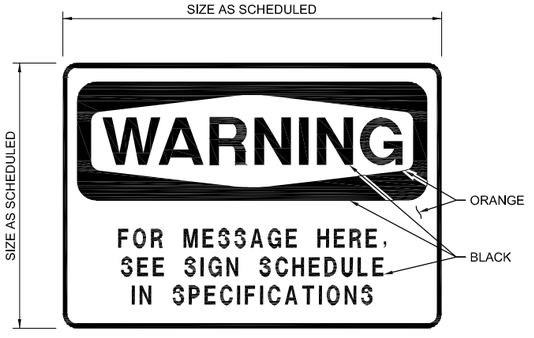
OVERHEAD
COILING DOOR JAMB AND SILL (INSULATED)
NTS

8304



DANGER SIGN
NTS

10401



WARNING SIGN
NTS

10403

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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PLOT DATE: 05-26-2012 PLOT TIME: 1:37:05 PM
FILENAME: DD-012_391538.DWG

DRN: ERB	ORIG DATE: JUNE 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: GVT	DWG #: DD-012		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

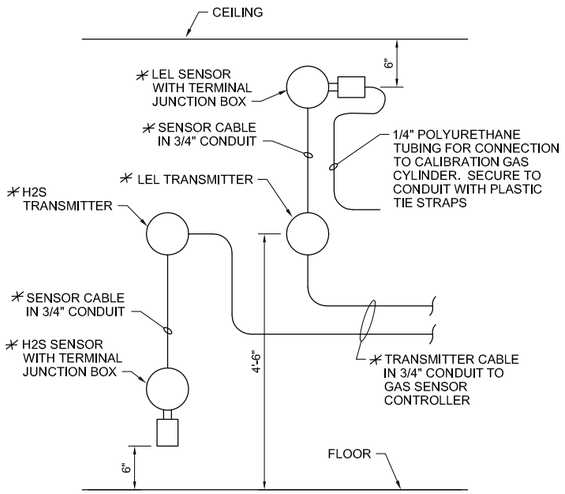
PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
DETAILS
DESIGN DETAILS

SHEET: D12 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #: DD-012

ENGR STAMP:

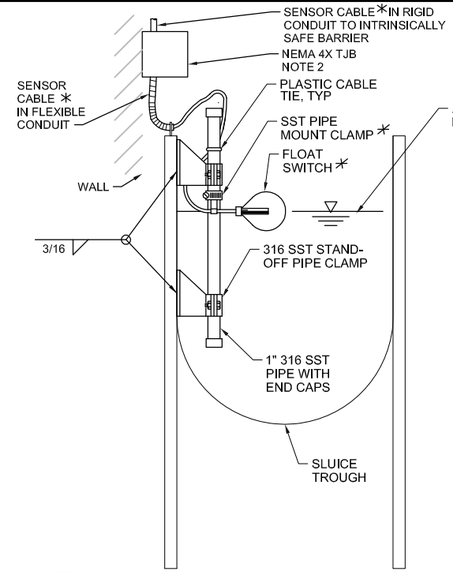


NOTES:
1. COMPONENTS DESIGNATED BY ✳ ARE SUPPLIED BY INSTRUMENT MANUFACTURER.

GAS SENSOR ELEMENT AND TRANSMITTER INSTALLATION

NTS

13150



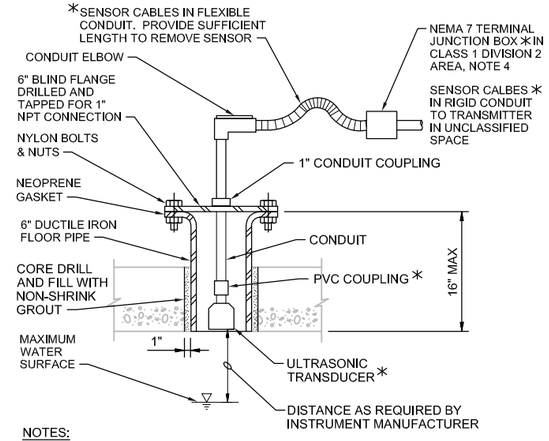
RECORD DRAWINGS Date APR 2012
Revisions Drawn By E.R. BROWN
THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION FURNISHED BY OTHERS. WE DO NOT INTERVENE TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

NOTES:
1. COMPONENTS DESIGNATED BY ✳ ARE SUPPLIED BY INSTRUMENT MANUFACTURER.
2. WALL MOUNTED 6" ABOVE FINISHED FLOOR (MINIMUM).

FLOAT TYPE LEVEL SWITCH INSTALLATION - SLUICE TROUGH

NTS

13249

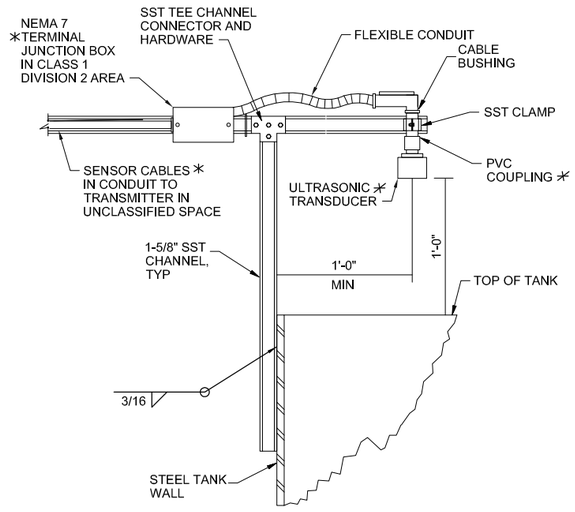


NOTES:
1. COMPONENTS DESIGNATED BY ✳ ARE SUPPLIED BY INSTRUMENT MANUFACTURER.
2. COAT FLOOR PIPE WITH SPECIFIED PAINT SYSTEM PRIOR TO GROUT FILL.
3. WHERE EXISTING CONCRETE STRUCTURE IS TO BE CORE DRILLED THE CONTRACTOR SHALL ULTRASONIC TEST OR X-RAY THE AREA FOR EMBEDDED ITEMS BEFORE CORE DRILLING CAN PROCEED. IF EMBEDDED ITEMS ARE FOUND, NOTIFY THE ENGINEER IMMEDIATELY.
4. WALL-MOUNTED 6" ABOVE FINISHED FLOOR (MINIMUM).

ULTRASONIC LEVEL ELEMENT INSTALLATION - CONCRETE SLAB

NTS

13253A

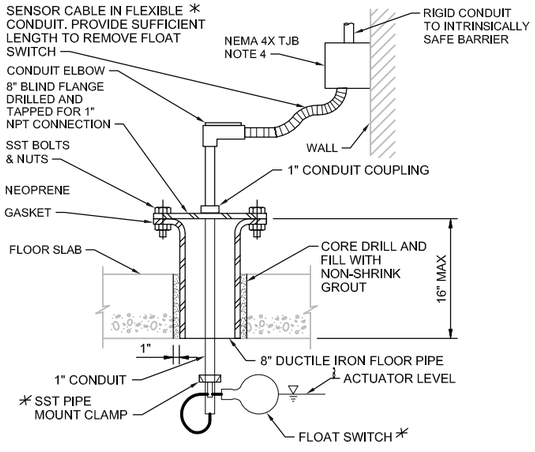


NOTES:
1. COMPONENTS DESIGNATED BY ✳ ARE SUPPLIED BY INSTRUMENT MANUFACTURER.

ULTRASONIC LEVEL ELEMENT INSTALLATION - STEEL TANK

NTS

13255

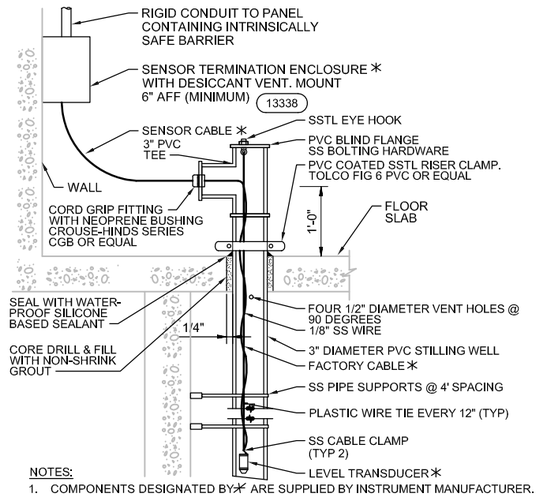


NOTES:
1. COMPONENTS DESIGNATED BY ✳ ARE SUPPLIED BY INSTRUMENT MANUFACTURER.
2. COAT FLOOR PIPE WITH SPECIFIED PAINT SYSTEM PRIOR TO GROUT FILL.
3. WHERE EXISTING CONCRETE STRUCTURE IS TO BE CORE DRILLED THE CONTRACTOR SHALL ULTRASONIC TEST OR X-RAY THE AREA FOR EMBEDDED ITEMS BEFORE CORE DRILLING CAN PROCEED. IF EMBEDDED ITEMS ARE FOUND, NOTIFY THE ENGINEER IMMEDIATELY.
4. WALL-MOUNT 6" ABOVE FINISHED FLOOR (MINIMUM).

FLOAT TYPE LEVEL SWITCH INSTALLATION - CONCRETE SLAB

NTS

13248

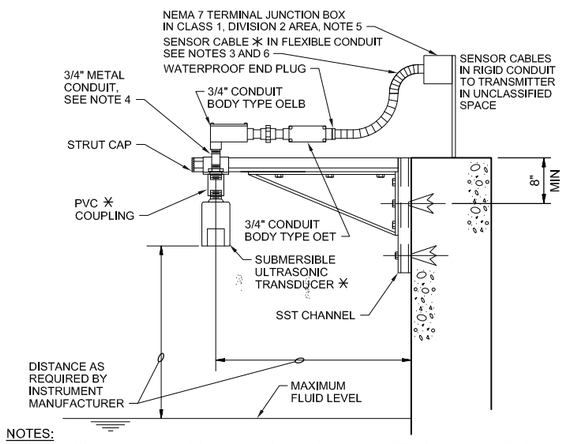


NOTES:
1. COMPONENTS DESIGNATED BY ✳ ARE SUPPLIED BY INSTRUMENT MANUFACTURER.
2. COAT FLOOR PIPE WITH SPECIFIED PAINT SYSTEM PRIOR TO GROUT FILL.
3. WHERE EXISTING CONCRETE STRUCTURE IS TO BE CORE DRILLED THE CONTRACTOR SHALL ULTRASONIC TEST OR X-RAY THE AREA FOR EMBEDDED ITEMS BEFORE CORE DRILLING CAN PROCEED. IF EMBEDDED ITEMS ARE FOUND, NOTIFY THE ENGINEER IMMEDIATELY.

SUBMERSIBLE LEVEL TRANSMITTER WITH STILLING WELL INSTALLATION - CONCRETE SLAB

NTS

13250A

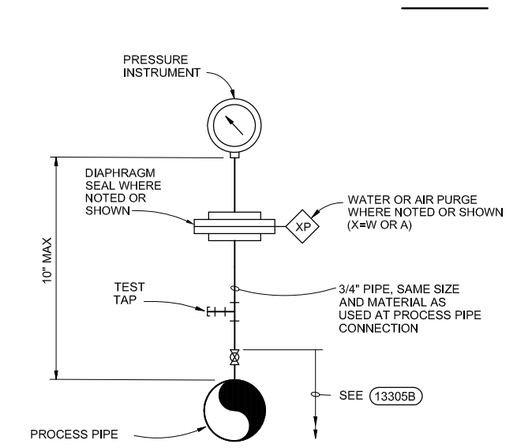


NOTES:
1. STRUT, SCREWS, WASHERS, NUTS AND ALL OTHER FITTINGS TO BE STAINLESS STEEL.
2. COMPONENTS DESIGNATED BY ✳ PROVIDED BY INSTRUMENT MANUFACTURER.
3. FLEXIBLE CONDUIT SHALL BE APPROVED FOR CLASS 1, DIVISION 1, GROUP D.
4. METAL CONDUIT LENGTH VARIES, DEPENDING ON DEPTH OF MEASUREMENT. LENGTH AS REQUIRED BY INSTRUMENT MANUFACTURER.
5. MOUNT ON ASSOCIATED SCREEN'S LOCAL CONTROL STATION STANCHION. AT LEAST 6" ABOVE FINISHED FLOOR.
6. PROVIDE SUFFICIENT LENGTH OF CABLE AND FLEXIBLE CONDUIT TO ACCOMMODATE SENSOR MAINTENANCE.

ULTRASONIC LEVEL ELEMENT INSTALLATION - OPEN CHANNEL

NTS

13254



DIRECT MOUNTING WITH DIAPHRAGM SEAL

NOTE:
MOUNT GAUGE FACE IN VERTICAL PLANE WITH TOP OF GAUGE FACE AT TOP (REGARDLESS OF PIPE ORIENTATION - HORIZONTAL OR VERTICAL).

PRESSURE INSTRUMENT INSTALLATION

NTS

13304A

PLOT TIME: 1:37:14 PM
PLOT DATE: 05-26-2012
FILENAME: DD-013_391538.DWG

DRN: ERB	ORIG DATE: JUNE 2010		
DSN: GVT	DWG #: DD-013		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

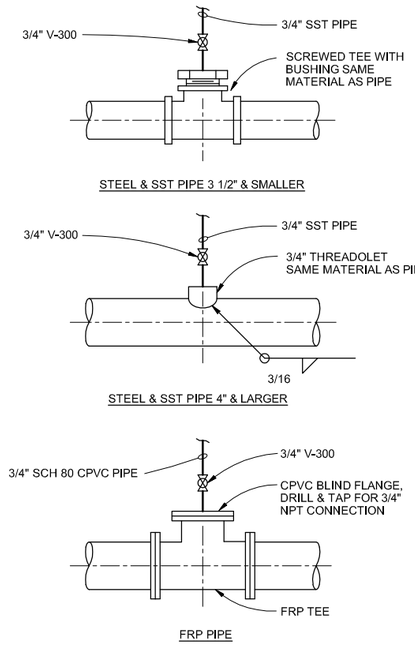
PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
DETAILS
DESIGN DETAILS

SHEET: D13 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #: DD-013

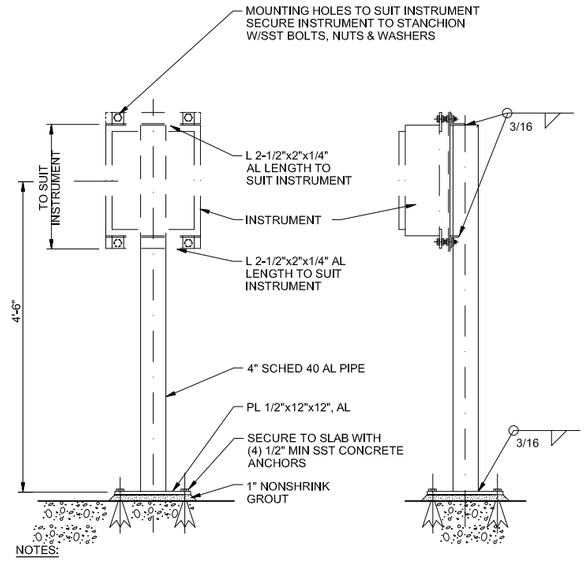
ENGR STAMP:



PRESSURE CONNECTION INSTALLATION

NTS

13305B



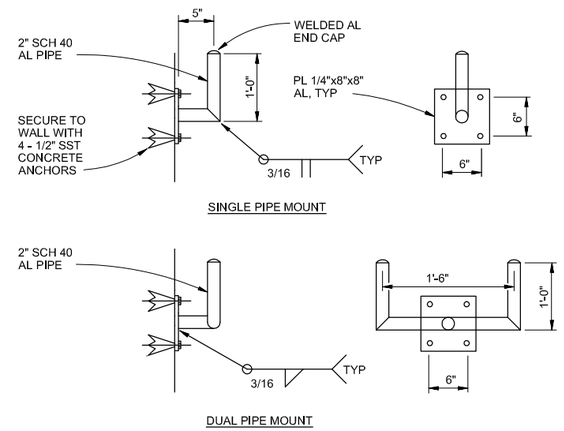
NOTES:

1. ROUND OFF ALL EXPOSED EDGES AND CORNERS.
2. PAINT ALUMINUM IN CONTACT WITH CONCRETE ACCORDING TO SPECIFICATIONS FOR PAINTING.

STANCHION SUPPORT FOR CASE MOUNTED INSTRUMENTS

NTS

13383A



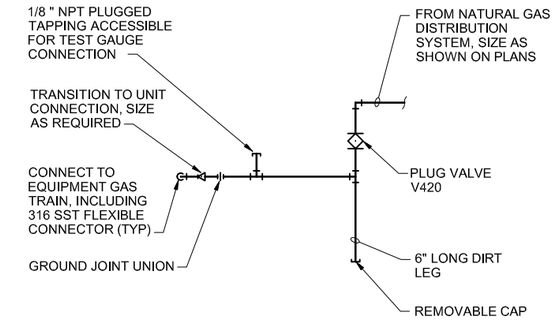
NOTES:

1. ALTERNATIVELY, SINGLE PIPE WALL MOUNT BRACKET SHALL BE O'BRIEN MODEL WE16M WITH 9 MIL ARC SPRAY ZINC METALLIZED COATING; OR EQUAL.
2. ALTERNATIVELY, DUAL PIPE WALL BRACKET SHALL BE O'BRIEN MODEL WTM-AT3M WALL BRACKET WITH MODEL S24M & A8M(2) ACCESSORIES, ALL WITH 9 MIL ARC SPRAY ZINC METALLIZED COATING, OR EQUAL.
3. INSTALL MOUNTING BRACKET SUCH THAT CENTERLINE OF INSTRUMENT OR DEVICE SUPPORTED IS APPROXIMATELY 4'-6" ABOVE FLOOR.
4. PAINT ALUMINUM IN CONTACT WITH CONCRETE ACCORDING TO SPECIFICATIONS FOR PAINTING.

WALL MOUNTED INSTRUMENT PIPE STANDS

NTS

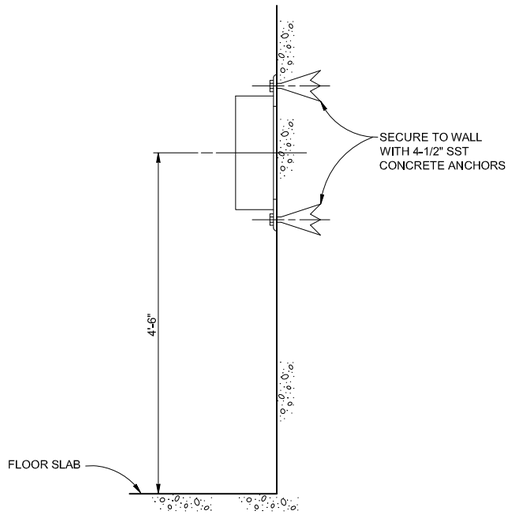
13400



GAS FIRED EQUIPMENT CONNECTION

NTS

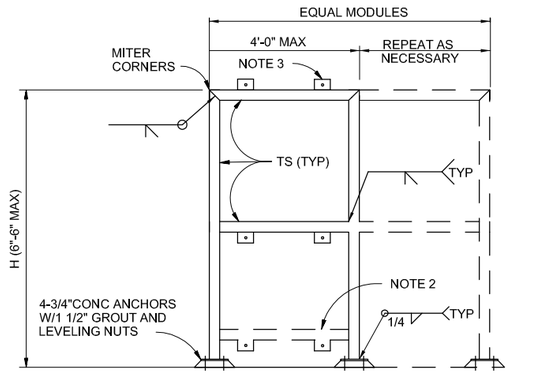
15100-2



WALL MOUNTED PANEL OR INSTRUMENT INSTALLATION

NTS

13338



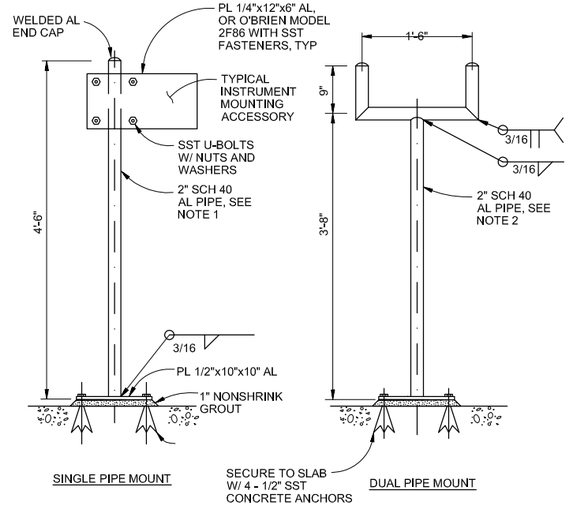
NOTES:

1. HSS SHALL BE AL 3x3x0.219, MINIMUM.
2. FOR PANELS WITH 'H' GREATER THAN 4'-0", ONE HORIZONTAL MEMBER MUST BE LOCATED WITHIN THE MIDDLE THIRD OF THE FRAME HEIGHT. PROVIDE ADDITIONAL MEMBERS AS NECESSARY FOR PANEL MOUNTING.
3. PROVIDE L 2 1/2"x2 1/2"x1/4"x 0'-3" AL. WELD ALL AROUND TO HSS: TYP AT EACH PANEL MOUNT.
4. TOTAL WEIGHT OF PANEL(S) SHALL NOT EXCEED 500 LBS IN EACH MODULE.
5. GRIND ALL WELDS AND SHARP CORNERS SMOOTH.
6. PROVIDE 1/4" AL PLATE, SIZED AS REQUIRED, FOR MOUNTING INSTRUMENTS AS INDICATED.

PANEL AND INSTRUMENT MOUNTING RACK

NTS

13389



NOTES:

1. ALTERNATIVELY, STANCHION SUPPORT SHALL BE O'BRIEN MODEL FP52 WITH 9 MIL ARC SPRAY ZINC METALLIZED COATING; OR EQUAL.
2. ALTERNATIVELY, DUAL SUPPORT SHALL BE O'BRIEN MODEL FP40 STANCHION WITH MODEL AFM, S24M & A8M(2) ACCESSORIES, ALL WITH 9 MIL ARC SPRAY ZINC METALLIZED COATING; OR EQUAL.
3. PAINT ALUMINUM IN CONTACT WITH CONCRETE ACCORDING TO SPECIFICATIONS FOR PAINTING.

FLOOR MOUNTED INST4UMENT PIPE STANDS

NTS

13401

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION, TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THE RECORD DRAWINGS.

FILENAME: DD-014_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:37:25 PM

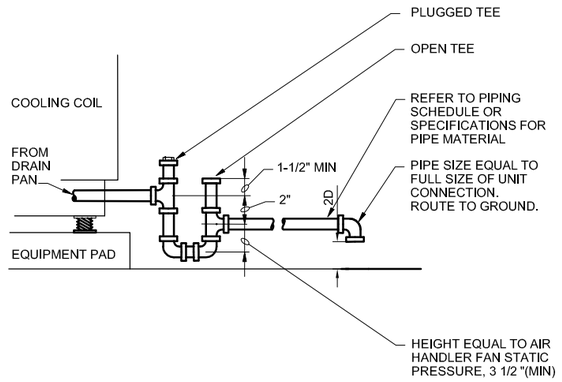
DRN: ERB	ORIG DATE: JUNE 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS
DSN: GVT	DWG #: DD-014		SHEET TITLE: DETAILS / DESIGN DETAILS
CHK: SBR	CAD FILE #:		SHEET: D14 OF: D24
APPD: LEC	SCALE: NONE		PLOT DATE: APRIL 2012
			PLC #:
			CWS PROJ #: 6410
			DWG #: DD-014

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

Clean Water Services — Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

ENGR STAMP:



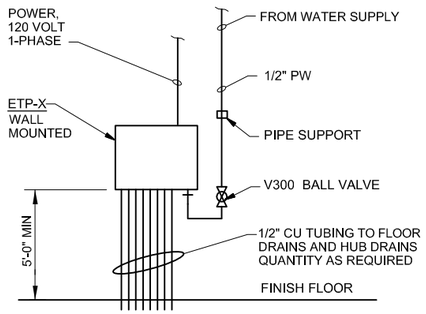
NOTE:

1. EXTERNALLY INSULATE ALL CONDENSATE LINES. (SEE PIPING SCHEDULE OR SPECIFICATIONS FOR INSULATION TYPE)

CONDENSATION DRAIN

NTS

15100-3

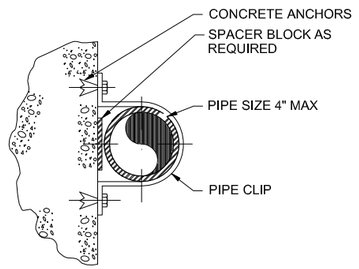


ELEVATION

ELECTRONIC TAP PRIMER

NTS

15408



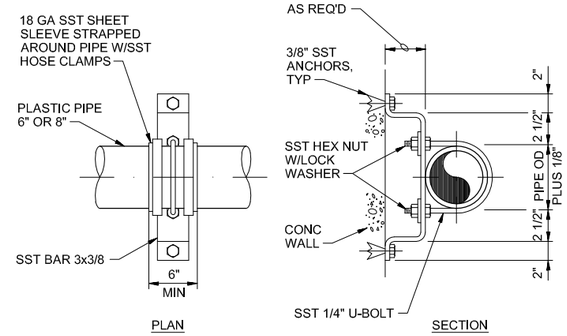
NOTES:

1. FOR VERTICAL PIPES ONLY.
2. PROVIDE PIPE PROTECTION BARRIER AS SPECIFIED. FABRICATE OVERSIZE STRAP WHERE REQUIRED.
3. FABRICATE FROM TYPE 316 SST UNLESS INDICATED OTHERWISE.
4. SEE ALSO SPECIFICATION SECTION 15060, PIPING SUPPORT SYSTEMS.

PIPE SUPPORT - WALL MOUNT

NTS

15503



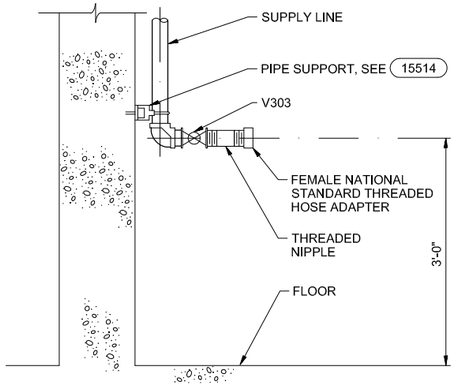
NOTES:

1. FABRICATE FROM TYPE 316 SST UNLESS INDICATED OTHERWISE.
2. SEE ALSO SPECIFICATION SECTION, PIPING SUPPORT SYSTEMS.

PIPE SUPPORT - WALL MOUNTED

NTS

15506



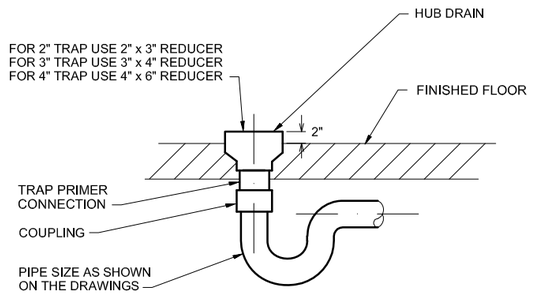
NOTES:

1. ROTATE BALL VALVE 30° OFF OF WALL.
2. VALVE TO MATCH LINE SIZE SHOWN ON DRAWINGS.

INTERIOR HOSE VALVE

NTS

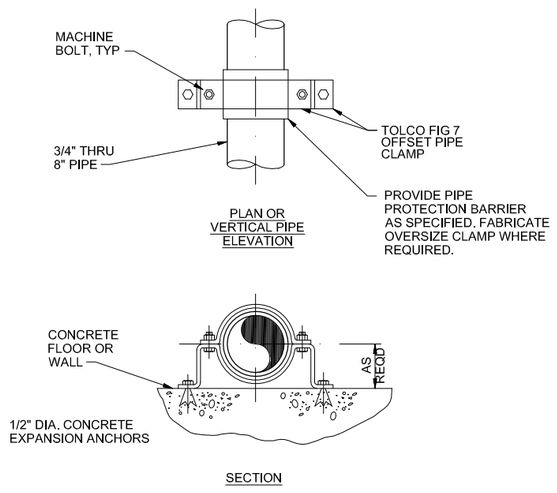
15164A



HUB DRAIN

NTS

15410-9



NOTES:

1. FABRICATE FROM TYPE 316 STAINLESS STEEL UNLESS INDICATED OTHERWISE.
2. SEE ALSO SPECIFICATION SECTION 15062, PIPING SUPPORT SYSTEMS.

PIPE SUPPORT - WALL MOUNTED

NTS

15505

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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PLOT TIME: 1:37:34 PM
PLOT DATE: 05-26-2012
FILENAME: DD-015_391538.DWG

DRN: ERB	ORIG DATE: JUNE 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: GVT	DWG #: DD-015		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

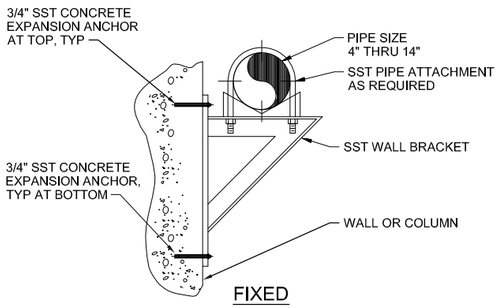
PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: DETAILS — DESIGN DETAILS

SHEET: D15 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #: DD-015

ENGR STAMP:



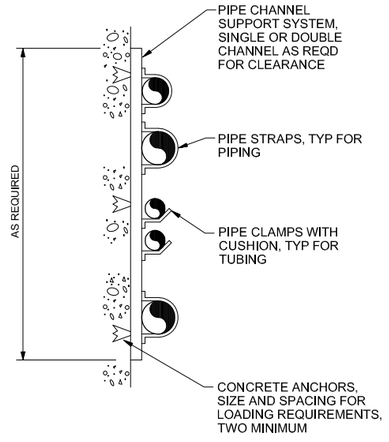
NOTES:

1. WALL BRACKET SHALL BE HEAVY DUTY TOLCO FIG 30H.
2. FABRICATE FROM TYPE 316 SST UNLESS INDICATED OTHERWISE.
3. SEE ALSO SPECIFICATION SECTION 15060, PIPING SUPPORT SYSTEMS.

PIPE SUPPORT - WALL MOUNTED MEDIUM

NTS

15508



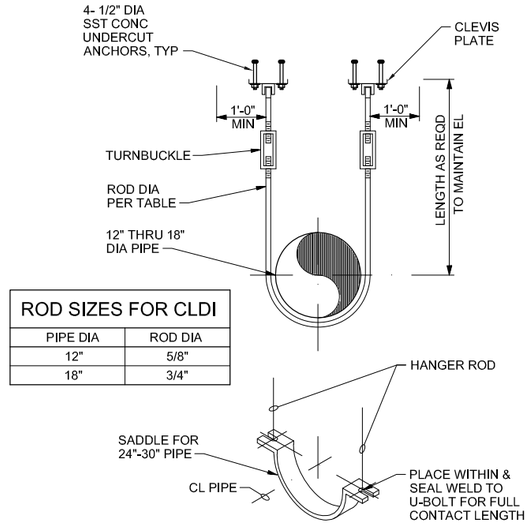
NOTES:

1. USE FOR VERTICAL OR HORIZONTAL SUPPORT, SINGLE OR MULTIPLE PIPES.
2. FOLLOW SUPPORT SYSTEM AND MANUFACTURER'S ANCHOR LOADING RECOMMENDATIONS.
3. FABRICATE FROM TYPE 316 SST UNLESS INDICATED OTHERWISE.
4. SEE ALSO SPECIFICATION SECTION 15060, PIPING SUPPORT SYSTEMS.

STACKED PIPE WALL SYSTEM

NTS

15521



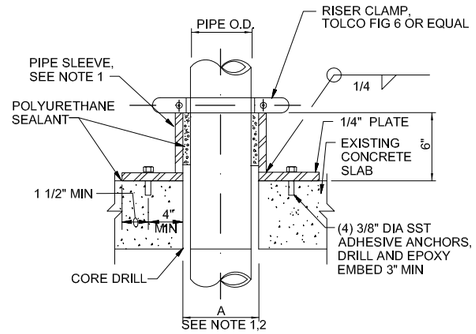
ROD SIZES FOR CLDI

PIPE DIA	ROD DIA
12"	5/8"
18"	3/4"

PIPE HANGER

NTS

15554



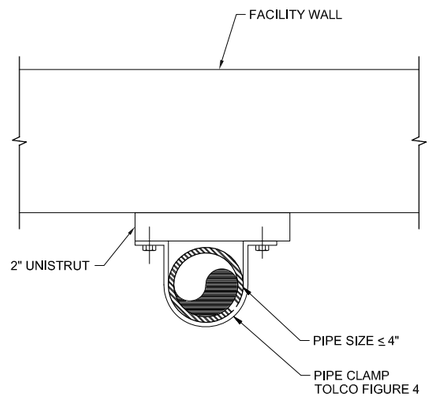
NOTES:

1. PIPE SLEEVE I.D. (A) SHALL BE EQUAL TO PIPE O.D. + 2 INCHES.
2. WHERE EXISTING CONCRETE STRUCTURE IS TO BE CORE DRILLED THE CONTRACTOR SHALL ULTRASONIC TEST OR X-RAY THE AREA FOR EMBEDDED ITEMS BEFORE CORE DRILLING CAN PROCEED. IF EMBEDDED ITEMS ARE FOUND, NOTIFY THE ENGINEER IMMEDIATELY.

VERTICAL PIPE SUPPORT

NTS

15568



PLAN

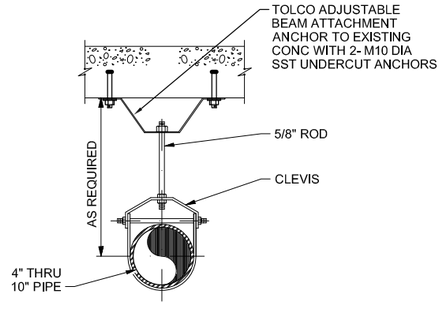
NOTES:

1. FABRICATE FROM TYPE 316 SST UNLESS INDICATED OTHERWISE.
2. SEE ALSO SPECIFICATION SECTION 15060, PIPING SUPPORT SYSTEMS.

PIPE SUPPORT

NTS

15514



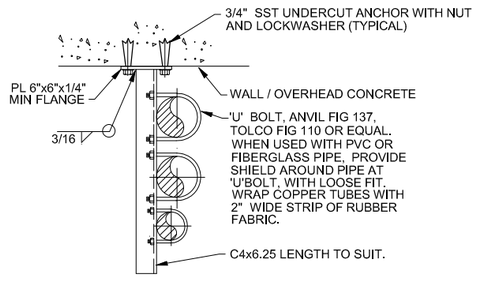
NOTES:

1. FABRICATE FROM TYPE 316 SST UNLESS INDICATED OTHERWISE.

PIPE HANGER

NTS

15550



NOTES:

1. CHANNEL, 'U' BOLT, LOCKWASHERS, NUTS, SHIELDS, AND ANCHORS TO BE MATERIAL AS SPECIFIED IN SECTION 15060, PIPE SUPPORT SYSTEMS.
2. THIS DETAIL IS SUITABLE FOR SIZE AND NUMBER OF PIPES AS SHOWN IN SPECIFIC LOCATIONS CALLED OUT ON THE DRAWINGS. IF USED IN OTHER LOCATIONS BY THE CONTRACTOR, DESIGN CALCULATIONS MUST BE SUBMITTED.

WALL / OVERHEAD PIPE SUPPORT

NTS

15565

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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PLOT DATE: 05-26-2012 PLOT TIME: 1:37:43 PM

FILENAME: DD-016_391538.DWG

DRN: ERB	ORIG DATE: JUNE 2010		
DSN: GVT	DWG #: DD-016		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

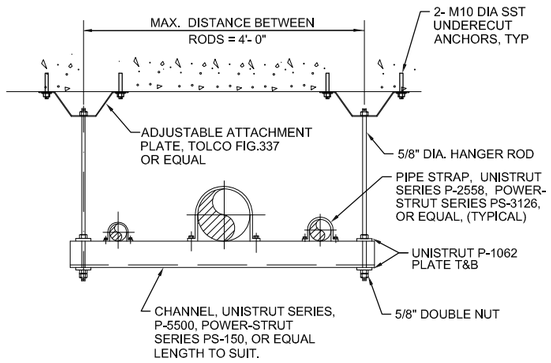
PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
DETAILS
DESIGN DETAILS

SHEET: D16 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #: DD-016

ENGR STAMP:



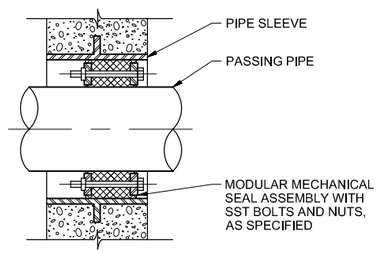
NOTE:

1. WHEN USED WITH PVC OR FIBERGLASS PIPE, PROVIDE STEEL SHIELD AROUND PIPE AT CLIP WITH LOOSE FIT. WRAP COPPER TUBES WITH 2" WIDE STRIP OF RUBBER FABRIC.
2. CHANNEL, PIPE STRAP, RODS, NUTS, AND WASHERS TO BE MATERIAL AS SPECIFIED IN SECTION 15060, PIPE SUPPORT SYSTEMS.

TRAPEZE PIPE HANGER WITH UNISTRUT OR POWER STRUT STEEL CHANNEL

NTS

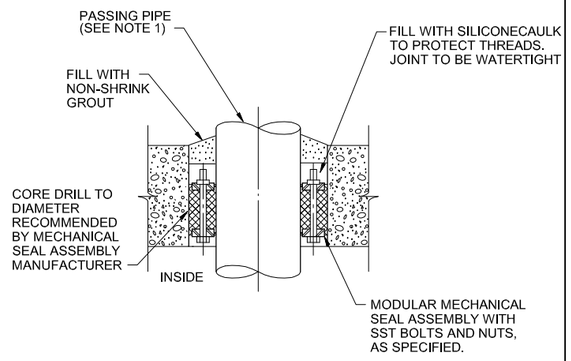
15570



WALL PIPE PENETRATION SEAL

NTS

15607



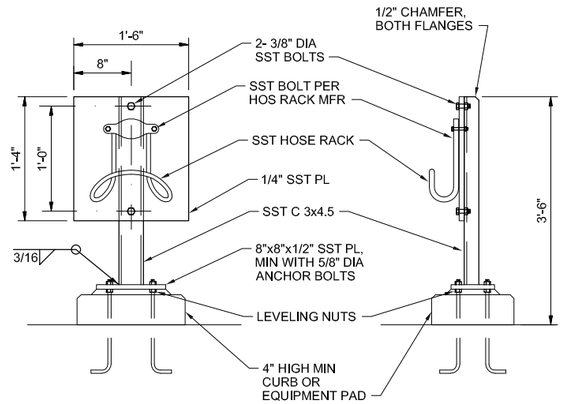
NOTES:

1. PROVIDE RISER CLAMP FOR PASSING PIPE AT ABOVE SLAB LOCATION.

FLOOR PENETRATION SEAL

NTS

15610



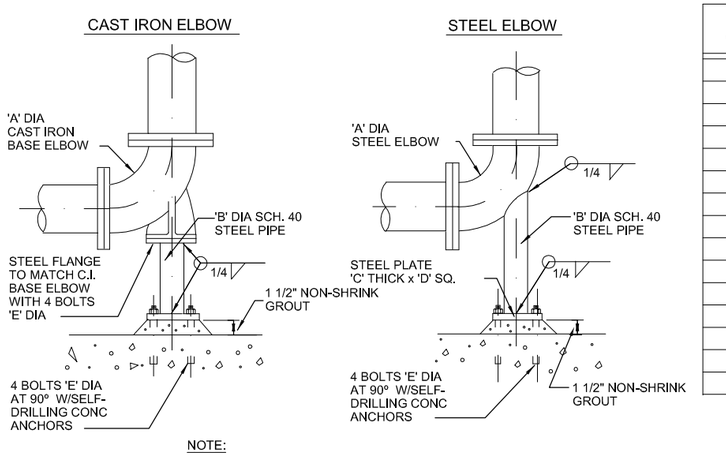
NOTES:

1. REMOVE ALL BURRS AND SHARP EDGES.

FLOOR MOUNTED HOSE RACK

NTS

15720



ELBOW 'A' DIA	DIMENSIONS IN INCHES			
	'B' DIA	'C' THICK	'D' SQ.	'E' DIA
4	2	3/8	6	5/8
6	2 1/2	3/8	7	5/8
8	4	1/2	9	5/8
10	4	1/2	9	5/8
12	6	1/2	11	3/4
14	6	1/2	11	3/4
16	6	1/2	11	3/4
18	8	1/2	13 1/2	3/4
20	8	1/2	13 1/2	3/4
24	8	1/2	13 1/2	3/4
30	10	3/4	16	7/8
36	12	3/4	19	7/8
42	16	3/4	23 1/2	1
48	18	3/4	25	1 1/8

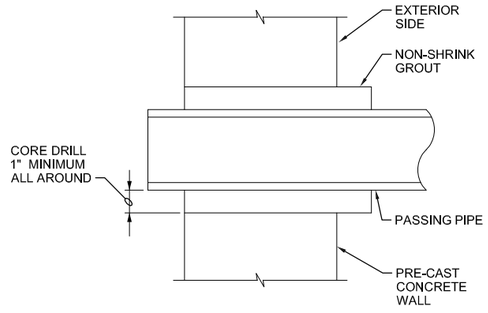
NOTE:

1. WHERE SUPPORT OCCURS AT GRADE, PROVIDE CONCRETE PAD WITH MINIMUM DIMENSIONS OF 'D' PLUS 2'-0" SQUARE BY 'D' PLUS 1'-0" DEEP. REINFORCE WITH #5@12" EACH WAY, TOP AND BOTTOM.

