ADDENDUM No. 1

RFP No. 22-22

ULTRAVIOLET DISINFECTION REPLACEMENT PROJECT

Bids Due: APRIL 6, 2022 at 2:00 P.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 seventy-five (75) pages.**

Bidder is to acknowledge receipt of this Addendum No. 1, including all attachments (if any) in its Bid. Bids submitted without acknowledgment of receipt of this addendum may be considered nonconforming.

The following forms provided within the RFP document should be included in submitted bids:

- **City of Ann Arbor Living Wage Ordinance Declaration of Compliance**
- **Vendor Conflict of Interest Disclosure Form**
- **City of Ann Arbor Non-Discrimination Ordinance Declaration of Compliance**

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

I. QUESTIONS AND ANSWERS

The following Questions have been received by the City. Responses are being provided in accordance with the terms of the RFP. Bidders are directed to take note in their 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: What is the date of the current WWTP NPDES Permit?
Answer 1: The current NPDES Permit effective February 1, 2022, is attached.

Question 2: What is the Capital Improvement Project (CIP) value for the UV Disinfection Replacement Project?
Answer 2: The programmed CIP value for this project is $1.95M, which includes design and construction support engineering costs.

Question 3: How will Phase 2 services be handled?
Answer 3: See page 12 of the RFP, which discussed Phase 2 Services (potential future services) for details.

Question 4: Are the gates in the two existing UV passes water tight to allow a train to be down during UV upgrade?
Answer 4: The functionality of the gates is not known. The proposer should address this based upon expected construction sequencing for the project.

Question 5: Can we get copies of as-builts for the existing UV system?
Answer 5: As-builts for the existing UV system are attached.

Question 6: Can the sign-in-sheet from the mandatory pre-proposal meeting be shared with bidders?
Answer 6: A copy of the meeting sign-in-sheet is attached.

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

PERMIT NO. MI0022217

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the federal Clean Water Act (federal Water Pollution Control Act, 33 U.S.C., Section 1251 *et seq*., as amended); Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA); Part 41, Sewerage Systems, of the NREPA; and Michigan Executive Order 2019-06,

City of Ann Arbor
PO Box 8647
301 East Huron Street
Ann Arbor, MI 48107

is authorized to discharge from the **Ann Arbor Wastewater Treatment Plant** located at

49 South Dixboro Road
Ann Arbor, MI 48105

designated as **Ann Arbor WWTP**

to the receiving water named the Huron River in accordance with effluent limitations, monitoring requirements, and other conditions set forth in this permit.

This permit is based on a complete application submitted on August 3, 2021, as amended through September 28, 2021, and a settlement agreement executed on July 7, 2021.

This permit takes effect on February 1, 2022. The provisions of this permit are severable. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked in whole or in part during its term in accordance with applicable laws and rules. On its effective date, this permit shall supersede National Pollutant Discharge Elimination System (NPDES) Permit No. MI0022217 (expiring October 1, 2008).

This permit and the authorization to discharge shall expire at midnight on **October 1, 2025**. In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit an application that contains such information, forms, and fees as are required by the Michigan Department of Environment, Great Lakes, and Energy (Department) by **April 4, 2025**.

Issued: January 21, 2022.

Original signed by Christine Alexander
Christine Alexander, Manager
Permits Section
Water Resources Division

PERMIT FEE REQUIREMENTS

In accordance with Section 324.3120 of the NREPA, the permittee shall make payment of an annual permit fee to the Department for each October 1 the permit is in effect regardless of occurrence of discharge. The permittee shall submit the fee in response to the Department's annual notice. Payment may be made electronically via the Department's MiWaters system. The MiWaters website is located at https://miwaters.deq.state.mi.us. Payment shall be submitted or postmarked by January 15 for notices mailed by December 1. Payment shall be submitted or postmarked no later than 45 days after receiving the notice for notices mailed after December 1.

Annual Permit Fee Classification: Municipal Major, 10 MGD to less than 50 MGD (Individual Permit)

In accordance with Section 324.3132 of the NREPA, the permittee shall make payment of an annual biosolids land application fee to the Department if the permittee land applies biosolids. The permittee shall submit the fee in response to the Department's annual notice. Payment may be made electronically via the Department's MiWaters system. The MiWaters website is located at https://miwaters.deq.state.mi.us. Payment shall be submitted or postmarked no later than January 31 of each year for notices mailed by December 15. Payment shall be submitted or postmarked no later than 45 days after receiving the notice for notices mailed after December 15.

CONTACT INFORMATION

Unless specified otherwise, all contact with the Department required by this permit shall be made to the Jackson District Office of the Water Resources Division. The Jackson District Office is located at 301 East Louis Glick Highway, Jackson, MI 49201-1535, Telephone: 517-780-7690, Fax: 517-780-7855.

CONTESTED CASE INFORMATION

Any person who is aggrieved by this permit may file a sworn petition with the Michigan Administrative Hearing System within the Michigan Department of Licensing and Regulatory Affairs, c/o the Michigan Department of Environment, Great Lakes, and Energy, setting forth the conditions of the permit which are being challenged and specifying the grounds for the challenge. The Department of Licensing and Regulatory Affairs may reject any petition filed more than 60 days after issuance as being untimely.

PART I

Section A. Limitations and Monitoring Requirements

1. Final Effluent Limitations, Monitoring Point 001A

During the period beginning on the effective date of this permit and lasting until the expiration date of this permit, the permittee is authorized to discharge treated municipal wastewater from Monitoring Point 001A through Outfall 001. Outfall 001 discharges to the Huron River at Latitude 42.2683, Longitude -83.6625. Such discharge shall be limited and monitored by the permittee as specified below.

	Maximum Limits for Quantity or Loading				Maximum Limits for Quality or Concentration				Monitoring	Sample
Parameter	Monthly	7-Day	Daily	Units	Monthly	7-Day	Daily	Units	Frequency	Type
Flow	(report)	---	(report)	MGD	---	---	---	---	Daily	Report Total Daily Flow
Carbonaceous Biochemical Oxygen Demand (CBOD5)										
May – November	980	2,500	(report)	lbs/day	4	---	10	mg/l	Daily	24-Hr Composite
December – March	3,700	7,400	(report)	lbs/day	15	---	30	mg/l	Daily	24-Hr Composite
April	4,900	7,400	(report)	lbs/day	20	---	30	mg/l	Daily	24-Hr Composite
Total Suspended Solids (TSS)										
May – November	4,900	7,400	(report)	lbs/day	20	30	(report)	mg/l	Daily	24-Hr Composite
December – April	7,400	11,000	(report)	lbs/day	30	45	(report)	mg/l	Daily	24-Hr Composite
Ammonia Nitrogen (as N)										
April	---	3,700	(report)	lbs/day	---	---	15	mg/l	Daily	24-Hr Composite
May – September	120	490	(report)	lbs/day	0.5	---	2.0	mg/l	Daily	24-Hr Composite
October	---	980	(report)	lbs/day	---	---	4.0	mg/l	Daily	24-Hr Composite
November	---	1,500	(report)	lbs/day	---	---	6.0	mg/l	Daily	24-Hr Composite
Chloride	---	---	---	---	(report)	---	(report)	mg/l	Monthly	24-Hr Composite
Sulfate	---	---	---	---	(report)	---	(report)	mg/l	Monthly	24-Hr Composite
Total Phosphorus (as P) (see Part I.A.2.)										
through October 1, 2023	200	---	(report)	lbs/day	0.8	---	(report)	mg/l	Daily	24-Hr Composite
beginning October 2, 2023 April	150	---	(report)	lbs/day	(report)	---	(report)	mg/l	Daily	24-Hr Composite
May	60	---	(report)	lbs/day	(report)	---	(report)	mg/l	Daily	24-Hr Composite
June	60	---	(report)	lbs/day	(report)	---	(report)	mg/l	Daily	24-Hr Composite
July	50	---	(report)	lbs/day	(report)	---	(report)	mg/l	Daily	24-Hr Composite
August	50	---	(report)	lbs/day	(report)	---	(report)	mg/l	Daily	24-Hr Composite
September	60	---	(report)	lbs/day	(report)	---	(report)	mg/l	Daily	24-Hr Composite
October – March	200	---	(report)	lbs/day	0.8	---	(report)	mg/l	Daily	24-Hr Composite
beginning October 2, 2048	25	---	(report)	lbs/day	0.2	---	(report)	mg/l	Daily	24-Hr Composite

PART I

Section A. Limitations and Monitoring Requirements

Parameter	Maximum Limits for Quantity or Loading				Maximum Limits for Quality or Concentration				Monitoring Frequency	Sample Type
	Monthly	7-Day	Daily	Units	Monthly	7-Day	Daily	Units		
Fecal Coliform Bacteria	---	---	---	---	200	400	(report)	cts/ 100 ml	Daily	Grab
Available Cyanide	1.8	---	(report)	lbs/day	7.4	---	(report)	ug/l	2x Monthly	Grab
Perfluorooctane sulfonate (PFOS)	(report)	---	(report)	lbs/day	(report)	---	(report)	ng/l	Quarterly	Grab
Perfluorooctanoic acid (PFOA)	(report)	---	(report)	lbs/day	(report)	---	(report)	ng/l	Quarterly	Grab
Total Mercury										
Corrected	(report)	---	(report)	lbs/day	(report)	---	(report)	ng/l	Quarterly	Calculation
Uncorrected	---	---	---	---	---	---	(report)	ng/l	Quarterly	Grab
Field Duplicate	---	---	---	---	---	---	(report)	ng/l	Quarterly	Grab
Field Blank	---	---	---	---	---	---	(report)	ng/l	Quarterly	Preparation
Laboratory Method Blank	---	---	---	---	---	---	(report)	ng/l	Quarterly	Preparation
	12-Month Rolling Avg				**12-Month Rolling Avg**					
Total Mercury	0.00049	---	---	lbs/day	2.0	---	---	ng/l	Quarterly	Calculation
					Minimum % Monthly		**Minimum % Daily**			
TSS Minimum % Removal										
December – April	---	---	---	---	85	---	(report)	%	Monthly	Calculation
					Minimum Daily		**Maximum Daily**			
pH	---	---	---	---	6.5	---	9.0	S.U.	Daily	Grab
Dissolved Oxygen	---	---	---	---	5.0	---	---	mg/l	Daily	Grab

The following design flow was used in determining the above limitations, but is not to be considered a limitation or actual capacity: 29.5 MGD.

a. Narrative Standard
The receiving water shall contain no turbidity, color, oil films, floating solids, foams, settleable solids, or deposits as a result of this discharge in unnatural quantities which are or may become injurious to any designated use.

b. Sampling Locations
Samples for all parameters shall be taken after disinfection. Samples for CBOD5 shall be properly seeded prior to analysis. The Department may approve alternate sampling locations that are demonstrated by the permittee to be representative of the effluent.

PART I

Section A. Limitations and Monitoring Requirements

c. Quarterly Monitoring
Quarterly samples shall be taken during the months of January, April, July, and October. If the facility does not discharge during these months, the permittee shall sample the next discharge occurring during the period in question. If the facility does not discharge during the period in question, a sample is not required for that period. For any month in which a sample is not taken, the permittee shall enter "*G" on the Discharge Monitoring Report (DMR). (For purposes of reporting on the Daily tab of the DMR, the permittee shall enter “*G” on the first day of the month only).

d. Ultraviolet Disinfection
It is understood that ultraviolet light will be used to achieve compliance with the fecal coliform limitations. If disinfection other than ultraviolet light will be used, the permittee shall notify the Department in accordance with Part II.C.12. of this permit.

e. Percent Removal Requirements
Monthly percent removal shall be calculated based on the monthly average effluent TSS concentrations and the monthly average influent concentrations for approximately the same period. Daily percent removal shall be calculated based on the daily effluent TSS concentrations and the daily influent concentrations for the same day. Reporting of Daily percent removal is only required on days on which an influent sample is obtained.

f. Monitoring Frequency Reduction for Perfluorooctane Sulfonate (PFOS) and/or Perfluorooctanoic Acid (PFOA)
After the submittal of 36 months of quarterly data or at least 10 equally spaced sample results obtained over a minimum of three (3) months, the permittee may request, in writing, Department approval of a reduction in monitoring frequency for PFOS and/or PFOA. This request shall contain an explanation as to why the reduced monitoring is appropriate. Upon receipt of written approval and consistent with such approval, the permittee may reduce the monitoring frequency indicated in Part I.A.1. of this permit. The monitoring frequency for PFOS and/or PFOA shall not be reduced to less than annually. The Department may revoke the approval for reduced monitoring at any time upon notification to the permittee.

g. Final Effluent Limitation for Total Mercury
The final limit for total mercury is the Discharge Specific Level Currently Achievable (LCA) based on a multiple discharger variance from the WQBEL of 1.3 ng/l, pursuant to Rule 1103(9) of the Water Quality Standards. Compliance with the LCA shall be determined as a 12-month rolling average, the calculation of which may be done using blank-corrected sample results. The 12-month rolling average shall be determined by adding the present monthly average result to the preceding 11 monthly average results then dividing the sum by 12. For facilities with quarterly monitoring requirements for total mercury, quarterly monitoring shall be equivalent to three (3) months of monitoring in calculating the 12-month rolling average. Facilities that monitor more frequently than monthly for total mercury must determine the monthly average result, which is the sum of the results of all data obtained in a given month divided by the total number of samples taken, in order to calculate the 12-month rolling average. If the 12-month rolling average for any quarter is less than or equal to the LCA, the permittee will be considered to be in compliance for total mercury for that quarter, provided the permittee is also in full compliance with the Pollutant Minimization Program for Total Mercury, set forth in Part I.A.5. of this permit.

PART I

Section A. Limitations and Monitoring Requirements

h. Total Mercury Testing and Additional Reporting Requirements

The analytical protocol for total mercury shall be in accordance with EPA Method 1631, Revision E, "Mercury in Water by Oxidation, Purge and Trap, and Cold Vapor Atomic Fluorescence Spectrometry," EPA-821-R-02-019, August 2002. The quantification level for total mercury shall be 0.5 ng/l, unless a higher level is appropriate because of sample matrix interference. Justification for higher quantification levels shall be submitted to the Department within 30 days of such determination.

The use of clean technique sampling procedures is required unless the permittee can demonstrate to the Department that an alternate sampling procedure is representative of the discharge. Guidance for clean technique sampling is contained in EPA Method 1669, “Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels (Sampling Guidance),” EPA-821-R96-001, July 1996. Information and data documenting the permittee's sampling and analytical protocols and data acceptability shall be submitted to the Department upon request.

In order to demonstrate compliance with EPA Method 1631E and EPA Method 1669, the permittee shall report, on the daily sheet, the analytical results of all field blanks and field duplicates collected in conjunction with each sampling event, as well as laboratory method blanks when used for blank correction. The permittee shall collect at least one (1) field blank and at least one (1) field duplicate per sampling event. If more than ten (10) samples are collected during a sampling event, the permittee shall collect at least one (1) additional field blank AND field duplicate for every ten (10) samples collected. Only field blanks or laboratory method blanks may be used to calculate a concentration lower than the actual sample analytical results (i.e., a blank correction). Only one (1) blank (field OR laboratory method) may be used for blank correction of a given sample result, and only if the blank meets the quality control acceptance criteria. If blank correction is not performed on a given sample analytical result, the permittee shall report under "Total Mercury – Corrected" the same value reported under "Total Mercury – Uncorrected." The field duplicate is for quality control purposes only; its analytical result shall not be averaged with the sample result.

PART I

Section A. Limitations and Monitoring Requirements

2. Schedule for Final Effluent Limits – Total Phosphorus

A settlement agreement was reached between the permittee and the Department which specified a schedule by which total phosphorus limits shall be based in the permittee's NPDES permit. This schedule was separated into three tiers: Tier 1, Tier 2, and Tier 3. Final effluent limitations and monitoring requirements for each Tier have been incorporated into Part I.A.1. of this permit. Final effluent limitations in Tier 1 are based on the permittee's existing effluent quality and remain in effect through October 1, 2023. Final effluent limitations in Tier 2 are based on the waste load allocation identified in the September 2004 Total Maximum Daily Load for Phosphorus in Ford and Belleville Lakes and may require operational changes at the treatment plant. The Tier 2 effluent limitations take effect on October 2, 2023 and will remain in effect through October 1, 2048.

Beginning October 2, 2048, Tier 3 final effluent limits will take effect. The Tier 3 limits are based on the waste load allocation identified in the November 2019 Total Maximum Daily Load for Phosphorus in Ford and Belleville Lakes. In addition to specifying final effluent limits for total phosphorus, Tier 3 included a compliance schedule the permittee must abide by to ensure they are able to meet the Tier 3 effluent limits on or before October 1, 2048. This compliance schedule has been incorporated below.

The permittee shall achieve compliance with the Tier 3 final effluent limitations for total phosphorus for monitoring point 001A specified in Part I.A.1., in accordance with the following schedule. All submittals shall be to the Department.

a. On or before October 1, 2040, the permittee shall complete a feasibility study to assess potential treatment technologies needed to comply with the Tier 3 limits unless the permittee already has the ability or planned ability to satisfy these limits.

b. On or before October 1, 2043, the permittee shall commence a basis of design report for any necessary upgrades needed to ensure the treatment plant has the capability of meeting the Tier 3 limits.

c. On or before October 1, 2044, the permittee shall submit a permit application to the Department pursuant to Part 41, Sewerage Systems, for review and approval for any necessary treatment plant upgrades identified in the basis of design. The permit application shall include the final basis of design report.

d. On or before March 1, 2045, the permittee shall commence construction of said facilities that have been approved pursuant to Part 41 by the Department.

e. On or before October 1, 2048, the permittee shall complete construction and attain the operational level necessary to meet the Tier 3 limits specified herein.

In the event the permittee believes that implementation of treatment technologies needed to comply with the Tier 3 limits are economically infeasible, then the permittee may assess its financial capability for implementation of necessary treatment technologies using the U.S. EPA's Financial Capability Assessment or similar U.S. EPA financial capability matrix. If the U.S. EPA's Financial Capability Assessment matrix places the permittee in the "High Burden" category, then the permittee may submit a request for modification of the deadlines contained in the Tier 3 compliance schedule to the Department.

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Section A. Limitations and Monitoring Requirements

3. Quantification Levels and Analytical Methods for Selected Parameters

Maximum acceptable quantification levels (QLs) are specified for selected parameters in the table below. These QLs apply to all monitoring conducted in compliance with this permit if and when the parameters specified herein are monitored. This includes monitoring conducted to meet the requirements of the application for permit reissuance. These QLs shall be considered the maximum acceptable unless a higher QL is appropriate because of sample matrix interference. Justification for higher QLs shall be submitted to the Department within 30 days of such determination.

Where necessary to help ensure that the QLs specified herein can be achieved, analytical methods may also be specified in the table below. The sampling procedures, preservation and handling, and analytical protocol for all monitoring conducted in compliance with this permit, including monitoring conducted to meet the requirements of the application for permit reissuance, shall be in accordance with the methods specified herein, or in accordance with Part II.B.2. of this permit if no method is specified herein, unless an alternate method is approved by the Department. The Department will consider only alternate methods that meet the requirements of Part II.B.2. and whose QLs are at least as sensitive (i.e., low) as those specified herein. **Not all QLs are expressed in the same units in the table below**. The table is continued on the following page:

Parameter	QL	Units	Analytical Method
1,2-Diphenylhydrazine (as Azobenzene)	3.0	ug/l	
2,4,6-Trichlorophenol	5.0	ug/l	
2,4-Dinitrophenol	19	ug/l	
3,3'-Dichlorobenzidine	1.5	ug/l	
4-Chloro-3-Methylphenol	7.0	ug/l	
4,4'-DDD	0.01	ug/l	
4,4'-DDE	0.01	ug/l	
4,4'-DDT	0.01	ug/l	
Acrylonitrile	1.0	ug/l	
Aldrin	0.01	ug/l	
Alpha-Endosulfan	0.01	ug/l	
Alpha-Hexachlorocyclohexane	0.01	ug/l	
Antimony, Total	1	ug/l	
Arsenic, Total	1	ug/l	
Barium, Total	5	ug/l	
Benzidine	0.1	ug/l	
Beryllium, Total	1	ug/l	
Beta-Endosulfan	0.01	ug/l	
Beta-Hexachlorocyclohexane	0.01	ug/l	
Bis (2-Chloroethyl) Ether	1.0	ug/l	
Bis (2-Ethylhexyl) Phthalate	5.0	ug/l	
Boron, Total	20	ug/l	
Cadmium, Total	0.2	ug/l	
Chlordane	0.01	ug/l	
Chloride	1.0	mg/l	
Chromium, Hexavalent	5	ug/l	
Chromium, Total	10	ug/l	
Copper, Total	1	ug/l	
Cyanide, Available	2	ug/l	EPA Method OIA 1677

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Section A. Limitations and Monitoring Requirements

Parameter	QL	Units	Analytical Method
Cyanide, Total	5	ug/l	
Delta-Hexachlorocyclohexane	0.01	ug/l	
Dieldrin	0.01	ug/l	
Di-N-Butyl Phthalate	9.0	ug/l	
Endosulfan Sulfate	0.01	ug/l	
Endrin	0.01	ug/l	
Endrin Aldehyde	0.01	ug/l	
Fluoranthene	1.0	ug/l	
Heptachlor	0.01	ug/l	
Heptachlor Epoxide	0.01	ug/l	
Hexachlorobenzene	0.01	ug/l	
Hexachlorobutadiene	0.01	ug/l	
Hexachlorocyclopentadiene	0.01	ug/l	
Hexachloroethane	5.0	ug/l	
Lead, Total	1	ug/l	
Lindane	0.01	ug/l	
Lithium, Total	10	ug/l	
Mercury, Total	0.5	ng/l	EPA Method 1631E
Nickel, Total	5	ug/l	
PCB-1016	0.1	ug/l	
PCB-1221	0.1	ug/l	
PCB-1232	0.1	ug/l	
PCB-1242	0.1	ug/l	
PCB-1248	0.1	ug/l	
PCB-1254	0.1	ug/l	
PCB-1260	0.1	ug/l	
Pentachlorophenol	1.8	ug/l	
Perfluorooctane sulfonate (PFOS)	2.0	ng/l	ASTM D7979 or an isotope dilution method (sometimes referred to as Method 537 modified)
Perfluorooctanoic acid (PFOA)	2.0	ng/l	ASTM D7979 or an isotope dilution method (sometimes referred to as Method 537 modified)
Phenanthrene	1.0	ug/l	
Phosphorus (as P), Total	10	ug/l	
Selenium, Total	1.0	ug/l	
Silver, Total	0.5	ug/l	
Strontium, Total	1000	ug/l	
Sulfate	2.0	mg/l	
Sulfides, Dissolved	20	ug/l	
Thallium, Total	1	ug/l	
Toxaphene	0.1	ug/l	
Vinyl Chloride	1.0	ug/l	
Zinc, Total	10	ug/l	

PART I

Section A. Limitations and Monitoring Requirements

4. Additional Monitoring Requirements

As a condition of this permit, the permittee shall monitor the discharge from monitoring point 001A for the constituents listed below. This monitoring is an application requirement of 40 CFR 122.21(j), effective December 2, 1999. Testing shall be conducted in August 2022, May 2023, March 2024, and October 2024. Grab samples shall be collected for total phenols and the Volatile Organic Compounds identified below. For all other parameters, 24-hour composite samples shall be collected.

Test species for whole effluent toxicity monitoring shall include fathead minnow **and** *Ceriodaphnia dubia,* for a total of four (4) tests on each species. Testing and reporting procedures shall follow procedures contained in EPA-821-R-02-013, "Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms" (Fourth Edition). When the effluent ammonia nitrogen (as N) concentration is greater than 3 mg/l, the pH of the toxicity test shall be maintained at a pH of 8 Standard Units. Acute and chronic toxicity data shall be included in the reporting for the toxicity test results. Toxicity test data acceptability is contingent upon the validation of the test method by the testing laboratory. Such validation shall be submitted to the Department upon request. The permittee shall report to the Department any whole effluent toxicity test results greater than 1.0 TU_A or 1.0 TU_C within five (5) days of becoming aware of the result.

The results of such additional monitoring shall be submitted with the application for reissuance (see the cover page of this permit for the application due date). The permittee shall notify the Department within 14 days of completing the monitoring for each month specified above in accordance with Part II.C.5. Additional reporting requirements are specified in Part II.C.11. If, upon review of the analysis, it is determined that additional requirements are needed to protect the receiving waters in accordance with applicable water quality standards, the permit may then be modified by the Department in accordance with applicable laws and rules.

Whole Effluent Toxicity

acute toxicity	chronic toxicity

Hardness

calcium carbonate

Metals (Total Recoverable), Cyanide and Total Phenols

antimony	arsenic	nickel	zinc
beryllium	cadmium	chromium	
copper	lead	thallium	
selenium	silver	total phenols	

Volatile Organic Compounds

acrolein	acrylonitrile	benzene	bromoform
carbon tetrachloride	chlorobenzene	chlorodibromomethane	chloroethane
2-chloroethylvinyl ether	chloroform	dichlorobromomethane	1,1-dichloroethane
1,2-dichloroethane	trans-1,2-dichloroethylene	1,1-dichloroethylene	1,2-dichloropropane
1,3-dichloropropylene	ethylbenzene	methyl bromide	methyl chloride
methylene chloride	1,1,2,2-tetrachloroethane	tetrachloroethylene	toluene
1,1,1-trichloroethane	1,1,2-trichloroethane	trichloroethylene	vinyl chloride

Acid-Extractable Compounds

4-chloro-3-methylphenol	2-chlorophenol	2,4-dichlorophenol	2,4-dimethylphenol
4,6-dinitro-o-cresol	2,4-dinitrophenol	2-nitrophenol	4-nitrophenol
pentachlorophenol	phenol	2,4,6-trichlorophenol	

PART I

Section A. Limitations and Monitoring Requirements

Base/Neutral Compounds

acenaphthene	acenaphthylene	anthracene	benzidine
benzo(a)anthracene	benzo(a)pyrene	3,4-benzofluoranthene	benzo(ghi)perylene
benzo(k)fluoranthene	bis(2-chloroethoxy)methane	bis(2-chloroethyl)ether	bis(2-chloroisopropyl)ether
bis(2-ethylhexyl)phthalate	4-bromophenyl phenyl ether	butylbenzyl phthalate	2-chloronaphthalene
4-chlorophenyl phenyl ether	chrysene	di-n-butyl phthalate	di-n-octyl phthalate
dibenzo(a,h)anthracene	1,2-dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene
3,3'-dichlorobenzidine	diethyl phthalate	dimethyl phthalate	2,4-dinitrotoluene
2,6-dinitrotoluene	1,2-diphenylhydrazine	fluoranthene	fluorene
hexachlorobenzene	hexachlorobutadiene	hexachlorocyclopentadiene	hexachloroethane
indeno(1,2,3-cd)pyrene	isophorone	naphthalene	nitrobenzene
n-nitrosodi-n-propylamine	n-nitrosodimethylamine	n-nitrosodiphenylamine	phenanthrene
pyrene	1,2,4-trichlorobenzene		

5. Pollutant Minimization Program for Total Mercury

The goal of the Pollutant Minimization Program is to maintain the effluent concentration of total mercury at or below 1.3 ng/l. The permittee shall continue to implement the Pollutant Minimization Program approved on January 26, 2010, and modifications thereto, to proceed toward the goal. The Pollutant Minimization Program includes the following:

a. an annual review and semi-annual monitoring of potential sources of mercury entering the wastewater collection system;

b. a program for quarterly monitoring of influent and periodic monitoring of sludge for mercury; and

c. implementation of reasonable cost-effective control measures when sources of mercury are discovered. Factors to be considered include significance of sources, economic considerations, and technical and treatability considerations.

On or before March 31 of each year, the permittee shall submit a status report to the Department for the previous calendar year that includes 1) the monitoring results for the previous year, 2) an updated list of potential mercury sources, and 3) a summary of all actions taken to reduce or eliminate identified sources of mercury.

Any information generated as a result of the Pollutant Minimization Program set forth in this permit may be used to support a request to modify the approved program or to demonstrate that the Pollutant Minimization Program requirement has been completed satisfactorily.

A request for modification of the approved program and supporting documentation shall be submitted in writing to the Department for review and approval. The Department may approve modifications to the approved program (approval of a program modification does not require a permit modification), including a reduction in the frequency of the requirements under items a. and b. above.

This permit may be modified in accordance with applicable laws and rules to include additional mercury conditions and/or limitations as necessary.

PART I

Section A. Limitations and Monitoring Requirements

6. Pollutant Minimization and Source Evaluation Program for Perfluorooctane Sulfonate (PFOS) and/or Perfluorooctanoic Acid (PFOA)

The goal of the Pollutant Minimization and Source Evaluation Program is to identify and address sources of PFOS and/or PFOA and to reduce and maintain the effluent concentrations of PFOS and/or PFOA at or below the water quality-based effluent limitations (WQBELs). The WQBELs are 12 ng/l for PFOS and 30,000 ng/l for PFOA.

Within 90 days of written notification by the Department or after the permittee notifies the Department that the final effluent concentration of PFOS and/or PFOA has exceeded the WQBELs, the permittee shall submit to the Department an approvable Pollutant Minimization and Source Evaluation Program for PFOS and/or PFOA to proceed toward the goal. The Pollutant Minimization and Source Evaluation Program shall continue work under the Industrial Pretreatment Program Per- and Polyfluoroalkyl Substances (IPP PFAS) Initiative and shall include the following at a minimum:

a. identification of and strategies to identify any additional potential and probable PFOS and/or PFOA sources;

b. monitoring plan for the permitted facility's influent and effluent, as well as effluent from potential sources;

c. implemented measures thus far to eliminate, reduce, and/or control sources, and an assessment of the degree of success and the strategies used to measure success; and

d. proposed measures and implementation schedules for elimination, control, and/or reduction of the identified sources (prioritizing highest loadings and concentrations), and the strategies that will be used to measure success.

The Pollutant Minimization and Source Evaluation Program shall be implemented upon approval by the Department.

On or before May 1 of each year following Pollutant Minimization and Source Evaluation Program implementation, the permittee shall submit to the Department a status report for the previous calendar year. Upon written notification by the Department, the permittee may be required to submit more frequent status reports. Status reports at a minimum shall include:

a. complete listing of PFOS and/or PFOA sources;

b. summary of influent and effluent monitoring data;

c. summary of monitoring data from known or potential sources;

d. history and compliance status for sources;

e. implemented measures to eliminate, reduce, or control sources, (prioritizing highest loadings and concentrations), and an assessment of the degree of success and the strategies used to measure success;

f. proposed measures and schedules for elimination, control, or reduction of any newly identified PFOS and/or PFOA sources (prioritizing highest loadings and concentrations), and the strategies that will be used to measure success;

g. barriers to implementation and revisions to the implementation schedule; and

h. laboratory reports, if not previously supplied.

Any information generated as a result of the Pollutant Minimization and Source Evaluation Program set forth in this permit may be used to support a request to modify the Pollutant Minimization and Source Evaluation Program or to demonstrate that the requirement has been completed satisfactorily.

PART I

Section A. Limitations and Monitoring Requirements

A request for modification of the approved Pollutant Minimization and Source Evaluation Program shall be submitted in writing to the Department along with supporting documentation for review and approval. The Department may approve modifications to the approved Pollutant Minimization and Source Evaluation Program, including a reduction in the frequency of the influent and known or potential source monitoring requirements. Approval of a Pollutant Minimization and Source Evaluation Program modification does not require a permit modification.

This permit may be modified in accordance with applicable laws and rules to include additional PFOS and/or PFOA conditions and/or limitations as necessary.

7. Untreated or Partially Treated Sewage Discharge Reporting and Testing Requirements

In accordance with Section 324.3112a of the NREPA, if untreated or partially treated sewage is directly or indirectly discharged from a sewer system onto land or into the waters of the state, the permittee shall immediately, but not more than 24 hours after the discharge begins, notify local health departments, a daily newspaper of general circulation in the county in which the permittee is located, and a daily newspaper of general circulation in the county or counties in which the municipalities whose waters may be affected by the discharge are located, that the discharge is occurring. The permittee shall also notify the Department via its MiWaters system on the form entitled “Report of Discharge (CSO\SSO\RTB).” The MiWaters website is located at https://miwaters.deq.state.mi.us. At the conclusion of the discharge, the permittee shall make all such notifications specified in, and in accordance with, Section 324.3112a of the NREPA, and shall notify the Department via its MiWaters system on the form entitled “Report of Discharge (CSO\SSO\RTB).”

The permittee shall also annually contact municipalities, including the superintendent of a public drinking water supply with potentially affected intakes, whose waters may be affected by the permittee's discharge of untreated or partially treated sewage, and if those municipalities wish to be notified in the same manner as specified above, the permittee shall provide such notification.

Additionally, in accordance with Section 324.3112a of the NREPA, each time a discharge of untreated or partially treated sewage occurs, the permittee shall test the affected waters for *Escherichia coli* to assess the risk to the public health as a result of the discharge and shall provide the test results to the affected local county health departments and to the Department. The results of this testing shall be submitted to the Department via MiWaters as part of the notification specified above, or, if the results are not yet available, submitted as soon as they become available. This testing is not required if it has been waived by the local health department, or if the discharge(s) did not affect surface waters. The testing shall be done at locations specified by each affected local county health department but shall not exceed 10 tests for each separate discharge event. The affected local county health department may waive this testing requirement if it determines that such testing is not needed to assess the risk to the public health as a result of the discharge event.

Permittees accepting sanitary or municipal sewage from other sewage collection systems are encouraged to notify the owners of those systems of the above reporting and testing requirements.

PART I

Section A. Limitations and Monitoring Requirements

8. Facility Contact

The "Facility Contact" was specified in the application. The permittee may replace the facility contact at any time, and shall notify the Department in writing within 10 days after replacement (including the name, address and telephone number of the new facility contact).

a. The facility contact shall be (or a duly authorized representative of this person):
- for a corporation, a principal executive officer of at least the level of vice president; or a designated representative if the representative is responsible for the overall operation of the facility from which the discharge originates, as described in the permit application or other NPDES form,
- for a partnership, a general partner,
- for a sole proprietorship, the proprietor, or
- for a municipal, state, or other public facility, either a principal executive officer, the mayor, village president, city or village manager or other duly authorized employee.

b. A person is a duly authorized representative only if:
- the authorization is made in writing to the Department by a person described in paragraph a. of this section; and
- the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the facility (a duly authorized representative may thus be either a named individual or any individual occupying a named position).

Nothing in this section releases the permittee from properly submitting reports and forms as required by law.

9. Monthly Operating Reports

Part 41 of Act 451 of 1994 as amended, specifically Section 324.4106 and associated R 299.2953, requires that the permittee file with the Department, on forms prescribed by the Department, operating reports showing the effectiveness of the treatment facility operation and the quantity and quality of liquid wastes discharged into waters of the state.

Within 30 days of the effective date of this permit, the permittee shall submit to the Department a revised treatment facility monitoring program to address monitoring requirement changes reflected in this permit, or submit justification explaining why monitoring requirement changes reflected in this permit do not necessitate revisions to the treatment facility monitoring program. The permittee shall implement the revised treatment facility monitoring program upon approval from the Department. Applicable forms and guidance are available on the Department's web site at https://www.michigan.gov/egle/0,9429,7-135-3313_71618_44117---,00.html. The permittee may use alternate forms if they are consistent with the approved treatment facility monitoring program. Unless the Department provides written notification to the permittee that monthly submittal of operating reports is required, operating reports that result from implementation of the approved treatment facility monitoring program shall be maintained on site for a minimum of three (3) years and shall be made available to the Department for review upon request.

PART I

Section A. Limitations and Monitoring Requirements

10. Asset Management

The permittee shall at all times properly operate and maintain all facilities (i.e., the sewer system and treatment works as defined in Part 41 of the NREPA), and control systems installed or used by the permittee to operate the sewer system and treatment works and achieve and maintain compliance with the conditions of this permit (also see Part II.D.3 of this permit). The requirements of an Asset Management Program function to achieve the goals of effective performance, adequate funding, and adequate operator staffing and training. Asset management is a planning process for ensuring that optimum value is gained for each asset and that financial resources are available to rehabilitate and replace those assets when necessary. Asset management is centered on a framework of five (5) core elements: the current state of the assets; the required sustainable level of service; the assets critical to sustained performance; the minimum life-cycle costs; and the best long-term funding strategy.

a. Asset Management Program Requirements

On or before August 1, 2022, the permittee shall submit to the Department an Asset Management Plan for review and approval. An approvable Asset Management Plan shall contain a schedule for the development and implementation of an Asset Management Program that meets the requirements outlined below in 1) – 4). A copy of any Asset Management Program requirements already completed by the permittee should be submitted as part of the Asset Management Plan. Upon approval by the Department the permittee shall implement the Asset Management Plan. (The permittee may choose to include the Operation and Maintenance Manual required under Part II.C.14. of this permit as part of their Asset Management Program).

1) *Maintenance Staff.* The permittee shall provide an adequate staff to carry out the operation, maintenance, repair, and testing functions required to ensure compliance with the terms and conditions of this permit. The level of staffing needed shall be determined by taking into account the work involved in operating the sewer system and treatment works, planning for and conducting maintenance, and complying with this permit.

2) *Collection System Map.* The permittee shall complete a map of the sewer collection system it owns and operates. The map shall be of sufficient detail and at a scale to allow easy interpretation. The collection system information shown on the map shall be based on current conditions and shall be kept up-to-date and available for review by the Department. **Note: Items below referencing combined sewer systems are not applicable to separate sewer systems.** Such map(s) shall include but not be limited to the following:

a) all sanitary sewer lines and related manholes;

b) all combined sewer lines, related manholes, catch basins and CSO regulators;

c) all known or suspected connections between the sanitary sewer or combined sewer and storm drain systems;

d) all outfalls, including the treatment plant outfall(s), combined sewer treatment facility outfalls, untreated CSOs, and any known SSOs;

e) all pump stations and force mains;

f) the wastewater treatment facility(ies), including all treatment processes;

g) all surface waters (labeled);

h) other major appurtenances such as inverted siphons and air release valves;

PART I

Section A. Limitations and Monitoring Requirements

i) a numbering system which uniquely identifies manholes, catch basins, overflow points, regulators and outfalls;

j) the scale and a north arrow;

k) the pipe diameter, date of installation, type of material, distance between manholes, and the direction of flow; and

l) the manhole interior material, rim elevation (optional), and invert elevations.

