

ADDENDUM No. 1

RFP No. 23-50

Ultraviolet (UV) Disinfection System Replacement Project

Due: OCTOBER 17, 2023 by 11:00 A.M. (local time)

The information contained herein shall take precedence over the original documents and all previous addenda (if any), and is appended thereto. **This Addendum includes forty-four (44) pages.**

The Proposer is to acknowledge receipt of this Addendum No. 1, including all attachments in its Proposal by so indicating in the proposal that the addendum has been received. Proposals submitted without acknowledgement of receipt of this addendum may be considered non-conforming.

A pre-bid meeting was held on September 19, 2023. The information disclosed in the pre-bid meeting is available in the Contract Documents. Bidders are reminded that oral statements made at the pre-bid meeting may not be relied upon and will not be binding or legally effective. The pre-bid meeting agenda and roster of attendees are on the attached pages.

The following forms provided within the RFP Document should be included in submitted proposal:

- **Attachment D - Prevailing Wage Declaration of Compliance**
- **Attachment E - Living Wage Declaration of Compliance**
- **Attachment G - Vendor Conflict of Interest Disclosure Form**
- **Attachment H - Non-Discrimination Declaration of Compliance**

Proposals that fail to provide these completed forms listed above upon proposal opening may be rejected as non-responsive and may not be considered for award.

I. CORRECTIONS/ADDITIONS/DELETIONS

Changes to the RFP documents which are outlined below are referenced to a page or Section in which they appear conspicuously. Offerors are to take note in its review of the documents and include these changes as they may affect work or details in other areas not specifically referenced here.

Section/Page(s)

Under the "Extended Cost"
Column of Base Bid Item 1.2,
"Permit Allowance": Page 16

Change

Remove: "\$10,000" and Replace with: "\$15,000"
Replace Page 16 with Page 16 (AD-1)

Section/Page(s)

Attachment K

Addition

Record Documents:

- 1999 Wastewater Treatment Plant Disinfection Facilities Upgrade (29 sheets)
- 1977 Wastewater Treatment Plant Improvements, sheets 91-94 (4 sheets)
- Existing UV Channel Slide Gate Shop Drawings (6 sheets)

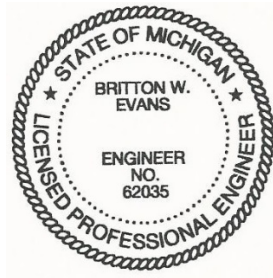
II. QUESTIONS AND ANSWERS

The following Questions have been received by the City. Responses are being provided in accordance with the terms of the RFP. Respondents are directed to take note in its review of the documents of the following questions and City responses as they affect work or details in other areas not specifically referenced here.

Question 1: SPECIFICATION SECTION 07 41 20 - METAL WALL PANELS specifies Centria "CS-660" or approved equal. Is product approval required before bidding.

Answer 1: No. Approving or accepting a product as equal is not allowed prior to bidding. Bidders shall reference the Contract Documents with regards to substitutions.

Offerors are responsible for any conclusions that they may draw from the information contained in the Addendum.





| | | | | | |
|--------------------------|---|---------------------------------|----------------------------|-----------------------------|---|
| Client Name: | City of Ann Arbor, MI | | | | |
| Project Name: | Ann Arbor WRRF UV Disinfection Replacement Project | | | | |
| Project No: | 413104 | B&V Project File No: | 81.0600 | | |
| Meeting Date: | 9/19/2023 | Meeting Time: | 11:00 AM - 12:00 PM EST | Meeting No: | 1 |
| Meeting Location: | Ann Arbor WRRF (49 S Dixboro Rd, Ann Arbor, MI 48105) | | Dial-In No. / Code: | (913) 278-0791/313 602 720# | |
| Prepared By: | Emily Schlanderer (Black & Veatch) | | | | |

Meeting Agenda: *Key objectives for the meeting are shown below.*

1. Attendance – **Prebid Meeting is Mandatory** for General Contractor Bidding
2. Introductions of Owner and Engineer
3. Safety Moment
4. Project Overview
5. UV Equipment Preselection Process, Contracts/Purchase Orders
6. Contract Documents
 - a. Drawings
 - b. Specifications
7. Addenda
8. Bid Form
9. Owner’s Forms and Other Bidding Documents
10. Prevailing Wage Requirements
11. Insurance and Bonds Requirements
12. RFP Scoring Criteria
13. Connections to Existing Facilities, Shutdowns, and Coordination
14. Submittals
15. Contractor Staging and Laydown
16. Site Security and Deliveries
17. Question Deadline
18. Bid Due Date
19. Additional Items
20. Open Discussion/Questions
21. Tour
22. Adjourn



BLACK & VEATCH

PREBID MEETING ATTENDANCE ROSTER

| | | | |
|------------------|---|----------------------------|--------------------------|
| Date: | 9/19/2023 | Time (start and end time): | 11:00 AM to 12:00 PM EST |
| Location: | Ann Arbor WRRF (49 S Dixboro Rd, Ann Arbor, MI 48105) | | |
| Presenter(s): | Emily Schlanderer (Black & Veatch) | | |
| Project: | Ann Arbor WRRF UV Disinfection Replacement Project | | |
| Subject/Purpose: | Prebid Meeting | | |

| Name | Title | Company | E-Mail | Initials |
|----------------|-----------------------------|------------------------|--------------------------------------|----------|
| Kyle Bentley | President / Program Rep | Peterson and MATE | Kyle.Bentley@petersonandmate.com | KB |
| BEN VITTORE | Project Manager / ESTIMATOR | MONROE PUMP & WATER Co | ben.v@monroe-pumps.com | BV |
| Brent Cooper | President | Midwest Power Systems | MidwestPowerSystems@midwestpower.com | BC |
| Chris KRAFT | Project Manager | Midwest Power | MidwestPower@midwestpower.com | CK |
| DON SUTTON | Senior Estimator | Weiss Const | CKLAFT@weiss-construction.com | DS |
| Jalal Joulan | Senior Estimator | Weiss Const. | DSUTTON@weiss-construction.com | JB |
| Fred Brewer | Field Superintendent | Commercial Contracting | CCJALAL.JOULAN@CCNETWORK.COM | JJ |
| CHRIS FECHTOLD | ESTIMATOR | FMC | Fred@fmcutility.com | CF |
| Eric Hoover | Project Manager | FMC | CHRIS@fmcutility.com | EH |
| Anne Larrow | WRRF Engineer | Unishut | Eric.Hoover@unishut.biz | AL |
| KEITH SANDERS | MANAGER AA WRRF | City of Ann Arbor | awarrows@a2gov.org | AS |
| ADAM MUDGE | PROJECT MANAGER | AA WRRF | ksanders@a2gov.org | AM |
| KEVEN KNOTT | ENG. Mgr | PP&E | akm@ppinc.net | KK |
| Bruce Smith | Estimator | Spence Brothers | KKNOTT@PERCEPTIVECONTRACTORS.COM | BS |
| | | | bruce.smith@spencebrothers.com | BS |
| | | | | |
| | | | | |
| | | | | |

E. Schedule of Pricing/Cost – 20 Points

Company: _____

Bid Items Notes –

1. Provide a Unit Price and Total Price for all bid items specified in Division 01 Section “Measurement and Payment” and herein.
2. Quantities included in the bid table represent estimated quantities for different work. The CONTRACTOR shall be compensated for the actual number of items completed using the unit prices provided.
3. The City, at its sole discretion, may elect to delete any portion of the work delineated below, with no change to the unit prices provided. Work shall be determined based upon the availability of funds.
4. Any item not provided in the following list shall be considered incidental.
5. Contract shall be awarded based on the base bid or any combination of a base bid and alternate bid in any manner the City believes to be in its best interest.

Base Bid Items –

For the entire work outlined in these documents for **RFP 23-50 – Ultraviolet (UV) Disinfection System Replacement Project**, complete as specified, using equipment and materials only of the type and manufacturers where specifically named.

| | Description | Unit | Quantity | Unit Cost | Extended Cost |
|-----|---|------|----------|----------------|----------------|
| 1.0 | General Conditions (max 10%) | LS | 1 | | |
| 1.1 | Mobilization (max 10%) | LS | 1 | | |
| 1.2 | Permit Allowance | LS | 1 | \$15,000.00 | \$15,000.00 |
| 1.3 | ¹ UVSS Balance of Work | LS | 1 | \$1,269,949.00 | \$1,269,949.00 |
| 1.4 | Installation of All Work (except UV Disinfection Building) | LS | 1 | | |
| 1.5 | Electrical, Instrumentation & Controls | LS | 1 | | |
| 1.6 | UV Disinfection Building | LS | 1 | | |
| 1.7 | Start-up, Commissioning, Training | LS | 1 | | |
| 1.8 | Special Inspections | LS | 1 | | |
| 1.9 | Maintenance of Plant Operations | LS | 1 | | |

BASE BID TOTAL: _____ (\$ _____)

CITY OF ANN ARBOR, MICHIGAN

WATER UTILITIES DEPARTMENT

WASTEWATER TREATMENT PLANT

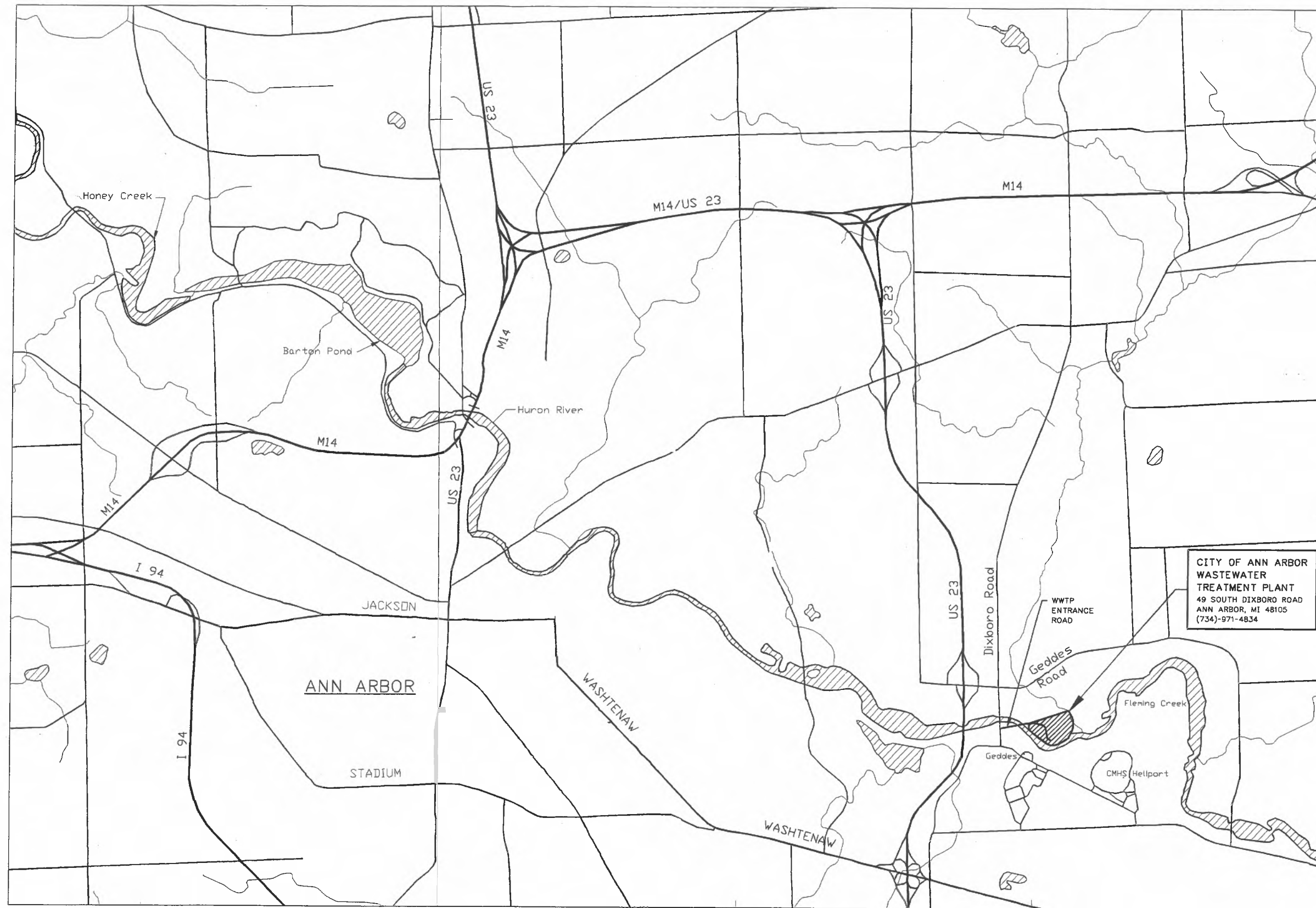
DISINFECTION FACILITIES UPGRADE

GREELEY AND HANSEN
211 WEST FORT STREET, SUITE 710
DETROIT, MICHIGAN 48226-3202

OCTOBER 1999

RECORD DRAWING

THIS RECORD IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS
UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES,
BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO
CHANGES MADE DURING CONSTRUCTION.



CITY OF ANN ARBOR
 WASTEWATER
 TREATMENT PLANT
 49 SOUTH DIXBORO ROAD
 ANN ARBOR, MI 48105
 (734)-971-4834

NOTE:

1. ADHERE TO LOAD LIMITS ON ALL ROADWAYS AND BRIDGES.

AREA MAP

RECORD DRAWING

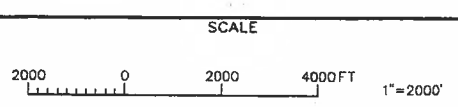
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FILE: 201A02 1: 10/26/99 11:31 GH-A

GREELEY AND HANSEN
 ENGINEERS
 211 WEST FORT STREET, SUITE 710
 DETROIT, MICHIGAN 48226-3202

DESIGNED NBJ
 DRAWN RPN
 CHECKED PJR

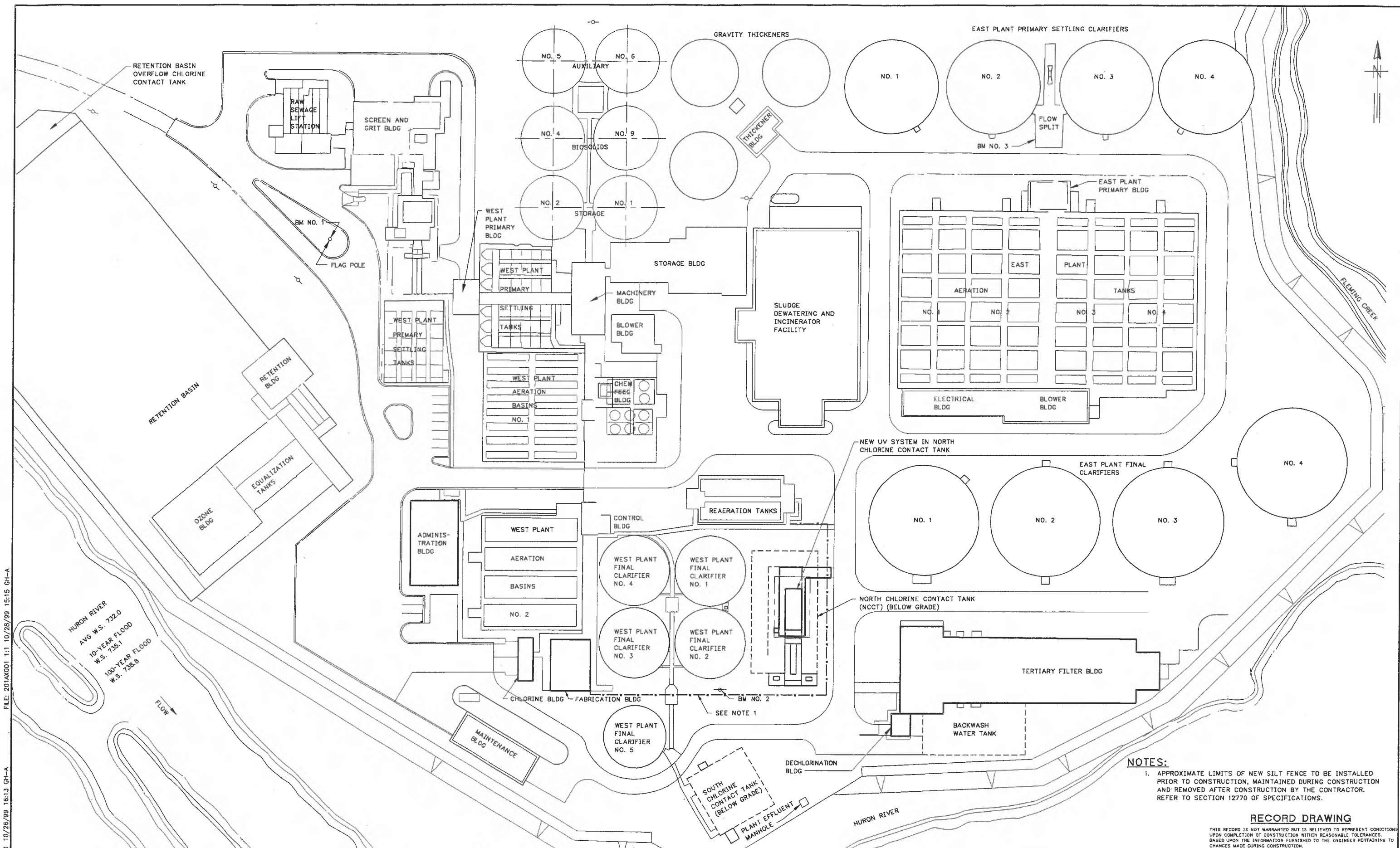
| NO. | DATE | APPO | REVISION |
|----------|------|------|----------------|
| 05/04/01 | PJV | | RECORD DRAWING |
| | | | |
| | | | |



CITY OF ANN ARBOR, MICHIGAN
 WATER UTILITIES DEPARTMENT
 WASTEWATER TREATMENT PLANT
 DISINFECTION FACILITIES UPGRADE

GENERAL
 VICINITY MAP
 AND SITE LOCATION

| | |
|-------|--------------------|
| PROJ | 02012 |
| DWG | G2 |
| SHEET | 2 OF 28 |
| DATE | OCTOBER 1999 REV 1 |



FILE: 201AXG01 1:1 10/28/99 15:15 GH-A
 FILE: 201AG03 1:1 10/26/99 16:13 GH-A

HURON RIVER
 AVG W.S. 732.0
 10-YEAR FLOOD
 W.S. 735.1
 100-YEAR FLOOD
 W.S. 738.8

RETENTION BASIN

RETENTION BASIN OVERFLOW CHLORINE CONTACT TANK

BM NO. 1
FLAG POLE

ADMINIS-
TRATION
BLDG

WEST PLANT
AERATION
BASINS
NO. 2

WEST PLANT
FINAL
CLARIFIER
NO. 4

WEST PLANT
FINAL
CLARIFIER
NO. 1

WEST PLANT
FINAL
CLARIFIER
NO. 3

WEST PLANT
FINAL
CLARIFIER
NO. 2

WEST PLANT
FINAL
CLARIFIER
NO. 5

SOUTH
CHLORINE
CONTACT TANK
(BELOW GRADE)

SEE NOTE 1

BM NO. 2

NORTH CHLORINE CONTACT TANK
(NCCT) (BELOW GRADE)

NO. 1

NO. 2

NO. 3

NO. 4

EAST PLANT FINAL
CLARIFIERS

NEW UV SYSTEM IN NORTH
CHLORINE CONTACT TANK

EAST PLANT
PRIMARY BLDG

EAST PLANT
AERATION
TANKS

NO. 1 NO. 2 NO. 3 NO. 4

ELECTRICAL
BLDG

BLOWER
BLDG

EAST PLANT PRIMARY SETTLING CLARIFIERS

NO. 1

NO. 2

NO. 3

NO. 4

BM NO. 3

GRAVITY THICKENERS

NO. 5

NO. 6

NO. 4

NO. 9

NO. 2

NO. 1

AUXILIARY

BIO-SOLIDS

STORAGE

STORAGE BLDG

MACHINERY
BLDG

CHEM
FEED
BLDG

SLUDGE
DEWATERING
AND
INCINERATOR
FACILITY

REAERATION TANKS

CONTROL
BLDG

WEST PLANT
AERATION
BASINS
NO. 2

CHLORINE BLDG

FABRICATION BLDG

MAINTENANCE
BLDG

DECHLORINATION
BLDG

TERTIARY FILTER BLDG

BACKWASH
WATER TANK

HURON RIVER

FLEMING CREEK

NOTES:

- APPROXIMATE LIMITS OF NEW SILT FENCE TO BE INSTALLED PRIOR TO CONSTRUCTION, MAINTAINED DURING CONSTRUCTION AND REMOVED AFTER CONSTRUCTION BY THE CONTRACTOR. REFER TO SECTION 12770 OF SPECIFICATIONS.

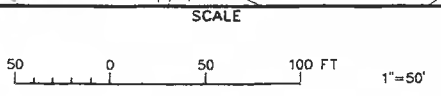
RECORD DRAWING

THIS RECORD IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES. BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN
 ENGINEERS
 211 WEST FORT STREET, SUITE 710
 DETROIT, MICHIGAN 48226-3202

DESIGNED NBJ
 DRAWN RPN
 CHECKED PJR

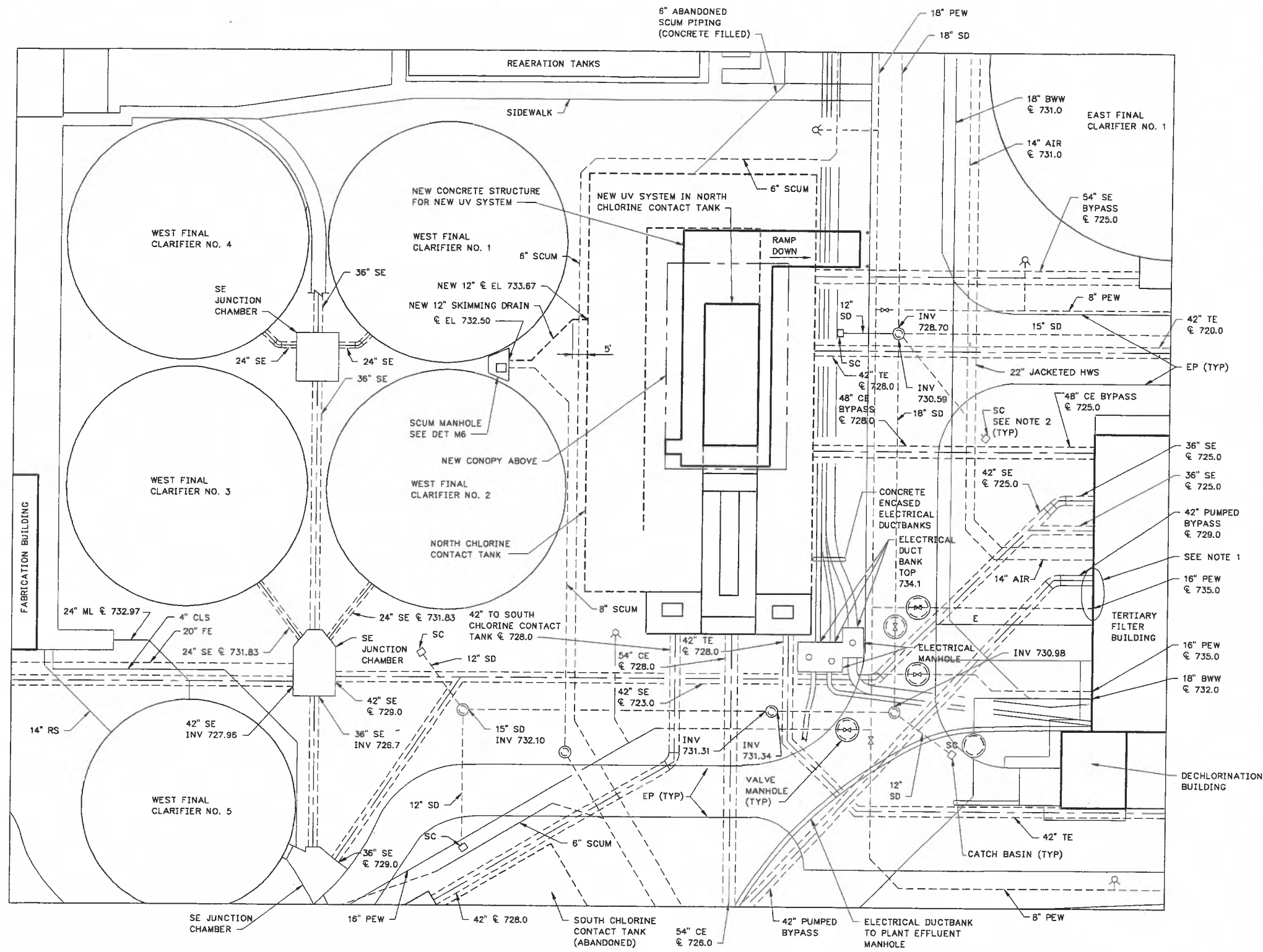
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|----------|------|------|----------------|
| 06/04/01 | | PJV | RECORD DRAWING |



CITY OF ANN ARBOR, MICHIGAN
 WATER UTILITIES DEPARTMENT
 WASTEWATER TREATMENT PLANT
 DISINFECTION FACILITIES UPGRADE

GENERAL
 SITE PLAN

| | |
|-------|--------------|
| PROJ | 02012 |
| DWG | G3 |
| SHEET | 3 OF 28 |
| DATE | OCTOBER 1999 |
| REV | 1 |



PLAN

NOTES:

1. FIELD VERIFY LOCATION OF SAMPLE, CHLORINE SOLUTION AND SULFUR DIOXIDE SOLUTION PIPING IN THIS AREA PRIOR TO INSTALLATION OF ELECTRICAL DUCTBANK.
2. FURNISH, INSTALL AND MAINTAIN DURING THE WORK MICHIGAN UNIFIED KEYING SYSTEM EROSION AND SEDIMENTATION CONTROL MEASURE NUMBER 3B (STRAW BALES WITH GEOTEXTILE FABRIC FILTER SURROUNDING BALES) AT ALL CATCH BASINS AND MANHOLES DESIGNATED SC. REFER TO SECTION 02270 OF SPECIFICATIONS.

RECORD DRAWING

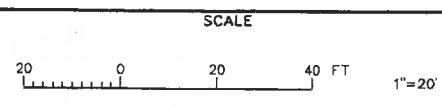
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FILE: 201A604 1:1 10/27/99 08:20 GH-A
 FILE: 201A603 1:1 10/27/99 08:11 GH-A
 FILE: 201A601 1:1 10/28/99 15:15 GH-A

GREELEY AND HANSEN
 ENGINEERS
 211 WEST FORT STREET, SUITE 710
 DETROIT, MICHIGAN 48226-3202

DESIGNED BYD
 DRAWN JFC
 CHECKED PJR

| NO. | DATE | APPD | REVISION |
|-----|----------|------|----------------|
| | 06/04/01 | PJV | RECORD DRAWING |

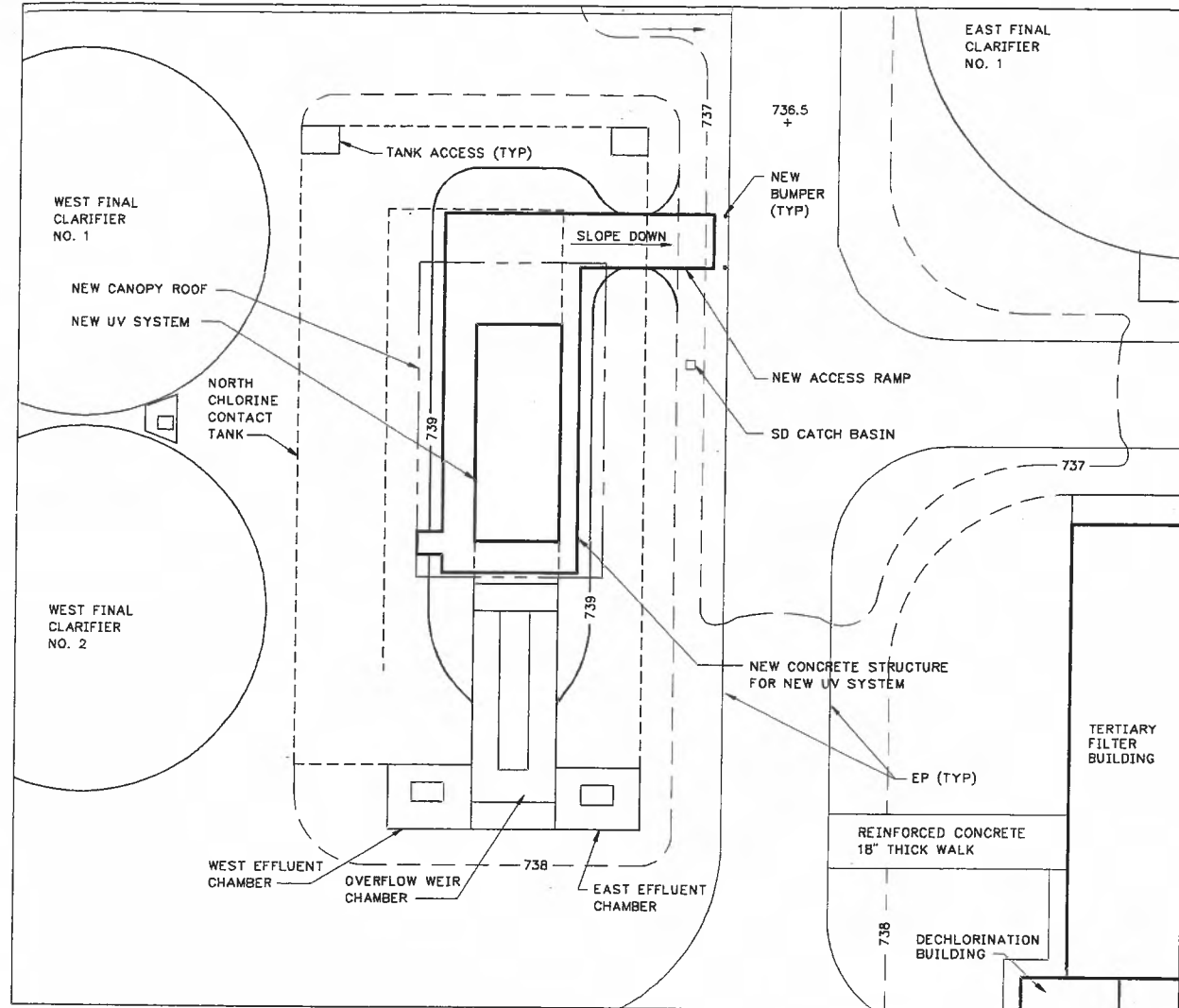


CITY OF ANN ARBOR, MICHIGAN
 WATER UTILITIES DEPARTMENT
 WASTEWATER TREATMENT PLANT
 DISINFECTION FACILITIES UPGRADE

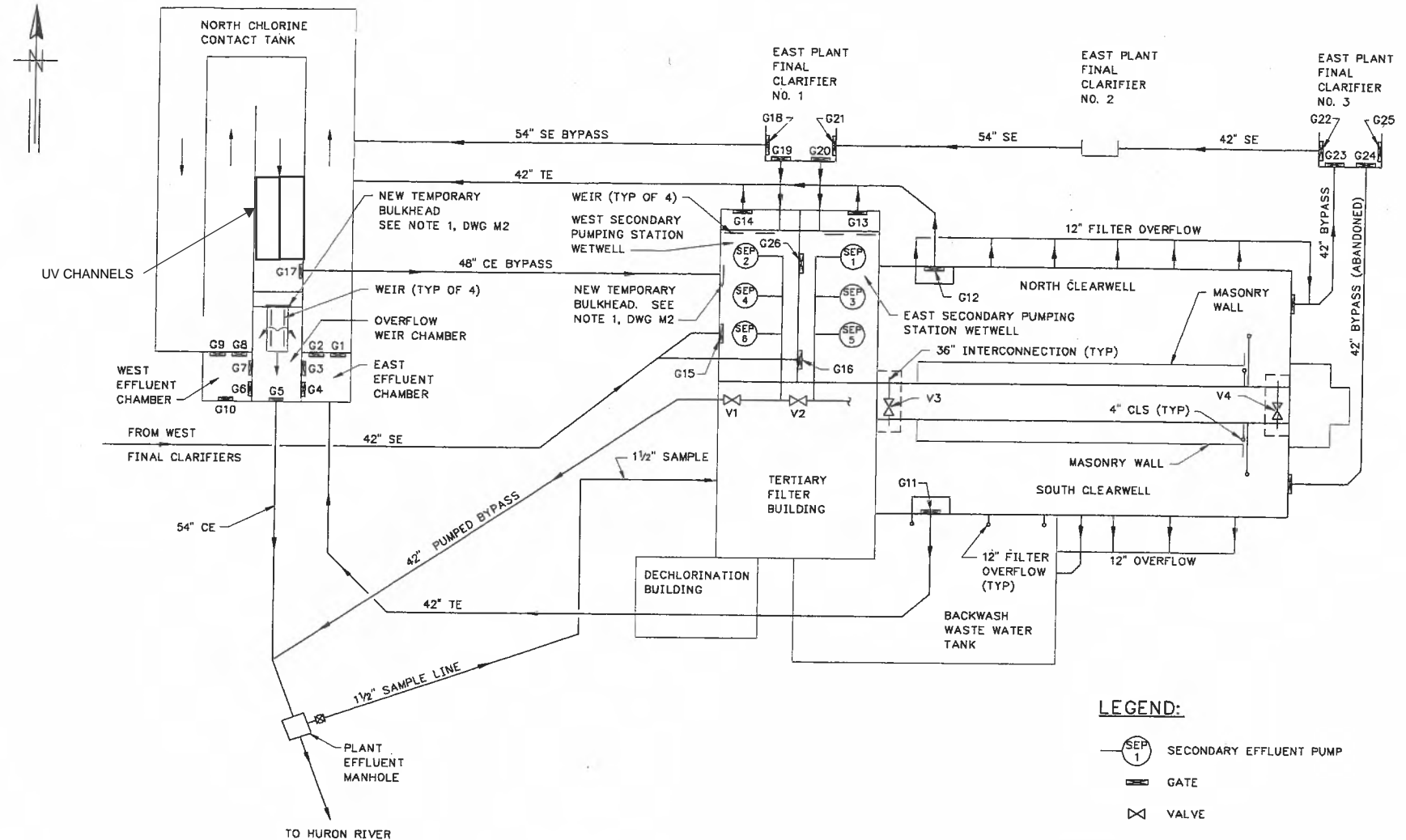
GENERAL
 NORTH CHLORINE CONTACT TANK
 YARD PIPING PLAN

| | |
|-------|--------------|
| PROJ | 02012 |
| DWG | G4 |
| SHEET | 4 OF 28 |
| DATE | OCTOBER 1999 |
| REV | 1 |

FILE: 201AUG05 1:1 10/28/99 16:37 GH-A
 FILE: 201AUG01 1:1 10/28/99 15:15 GH-A
 FILE: 201AUG02 1:1 10/28/99 14:36 GH-A



GRADING PLAN
 SCALE: 1"=20'



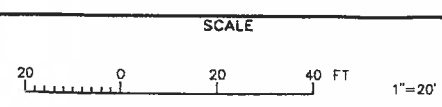
EFFLUENT FLOW DIAGRAM
 SCALE: NOT TO SCALE

LEGEND:
 (SEP 1) SECONDARY EFFLUENT PUMP
 G GATE
 V VALVE

NOTES:
 1. A DASHED LINE (---) INDICATES EXISTING CONTOUR.
 A HEAVY SOLID LINE (—) INDICATES NEW CONTOUR.
 2. FIELD VERIFY EXISTING TOPOGRAPHIC CONDITIONS.
 3. SLOPE WALK FROM EL 743.00 TO MATCH EXISTING ELEVATION AT ROAD.

| GATE AND VALVE IDENTIFICATION TABLE | | | | | |
|-------------------------------------|----------------------------|---|---------------|-----------|----------------------|
| Identification Number | Contract 77-S-7 ID Numbers | Process Information and Control System ID Numbers | Gate or Valve | Type | Centerline Elevation |
| G1 | S-12-1 | S-52-1 | Gate | Sluice | 42" x 42" |
| G2 | S-12-2 | S-52-2 | Gate | Sluice | 42" x 42" |
| G3 | S-14-1 | S-54-1 | Gate | Sluice | 36" x 36" |
| G4 | S-14-2 | S-54-2 | Gate | Sluice | 36" x 36" |
| G5 | S-15-1 | S-55-1 | Gate | Sluice | 54" dia. |
| G6 | S-14-4 | S-54-4 | Gate | Sluice | 36" x 36" |
| G7 | S-14-3 | S-54-3 | Gate | Sluice | 36" x 36" |
| G8 | S-13-1 | S-53-1 | Gate | Sluice | 42" x 42" |
| G9 | S-13-2 | S-53-2 | Gate | Sluice | 42" x 42" |
| G10 | S-16-1 | S-56-1 | Gate | Sluice | 42" dia. |
| G11 | S-5-1 | --- | Gate | Sluice | 42" dia. |
| G12 | S-4-1 | --- | Gate | Sluice | 42" dia. |
| G13 | S-1-2 | --- | Gate | Sluice | 42" dia. |
| G14 | S-1-1 | --- | Gate | Sluice | 42" dia. |
| G15 | S-2-1 | --- | Gate | Sluice | 36" dia. |
| G16 | S-2-2 | --- | Gate | Sluice | 36" dia. |
| G17 | S-11-1 | S-51-1 | Gate | Sluice | 48" dia. |
| G18 | S-7-1 | S-47-1 | Gate | Sluice | 54" dia. |
| G19 | S-6-1 | S-46-1 | Gate | Sluice | 48" dia. |
| G20 | S-6-2 | S-46-2 | Gate | Sluice | 48" dia. |
| G21 | S-7-2 | S-47-2 | Gate | Sluice | 54" dia. |
| G22 | S-9-1 | S-49-1 | Gate | Sluice | 42" dia. |
| G23 | S-8-1 | S-48-1 | Gate | Sluice | 42" dia. |
| G24 | S-8-2 | S-48-2 | Gate | Sluice | 42" dia. |
| G25 | S-10-1 | S-50-1 | Gate | Sluice | 42" dia. |
| G26 | S-3-1 | --- | Gate | Sluice | 36" x 36" |
| V1 | B-3-1 | --- | Valve | Butterfly | 42" dia. |
| V2 | B-2-1 | --- | Valve | Butterfly | 48" dia. |
| V3 | B-9-1 | --- | Valve | Butterfly | 36" dia. |
| V4 | B-9-2 | --- | Valve | Butterfly | 36" dia. |

| NEW GATES IDENTIFICATION TABLE | | | |
|--------------------------------|--------|-----------|----------------------|
| New Gate ID | Type | Size | Centerline Elevation |
| S-57-1 | Slide | 72" x 72" | 727.65 |
| S-57-2 | Slide | 72" x 72" | 727.65 |
| S-57-3 | Slide | 72" x 72" | 727.05 |
| S-57-4 | Slide | 72" x 72" | 727.05 |
| S-58-1 | Sluice | 12" x 12" | 732.33 |