ELBOW SUPPORT

NTS

15573



PIPE PENETRATION

NTS

15611

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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FILENAME: DD-017_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:37:53 PM

DRN: ERB	ORIG DATE: JUNE 2010		
DSN: GVT	DWG #: DD-017		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

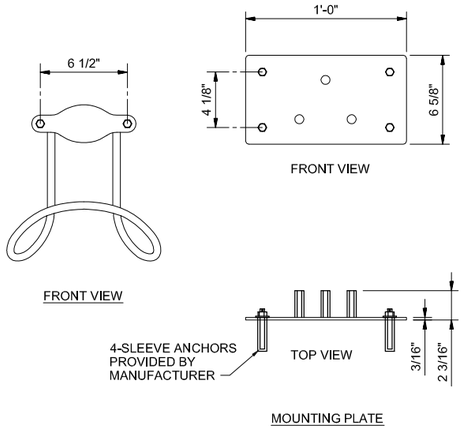
PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
DETAILS
DESIGN DETAILS

SHEET: D17 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #: DD-017

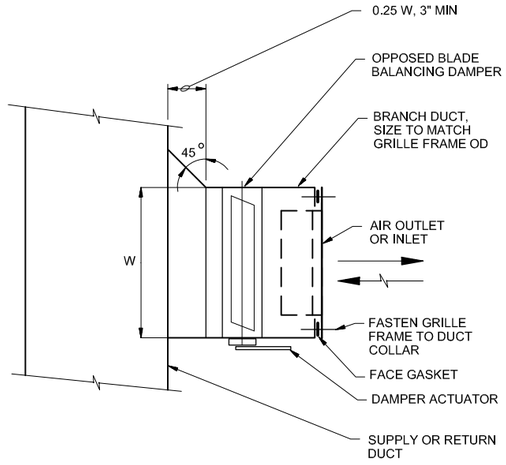
ENGR STAMP:



WALL MOUNTED HOSE RACK

NTS

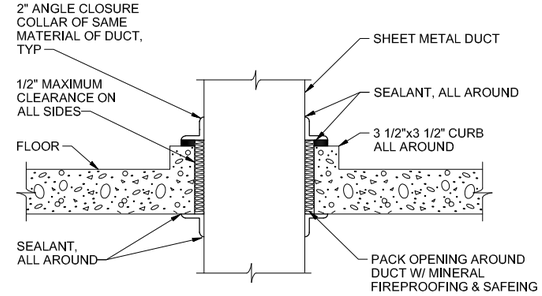
15725



DUCT MOUNTED AIR OUTLET OR INLET

NTS

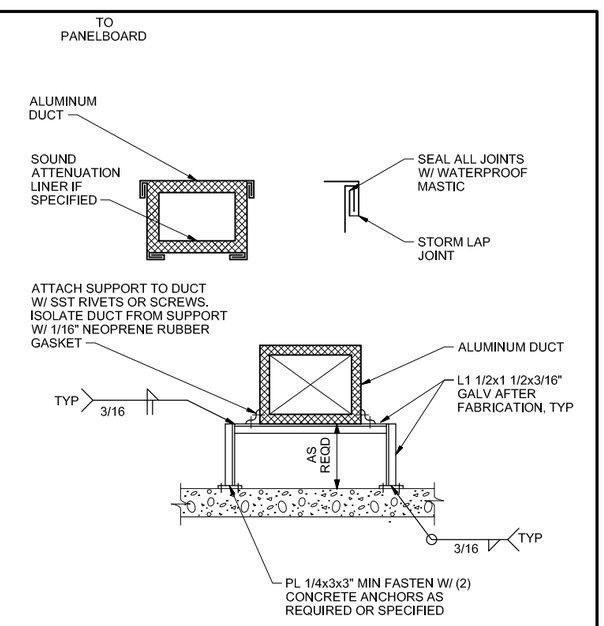
15810-9



FLOOR PENETRSTION - WET AREA

NTS

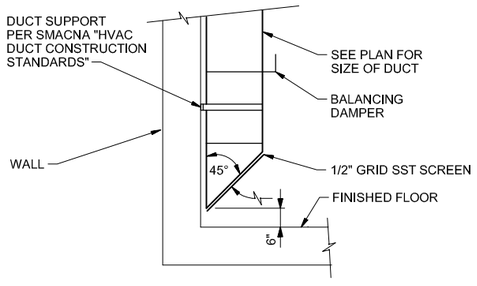
15811



DECK MOUNTED DUCTING AND SUPPORT

NTS

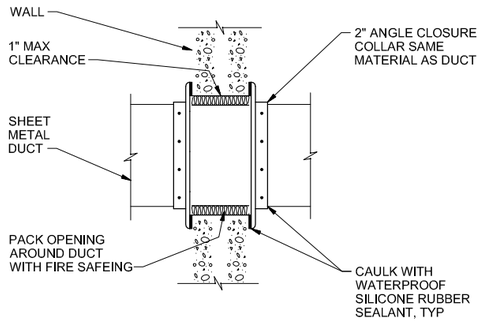
15813



FLOOR EXHAUST DUCT

NTS

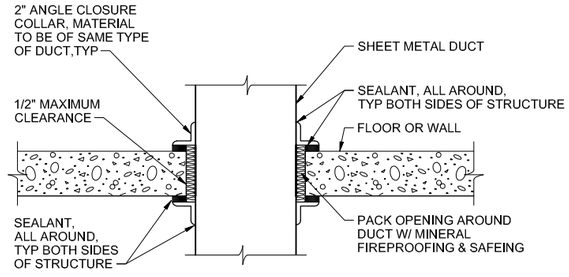
15810-5



DUCT WALL PENETRATION

NTS

15810-10



FLOOR PENETRATION - DRY AREA

NTS

15812

NOTES:

1. WALL PENETRATION SIMILAR.
2. 2" ANGLE CLOSURE COLLAR OF SAME MATERIAL AS DUCT.

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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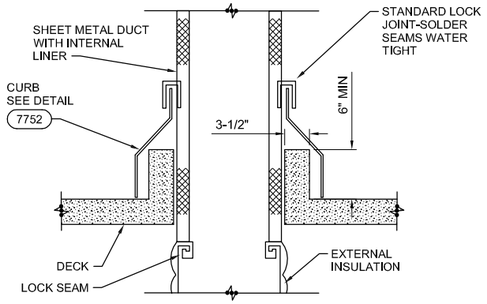
DRN: ERB	ORIG DATE: JUNE 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS
DSN: GVT	DWG #: DD-018		SHEET TITLE: DETAILS / DESIGN DETAILS
CHK: SBR	CAD FILE #:		SHEET: D18 OF: D24
APPD: LEC	SCALE: NONE		PLOT DATE: APRIL 2012
			PLC #:
			CWS PROJ #: 6410
			DWG #: DD-018

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

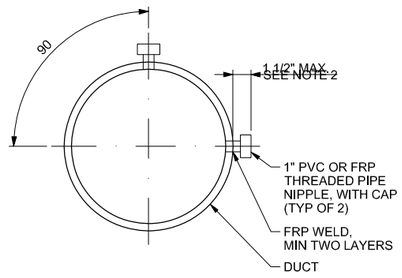
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INSULATED DUCT THROUGH DECK

NTS

15814



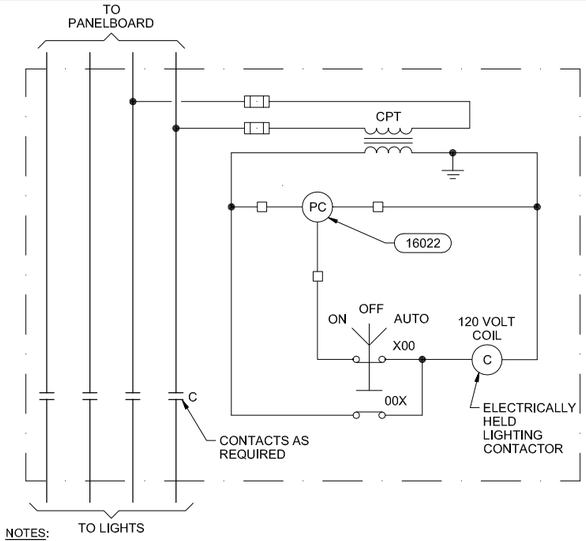
NOTES:

1. INSTALL TEST PORT WITH A MINIMUM LENGTH OF 3 DUCT DIAMETERS OF STRAIGHT DUCT UPSTREAM AND MINIMUM OF 1 DUCT DIAMETER OF STRAIGHT DUCT DOWNSTREAM
2. AS CONSTRUCTED EACH PORT MUST BE ABLE TO FREELY PASS A DWYER SERIES 160 PITOT TUBE.
3. WHERE POSSIBLE ON HORIZONTAL DUCT RUNS DO NOT INSTALL TEST PORTS WITHIN 45 DEGREES OF THE DUCT INVERT.
4. DETAIL TAILORED TO FRP DUCT. SIMILAR FOR STAINLESS STEEL COATED DUCT SYSTEM.

FOUL AIR TEST PORT

NTS

15899



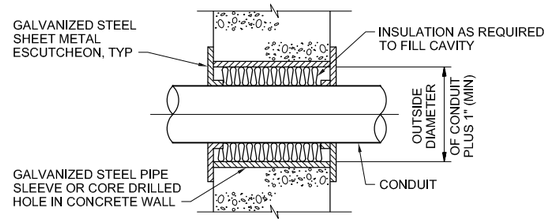
NOTES:

1. CONTROL POWER TRANSFORMER MAY BE DELETED IF LIGHT CIRCUIT IS 120 VOLTS PHASE-TO-NEUTRAL AND A NEUTRAL CONNECTION IS PROVIDED FROM THE PANELBOARD.
2. ALL EXTERIOR BUILDING LIGHTS, EITHER POLE OR WALL MOUNTED SHALL BE CONTROLLED AND WIRED USING THIS DETAIL.

MULIT-POLE LIGHTING CONTACTOR CONTROL

NTS

16026



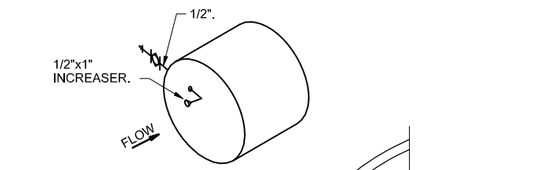
NOTE:

CONDUITS WHICH INDIVIDUALLY PASS THRU AN INTERIOR WALL SHALL BE INSTALLED IN ACCORDANCE WITH THIS DETAIL.

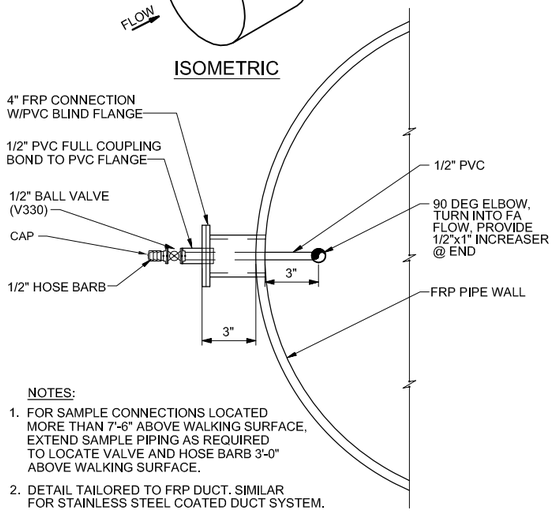
INTERIRO WALL PENETRATION

NTS

16106



ISOMETRIC



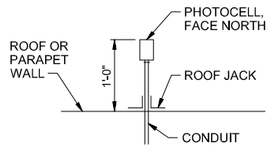
NOTES:

1. FOR SAMPLE CONNECTIONS LOCATED MORE THAN 7'-6" ABOVE WALKING SURFACE, EXTEND SAMPLE PIPING AS REQUIRED TO LOCATE VALVE AND HOSE BARB 3'-0" ABOVE WALKING SURFACE.
2. DETAIL TAILORED TO FRP DUCT. SIMILAR FOR STAINLESS STEEL COATED DUCT SYSTEM.

GAS SAMPLE PROBE

NTS

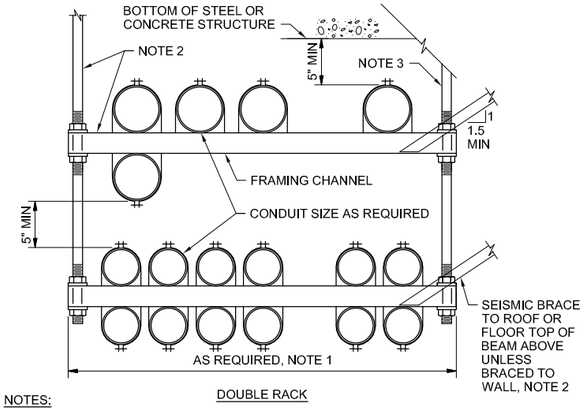
15897



PHOTOCELL MOUNTING

NTS

16022



DOUBLE RACK

NOTES:

1. LENGTH VARIES WITH NUMBER OF CONDUITS TO BE SUPPORTED AND SPACING BETWEEN CONDUITS.
2. DETERMINE SPAN AND TYPE OF SUPPORTS, LOCATE SUPPORTS, AND SIZE SUPPORT RODS, CONNECTIONS AND BRACES PER MANUFACTURER'S RECOMMENDATIONS AND SEISMIC REQUIREMENTS.
3. AT STEEL STRUCTURE, USE GRINNEL MALLEABLE BEAM CLAMP. AT CONCRETE STRUCTURE, USE UNIVERSAL CONCRETE INSERT, UNISTRUT CHANNEL WITH #4 x 3'-0" BELOW, OR GRINNEL FIGURE 52 ATTACHMENT PLATE, SIMILAR. TYPE AND SIZE AS REQUIRED BY TOTAL LOADS.
4. USE STAINLESS STEEL HARDWARE.
5. SPACE CONDUIT SUFFICIENTLY TO ALLOW REMOVAL OF ONE CONDUIT WITHOUT DISTURBING ADJACENT CONDUITS.

CONDUIT RACKING SYSTEM

NTS

16101

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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FILENAME: DD-019_391538.DWG PLOT DATE: 05-26-2012 PLOT TIME: 1:38:11 PM

DRN: ERB	ORIG DATE: JUNE 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
DSN: GVT	DWG #: DD-019		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

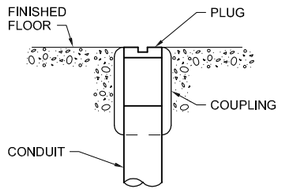
PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: DETAILS — DESIGN DETAILS

SHEET: D19 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #: DD-019

ENGR STAMP:



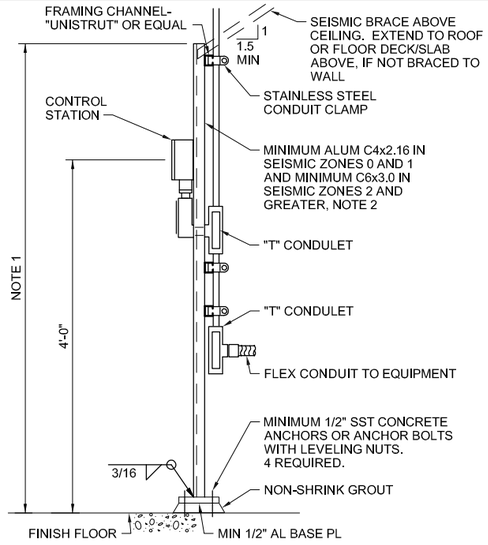
NOTE:

CONDUITS WHICH ARE STUBBED UP IN A CONCRETE SLAB FOR FUTURE EXTENSION SHALL BE INSTALLED IN ACCORDANCE WITH THIS DETAIL.

FLUSH CONDUIT STUB

NTS

16109



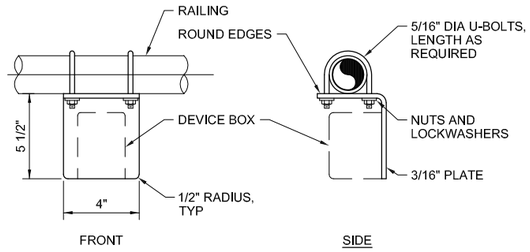
NOTES:

1. AS REQUIRED TO LIMIT UNSUPPORTED CONDUIT LENGTH TO MAXIMUM VALUES ALLOWED BY NEC, OR 10'-0" MAXIMUM. FOR LENGTHS EXCEEDING 6'-0", EXTEND TO STRUCTURE ABOVE. TOP CONNECTION TO ALLOW FOR 5/8" VERTICAL STRUCTURE DEFLECTION.
2. SIZE SUPPORT POST, TOP BRACE(S) AND CONNECTIONS FOR VERTICAL AND LATERAL LOADS. SEE GENERAL ELECTRICAL CONSTRUCTION NOTES ON DRAWINGS.

PEDESTAL MOUNTED DEVICE OVERHEAD FEED

NTS

16111



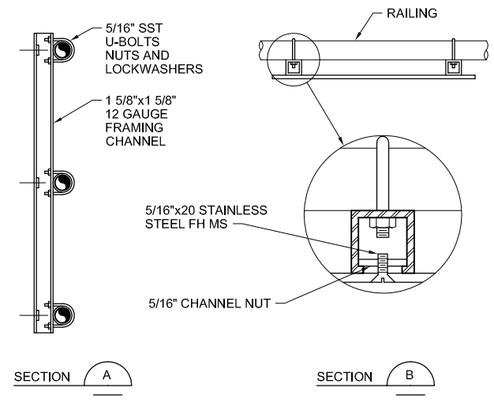
NOTE:

AT ALUMINUM RAILING, PROVIDE PROTECTION FOR ALUMINUM IN CONTACT WITH STEEL MEMBERS AND CONNECTIONS PER SPECIFICATIONS.

RAILING MOUNTED EQUIPMENT SUPPORT

NTS

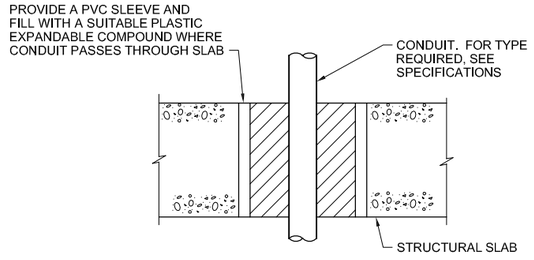
16159A



RAILING MOUNTED EQUIPMENT SUPPORT

NTS

16160B



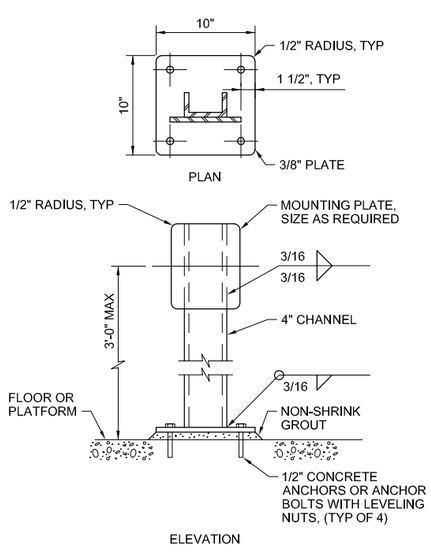
NOTE:

ALL CONDUITS THROUGH CONCRETE FLOOR SLABS AND EQUIPMENT PADS SHALL BE INSTALLED IN ACCORDANCE WITH THIS DETAIL.

SLAB PENETRATION

NTS

16110



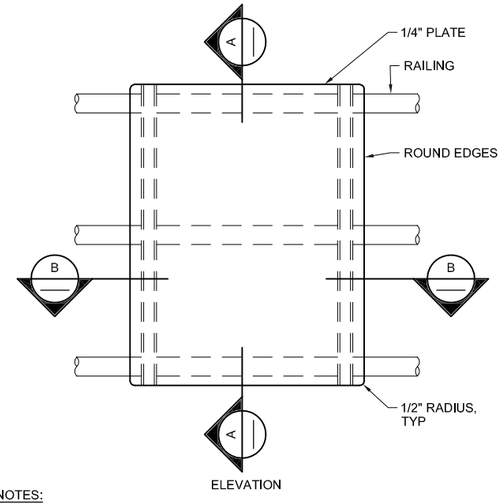
NOTES:

1. USE STAINLESS STEEL MOUNTING HARDWARE. USE WASHERS AND SPLIT-LOCK WASHERS UNDER ALL NUTS AND BOLTS.

EQUIPMENT MOUNTING PEDESTAL

NTS

16158A



NOTES:

1. ALL HARDWARE SHALL BE STAINLESS STEEL. USE WASHERS AND SPLIT-LOCK WASHERS ON ALL NUTS AND BOLTS.
2. DIMENSIONS SHALL BE AS REQUIRED FOR EQUIPMENT TO BE MOUNTED. EDGE OF MOUNTING PLATE SHALL EXTEND A MINIMUM OF 2 INCHES EACH SIDE OF THE MOUNTED EQUIPMENT.
3. THIS DETAIL SHALL BE USED FOR MOUNTING EQUIPMENT AND JUNCTION BOXES WEIGHING LESS THAN 50 LBS ON RAILINGS WHETHER DETAIL IS CALLED OUT OR NOT. EQUIPMENT MOUNTING SHALL NOT REDUCE THE WIDTH OF A WALKWAY TO LESS THAN 3'-0".

RAILING MOUNTED EQUIPMENT SUPPORT

NTS

16160A

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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PLOT TIME: 1:38:20 PM
PLOT DATE: 05-26-2012
FILENAME: DD-020_391538.DWG

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DSN: GVT	DWG #: DD-020		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

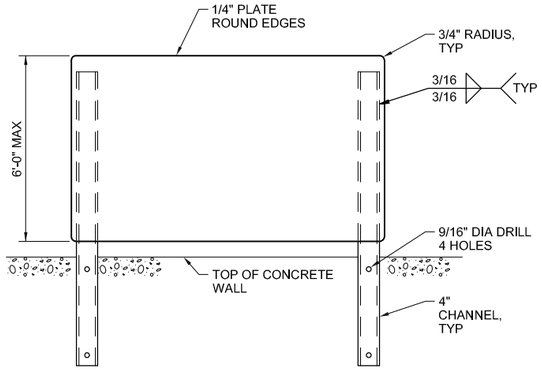
PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: DETAILS — DESIGN DETAILS

SHEET: D20 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #: DD-020

ENGR STAMP:



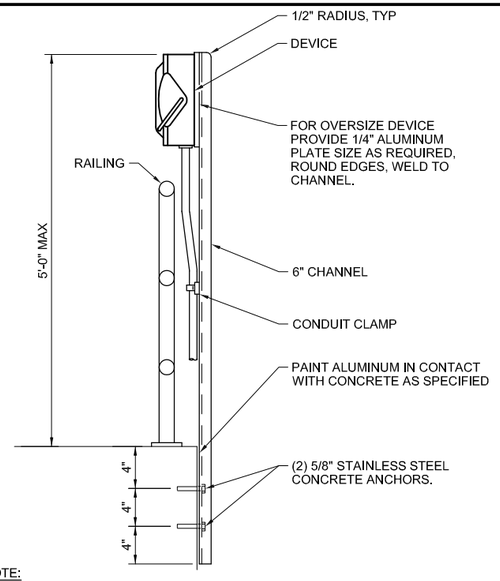
NOTES:

1. DIMENSIONS SHALL BE AS SHOWN ON DRAWINGS.
2. FOR HEIGHTS EXCEEDING 5'-0" OR WEIGHT OF MOUNTED EQUIPMENT EXCEEDING 200 LBS, SIZE POSTS AND CONNECTIONS FOR LATERAL LOADS. EXTEND POSTS TO STRUCTURE ABOVE WHERE REQUIRED BY CALCULATION. SEE GENERAL ELECTRICAL CONSTRUCTION NOTES ON DRAWINGS.

ELECTRICAL EQUIPMENT SUPPORT

NTS

16162A



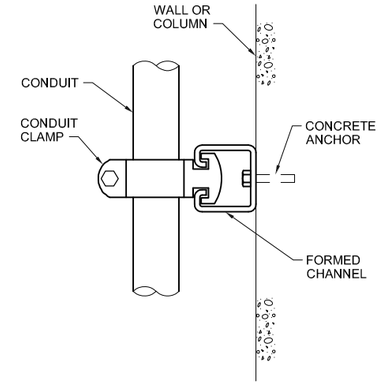
NOTE:

EQUIPMENT HAVING A FRONTAL AREA GREATER THAN 3 SQUARE FEET OR WIDER THEN 18 INCHES SHALL BE SUPPORTED BY TWO CHANNELS. USE STAINLESS STEEL MOUNTING HARDWARE. INSTALL RING AND SPLIT LOCK WASHERS UNDER ALL NUTS AND BOLTS.

PEDESTAL MOUNTED DEVICE AT RAILING

NTS

16167



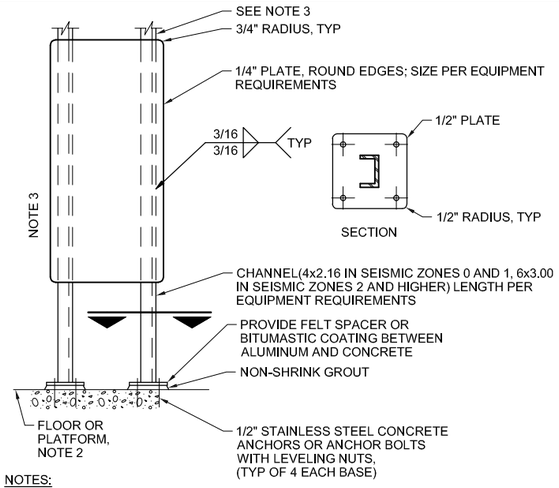
NOTE:

SUPPORT ALL EXPOSED CONDUITS ON FORMED CHANNELS.

CONDUIT SUPPORT ON STRUCTURE

NTS

16195



NOTES:

1. USE STAINLESS STEEL MOUNTING HARDWARE. USE WASHER AND SPLIT LOCK WASHER UNDER ALL NUTS.
2. FOR YARD LOCATIONS PROVIDE A 6 INCH THICK CONCRETE PAD AT GRADE WITH #4 BAR @ 12" OC EACH WAY, CENTERED. THE PAD SHALL BE 12 INCHES LONGER THAN THE MOUNTING PLATE BY ONE HALF THE HEIGHT OF THE MOUNTING PLATE ABOVE FINISHED GRADE. MINIMUM WIDTH 24 INCHES.
3. FOR HEIGHTS EXCEEDING 5'-0" OR WEIGHT OF MOUNTED EQUIPMENT EXCEEDING 200 LBS, SIZE POSTS AND CONNECTIONS FOR LATERAL LOADS. EXTEND POSTS TO STRUCTURE ABOVE WHERE REQUIRED BY CALCULATION, SEE GENERAL ELECTRICAL CONSTRUCTION NOTES ON DRAWINGS.

ELECTRICAL EQUIPMENT SUPPORT

NTS

16162B

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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PLOT DATE: 05-26-2012
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DSN: GVT	DWG #: DD-021		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

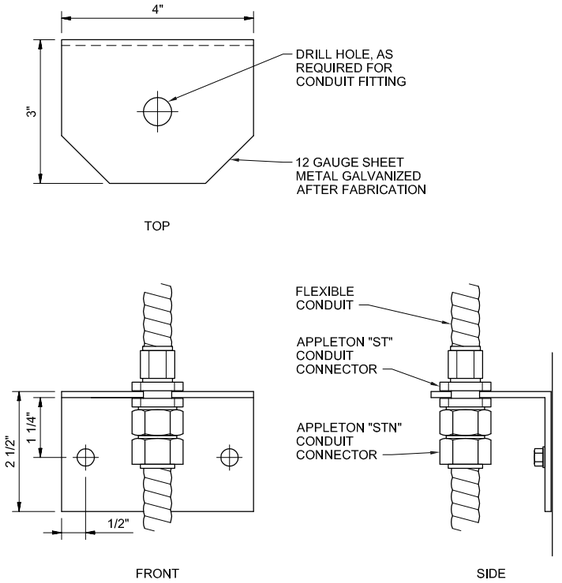
PROJ NAME: CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE: DETAILS
DESIGN DETAILS

SHEET: D21 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #: DD-021

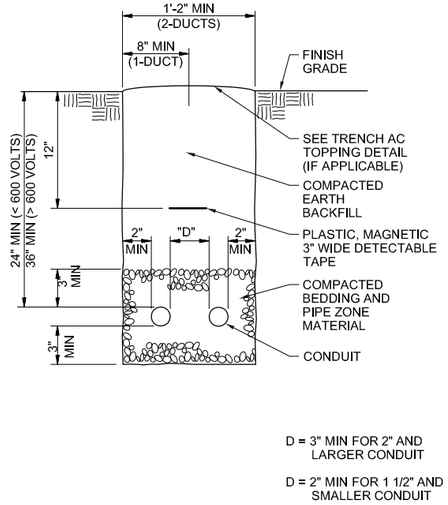
ENGR STAMP:



FLEXIBLE CONDUIT SUPPORT

NTS

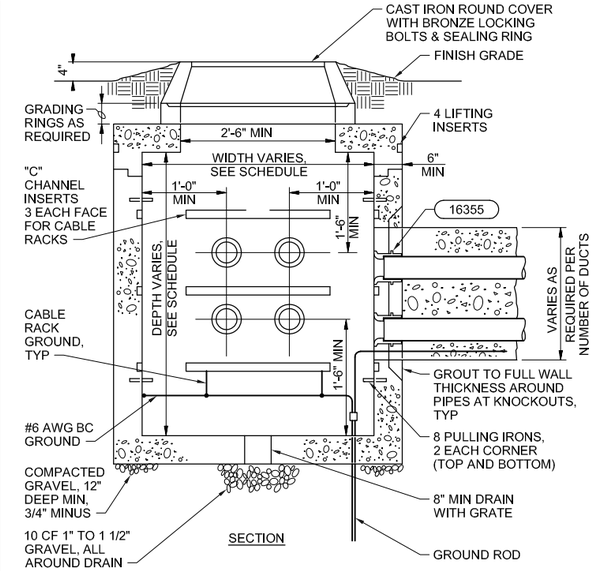
16196



TRENCH AND CONDUIT PLACEMENT

NTS

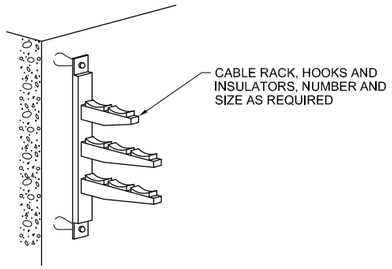
16325B



MANHOLE WITH GROUNDING

NTS

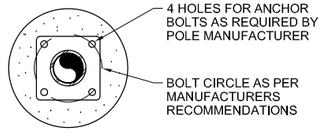
16351B

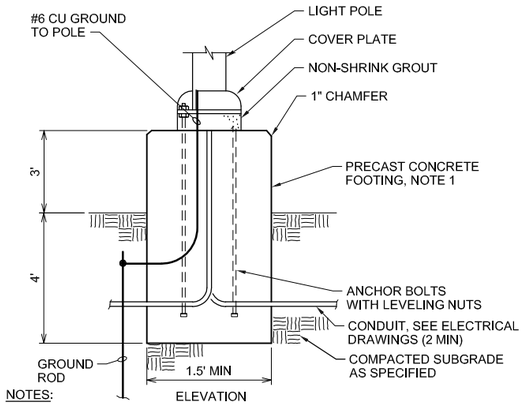


CABLE RACK

NTS

16358





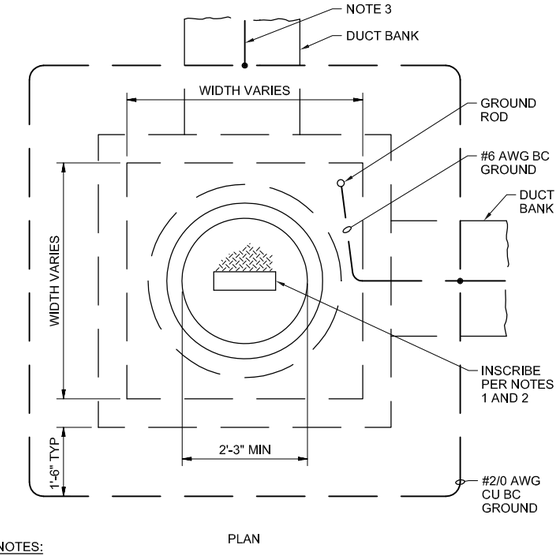
NOTES:

1. CONDUITS SHALL BE STUBBED UP TO WITHIN 6 INCHES OF THE POLE MANHOLE.
2. FOR PROPER ORIENTATION OF POLE, COORDINATE WITH SITE PLANS.

TYPICAL PRECAST LIGHT POLE BASE IN LANDSCAPE

NTS

16201



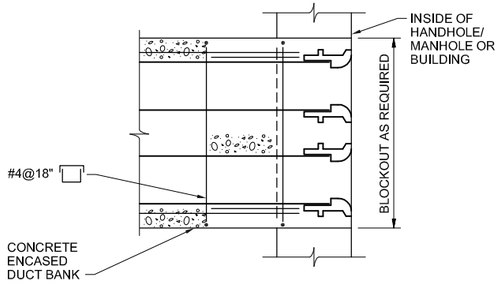
NOTES:

1. INSCRIBE "ELECTRICAL HIGH VOLTAGE" IF ANY CIRCUIT IN MANHOLE IS ABOVE 600V.
2. INSTALL #2/0 AWG BARE COPPER GROUND CENTERED ON TOP OF ALL DUCT RUNS.

MANHOLE LID WITH GROUNDING

NTS

16351A



NOTE:

EXTEND REBAR A MINIMUM OF 2' BEYOND THE LIMIT OF EXCAVATION.

CONDUIT HANDHOLE / MANHOLE ENTRANCE

NTS

16355

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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PLOT TIME: 1:38:39 PM
PLOT DATE: 05-26-2012
FILENAME: DD-022_391538.DWG

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DSN: GVT	DWG #: DD-022		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

Clean Water Services
Our commitment is clear
2550 SW Hillsboro Hwy. Hillsboro, Oregon 97123-9379

CH2MHILL

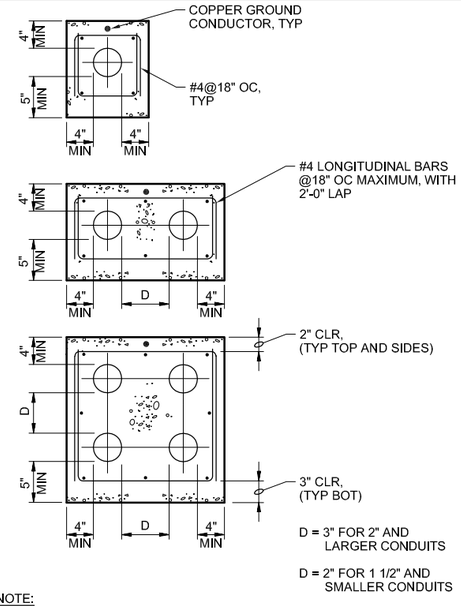
PROJ NAME: CLEAN WATER SERVICES DURHAM AWWTF PHASE 5B1 HEADWORKS IMPROVEMENTS

SHEET TITLE: DETAILS
DESIGN DETAILS

SHEET: D22 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #: DD-022

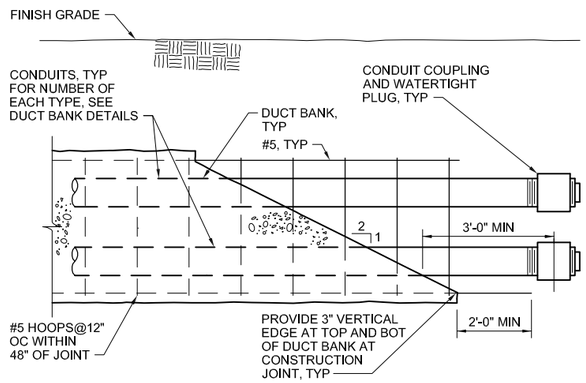
ENGR STAMP:



NOTE:
PROVIDE 6" MINIMUM COMPACTED GRAVEL, 3/4" MINUS, UNDER ALL CONCRETE ENCASED DUCT RUNS.

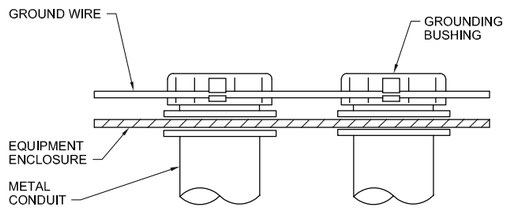
DUCT BANK
NTS

16400A



DUCT BANK CONSTRUCTION AT CONTRACT LIMIT
NTS

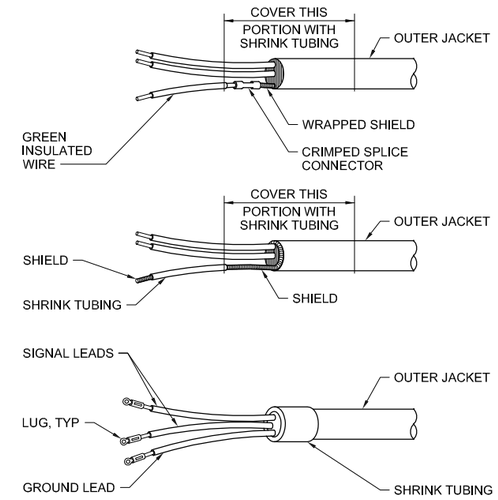
16401



NOTE:
THE ENDS OF ALL CONDUITS REQUIRED TO BE GROUNDED BY THE SPECIFICATIONS SHALL BE GROUNDED IN ACCORDANCE WITH THIS DETAIL.

CONDUIT GROUNDING
NTS

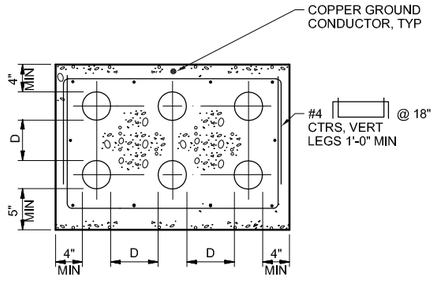
16452

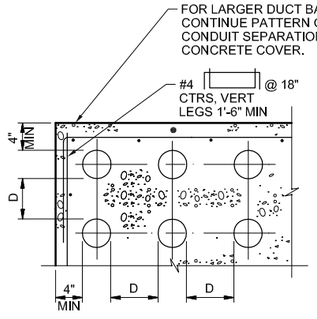


NOTE:
ALL SHIELDED INSTRUMENTATION CABLE SHALL BE TERMINATED IN ACCORDANCE WITH THIS DETAIL WHERE GROUNDING IS REQUIRED.

TERMINATION OF SHIELDED INSTRUMENTATION CABLE
NTS

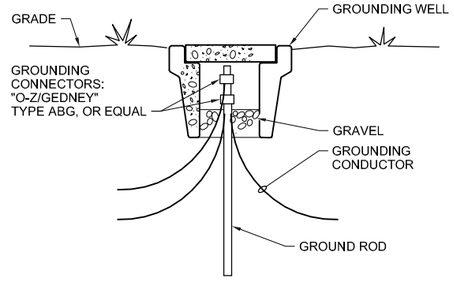
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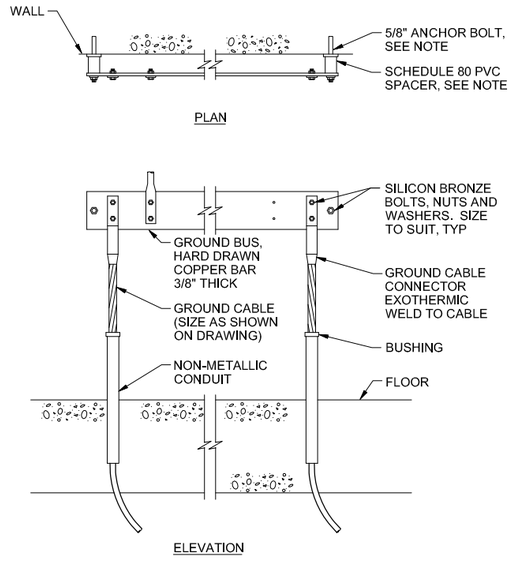
DUCT BANK
NTS

16400B



GROUND TEST WELL
NTS

16451



NOTE:
MAXIMUM SPAN BETWEEN SUPPORTS NOT TO EXCEED 24".

GROUND BUS
NTS

16458

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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PLOT TIME: 1:38:48 PM
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DRN: ERB	ORIG DATE: JUNE 2010	THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.	
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CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

Clean Water Services
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CH2MHILL

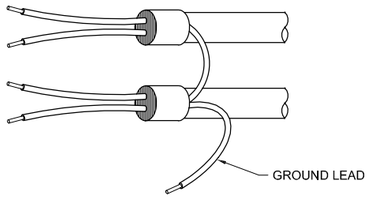
PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
DETAILS
DESIGN DETAILS

SHEET: D23 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #:
DD-023

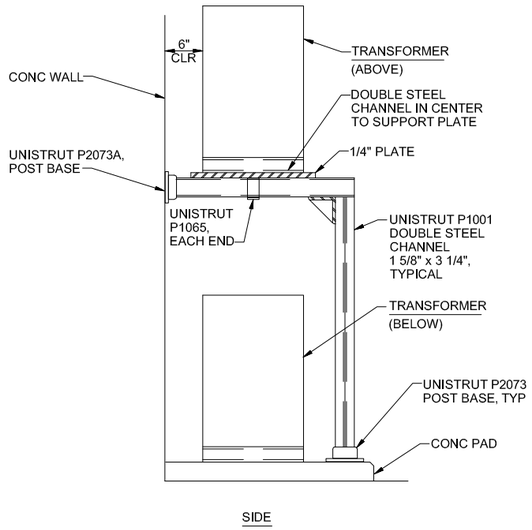
ENGR STAMP:



UNACCEPTABLE METHOD OF GROUNDING INSTRUMENTATION CABLE SHIELD

NTS

16560C

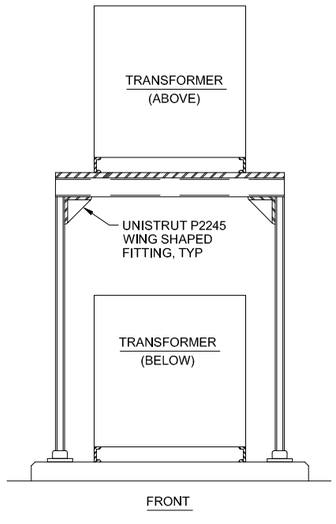


SIDE

STACKED TRANSFORMER MOUNTING INSTALLATION

NTS

16711B



FRONT

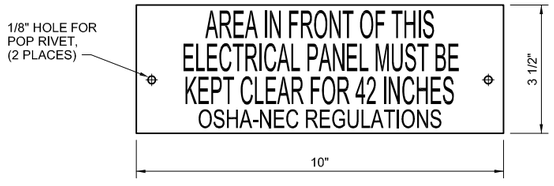
NOTES:

1. USE STAINLESS STEEL MOUNTING HARDWARE. USE WASHERS, SPLIT-LOCK WASHERS UNDER ALL NUTS AND BOLTS.

TRANSFORMER

NTS

16711A



TOP 3 ROWS: 3/4 " LETTERS
BOTTOM ROW: 1/2 " LETTERS
BLACK LETTERING ON WHITE BACKGROUND

OSHA / NEC PLACARD

NTS

16715

RECORD DRAWINGS

Revisions Drawn By E.R. BROWN Date APR 2012

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PLOT TIME: 1:38:58 PM
PLOT DATE: 05-26-2012
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DSN: GVT	DWG #: DD-024		
CHK: SBR	CAD FILE #:		
APPD: LEC	SCALE: NONE		

THIS BAR IS ONE INCH WHEN DRAWING IS FULL SCALE.

