



Town of Winchester
Public Works Department

189 Rowley Street
Winsted, CT 06098
Phone: (860) 379-4101
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REQUEST FOR PROPOSALS

Crystal Lake Water Treatment Plant 90,000 gallon Cast in Place Clearwell and 1 MG Prestressed Concrete Tank Inspections

Posting Date: August 25, 2026

Winsted Water Works is seeking Proposals from Qualified Contractors to perform an interior and exterior inspection of 1.0 MG Post-tensioned concrete tank. The purpose of this inspection is to perform a DPH required 10-yr Inspection and identify the area, location and depth of the internal concrete scaling on the exterior wall and the interior baffle walls. The exterior inspection is to include the condition of the shotcrete finish on the walls. This initial inspection will be the basis for determining the scope of an inspection for developing contract documents for the repair of the tank.

Additionally, there is the concrete clear well in the Treatment Plant that requires the typical 10-yr inspection and sediment removal.

Bids will be accepted until 10 AM, September 25, 2026.

Existing Conditions

The 1 MG Tank was originally constructed by Preload Concrete Tanks and placed in service in 1998. The As-built plans have been attached for reference. The previous inspection in 2017 showed that the water side of exterior walls have moderate spalling that exposed rebar in some limited locations. The baffle walls appeared in good condition; however, some corrosion was apparent on the structural members that supported the top of the baffle walls. A copy of the inspection report is included. No detailed inspection of the exterior shotcrete wall or roof has been performed.

The Clear well was placed into service in 1998. The clear well was cleaned in 2024 after an underdrain failure allowed filter media to enter the tank. There have been no concerns with this tank, but, no formal inspection has been performed.

Information Provided:

1. 2017 Inspection Report of the Preload Tank;
2. 1997 Shop Drawing Plans by Preload;
3. 1996 Design Drawings and volume calculation for Concrete Clear Well;
4. 2009 CTDPH 10-yr Atmospheric Storage Tank Inspection Guidelines;

Qualification for Inspection Contractor

The inspector and their team must have experience in inspecting reinforced concrete tanks while those tanks are in service. The inspection team should be certified for confined space entry as defined by OSHA for Diver Inspection. ROV inspections may be permissible; however the presence of baffle walls and roof structures in the tanks to be inspected suggest that Diver Inspection is more appropriate to the project. ROV's may be useful to supplement the Diver Inspections.

The inspector shall be responsible for all disinfection requirements of his equipment prior to entry into the tank and shall be responsible for disinfection and any required Bacteria testing after the inspection is complete. AWWA C652 and CTDPH disinfection standards shall apply.

The inspector and their team must all have adequate OSHA training and certifications in fall protection for accessing roof, climbing ladders, staging, hydraulic lifts, etc. All work shall comply with OSHA standards: Confined space entry procedures shall be strictly followed, Fall protection systems shall be used where required. All OSHA qualifications shall be submitted with the proposal.

Outline of minimum inspection/cleaning requirements for Plant Clear Well

The inspection of the clearwell must be done at a time when the Plant is off and the water level is at its highest level. This will need to be coordinated with the Plant Operator. The off periods for the plant are as long as 8 hours, but, happen "randomly" during the day depending on the water system demands. In no case shall the inspection and cleaning process take place while the plant is in operation. Inspection may be done by ROV or Diver, or both.

The inspection must include assessing the condition of:

1. the vents to determine that the vent/vent screen and pipe are clear and in good condition;
2. The access hatches to determine that they close properly, with a tight fit, have adequate curbing or drainage to prevent contamination of water in the tank;
3. Penetrations into the tank "roof" and their curbing and seals;
4. the roof (i.e. bottom of the concrete floor);
5. the concrete walls (exterior and baffle) above the water line;

6. the concrete (exterior and baffle) walls below the water line;
7. the concrete floor (Items 3 to 6 shall look for signs of concrete distress including Cracking, Spalling and delamination, areas of exposed rebar, excessive staining, or, signs of infiltration or exfiltration);
8. the amount of Debris to be cleaned from the bottom of the floor and its location (One or more samples of the debris shall be provided for Inspection by the Owner);
9. the piping, its joints, penetration seals and support systems in the wetwell;
10. the pump "cans" and their intake screens in the wetwell, the penetrations and seals through the floor;
11. Emergency Alarm floats, their condition and operating them to determine if they are still functional;
12. any other equipment, coatings, conduits, etc that may be in the wetwell; and
13. other points of interest required by the DPH inspection guidelines.

A sketch shall be provided showing location and extent of any defects and shall be keyed to the written and photographic observations made.

The Walls will be inspected to determine if there are any accumulations of bio-growth, corrosion, efflorescence, or, sediment accumulation that may require removal. Significant cleaning of the wall is not anticipated to be part of this inspection and cleaning project. Light accumulations on the walls are expected to be removed as part of the floor cleaning effort.

The floor is anticipated to have a light coating of filter media and chemical floc that will require removal. Removal of debris is expected to be cleaned in a manner that minimizes suspension of sediment.

Outline of minimum inspection/cleaning requirements for 1 MG Prestressed Concrete Tank

Exterior Inspection shall inspect and evaluate the condition of:

1. the coating system for peeling, blistering, cracking, rust staining, or other defects;
2. the shotcrete for cracking, delamination, freeze thaw damage and any signs of water penetration into the shotcrete that could cause damage to the shotcrete or prestressing wire;
3. the Overflow discharge pipe to determine that the self-closing valve is closing properly, that the seal, seat and screen are still in good condition,
4. the vents to determine that the vent/vent screen are clear and in good condition and preventing contamination;
5. the access hatches to determine that they close properly, with a tight fit, have adequate curbing or drainage to prevent contamination of water in the tank;
6. the Penetrations into the tank "roof" and their curbing and seals;
7. The Cast-in-place roof looking for signs of concrete distress including Cracking, Spalling and delamination, areas of exposed rebar, excessive staining, or, signs of infiltration or exfiltration.

8. Low level drain valve shall be operated;
9. The stilling line for the tank water level sensor shall be flushed to exercise its valve and remove any accumulated sediment;
10. Other issues that become apparent during the inspection of the tank exterior.

Internal Inspection

The tank will be taken off-line during the internal inspection by the owner. The tank is not anticipated to be drained. This inspection is to be used to set up a more detailed inspection with the tank dry.

The interior inspection shall include:

1. Visual inspection of wall, baffle walls, floor, and roof surfaces for:
 - Cracking, spalling,
 - Delamination or hollow sounding areas
 - Areas of exposed reinforcement or corrosion staining (if present)
 - Active leakage or seepage;
 - Efflorescence;
 - Bio-growth;
 - Chemical floc, Sediment or iron and/or manganese accumulation;
 - Signs of insect, bird or other animal activity anywhere in the tank, but, especially on the roof beams and top of baffle walls
2. There is known spalling and exposed rebar in the tank. The inspection should include measurements of the depth and area of the damaged concrete surfaces. A plan should be prepared showing the areas impact located with accurate measurements of positions on the tank walls and height above the floor; Observations made should reference the plan; (NOTE: This is critical information needed for planning the next steps in the rehabilitation process.)
3. the amount of Debris to be cleaned from the bottom of the floor and its location (One or more samples of the debris shall be provided for Inspection by the Owner All samples shall be labelled indicating location that the sample was taken from);
4. Inspection of all interior piping to identify any corrosion or other defect;
5. Inspection of overflow structure to determine its condition and whether it is clear and ready to be used;
6. penetrations;
7. Inspection of the aluminum support structure for the top of the baffle walls and roof for signs of corrosion and structural defects

Cleaning of the tank prior to inspection may be necessary in order to allow all components to be easily viewed. The Walls will be inspected to determine if there are any accumulations of bio-growth, corrosion, efflorescence, or, sediment accumulation that may require removal. Significant cleaning of the wall is not anticipated to be part of this inspection and cleaning

project. Light accumulation on the walls are expected to be removed as part of the floor cleaning effort.

The floor is anticipated to have a light coating of filter media and chemical floc that will require removal. The concrete spalled off of the exterior wall should be removed. Removal of debris is expected to be performed in a manner that minimizes suspension of sediment.

The tank will be returned to service after the inspection and cleaning have been completed. Disinfection of the tanks is not anticipated because all equipment entering the tank shall be fully cleaned and disinfected prior to entry. However, the conditions in the tank should be evaluated to determine if additional disinfection is needed such as internal turbidity, unexpected contamination during the inspection and cleaning. This shall be reviewed with the owner at the time of the inspection. If additional disinfection is needed because of contamination by the contractor, this effort is the responsibility of the contractor.

For all work in this proposal, all services not specifically mentioned in this request for proposal that are necessary to provide the functional capabilities described by the proposer shall be included in their Scope of Services.

Deliverables

The inspections shall be used to evaluate the Structural integrity of each tank and its substructures by:

- Identifying any signs of distress, including cracking, movement, or settlement
- Evaluating prestressing system (if applicable) for signs of failure
- Documenting any areas requiring further structural analysis.

The inspection shall evaluate the cleanliness of the tank by identifying any source of contamination and/or routes contamination may enter the tank.

The inspection shall identify the presence of any leakage or potential leakage

Each tank must have a written report as detailed below:

Executive Summary

Inspection Methodology

Construction Description

Findings and Observations (Classified by component) This shall include:

- Photographic documentation of all deficiencies;
- A sketch shall be provided showing location and extent of any defects and shall be keyed to the written and photographic observations made.

Conclusions (Classified by component)

Recommendations

Captioned Photographs

Inspection videos

Draft inspection report within 2–3 weeks of inspection. Final report incorporating Owner comments within 1 to 2 weeks after receiving comments. Two paper copies of each Final Report will be provided. A pdf version of the report shall also be provided. Video files may be provided separately.

Disposal of Debris Removed

The debris removed from the tank will likely be vacuumed from the tank. The discharge of the water and debris shall enter a tank of sufficient volume to allow the heavy sediment to be removed, or, a filtration sack. The lighter sediment and floc may be discharged into the filter waste tanks in the Plant, or, (discharged to the ground if adequately dechlorinated.) Sediments that must be removed manually shall be disposed of in a location directed by the plant operator. The cost of disposal shall be in the unit price of cleaning item. Removal of the heavier sediment may be removed from the contract depending on the costs. Samples of debris should be provided to the owner.

General Supervision and Superintendence Responsibilities of the contractor

- A. Contractor shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Request for Proposal. Contractor shall be solely responsible for the means, methods, techniques, sequences, safety, and procedures of construction.
- B. Contractor shall assign a competent resident superintendent who is to be present at all times during the execution of the Work. This resident superintendent shall not be replaced without written notice to, and approval by the Owner and The Town except under extraordinary circumstances.
- C. Contractor shall, at all times, maintain good discipline and order at the Site.
- D. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Request for Proposal, all Work at the Site shall be performed during regular working hours, Monday through Friday.

Other Work at the Site

- A. In addition to and apart from the Work of the Contractor, other work may occur at or adjacent to the Site. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.

Services, Materials, and Equipment

- A. Unless otherwise specified in the RFP, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction

equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Request for Proposal.

- B. All materials and equipment incorporated into the Work shall be new, of good quality and shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable supplier, except as otherwise may be provided in the Request for Proposal.

Subcontractors and Suppliers

Contractor may retain subcontractors and suppliers for the performance of parts of the Work. Such subcontractors and suppliers must be acceptable to Owner.

Quality Management

Contractor is fully responsible for the managing quality to ensure Work is completed in accordance with the Request for Proposal.

Licenses, Fees and Permits

- A. Contractor shall pay all license fees and royalties and assume all costs incident to performing the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others.
- B. Contractor shall obtain and pay for all construction permits and licenses if needed.

Laws and Regulations; Taxes

- A. Contractor shall give all notices required by and shall comply with all local, state, and federal Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor The Town shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and The Town, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages if Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations.
- C. Contractor shall pay all applicable sales, consumer, use, and other similar taxes Contractor is required to pay in accordance with Laws and Regulations
- D. Owner is exempt from Connecticut state sales and use taxes on materials and equipment to be incorporated in the Work. Said taxes shall not be included in the Bid. The winning bidder will be provided a Sales Tax exemption form.

Safety and Protection

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work.
- B. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. All persons on the Site or who may be affected by the Work;
 - 2. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. Other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and underground facilities not designated for removal, relocation, or replacement in the course of construction.
- C. All damage, injury, or loss to any property caused, directly or indirectly, in whole or in part, by Contractor, or anyone for whose acts the Contractor may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Request for Proposal or to the acts or omissions of Owner or The Town and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor).
- D. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.
- E. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor shall act to prevent threatened damage, injury, or loss.
- F. Contractor shall give The Town prompt written notice if Contractor believes that any significant changes in the Work or variations from the Request for Proposal have been caused thereby or are required as a result thereof. If The Town determines that a change in the Request for Proposal is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

Shop Drawings, Samples, and Other Submittals

- A. The selected Contractor shall submit a list of personnel, equipment and supplies to be used during the inspections. Additionally, a brief description of the method that work will be performed, the estimated time needed to complete each task and an overall schedule for completing the work. These, for the purposes of this RFP, shall be considered shop drawings.
- B. Contractor shall review and coordinate the shop drawing and samples with the requirements of the Work and the Request for Proposal and shall verify all related

field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information.

- C. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Request for Proposal with respect to Contractor's review of that submittal, and that Contractor approves the submittal.
- D. With each submittal, Contractor shall give The Town specific written notice, in a communication separate from the submittal, of any variations that the shop drawing or sample may have from the requirements of the Request for Proposal.
- E. The Town will provide timely review of shop drawings and samples.
- F. The Town's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs.
- G. The Town's review and approval of a separate item does not indicate approval of the assembly in which the item functions.
- H. Contractor shall make corrections required by The Town and shall return the required number of corrected copies of shop drawings and submit, as required, new samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by The Town on previous submittals.

Warranties and Guarantees

Contractor warrants and guarantees to Owner that all Work will be in accordance with the Request for Proposal and will not be defective. The Town and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor's warranty and guarantee.

Correction Period

If within one year after the date of substantial completion, any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly and without cost to Owner, correct such defective Work.

Indemnification

To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and The Town, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of the Towns, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other

than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any subcontractor, any supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts they may be liable.

Controlling Law - This Contract is to be governed by the law of the State of Connecticut.

Preparing the Proposal

It is the responsibility of each Bidder before submitting a Bid to:

- A. examine and carefully study the Bidding Documents, the other related data identified in the Bidding Documents, and any Addenda;
- B. visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work. There is no mandatory prebid conference;
- C. become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work;
- D. carefully study all reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site.
- E. All questions about the meaning or intent of the Bidding Documents are to be submitted to Town in writing. Interpretations or clarifications considered necessary by Town in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by The Town as having received the Bidding Documents.
- F. Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by Owner or The Town. Failure of any bidder to receive any such addendum or interpretation shall not relieve such Bidder from the obligation to comply with the terms of such addenda. All addenda so issued shall become part of this RFP.
- G. The Bidder will provide a preliminary schedule for with the bid.
- H. The winning bidder will provide a certificate of insurance and a W-9 form.
- I. Insurance shall meet the minimum requirements found on the enclosed attached document. A Certificate of Insurance will be requested from the winning bidder.

J. **Each Bidder shall include a list of at least 5 References for similar work.** At least two shall be for a projects involving potable water. The reference shall include the name of the project, the name of the client, the date project was completed, and the contact person for the project with contact information including phone number.

K. The Town will not be liable for any costs incurred by any respondents in the preparation and presentation of responses to this RFP, or in the participation in views, interviews, negotiations, or any other aspect of this RFP process.

Review of Proposals submitted

A. Proposers are cautioned that it is the responsibility of each individual proposer to assure that their proposal is in the possession of the responsible official or a designated alternate prior to the stated time and at the place of proposal by the due date. The Town is not responsible for proposals delayed by mail and/or delivery service of any nature. Late responses will not be accepted, nor will additional time be granted to individual respondents unless the Town extends the required submittal date for all proposers.

B. All proposals become the property of the Town of Winchester upon receipt. All proposals are deemed to be public records under Connecticut General Statutes.

C. The owner will award to the bidder having the experience needed to perform the required inspections, having a history of preparing reports meeting the requirements of this RFP and being well regarded by the references provided. Proposed Fees will be considered after the evaluation of the qualifications provided. This is an informal Qualifications Base selection process.

D. The Town may, at its option, interview proposers as part of this selection process. However, selection may take place without such interviews. Therefore, proposals should be complete as initially submitted.

E. The Town reserves the right to reject any and all proposals, to negotiate any and all nonmandatory contract terms with the successful proposer, or to cancel this procurement at any time if it is in the Town's best interest to do so.

F. Failure to meet the submittal requirements may be sufficient cause to reject a proposal. Proposers are solely responsible for reviewing all the provisions of this RFP and any attachments prior to submitting the proposal. Proposals that are incomplete, not properly endorsed, or are otherwise in conflict with the requirements of this RFP, may be rejected.

G. The Town reserves the right to conduct a standard criminal and business background check of each proposer which may include but is not limited to contacting contractual business associates and practices, researching employment histories, conducting background

checks with former colleagues or customers, and verifying a bidder's financial wherewithal to complete the proposed project. By submitting qualifications to the Town of Winchester, the proposer consents to such an inquiry and agrees to make available to the Town financial books, records, and references as the Town deems necessary to conduct the inquiry.

H. The selected firm will be required to enter into a formal contract with the town, subject to negotiation of terms and conditions.