3) *Inventory and assessment of fixed assets.* The permittee shall complete an inventory and assessment of operations-related fixed assets including portions of the collection system owned and operated by the permittee. Fixed assets are assets that are normally stationary (e.g., pumps, blowers, buildings, manholes, and sewer lines). The inventory and assessment shall be based on current conditions and shall be kept up-to-date and available for review by the Department.

a) The fixed asset inventory shall include the following:

(1) a brief description of the fixed asset, its design capacity (e.g., pump: 120 gallons per minute), its level of redundancy, and its tag number if applicable;

(2) the location of the fixed asset;

(3) the year the fixed asset was installed;

(4) the present condition of the fixed asset (e.g., excellent, good, fair, poor); and

(5) the current fixed asset (replacement) cost in dollars for year specified in accordance with approved schedules;

b) The fixed asset assessment shall include a “Business Risk Evaluation” that combines the probability of failure of the fixed asset and the criticality of the fixed asset, as follows:

(1) Rate the probability of failure of the fixed asset on a scale of 1-5 (low to high) using criteria such as maintenance history, failure history, and remaining percentage of useful life (or years remaining);

(2) Rate the criticality of the fixed asset on a scale of 1-5 (low to high) based on the consequence of failure versus the desired level of service for the facility; and

(3) Compute the Business Risk Factor of the fixed asset by multiplying the failure rating from (1) by the criticality rating from (2).

4) *Operation, Maintenance & Replacement (OM&R) Budget and Rate Sufficiency for the Sewer System and Treatment Works.* The permittee shall complete an assessment of its user rates and replacement fund, including the following:

a) beginning and end dates of fiscal year;

b) name of the department, committee, board, or other organization that sets rates for the operation of the sewer system and treatment works;

PART I

Section A. Limitations and Monitoring Requirements

c) amount in the permittee's replacement fund in dollars for year specified in accordance with approved schedules;

d) replacement fund strategy of all assets with a useful life of 20 years or less;

e) expenditures for maintenance, corrective action and capital improvement taken during the fiscal year;

f) OM&R budget for the fiscal year; and

g) rate calculation demonstrating sufficient revenues to cover OM&R expenses. If the rate calculation shows there are insufficient revenues to cover OM&R expenses, the permittee shall document, within three (3) fiscal years after submittal of the Asset Management Plan, that there is at least one rate adjustment that reduces the revenue gap by at least 10 percent. The permittee may prepare and submit an alternate plan, subject to Department approval, for addressing the revenue gap. The ultimate goal of the Asset Management Program is to ensure sufficient revenues to cover OM&R expenses.

b. Annual Reporting

The permittee shall develop a written report that summarizes asset management activities completed during the previous year and planned for the upcoming year. The written report shall be submitted to the Department on or before August 1 of each year. The written report shall include:

1) a description of the staffing levels maintained during the year;

2) a description of inspections and maintenance activities conducted and corrective actions taken during the previous year;

3) expenditures for collection system maintenance activities, treatment works maintenance activities, corrective actions, and capital improvement during the previous year;

4) a summary of assets/areas identified for inspection/action (including capital improvement) in the upcoming year based on the five (5) core elements and the Business Risk Factors computed in accordance with condition a.3)b)(3) above;

5) a maintenance budget and capital improvement budget for the upcoming year that take into account implementation of an effective Asset Management Program that meets the five (5) core elements;

6) an updated asset inventory based on the original submission; and

7) an updated OM&R budget with an updated rate schedule that includes the amount of insufficient revenues, if any.

PART I

Section A. Limitations and Monitoring Requirements

11. Discharge Monitoring Report – Quality Assurance Study Program

The permittee shall participate in the Discharge Monitoring Report – Quality Assurance (DMR-QA) Study Program. The purpose of the DMR-QA Study Program is to annually evaluate the proficiency of all in-house and/or contract laboratory(ies) that perform, on behalf of the facility authorized to discharge under this permit, the analytical testing required under this permit. In accordance with Section 308 of the Clean Water Act (33 U.S.C. § 1318); and R 323.2138 and R 323.2154 of Part 21, Wastewater Discharge Permits, promulgated under Part 31 of the NREPA, participation in the DMR-QA Study Program is required for all major facilities, and for minor facilities selected for participation by the Department.

Annually and in accordance with DMR-QA Study Program requirements and submittal due dates, the permittee shall submit to the Michigan DMR-QA Study Program state coordinator all documentation required by the DMR-QA Study. DMR-QA Study Program participation is required only for the analytes required under this permit and only when those analytes are also identified in the DMR-QA Study.

If the permitted facility's status as a major facility should change, participation in the DMR-QA Study Program may be reevaluated. Questions concerning participation in the DMR-QA Study Program should be directed to the Michigan DMR-QA Study Program state coordinator.

All forms and instructions required for participation in the DMR-QA Study Program, including submittal due dates and state coordinator contact information, can be found at http://www.epa.gov/compliance/discharge-monitoring-report-quality-assurance-study-program.

12. Continuous Monitoring

If continuous monitoring equipment is used and becomes temporarily inoperable, the permittee shall manually obtain a minimum of three (3) equally spaced grab samples/readings within each 24-hour period for the affected parameter(s). On such days, in the comment field on the Daily tab of the DMR, the permittee shall indicate "continuous monitoring system inoperable," the date on which the system is expected to become operable again, and the number of samples/readings obtained during each 24-hour period.

PART I

Section B. Storm Water Pollution Prevention

Section B. Storm Water Pollution Prevention is not required for this permit.

PART I

Section C. Industrial Waste Pretreatment Program

1. Federal Industrial Pretreatment Program

a. The permittee shall continue to implement the Federal Industrial Pretreatment Program (FIPP) approved on July 23, 1985, and any subsequent modifications approved up to the issuance of this permit. Approval of substantial program modifications after the issuance of this permit shall be incorporated into this permit by minor modification in accordance with 40 CFR 122.63.

b. The permittee shall comply with R 323.2301 through R 323.2317 of the Michigan Administrative Code (Part 23 Rules), the General Pretreatment Regulations for Existing and New Sources of Pollution (40 CFR Part 403), and the approved FIPP.

c. The permittee shall have the legal authority and necessary interjurisdictional agreements that provide the basis for the implementation and enforcement of the approved FIPP throughout the service area. The legal authority and necessary interjurisdictional agreements shall include, at a minimum, the authority to carry out the activities specified in R 323.2306(a).

d. The permittee shall develop procedures which describe, in sufficient detail, program commitments which enable implementation of the approved FIPP, 40 CFR Part 403, and the Part 23 Rules in accordance with R 323.2306(c).

e. The permittee shall establish an interjurisdictional agreement (or comparable document) with all tributary governmental jurisdictions. Each interjurisdictional agreement shall contain, at a minimum, the following:

1) identification of the agency responsible for the implementation and enforcement of the approved FIPP within the tributary governmental jurisdiction's boundaries; and

2) the provision of the legal authority which provides the basis for the implementation and enforcement of the approved FIPP within the tributary governmental jurisdiction's boundaries.

f. The permittee shall prohibit discharges that:

1) cause, in whole or in part, the permittee's failure to comply with any condition of this permit or the NREPA;

2) restrict, in whole or in part, the permittee's management of biosolids;

3) cause, in whole or in part, operational problems at the treatment facility or in its collection system;

4) violate any of the general or specific prohibitions identified in R 323.2303(1) and (2);

5) violate categorical standards identified in R 323.2311; and

6) violate local limits established in accordance with R 323.2303(4).

g. The permittee shall maintain a list of its nondomestic users that meet the criteria of a significant industrial user as identified in R 323.2302(cc).

PART I

Section C. Industrial Waste Pretreatment Program

h. The permittee shall develop an enforcement response plan which describes, in sufficient detail, program commitments which will enable the enforcement of the approved FIPP, 40 CFR Part 403, and the Part 23 Rules in accordance with R 323.2306(g).

i. The Department may require modifications to the approved FIPP which are necessary to ensure compliance with 40 CFR Part 403 and the Part 23 Rules in accordance with R 323.2309.

j. The permittee shall not implement changes or modifications to the approved FIPP without notification to the Department. Any substantial modification shall be subject to Department public noticing and approval in accordance with R 323.2309.

k. The permittee shall maintain an adequate revenue structure and staffing level for effective implementation of the approved FIPP.

l. The permittee shall develop and maintain, for a minimum of three (3) years, all records and information necessary to determine nondomestic user compliance with 40 CFR Part 403, Part 23 Rules and the approved FIPP. This period of retention shall be extended during the course of any unresolved enforcement action or litigation regarding a nondomestic user or when requested by the Department or the United States Environmental Protection Agency. All of the aforementioned records and information shall be made available upon request for inspection and copying by the Department and the United States Environmental Protection Agency.

m. The permittee shall evaluate the approved FIPP for compliance with the 40 CFR Part 403, Part 23 Rules and the prohibitions stated in item f. above. Based upon this evaluation, the permittee shall propose to the Department all necessary changes or modifications to the approved FIPP no later than the next Industrial Pretreatment Program Annual Report due date (see item p. below).

n. The permittee shall develop and enforce local limits to implement the prohibitions listed in item f above. Local limits shall be based upon data representative of actual conditions demonstrated in a maximum allowable headworks loading analysis. An evaluation of whether the existing local limits need to be revised shall be submitted to the Department by February 1, 2023. The submittal shall provide a technical evaluation of the basis upon which this determination was made which includes information regarding the maximum allowable headworks loading, collection system protection criteria, and worker health and safety, based upon data collected since the last local limits review.

The following pollutants shall be evaluated:

1) Arsenic, Cadmium, Chromium, Copper, Cyanide, Lead, Mercury, Nickel, Silver, and Zinc;

2) Pollutants that are subject to limits or monitoring in this permit;

3) Pollutants that have an existing local limit; and,

4) Other pollutants of concern which would reasonably be expected to be discharged or transported by truck or rail or otherwise introduced into the POTW.

o. The permittee is required under this permit and R 323.2303(4) of the Michigan Administrative Code to review and update their local limits when:

1) new pollutants are introduced;

PART I

Section C. Industrial Waste Pretreatment Program

2) new pollutants that were previously unevaluated are identified;

3) new water quality or biosolids standards are established or additional information becomes available about the nature of pollutants, such as removal rates and accumulation in biosolids; or

4) substantial increases of pollutants are proposed as required in the notification of new or increased uses in accordance with the provisions of 40 CFR 122.42.

p. On or before April 1 of each year, the permittee shall submit to the Department, as required by R 323.2310(8), an Industrial Pretreatment Program Annual Report on the status of program implementation and enforcement activities. The reporting period shall begin on January 1 and end on December 31. At a minimum, the Industrial Pretreatment Program Annual Report shall include:

1) the Pretreatment Program Reports data identified in Appendix A to 40 CFR Part 127 – NPDES Electronic Reporting;

2) a summary of changes to the approved FIPP that have not been previously reported to the Department;

3) a summary of results of all the sampling and analyses performed of the wastewater treatment plant's influent, effluent, and biosolids conducted in accordance with approved methods during the reporting period. The summary shall include the monthly average, daily maximum, quantification level, and number of samples analyzed for each pollutant. At a minimum, the results of analyses for all locally limited parameters for at least one monitoring event that tests influent, effluent and biosolids during the reporting period shall be submitted with each report, unless otherwise required by the Department. Sample collection shall be at intervals sufficient to provide pollutant removal rates, unless the pollutant is not measurable; and

4) any other relevant information requested by the Department.

PART I

Section D. Residuals Management Program

1. Residuals Management Program for Land Application of Biosolids

The permittee is authorized to land-apply bulk biosolids or prepare bulk biosolids for land application in accordance with the permittee's approved Residuals Management Program (RMP) approved on September 27, 2002, and approved modifications thereto, and the requirements established in R 323.2401 through R 323.2418 of the Michigan Administrative Code (Part 24 Rules). The approved RMP, and any approved modifications thereto, are enforceable requirements of this permit. Incineration, landfilling and other residual disposal activities shall be conducted in accordance with Part II.D.7. of this permit. The Part 24 Rules can be obtained via the internet (http://www.michigan.gov/egle/ and near the top of the screen click on Water, then towards the bottom right of the screen click on Permits, Wastewater, Biosolids, then click on Biosolids Laws and Rules Information which is under the Laws & Rules banner in the center of the screen).

a. Annual Report

On or before October 30 of each year, the permittee shall submit an annual report to the Department for the previous fiscal year of October 1 through September 30. The report shall be submitted electronically via the Department's MiWaters system at https://miwaters.deq.state.mi.us. At a minimum, the report shall contain:

1) a certification that current residuals management practices are in accordance with the approved RMP, or a proposal for modification to the approved RMP; and

2) a completed Annual Report Form for Reporting Biosolids, available at https://miwaters.deq.state.mi.us.

b. Modifications to the Approved RMP

Prior to implementation of modifications to the RMP, the permittee shall submit proposed modifications to the Department for approval. The approved modification shall become effective upon the date of approval. Upon written notification, the Department may impose additional requirements and/or limitations to the approved RMP as necessary to protect public health and the environment from any adverse effect of a pollutant in the biosolids.

c. Record Keeping

Records required by the Part 24 Rules shall be kept for a minimum of five (5) years. However, the records documenting cumulative loading for sites subject to cumulative pollutant loading rates shall be kept as long as the site receives biosolids.

d. Contact Information

RMP-related submittals shall be made to the Department.

PART II

Section A. Definitions

Part II may include terms and /or conditions not applicable to discharges covered under this permit.

Acute toxic unit (TUA) means 100/LC50 where the LC50 is determined from a whole effluent toxicity (WET) test which produces a result that is statistically or graphically estimated to be lethal to 50% of the test organisms.

Annual monitoring frequency refers to a calendar year beginning on January 1 and ending on December 31. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Authorized public agency means a state, local, or county agency that is designated pursuant to the provisions of Section 9110 of Part 91, Soil and Sedimentation Control, of the NREPA, to implement soil erosion and sedimentation control requirements with regard to construction activities undertaken by that agency.

Best management practices (BMPs) means structural devices or nonstructural practices that are designed to prevent pollutants from entering into storm water, to direct the flow of storm water, or to treat polluted storm water.

Bioaccumulative chemical of concern (BCC) means a chemical which, upon entering the surface waters, by itself or as its toxic transformation product, accumulates in aquatic organisms by a human health bioaccumulation factor of more than 1000 after considering metabolism and other physiochemical properties that might enhance or inhibit bioaccumulation. The human health bioaccumulation factor shall be derived according to R 323.1057(5). Chemicals with half-lives of less than 8 weeks in the water column, sediment, and biota are not BCCs. The minimum bioaccumulation concentration factor (BAF) information needed to define an organic chemical as a BCC is either a field-measured BAF or a BAF derived using the biota-sediment accumulation factor (BSAF) methodology. The minimum BAF information needed to define an inorganic chemical as a BCC, including an organometal, is either a field-measured BAF or a laboratory-measured bioconcentration factor (BCF). The BCCs to which these rules apply are identified in Table 5 of R 323.1057 of the Water Quality Standards.

Biosolids are the solid, semisolid, or liquid residues generated during the treatment of sanitary sewage or domestic sewage in a treatment works. This includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes and a derivative of the removed scum or solids.

Bulk biosolids means biosolids that are not sold or given away in a bag or other container for application to a lawn or home garden.

CAFO means concentrated animal feeding operation.

Certificate of Coverage (COC) is a document, issued by the Department, which authorizes a discharge under a general permit.

Chronic toxic unit (TUC) means 100/MATC or 100/IC25, where the maximum acceptable toxicant concentration (MATC) and IC25 are expressed as a percent effluent in the test medium.

Class B biosolids refers to material that has met the Class B pathogen reduction requirements or equivalent treatment by a Process to Significantly Reduce Pathogens (PSRP) in accordance with the Part 24 Rules, Land Application of Biosolids, promulgated under Part 31 of the NREPA. Processes include aerobic digestion, composting, anaerobic digestion, lime stabilization and air drying.

Combined sewer system is a sewer system in which storm water runoff is combined with sanitary wastes.

PART II

Section A. Definitions

Composite sample is a sample collected over time, either by continuous sampling or by mixing discrete samples. A composite sample represents the average wastewater characteristics present during the compositing period. Various methods for compositing are available and are based on either time or flow-proportioning, the choice of which will depend on the permit requirements.

Continuous monitoring refers to sampling/readings that occur at regular and consistent intervals throughout a 24-hour period and at a frequency sufficient to capture data that are representative of the discharge. The maximum acceptable interval between samples/readings shall be one (1) hour.

Daily concentration
FOR PARAMETERS OTHER THAN pH, DISSOLVED OXYGEN, TEMPERATURE, AND CONDUCTIVITY – Daily concentration is the sum of the concentrations of the individual samples of a parameter taken within a calendar day divided by the number of samples taken within that calendar day. The daily concentration will be used to determine compliance with any maximum and minimum daily concentration limitations. For guidance and examples showing how to perform calculations using results below quantification levels, see the document entitled "Reporting Results Below Quantification," available at https://www.michigan.gov/documents/deq/wrd-npdes-results-quantification_620791_7.pdf.

FOR pH, DISSOLVED OXYGEN, TEMPERATURE, AND CONDUCTIVITY – The daily concentration used to determine compliance with maximum daily pH, temperature, and conductivity limitations is the highest pH, temperature, and conductivity readings obtained within a calendar day. The daily concentration used to determine compliance with minimum daily pH and dissolved oxygen limitations is the lowest pH and dissolved oxygen readings obtained within a calendar day.

Daily loading is the total discharge by weight of a parameter discharged during any calendar day. This value is calculated by multiplying the daily concentration by the total daily flow and by the appropriate conversion factor. The daily loading will be used to determine compliance with any maximum daily loading limitations. When required by the permit, report the maximum calculated daily loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMRs.

Daily monitoring frequency refers to a 24-hour day. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Department means the Michigan Department of Environment, Great Lakes, and Energy.

Detection level means the lowest concentration or amount of the target analyte that can be determined to be different from zero by a single measurement at a stated level of probability.

Discharge means the addition of any waste, waste effluent, wastewater, pollutant, or any combination thereof to any surface water of the state.

EC_{50} means a statistically or graphically estimated concentration that is expected to cause 1 or more specified effects in 50% of a group of organisms under specified conditions.

PART II

Section A. Definitions

Fecal coliform bacteria monthly
FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – Fecal coliform bacteria monthly is the geometric mean of all daily concentrations determined during a discharge event. Days on which no daily concentration is determined shall not be used to determine the calculated monthly value. The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMR. If the period in which the discharge event occurred was partially in each of two months, the calculated monthly value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – Fecal coliform bacteria monthly is the geometric mean of all daily concentrations determined during a reporting month. Days on which no daily concentration is determined shall not be used to determine the calculated monthly value. The calculated monthly value will be used to determine compliance with the maximum monthly fecal coliform bacteria limitations. When required by the permit, report the calculated monthly value in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMR.

Fecal coliform bacteria 7-day
FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – Fecal coliform bacteria 7-day is the geometric mean of the daily concentrations determined during any 7 consecutive days of discharge during a discharge event. If the number of daily concentrations determined during the discharge event is less than 7 days, the number of actual daily concentrations determined shall be used for the calculation. Days on which no daily concentration is determined shall not be used to determine the value. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day geometric mean value for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. If the 7-day period was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – Fecal coliform bacteria 7-day is the geometric mean of the daily concentrations determined during any 7 consecutive days in a reporting month. If the number of daily concentrations determined is less than 7, the actual number of daily concentrations determined shall be used for the calculation. Days on which no daily concentration is determined shall not be used to determine the value. The calculated 7-day value will be used to determine compliance with the maximum 7-day fecal coliform bacteria limitations. When required by the permit, report the maximum calculated 7-day geometric mean for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs. The first calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

Flow-proportioned composite sample is a composite sample in which either a) the volume of each portion of the composite is proportional to the effluent flow rate at the time that portion is obtained; or b) a constant sample volume is obtained at varying time intervals proportional to the effluent flow rate.

General permit means an NPDES permit authorizing a category of similar discharges.

Geometric mean is the average of the logarithmic values of a base 10 data set, converted back to a base 10 number.

Grab sample is a single sample taken at neither a set time nor flow.

IC_{25} means the toxicant concentration that would cause a 25% reduction in a nonquantal biological measurement for the test population.

PART II

Section A. Definitions

Illicit connection means a physical connection to a municipal separate storm sewer system that primarily conveys non-storm water discharges other than uncontaminated groundwater into the storm sewer; or a physical connection not authorized or permitted by the local authority, where a local authority requires authorization or a permit for physical connections.

Illicit discharge means any discharge to, or seepage into, a municipal separate storm sewer system that is not composed entirely of storm water or uncontaminated groundwater. Illicit discharges include non-storm water discharges through pipes or other physical connections; dumping of motor vehicle fluids, household hazardous wastes, domestic animal wastes, or litter; collection and intentional dumping of grass clippings or leaf litter; or unauthorized discharges of sewage, industrial waste, restaurant wastes, or any other non-storm water waste directly into a separate storm sewer.

Individual permit means a site-specific NPDES permit.

Inlet means a catch basin, roof drain, conduit, drain tile, retention pond riser pipe, sump pump, or other point where storm water or wastewater enters into a closed conveyance system prior to discharge off site or into waters of the state.

Interference is a discharge which, alone or in conjunction with a discharge or discharges from other sources, both: 1) inhibits or disrupts a POTW, its treatment processes or operations, or its sludge processes, use or disposal; and 2) therefore, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or, of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent state or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including Title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including state regulations contained in any state sludge management plan prepared pursuant to Subtitle D of the SWDA), the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act. [This definition does not apply to sample matrix interference].

Land application means spraying or spreading biosolids or a biosolids derivative onto the land surface, injecting below the land surface, or incorporating into the soil so that the biosolids or biosolids derivative can either condition the soil or fertilize crops or vegetation grown in the soil.

LC_{50} means a statistically or graphically estimated concentration that is expected to be lethal to 50% of a group of organisms under specified conditions.

Maximum acceptable toxicant concentration (MATC) means the concentration obtained by calculating the geometric mean of the lower and upper chronic limits from a chronic test. A lower chronic limit is the highest tested concentration that did not cause the occurrence of a specific adverse effect. An upper chronic limit is the lowest tested concentration which did cause the occurrence of a specific adverse effect and above which all tested concentrations caused such an occurrence.

Maximum extent practicable means implementation of best management practices by a public body to comply with an approved storm water management program as required by a national permit for a municipal separate storm sewer system, in a manner that is environmentally beneficial, technically feasible, and within the public body’s legal authority.

MBTU/hr means million British Thermal Units per hour.

MGD means million gallons per day.

PART II

Section A. Definitions

Monthly concentration is the sum of the daily concentrations determined during a reporting period divided by the number of daily concentrations determined. The calculated monthly concentration will be used to determine compliance with any maximum monthly concentration limitations. Days with no discharge shall not be used to determine the value. When required by the permit, report the calculated monthly concentration in the "AVERAGE" column under "QUALITY OR CONCENTRATION" on the DMR.

For minimum percent removal requirements, the monthly influent concentration and the monthly effluent concentration shall be determined. The calculated monthly percent removal, which is equal to 100 times the quantity [1 minus the quantity (monthly effluent concentration divided by the monthly influent concentration)], shall be reported in the "MINIMUM" column under "QUALITY OR CONCENTRATION" on the DMRs.

Monthly loading is the sum of the daily loadings of a parameter divided by the number of daily loadings determined during a reporting period. The calculated monthly loading will be used to determine compliance with any maximum monthly loading limitations. Days with no discharge shall not be used to determine the value. When required by the permit, report the calculated monthly loading in the "AVERAGE" column under "QUANTITY OR LOADING" on the DMR.

Monthly monitoring frequency refers to a calendar month. When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Municipal separate storm sewer means a conveyance or system of conveyances designed or used for collecting or conveying storm water which is not a combined sewer and which is not part of a POTW as defined in the Code of Federal Regulations at 40 CFR 122.2.
Municipal separate storm sewer system (MS4) means all separate storm sewers that are owned or operated by the United States, a state, city, village, township, county, district, association, or other public body created by or pursuant to state law, having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under state law, such as a sewer district, flood control district, or drainage district, or similar entity, or a designated or approved management agency under Section 208 of the Clean Water Act that discharges to the waters of the state. This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

National Pretreatment Standards are the regulations promulgated by or to be promulgated by the Federal Environmental Protection Agency pursuant to Section 307(b) and (c) of the Clean Water Act. The standards establish nationwide limits for specific industrial categories for discharge to a POTW.

No observed adverse effect level (NOAEL) means the highest tested dose or concentration of a substance which results in no observed adverse effect in exposed test organisms where higher doses or concentrations result in an adverse effect.

Noncontact cooling water is water used for cooling which does not come into direct contact with any raw material, intermediate product, by-product, waste product or finished product.

Nondomestic user is any discharger to a POTW that discharges wastes other than or in addition to water-carried wastes from toilet, kitchen, laundry, bathing or other facilities used for household purposes.

Nonstructural controls are practices or procedures implemented by employees at a facility to manage storm water or to prevent contamination of storm water.

NPDES means National Pollutant Discharge Elimination System.

Outfall is the location at which a point source discharge first enters a surface water of the state.

PART II

Section A. Definitions

Part 91 agency means an agency that is designated by a county board of commissioners pursuant to the provisions of Section 9105 of Part 91 of the NREPA; an agency that is designated by a city, village, or township in accordance with the provisions of Section 9106 of Part 91 of the NREPA; or the Department for soil erosion and sedimentation control activities under Part 615, Supervisor of Wells; Part 631, Reclamation of Mining Lands; or Part 632, Nonferrous Metallic Mineral Mining, of the NREPA, pursuant to the provisions of Section 9115 of Part 91 of the NREPA.

Part 91 permit means a soil erosion and sedimentation control permit issued by a Part 91 agency pursuant to the provisions of Part 91 of the NREPA.

Partially treated sewage is any sewage, sewage and storm water, or sewage and wastewater, from domestic or industrial sources that is treated to a level less than that required by the permittee's NPDES permit, or that is not treated to national secondary treatment standards for wastewater, including discharges to surface waters from retention treatment facilities.

Point of discharge is the location of a point source discharge where storm water is discharged directly into a separate storm sewer system.

Point source discharge means a discharge from any discernible, confined, discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, or rolling stock. Changing the surface of land or establishing grading patterns on land will result in a point source discharge where the runoff from the site is ultimately discharged to waters of the state.
Polluting material means any material, in solid or liquid form, identified as a polluting material under the Part 5 Rules, Spillage of Oil and Polluting Materials, promulgated under Part 31 of the NREPA (R 324.2001 through R 324.2009 of the Michigan Administrative Code).

POTW is a publicly owned treatment work.

Predevelopment is the last land use prior to the planned new development or redevelopment.

Pretreatment is reducing the amount of pollutants, eliminating pollutants, or altering the nature of pollutant properties to a less harmful state prior to discharge into a public sewer. The reduction or alteration can be by physical, chemical, or biological processes, process changes, or by other means. Dilution is not considered pretreatment unless expressly authorized by an applicable National Pretreatment Standard for a particular industrial category.

Public (as used in the MS4 individual permit) means all persons who potentially could affect the authorized storm water discharges, including, but not limited to, residents, visitors to the area, public employees, businesses, industries, and construction contractors and developers.

Public body means the United States; the state of Michigan; a city, village, township, county, school district, public college or university, or single-purpose governmental agency; or any other body which is created by federal or state statute or law.

Qualified Personnel means an individual who meets qualifications acceptable to the Department and who is authorized by an Industrial Storm Water Certified Operator to collect the storm water sample.

Qualifying storm event means a storm event causing greater than 0.1 inch of rainfall and occurring at least 72 hours after the previous measurable storm event that also caused greater than 0.1 inch of rainfall. Upon request, the Department may approve an alternate definition meeting the condition of a qualifying storm event.

PART II

Section A. Definitions

Quantification level means the measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calculated at a specified concentration above the detection level. It is considered the lowest concentration at which a particular contaminant can be quantitatively measured using a specified laboratory procedure for monitoring of the contaminant.

Quarterly monitoring frequency refers to a three-month period, defined as January through March, April through June, July through September, and October through December (or otherwise defined in the permit). When required by this permit, an analytical result, reading, value or observation shall be reported for that period if a discharge occurs during that period.

Regional Administrator is the Region 5 Administrator, U.S. EPA, located at R-19J, 77 W. Jackson Blvd., Chicago, Illinois 60604.

Regulated area means the permittee's urbanized area, where urbanized area is defined as a place and its adjacent densely-populated territory that together have a minimum population of 50,000 people as defined by the United States Bureau of the Census and as determined by the latest available decennial census.

Secondary containment structure means a unit, other than the primary container, in which significant materials are packaged or held, which is required by state or federal law to prevent the escape of significant materials by gravity into sewers, drains, or otherwise directly or indirectly into any sewer system or to the surface waters or groundwaters of the state.

Separate storm sewer system means a system of drainage, including, but not limited to, roads, catch basins, curbs, gutters, parking lots, ditches, conduits, pumping devices, or man-made channels, which is not a combined sewer where storm water mixes with sanitary wastes, and is not part of a POTW.

Significant industrial user is a nondomestic user that: 1) is subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; or 2) discharges an average of 25,000 gallons per day or more of process wastewater to a POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process waste stream which makes up five (5) percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the permittee as defined in 40 CFR 403.12(a) on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's treatment plant operation or violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Significant materials means any material which could degrade or impair water quality, including but not limited to: raw materials; fuels; solvents, detergents, and plastic pellets; finished materials such as metallic products; hazardous substances designated under Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (see 40 CFR 372.65); any chemical the facility is required to report pursuant to Section 313 of Emergency Planning and Community Right-to-Know Act (EPCRA); polluting materials as identified under the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code); Hazardous Wastes as defined in Part 111, Hazardous Waste Management, of the NREPA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with storm water discharges.

Significant spills and significant leaks means any release of a polluting material reportable under the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code).

Special-use area means storm water discharges for which the Department has determined that additional monitoring is needed from: secondary containment structures required by state or federal law; lands on Michigan's List of Sites of Environmental Contamination pursuant to Part 201, Environmental Remediation, of the NREPA; and/or areas with other activities that may contribute pollutants to the storm water.

PART II

Section A. Definitions

Stoichiometric means the quantity of a reagent calculated to be necessary and sufficient for a given chemical reaction.

Storm water means storm water runoff, snow melt runoff, surface runoff and drainage, and non-storm water included under the conditions of this permit.

Storm water discharge point is the location where the point source discharge of storm water is directed to surface waters of the state or to a separate storm sewer. It includes the location of all point source discharges where storm water exits the facility, including outfalls which discharge directly to surface waters of the state, and points of discharge which discharge directly into separate storm sewer systems.

Structural controls are physical features or structures used at a facility to manage or treat storm water.

SWPPP means the Storm Water Pollution Prevention Plan prepared in accordance with this permit.

Tier I value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier I toxicity database.

Tier II value means a value for aquatic life, human health or wildlife calculated under R 323.1057 of the Water Quality Standards using a tier II toxicity database.

Total maximum daily loads (TMDLs) are required by the Clean Water Act for waterbodies that do not meet water quality standards. TMDLs represent the maximum daily load of a pollutant that a waterbody can assimilate and meet water quality standards, and an allocation of that load among point sources, nonpoint sources, and a margin of safety.

Toxicity reduction evaluation (TRE) means a site-specific study conducted in a stepwise process designed to identify the causative agents of effluent toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in effluent toxicity.
Water Quality Standards means the Part 4 Water Quality Standards promulgated pursuant to Part 31 of the NREPA, being R 323.1041 through R 323.1117 of the Michigan Administrative Code.

Weekly monitoring frequency refers to a calendar week which begins on Sunday and ends on Saturday. When required by this permit, an analytical result, reading, value, or observation shall be reported for that period if a discharge occurs during that period. If the calendar week begins in one month and ends in the following month, the analytical result, reading, value, or observation shall be reported in the month in which monitoring was conducted.

WWSL is a wastewater stabilization lagoon.

WWSL discharge event is a discrete occurrence during which effluent is discharged to the surface water up to 10 days of a consecutive 14-day period.

3-portion composite sample is a sample consisting of three equal-volume grab samples collected at equal intervals over an 8-hour period.

PART II

Section A. Definitions

7-day concentration
FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – The 7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days of discharge during a WWSL discharge event divided by the number of daily concentrations determined. If the number of daily concentrations determined during the WWSL discharge event is less than 7 days, the number of actual daily concentrations determined shall be used for the calculation. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations. When required by the permit, report the maximum calculated 7-day concentration for the WWSL discharge event in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMR. If the WWSL discharge event was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – The 7-day concentration is the sum of the daily concentrations determined during any 7 consecutive days in a reporting month divided by the number of daily concentrations determined. If the number of daily concentrations determined is less than 7, the actual number of daily concentrations determined shall be used for the calculation. The calculated 7-day concentration will be used to determine compliance with any maximum 7-day concentration limitations in the reporting month. When required by the permit, report the maximum calculated 7-day concentration for the month in the "MAXIMUM" column under "QUALITY OR CONCENTRATION" on the DMR. The first 7-day calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

7-day loading
FOR WWSLs THAT COLLECT AND STORE WASTEWATER AND ARE AUTHORIZED TO DISCHARGE ONLY IN THE SPRING AND/OR FALL ON AN INTERMITTENT BASIS – The 7-day loading is the sum of the daily loadings determined during any 7 consecutive days of discharge during a WWSL discharge event divided by the number of daily loadings determined. If the number of daily loadings determined during the WWSL discharge event is less than 7 days, the number of actual daily loadings determined shall be used for the calculation. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations. When required by the permit, report the maximum calculated 7-day loading for the WWSL discharge event in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMR. If the WWSL discharge event was partially in each of two months, the value shall be reported on the DMR of the month in which the last day of discharge occurred.

FOR ALL OTHER DISCHARGES – The 7-day loading is the sum of the daily loadings determined during any 7 consecutive days in a reporting month divided by the number of daily loadings determined. If the number of daily loadings determined is less than 7, the actual number of daily loadings determined shall be used for the calculation. The calculated 7-day loading will be used to determine compliance with any maximum 7-day loading limitations in the reporting month. When required by the permit, report the maximum calculated 7-day loading for the month in the "MAXIMUM" column under "QUANTITY OR LOADING" on the DMR. The first 7-day calculation shall be made on day 7 of the reporting month, and the last calculation shall be made on the last day of the reporting month.

24-hour composite sample is a flow-proportioned composite sample consisting of hourly or more frequent portions that are taken over a 24-hour period and in which the volume of each portion is proportional to the discharge flow rate at the time that portion is taken. A time-proportioned composite sample may be used upon approval from the Department if the permittee demonstrates it is representative of the discharge.

PART II

Section B. Monitoring Procedures

1. Representative Samples

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge.

2. Test Procedures

Test procedures for the analysis of pollutants shall conform to regulations promulgated pursuant to Section 304(h) of the Clean Water Act (40 CFR Part 136 – Guidelines Establishing Test Procedures for the Analysis of Pollutants), unless specified otherwise in this permit. **Test procedures used shall be sufficiently sensitive to determine compliance with applicable effluent limitations**. For lists of approved test methods, go to https://www.epa.gov/cwa-methods. Requests to use test procedures not promulgated under 40 CFR Part 136 for pollutant monitoring required by this permit shall be made in accordance with the Alternate Test Procedures regulations specified in 40 CFR 136.4. These requests shall be submitted to the Manager of the Permits Section, Water Resources Division, Michigan Department of Environment, Great Lakes, and Energy, P.O. Box 30458, Lansing, Michigan, 48909-7958. The permittee may use such procedures upon approval.

The permittee shall periodically calibrate and perform maintenance procedures on all analytical instrumentation at intervals to ensure accuracy of measurements. The calibration and maintenance shall be performed as part of the permittee's laboratory Quality Assurance/Quality Control program.

3. Instrumentation

The permittee shall periodically calibrate and perform maintenance procedures on all monitoring instrumentation at intervals to ensure accuracy of measurements.

4. Recording Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information: 1) the exact place, date, and time of measurement or sampling; 2) the person(s) who performed the measurement or sample collection; 3) the dates the analyses were performed; 4) the person(s) who performed the analyses; 5) the analytical techniques or methods used; 6) the date of and person responsible for equipment calibration; and 7) the results of all required analyses.

5. Records Retention

All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed, calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation, shall be retained for a minimum of three (3) years, or longer if requested by the Regional Administrator or the Department.

PART II

Section C. Reporting Requirements

1. Start-Up Notification

The permittee shall notify the Department of start-up if one of the following conditions applies and in accordance with the applicable condition:

a. Non-CAFOs

1) **If this is an individual permit** and the permittee will not discharge during the first 60 days following the effective date of this permit, the permittee shall notify the Department via MiWaters within 14 days following the effective date of this permit, and then again 60 days prior to commencement of the discharge.

2) **If this is a general permit** and the permittee will not discharge during the first 60 days following the effective date of the Certificate of Coverage (COC) issued under this general permit, the permittee shall notify the Department via MiWaters within 14 days following the effective date of the COC, and then again 60 days prior to commencement of the discharge.

b. CAFOs

1) **If this is an individual permit** and the permittee will not populate with animals during the first 60 days following the effective date of this permit, the permittee shall notify the Department via MiWaters within 14 days following the effective date of this permit, and then again 60 days prior to populating with animals.