REV #	DATE	DRN	APPD	DESCRIPTION
	03/12	ERB	LEC	RECORD DRAWING

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CH2MHILL

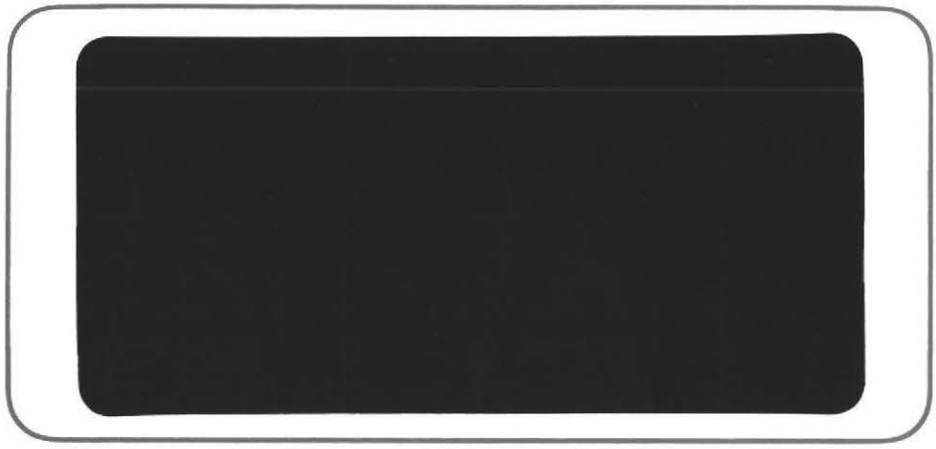
PROJ NAME:
CLEAN WATER SERVICES
DURHAM AWWTF
PHASE 5B1
HEADWORKS IMPROVEMENTS

SHEET TITLE:
DETAILS
DESIGN DETAILS

SHEET: D24 OF: D24
PLOT DATE: APRIL 2012
PLC #:
CWS PROJ #: 6410

DWG #: DD-024

ENGR STAMP:



CALVERT

CONTRACTORS INC.

APPROVED subject to the approval by the architect and engineer.

Approval of these submittals by the Architect and Contractors Inc. does not alleviate you from the responsibilities of your errors and/or commissions.

By _____ Date 10-2-93

DESIGN SUBMITTAL

FOR

DURHAM AWTP

PHASE I EXPANSION

ODOR CONTROL SYSTEM

CALVERT Project No. 1181

Submittal No. 1

September 29, 1989

Submitted by:

Jim L. Pike
CALVERT ENVIRONMENTAL
5985 Santa Fe Street
San Diego, CA 92109
619-272-0050

TABLE OF CONTENTS

SECTION NO.		TAB NO.
1.	DESIGN CALCULATIONS	1
2.	SCRUBBER LAYOUT DRAWINGS	2
3.	CHEMICAL FEED SYSTEM	3
4.	ELECTRICAL CONTROL PANEL	4
5.	WATER SOFTENER	5

SECTION 1

DESIGN CALCULATIONS

(NOT REVIEWED

(REVIEW COMMENTS TO BE SUBMITTED IN FUTURE REVIEW SUBMITTAL.)

STRUCTURAL CALCULATIONS

FOR

CALVERT ODOR CONTROL SYSTEMS

AT

DURHAM, OREGON A.W.W.T.P.

SEPTEMBER 25, 1989

Michael W. Duncan
Consulting Engineer

4212 N. 69th Lane #3
Phoenix, Arizona 85033

(602) 242-5181

TABLE OF CONTENTS & RESULT SUMMARY

CALVERT ODOR CONTROL SYSTEMS AT DURHAM, OREGON AWWTP

42-381 50 SHEETS 5 SQUARE
42-382 100 SHEETS 5 SQUARE
42-389 200 SHEETS 5 SQUARE
NATIONAL

ITEM	RESULT	SHEET NO.
	CHAMBERS AT SOLIDS HANDLING	
DIMENSIONS & CRITERIA	—	1 TO 2
TOP DOME THICKNESS	0.38 in. INCLUDING LINER	2 TO 4
WALL THICKNESS	AT 0 TO 6' FROM BASE, 0.45 in INCLUDING LINER ABOVE 6', 0.38 in INCLUDING LINER 1 STIFFENER AT MIDHEIGHT	4 TO 9
ANCHORS	12 OF STD. ANCHOR LUGS WITH $\frac{1}{2}$ in. OVERLAY WITH $\frac{5}{8}$" DIA. 316 S.S. HILTI HVA ADHESIVE ANCHORS WITH $7\frac{1}{2}$" OF EMBEDMENT IN 3,000 psi OR STRONGER CONCRETE, OR USE EXISTING 20 OF $\frac{3}{4}$" DIA ON 6'-5" RADIUS WITH SPECIAL ANCHOR LUGS TO MATCH BOLT CIRCLE	9 TO 11
ATTACHMENT LUG	$\frac{3}{8}$" THICK OVERLAY AS SHOWN ON SHEET 12 IS O.K.	12
STACK WALL THICKNESS	0.25 in. INCLUDING LINER	13
	CHAMBER AT HEADWORKS	
DIMENSIONS & CRITERIA	—	14
STACK WALL	$\frac{3}{16}$ in. INCLUDING LINER	15
MISCELLANEOUS	0.38 in THICKNESS EVERYWHERE (INCLUDING LINER); ONE STIFFENER AT "2ND FLOOR"; 4 ANCHOR LUGS WITH $\frac{1}{2}$" OVERLAY.	16

CONTENTS & RESULTS, CON'T

CALVERT ODOR CONTROL SYSTEMS AT DURHAM, OREGON AWWTP

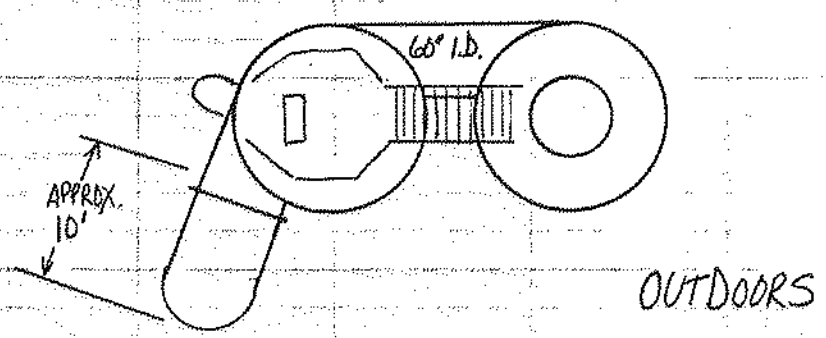
ITEM	RESULT	SHEET NO.
(CON'T)	½" DIA. HILTI HVA ADHESIVE ANCHORS, 316 S.S., WITH 4¼" EMBEDMENT IN 3000 psi OR STRONGER CONCRETE	16
	CHAMBER AT PRIMARY CLARIFIERS	
DIMENSIONS & CRITERIA		17 TO 18
WALL THICKNESS & STIFFENERS	0.50 in THICK INCLUDING LINER WITH 4 STIFFENERS EQUALLY SPACED WITH CROSS-SECTION AS SHOWN ON SHEET 18	18 TO 23
STACK WALL	3/16 in. THICK INCLUDING LINER	23
STANDARD ANCHOR LUG	(SUMMARY ON SHEET A-6)	A-1 TO A-6

REGISTERED PROFESSIONAL ENGINEER
MICHAEL W. DUNCAN
NO. 30374
EXP 3/31/92
CIVIL
STATE OF CALIFORNIA
2/24/89

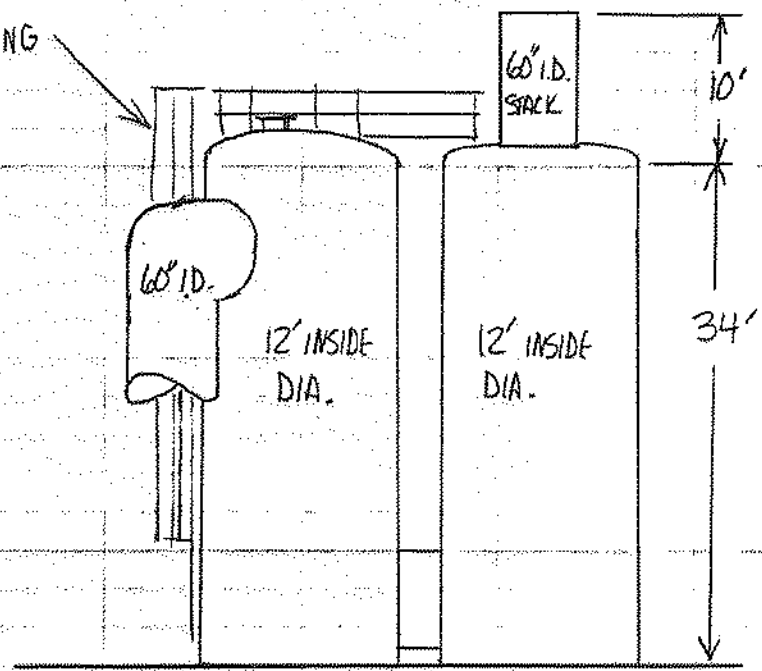
DURHAM, OR | M. Dunlap 9-23-89 | SHEET 1

REACTOR CHAMBERS AT SOLIDS HANDLING

DIMENSIONS



PLAN



ELEVATION

DESIGN CRITERIA

1 PSIG INTERNAL PRESSURE

100 M.P.H. WIND LOAD

SEISMIC ZONE II, UBC

CONCENTRATED TOP LOAD: COMPUTE AT 100 PSF PLUS DEAD LOAD

ASTM C582

NBS PS 15-69

ASTM C581

ASTM D3299

DESIGN ELEMENT: TOP DOME THICKNESS

LOADING: 250 LB. CONCENTRATED LOAD (AS PER ASTM D3299 6.2.1)

FAILURE MODES: EXCESSIVE MEMBRANE STRESS, BENDING STRESS, OR DEFLECTION

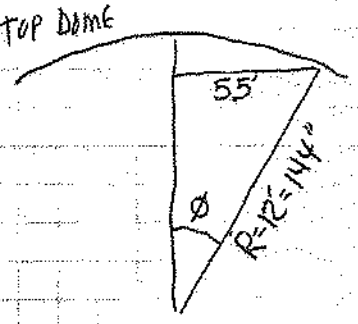
ASTM D3299 SEC. 6.2.1: TOP HEAD SHALL BE ABLE TO SUPPORT A SINGLE 250 lbf LOAD ON A 4 in. BY 4 in. AREA WITHOUT DAMAGE AND WITH A MAXIMUM DEFLECTION OF $\frac{1}{2}$% OF THE TANK DIA. AT THE AREA THE LOAD IS APPLIED.

THE READILY AVAILABLE STRESS & STRAIN ANALYSIS THAT I WILL USE, IS BASED ON A ROUND AREA RATHER THAN SQUARE;

MATCHING PERIMETERS OF AREA, DIA. OF AREA $= \frac{\text{PERIMETER}}{\pi} = \frac{4(4\text{in})}{\pi} = 5.09$ in

LET RADIUS OF AREA $= r_0 = \frac{5.09}{2} = 2.55$ in.

THEN FOLLOWING THE ANALYSIS FOR A PARTIAL SPHERICAL SHELL OF FORMULAS FOR STRESS & STRAIN, 5TH ED., ROARK & YOUNG, p. 476,



$\phi = \arcsin\left(\frac{5.5}{12}\right) = 27.3°$

APPLICABILITY REQUIREMENT: $\phi > \arcsin\left(1.65\sqrt{\frac{t}{R}}\right)$

ASSUME $t = 0.38"$

$\arcsin\left(1.65\sqrt{\frac{0.38}{144}}\right) = 4.9°$ ← O.K. HERE

ASSUMING $t = 0.38"$

$0.5t = 0.5(0.38in) = 0.19in < r_o = 2.55in$; SO $r_o' = r_o = 2.55in$

$\mu = r_o'\left[\frac{12(1-\nu^2)}{R^2t^2}\right]^{\frac{1}{4}} = 2.55in\left[\frac{12[1-(0.3)^2]}{(144in)^2(0.38in)^2}\right]^{\frac{1}{4}} = 0.627$

WHERE: ν = POISSON'S RATIO = 0.3 (FROM P.P.&G. TABLE OF F.R.P. PROPERTIES)

THEN FOR $\mu \approx 0.6$ { A = 0.386, B = 0.193, C = 0.554 (TABLE OF ROARK & YOUNG, p. 476)

P = LOAD = 250 lb

E = FLEXURAL MODULUS = 1.0×10^6 psi (FOR CONTACT MOLDED F.R.P.; FROM ASHLAND CHEMICAL'S PROPERTIES BOOKLET)

DEFLECTION UNDER LOAD = $\Delta = \frac{APR\sqrt{1-\nu^2}}{Et^2} = \frac{0.386(250lb)(144in)\sqrt{1-(0.3)^2}}{1\times10^6\frac{lb}{in^2}(0.38in)^2}$

$= 0.0918in$

LIMIT = $\frac{1}{2}\%$ OF 144 in. = $0.005(144in) = 0.72in$; O.K. FOR DEFLECTON

MAX. MEMBRANE STRESS = $\sigma = \frac{-BP\sqrt{1-\nu^2}}{t^2} = \frac{-0.193(250lb)\sqrt{1-(0.3)^2}}{(0.38in)^2} = -319$ psi, ↳ COMPRESSIVE

COMPRESSIVE STRENGTH ≈ 15,000 psi (FROM PP&G PROPERTY TABLE)

THEN WITH SAFETY FACTOR OF 5,

ALLOWABLE COMPRESSIVE STRESS = $F_c = \frac{15,000}{5} = 3,000$ psi

COMPRESSIVE MEMBRANE STRESS O.K.

MAX. BENDING STRESS = $f_b = \frac{CP(1+\nu)}{t^2} = \frac{0.554(250\,lb)(1.3)}{(0.38\,in)^2} = 1{,}247\ psi$

BENDING STRENGTH ≈ 20,000 psi (FROM ASHLAND CHEMICAL TABLE)

ALLOWABLE BENDING STRESS = $F_b = \frac{20{,}000\ psi}{5} = 4{,}000\ psi$

BENDING STRESS O.K.

TOP DOME THICKNESS, INCLUDING LINER, AT SOLIDS HANDLING CHAMBER OF 0.38 in. IS MORE THAN ADEQUATE

DESIGN ELEMENT: WALL THICKNESS

LOADING: 1 P.S.I.G. INTERNAL PRESSURE

FAILURE MODE: EXCESSIVE STRAIN

ALLOWABLE HOOP STRESS = $S_H = E_1 Z$ (ASTM D3299 6.1.1)

E_1 = HOOP TENSILE MODULUS = 3×10^6 psi (FROM MATERIAL TESTS OF CALVERT MAT'L INCLUDING LINER)

Z = ALLOWABLE STRAIN = 0.0010 (ASTM D3299 6.1.2)

$S_H = 3 \times 10^6\ psi\ (0.001) = 3{,}000\ psi$

$t = \frac{PD}{2S_H} = \frac{1\ \frac{lb}{in^2}\ (144\,in)}{2\ (3{,}000\ \frac{lb}{in^2})} = 0.024\,in$ (ASTM D3299 6.1.4)

$t_{MIN\ INCLUDING\ LINER} = 0.024\,in$

DESIGN ELEMENT: WALL THICKNESS

LOADING: 100 M.P.H WIND LOAD

FAILURE MODE: BUCKLING UNDER EXTERNAL PRESSURE

DESIGN WIND PRESSURE = $p = C_e C_q q_s I$ (UNIFORM BUILDING CODE SEC. 2311)

WHERE: C_e = HEIGHT, EXPOSURE, & GUST FACTOR ; FOR WORSE EXPOSURE (C)

$C_{e\ 0\ TO\ 20\ FT} = 1.2$ (UBC TABLE 23G)

$C_{e\ 20\ TO\ 40\ FT} = 1.3$

C_q = PRESSURE COEFFICIEN = 0.8 (UBC TABLE 23-H, 4.c.)

q_s = WIND STAGNATION PRESSURE = 26 PSF (UBC TABLE 23-F)

I = IMPORTANCE FACTOR = 1.0 (UBC 2311 (h))

$P_{0\ TO\ 20\ FT.} = 1.2\ (0.8)(26\ PSF)(1.0) = 25\ PSF$ OR $0.174\ psi$

$P_{20\ TO\ 40\ FT} = 1.3\ (0.8)(26\ PSF)(1.0) = 27\ PSF$ OR $0.188\ psi$

ASSUME $t = 0.38\ in$ AND 1 STIFFENER AT MIDHEIGHT

WALL LENGTH = $l = \frac{34'}{2} = 17' = 204\ in.$

LET D_o = OUTSIDE DIAMETER = 144.76 in.

$\frac{l}{D_o} = \frac{204}{144.76} = 1.41$ $\qquad$ $\frac{D_o}{t} = \frac{144.76}{0.38} = 381$

THEN USING A 3-DIMENSIONAL GRAPH FOR COLLAPSING PRESSURE, BASED ON ASME PRESSURE VESSEL CODE, APPENDIX V OF SECTION VIII, AS PRESENTED IN CORROSION-RESISTANT PLASTIC COMPOSITES IN CHEMICAL PLANT DESIGN, JOHN MALLINSON, 1988, FIG. 7.12, p. 276,

FOR $\frac{L}{D_o} = 1.41$, $\frac{D_o}{t} = 381$, AND $E = 1.5 \times 10^6$ psi, (FROM MATERIAL TESTS OF CALVERT MATERIAL INCLUDING LINER, FLEXURAL MODULUS $= 1.5 \times 10^6$ psi)

$B = 450$ psi (FROM THE FIG. 7.12)

COLLAPSING PRESSURE $= P = \frac{B}{\left(\frac{D_o}{t}\right)} = \frac{450 \text{ psi}}{381} = 1.18$ psi

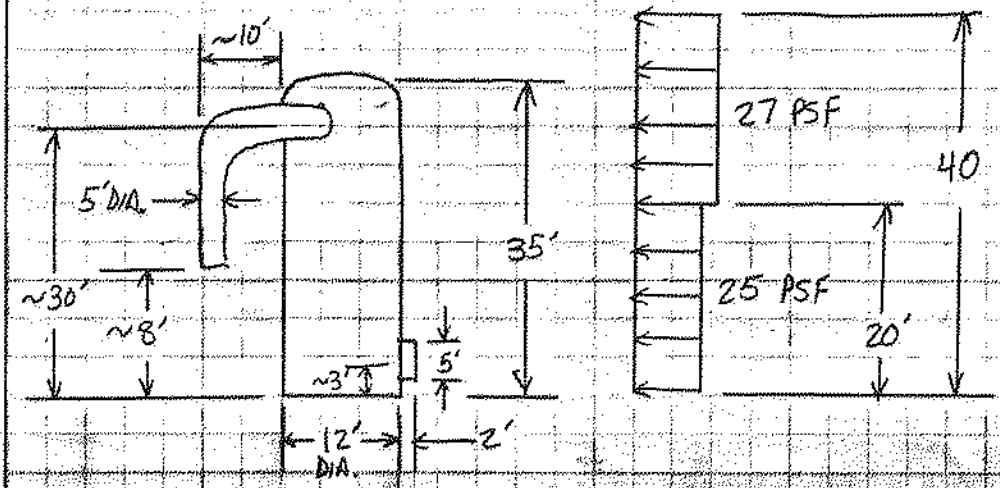
ALLOWABLE EXTERNAL PRESSURE $= \frac{P}{\text{SAFETY FACTOR}} = \frac{1.18 \text{ psi}}{5} = 0.236 \text{ psi} > 0.188 \text{ psi}$ ($P_{20 \text{ TO } 40 \text{ FT}}$)

$t = 0.38''$ INCLUDING LINER WITH ONE STIFFENER AT MIDHEIGHT O.K. HERE

DESIGN ELEMENT: WALL THICKNESS

LOADING: 100 M.P.H. WIND

FAILURE MODE: BUCKLING UNDER BENDING



STAGE I CHAMBER

BENDING MOMENT AT BASE $= M_{BASE} = 27 \frac{\text{lb}}{\text{ft}^2}\left[12\text{ft}(15\text{ft})(27.5\text{ft}) + 5(10)(30) + 5(10)(25)\right]$
$+ 25 \frac{\text{lb}}{\text{ft}^2}\left[12(20)(10) + 5(2)(3) + 5(12)\left(\frac{8+20}{2}\right)\right]$

$M_{BASE\ STAGE\ I} = 289{,}650 \text{ ft-lb} = 3.48 \times 10^6 \text{ in-lb}$

A SIMILAR CALC. FOR THE STAGE II CHAMBER YIELDS: $M_{BASE\ STAGE\ II} = 245{,}753$ ft-lb.

I'LL USE THE LARGER $M_{\text{BASE STAGE I}}$ TO DESIGN BOTH CHAMBERS.

FOR A THIN TUBE UNDER BENDING,

$$t_{MIN} = \sqrt{\frac{Mn(1-\nu^2)}{KEr}}$$

(FROM FORMULAS FOR STRESS & STRAIN 5TH ED, ROARK & YOUNG, p.555)

WHERE: t_{MIN} = MINIMUM WALL THICKNESS INCLUDING LINER

M = BENDING MOMENT

n = SAFETY FACTOR = 5

ν = POISSON'S RATIO = 0.3 (P.P.&G. PROPERTY TABLE)

K = COEFFICIENT; I'LL USE $K = K_{MIN} = 0.72$ (ROARK & YOUNG, p.555)

E = FLEXURAL MODULUS = 1.5×10^6 psi (MAT'L. TESTS OF CALVERT MAT'L. INCLUDING LINER)

r = RADIUS OF TUBE = 72 in

$$t_{MIN\ BASE} = \sqrt{\frac{(3.48\times10^6\ \text{in-lb})(5)(1-(0.3)^2)}{0.72\,(1.5\times10^6\ \text{lb/in}^2)(72\ \text{in})}} = 0.45\ \text{in}$$

USING THE SKETCH ON SHEET 6,

$$M_{AT\ 6'\ ABOVE\ BASE} = 27\left[12(15)(21.5)+5(10)(24)+5(10)(19)\right]+25\left[12(14)(7)+5(12)(8)\right]$$

$$= 203{,}940\ \text{ft-lb} = 2.45\times10^6\ \text{in-lb}$$

$$t_{MIN\ 6'\ ABOVE\ BASE} = \sqrt{\frac{2.45(5)(0.91)}{0.72(1.5)(72)}} = 0.38\ \text{in}$$

AT 0 TO 6' FROM BASE, 0.45 in. WALL THICKNESS INCLUDING LINER

ABOVE 6', 0.38 in

ITEM: CHAMBER WEIGHTS

(FROM PP&G TABLE)

VERTICAL WALLS = $\pi d \delta \sum \ell t = \pi (144in)(0.07 \frac{lb}{in^3})\left[72in(045\frac{lb}{in}) + 28ft(\frac{12in}{ft})(0.38in)\right]$

$= 5,069\ lb$

TOP DOME = $\frac{\pi}{4} d^2 t \delta = \frac{\pi}{4}\left[14ft(\frac{12in}{ft})\right]^2 (0.38in)(0.07\frac{lb}{in^3}) = 590\ lb$

BOTTOM = $\frac{\pi}{4} d^2 t \delta = \frac{\pi}{4}(144in)^2(0.5in)(0.07\frac{lb}{in^3}) = 570\ lb$

DUCT WORK, LADDER, PIPING, ETC. $\approx 500\ lb$

TOTAL $\approx$ 6,729 lb

I'LL USE 6,700 lb

DESIGN ELEMENT: WALL THICKNESS

LOADING: SEISMIC ZONE II

FAILURE MODE: INSTABILITY UNDER BENDING

TOTAL LATERAL SEISMIC FORCE = $V = ZIKCSW$ (UBC SEC. 2312 (d))

WHERE: Z = ZONE FACTOR $Z_{II} = \frac{3}{8}$

I = OCCUPANCY IMPORTANCE FACTOR = 1.0 (UBC TABLE 23-K)

K = COEFFICIENT = 2.0 (UBC TABLE 23-I 6.)

C = COEF. } $(CS)_{MAX} = 0.14$ (UBC 2312 (d))
S = COEF. }

W = TOTAL DEAD LOAD = 6,700 lb (FROM ABOVE)

$V = ZIKCSW = \frac{3}{8}(1.0)(2.0)(0.14)(6{,}700\,\#) = 704\,\#$

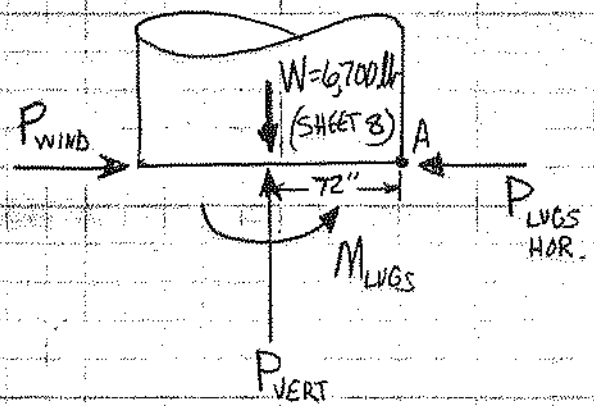
APPLIED AT MID-HEIGHT, $M_{BASE\ SEISMIC} = (704\#)(17') = 11{,}968\,ft\text{-}\# \ll 289{,}650\,ft\text{-}\#$ $M_{BASE\ WIND}$ (SHEET 6)

SEISMIC STRESSES NEGLIGIBLE COMPARED TO WIND STRESSES

DESIGN ELEMENT: NO. OF ANCHOR LUGS

BASE OF CHAMBER:

$M_{BASE} = 3.48 \times 10^6\ in\text{-}\#$ (SHEET 6)



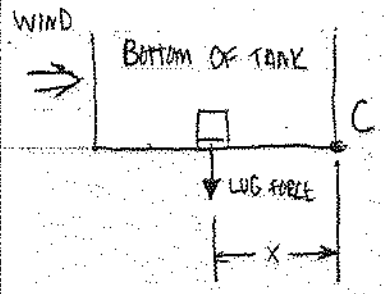
$\Sigma M_A = 0$: $M_{LUGS} = 3.48 \times 10^6\ in\text{-}\# - 6{,}700\,\#(72\,in) = 3.00 \times 10^6\ in\text{-}\#$

I PLAN TO USE $\frac{1}{2}$" THICK OVERLAY ON ANCHOR LUGS,

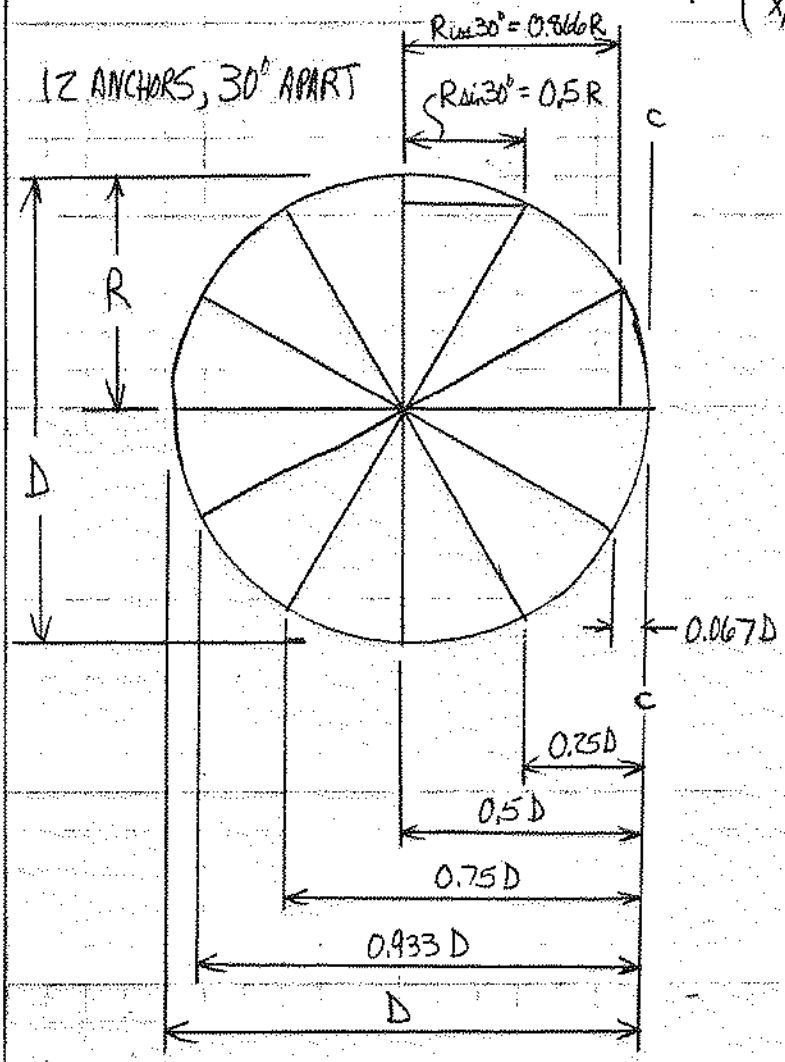
ALLOWABLE VERTICAL FORCE AT LUG = $P_{ALL\ VER} = 9333\,\#\left(\frac{0.5\,in}{1\,in}\right) = 4{,}667\,\#$ (SHEET A-6)

RATIO FOR SELECTING NO. OF ANCHORS $= \left(\frac{M}{PD}\right) = \frac{3.00 \times 10^6\ in\text{-}\#}{4{,}667\,\#(144\,in)} = 4.46$, FROM PAST EXPERIENCE,

THIS INDICATES 12 ANCHORS. I'LL SHOW THAT 12 ARE ADEQUATE.



FOR EACH ANCHOR, IN THE ELASTIC REGION OF DEFORMATION OF ANCHOR LUG & STUD, THE STRAIN, STRESS, & FORCE AT THE ANCHOR IS PROPORTIONAL TO THE DISTANCE x FROM PIVOT LINE C. THE ANCHOR FARTHEST FROM C WOULD HAVE THE MAXIMUM RESISTING FORCE, & THE OTHER ANCHORS WOULD HAVE A FORCE OF $P_i = \left(\frac{X_i}{X_{MAX}}\right) P_{MAX}$.



$$\sum M_{LUG}^{C} = P_{MAX}\, D \left[1 + 2\left(\frac{0.933D}{D}\right)(0.933) + 2(0.75)^2 + 2(0.5)^2 + 2(0.25)^2 + 2(0.067)^2\right]$$

$$\sum M_{LUG}^{C} = P_{MAX}\, D\,(4.50)$$

OR $$P_{MAX} = \frac{M}{4.50\,D}$$

THEN $P_{MAX} = \frac{3.00 \times 10^6 \text{ in-lb}}{4.50(144 \text{ in})} = 4,630 \text{ lb} < P_{ALLOW. VERT.} = 4,667 \text{ lb}$ (SHEET 9)

SO 12 ANCHORS ARE O.K.

USING THE SKETCH ON SHEET 6,

RESULTANT WIND FORCE = $P_{WIND} = 27 \frac{\text{lb}}{\text{ft}^2}\left[12\text{ft}(15\text{ft}) + 5(10) + 5(10)\right]$
$+25\left[12(20) + 5(2) + 5(12)\right] = 15,310 \text{ lb}$

$P_{\substack{LUG \\ HOR}} = \frac{P_{WIND}}{NO. \text{ OF LUGS}} = \frac{15,310 \text{ lb}}{12} = 1,276 \text{ lb}$

$P_{\substack{LUG \\ VERT.}} = P_{MAX} = 4,630 \text{ lb}$

I SELECT HILTI HVA ADHESIVE ANCHOR,

$\frac{5}{8}$" DIA., 316 S.S., WITH $7\frac{1}{2}$" OF EMBEDMENT IN 3,000 psi OR STRONGER CONCRETE

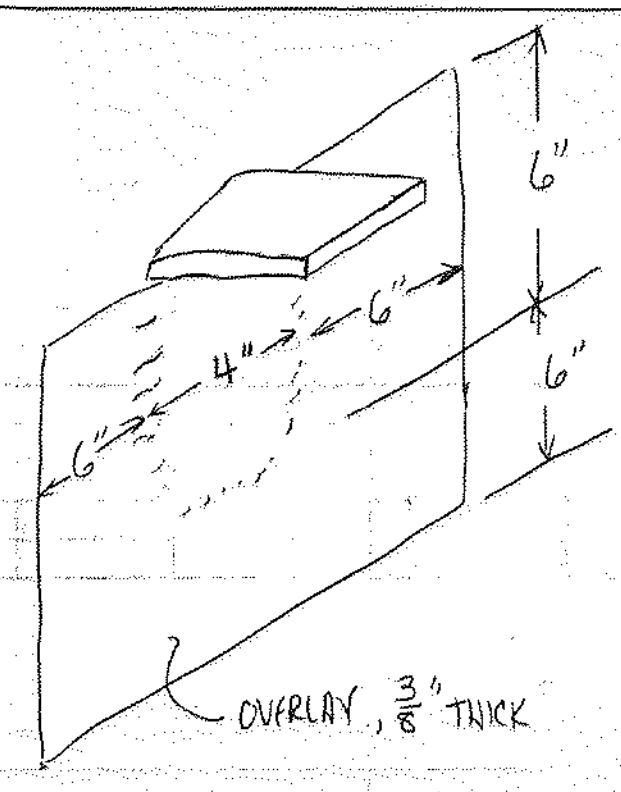
$\frac{P_{SHEAR}}{P_{\substack{SHEAR \\ ALLOW.}}} + \frac{P_{TENSILE}}{P_{\substack{TENS. \\ ALLOW.}}} = \frac{1276 \text{ lb}}{5050} + \frac{4630 \text{ lb}}{6890 \text{ lb}} = 0.92 \leq 1.0$ O.K.

IF THE 20 OF $\frac{3}{4}$" DIA. ANCHOR BOLTS ON 6'-5" RADIUS ARE STILL IN PLACE, USE ALL 20 AND USE SPECIAL ANCHOR LUGS TO MATCH THE BOLT CIRCLE (WITH $\frac{1}{2}$" THICK OVERLAY ON LUGS).

OTHER OPTION: USE 12 OF STANDARD ANCHOR LUGS WITH $\frac{1}{2}$" THICK OVERLAY WITH $\frac{5}{8}$" DIA, 316 S.S. HILTI HVA ADHESIVE ANCHORS WITH $7\frac{1}{2}$" OF EMBEDMENT IN 3,000 psi OR STRONGER CONCRETE.

DESIGN ELEMENT: ATTACHMENT LUG FOR LADDER, ETC.

FAILURE MODE: EXCESSIVE SHEAR STRESS IN F.R.P. OVERLAY



WEAKEST PART OF THE ATTACHMENT LUG IS THE F.R.P. OVERLAY & THE SHEAR PLANES AROUND THE PERIMETER OF THE LUG

MAX. EXPECTED FORCE ON ATTACHMENT LUG $\approx$ 500 lbs

SHEAR STRENGTH OF F.R.P. $\approx$ 8,000 psi (P.P.&G. FRP PROPERTY GUIDELINES)

ALLOWABLE SHEAR STRESS = $\frac{8000 \text{ psi}}{5}$ = 1600 psi = F_s

FOR A RECTANGULAR CROSS-SECTION, SHEAR STRESS = $f_s = \frac{3P_s}{2A}$ OR $P_s = \frac{2AF_s}{3}$

$$P_{s_{ALLOW.}} = \frac{2AF_s}{3} = \frac{2\left(\frac{3}{8}\text{in}\right)\left(6\text{in} + 4\text{in} + 6\text{in}\right)\left(1600 \frac{\text{lbs}}{\text{in}^2}\right)}{3} = 6{,}400 \text{ lbs}$$

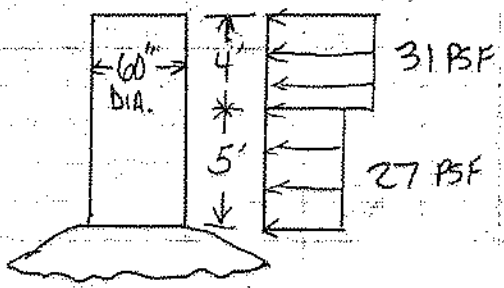
$$P_{s_{ALLOWABLE}} = 6{,}400 \text{ lbs} \gg P_{EXPECTED\ MAX} = 500 \text{ lbs} \quad \text{O.K.}$$

DESIGN ELEMENT: STACK WALL THICKNESS

LOADING: WIND

FAILURE MODE: BUCKLING UNDER BENDING

$P_{40' \text{ TO } 60'} = 1.5\,(0.8)(26\ \text{PSF})(1.0) = 31\ \text{PSF}$ OR $0.215\ \text{psi}$ (UBC 2311)



$M_{\text{STACK BASE}} = 31\ \frac{\text{lb}}{\text{ft}}(5\text{ft})(4\text{ft})(7\text{ft}) + 27\ \frac{\text{lb}}{\text{ft}}(5\text{ft})(5\text{ft})(2.5\text{ft})$

$= 6{,}028\ \text{ft-lb} = 7.23 \times 10^4\ \text{in-lb}$

AS ON SHEET 7,

THEN $t_{MIN} = \sqrt{\dfrac{(7.23\times10^4\ \text{in-lb})(5)(0.91)}{(0.72)(1.0\times10^6\ \frac{\text{lb}}{\text{in}^2})(30\text{in})}} = 0.123\ \text{in} = t_{min}$ INCLUDING LINER

DESIGN ELEMENT: STACK WALL THICKNESS

LOADING: WIND

FAILURE MODE: BUCKLING UNDER EXTERNAL PRESSURE

FLANGE OF STACK MAKE $\ell = 8\text{ft} = 96\ \text{in}$

ASSUME $t = 0.25\ \text{in}$

$\frac{\ell}{D_o} = \frac{96}{60.5} = 1.59$ $\qquad \frac{D_o}{t} = \frac{60.5}{0.25} = 242$

ALSO ASSUME $E = 1.0\times10^6\ \text{psi}$

$B = 530\ \text{psi}$ (FROM MALLINSON, 1988, FIG. 7-12, p. 276)

ALLOWABLE EXT. PRESSURE $= P = \dfrac{B}{n(D_o/t)} = \dfrac{530\ \text{psi}}{5(242)} = 0.438\ \text{psi} > P_{40'\text{-}60'} = 0.215\ \text{psi}$

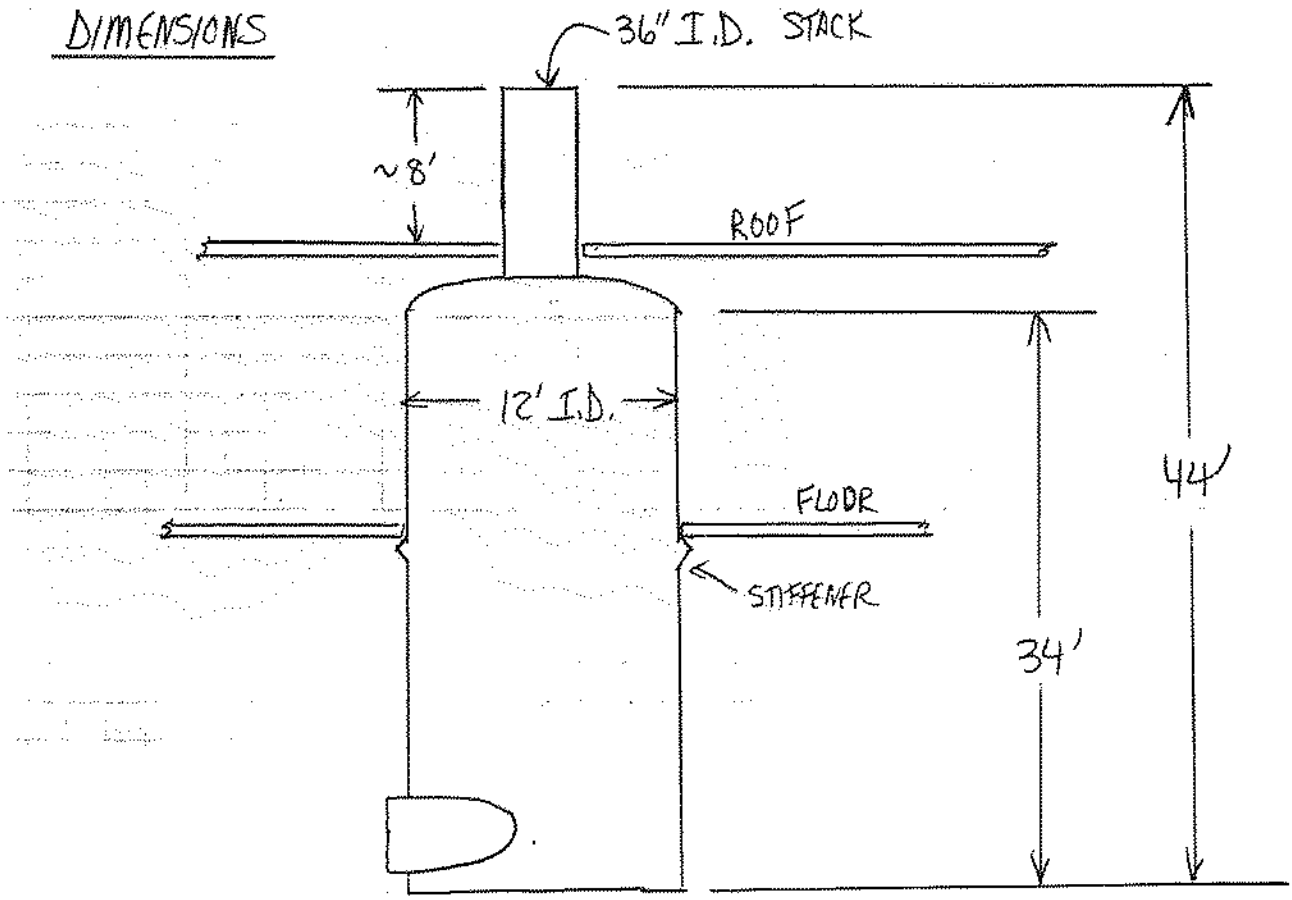
(n = SAFETY FACTOR)

$t = 0.25\ \text{in}$ INCLUDING LINER IS O.K.