Bid Form (2 Pages)

Fees for Proposed Services

Line No.	Description	Unit	No. of Units	Unit Price	Total
1 MG Concrete Tank					
1.	Installation of Roof Safety Hardware	Lump Sum			
2.	Exterior Inspection	Lump Sum			
3.	Interior Inspection	Lump Sum			
4.	Cleaning and Removal of Light Sediment	Hour			
5.	Removal of Heavy Sediment	Hour			
6.	Inspection Report	Lump Sum			
	Subtotal 1 MG tank				
Concrete Clear Well					
7.	Inspection of Tank	Lump Sum			
8.	Cleaning and Removal and Disposal of Light Sediment	Hour			
9.	Removal of Heavy Sediment	Hour			
10.	Inspection Report	Lump Sum			
	Subtotal Concrete Clearwell				
	Total Estimated Fees				

The Inspector will be paid based on the work completed. The inspector may request payment no more frequently than monthly. The inspection of the two tanks may be scheduled at different times; however, scheduling them at the same time would seem to be most efficient.

The amount allowed for the completion of each inspection report shall not be less than 20% of the subtotal for each tank.

The Anticipated schedule for completing the work after the bid is awarded is:

Field Inspection will begin _____ weeks after award.

Field Inspection will be completed _____ weeks after award.

A draft inspection report will be submitted 7 to 10 Days after inspection is complete.

This Proposal is submitted by:

	Individual		Partnership		Corporation
Name of Entity (or DOB)					
Name of Responsible Party					
Title					
Street Address					
Town		State		Zip Code	
Phone No.			Email		
Attach evidence of authority to sign					
Corporation (provide state of incorporation)					
Signature			Date		
Printed Name					
Apply Corporate Seal (if a Corporation)					

ONE 1.0 MILLION GALLON WATER STORAGE TANK

CONTRACT No. 97 PD 018 WITH THE
CITY OF WINSTED, CONNECTICUT

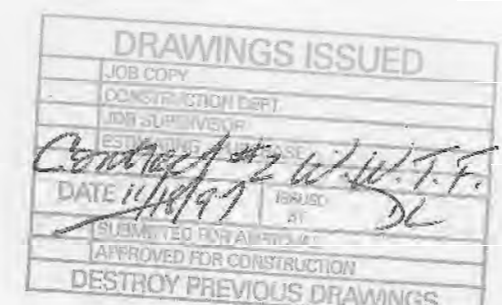
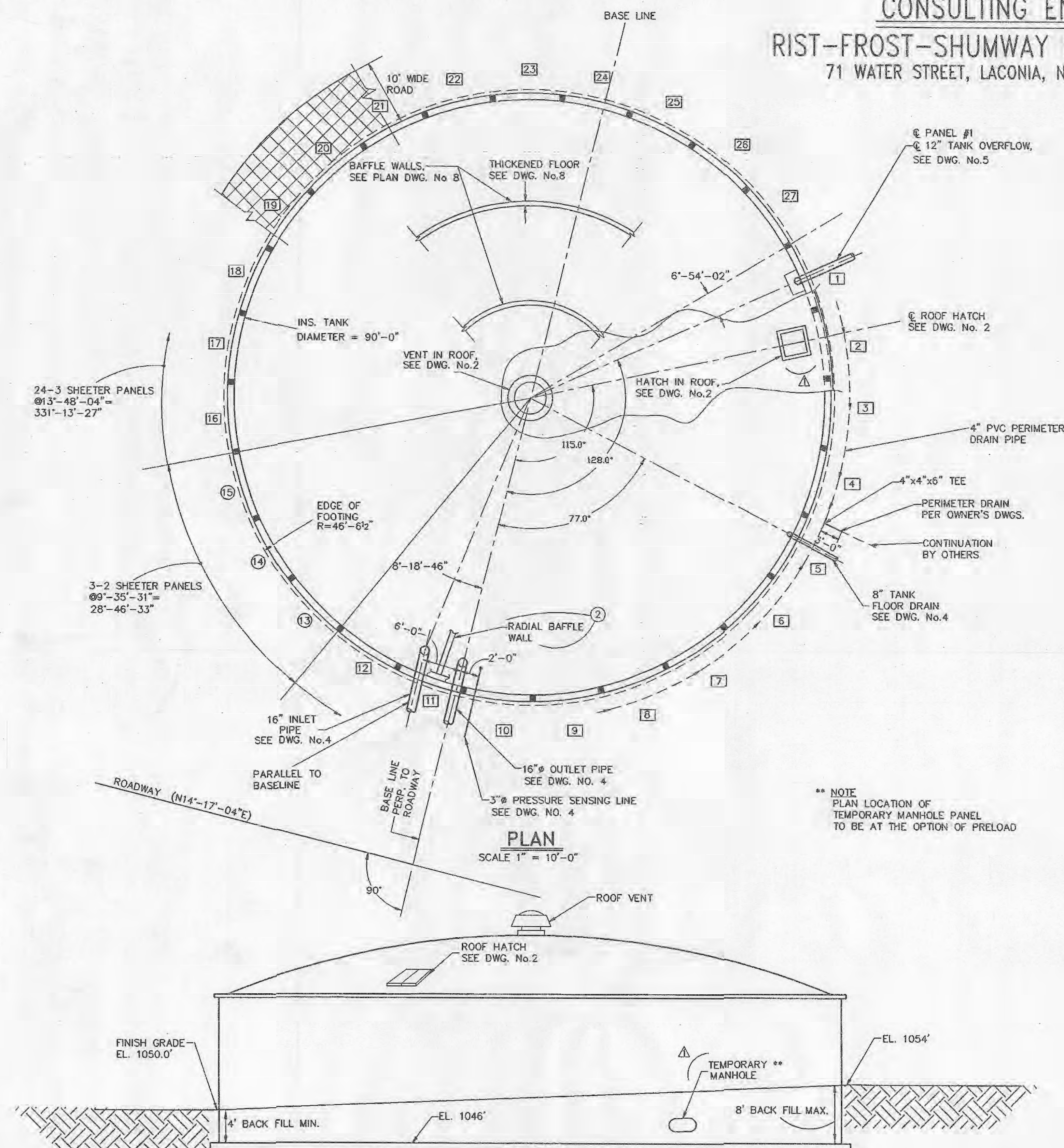
CONSULTING ENGINEERS:

RIST-FROST-SHUMWAY ENGINEERING, P.C.
71 WATER STREET, LACONIA, NEW HAMPSHIRE 03246

PRELOAD WORKING DRAWINGS

WNS97-01	GENERAL ARRANGEMENT
WNS97-02	TYPICAL TANK SECTION
WNS97-03	PANEL DETAILS
WNS97-04	WIREWINDING SCHEDULE & PIPING DETAILS
WNS97-05	TEMPORARY MANHOLE & OVERFLOW DETAILS
WNS97-06	REBAR SCHEDULE
WNS97-07	BAFFLE WALL DETAILS

THIS SHOP DRAWING HAS BEEN REVIEWED AND
DETERMINED TO BE IN COMPLIANCE WITH THE
CONTRACT DOCUMENTS INCLUDING PLANS AND
SPECIFICATIONS AS MODIFIED BY ADDENDA,
CHANGE ORDERS AND FIELD ORDERS.
CONTRACT NO. PRELOAD INC.
BY: *[Signature]*
DATE: 11/18/97



WORKING DRAWING

ONE 1.0 MG WATER STORAGE TANK
WINSTED, CONNECTICUT

GENERAL ARRANGEMENT

DRAWN: SB SCALE: AS SHOWN CONTRACT NUMBER: 97 PD 018
DESIGNED: RAO DATE: 10-22-97 DRAWING NUMBER: CT
CHECKED: TM

REVISIONS				
NO.	DATE	DESCRIPTION	BY	CHKD
1	11/5/97	PER DISCUSSION WITH ENGINEER	SB	NAL
2	11/12/97	SHOWED RADIAL BAFFLE WALL	JD	DM