2) **If this is a general permit** and the permittee will not populate with animals during 60 days following the effective date of the Certificate of Coverage (COC) issued under this general permit, the permittee shall notify the Department via MiWaters within 14 days following the effective date of the COC, and then again 60 days prior to populating with animals.

2. Submittal Requirements for Self-Monitoring Data

Part 31 of the NREPA (specifically Section 324.3110(7)); and R 323.2155(2) of Part 21, Wastewater Discharge Permits, promulgated under Part 31 of the NREPA, allow the Department to specify the forms to be utilized for reporting the required self-monitoring data. Unless instructed on the effluent limitations page to conduct "Retained Self-Monitoring," the permittee shall submit self-monitoring data via the Department's MiWaters system.

The permittee shall utilize the information provided on the MiWaters website, located at https://miwaters.deq.state.mi.us, to access and submit the electronic forms. Both monthly summary and daily data shall be submitted to the Department no later than the 20th day of the month following each month of the authorized discharge period(s). The permittee may be allowed to submit the electronic forms after this date if the Department has granted an extension to the submittal date.

3. Retained Self-Monitoring Requirements

If instructed on the effluent limits page (or otherwise authorized by the Department in accordance with the provisions of this permit) to conduct retained self-monitoring, the permittee shall maintain a year-to-date log of retained self-monitoring results and, upon request, provide such log for inspection to the staff of the Department. Retained self-monitoring results are public information and shall be promptly provided to the public upon request.

The permittee shall certify, in writing, to the Department, on or before January 10 (April 1 for animal feeding operation facilities) of each year, that: 1) all retained self-monitoring requirements have been complied with and a year-to-date log has been maintained; and 2) the application on which this permit is based still accurately

PART II

Section C. Reporting Requirements

describes the discharge. With this annual certification, the permittee shall submit a summary of the previous year's monitoring data. The summary shall include maximum values for samples to be reported as daily maximums and/or monthly maximums and minimum values for any daily minimum samples.

Retained self-monitoring may be denied to a permittee by notification in writing from the Department. In such cases, the permittee shall submit self-monitoring data in accordance with Part II.C.2., above. Such a denial may be rescinded by the Department upon written notification to the permittee. Reissuance or modification of this permit or reissuance or modification of an individual permittee's authorization to discharge shall not affect previous approval or denial for retained self-monitoring unless the Department provides notification in writing to the permittee.

4. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Discharge Monitoring Report. Such increased frequency shall also be indicated.

Monitoring required pursuant to Part 41 of the NREPA or Rule 35 of the Mobile Home Park Commission Act, 1987 PA 96, as amended, for assurance of proper facility operation, shall be submitted as required by the Department.

5. Compliance Dates Notification

Within 14 days of every compliance date specified in this permit, the permittee shall submit a written notification to the Department via MiWaters (https://miwaters.deq.state.mi.us) indicating whether or not the particular requirement was accomplished. If the requirement was not accomplished, the notification shall include an explanation of the failure to accomplish the requirement, actions taken or planned by the permittee to correct the situation, and an estimate of when the requirement will be accomplished. If a written report is required to be submitted by a specified date and the permittee accomplishes this, a separate written notification is not required.

6. Noncompliance Notification

Compliance with all applicable requirements set forth in the Clean Water Act, Parts 31 and 41 of the NREPA, and related regulations and rules is required. All instances of noncompliance shall be reported as follows:

a. 24-Hour Reporting
Any noncompliance which may endanger health or the environment (including maximum and/or minimum daily concentration discharge limitation exceedances) shall be reported, verbally, within 24 hours from the time the permittee becomes aware of the noncompliance by calling the Department at the number indicated on the second page of this permit (or, if this is a general permit, on the COC). A written submission shall also be provided via MiWaters (https://miwaters.deq.state.mi.us) within five (5) days.

b. Other Reporting
The permittee shall report, in writing via MiWaters (https://miwaters.deq.state.mi.us), all other instances of noncompliance not described in a. above at the time monitoring reports are submitted; or, in the case of retained self-monitoring, within five (5) days from the time the permittee becomes aware of the noncompliance.

Reporting shall include: 1) a description of the discharge and cause of noncompliance; and 2) the period of noncompliance, including exact dates and times, or, if not yet corrected, the anticipated time the noncompliance is expected to continue, and the steps taken to reduce, eliminate and prevent recurrence of the noncomplying discharge.

PART II

Section C. Reporting Requirements

7. Spill Notification

The permittee shall immediately report any release of any polluting material which occurs to the surface waters or groundwaters of the state, unless the permittee has determined that the release is not in excess of the threshold reporting quantities specified in the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code), by calling the Department at the number indicated on the second page of this permit (or, if this is a general permit, on the COC); or, if the notice is provided after regular working hours, by calling the Department's 24-hour Pollution Emergency Alerting System telephone number, 1-800-292-4706.

Within 10 days of the release, the permittee shall submit to the Department via MiWaters (https://miwaters.deq.state.mi.us) a full written explanation as to the cause of the release, the discovery of the release, response measures (clean-up and/or recovery) taken, and preventive measures taken or a schedule for completion of measures to be taken to prevent reoccurrence of similar releases.

8. Upset Noncompliance Notification

If a process "upset" (defined as an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee) has occurred, the permittee who wishes to establish the affirmative defense of upset shall notify the Department by telephone within 24 hours of becoming aware of such conditions; and within five (5) days, provide in writing, the following information:

a. that an upset occurred and that the permittee can identify the specific cause(s) of the upset;

b. that the permitted wastewater treatment facility was, at the time, being properly operated and maintained (note that an upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation); and

c. that the permittee has specified and taken action on all responsible steps to minimize or correct any adverse impact in the environment resulting from noncompliance with this permit.

No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

In any enforcement proceedings, the permittee, seeking to establish the occurrence of an upset, has the burden of proof.

9. Bypass Prohibition and Notification

a. Bypass Prohibition
Bypass is prohibited, and the Department may take an enforcement action, unless:

1) bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

2) there were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass; and

3) the permittee submitted notices as required under 9.b. or 9.c. below.

b. Notice of Anticipated Bypass

PART II

Section C. Reporting Requirements

If the permittee knows in advance of the need for a bypass, the permittee shall submit written notification to the Department before the anticipated date of the bypass. This notification shall be submitted at least 10 days before the date of the bypass; however, the Department will accept fewer than 10 days advance notice if adequate explanation for this is provided. The notification shall provide information about the anticipated bypass as required by the Department. The Department may approve an anticipated bypass, after considering its adverse effects, if it will meet the three (3) conditions specified in a. above.

c. Notice of Unanticipated Bypass
As soon as possible but no later than 24 hours from the time the permittee becomes aware of the unanticipated bypass, the permittee shall notify the Department by calling the number indicated on the second page of this permit (or, if this is a general permit, on the COC); or, if notification is provided after regular working hours, call the Department's 24-hour Pollution Emergency Alerting System telephone number, 1-800-292-4706.

d. Written Report of Bypass
A written submission shall be provided within five (5) working days of commencing any bypass to the Department, and at additional times as directed by the Department. The written submission shall contain a description of the bypass and its cause; the period of bypass, including exact dates and times, and if the bypass has not been corrected, the anticipated time it is expected to continue; steps taken or planned to reduce, eliminate, and prevent reoccurrence of the bypass; and other information as required by the Department.

e. Bypass Not Exceeding Limitations
The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to ensure efficient operation. These bypasses are not subject to the provisions of 9.a., 9.b., 9.c., and 9.d., above. This provision does not relieve the permittee of any notification responsibilities under Part II.C.11. of this permit.

f. Definitions

1) Bypass means the intentional diversion of waste streams from any portion of a treatment facility.

2) Severe property damage means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

10. Bioaccumulative Chemicals of Concern (BCC)

Consistent with the requirements of R 323.1098 and R 323.1215 of the Michigan Administrative Code, the permittee is prohibited from undertaking any action that would result in a lowering of water quality from an increased loading of a BCC unless an increased use request and antidegradation demonstration have been submitted and approved by the Department.

11. Notification of Changes in Discharge

The permittee shall notify the Department via MiWaters (https://miwaters.deq.state.mi.us), as soon as possible but within no more than 10 days of knowing, or having reason to believe, that any activity or change has occurred or will occur which would result in the discharge of: 1) detectable levels of chemicals on the current Michigan Critical Materials Register, priority pollutants or hazardous substances set forth in 40 CFR 122.21, Appendix D, or the Pollutants of Initial Focus in the Great Lakes Water Quality Initiative specified in 40 CFR 132.6, Table 6, which were not acknowledged in the application or listed in the application at less than

PART II

Section C. Reporting Requirements

detectable levels; 2) detectable levels of any other chemical not listed in the application or listed at less than detection, for which the application specifically requested information; or 3) any chemical at levels greater than five times the average level reported in the complete application (see the first page of this permit, for the date(s) the complete application was submitted). Any other monitoring results obtained as a requirement of this permit shall be reported in accordance with the compliance schedules.

12. Changes in Facility Operations

Any anticipated action or activity, including but not limited to facility expansion, production increases, or process modification, which will result in new or increased loadings of pollutants to the receiving waters must be reported to the Department by a) submission of an increased use request (application) and all information required under R 323.1098 (Antidegradation) of the Water Quality Standards or b) by written notice if the following conditions are met: 1) the action or activity will not result in a change in the types of wastewater discharged or result in a greater quantity of wastewater than currently authorized by this permit; 2) the action or activity will not result in violations of the effluent limitations specified in this permit; 3) the action or activity is not prohibited by the requirements of Part II.C.10.; and 4) the action or activity will not require notification pursuant to Part II.C.11. Following such written notice, the permit or, if applicable, the facility's COC, may be modified according to applicable laws and rules to specify and limit any pollutant not previously limited.

13. Transfer of Ownership or Control

In the event of any change in ownership or control of facilities from which the authorized discharge emanates, the following requirements apply: Not less than 30 days prior to the actual transfer of ownership or control – for non-CAFOs, or within 30 days of the actual transfer of ownership or control – for CAFOs, the permittee shall submit to the Department via MiWaters (https://miwaters.deq.state.mi.us) a written agreement between the current permittee and the new permittee containing: 1) the legal name and address of the new owner; 2) a specific date for the effective transfer of permit responsibility, coverage and liability; and 3) a certification of the continuity of or any changes in operations, wastewater discharge, or wastewater treatment.

If the new permittee is proposing changes in operations, wastewater discharge, or wastewater treatment, the Department may propose modification of this permit in accordance with applicable laws and rules.

14. Operations and Maintenance Manual

For wastewater treatment facilities that serve the public (and are thus subject to Part 41 of the NREPA), Section 4104 of Part 41 and associated Rule 2957 of the Michigan Administrative Code allow the Department to require an Operations and Maintenance (O&M) Manual from the facility. An up-to-date copy of the O&M Manual shall be kept at the facility and shall be provided to the Department upon request. The Department may review the O&M Manual in whole or in part at its discretion and require modifications to it if portions are determined to be inadequate.

At a minimum, the O&M Manual shall include the following information: permit standards; descriptions and operation information for all equipment; staffing information; laboratory requirements; record keeping requirements; a maintenance plan for equipment; an emergency operating plan; safety program information; and copies of all pertinent forms, as-built plans, and manufacturer's manuals.

Certification of the existence and accuracy of the O&M Manual shall be submitted to the Department at least sixty days prior to start-up of a new wastewater treatment facility. Recertification shall be submitted sixty days prior to start-up of any substantial improvements or modifications made to an existing wastewater treatment facility.

PART II

Section C. Reporting Requirements

15. Signatory Requirements

All applications, reports, or information submitted to the Department in accordance with the conditions of this permit and that require a signature shall be signed and certified as described in the Clean Water Act and the NREPA.

The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

The NREPA (Section 3115(2)) provides that a person who at the time of the violation knew or should have known that he or she discharged a substance contrary to this part, or contrary to a permit, COC, or order issued or rule promulgated under this part, or who intentionally makes a false statement, representation, or certification in an application for or form pertaining to a permit or COC or in a notice or report required by the terms and conditions of an issued permit or COC, or who intentionally renders inaccurate a monitoring device or record required to be maintained by the Department, is guilty of a felony and shall be fined not less than $2,500.00 or more than $25,000.00 for each violation. The court may impose an additional fine of not more than $25,000.00 for each day during which the unlawful discharge occurred. If the conviction is for a violation committed after a first conviction of the person under this subsection, the court shall impose a fine of not less than $25,000.00 per day and not more than $50,000.00 per day of violation. Upon conviction, in addition to a fine, the court in its discretion may sentence the defendant to imprisonment for not more than 2 years or impose probation upon a person for a violation of this part. With the exception of the issuance of criminal complaints, issuance of warrants, and the holding of an arraignment, the circuit court for the county in which the violation occurred has exclusive jurisdiction. However, the person shall not be subject to the penalties of this subsection if the discharge of the effluent is in conformance with and obedient to a rule, order, permit, or COC of the Department. In addition to a fine, the attorney general may file a civil suit in a court of competent jurisdiction to recover the full value of the injuries done to the natural resources of the state and the costs of surveillance and enforcement by the state resulting from the violation.

16. Electronic Reporting

Upon notice by the Department that electronic reporting tools are available for specific reports or notifications, the permittee shall submit electronically via MiWaters (https://miwaters.deq.state.mi.us) all such reports or notifications as required by this permit, on forms provided by the Department.

PART II

Section D. Management Responsibilities

1. Duty to Comply

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit, more frequently than, or at a level in excess of, that authorized, shall constitute a violation of the permit.

It is the duty of the permittee to comply with all the terms and conditions of this permit. Any noncompliance with the Effluent Limitations, Special Conditions, or terms of this permit constitutes a violation of the NREPA and/or the Clean Water Act and constitutes grounds for enforcement action; for permit or COC termination, revocation and reissuance, or modification; or denial of an application for permit or COC renewal.

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

2. Operator Certification

The permittee shall have the waste treatment facilities under direct supervision of an operator certified at the appropriate level for the facility certification by the Department, as required by Sections 3110 and 4104 of the NREPA. Permittees authorized to discharge storm water shall have the storm water treatment and/or control measures under direct supervision of a storm water operator certified by the Department, as required by Section 3110 of the NREPA.

3. Facilities Operation

The permittee shall, at all times, properly operate and maintain all treatment or control facilities or systems installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes adequate laboratory controls and appropriate quality assurance procedures.

4. Power Failures

In order to maintain compliance with the effluent limitations of this permit and prevent unauthorized discharges, the permittee shall either:

a. provide an alternative power source sufficient to operate facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit; or

b. upon the reduction, loss, or failure of one or more of the primary sources of power to facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit, the permittee shall halt, reduce or otherwise control production and/or all discharge in order to maintain compliance with the effluent limitations and conditions of this permit.

5. Adverse Impact

The permittee shall take all reasonable steps to minimize or prevent any adverse impact to the surface waters or groundwaters of the state resulting from noncompliance with any effluent limitation specified in this permit including, but not limited to, such accelerated or additional monitoring as necessary to determine the nature and impact of the discharge in noncompliance.

6. Containment Facilities

The permittee shall provide facilities for containment of any accidental losses of polluting materials in accordance with the requirements of the Part 5 Rules (R 324.2001 through R 324.2009 of the Michigan Administrative Code). For a POTW, these facilities shall be approved under Part 41 of the NREPA.

PART II

Section D. Management Responsibilities

7. Waste Treatment Residues

Residuals (i.e. solids, sludges, biosolids, filter backwash, scrubber water, ash, grit, or other pollutants or wastes) removed from or resulting from treatment or control of wastewaters, including those that are generated during treatment or left over after treatment or control has ceased, shall be disposed of in an environmentally compatible manner and according to applicable laws and rules. These laws may include, but are not limited to, the NREPA, Part 31 for protection of water resources, Part 55 for air pollution control, Part 111 for hazardous waste management, Part 115 for solid waste management, Part 121 for liquid industrial wastes, Part 301 for protection of inland lakes and streams, and Part 303 for wetlands protection. Such disposal shall not result in any unlawful pollution of the air, surface waters or groundwaters of the state.

8. Right of Entry

The permittee shall allow the Department, any agent appointed by the Department, or the Regional Administrator, upon the presentation of credentials and, for animal feeding operation facilities, following appropriate biosecurity protocols:

a. to enter upon the permittee's premises where an effluent source is located or any place in which records are required to be kept under the terms and conditions of this permit; and

b. at reasonable times to have access to and copy any records required to be kept under the terms and conditions of this permit; to inspect process facilities, treatment works, monitoring methods and equipment regulated or required under this permit; and to sample any discharge of pollutants.

9. Availability of Reports

Except for data determined to be confidential under Section 308 of the Clean Water Act and Rule 2128 (R 323.2128 of the Michigan Administrative Code), all reports prepared in accordance with the terms of this permit and required to be submitted to the Department shall be available for public inspection via MiWaters (https://miwaters.deq.state.mi.us). As required by the Clean Water Act, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Clean Water Act and Sections 3112, 3115, 4106 and 4110 of the NREPA.

10. Duty to Provide Information

The permittee shall furnish to the Department via MiWaters (https://miwaters.deq.state.mi.us), within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or the facility's COC, or to determine compliance with this permit. The permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

PART II

Section E. Activities Not Authorized by This Permit

1. Discharge to the Groundwaters

This permit does not authorize any discharge to the groundwaters. Such discharge may be authorized by a groundwater discharge permit issued pursuant to the NREPA.

2. POTW Construction

This permit does not authorize or approve the construction or modification of any physical structures or facilities at a POTW. Approval for the construction or modification of any physical structures or facilities at a POTW shall be by permit issued under Part 41 of the NREPA.

3. Civil and Criminal Liability

Except as provided in permit conditions on "Bypass" (Part II.C.9. pursuant to 40 CFR 122.41(m)), nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond the permittee's control, such as accidents, equipment breakdowns, or labor disputes.

4. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee may be subject under Section 311 of the Clean Water Act except as are exempted by federal regulations.

5. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Clean Water Act.

6. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other Department of Environment, Great Lakes, and Energy permits, or approvals from other units of government as may be required by law.

CITY OF ANN ARBOR, MICHIGAN

WATER UTILITIES DEPARTMENT

WASTEWATER TREATMENT PLANT

DISINFECTION FACILITIES UPGRADE

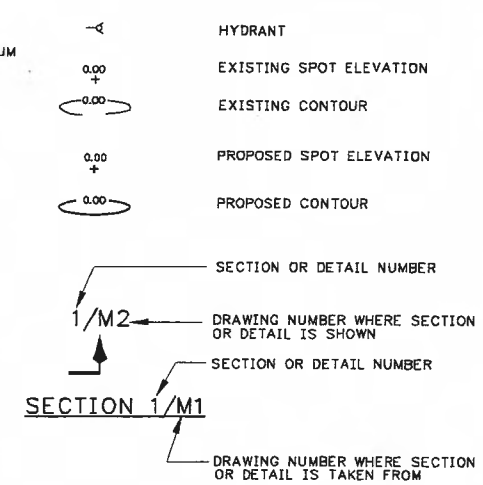
GREELEY AND HANSEN
211 WEST FORT STREET, SUITE 710
DETROIT, MICHIGAN 48226-3202

OCTOBER 1999

ABBREVIATIONS

ADDL	ADDITIONAL
BITUM	BITUMINOUS
BC	BOLT CIRCLE
BM	BENCH MARK
BWW	BACKWASH WASTE WATER
CI	CAST IRON
CIP	CAST IN PLACE
CB	CATCH BASIN
C.C OR C/C	CENTER TO CENTER
CE	CHLORINATED EFFLUENT
CHS	CALCIUM HYPOCHLORYTE SOLUTION
℄	CENTER LINE
CLG	CHLORINE GAS
CLR OR CL.	CLEARANCE
CLS	CHLORINE SOLUTION
CMCP	CORRUGATED METAL CULVERT PIPE
CONC	CONCRETE
DWG	DRAWING
DI	DUCTILE IRON
ϕ OR DIA OR ⌀	DIAMETER
DIM	DIMENSION
DWLS	DOWELS
EF	EACH FACE
EL OR ELEV	ELEVATION
EMB	EMBEDMENT
EP	EDGE OF PAVEMENT
EQUIP.OR EQPT.	EQUIPMENT
EXIST. OR EX.	EXISTING
℄	CONSTRUCTION JOINT
EXP	EXPANSION
FE	FILTERED EFFLUENT
FIG	FIGURE
GAL. OR GALV	GALVANIZED
HDPE	HIGH DENSITY POLYETHYLENE
HOR	HORIZONTAL
HP	HIGH POINT
HWS	HOT WATER SERVICE
ID	INSIDE DIAMETER
INV	INVERT ELEVATION
IN.	INCH
LF	LINEAL FEET
LP	LOW POINT
MH	MANHOLE
MDOT	MICHIGAN DEPARTMENT OF TRANSPORTATION
MAX	MAXIMUM
MIN	MINIMUM
ML	MIXED LIQUOR
N	NORTH
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTER DIAMETER
PEW	PLANT EFFLUENT WATER
PL	PLATE
PVM'T	PAVEMENT
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
PL	PROPERTY LINE
PRV	PRESSURE RELIEF VALVE
RCP	REINFORCED CONCRETE PIPE
R/W OR ROW	RIGHT-OF-WAY
REINF	REINFORCING
RS	RETURN SLUDGE
SD	STORM DRAIN
SDS	SULFUR DIOXIDE SOLUTION
SE	SECONDARY EFFLUENT
SH	SHEET
SS OR SST	STAINLESS STEEL
S.P. OR SAM	SAMPLING PIPE
SPEC	SPECIFICATION
SQ	SQUARE
STD	STANDARD
STL	STEEL
T/	TOP OF
TE	TERTIARY EFFLUENT
TOC	TOP OF CONCRETE
TYP	TYPICAL
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VP	VENT PIPE
W	WEST
W/	WITH
WM	WATER MAIN
WP	WORK POINT
WS	WATER SURFACE
UNO	UNLESS NOTED OTHERWISE
USGS	UNITED STATES COAST AND GEODETIC SURVEY
UV	ULTRAVIOLET

LEGEND



GENERAL NOTES:

1. SECTION CUTTING PLANES ARE IDENTIFIED WITH A SECTION NUMBER AND THE DRAWING NUMBER ON WHICH THE SECTION IS SHOWN , I.E. 1/M3. SECTION TITLES INCLUDE A FRACTION, WHERE THE NUMERATOR SHOWS THE SECTION IDENTIFYING NUMBER , AND THE DENOMINATOR INDICATES THE DRAWING ON WHICH THE SECTION IS CUT, I.E. SECTION 1/M3.
2. DETAILS ARE IDENTIFIED WITH A NUMBER FOLLOWED BY THE DRAWING ON WHICH THE DETAIL IS SHOWN, I.E. 1/M3. DETAIL TITLES INCLUDE A FRACTION, WHERE THE NUMERATOR SHOWS THE DETAIL NUMBER AND THE DENOMINATOR INDICATES THE DRAWING ON WHICH THE DETAIL IS CROSS REFERENCED, I.E. DETAIL 3/S1.
3. MAKE AN ON-SITE INSPECTION OF THE FACILITY AND RELATED CONDITIONS PRIOR TO BIDDING THIS CONTRACT.
4. A DISTINCTION BETWEEN NEW AND EXISTING MATERIALS, EQUIPMENT AND STRUCTURES HAS BEEN MADE ON THE DRAWINGS BY LINE WEIGHT. HEAVY REPRESENTS NEW, LIGHT REPRESENTS EXISTING.
5. AN ASTERISK (*) AT NEW CONSTRUCTION DENOTES LOCATIONS, ELEVATIONS, DIMENSIONS AND OTHER INFORMATION DEPENDENT ON THE CONTRACTOR'S APPROVED WORKING DRAWINGS. DEVELOP AND SHOW THE INFORMATION MARKED WITH AN ASTERISK (*) ON SUBMITTALS AND DEVELOP AND PROVIDE SUCH INFORMATION FOR ALL ASTERISKS (*) WITHIN OR INTERFACING WITH ANY SUBMITTALS AND BETWEEN SUBMITTALS. THIS REQUIREMENT ALSO EXTENDS TO CONDITIONS OR SITUATIONS WHERE A LOCATION, DIMENSION, ELEVATION OR OTHER ITEM IS INDICATED TO BE DETERMINED AFTER FINAL SELECTION OF EQUIPMENT AND/OR APPURTENANCES. ALL INFORMATION FOR ASTERISK (*) EQUIPMENT AND APPURTENANCES SITUATIONS DESCRIBED HEREIN ARE THE RESPONSIBILITY OF THE CONTRACTOR TO DEVELOP AND ASSURE COMPATIBLE INTERFACING FOR A COMPLETE, COORDINATED AND TROUBLE-FREE OPERATING INSTALLATION.
6. GENERAL NOTES AND SYMBOLS ARE PROVIDED FOR EACH DISCIPLINE (E.G. ELECTRICAL, MECHANICAL, ETC). SEE APPROPRIATE DISCIPLINE DRAWINGS IN GENERAL SECTION OF THE PLANS.
7. ▭ INDICATES AREAS OF NEW WORK, //// INDICATES DEMOLITION.
8. PERFORM ALL WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE MICHIGAN SOIL EROSION AND SEDIMENTATION CONTROL ACT, ACT 347, OF THE PUBLIC ACTS OF 1972 AS AMENDED AND THE REGULATIONS OF THE LOCAL ENFORCING AGENCIES.
9. IN COMPLIANCE WITH PUBLIC ACT 53 OF THE STATE OF MICHIGAN NOTIFY IN ADVANCE OF CONSTRUCTION ALL PUBLIC AND PRIVATE OWNERS HAVING EXISTING IN OR NEAR THE IMMEDIATE WORK AREA.
10. LOCATIONS, ELEVATIONS AND DIMENSIONS OF EXISTING STRUCTURES, PIPING, EQUIPMENT, APPURTENANCES AND OTHER FEATURES ARE SHOWN ACCORDING TO THE BEST INFORMATION AT THE TIME OF PREPARATION OF THESE CONTRACT DOCUMENTS BUT DO NOT PURPORT TO BE ABSOLUTELY CORRECT. FIELD VERIFY THE LOCATIONS AND DIMENSIONS OF ALL EXISTING STRUCTURES, PIPING, EQUIPMENT, APPURTENANCES AND OTHER FEATURES AFFECTING WORK PRIOR TO CONSTRUCTION.
11. ELEVATION DATUM IS THE NGVD OF 1929 OF THE U.S.G.S. BENCH MARKS ARE SHOWN ON THE SITE PLAN AND ARE AS FOLLOWS:
    NO. 1. CHISELED 'x' IN CONCRETE BASE ON FLAGPOLE, ELEVATION 739.44.
    NO. 2. TOP OF NE ANCHOR BOLT ON LIGHT POLE ELEVATION, 736.53.
    NO. 3. CHISELED SQUARE IN CONCRETE AT EAST PLANT FLOW SPLIT, ELEVATION 744.03.
12. ALL PIPE SUPPORTS, ANCHOR BOLT ASSEMBLIES, MOUNTING BRACKETS, UNISTRUT, CLAMPS AND METAL FASTENERS SHALL BE CONSTRUCTED OF TYPE 316 L STAINLESS STEEL.
13. REQUIREMENTS FOR, AND LOCATIONS, ARRANGEMENTS, ELEVATIONS AND DIMENSIONS OF STRUCTURAL WORK, PIPING, EQUIPMENT, GRATING, ELECTRICAL GEAR, CONDUIT, CABLE, WIRING AND APPURTENANCES ARE DEPENDENT ON CONTRACTOR'S SELECTION OF PRE-QUALIFIED MANUFACTURER OF UV EQUIPMENT. CONTRACTOR'S BID SHALL REFLECT HIS SELECTION OF THE PRE-QUALIFIED MANUFACTURER OF UV EQUIPMENT INCLUDING ALL COSTS FOR PROVIDING AND INSTALLING ALL NECESSARY STRUCTURAL WORK, PIPING, EQUIPMENT, GRATING, ELECTRICAL GEAR, CONDUIT, CABLE, WIRING AND APPURTENANCES. FINAL LOCATIONS, ARRANGEMENTS, ELEVATIONS AND DIMENSIONS OF STRUCTURAL WORK, PIPING, EQUIPMENT, GRATING, ELECTRICAL GEAR, CONDUIT, CABLE, WIRING AND APPURTENANCES SHALL BE IN ACCORDANCE WITH APPROVED WORKING DRAWINGS.
14. THE ELECTRICAL DRAWINGS DEPICT ALTERNATE ELECTRICAL WORK DEPENDENT ON THE UV EQUIPMENT PROVIDED AS FOLLOWS:
    ALTERNATE A TROJAN TECHNOLOGIES, INC.
    ALTERNATE B CALGON CARBON CORPORATION?

GENERAL STRUCTURAL NOTES

1. CONSIDER ALL SECTIONS, DETAILS AND NOTES TO BE TYPICAL AND TO APPLY TO SIMILAR SITUATIONS.
2. CONSIDER ALL DIMENSIONS AND SIZES OF EXISTING CONSTRUCTION INDICATED ON DRAWINGS APPROXIMATE AND VERIFY IN FIELD.
3. REPORT VARIATIONS BETWEEN ACTUAL FIELD CONDITIONS AND CONDITIONS SHOWN ON THE DRAWINGS TO THE ENGINEER PRIOR TO BEGINNING WORK.
4. THE WORK INCLUDES THE DESIGN AND CONSTRUCTION OF ALL SHORING, BRACING AND FALSEWORK REQUIRED FOR THE WORK.
5. STRENGTH OF CONCRETE AT 28 DAYS: F'c = 4,000 P.S.I.
   YIELD STRENGTH OF REINFORCING STEEL: Fy = 60,000 P.S.I.
6. PROVIDE EXPOSED CORNERS WITH A 3/4" CHAMFER AND REENTRANT CORNERS WITH A 3/4" FLAT FILLET UNLESS OTHERWISE NOTED.
7. LOCATE EXISTING REINFORCEMENT BARS WITH A PACHOMETER BEFORE ANY PENETRATIONS ARE MADE IN THE EXISTING CONCRETE.

DRAWING INDEX

RECORD DRAWING

THIS RECORD IS NOT WARRANTED BUT IS BELLEVED 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

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

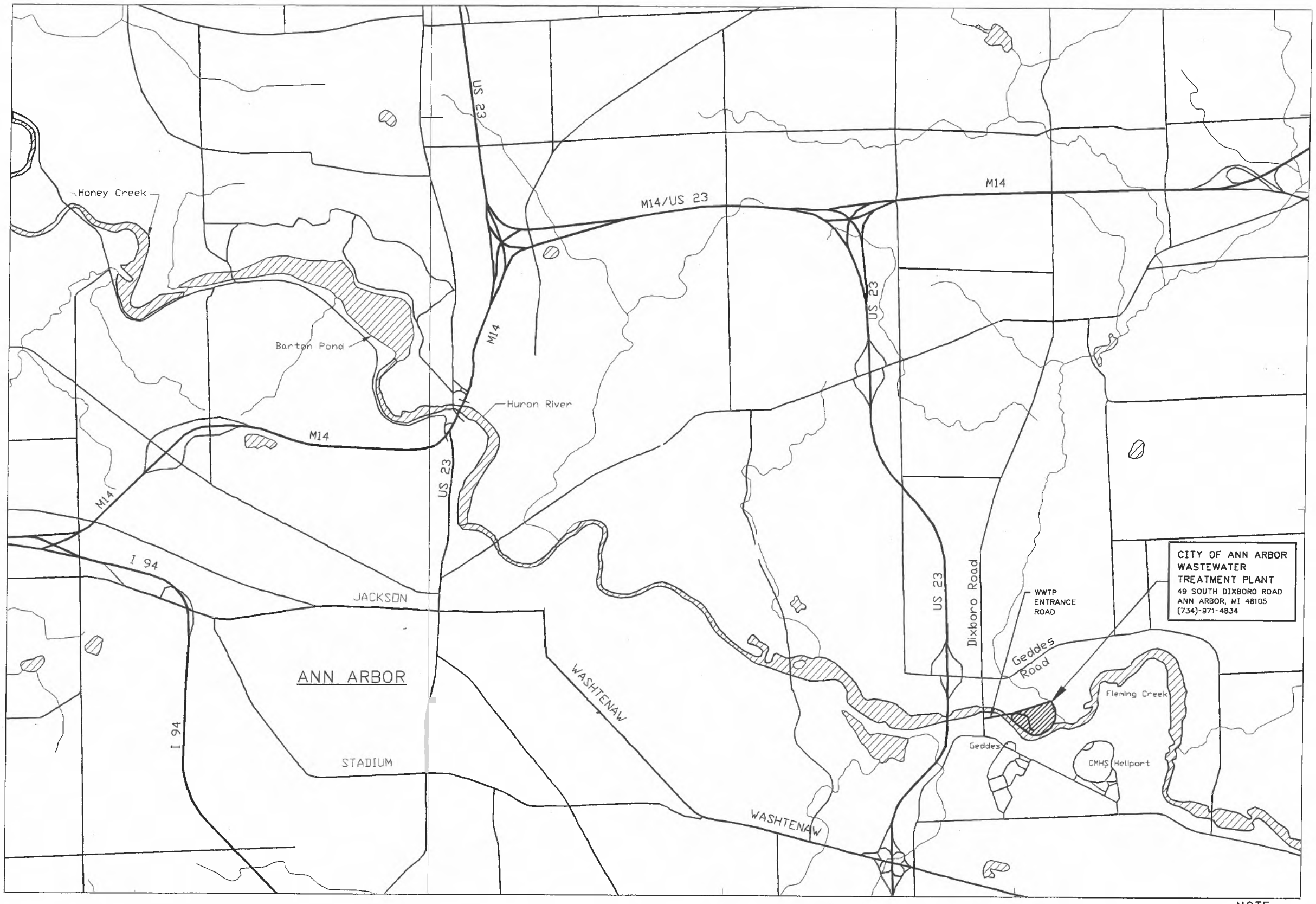
SCALE
NOT TO SCALE

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

GENERAL
INDEX, GENERAL NOTES AND ABBREVIATIONS

PROJ 02012
DWG G1
SHEET 1 OF 28
DATE OCTOBER 1999 REV 1

FILE: 201AG01 1:1 10/28/99 16:16 GH-A



AREA MAP

NOTE:

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

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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DESIGNED NBJ
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NO.	DATE	APPD	REVISION
1	06/04/01	PJV	RECORD DRAWING

SCALE
2000 0 2000 4000 FT
1"=2000'

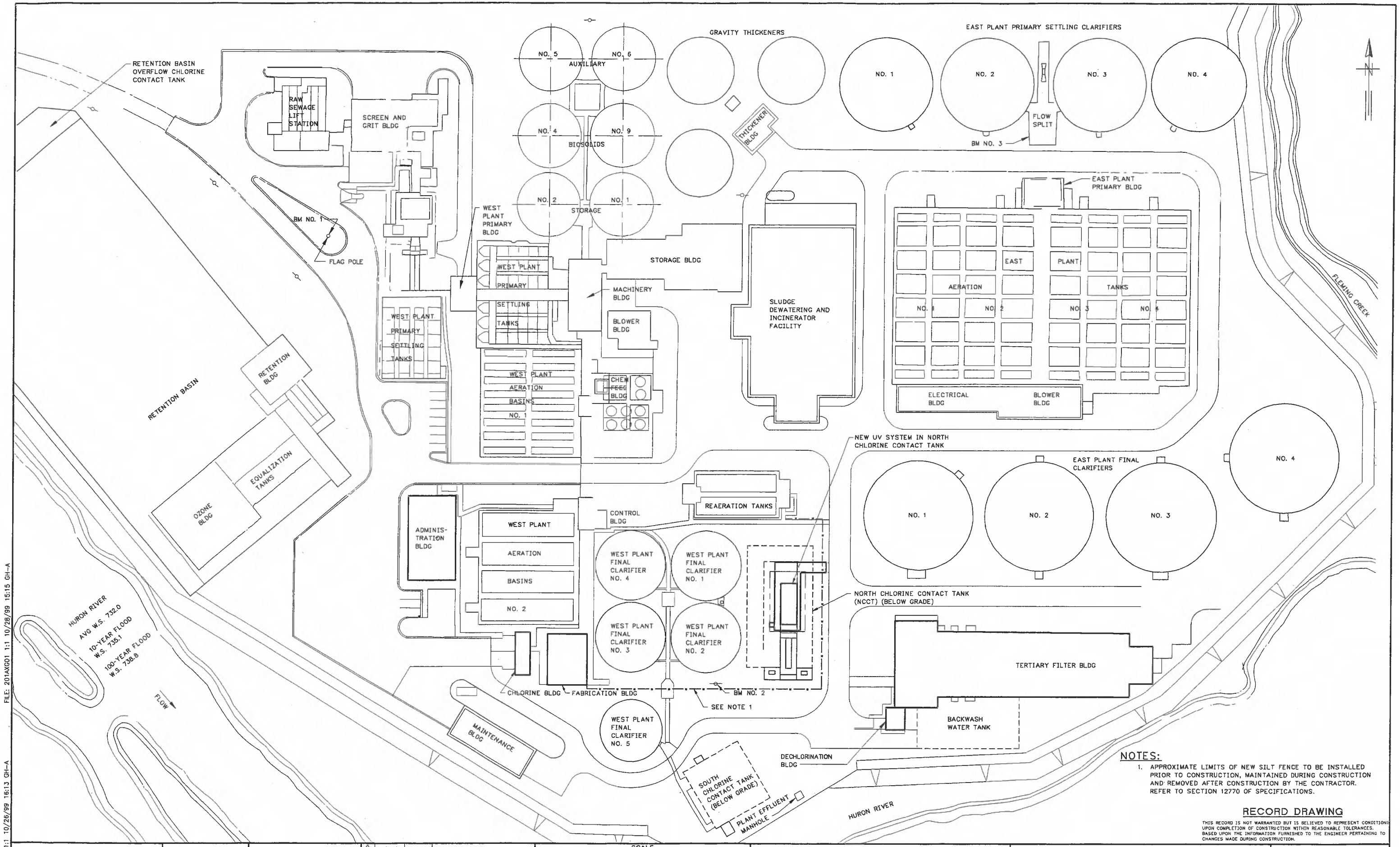
CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