REACTOR CHAMBER AT HEADWORKS

42-381 50 SHEETS 5 SQUARE
42-382 100 SHEETS 5 SQUARE
42-389 200 SHEETS 5 SQUARE
NATIONAL

DIMENSIONS



ELEVATION

DESIGN CRITERIA

1 PSIG INTERNAL PRESSURE

100 MPH WIND LOAD ONLY ON 8 FT. OF STACK

SEISMIC ZONE II

CONC. TOP LOAD: 100 PSF + DEAD

ASTM C582

NBS PS 15-69

ASTM C581

ASTM D3299

DESIGN ELEMENT: STACK WALL THICKNESS

LOADING: 100 M.P.H. WIND

FAILURE MODE: BUCKLING UNDER EXTERNAL PRESSURE

$P_{40 \text{ to } 60'} = 31 \text{ PSF} = 0.215 \text{ psi}$ (SHEET 13)

ASSUME $\frac{3}{16}$" THICKNESS

$\frac{\ell}{D_o} = \frac{96 \text{ in}}{36.375} = 2.64$ $\quad \frac{D_o}{t} = \frac{36.375 \text{ in}}{\frac{3}{16} \text{ in}} = 194$

$E = 1.0 \times 10^6 \text{ psi}$; THEN $B = 380 \text{ psi}$ (FROM MALLINSON, 1988, FIG. 7-12, p. 276)

$\text{ALLOW. EXT. PRESS.} = \frac{B}{n\left(\frac{D_o}{t}\right)} = \frac{380 \text{ psi}}{5(194)} = 0.392 \text{ psi} > P_{40 \text{ to } 60'} = 0.215 \text{ psi}$

$t = \frac{3}{16}$" INCLUDING LINER IS O.K. 0.188"

DESIGN ELEMENT: STACK WALL THICKNESS

LOADING: 100 MPH WIND

FAILURE MODE: BUCKLING UNDER BENDING

$M_{\substack{\text{BASE} \\ \text{STACK}}} = 31 \frac{\text{lb}}{\text{ft}^2}(3\text{ft})(8\text{ft})(5\text{ft}) = 3{,}720 \text{ ft-lb} = 44{,}640 \text{ in-lb}$

$t_{MIN} = \sqrt{\frac{44{,}640\,(5)(.091)}{0.72\,(1\times10^6)(18)}} = 0.125 \text{ in} = t_{MIN}$ INCLUDING LINER

MISCELLANEOUS ITEMS FOR HEADWORKS CHAMBER

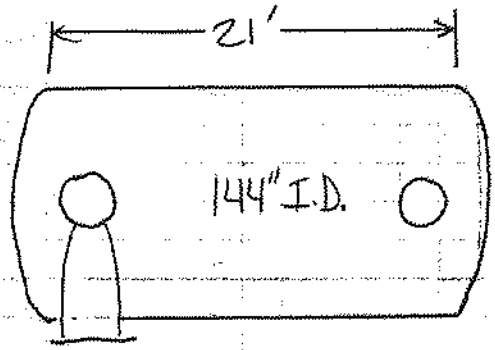
- USE ONE STIFFENER AT FLOOR RESIST CONCRETE POURING.
- USE 4 STANDARD ANCHOR LUGS WITH ½" THICK OVERLAYS, WITH ½" DIA. HILTI HVA ADHESIVE ANCHORS, 316 S.S., WITH 4¼" EMBEDMENT IN 3,000 psi OR STRONGER CONCRETE
- USE 0.38" WALL THICKNESS INCLUDING LINER EVERY WHERE.

(TOP DOME AND ATTACHMENT LUGS ARE SAME AS CALCS. FOR SOLIDS HANDLING ON SHEETS 2, 3, 4, & 12)

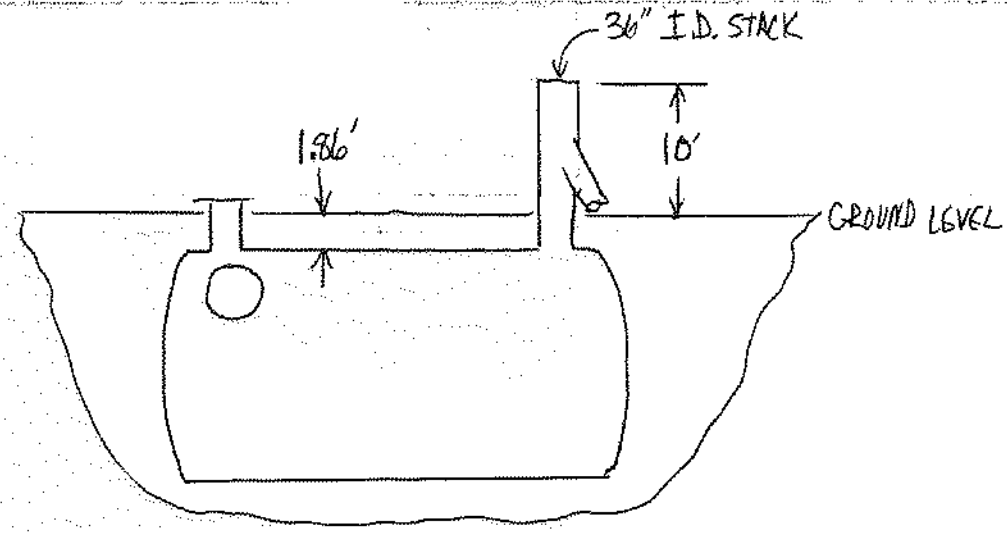
(SEISMIC OVERTURNING MOMENT IS LESS THAN THE RESISTING MOMENT CAUSED BY THE WEIGHT OF THE CHAMBER.)

REACTOR CHAMBER AT PRIMARY CLARIFIERS

DIMENSIONS



PLAN



ELEVATION

DESIGN CRITERIA

ASSHTO H-20 WHEEL LOAD

100 M.P.H. WIND ON STACK

GROUND WATER DEPTH: 2½' DOWN FROM GROUND LEVEL AT SOME SPOTS AT THE SITE

MAX. DEFLECTION FOR EARTH LOADS: 5%

1 PSIG INTERNAL PRESSURE

ASTM C582

NBS PS 15-69

ASTM C581

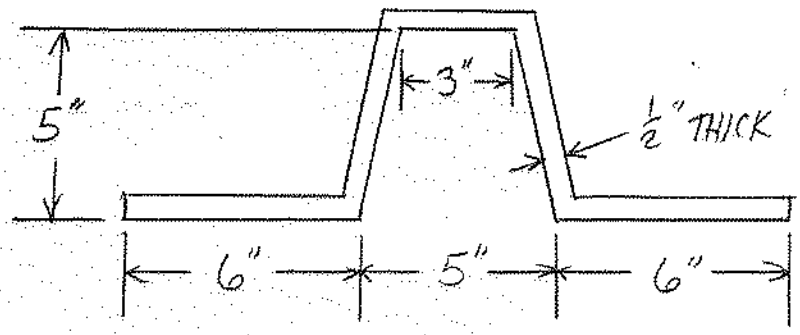
ASTM D3299

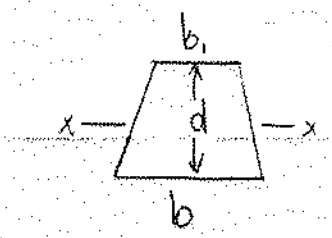
DESIGN ELEMENT: WALL THICKNESS & STIFFENERS

LOADING: EARTH & GROUND WATER LOADS

FAILURE MODE: BUCKLING

PROPOSED STIFFENER





FOR A TRAPEZOID

$$I_{xx} = \frac{d^3(b^2 + 4bb_1 + b_1^2)}{36(b+b_1)}$$

(FROM AISC MANUAL OF STEEL CONSTRUCTION 8TH ED p. 6-22)

FOR OUTER TRAPEZOID, $d = 5.5\,in$, $b = 6\,in$, $b_1 = 4\,in$

$$I_{OUTER} = \frac{(5.5)^3[(6)^2 + 4(6)(4) + (4)^2]}{36(6+4)} = 68.4\,in^4$$

FOR INNER TRAPEZOID, TO "SUBTRACT" FOR HOLLOW AREA: $d = 5"$, $b = 5"$, $b_1 = 3"$

$$I_{INNER} = \frac{(5)^3[(5)^2 + 4(5)(3) + (3)^2]}{36(5+3)} = 40.8\,in^4$$

$$I_{RESULTANT} = I_{OUTER} - I_{INNER} = (68.4 - 40.8)\,in^4 = 27.6\,in^4$$

ALLOWABLE BUCKLING PRESSURE $= q_a = \frac{1}{n_{FS}}\left(32 R_w B' E' \frac{EI}{D_m^3}\right)^{\frac{1}{2}}$

(FROM CORROSION-RESISTANT PLASTIC COMPOSITES IN CHEMICAL PLANT DESIGN, MALLINSON, 1988, p. 216 TO 228; 224)

(THIS METHOD IS BASED ON ANSI/AWWA C950-81 AND ADDENDUM C 950a-83)

WHERE: n_{FS} = DESIGN FACTOR = 2.5 FOR FILAMENT WOUND WALL; FOR STIFFENER USE 5

R_w = WATER BUOYANCY FACTOR $= 1 - 0.33\left(\frac{h_w}{h}\right)$, $0 \le h_w \le h$

h_w = HEIGHT OF WATER SURFACE ABOVE TOP OF PIPE = 0

h = HEIGHT OF GROUND SURFACE ABOVE TOP OF PIPE = 1.86 ft = 22.3 in

B' = EMPIRICAL COEFFICIENT OF ELASTIC SUPPORT $= \frac{1}{1 + 4e^{-0.065H}}$

H = BURIAL DEPTH TO TOP OF PIPE IN FEET = 1.86 ft

$$R_w = 1 - 0.33\left(\frac{0}{h}\right) = 1$$

$$B' = \frac{1}{1 + 4e^{-0.065(1.86)}} = 0.220$$

E' = MODULUS OF SOIL REACTION (BASED ON TYPE OF BACKFILL MATERIAL & DEGREE OF COMPACTION)

E = FLEXURAL MODULUS $\quad E_{WALL} = 1.5 \times 10^6$ psi $\quad E_{STIFFENER} = 1.0 \times 10^6$ psi (FROM MATERIAL TESTS OF CALVERT MATL INCLUDING LINER)

I = MOMENT OF INERTIA PER WIDTH, $\frac{in^4}{in}$

D_m = MEAN DIA. OF TUBE

SOIL INFO: STRUCTURAL FILL & TOPSOIL (FROM CONTRACT DWG.)
EARTH ONLY (2200-3 Fc. OF SPECS.)
95% COMPACTION (2200-7 I3. OF SPECS.)
SANDY SILTS & FINE SANDS (SOILS SUMMARY)
THEN TYPE IS ML OR SM (Table 6.7, Mallinson, 1988)
THEN $E' = 1000$ psi (Table 6.6, Mallinson, 1988)

ASSUME 4 STIFFENERS, EQUALLY SPACED & $t_{WALL} = 0.50''$

$$\text{SPACING} = \frac{21\,ft}{5} = 4.2\,ft = 50.4\,in$$

NEGLECTING STIFFNESS OF WALL, AND ONLY CONSIDERING STIFFENERS,

$$I_{STIFFENERS} = \frac{27.6\,in^4}{50.4\,in} = 0.548\,in^3$$

$$q_{a_{STIF.}} = \frac{1}{n_{FS_{STIF}}}\left(32 R_w B' E' \frac{EI}{D_m^3}\right)^{\frac{1}{2}} = \frac{1}{5}\left[32(1)(0.22)(1000\,psi)\frac{(1\times10^6\,psi)(0.548\,in^3)}{(144.5\,in)^3}\right]^{\frac{1}{2}}$$

$$q_{a_{STIF.}} = 7.15\,psi$$

LOOKING AT WALL ONLY NOW,

$$I = \frac{t^3}{12} = \frac{(0.5\,in)^3}{12} = 0.01042\,in^3$$

$$q_{a_{WALL}} = \frac{1}{2.5}\left[32(1)(0.22)(1000\,psi)\frac{(1.5\times10^6\,psi)(0.01042\,in^3)}{(144.5\,in)^3}\right]^{\frac{1}{2}} = 2.42\,psi = q_{a_{WALL}}$$

NOW FOR THE CALC. OF EXPECTED PRESSURE,

$$\text{PRESSURE TENDING TO CAUSE BUCKLING} = q_t = \gamma_w \cancel{h_w}^{0} + \frac{R_w W_c}{D_m} + \frac{W_L}{D_m}$$

WHERE: γ_w = SPECIFIC WT. OF WATER

h_w = HT. OF WATER ABOVE PIPE = 0

$W_c = \frac{\gamma_s H D_o}{144}$ = VERTICAL SOIL LOAD, lb/in

γ_s = SPECIFIC WT. OF SOIL = 120 $\frac{lb}{ft^3}$ (ASSUMED)

$W_L = \frac{C_L P (1+I_f)}{12}$ = LIVE LOAD ON PIPE, lb/in

ASSUMING 1 TRUCK,

$$C_L = \frac{1}{3} - \frac{2}{3\pi} \arcsin\left[H \sqrt{\frac{(R)^2+(H)^2}{(R^2+H^2)(H^2+1.5^2)}} \right] + \frac{RH\left[\frac{1}{(R^2+H^2)} + \frac{1}{(H^2+1.5^2)}\right]}{\pi \sqrt{R^2+H^2+1.5^2}}$$

R = PIPE RADIUS, ft = 6 ft

H = EARTH COVER, ft = 1.86 ft

$$C_L = \frac{1}{3} - \frac{2}{3\pi} \arcsin\left[1.86 \sqrt{\frac{6^2+1.86^2+1.5^2}{[6^2+1.86^2][1.86^2+1.5^2]}} \right] + \frac{6(1.86)\left[\frac{1}{6^2+1.86^2} + \frac{1}{1.86^2+1.5^2}\right]}{\pi \sqrt{6^2+1.86^2+1.5^2}}$$

$C_L = 0.247$

P = WHEEL LOAD = 16,000 lb (MERRITT p. 23-1 & STD. HANDBOOK FOR CIVIL ENGR, MERRITT Fig 17-3, p. 17-4)

I_f = IMPACT FACTOR = $0.766 - 0.133H$ $(0 \le I_f \le 0.50)$

$0.766 - 0.133(1.86) = 0.52$, SO $I_f = 0.50$; D_o = OUTSIDE DIA. = 145 in

$$W_c = \frac{\gamma_s H D_o}{144} = \frac{120(1.86)(145)}{144} = 225 \ \#/in$$

$$W_L = \frac{C_L P(1+I_f)}{12} = \frac{0.247(16{,}000)(1.5)}{12} = 494 \ \#/in$$

THEN FINALLY

PRESSURE CAUSING BUCKLING $= q_T = \dfrac{R_w W_c + W_L}{D_m} = \dfrac{1(225 \ \#/in) + 494 \ \#/in}{144.5 \ in} = 4.98 \ psi$

$q_T = 4.98 \ psi < q_{a\ STIF.} = 7.15 \ psi$ OK. HERE.

DESIGN ELEMENT: WALL THICKNESS & STIFFENERS

LOADING: EARTH, ETC.

FAILURE MODE: EXCESSIVE DEFLECTION

MAX. DEFLECTION $= 0.05 D_m = 0.05(144.5_{in}) = 7.23 \ in$

VERTICAL PIPE DEFLECTION (in) $= \Delta = \dfrac{(D_L W_c + W_L) K_x r^3}{E_F I + 0.061 K_n E' r^3} + \Delta_q$ (MALLINSON, 1986, p. 214)

WHERE: D_L = DEFLECTION LAG FACTOR = 2.0 (MALLINSON, TABLE 6.2)

K_x = DEFLECTION COEFFICIENT = 0.103 (TABLE 6.5)

r = MEAN RADIUS = 72.25 in

E_F = HOOP FLEXURAL MODULUS = 1.5×10^6 psi FOR WALL

I = MOMENT OF INERTIA OF WALL PER WIDTH, in^4/in

K_a = FACTOR = 0.75

Δa = FACTOR = 0

} (p.233)

$$\Delta = \frac{\left(2.0\,(225) + 494\right)(0.103)\left(72.25_{in}\right)^3}{(1.5\times10^6)(0.01042) + 0.061\,(0.75)(1000)(72.25)^3} + 0$$

$\Delta = 2.12\,in < \Delta_{MAX} = 7.23\,in$ O.K.

DESIGN ELEMENT: STACK WALL THICKNESS

LOADING: WIND

FAILURE MODE: BUCKLING WHEN BENDING OR EXT. PRESSURE

I PROPOSE $t = \frac{3}{16}"$.

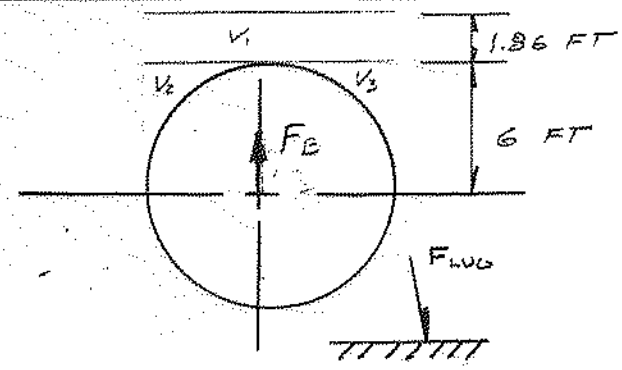
EXTERNAL PRESSURE = 0.174 psi, NO PROBLEM, AS SHOWN ON SHEET 15 OK.

BENDING

$$M_{BASE\ STACK} = 25\,\frac{lb}{ft^2}(3ft)(10ft)(5+1.86)ft = 5{,}145\,ft\text{-}lb = 61{,}740\,in\text{-}lb$$

$$t_{MIN} = \sqrt{\frac{61{,}740(5)(.091)}{0.72\,(10^6)(18)}} = 0.147\,in < 0.188\,in \quad OK.$$

$\frac{3}{16}"$ INCLUDING LINER O.K.



BUOYANT FORCE UPWARD:

FROM ARCHIMIDIES PRINCIPLE, THE UPWARD FORCE IS EQUAL TO THE WEIGHT OF DISPLACED FLUID.

$F_{UPWARD} = V_{DISPLACED} \cdot \rho_{FLUID} - W_{TOPSOIL}$ WHERE:

$\therefore F_B = V_{VESSEL} \cdot 62.4\ lb/ft^3$

$= (\pi \cdot 6^2 \cdot 22)(62.4) = \underline{155259.89\ lb}$

$\rho_{FLUID} = 62.4\ lb/ft^3$

$W_{TOPSOIL} = 120\ lb/ft^3$ (FROM SHEET 21)

$V_{TOPSOIL} = V_1 + V_2 + V_3$

$= [12 \cdot 1.86 \cdot 22] - 2[\pi \cdot 6^2 \cdot .5 \cdot 22]$

$=$

$W_S = \frac{W}{V} \cdot V$

$= (120)(830.97) = \underline{99716.4\ lb}$

NEGLECTING WEIGHT OF VESSEL;

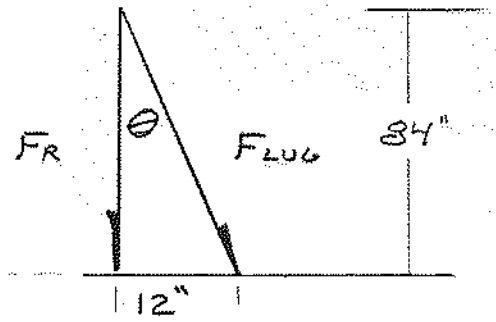
$F_{UPWARD} = F_{BUOYANT} - W_S$

$= 155259.89 - 99716.4$

$= \underline{55543.49\ lb}$

USING 8 LUGS, THE REACTION FORCE IS;

$\boxed{F_R = 6942.94\ lb}$



$\theta = \tan^{-1} \frac{12}{84}$

$= 8.13°$

FROM THIS; THE FORCE PER LUG IS

$F_{LUG} = F_R / \cos\theta$

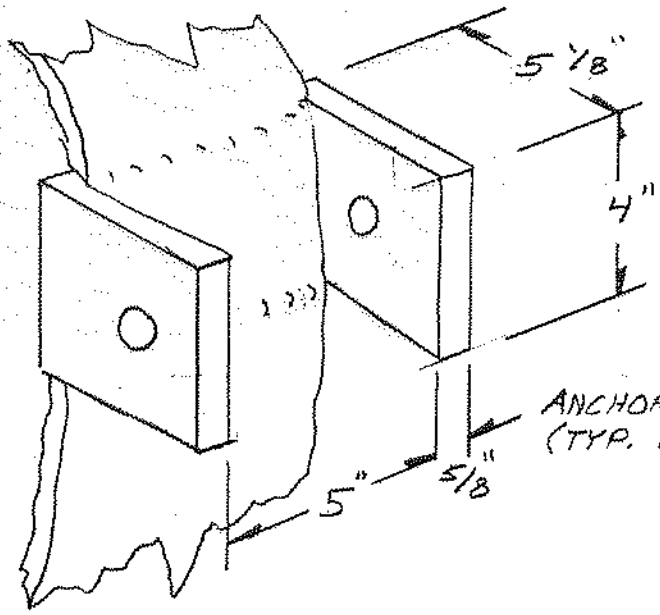
$= 6942.94 / \cos(8.13)$

$= 7013.42$ lb

FROM THIS, I SELECT 1 1/4" GALV C.S. WELDED EYERODS AND TURNBUCKLES.

L = ALLOWABLE LOAD = 8000 lb

[FROM SECTION 2, ITEM 42 & 43]



MAXIMUM EXPECTED FORCE PER LUG IS 7013.42 lb (FROM SHEET 25)

SHEAR STRENGTH OF FRP = 8000 psi (FROM PP46 FRP PROPERTY GUIDELINES)

F_S = SHEAR STRESS ALLOWABLE

$= \frac{8000}{5} = 1600$ psi

FOR A RECTANGULAR CROSS SECTION

$$\text{SHEAR STRESS} = P_s = \frac{2 \cdot A \cdot f_s}{3}$$

FROM THIS;

$$P_{s,\text{ALLOWABLE}} = \frac{2}{3}(1600\text{ psi}) \cdot (2.5) \cdot (3/4)$$

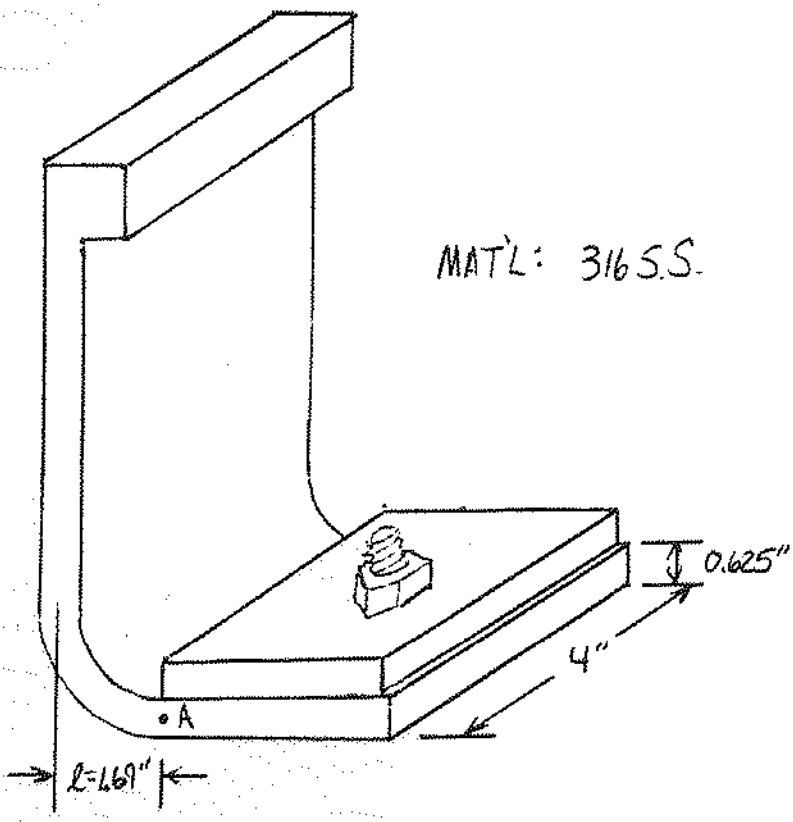
$$\boxed{= 8000 \text{ lb}}$$ OK HERE

USING 3/4" THICK OVERLAY IS ADEQUATE.

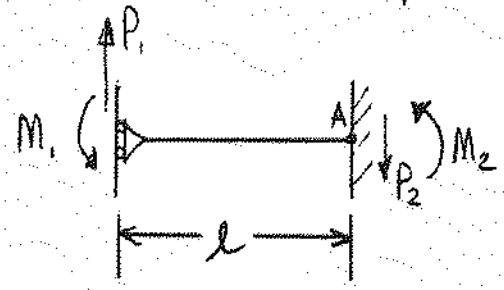
DESIGN ELEMENT: ANCHOR LUG ALLOWABLE CAPACITY

FAILURE MODE: BENDING STRESS YIELDING

ANCHOR LUG:



MAT'L: 316 S.S.



$\Sigma F_{VERT.} = 0$: $P_1 = P_2 = P_o$

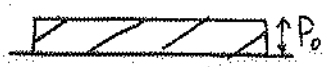
SYMMETRY: $M_1 = M_2 = M_o$

$+\circlearrowleft \Sigma M_A = 0$: $P_o \ell - M_o - M_o = 0$

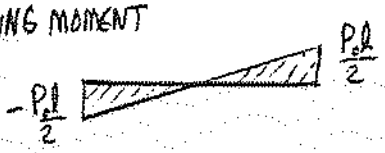
$P_o \ell = 2M_o$

$M_o = \frac{P_o \ell}{2}$

SHEAR



BENDING MOMENT



$\Rightarrow M_{MAX} = M_c = \frac{P_o \ell}{2}$

OR $P_{CAPACITY} = \frac{2 M_{CAPACITY}}{\ell}$

FOR 316 S.S., $F_y = 42{,}000$ psi (A.I.S.I. DESIGN GUIDELINES FOR STAINLESS STEEL)

ALLOWABLE BENDING STRESS $= F_b = 0.66 F_y$ (A.I.S.C. 1.5.1.4.1)

$= 0.66(42{,}000 \text{ psi}) = 27{,}720$ psi

SECTION MODULUS $= S = \frac{bh^2}{6} = \frac{4\text{in}(0.625\text{in})^2}{6} = 0.260\text{ in}^3$

$M_{CAPACITY} = F_b S = 27{,}720 \frac{\text{lb}}{\text{in}^2}(0.260\text{in}^3) = 7{,}207$ in-lb

$P_{CAPACITY} = \frac{2M_{CAP.}}{L} = \frac{2(7207\text{ in-lb})}{1.69\text{ in}} = 8{,}530$ lb

HORIZONTAL & VERTICAL DIMENSIONS OF THE RADIUS OF THE LUG ARE VERY SIMILAR, SO

VERTICAL CAPACITY ACCORDING TO BENDING STRESS $= P_{b}^{VERT} =$ HORIZONTAL CAPACITY ACCORDING TO BENDING STRESS $= P_{b}^{HOR} = 8{,}530$ lb

DESIGN ELEMENT: ANCHOR LUG ALLOWABLE CAPACITY

FAILURE MODE: TENSILE STRESS YIELDING

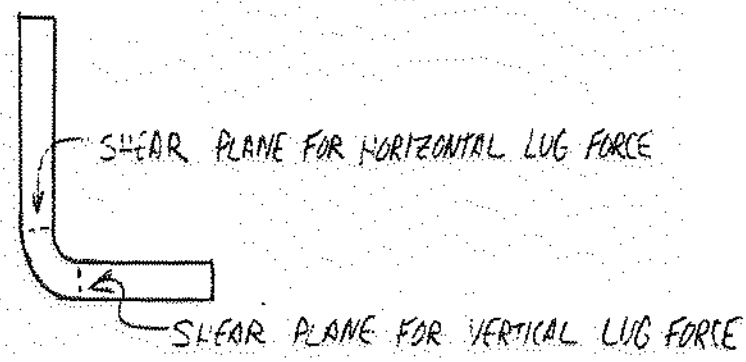
$F_t = 0.6 F_y = 0.6(42{,}000 \text{ psi}) = 25{,}200$ psi (A.I.S.C. 1.5.1.1)

$P_t = F_t A = 25{,}200 \frac{\text{lb}}{\text{in}^2}(4\text{in})(0.625\text{in}) = 63{,}000$ lb

$P_{t}^{VERT} = P_{t}^{HOR} = 63{,}000$ lb

DESIGN ELEMENT: ANCHOR LUG ALLOWABLE CAPACITY

FAILURE MODE: SHEAR STRESS YIELDING



FOR A RECTANGULAR CROSS SECTION, SHEAR STRESS $= f_s = \frac{3P_s}{2A} \Rightarrow P_s = \frac{2Af_s}{3}$

WHERE: P_s = SHEAR FORCE

A = CROSS-SECTIONAL AREA $= (0.625\text{in})(4\text{in}) = 2.5\ \text{in}^2$

$F_s = 0.4\,F_y = 0.4(42{,}000\ \text{psi}) = 16{,}800\ \text{psi}$ (A.I.S.C. 1.5.1.2)

$P_{s_{MAX}} = \frac{2AF_s}{3} = \frac{2(2.5\text{in}^2)(16{,}800\ \text{lb/in}^2)}{3} = 28{,}000\ \text{lb}$

$$P_{s_{VERT}} = P_{s_{HOR}} = 28{,}000\ \text{lb}$$

DESIGN ELEMENT: ANCHOR LUG ALLOWABLE CAPACITY

FAILURE MODE: BEARING STRESS YIELDING AT STUD

ALLOWABLE BEARING STRESS $= F_p = 0.90\,F_y$ (A.I.S.C. 8TH ED., 1.5.1.5.1)

$= 0.90(42{,}000\ \text{psi})$

$F_p = 37{,}800\ \text{psi}$

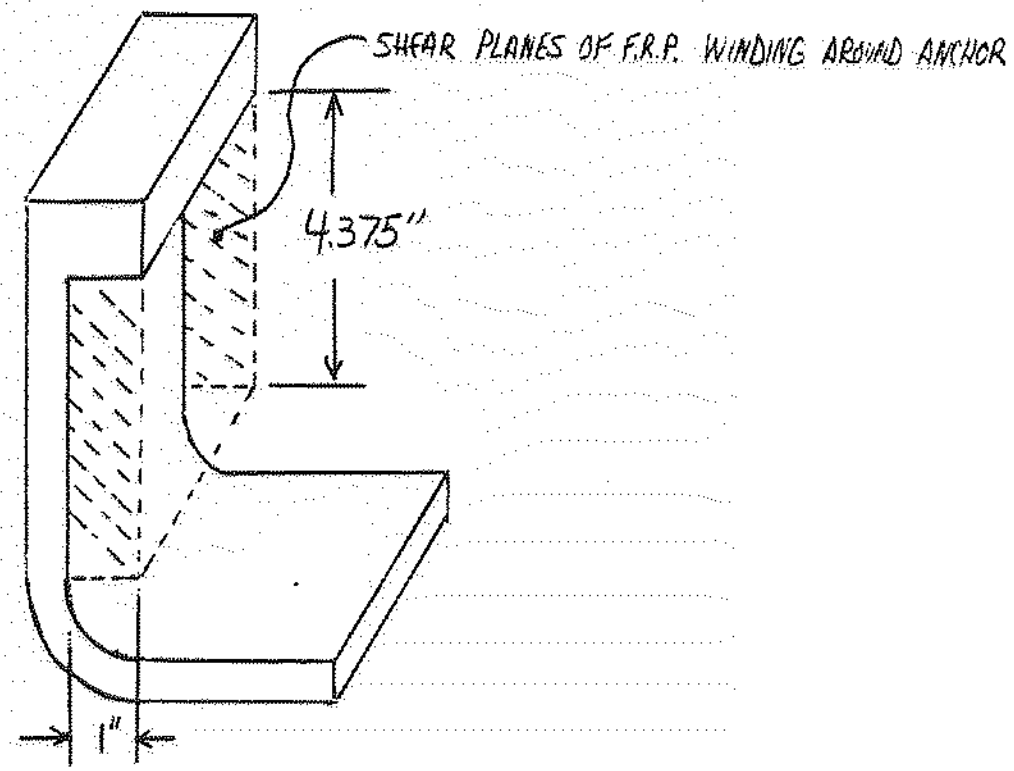
$P = F_p A$

A = LUG THICKNESS × STUD DIA = td ; t = 0.625 in

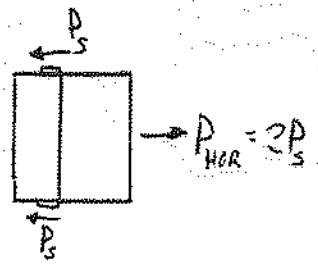
STUD DIA., d	$P_{HOR\ BEARING} = F_p td$ (lb)
3/8"	8,859
1/2"	11,813
5/8"	14,766
3/4"	17,719
7/8"	20,672

DESIGN ELEMENT: ANCHOR LUG ALLOWABLE CAPACITY

FAILURE MODE: SHEAR STRESS YIELDING OF FIBERGLASS REINFORCED PLASTIC

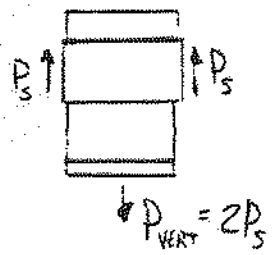


HORIZONTAL SHEAR:



TOP VIEW

VERTICAL SHEAR:



SIDE VIEW

BOTH HOR. & VERT. CASES ARE DOUBLE SHEAR & BOTH HAVE THE SAME CROSS-SECTIONAL AREA.

FOR A RECTANGULAR CROSS-SECTION, SHEAR STRESS = $f_s = \frac{3P_s}{2A}$ OR $P_s = \frac{2Af_s}{3}$

SHEAR STRENGTH OF F.R.P. $\approx$ 8,000 psi. (P.P.&G. FRP PROPERTY GUIDELINES)

ALLOWABLE SHEAR STRESS = $F_{s_{FRP}} = \frac{\text{SHEAR STRENGTH}}{\text{SAFETY FACTOR}} = \frac{8000\,psi}{5} = 1{,}600\,psi$

$$P_{s_{ALLOW.}} = \frac{2AF_s}{3} = \frac{2(1in)(4.375in)(1600\,lb/in^2)}{3} = 4667\,lb$$

$$P_{HOR} = P_{VER} = 2P_s = 2(4667\,lb) = 9333\,lb$$

$$P_{VERT_{FRP\,S}} = P_{HOR_{FRP\,S}} = 9{,}333\,lb$$

SUMMARY OF ANCHOR ALLOWABLE CAPACITIES

FAILURE MODE	VERTICAL DIRECTION	HORIZONTAL DIRECTION
BENDING	8,530 lb	8,530 lb
TENSILE	63,000 lb	63,000 lb
SHEAR	28,000 lb	28,000 lb
BEARING	(NOT APPLICABLE)	STUD DIA.
		3/8" 8,859 lb
		1/2" 11,813 lb
		5/8" 14,766 lb
		3/4" 17,719 lb
		7/8" 20,672 lb
F.R.P. ATTACHMENT SHEAR	9,333 lb	9,333 lb
OVERALL MINIMUM CAPACITIES	**8,530 lb**	**8,530 lb**

SECTION 2
SCRUBBER LAYOUT DRAWINGS

A.	Drawing M01:	Process Flow Diagram
B.	Drawing A01:	12' Dia. CALVERT Odor Control Scrubber - OS-354 Headworks
C.	Drawing A02:	Parts List
D.	Drawing A03:	12' Dia. CALVERT Odor Control Scrubber - OS-701 Stage I - Solids Handling Building
E.	Drawing A04:	Parts List
F.	Drawing A05:	12' Dia. CALVERT Odor Control Scrubber - OS-702 Stage II - Solids Handling Building
G.	Drawing A06:	Parts List
H.	Drawing A07:	Ladder and Platform Assembly - Solids Handling Building
I.	Drawing A08:	12' Dia. CALVERT Odor Control Scrubber - OS-402 Primary Sludge Pumping Station
J.	Drawing A09:	Parts List
K.	Drawing D01:	Sloped Bottom & pH Probe Trap
L.	Drawing D02:	Support Lug & Dome Cover
M.	Drawing D03:	Lifting Lug & Anchor Lug
N.	Drawing D04:	Manway
O.	Drawing D05:	Spray Nozzleway & Spray Nozzle Flange
P.	Drawing D06:	Bottom Knuckle & Inlet & Outlet
Q.	Drawing D07:	Spray Nozzle & Sample Port
R.	Drawing D08:	Anchor Bolt & Stiffener
S.	Drawing D09:	Anchor Lug (OS-402)
T.	Material Data Sheets	
U.	Anchor Bolt Cut Sheets	

OUTLET
CLEAN AIR

LOCATE ON STACK PER PLANS & DETAIL C/702

3/4
1/2" PVC CHEMICAL LINE

1" WATER

HARD WATER IN

INSTALLATION CONTRACTOR SHALL PROVIDE ALL INTERCONNECTING PIPING

AUTOMATIC DUPLEX WATER SOFTENER SYSTEM

SEE SECTION 5

TO OS 402
(NOT SHOWN)

351

352

pH

pH

CALVERT

OS-354

OS-701, OS-702 & OS-402
NOT SHOWN

3" AIR LINE CONNECTION

1/2" CONNECTION

NaOH STORAGE DRUM

TO NaOCl STORAGE TANK ST-355

INLET
FOUL GAS

INCOMING
480V
3ϕ
60HZ

BOX

pH PROBE, TRAP & JUNCTION BOX

SEE DETAIL 4/809

pH SIGNAL
8-WIRE SHIELDED

CHEMICAL DILUTION AND ELECTRICAL CONTROL SYSTEM

SEE SECTION 3 & 4

REACTION CHAMBER SYSTEMS

SEE SECTION 2

BLOWER SYSTEM

NOTES:

1. INSTALLATION CONTRACTOR TO PROVIDE AND INSTALL ALL INTER-CONNECTING WIRING, PIPE, FITTINGS AND APPURTANANCES.
2. SEEINDIVIDUAL EQUIPMENT SECTION FOR DETAILS.

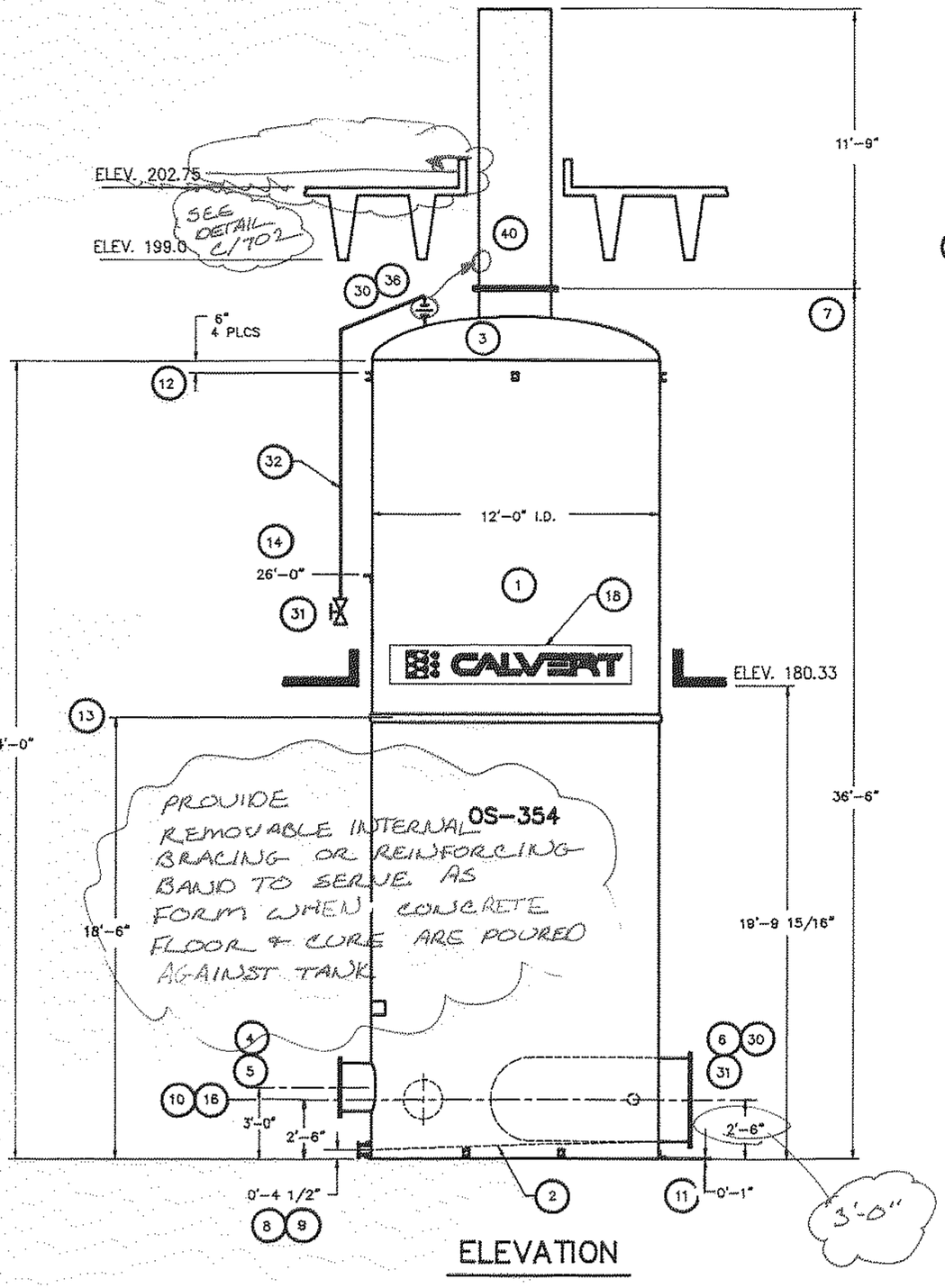
CALVERT

DURHAM ODOR CONTROL
PROCESS DIAGRAM

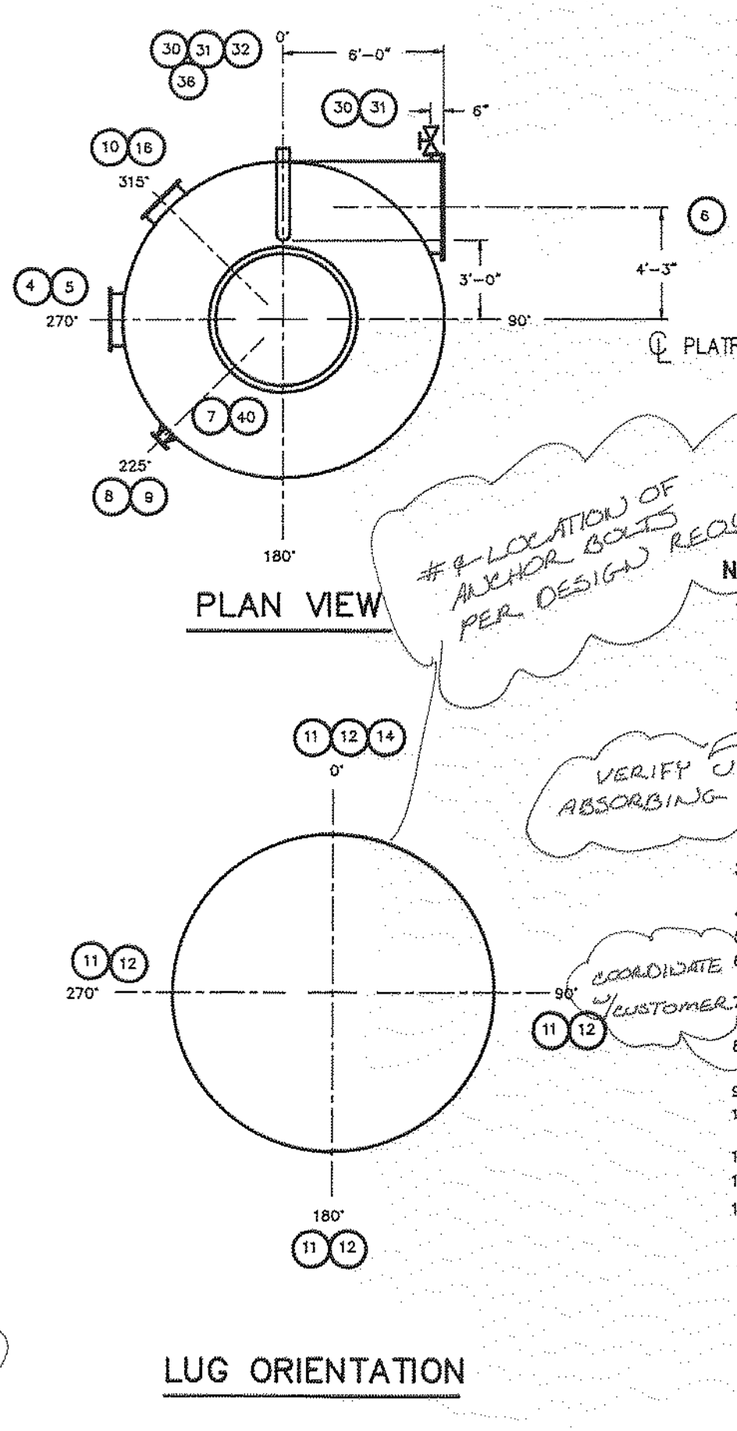
DRAWN BY: D. CHARTARSKY
CHKD: J.A. HARBER
PROJ ENGR:
APPROVED BY:
DATE: OCT. 3, 1989
PROJECT: 1181
DRAWING: M01

FILE: 1181M01

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ELEVATION



PLAN VIEW

LUG ORIENTATION

NOTES:

1. DESIGN CRITERIA:
   SEIMIC: ZONE 2
   WIND LOAD: 100 MPH (ON EXHAUST STACK)
   PRESSURE: 1 PSI Also TO -5" H_2O
2. RESIN: HETRON 922 .
   SURFACING VEIL: 10 MIL "C" GLASS (1 PLY)
   1.5 OZ. Sq. ft. CHOPPED STRAND
   ELECTRICAL GRADE (2 PLY)
   TOTAL LINER THK.; .100 IN.
   STRUCTURAL WALL: FILAMENT WOUND
   TOTAL MIN., THK.: SEE DRAWING A02 .
3. QUALITY ASSURANCE TO BE IN ACCORDANCE WITH GENERAL SPEC., SECTION 01400, 11700, AND 13420 .
4. TANK IS TO BE BUILT PER ASTM D3299, PS15-69.
5. TRUE ORIENTATION IN PLAN VIEW ONLY.
6. ALL TANK NOZZLE BOLT HOLES ARE TO STRADDLE NATURAL CENTERLINE, UNLESS NOTED OTHERWISE.
7. ALL NOZZLE BOLT HOLES ARE TO BE FACED FOR SAE WASHERS.
8. TANK EXTERIOR IS TO BE TOP COATED. COLOR TO BE CHOSEN BY THE CUSTOMER.
9. MARK AND RETAIN ALL NOZZLE CUTOUTS.
10. NOZZLE CUTOUT REINFORCEMENT SHALL BE IN ACCORDANCE WITH ASTM D-3299
11. SEE DRAWINGS D01 THRU D08 FOR FABRCATION DETAILS.
12. PART NUMBERS CORRESPOND WITH PARTS LIST DWG A02 .
13. REFER TO DRAWING D01 AND D02 FOR SLOPED BOTTOM AND ANCHOR LUG DETAILS.