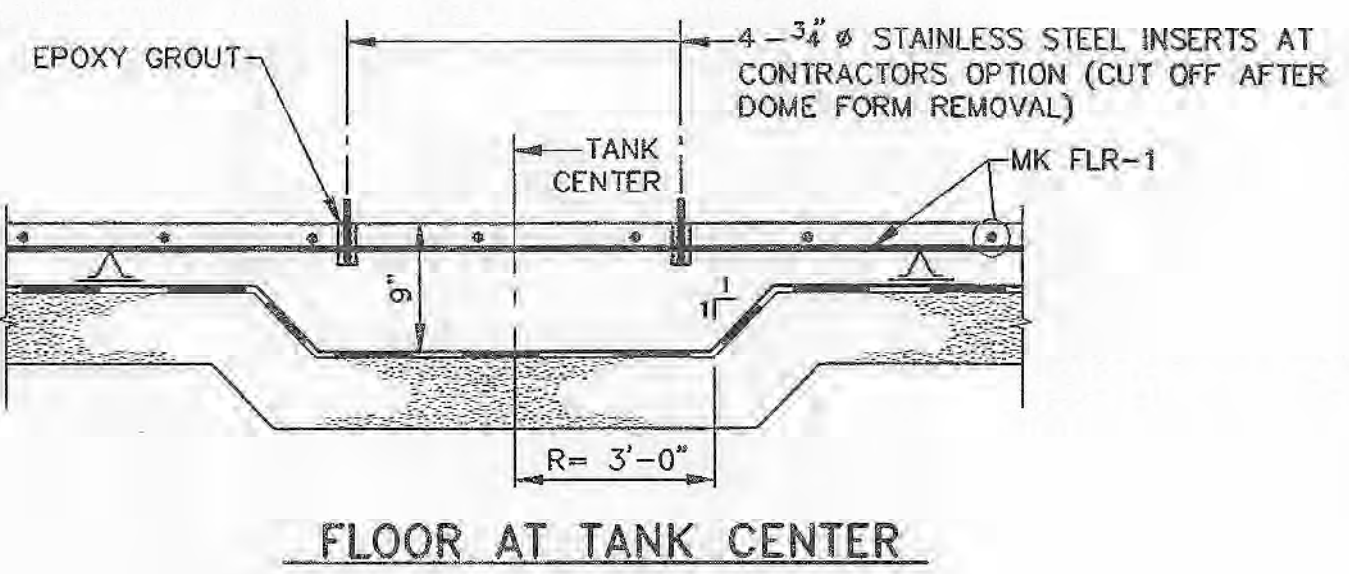
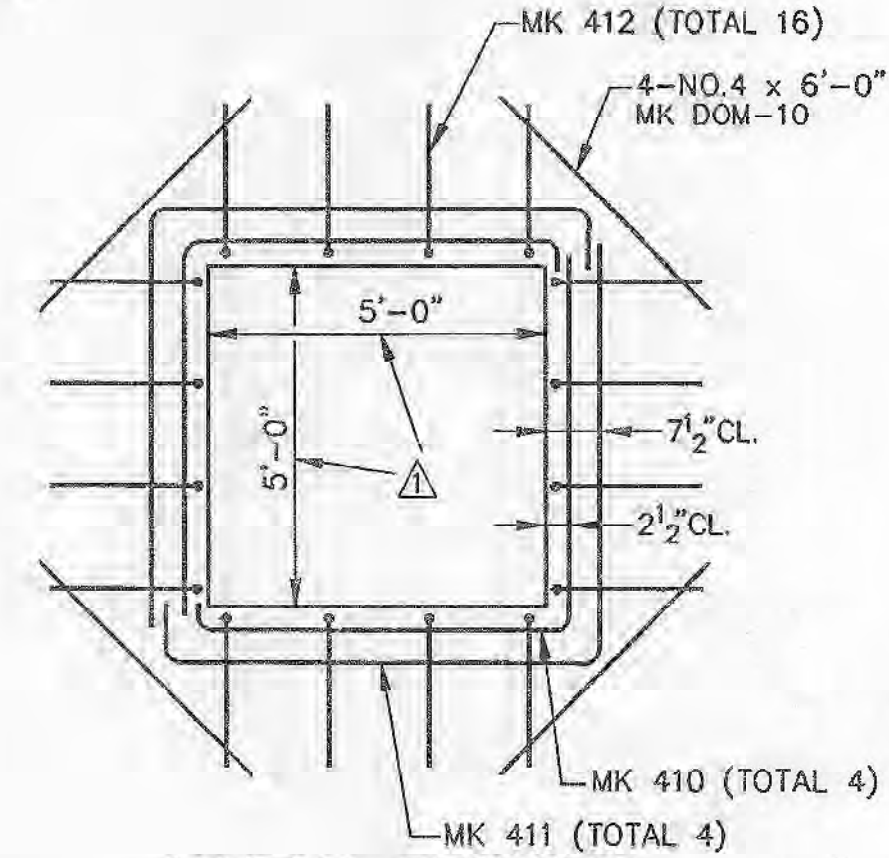
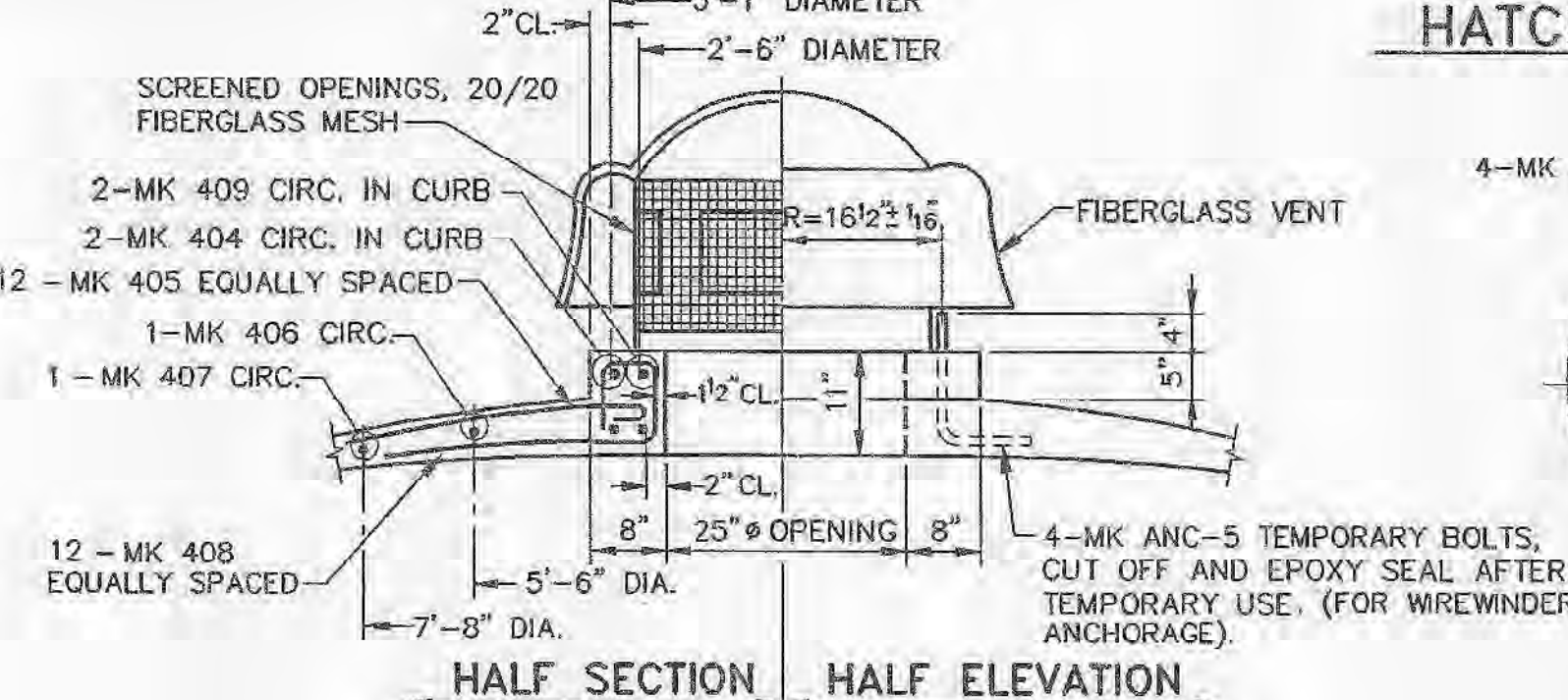
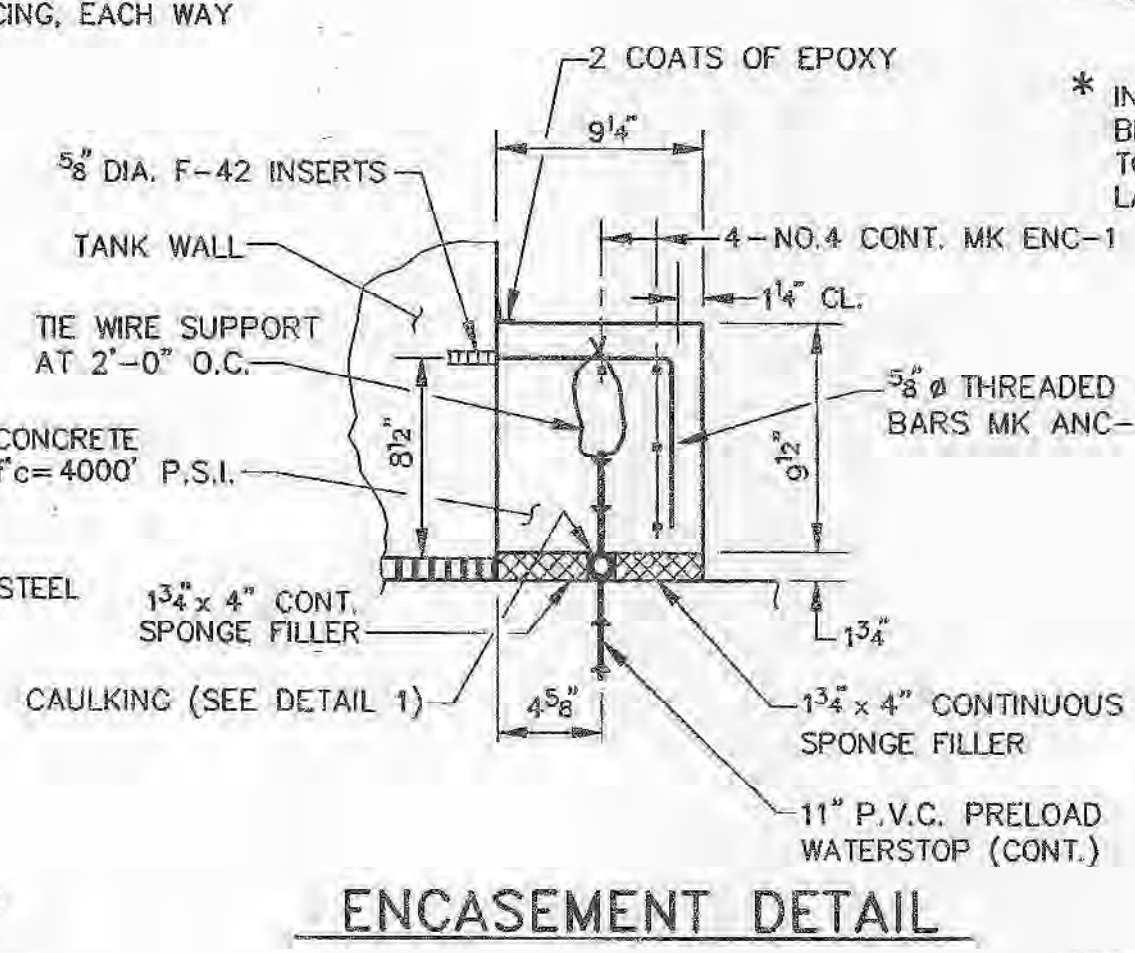
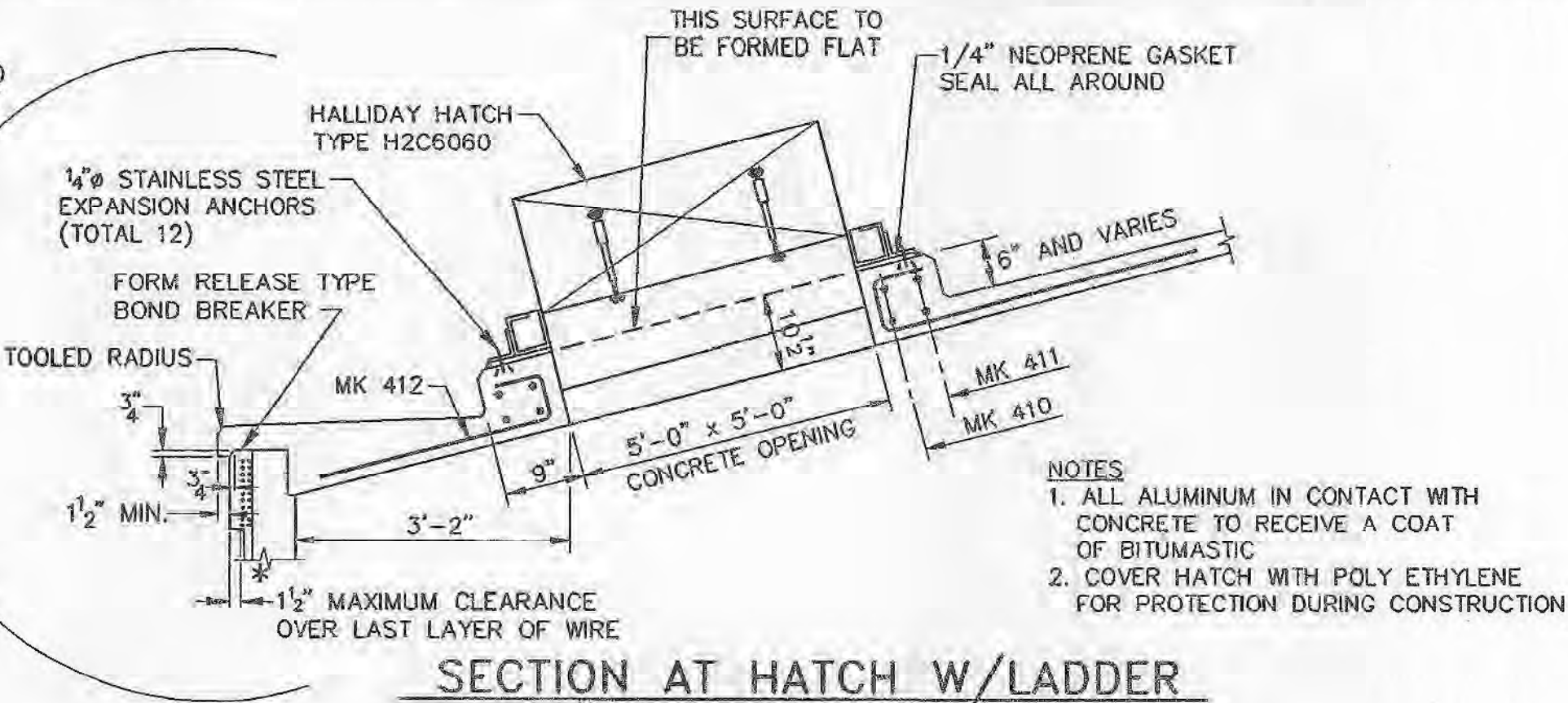
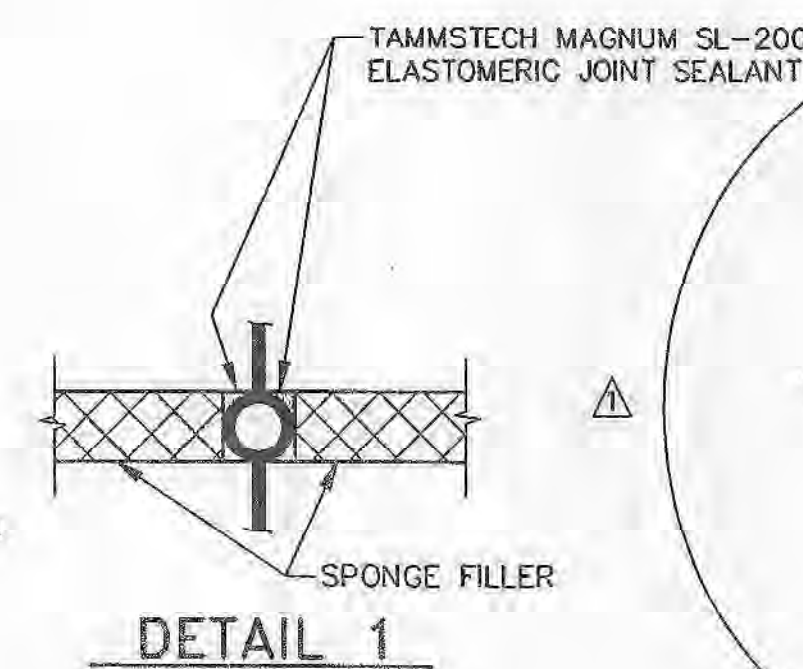
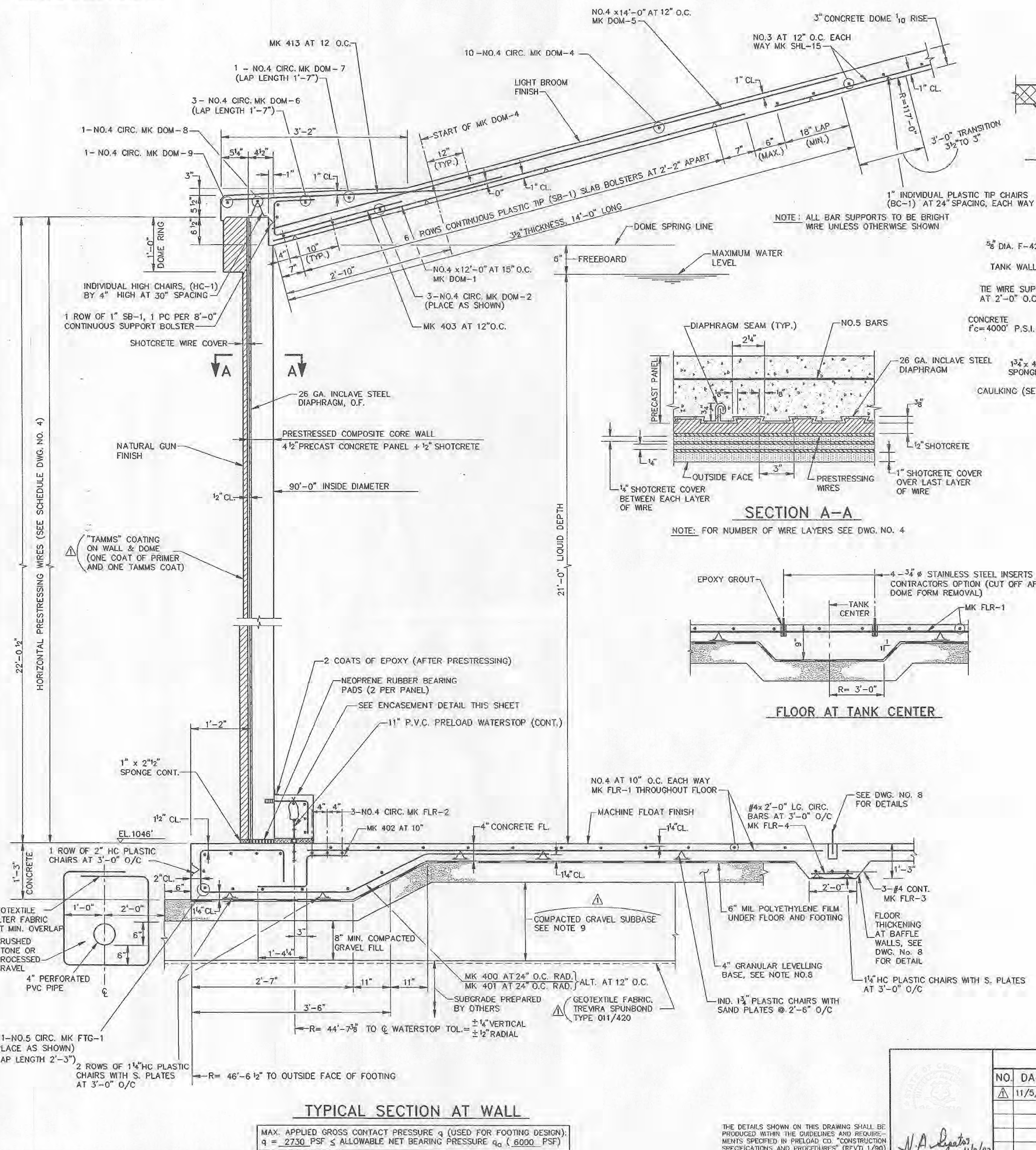
839 STEWART AVENUE, GARDEN CITY, NEW YORK, 11530

THIS DRAWING IS THE PROPERTY OF PRELOAD INC. AND IS SUBJECT TO RETURN ON DEMAND. IT CONTAINS TRADE SECRETS AND CERTAIN FEATURES OF DESIGN WHICH ARE COVERED BY PATENTS. IT IS SUBMITTED FOR USE ONLY IN CONNECTION WITH PROPOSALS OR CONTRACTS OF PRELOAD OR ITS LICENSEES, UPON THE EXPRESS CONDITION THAT IT MAY NOT BE USED FOR ANY PURPOSE WITHOUT APPROVAL OF PRELOAD.

THE DETAILS SHOWN ON THIS DRAWING SHALL BE PRODUCED WITHIN THE GUIDELINES AND REQUIREMENTS SPECIFIED IN PRELOAD CO. "CONSTRUCTION SPECIFICATIONS AND PROCEDURES" (REV'D 1/90)

N.A. Repates
11/18/97

NOTE:
ALL REBAR SUPPORTS IN CONTACT WITH
DOME FORM TO HAVE PLASTIC TIPS



- GENERAL NOTES:-
- SHOTCRETE (28 DAY COMPRESSIVE STRENGTH = 4500 PSI)
 - MINIMUM 28 DAY CONCRETE CYLINDER STRENGTHS:
FOOTING AND FLOOR _____ 3000 PSI
DOME _____ 4000 PSI
WALL _____ 4000 PSI
PIPE ENCASEMENT _____ 3000 PSI
 - DOME LIVE LOAD = 45 P.S.F.
 - REBAR TO BE NEW BILLET STEEL ASTM A615, GRADE 60, DEFORMED. SEE REBAR SCHEDULE FOR LAP REQUIREMENT EXCEPT AS NOTED ON THIS DWG.
 - ALL FLOOR REBAR SUPPORTS TO BE FURNISHED AS SHOWN WITH SAND PLATES.
 - ALL SPONGE RUBBER ON THIS DWG. SHALL CONFORM TO ASTM D1055-85, TYPE 2A-1.
 - WALL BEARING PADS TO BE 40 DURO, WITH AN ULTIMATE TENSILE STRENGTH OF 1500 PSI AND A MINIMUM ELONGATION OF 500 PERCENT.
 - 4\"/>

THIS SHOP DRAWING HAS BEEN REVIEWED AND DETERMINED TO BE IN COMPLIANCE WITH THE CONTRACT DOCUMENTS INCLUDING PLANS AND SPECIFICATIONS AS MODIFIED BY ADDENDA, CHANGE ORDERS AND FIELD ORDERS.