GENERAL

VICINITY MAP
AND SITE LOCATION

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

FILE: 201AG02 1:1 10/26/99 11:31 GH-A



NOTES:

1. 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

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

SCALE
50 0 50 100 FT
1"=50'

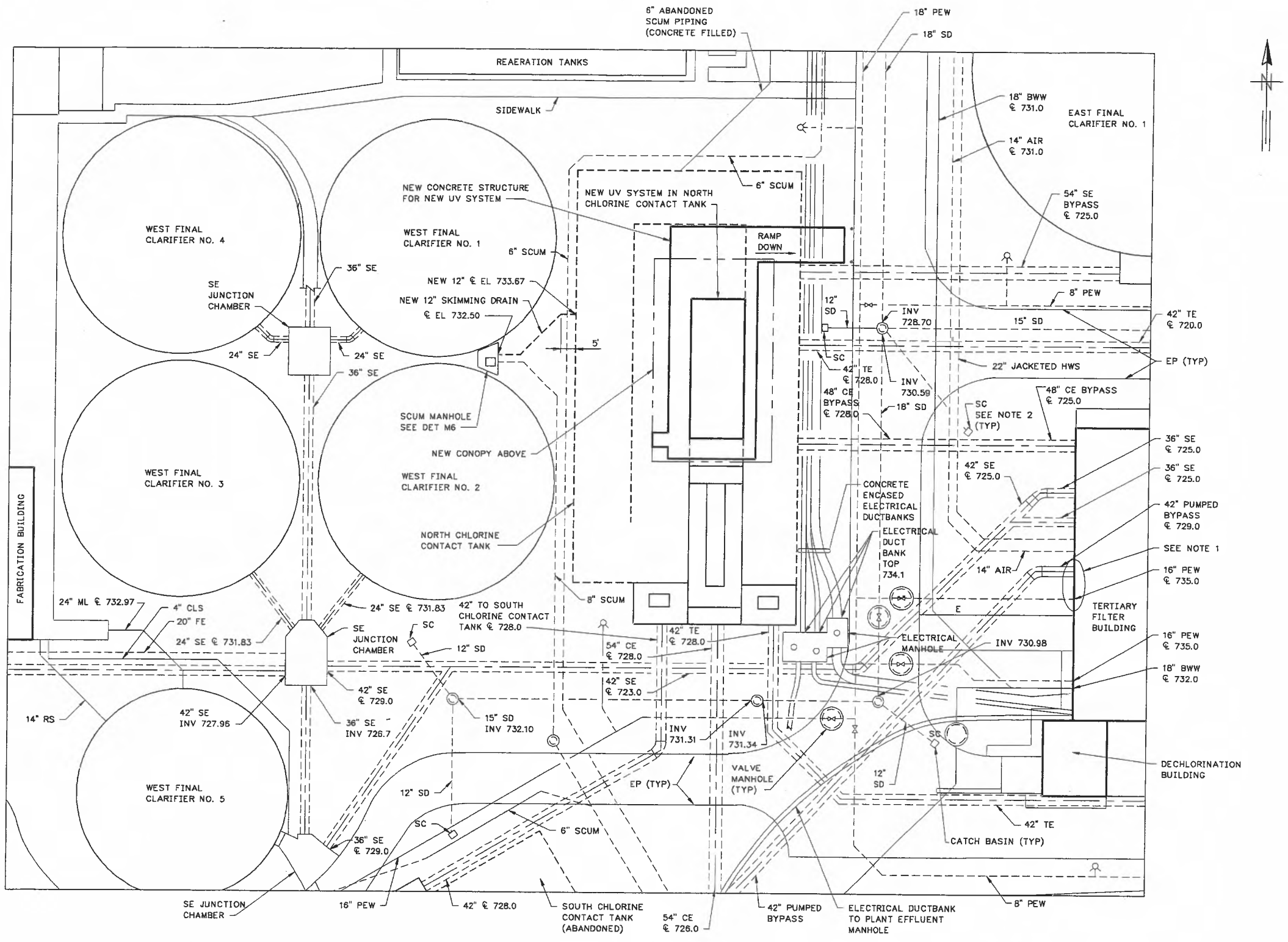
CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

GENERAL

SITE PLAN

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

FILE: 201AG01 1:1 10/28/99 15:15 GH-A
FILE: 201AG03 1:1 10/26/99 16:13 GH-A



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

DESIGNED BYD
DRAWN JFC
CHECKED PJR

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

SCALE 20 0 20 40 FT 1"=20'

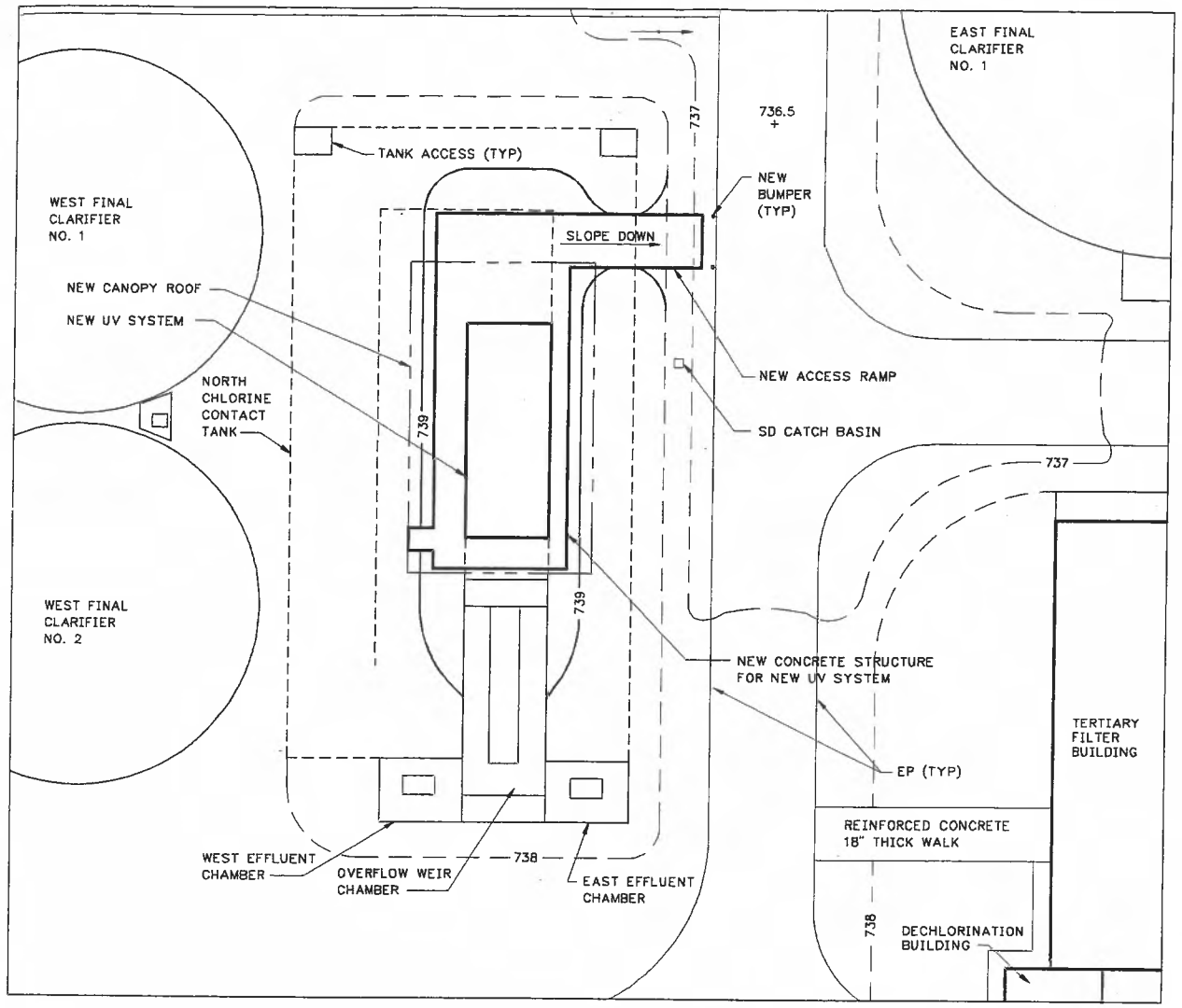
CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

GENERAL
NORTH CHLORINE CONTACT TANK

YARD PIPING PLAN

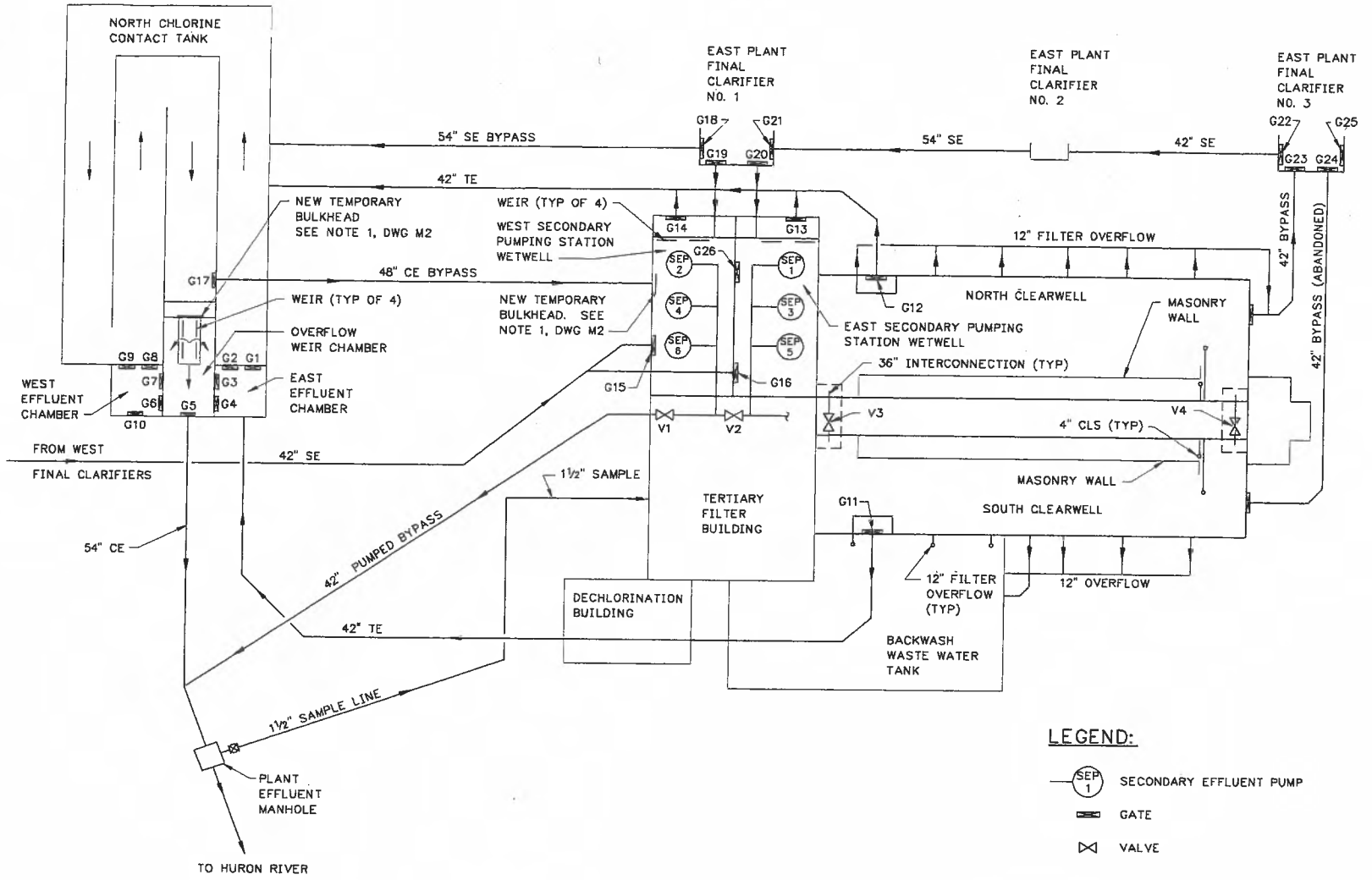
PROJ 02012
DWG G4
SHEET 4 OF 28
DATE OCTOBER 1999 REV 1

FILE: 201AG01 1:1 10/28/99 15:15 GH-A
FILE: 201AX603 1:1 10/27/99 08:11 GH-A
FILE: 201AG04 1:1 10/27/99 08:20 GH-A



GRADING PLAN

SCALE: 1"=20'



EFFLUENT FLOW DIAGRAM

SCALE: NOT TO SCALE

GATE AND VALVE IDENTIFICATION TABLE

Identification Number	Contract 77-S-7 ID Numbers	Process Information and Control System ID Numbers	Gate or Valve	Type	Size	Centerline Elevation
G1	S-12-1	S-52-1	Gate	Sluice	42"x 42"	728
G2	S-12-2	S-52-2	Gate	Sluice	42" x 42"	728
G3	S-14-1	S-54-1	Gate	Sluice	36" x 36"	728
G4	S-14-2	S-54-2	Gate	Sluice	36" x 36"	728
G5	S-15-1	S-55-1	Gate	Sluice	54" dia.	728
G6	S-14-4	S-54-4	Gate	Sluice	36" x 36"	728
G7	S-14-3	S-54-3	Gate	Sluice	36" x 36"	728
G8	S-13-1	S-53-1	Gate	Sluice	42" x 42"	732
G9	S-13-2	S-53-2	Gate	Sluice	42" x 42"	732
G10	S-16-1	S-56-1	Gate	Sluice	42" dia.	728
G11	S-5-1	---	Gate	Sluice	42" dia.	728
G12	S-4-1	---	Gate	Sluice	42" dia.	728
G13	S-1-2	---	Gate	Sluice	42" dia.	726
G14	S-1-1	---	Gate	Sluice	42" dia.	726
G15	S-2-1	---	Gate	Sluice	36" dia.	725
G16	S-2-2	---	Gate	Sluice	36" dia.	725
G17	S-11-1	S-51-1	Gate	Sluice	48" dia.	728
G18	S-7-1	S-47-1	Gate	Sluice	54" dia.	725
G19	S-6-1	S-46-1	Gate	Sluice	48" dia.	725
G20	S-6-2	S-46-2	Gate	Sluice	48" dia.	725
G21	S-7-2	S-47-2	Gate	Sluice	54" dia.	725
G22	S-9-1	S-49-1	Gate	Sluice	42" dia.	725
G23	S-8-1	S-48-1	Gate	Sluice	42" dia.	725
G24	S-8-2	S-48-2	Gate	Sluice	42" dia.	725
G25	S-10-1	S-50-1	Gate	Sluice	42" dia.	725
G26	S-3-1	---	Gate	Sluice	36" x 36"	725
V1	B-3-1	---	Valve	Butterfly	42" dia.	729.5
V2	B-2-1	---	Valve	Butterfly	48" dia.	747.5
V3	B-9-1	---	Valve	Butterfly	36" dia.	725
V4	B-9-2	---	Valve	Butterfly	36" dia.	725

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

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.

RECORD DRAWING

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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

SCALE: 20 0 20 40 FT — 1"=20'

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

FILE: 201AG05 1:1 10/28/99 16:37 GH-A
FILE: 201AG01 1:1 10/28/99 15:15 GH-A
FILE: 201AG02 1:1 10/28/99 14:36 GH-A

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	AVR	AVR	AVR
AUTO AIR RELEASE	AR	AR	AR
AUTO VACUUM RELEASE	VR	VR	VR
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	LR	LR
45° ELBOW	NA		
45° ELBOW	NA		
45° ELBOW	NA		
45° ELBOW (LONG RADIUS)	NA	LR	LR
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)	H	H	H
GROOVED TYPE COUPLING	GC	GC	GC
EXPANSION JOINT RUBBER BELLOWS TYPE			
EXPANSION JOINT METAL BELLOWS TYPE			
VENTURI METER			
METER	M	M	M
STRAINER			
DUPLEX STRAINER			
LUBE OIL FILTER		NA	
MOISTURE SEPARATOR		NA	
SCALE TRAP		NA	
FLAME TRAP			
VENT			
THERMOSTAT (TEMPERATURE REGULATOR)	T	T	T
PRESSURE GAUGE			
THERMOMETER			
WATER LEVEL ALARM	HWL OR LWL	HWL OR LWL	HWL OR LWL
DIFFERENTIAL PRESSURE GAUGE			

PIPE JOINTS

DESCRIPTION	SCHEMATIC	THREE LINE	SINGLE LINE
FLANGE	NA		
MECHANICAL JOINT	NA		
MECHANICAL JOINT (RESTRAINED)	NA	R	R
PUSH ON OR BELL AND SPIGOT	NA		
PUSH ON OR BELL AND SPIGOT (RESTRAINED)	NA	R	R
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

VALVE OPERATORS

PLACE KEY FOR OPERATOR IN PLACE OF *

NONE	MANUAL	M	MOTOR (ELECTRIC)
C	CHAINWHEEL	P	PNEUMATIC CYLINDER
D	DIAPHRAGM	S	SOLENOID
F	FLOAT	A	AIR MOTOR
G	GEAR	N	NUT
H	HYDRAULIC CYLINDER		

RECORD DRAWING

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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.

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

DESIGNED LCC
DRAWN RPN
CHECKED PJV

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

SCALE
NOT TO SCALE

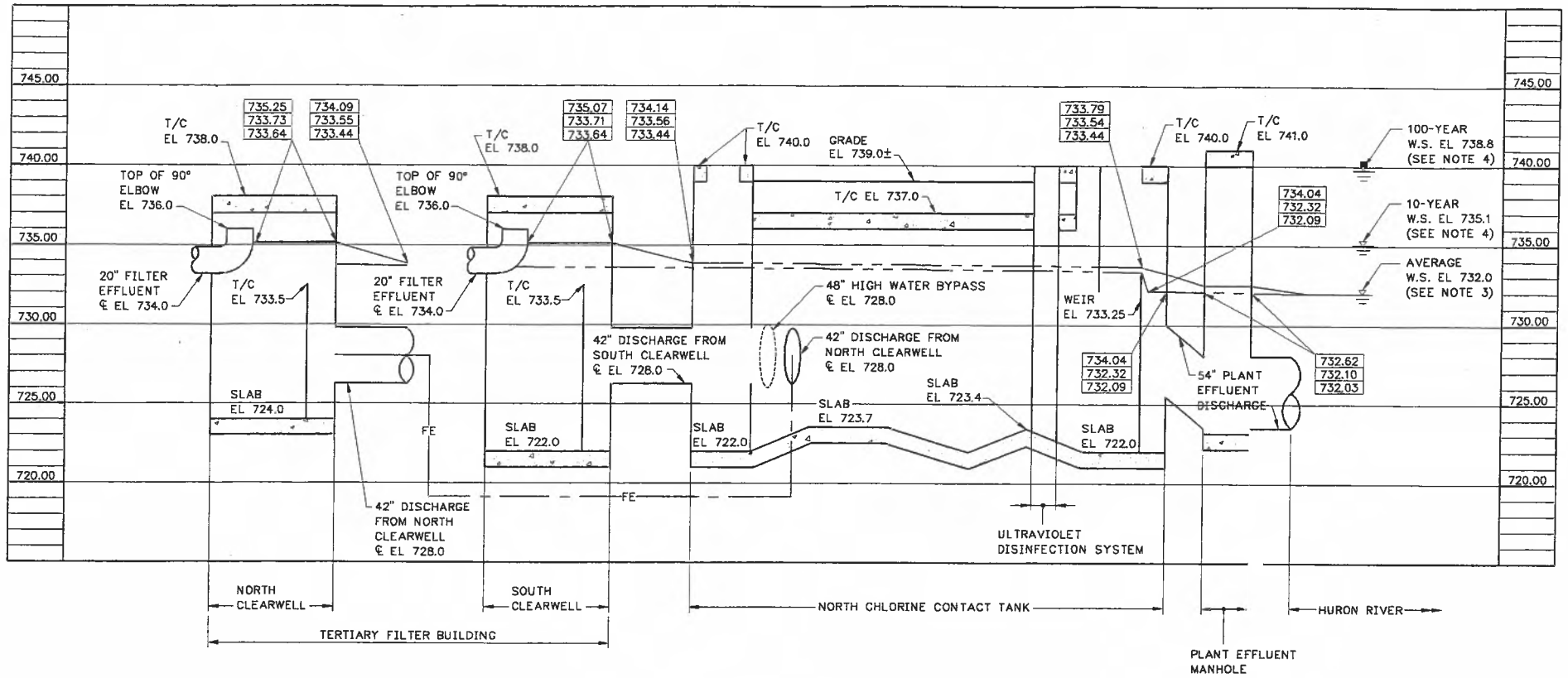
CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

PIPING AND EQUIPMENT

PIPING SYMBOLS

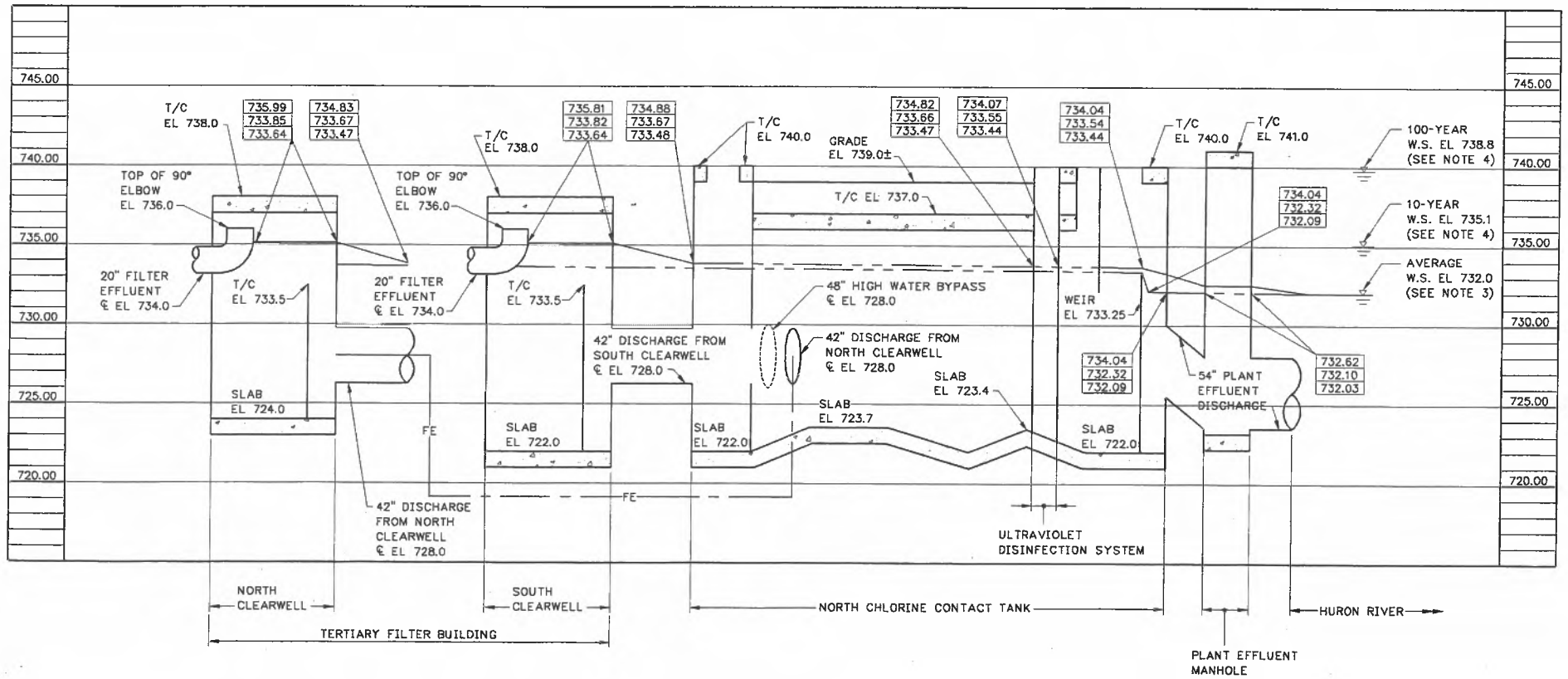
PROJ 02012
DWG G6
SHEET 6 OF 28
DATE OCTOBER 1999 REV 1

FILE: 2014G06 1:1 10/26/99 11:42 GH-A



HYDRAULIC PROFILE OF EXISITNG CONDITIONS

HORZ: NO SCALE
VERT: 1"=5'



HYDRAULIC PROFILE INCLUDING ULTRAVIOLET DISINFECTION SYSTEM

HORZ: NO SCALE
VERT: 1"=5'

NOTES:

1. ELEVATIONS SHOWN REFER TO NGVD OF 1929 OF THE U.S.G.S. DATUM.
2. 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.
3. AVERAGE RIVER WATER SURFACE ELEVATION FROM WASHTENAW COUNTY, DEPARTMENT OF PUBLIC WORKS, CITY OF ANN ARBOR, MICHIGAN WASTEWATER TREATMENT PLANT IMPROVEMENTS, CONTRACT 77-S-7, C26 2539 05, VOLUME II DRAWINGS, DATED JULY 1977.
4. 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.

RECORD DRAWING

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

DESIGNED NBJ
DRAWN KPB
CHECKED PJV

NO.	DATE	APPD	REVISION
1	05/04/01	PJV	RECORD DRAWING

SCALE
HORIZ: NO SCALE
5 0 5 10 FT VERT: 1"=5'

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

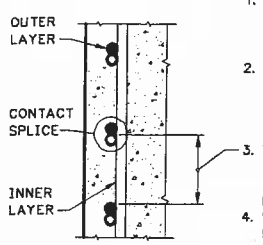
GENERAL

HYDRAULIC PROFILES

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

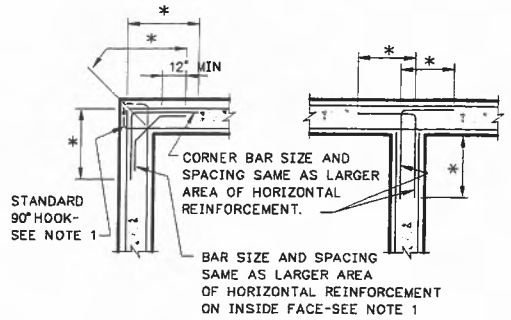
FILE: 201AG07 1:1 10/26/99 11:30 GH-A

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"



1. 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.
2. FOR EPOXY COATED BARS:
   FOR TOP BARS - MULTIPLY THE TABULATED VALUES BY 1.70.
   FOR OTHER BARS - MULTIPLY THE TABULATED VALUES BY 1.50.
3. 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.
4. WHERE BARS OF DIFFERENT SIZES ARE LAP SPLICED USE LAP LENGTH OF SMALLER BAR.

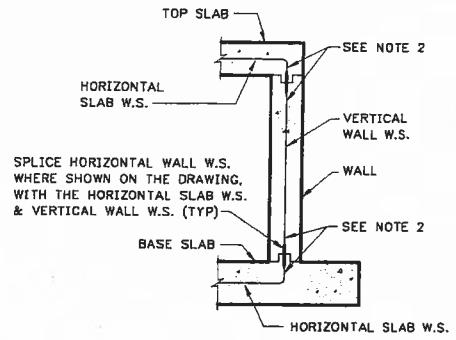
1



NOTES:
1. REQUIRED ONLY WHERE WALLS ARE SUBJECT TO FLUID PRESSURE FROM INSIDE.
2. *- SEE SPLICE TABLE.

HORIZONTAL CORNER BAR DETAIL

2



NOTES:
1. W.S. DENOTES WATERSTOP
2. SPLICE & EXTEND VERTICAL WALL W.S. 8" PAST HORIZONTAL WALL W.S. OR SPLICE WITH HORIZONTAL SLAB W.S. WHERE REQUIRED.
3. PROVIDE CONTINUOUS WATERSTOPS. SHOP SPLICE AT ALL INTERSECTIONS & FIELD SPLICE AT STRAIGHT RUNS ONLY.

WATERSTOP PLACING DETAIL

3

GENERAL STRUCTURAL NOTES

THE FOLLOWING GENERAL NOTES ARE SHOWN FOR CONVENIENCE AND ARE SUPPLEMENTAL TO THE SPECIFICATIONS:

1. 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.
2. PROVIDE A ¾" CHAMFER AT EXPOSED CORNERS AND PROVIDE A ¾" FLAT FILLET AT RE-ENTRANT CORNERS UNLESS OTHERWISE NOTED.
3. OBTAIN ENGINEER'S APPROVAL FOR USE OF CONSTRUCTION JOINTS AT LOCATIONS NOT SHOWN ON THE DRAWINGS.
4. 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.
5. 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.
6. 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.
7. PROVIDE ASTM A615, GRADE 60 REINFORCING STEEL AND DETAIL ACCORDING TO THE ACI DETAILING MANUAL 1994 PUBLICATION SP-66.
8. 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 ..... 1½"
  - b) PRINCIPAL REINFORCEMENT ..... 2"
- B) EXPOSED TO EARTH, WATER OR WEATHER:
  - a) STIRRUPS AND TIES ..... 2"
  - b) PRINCIPAL REINFORCEMENT ..... 2½"

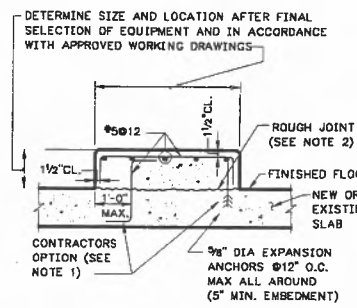
WALLS
- A) FOR DRY CONDITIONS:
  - a) WALLS 8" THICK OR LESS ..... 1"
  - b) WALLS OVER 8" THICK ..... 2"
- B) EXPOSED TO EARTH, WATER OR WEATHER:
  - a) CIRCULAR TANKS WITH RING TENSION ..... 2½"
  - b) ALL OTHERS ..... 2"

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"

9. 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 ¾" 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).
10. 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:

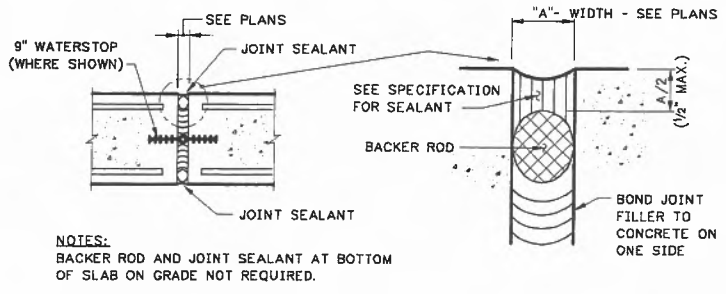
℄	CONSTRUCTION JOINT	L	ANGLE
W.S.	WATERSTOP	#	PLATE
EXP. JT.	EXPANSION JOINT	A.B.	ANCHOR BOLT
C.G.	CONTROL GROOVE	S.S.	STAINLESS STEEL
H.P.	HIGH POINT	F.R.P.	FIBERGLASS REINFORCED PLASTIC
L.P.	LOW POINT	M.C.	MECHANICAL CONNECTIONS
W.P.	WORK POINT	N.T.S.	NOT TO SCALE
E.P.	EQUIPMENT PAD	U.N.O.	UNLESS NOTED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



NOTES:
1. PROVIDE EXPANSION ANCHORS WITH #5 REINFORCEMENT BAR (THREADED AT ONE END) IN EXISTING SLABS. SUBSTITUTE EXPANSION ANCHORS FOR #5@12 DOWELS IN NEW SLABS IF REQUIRED. DO NOT DRILL THROUGH EXISTING SLAB REINFORCEMENT.
2. CLEAN JOINT BEFORE PLACING CONCRETE FOR EQUIPMENT PAD.
3. FOR EQUIPMENT PADS NOT SHOWN SEE MECHANICAL, ELECTRICAL AND HEATING & VENTILATION DRAWINGS.

EQUIPMENT PAD DETAIL

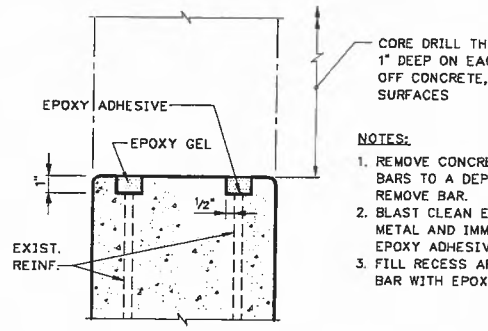
4



NOTES:
BACKER ROD AND JOINT SEALANT AT BOTTOM OF SLAB ON GRADE NOT REQUIRED.

EXPANSION JOINT DETAIL AT WALLS AND SLABS

5



NOTES:
1. REMOVE CONCRETE FROM AROUND EXISTING BARS TO A DEPTH OF ONE INCH, AND REMOVE BAR.
2. BLAST CLEAN EXPOSED REINFORCING TO WHITE METAL AND IMMEDIATELY SPOT-COAT WITH A EPOXY ADHESIVE.
3. FILL RECESS AROUND EXISTING REINFORCING BAR WITH EPOXY GEL.

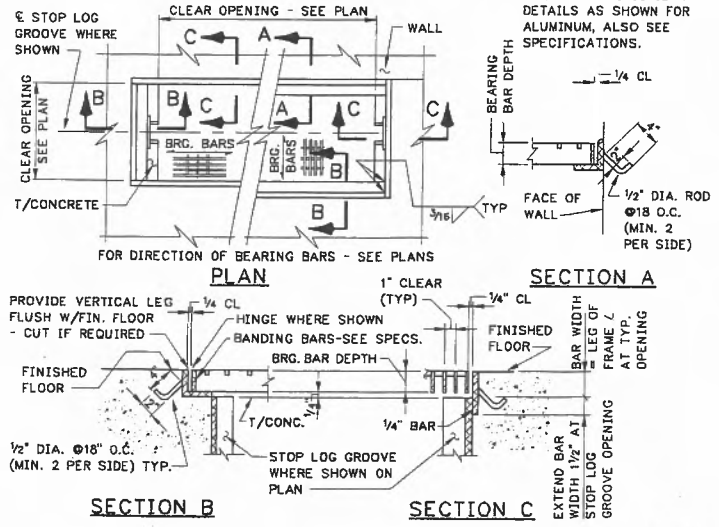
DETAIL FOR NEW OPENING IN EXISTING CONCRETE SLAB (WET)

6

GRATING SCHEDULE	LL = 150 PSF MAX. DEFL. = SPAN/360			
SPAN	ALUMINUM (SERRATED)		STAINLESS STEEL OR GALVANIZED (SERRATED)	
	BRG. BARS 1" CLEAR	FRAME	BRG. BARS 1" CLEAR	FRAME
4'-0" OR LESS	1¾ X 3/16	∠ 2X2X¼	1½ X 3/16	∠ 2X2X¼
4'-1" TO 5'-0"	2¼ X 3/16	∠ 2½X2X¼	1¾ X 3/16	∠ 2X2X¼
5'-1" TO 6'-0"	2½ X 3/16	∠ 3X2X¼	2 X 3/16	∠ 2½X2X¼
6'-1" TO 7'-0" *	3 X 3/16	∠ 3½X2½X¼	2¼ X 3/16	∠ 2½X2X¼
7'-1" TO 8'-0" *	3¼ X ¼	∠ 3½X2½X¼	2½ X ¼	∠ 3X2½X¼

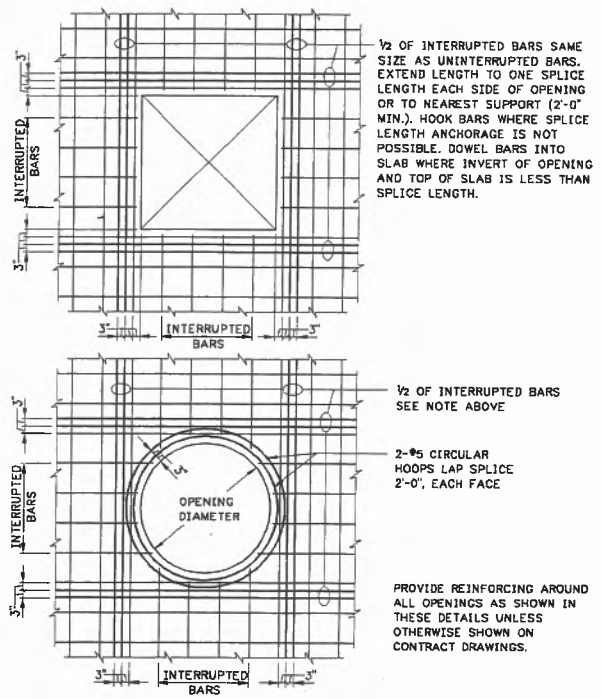
* HEAVY DUTY (NOT STANDARD)

NOTES:
1. FOR GRATING MATERIAL SEE PLAN OR SECTIONS.
2. SIZE OF GRATING AS SHOWN IN SCHEDULE UNLESS NOTED OTHERWISE ON PLAN.
3. PAINT ALL ALUMINUM SURFACES IN CONTACT WITH CONCRETE, SEE SPECIFICATIONS.
4. PROVIDE ANGLES, BARS & ANCHOR BOLTS OF THE SAME MATERIAL AS THE GRATING.
5. WHERE FRP GRATING IS REQUIRED USE SIMILAR DETAILS AS SHOWN FOR ALUMINUM, ALSO SEE SPECIFICATIONS.