GREELEY AND HANSEN
 ENGINEERS
 211 WEST FORT STREET, SUITE 710
 DETROIT, MICHIGAN 48226-3202

DESIGNED NBJ
 DRAWN GSD
 CHECKED PJR

| NO. | DATE | APPD | REVISION |
|-----|----------|------|----------------|
| 1 | 06/04/01 | PJV | RECORD DRAWING |

CITY OF ANN ARBOR, MICHIGAN
 WATER UTILITIES DEPARTMENT
 WASTEWATER TREATMENT PLANT
 DISINFECTION FACILITIES UPGRADE

GENERAL
 NORTH CHLORINE CONTACT TANK
 GRADING PLAN AND DIAGRAM

PROJ 02012
 DWG G5
 SHEET 5 OF 28
 DATE OCTOBER 1999 REV 1

RECORD DRAWING
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| VALVE SYMBOLS | | | |
|-----------------------------|-----------|------------|-------------|
| DESCRIPTION | SCHEMATIC | THREE LINE | SINGLE LINE |
| GATE | | | |
| BUTTERFLY | | | |
| PLUG | | | |
| CHECK (SWING) | | | |
| CONE | | | |
| BALL | | | |
| DIAPHRAGM | | | |
| GLOBE | | | |
| ANGLE | | | |
| THREE WAY | | | |
| FOUR WAY | | | |
| FLAP | | | |
| PRESSURE RELIEF | | | |
| AUTO AIR AND VACUUM RELEASE | | | |
| AUTO AIR RELEASE | | | |
| AUTO VACUUM RELEASE | | | |
| PRESSURE REDUCING | | | |
| HOSE | | | |
| STOP AND DRAIN | | | |

| PIPE FITTINGS | | | |
|-------------------------|-----------|------------|-------------|
| DESCRIPTION | SCHEMATIC | THREE LINE | SINGLE LINE |
| CROSS | NA | | |
| CROSS | NA | | |
| TEE | NA | | |
| TEE | NA | | |
| TEE | NA | | |
| SIDE OUTLET TEE | NA | | |
| SIDE OUTLET TEE | NA | | |
| LATERAL | NA | | |
| 90° ELBOW | NA | | |
| 90° ELBOW | NA | | |
| 90° ELBOW | NA | | |
| 90° ELBOW (LONG RADIUS) | NA | | |
| 45° ELBOW | NA | | |
| 45° ELBOW | NA | | |
| 45° ELBOW | NA | | |
| 45° ELBOW (LONG RADIUS) | NA | | |
| SIDE OUTLET ELBOW | NA | | |
| SIDE OUTLET ELBOW | NA | | |
| BASE ELBOW | NA | | |

| PIPE FITTINGS | | | |
|-------------------------------------|-----------|------------|-------------|
| DESCRIPTION | SCHEMATIC | THREE LINE | SINGLE LINE |
| UNION (SCREWED) | | | |
| REDUCER | | | |
| REDUCER - ECCENTRIC (OFFSET VIEW) | NA | | |
| BLIND FLANGE | | | |
| SLEEVE TYPE COUPLING | | | |
| SLEEVE TYPE COUPLING (HARNESSED) | | | |
| GROOVED TYPE COUPLING | | | |
| EXPANSION JOINT RUBBER BELLOWS TYPE | | | |
| EXPANSION JOINT METAL BELLOWS TYPE | | | |
| VENTURI METER | | | |
| METER | | | |
| STRAINER | | | |
| DUPLEX STRAINER | | | |
| LUBE OIL FILTER | | NA | |
| MOISTURE SEPARATOR | | NA | |
| SCALE TRAP | | NA | |
| FLAME TRAP | | | |
| VENT | | | |
| THERMOSTAT (TEMPERATURE REGULATOR) | | | |
| PRESSURE GAUGE | | | |
| THERMOMETER | | | |
| WATER LEVEL ALARM | | | |
| DIFFERENTIAL PRESSURE GAUGE | | | |

| PIPE JOINTS | | | |
|---|-----------|------------|-------------|
| DESCRIPTION | SCHEMATIC | THREE LINE | SINGLE LINE |
| FLANGE | NA | | |
| MECHANICAL JOINT | NA | | |
| MECHANICAL JOINT (RESTRAINED) | NA | | |
| PUSH ON OR BELL AND SPIGOT | NA | | |
| PUSH ON OR BELL AND SPIGOT (RESTRAINED) | NA | | |
| WELDED | NA | | NA |
| SCREWED | NA | | |
| JOINT IN CONCRETE PIPE | NA | | NA |

| WALL FITTINGS | | | |
|--|-----------|------------|-------------|
| DESCRIPTION | SCHEMATIC | THREE LINE | SINGLE LINE |
| WALL SLEEVE (CAULKED) | NA | | |
| WALL SLEEVE (ANNULAR TYPE SEAL) | NA | | |
| WALL SLEEVE (MECHANICAL JOINT) | NA | | |
| FLANGE AND FLANGE WALL PIPE WITH INTERMEDIATE COLLAR (F x F x F) | NA | | |
| BELL AND BELL WALL PIPE WITH INTERMEDIATE COLLAR (B x F x B) | NA | | |
| MECHANICAL JOINT AND MECHANICAL JOINT WALL PIPE WITH INTERMEDIATE COLLAR (MJ x F x MJ) | NA | | |
| BELL AND FLANGE WALL PIPE WITH INTERMEDIATE COLLAR (B x F x F) | NA | | |
| MECHANICAL JOINT AND FLANGE WALL PIPE WITH INTERMEDIATE COLLAR (MJ x F x F) | NA | | |
| STEEL WALL RING FOR MECHANICAL JOINT AND CONCRETE PIPE (RUBBER AND STEEL) | NA | | NA |

- NOTES:**
1. THIS IS A GENERAL LEGEND PROVIDED TO FACILITATE USE OF THE DRAWINGS. REFER TO THE DRAWINGS AND SPECIFICATIONS FOR ITEMS REQUIRED.
 2. VALVES AND PIPE FITTINGS ARE SHOWN WITH FLANGED JOINTS. ITEMS ARE AVAILABLE WITH VARIOUS JOINTS AND ARE SHOWN AS REQUIRED.
 3. NA MEANS NOT APPLICABLE.

VALVE OPERATORS

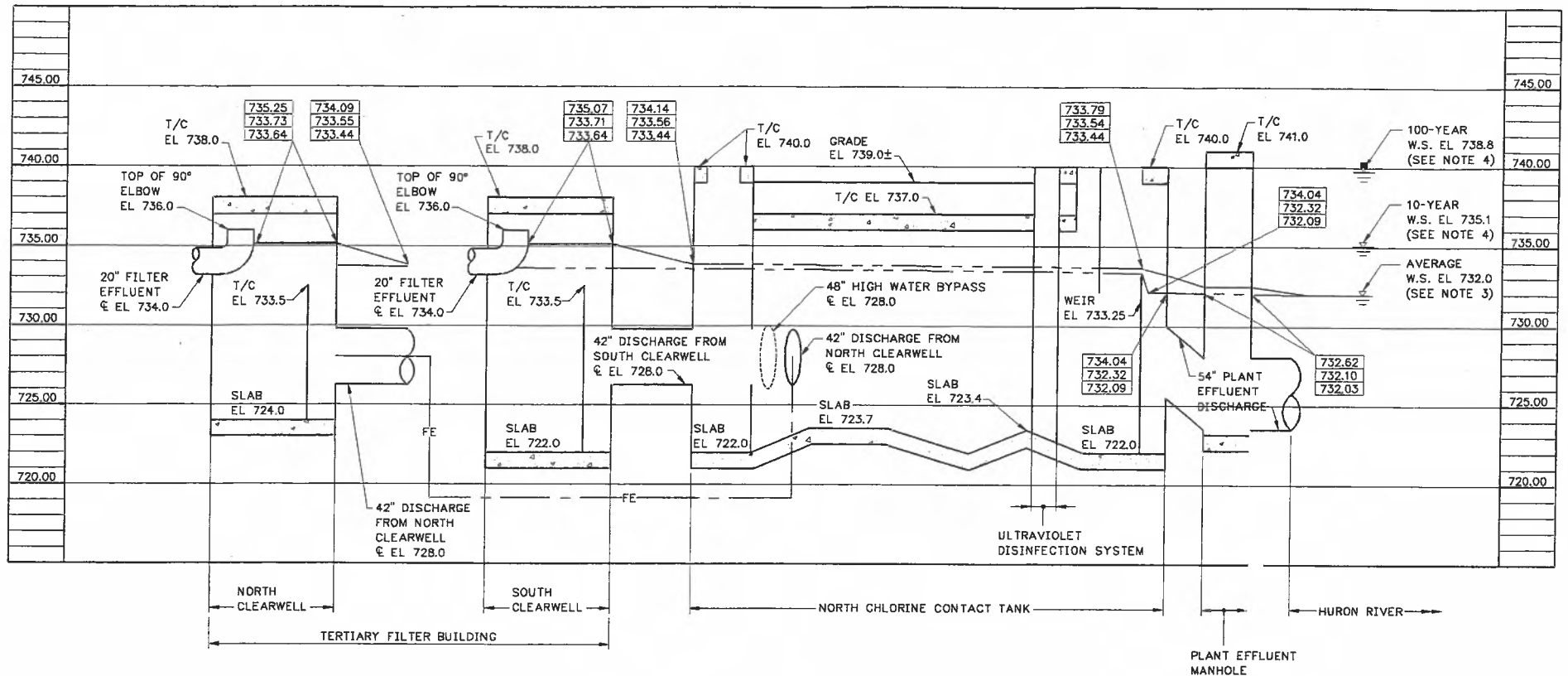
- * PLACE KEY FOR OPERATOR IN PLACE OF *
- NONE
- MANUAL
- C CHAINWHEEL
- D DIAPHRAGM
- F FLOAT
- G GEAR
- H HYDRAULIC CYLINDER
- M MOTOR (ELECTRIC)
- P PNEUMATIC CYLINDER
- S SOLENOID
- A AIR MOTOR
- N NUT

RECORD DRAWING

THIS RECORD IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

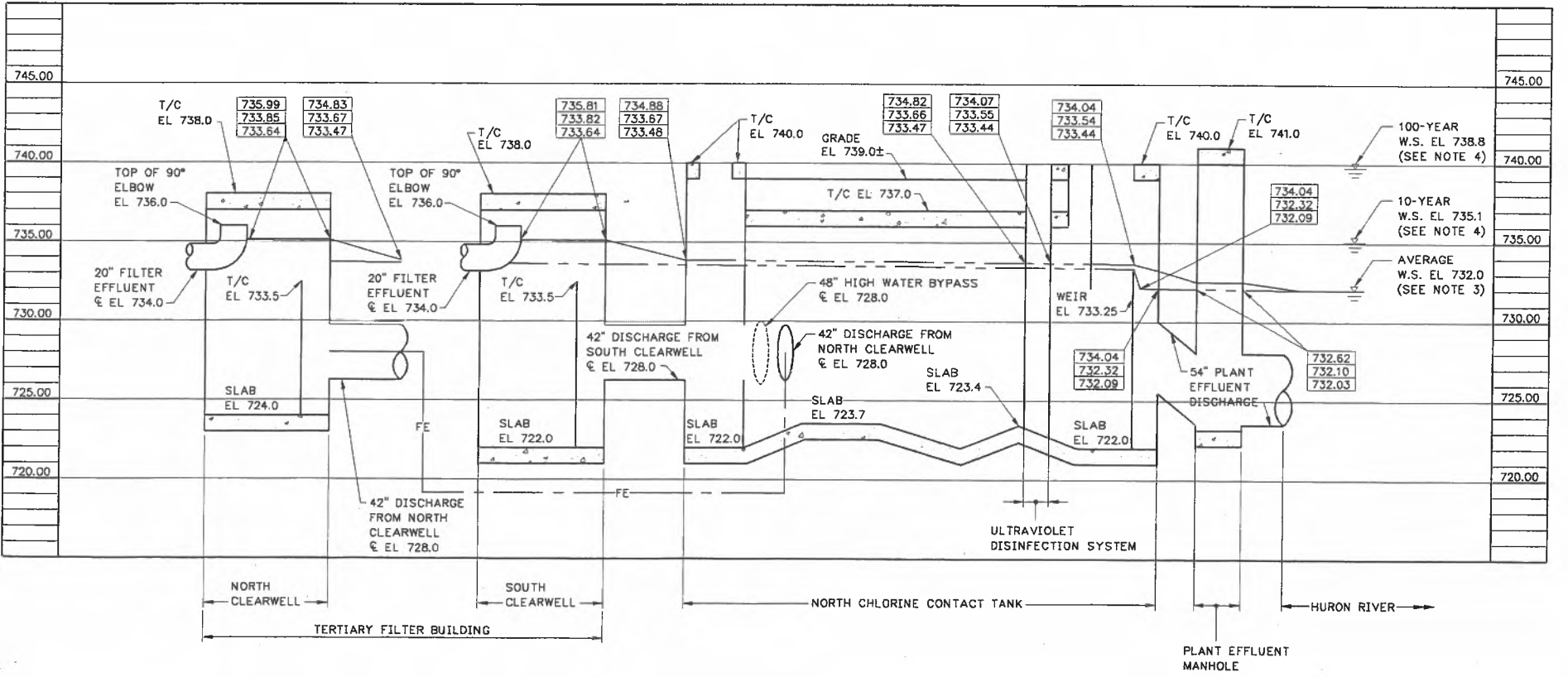
FILE: 201AC08 1:1 10/26/98 11:42 GH-A

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|--|--|-----------------------------|-----------------------|--|--|--|
| GREELEY AND HANSEN ENGINEERS 211 WEST FORT STREET, SUITE 710 DETROIT, MICHIGAN 48226-3202 | DESIGNED LCC DRAWN RPN CHECKED PJV | 06/04/01 PJV RECORD DRAWING | SCALE NOT TO SCALE | CITY OF ANN ARBOR, MICHIGAN WATER UTILITIES DEPARTMENT WASTEWATER TREATMENT PLANT DISINFECTION FACILITIES UPGRADE | PIPING AND EQUIPMENT PIPING SYMBOLS | PROJ 02012 DWG G6 SHEET 6 OF 28 DATE OCTOBER 1999 REV 1 |
| | NO. DATE APPD REVISION | | | | | |



HYDRAULIC PROFILE OF EXISTING CONDITIONS

HORZ: NO SCALE
VERT: 1"=5'



HYDRAULIC PROFILE INCLUDING ULTRAVIOLET DISINFECTION SYSTEM

HORZ: NO SCALE
VERT: 1"=5'

NOTES:

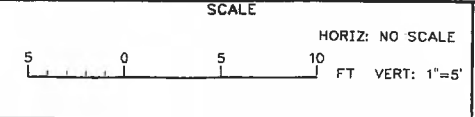
- ELEVATIONS SHOWN REFER TO NGVD OF 1929 OF THE U.S.G.S. DATUM.
- VALUE SHOWN [XXX.XX] IN UPPER BOX DENOTES WATER SURFACE AT PEAK HOUR FLOW OF 48 MGD BASED ON AVERAGE RIVER WATER SURFACE ELEVATION.
- VALUE SHOWN [XXX.XX] IN MIDDLE BOX DENOTES WATER SURFACE AT AVERAGE FLOW OF 19 MGD BASED ON AVERAGE RIVER WATER SURFACE ELEVATION.
- VALUE SHOWN [XXX.XX] IN LOWER BOX DENOTES WATER SURFACE AT LOW FLOW OF 10 MGD BASED ON AVERAGE RIVER WATER SURFACE ELEVATION.
- AVERAGE RIVER WATER SURFACE ELEVATION FROM WASHTENAW COUNTY, DEPARTMENT OF PUBLIC WORKS, CITY OF ANN ARBOR, MICHIGAN WASTEWATER TREATMENT PLANT IMPROVEMENTS, CONTRACT 77-5-7, C26 2539 05, VOLUME II DRAWINGS, DATED JULY 1977.
- 10- AND 100-YEAR RIVER WATER SURFACE ELEVATIONS FROM THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD BOUNDARY AND FLOODWAY MAP FOR TOWNSHIP OF ANN ARBOR, MICHIGAN, PANEL 5 OF 10, DATED JUNE 18, 1980.

FILE: 201A607 1:1 10/26/99 11:30 GH-A

GREELEY AND HANSEN
ENGINEERS
211 WEST FORT STREET, SUITE 710
DETROIT, MICHIGAN 48226-3202

DESIGNED NBJ
DRAWN KPB
CHECKED PJV

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| NO. | DATE | APPD | REVISION |
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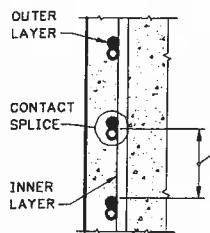
CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

GENERAL
HYDRAULIC PROFILES

RECORD DRAWING
THIS RECORD IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

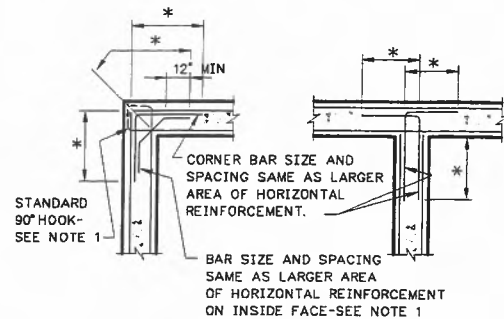
| | |
|-------|----------------------|
| PROJ | 02012 |
| DWG | G7 |
| SHEET | 7 OF 28 |
| DATE | OCTOBER 1999 REV 1 |

| REINFORCING-LAP SPLICE TABLE | | GRADE 60 REINF - 4000 PSI CONC | | | | | | | | | |
|------------------------------|--|--------------------------------|-------|-------|-------|--------|-------|--------|-------|-------|--|
| BAR SIZE | | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | |
| TOP BARS | | 2'-0" | 2'-8" | 3'-4" | 4'-0" | 5'-10" | 6'-8" | 7'-7" | 8'-6" | 9'-5" | |
| OTHER BARS | | 1'-7" | 2'-1" | 2'-7" | 3'-1" | 4'-6" | 5'-2" | 5'-10" | 6'-7" | 7'-3" | |



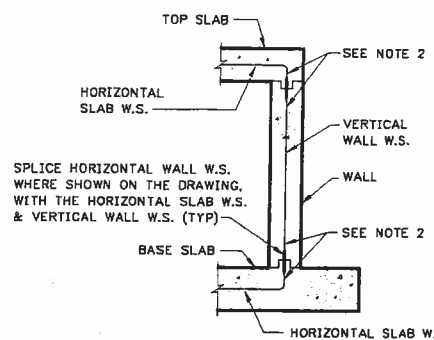
- TOP BARS ARE ALL HORIZONTAL BARS SO PLACED THAT MORE THAN 12" OF CONCRETE IS PLACED IN THE MEMBER BELOW THE BAR. THIS INCLUDES HORIZONTAL WALL REINFORCEMENT.
- FOR EPOXY COATED BARS:
FOR TOP BARS - MULTIPLY THE TABULATED VALUES BY 1.70.
FOR OTHER BARS - MULTIPLY THE TABULATED VALUES BY 1.50.
- WHERE CLEAR BAR SPACING IS LESS THAN 2 BAR DIAMETERS IN BEAMS AND COLUMNS AND LESS THAN 3 BAR DIAMETERS AT OTHER LOCATIONS MULTIPLY THE TABULATED VALUES BY 1.50.
- WHERE BARS OF DIFFERENT SIZES ARE LAP SPICED USE LAP LENGTH OF SMALLER BAR.

1



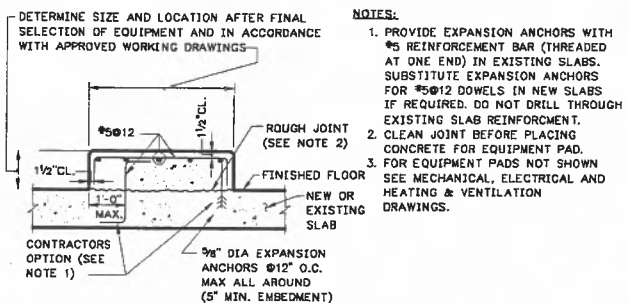
HORIZONTAL CORNER BAR DETAIL

2



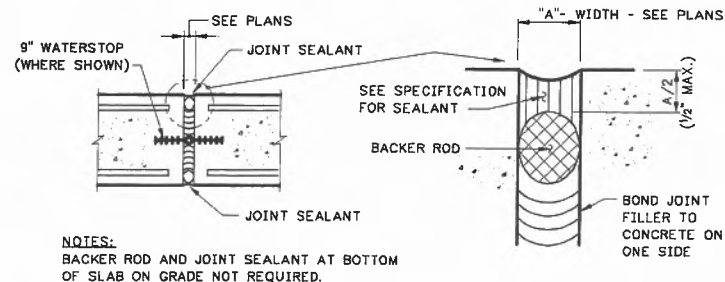
WATERSTOP PLACING DETAIL

3



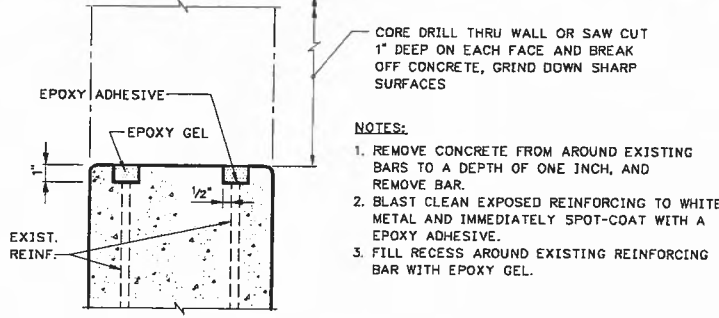
EQUIPMENT PAD DETAIL

4



EXPANSION JOINT DETAIL AT WALLS AND SLABS

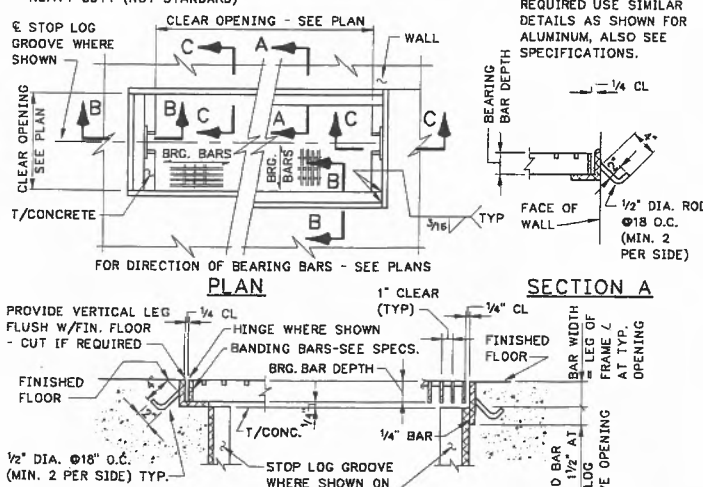
5



DETAIL FOR NEW OPENING IN EXISTING CONCRETE SLAB (WET)

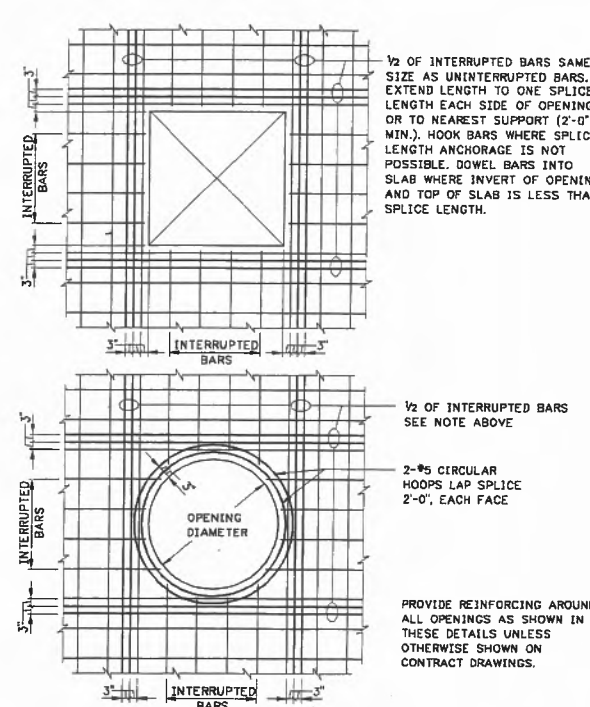
6

| SPAN | ALUMINUM (SERRATED) | | STAINLESS STEEL OR GALVANIZED (SERRATED) | |
|----------------|---------------------|-------------------|--|---------------|
| | BRG. BARS | FRAME | BRG. BARS | FRAME |
| 4'-0" OR LESS | 1 3/4 x 3/16 | L 2X2X1/4 | 1 1/2 x 3/16 | L 2X2X1/4 |
| 4'-1" TO 5'-0" | 2 1/4 x 3/16 | L 2 1/2X2X1/4 | 1 3/4 x 3/16 | L 2X2X1/4 |
| 5'-1" TO 6'-0" | 2 1/2 x 3/16 | L 3X2X1/4 | 2 x 3/16 | L 2 1/2X2X1/4 |
| 6'-1" TO 7'-0" | 3 x 3/16 | L 3 1/2X2 1/2X1/4 | 2 1/4 x 3/16 | L 2 1/2X2X1/4 |
| 7'-1" TO 8'-0" | 3 1/4 x 1/4 | L 3 1/2X2 1/2X1/4 | 2 1/2 x 1/4 | L 3X2 1/2X1/4 |



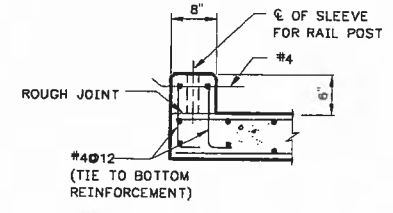
GRATING DETAILS

7



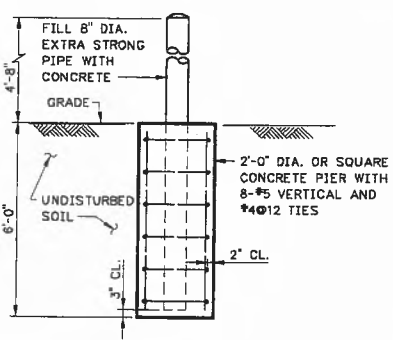
ADDITIONAL REINFORCING AT OPENINGS IN WALLS AND SLABS

8



CURB DETAIL

9



BUMPER DETAIL

10

GENERAL STRUCTURAL NOTES

- THE FOLLOWING GENERAL NOTES ARE SHOWN FOR CONVENIENCE AND ARE SUPPLEMENTAL TO THE SPECIFICATIONS:
- ALL SECTIONS, DETAILS AND NOTES ARE TYPICAL UNLESS OTHERWISE INDICATED. PREPARE WORKING DRAWINGS TO SHOW THE APPLICATION OF TYPICAL SECTIONS AND DETAILS FOR SIMILAR SITUATIONS.
 - PROVIDE A 3/4" CHAMFER AT EXPOSED CORNERS AND PROVIDE A 3/4" FLAT FILLET AT RE-ENTRANT CORNERS UNLESS OTHERWISE NOTED.
 - OBTAIN ENGINEER'S APPROVAL FOR USE OF CONSTRUCTION JOINTS AT LOCATIONS NOT SHOWN ON THE DRAWINGS.
 - VERIFY LOCATION OF ALL OPENINGS, EMBEDDED ITEMS AND CONCRETE CONFIGURATIONS WITH DRAWINGS AND SPECIFICATIONS FROM ALL OTHER DISCIPLINES. LOCATE AND SHOW ALL THESE ITEMS ON APPROVED WORKING (SHOP) DRAWINGS.
 - DO NOT PLACE BACKFILL AGAINST SUBSTRUCTURE WALLS UNTIL FLOOR SLABS SUPPORTING TOP AND BOTTOM OF THE WALLS HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI. PLACE BACKFILL EVENLY AGAINST EACH SIDE OF SUBSTRUCTURES TO PRODUCE EQUAL AND OPPOSITE LATERAL PRESSURES. THE DIFFERENCE IN ELEVATION NOT TO EXCEED ONE FOOT.
 - COMPRESSIVE STRENGTH OF CONCRETE: CAST-IN-PLACE CONCRETE (EXCEPT CONCRETE WORKMATS) F_c = 4,000 PSI AT 28 DAYS AND CONCRETE WORKMATS F_c = 2,000 PSI AT 28 DAYS.
 - PROVIDE ASTM A615, GRADE 60 REINFORCING STEEL AND DETAIL ACCORDING TO THE ACI DETAILING MANUAL 1994 PUBLICATION SP-86.
 - PROVIDE THE FOLLOWING CONCRETE PROTECTION FOR REINFORCEMENT, UNLESS OTHERWISE INDICATED ON THE PLANS OR ORDERED BY THE ENGINEER.

SLABS

| | |
|---|----|
| A) FOR DRY CONDITIONS: | |
| a) SLABS 8" THICK OR LESS | 1" |
| b) SLABS OVER 8" THICK | 2" |
| B) EXPOSED TO EARTH, WATER OR WEATHER AND FOR BOTTOMS BEARING ON WORKMATS | 2" |

BEAMS AND COLUMNS

| | |
|--|--------|
| A) FOR DRY CONDITIONS: | |
| a) STIRRUPS AND TIES | 1 1/2" |
| b) PRINCIPAL REINFORCEMENT | 2" |
| B) EXPOSED TO EARTH, WATER OR WEATHER: | |
| a) STIRRUPS AND TIES | 2" |
| b) PRINCIPAL REINFORCEMENT | 2 1/2" |

WALLS

| | |
|--|--------|
| A) FOR DRY CONDITIONS: | |
| a) WALLS 8" THICK OR LESS | 1" |
| b) WALLS OVER 8" THICK | 2" |
| B) EXPOSED TO EARTH, WATER OR WEATHER: | |
| a) CIRCULAR TANKS WITH RING TENSION | 2 1/2" |
| b) ALL OTHERS | 2" |

FOOTINGS AND BASE SLABS

| | |
|--|----|
| A) TOP OF FOOTING OR BASE SLAB | 2" |
| B) ALL FORMED SIDES AND ENDS AND BOTTOMS BEARING ON CONCRETE WORKMAT | 2" |
| C) AT UNFORMED SIDES AND ENDS, AND BOTTOMS IN CONTACT WITH EARTH | 3" |
| D) OVER TOP OF PILES | 2" |

- DETAIL, FABRICATE AND ERECT STRUCTURAL STEEL IN ACCORDANCE WITH THE AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN, JUNE 1, 1989 AND CONFORM TO ASTM A36 UNLESS OTHERWISE SHOWN OR SPECIFIED. PROVIDE 3/4" DIAMETER, HIGH STRENGTH BOLTS CONFORMING TO ASTM A325 IN SLIP CRITICAL CONNECTIONS, UNLESS NOTED OTHERWISE. PROVIDE E70XX ELECTRODES FOR WELDING, COMPLYING WITH AWS D1.1, DESIGN OF NEW BUILDINGS (SECTION 8).
- ALL ABBREVIATIONS SHOWN ON DRAWINGS CONFORM TO ANSI / ASME - Y1.1-1989. THE FOLLOWING LEGEND SHOWS ABBREVIATIONS AND SYMBOLS COMMONLY USED IN THE STRUCTURAL DETAILING AND CONSTRUCTION INDUSTRY:

LEGEND:

| | | | |
|----------|--------------------------|--------|---|
| § | CONSTRUCTION JOINT | L | ANGLE |
| W.S. | WATERSTOP | PL | PLATE |
| EXP. JT. | EXPANSION JOINT | A.B. | ANCHOR BOLT |
| C.G. | CONTROL GROOVE | S.S. | STAINLESS STEEL |
| H.P. | HIGH POINT | F.R.P. | FIBERGLASS REINFORCED PLASTIC |
| L.P. | LOW POINT | | |
| W.P. | WORK POINT | M.C. | MECHANICAL CONNECTIONS |
| E.P. | EQUIPMENT PAD | N.T.S. | NOT TO SCALE |
| E.E.P. | ELECTRICAL EQUIPMENT PAD | U.N.O. | UNLESS NOTED OTHERWISE |
| P.S. | PIPE SUPPORT | * | DIMENSIONS OR ELEVATION TO BE DETERMINED OR VERIFIED AFTER FINAL SELECTION OF EQUIPMENT |
| CL | CENTER LINE | | |
| C/C | CENTER TO CENTER | | |
| O.C. | ON CENTER | | |

RECORD DRAWING

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KLEIN AND HOFFMAN, INC.
CONSULTING ENGINEERS
100 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

FILE: 201AS01.1:1 10/28/99 16:14 GH-A

GREELEY AND HANSEN
ENGINEERS
211 WEST FORT STREET, SUITE 710
DETROIT, MICHIGAN 48226-3202

DESIGNED SKC
DRAWN GNG
CHECKED SKC

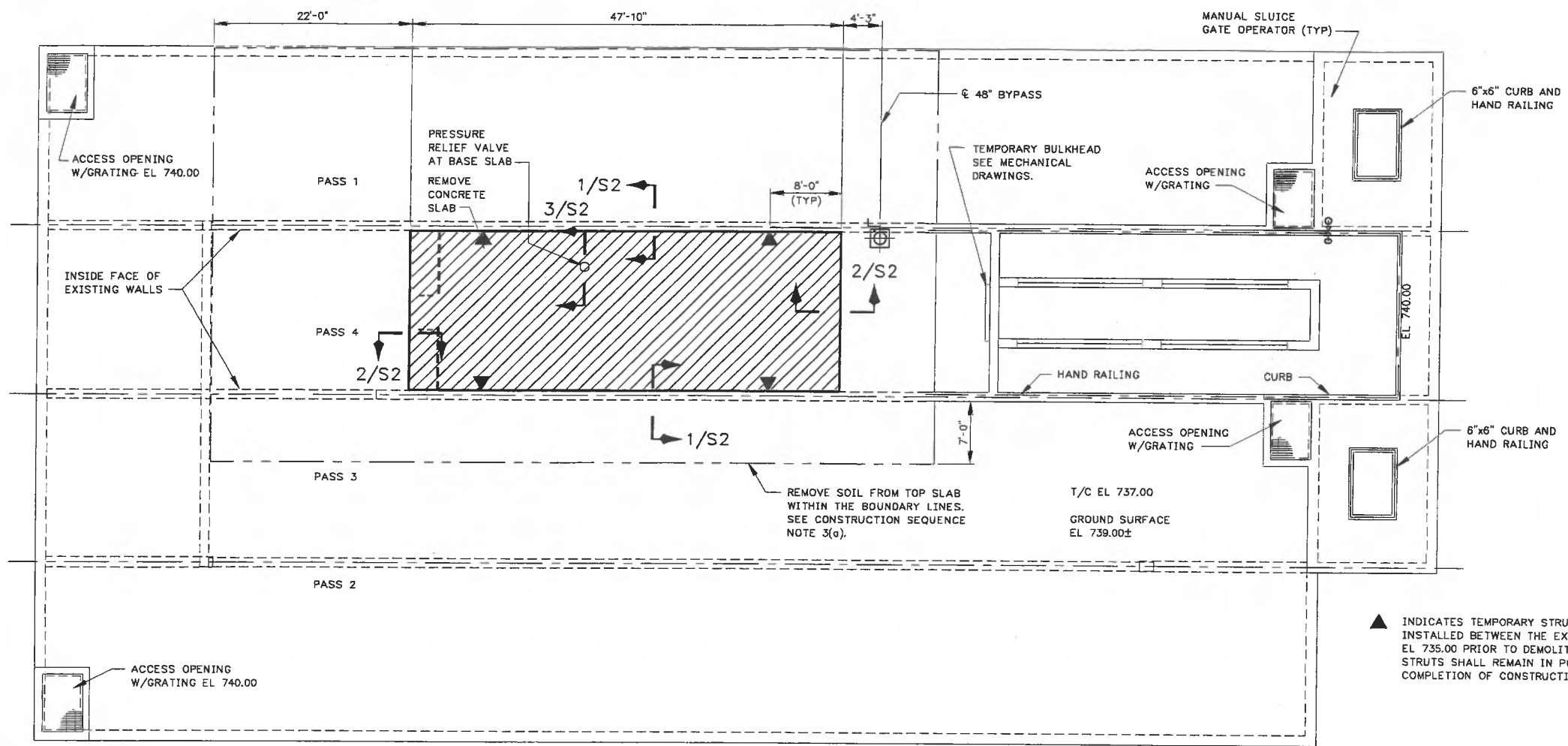
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| NO. | DATE | APPD | REVISION |
| | 06/04/01 | PJV | RECORD DRAWING |

SCALE
NOT TO SCALE

CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

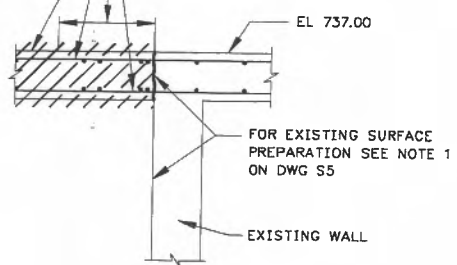
STRUCTURAL
TYPICAL DETAILS AND
GENERAL NOTES

| | |
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| PROJ | 02012 |
| DWG | S1 |
| SHEET | 8 OF 28 |
| DATE | OCTOBER 1999 |
| REV | 1 |



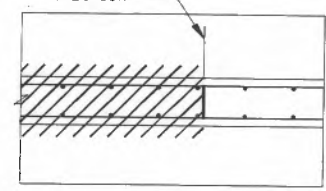
DEMOLITION PLAN AT EL 737.00
SCALE: 1/8"=1'-0"

DEMOLISH TOP SLAB. SAVE EXISTING REINFORCING. CLEAN REINFORCING THOROUGHLY. CUT AND BEND TO SUIT EMBEDMENT IN NEW WALL. SEE SECTION 2/S5

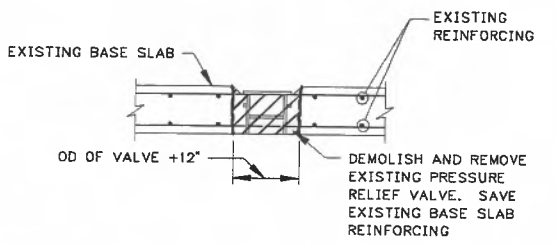


SECTION 1/S2
SCALE: 1/2"=1'-0"

SAWCUT & REMOVE CONCRETE SLAB SEE TYP DETAIL 6/AS1 FOR EXISTING REINFORCEMENT PROTECTION



SECTION 2/S2
SCALE: 1/2"=1'-0"



SECTION 3/S2
SCALE: 1/2"=1'-0"

▲ INDICATES TEMPORARY STRUTS. STRUTS TO BE INSTALLED BETWEEN THE EXISTING WALLS AT EL 735.00 PRIOR TO DEMOLITION OF TOP SLAB. STRUTS SHALL REMAIN IN POSITION UNTIL THE COMPLETION OF CONSTRUCTION.