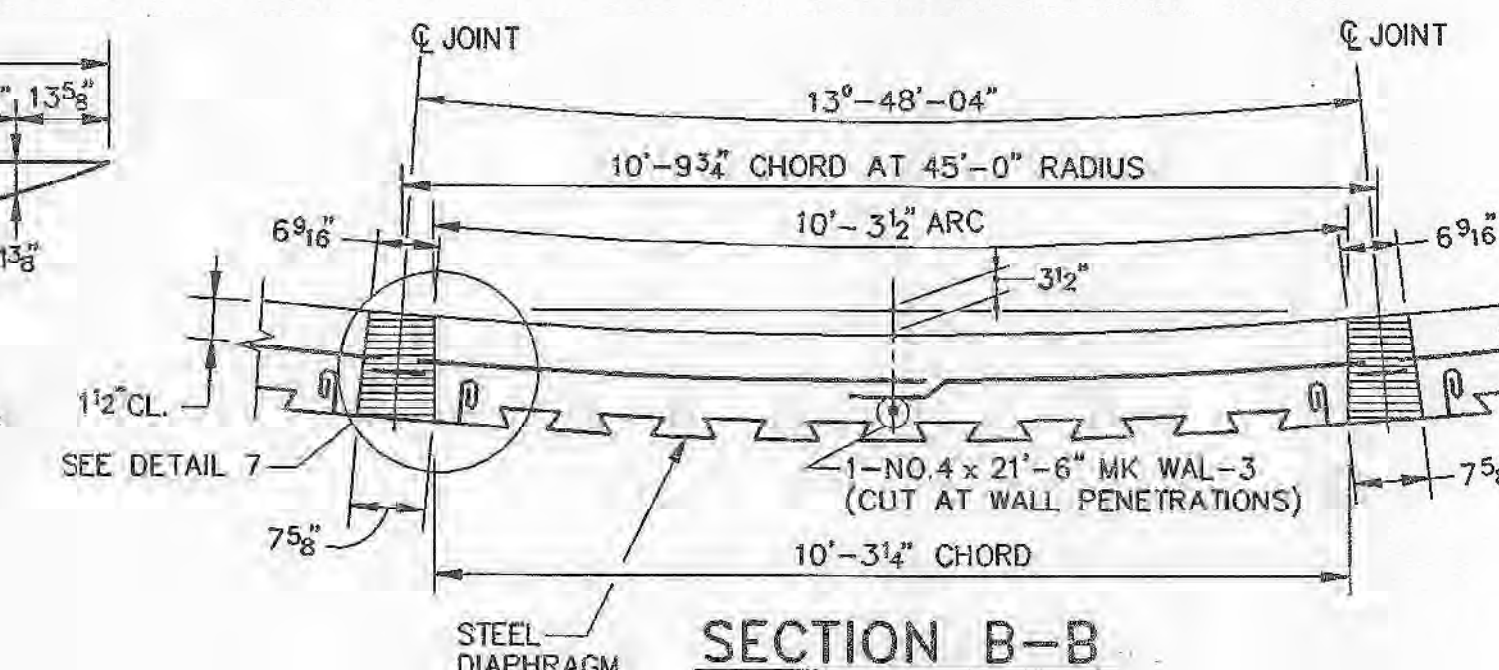
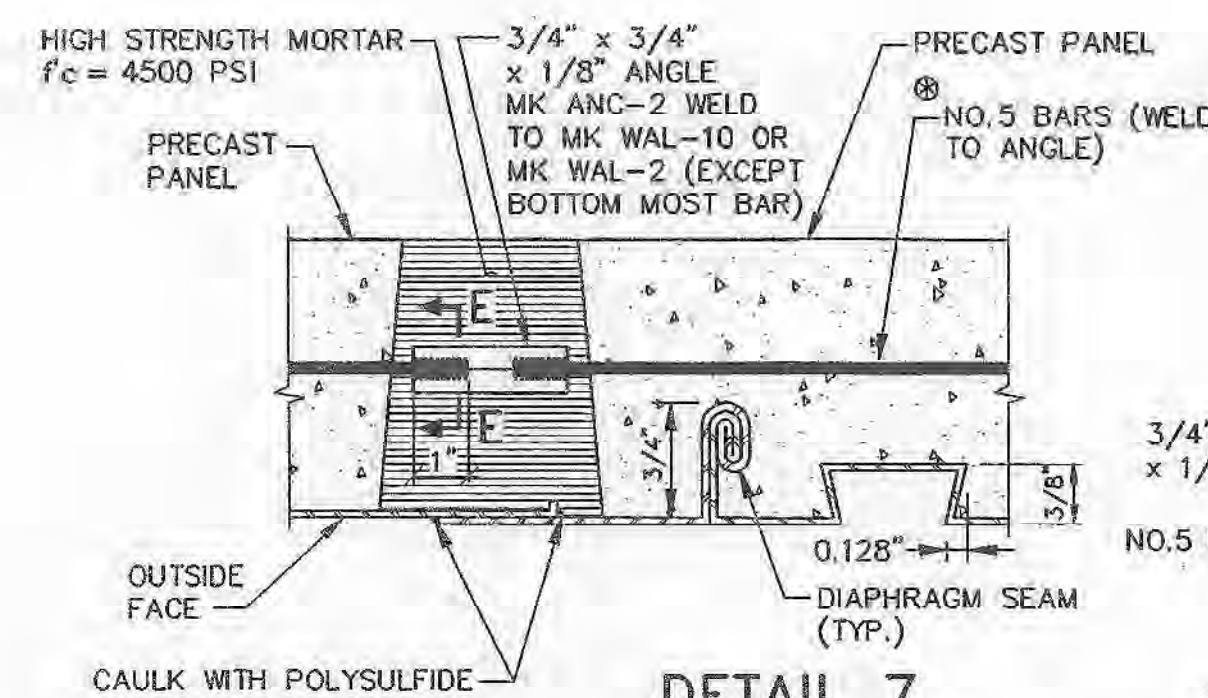
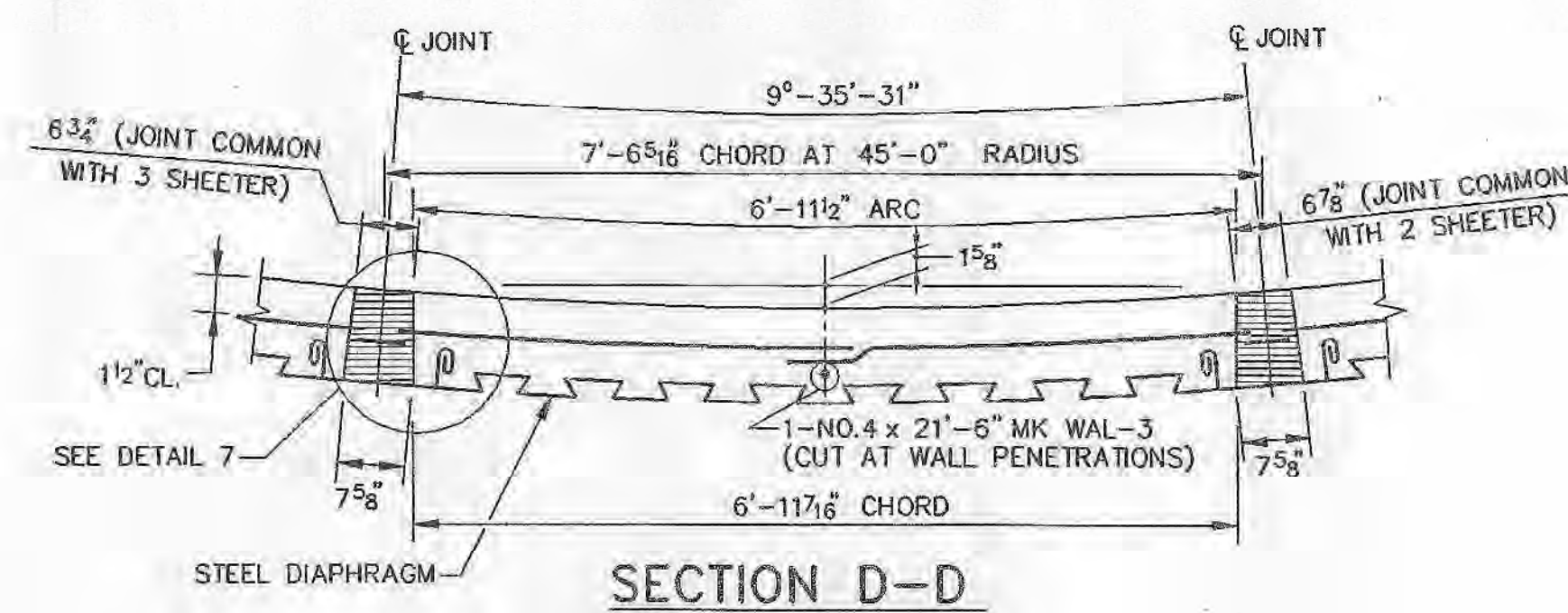
CONTRACTOR: PRELOAD INC.
BY: *[Signature]*
DATE: 11/18/97

REVISIONS				
NO.	DATE	DESCRIPTION	BY	CHKD
1	11/5/97	PER DISCUSSION WITH ENGINEER	SB	NAL

839 STEWART AVENUE, GARDEN CITY, NEW YORK, 11530

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WORKING DRAWING			
ONE 1.0 M.G. WATER STORAGE TANK			
WINSTED, CONNECTICUT			
TYPICAL TANK SECTION			
DRAWN: SB	SCALE: NTS	CONTRACT NUMBER: 97 PD 018	
DESIGNED: RAO		DRAWING NUMBER: CT	
CHECKED: TM	DATE: 10-22-97	DRAWING NUMBER: WNS97-02	



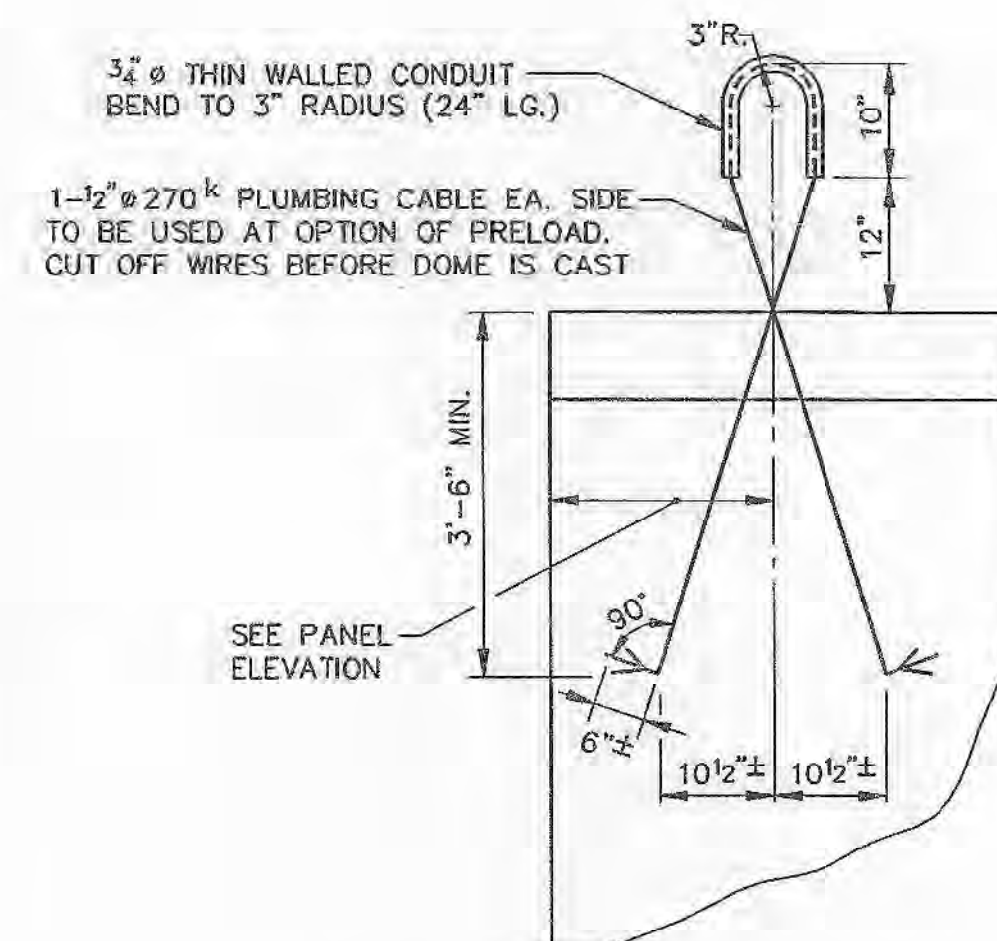
THIS SHOP DRAWING HAS BEEN REVIEWED AND
DETERMINED TO BE IN COMPLIANCE WITH THE
CONTRACT DOCUMENTS INCLUDING PLANS AND
SPECIFICATIONS AS MODIFIED BY ADDENDA,
CHANGE ORDERS AND FIELD ORDERS.
CONTRACTOR: STANLEY INC.
BY: [Signature]
DATE: 11/18/97

⊗ NOTE:—

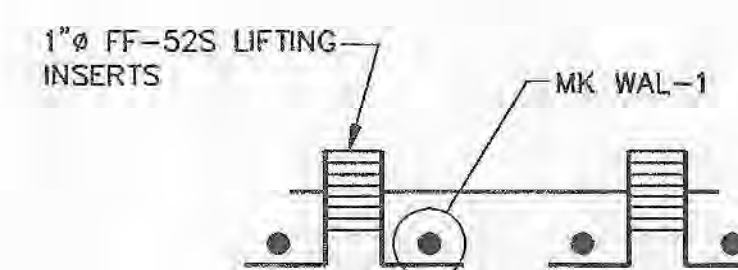
WELDING OF BARS TO ANGLE IS FOR CONSTRUCTION PURPOSES ONLY AND HAS NO STRUCTURAL SIGNIFICANCE

WALL PANEL NOTES:

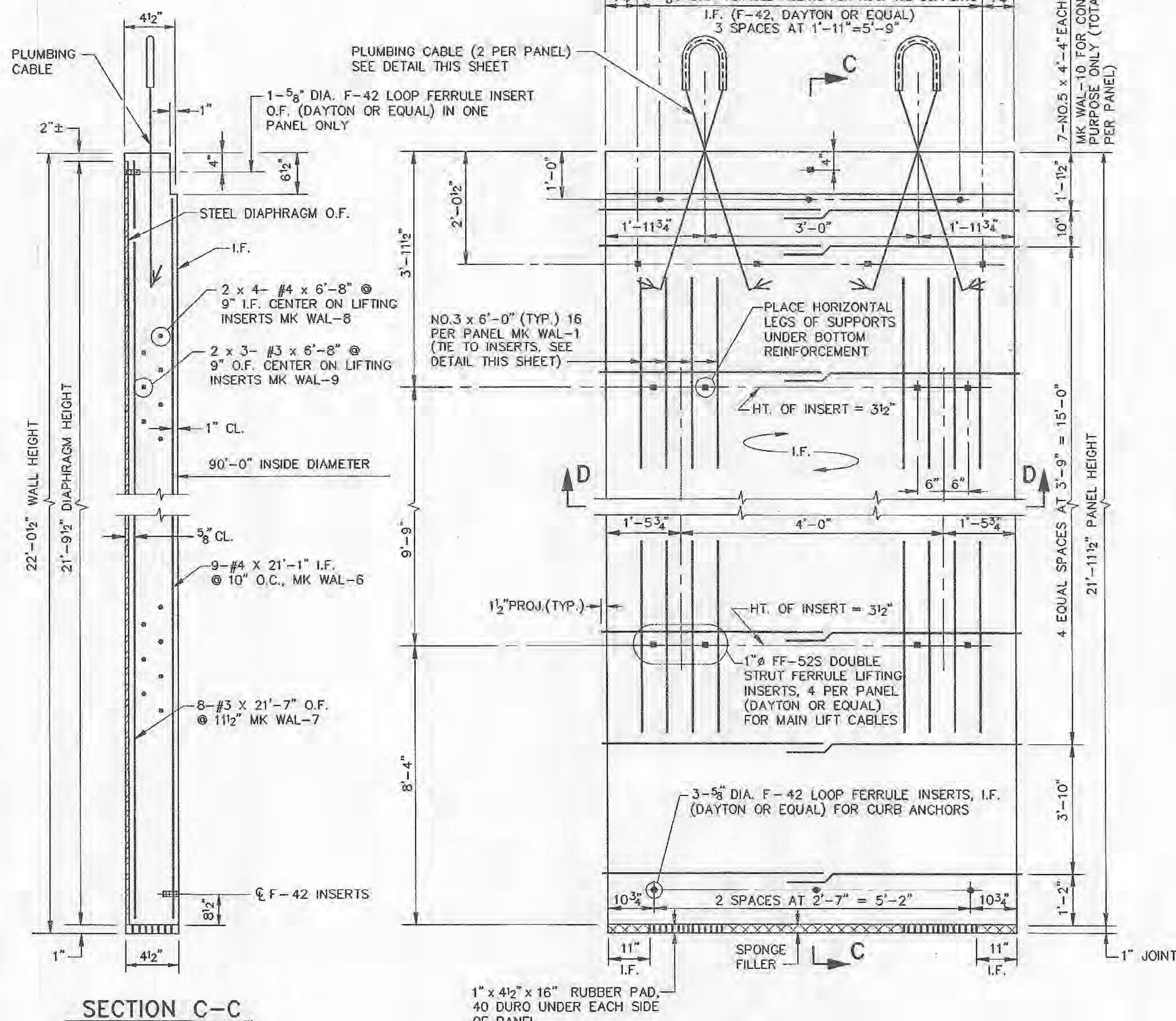
1. PACK ALL INSERT HOLES WITH GROUT AND APPLY TWO COATS OF EPOXY UPON COMPLETION OF THEIR USE.
2. INSIDE FACE OF PANEL TO BE FINE BROOM FINISHED.
3. PANELS NOT TO BE LIFTED UNTIL CONCRETE STRENGTH OF 3500 PSI IS ATTAINED
4. LIFTING CABLE: 4 POINT PICKUP
50' CABLE LENGTH (MIN.)
5. CEMENT SPONGE FILLER WITH WATERPROOF CONTACT CEMENT.
6. TRANSFER LOADS TO PLUMBING CABLES ONLY AFTER ENTIRE PANEL IS CLEAR OF THE GROUND USING MAIN LIFTING CABLES.
7. LIFTING GEAR CABLE SIZE:
CABLES FOR LIFTING = 1"Ø
CABLES FOR PLUMBING = 1"Ø



PLUMBING CABLE DETAIL

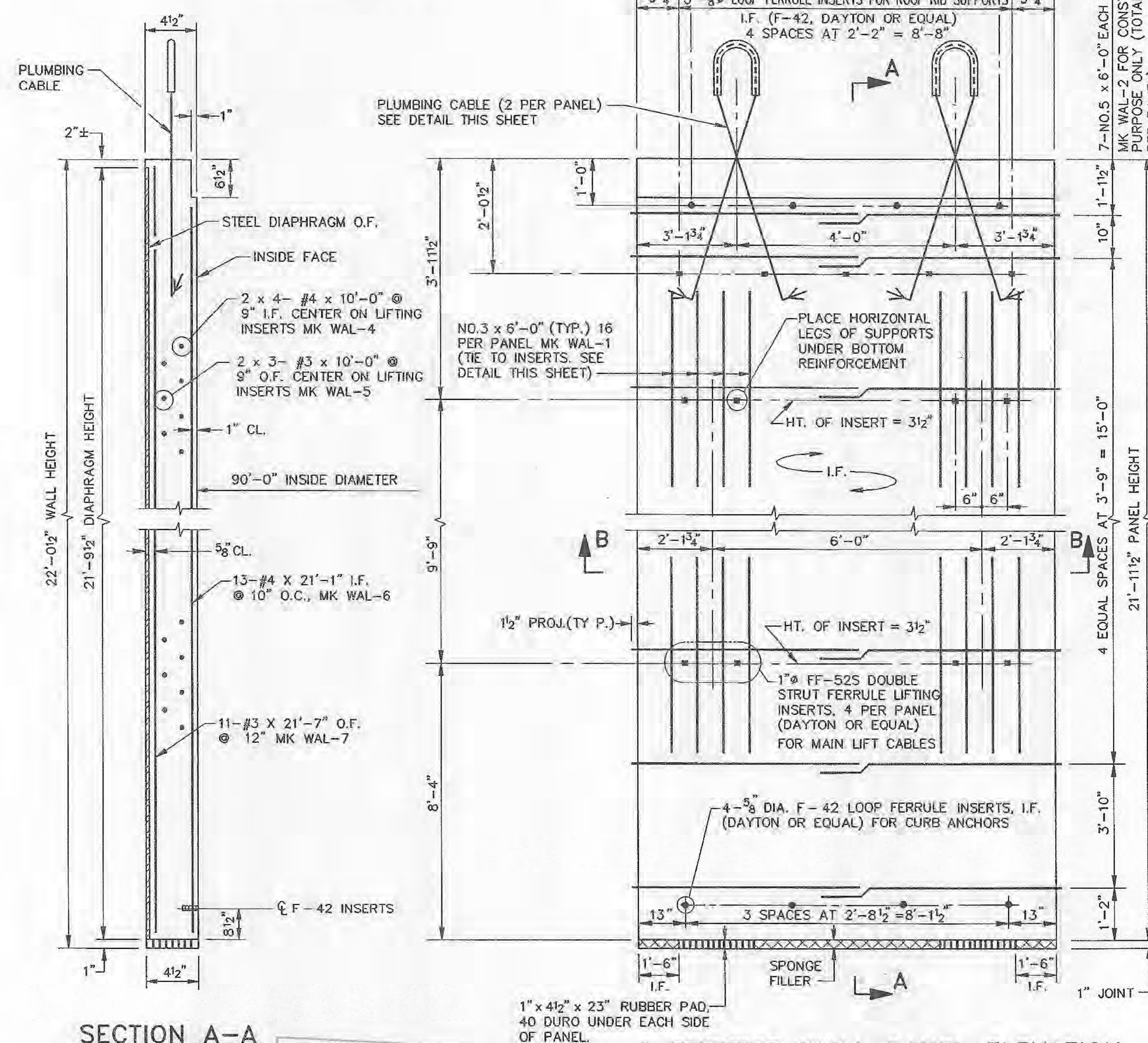


LIFTING INSERT DETAIL



SECTION C-C

2 SHEETER WALL PANEL ELEVATION
(WEIGHT OF PANEL = 4.10 TONS)
(3 REQUIRED)



SECTION A-A

1" x 4 1/2" x 23" RUBBER PAD,
40 DURO UNDER EACH SIDE
OF PANEL.