GRATING DETAILS

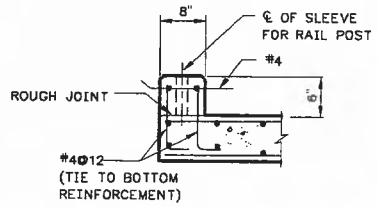
7



ADDITIONAL REINFORCING AT OPENINGS IN WALLS AND SLABS

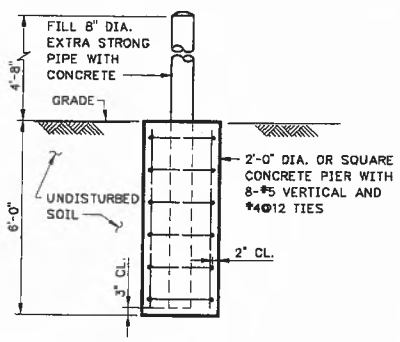
* 48" OR SMALLER

8



CURB DETAIL

9



BUMPER DETAIL

10

RECORD DRAWING

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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

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

SCALE
NOT TO SCALE

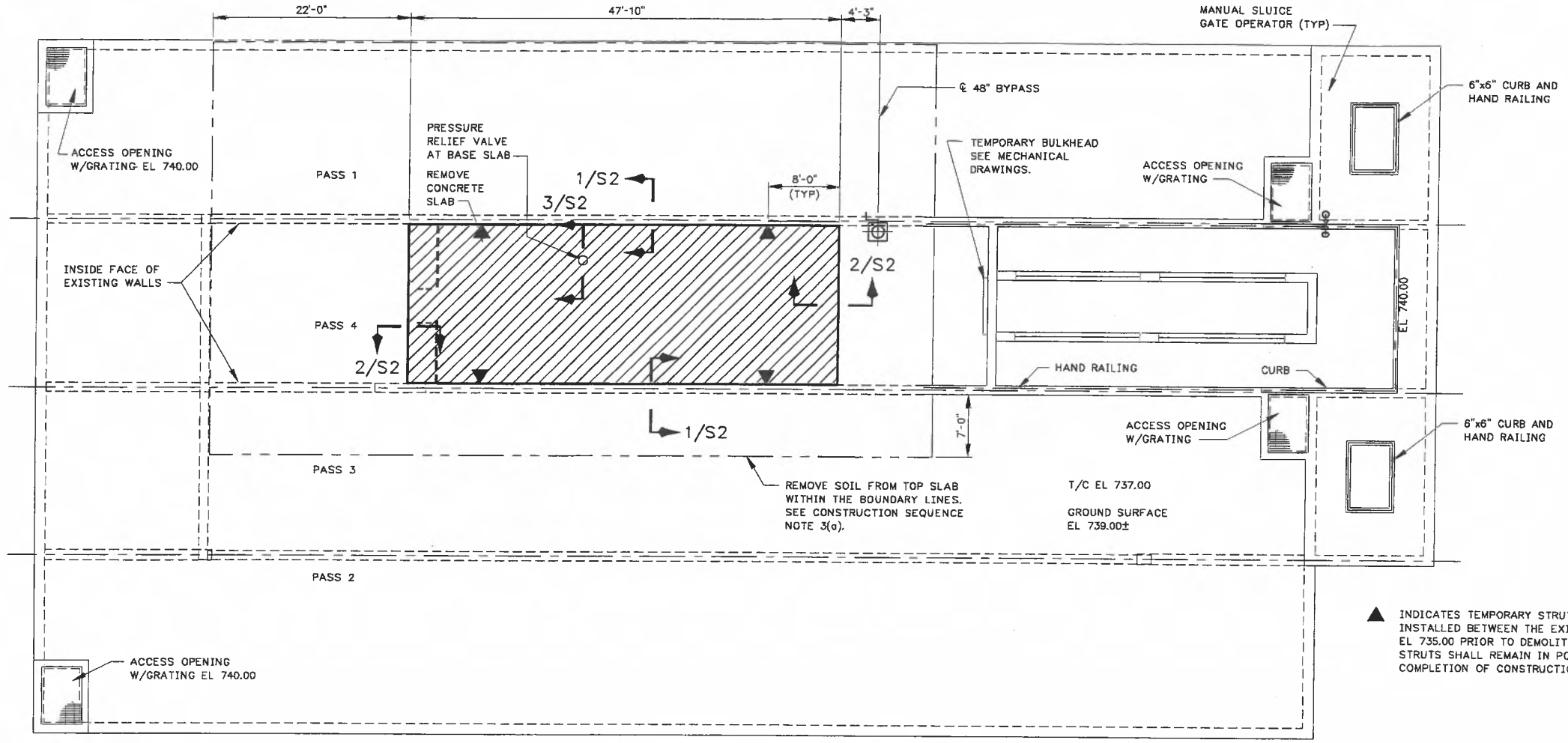
CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

STRUCTURAL

TYPICAL DETAILS AND GENERAL NOTES

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

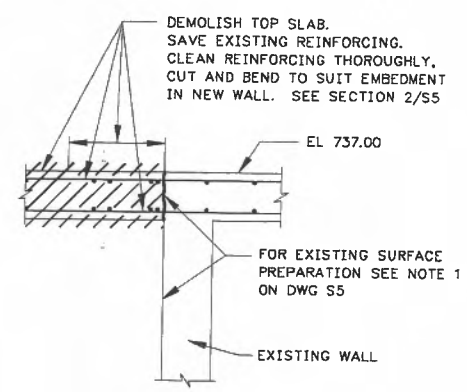
FILE: 201AS01 1:1 10/28/99 16:14 GH-A



DEMOLITION PLAN AT EL 737.00

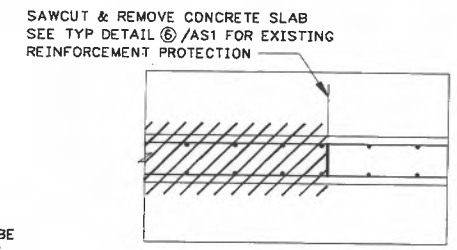
SCALE: 1/8"=1'-0"

▲ 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.



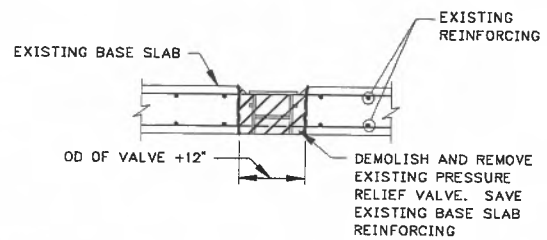
SECTION 1/S2

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



SECTION 2/S2

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



SECTION 3/S2

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

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.

KLEIN AND HOFFMAN, INC.
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100 SOUTH WACKER DRIVE
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GREELEY AND HANSEN
ENGINEERS
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DETROIT, MICHIGAN 48226-3202

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CHECKED SKC

NO.	DATE	APPD	REVISION
1	08/04/01	PJV	RECORD DRAWING

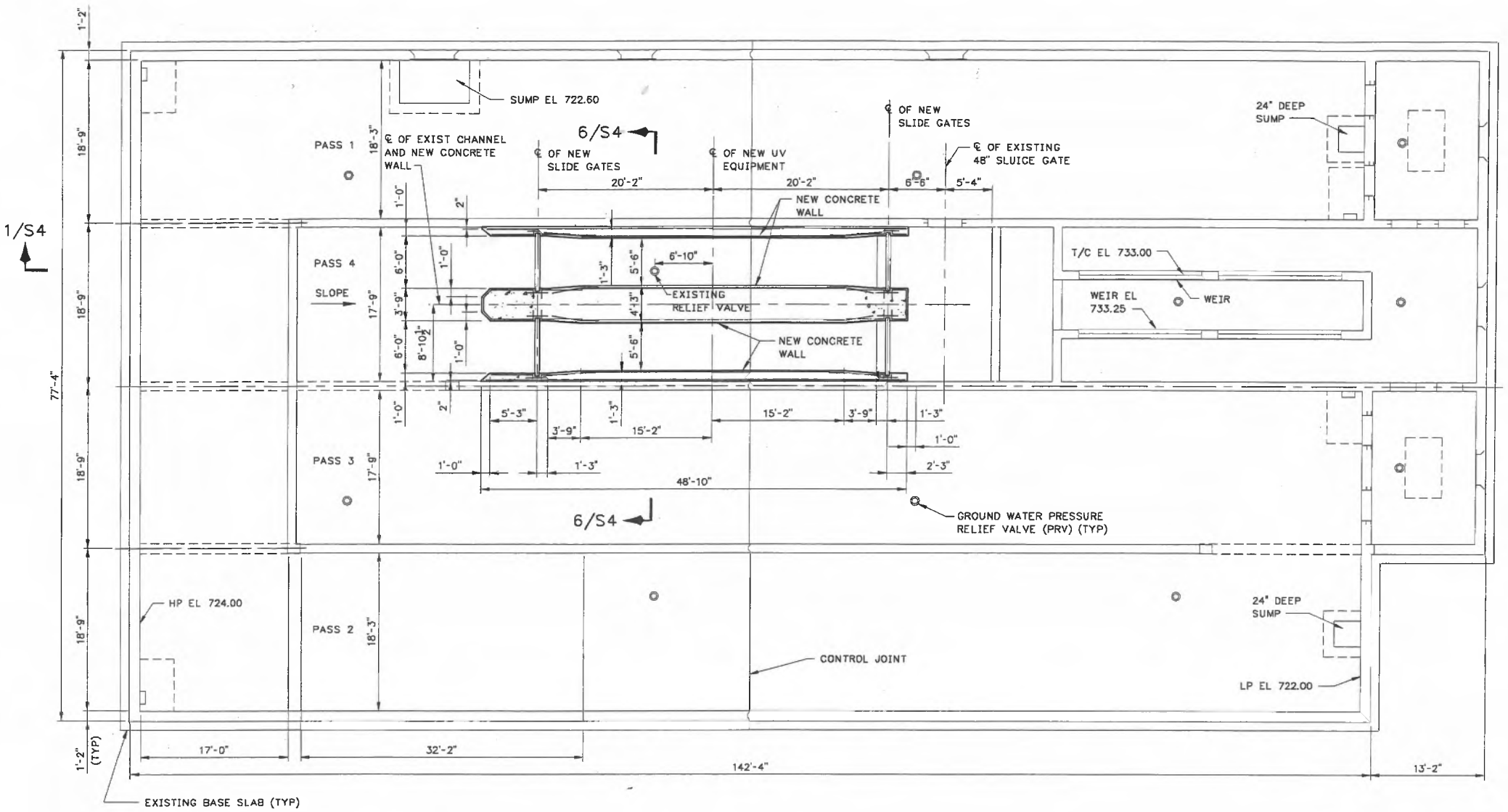
SCALE
8 0 8 16 FT 1/8"=1'-0"
1 0 1 2 3 4 5 FT 1/2"=1'-0"

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

FILE: 201AS02 1:1 10/28/99 16:15 GH-A
FILE: 201AXS01 1:1 11/17/99 14:02 GH-A



PLAN AT EL 727.00

NOTE:

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

RECORD DRAWING

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

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CHECKED SKC

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

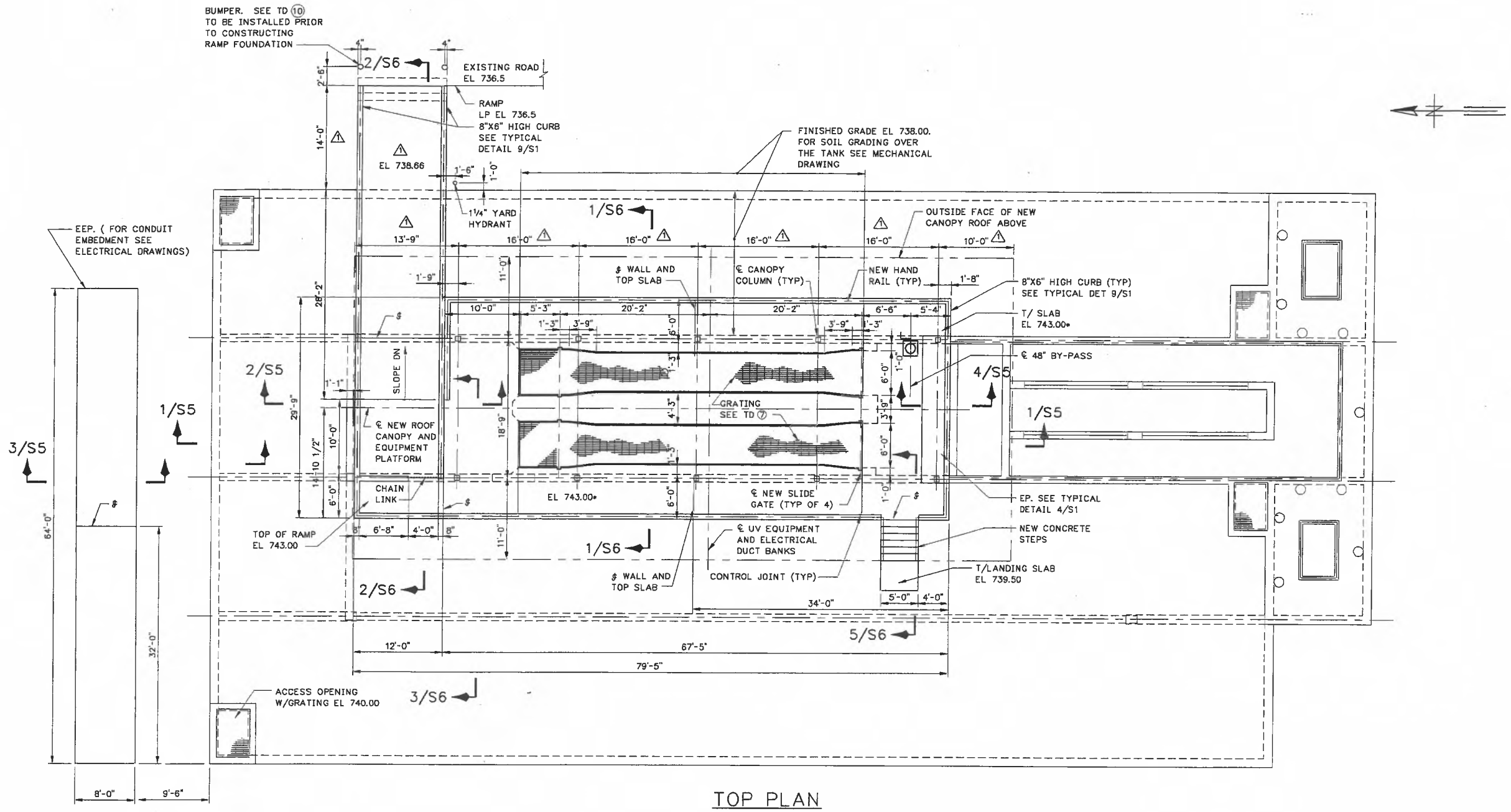
SCALE 8 0 8 16 FT 1/8"=1'-0"

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

FILE: 201AS03 1:1 10/28/99 16:15 GH-A
FILE: 201AXS01 1:1 11/17/99 14:02 GH-A



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.

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CHECKED SKC

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

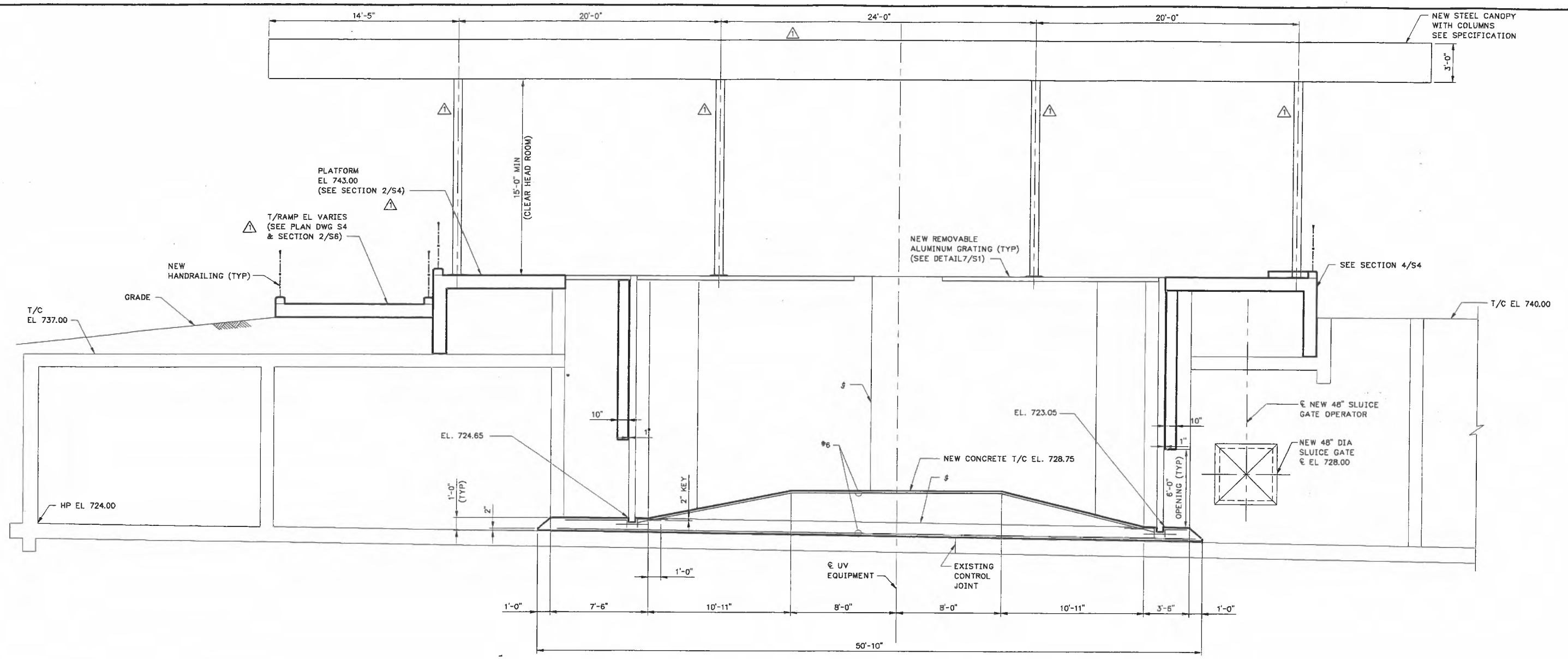
SCALE
8 0 8 16 FT
1/8"=1'-0"

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

STRUCTURAL
NORTH CHLORINE CONTACT TANK
TOP PLAN

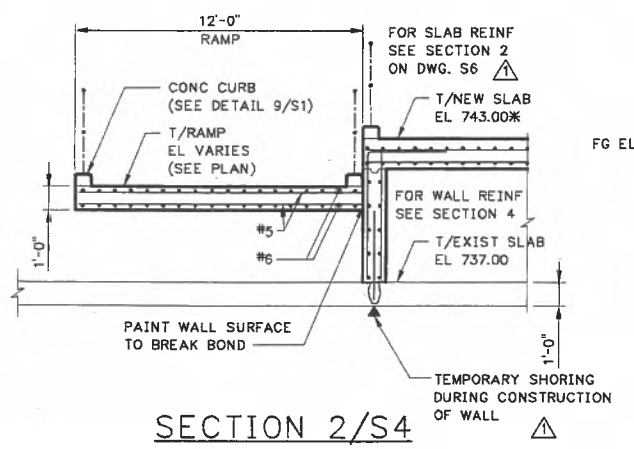
PROJ 02012
DWG S4
SHEET 11 OF 28
DATE OCTOBER 1999 REV 2

FILE: 201AS04 1:1 11/18/99 09:52 GH-A
FILE: 201AXS01 1:1 11/17/99 14:02 GH-A



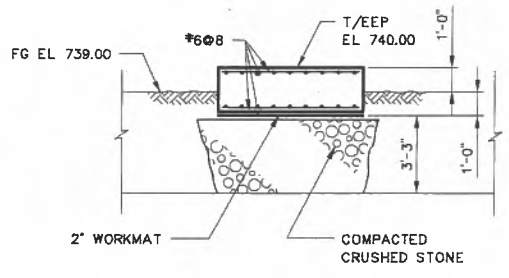
SECTION 1/S3, S4

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



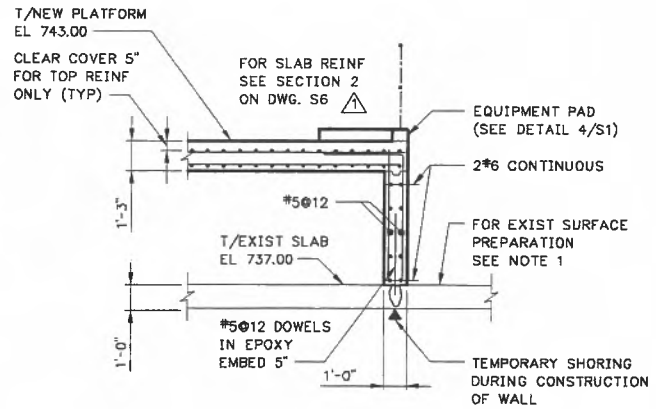
SECTION 2/S4

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



SECTION 3/S4

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



SECTION 4/S4

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

NOTES:

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

KLEIN AND HOFFMAN, INC.
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DETROIT, MICHIGAN 48226-3202

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NO.	DATE	APPD	REVISION
1	11/19/99	PJV	ADDENDUM NO. 1 REVISION
2	08/04/01	PJV	RECORD DRAWING

SCALE
4 0 4 8 FT
1/4"=1'-0"

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

STRUCTURAL
NORTH CHLORINE CONTACT TANK

SECTIONS

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

RECORD DRAWING

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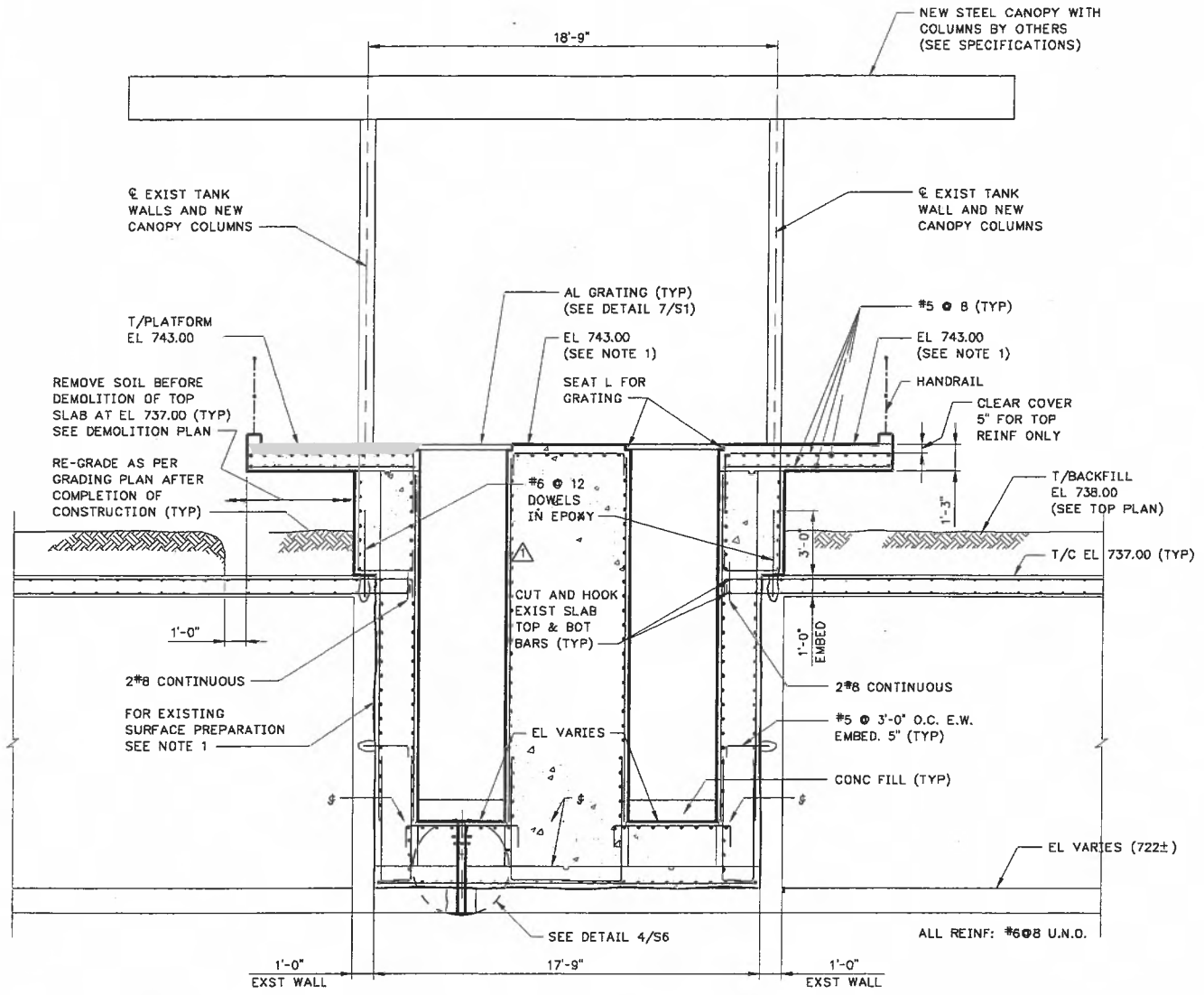
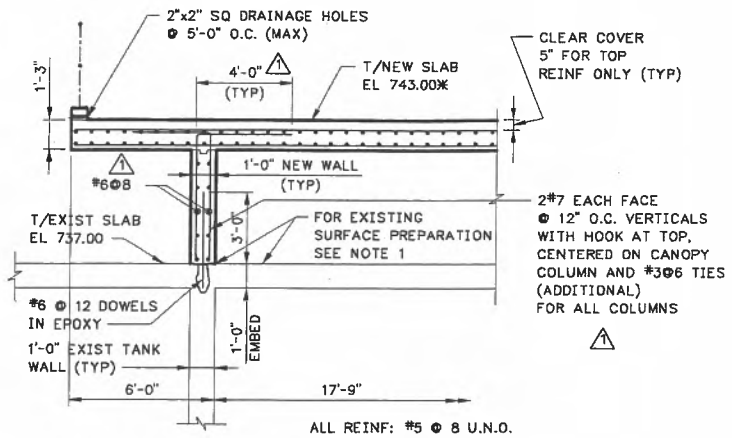
FILE: 201AS05 1:1 11/18/99 09:56 GH-A



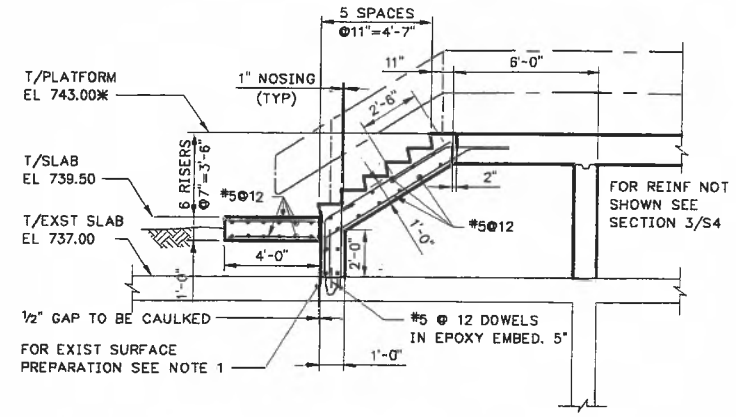
SECTION 1/S3, S4

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



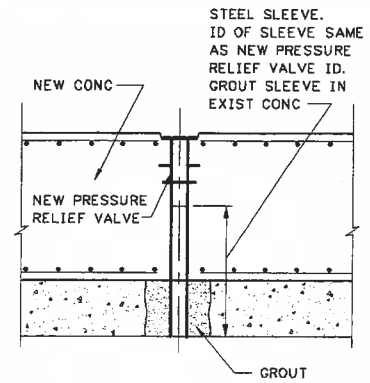
SECTION 3/S4

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



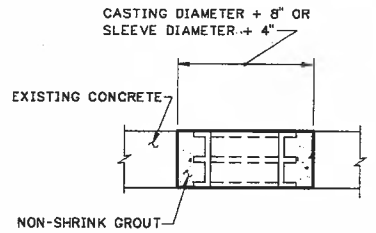
SECTION 5/S4

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



DETAIL 4/S6

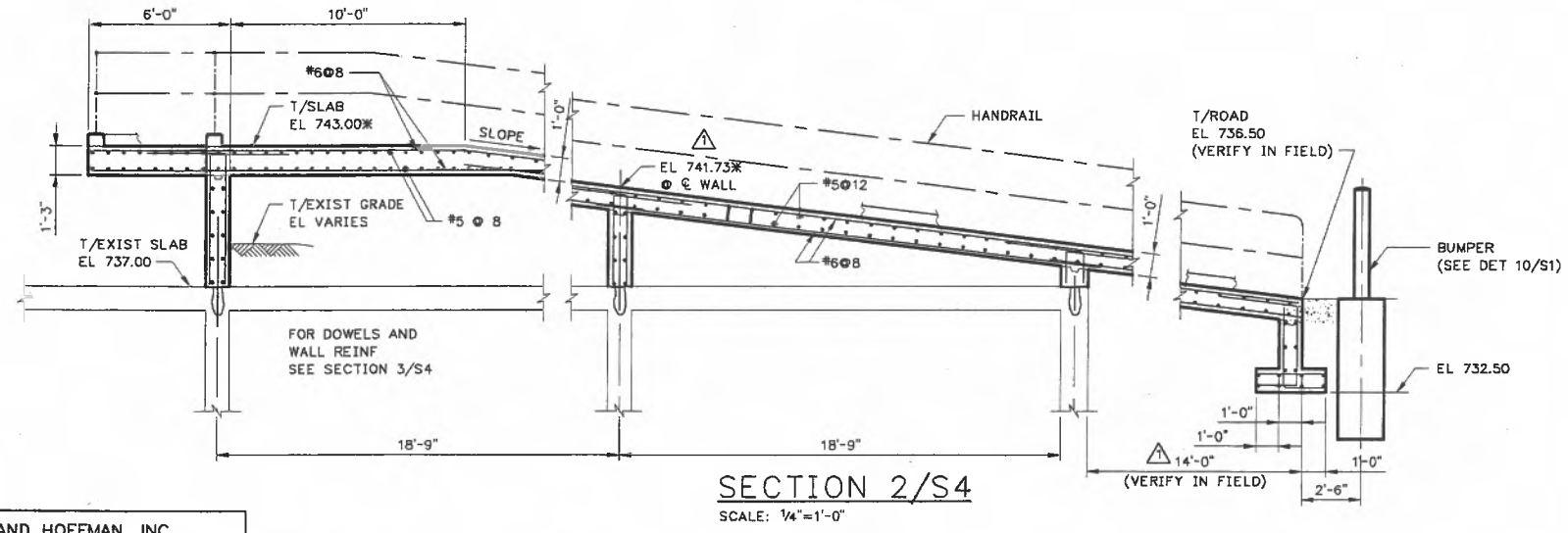
SCALE: 1/2"=1'-0"



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

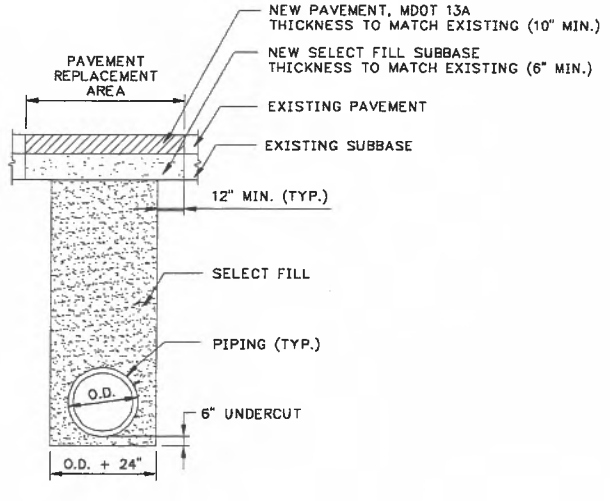
NEW WALL PIPE IN EXISTING WALL - DETAIL

NOT TO SCALE



SECTION 2/S4

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



PIPE TRENCH IN ROADWAY DETAIL

NOT TO SCALE

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

RECORD DRAWING

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

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

DESIGNED SKC
DRAWN GNG
CHECKED SKC

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

SCALE
4 0 4 8 FT 1/4"=1'-0"
1 0 1 2 3 4 5 FT 1/2"=1'-0"

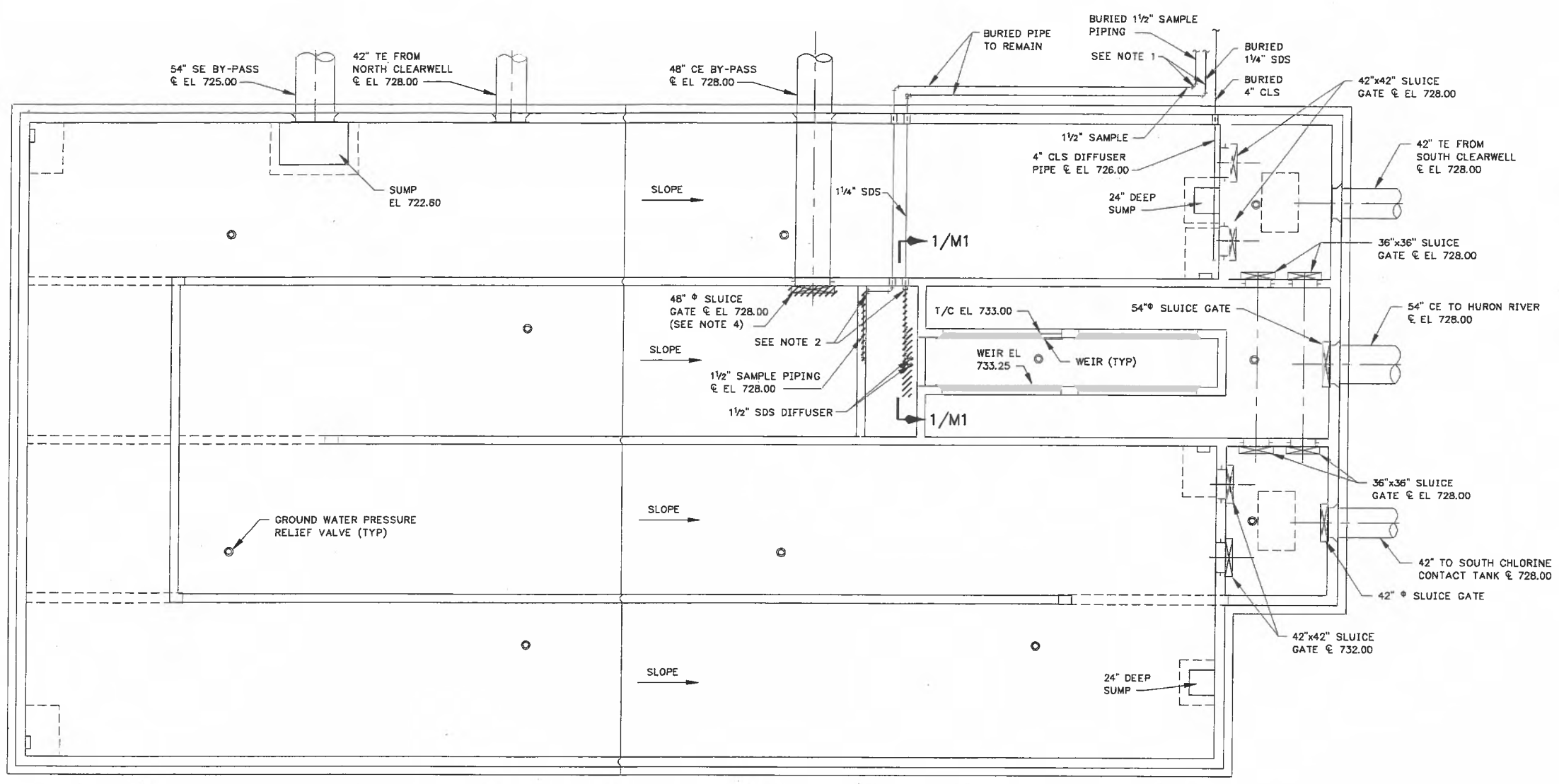
CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

STRUCTURAL
NORTH CHLORINE CONTACT TANK

SECTIONS AND DETAILS

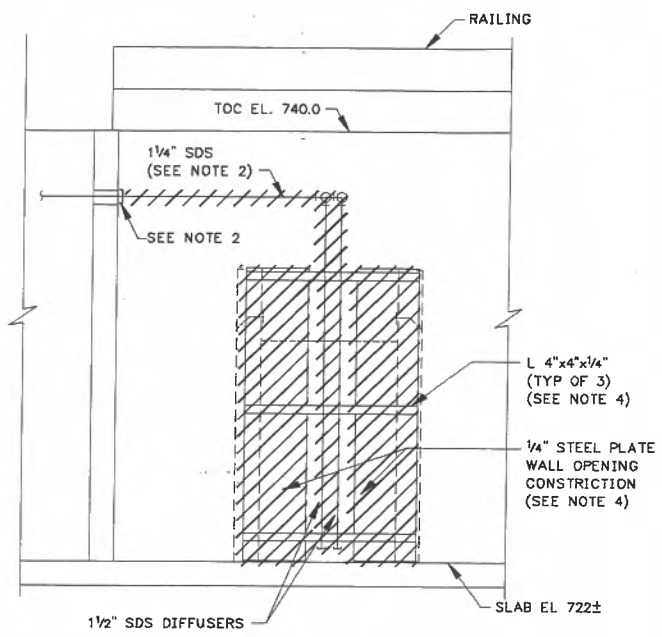
PROJ 02012
DWG S6
SHEET 13 OF 28
DATE OCTOBER 1999 REV 2

FILE: 201AS06 1:1 06/15/01 15:45 GH-A



PLAN AT EL 736.00

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



SECTION 1/M1

SCALE: ¼"=1'-0"

NOTES:

1. NOTE REMOVED.
2. 1½" SAMPLE PIPING AND 1¼" SDS PIPING CAPPED.
3. REMOVE ALL ¼" STEEL PLATES, 4"x4"x¼" ANGLE AND ALL ASSOCIATED HARDWARE FROM STEEL PLATE WALL OPENING CONSTRICTION.
4. REMOVE EXISTING 48"Φ SLUICE GATE STEM, OPERATOR STAND AND MOTOR OPERATOR, EXISTING WALL THIMBLE TO REMAIN.