CONSTRUCTION NOTES:

1. INSTALL DEWATERING AND GROUND WATER MONITORING SYSTEMS, ALL AROUND THE NORTH CHLORINE CONTACT TANK.
2. THROUGHOUT THE CONSTRUCTION PERIOD, MONITOR GROUND WATER TABLE AND WATER IN THE TANK PASSES EXCEPT THE WORK AREA BETWEEN TEMPORARY BULK HEADS IN PASS NO. 4. TO PREVENT HYDROSTATIC UPLIFT OF THE TANK DURING CONSTRUCTION, TABLE BELOW INDICATING GROUND WATER ELEVATION AND CORRESPONDING WATER DEPTH NEEDED IN THE TANKS, IS PROVIDED FOR GUIDANCE OF THE CONTRACTOR.

| GROUND WATER EL | MINIMUM HEIGHT OF WATER IN TANK PASSES MEASURED AT H.P. OF EXISTING BASE SLAB TOP |
|----------------------------|---|
| BELOW OR UP TO 731.0 | TANK EMPTY |
| 733.0 | 3.5' |
| 735.0 | 7.0' |
| 737.0 | 10.75' |
| 740.0 (100 YEARS FLOOD EL) | FLOOD ENTIRE TANK |

3. REMOVAL OF SOIL FROM TOP OF EXISTING TOP SLAB BEFORE CONSTRUCTION AND RE-GRADING AFTER COMPLETION OF THE CONSTRUCTION:
 a) PRIOR TO COMMENCEMENT OF DEMOLITION OF TOP SLAB, REMOVE SOIL FROM THE TOP SLAB (EL 737.00) IN THE AREA MARKED ON THE DEMOLITION PLAN WITH THE HELP OF LIGHT EQUIPMENT/MACHINERY.
 b) RE-GRADE THE AREA AS PER THE GRADING PLAN AFTER COMPLETION OF CONSTRUCTION.
4. THE MACHINERY OR EQUIPMENT USED OVER THE TANK TOP SLAB TO REMOVE SOIL OR FOR OTHER GENERAL CONSTRUCTION PURPOSES SHOULD NOT PRODUCE LIVE LOADS MORE THAN 100 PSF.
5. DO NOT PLACE ANY HEAVY EQUIPMENT OR CRANES PRODUCING MORE THAN 300 PSF VERTICAL LOAD WITHIN 3'-0" FROM OUTER EDGES OF THE TANK.

NOTE:

1. SEE DRAWING S1 FOR GENERAL NOTES AND TYPICAL DETAILS.

RECORD DRAWING

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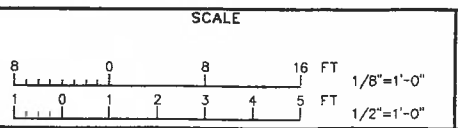
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CONSULTING ENGINEERS
100 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

GREELEY AND HANSEN ENGINEERS
211 WEST FORT STREET, SUITE 710
DETROIT, MICHIGAN 48226-3202

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| DESIGNED | SKC |
| DRAWN | GNG |
| CHECKED | SKC |

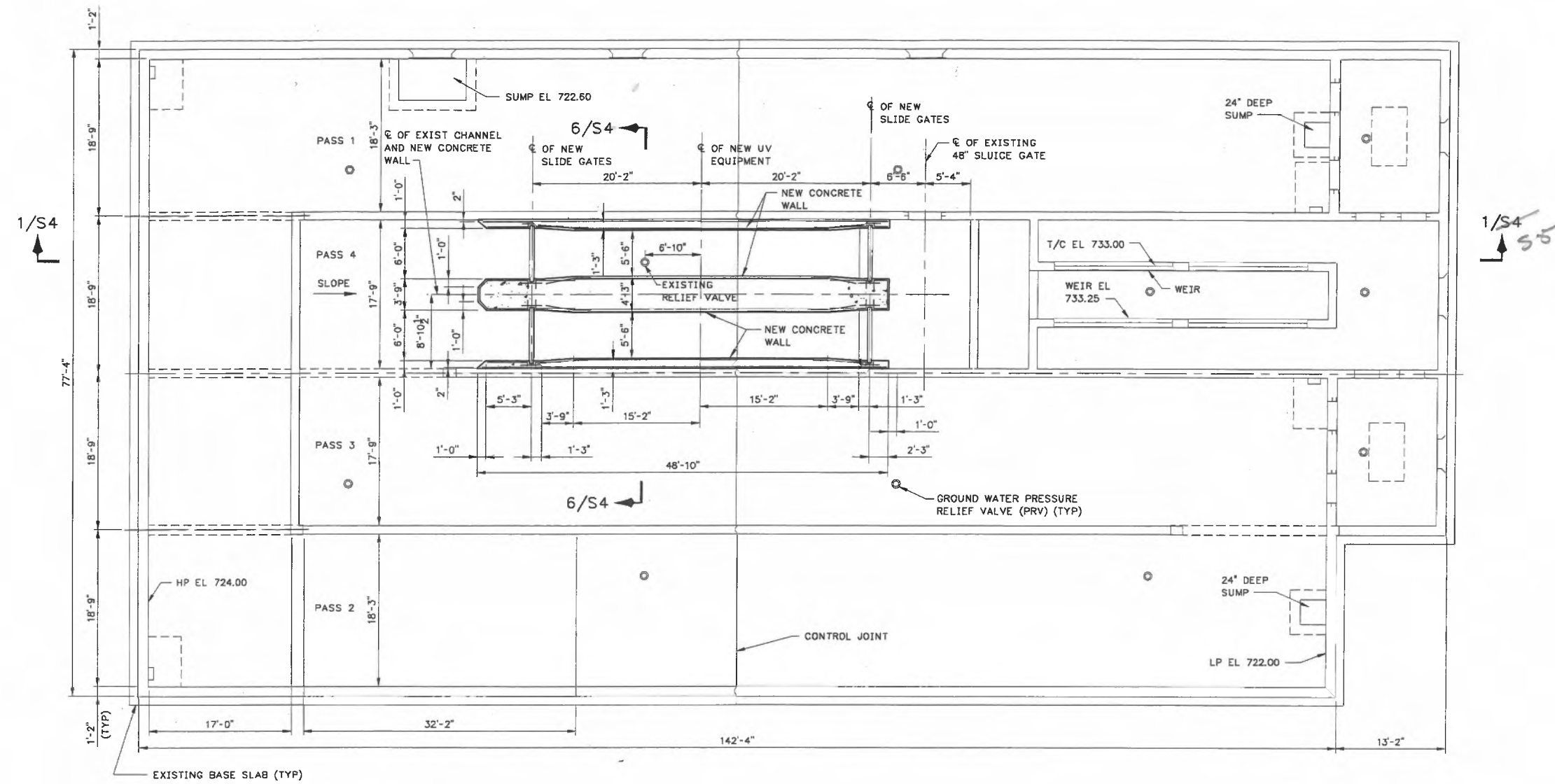
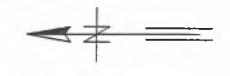
| NO. | DATE | APPD | REVISION |
|----------|------|------|----------------|
| 08/04/01 | PJV | | RECORD DRAWING |



CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

STRUCTURAL
NORTH CHLORINE CONTACT TANK
DEMOLITION -- TOP PLAN,
SECTIONS AND DETAILS

| | |
|-------|--------------|
| PROJ | 02012 |
| DWG | S2 |
| SHEET | 9 OF 28 |
| DATE | OCTOBER 1999 |
| REV | 1 |



PLAN AT EL 727.00

NOTE:
1. SEE DRAWING S1 FOR GENERAL NOTES AND TYPICAL DETAILS.

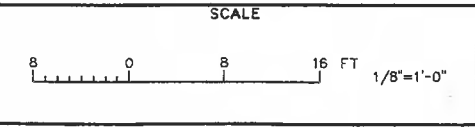
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KLEIN AND HOFFMAN, INC.
CONSULTING ENGINEERS
100 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

GREELEY AND HANSEN
ENGINEERS
211 WEST FORT STREET, SUITE 710
DETROIT, MICHIGAN 48226-3202

| | |
|----------|-----|
| DESIGNED | SKC |
| DRAWN | GNG |
| CHECKED | SKC |

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|-----|----------|------|----------------|
| NO. | DATE | APPD | REVISION |
| | 06/04/01 | PJV | RECORD DRAWING |



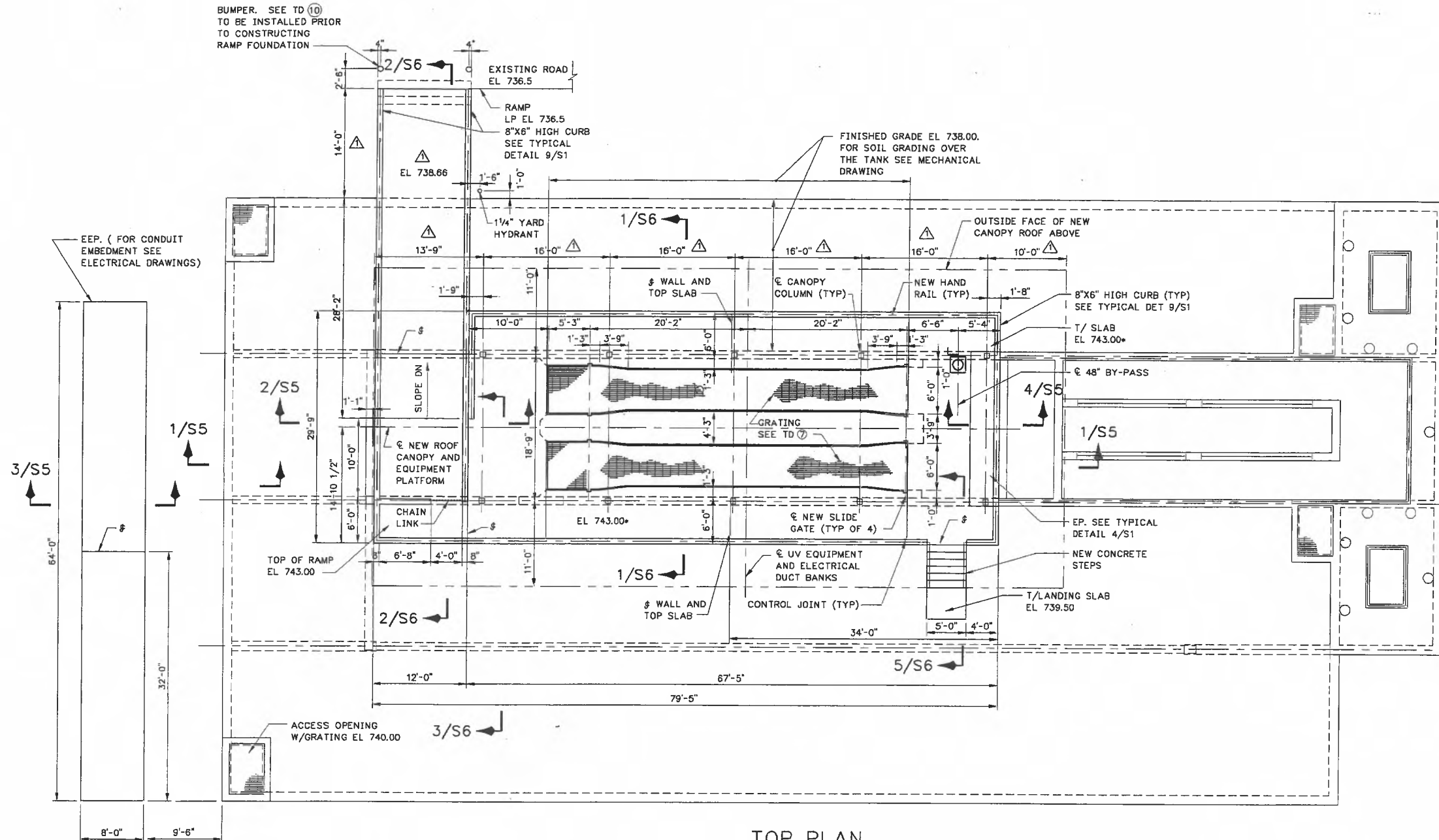
CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

STRUCTURAL
NORTH CHLORINE CONTACT TANK
PLAN AT EL 727.00

| | |
|-------|--------------|
| PROJ | 02012 |
| DWG | S3 |
| SHEET | 10 OF 28 |
| DATE | OCTOBER 1999 |
| REV | 1 |

RECORD DRAWING
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BUMPER. SEE TD 10
TO BE INSTALLED PRIOR
TO CONSTRUCTING
RAMP FOUNDATION



TOP PLAN

LIVE LOADS

PLATFORM AND GRATINGS AT EL 743* = 150 PSF.
RAMP: 150 PSF.

OR

VEHICLE LOADS AS BELOW:
750 LBS EACH OF FRONT & REAR AXLE WHEELS W/IMPACT (TOTAL 4 WHEELS).
AXLE CENTERS = 5'-10"
WHEEL CENTERS = 4'-0"
EXISTING TANK TOP SLAB = 100 PSF.

CANOPY COLUMN LOADS ON PLATFORM AT EL 743'-0" (FOR EACH COLUMN)

VERTICAL P: DL = 11,600 LBS ↓
LL = 9,030 LBS ↓
WIND = 6,000 LBS (UPLIFT)
HORIZONTAL H: DL = 100 LBS (TRANSVERSE)
LL = 90 LBS (TRANSVERSE)
WIND = 1,100 LBS (TRANSVERSE/LONGITUDINAL)

NOTE:

1. SEE DRAWING S1 FOR GENERAL NOTES AND TYPICAL DETAILS.

FILE: 201XAS01 1:1 11/17/99 14:02 GH-A

FILE: 201XAS04 1:1 11/19/99 08:52 GH-A

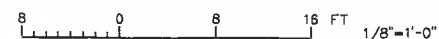
KLEIN AND HOFFMAN, INC.
CONSULTING ENGINEERS
100 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

GREELEY AND HANSEN
ENGINEERS
211 WEST FORT STREET, SUITE 710
DETROIT, MICHIGAN 48226-3202

DESIGNED SKC
DRAWN GNG
CHECKED SKC

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|-----|----------|------|-------------------------|
| 1 | 11/19/99 | PJV | ADDENDUM NO. 1 REVISION |
| 2 | 06/04/01 | PJV | RECORD DRAWING |

SCALE



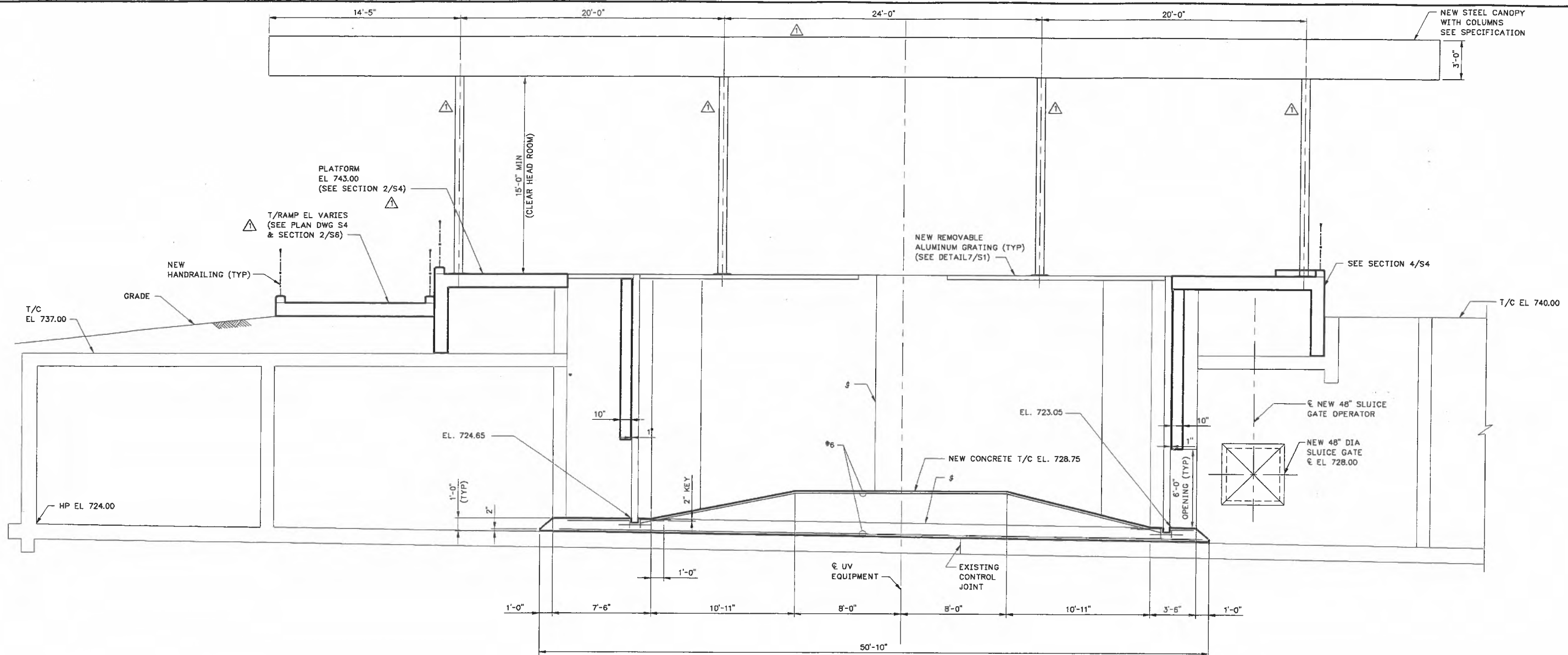
CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

STRUCTURAL
NORTH CHLORINE CONTACT TANK
TOP PLAN

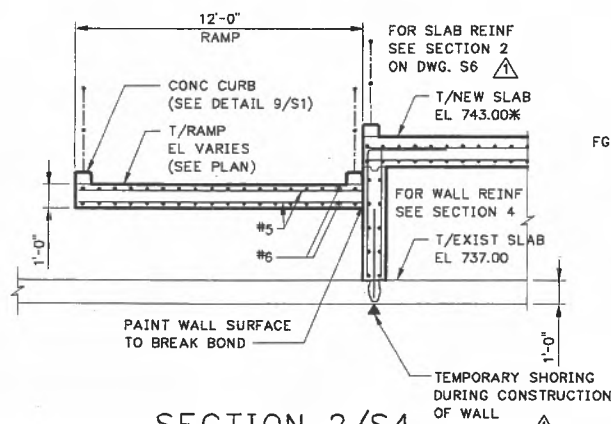
RECORD DRAWING

THIS RECORD IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

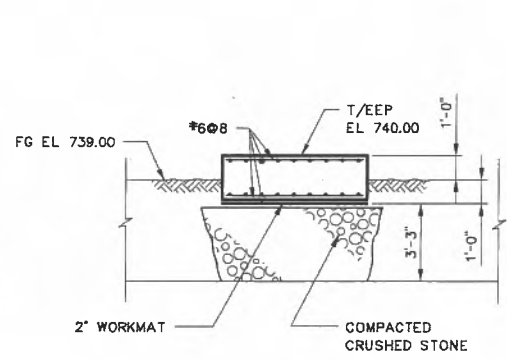
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| PROJ | 02012 |
| DWC | S4 |
| SHEET | 11 OF 28 |
| DATE | OCTOBER 1999 REV 2 |



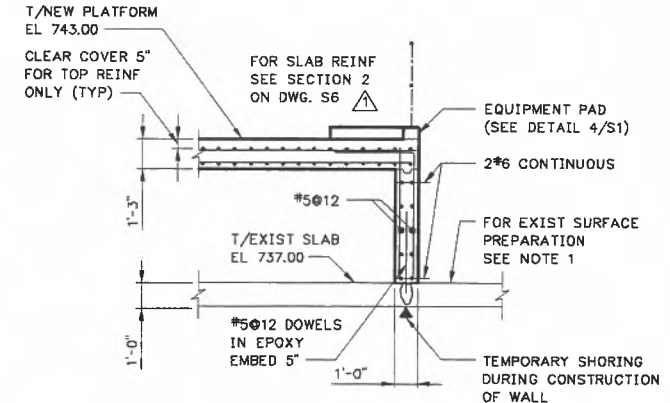
SECTION 1/S3, S4
SCALE: 1/4"=1'-0"



SECTION 2/S4
SCALE: 1/4"=1'-0"



SECTION 3/S4
SCALE: 1/4"=1'-0"



SECTION 4/S4
SCALE: 1/4"=1'-0"

- NOTES:**
- EXISTING SURFACE PREPARATION FOR PLACING NEW CONCRETE AGAINST IT:
 - CLEAN THOROUGHLY TO REMOVE DIRT & MUCK AND EXPOSE CONCRETE SURFACE.
 - ROUGHEN THE SURFACE TO 1/4" AMPLITUDE.
 - FOR CONSTRUCTION NOTES SEE DWG NO. S2.
 - FOR GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS SEE DWG NO. S1.

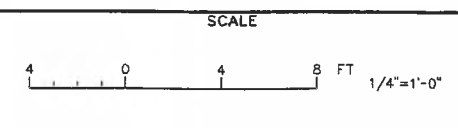
FILE: 201AS06 1:1 11/18/99 09:56 GH-A

KLEIN AND HOFFMAN, INC.
CONSULTING ENGINEERS
100 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

GREELEY AND HANSEN
ENGINEERS
211 WEST FORT STREET, SUITE 710
DETROIT, MICHIGAN 48226-3202

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| CHECKED | SKC |

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| NO. | DATE | APPD | REVISION |
| 1 | 11/19/99 | PJV | ADDENDUM NO. 1 REVISION |
| 2 | 06/04/01 | PJV | RECORD DRAWING |



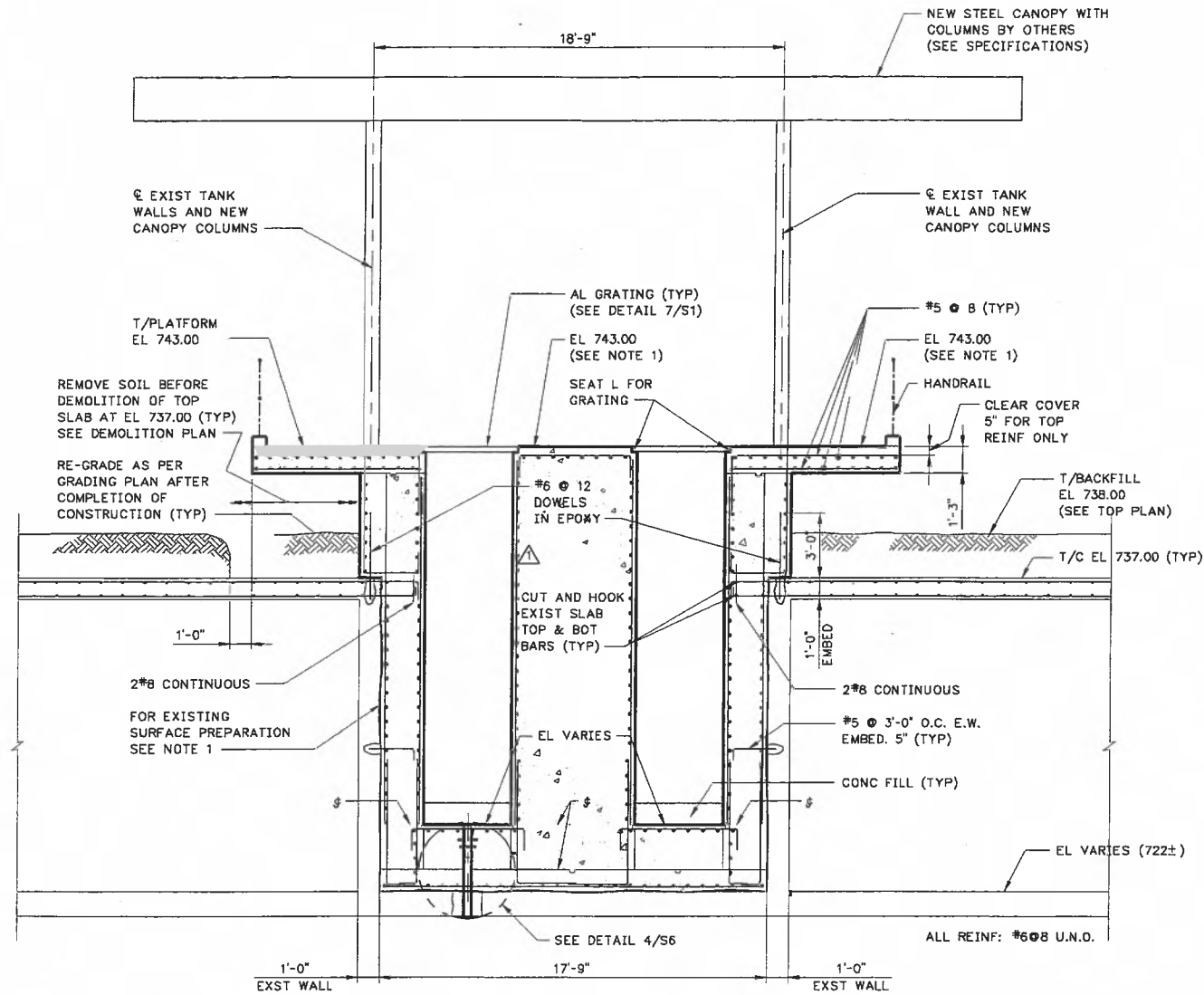
CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

STRUCTURAL
NORTH CHLORINE CONTACT TANK
SECTIONS

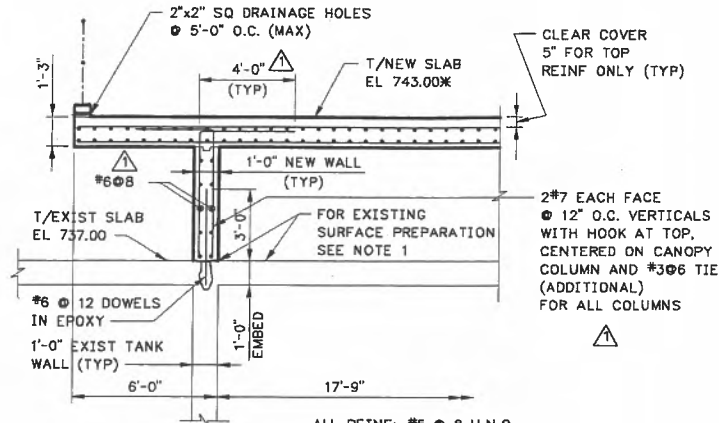
RECORD DRAWING

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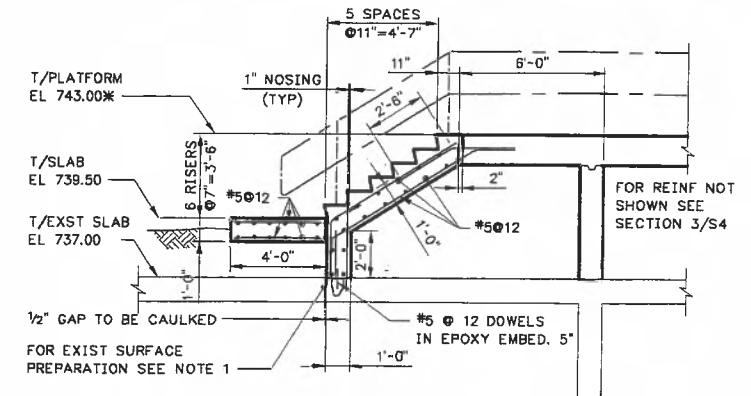
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| PROJ | 02012 |
| DWG | S5 |
| SHEET | 12 OF 28 |
| DATE | OCTOBER 1999 REV 2 |



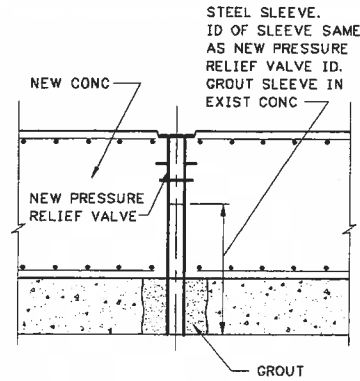
SECTION 1/S3, S4
SCALE: 1/4"=1'-0"



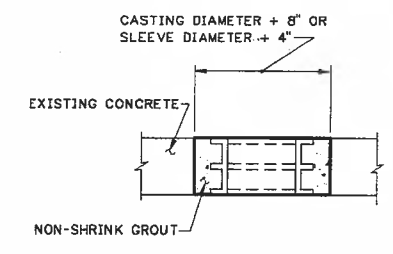
SECTION 3/S4
SCALE: 1/4"=1'-0"



SECTION 5/S4
SCALE: 1/4"=1'-0"

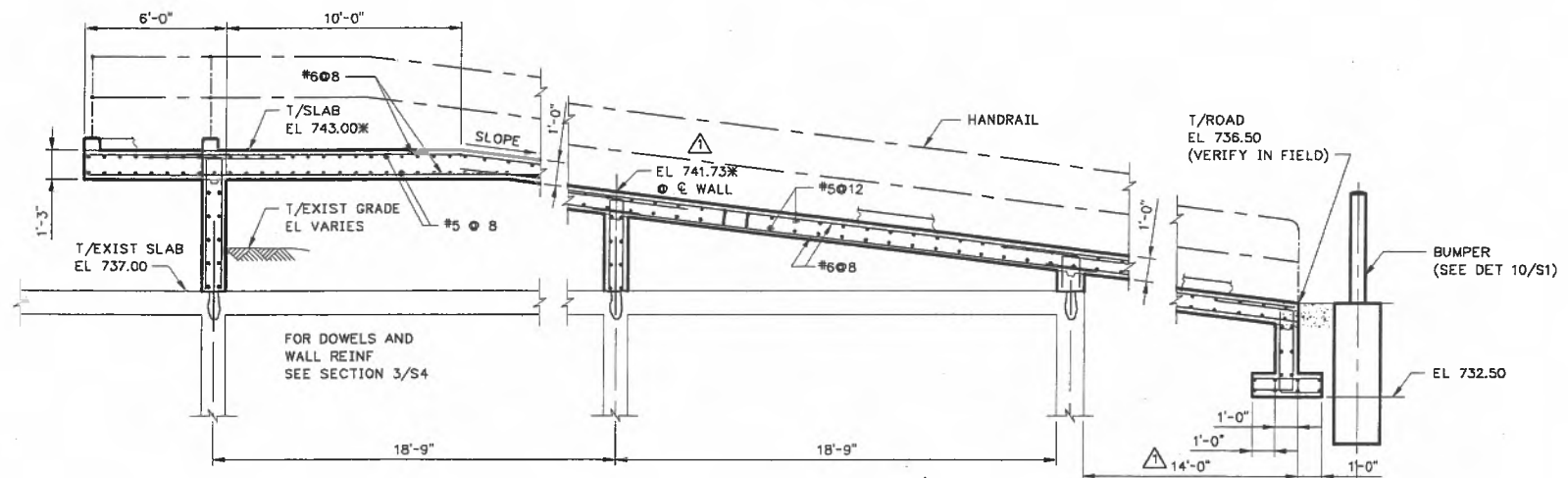


DETAIL 4/S6
SCALE: 1/2"=1'-0"

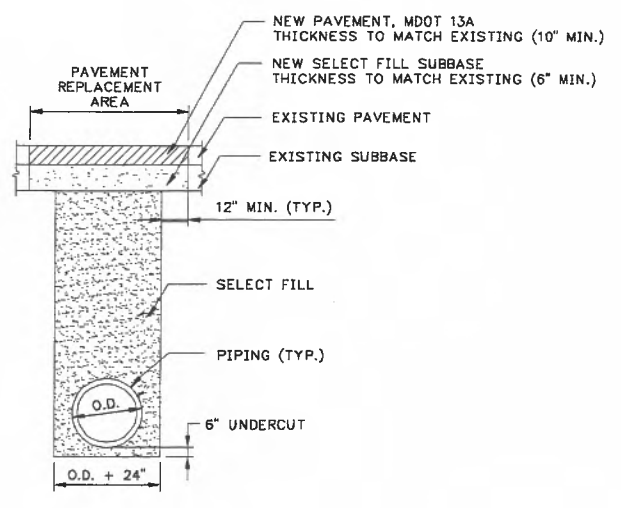


NEW WALL PIPE IN EXISTING WALL - DETAIL
NOT TO SCALE

- NOTES:
- OVERCUT EXISTING CONCRETE AS SHOWN.
 - SAVE EXISTING REINFORCEMENT- CUT ONLY AS REQUIRED.
 - ROUGHEN AND CLEAN SURFACES AND COAT WITH CEMENT-SAND (1:1) GROUT PRIOR TO PLACING NON-SHRINK GROUT.



SECTION 2/S4
SCALE: 1/4"=1'-0"



PIPE TRENCH IN ROADWAY DETAIL
NOT TO SCALE

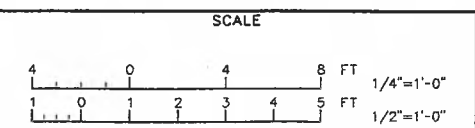
- NOTES:
- EXISTING SURFACE PREPARATION FOR PLACING NEW CONCRETE AGAINST IT:
 - CLEAN THOROUGHLY TO REMOVE DIRT & MUCK AND EXPOSE CONCRETE SURFACE.
 - ROUGHEN THE SURFACE TO 1/4" AMPLITUDE.
 - FOR CONSTRUCTION NOTES SEE DWG NO. S2.
 - FOR GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS SEE DWG NO. S1.

KLEIN AND HOFFMAN, INC.
CONSULTING ENGINEERS
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CHICAGO, ILLINOIS 60606

GREELEY AND HANSEN
ENGINEERS
211 WEST FORT STREET, SUITE 710
DETROIT, MICHIGAN 48226-3202

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| DRAWN | GNG |
| CHECKED | SKC |

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| 06/04/01 | PJV | | RECORD DRAWING |



CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

STRUCTURAL
NORTH CHLORINE CONTACT TANK
SECTIONS AND DETAILS

RECORD DRAWING

THIS RECORD IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

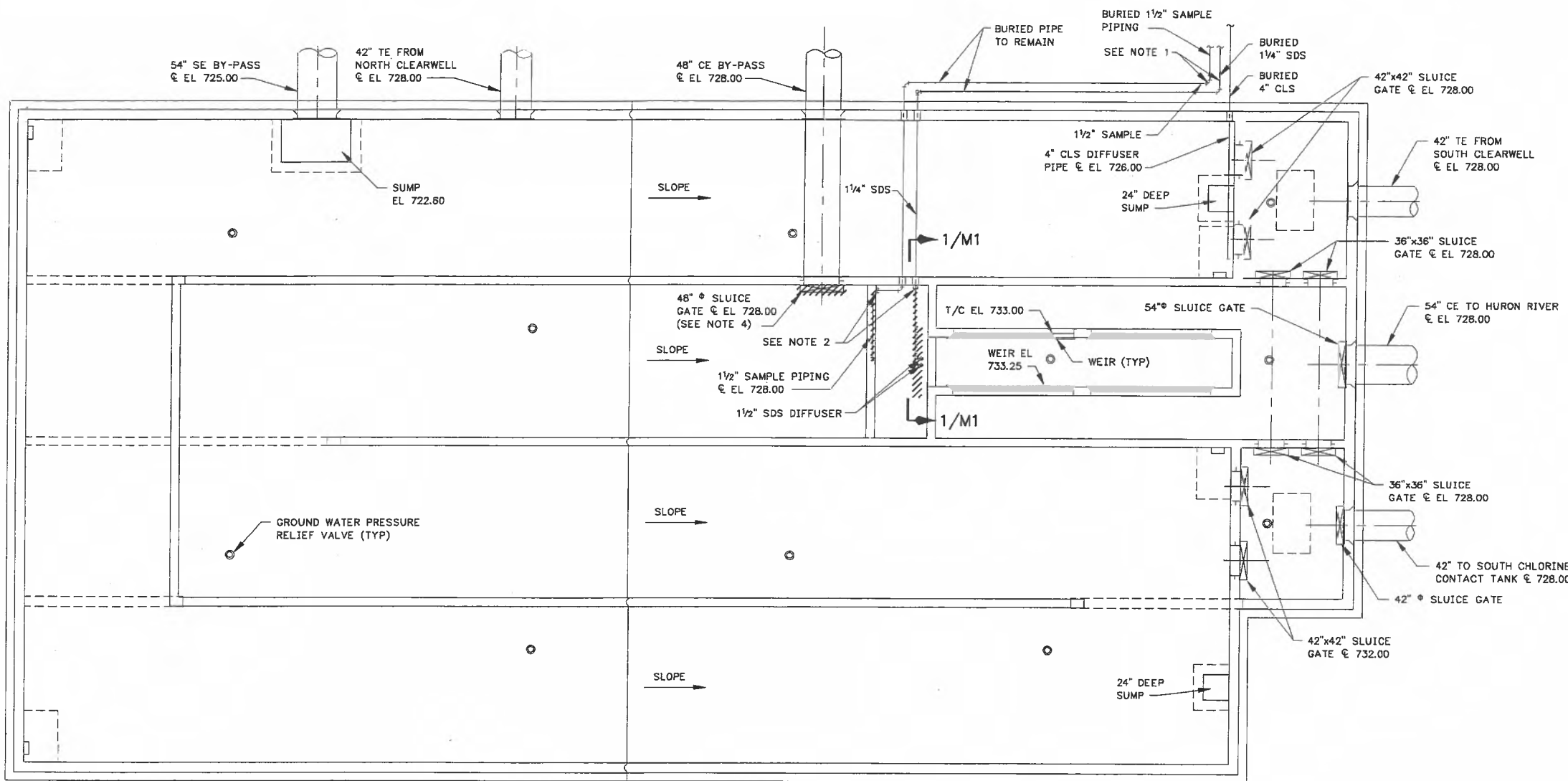
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| PROJ | 02012 |
| DWG | S6 |
| SHEET | 13 OF 28 |
| DATE | OCTOBER 1999 |
| REV | 2 |

FILE: 201AS08 1:1 06/15/01 15:45 GH-A

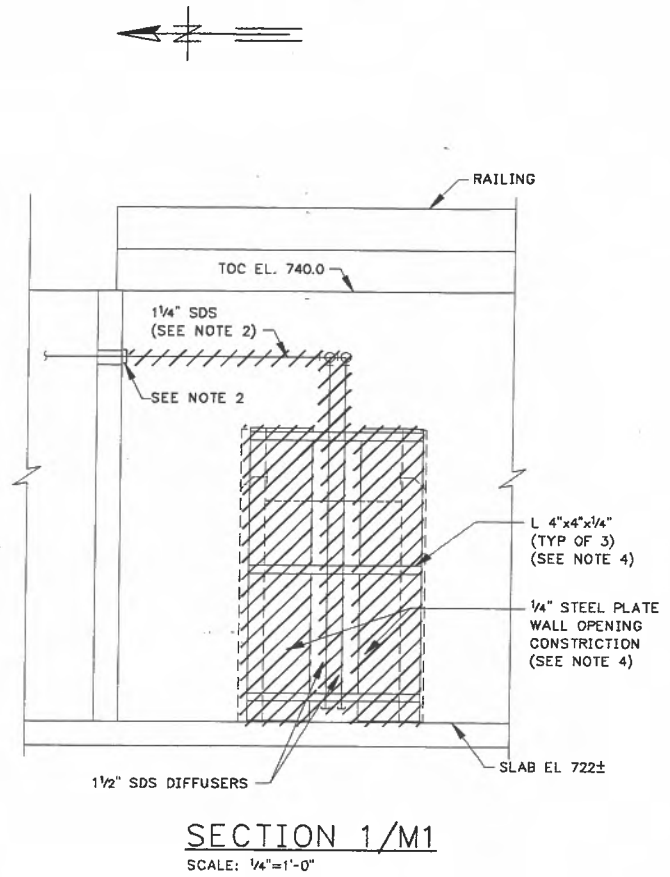
FILE: 201AXM01 1:1 10/28/99 13:33 GH-A

FILE: 201AXS01 1:1 11/17/99 14:02 GH-A

FILE: 201AM01 1:1 06/26/01 16:28 GH-A



PLAN AT EL 736.00
SCALE: 1/8"=1'-0"



SECTION 1/M1
SCALE: 1/4"=1'-0"

- NOTES:**
- NOTE REMOVED.
 - 1/2" SAMPLE PIPING AND 1/4" SDS PIPING CAPPED.
 - REMOVE ALL 1/4" STEEL PLATES, 4"x4"x1/4" ANGLE AND ALL ASSOCIATED HARDWARE FROM STEEL PLATE WALL OPENING CONSTRUCTION.
 - REMOVE EXISTING 48" SLUICE GATE STEM, OPERATOR STAND AND MOTOR OPERATOR, EXISTING WALL THIMBLE TO REMAIN.