3 SHEETER WALL PANEL ELEVATION
(WEIGHT OF PANEL = 6.10 TONS)
(24 REQUIRED)

22 - 3 SHEETER PANELS AS SHOWN ABOVE
1 - 3 SHEETER PANEL WITH TEMPORARY MANHOLE, SEE DWG. NO. 05
1 - 3 SHEETER PANEL WITH OVERFLOW, SEE DWG. NO. 05

WORKING DRAWING

ONE 1.0 M.G. WATER STORAGE TANK
WINSTED, CONNECTICUT

PANEL DETAILS

DRAWN: EZ	SCALE: NTS	CONTRACT NUMBER: 97 PD 018
DESIGNED: RAO		DRAWING CT
CHECKED: TM	DATE: 10-22-97	DRAWING NUMBER: WNS97-03

THE DETAILS SHOWN ON THIS DRAWING SHALL BE PRODUCED WITHIN THE GUIDELINES AND REQUIREMENTS SPECIFIED IN PRELOAD CO. "CONSTRUCTION SPECIFICATIONS AND PROCEDURES" (REV'D 1/90)

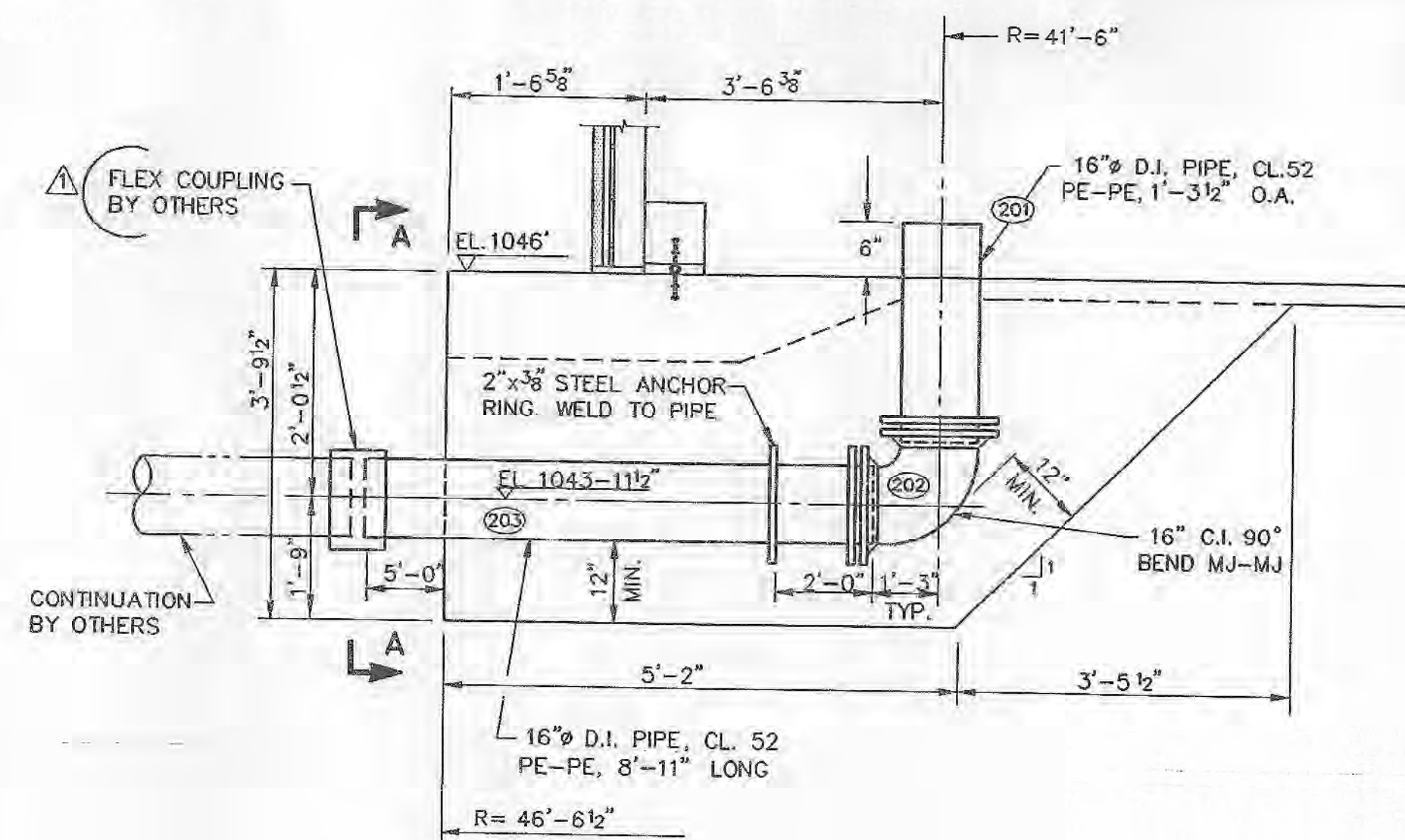
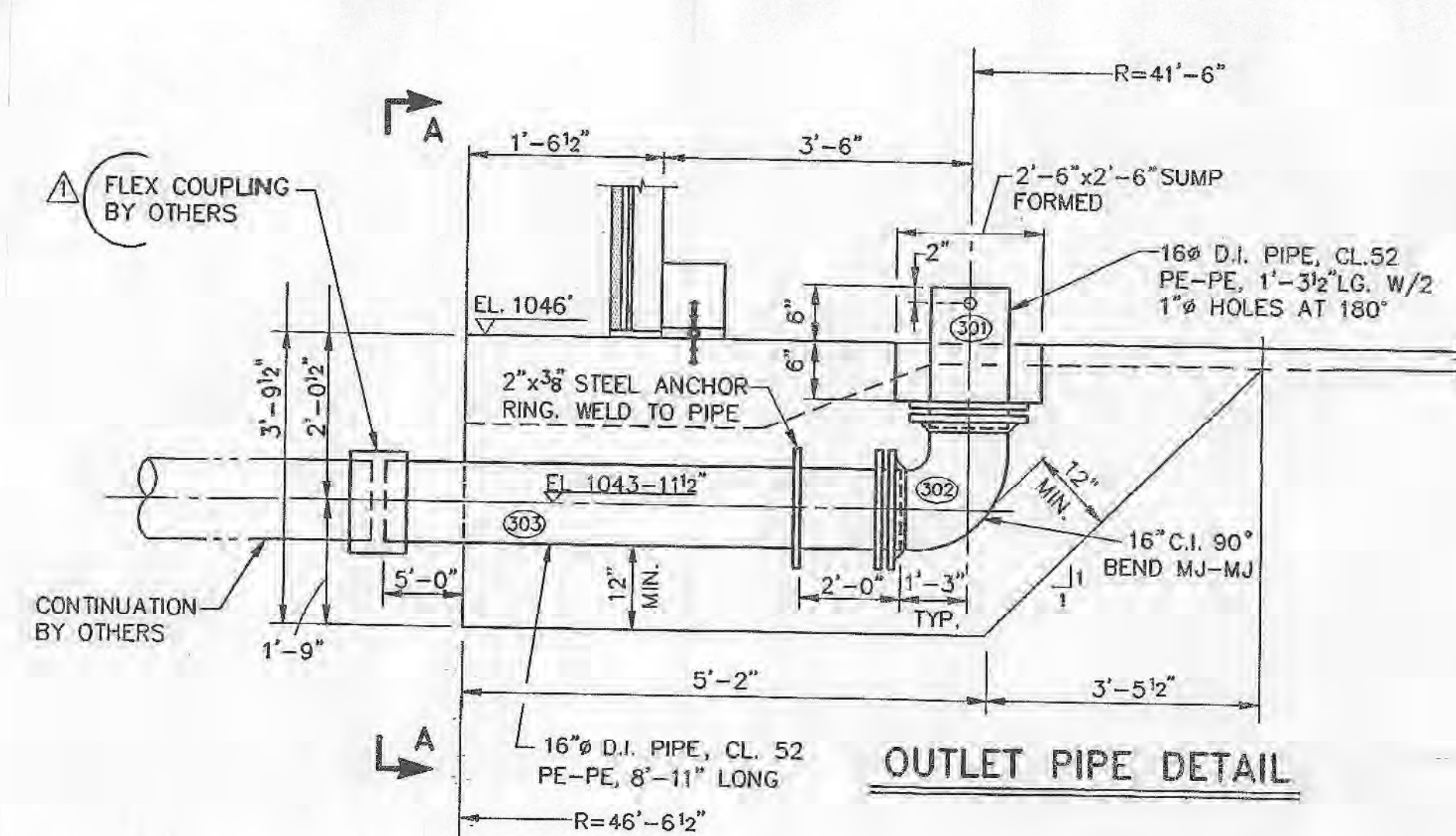
N.A. Ligato 11/2/0

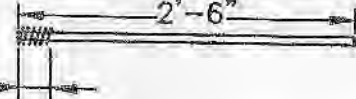
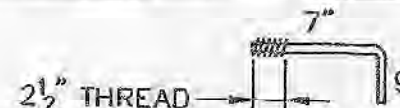
REVISIONS				
NO.	DATE	DESCRIPTION	BY	CHKD
Δ	11/5/97	PER DISCUSSION WITH ENGINEER	SB	NAL

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PRELOAD

839 STEWART AVENUE, GARDEN CITY, NEW YORK, 11530



MISCELLANEOUS IRON SCHEDULE							
MK	QUANTITY		SIZE	LENGTH	WEIGHT (LBS.)	SKETCH	LOCATION
	DESIGN	ORDER					
ANC-1	250	255	5/8"	2'-6"	671		FOR BAFFLE WALLS
ANC-2		7	$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{8}$ L (.59 PLF)	20'-0"	83	FORMULA: $\frac{\text{TOTAL NO. WAL} - 2 \text{ BARS}}{2} \times \frac{0.67}{20}$ (TO NEXT HIGHER 20')	PANEL JOINTS
ANC-3	40	42	5/8 φ	1'-4"	59		
ANC-4	105	109	3/8 φ	1'-4"	153		WATERSTOP ENCASEMENT
ANC-5		4	1" φ	1'-9"	19		VENT AT APEX