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

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

SCALE

8 0 8 16 FT 1/8"=1'-0"

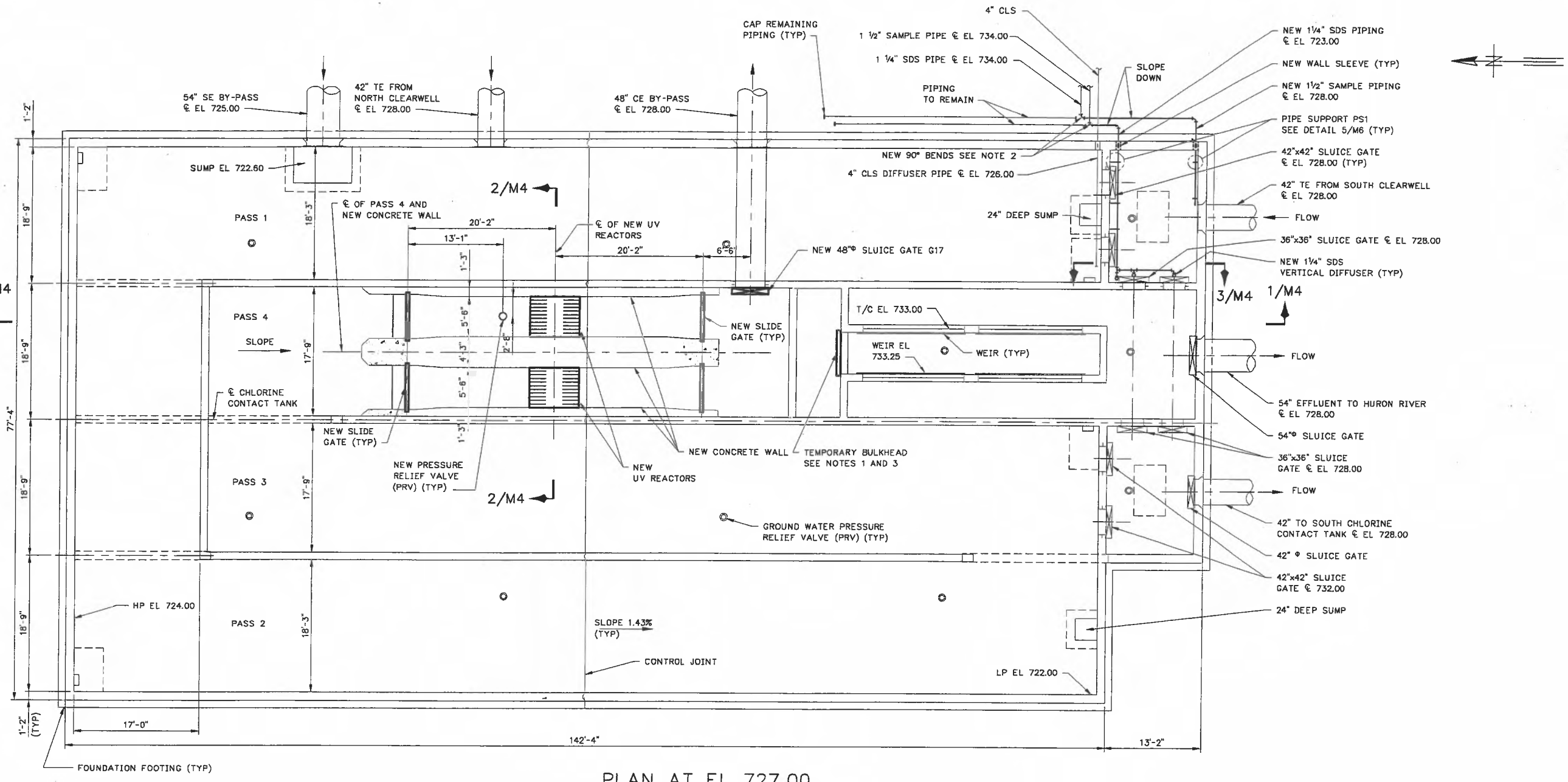
4 0 4 8 FT 1/4"=1'-0"

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

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

FILE: 201AM01 1:1 06/26/01 16:28 GH-A
FILE: 201AXS01 1:1 11/17/99 14:02 GH-A
FILE: 201AXW01 1:1 10/28/99 13:33 GH-A



PLAN AT EL 727.00

NOTES:

1. 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.
2. INSTALL NEW 1¼" 90° BEND ON EXISTING 1¼" SDS PIPING TO CONNECT TO NEW 1¼" SDS PIPING. INSTALL NEW 1½" 90° BEND ON EXISTING 1½" SAMPLE PIPING TO CONNECT TO NEW 1½" SAMPLE PIPING.
3. 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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GREELEY AND HANSEN
ENGINEERS
211 WEST FORT STREET, SUITE 710
DETROIT, MICHIGAN 48226-3202

DESIGNED PJR
DRAWN RPN
CHECKED PJR

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

SCALE
8 0 8 16 FT
1/8"=1'-0"

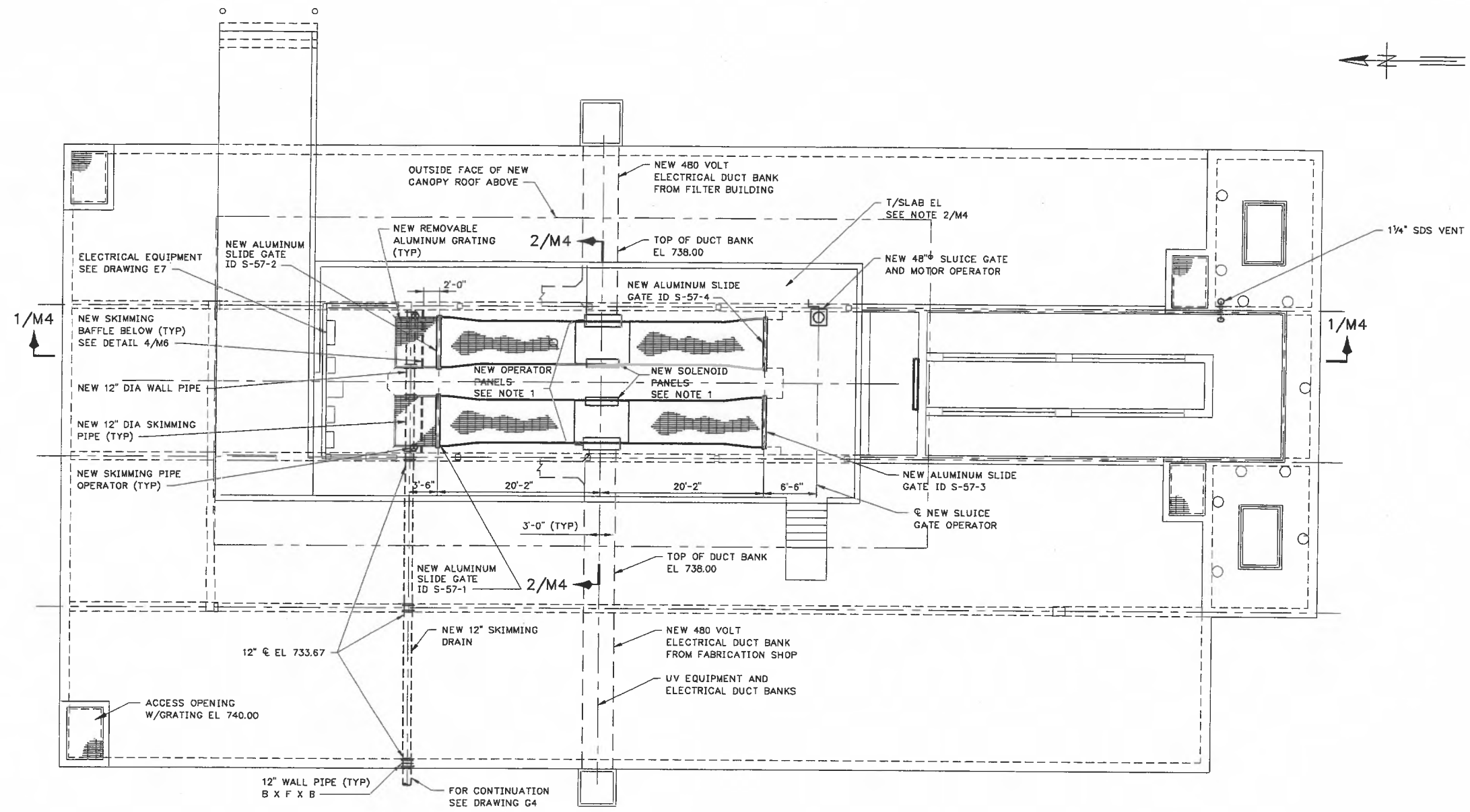
CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

PIPING AND EQUIPMENT
NORTH CHLORINE CONTACT TANK

PLAN AT EL 727.00

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

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



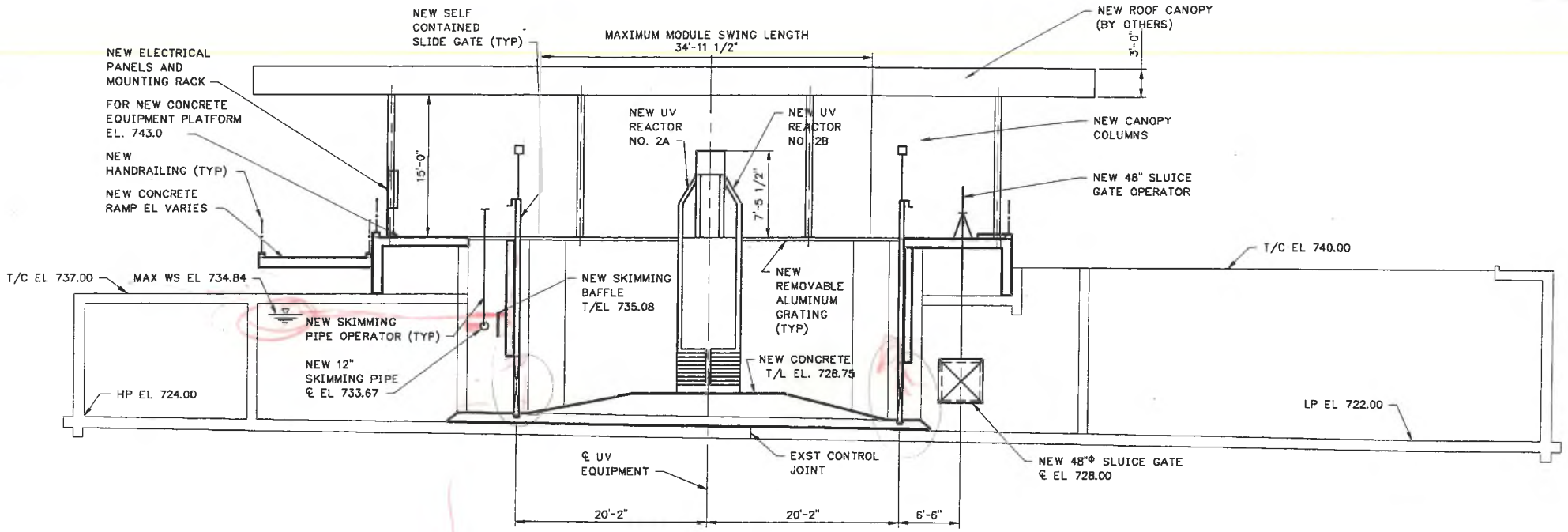
TOP PLAN

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.

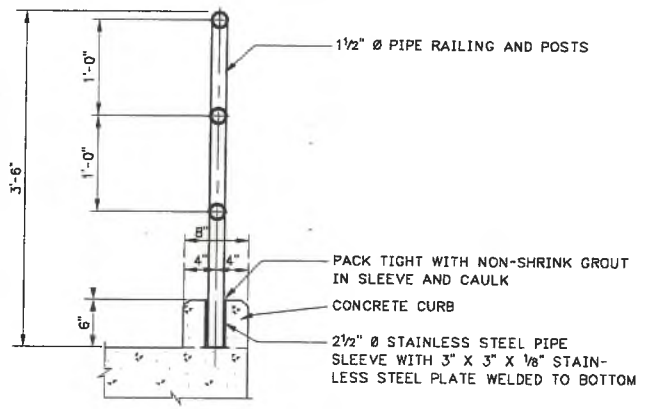
GREELEY AND HANSEN ENGINEERS 211 WEST FORT STREET, SUITE 710 DETROIT, MICHIGAN 48226-3202	DESIGNED PJR DRAWN GD CHECKED PJR	NO. 1 | DATE 06/04/01 | APPD PJV | REVISION: RECORD DRAWING
SCALE: 8 0 8 16 FT, 1/8"=1'-0"	CITY OF ANN ARBOR, MICHIGAN WATER UTILITIES DEPARTMENT WASTEWATER TREATMENT PLANT DISINFECTION FACILITIES UPGRADE	PIPING AND EQUIPMENT NORTH CHLORINE CONTACT TANK TOP PLAN
PROJ 02012 DWG M3 SHEET 16 OF 28 DATE OCTOBER 1999 REV 1		

FILE: 201AM03 1:1 10/28/99 13:41 GH-A FILE: 201AXS01 1:1 11/17/99 14:02 GH-A FILE: 201AXM01 1:1 10/28/99 13:33 GH-A FILE: 201AXE01 1:1 06/28/01 10:37 GH-A



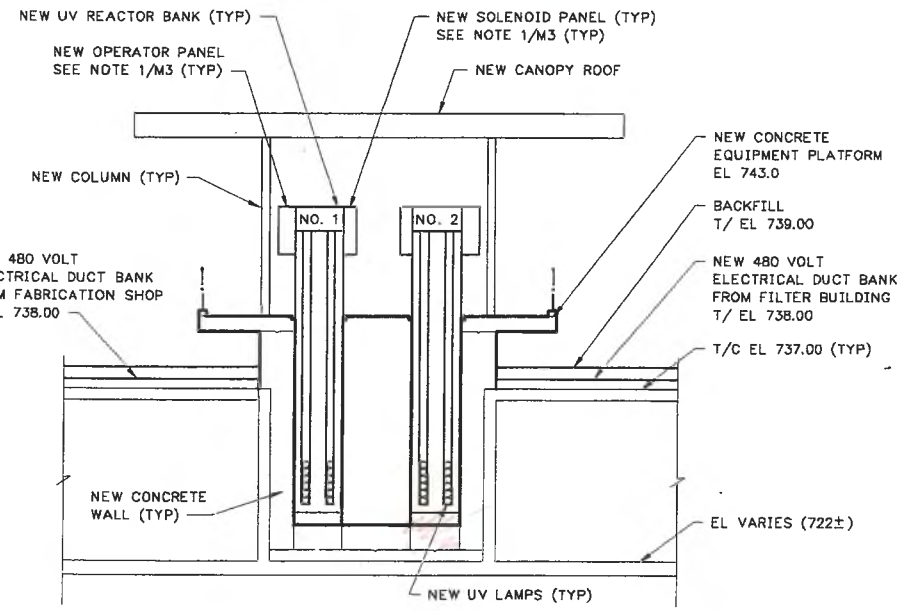
SECTION 1/M2, 3

SCALE: NOT TO SCALE



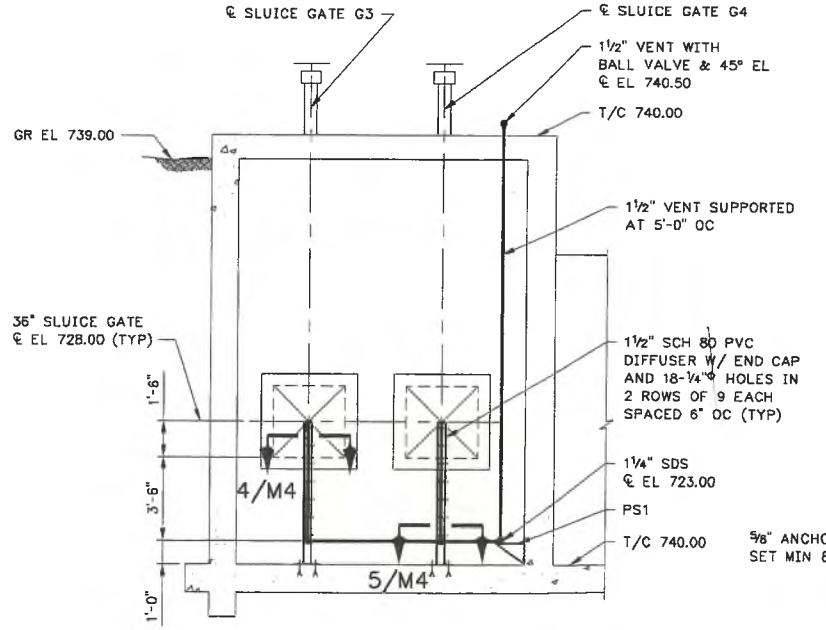
HANDRAIL AND POST DETAIL

SCALE: 1"= 1'- 0"



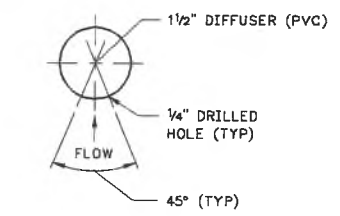
SECTION 2/M2, 3

SCALE: ⅛"=1'-0"



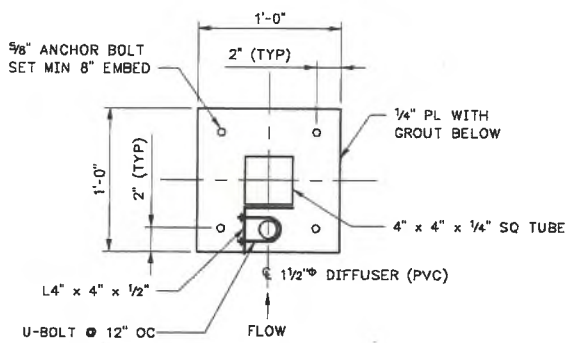
SECTION 3/M2, 3

SCALE: ¼"=1'-0"



SECTION 4/M4

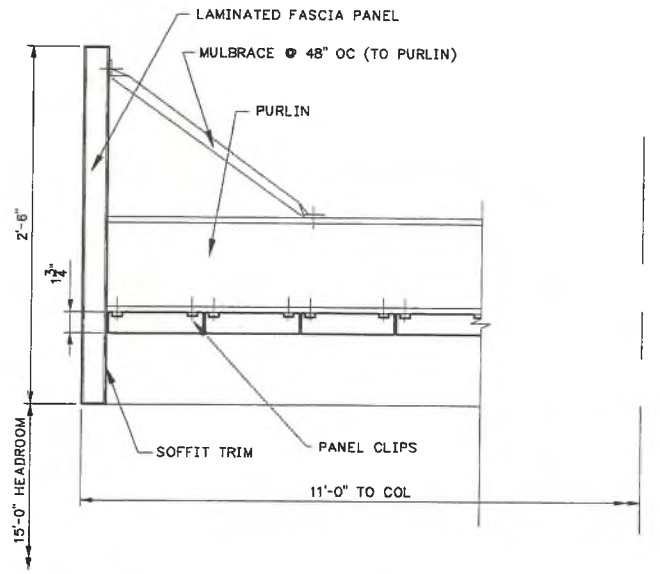
SCALE: ½"=1"



NOTE: ALL METAL MATERIALS TYPE 316 L SST.

SECTION 5/M4

SCALE: 1½"=1'-0"



CANOPY FASCIA / SOFFIT DETAIL

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

RECORD DRAWING

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

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

DESIGNED PJR
DRAWN GD
CHECKED PJV

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

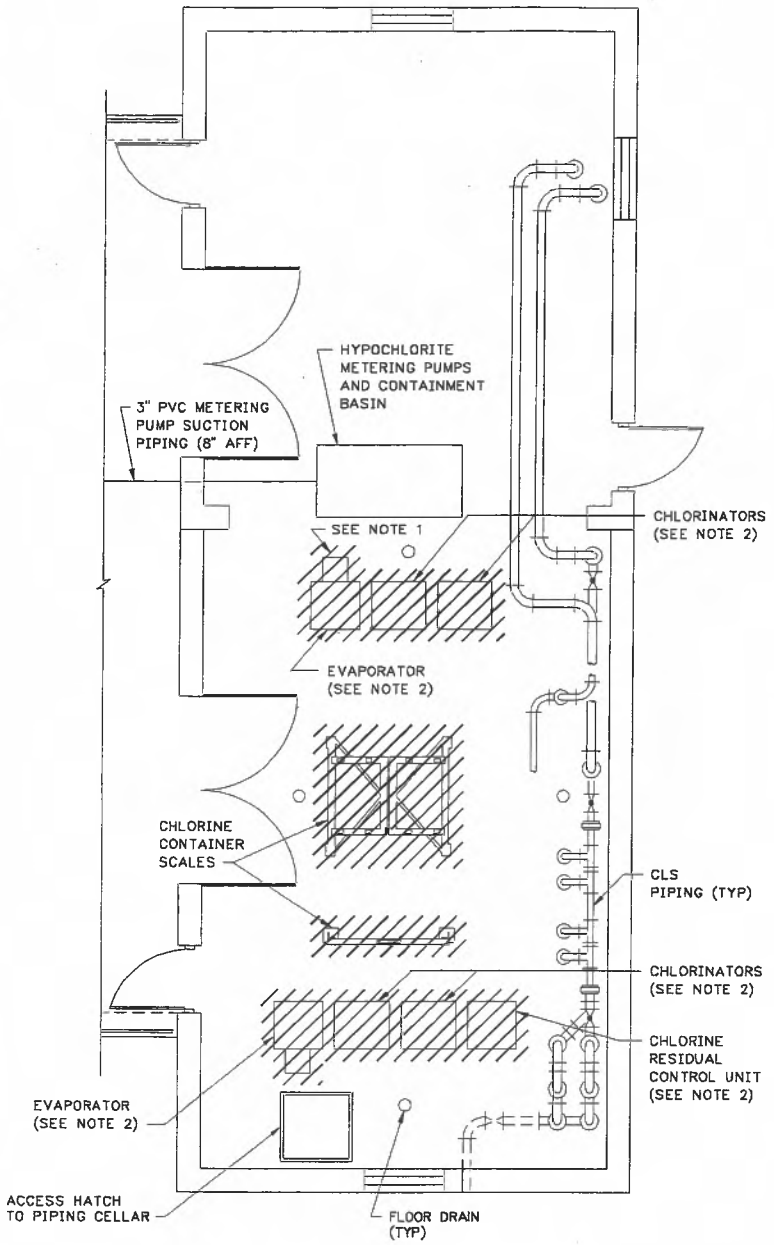
SCALE: 8 0 8 16 FT — 1/8"=1'-0"

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

PIPING AND EQUIPMENT
NORTH CHLORINE CONTACT TANK

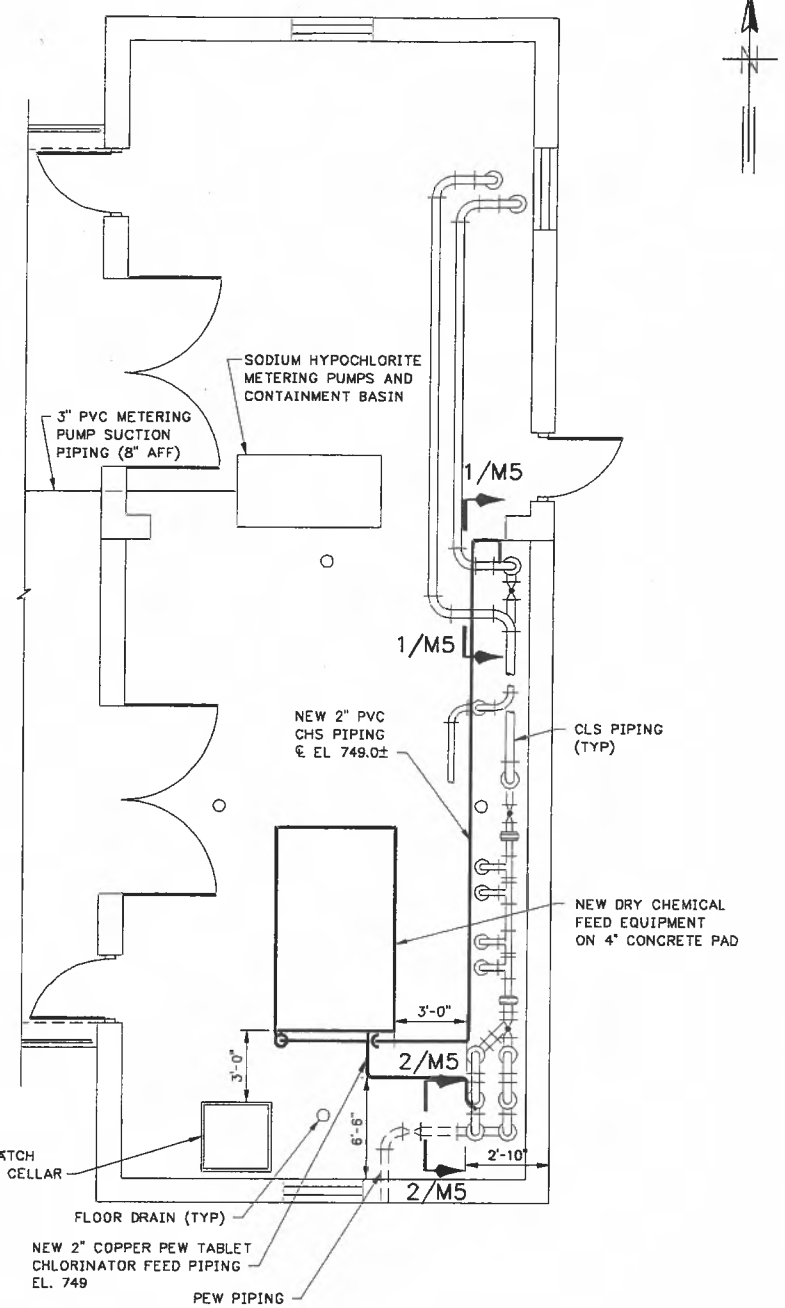
SECTIONS AND DETAILS

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



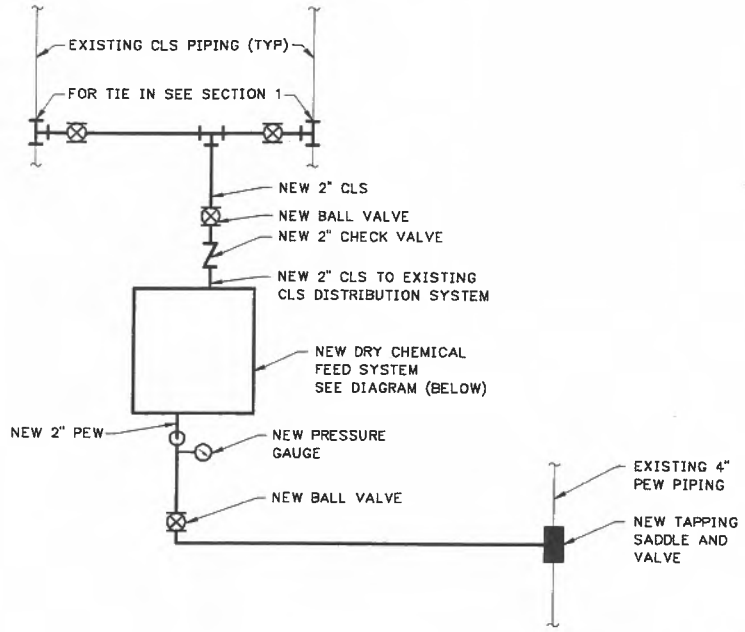
EXISTING PLAN FL EL 742.0

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



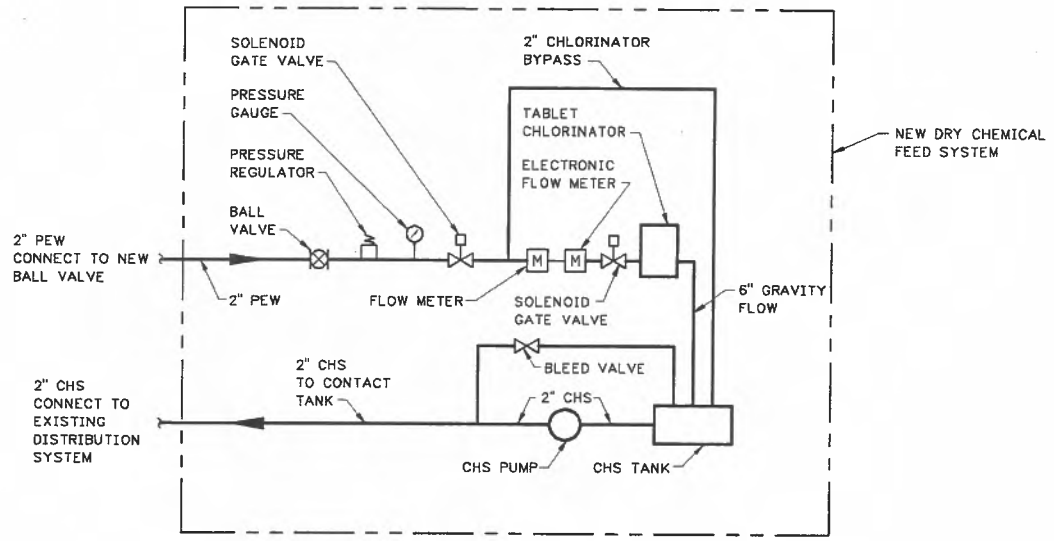
NEW PLAN FL EL 742.0

NOT TO SCALE



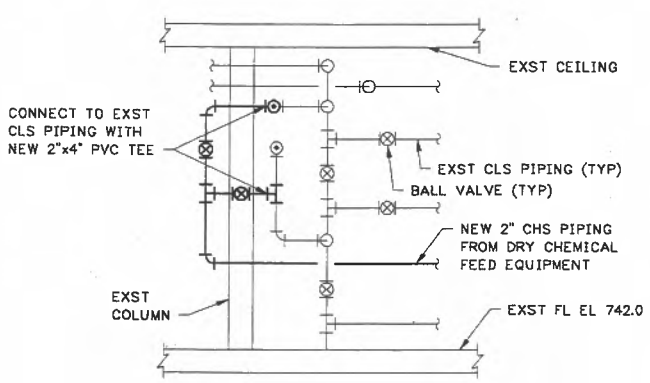
NEW DRY CHEMICAL FEED DIAGRAM

NOT TO SCALE



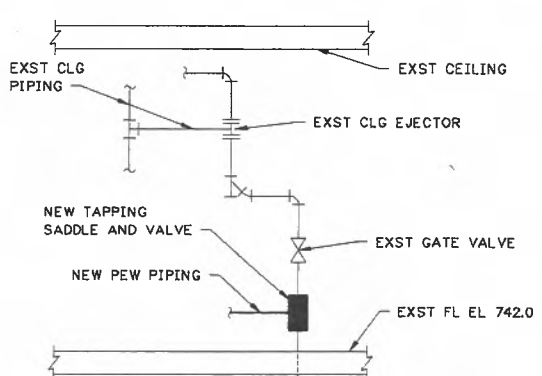
NEW DRY CHEMICAL FEED SYSTEM

NOT TO SCALE



SECTION 1

NOT TO SCALE



SECTION 2

NOT TO SCALE

RECORD DRAWING

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NOTES:

1. 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.
2. 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.

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

DESIGNED BYD
DRAWN JRJ
CHECKED PVR

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

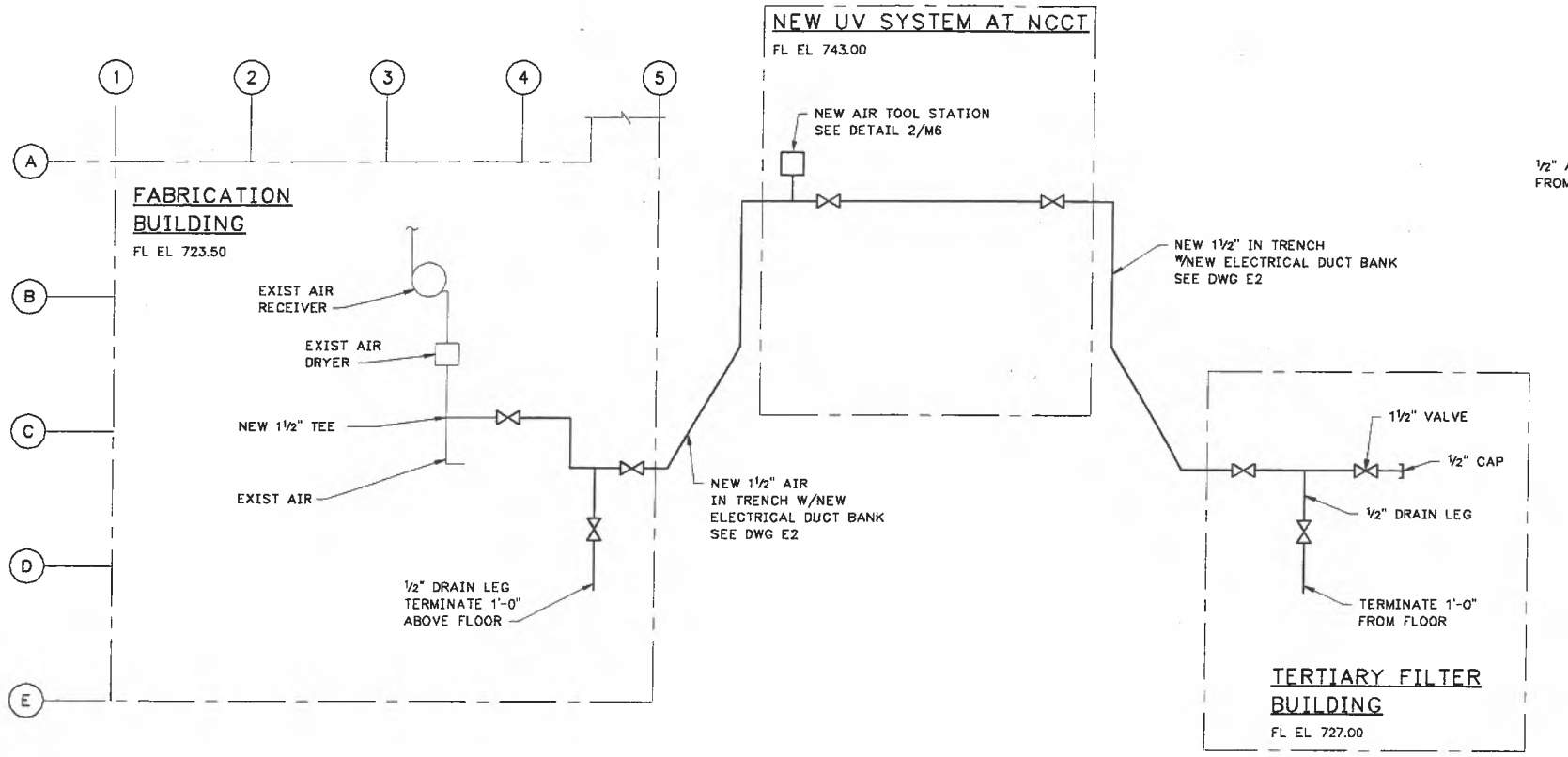
SCALE
4 0 4 8 FT
1/4"=1'-0"

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

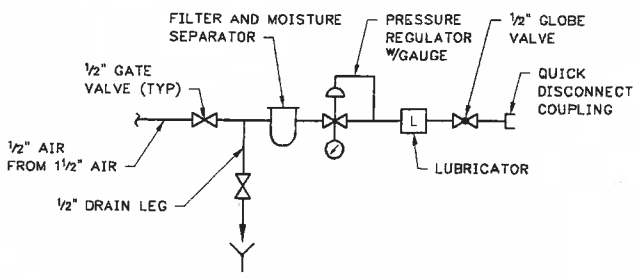
PIPING AND EQUIPMENT
CHLORINE BUILDING
PLANS, SECTIONS AND DIAGRAMS

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

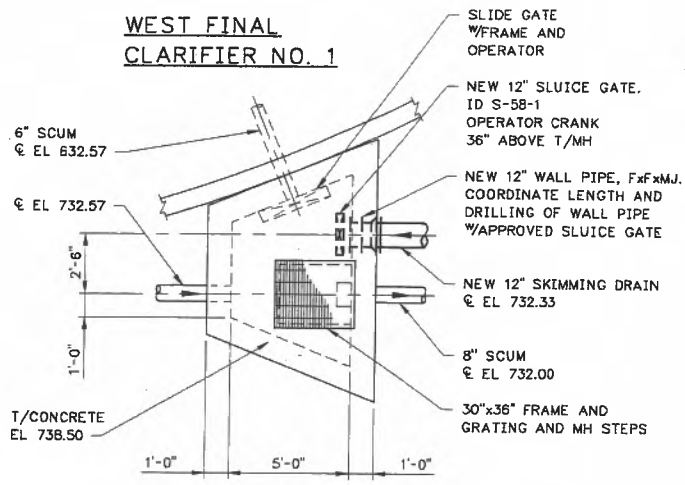
FILE: 201AM05 1:1 10/28/99 16:20 GH-A



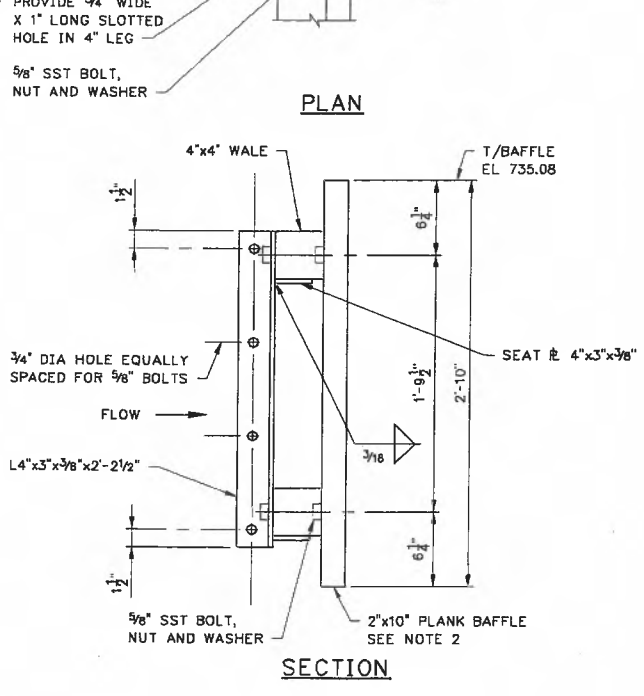
DETAIL 1
AIR DIAGRAM
NOT TO SCALE



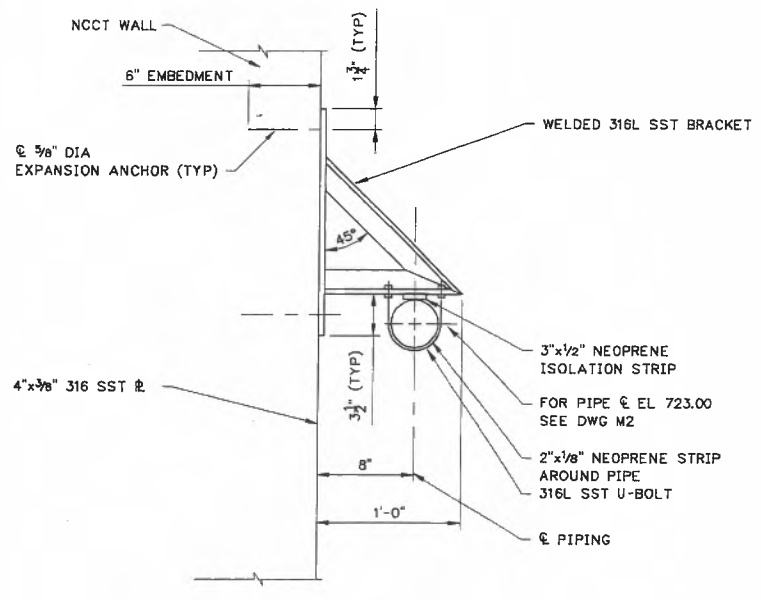
DETAIL 2
AIR TOOL STATION DIAGRAM
NOT TO SCALE



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



DETAIL 4
BAFFLE MOUNTING END CONNECTION
SCALE: 1½"=1'-0"



DETAIL 5
PIPE SUPPORT PS1
SCALE: 1½"=1'-0"

NOTES:

1. ALL AIR PIPING, VALVES, FITTINGS, AND APPURTENANCES TO BE PROVIDED.
2. PROVIDE ⅛" GAP BETWEEN 2"x10" VERTICAL PLANKS. FASTEN EACH PLANK TO DOUGLAS FIR-LARCH TREATED WOOD 4"x4" WALES W/(4) ½"Φ SST LAG SCREWS AND WASHERS. UTILIZE TYPE 316L SST PLATES, ANGLES, BARSTOCK, BELT ASSEMBLIES AND SCREWS.