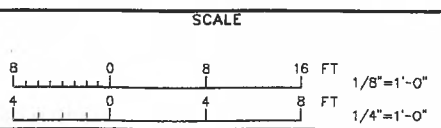
RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
211 WEST FORT STREET, SUITE 710
DETROIT, MICHIGAN 48226-3202

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DRAWN RPN
CHECKED PJR

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| | 06/04/01 | PJV | RECORD DRAWING |

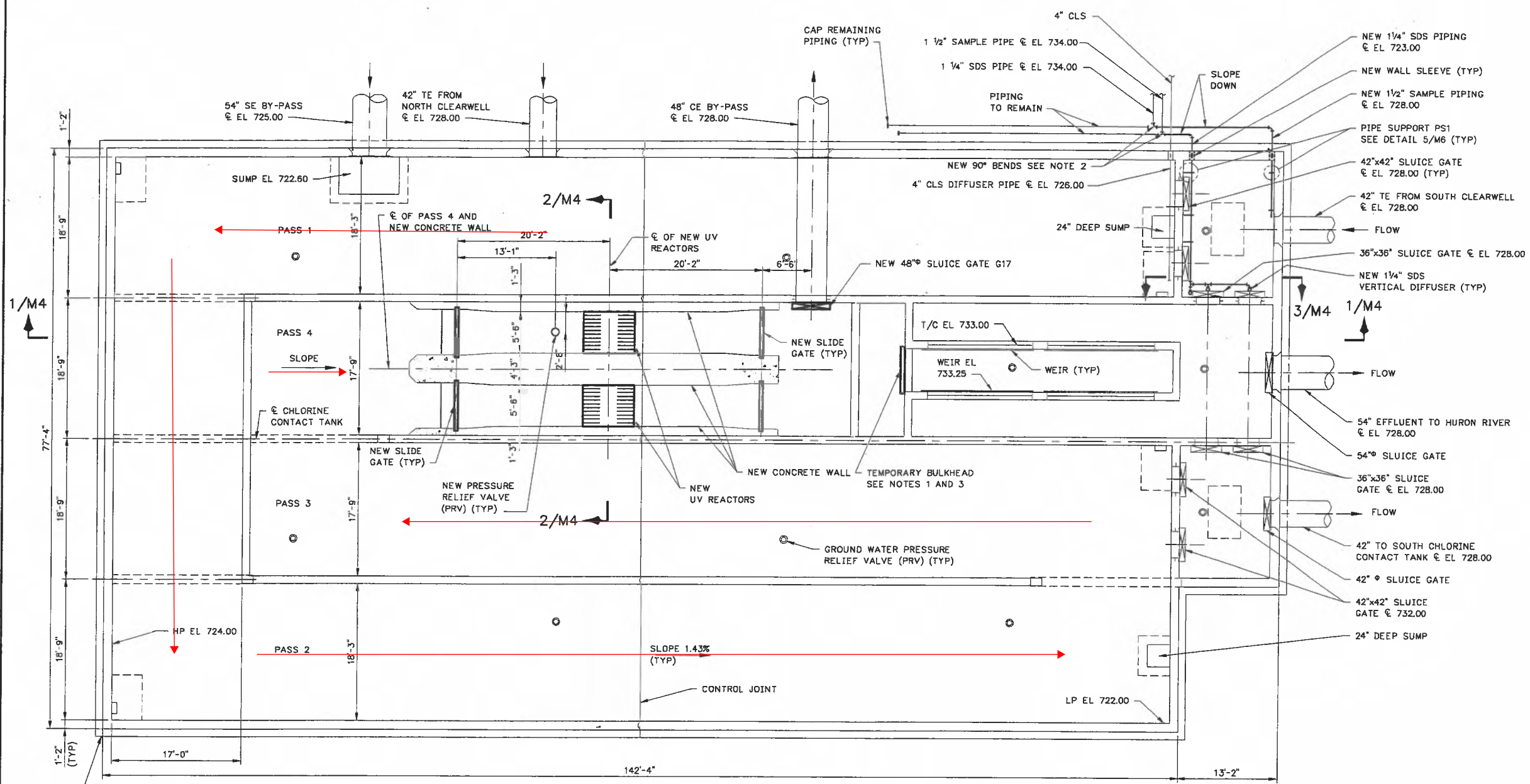


CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

PIPING AND EQUIPMENT
NORTH CHLORINE CONTACT TANK
DEMOLITION
PLAN AT EL 736.00

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| PROJ | 02012 |
| DWG | M1 |
| SHEET | 14 OF 28 |
| DATE | OCTOBER 1999 |
| REV | 1 |

FILE: 201AXM01 1:1 10/28/99 13:33 GH-A
 FILE: 201AXS01 1:1 11/17/99 14:02 GH-A
 FILE: 201AM02 1:1 10/28/99 16:30 GH-A



PLAN AT EL 727.00

NOTES:

- CONTRACTOR TO DESIGN AND CONSTRUCT TEMPORARY BULKHEAD PRIOR TO ISOLATION AND DEWATERING OF NORTH CHLORINE CONTACT TANK IN ACCORDANCE WITH CONSTRAINTS IN SPECIFICATION SECTION 01010. DESIGN BULKHEAD TO WITHSTAND A WATER ELEVATION OF 740' ON THE OVERFLOW WEIR CHAMBER SIDE OF THE BULKHEAD WHILE THE NCCT SIDE OF THE BULKHEAD IS ELEVATED DOWN TO THE BASE SLAB. BULKHEAD DESIGN TO BE PERFORMED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF MICHIGAN.
- INSTALL NEW 1/4" 90° BEND ON EXISTING 1/4" SDS PIPING TO CONNECT TO NEW 1/4" SDS PIPING. INSTALL NEW 1/2" 90° BEND ON EXISTING 1/2" SAMPLE PIPING TO CONNECT TO NEW 1/2" SAMPLE PIPING.
- CONTRACTOR TO DESIGN AND CONSTRUCT TEMPORARY BULKHEAD PRIOR TO REPLACEMENT OF GATE G17 IN ACCORDANCE WITH SPECIFICATION SECTION 01010.

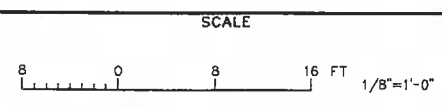
RECORD DRAWING

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 ENGINEERS
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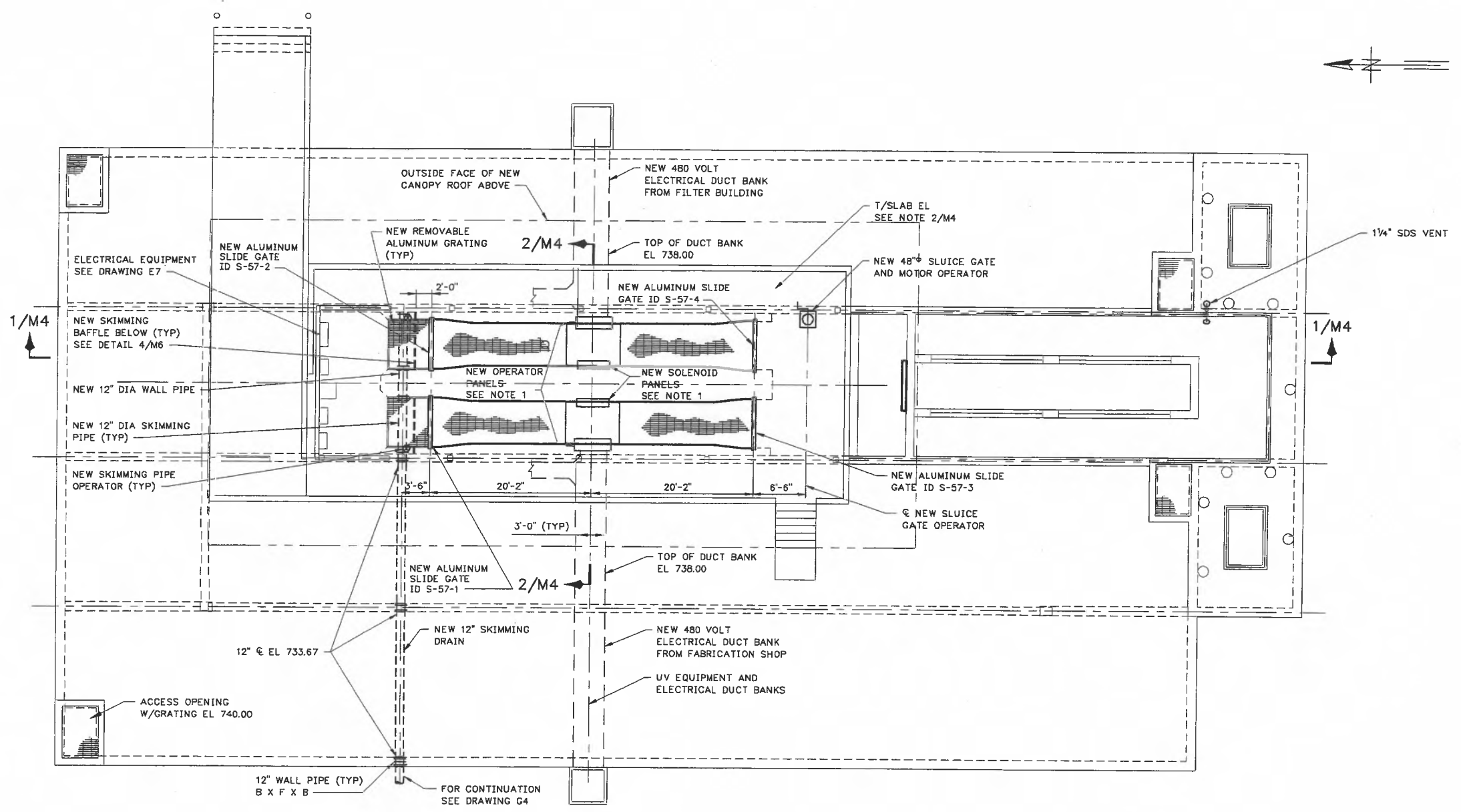


CITY OF ANN ARBOR, MICHIGAN
 WATER UTILITIES DEPARTMENT
 WASTEWATER TREATMENT PLANT
 DISINFECTION FACILITIES UPGRADE

PIPING AND EQUIPMENT
 NORTH CHLORINE CONTACT TANK
 PLAN AT EL 727.00

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| PROJ | 02012 | | |
| DWG | M2 | | |
| SHEET | 15 | OF | 28 |
| DATE | OCTOBER 1999 | REV | 1 |

FILE: 201AM03 1:1 10/28/99 13:41 GH-A
 FILE: 201AM01 1:1 11/17/99 14:02 GH-A
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TOP PLAN

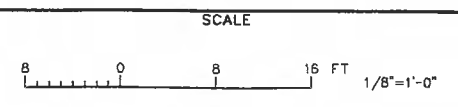
RECORD DRAWING

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 ENGINEERS
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 DETROIT, MICHIGAN 48226-3202

DESIGNED PJR
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 CHECKED PJR

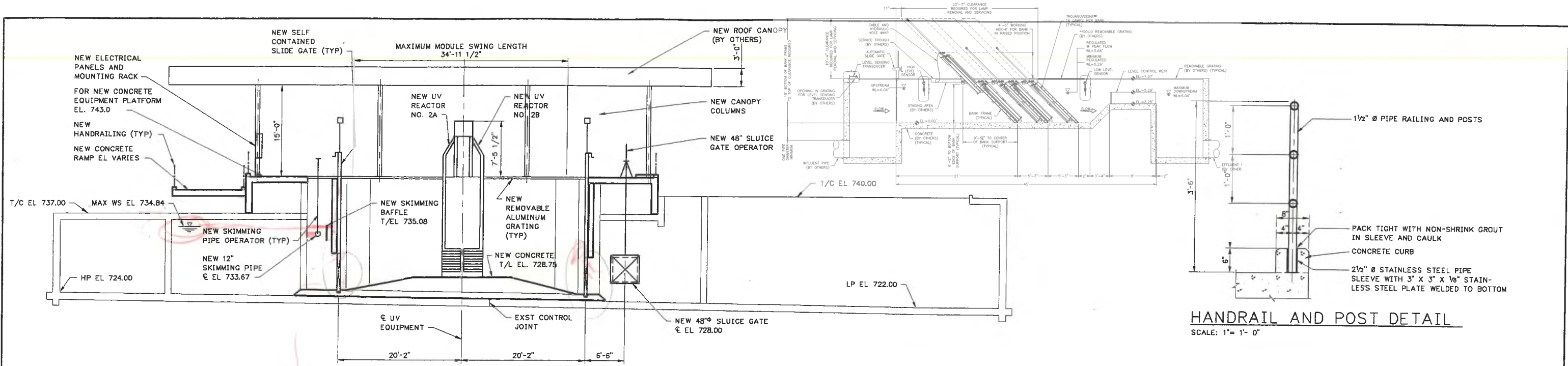
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CITY OF ANN ARBOR, MICHIGAN
 WATER UTILITIES DEPARTMENT
 WASTEWATER TREATMENT PLANT
 DISINFECTION FACILITIES UPGRADE

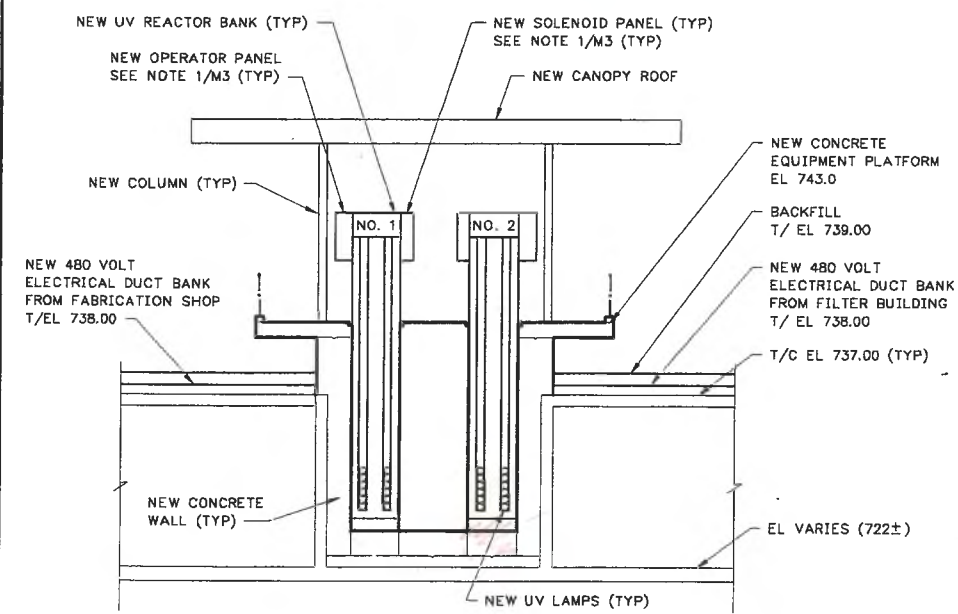
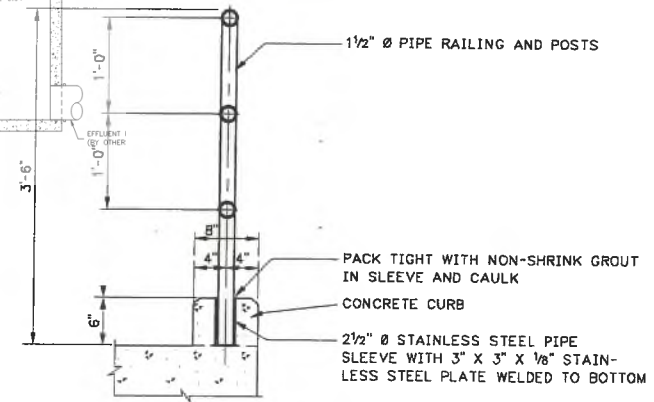
PIPING AND EQUIPMENT
 NORTH CHLORINE CONTACT TANK
 TOP PLAN

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| PROJ | 02012 |
| DWG | M3 |
| SHEET | 16 OF 28 |
| DATE | OCTOBER 1999 |
| REV | 1 |

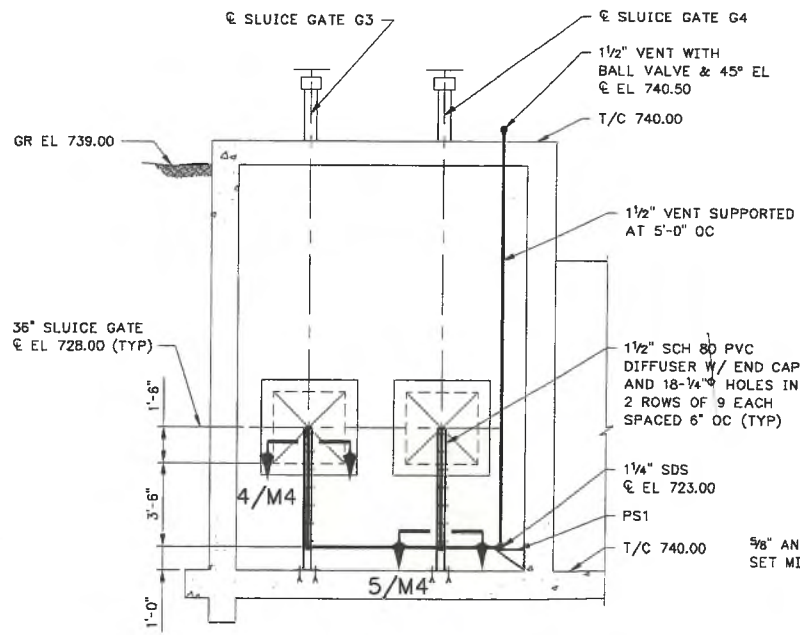


SECTION 1/M2, 3
SCALE: NOT TO SCALE

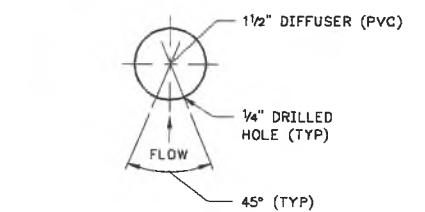
HANDRAIL AND POST DETAIL
SCALE: 1" = 1'-0"



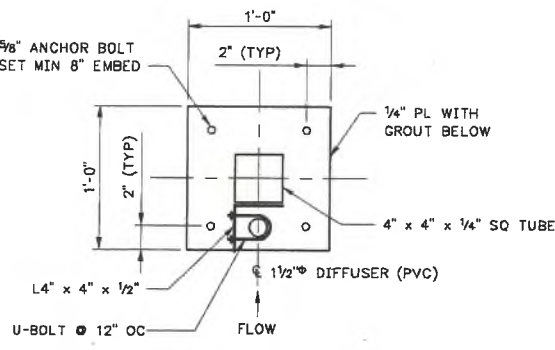
SECTION 2/M2, 3
SCALE: 1/8" = 1'-0"



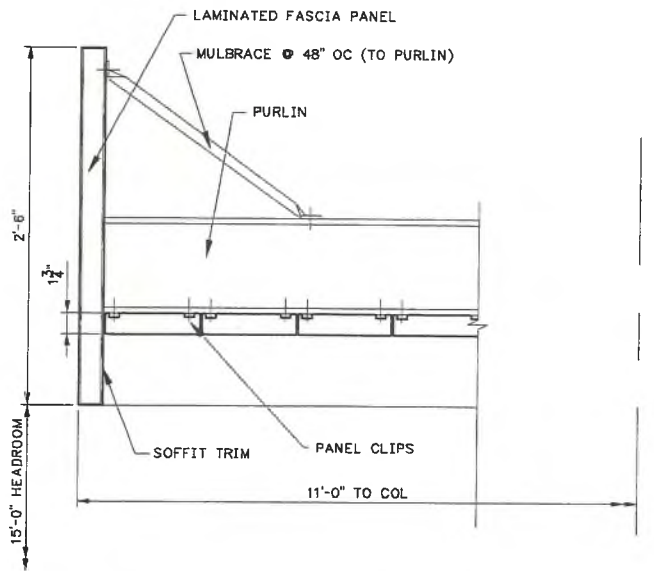
SECTION 3/M2, 3
SCALE: 1/4" = 1'-0"



SECTION 4/M4
SCALE: 1/2" = 1'



SECTION 5/M4
SCALE: 1/2" = 1'-0"



CANOPY FASCIA / SOFFIT DETAIL
SCALE: 3/4" = 1'-0"

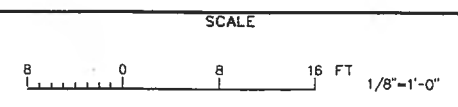
NOTE: ALL METAL MATERIALS TYPE 316 L SST.

FILE: 201AM04 1:1 04/23/01 10:20 GH-A

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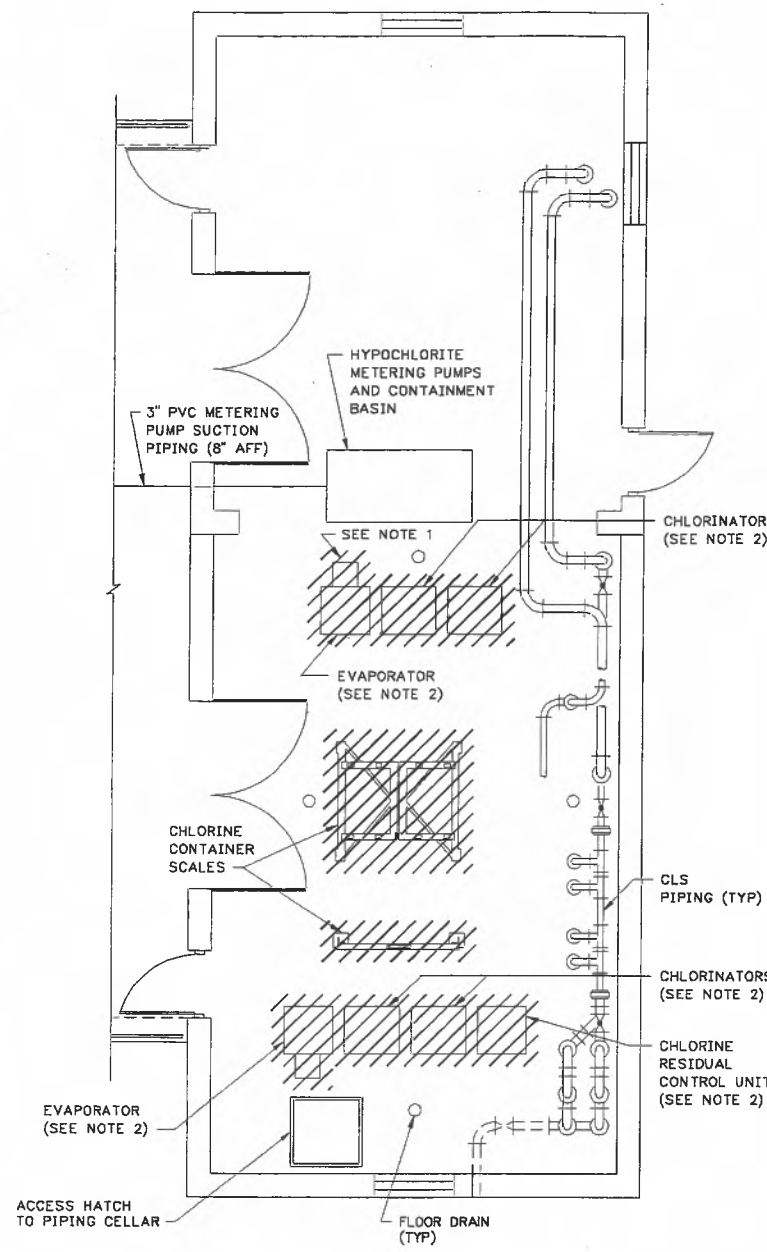


CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

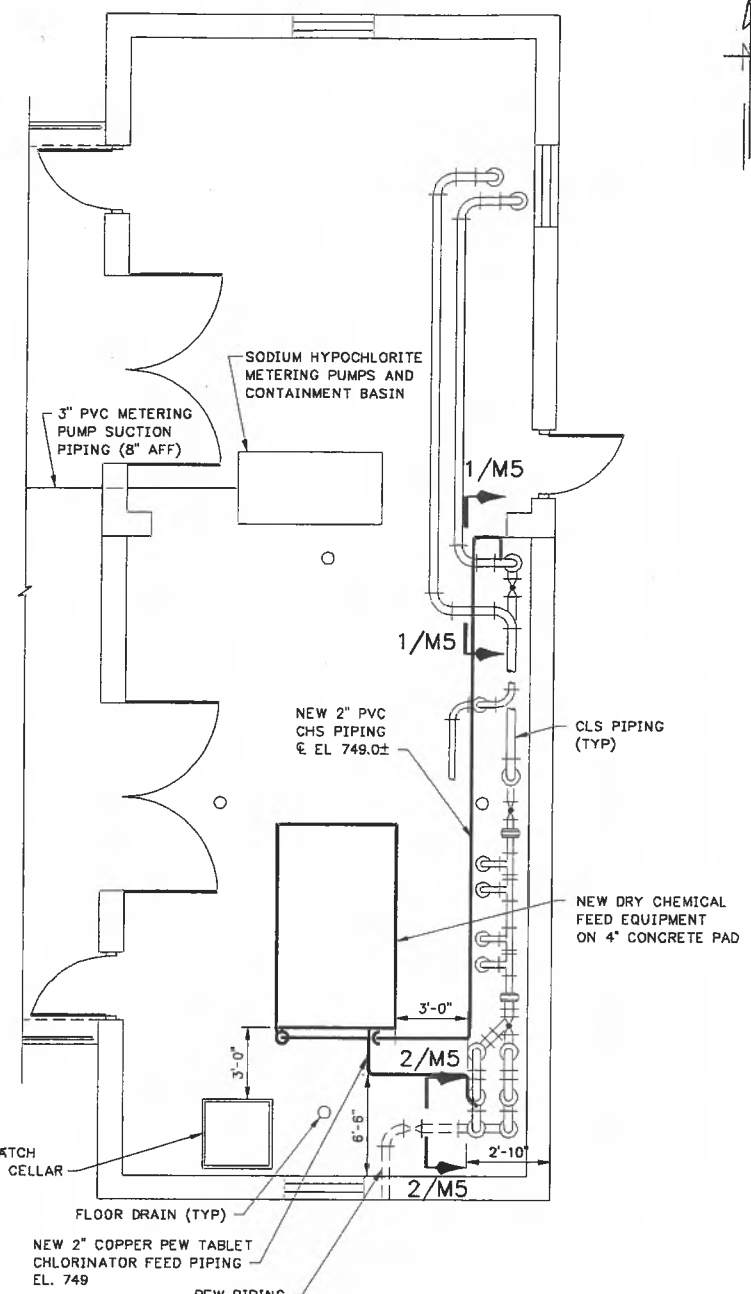
PIPING AND EQUIPMENT
NORTH CHLORINE CONTACT TANK
SECTIONS AND DETAILS

RECORD DRAWING
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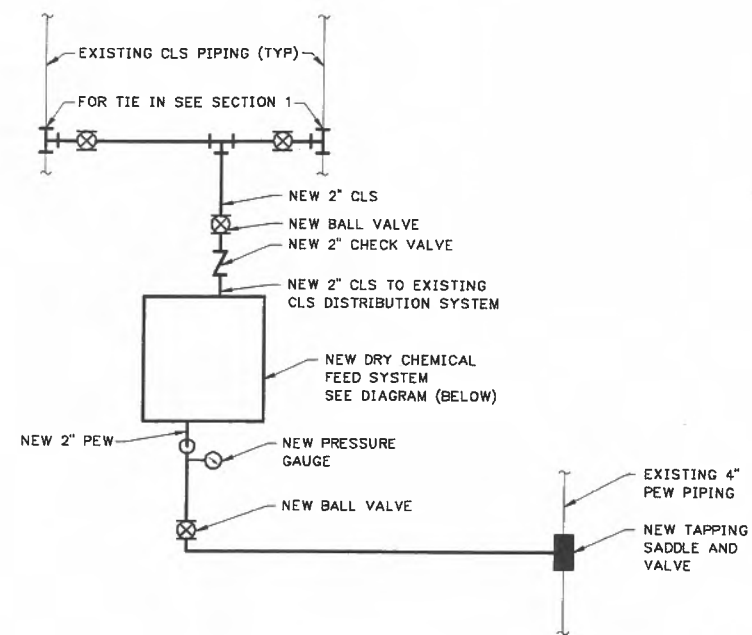
PROJ 02012
DWG M4
SHEET 17 OF 28
DATE OCTOBER 1999 REV 1



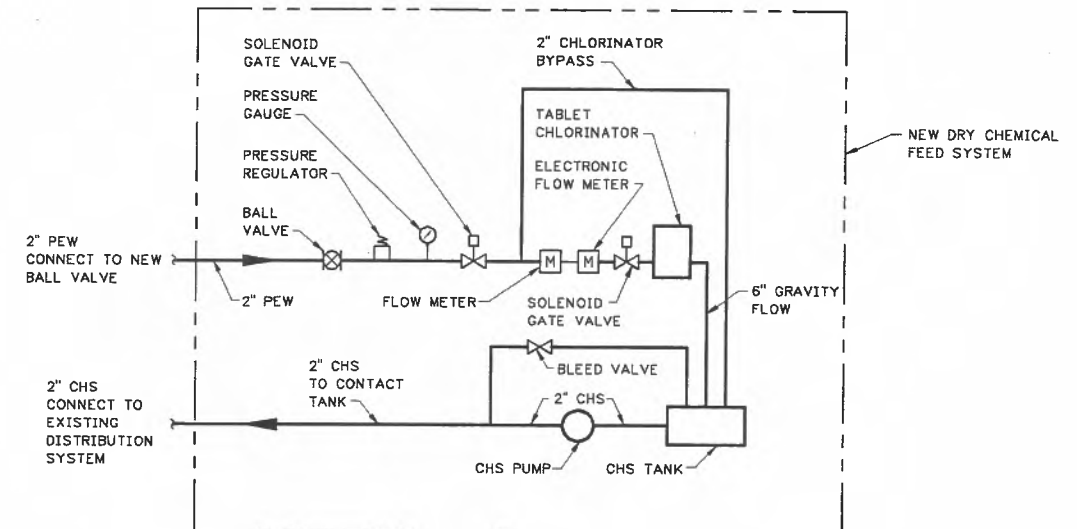
EXISTING PLAN FL EL 742.0
SCALE: 1/4"=1'-0"



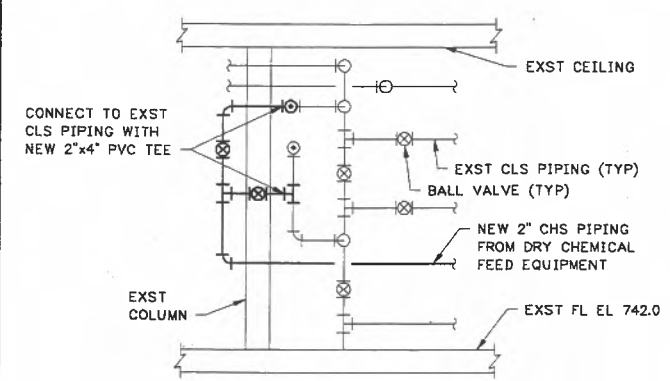
NEW PLAN FL EL 742.0
NOT TO SCALE



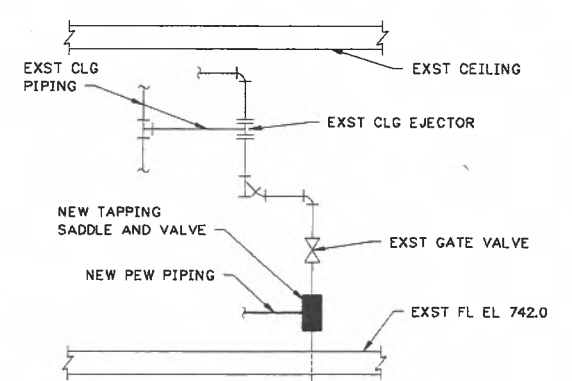
NEW DRY CHEMICAL FEED DIAGRAM
NOT TO SCALE



NEW DRY CHEMICAL FEED SYSTEM
NOT TO SCALE



SECTION 1
NOT TO SCALE

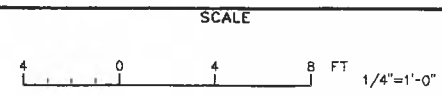


SECTION 2
NOT TO SCALE

- NOTES:**
- CROSS HATCHING INDICATES REMOVAL OF ALL GAS CHLORINATION AND EVAPORATION EQUIPMENT, INCLUDING CHLORINE GAS PIPING AND FITTINGS, ELECTRICAL WIRING AND CONDUIT, CONTROLS AND ALL APPURTENANCES RELATED TO THE EXISTING GAS CHLORINATION AND EVAPORATION SYSTEM. EQUIPMENT REMOVAL DOES NOT INCLUDE REMOVAL OF EXISTING PEW AND CLS PIPING. PROVIDE PIPE PLUGS AND CAPS AS NEEDED WHERE REMOVED PIPING IS DISCONNECTED FROM PIPING WHICH WILL REMAIN. PROVIDE PIPE SUPPORTS AS NEEDED TO SUPPORT REMAINING PIPING. COORDINATE ALL REMOVAL OPERATIONS WITH CITY SUCH THAT EXISTING LIQUID SODIUM HYPOCHLORITE SYSTEM REMAINS IN OPERATION.
 - EXISTING EQUIPMENT IS LOCATED ON A CONCRETE EQUIPMENT PAD. REMOVE EXISTING PAD TO 1" BELOW EXISTING FLOOR ELEVATION. PATCH REMAINING DEPRESSION FLUSH WITH EXISTING FLOOR.