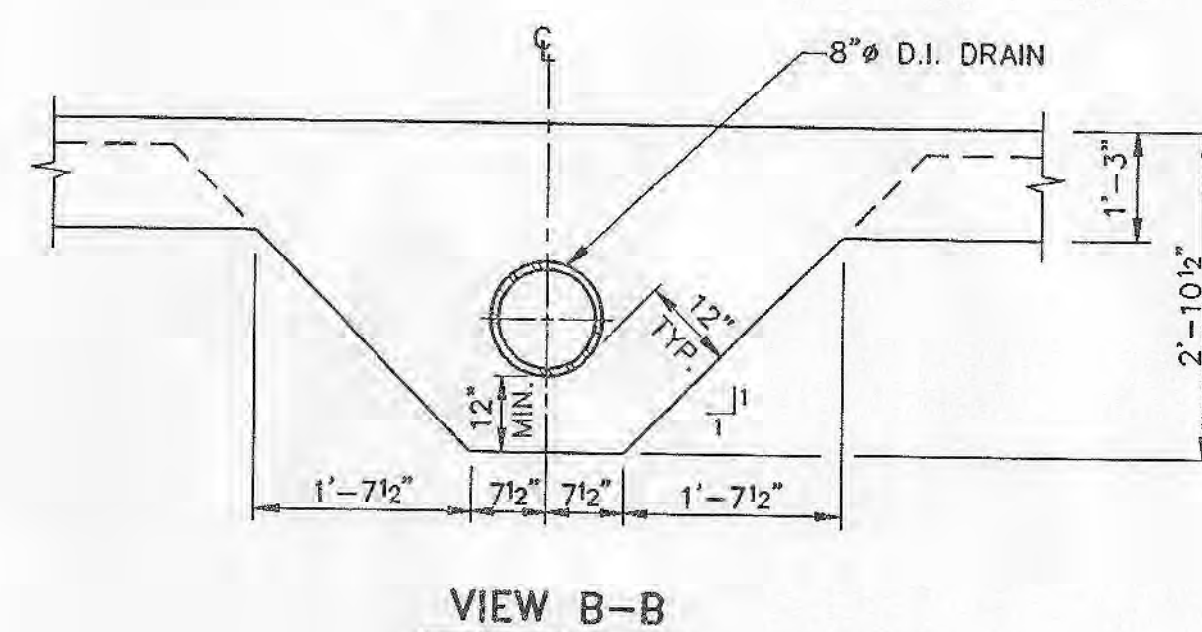
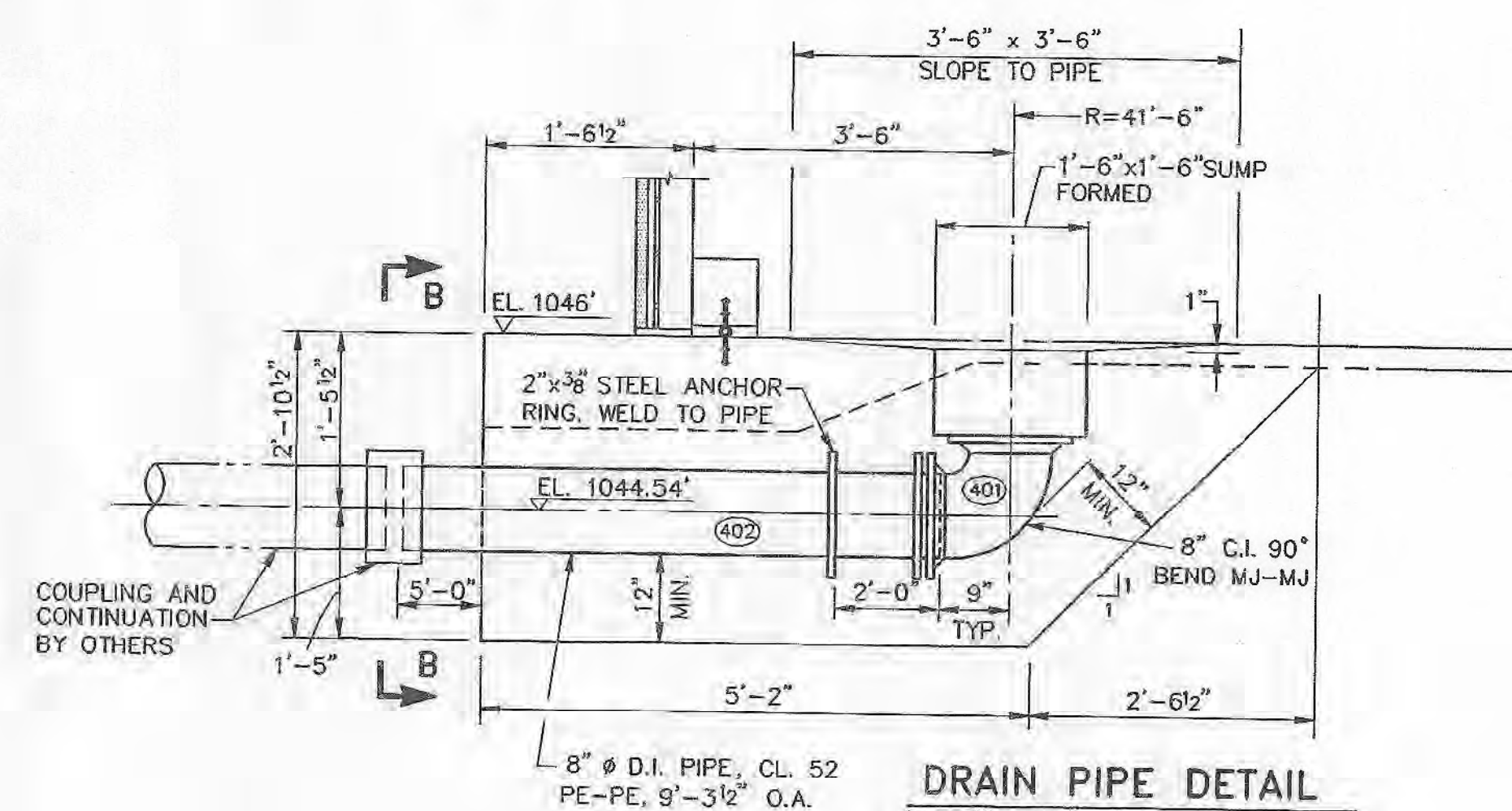
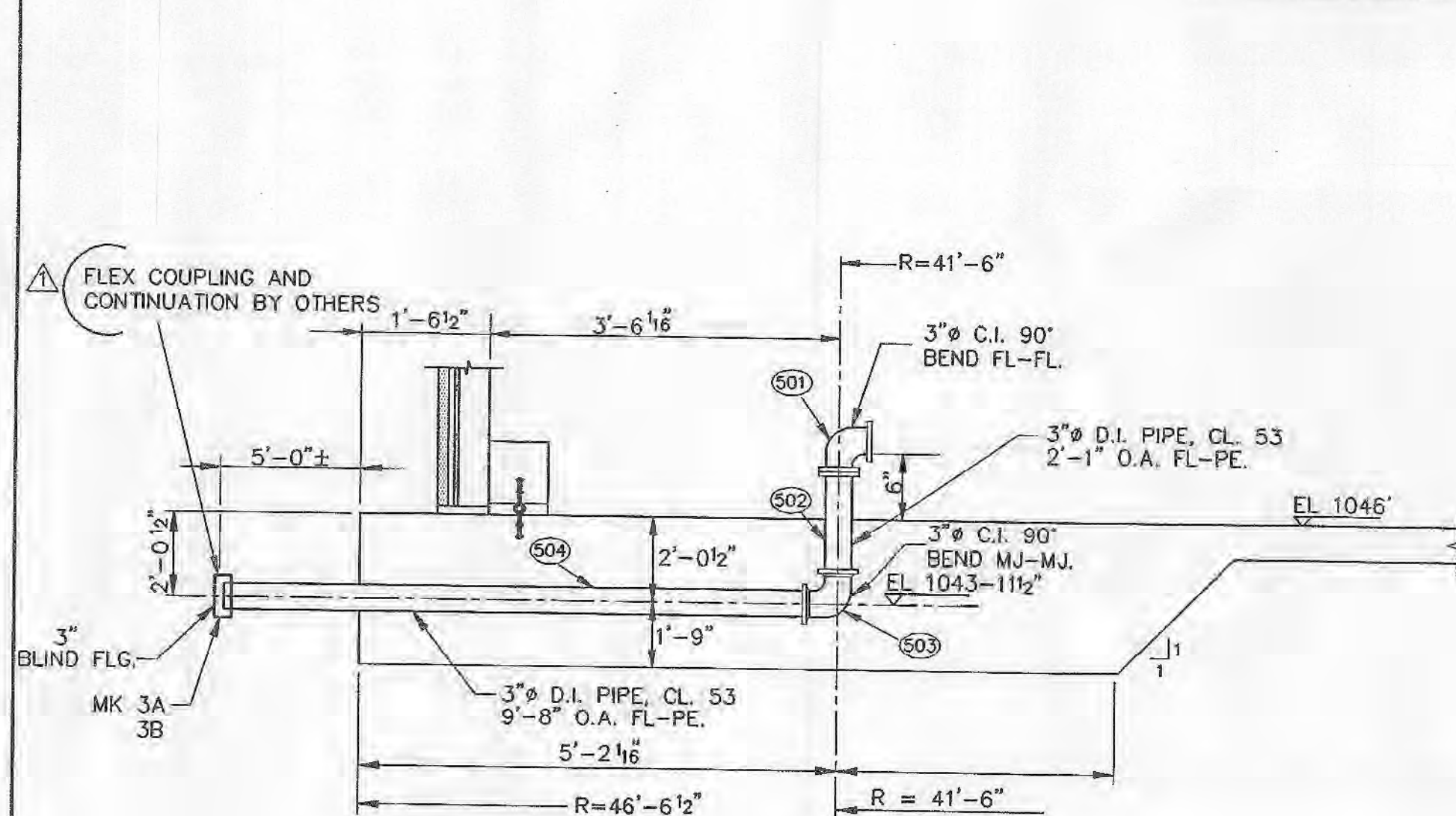
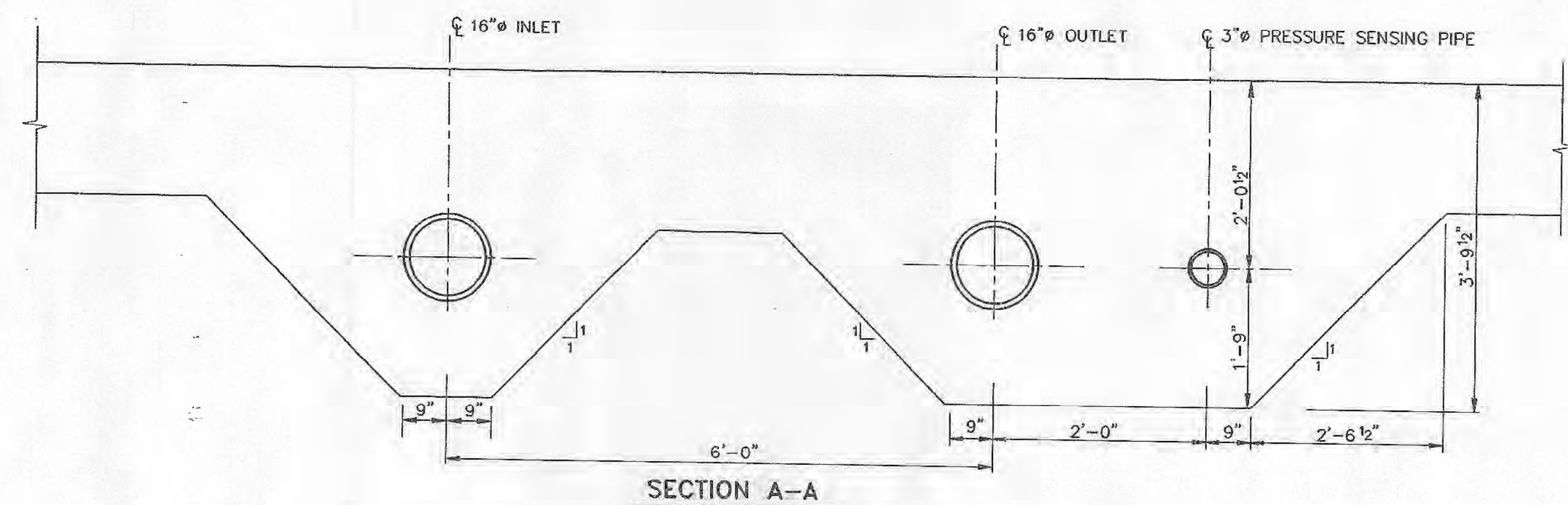
PRESTRESS WIRE QUANTITIES					
PHASE	WALL		DOME		TOTAL
	WRAPS	WEIGHT	WRAPS	WEIGHT	
I	82	1765	0	0	
II	0	0	17	384	
III	0	0	17	384	
IV	0	0	16	361	
V	0	0	16	361	
VI	0	0	15	338	
VII	152	3272	0	0	
VIII	80	1722	0	0	
IX	84	1808	0	0	
X	0	0	0	0	
XI	0	0	0	0	
T.WRAPS=	398	X	81	X	478
T. WGT.=	X	8567	X	1828	10373
LIN. FT.= PER WRAP	285.36	DIE DIA. WALL = 0.168 DOME = 0.172	WT/WRAP WALL = 21.524 DOME = 22.562		

THIS SHOP DRAWING HAS BEEN REVIEWED AND
DETERMINED TO BE IN COMPLIANCE WITH THE
CONTRACT DOCUMENTS INCLUDING PLANS AND
SPECIFICATIONS AS MODIFIED BY ADDENDA,
CHANGE ORDERS AND FIELD ORDERS.

CONTRACTOR RESIDUALS

BY R. [Signature]

DATE 11/18/07



VI V IV III II

15 16 16 17 17

22-012⁸
21-012 81 244620 242600 250660

Diagram illustrating the wirewinding schedule for a 21-012 inch diameter coil. The diagram shows a cross-section of the coil with various layers and dimensions. Key dimensions include: O.F.L.W. (Outside Flow Line) at EL. 1052'-2", TEMP. MH (Temperature Measurement Hole) at EL. 1049'-0", and EL. 1046' at the bottom. The diagram also shows a vertical scale from 1 to 21 feet from the base.

No. OF WIRES	TOTAL WIRE FORCE PER SCHEDULE (lbs.)	MIN. INITIAL FORCE REQUIRED (lbs.)	MAX. INITIAL FORCE ALLOWED (lbs.)
25+19	162680	157490	170800
25	146080	144290	153380
24			
23	229080	221640	240330
22	39840	37850	41830
21	39840	37850	41830
20	136120	131790	142930
19	63080	60630	69720
18	59760	57120	66400
17	56440	53610	63080
16	53120	50100	59760
15	49800	46590	56440
14	46480	43080	53120
13	43160	39570	49800
12	39840	36060	46480
11	36520	32550	43160
10	33200	29040	39840
9	29880	25530	33200
8	26560	22020	29880
7			
6			
5			
4			
3			
2			
1			

LEGEND

NOTES :

REVISIONS				
NO.	DATE	DESCRIPTION	BY	CHKD
1	11/5/97	PER DISCUSSION WITH ENGINEER	SB	NA

PRELOAD

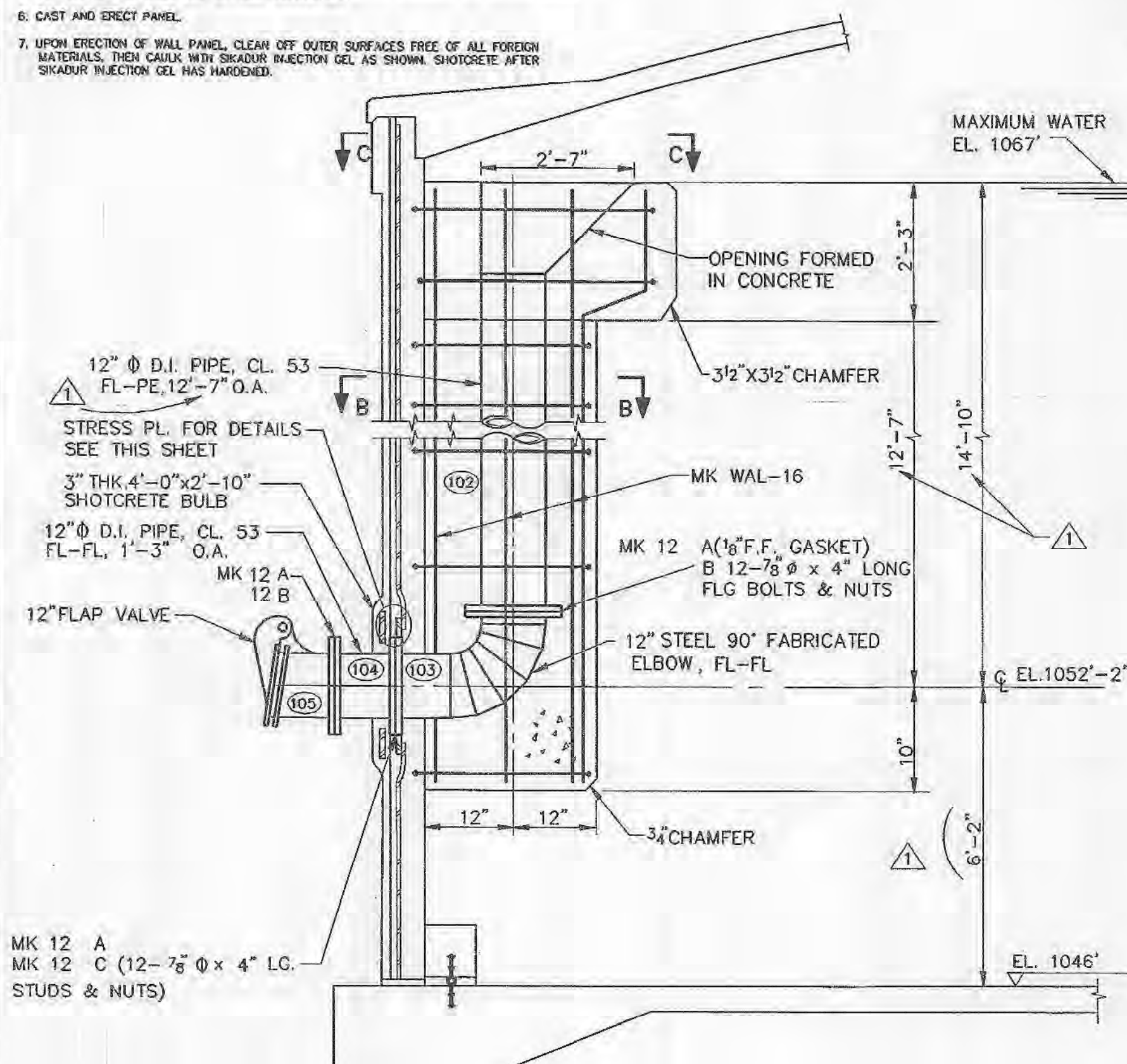
839 STEWART AVENUE, GARDEN CITY, NEW YORK, 11530

ONE 1.0 M.G. WATER STORAGE TANK
WINSTED, CONNECTICUT

WIREWINDING SCHEDULE & PIPING DETAIL

DRAWN: SB	SCALE: NTS	CONTRACT NUMBER: 97 PD 018
DESIGNED: RAO		DRAWING NUMBER: CT WNS97-04
CHECKED: TM	DATE: 10-22-97	

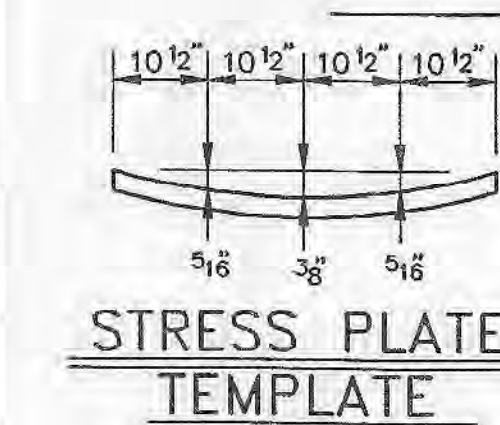
1. CLEAN ALL INSIDE SURFACES FREE OF DIRT, SLAG, OIL OR OTHER FOREIGN SUBSTANCES TO FACILITATE GOOD BOND SURFACES.
2. PLACE OPERATOR AT PROPER LOCATION IN PANEL BED, CUT DIAPHRAGM TO PRODUCE 1" LAP OVER WATERSTOP.
3. LOCATE AND PLACE DIAPHRAGM IN PANEL BED WITH OPERING REMOVED AS REQUIRED. FASTEN TO WATERSTOP PLATE WITH SELF TAPPING SCREWS, THEN REMOVE OPERING.
4. LIFT DIAPHRAGM AND CLEAN OUTER TOP SURFACE OF DIAPHRAGM AND INNER SURFACE OF WATERSTOP PLATE WITH SHADEUR INJECTION GUN. IMMEDIATELY RE-INSERT SELF TAPPING SCREWS TO FACILITATE PERMANENT SEAL. ALLOW DIAPHRAGM TO CURE.
5. APPLY SHADEUR INJECTION GUN TO END OF DIAPHRAGM OVER SELF TAPPING SCREWS HEADS AND OVER ALL WATERTIGHT WELDS AS SHOWN. LET SHAOUR INJECTION GUN HARDEN BEFORE PROCEEDING WITH NEXT STEP IN PANEL FABRICATION.
6. CAST AND CURE PANEL.
7. UPON COMPLETION OF WALL PANEL, CLEAN OFF OUTER SURFACES FREE OF ALL FOREIGN MATERIALS. THEN CAST WITH SHAOUR INJECTION GUN, AS SHOWN. SHOOT/STREAR AFTER SHAOUR INJECTION GUN HAS HARDENED.