OS-354 HEADWORKS

CALVERT

DURHAM AWWTP

DESIGNED BY	BOND	ISSUED	ISSUED FOR
DRAWN	J. PIKE		
CHECKED BY		APPROVED BY	
DATE	SEPT. 25,1989	JOB NO.	1181
DRAWING NO.	A01	REV.	

FILE: 1181A01

PARTS LIST DS-154 - HEADWORKS

ITEM NO.	QTY	DESCRIPTION	MATERIAL	VERTICAL LOCATION: PART OF ITEM	VERTICAL LOCATION: DISTANCE OUTSIDE ⌀ OF TANK	ANGULAR ORIENTATION	REFERENCE DETAILS
1	1	12' DIA.X 34'-0" SHELL	FRP	----			
2	1	12' DIA. SLOPED BOTTOM	FRP	----			D01
3	1	12' DIA. DOME TOP, 0.500 THK	FRP	BOTTOM OF DOME	34'-0"		D02
4	1	24" DIA. MANWAY	FRP/S.S.	CENTERLINE	3'-0"	270 DEGREES	D04
5	1	24" DIA. HANDOVER	FRP	CENTERLINE	3'-0"	270 DEGREES	D04
6	1	42" DIA. TANG.DUCT FLG, 6'-0" LG	FRP	CENTERLINE	2'-6"		D04/D06
7	1	36" DIA. DUCT FLANGE	FRP	TOP OF FLANGE	36'-6"		D04
8	1	1-1/2" DIA. DRAIN	316 S.S.	CENTERLI	0'-4-1/2"	225 DEGREES	D01
9	1	pH DRAIN TRAP	PVC	CENTERLINE	0'-4 1/2"	225 DEGREES	D01/D04
10	1	20" DIA. FLANGE	FRP	CENTERLINE	2'-6"	315 DEGREES	D05
11	4	ANCHOR LUGS	316 S.S.	BOTTOM OF LUG	0'-1"	0, 90, 180, 270 DEGREES	D03
12	4	LIFTING LUGS	316 S.S.	TOP OF LUG	33'-6"	0, 90, 180, 270 DEGREES	D03
13	1	5" X 5" X 3" X 1/2"THK STIFFENER	FRP	CENTERLINE	18'-6"		D08
14	1	SUPPORT LUGS	316 S.S.	TOP OF LUG	26'-0"	0 DEGREES	D02
16	1	SPRAY NOZZLE FLANGE	316 S.S.				D05
17	1	EQUIPMENT TAG	VARIOUS				
18	1	CALVERT LOGO	VARIOUS				
19	108	3/8" X 2" HEX HEAD BOLTS	316 S.S.				
20	216	3/8" FLAT WASHERS	316 S.S.				
21	108	3/8" HEX NUTS	316 S.S.				
22	4	1/2" X 2-1/4" HEX HEAD BOLTS	316 S.S.				
23	8	1/2" FLAT WASHERS	316 S.S.				
24	4	1/2" HEX NUTS	316 S.S.				
25	4	1/2" ANCHOR BOLTS	316 S.S.				
26	1	24" MANWAY GASKET	EPDM				
27	1	42" DUCT FLANGE GASKET	EPDM				
28	1	1-1/2" DRAIN GASKET	EPDM				
29	1	20" DIA. GASKET	EPDM				
30	2	1" NPT-F COUPLING	FRP				
31	2	1" BALL VALVE	PVC				
32	1	SNIFF PIPE ~ 3/4"	PVC				
36	1	1" NPT-F UNION	PVC				
39	1	36" DIA. DUCT FLANGE GASKET	EPDM				
40	1	36"DIA X 11'-9" FLGD STACK, 0.250 THK	FRP				

VERIFY AGAINST PLANS

PER STRUCTURAL DESIGN

VESSEL LAMINATE SEQUENCE: INNER LINER: 1 PLY 10 MIL TYPE C FIBERGLASS, 2 PLY 1.5 OZ. MAT, 0.100 NOMINAL THICKNESS

TOTAL WALL THICKNESS: 0.380 INCHES

CALVERT ENVIRONMENTAL
5985 Santa Fe Street, San Diego, CA 92109

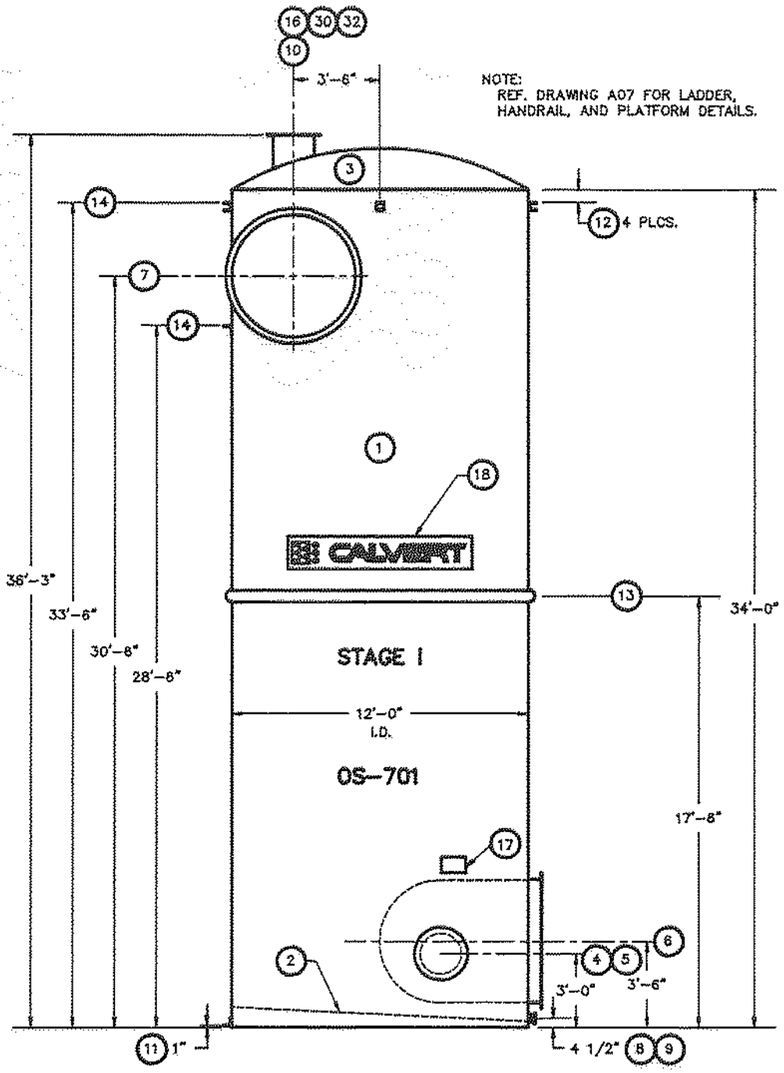
12'-6" DIA. ODOR CONTROL SCRUBBER

ENGR: J.L. PIKE SCALE: None

PROJ ENGR: NEXT ASSY:

FILE: C1181.A02 | DATE: 09-14-89 | PROJ: 1181 DWG: A02

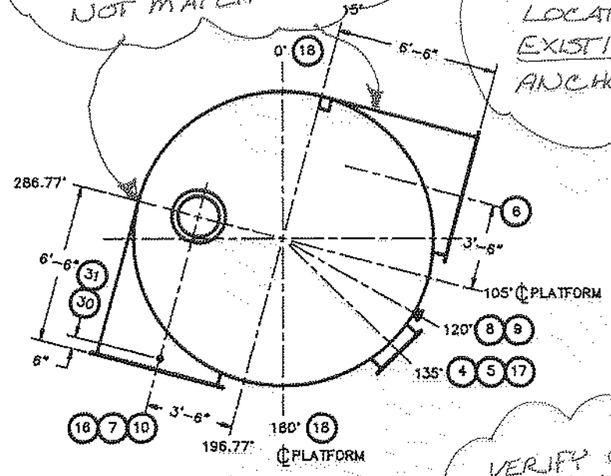
PROVIDE 24"ø MANWAY (NOT 20"ø)



ELEVATION

ORIENTATION OF INLET & OUTLET DOES NOT MATCH PLANS

FIELD VERIFY LOCATION & DIMENSION OF EXISTING DUCTS & ANCHOR BOLTS

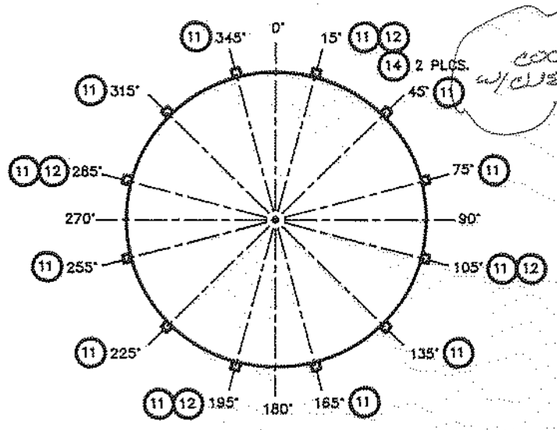


PLAN VIEW

VERIFY UV ABSORBING

NOTES:

1. DESIGN CRITERIA:
   SEISMIC: ZONE 2
   WIND LOAD: 100 MPH
   PRESSURE: 1 PSIG (ALSO TO 5 PSIG)
2. RESIN: HETRON 922 .
   SURFACING VEIL: 10 MIL "C" GLASS (1 PLY)
   1.5 OZ, CHOPPED STRAND ELECTRICAL GRADE (2 PLY)
   TOTAL LINER THK.: .100 IN.
   STRUCTURAL WALL: FILAMENT WOUND
   TOTAL MIN., THK.: SEE DRAWING A04 .
3. QUALITY ASSURANCE TO BE IN ACCORDANCE WITH GENERAL SPEC., SECTION 01400,11700, AND 13420 .
4. TANK IS TO BE BUILT PER ASTM D3299, PS15-89.
5. TRUE ORIENTATION IN PLAN VIEW ONLY.
6. ALL TANK NOZZLE BOLT HOLES ARE TO STRADDLE NATURAL CENTERLINE, UNLESS NOTED OTHERWISE.
7. ALL NOZZLE BOLT HOLES ARE TO BE FACED FOR SAE WASHERS.
8. TANK EXTERIOR IS TO BE TOP COATED. COLOR TO BE CHOSEN BY THE CUSTOMER.
9. MARK AND RETAIN ALL NOZZLE CUTOUTS.
10. NOZZLE CUTOUT REINFORCEMENT SHALL BE IN ACCORDANCE WITH ASTM D-3299
11. SEE DRAWINGS D01 THRU D08 FOR FABRICATION DETAILS.
12. PART NUMBERS CORRESPOND WITH PARTS LIST DWG A04 .
13. REFER TO DRAWING D01 AND D02 FOR SLOPED BOTTOM AND ANCHOR LUG DETAILS.



COORDINATE W/CUSTOMER

LUG ORIENTATION

OS-701 STAGE I SOLIDS HANDLING BUILDING

ITEM NO.	QTY.	MATL.	NAME & DESCRIPTION
DECIMAL ±			
FRACTIONAL ±			
ANGULAR ±			

CALVERT ENVIRONMENTAL — 3000 NORTH 77 STREET, SUITE 160 MILWAUKEE, WI 53213 (414) 771-1600

DURHAM AWWTP

DRAWN BY: D. CHARTARIFSKY	SCALE:
CHKD:	NEXT ASSY:
PROJ ENGR: J. PIKE	APPROVED BY:
DATE: SEPT. 20, 1989	PROJECT: 1181
DRAWING: A03	REV:

FILE: 1181A.030

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PARTS LIST - STAGE 1 - DS-701 - SOLIDS HANDLING

ITEM NO.	QTY	DESCRIPTION	MATERIAL	VERTICAL LOCATION: PART OF ITEM	VERTICAL LOCATION: DISTANCE OUTSIDE @ OF TANK	ANGULAR ORIENTATION	REFERENCE DETAILS
1	1	12' DIA.X 34'-0" SHELL	FRP	-----			
2	1	12' DIA. SLOPED BOTTOM	FRP	-----			D01
3	1	12' DIA. DOME TOP, 0.500 THK	FRP	BOTTOM OF DOME	34'-0"		D02
4	1	24" DIA. MANWAY	FRP/S.S.	CENTERLINE	3'-0"	135 DEGREES	D04
5	1	24" DIA. MANCOVER	FRP	CENTERLINE	3'-0"	135 DEGREES	D04
6	1	60" DIA. TANG.DUCT FLG, 6'-6" LG	FRP	CENTERLINE	3'-6"		D04/D06
7	1	36" DIA. TANG.DUCT FLG, 6'-6" LG	FRP	CENTERLINE	36'-3"		D04
8	1	1-1/2" DIA. DRAIN	316 S.S.	CENTERLI	0'-4-1/2"	120 DEGREES	D01
9	1	6H DRAIN TRAP	PVC	CENTERLINE	0'-4 1/2"	120 DEGREES	D01/D04
10	1	20" DIA. FLANGE	FRP	CENTERLINE	3'-6"	286.77 DEGREES	D05
11	12	ANCHOR LUGS	316 S.S.	BOTTOM OF LUG	0'-1"	15,45,75,105,135,165,195,225,255,285,315,345	D03
12	4	LIFTING LUGS	316 S.S.	TOP OF LUG	33'-6"	15, 105, 195, 285 DEGREES	D03
13	1	5" X 5" X 3" 1/2" THK STIFFENER	FRP	CENTERLINE			D08
14	2	SUPPORT LUGS	316 S.S.	TOP OF LUG	28'6", 33	15 DEGREES	D02
16	1	SPRAY NOZZLE FLANGE	316 S.S.				D05
17	1	EQUIPMENT TAG	VARIOUS				
18	1	CALVERT LOGO	VARIOUS				
19	40	3/8" X 2" HEX HEAD BOLTS	316 S.S.				
20	80	3/8" FLAT WASHERS	316 S.S.				
21	40	3/8" HEX NUTS	316 S.S.				
22	56	1/2" X 2-1/4" HEX HEAD BOLTS	316 S.S.				
23	102	1/2" FLAT WASHERS	316 S.S.				
24	56	1/2" HEX NUTS	316 S.S.				
25	12	5/8" ANCHOR BOLTS	316 S.S.				
26	1	24" MANWAY GASKET	EPDM				
27	1	60" DUCT FLANGE GASKET	EPDM				
28	1	1-1/2" DRAIN GASKET	EPDM				
29	1	20" DIA. GASKET	EPDM				
30	1	1" NPT-F COUPLING	FRP				
31	1	1" BALL VALVE	PVC				
32	A/R	LADDER LUGS	316 S.S.				
36	A/R	PLATFORM/HANDRAIL LUGS	316 S.S.				
39	1	LADDER W/INTERMEDIATE PLATFORM	FRP				
40	1	HANDRAIL	FRP				
41	1	PLATFORM & HANDRAIL ASSEMBLY	FRP				

24

20

FIELD VERIFY

VITON?

VESSEL LAMINATE SEQUENCE: INNER LINER: 1 PLY 10 MIL TYPE C FIBERGLASS, 2 PLY 1.5 OZ. MAT, 0.100 NOMINAL THICKNESS

TOTAL WALL THICKNESS:	0'-0" -- 6'-0"	6-0" -- 34'-0"
	0.450" THK	0.380" THK

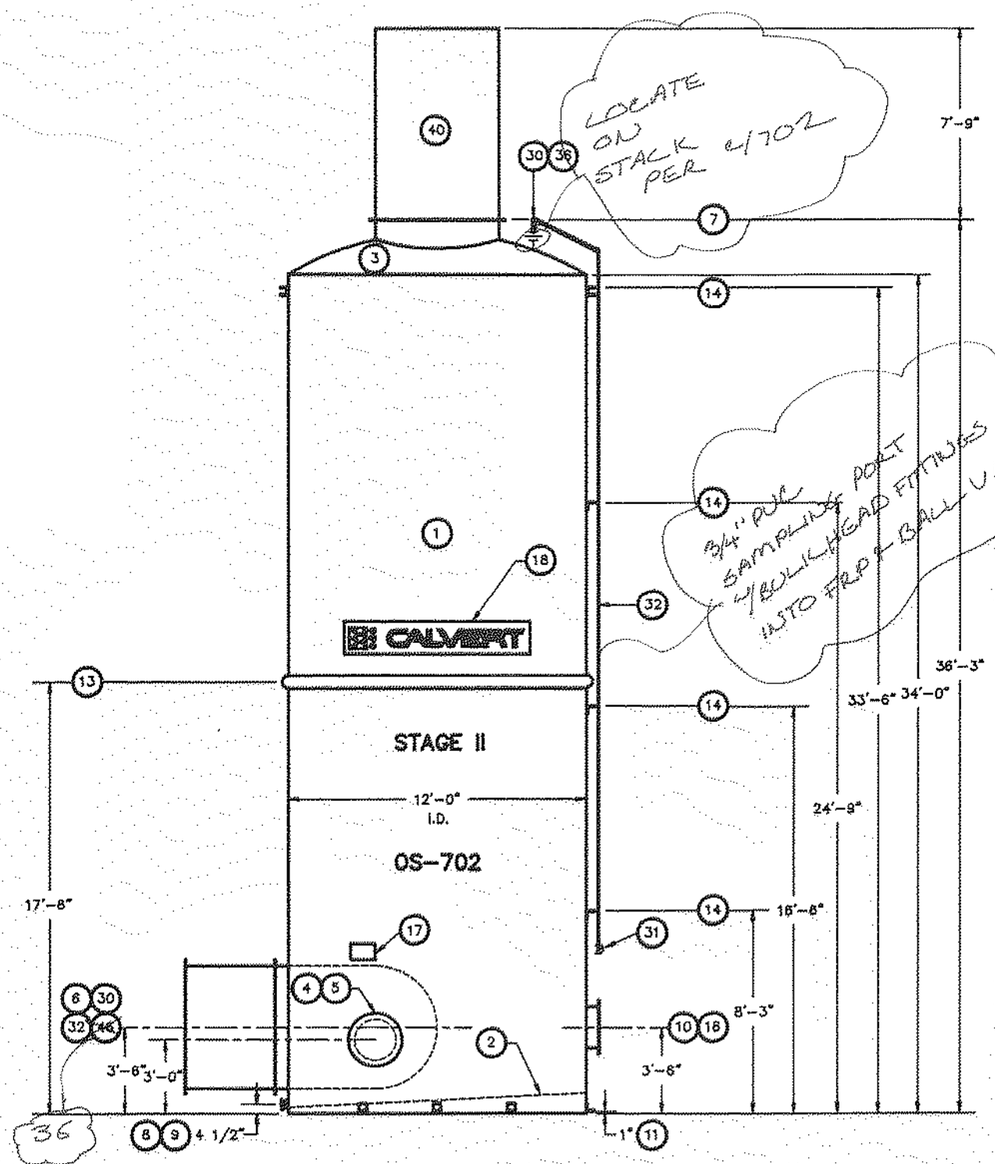
CALVERT ENVIRONMENTAL
5985 Santa Fe Street, San Diego, CA 92109

12'-0" DIA. ODOR CONTROL SCRUBBER

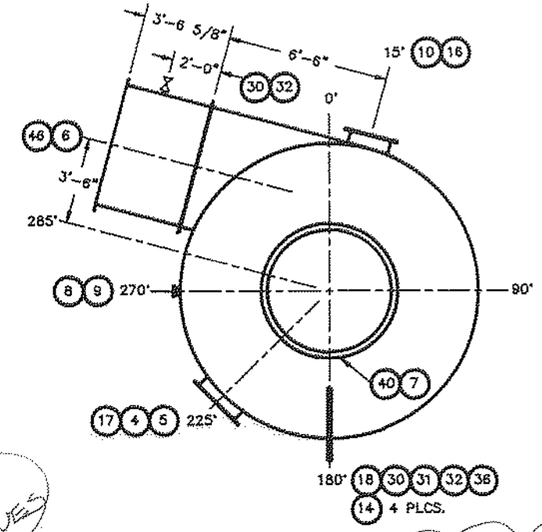
ENGR: J.L. PIKE SCALE: None

PROJ ENGR: NEXT ASSY:

FILE: C1181.A04 | DATE: 09-20-89 | PROJ: 1181 DWG: A04

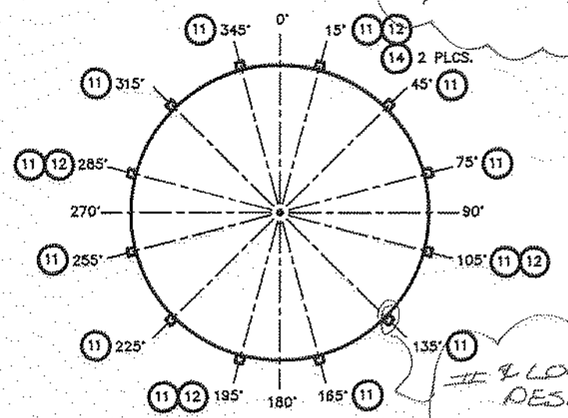


ELEVATION



PLAN VIEW

VERIFY UV ABSORPTION @



LUG ORIENTATION

NOTES:

1. DESIGN CRITERIA:
   SEISMIC: ZONE 2
   WIND LOAD: 100 MPH
   PRESSURE: 1 PSIG (ALSO TO - 5 PSIG)
2. RESIN: HETRON 922 .
   SURFACING VEIL: 10 MIL "C" GLASS (1 PLY)
   1.5 OZ. CHOPPED STRAND
   ELECTRICAL GRADE (2 PLY)
   TOTAL LINER THK.: .100 IN.
   STRUCTURAL WALL: FILAMENT WOUND
   TOTAL MIN., THK.: SEE DRAWING A06 .
3. QUALITY ASSURANCE TO BE IN ACCORDANCE WITH GENERAL SPEC., SECTION 01400,11700, AND 13420 .
4. TANK IS TO BE BUILT PER ASTM D3299, PS15-89.
5. TRUE ORIENTATION IN PLAN VIEW ONLY.
6. ALL TANK NOZZLE BOLT HOLES ARE TO STRADDLE NATURAL CENTERLINE, UNLESS NOTED OTHERWISE.
7. ALL NOZZLE BOLT HOLES ARE TO BE FACED FOR SAE WASHERS.
8. TANK EXTERIOR IS TO BE TOP COATED. COLOR TO BE CHOSEN BY THE CUSTOMER.
9. MARK AND RETAIN ALL NOZZLE CUTOUTS.
10. NOZZLE CUTOUT REINFORCEMENT SHALL BE IN ACCORDANCE WITH ASTM D-3299
11. SEE DRAWINGS D01 THRU D08 FOR FABRICATION DETAILS.
12. PART NUMBERS CORRESPOND WITH PARTS LIST DWG A06 .
13. REFER TO DRAWING D01 AND D02 FOR SLOPED BOTTOM AND ANCHOR LUG DETAILS.

OS-702 STAGE II SOLIDS HANDLING BUILDING

ITEM NO.	QTY.	MAT'L	NAME & DESCRIPTION

DECIMAL ±
FRACTIONAL ±
ANGULAR ±

CALVERT ENVIRONMENTAL 5000 SOUTH 19TH STREET FORT SMITH, AR 72904 (501) 573-4000

DURHAM AWWTP

DRAWN BY: D. CHARTARIFSKY | SCALE:
CHKD: | NEXT ASSY:
PROJ ENGR: J. PIKE | APPROVED BY:
DATE: SEPT. 28, 1989 | PROJECT: 1181 | DRAWING: A05 | REV:

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FILE: 1181A.050

PARTS LIST - STAGE II - DS-702 - SOLIDS HANDLING

ITEM NO.	QTY	DESCRIPTION	MATERIAL	VERTICAL LOCATION: PART OF ITEM	VERTICAL LOCATION: DISTANCE OUTSIDE @ OF TANK	ANGULAR ORIENTATION	REFERENCE DETAILS
1	1	12' DIA.x 34'-0" SHELL	FRP	----			
2	1	12' DIA. SLOPED BOTTOM	FRP	----			D01
3	1	12' DIA. DOME TOP, 0.500 THK	FRP	BOTTOM OF DOME	34'-0"		D02
4	1	24" DIA. MANWAY	FRP/S.S.	CENTERLINE	3'-0"	225 DEGREES	D04
5	1	24" DIA. MANCOVER	FRP	CENTERLINE	3'-0"	225 DEGREES	D04
6	1	60" DIA. TANG.DUCT FLG, 6'-6" LG	FRP	CENTERLINE	3'-6"		D04/D06
7	1	60" DIA. DUCT FLANGE	FRP	CENTERLINE	36'-3"		D04
8	1	1-1/2" DIA. DRAIN	316 S.S.	CENTERLI	0'-4-1/2"	270 DEGREES	D01
9	1	pH DRAIN TRAP	PVC	CENTERLINE	0'-4 1/2"	270 DEGREES	D01/D04
10	1	20" DIA. FLANGE	FRP	CENTERLINE	3'-6"	15 DEGREES	D05
11	12	ANCHOR LUGS	316 S.S.	BOTTOM OF LUG	0'-1"	15,45,75,105,135,165,195,225,255,315,345 DEG	D03
12	4	LIFTING LUGS	316 S.S.	TOP OF LUG	33'-6"		D03
13	1	5" X 5" X 3" X 1/2" THK STIFFENER	FRP	CENTERLINE			D08
14	4	SUPPORT LUGS	316 S.S.	TOP OF LUG	8'-3",16' AND 33'-	180 DEGREES	D02
16	1	SPRAY NOZZLE FLANGE	316 S.S.				D05
17	1	EQUIPMENT TAG	VARIOUS				
18	1	CALVERT LOGO	VARIOUS				
19	40	3/8" X 2" HEX HEAD BOLTS	316 S.S.				
20	80	3/8" FLAT WASHERS	316 S.S.				
21	40	3/8" HEX NUTS	316 S.S.				
22	108	1/2" X 2-1/4" HEX HEAD BOLTS	316 S.S.				
23	216	1/2" FLAT WASHERS	316 S.S.				
24	108	1/2" HEX NUTS	316 S.S.				
25	12	5/8" ANCHOR BOLTS	316 S.S.				
26	1	24" MANWAY GASKET	EPDM				
27	2	20" DIA. GASKET	EPDM				
28	1	1-1/2" DRAIN GASKET	EPDM				
29	1	12"O.D.X28"O.D. SPRAY NZL GASKET	EPDM				
30	2	1" NPT-F COUPLING	FRP				
31	2	1" BALL VALVE	PVC				
32	1	SNIFF PIPE — 3/4"	PVC				
36	1	1" NPT-F UNION	PVC				
40	1	60" DIA. X 7'-9" FLGD STACK, 0.250 THK	FRP				
			FRP				

VESSEL LAMINATE SEQUENCE: INNER LINER: 1 PLY 10 MIL TYPE C FIBERGLASS, 2 PLY 1.5 OZ. MAT, 0.100 NOMINAL THICKNESS

TOTAL WALL THICKNESS:	0'-0" -- 6'-0"	6'-0" -- 34'-0"
	0.450" THK	0.380" THK

CALVERT ENVIRONMENTAL
5985 Santa Fe Street, San Diego, CA 92109

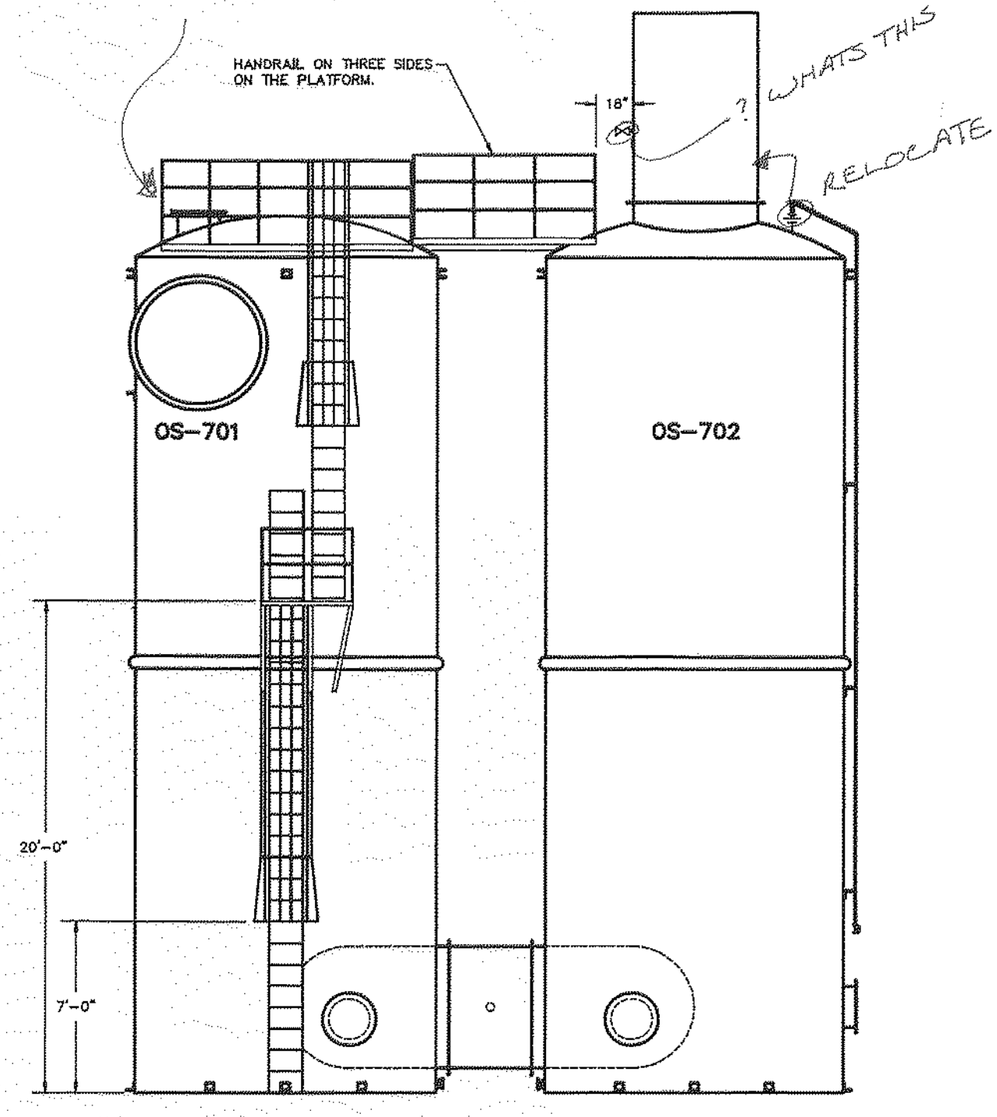
12'-0" DIA. DOOR CONTROL SCRUBBER

ENGR: J.L. PIKE SCALE: None

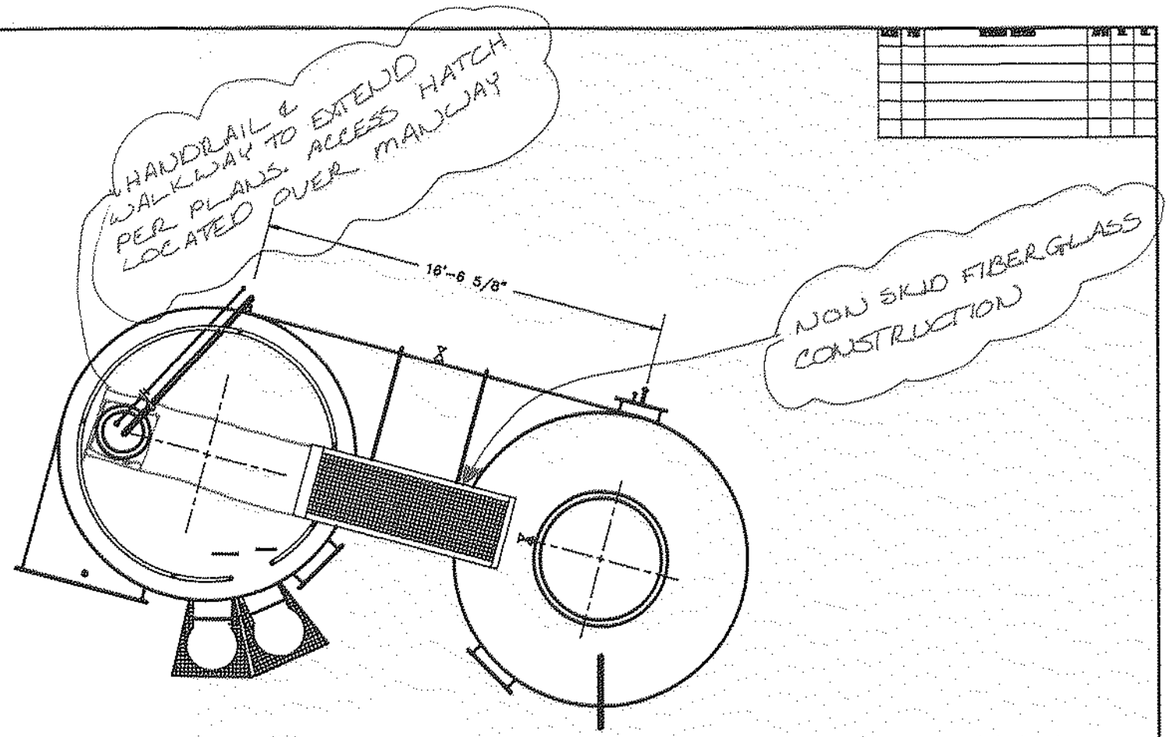
PROJ ENGR: NEXT ASSY:

FILE: C1181.A06 | DATE: 09-20-89 | PROJ: 1181 DWG: A06

LOCATE HATCH OVER MAN HOLE



ELEVATION



PLAN VIEW

NOTES:

1. LADDER, SAFETY CAGE, INTERMEDIATE PLATFORM, HANDRAILS, AND PLATFORM SHALL BE PROVIDED IN ACCORDANCE WITH OSHA STANDARDS AND THE GENERAL SPECIFICATIONS FOR DURHAM AWWTP MODIFICATIONS.