RECORD DRAWING

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GREELEY AND HANSEN
ENGINEERS
211 WEST FORT STREET, SUITE 710
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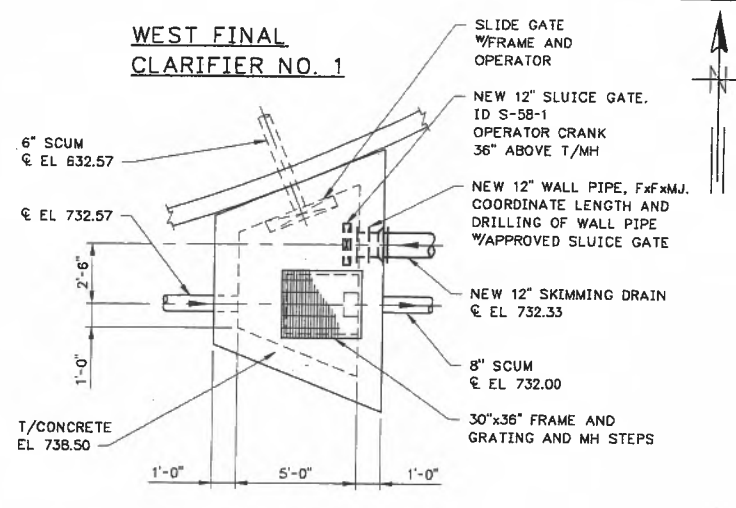
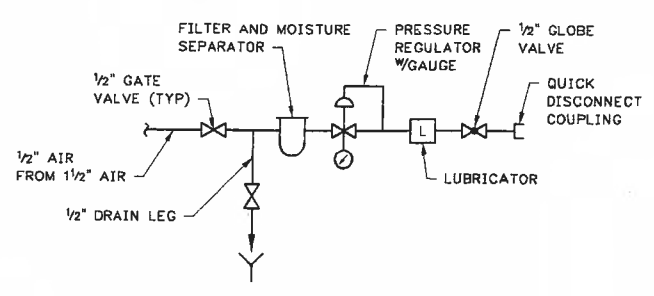
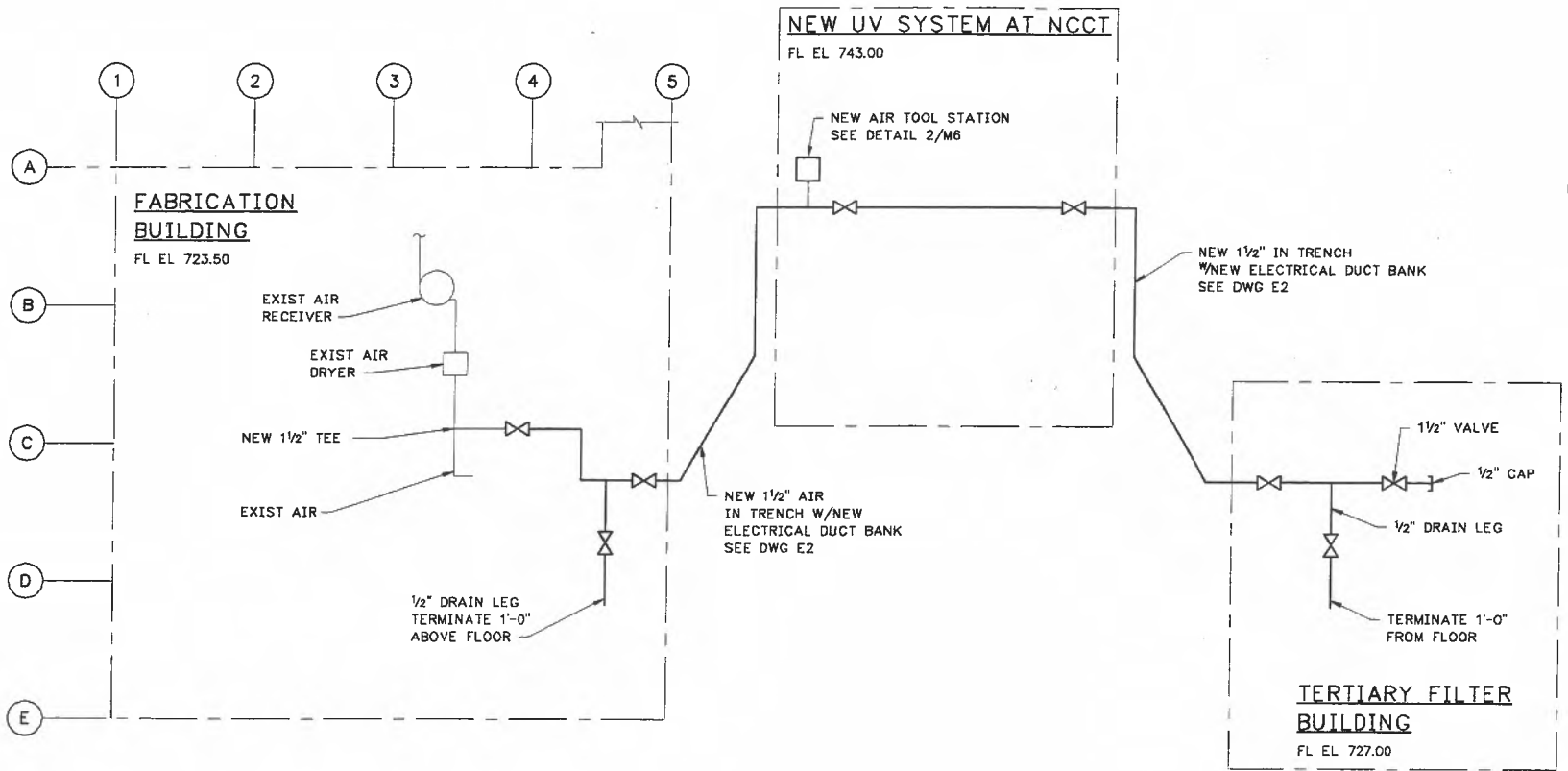
| NO. | DATE | APPD | REVISION |
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| | 06/04/01 | PJV | RECORD DRAWING |

CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

PIPING AND EQUIPMENT
CHLORINE BUILDING
PLANS, SECTIONS
AND DIAGRAMS

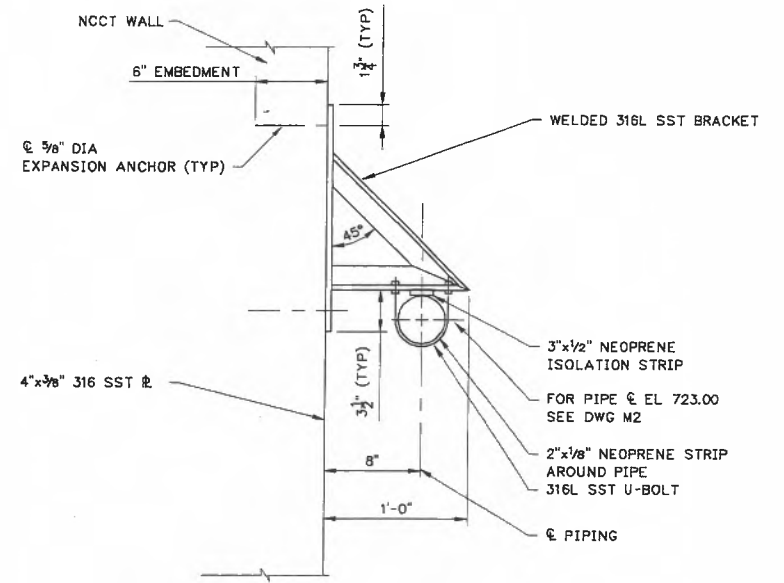
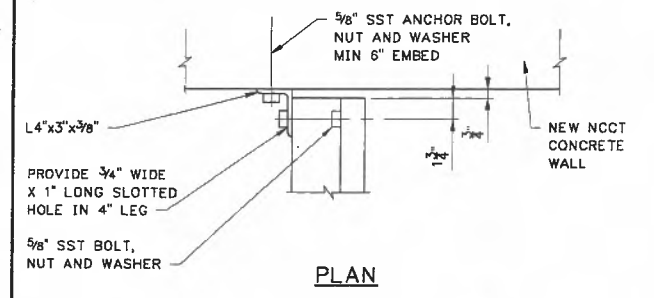
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| PROJ | 02012 |
| DWG | M5 |
| SHEET | 18 OF 28 |
| DATE | OCTOBER 1999 |
| REV | 1 |

FILE: 201AMG05 11 10/28/99 1620 CH-A

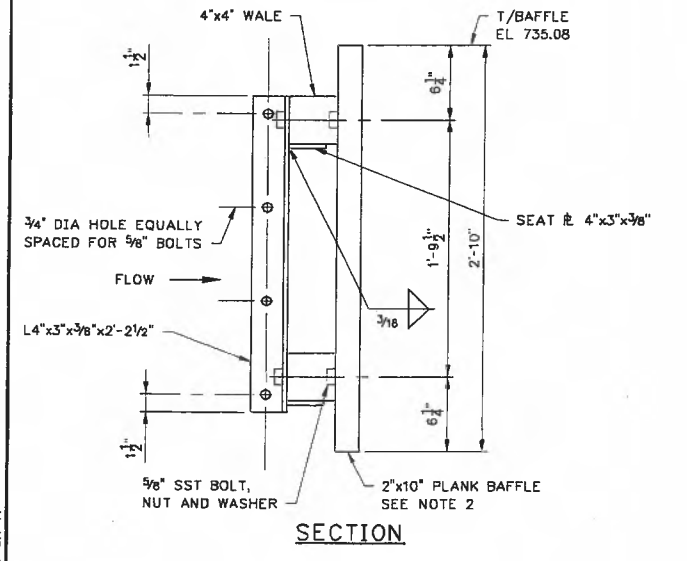


DETAIL 3
EXISTING SCUM MANHOLE PLAN
SCALE: 1/4"=1'-0"

DETAIL 1
AIR DIAGRAM
NOT TO SCALE



DETAIL 5
PIPE SUPPORT PS1
SCALE: 1/2"=1'-0"



DETAIL 4
BAFFLE MOUNTING END CONNECTION
SCALE: 1/2"=1'-0"

- NOTES:**
1. ALL AIR PIPING, VALVES, FITTINGS, AND APPURTENANCES TO BE PROVIDED.
 2. PROVIDE 1/8" GAP BETWEEN 2"x10" VERTICAL PLANKS. FASTEN EACH PLANK TO DOUGLAS FIR-LARCH TREATED WOOD 4"x4" WALES W/(4) 1/2" SST LAG SCREWS AND WASHERS. UTILIZE TYPE 316L SST PLATES, ANGLES, BARSTOCK, BELT ASSEMBLIES AND SCREWS.

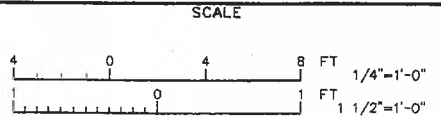
RECORD DRAWING

THIS RECORD IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES. BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN
ENGINEERS
211 WEST FORT STREET, SUITE 710
DETROIT, MICHIGAN 48226-3202

DESIGNED BYD
DRAWN GD
CHECKED PJV

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| NO. | DATE | APPD | REVISION |
| 06/04/01 | PJV | | RECORD DRAWING |



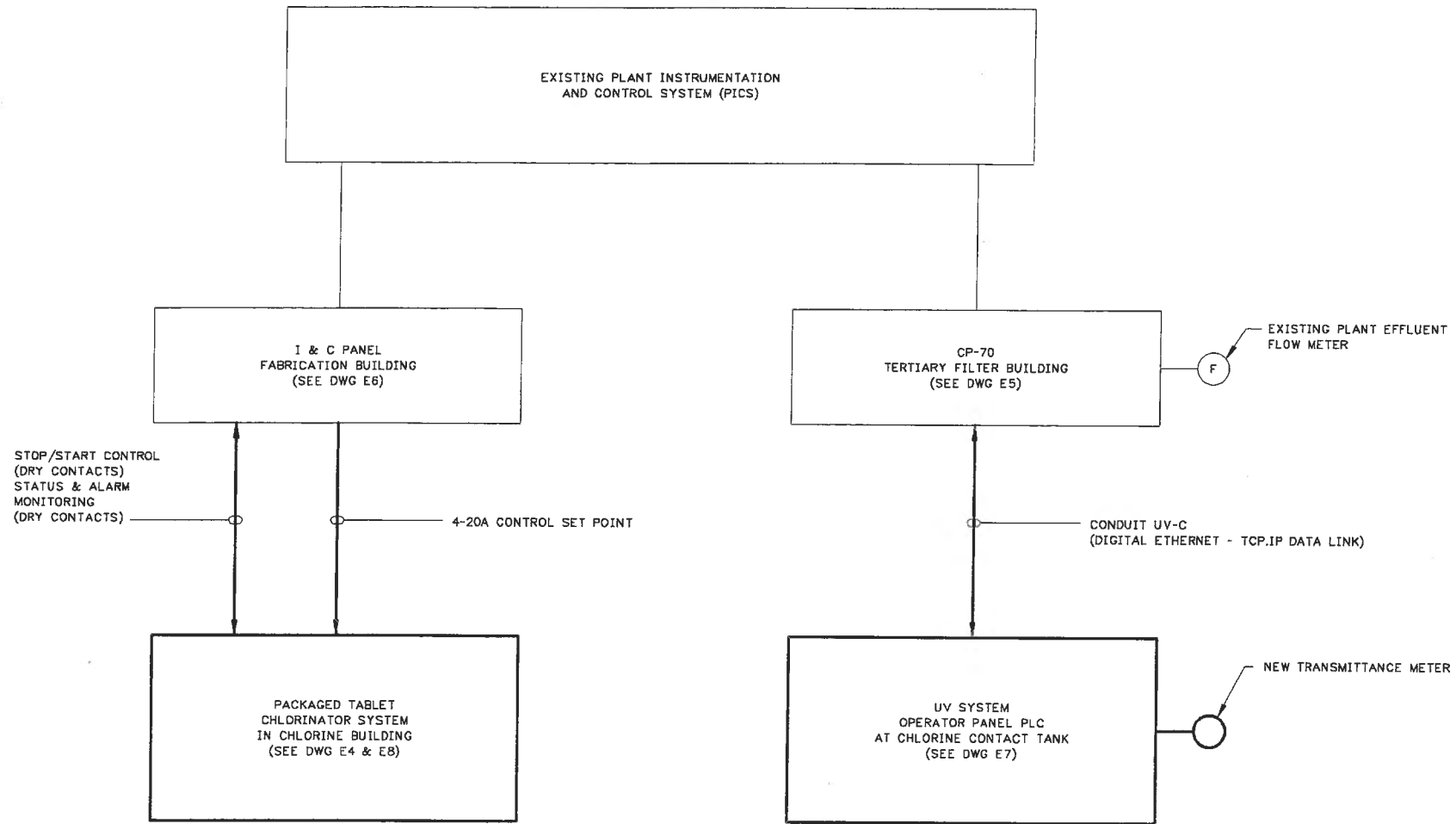
CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

PIPING AND EQUIPMENT

DIAGRAMS AND DETAILS

| | |
|-------|--------------|
| PROJ | 02012 |
| DWG | M6 |
| SHEET | 19 OF 28 |
| DATE | OCTOBER 1999 |
| REV | 1 |

FILE: 201AM06 1:1 10/28/99 16:39 GH-4



RECORD DRAWING

THIS RECORD IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

FILE: 201A01.1: 10/26/99 15:30 GH-A

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ENGINEERS
211 WEST FORT STREET, SUITE 710
DETROIT, MICHIGAN 48226-3202

DESIGNED SHP
DRAWN AF
CHECKED SHP

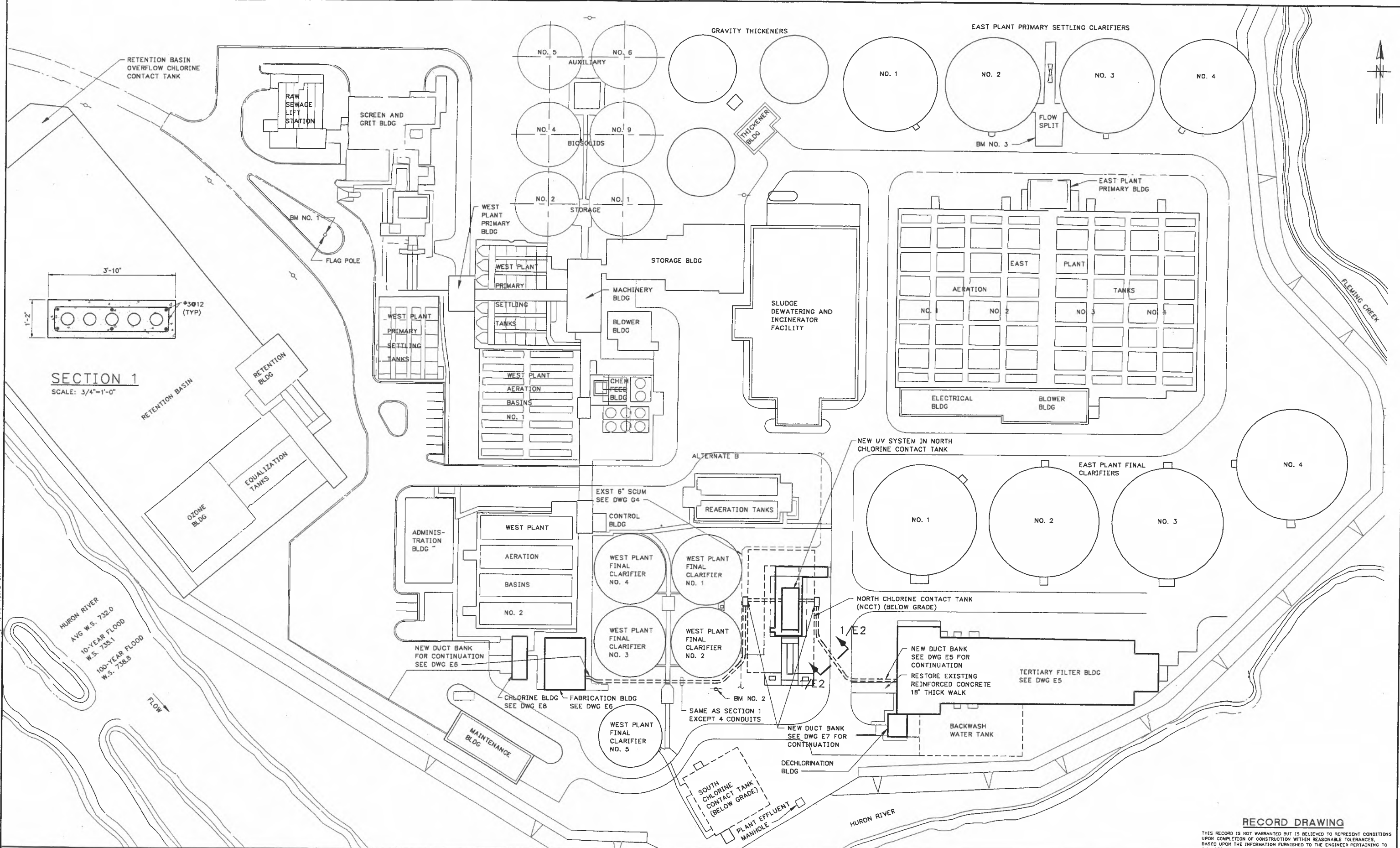
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| NO. | DATE | APPD | REVISION |
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SCALE
NOT TO SCALE

CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

INSTRUMENTATION
INSTRUMENTATION
AND CONTROL DIAGRAMS

| | |
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| PROJ | 02012 |
| DWG | I1 |
| SHEET | 20 OF 28 |
| DATE | OCTOBER 1999 |
| REV | 1 |

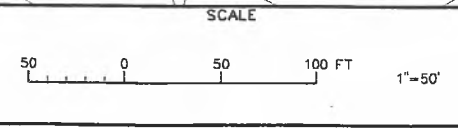


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 FILE: 201AEG02 1:1 10/28/99 15:03 GH-A

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 ENGINEERS
 211 WEST FORT STREET, SUITE 710
 DETROIT, MICHIGAN 48226-3202

DESIGNED SLL
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 CHECKED PJV

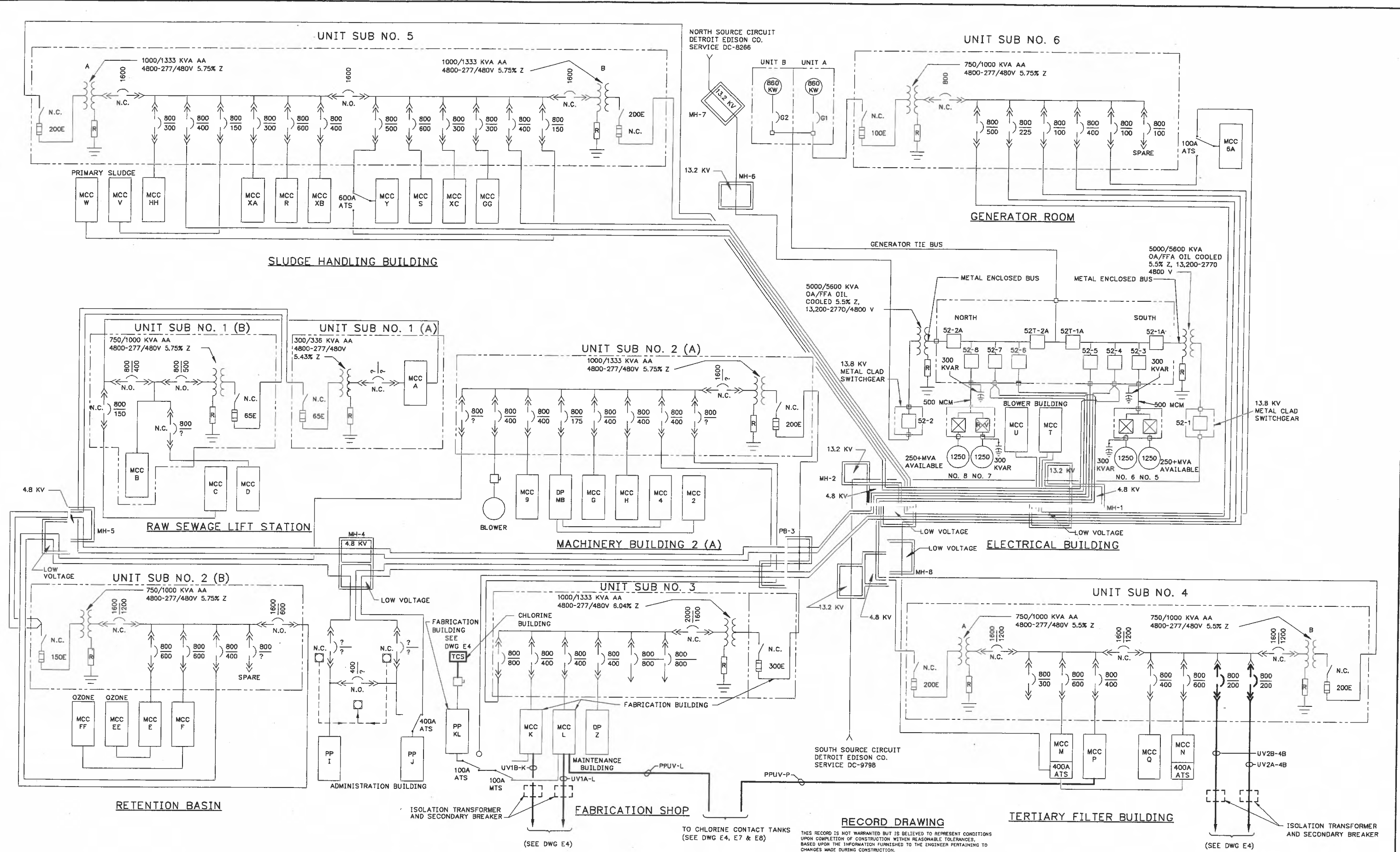
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| | 06/04/01 | PJV | RECORD DRAWING |



CITY OF ANN ARBOR, MICHIGAN
 WATER UTILITIES DEPARTMENT
 WASTEWATER TREATMENT PLANT
 DISINFECTION FACILITIES UPGRADE

ELECTRICAL
 SITE PLAN

RECORD DRAWING
THIS RECORD IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.
 PROJ 02012
 DWG **E2**
 SHEET 22 OF 28
 DATE OCTOBER 1999 REV 1



THIS RECORD IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES. BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN
ENGINEERS
211 WEST FORT STREET, SUITE 710
DETROIT, MICHIGAN 48226-3202

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CHECKED SHP

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| NO. | DATE | APPD | REVISION |
| | 06/04/01 | PJV | RECORD DRAWING |

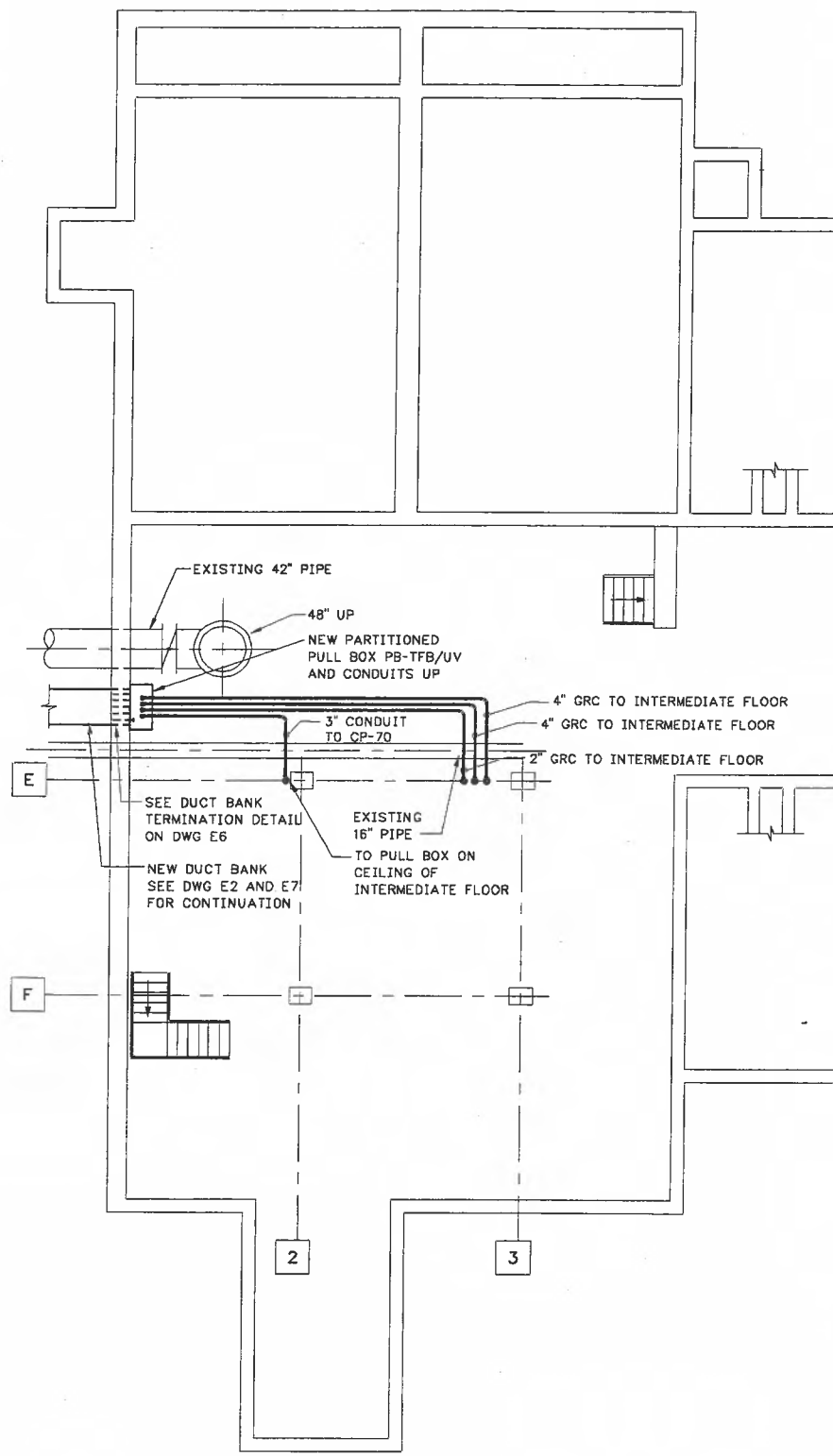
SCALE
NOT TO SCALE

CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

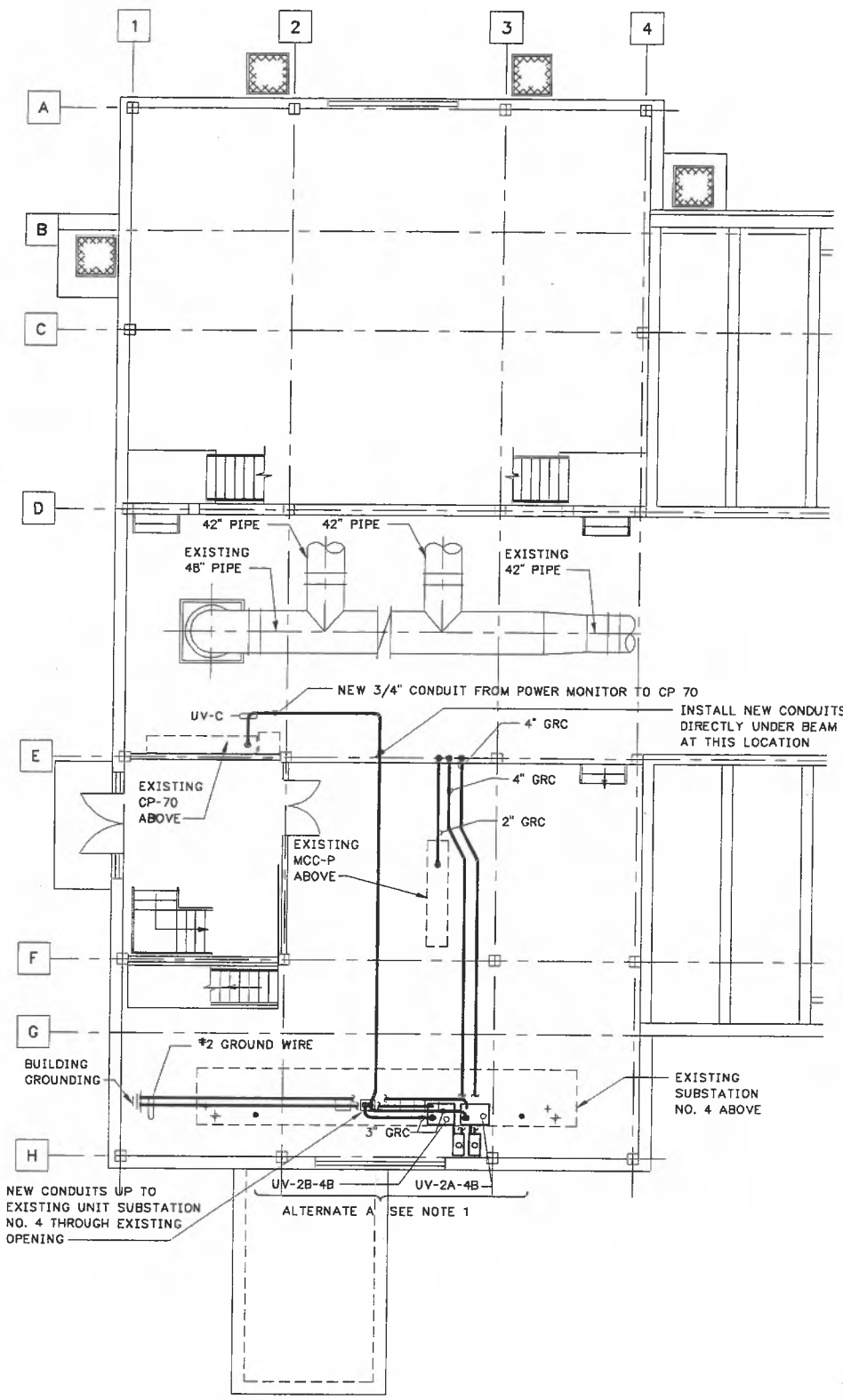
ELECTRICAL
ONE LINE DIAGRAM

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| PROJ | 02012 |
| DWG | E3 |
| SHEET | 23 OF 28 |
| DATE | OCTOBER 1999 |
| REV | 1 |

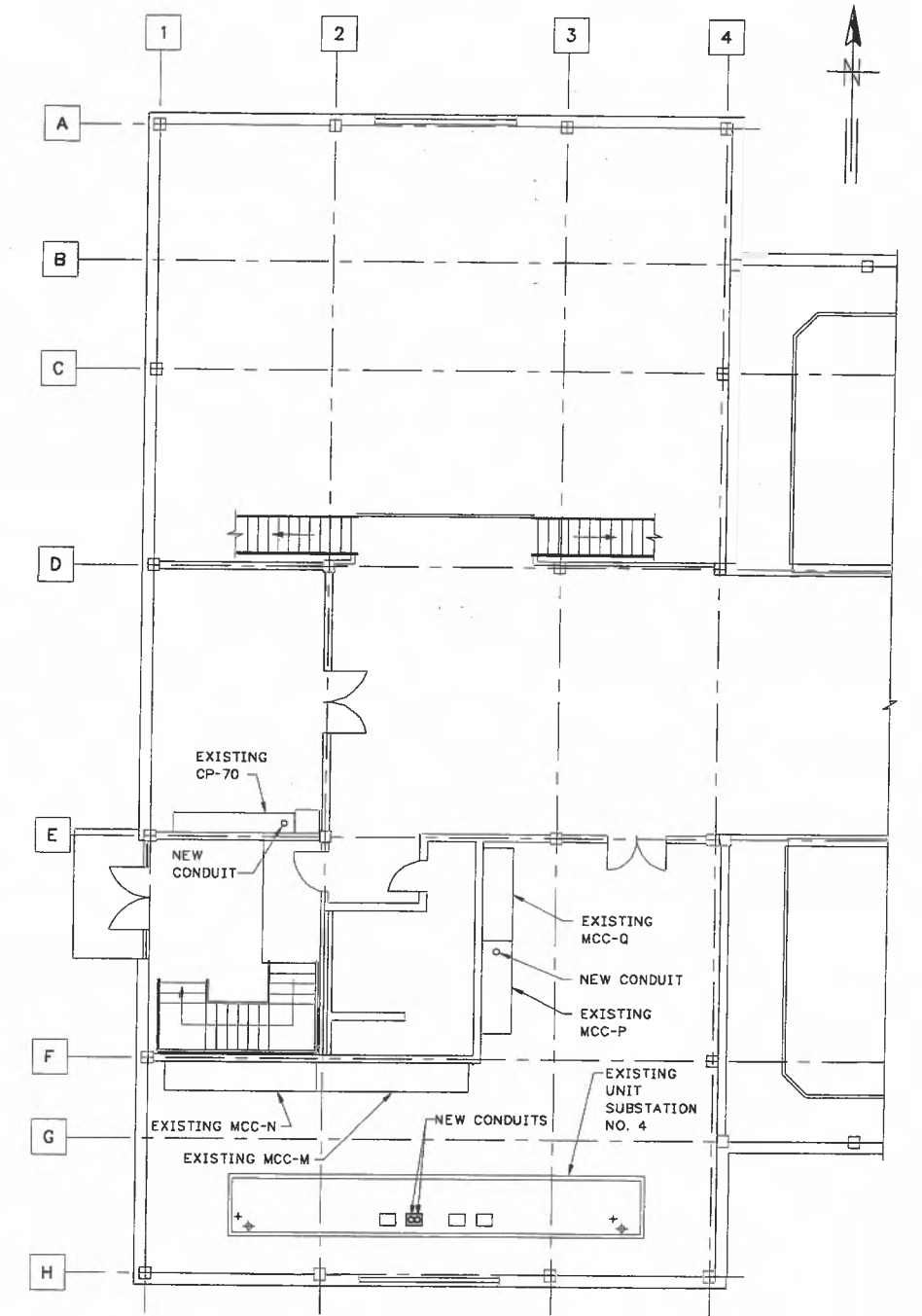
FILE: 201AE03 1:1 10/26/99 15:39 GH-A



BASEMENT FLOOR PLAN EL 727.00



INTERMEDIATE FLOOR PLAN EL 743.00



MAIN FLOOR PLAN EL 753.00

NOTE:
1. IF REQUIRED BY THE UV EQUIPMENT, PROVIDE A 480-VOLT DELTA 480/277 VOLT WYE ISOLATION TRANSFORMER WITH SECONDARY BREAKER FOR EACH UV UNIT POWER SUPPLY. TRANSFORMERS SHALL BE FLOOR MOUNTED, RATED A MINIMUM OF 125% OF MAXIMUM LOAD, AIR-COOLED WITH CLASS H COPPER WIRING. SECONDARY BREAKERS SHALL BE WALL MOUNTED, 600 VOLT, MOLDED CASE, WITH ELECTRONIC TRIP UNIT AND NEMA 12 ENCLOSURE WITH EXTERNAL OPERATING MECHANISM. PROVIDE ALL CONDUIT AND WIRING FOR UNITS AND GROUND THE SECONDARY WYE CONNECTION TO THE EXISTING BUILDING ELECTRICAL GROUND SYSTEM WITH NEC SIZED BARE COPPER GROUND CABLES.

RECORD DRAWING

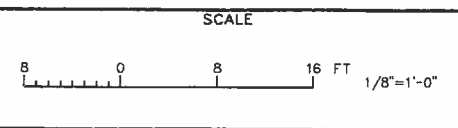
THIS RECORD IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES. BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

FILE: 201AED5 1:1 10/28/99 12:50 GH-A

GREELEY AND HANSEN
ENGINEERS
211 WEST FORT STREET, SUITE 710
DETROIT, MICHIGAN 48226-3202

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| 06/04/01 | PJV | | RECORD DRAWING |

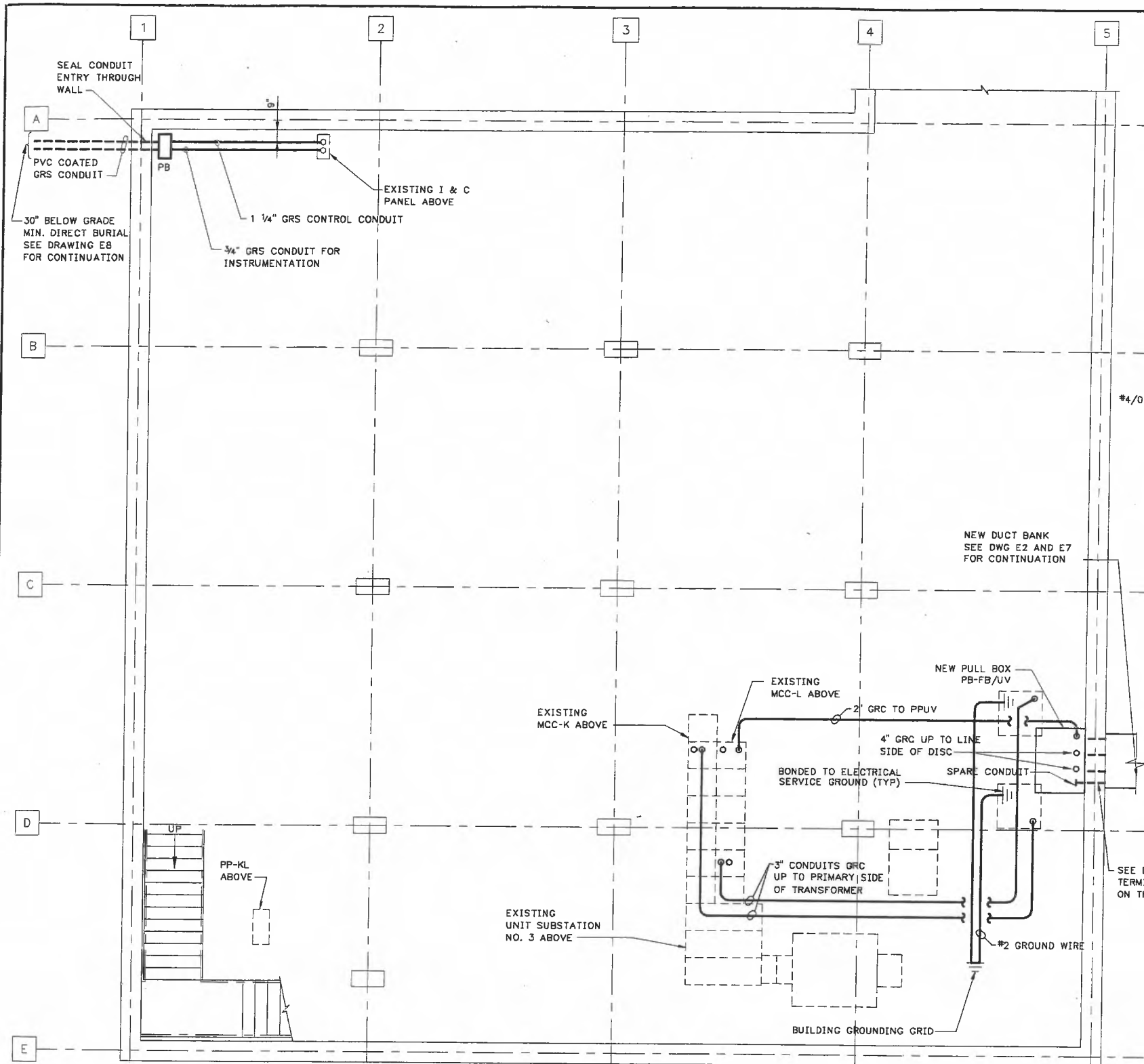


CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

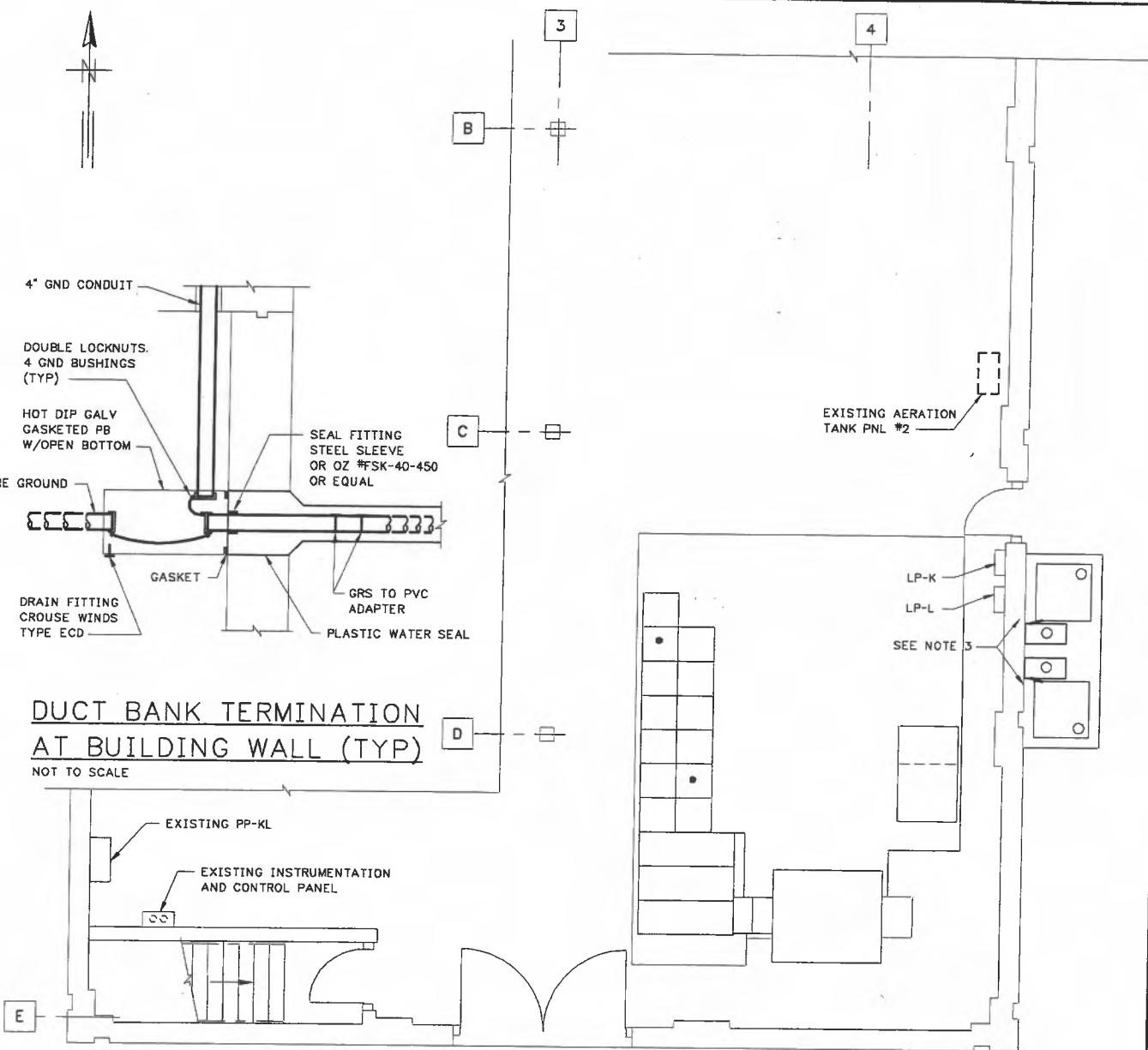
ELECTRICAL
TERTIARY FILTER BUILDING
PLANS

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| PROJ | 02012 |
| DWG | E5 |
| SHEET | 25 OF 28 |
| DATE | OCTOBER 1999 |
| REV | 1 |

FILE: 201A01 1:1 06/28/01 10:37 GH-A
 FILE: 201A01 1:1 10/08/99 15:31 GH-A
 FILE: 201A01 1:1 06/28/01 10:42 GH-A



BASEMENT PLAN



PARTIAL MAIN FLOOR PLAN

NOTES:

1. THERE ARE 4" CONDUITS FROM MCC-K AND MCC-L IN THE LOWER LEVEL OF THE FABRICATION BUILDING THAT FED BLOWERS NOS. 1 AND 2. CUT UN-NEEDED PORTIONS OF THESE CONDUITS, THREAD ENDS AND PROVIDE NEW RGS CONDUIT AS REQUIRED FOR FEEDERS TO UV-1A AND UV-1B. PROVIDE NEW CONDUIT FROM MCC-L AS REQUIRED FOR THE FEEDER TO PP-UV.
2. MODIFY MCC-K AND MCC-L AS SPECIFIED AND AS SHOWN ON DWG E4.
3. PROVIDE A 480-VOLT DELTA - 480/277 VOLT WYE ISOLATION TRANSFORMER WITH SECONDARY BREAKER FOR EACH UV UNIT POWER SUPPLY. TRANSFORMERS SHALL BE FLOOR MOUNTED, RATED A MINIMUM OF 125% OF MAXIMUM LOAD, AIR-COOLED WITH CLASS H COPPER WIRING. SECONDARY BREAKERS SHALL BE WALL MOUNTED, 600 VOLT, MOLDED CASE, WITH ELECTRONIC TRIP UNIT AND NEMA 12 ENCLOSURE WITH EXTERNAL OPERATING MECHANISM. PROVIDE ALL CONDUIT AND WIRING FOR UNITS AND GROUND THE SECONDARY WYE CONNECTION TO THE EXISTING BUILDING ELECTRICAL GROUND SYSTEM WITH NEC SIZED BARE COPPER GROUND CABLES.