Technical drawing of a prestressed concrete slab with dimensions and annotations:

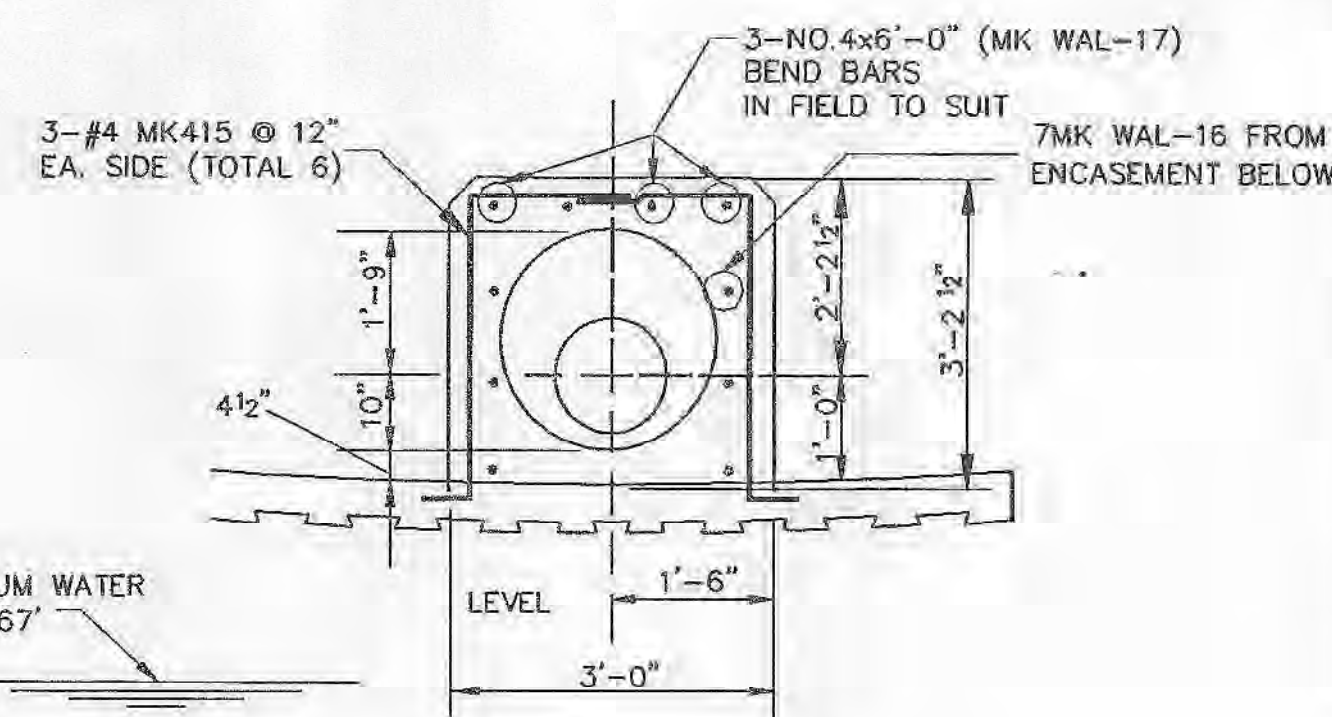
- Overall width: 3'-6"
- Overall height: 2'-6"
- Top edge dimensions: 3" (left), 3" (right), 1'-6" (center)
- Left edge dimensions: 2" (top), 2'-3 3/8" (bottom)
- Right edge dimensions: 1'-0" (top), 3" (bottom)
- Bottom edge dimensions: 10" (left), 10" (right)
- Central circular feature: 20" diameter, 20° angle, with a vertical arrow labeled 'A' pointing down.
- Annotations:
 - SEE STRESS PL. TEMPLATE
 - TYP.
 - 5/16"
 - (4) 3/4" x 1 1/2" SLOTTED HOLES
- Text at bottom: PRESTRESS WIRE CLAMP WITH 2 WIRE GROOVES TOTAL 12 REQUIRED

MATERIAL: 3/8" THK. ASTM A-36 STEEL
WITH 20" Ø HOLE

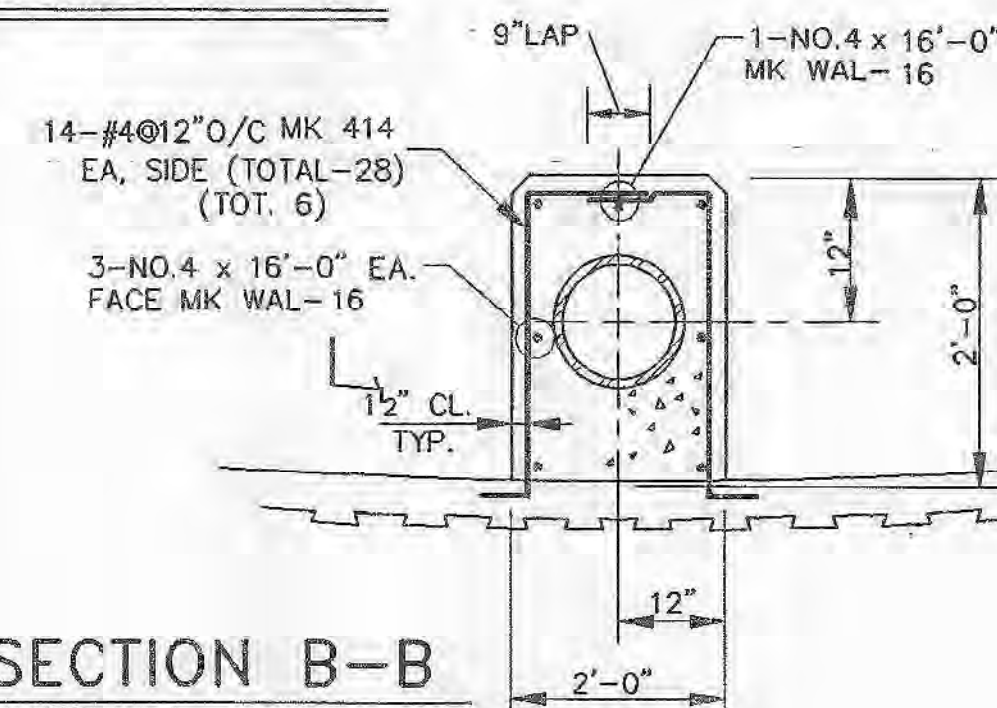


WATERSTOP
SIKADUR INJECTION GEL
3"
SIKADUR INJECTION GEL
DIAPHRAGM
DETAIL 6

DETAIL 6

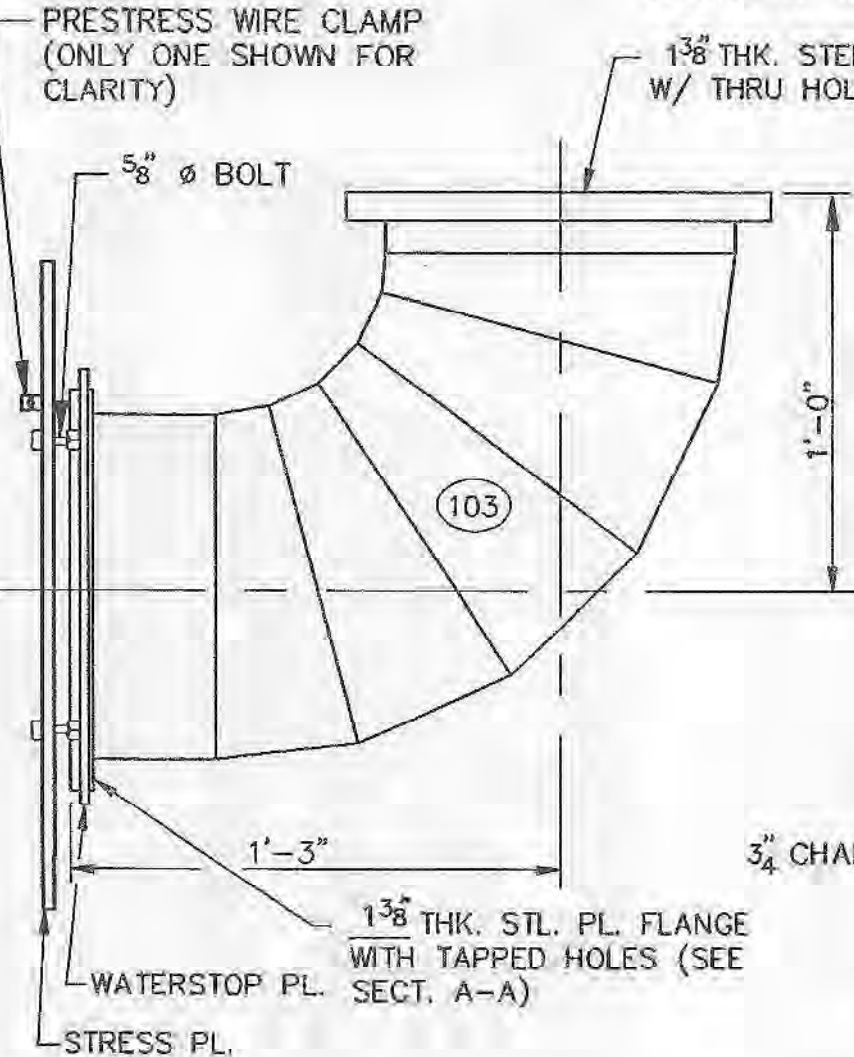


SECTION C-C

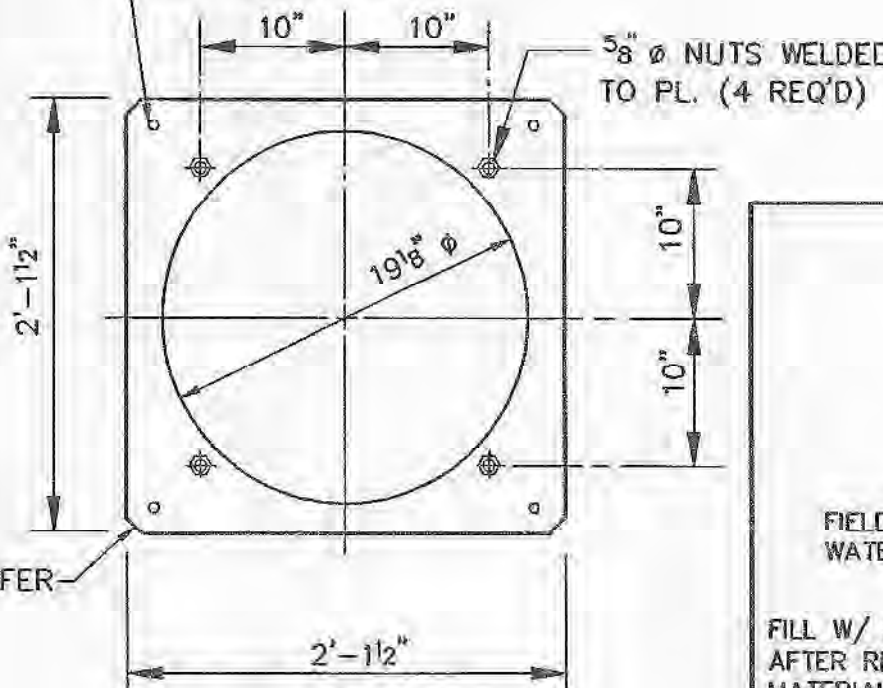


SECTION B-B

1. WELD CLAMPS TO STESS PL. USING E70XX ELECTRODES. ALL WELDING SHALL BE IN ACCORDANCE WITH ANSI/AWS D1.1-86.
2. WRAP WIRES OVER OVERTFLOW, MAKING SURE WIRES DROP INTO SLOTS IN CLAMPS.
3. INSTALL TOP HALF OF CLAMPS AND TIGHTEN WITH BOLTS.
4. CUT WIRES 1" FROM EDGE OF CLAMPS AS SHOWN.
5. WIRES TO BE CUT AT CENTER LINE OF OP'NG ALTERNATING WIRES ABOVE AND BELOW OP'NG (MAX. UNBALANCED LOAD = 2 WIRES)
6. APPLY SHOTCRETE TO COVER WIRES AND ANCHORAGES AFTER PIPE PROJECTING OUTSIDE OF WALL HAS BEEN CONNECTED.

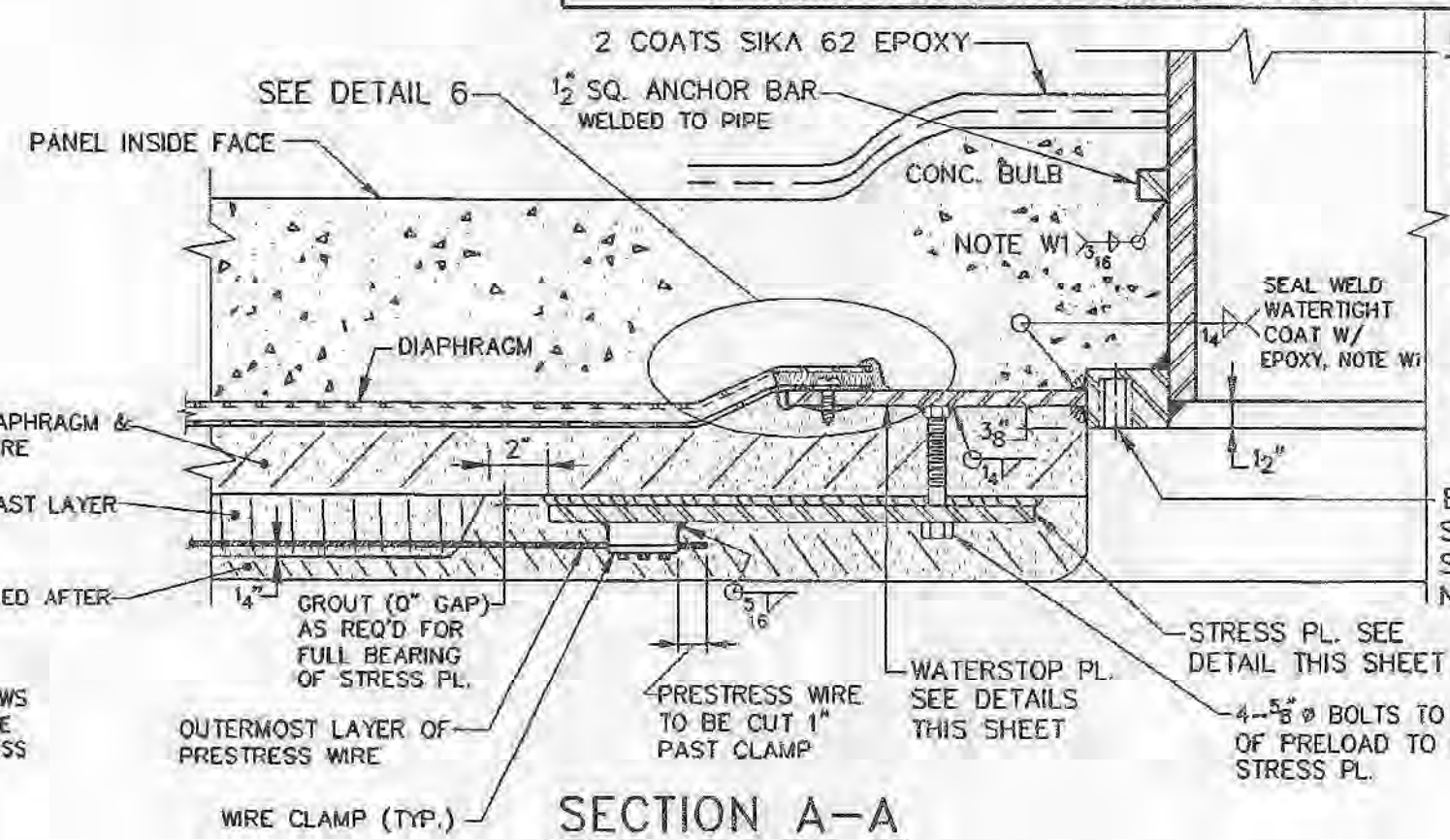


MATERIAL: 1/4" THK. ASTM A-36 STEEL
WITH 1 9/16" Ø HOLE



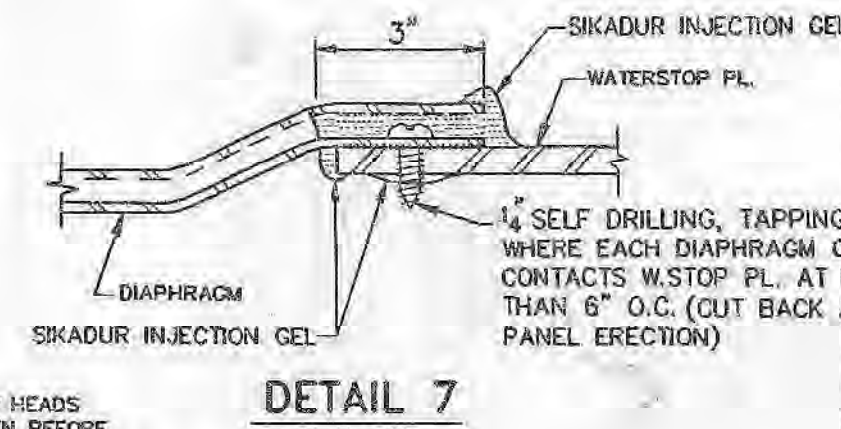
MATERIAL: 1/4" THK. ASTM A-36 STEEL
WITH 1 9/16" Ø HOLE

NOTE: MK 103 IS STEEL FAB. EL. EPOXY COATED
ON BOTH INSIDE AND OUTSIDE FACES.