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

DESIGNED	BYD
DRAWN	GD
CHECKED	PJV

NO.	DATE	APPD	REVISION
1	05/04/01	PJV	RECORD DRAWING

SCALE
4 0 4 8 FT 1/4"=1'-0"
1 0 1 1/2 FT 1 1/2"=1'-0"

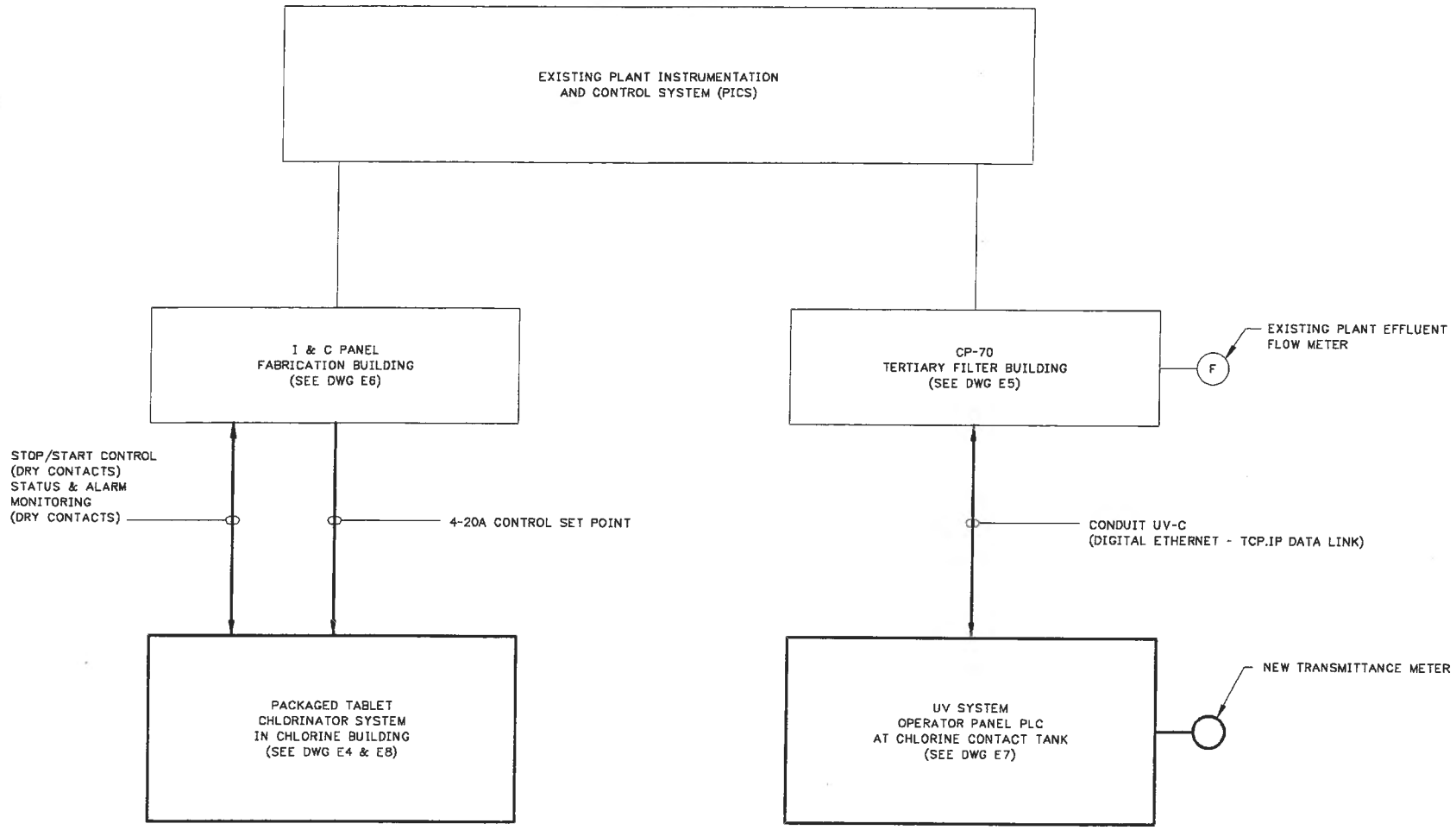
CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

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-A



RECORD DRAWING

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

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

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DRAWN AF
CHECKED SHP

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

SCALE

NOT TO SCALE

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

INSTRUMENTATION

INSTRUMENTATION AND CONTROL DIAGRAMS

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

INCOMING FEEDER

OUTGOING FEEDER

CONDUCTORS CONNECTED

GROUNDING CONNECTION

LIGHTNING OR SURGE ARRESTOR

RECTIFIER OR DIODE

SURGE CAPACITOR

POWER TRANSFORMER

CPT — CONTROL POWER TRANSFORMER

2 CT — CURRENT TRANSFORMER (NUMBER DENOTES QUANTITY REQUIRED)

CT — CURRENT TRANSFORMER - 3 PHASE WINDOW TYPE

2 PT — POTENTIAL TRANSFORMER (NUMBER DENOTES QUANTITY REQUIRED)

52 — MEDIUM VOLTAGE DRAWOUT TYPE CIRCUIT BREAKER

DISCONNECTING OR DRAWOUT DEVICE

100A — LOW VOLTAGE AIR CIRCUIT BREAKER WITH 100A TRIP

225AF/125AT — LOW VOLTAGE AIR CIRCUIT BREAKER
225A FRAME AND 125A TRIP

225AF/150AT — LOW VOLTAGE AIR CIRCUIT BREAKER WITH COORDINATED
CURRENT LIMITING FUSES - 225A FRAME AND 150A TRIP

KEY INTERLOCK - DASHED LINE WITH ARROWS
INDICATES MOVEMENT OF KEY DURING INTERLOCK PROCEDURE

FULL VOLTAGE MAGNETIC MOTOR CIRCUIT PROTECTOR COMBINATION STARTER
WITH CONTROL TRANSFORMER AND OVERLOAD RELAYS
(M - OPERATING COIL)

FULL VOLTAGE MAGNETIC MOTOR CIRCUIT PROTECTOR COMBINATION REVERSING
STARTER WITH CONTROL TRANSFORMER AND OVERLOAD RELAYS
(F - FORWARD, R - REVERSE)

FULL VOLTAGE MAGNETIC MOTOR CIRCUIT PROTECTOR COMBINATION TWO SPEED
STARTER WITH CONTROL TRANSFORMER AND OVERLOAD RELAYS
(H - HIGH, L - LOW, F - FAST, S - SLOW)

OPERATING COIL (AR-AUXILIARY RELAY, C-CONTACTOR, CR-CONTROL RELAY, F-FORWARD, LOR-LOCKOUT RELAY, M-MOTOR STARTER, R-REVERSE, TR-TIME DELAY RELAY)

NORMALLY OPEN CONTACT

NORMALLY CLOSED CONTACT

OL — OVERLOAD RELAY CONTACT

X-X-O — NORMALLY OPEN (SHOWN) OR NORMALLY CLOSED RESET TIMER CONTACT (X-X-O - DENOTES TIMER SEQUENCE FOR RESET-TIMING-TIMED OUT PERIODS. X INDICATES CONTACT CLOSED)

TC — NORMALLY OPEN CONTACT WITH TIME DELAY CLOSING (ON DELAY)

TC — NORMALLY CLOSED CONTACT WITH TIME DELAY CLOSING (OFF DELAY)

TO — NORMALLY CLOSED CONTACT WITH TIME DELAY OPENING (ON DELAY)

TO — NORMALLY OPEN CONTACT WITH TIME DELAY OPENING (OFF DELAY)

LS — LIMIT SWITCH

FS — FLOAT SWITCH

PS OR VS — PRESSURE OR VACUUM SWITCH

FLS — FLOW SWITCH

TS — TEMPERATURE SWITCH

TQ — TORQUE SWITCH

U / L / L / U — LATCHING RELAY WITH CLEARING CONTACTS

SELECTOR SWITCH

NORMALLY OPEN PUSHBUTTON

NORMALLY CLOSED PUSHBUTTON

PUSHBUTTON STATION (ONE, TWO OR THREE UNIT)

R — INDICATING LIGHT (A-AMBER, B-BLUE, G-GREEN, R-RED, W-WHITE)

THERMAL OVERLOAD ELEMENT (OL)

ON-OFF SWITCH

R — RESISTOR

FUSE

BATTERY

HEATING ELEMENT

EXPOSED CONDUIT RUN

CONCEALED CONDUIT RUN ABOVE CEILING OR IN WALLS

CONCEALED CONDUIT RUN IN OR BELOW FLOOR SLAB

E — UNDERGROUND CONDUIT (CONCRETE ENCASED)

DB — UNDERGROUND CONDUIT (DIRECT BURIED)

C — UNDERGROUND CABLE (DIRECT BURIED)

CONDUIT CAPPED

CONDUIT UP

CONDUIT DOWN

CONDUIT WITH HOT, NEUTRAL AND GROUND WIRES
(LONG LINE DENOTES NEUTRAL; LONG LINE WITH DOT DENOTES GROUND)

LP6 1,3,5 — HOME RUN TO LIGHTING PANELBOARD (LP6 INDICATES PANELBOARD AND 1,3,5 INDICATES CIRCUITS 1, 3 AND 5)

FLEXIBLE CONDUIT OR CABLE

GROUNDING CONDUCTOR

EQUIPMENT ENCLOSURE AS INDICATED ON PLAN

LIGHTING PANELBOARD 208Y/120V OR 120/240V

LIGHTING PANELBOARD 480Y/277V

T — DRY TYPE TRANSFORMER

JUNCTION BOX, PULL BOX OR TERMINAL BOX

MANUALLY OPERATED DISCONNECTING CIRCUIT BREAKER OR SWITCH
(SEE SPECIFICATIONS)

RS — MANUAL REVERSING DRUM SWITCH,
FORWARD-OFF-REVERSE, MAINTAINED CONTACTS

FULL VOLTAGE MAGNETIC STARTER OR CONTACTOR

COMBINATION CIRCUIT BREAKER STARTER

S — MOTOR - THREE PHASE (NUMBER DENOTES HORSEPOWER)
(USED ON ONE LINE DIAGRAMS)

MOTOR - THREE PHASE
(USED ON PLANS)

MOTOR - SINGLE PHASE
(USED ON PLANS)

M — MOTOR OPERATED VALVE OR SLUICE GATE WITH INTEGRAL CONTROLLER AND CONTROL STATION

CONTROL STATION (SEE SCHEMATIC DIAGRAMS FOR ASSOCIATED DEVICES)

X — CONTROL STATION AND FIELD CONTROL DEVICES
(SEE ONE LINE DIAGRAMS AND SCHEMATICS FOR DETAILS)

GROUND ROD

GROUND ROD WITH ACCESS BOX

LIGHTNING ROD

M — METER SOCKET

WH — WATER HEATER

UNIT HEATER

C — COMPUTER OUTLET

T — TELEPHONE OUTLET

EBH (ELECTRIC BASEBOARD HEATER)

A / 1A — WALL OR CEILING MOUNTED INCANDESCENT OR HID LIGHTING FIXTURE
UPPER LETTER DENOTES FIXTURE TYPE
NUMBER DENOTES CIRCUIT NUMBER AND LETTER DENOTES SWITCH CONTROLLING FIXTURE

EMERGENCY LIGHTING FIXTURE

WALL OR CEILING MOUNTED EXIT OR DIRECTIONAL SIGN (SHADED SIDE DENOTES ILLUMINATED FACE ARROW INDICATES DIRECTION)

POLE MOUNTED LIGHTING FIXTURE

FLOODLIGHT

FLUORESCENT STRIP LIGHTING FIXTURE

FLUORESCENT LIGHTING FIXTURE

EMERGENCY FLUORESCENT LIGHTING FIXTURE

T — REMOTE TEST PUSHBUTTON AND "ON" INDICATING LIGHT FOR BATTERY EQUIPPED LIGHTING FIXTURES

EMERGENCY BATTERY PACK WITH TWO LIGHTING HEADS

RH — EMERGENCY BATTERY PACK WITH REMOTE HEAD

PC — PHOTOELECTRIC CELL

SINGLE RECEPTACLE - 2 POLE, 3 WIRE, 120 VOLT, 20A, OR AS NOTED

DUPLEX RECEPTACLE - 2 POLE, 3 WIRE, 120 VOLT, 20A, OR AS NOTED

DUPLEX RECEPTACLE - 2 POLE, 3 WIRE, 208 VOLT, 20A, OR AS NOTED

FLOOR OUTLET BOX WITH DUPLEX RECEPTACLE - 2 POLE, 3 WIRE, 120 VOLT, 20A, OR AS NOTED

SINGLE RECEPTACLE - SINGLE PHASE (RATING AS NOTED)

SINGLE RECEPTACLE - THREE PHASE (RATING AS NOTED)

C — CLOCK WITH RECEPTACLE

TYPE — SINGLE POLE SWITCH UNLESS NOTED OTHERWISE

2P - TWO POLE SWITCH
3 - THREE WAY SWITCH
4 - FOUR WAY SWITCH
D - DOOR SWITCH
TS - TIME SWITCH
M - MOMENTARY CONTACT SWITCH
MS - MOTOR STARTING SWITCH
PL - SWITCH WITH PILOT LIGHT
T - SWITCH WITH THERMAL OVERLOAD

INTERCOM TELEPHONE OUTLET

INTERCOM TELEPHONE FLOOR OUTLET

PUBLIC TELEPHONE OUTLET

PUBLIC TELEPHONE FLOOR OUTLET

S — SPEAKER

S — BI-DIRECTIONAL SPEAKER

S — INTERCOMMUNICATION SPEAKER

V — INTERCOMMUNICATION SPEAKER VOLUME CONTROL

TV — CLOSED CIRCUIT TELEVISION CAMERA

ALARM HORN

ALARM BELL

FACP — FIRE ALARM CONTROL PANEL

FAAP — FIRE ALARM ANNUNCIATOR PANEL

F — MANUAL PULL STATION

S — SMOKE DETECTOR

H — HEAT DETECTOR

PHOTOELECTRIC BEAM SMOKE DETECTOR TRANSMITTER

PHOTOELECTRIC BEAM SMOKE DETECTOR RECEIVER

A — AUDIBLE/VISIBLE INDICATING DEVICE WITH HORN

A — AUDIBLE/VISIBLE INDICATING DEVICE WITH BELL

A — VISIBLE INDICATING DEVICE

FS — SPRINKLER SYSTEM FLOW SWITCH

TS — SPRINKLER SYSTEM TAMPER SWITCH

M — MAGNETIC DOOR SWITCH

PI — PASSIVE INFRARED MOTION DETECTOR

INFRARED BEAM MOTION DETECTION TRANSMITTER

INFRARED BEAM MOTION DETECTION RECEIVER

(27) PROTECTIVE RELAYS:

25 - SYNCHRONIZING CHECK
27 - UNDERVOLTAGE
32 - REVERSE POWER
43 - SELECTOR SWITCH
49 - THERMAL
50 - INSTANTANEOUS OVERCURRENT
51 - AC TIME OVERCURRENT
52 - AC CIRCUIT BREAKER
60 - VOLTAGE OR CURRENT BALANCE
62 - TIME DELAY
64 - GROUND
67 - DIRECTIONAL OVERCURRENT
86 - LOCKOUT
87 - DIFFERENTIAL CURRENT
DBX - DEAD BUS AUXILIARY
G - DEVICE IN GROUND CIRCUIT
GSR - GROUND SENSING
IR - INTERPOSING
LOR - LOCKOUT
N - DEVICE IN NEUTRAL CIRCUIT
PSR - PHASE SENSING
X - AUXILIARY

A — METER, INSTRUMENT OR INSTRUMENT SWITCHES:

A - AMMETER
AS - AMMETER SWITCH
AT - CURRENT TRANSDUCER
CS - BREAKER CONTROL SWITCH
DT - DUTY TRANSFER SWITCH
PF - POWER FACTOR METER
POT - POTENTIOMETER
SI - SPEED INDICATOR
SS - SELECTOR SWITCH
TM - ELAPSED TIME METER
TMR - TIMER
V - VOLTMETER
VAR - VARMETER
VART - VARS TRANSDUCER
VS - VOLTMETER SWITCH
VT - VOLTAGE TRANSDUCER
W - WATTMETER
WHD - WATTHOUR DEMAND METER
WH - WATTHOUR METER
WT - WATTS TRANSDUCER
ZT - POSITION TRANSMITTER

DPS — CONTROL DEVICES:

DPS - DIFFERENTIAL PRESSURE SWITCH
FS - FLOAT SWITCH
FLS - FLOW SWITCH
LLS - LEVEL SWITCH
LS - LIMIT SWITCH
PS - PRESSURE SWITCH
RDS - REVERSING DRUM SWITCH
ST - SHUNT TRIP
SV - SOLENOID VALVE
T - THERMOSTAT
TQ - TORQUE SWITCH
TS - TEMPERATURE SWITCH
VIB - VIBRATION SWITCH
VS - VACUUM SWITCH

ABBREVIATIONS

AFF - ABOVE FINISHED FLOOR
AFG - ABOVE FINISHED GRADE
ATS - AUTOMATIC TRANSFER SWITCH
AWG - AMERICAN WIRE GAUGE
BKR - BREAKER
CKT - CIRCUIT
DP - DISTRIBUTION PANELBOARD
DTC - DATA TERMINAL CABINET
GFI - GROUND FAULT INTERRUPTER
GND - GROUND
JB - JUNCTION BOX
LCP - LIGHTING CONTROL PANEL
LP - LIGHTING PANELBOARD
LTG - LIGHTING
MCC - MOTOR CONTROL CENTER
MH - MOUNTING HEIGHT
PB - PULL BOX
PNL - PANEL
RTU - REMOTE TERMINAL UNIT
TCP - TEMPERATURE CONTROL PANEL
TTC - TELEPHONE TERMINAL CABINET
TYP - TYPICAL
WP - WEATHERPROOF
XP - EXPLOSION-PROOF

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.

NOTE:

THIS IS A GENERAL LEGEND PROVIDED TO FACILITATE USE OF THE ELECTRICAL DRAWINGS. ALL SYMBOLS MAY NOT BE USED IN THIS SET OF ELECTRICAL DRAWINGS. REFER TO THE DRAWINGS AND SPECIFICATIONS FOR ITEMS REQUIRED.

FILE: 201AE01 v1 10/26/99 16:33 GH-A

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

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DRAWN GD
CHECKED SHP

NO.	DATE	APPD	REVISION
1	05/04/01	PJV	RECORD DRAWING

SCALE: NOT TO SCALE

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

ELECTRICAL

SYMBOL LIST

PROJ 02012
DWG E1
SHEET 21 OF 28
DATE OCTOBER 1999 REV 1

RETENTION BASIN OVERFLOW CHLORINE CONTACT TANK
RAW SEWAGE LIFT STATION
SCREEN AND GRIT BLDG
BM NO. 1
FLAG POLE
NO. 5
NO. 6
AUXILIARY
NO. 4
NO. 9
BIOSOLIDS
NO. 2
NO. 1
STORAGE
GRAVITY THICKENERS
THICKENER BLDG
EAST PLANT PRIMARY SETTLING CLARIFIERS
NO. 1
NO. 2
NO. 3
NO. 4
FLOW SPLIT
BM NO. 3
WEST PLANT PRIMARY BLDG
WEST PLANT PRIMARY SETTLING TANKS
STORAGE BLDG
MACHINERY BLDG
BLOWER BLDG
SLUDGE DEWATERING AND INCINERATOR FACILITY
EAST PLANT PRIMARY BLDG
EAST PLANT AERATION TANKS
NO. 1
NO. 2
NO. 3
NO. 4
ELECTRICAL BLDG
BLOWER BLDG
FLEMING CREEK
N
3'-10"
1'-2"
#3@12 (TYP)
SECTION 1
SCALE: 3/4"=1'-0"
RETENTION BASIN
RETENTION BLDG
EQUALIZATION TANKS
OZONE BLDG
WEST PLANT AERATION BASINS NO. 1
CHEM FEED BLDG
ALTERNATE B
EXST 6" SCUM SEE DWG G4
CONTROL BLDG
REAERATION TANKS
ADMINISTRATION 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
NEW DUCT BANK FOR CONTINUATION SEE DWG E6
CHLORINE BLDG SEE DWG E8
FABRICATION BLDG SEE DWG E6
BM NO. 2
SAME AS SECTION 1 EXCEPT 4 CONDUITS
MAINTENANCE BLDG
NEW UV SYSTEM IN NORTH CHLORINE CONTACT TANK
EAST PLANT FINAL CLARIFIERS
NO. 1
NO. 2
NO. 3
NO. 4
NORTH CHLORINE CONTACT TANK (NCCT) (BELOW GRADE)
1/E2
NEW DUCT BANK SEE DWG E5 FOR CONTINUATION
RESTORE EXISTING REINFORCED CONCRETE 18" THICK WALK
TERTIARY FILTER BLDG SEE DWG E5
BACKWASH WATER TANK
NEW DUCT BANK SEE DWG E7 FOR CONTINUATION
DECHLORINATION BLDG
SOUTH CHLORINE CONTACT TANK (BELOW GRADE)
PLANT EFFLUENT MANHOLE
HURON RIVER
AVG W.S. 732.0
10-YEAR FLOOD W.S. 735.1
100-YEAR FLOOD W.S. 738.8
FLOW

RECORD DRAWING

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FILE: 201AE02 1:1 10/28/99 15:03 GH-A
FILE: 201AXG01 1:1 10/28/99 15:15 GH-A

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

SCALE
50 0 50 100 FT
1"=50'

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

ELECTRICAL

SITE PLAN

PROJ 02012
DWG E2
SHEET 22 OF 28
DATE OCTOBER 1999 REV 1

UNIT SUB NO. 5

1000/1333 KVA AA
4800-277/480V 5.75% Z

1000/1333 KVA AA
4800-277/480V 5.75% Z

PRIMARY SLUDGE

MCC W | MCC V | MCC HH | MCC XA | MCC R | MCC XB | 600A ATS | MCC Y | MCC S | MCC XC | MCC GG

SLUDGE HANDLING BUILDING

NORTH SOURCE CIRCUIT
DETROIT EDISON CO.
SERVICE DC-8266

UNIT B | UNIT A

860 KW | 860 KW

13.2 KV | MH-7 | G2 | G1

13.2 KV | MH-6

UNIT SUB NO. 6

750/1000 KVA AA
4800-277/480V 5.75% Z

SPARE | 100A ATS | MCC 6A

GENERATOR ROOM

GENERATOR TIE BUS

5000/5600 KVA
OA/FFA OIL
COOLED 5.5% Z,
13,200-2770/4800 V

5000/5600 KVA
OA/FFA OIL COOLED
5.5% Z, 13,200-2770
480D V

METAL ENCLOSED BUS | METAL ENCLOSED BUS

NORTH | SOUTH

52-2A | 52T-2A | 52T-1A | 52-1A | 52-8 | 52-7 | 52-6 | 52-5 | 52-4 | 52-3

300 KVAR | 300 KVAR

13.8 KV
METAL CLAD
SWITCHGEAR

500 MCM | 500 MCM

52-2 | 52-1

BLOWER BUILDING

MCC U | MCC T

250+MVA AVAILABLE | 1250 | 1250 | 300 KVAR | NO. 8 NO. 7

300 KVAR | 1250 | 1250 | 250+MVA AVAILABLE | NO. 6 NO. 5

13.2 KV | MH-2 | 4.8 KV | MH-1

LOW VOLTAGE | LOW VOLTAGE

ELECTRICAL BUILDING

LOW VOLTAGE | MH-8

UNIT SUB NO. 1 (B)

750/1000 KVA AA
4800-277/480V 5.75% Z

MCC B | MCC C | MCC D

RAW SEWAGE LIFT STATION

UNIT SUB NO. 1 (A)

300/336 KVA AA
4800-277/480V
5.43% Z

MCC A

UNIT SUB NO. 2 (A)

1000/1333 KVA AA
4800-277/480V 5.75% Z

BLOWER | MCC 9 | DP MB | MCC G | MCC H | MCC 4 | MCC 2

MACHINERY BUILDING 2 (A)

4.8 KV | MH-5 | MH-4 4.8 KV | PB-3

LOW VOLTAGE

UNIT SUB NO. 2 (B)

750/1000 KVA AA
4800-277/480V 5.75% Z

SPARE

OZONE | OZONE | MCC FF | MCC EE | MCC E | MCC F

RETENTION BASIN

LOW VOLTAGE

400A ATS | PP I | PP J

ADMINISTRATION BUILDING

FABRICATION BUILDING SEE DWG E4 | TCS | PP KL

100A ATS | 100A MTS

UNIT SUB NO. 3

1000/1333 KVA AA
4800-277/480V 6.04% Z

CHLORINE BUILDING

FABRICATION BUILDING

MCC K | MCC L | DP Z

UV1B-K | UV1A-L

MAINTENANCE BUILDING

PPUV-L | PPUV-P

ISOLATION TRANSFORMER AND SECONDARY BREAKER

FABRICATION SHOP

(SEE DWG E4)

TO CHLORINE CONTACT TANKS
(SEE DWG E4, E7 & E8)

SOUTH SOURCE CIRCUIT
DETROIT EDISON CO.
SERVICE DC-9798

UNIT SUB NO. 4

750/1000 KVA AA
4800-277/480V 5.5% Z

750/1000 KVA AA
4800-277/480V 5.5% Z

MCC M | MCC P | MCC Q | MCC N

400A ATS | 400A ATS

UV2B-4B | UV2A-4B

ISOLATION TRANSFORMER AND SECONDARY BREAKER

(SEE DWG E4)

TERTIARY FILTER BUILDING

RECORD DRAWING

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FILE: 2014E03 1:1 10/26/99 15:39 GH-A

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

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

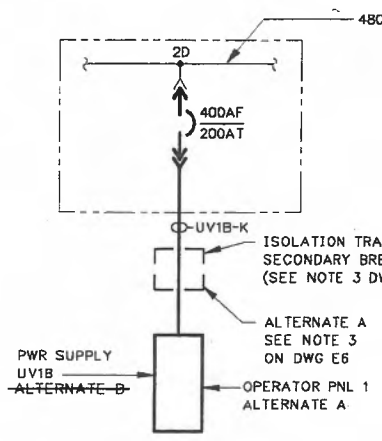
SCALE
NOT TO SCALE

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

ELECTRICAL

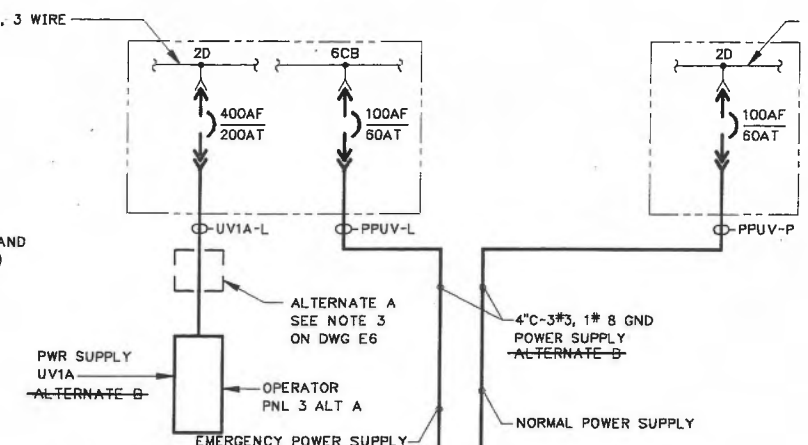
ONE LINE DIAGRAM

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



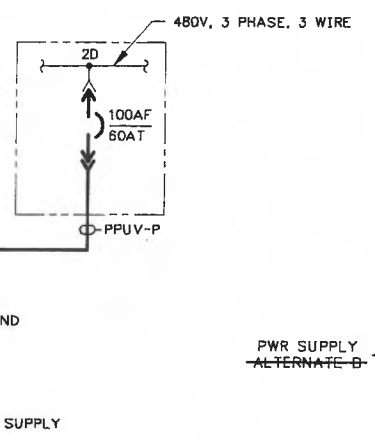
MODIFICATIONS TO EXISTING MCC-K IN FABRICATION BLDG

(SEE NOTE 1)



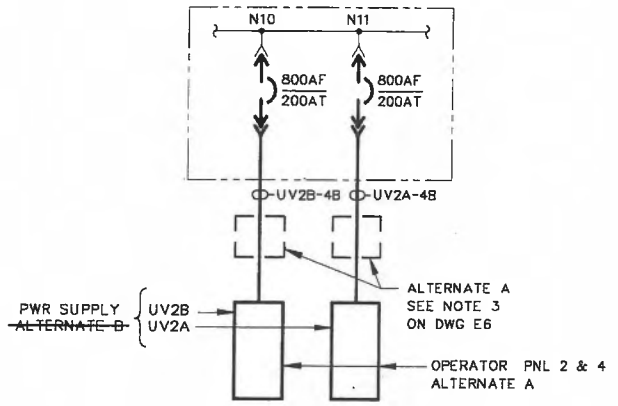
MODIFICATIONS TO EXISTING MCC-L IN FABRICATION BLDG

(SEE NOTE 2)



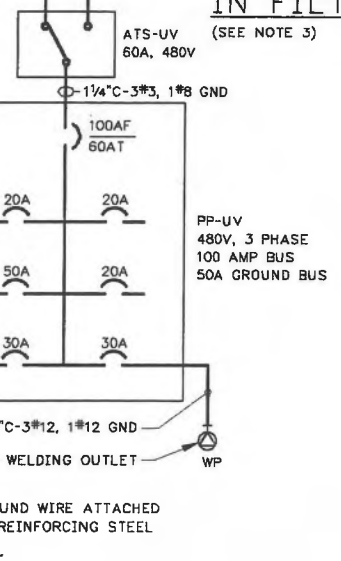
MODIFICATIONS TO EXISTING MCC-P IN FILTER BLDG

(SEE NOTE 3)



MODIFICATIONS TO EXISTING UNIT SUB NO. 4B IN FILTER BLDG

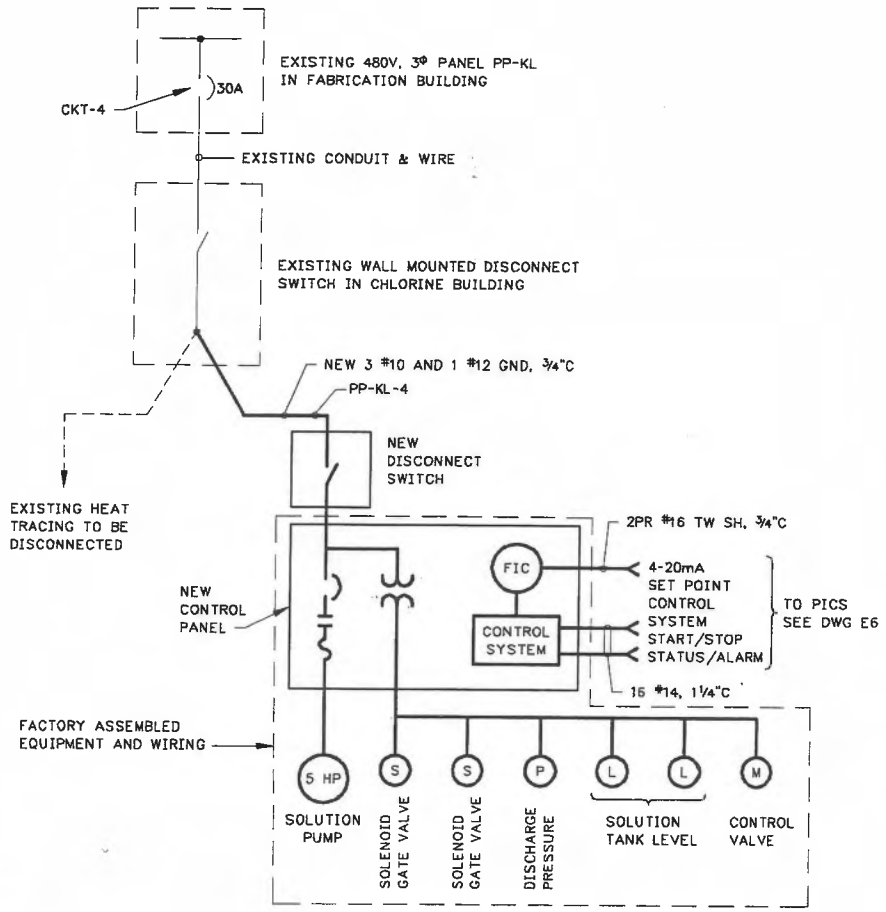
(SEE NOTE 4)



FEDDER SCHEDULE

	ALTERNATE A TROJAN EQUIPMENT				ALTERNATE B CALGON EQUIPMENT			
FEEDER NO	FROM	TO	CONDUIT SIZE	NO. OF WIRES	FROM	TO	CONDUIT SIZE	NO. OF WIRES
UV1A-K	MCC-K	TRANSF	3"	3#250 Kcmil, 1#4 GND	MCC-K	POWER SUPPLY 1A	4"	3#250 Kcmil, 1#4 GND
UV1A-K	TRANSF	OPERATOR PANEL	4"	4#250 Kcmil, 1#4 GND				
UV1A-L	MCC-L	TRANSF	3"	3#250 Kcmil, 1#4 GND	MCC-L	POWER SUPPLY 1B	4"	3#250 Kcmil, 1#4 GND
UV1A-L	TRANSF	OPERATOR PANEL	4"	4#250 Kcmil, 1#4 GND				
UV2A-4B	MCC-4B	TRANSF	3"	3#250 Kcmil, 1#4 GND	MCC-4B	POWER SUPPLY 2A	4"	3#250 Kcmil, 1#4 GND
UV2A-4B	TRANSF	OPERATOR PANEL	4"	4#250 Kcmil, 1#4 GND				
UV2A-4B	MCC-4B	TRANSF	3"	3#250 Kcmil, 1#4 GND	MCC-4B	POWER SUPPLY 2B	4"	3#250 Kcmil, 1#4 GND
UV2A-4B	TRANSF	OPERATOR PANEL	4"	4#250 Kcmil, 1#4 GND				

ALTERNATE B NOT USED



NEW TABLET CHLORINATOR SYSTEM DIAGRAM IN CHLORINE BUILDING

NOTES:

1. EXISTING MCC-K IN THE FABRICATION BUILDING IS AN I-T-E GOULD MCC MANUFACTURED IN 1979 ON GOULD'S SHOP ORDER NO. 84-64321. REMOVE THE EXISTING COMBINATION MOTOR STARTER THAT FED BLOWER NO. 1 FROM UNIT 2D. REMOVE ALL ASSOCIATED CONTROL DEVICES AND WIRING. PROVIDE A 400-AMP FRAME, 200-AMP TRIP, 3 POLE, 600 VOLT RATED, STAB-ON MOLDED CASE CIRCUIT BREAKER IN THIS UNIT TO FEED UV-1A. PROVIDE A NEW DOOR WITH BREAKER OPERATING MECHANISM AND A NAMEPLATE ON THE DOOR.
2. EXISTING MCC-L IN THE FABRICATION BUILDING IS AN I-T-E GOULD MCC MANUFACTURED IN 1979 ON GOULD'S SHOP ORDER NO. 84-64321. REMOVE THE EXISTING COMBINATION MOTOR STARTER THAT FED BLOWER NO. 2 FROM UNIT 2D. REMOVE ALL ASSOCIATED CONTROL DEVICES AND WIRING. PROVIDE A 400-AMP FRAME, 200-AMP TRIP, 3 POLE, 600 VOLT RATED, STAB-ON MOLDED CASE CIRCUIT BREAKER IN THIS UNIT TO FEED NEW UV-1B. PROVIDE A NEW DOOR WITH BREAKER OPERATING MECHANISM AND A NAMEPLATE ON THE DOOR. PROVIDE IN MCC-L UNIT 6CB A NEW 100 AMP FRAME, 60-AMP TRIP, 3 POLE, 600 VOLT RATED, STAB-ON MOLDED CASE CIRCUIT BREAKER TO FEED NEW PP-UV THROUGH NEW ATS-UV. MODIFY OR REPLACE THE UNIT DOOR AS NECESSARY AND PROVIDE A NAMEPLATE ON THE DOOR.
3. EXISTING MCC-P IN THE FILTER BUILDING IS AN I-T-E GOULD MCC MANUFACTURED IN 1979 ON GOULD'S SHOP ORDER NO. 84-64321. PROVIDE IN UNIT 2D A NEW 100 AMP FRAME, 60-AMP TRIP, 3 POLE, 600 VOLT RATED, MOLDED CASE CIRCUIT BREAKER TO FEED NEW PP-UV THROUGH NEW ATS-UV. MODIFY OR REPLACE THE UNIT DOOR AS NECESSARY AND PROVIDE A NAMEPLATE ON THE DOOR.
4. EXISTING UNIT SUB NO. 4B IN THE FILTER BUILDING IS AN I-T-E GOULD INDOOR METAL ENCLOSED UNIT MANUFACTURED IN 1979 ON GOULD'S SHOP ORDER NO. 33-53325. PROVIDE 800-AMP FRAME, 200-AMP TRIP, 3 POLE, 600 VOLT RATED, DRAWOUT, STEEL FRAME AIR CIRCUIT BREAKERS IN UNITS N10 TO FEED UV-2A AND IN UNIT N11 TO FEED UV-2B. PROVIDE NEW DRAWOUT MECHANISM IN COMPARTMENTS AND DOORS AS REQUIRED WITH BREAKER OPERATING MECHANISMS AND NAMEPLATES ON THE DOORS.