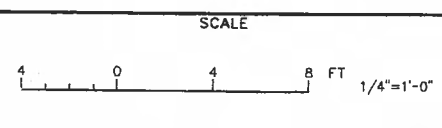
RECORD DRAWING

THIS RECORD IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

GREELEY AND HANSEN
 ENGINEERS
 211 WEST FORT STREET, SUITE 710
 DETROIT, MICHIGAN 48226-3202

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| 05/04/01 | PJV | RECORD DRAWING |
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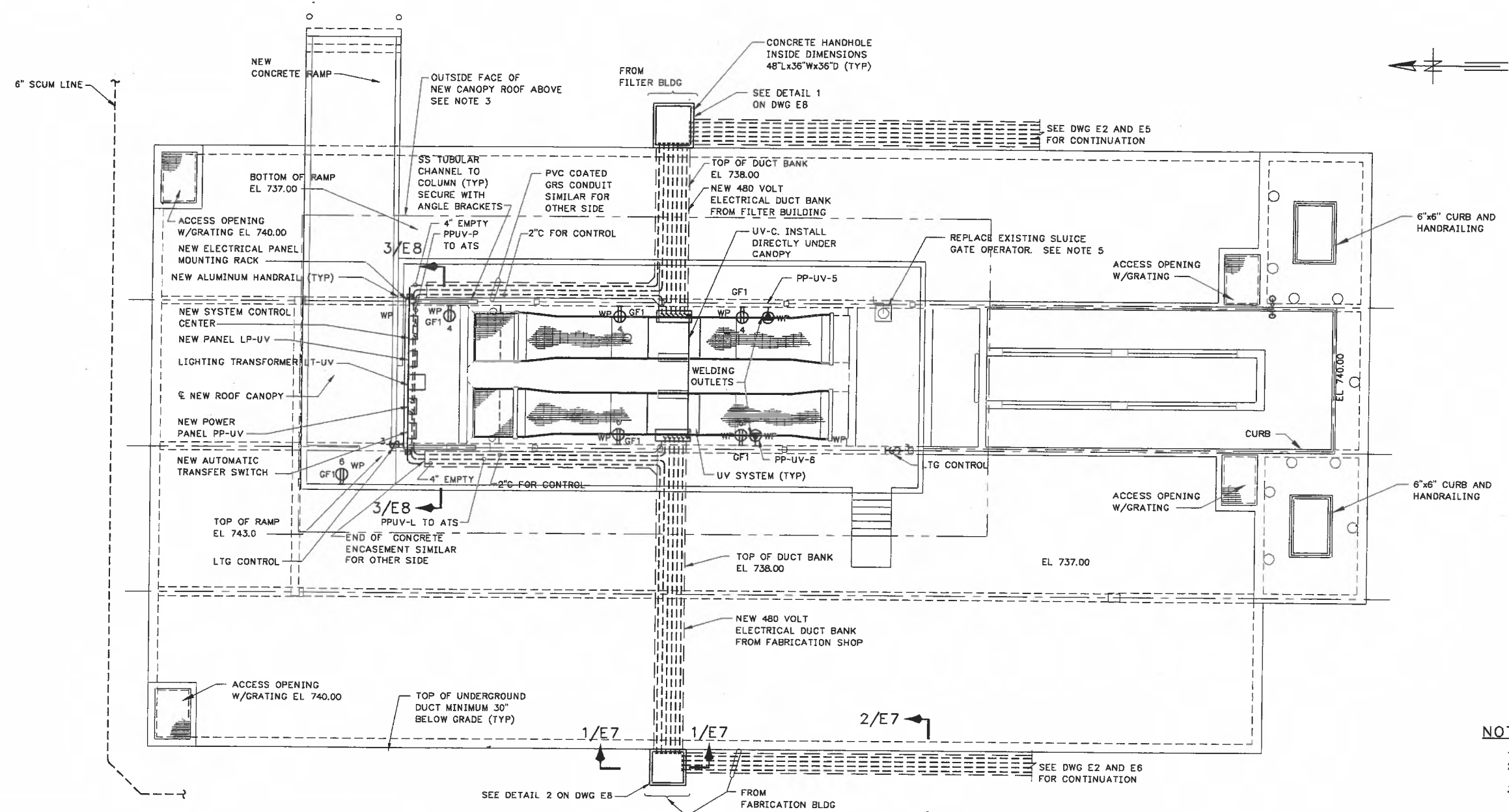


CITY OF ANN ARBOR, MICHIGAN
 WATER UTILITIES DEPARTMENT
 WASTEWATER TREATMENT PLANT
 DISINFECTION FACILITIES UPGRADE

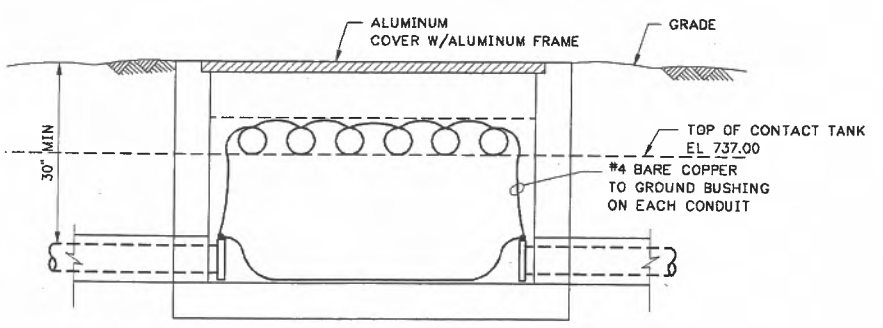
ELECTRICAL
 FABRICATION BUILDING
 PLANS

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| PROJ | 02012 |
| DWG | E6 |
| SHEET | 26 OF 28 |
| DATE | OCTOBER 1999 |
| REV | 1 |

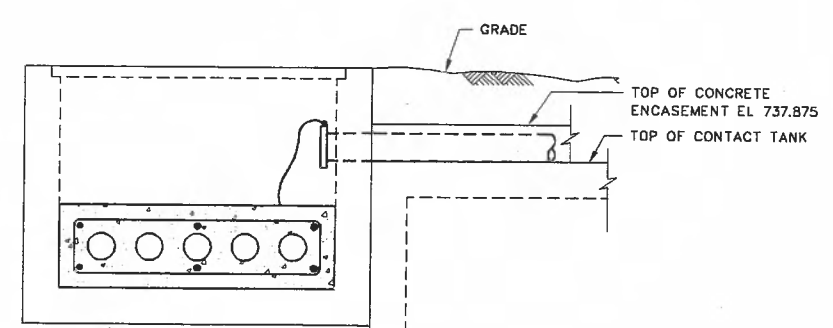
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 FILE: 201AXS01 1:1 11/17/99 14:02 GH-A
 FILE: 201AXS01 1:1 10/28/99 16:29 GH-A
 FILE: 201AE07 1:1 10/28/99 16:29 GH-A



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



SECTION 1
 NOT TO SCALE



SECTION 2
 NOT TO SCALE

- NOTES:**
- FOR DIMENSION SEE DWG M5.
 - REMOVED
 - UNDERNEATH NEW CANOPY OVER CONTACT TANK, INSTALL TWENTY SEVEN (27) NEW FLUORESCENT LIGHTING FIXTURES (TYPE A) AND TWO (2) NEW METAL HALIDE LIGHTING FIXTURES (TYPE B). INSTALL THREE ROWS OF NINE TYPE A FIXTURES ALONG THE LONG AXIS OF THE CANOPY. INSTALL THE TWO METAL HALIDE FIXTURES ABOVE AND IN FRONT OF EACH NEW UV SYSTEM. SEE PANEL LP-UV SCHEDULE ON DWG E8 FOR LIGHTING CIRCUITS. PROVIDE 3/4 INCH CONDUIT, 5#12, 1#12 GROUND FOR CIRCUITING. PROVIDE A PHOTOCELL ON NORTH EDGE OF CANOPY FACING NORTH FOR THE AUTOMATIC CONTROL OF THE METAL HALIDE FIXTURES. PROVIDE A SIX POLE CONTACTOR IN A NEMA 4X CONTROL CABINET FOR MANUAL CONTROL OF FLUORESCENT AND METAL HALIDE FIXTURES THROUGH TWO-THREE WAY SWITCHES.
 - REMOVED
 - DISCONNECT CONDUIT AND WIRE FROM EXISTING SLUICE GATE OPERATOR AND RECONNECT TO THE NEW SLUICE GATE OPERATOR IN THE SAME LOCATION. PROVIDE ANY NEW PVC COATED GRS CONDUIT, WIRING, ACCESSORIES AND DEVICES REQUIRED. RECONNECT CONTROL WIRING AS REQUIRED.

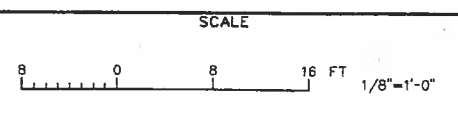
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GREELEY AND HANSEN
 ENGINEERS
 211 WEST FORT STREET, SUITE 710
 DETROIT, MICHIGAN 48226-3202

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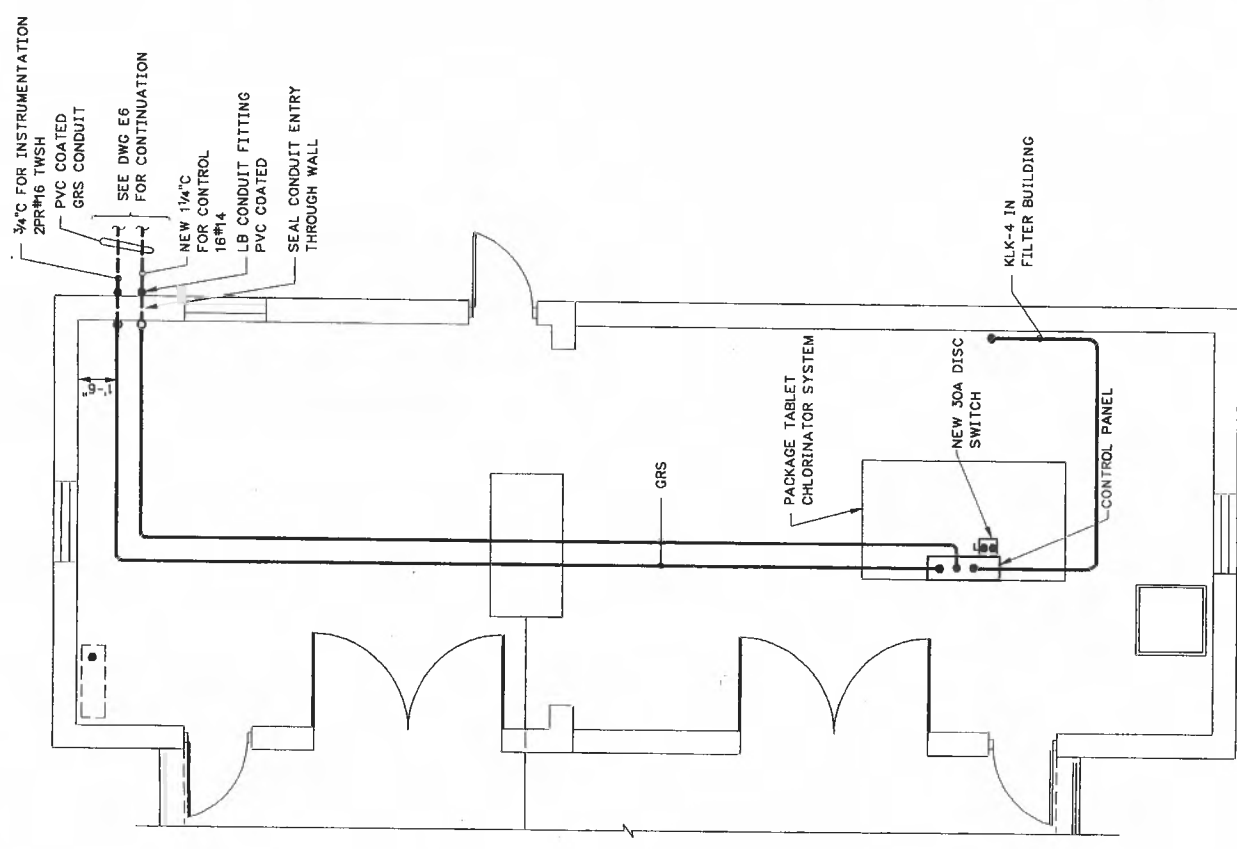
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| 06/04/01 | | PJV | RECORD DRAWING |



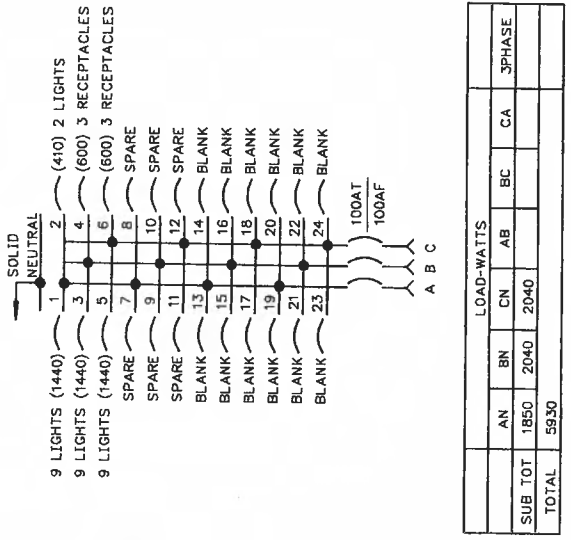
CITY OF ANN ARBOR, MICHIGAN
 WATER UTILITIES DEPARTMENT
 WASTEWATER TREATMENT PLANT
 DISINFECTION FACILITIES UPGRADE

ELECTRICAL
 CHLORINE CONTACT TANK
 PLANS AND SECTIONS

| | |
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| PROJ | 02012 |
| DWG | E7 |
| SHEET | 27 OF 28 |
| DATE | OCTOBER 1999 |
| REV | 1 |

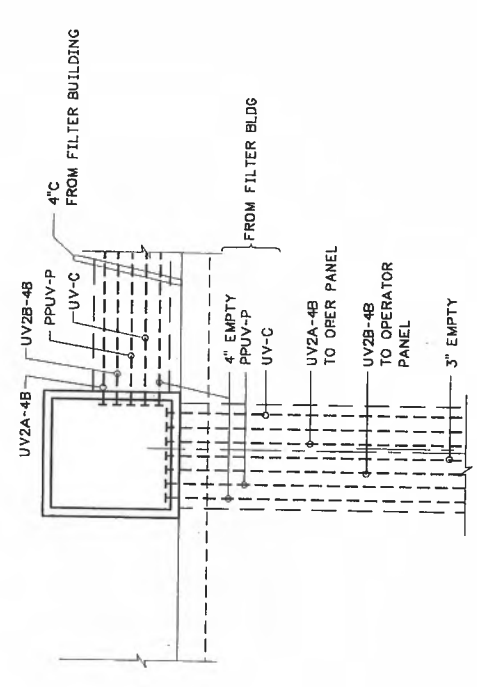


PLAN FL EL 742.00
SCALE: 1/4"=1'-0"

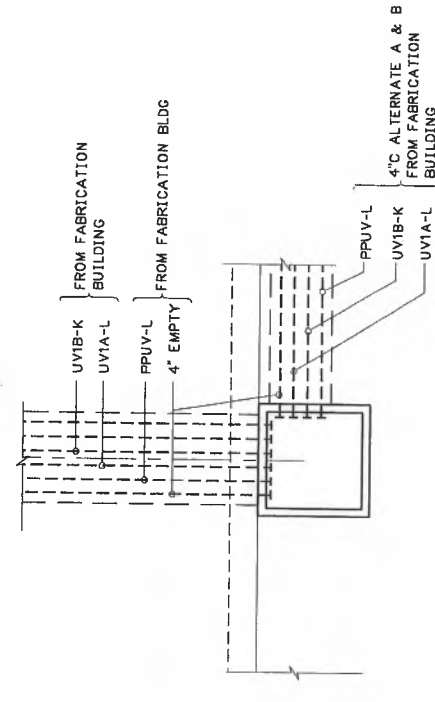


PANEL LP-UV
(208Y/120V, 3Ø, 4W, 225A BUS)
100A GND BUS

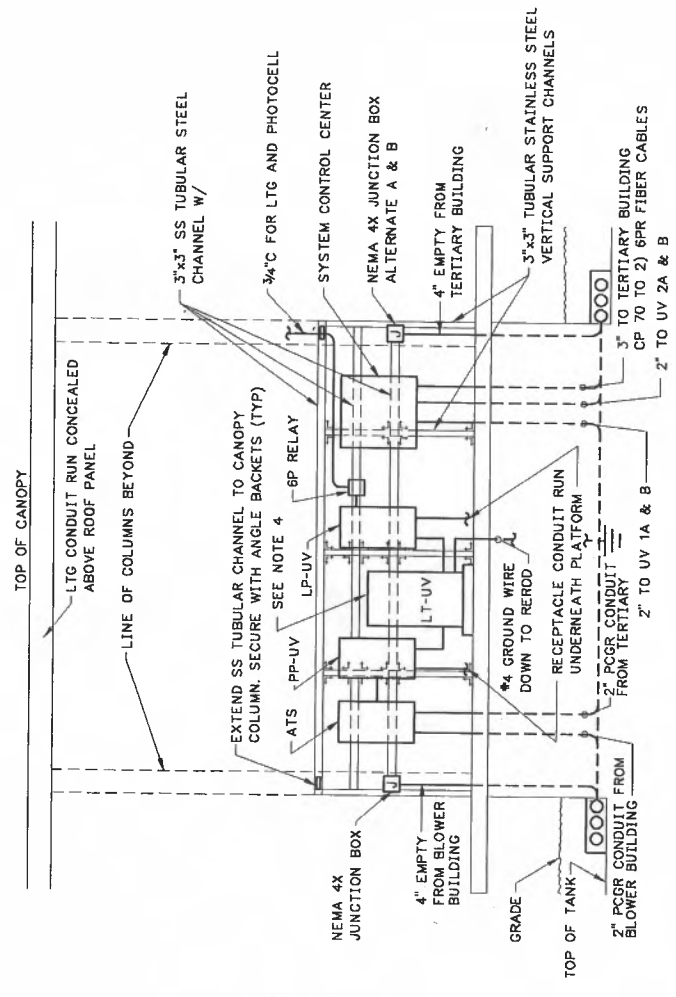
ALTERNATE-B
NOT USED



DETAIL 1
NOT TO SCALE



DETAIL 2
NOT TO SCALE



SECTION 3/E7
SCALE: 1/4"=1'-0"
SEE NOTE 5

NOTES:

1. PROVIDE GROUND BUSHINGS AND LUGS ON ALL CONDUITS TERMINATING IN HANDHOLES. LOOP 1-1/4" Ø GROUND CONDUCTOR TO EACH CONDUIT GROUND LUG.
2. PROVIDE CAST IRON FRAME AND LID FOR HANDHOLES.
3. SS SUPPORT CHANNELS SHALL BE SECURED TO CONCRETE WITH ANGLE BRACKETS AND EMBEDDED ANCHORS. SUBMIT DETAILED DESIGN SHOP DRAWING.
4. TRANSFORMER SHALL BE OUTDOOR WEATHERPROOF EPOXY ENCAPSULATED TYPE WITH ENCLOSURE PAINTED WITH CORROSION RESISTANT FINISH COORDINATE WITH STRUCTURAL AND ARCHITECTURAL FOR PAINT FINISH TYPE.
5. ALL ELECTRICAL ENCLOSURES SHALL BE NEMA 4X. ALL METAL SUPPORT CHANNELS, ANGLES BRACKETS, NUTS, BOLTS, WASHERS AND ACCESSORIES SHALL BE STAINLESS STEEL.

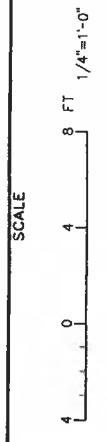
RECORD DRAWING

THIS RECORD IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES. ANY CHANGES MADE DURING CONSTRUCTION SHALL BE INDICATED BY CHANGES MADE DURING CONSTRUCTION.

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| PROJ | 02012 |
| DWG | E8 |
| SHEET | 28 OF 28 |
| DATE | OCTOBER 1999 |
| REV | 1 |

**ELECTRICAL BUILDING
CHLORINE BUILDING
PLAN, DETAILS AND SCHEDULE**

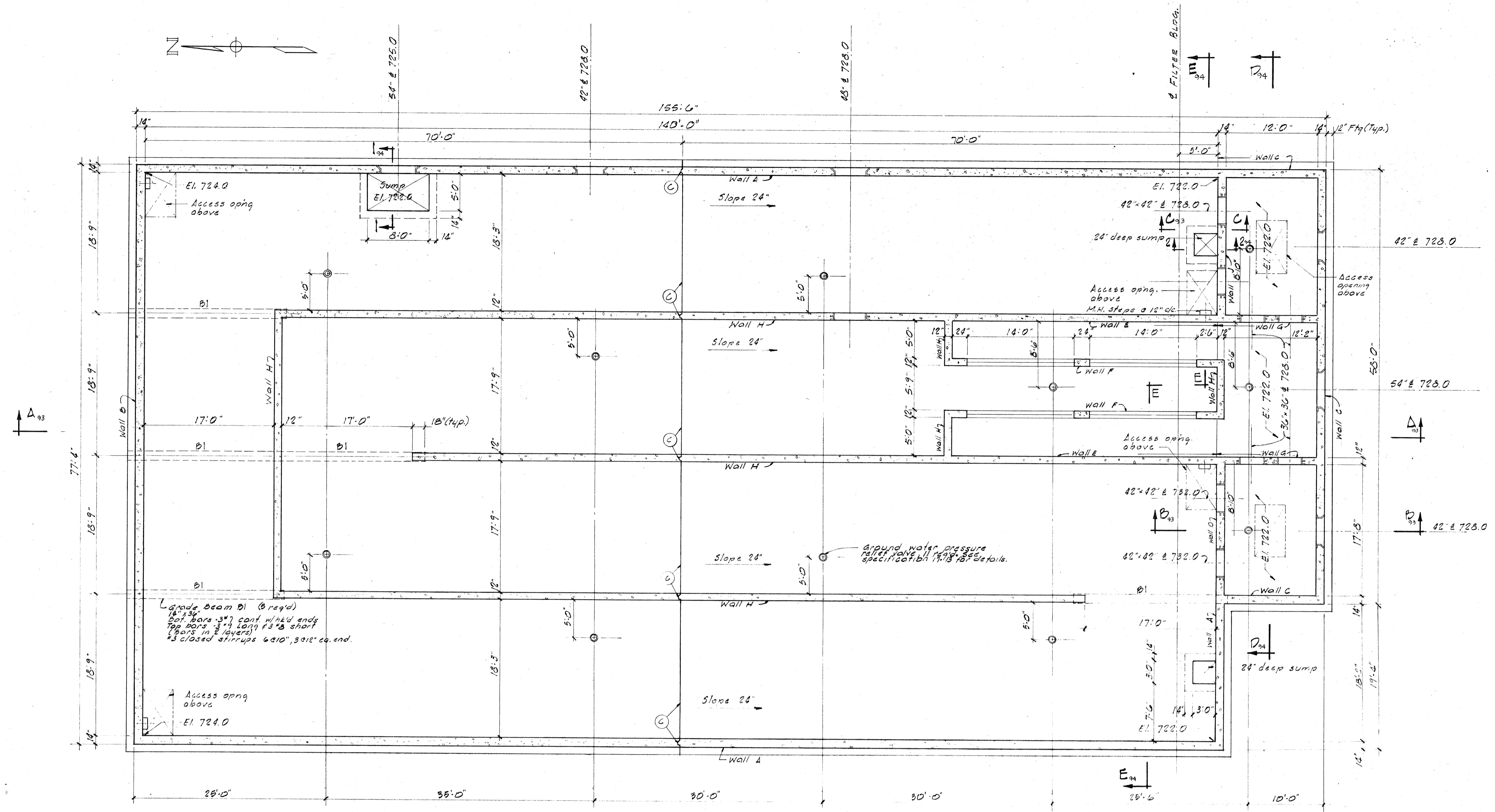
**CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE**



| NO. | DATE | APPD | REVISION |
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**GREELEY AND HANSEN
ENGINEERS**
211 WEST FORT STREET, SUITE 710
DETROIT, MICHIGAN 48226-3202



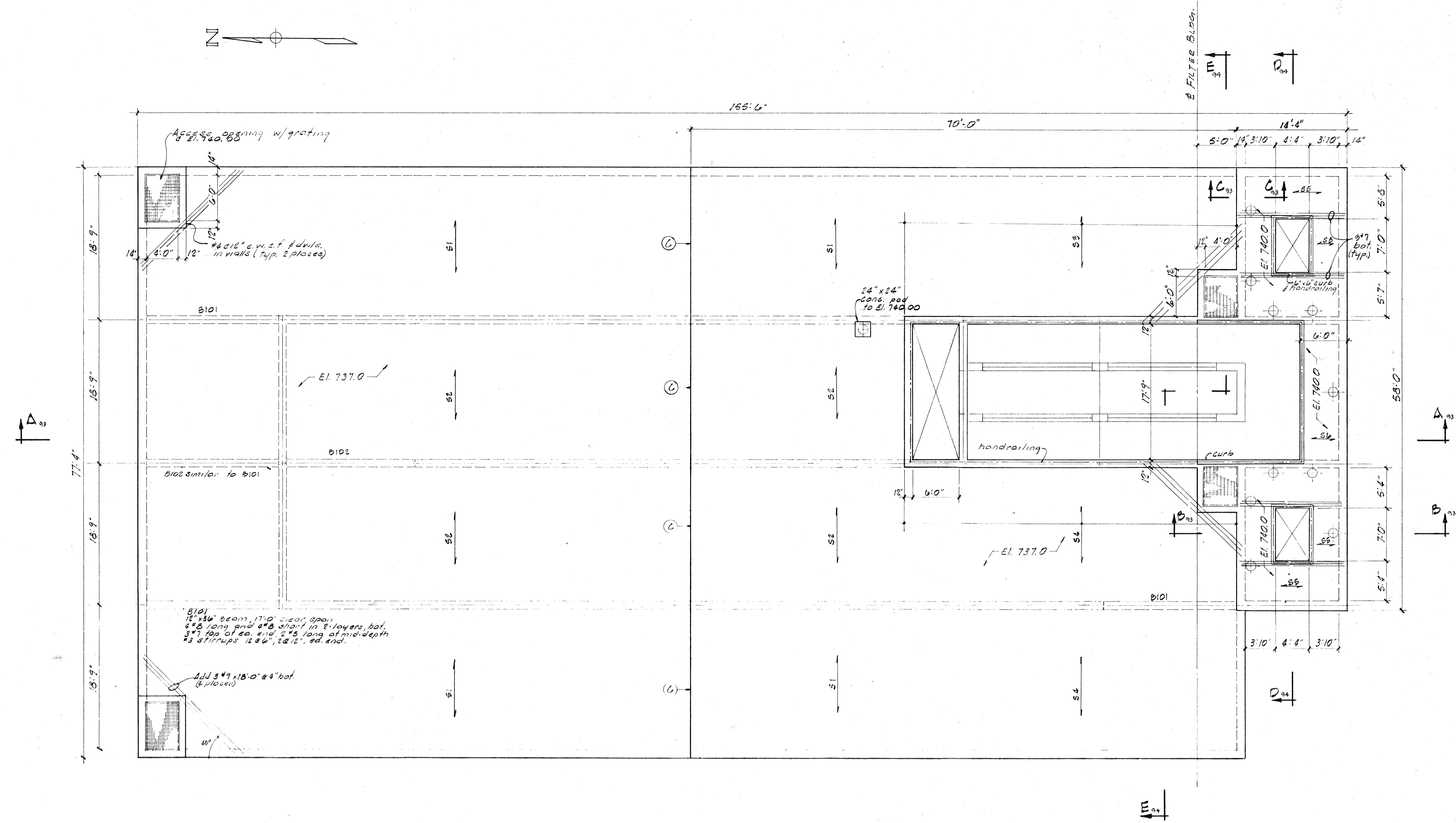
SECTIONAL PLAN

Grade beam B1 (Grey)
 18" x 36"
 Top bars 5#7 cont. w/ 24" ends
 Top bars 3#4 cont. 12" x 3" start
 ("bars in 2 layers")
 3 closed stirrups 6#10, 3@12' ca. end.

around water pressure
 relief valve. See
 specification B1 17.18.18.2 details.

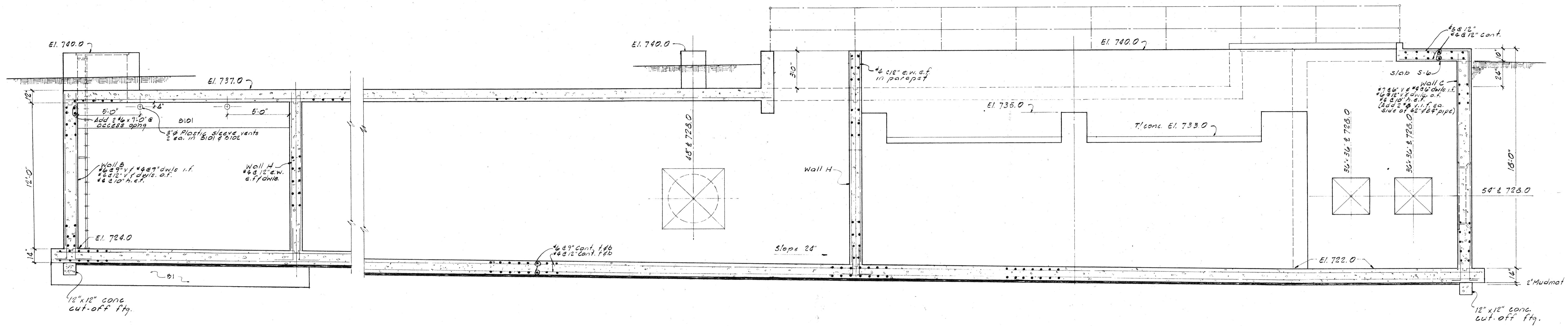
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| McNAMEE, PORTER AND SEELEY CONSULTING ENGINEERS ANN ARBOR, MICHIGAN | | WASHTENAW COUNTY DEPARTMENT OF PUBLIC WORKS CITY OF ANN ARBOR, MICHIGAN WASTEWATER TREATMENT PLANT IMPROVEMENTS | |
| SCALE | 1/8" = 1'-0" | ISSUED | JULY 1977 |
| DRAWN | HL | TRACED | KMU |
| ISSUE | | CHECKED | DHN |
| | | DATE | |
| CONTRACT 77-5-7 | | CONTRACT C26 2539 05 | |
| SHEET 91 | | OF 103 | |

| SLAB REINFORCEMENT SCHEDULE | | | | | |
|-----------------------------|--|-----------------------|----------------|-------------------|-----------------------|
| MARK | BOTTOM BARS | | TOP BARS | | |
| | MAIN REINF. (LONG & SHORT ALTERNATING) | TIE BARS (CONTINUOUS) | CONTINUOUS END | DISCONTINUOUS END | TIE BARS (CONTINUOUS) |
| S1 | #6 @ 8" | #5 @ 12" | #6 @ 8" | #5 @ 7" | #4 @ 12" |
| S2 | #6 @ 9" | #5 @ 12" | #6 @ 8" | - | #4 @ 12" |
| S3 | #7 @ 8" | #5 @ 12" | - | #5 @ 12" | #4 @ 12" |
| S4 | #6 @ 8" | #5 @ 12" | #6 @ 8" | #5 @ 7" | #4 @ 12" |
| S5 | #5 @ 12" | #5 @ 12" | - | - | - |
| S6 | See | Section A-A | - | - | - |

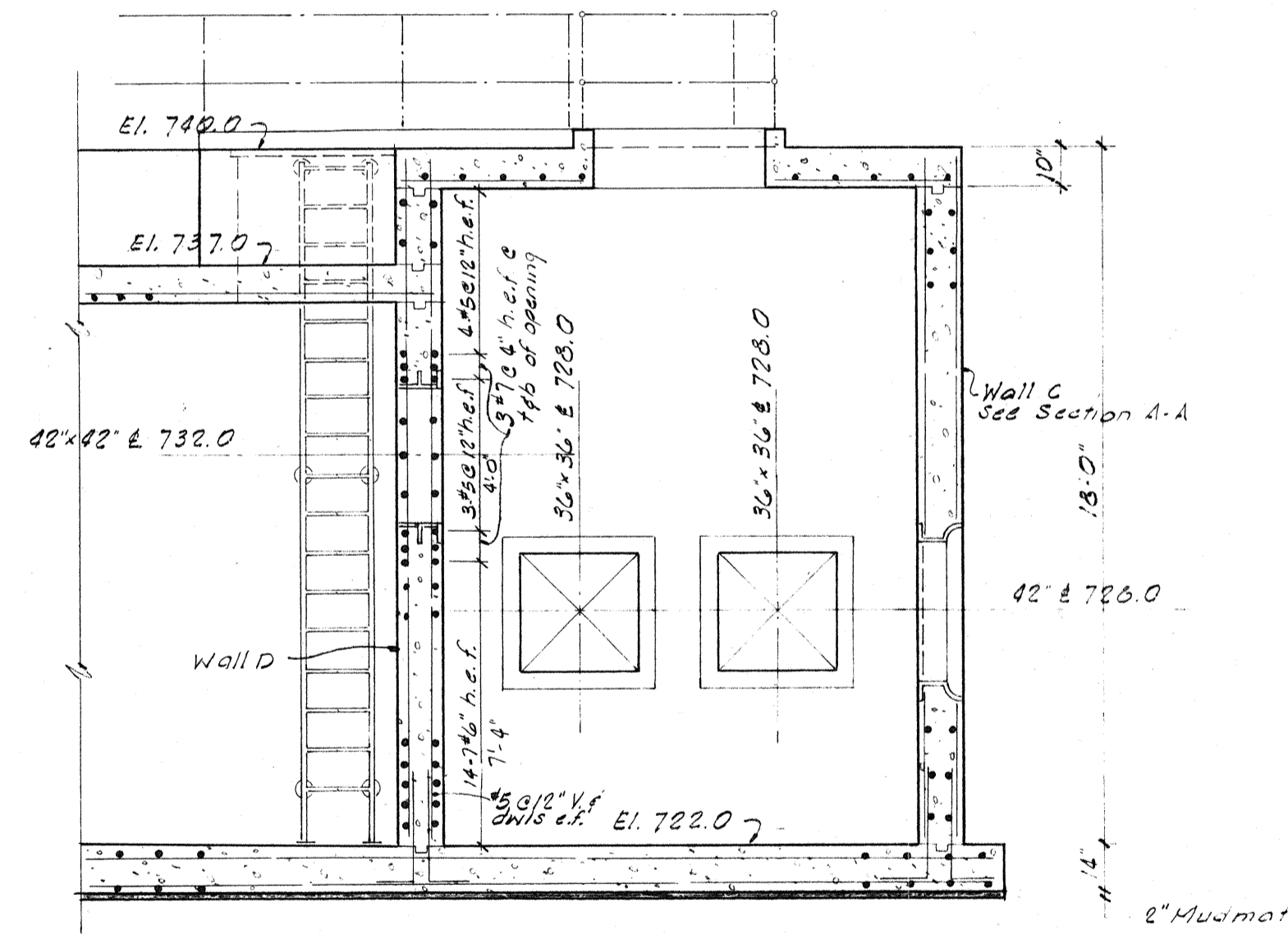


PLAN

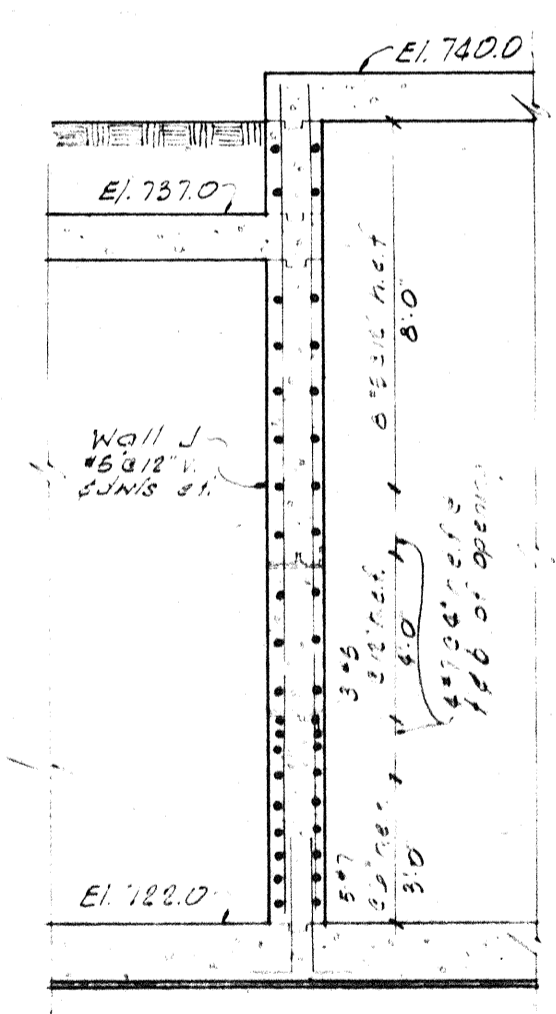
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| McNAMEE, PORTER AND SEELEY CONSULTING ENGINEERS ANN ARBOR, MICHIGAN | | | WASHTENAW COUNTY DEPARTMENT OF PUBLIC WORKS CITY OF ANN ARBOR, MICHIGAN WASTEWATER TREATMENT PLANT IMPROVEMENTS STRUCTURAL CHLORINE CONTACT TANK TOP PLAN | | |
| SCALE | 1/8" = 1'-0" | ISSUED | JULY 1977 | | |
| DRAWN | HL | TRACED | KMU | CHECKED | DHN |
| ISSUE | NATURE OF REVISION | | DATE | | |
| CONTRACT | 77-S-7 | C26 2539 05 | SHEET | | 92 |
| | | | | | OF 105 |