2. MATERIAL OF CONSTRUCTION TO BE FIBERGLASS REINFORCED PLASTICS.

SUBMIT PLANS & DETAILS SHOWING CONFORMANCE W/ GENERAL SPECS

SOLIDS HANDLING BUILDING

ITEM NO.	QTY.	MATL.	NAME & DESCRIPTION

DECIMAL ±
FRACTIONAL ±
ANGULAR ±

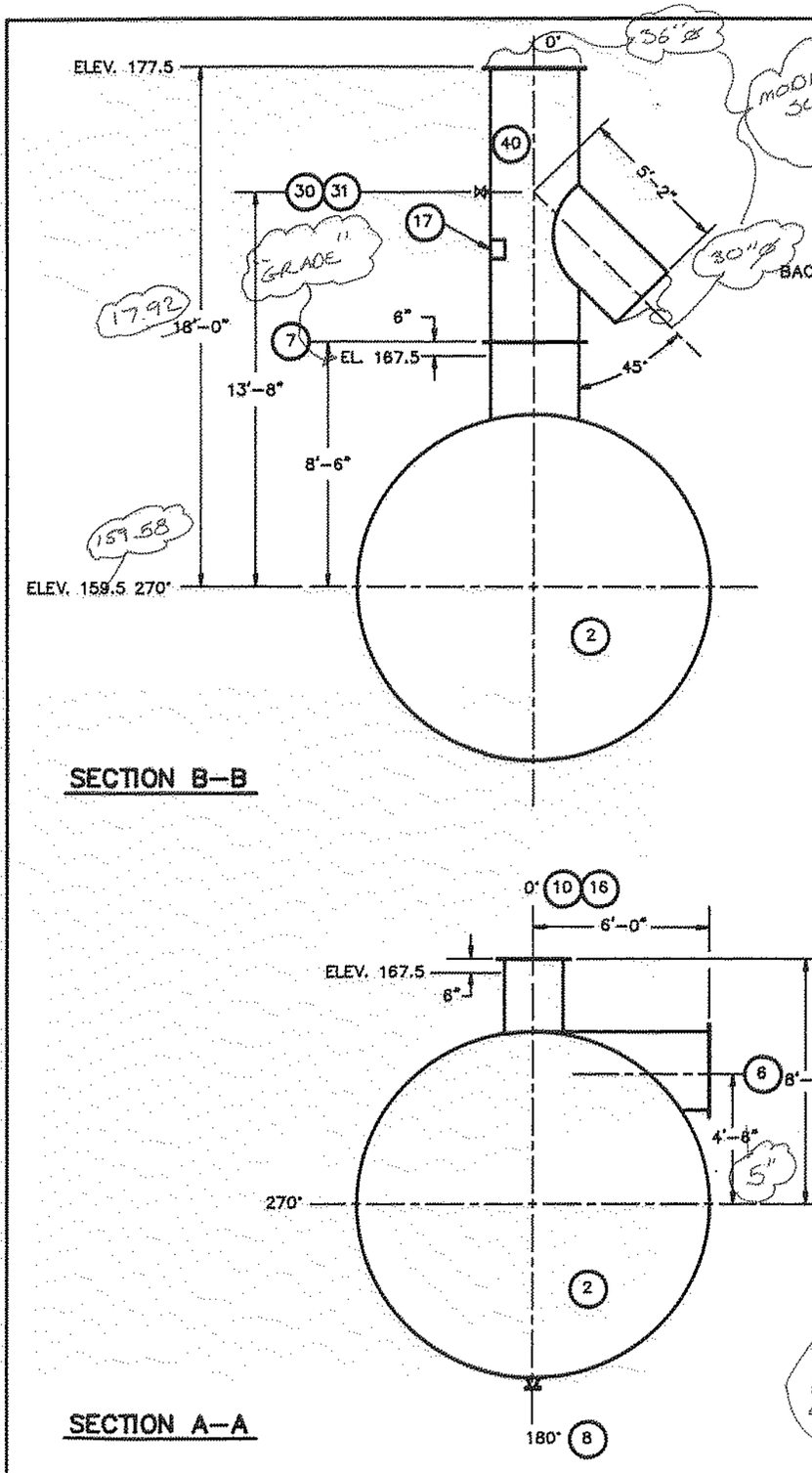
CALVERT ENVIRONMENTAL

DURHAM AWWTP

DRAWN BY: D. CHARTARIFSKY | SCALE:
ENGR: | NEXT ASSY:
PROJ ENGR: J. PIKE | APPROVED BY:
DATE: SEPT. 25, 1989 | PROJECT: 1181 | DRAWING: A07 | REV:

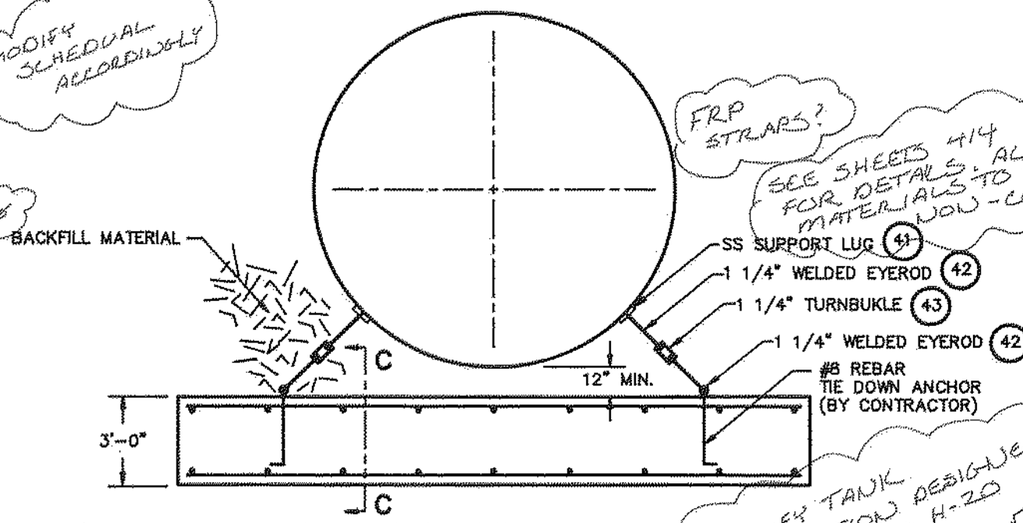
FILE: 1181A07

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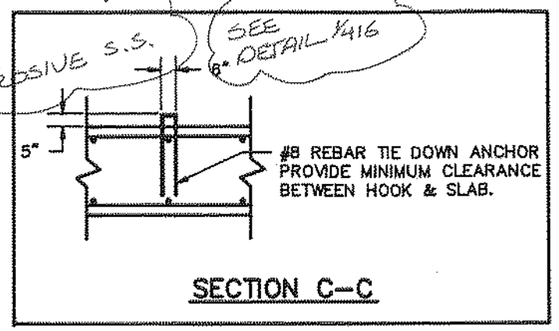


SECTION B–B

SECTION A–A

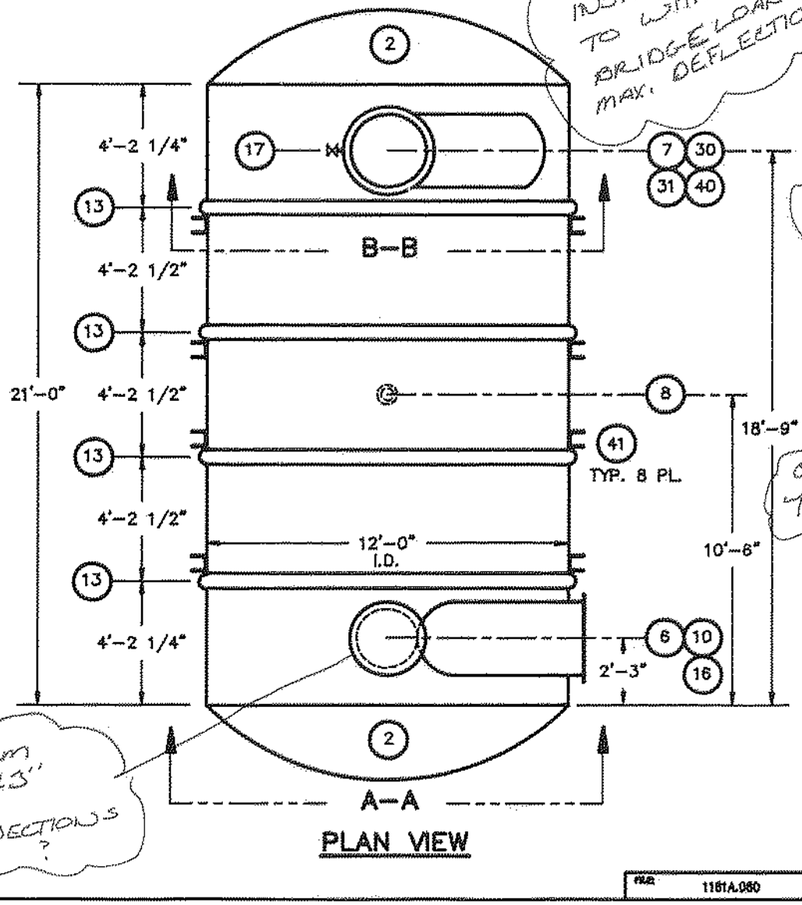


OS–402 REACTION CHAMBER



SECTION C–C

VERIFY TANK INSTALLATION DESIGNED TO WITHSTAND H-20 BRIDGE LOADING. MAX. DEFLECTION 5%



PLAN VIEW

1, CHEM FEED &3", LPA CONNECTIONS ?

UV ABSORBANT

COORDINATE W/CUSTOMER

NOTES:

1. DESIGN CRITERIA:
   SEIMIC: ZONE 2, UBC
   WIND LOAD: 100 MPH (ON EXHAUST STACK)
   PRESSURE: 1 PSIG
2. RESIN: HETRON 922 . SPECIFIED
   EARTHLOAD: 2" COVER, ASSHTO H-20 WHEEL LOAD
   SURFACING VEIL: 10 MIL "C" GLASS (1 PLY)
   1.5 OZ, CHOPPED STRAND
   ELECTRICAL GRADE (2 PLY)
   TOTAL LINER THK.: .100 IN.
   STRUCTURAL WALL: FILAMENT WOUND
   TOTAL MIN., THK.: SEE DRAWING A09 .
3. QUALITY ASSURANCE TO BE IN ACCORDANCE WITH GENERAL SPEC., SECTION 01400,11700, AND 13420 .
4. TANK IS TO BE BUILT PER ASTM D3299, PS15–69.
5. TRUE ORIENTATION IN PLAN VIEW ONLY.
6. ALL TANK NOZZLE BOLT HOLES ARE TO STRADDLE NATURAL CENTERLINE, UNLESS NOTED OTHERWISE.
7. ALL NOZZLE BOLT HOLES ARE TO BE FACED FOR SAE WASHERS.
8. TANK EXTERIOR IS TO BE TOP COATED. COLOR TO BE CHOSEN BY THE CUSTOMER.
9. MARK AND RETAIN ALL NOZZLE CUTOUTS.
10. NOZZLE CUTOUT REINFORCEMENT SHALL BE IN ACCORDANCE WITH ASTM D–3299
11. SEE DRAWINGS D01 THRU D08 FOR FABRICATION DETAILS.
12. PART NUMBERS CORRESPOND WITH PARTS LIST DWG A09 .

OS–402 PRIMARY SLUDGE PUMPING STATION

ITEM NO.	QTY.	MATL.	NAME & DESCRIPTION
1	1	SA-516-70	SHELL
2	1	SA-516-70	HEAD
3	1	SA-516-70	SUPPORT RING
4	1	SA-516-70	SUPPORT RING
5	1	SA-516-70	SUPPORT RING
6	2	SA-105	6" 150# RF FLANGE
7	1	SA-105	4" 150# RF FLANGE
8	1	SA-105	12" 150# RF FLANGE
9	1	SA-105	3" 150# RF FLANGE
10	2	SA-105	6" 150# RF BLIND FLANGE
11	1	SA-105	3" 150# RF BLIND FLANGE
12	1	SA-105	4" 150# RF BLIND FLANGE
13	4	SA-105	12" 150# RF BLIND FLANGE
14	1	SA-105	2" 150# RF BLIND FLANGE
15	1	SA-105	1" 150# RF BLIND FLANGE
16	2	SA-105	6" 150# RF BLIND FLANGE
17	1	SA-105	30" 150# RF BLIND FLANGE
18	1	SA-105	24" 150# RF BLIND FLANGE
19	1	SA-105	20" 150# RF BLIND FLANGE
20	1	SA-105	16" 150# RF BLIND FLANGE
21	1	SA-105	14" 150# RF BLIND FLANGE
22	1	SA-105	10" 150# RF BLIND FLANGE
23	1	SA-105	8" 150# RF BLIND FLANGE
24	1	SA-105	6" 150# RF BLIND FLANGE
25	1	SA-105	4" 150# RF BLIND FLANGE
26	1	SA-105	3" 150# RF BLIND FLANGE
27	1	SA-105	2" 150# RF BLIND FLANGE
28	1	SA-105	1" 150# RF BLIND FLANGE
29	1	SA-105	30" 150# RF BLIND FLANGE
30	1	SA-105	24" 150# RF BLIND FLANGE
31	1	SA-105	20" 150# RF BLIND FLANGE
32	1	SA-105	16" 150# RF BLIND FLANGE
33	1	SA-105	14" 150# RF BLIND FLANGE
34	1	SA-105	10" 150# RF BLIND FLANGE
35	1	SA-105	8" 150# RF BLIND FLANGE
36	1	SA-105	6" 150# RF BLIND FLANGE
37	1	SA-105	4" 150# RF BLIND FLANGE
38	1	SA-105	3" 150# RF BLIND FLANGE
39	1	SA-105	2" 150# RF BLIND FLANGE
40	1	SA-105	1" 150# RF BLIND FLANGE
41	8	SA-105	1" 150# RF BLIND FLANGE
42	2	SA-105	1" 150# RF BLIND FLANGE
43	1	SA-105	1" 150# RF BLIND FLANGE

CALVERT ENVIRONMENTAL

DURHAM AWWTP

DRAWN BY: D. CHARTARISKY | SCALE:
CHK'D: | NEXT ASSY:
PROJ ENGR: J. PIKE | APPROVED BY:
DATE: OCT. 2, 1989 | PROJECT: 1181 | DRAWING: A08 | REV:

FILE: 1181A.DGN

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PARTS LIST - OS-402 - PRIMARY CLARIFIERS

ITEM NO.	QTY	DESCRIPTION	MATERIAL	VERTICAL LOCATION: PART OF ITEM	VERTICAL LOCATION: DISTANCE OUTSIDE @ OF TANK	ANGULAR ORIENTATION	REFERENCE DETAILS
1	1	12' DIA.X 21'-0" SHELL	FRP	----			
3	2	12' DIA. DOME, 0.500" THK	FRP	BOTTOM OF DOME	34'-0"		D02
6	1	30" DIA. TANG. FLANGE, 6'-0" LG	FRP	CENTERLINE	4'-6"		D04/D06
7	1	36" DIA. FLANGE, 2'-6" LG	FRP	CENTERLINE	8'-6"		D04
8	1	1-1/2" DIA. DRAIN	316 S.S.	CENTERLINE	0'-4-1/2"	225 DEGREES	D01
9	1	pH DRAIN TRAP	PVC	CENTERLINE	0'-4 1/2"	225 DEGREES	D01/D04
10	1	24" DIA. FLANGE, 2'-6" LG	FRP	CENTERLINE	2'-6"	315 DEGREES	D05
13	4	5" X 5" X 3" X 1/2" THK STIFFENER	FRP	CENTERLINE	18'-6"		D08
16	1	SPRAY NOZZLE FLANGE	316 S.S.				D05
17	1	EQUIPMENT TAG	VARIOUS				
19	52	3/8" X 2" HEX HEAD BOLTS	316 S.S.				
20	104	3/8" FLAT WASHERS	316 S.S.				
21	52	3/8" HEX NUTS	316 S.S.				
23	8	1/2" FLAT WASHERS	316 S.S.				
24	4	1/2" HEX NUTS	316 S.S.				
26	1	24" DIA. GASKET	EPDM				
27	1	30" DIA. GASKET	EPDM				
28	1	1-1/2" DRAIN GASKET	EPDM				
30	1	1" NPT-F COUPLING	FRP				
31	1	1" BALL VALVE	PVC				
39	1	36" DIA. GASKET	EPDM				
40	1	36"DIA. X 9'-6" X 0.250 THK FLGD STACK WITH 30" DIA. LATERAL	FRP				
41	8	ANCHOR LUG	316 S.S.				DETAIL T
42	16	1-1/4" WELDED EYE ROD	GALV. C/S				
43	8	1-1/4" TURNBUCKLE	GALV. C/S				
44	8	1" X 9" LONG BOLTS	316 S.S.				
45	10	1" NUTS & WASHERS	316 S.S.				

FRP STRAP

SEE SHEET 4/4 DETAIL

VESSEL LAMINATE SEQUENCE: INNER LINER: 1 PLY 10 MIL TYPE C FIBERGLASS, 2 PLY 1.5 OZ. MAT, 0.120 NOMINAL THICKNESS

TOTAL WALL THICKNESS: 0.500 INCHES, FILAMENT WOUND

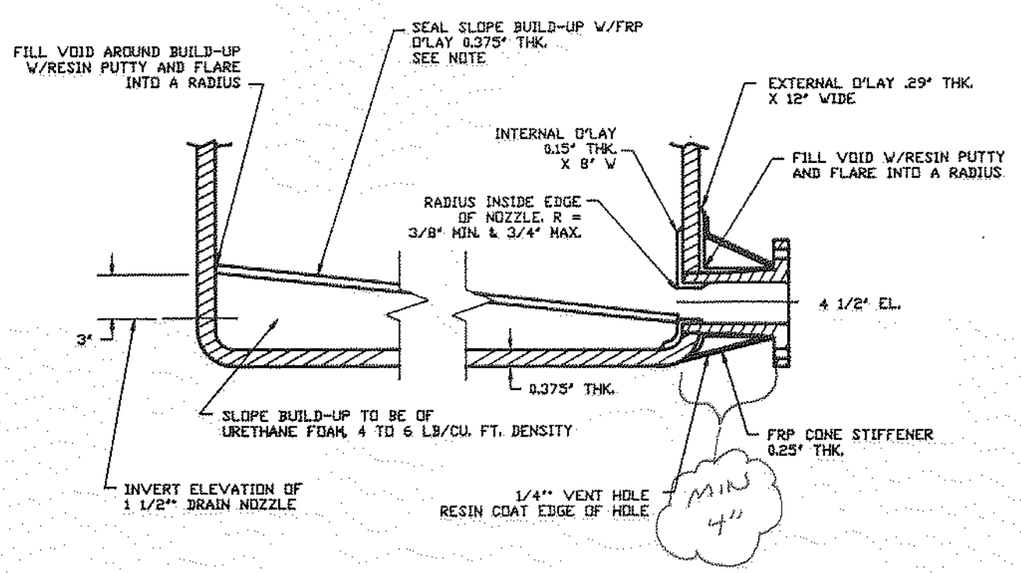
CALVERT ENVIRONMENTAL
5985 Santa Fe Street, San Diego, CA 92109

12'-0" DIA. DDOR CONTROL SCRUBBER

ENGR: J.L. PIKE SCALE: None

PROJ ENGR: NEXT ASSY:

FILE: C1181.A09 | DATE: 09-20-89 | PROJ: 1181 DWG: A09

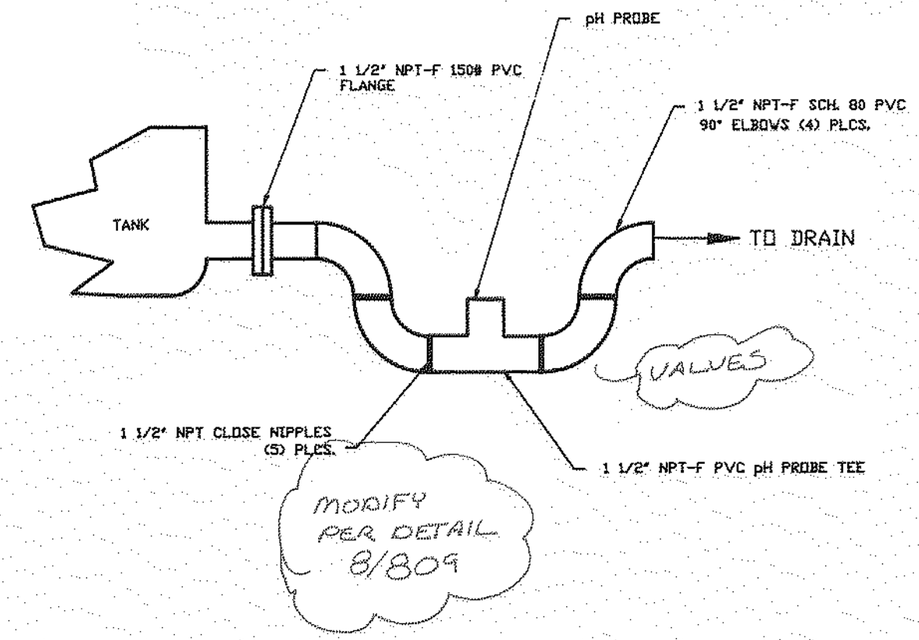


NOTE:

THE (1) ONE PLY OF WOVEN IN THE O'LAY, TO EXTEND NO FUTHER THAN 3" UP THE SIDEWALL. MAT PLIES, TO EXTEND 7" UP THE SIDEWALL AND THE 2 PLY 'C' GLASS TO EXTEND 8".

DETAIL "A"

SLOPED BOTTOM



NOTE:

SEE SECTION 6 FOR WIRING INFORMATION. ELECTRICAL CONTRACTOR TO PROVIDE WIRING AND CONDUIT BETWEEN pH PROBE ON SCRUBBER DRAIN AND pH CONTROLLER ON LOCAL CONTROL PANEL.

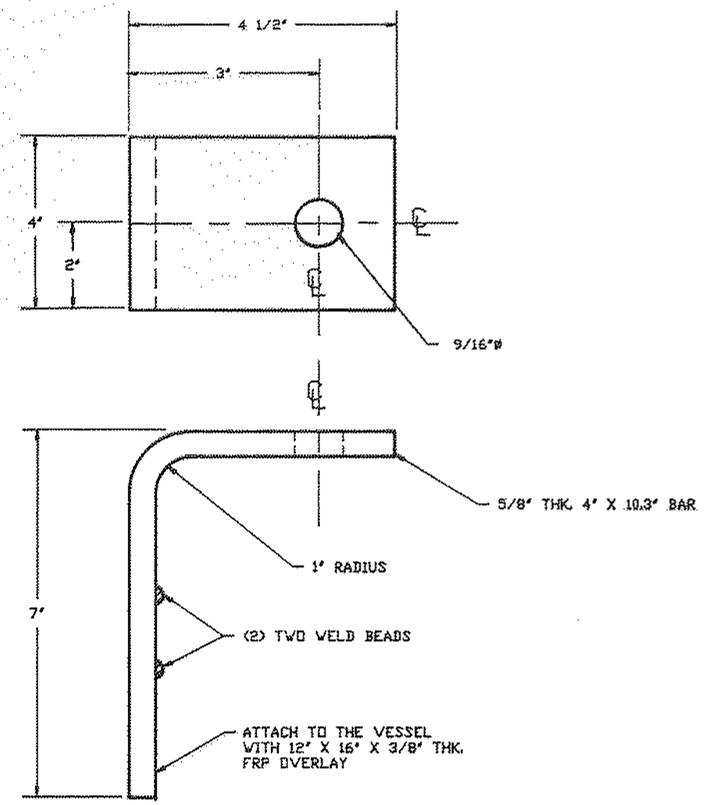
DETAIL "F"

pH PROBE TRAP

CALMERT

FILE: 1181D01

SEE DETAIL 3/809

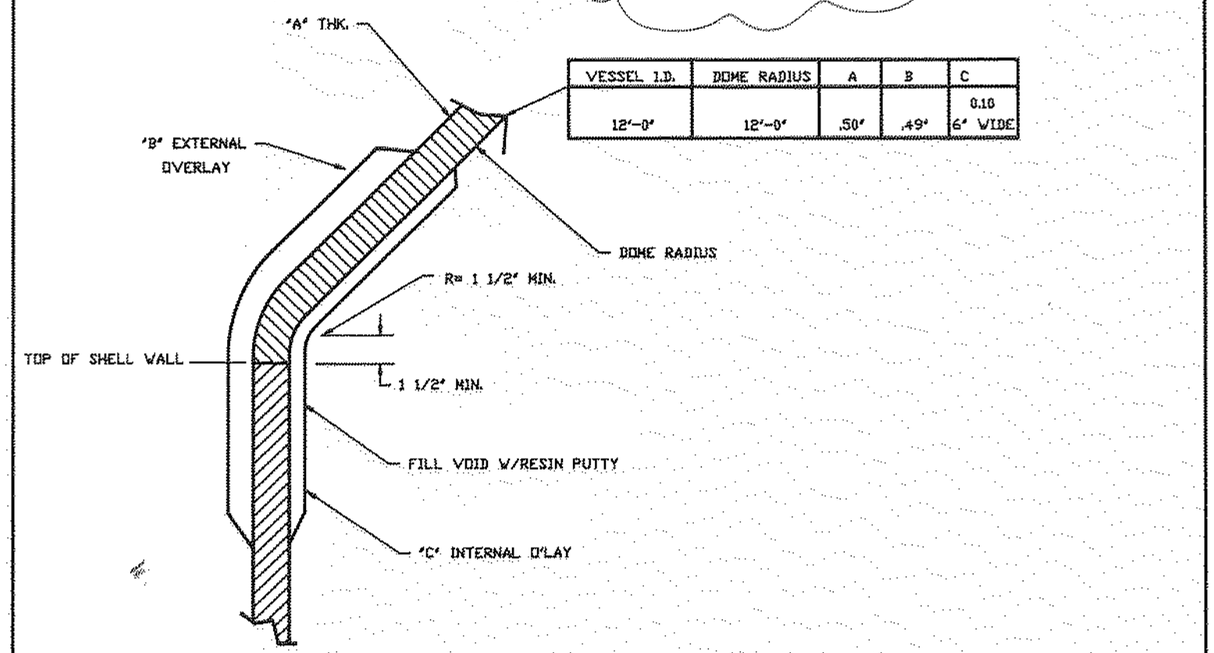


DETAIL "B"

SUPPORT LUG

MODIFY TO CONFORM TO ASTM D3299 STANDARDS

VESSEL I.D.	DOME RADIUS	A	B	C
12'-0"	12'-0"	.50"	.49"	0.10 6" WIDE



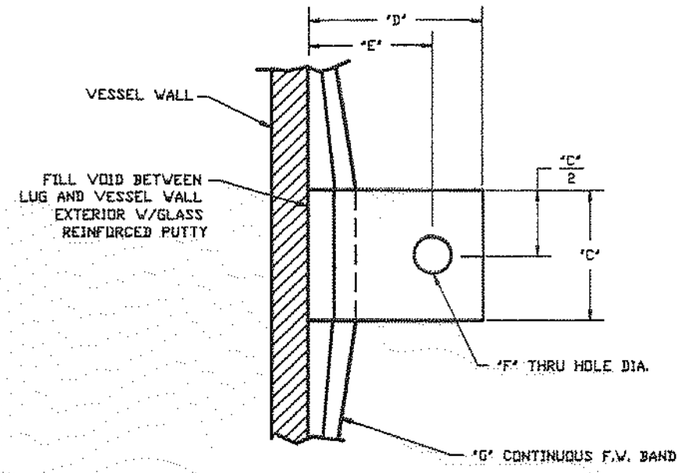
DETAIL "M"

DOME COVER ATTACHED TO SHELL

BY BUTT JOINT O'LAY

CALVERT

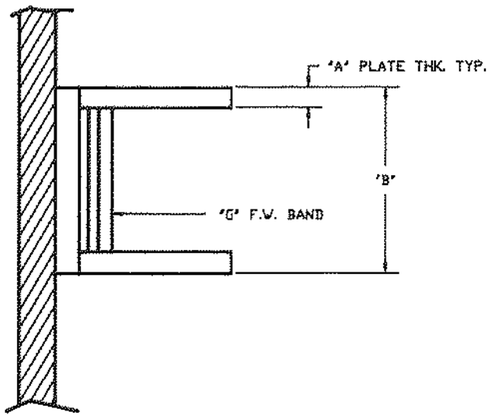
FILE: 1181D02



PLAN VIEW

VESSEL I.D.	A	B	C	D	E	F	G
8'-0"	0.50"	6"	4"	3.50"	2"	1"	0.50"

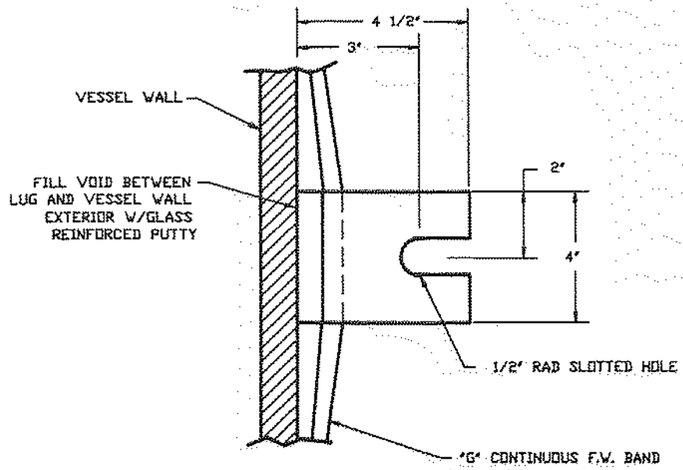
NOTE: ALL METAL PARTS TO BE 316 SS



ELEVATION VIEW

DETAIL "C"

LIFTING LUG



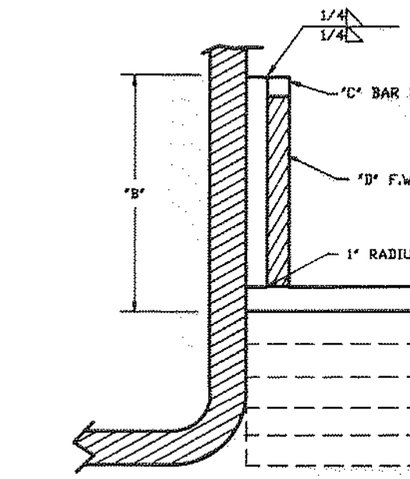
NOTES:

1. STEEL SHIMS AS REQUIRED IN FIELD. NO VOIDS ARE ALLOWED UNDER ANCHOR LUGS. SHIMS TO BE 4" X 4" SUPPLIED BY CONTRACTOR.
2. ALL METAL PARTS TO BE 316 SS.
3. SEE DETAIL DRAWING D08 FOR ANCHOR BOLT SIZE AND EMBEDMENT.

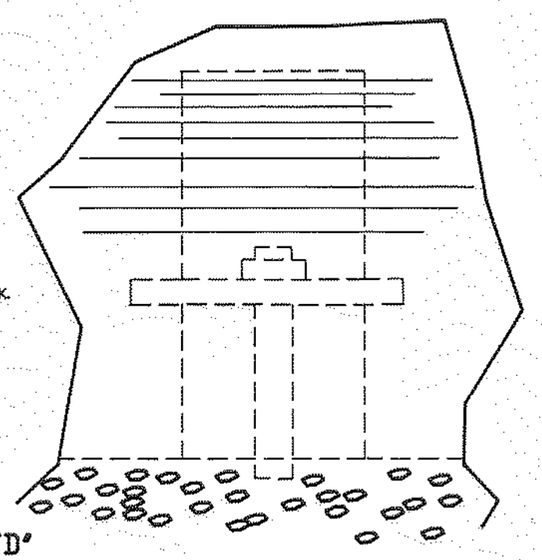
SEE DETAIL 3/809

PLAN VIEW

VESSEL I.D.	A	B	C	D
12'-0"	0.625"	7"	0.50"	0.50"



ELEVATION VIEW



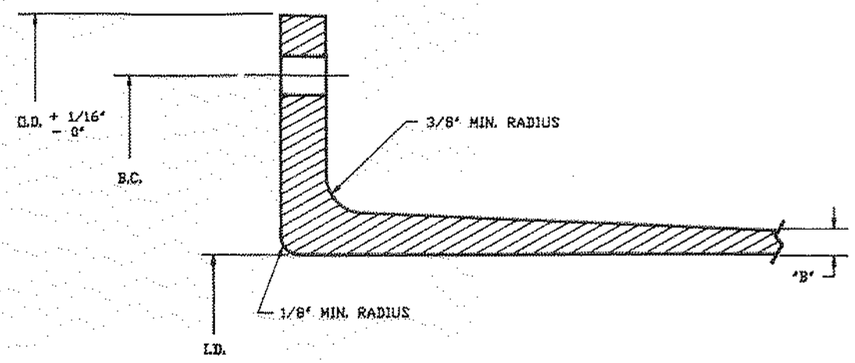
DETAIL "D"

ANCHOR LUG

SIDE VIEW

CALVERT

FILE: 1181D03



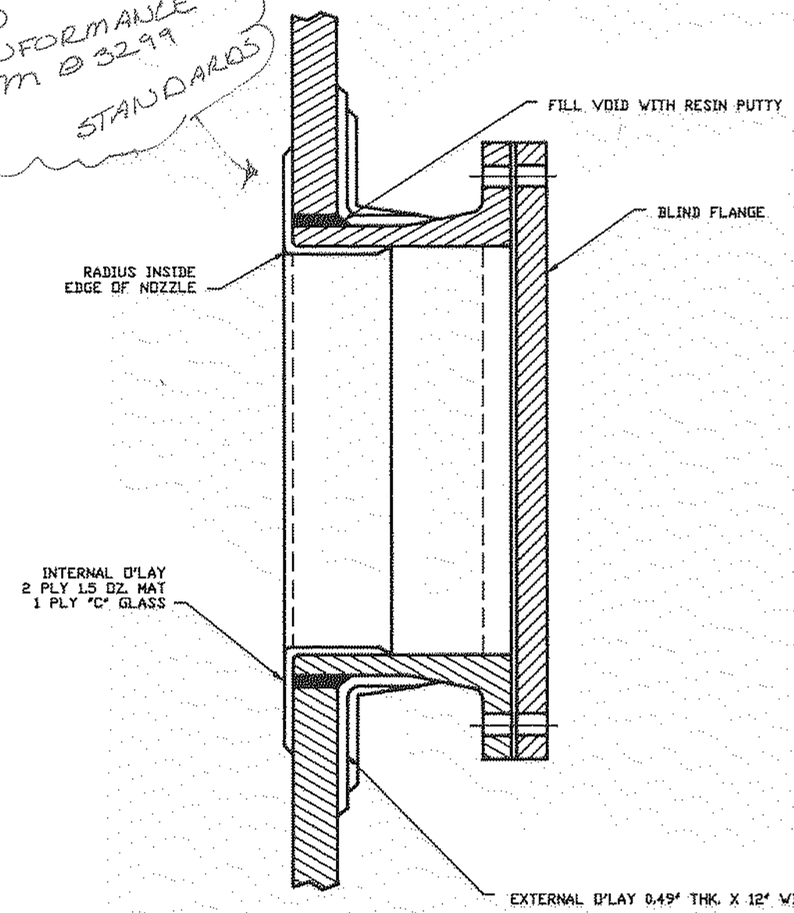
HEADWORKS & SOLIDS HANDLING BUILDING

I.D.	O.D.	B.C.	# OF BOLT HOLES	ø OF BOLT HOLES	B	D
1 1/2"	5 1/2"	3 7/8"	4	5/8"	0.25"	0.50"
20"	24 3/8"	23"	20	7/16"	0.25"	0.50"
24"	28 3/8"	27"	20	7/16"	0.25"	0.50"
36"	40 3/8"	39"	32	7/16"	0.25"	0.50"
42"	46 3/8"	45"	36	7/16"	0.25"	0.50"
60"	66 3/8"	64"	52	9/16"	0.25"	0.625"

PRIMARY CLARIFIER

I.D.	O.D.	B.C.	# OF BOLT HOLES	ø OF BOLT HOLES	B	D
1 1/2"	5 1/2"	3 7/8"	4	5/8"	0.25"	0.50"
24"	28 7/8"	27"	20	7/16"	0.375"	0.50"
30"	39 1/4"	36"	28	1 3/8"	0.375"	1.375"
36"	40 3/8"	39"	32	7/16"	0.375"	0.50"

SHOW CONFORMANCE W/ ASTM D 3299 STANDARDS

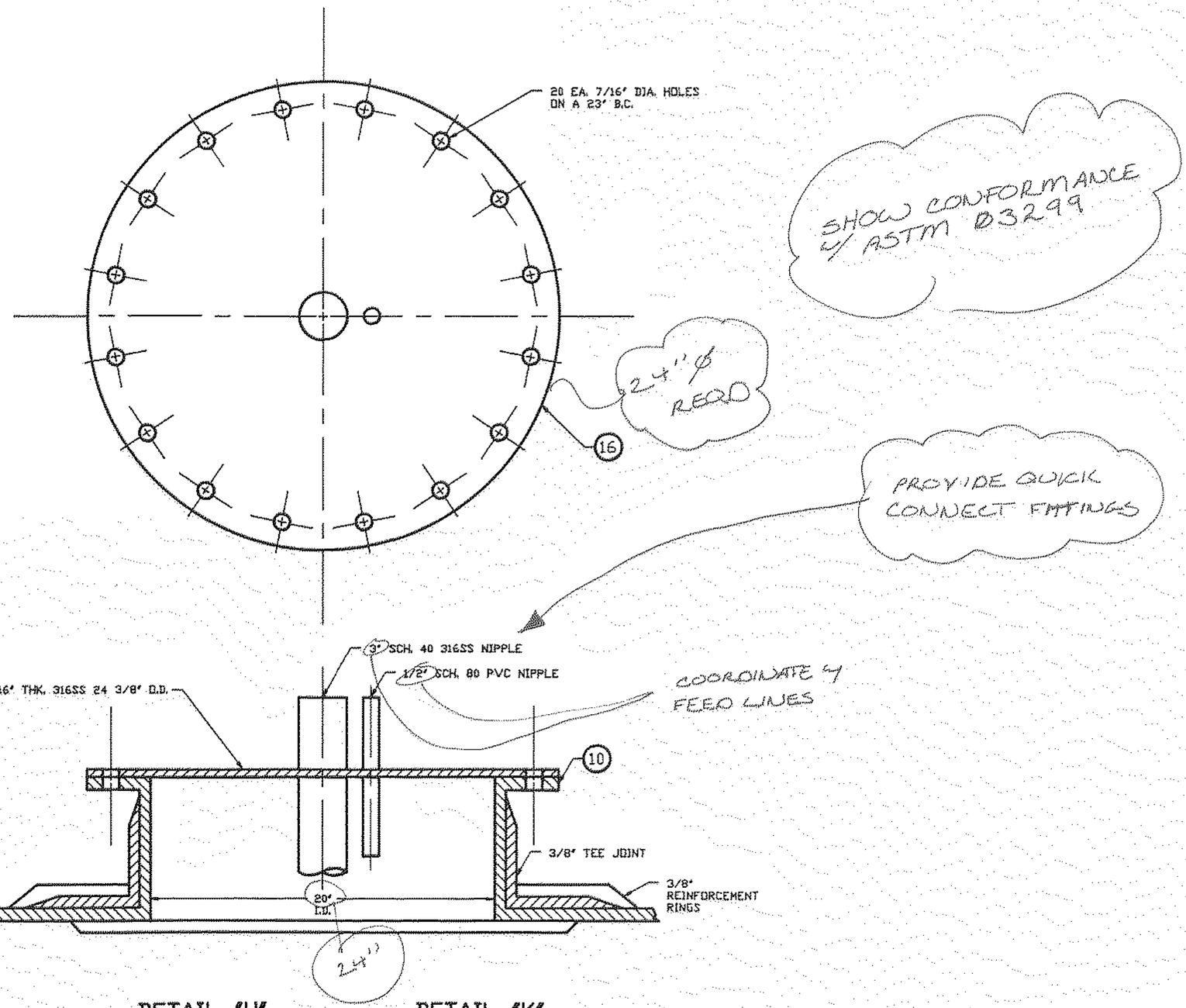


DETAIL "G"

24"ø MANWAY

CALVERT

FILE: 1181D04

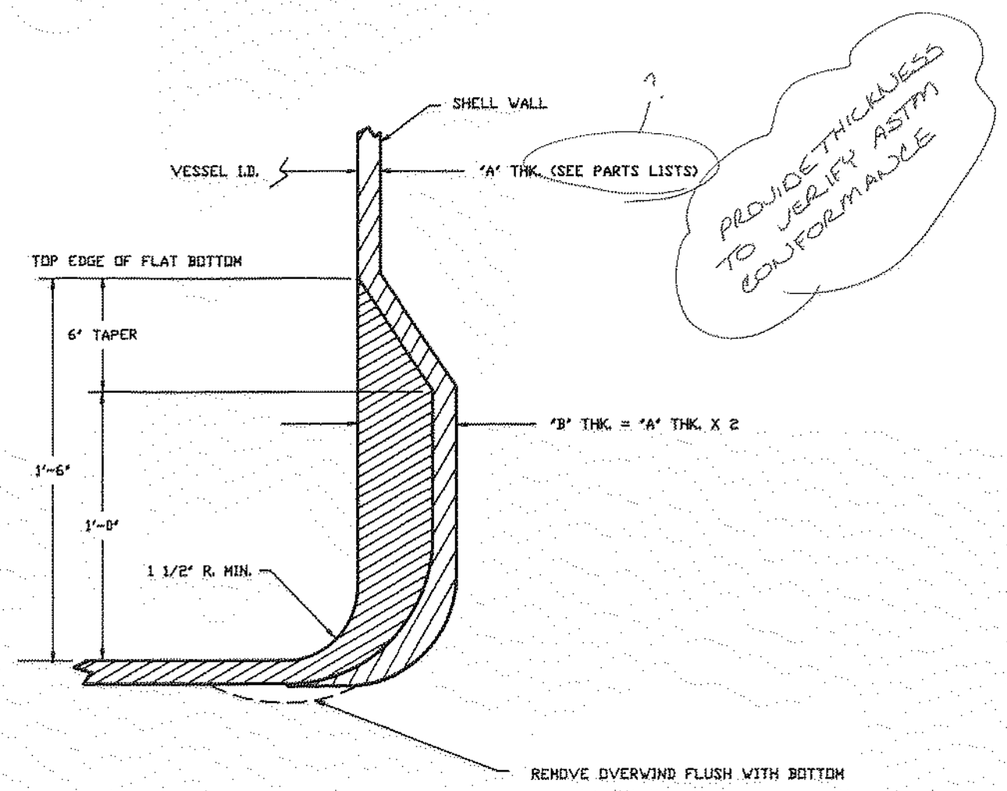


DETAIL "H" DETAIL "K"

SPRAY NOZZLEWAY & SPRAY NOZZLE FLANGE

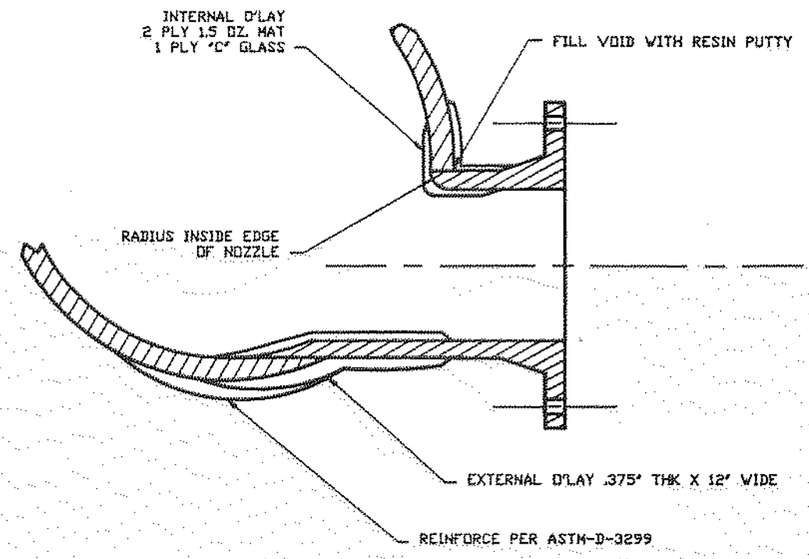
CALVERT

FILE: 1181D05



DETAIL "I"

BOTTOM KNUCKLE

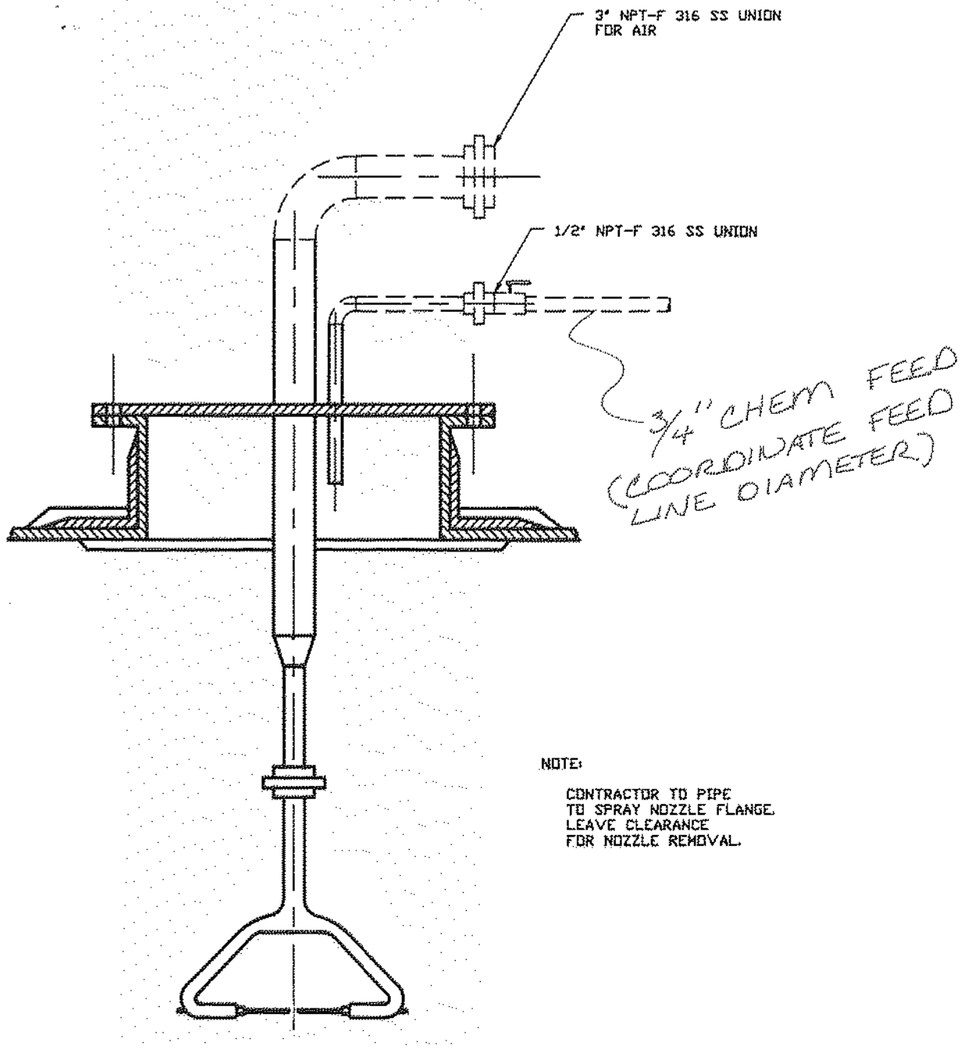


DETAIL "J"

INLET & OUTLET

CALMENT

FILE: 1181D06

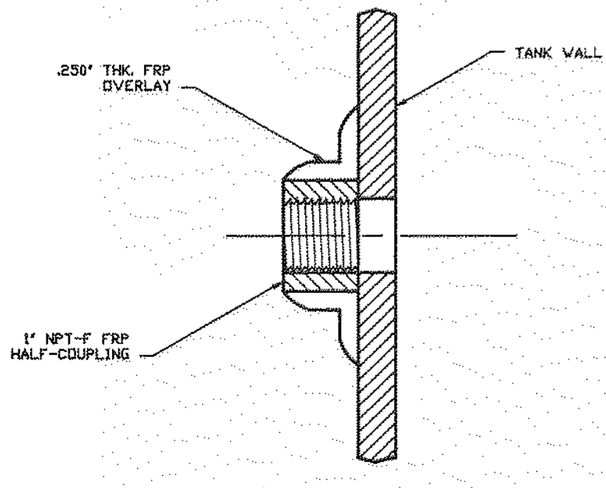


NOTE:

CONTRACTOR TO PIPE
TO SPRAY NOZZLE FLANGE.
LEAVE CLEARANCE
FOR NOZZLE REMOVAL.