RECORD DRAWING

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FILE: 201AE04 1:1 10/26/99 15:40 GH-A

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

DESIGNED NBJ
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CHECKED SHP

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

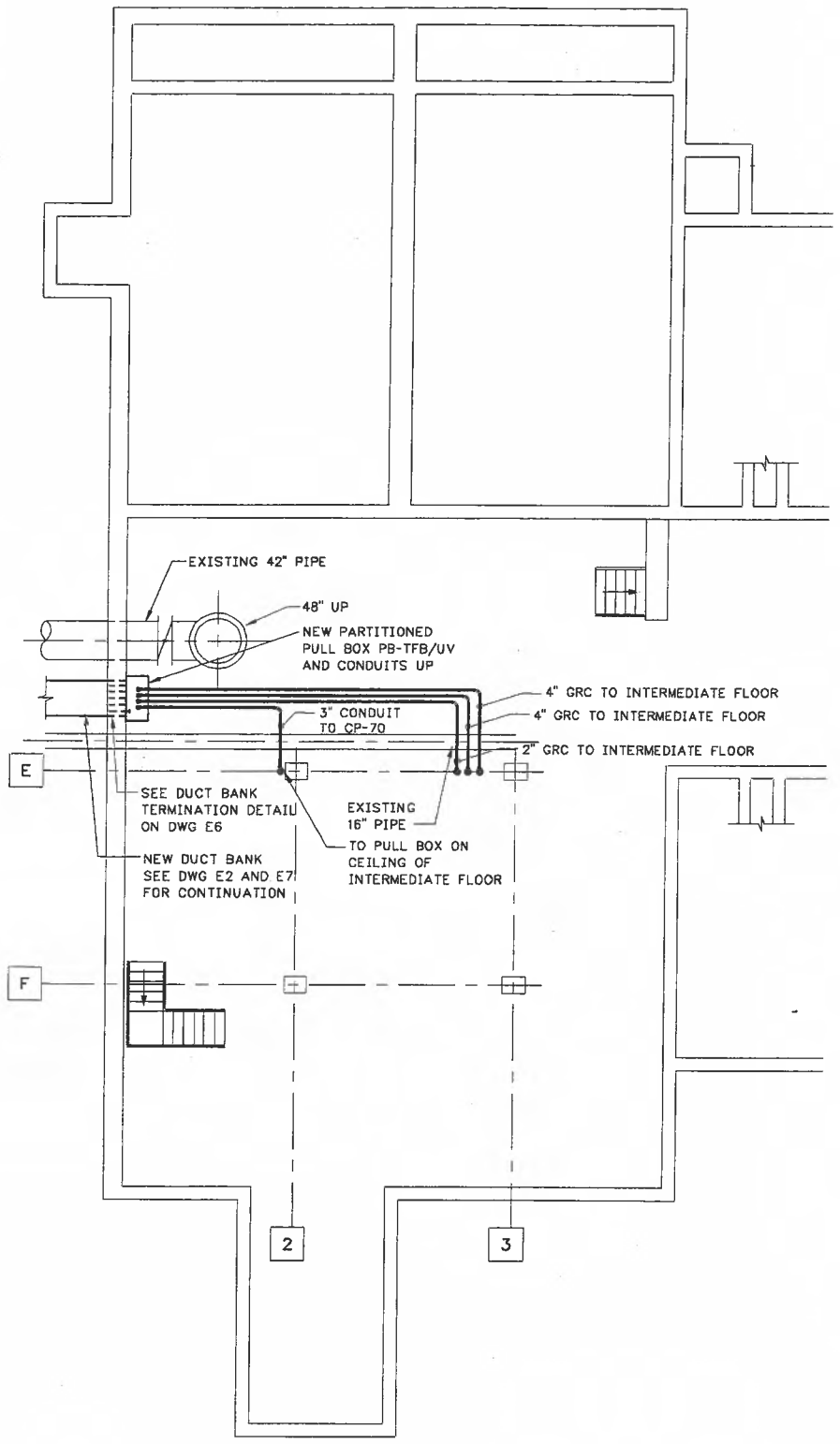
SCALE
NOT TO SCALE

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

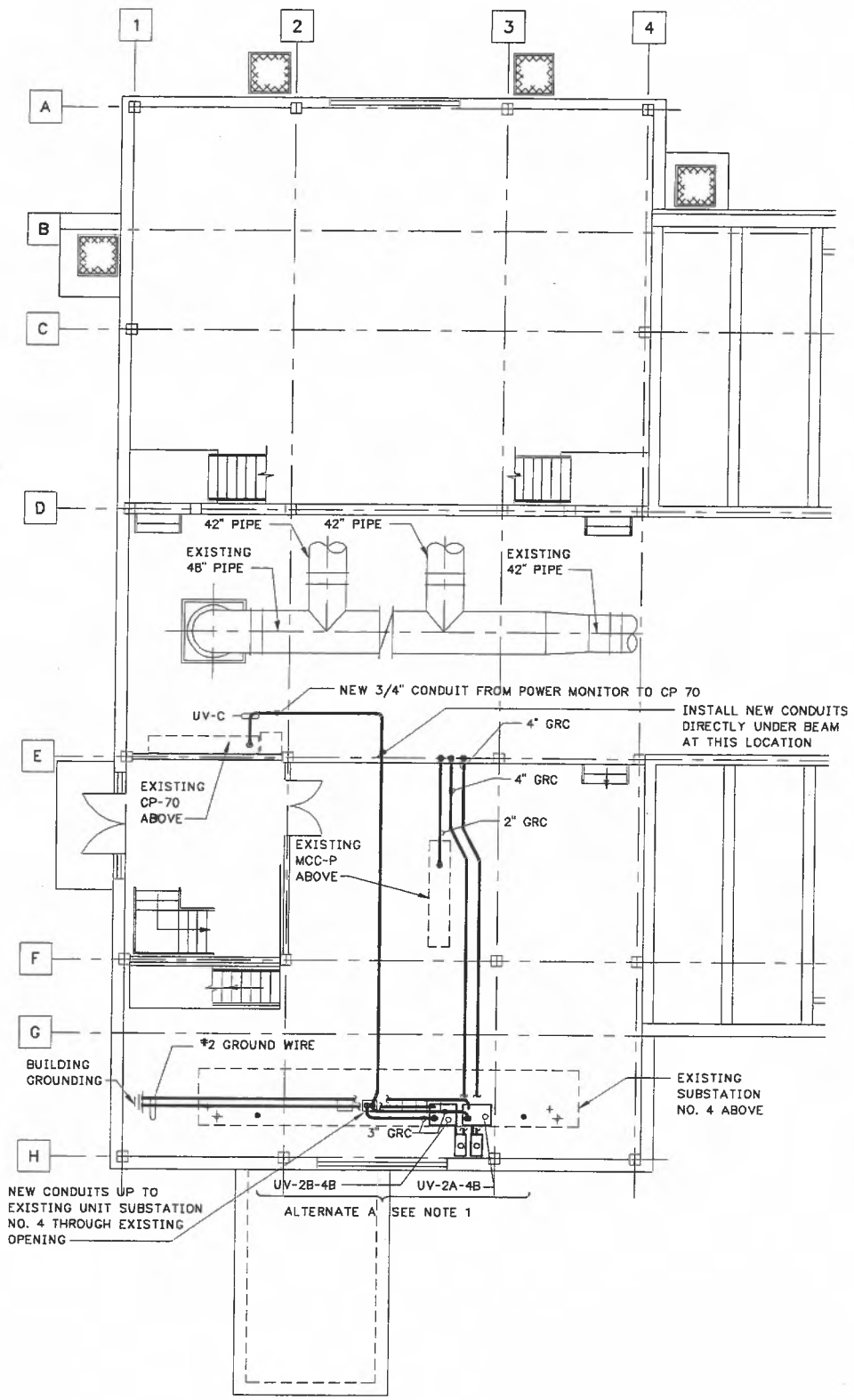
ELECTRICAL

PARTIAL ONE LINE DIAGRAMS

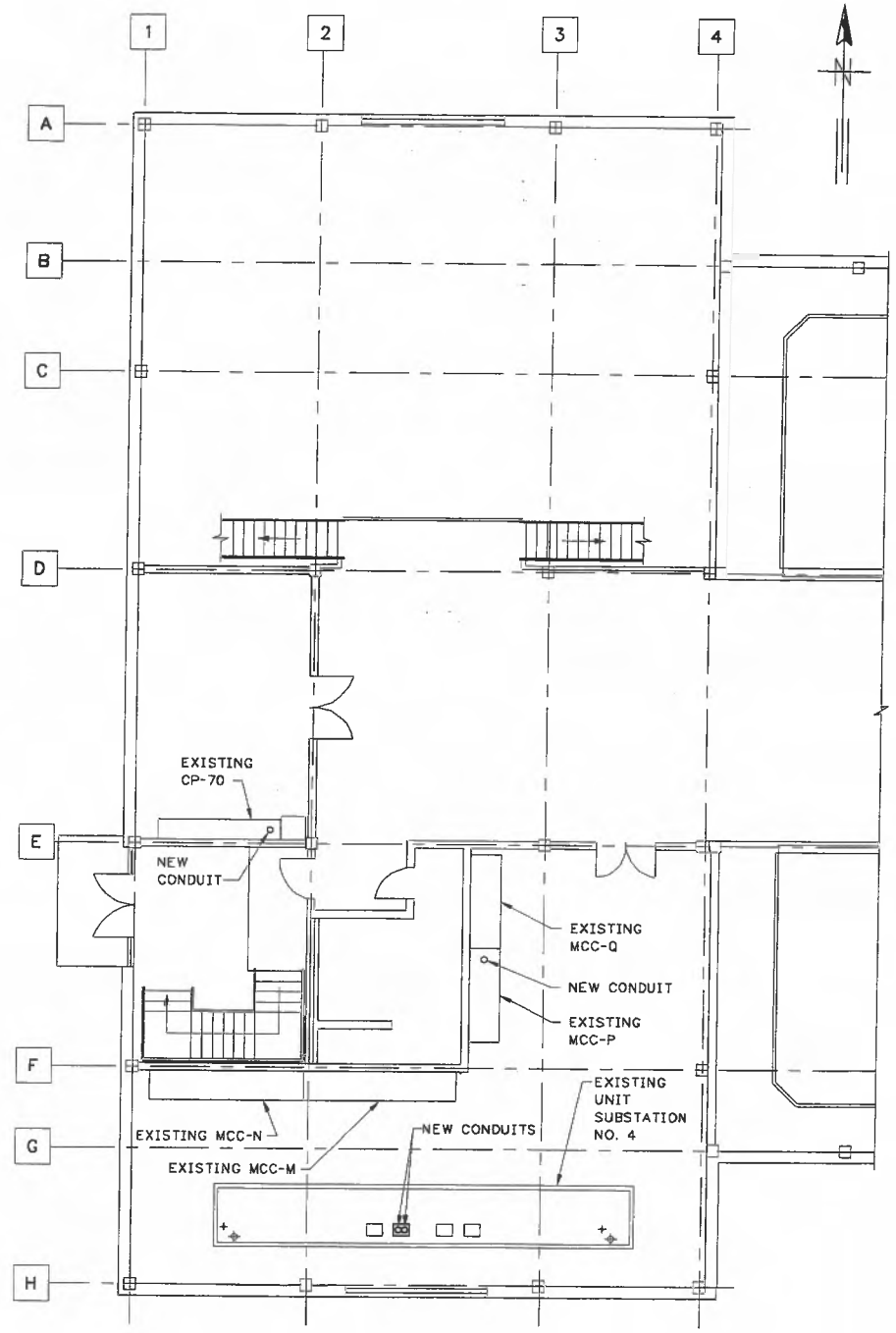
PROJ 02012
DWG E4
SHEET 24 OF 28
DATE OCTOBER 1999 REV 1



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

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

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CHECKED SHP

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

SCALE
8 0 8 16 FT
1/8"=1'-0"

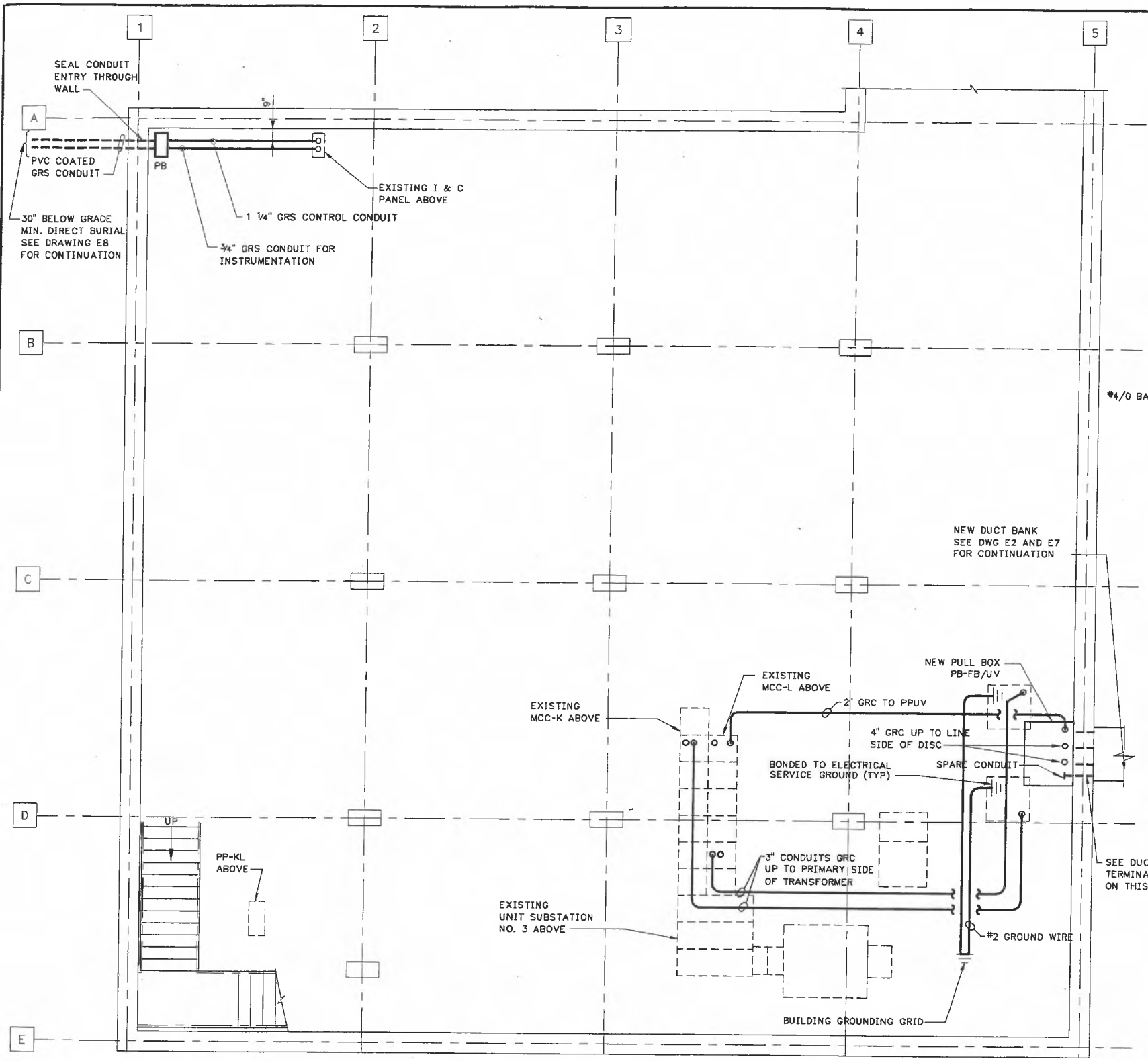
CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

ELECTRICAL
TERTIARY FILTER BUILDING

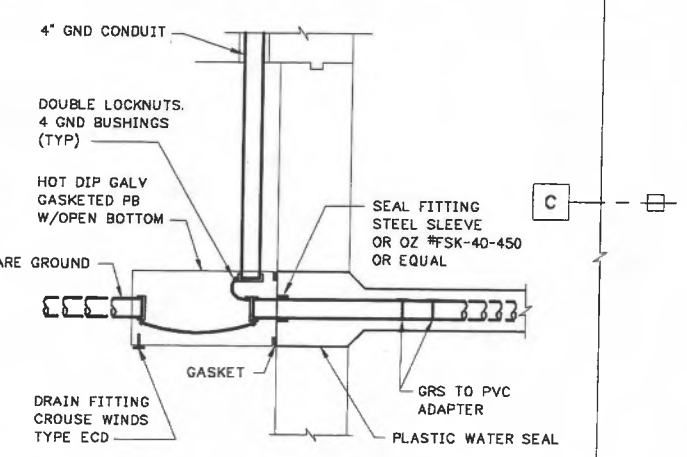
PLANS

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

FILE: 201AE05 1:1 10/28/99 12:50 GH-A

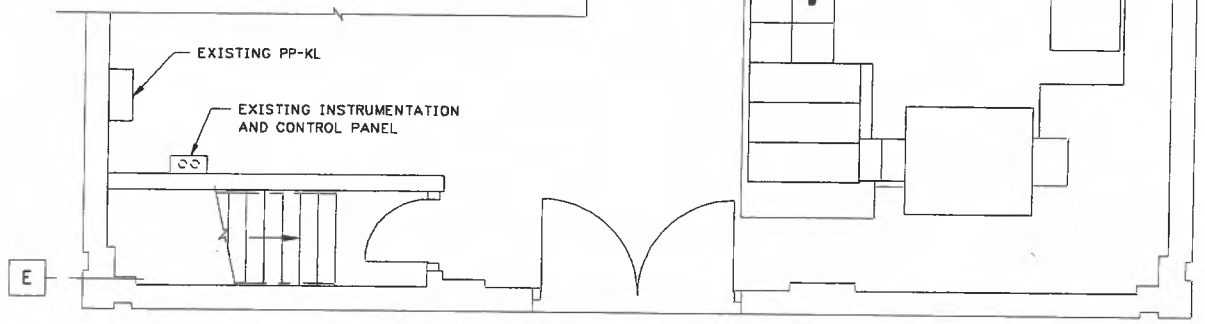


BASEMENT PLAN



DUCT BANK TERMINATION AT BUILDING WALL (TYP)

NOT TO SCALE



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.

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

SCALE: 4 0 4 8 FT — 1/4"=1'-0"

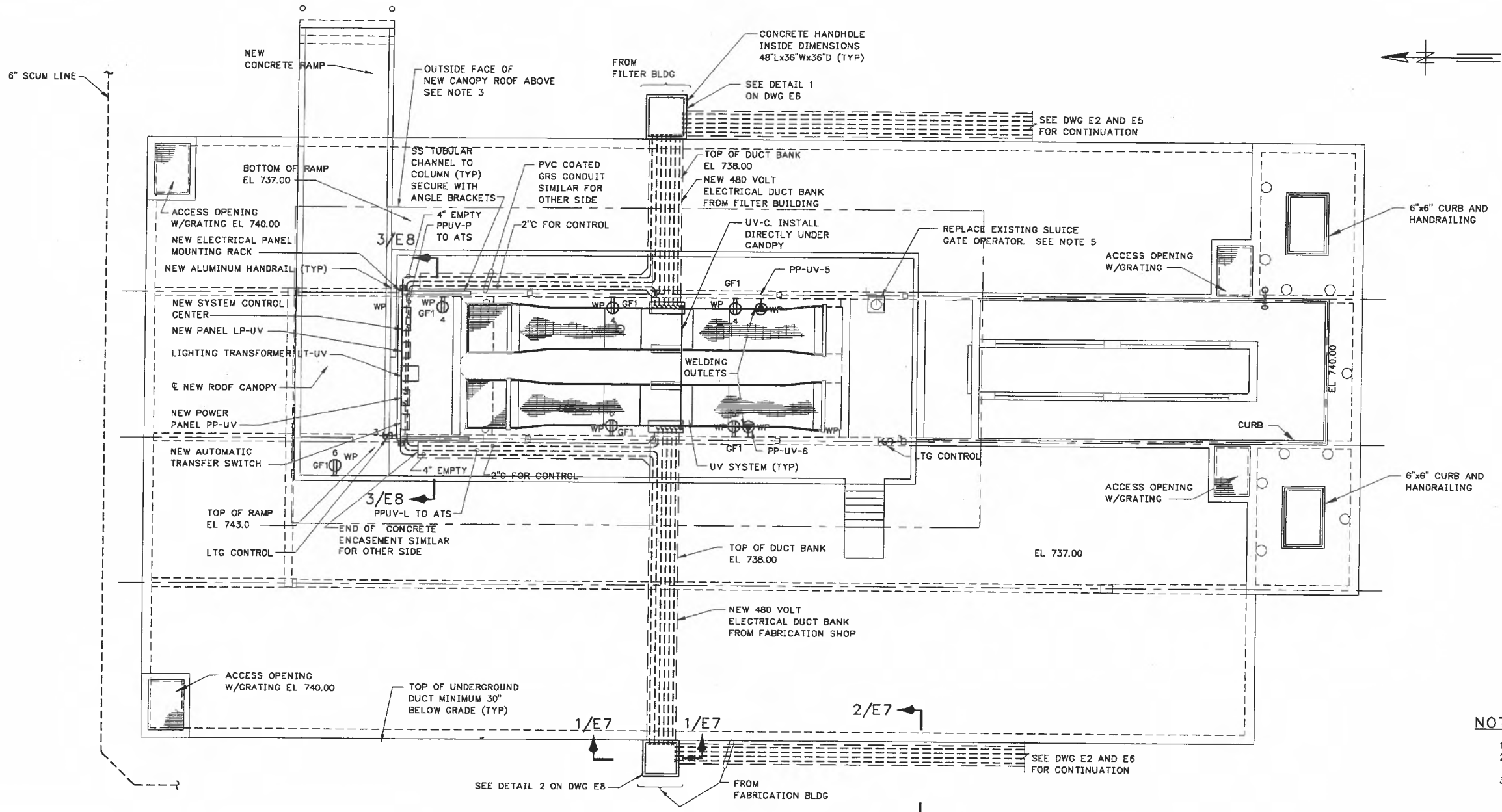
CITY OF ANN ARBOR, MICHIGAN
WATER UTILITIES DEPARTMENT
WASTEWATER TREATMENT PLANT
DISINFECTION FACILITIES UPGRADE

ELECTRICAL
FABRICATION BUILDING

PLANS

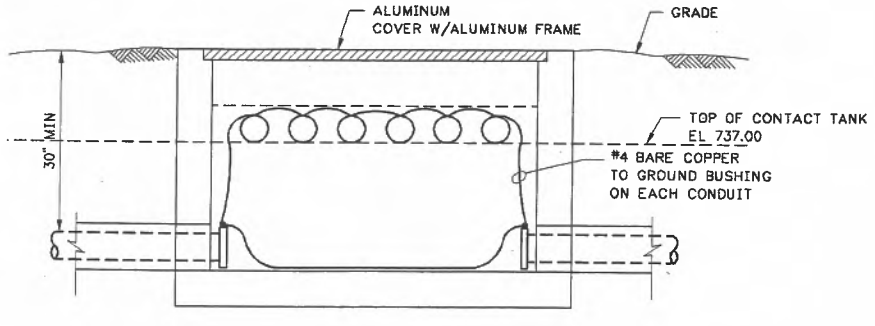
PROJ 02012
DWG E6
SHEET 26 OF 28
DATE OCTOBER 1999 REV 1

FILE: 201AE06 1:1 06/28/01 10:42 GH-A
FILE: 201AX01 1:1 10/08/98 15:31 GH-A
FILE: 201AXE01 1:1 06/28/01 10:37 GH-A



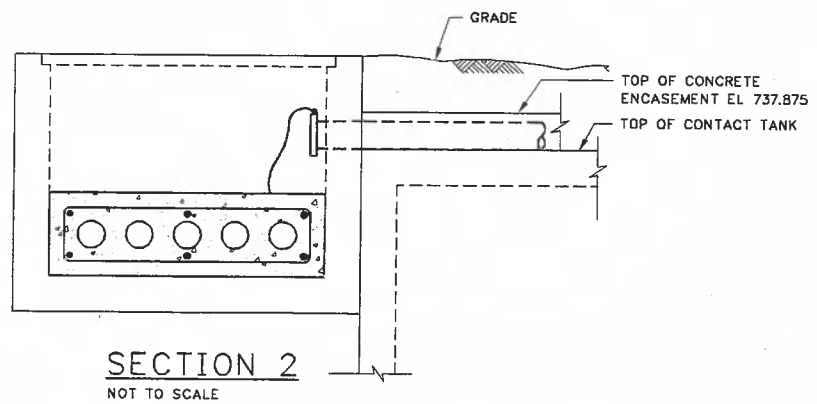
TOP PLAN

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



SECTION 1

NOT TO SCALE



SECTION 2

NOT TO SCALE

NOTES:

1. FOR DIMENSION SEE DWG M5.
2. REMOVED
3. 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.
4. REMOVED
5. 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.

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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1	06/04/01	PJV	RECORD DRAWING

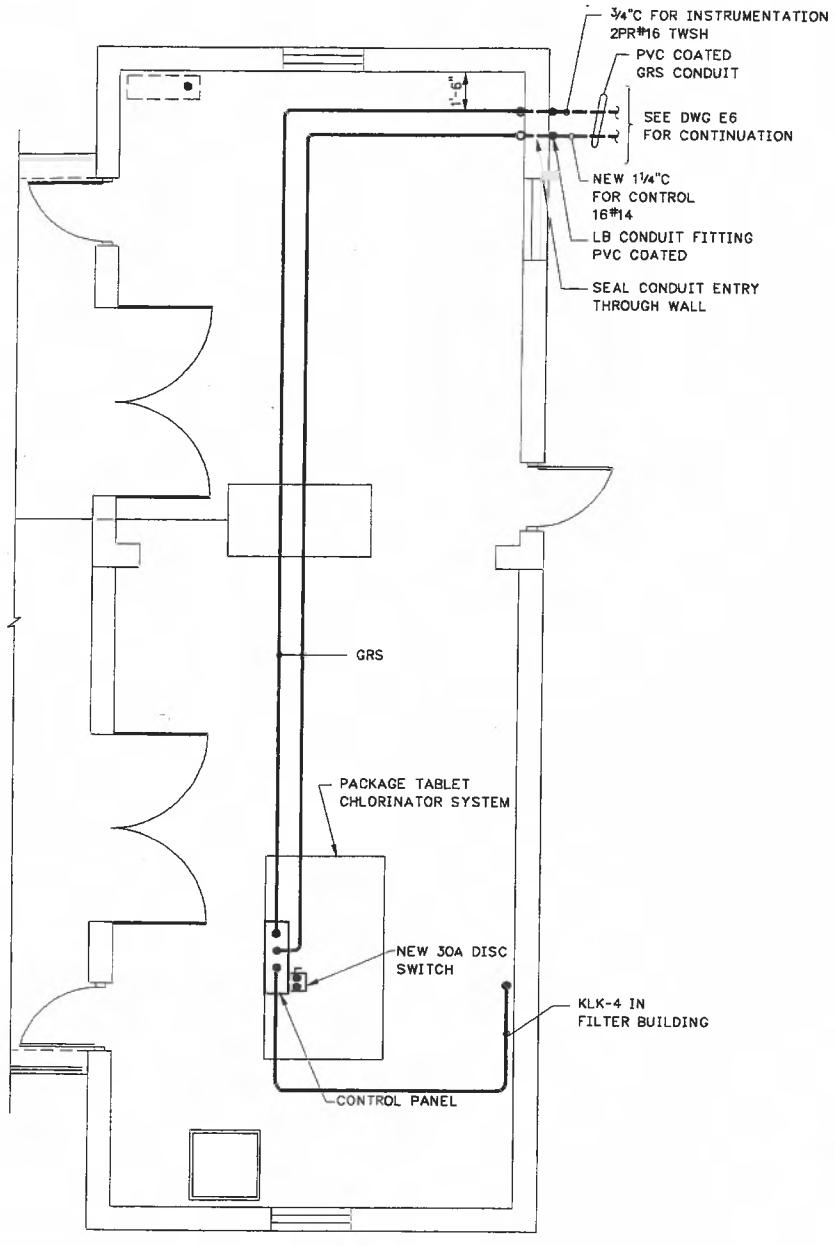
SCALE
8 0 8 16 FT
1/8"=1'-0"

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

ELECTRICAL
CHLORINE CONTACT TANK

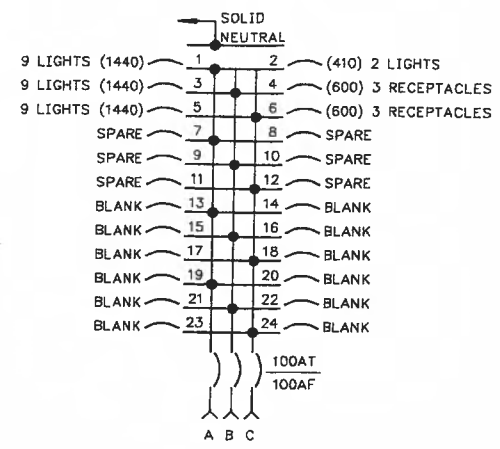
PLANS AND SECTIONS

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



PLAN FL EL 742.00

SCALE: ¼"=1'-0"



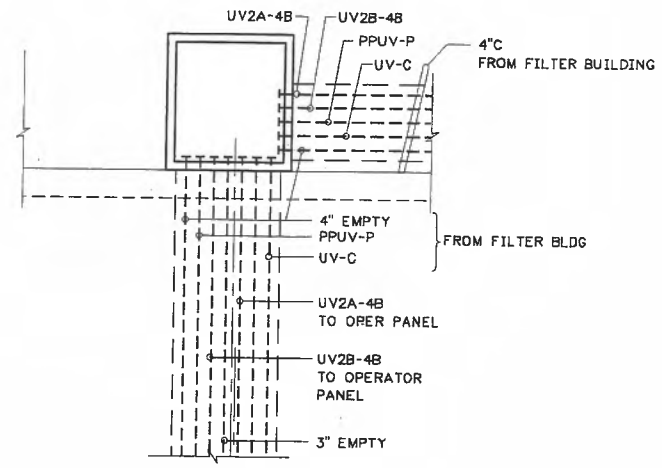
	LOAD-WATTS						
	AN	BN	CN	AB	BC	CA	3PHASE
SUB TOT	1850	2040	2040				
TOTAL	5930						

PANEL LP-UV

(208Y/120V, 3Φ, 4W, 225A BUS)
100A GND BUS

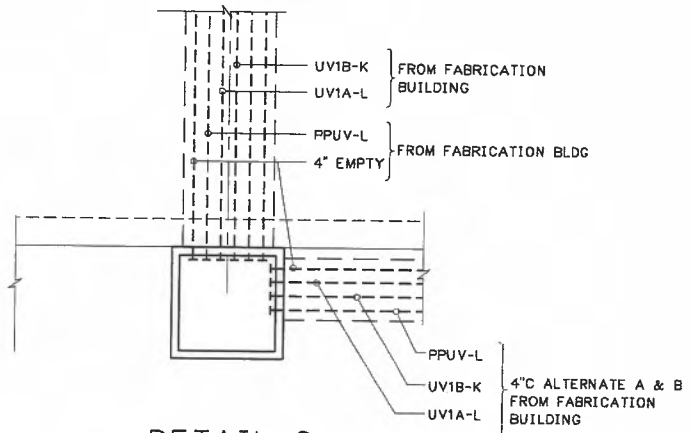
~~ALTERNATE B~~

NOT USED



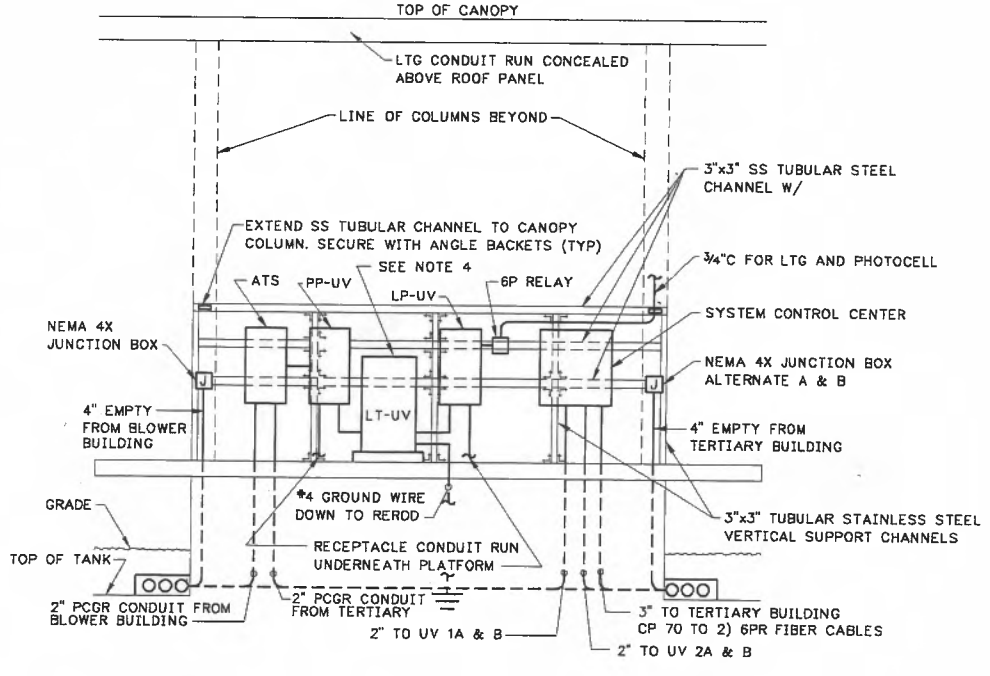
DETAIL 1

NOT TO SCALE



DETAIL 2

NOT TO SCALE



SECTION 3/E7

SCALE: ¼"=1'-0"
SEE NOTE 5

NOTES:

1. PROVIDE GROUND BUSHINGS AND LUGS ON ALL CONDUITS TERMINATING IN HANDHOLES. LOOP 1-#4/0 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

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SCALE
4 0 4 8 FT
1/4"=1'-0"

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

ELECTRICAL
CHLORINE BUILDING

PLAN, DETAILS AND SCHEDULE

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

FILE: 201AEG8 1:1 10/28/99 16:28 GH-A
FILE: 201AXM01 1:1 10/28/99 13:33 GH-A
FILE: 201AXE01 1:1 06/28/01 10:37 GH-A

UV REPLACEMENT PROJECT
Mandatory Pre-Proposal Meeting
March 9, 2022 - 10:00 am
Sign In Sheet

1/

Name	Company	Phone / Email
Ross Vander Meulen	Hazen & Sawyer	616-510-0275 / rvandermeulen@hazenandsawyer.com
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Fred Simmons	ARCADIS	517.648.4377 Fredrick.Simmons@Arcadis.G

2/

UV REPLACEMENT PROJECT
Mandatory Pre-Proposal Meeting
March 9, 2022 - 10:00 am
Sign In Sheet

Name	Company	Phone / Email
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Adam Smith	AAWWTP	
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