SECTION A-A 01,92

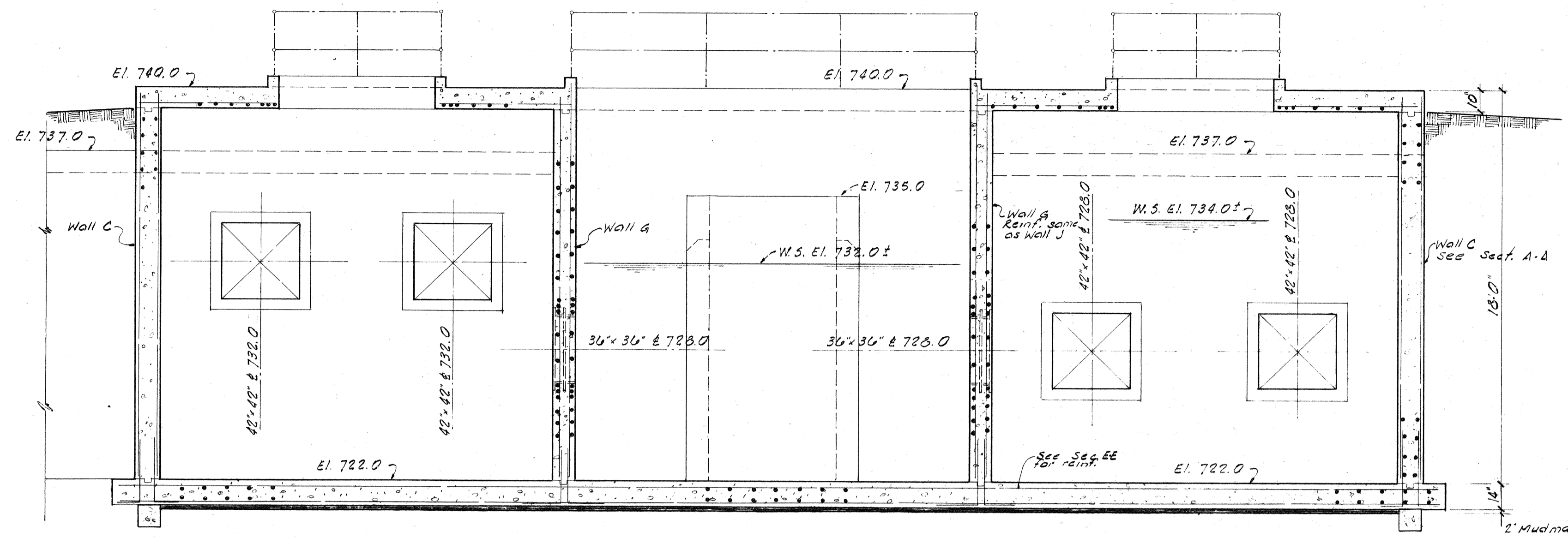


SECTION B-B 01,92

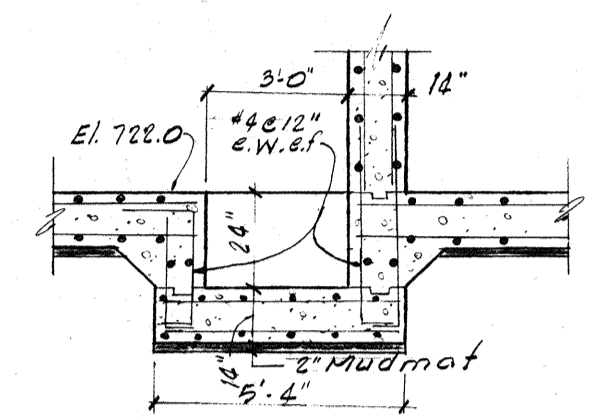


SECTION C-C 01,92

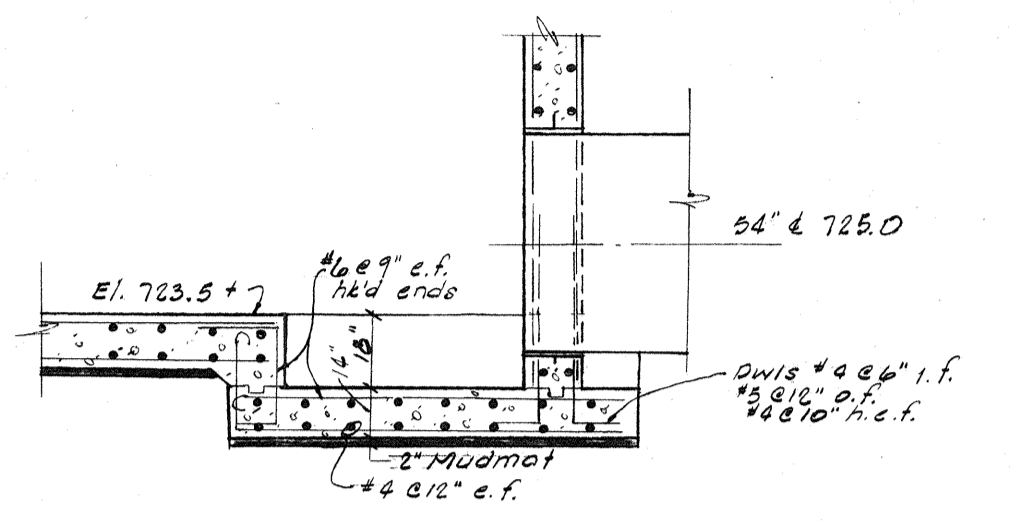
| | | | | |
|---|--------------------|---|-----------------|-------------|
| MCNAMEE, PORTER AND SEELEY CONSULTING ENGINEERS ANN ARBOR, MICHIGAN | | WASHTENAW COUNTY DEPARTMENT OF PUBLIC WORKS CITY OF ANN ARBOR, MICHIGAN WASTEWATER TREATMENT PLANT IMPROVEMENTS | | |
| SCALE 1/4" = 1'-0" | ISSUED JULY 1977 | STRUCTURAL CHLORINE CONTACT TANK SECTIONS | | |
| DRAWN HL | TRACED KMU | | | CHECKED DAN |
| ISSUE | NATURE OF REVISION | | | DATE |
| CONTRACT 77-S-7 | | C26 2539 05 | SHEET 93 OF 102 | |



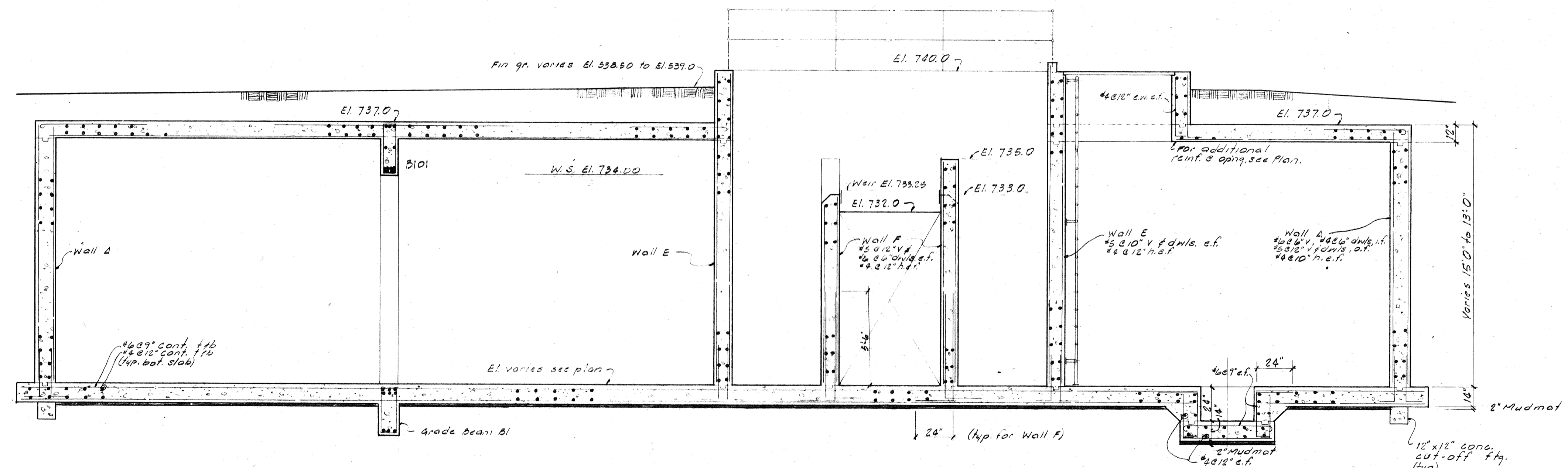
SECTION D-D_{91, 92}



SECTION 2-2₉₁



SECTION 1-1₉₁



SECTION E-E_{91, 92}

| | | | | | |
|---|--------------------|-------------|---|--|--|
| MCMAMEE, PORTER AND SEELEY CONSULTING ENGINEERS ANN ARBOR, MICHIGAN | | | WASHTENAW COUNTY DEPARTMENT OF PUBLIC WORKS CITY OF ANN ARBOR, MICHIGAN WASTEWATER TREATMENT PLANT IMPROVEMENTS | | |
| SCALE 1/4"=1'-0" | ISSUED JULY 1977 | | STRUCTURAL | | |
| DRAWN HL | TRACED KML | CHECKED DWH | CHLORINE CONTACT TANK | | |
| ISSUE | NATURE OF REVISION | DATE | SECTIONS | | |
| CONTRACT 77-S-7 | | C26 2539 05 | SHEET 94 | | |
| | | | OF 105 | | |

CITY OF ANN ARBOR, MICHIGAN
 Water Utilities Department
 Wastewater Treatment Plant

Disinfection Facilities Upgrade

RECEIVED MAY 1 2000

CONTRACTOR'S SUBMITTAL TRANSMITTAL FORM

TO: **Greeley & Hansen**
 211 West Fort Street Suite 710
 Detroit, MI 48226
 ATTN: **Nicole Jannis**

DATE: **Thursday, April 27, 2000**
 SUBMITTAL NO.: **4B**
 PREVIOUS SUBMITTAL NO. & DATE:
No. 4 (2/23/2000), No. 5 (2/21/2000), No. 6 (2/23/2000)
 SPEC. PARA. REF. NO.: **11285**
 PLAN REF. NO.:
 SUPPLIER/MANUFACTURER:
WATERMAN INDUSTRIES

FROM: **3-S Construction**
 3200 James Savage Rd. Suite 1
 Midland, MI 48642

1. The following submittals are forwarded for your review:

| Item | Drawing No. | Copies Submitted | Description | Deviation (Yes/No) |
|------|-------------|------------------|-------------------------------|--------------------|
| 1 | | 11 10 | 48" X 48" GATE | NO |
| 2 | | 11 10 | 12" X 12" GATE | NO |
| 3 | | 11 10 | 72" X 72" GATE | NO |
| 4 | | 11 10 | EM-25 TRIPOD MOUNTED OPERATOR | NO |
| 5 | | 11 10 | IDENTIFICATION TAG | NO |
| 6 | | 11 1 | TNEMEC COLOR BOOK | NO |

2. Will item submitted for review fit in space provided in the Contract Documents? Yes
3. Has work indicated in this submittal been coordinated with all trades? Yes
4. Is work by all trades being provided as necessary to accommodate this submittal? Yes
5. Contractor has approved submittal and has affixed his certification stamp? Yes
6. Contractor's description and justification for deviations from Contract Documents. (Use additional sheet, if necessary)

7. Remarks: _____

Signature: *Vince Duumright*

JOHN DARR MECHANICAL

CITY OF ANN ARBOR, MICHIGAN
 WATER UTILITIES DEPARTMENT
 WASTEWATER TREATMENT PLANT
 DISINFECTION FACILITIES UPGRADE
 3-S CONSTRUCTION, INC.

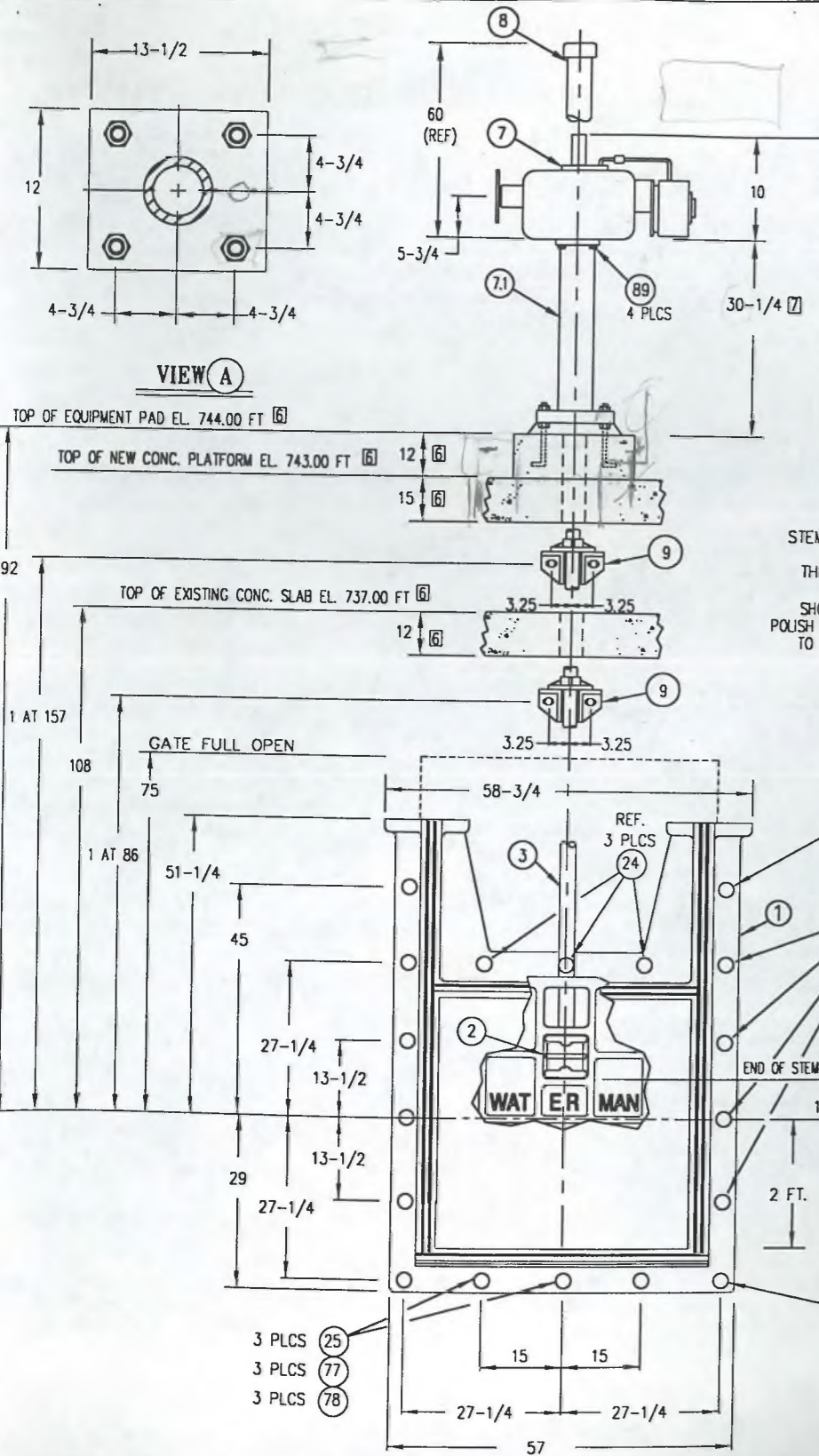
- APPROVED NOT APPROVED
- APPROVED AS NOTED
- REVISE & RESUBMIT
- CHECKED FOR GENERAL ARRANGEMENT

THESE SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED FOR AND ARE FOUND TO BE IN COMPLIANCE WITH THE CONTRACT REQUIREMENTS.
 SPEC SECTION: 11285
 DATE: 4/24/00

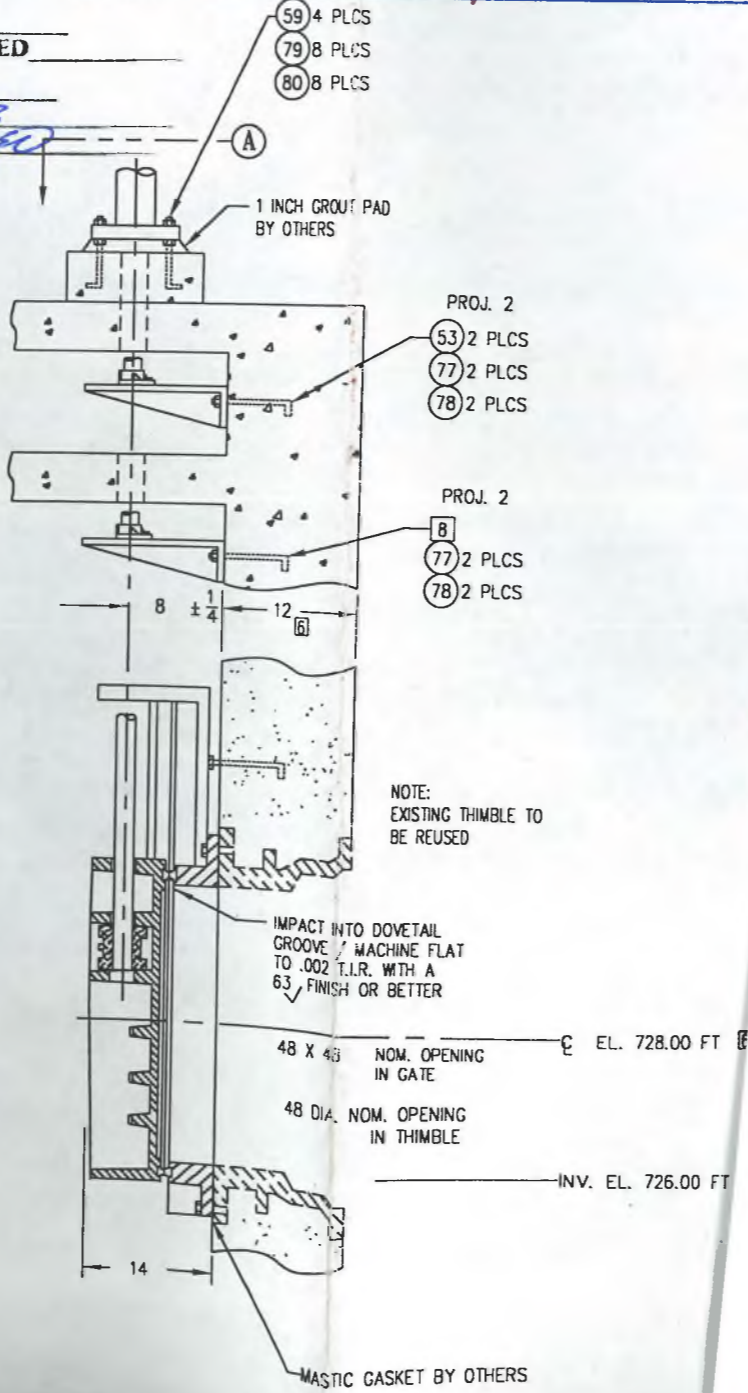
APPROVED
 APPROVED AS NOTED
 DATE 4-27
 SUBMITTAL # 4B
 APPROVED BY [Signature]

| MATERIAL KEY | | FINISH KEY | | | |
|---|--|-------------------------|----|--|--|
| 1. CAST IRON: ASTM A-126 CL. B | | 1. AS CAST | 6E | | |
| 4. MANG. BRZ.: ASTM B-584 AL. C86500 | | 2. MILL | | | |
| 5. NAVAL BRZ.: ASTM B-21 AL. C48200 | | 3. MACHINED | | | |
| 6. STRUCTURAL STEEL: ASTM A-36 | | 4. GALVANIZE-ASTM A-123 | | | |
| 9A. STN. STEEL: ASTM A-276 TY. 304 | | 6. SEE PAINT KEY | | | |
| 11. STL. PIPE: ASTM A-53 TY. E GR. A | | 7. ZINC PLATED | | | |
| 12. COMMERCIAL BRONZE | | | | | |
| 14. CLEAR PLASTIC BUTYRATE PIPE | | | | | |
| 15A. STN. STL. HDW.: ASTM F-593 & 594 TYPE 304 (GRADE 8 & 88) | | | | | |
| 26. PHOSPHOR BRZ.: ASTM B-139 AL. 510 | | | | | |
| 37. M.S. STEEL HDW.: ASTM A-449 | | | | | |

| ITEM DESCRIPTION | MATERIAL KEY | FIN KEY | PART NO. OR SIZE (FOR WATERMAN USE ONLY) | QTY/GATE | TOTAL QTY |
|-------------------------------|--------------|---------|--|----------|-----------|
| 1. SLUICE GATE ASSEMBLY | | | 48 X 48 S-5000-F | 1 | 1 |
| a) FRAME | 1 | 6E | W-5532 | 1 | 1 |
| b) COVER | 1 | 6E | W-5057 | 1 | 1 |
| c) SEAT | 5 | 3 | | | |
| d) GUIDE RAIL | 1 | 6E | | | |
| e) SIDE WEDGE ASSEMBLY | | | CAST INTEGRAL WITH FRAME SYSTEM B1 | 4eo | |
| WEDGES | 1,4,5 | 1,3 | W-5511 L&R & W-5139 L&R | | |
| ASSEMBLY / ADJUSTING HARDWARE | 15A | 2 | | | |
| f) TOP WEDGE ASSEMBLY | | | | | |
| WEDGES & BRACKETS | 4 | 1,3 | W-5006 & W-5007 | 2 | |
| ASSEMBLY / ADJUSTING HARDWARE | 15A | 2 | | | |
| g) BOTTOM WEDGE ASSEMBLY | | | | | |
| WEDGES & BRACKETS | 4 | 1,3 | W-5006 & W-5008 | 2 | |
| ASSEMBLY / ADJUSTING HARDWARE | 15A | 2 | | | |
| 2. THRUST NUT | 4 | 1,3 | W-5014 MB (2 DIA., 4TPI, LH) | 1 | 1 |
| 3. STEM | 9A | 2,3 | 2 DIA., 5TPI, LH | 1 | 1 |
| | | 6T | EIM-MODEL 2FRG-3 | 1 | 1 |



STEM LENGTH 221
 THREADED 60
 SHOP NOTE: POLISH STEM THREADS TO 63 FINISH



APPROVED AS NOTED
 ONLY AS TO GENERAL DESIGN AND ARRANGEMENT WITH THE UNDERSTANDING THAT IT IS THE CONTRACTOR'S SUBMISSION FOR WORK CALLED FOR UNDER THE CONTRACT, AND DOES NOT INVOLVE OR AUTHORIZE ANY EXTRA WORK IN EXCESS OF THE CONTRACT PRICE. THE CONTRACTOR IS NOT RELIEVED THEREBY OF RESPONSIBILITY FOR CORRECT DETAIL, CONFORMITY TO SPECIFICATIONS AND FIT OF PARTS WHEN ASSEMBLED.
 GREELEY and HANSEN, Engineers
 DATE 05/03/2000 BY [Signature]

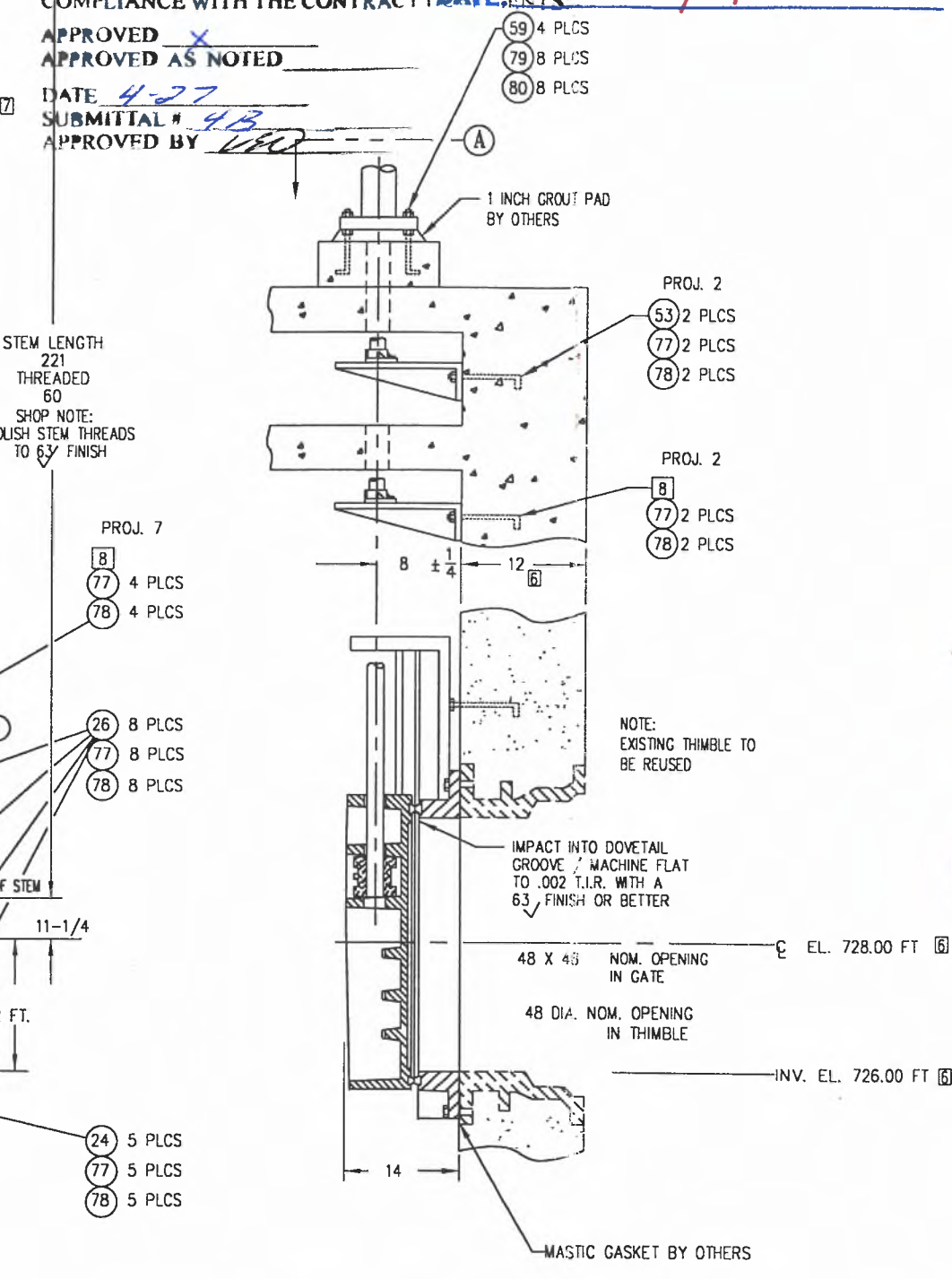
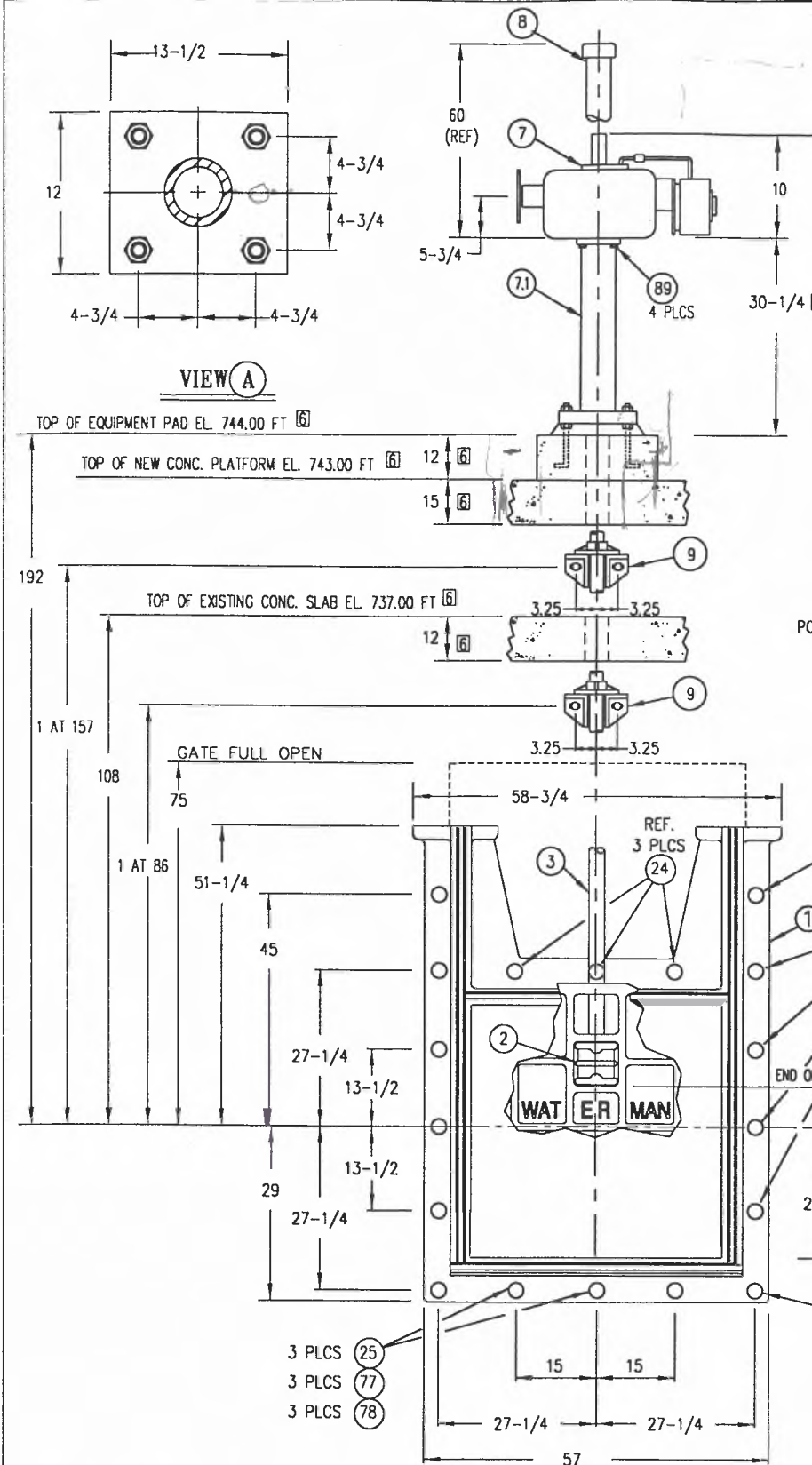
JOHN DARR MECHANICAL

CITY OF ANN ARBOR, MICHIGAN
 WATER UTILITIES DEPARTMENT
 WASTEWATER TREATMENT PLANT
 DISINFECTION FACILITIES UPGRADE
 3-S CONSTRUCTION, INC.