DETAIL "L"

SPRAY NOZZLE



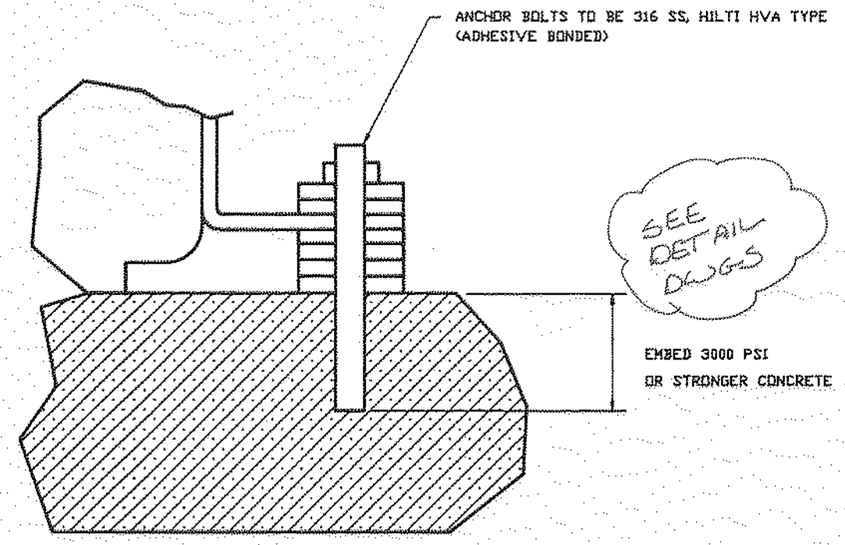
DETAIL "S"

SAMPLE PORT

CALMERT

FILE: 1101D07

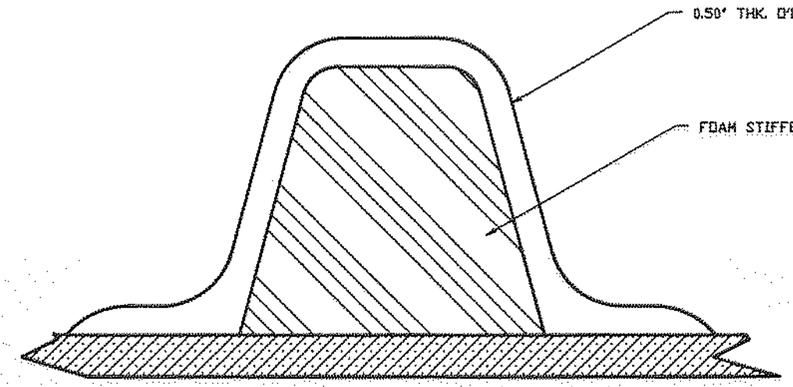
I.D.	BOLT ø	EMBEDMENT
OS-701	5/8"	7 1/2"
OS-702	5/8"	7 1/2"
OS-354	1/2"	4 1/2"



(ADHESIVE BONDED ANCHOR BOLTS)

DETAIL "Q"

ANCHOR BOLT

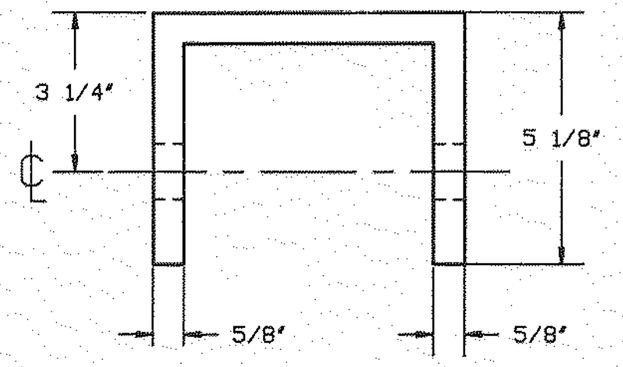


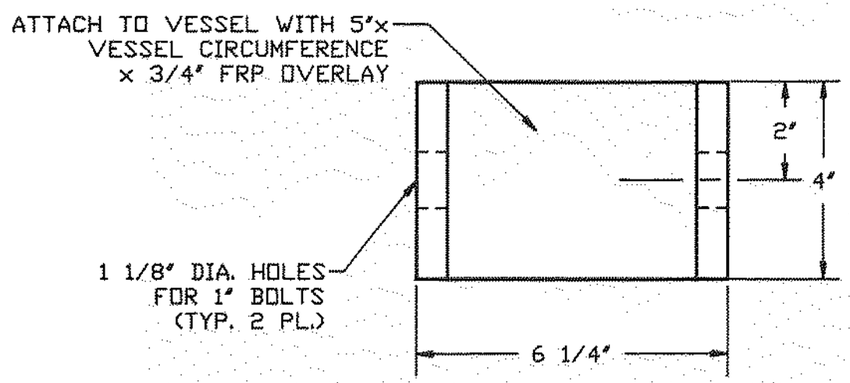
DETAIL "R"

STIFFENER

CALVERT

FILE: 1101008





DETAIL "T" NOT ACCEPTABLE
OS-402 ANCHOR LUG
(8 LUGS TOTAL)

CALVERT

FILE: 1181D09

Ashland

Ashland Chemical Company

DIVISION OF ASHLAND OIL, INC.

CHEMICAL POLYMERS DIVISION • P.O. BOX 2219 • COLUMBUS, OHIO 43216 • (614) 889-3333

January 4, 1988

VERIFY OK FOR 15% SOLUTION AND 100°F

Mr. Dutch Neiswender
Industrial Products Division
Red Ewald, Inc.
PO Box 519
Karnes City, Texas 78118-0519

Dear Dutch:

As you requested in our telephone conversation, I am writing to confirm that HETRON® 922 resin or HETRON 922L resin is suitable for use in scrubbers where the scrubbing media will be either 50% sodium hydroxide or 12% sodium hypochlorite and the operating temperature will be ambient.

If you have any questions or I can be of further assistance, please contact me.

Yours very truly,

IC SHANK
National Sales Manager - HETRONS

ICS:chb

Enclosure

cc: Mr. Carl Ricco - Red Ewald, Inc.
11931 Wickchester Lane
Suite 204
Houston, Texas 77043

TR Evans/LA Baker/RC Talbot/SJ Scott/T O'Hearn/K Poss/A Damiani/M Duffy

Ashland's Commitment to Quality and Productivity

Ashland Chemicals

HETRON® 922*
Vinyl Ester Resin

July 1982

ASHLAND CHEMICAL COMPANY • DIVISION OF ASHLAND OIL, INC.
BOX 2219, COLUMBUS, OHIO 43216 • (614) 889-3333

CORROSION RESISTANT, VINYL ESTER RESIN

DESCRIPTION: HETRON 922 is a low viscosity, unpromoted vinyl ester resin containing styrene.

PERFORMANCE: Excellent corrosion resistance
Excellent impact strength
High tensile elongation

SUGGESTED USES: Hand lay-up and spray-up, filament winding, flake glass and filled lining and coating compounds.

ALTERNATIVE PRODUCT: HETRON 980 vinyl ester resin for higher operating temperatures and greater resistance to organic solvents.

TYPICAL LIQUID PROPERTIES AT 77°F (25°C)

Percent Solids	55
Viscosity, Brookfield, cps	500
Appearance	Clear
Color, Gardner	5 max
Acidity (Solids), eq/100 g	0.02 max
Pounds per Gallon	8.7
DOT Flammability Rating, °F	73 – 100

STANDARD PACKAGE: Nonreturnable 55 gallon drums, 450 lb net

DOT Label Required: Flammable Liquid

CODE: 566-604

® Registered trademark, Ashland Oil, Inc.

*This product was formerly called Epocryl 322 resin manufactured by Shell Chemical Company.

NOTICE: Ashland makes no warranty or representation as to the suitability of the product as specified herein for any particular application. The determination of the suitability of the above specification for any particular use is solely the responsibility of the user.

All precautionary labels and notices should be read and understood by all supervisory personnel and employees before using. Consult Ashland Chemical Company and OSHA regulations for additional safety and health information. Purchaser is responsible for complying with all applicable federal, state or local laws and regulations covering use of the product. Special attention should be given to consumer applications. Freedom to use any patent owned by Ashland or others is not to be inferred from any statement contained herein.

CALVERT

Item:#MTI Sh: 1 of 11
Sect:# Dwg:# Adj

TYPICAL PERFORMANCE DATA

(for guidance only)

Typical SPI Curing Characteristics (2.0% Luperco[1] ATC Paste)

Gel Time, minutes	8 – 16
Total Time, minutes	20 max.
Peak Exotherm, °F	350 – 390

[1] Lucidol Division, Pennwalt Corporation

TYPICAL CURING CHARACTERISTICS:

Promoters		Catalyst	Temperature,	Gel Time
6% Cobalt Naphthenate	DMA	(9% MEKP)	(°F)	(Min.)
0.3	0.15	1.25	60 – 70	10 – 20
0.3	0.10	1.25	70 – 80	10 – 20
0.2	0.075	1.25	80 – 90	10 – 20
0.4	0.1	1.25	60 – 70	20 – 30
0.3	0.075	1.25	70 – 80	20 – 30
0.3	0.05	1.25	80 – 90	20 – 30
0.3	0.075	1.25	60 – 70	30 – 40
0.3	0.05	1.25	70 – 80	30 – 40
0.2	0.05	1.25	80 – 90	30 – 40

CAUTION: Thoroughly mix promoters with resin before adding catalyst.

Promoter	Catalyst	Temperature	Gel Time
DMA	(50% BPO paste)	(°F)	(min.)
0.15	2.0	75	10 – 14
0.1	2.0	75	15 – 20
0.05	2.0	75	30 – 40

Item:#MT! Sh: of 11
Sect:# 7 Dwg:# All

MASTER BATCH GUIDE

6% Cobalt Naphthenate Quantity for:

PHR	55 gallon (450 lb)	5 gallon (41 lb)
0.2	15.2 fl oz/450 cc	1.4 fl oz/39 cc
0.3	23 fl oz/675 cc	2 fl oz/59 cc
0.4	30.4 fl oz/900 cc	2.8 fl oz/78 cc

DMA Quantity for:

PHR	55 gallon (450 lb)	5 gallon (41 lb)
0.05	3.3 fl oz/98 cc	0.33 fl oz/9.8 cc
0.1	6.6 fl oz/196 cc	0.66 fl oz/19.6 cc
0.15	9.9 fl oz/294 cc	0.99 fl oz/29.4 cc

9% MEKP Quantity for:

PHR	1 quart	5 lb
1.25	0.41 fl oz/11.9 cc	0.81 fl oz/24.8 cc

RECOMMENDED STORAGE: Drums – Store at temperatures below 80°F. Storage life decreases with increasing storage temperature. Avoid exposure to heat sources such as direct sunlight or steam pipes. Keep containers sealed to prevent moisture pickup and monomer loss. Rotate stock.

Bulk – Store in stainless steel tanks or tanks lined with epoxy or phenolic coatings. Observe precautions against heat and moisture (see above). An inert gas or nitrogen blanket may be desirable.

SHELF LIFE: This product has a limited shelf life. When stored in accordance with the above conditions, this product has a usuable life of three months.

DO NOT STORE LONGER THAN SHELF LIFE

NOTICE: Ashland makes no warranty or representation as to the suitability of the product as specified herein for any particular application. The determination of the suitability of the above specification for any particular use is solely the responsibility of the user.

All precautionary labels and notices should be read and understood by all supervisory personnel and employees before using. Consult Ashland Chemical Company and OSHA regulations for additional safety and health information. Purchaser is responsible for complying with all applicable federal, state or local laws and regulations covering use of the product. Special attention should be given to consumer applications. Freedom to use any patent owned by Ashland or others is not to be inferred from any statement contained herein.

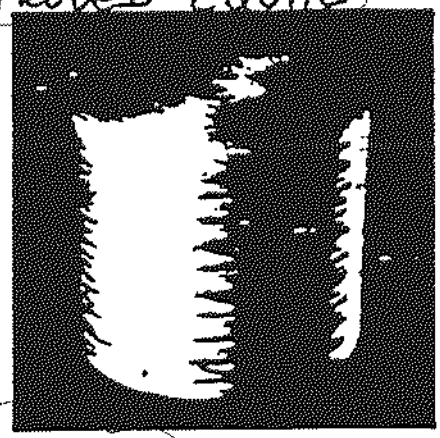
Item:#MTI Sh: 3 of 11
Sect:# 2 Dwg:#A01

CertainTeed FiberGlass

Data Sheet 282-B1

OR APPROVED EQUAL

Continuous Strand Roving



Product Description—This continuous strand roving is designed to deliver the high performance required for general purpose spray-up with both filled and unfilled resin systems. The 282-B1 roving has rapid wet-out, low static and excellent chopping characteristics while producing the required physical properties in the finished laminate. Each roving is wound with even tension to provide virtually trouble-free package feed. Even fiber lay-down, easy roll-out and resin drain resistance are distinguishing features of 282-B1 roving.

- VERIFY TYPE "E" GLASS ROVING
- VERIFY 1½" OZ./SQ.FT.

Product Specifications

Strand Treatment	Chrome
Roving Yield	207 yards/lb.
Ignition Loss	1.15% Nominal
Filament Diameter	10 Microns (G)
Package Height	9¾ Inches
Approximate Package O.D	10 Inches
Approximate Net Package Weight	33 lbs.
Red Tracer	Available

Packaging Specifications

Carton Types	Closed Top & Open Top
Pallet Pack Design	Vertical & Horizontal
Packaging Bags	Kraft (all ctn. types) Poly (closed & open top only)
Approximate Pallet Dimensions	L-43" x W-32" x H-49"
Approximate Net Pallet Weight	1585 lbs.
Approximate Gross Pallet Weight	1670 lbs.
Number of Units per Pallet	48
Pallet Packaging	Film Wrap

CALVET

Item: #MTLSh: 4 of 11

Sect: # 2 Dwg: # A01

Test Data

Unfilled Polyester Resin System

Properties	282-B1	
	Dry	Wet*
Tensile Strength, psi	7,200 - 9,000	6,800 - 8,600
Flexural Strength, psi	17,200 - 19,200	14,600 - 16,300
Flexural Modulus, psi	0.7 - 1.1 x 10^6	0.6 - 0.9 x 10^6
Notched Izod Impact ft.-lbs./inch	7.5 - 13.5	
Glass Content, % Wt.	25 - 35	25-35

*24 hour boil in deionized water

Filled Polyester Resin System
(50% resin, 50% aluminum trihydrate)

Properties	282-B1
	Dry
Tensile Strength, psi	4,700
Flexural Strength, psi	10,300
Flexural Modulus, psi	1.1 x 10^6
Notched Izod Impact ft.-lbs./inch	3.9
Glass Content, % Wt	13.9

Manufacturing Facility
CertainTeed Corporation
Fiber Glass Reinforcements
4515 Allendale Road
Wichita Falls, TX 76310
(800) 433-0922

Corporate Offices
CertainTeed Corporation
Fiber Glass Reinforcements
P.O. Box 860
Valley Forge, PA 19482
(215) 687-5000

CALVERT

Item:#MTLSh: 5 of 11
Sect:#2 Dwg:#A01

Test Data

Unfilled Polyester Resin System

Properties	282-B1	
	Dry	Wet*
Tensile Strength, psi	7,200 - 9,000	6,800 - 8,600
Flexural Strength, psi	17,200 - 19,200	14,600 - 16,300
Flexural Modulus, psi	0.7 - 1.1 x 10^6	0.6 - 0.9 x 10^6
Notched Izod Impact ft.-lbs./inch	7.5 - 13.5	
Glass Content, % Wt.	25 - 35	25-35

*24 hour boil in deionized water

Filled Polyester Resin System
(50% resin, 50% aluminum trihydrate)

Properties	282-B1
	Dry
Tensile Strength, psi	4,700
Flexural Strength, psi	10,300
Flexural Modulus, psi	1.1 x 10^6
Notched Izod Impact ft.-lbs./inch	3.9
Glass Content, % Wt.	13.9

Manufacturing Facility
CertainTeed Corporation
Fiber Glass Reinforcements
4515 Allendale Road
Wichita Falls, TX 76310
(800) 433-0922

Corporate Offices
CertainTeed Corporation
Fiber Glass Reinforcements
P.O. Box 860
Valley Forge, PA 19482
(215) 687-5000

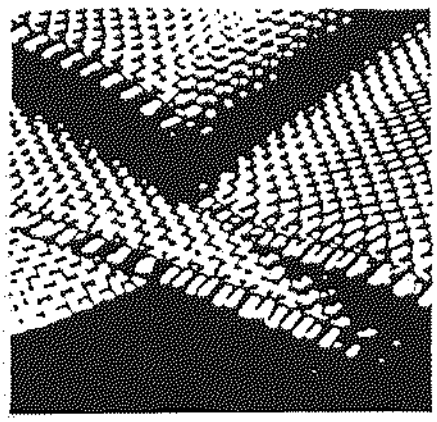
CALVERT

Item:#MTLSh: 6 of 11
Sect:#2 Dwg:#A01

CertainTeed FiberGlass

Data Sheet 318 322 324 319 325

Woven Roving



Plain Weave

Product Description—Heavyweight fabrics woven from specially designed continuous strand roving. The 300 series of woven roving fabrics are designed for hand lay-up contact molding and other low pressure processes using polyester resin, vinylester and other high performance resin systems.

Twin Weave

Product Description—Lower cost, heavyweight fabrics woven from specially designed continuous strand rovings. The twin weave is more open, allowing a faster wet-through of the resin.

Plain Weave Product Specifications

Product Number	Nominal Weight Per Sq. Yard	Construction Warp	(% wt)	Fill	(% wt)	Nominal Feet Per Roll	Approx. Roll Weight (lbs.) 38"	50"	60"
318	18	5.0	(55%)	4.0	(45%)	365	150	200	230
322	22	5.0	(59%)	3.4	(41%)	300	150	200	230
324	24	5.0	(55%)	4.0	(45%)	275	150	200	230

Standard Widths: 6", 8", 10", 12", 38", 50", 60"
Made to order widths are available from 4" to 129" on request for quotation basis.
Large continuous roll lengths are available on request for quotation basis.

Twin Weave Product Specifications

Product Number	Nominal Weight Per Sq. Yard	Construction Warp	(% wt)	Fill	(% wt)	Nominal Feet Per Roll
319	18	10	(55%)	2	(45%)	365
325	24	10	(55%)	2	(45%)	275

Standard Widths: 50" and 60"

Packaging Specifications

Carrier	3" I.D. Chipboard Tube
Roll Packaging	Corrugated Cartons
Number of Units per Pallet	12 Cartons per Pallet-38" 9 Cartons per Pallet-50" and 60"
Approximate Pallet Dimensions	L-52½" x W-45" up to 50" L-62½" x W-45" for 60"

CALVERT

Item:#MTLSh: 7 of 11

Sect:# 2 Dwg:#A01

Test Data

CertainTeed woven rovings meet or exceed ASTM and Military Specifications Laminate requirements.

Properties **318, 322, 324, 319, 325**

	Warp Direction			Fill Direction		
	ASTM[1] Spec.	Mil[2] Spec.	Typical Values	ASTM[1] Spec.	Mil[2] Spec.	Typical Values
Flexural Strength Dry, psi	50,000	60,000	64,600-76,000	40,000	50,000	51,800-69,000
Tensile Strength Dry, psi	—	38,000	47,000-55,700	—	30,000	39,100-46,900
Notched Izod Impact Dry, ft.-lbs./inch	—	—	33–42	—	—	34–39
Glass Content % Wt	55–60	60 max.	55–60	55–60	60 max.	55–60

1. ASTM D 2150–70 Type 3 Min. Values
2. MIL-C-19663B (Navy) 2/8/65 Min. Values

Manufacturing Facility
CertainTeed Corporation
Fiber Glass Reinforcements
4515 Allendale Road
Wichita Falls, TX 76310
(800) 433-0922

Corporate Offices
CertainTeed Corporation
Fiber Glass Reinforcements
P.O. Box 860
Valley Forge, PA 19482
(215) 687-5000

CALVERT

Item:#MTLSh: 6 of 11
Sect:#2 Dwg:#A01

Test Data

CertainTeed woven rovings meet or exceed ASTM and Military Specifications Laminate requirements.

Properties **318, 322, 324, 319, 325**

	Warp Direction			Fill Direction		
	ASTM[1] Spec.	Mil[2] Spec.	Typical Values	ASTM[1] Spec.	Mil[2] Spec.	Typical Values
Flexural Strength Dry, psi	50,000	60,000	64,600-76,000	40,000	50,000	51,800-69,000
Tensile Strength Dry, psi	—	38,000	47,000-55,700	—	30,000	39,100-46,900
Notched Izod Impact Dry, ft.-lbs./inch	—	—	33–42	—	—	34–39
Glass Content % Wt	55–60	60 max.	55–60	55–60	60 max.	55–60

1. ASTM D 2150–70 Type 3 Min. Values
2. MIL-C-19663B (Navy) 2/8/65 Min. Values

Manufacturing Facility
CertainTeed Corporation
Fiber Glass Reinforcements
4515 Allendale Road
Wichita Falls, TX 76310
(800) 433-0922

Corporate Offices
CertainTeed Corporation
Fiber Glass Reinforcements
P.O. Box 860
Valley Forge, PA 19482
(215) 687-5000

CALVERT

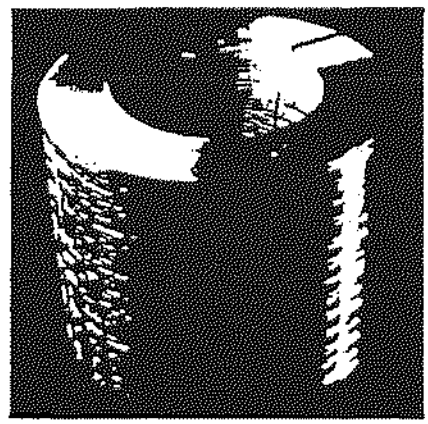
Item:#MTI Sh: 9 of 11
Sect:# 2 Dwg:#A01

CertainTeed FiberGlass

Data Sheet 612 R099™

OR APPROVED EQUAL

Continuous Strand Roving



Product Description—612-R099 is designed for general purpose filament winding and weaving applications. 612-R099 has polyester compatibility and is a single ribbon (zero catenary) type strand, which contributes to the product's processability and wet-out. In the finished laminate, 612-R099 offers excellent clarity and physical properties.

Product Specifications

Strand Treatment	Silane
Roving Yield	434 and 600 yards/lb.*
Ignition Loss	.47% Nominal
Approximate Package O.D.	11"
Package Height	10"
Approximate Net Package Weight	35 lbs.

Packaging Specifications

Pallet Pack Design	Bulk Pack
Packaging Bags	Poly
Approximate Pallet Dimension	L-45" x W-35" x H-41"
Approximate Net Pallet Weight	1,680 lbs.
Approximate Gross Pallet Weight	1,760 lbs.
No. of Units Per Pallet	48
Pallet Packaging	Film Wrap

*When ordering, specify nominal yield (434 or 600 yards/lb.)—additional yields available upon request.

CALVERT

Item:#MTLSh:10 of 11

Sect:# 2 Dwg:#A01

Test Data

Polyester Resin System

Properties	612-RO99*
Shear Strength (dry), psi	6,100
Shear Strength (wet**), psi	4,200
% Retention	68
Glass Content, %	71

* NOL Ring Shear—All data Avg. 2 rings, 10 breaks/ring
** 3 hrs. boil—wet condition

Vinylester System

Properties	612 - RO99*
Shear Strength (dry), psi	6,800
Shear Strength (wet**), psi	5,400
% Retention	80
Glass Content, %	75

* NOL Ring Shear—All data Avg. of 4 rings, 10 breaks/ring.
** 48 Hrs. boil—wet condition

Manufacturing Facilities
CertainTeed Corporation
Fiber Glass Reinforcements
P.O. Box CT
Wichita Falls, Texas 76310
(800) 433-2620

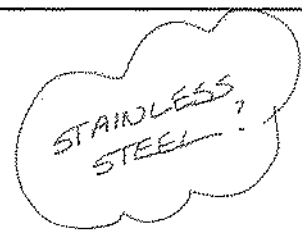
Corporate Offices
CertainTeed Corporation
Fiber Glass Reinforcements
P.O. Box 860
Valley Forge, Pa., 19482
(215) 687-5000

CALVERT

Item:#MTI Sh: 11 of 11
Sect:#2 Dwg:#A01

HSL - Allowable Working Loads (lbs.)

Anchor Size	4000 PSI Concrete Tension	Shear
⅜"	1610	2460
½"	2730	4580
¾"	4930	6420
1"	8070	11790



Approvals

International Conference of Building Officials Report No. 3987

Suggested Specification:

Expansion Anchors — Expansion Anchors shall be heavy duty sleeve type anchors, zinc plated in accordance with ASTM B 633-78 SC1, Type III. Anchors shall be HSL expansion anchors by Hilti Fastening Systems, 4115 South 100th East Avenue, Tulsa OK 74146

Installation — HSL Expansion Anchors to be installed in holes drilled with Hilti carbide tipped drill bits. Anchors shall be installed and torqued per manufacturers recommendations.

The Hilti HVA Adhesive Anchor



Advantages:

Anchor fastening does not exert expansion pressure

High loading capacity

Good performance under dynamic load

Material:

Standard rod material meets the mechanical requirements of A307 Grade A

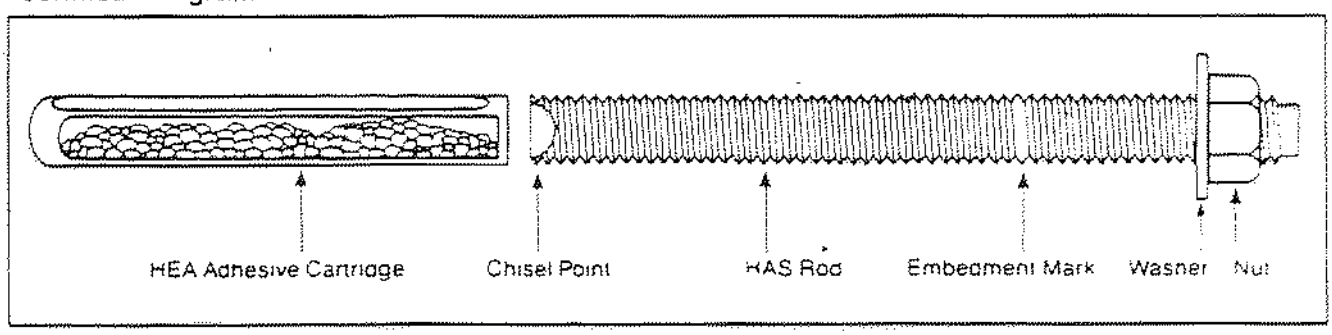
Rod material also available is A193, Grade B7 steel or 304 stainless steel

All standard HAS and HAS Super Rods except ⅜" are zinc plated

⅜" hot dipped galvanized in accordance with ASTM A153-78

HEA Adhesive Capsule contains a vinylester adhesive resin

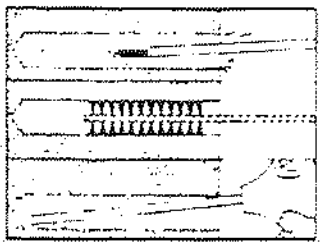
Technical Diagram



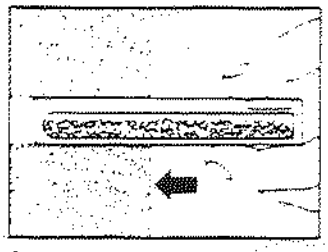
Sect:#2 Dwg:#A11 Item:#Hilti HVA/SN

The Hilti HVA Adhesive Anchor continued

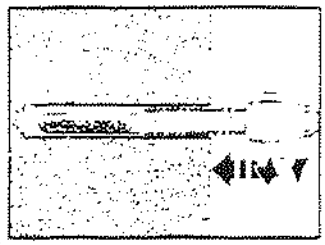
Installation Instructions (HAS Threaded Rod)



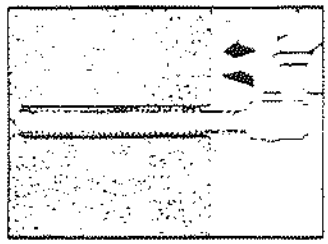
1 Set the drill depth gauge and drill the hole to the required hole depth IMPORTANT Clear out dust and fragments, preferably using a jet of water or compressed air and a wire brush The hole may be damp, but the water should be blown out



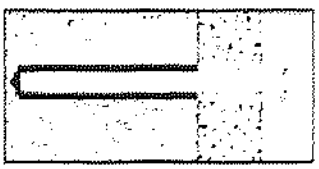
2 Insert the cartridge



3 Insert the shaft in the rotary hammer chuck, screw the anchor rod in the adaptor and place the adaptor on the shaft With the drill set in the rotary drill mode drill in the rod to the embedment depth mark Remove the drill and shaft assembly from the adaptor

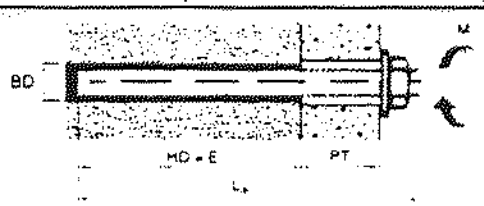


4 Rotate the hex bolt and unscrew the adaptor from the anchor rod immediately When removing the adaptor do not pull out the rod If the adaptor is removed immediately, movement of the rod will not be detrimental to the fastening



5 The set anchor rod may not be disturbed or loaded during or before the end of the specified hardening time

Specification Table (HAS-Anchor Rod)



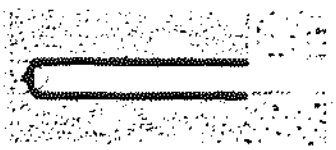


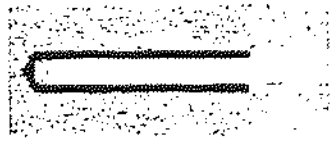
Details		Anchor size HVA ⅜"	HVA ½"	HVA ⅝"	HVA ¾"	HVA ⅞"	HVA 1"	HVA 1¼"
BD	bit diameter (inches)	13/32	9/16	11/16	⅞	1	1⅛	1½
E	min. depth of embedment = capsule length	3½	4½	5	6⅜	6⅜	8¼	12
PT	max. thickness fastened (inches)	1	1½	1¾	2	2¼	2½	2¾
L_s	anchor length (inches)	5⅛	6½	7⅜	9⅜	10	12	16
M	max. tightening torque (ft. lbs.) HAS S.S	18	30	75	150	175	235	400
	HAS Std HAS-Super	18	35	80	160	200	330	550
Drill bit size		TE-C-13/32-12	TE-D-9/16-12	TE-D-11/16-12	TE-F-⅞-13	TE-F-1-13	TE-F-1⅛-17	TE-G 1½-23
BMT	min. base material thickness (inches)	5½	6¼	7⅞	8½	8½	10½	15
AS	spacing required to obtain maximum working load (inches)	3½	4¼	5	6⅜	6⅜	8¼	12
AS min	Minimum allowable spacing between anchors (inches) Refer to note 1	1¾	2⅛	2½	3¼	3¼	4⅛	6
ED	Edge distance required to obtain maximum working load (inches)	5⅛	6⅜	7½	10	10	12⅜	18
ED min	Minimum allowable edge distance (inches) Refer to notes 2 and 3	1¾	2⅛	2½	3¼	3¼	4⅛	6

NOTES 1 When using AS_{min}, reduce the working load by 30%
2 When using ED_{min} and the load is a shear load, reduce the working load by 50%
3 When using ED_{min} and the load is a tensile load, reduce the working load by 40%

Item:#ANC Sh: 2 of 5
Sect:# 2 Dwg:#ANI

Average Allowable Tensile Strength (lbs) Average Allowable Shear Strength (lbs)





Anchor Diameter (in.)	Embed. Depth (in.)	Bond Strength Allowable Tensile Loads[1] 2000 psi Conc.	3000 psi Conc.	4000 psi Conc.	6000 psi Conc.	Anchor Rod Allowable Loads HAS Std. (SAE 1018) [2]Tensile	[2]Shear	HAS Super SAE 4140 [2]Tensile	[2]Shear	HAS SS (304 SS) [2]Tensile	[2]Shear
	3½	2010	2210	2420	2830						
⅜	5¼	3010	3320	3630	4250	1560	1070	3250	1900	2600	1850
	7	4010	4425	4840	5665						
	4½	2660	2990	3330	3990						
½	6⅜	4000	4490	4990	5980	2840	2090	5920	3270	4730	3600
	8½	5330	5990	6650	7970						
	5	4120	4590	5070	6020						
⅝	7½	6180	6890	7600	9030	4520	3000	9420	5632	7530	5050
	10	8240	9190	10140	12040						
	6⅜	5750	6510	7260	8770						
¾	10	8630	9760	10890	13150	6680	4800	13920	7650	9460	7270
	13¼	11510	13020	14520	17530						
	6⅜	5770	7660	8550	10320						
⅞	10	10160	11490	12820	15490	9240	6350	19250	10780	13090	—
	13¼	13540	15320	17090	20650						
	8¼	9640	10960	12290	14930						
1	12⅜	14460	16450	18430	22390	12120	7630	25250	13760	17170	—
	16½	19280	21930	24570	29860						
	12	20510	23220	25940	31370						
1¼	18	29360	31850	34340	39310	19380	13070	40375	21530	27450	—

Allowable tensile loads (AWL) for bond strength are based upon the following formula

$$AWL = \frac{\overline{F}_t - 2S_t}{3} \quad \text{WITH} \quad S_t = (C.V.)\,\overline{F}_t,\ C.V. = 10\%$$

$\overline{F}_t$ determined by actual test results

[1]Allowable tensile load for anchor rods is based upon allowable stress = .33 F_u Acting upon the tensile stress area of the rods. Per AISC Section 1.5

[2]Values are based upon tests performed at minimum embedment and the following formula:

$$\text{allowable shear load} = \frac{\overline{F}_t - 2S_t}{3}$$

$\overline{F}_t$ determined by testing
$S_t = (C.V.)\,\overline{F}_t,\ C.V. = 10\%$

HVA Ultimate Bond Strength/Steel Strength (lbs) for Threaded Anchor Rods

Anchor Diameter (in.)	Embed. Depth (in.)	HEA ULTIMATE Bond Strength (lbs) Concrete Strength 2000 psi	3000 psi	4000 psi	6000 psi	Steel Strength (lbs)[1] HAS Std. (SAE 1018) Yield Strength	Tensile Strength	Shear Strength	HAS Super (SAE 4140) Yield Strength	Tensile Strength	Shear Strength	HAS SS (304 SS) Yield Strength	Tensile Strength	Shear Strength
	3½	7530	8300	9070	10620									
⅜	5¼	11290	12450	13610	15930	2810	4680	4015	8190	9750	7120	5070	7800	6930
	7	15050	16600	18140	21240									
	4½	9990	11230	12470	14950									
½	6⅜	14980	16840	18700	22420	5110	8520	7850	14910	17750	12280	9230	14200	10490
	8½	19980	22460	24930	29890									
	5	15440	17220	19010	22570									
⅝	7½	23160	25840	28510	33860	8140	13560	11240	23730	28250	21120	14690	22600	18950
	10	30890	34450	38010	45140									
	6⅜	21580	24400	27230	32870									
¾	10	32370	36600	40840	49310	12020	20040	16010	35070	41750	28700	15030	28390	27250
	13¼	43160	48810	54450	65740									
	6⅜	25390	28720	32050	38710									
⅞	10	38090	43080	48080	58070	16630	27720	23805	48510	57750	40410	20790	39270	—
	13¼	50780	57440	64100	77420									
	8¼	36160	41110	46070	55980									
1	12⅜	54230	61670	69100	83970	21820	36360	28615	63630	75750	51590	27270	51510	—
	16½	72310	82230	92140	111970									
	12	76910	87080	97260	117620									
1¼	18	110100	119430	128760	147420	34880	58140	49000	101745	121125	80740	40605	82365	—

[1] Steel strength based on tensile stress [illegible] standard UNC thread

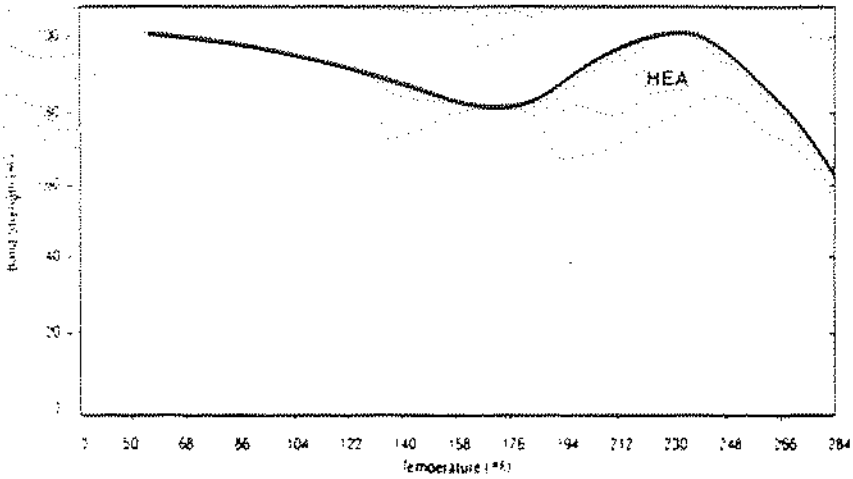
[2] Use lower value of either bond or steel strength

CALVERT

Item:#ANC Sh: 2 of 5
Sect:# 2 Dwg:#ANI

The Hilti HVA Adhesive Anchor continued

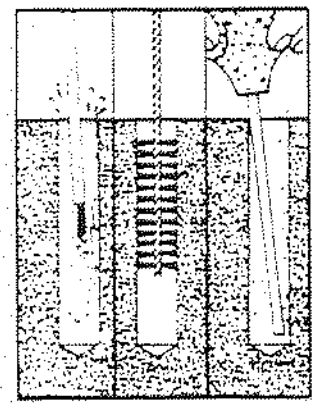
Influence of Temperature on Bond Strength



Curing Time	Base Material Temperature
20 Min	Above 68°F
30 Min	50°F to 68°F
1 Hr	32°F to 50°F
5 Hr	23°F to 32°F

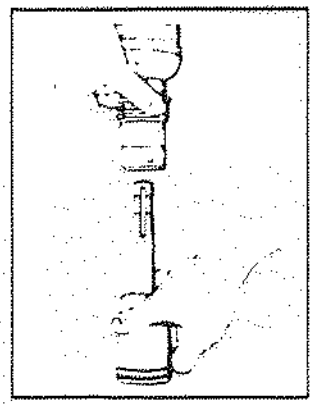
Below 23°F, consult your Hilti Engineer

Installation Instructions (Rebar)

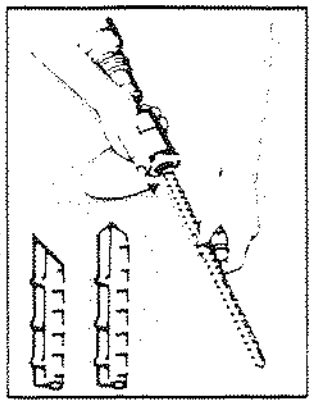


1. Drill the hole to the required hole depth

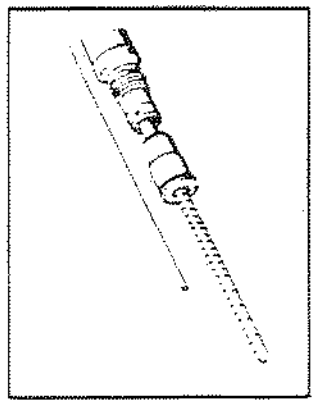
   IMPORTANT: Clear out dust and fragments, preferably using a jet of water or compressed air and a wire brush (The damp hole does not influence the holding value!)