- APPROVED NOT APPROVED
- APPROVED AS NOTED
- REVISE & RESUBMIT
- CHECKED FOR GENERAL ARRANGEMENT

THESE SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED FOR AND ARE FOUND TO BE IN COMPLIANCE WITH THE CONTRACT SPECIFICATIONS.
 DATE: 4/27/00

APPROVED AS NOTED
 DATE 4-27
 SUBMITTAL # 4B
 APPROVED BY [Signature]



| MATERIAL KEY | | FINISH KEY | |
|---|-------------------------|------------|---------------------|
| 1. CAST IRON: ASTM A-126 CL. B | 1. AS CAST | 6E | |
| 4. MANG. BRZ.: ASTM B-584 AL. C86500 | 2. MILL | | F |
| 5. NAVAL BRZ.: ASTM B-21 AL. C48200 | 3. MACHINED | | |
| 6. STRUCTURAL STEEL: ASTM A-36 | 4. GALVANIZE-ASTM A-123 | | |
| 9A. STN. STEEL: ASTM A-276 TY. 304 | 6. SEE PAINT KEY | | |
| 11. STL. PIPE: ASTM A-53 TY. E GR. A | 7. ZINC PLATED | | |
| 12. COMMERCIAL BRONZE | | | |
| 14. CLEAR PLASTIC BUTYRATE PIPE | | | |
| 15A. STN. STL. HDW.: ASTM F-593 & 594 TYPE 304 (GRADE 8 & 8B) | | | |
| 26. PHOSPHOR BRZ.: ASTM B-139 AL. 510 | | | |
| 37. M.S. STEEL HDW.: ASTM A-449 | | | |
| | | | 6T EIM STANDARD SP. |

| ITEM DESCRIPTION | MATERIAL KEY | FIN KEY | PART NO. OR SIZE (FOR WATERMAN USE ONLY) | QTY/GATE | TOTAL QTY |
|------------------------------------|--------------|---------|--|----------|-----------|
| 1. SLUICE GATE ASSEMBLY | - | - | 48 X 48 S-5000-F | 1 | 1 |
| a) FRAME | 1 | 6E | W-5532 | 1 | |
| b) COVER | 1 | 6E | W-5057 | 1 | |
| c) SEAT | 5 | 3 | | - | |
| d) GUIDE RAIL | 1 | 6E | | - | |
| e) SIDE WEDGE ASSEMBLY | - | - | CAST INTEGRAL WITH FRAME SYSTEM B1 | 4eo | |
| WEDGES | 1,4,5 | 1,3 | W-5511 L&R & W-5139 L&R | - | |
| ASSEMBLY / ADJUSTING HARDWARE | 15A | 2 | | - | |
| f) TOP WEDGE ASSEMBLY | - | - | | 2 | |
| WEDGES & BRACKETS | 4 | 1,3 | W-5006 & W-5007 | - | |
| ASSEMBLY / ADJUSTING HARDWARE | 15A | 2 | | - | |
| g) BOTTOM WEDGE ASSEMBLY | - | - | | 2 | |
| WEDGES & BRACKETS | 4 | 1,3 | W-5006 & W-5008 | - | |
| ASSEMBLY / ADJUSTING HARDWARE | 15A | 2 | | - | |
| 2. THRUST NUT | 4 | 1,3 | W-5014 MB (2 DIA, 4TPI, LH) | 1 | 1 |
| 3. STEM | 9A | 2,3 | 2 DIA., 5 TPI, LH | 1 | 1 |
| 7. LIFT ASSEMBLY | - | - | | 1 | 1 |
| a) ELECTRIC OPERATOR | - | 6T | EIM-MODEL 2FRG-3 | 1 | |
| OUTLINE DWG. | - | - | 2-0001/14G | - | |
| SCHEMATIC DWG. | - | - | 54393 | - | |
| 7.1 PEDESTAL | 6,11 | 6H | 102806 | 1 | |
| 8. STEM COVER | 14 | 2 | REF. 102786 (3in); 52 LG. | 1 | 1 |
| 9. STEM GUIDE (LZ BRONZE BUSHED) | 1,26 | 6E | TYPE K-2 | 2 | 2 |
| 14. IDENTIFICATION TAG (NOT SHOWN) | 12 | 2 | SEE DRAWING RA-99-1556 | 1 | 1 |
| 24. DOUBLE ENDED STUD | 9A | 2,3 | 5/8 NC X 3-1/2 LG. | 5 | 5 |
| 25. DOUBLE ENDED STUD | 9A | 2,3 | 5/8 NC X 6-1/2 LG. | 3 | 3 |
| 26. DOUBLE ENDED STUD | 9A | 2,3 | 5/8 NC X 8 LG. | 8 | 8 |
| 53. ANCHOR BOLT | 9A | 2,3 | 5/8 NC X 10 LG. | 2 | 2 |
| 59. ANCHOR BOLT | 9A | 2,3 | 3/4 NC X 12 LG. | 4 | 4 |
| 77. HEX NUT | 15A | 2 | 5/8 NC | 20 | 20 |
| 78. WASHER | 15A | 2 | 5/8 DIA | 20 | 20 |
| 79. HEX NUT | 15A | 2 | 3/4 NC | 8 | 8 |
| 80. WASHER | 15A | 2 | 3/4 | 8 | 8 |
| 89. HEX HEAD BOLT | 37 | 7 | 5/8 NC X 1-3/4 LG. | 4 | 4 |

NOTES: UNLESS OTHERWISE SPECIFIED.
 1. (GATE CAPACITY) MAX. SEATING HD.= 70 FT.; MAX UNSEATING HD.= 26 FT.
 2. OPERATING HEAD FROM CENTER LINE: SEATING= 12 FT.; UNSEATING= 12 FT.
 3. LIFT CAPACITY = 8,065 LBS @ 12 IN/MIN (125 FT.-LBS. TORQUE; 48 RPM)
 4. TURN HANDWHEEL CCW TO OPEN (RAISE) GATE.
 5. 1/4 PITCH; 1/4 LEAD (SINGLE LEAD REF); 29° STUB ACME THREAD.
 6. CONTRACTOR TO VERIFY OR SUPPLY.
 7. DIMENSION INCLUDES 1 INCH FOR GROUT PAD.
 8. CONTRACTOR TO REUSE EXISTING 5/8 NC ANCHOR BOLTS.

| | | | | |
|----------|-----------|------|-------------|-----------------|
| REV. NO. | DATE | BY | JOB NO. | PROJECT MANAGER |
| | | | L-5189 | DREW |
| REV. NO. | DATE | BY | QUOTE NO. | QUOTE ITEM NO. |
| | | | GQ99-A-1159 | 1 |
| REV. NO. | DATE | BY | DRAWN BY | CHECKED BY |
| | | | DR | GT |
| REV. NO. | DATE | BY | SCALE | DATE |
| | | | NONE | 12/28/99 |
| REV. NO. | DATE | BY | DRAWING NO. | |
| | 4-3-00 ME | DREW | RB-99-1552 | |

REF: WASTEWATER TREATMENT PLANT
 DISINFECTION FACILITIES UPGRADE
 WATER UTILITIES DEPARTMENT
 CITY OF ANN ARBOR, MICHIGAN
 ENGRS: GREELEY AND HANSEN

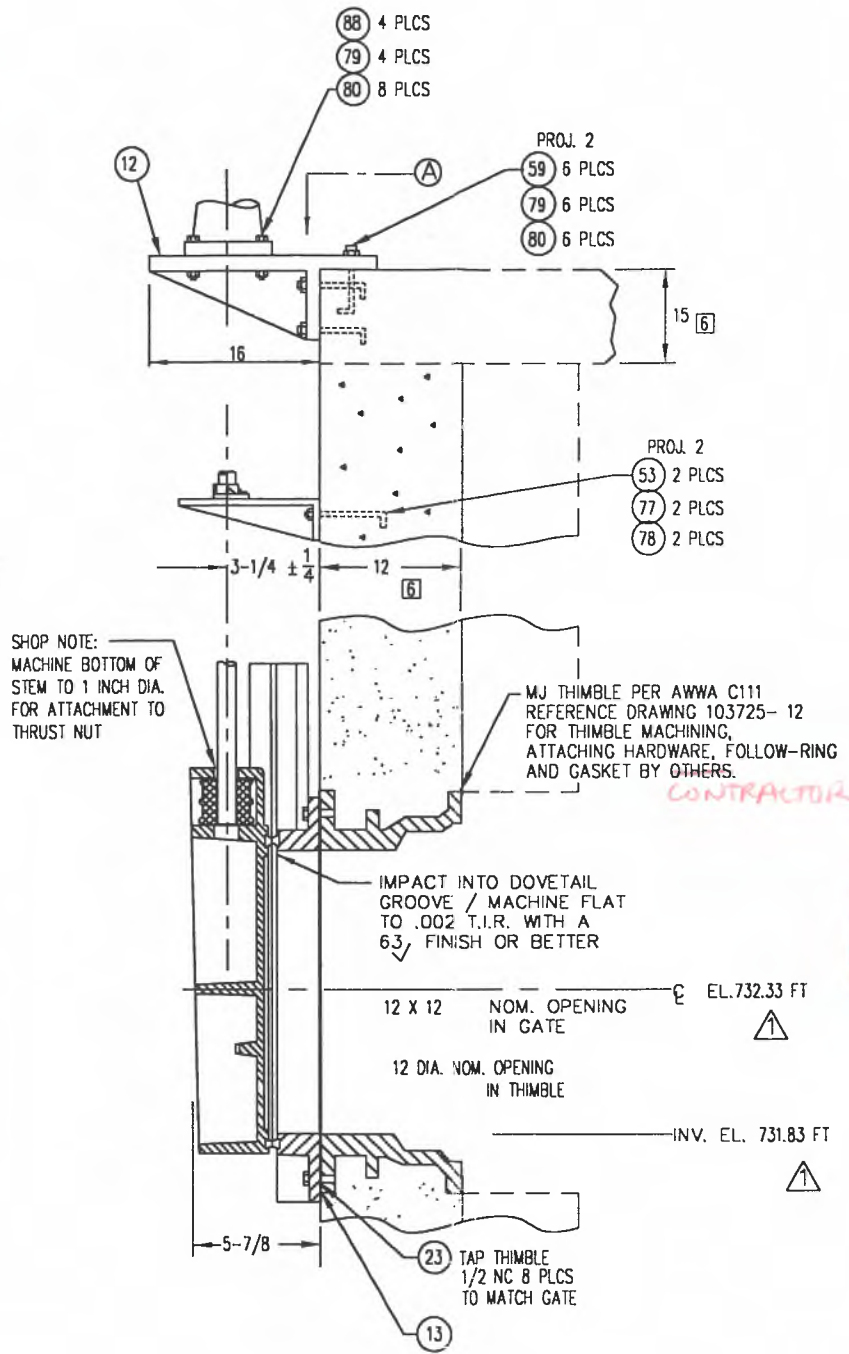
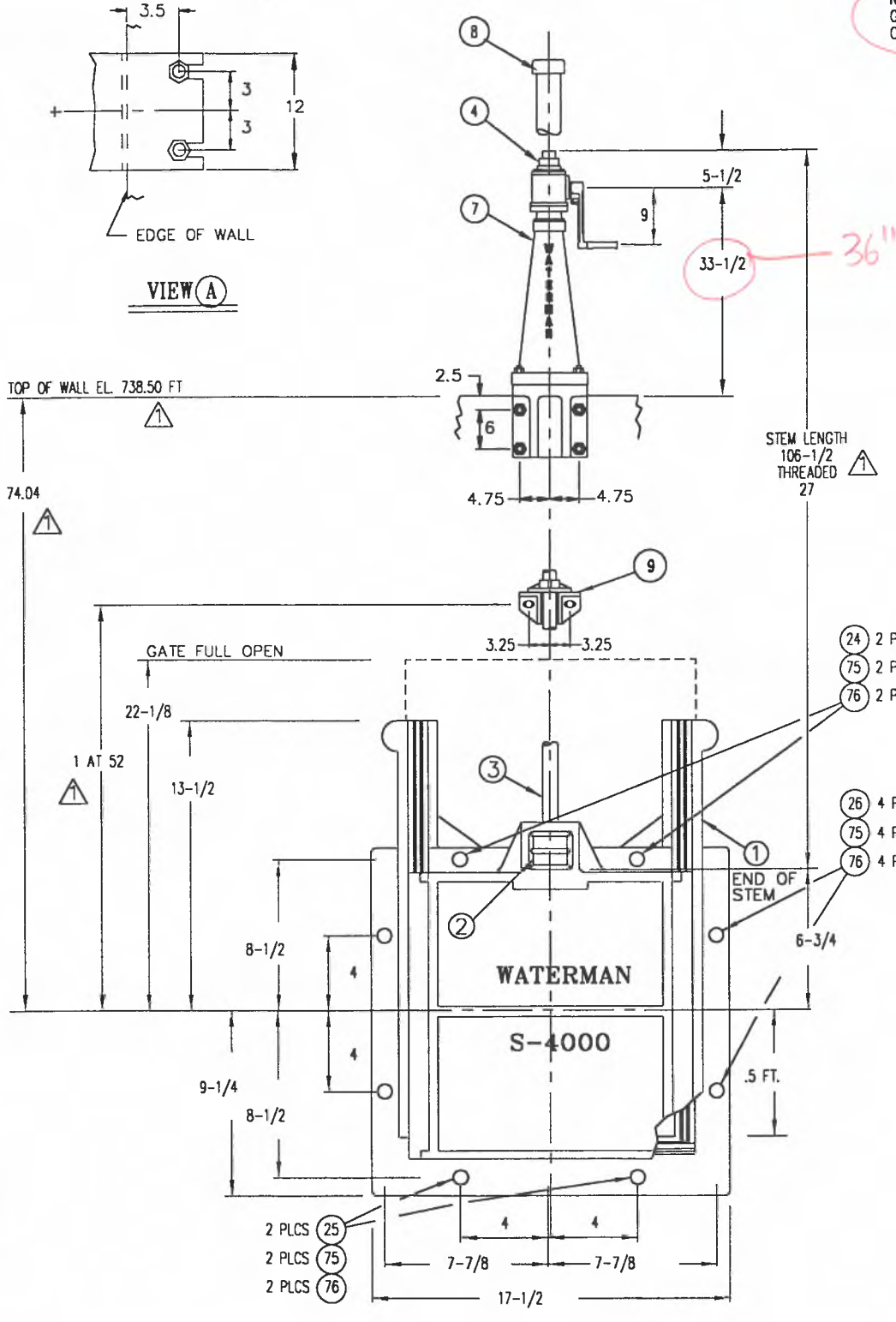
**48 X 48 WATERMAN MODEL
 S-5000-F
 SLUICE GATE**

FOR: JOHN DARR MECHANICAL, INC.
 1046 BAKER ROAD
 DEXTER, MI 48130

NOTE:
DIRECTIONAL ARROW AND WORD
OPEN CAST IN LIFT HOUSING

NOTE:
GRATING BY OTHERS (NOT SHOWN)
CONTRACTOR TO PROVIDE REQUIRED OPENINGS.

*Grating not required
at 12" x 12" sluice gate.*



| MATERIAL KEY | | FINISH KEY | | PART NO. Q | |
|---|--|-------------------------|----------|------------|--|
| 1. CAST IRON: ASTM A-126 CL. B | | 1. AS CAST | 6E BL TO | | |
| 4. MANG. BRZ.: ASTM B-584 AL. C86500 | | 2. MILL | | | |
| 5. NAVAL BRZ.: ASTM B-21 AL. C48200 | | 3. MACHINED | | | |
| 9A. STN. STEEL: ASTM A-276 TY. 304 | | 4. GALVANIZE-ASTM A-123 | | | |
| 12. COMMERCIAL BRONZE | | 5. GALVANIZE-ASTM A-153 | | | |
| 14. CLEAR PLASTIC BUTYRATE PIPE | | 6. SEE PAINT KEY | | | |
| 15A. STN. STL. HDW.: ASTM F-593 & 594 TYPE 304 (GRADE B & B8) | | | | | |
| 16. MASTIC: BUTYL RUBBER | | | | | |
| 26. PHOSPHOR BRZ.: ASTM B-139 AL. 510 | | | | | |

| ITEM DESCRIPTION | MATERIAL KEY | FIN KEY | PART NO. Q (FOR WATERMAN) | GATE | QTY |
|---|--------------|---------|--|------|-----|
| 1. SLUICE GATE ASSEMBLY | - | - | 12 X 12 S-4000-F | 1 | 1 |
| a) FRAME | 1 | 6E | W-4060-1 | 1 | 1 |
| b) COVER | 1 | 6E | W-4059 | 1 | 1 |
| c) SEAT | 5 | 3 | | 2 | 2 |
| d) GUIDE RAIL ATTACHING HARDWARE | 15A | 2 | W-4066 & W-4067 | 1/1 | 1 |
| e) SIDE WEDGE ASSEMBLY R & L WEDGES ASSEMBLY / ADJUSTING HARDWARE | 4 | 1,3 | W-4009; W-4010; W-5005 L&R | 1ea | 1 |
| 2. THRUST NUT | 4 | 1,3 | 1-3/8 X 1-3/8 X 1-1/2 (1 DIA., 4TPI, LH) | 1 | 1 |
| 3. STEM | 9A | 2,3 | 1-1/8 DIA., 4TPI, LH [5] | 1 | 1 |
| 4. LIMIT NUT | 1 | 5 | 1-1/8 DIA., 4TPI, LH STD | 2 | 2 |
| 7. LIFT ASSEMBLY | 1,4 | 6H | TYPE 3ESL-2:1-A | 1 | 1 |
| a) HANDCRANK | 1,12 | 6H | 102671 | 1 | 1 |
| b) PEDESTAL | 1 | 6H | W-2098 (REF. 105605) | 1 | 1 |
| 8. STEM COVER (W/MYLAR STRIP) | 14 | 2 | REF. 102785 (2.5in); 19 LG. | 1 | 1 |
| 9. STEM GUIDE (LZ BRONZE BUSHED) | 1,26 | 6E | TYPE K-2 | 1 | 1 |
| 12. TOP WALL MOUNTING BRACKET | 1 | 6E | TYPE K-3B | 1 | 1 |
| 13. GASKET | 16 | 2 | TUBE TYPE | 1 | 1 |
| 14. IDENTIFICATION TAG (NOT SHOWN) | 12 | 2 | SEE DRAWING RA-99-1556 | 1 | 1 |
| 23. THIMBLE (PAINT INSIDE ONLY) | 1 | 6E | 12 TYPE MJ-SC X 12 LG. | 1 | 1 |
| 24. DOUBLE ENDED STUD | 9A | 2,3 | 1/2 NC X 2-1/4 LG. | 2 | 2 |
| 25. DOUBLE ENDED STUD | 9A | 2,3 | 1/2 NC X 3-3/4 LG. | 2 | 2 |
| 26. DOUBLE ENDED STUD | 9A | 2,3 | 1/2 NC X 4-3/4 LG. | 4 | 4 |
| 53. ANCHOR BOLT | 9A | 2,3 | 5/8 NC X 10 LG. | 2 | 2 |
| 59. ANCHOR BOLT | 9A | 2,3 | 3/4 NC X 12 LG. | 6 | 6 |
| 75. HEX NUT | 15A | 2 | 1/2 DIA. | 8 | 8 |
| 76. WASHER | 15A | 2 | 1/2 DIA. | 8 | 8 |
| 77. HEX NUT | 15A | 2 | 5/8 DIA. | 2 | 2 |
| 78. WASHER | 15A | 2 | 5/8 DIA. | 2 | 2 |
| 79. HEX NUT | 15A | 2 | 3/4 NC | 10 | 10 |
| 80. WASHER | 15A | 2 | 3/4 DIA. | 14 | 14 |
| 88. HEX HEAD BOLT | 15A | 2 | 3/4 NC X 3-1/2 LG. | 4 | 4 |

NOTES: UNLESS OTHERWISE SPECIFIED.
 1. (GATE CAPACITY) MAX. SEATING HD. = 30 FT.; MAX UNSEATING HD. = 20 FT.
 2. OPERATING HEAD FROM CENTERLINE: SEATING = 10 FT.; UNSEATING = 10 FT. [6]
 3. LIFT CAPACITY @ 40 LBS. PULL = 4,730 LBS.
 4. TURN HANDCRANK CCW TO OPEN (RAISE) GATE.
 [5] 29° MODIFIED STUB ACME THREADS.
 [6] CONTRACTOR TO VERIFY OR SUPPLY.

(1) GATE REQUIRED AT NORTH CHLORINE CONTACT TANK-SKIMMING DRAIN, GATE NO. [6] REF PLAN SHEET M-3

| REV. NO. | DATE | BY | JOB NO. | PROJECT MANAGER |
|----------|------|----|-------------|-----------------|
| | | | L-5189 | DREW |
| REV. NO. | DATE | BY | QUOTE NO. | QUOTE ITEM NO. |
| | | | GQ99-A-1159 | 2 |
| REV. NO. | DATE | BY | DRAWN BY | CHECKED BY |
| | | | DR | SH |
| REV. NO. | DATE | BY | SCALE | DATE |
| | | | NONE | 12/28/99 |
| REV. NO. | DATE | BY | DRAWING NO. | |
| | | | RB-99-1553 | |

REF: WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE
WATER UTILITIES DEPARTMENT
CITY OF ANN ARBOR, MICHIGAN
ENGRS: GREELEY AND HANSEN

12 X 12 WATERMAN MODEL S-4000-F SLUICE GATE

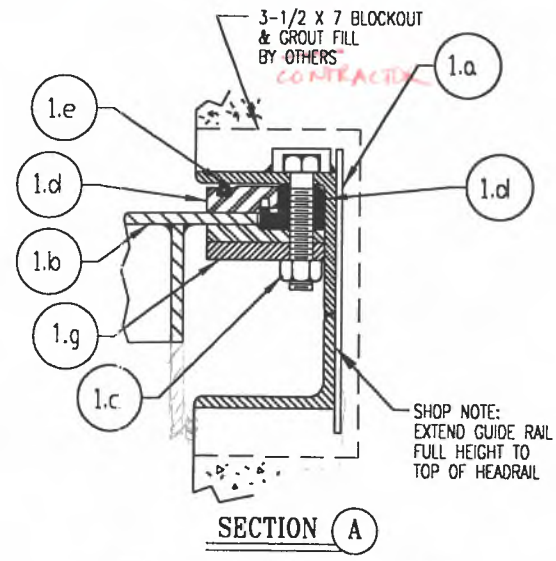
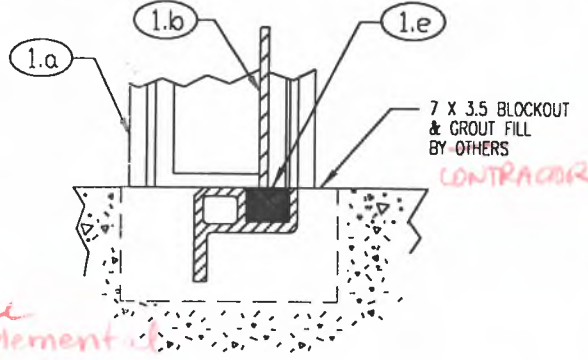
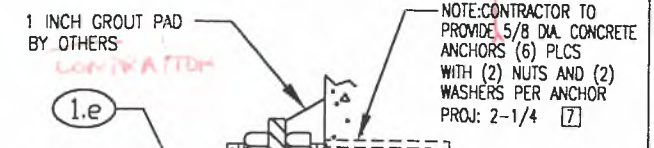
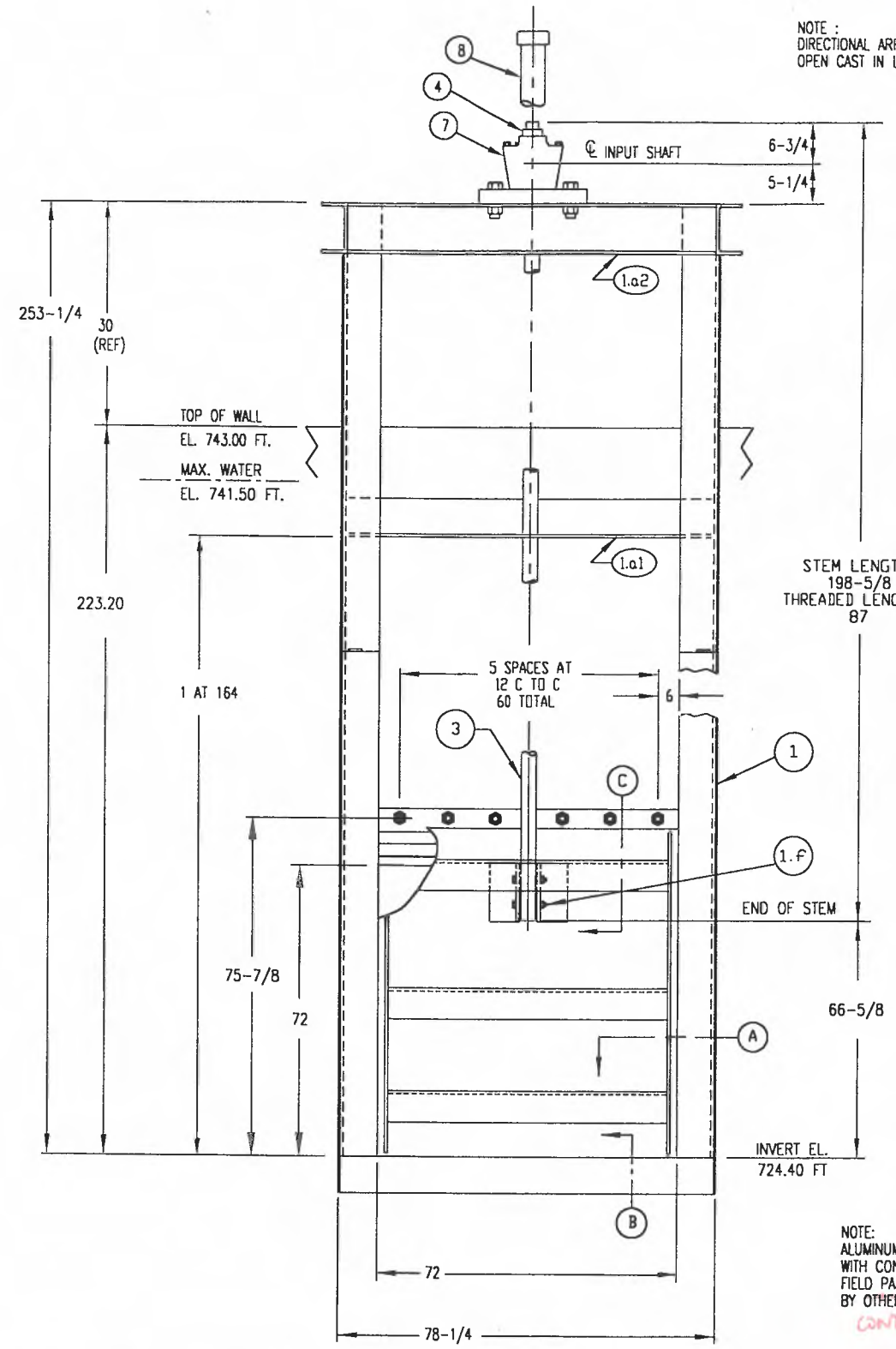
FOR: JOHN DARR MECHANICAL, INC.
1046 BAKER ROAD
DEXTER, MI 48130

APPROVED & NOTED

Type 316L stainless steel

NOTE: CONTRACTOR GRATING BY OTHERS (NOT SHOWN) CONTRACTOR TO PROVIDE REQUIRED OPENINGS.

NOTE: DIRECTIONAL ARROW AND WORD OPEN CAST IN LIFT HOUSING



| MATERIAL KEY | | FINISH KEY | | | |
|---|--------------|-------------------------|--|---|-----------|
| 1. CAST IRON: ASTM A-126 CL. B | | 1. AS CAST | | 6H BLAST CLEAN (2) CTS POLY. & (1) CT POLY. (TDF-10 MILS) | |
| 4. MANG. BRZ.: ASTM B-584 AL. C86500 | | 2. MILL | | | |
| 9A. STN. STEEL: ASTM A-276 TY. 304 | | 3. MACHINED | | | |
| 12. COMMERCIAL BRONZE | | 4. GALVANIZE-ASTM A-123 | | | |
| 13. NEOPRENE RUBBER: ASTM D-2000 | | 5. GALVANIZE-ASTM A-153 | | | |
| 14. CLEAR PLASTIC BUTYRATE PIPE | | 6. SEE PAINT KEY | | | |
| 15A. STN. STL. HDW.: ASTM F-593 & 594 TYPE 304 (GRADE 8 & B8) | | | | | |
| 17. ALUMINUM: ASTM B-209 AL. 6061-T6 | | | | | |
| 21. UHMW POLYETHYLENE | | | | | |
| ITEM DESCRIPTION | MATERIAL KEY | FIN KEY | PART NO. OR SIZE (FOR WATERMAN USE ONLY) | QTY/GATE | TOTAL QTY |
| 1. GATE ASSEMBLY | - | - | 105518 (MODIFIED) | 1 | 2 |
| a) FRAME WELDMENT | 17 | 2 | 105654 (MODIFIED) | 1 | |
| 1) STEM BRACE | 17 | 2 | 105438-1 | 1 | |
| 2) HEADRAIL | 17 | 2 | C8 X 4.75 CHANNEL | 2 | |
| b) COVER | 17 | 2 | | 1 | |
| c) ASSEMBLY HARDWARE | 15A | 2 | 1/2 NC | A/R | |
| d) SEATS & GUIDE | 21 | 2 | 105078 & 105075 | -- | |
| e) SEAT & FLUSH SEAL | 13 | 2 | 105160 & 105073 | -- | |
| f) STEM BOLT & NUT | 15A | 2 | 3/4 NC x 3-1/2 LG. | 2/2 | |
| g) RETAINER BAR | 17 | 2 | 105074 | 2 | |
| 2. CROSSRAIL | 17 | 2 | REF: 105461 (MODIFIED) | 1 | |
| 3. STEM | 9A | 2,3 | 2 DIA., 106220-1; 4TPI, LH [5] | 1 | 2 |
| 4. LIMIT NUT | 1 | 5 | 2 DIA., 4TPI, LH STD | 1 | 2 |
| 7. LIFT ASSEMBLY | - | - | | 1 | 2 |
| a) LIFT | 1,4 | 6H | TYPE 3ED-4-1-A | 1 | |
| b) BASEPLATE | 1 | 6H | W-2044 | 1 | |
| c) HANDCRANK | 1,12 | 6H | REF. 101653 | 1 | |
| d) MOUNTING HARDWARE | 15A | 2 | 5/8 NC | 4 | |
| 8. STEM COVER (W/MYLAR STRIP) | 14 | 2 | REF. 102786 (3in); 78 LG. | 1 | 2 |
| 14 IDENTIFICATION TAG (NOT SHOWN) | 12 | 2 | SEE DRAWING RA-99-1556 | 1 | 2 |

NOTES: UNLESS OTHERWISE SPECIFIED.

- (GATE CAPACITY) MAX. SEATING HD. = 15 FT.; MAX UNSEATING HD. = 15 FT.
- OPERATING HEAD FROM CENTERLINE: SEATING = 14.0 FT.; UNSEATING = 14.0 FT. [6]
- LIFT CAPACITY @ 40 LBS. PULL = 10,800 LBS. (@ 4:1 RATIO)
- TURN HANDCRANK CCW TO OPEN (RAISE) GATE. (@ 2:1 RATIO)
- 29° MODIFIED STUB ACME THREADS.
- CONTRACTOR TO VERIFY OR SUPPLY.

(2) GATES REQUIRED AT NORTH CHLORINE CONTACT TANK-UV EQUIPMENT CHANNEL, TAG NO. [6] REF PLAN SHEET M-2

| REV. NO. | DATE | BY | JOB NO. | PROJECT MANAGER |
|----------|----------------|------|-------------|-----------------|
| | | | L-5189 | DREW |
| REV. NO. | DATE | BY | QUOTE NO. | QUOTE ITEM NO. |
| | | | GQ99-A-1159 | 3A |
| REV. NO. | DATE | BY | DRAWN BY | CHECKED BY |
| | | | DR | SH |
| REV. NO. | DATE | BY | SCALE | DATE |
| | | | NONE | 12-28-1999 |
| REV. NO. | DATE (REDRAWN) | BY | DRAWING NO. | |
| | 4-3-00 ME | DREW | RB-99-1554 | |

REF: WASTEWATER TREATMENT PLANT DISINFECTION FACILITIES UPGRADE WATER UTILITIES DEPARTMENT CITY OF ANN ARBOR, MICHIGAN

ENGRS: GREELEY AND HANSEN

72 X 72 WATERMAN MODEL
A-228-Y-X
SLIDE GATE - NORTH (TYP. OF 2)

FOR: JOHN DARR MECHANICAL, INC.
1046 BAKER ROAD
DEXTER, MI 48130

DRAWING NO. RB-99-1554

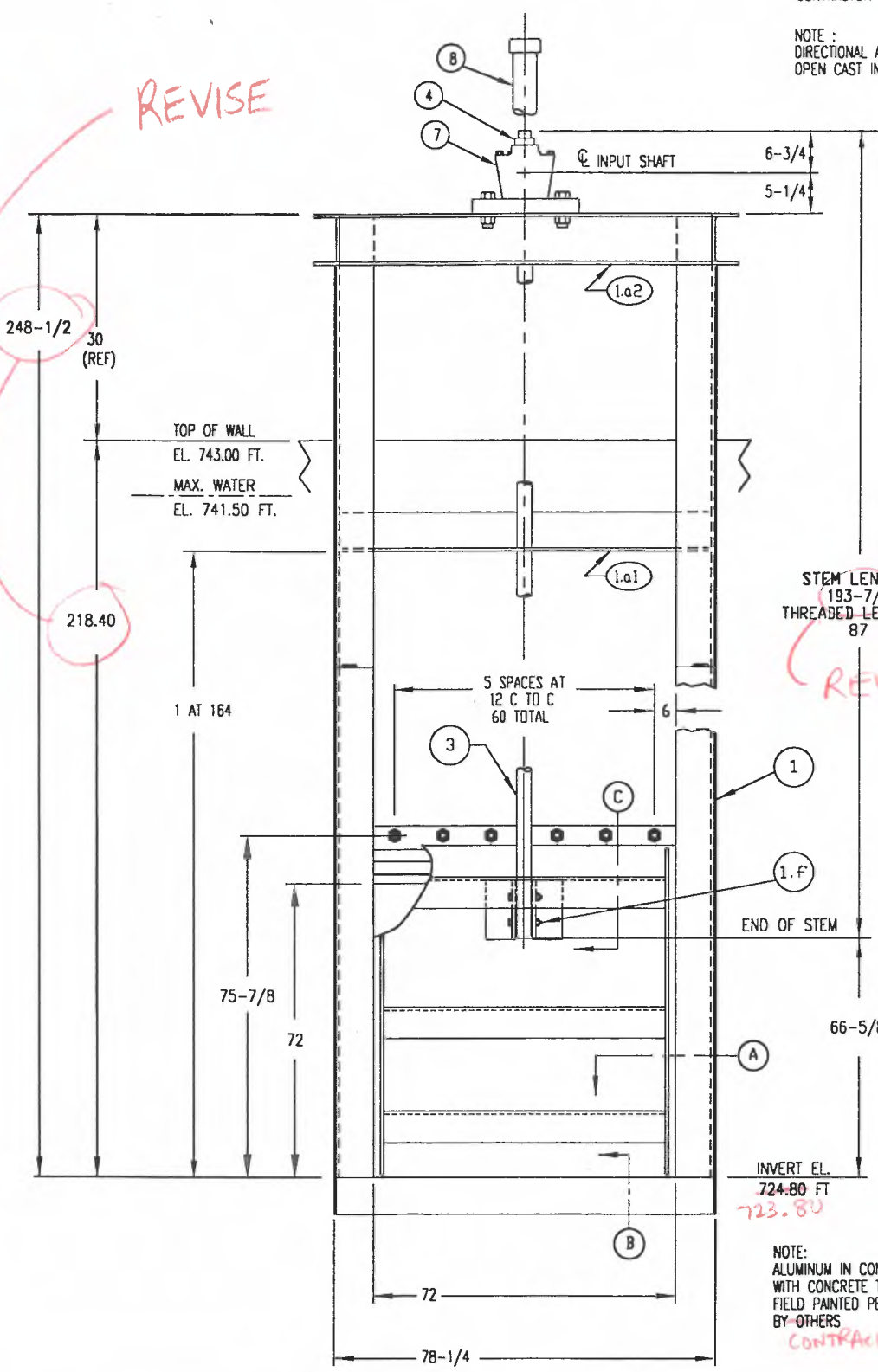
Type 316 L stainless steel

NOTE: **CONTRACTOR**
GRATING BY OTHERS (NOT SHOWN)
CONTRACTOR TO PROVIDE REQUIRED OPENINGS.

NOTE:
DIRECTIONAL ARROW AND WORD
OPEN CAST IN LIFT HOUSING

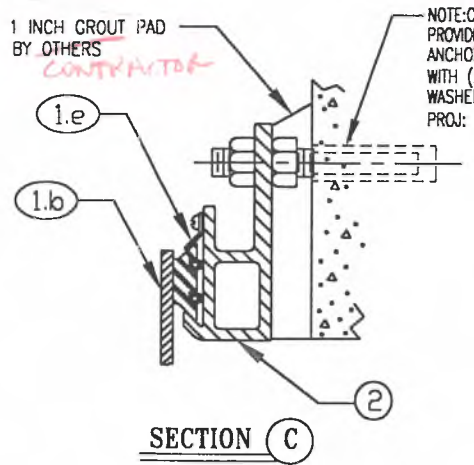
1 INCH GROUT PAD
BY OTHERS

NOTE: CONTRACTOR TO
PROVIDE 5/8 DIA. CONCRETE
ANCHORS (6) PLCS
WITH (2) NUTS AND (2)
WASHERS PER ANCHOR
PROJ: 2-1/4 [7]

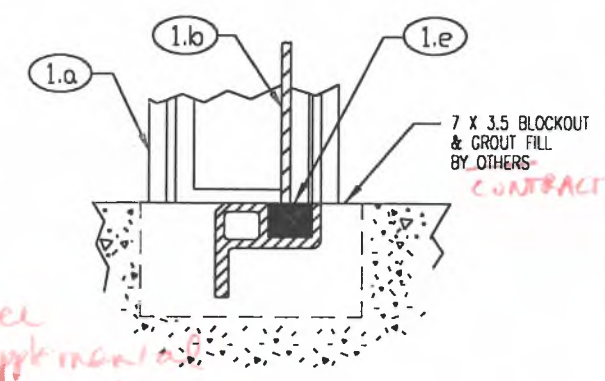


STEM LENGTH
193-7/8
THREADED LENGTH
87

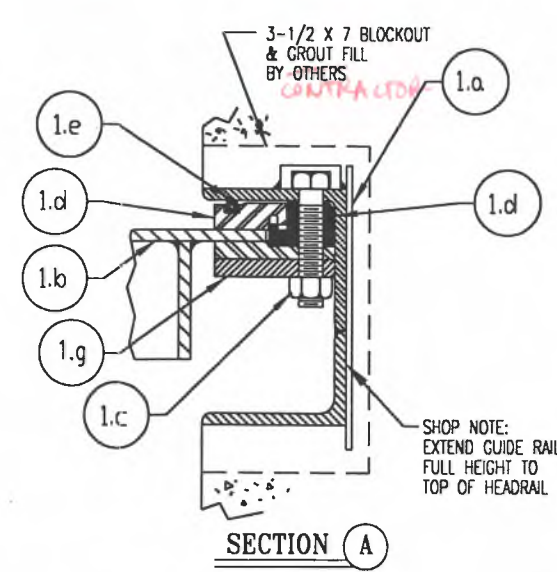
NOTE:
ALUMINUM IN CONTACT
WITH CONCRETE TO BE
FIELD PAINTED PER SPECS
BY OTHERS
CONTRACTOR



SECTION C



SECTION B



SECTION A

| MATERIAL KEY | | FINISH KEY | | | |
|---|--------------|--|---|--|--------------|
| 1. CAST IRON: ASTM A-126 CL. B 4. MANG. BRZ.: ASTM B-584 AL. C86500 9A. STN. STEEL: ASTM A-276 TY. 304 12. COMMERCIAL BRONZE 13. NEOPRENE RUBBER: ASTM D-2000 14. CLEAR PLASTIC BUTYRATE PIPE 15A. STN. STL. HDW.: ASTM F-593 & 594 TYPE 304 (GRADE B & BB) 17. ALUMINUM: ASTM B-209 AL. 6061-T6 21. UHMW POLYETHYLENE | | 1. AS CAST 2. MILL 3. MACHINED 4. GALVANIZE-ASTM A-123 5. GALVANIZE-ASTM A-153 6. SEE PAINT KEY | | 6H BLAST CLEAN (2) CTS POLY. & (1) CT POLY (TDFI-10 MILS) | |
| ITEM DESCRIPTION | MATERIAL KEY | FIN KEY | PART NO. OR SIZE (FOR WATERMAN USE ONLY) | QTY/ GATE | TOTAL QTY |
| 1. GATE ASSEMBLY | - | - | 105518 (MODIFIED) | 1 | 2 |
| a) FRAME WELDMENT | 17 | 2 | 105654 (MODIFIED) | 1 | |
| 1) STEM BRACE | 17 | 2 | 105438-1 | 1 | |
| 2) HEADRAIL | 17 | 2 | CB X 4.75 CHANNEL | 2 | |
| b) COVER | 17 | 2 | | 1 | |
| c) ASSEMBLY HARDWARE | 15A | 2 | 1/2 NC | A/R | |
| d) SEATS & GUIDE | 21 | 2 | 105078 & 105075 | -- | |
| e) SEAT & FLUSH SEAL | 13 | 2 | 105160 & 105073 | -- | |
| f) STEM BOLT & NUT | 15A | 2 | 3/4 NC x 3-1/2 LG. | 2/2 | |
| g) RETAINER BAR | 17 | 2 | 105074 | 2 | |
| 2. CROSSRAIL | 17 | 2 | REF: 105461 (MODIFIED) | 1 | |
| 3. STEM | 9A | 2,3 | 2 DIA., 106220-1; 4TPI, LH [5] | 1 | 2 |
| 4. LIMIT NUT | 1 | 5 | 2 DIA., 4TPI, LH STD | 1 | 2 |
| 7. LIFT ASSEMBLY | - | - | | 1 | 2 |
| a) LIFT | 1,4 | 6H | TYPE 3ED-4:1-A | 1 | |
| b) BASEPLATE | 1 | 6H | W-2044 | 1 | |
| c) HANDCRANK | 1,12 | 6H | REF. 101653 | 1 | |
| d) MOUNTING HARDWARE | 15A | 2 | 5/8 NC | 4 | |
| 8. STEM COVER (W/MYLAR STRIP) | 14 | 2 | REF. 102786 (3in); 78 LG. | 1 | 2 |
| 14 IDENTIFICATION TAG (NOT SHOWN) | 12 | 2 | SEE DRAWING RA-99-1556 | 1 | 2 |

NOTES: UNLESS OTHERWISE SPECIFIED.

- (GATE CAPACITY) MAX. SEATING HD. = 15 FT.; MAX UNSEATING HD. = 15 FT.
- OPERATING HEAD FROM CENTERLINE: SEATING = 14.0 FT.; UNSEATING = 14.0 FT. [6]
- LIFT CAPACITY @ 40 LBS. PULL = 10,800 LBS. (@ 4:1 RATIO)
- TURN HANDCRANK CCW TO OPEN (RAISE) GATE. (@ 2:1 RATIO)
- 29° MODIFIED STUB ACME THREADS.
- CONTRACTOR TO VERIFY OR SUPPLY.

(2) GATES REQUIRED AT SOUTH CHLORINE CONTACT TANK-UV EQUIPMENT CHANNEL, TAG NO. [6] REF PLAN SHEET M-2

| REV. NO. | DATE | BY | JOB NO. | PROJECT MANAGER |
|----------|--------------------------|------|-------------|-----------------|
| | | | L-5189 | DREW |
| REV. NO. | DATE | BY | QUOTE NO. | QUOTE ITEM NO. |
| | | | GQ99-A-1159 | 3B |
| REV. NO. | DATE | BY | DRAWN BY | CHECKED BY |
| | | | DR | SH |
| REV. NO. | DATE | BY | SCALE | DATE |
| | | | NONE | 4-3-00 |
| REV. NO. | DATE (ADDED NEW DRAWING) | BY | DRAWING NO. | |
| 1 | 4-3-00 ME | DREW | RB-00-0382 | |

REF: WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE
WATER UTILITIES DEPARTMENT
CITY OF ANN ARBOR, MICHIGAN

ENGRS: GREELEY AND HANSEN

72 X 72 WATERMAN MODEL
A-228-Y-X
SLIDE GATE - SOUTH (TYP. OF 2)

FDR: JOHN DARR MECHANICAL, INC.
1046 BAKER ROAD
DEXTER, MI 48130

See remarks

DRAWING NO. RB-00-0382