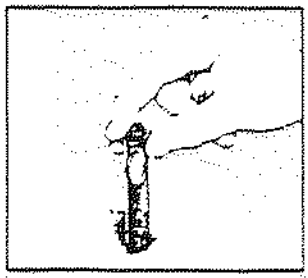
2. Insert shank of rebar tool into drill chuck. Switch drill to hammer with rotation mode



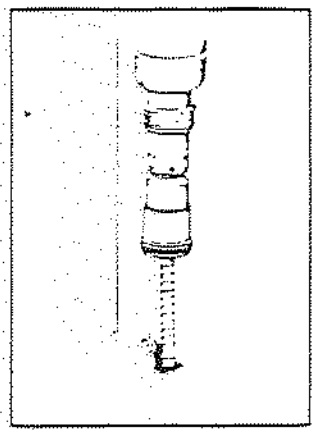
3. Rotate knurled locking sleeve and insert appropriate diameter rebar. End of rebar being inserted into base material must have a 45° or chisel point (90°)



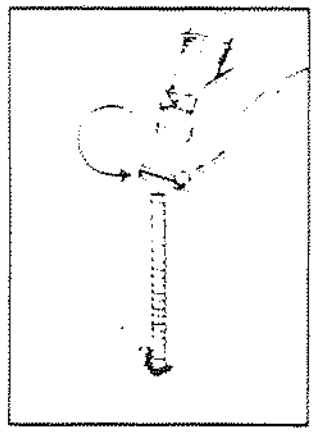
4. Set drill depth gauge or mark rebar to determine bottom of hole



5. Insert appropriate diameter HEA adhesive cartridge(s) into pre-drilled hole in base material



6. Place chisel pointed end of rebar on top of HEA cartridge and switch on drill. Drive rebar to bottom of hole



7. Once the rebar reaches the bottom of the hole, the drill should be switched off. To release rebar setting tool, rotate knurled locking sleeve and remove tool from rebar. Care should be taken not to disturb the installed rebar when removing the rebar tool

NOTE

1. The rebar setting tool can be cleaned by soaking it in a solvent and then blowing dry with compressed air
2. The locking rollers of the setting tool should be lubricated every 100 installations, or as required, using Hilti Spray Lube or equivalent

IMPORTANT: Use of safety glasses during installation of rebar is recommended

Item:#ANr Sh:1 of 1
Sect:#? Dwg:#ANI

Specification Table (Rebar)

Rebar Setting Tool		Rebar Dia.	Adhesive Cartridge Description	Hilti Drill	Hilti Drill-Bit Diameter (in.)	Recommended Standard Embedment (in.)	Cartridge Per Hole	Minimum Overall Rebar Length (in.)
Cat. No.	Description							
5460660	TE-F Rebar Adaptor #3	#3 or 3/8"	HEA 3/8"-3 1/2"	TE-52/72	1/2	3 1/2	1	7 1/2
5460662	TE-F Rebar Adaptor #4	#4 or 1/2"	HEA 1/2"-4 1/4"	TE-52/72	5/8	4 1/4	1	8 1/4
5460664	TE-F Rebar Adaptor #5	#5 or 5/8"	HEA 5/8"-5"	TE-72/92	13/16	5	1	9
5460666	TE-F Rebar Adaptor #6	#6 or 3/4"	HEA 3/4"-6 5/8"	TE-72/92	1	6 5/8	1	10 1/2
5460667	TE-F Rebar Adaptor #7	#7 or 7/8"	HEA 7/8"-6 5/8"	TE-72/92	1 1/8	6 5/8	1	11
5460668	TE-F Rebar Adaptor #8	#8 or 1"	HEA 1"-8 1/4"	TE-72/92	1 1/4	8 1/4	1	12 1/2
5460670	TE-F Rebar Adaptor #9	#9 or 1 1/8"	HEA 1"-8 1/4"	TE-92 only	1 1/2	8 1/2	2*	12 1/2
5460672	TE-F Rebar Adaptor #10	#10 or 1 1/4"	HEA 1 1/4"-12"	TE-92 only	1 3/4	12	1	18

* The best method for setting the #9 rebar is to crush the first cartridge into the hole and insert the second on the top of the first

Bond Strength For Rebar Installed With HILTI HEA Capsules

Rebar Diameter	Embed Depth	HVA Ultimate Bond Strength (lbs)				Grade 60 Rebar*	
		2000 PSI	3000 PSI	4000 PSI	6000 PSI	Yield Strength	Tensile Strength
#3	3 1/2	6320	7150	7970	9620	6600	9900
	5 1/4	9480	10720	11960	14430	6600	9900
	7	12640	14290	15940	19240	6600	9900
#4	4 1/4	9680	10980	12270	14850	12000	18000
	6 3/8	14520	16460	18400	22280	12000	18000
	8 1/2	19360	21950	24530	29710	12000	18000
#5	5	15000	16920	18830	22650	18600	27900
	7 1/2	22490	25370	28240	33980	18600	27900
	10	29990	33820	37650	45310	18600	27900
#6	6 3/8	21020	24250	27470	33930	26400	39600
	10	31530	36370	41210	50890	26400	39600
	13 1/4	42040	48500	54950	67850	26400	39600
#7	6 3/8	23650	27280	30910	38170	36000	54000
	10	35470	40920	46360	57250	36000	54000
	13 1/4	47300	54560	61810	76330	36000	54000
#8	8 1/4	35640	40500	45360	55080	47400	71100
	12 3/8	53460	60750	68040	82610	47400	71100
	16 1/2	71270	80990	90710	110150	47400	71100
#9	8 1/4	48210	54820	61430	74640	60000	90000
	12 3/8	72310	82230	92140	111970	60000	90000
#10	12	63330	71910	80490	97640	76200	114300
	18	79170	90060	100940	122710	76200	114300

* Steel strength based on nominal cross-sectional area of Rebar

Approvals

For current approvals please contact your Hilti engineer or Technical Marketing services.

Suggested Specification:

Adhesive Anchors — Adhesive anchors shall consist of all-thread anchor rod, nut, washer, and adhesive capsule. Anchor rods to be manufactured from (1) SAE 1018 meeting the mechanical requirements of ASTM A 307-80, Grade A (2) AISI 4140, 4142, 4145, 4140H, 4142H, or 4145H meeting the requirements of ASTM A-193, Grade B-7 (3) AISI 304 stainless steel which meets the requirements of ASTM F 593-80. Anchor rods shall have rolled threads. The adhesive capsules used shall contain a vinylester resin as supplied in the Hilti HEA adhesive capsules.

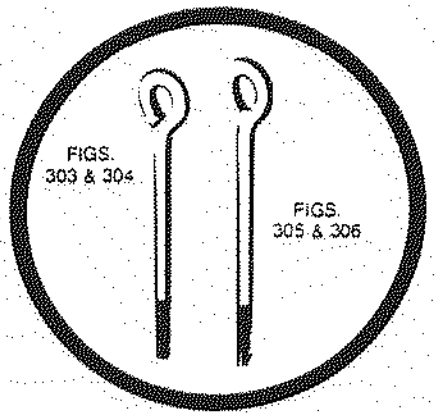
Installation — Adhesive anchors to be installed in holes drilled with Hilti carbide tipped drill bits. Anchors shall be installed per manufacturer's recommendations.

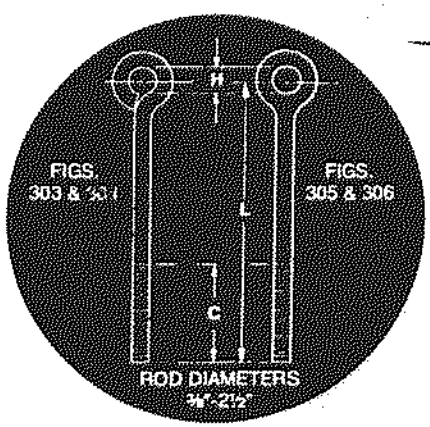
Item:#ANV Sh: 5 of 5
Sect:# 2 Dwg:#ANI

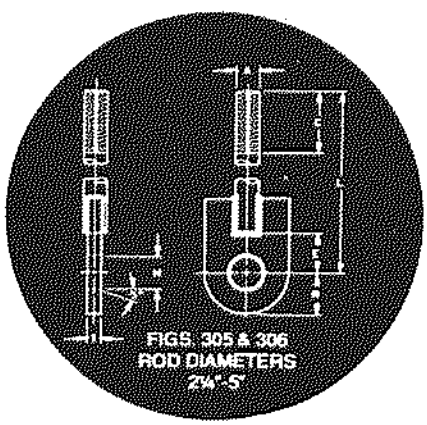
FIG. 303 EYE ROD — NOT WELDED RIGHT HAND THREAD
FIG. 304 — NOT WELDED LEFT HAND THREAD
FIG. 305 — WELDED RIGHT HAND THREAD
FIG. 306 — WELDED LEFT HAND THREAD

MATERIAL: Carbon Steel S5

ORDERING: Specify Rod Diameter, Rod Length, Figure Number, And Thread Length If Other Than Standard. Where Eye Rod Is 2¼" Or Larger, Specify H (Not To Exceed Max. H Shown Below).







DIMENSIONS — LOADS — FIG. 303-306

Rod Dia.	Maximum Rated Load Fig. 303-304	Maximum Rated Load Fig. 305-306	Max. Eye Dia. H	Standard Thread C	Min. L w/Std. Thd. Length
⅜	210	810	9/16	6	8
½	390	1130	¾		8
⅝	630	1810	15/16		8½
¾	940	2710	1⅛	6	9
1	1730	4960	1½		9½
1¼	2800	8000	1⅞		9½
1½	4070	11630	2¼	6	10½
1¾	5490	15700	2½	7	11½
2	7240	20700	2¾	8	12½

(SEE SH. 414 FOR TANK TYPE DOWN DETAIL. S.S. EYE RODS FOR USE IN GROUND

DIMENSIONS — LOADS — LARGE SIZE — FIG. 305 & 306

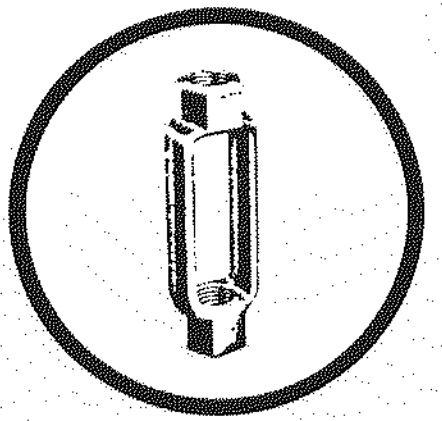
Rod Dia.*	Max. Rated Load	Max. Eye Dia. H	Standard Thread C	E	Min. L w/Std. Thd. Length	R	T
2¼	27200	3⅛	12	4	18¾	4	1¼
2½	33500	3⅜		4	19	4¼	
2¾	41600	3⅝	12	4¼	20	4½	1½
3	50600	3⅞		4½	21	4¾	
3¼	60500	4⅛		4½	22	5	
3½	71260	4⅜	15	5¼	25	5¼	2
3¾	82900	4⅝		5½	26	5¾	
4	95500	4⅞		5½	27	6	
4¼	108900	5⅛	18	5¾	31	6¼	2
4½	123200	5⅜		6¼	31	6½	2½
4¾	138400	5⅝		6¼	32	6¾	2½
5	154500	5⅞		6¼	33	7¼	2½

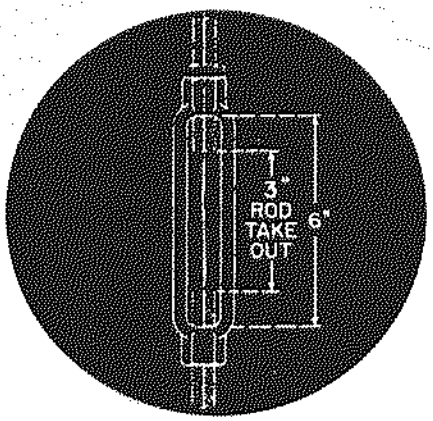
*UNC-2A thread series furnished for rod sizes thru 3".
8UN-2A thread series furnished for 3¼" thru 5" rod sizes.

CALVERT ENVIRONMENTAL 5985 SANTA FE STREET SAN DIEGO, CA 92109 (619) 272-0050 FAX: (619) 272-3672

CALVERT Item #: 42

FIG. 360 TURNBUCKLE





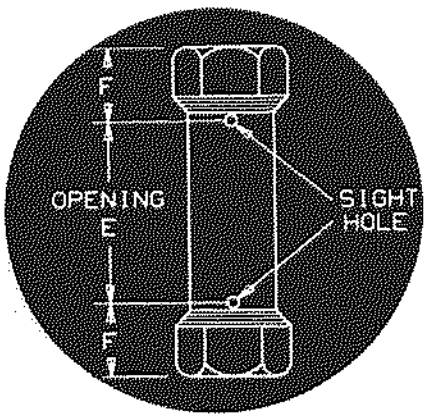
MATERIAL: Forged Steel S.S.
ORDERING: Specify Rod Size And Figure Number

LOADS — WEIGHTS

Rod Size	Max. Rated Load	Weight Per 100
⅜	610	42
½	1130	65
⅝	1810	98
¾	2710	145
1	4960	260
1¼	8000	445
1½	11630	640
1¾	15700	1100
2	20700	1490
2¼	27200	1960
2½	33500	2693

STAINLESS STEEL REQ'D FOR BELOW GROUND

FIG. 361 FABRICATED TURNBUCKLE



MATERIAL: Carbon Steel
ORDERING: Specify Rod Size, Figure Number And Opening

LOADS — DIMENSIONS

Rod Size*	Max. Rated Load	Opening — E** (Specify)	F
1¼	8000	6, 12, 18 or 24	1½
1½	11630		1¾
1¾	15700		2
2	20700	6, 12, 18 or 24	2¼
2¼	27200		2½
2½	33500		3
2¾	41600	6, 12, 18 or 24	3¼
3	50600		3½
3¼	60500		3¾
3½	71260	6, 12, 18 or 24	4
3¾	82900		4¼
4	95500		4½
4¼	108900	6, 12, 18 or 24	4¾
4½	123200		5
4¾	138400		5¼

CALVERT ENVIRONMENTAL 5985 SANTA FE STREET SAN DIEGO, CA 92109 (619) 272-0050 FAX: (619) 272-3672

CONTRACTORS INC.

APPROVED subject to the approval by the architect and engineer.

Approval of these submittals by the Architect and Contractors Inc. does not relieve you from the responsibilities of your errors and/or omissions.

By _____ Date 12-11-89

DAVID P. WILSON CO., INC.

5319 S.W. Westgate Drive
PORTLAND, OREGON 97221

SUBMITTAL DATA
PROJECT: Durham WWTP Phase 1
EQUIPMENT NO: EF-301, OCF-401,2,3,4
MFR: Hartzell Fan Company
Piqua, Ohio

CWC-HDR, INC.
CWC-HDR PN 39.3302
CHECKED BY JEK
REF 317 15800
MAR 2 1990
☐ NO EXCEPTIONS NOTED
☒ EXCEPTIONS NOTED
☐ RETURNED FOR CORRECTION
REVISE & RESUBMIT

CONTENTS

EF-301 Fan and Accessories	1A
OCF-401,2,3 Fans and Accessories	7A
OCF-404 Fan and Accessories	11A
Motor Data	14A
Installation, Operation and Maintenance	17A

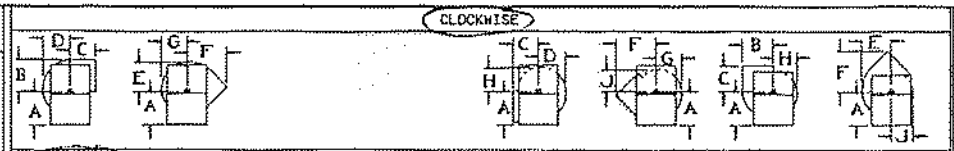
EF-301

FAN AND ACCESSORIES

LET	DATE	BY	ECN NO.
--			
A	5/27/88	JAY	C89-143
	5/28/89	RLB	

HARTZELL FAN, INC.
Piqua :: Ohio

CLOCKWISE



COUNTERCLOCKWISE

FAN SIZE	A	B	C	D	E	F	G	H	J
40	47	47 3/8	35 7/8	39 7/16	41 15/16	58 7/8	36 15/16	34 3/8	31 7/8
49	56 1/2	57 13/16	40	47 13/16	50 7/8	69 3/16	44 3/4	41 11/16	38 5/8

ACCESSORIES

1) X FLANGE-INLET ☒ UNDRILLED ☐ DRILLED
2) ___ FLANGE-OUTLET ☐ UNDRILLED ☐ DRILLED
3) ___ GUARD ☐ INLET ☐ OUTLET
4) X ACCESS DOOR – BOLT ON TYPE
5) X DRIVE GUARD
6) X WEATHER COVER
7) ___ HI-CORROSIVE CONSTRUCTION
8) ___ NAMEPLATE
9) ___ STATIC GROUNDING
10) ___ SUB BASE
11) ___ INSPECTION DOOR – BOLT ON TYPE
12) ___ DISCONNECT SWITCH
13) X DRAIN-SCROLL 1" NPT
14) ___ VIBRATION ISOLATORS ☐ RUBBER-IN-SHEAR ☐ SPRING
15) ___ INLET CONTROL DAMPER
16) X SHAFT SEAL – NEOPRENE Viton
17) ___ OUTLET DAMPER ☐ PARALLEL BLADE ☐ OPPOSED BLADE

SPECIFICATIONS

ROTATION: ☒ CW ☐ CCW
DISCHARGE: TOP HORIZONTAL

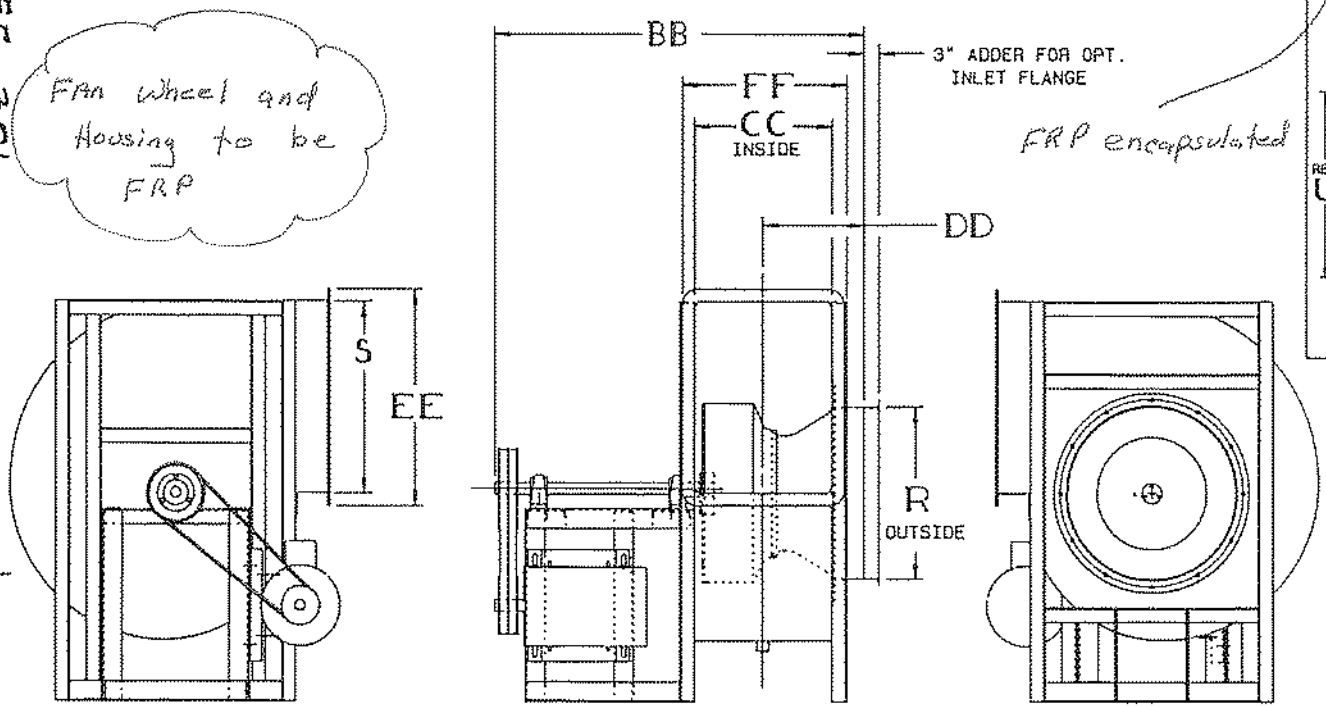
GENERAL NOTES

1. CAUTION: WHEN THE PERIPHERY OF THE BLADES OF A FAN IS LESS THAN SEVEN (7) FEET ABOVE THE FLOOR OR WORKING LEVEL THE BLADES MUST BE GUARDED TO COMPLY WITH OSHA REQUIREMENTS.
2. CLOCKWISE ROTATION SHOWN. COUNTER CLOCKWISE ROTATION IS OPPOSITE AS SHOWN
3. STANDARD ALLOWABLE OPERATING TEMP. IS 200°. ABOVE 200° CONTACT FACTORY.
4. SHAFT-304 STAINLESS STEEL
5. ALL INTERNAL HARDWARE IS 304 STAINLESS STEEL INCAPSULATED IN FIBERGLASS
6. SHAFT SEAL-STANDARD NEOPRENE (NOT GAS TIGHT)

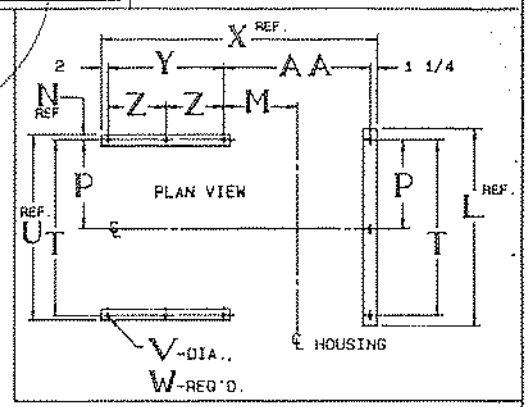
Viton

EF-301

Fan wheel and Housing to be FRP



FRP encapsulated



FAN SIZE	MAX. MOTOR FRAME	MAX. WEIGHT IS LESS MOTOR WEIGHT & ACCESSORIES
40	364T	-
49	405T	-

Confirm layout with ductwork

FAN SIZE	L	M	N	P	R	S	T	U	V	W	X	Y	Z	AA	BB	CC	DD	EE	FF
40	58 1/4	21 1/4	2	22	42 7/8	43 5/16	44	48	13/16	9	70 1/4	27 3/4	13 7/8	39 1/8	85 3/8	31 3/8	20	50 5/16	38 3/8
49	67 1/4	24 11/16	2 1/2	22 1/2	52 1/16	52 5/8	45	50	13/16	9	82 3/8	32 3/4	16 3/8	48 1/4	101	38 1/8	23 5/8	61 5/8	47 1/8

HARTZELL ORDER NO.: 68168-1 MODEL NO.: 41-40G03 DATE: 9-1-89

TITLE: FIBERGLASS BACKWARD CURVED CENTRIFUGAL FAN-BELT DRIVE (FAN SIZES 40" & 49") (SERIES 41 ARRANGEMENT #1 & #9)

DRAWN: CHECKED: APPR.: DATE: 1/25/88 DATE:

DRAWING NO. 41-10154-6

SHEET 1 OF 3 REV. A

279

Hartzell · FAN, INC.
P.O. BOX 919 • PIQUA, OHIO, U.S.A. 45356
PHONE 513-773-7411
Manufacturers of Fans and Blowers
DUNS NO. 00-427-1433

CERTIFIED PRINT

FOR APPROVAL

			CUSTOMER ORDER NO.	OUR ORDER NO.		
3/29/89	PER INVOICE	1711	389-22 (NO OREGON TAX)	68768	00891120	PAGE 1

J D MECHANICAL INC

5687-H SE INTERNAT'L WAY
MILWAUKIE OR 972220000

J D MECHANICAL INC

18560 SW 85TH AVENUE
TIGARD OR 97224
MARK: AS NOTED BELOW EACH ITEM

	SALESMAN ORDER NO. 89DW PH-89108				
D48009003	DAVID P WILSON CO INC	09	BEST WAY PPD CS		

**WARNING: DO NOT SCALE COPIES OF DRAWING TO OBTAIN DIMENSIONS NOT SHOWN ON THE DRAWING. CONSULT FACTORY IF ADDITIONAL DRAWING DIMENSIONS ARE REQUIRED.

1 8641**40*GQJ
40 FIBERGLASS BACK CURVE CENTRI BD
MOTOR: 25 HP 1800 RPM 1 SP XP, POS. R 480/60/3
FAN: 1125 RPM 16,600 CFM 6" SP CW ROTATION, TH DISCHARGE, ARRT. #1
WITH: ADJ. DRIVES
FLANGED INLET, outlet Transition
MOTOR COVER
BELT GUARD
EXTENDED LUBE TUBES
SCROLL DRAIN
EPOXY COATED UNITARY BASE
INSPECTION PORT
VIBRATION ISOLATORS (RIS)
VITON SHAFT SEAL & DOUBLE ROW
SPHERICAL ROLLAR BEARINGS
High Efficiency Motor
TAG: HEADWORKS EXHAUST FAN (EF-301)

Provide performance Curve

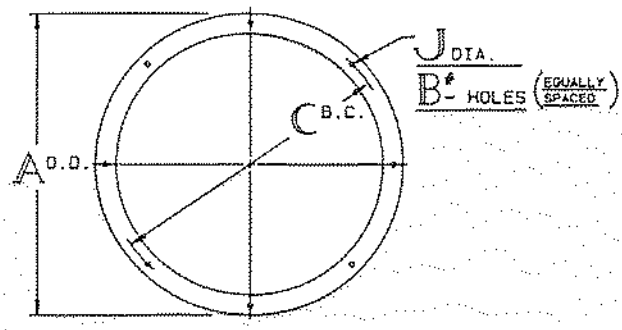
Flanged FRP

THE ABOVE ITEM #1

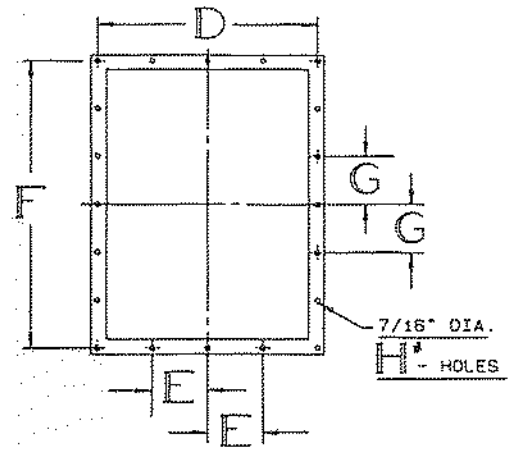
1 REMARKS
ENGINEERING NOTES:
8 DRAWINGS REQUIRED FOR APPROVAL, COMPLETE ASSEMBLY, INSTALLATION, IOM MANS., VPL, STD WIRING DIAGRAM FOR ELECTRICAL, & MOTOR DATA.

FAN SIZE	A	B	C	D	E	F	G	H	J	K	L	M
15	20 3/8	8	18 1/2	15 1/2	3 7/8	20	5	16	7/16			
22	27 3/4	8	25 1/2	21	5 1/4	27 1/2	6 7/8	16	7/16			
27	32 1/2	8	30 1/4	25	6 1/4	33	5 1/2	20	7/16			
33	38 1/4	8	36 15/16	29 1/2	7 3/8	39 3/4	6 5/8	20	7/16			
40	46 5/16	8	45 3/16	35 1/2	8 7/8	48	8	20	7/16			
49	56	16	54 7/8	43 1/2	10 7/8	58 1/2	9 3/4	20	9/16			

FAN SIZE	WEIGHTS (LBS) NO.1	NO.2
15	4.5	----
22	6	----
27	8.5	----
33	11.5	----
40	17.5	----
49	25	----



1.) INLET FLANGE -DRILLED OR UNDRILLED.



2.) OUTLET FLANGE -DRILLED

outlet Transition

TITLE

ACCESSORIES
SERIES 41
(SIZES-15 THRU 49)

HARTZELL
FAN, INC.
PIQUA :: OHIO

LET	ECN NUMBER	BY	DATE
---	C84-34	GE	2/27/84
A	C84-88	DT	7/23/84

EF-301

HARTZELL ORDER NO. 68768-1
MODEL: 41-40-693

PAGE 2 OF 3
DATE: 9-1-89

DRAWING NO. 41-10041-2

3A

Hartzell • FAN, INC.

P.O. BOX 919 • PIQUA, OHIO, U.S.A. 45356

PHONE 513-773-7411 *Manufacturers of Fans and Blowers* DUNS NO. 00-427-1433

CERTIFIED PRINT

FOR APPROVAL

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3/29/89	PER INVOICE	1711	389-22 (NO OREGON TAX)	68768	00891120	PAGE 1

J D MECHANICAL INC

5687-H SE INTERNAT'L WAY
MILWAUKIE OR 972220000

J D MECHANICAL INC

19560 SW 85TH AVENUE
TIGARD OR 97224
MARK: AS NOTED BELOW EACH ITEM

	SALESMAN ORDER NO. SYLW PH-89108				
048009003	DAVID P WILSON CO INC	09	BEST WAY PPD CS		

**WARNING: DO NOT SCALE COPIES OF DRAWING TO OBTAIN DIMENSIONS NOT SHOWN ON THE DRAWING. CONSULT FACTORY IF ADDITIONAL DRAWING DIMENSIONS ARE REQUIRED.

1 8641**40*003
40 FIBERGLASS BACK CURVE CENTRI BD
MOTOR: 25 HP 1800 RPM 1 SP XP, POS. R 480/60/3
FAN: 1125 RPM 16,800 CFM 6" SP CW ROTATION, TH DISCHARGE, ARRT. #1
WITH: ADJ. DRIVES
FLANGED INLET
MOTOR COVER
BELT GUARD
EXTENDED LUBE TUBES
SCROLL DRAIN
EPOXY COATED UNITARY BASE
INSPECTION PORT
VIBRATION ISOLATORS (RIS)
VITON SHAFT SEAL & DOUBLE ROW
SPHERICAL ROLLAR BEARINGS

TAG: HEADWORKS EXHAUST FAN (EF-301)

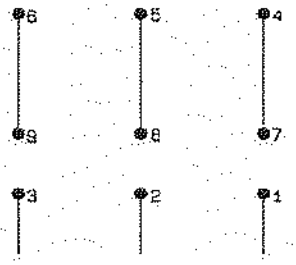
THE ABOVE ITEM #1

1 REMARKS
ENGINEERING NOTES:
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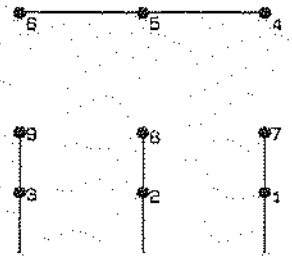
TERMINAL MARKINGS AND CONNECTIONS

CONNECTIONS FOR NINE LEAD, THREE PHASE, DUAL VOLTAGE MOTORS.

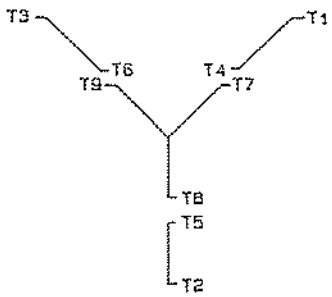
HIGHER VOLTAGE



LOWER VOLTAGE



STAR (Y) CONNECTED



NOTES: 1. TO REVERSE ROTATION, INTERCHANGE ANY TWO (2) POWER LEADS. 2. SEE NAMEPLATE ON MOTOR FOR TYPE.

TITLE
TYPICAL MOTOR
WIRING DIAGRAM
230 OR 460 VOLT, 3 PHASE

HARTZELL
FAN, INC.
PIQUA :: OHIO

LET	ECN NUMBER	BY	DATE
PR	083-31	SCP	3-16-83

DRAWING NO.
101-10118

EF-301

HARTZELL ORDER NO. 68768-1
MODEL: 41-40-603

PAGE 1 OF 1
DATE: 11-22-89

Hartzell · FAN, INC.
P.O. BOX 919 • PIQUA, OHIO, U.S.A. 45356
PHONE 513-773-7411
Manufacturers of Fans and Blowers
DUNS NO. 00-427-1433

CERTIFIED PRINT

FOR APPROVAL

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3/29/89	PER INVOICE	1711	389-22 (NO OREGON TAX)	68768	00891120	PAGE 1

J D MECHANICAL INC

5687-N SE INTERNAT'L WAY
MILWAUKIE OR 972220000

J D MECHANICAL INC

18560 SW 85TH AVENUE
TIGARD OR 97224
MARK: AS NOTED BELOW EACH ITEM

	SALESMAN ORDER NO.				
	87UW PH-89108				
048009003	DAVID P WILSON CO INC	09	BEST WAY FPD CS		

**WARNING: DO NOT SCALE COPIES OF DRAWING TO OBTAIN DIMENSIONS NOT SHOWN ON THE DRAWING. CONSULT FACTORY IF ADDITIONAL DRAWING DIMENSIONS ARE REQUIRED.

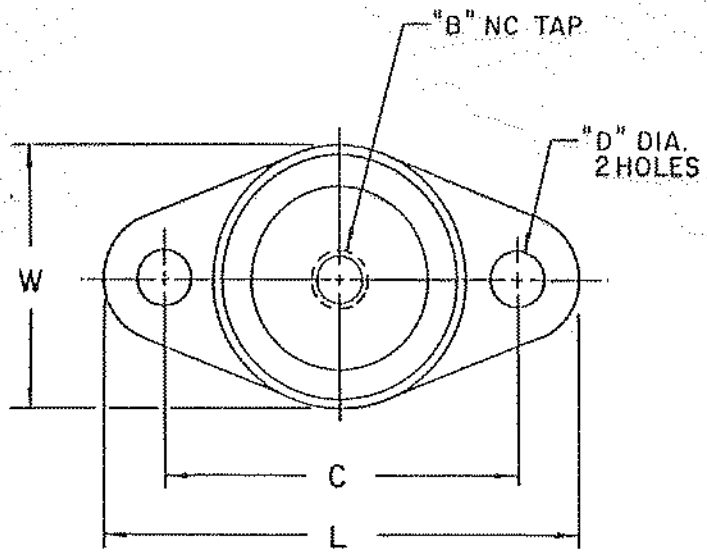
****

1 8641**40*003
40 FIBERGLASS BACK CURVE CENTRI BD
MOTOR: 25 HP 1800 RPM 1 SP XP,
POS. R 460/60/3
FAN: 1125 RPM 16,800 CFM 6" SP
CW ROTATION, TH DISCHARGE,
ARRT. #1
WITH: ADJ. DRIVES
FLANGED INLET
MOTOR COVER
BELT GUARD
EXTENDED LUBE TUBES
SCROLL DRAIN
EPOXY COATED UNITARY BASE
INSPECTION PORT
VIBRATION ISOLATORS (RIS)
VITON SHAFT SEAL & DOUBLE ROW
SPHERICAL ROLLAR BEARINGS

TAG: HEADWORKS EXHAUST FAN (EF-301)

THE ABOVE ITEM #1

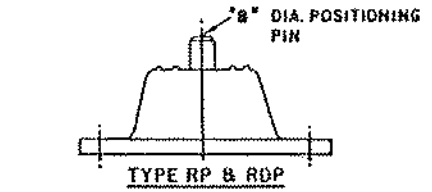
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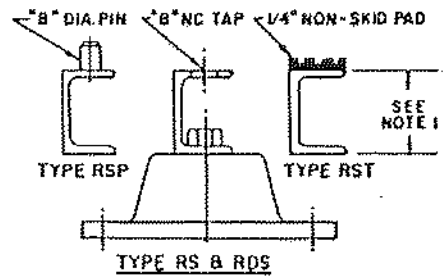
TYPE		MAX. LOAD EACH LBS.	DEFLECTION IN INCHES R	DEFLECTION IN INCHES RD	APPX SHPG WT. LBS.	DIMENSIONS IN INCHES L	W	H	*HD	A	B	C	D	E
R-1 OR RD-1	BLUE	35	0.20	0.40	1/2	3 1/4	1 1/2	1	1 1/4	1 1/4	3/16	2 1/8	11/32	3/16
	BLACK	45												
	RED	70												
	GREEN	120												
R-2 OR RD-2	BLUE	135	0.25	0.50	1 1/2	3 1/4	2 1/2	1 1/2	2 1/2	1 1/2	3/8	3	11/32	3/32
	BLACK	170												
	RED	240												
	GREEN	380												
R-3 OR RD-3	BLACK	250	0.25	0.50	3	5 1/2	3 1/4	1 1/2	2 1/2	1 1/2	1/2	4 1/8	3/16	1/4
	RED	325												
	GREEN	750												
	GRAY	1100												
R-4 OR RD-4	BLACK	1500	0.25	0.50	2 1/2	4 1/2	4 1/2	1 1/2	2 1/2	1 1/2	1/2	6	3/16	1/4
	RED	2250												
	GREEN	3000												
	GRAY	4000												

*HD DIMENSION APPLIES TO DOUBLE DEFLECTION TYPE RD MOUNTINGS ONLY.

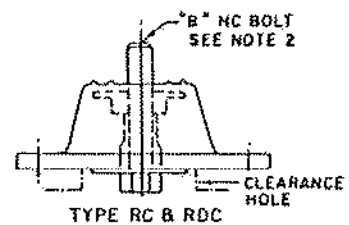
1. SPACER SIZE OPTIONAL FROM 1/4" TO 8" IN HEIGHT. (SPECIFY HEIGHT REQUIRED)
2. THROUGH BOLT IN MOUNTING MAKES MOUNTING AND SUPPORTED EQUIPMENT CAPTIVE. A CLEARANCE HOLE IS REQUIRED TO ACCOMODATE THE BOLT HEAD.



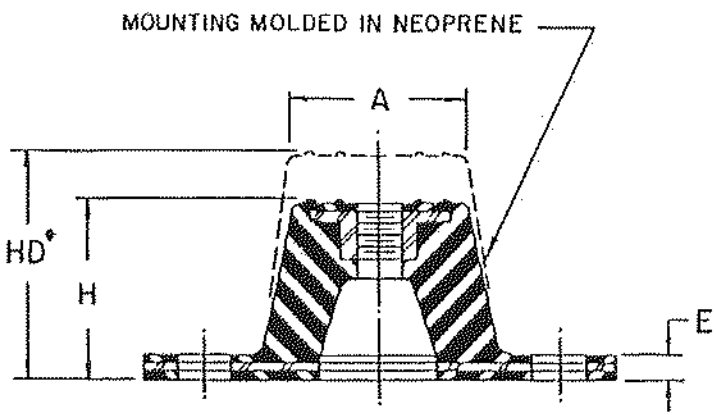
TYPE RP & RDP



TYPE RS & RDS



TYPE RC & RDC



CUSTOMER: _____ P.O. NO.: _____

JOB: _____

HARTZELL ORDER NO: 68768-1
CUSTOMER: J D MECHANICAL INC.
CUSTOMER NO: 389-22
AGENT: DAVID P WILSON CO INC
AGENT NO: Ph-89108
MODEL: 41-40-GQ3
ISOLATORS: (3) R3 GREEN (2) R3 RED (1) R3 GRAY

EF-301

NO.	ALTERATION	DATE
1	Revised Dimension	11/78

Dwn: HJS Chk: CG
Scale: NONE
Date: 12-6-62

SERIES R & RD NEOPRENE-IN-SHEAR MOUNTINGS

VIBRATION MOUNTINGS & CONTROLS, INC.
BUTLER, NEW JERSEY
DRAWING NO: VM A-7076-1

Hartzell FAN, INC.
PIQUA, OHIO 45356
(513) 773-7411

ORDER# 68768

FAN MODEL# 41-40GQ3 CW TH

BY Tom

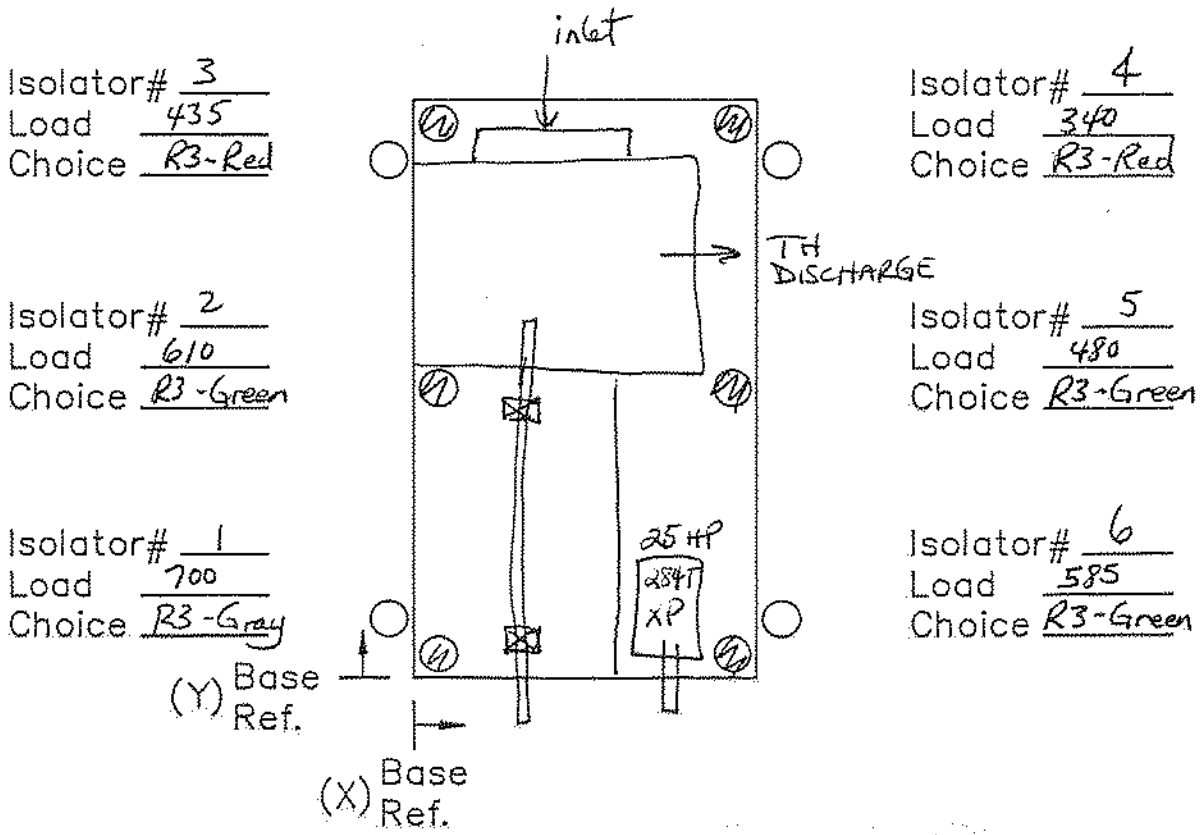
DATE 8/31/89

LOADS

	DESCRIPTION	LOAD (lbs)	x (in.) ref. lower	y (in.) /left
1)	FAN	2020	22	20 3/4
2)	MOTOR	470	59	1
3)	COVER	165	44	15
4)	~~BLOWER~~		—	—
5)	BASE	415	44	25
6)	Thrust	—	—	—

ISOLATOR LOCATIONS

	X (in.)	Y (in.)
1)	0	0
2)	0	26
3)	0	52
4)	73 5/8	52
5)	73 5/8	26
6)	73 5/8	0
7)	—	—
8)	—	—



SK 1060
4/21/89

EF-301

6A