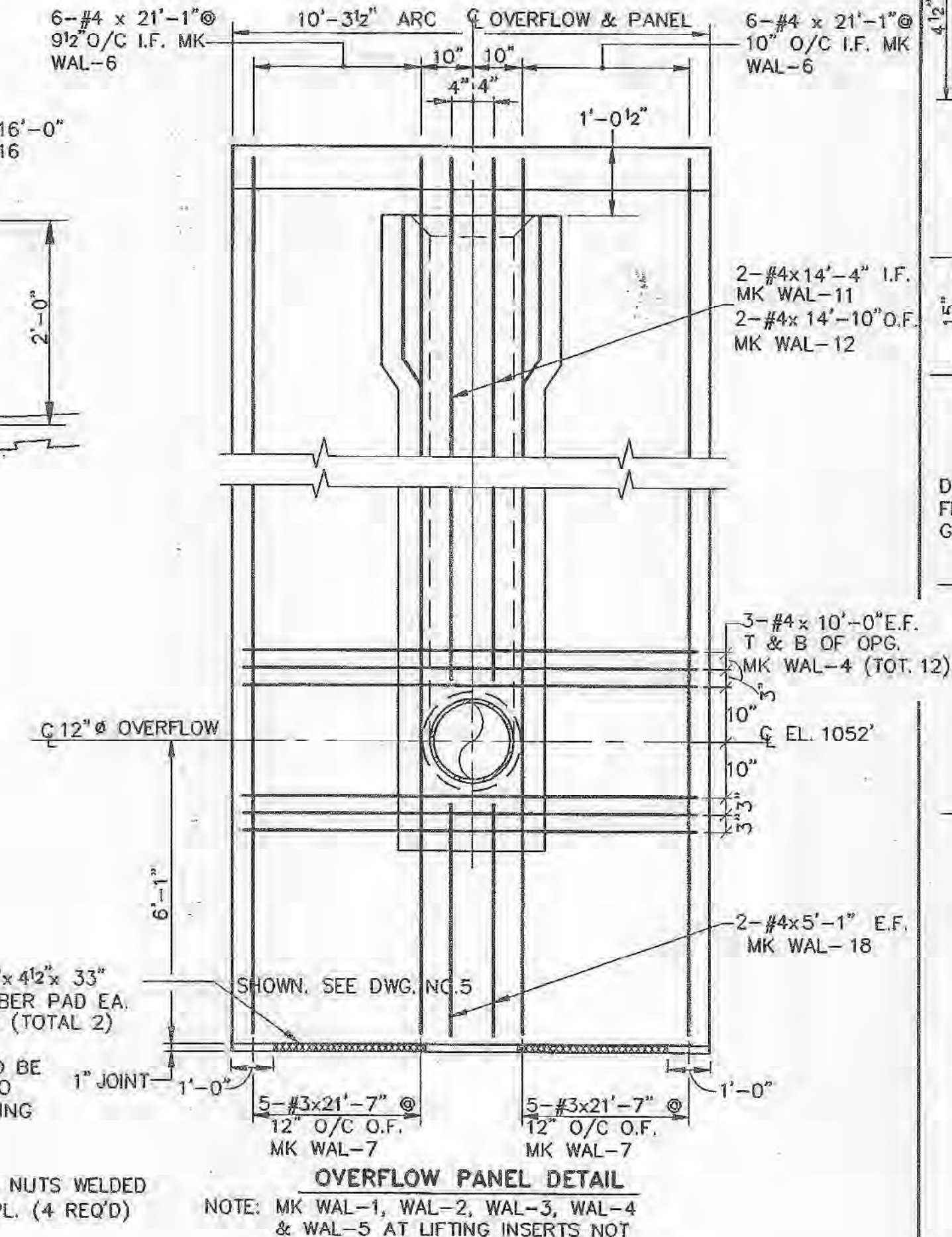


SECTION A-A

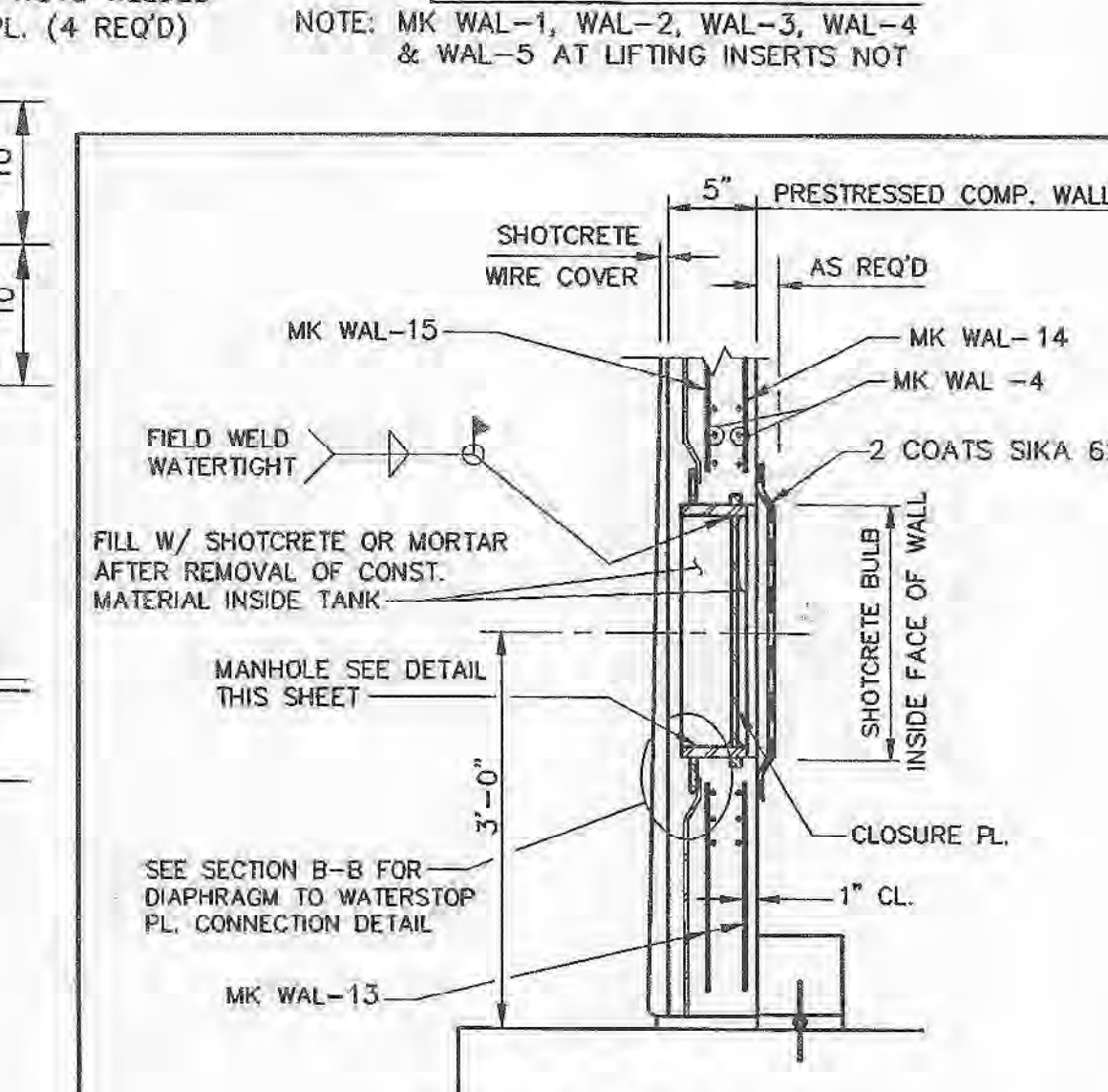
1. CLEAN ALL INSIDE SURFACES FREE OF DIRT, SLAG, OIL OR OTHER FOREIGN SUBSTANCES TO FACILITATE GOOD BOND SURFACES.
2. PLACE SLEEVE AND WATERSTOP PLATE ASSEMBLY AT PROPER LOCATION IN PANEL BED. CUT DIAPHRAGM TO PROVIDE 3" LAP OVER WATERSTOP PLATE.
3. LOCATE AND PLACE DIAPHRAGM IN PANEL BED WITH OPENING REMOVED AS REQUIRED. FASTEN TO WATERSTOP PLATE WITH SELF TAPPING SCREWS. THEN REMOVE SCREWS.
4. LIFT DIAPHRAGM AND CAULK BETWEEN OUTER SURFACE OF DIAPHRAGM AND INNER SURFACE OF WATERSTOP PLATE WITH SIKADUR INJECTION GEL. IMMEDIATELY RE-INSERT SELF TAPPING SCREWS TO FACILITATE PERMANENT SEAL. ALLOW SIKADUR INJECTION GEL TO SET.
5. APPLY SIKADUR INJECTION GEL TO END OF DIAPHRAGM OVER SELF TAPPING SCREW HEADS AND OVER ALL WATERIGHT WELDS AS SHOWN. LET SIKADUR INJECTION GEL HARDEN BEFORE PROCEEDING WITH NEXT STEP IN PANEL FABRICATION.
6. CAST AND ERECT PANEL.
7. UPON ERECTION OF WALL PANEL, CLEAN OFF OUTER SURFACES FREE OF ALL FOREIGN MATERIALS. THEN CAULK WITH SIKADUR INJECTION GEL AS SHOWN. SHOTCRETE AFTER SIKADUR INJECTION GEL HAS HARDENED.



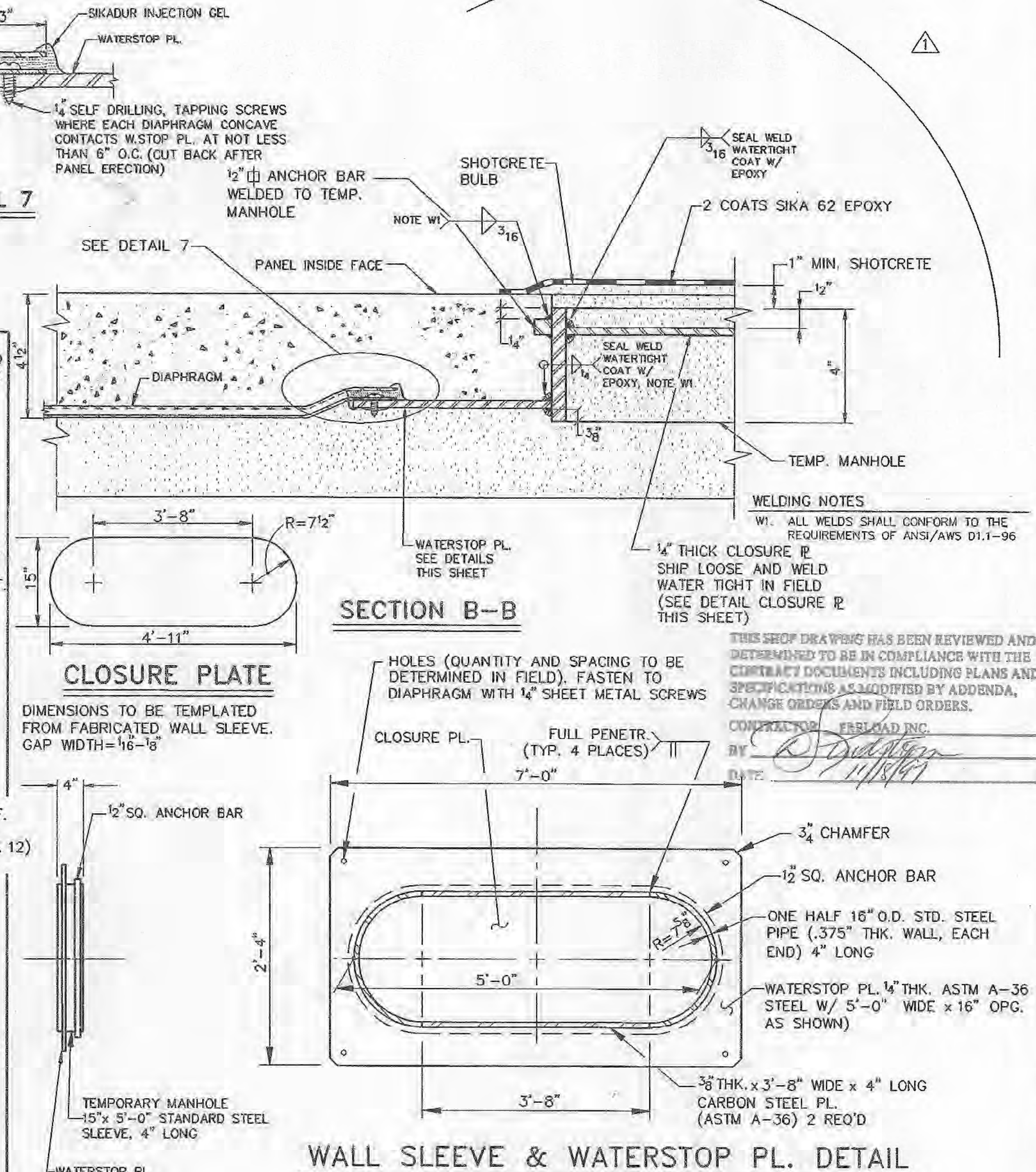
DETAIL 7



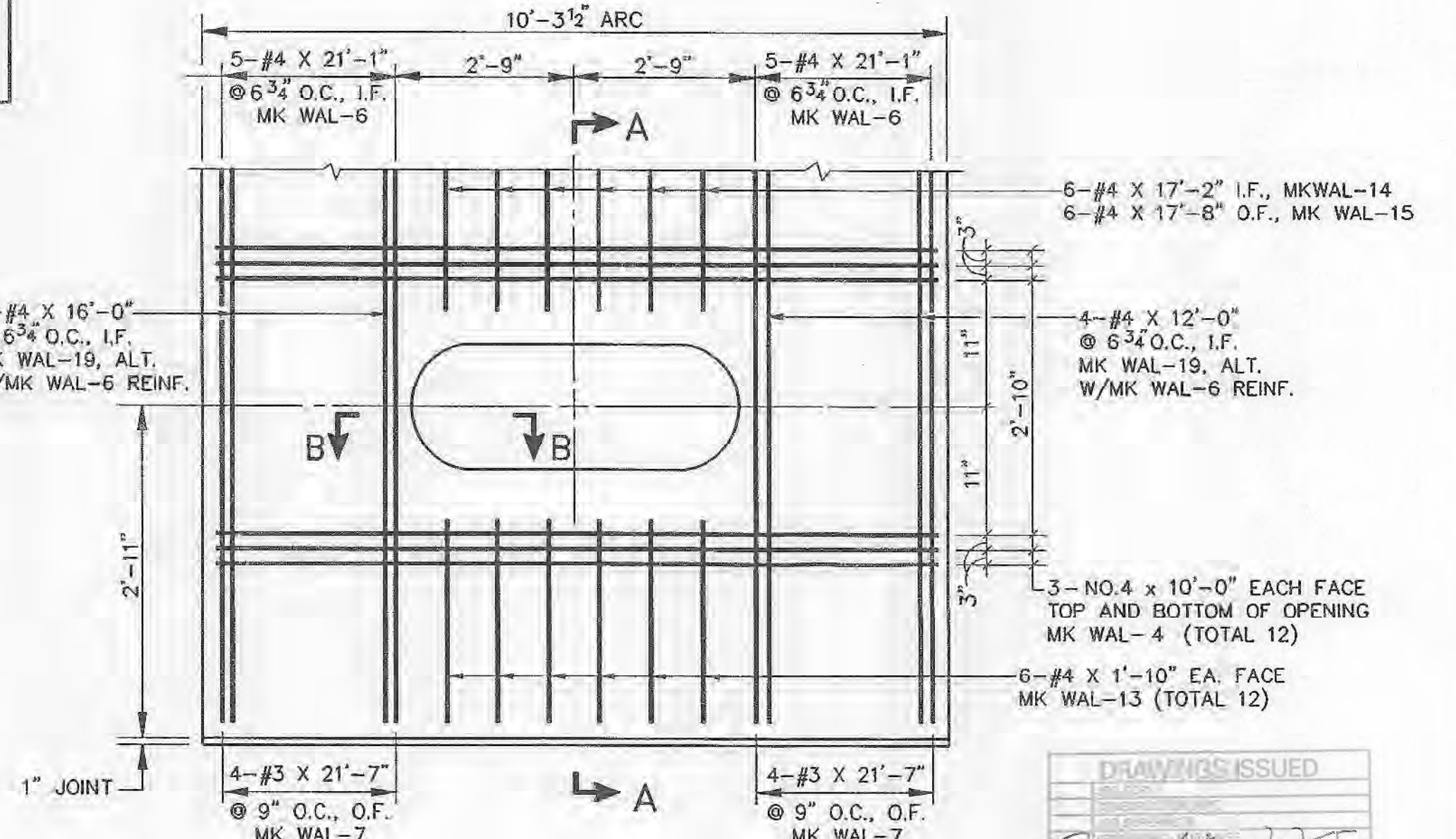
OVERFLOW PANEL DETAIL



SECTION A-A



WALL SLEEVE & WATERSTOP PL. DETAIL



WALL SLEEVE PANEL

NOTE : MK WAL-1, WAL-2, WAL-3, WAL-4 & WAL-5 AT LIFTING INSERTS NOT SHOWN. SEE DRAWING NO. 3

REVISIONS				
NO.	DATE	DESCRIPTION	BY	CHK
△	11/5/97	O.FLOW & ADDED T.M.HOLE	SB	NAL

PRELOAD

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WORKING DRAWING			
ONE 1.0 M.G. WATER STORAGE TANK			
WINSTED, CONNECTICUT			
TEMPORARY MANHOLE AND OVERFLOW PIPE DETAILS			
DRAWN: SB	SCALE: NTS	CONTRACT NUMBER: 97 PD 018	
DESIGNED: RAO		DRAWING NUMBER: CT	
CHECKED: TM	DATE: 10-22-97	DRAWING NUMBER: WNS97-05	

FLOOR AND FOOTING

FLOOR AND FOOTING										
MARK	QUANTITIES		SIZE #	LENGTH FT - IN	WEIGHT(LBS)			TYPE	LOCATION	
	DESIGN	ORDER			NO.5	NO.4	NO.3			
S T R A I G H T	FTG-1	112	116	5	30	0	3630	0	0	FOOTING
	FLR-1	519	530	4	30	0	0	10621	0	EACH MAY
	FLR-2	29	30	4	30	0	0	601	0	CIRCUMF.
	FLR-3	36	38	4	30	0	0	762	0	FLTHKNG.
	FLR-4	152	155	4	2	2	0	224	0	FLTHKNG.
	EXTRA	3	5	30	0	0	94	0	0	
	EXTRA	7	4	30	0	0	0	140	0	
	EXTRA	0	3	30	0	0	0	0	0	
	TOTAL	XXXXXX	XXXXXX	XXXXX	XXXX - XXXX		3724	12348	0	
H B E N D	400	146	152	4	10	6	0	1066	0	H2 FOOTING
	401	146	146	4	10	0	0	973	0	H2 FOOTING
	402	337	344	4	2	2	0	728	0	H2 FOOTING
	TOTAL	XXXXXX	XXXXXX	XXXXX	XXXX - XXXX		0	2767	0	
L B E N D										
	TOTAL	XXXXXX	XXXXXX	XXXXX	XXXX - XXXX		0	0	0	

WALL

WALL										
MARK	QUANTITIES		SIZE #	LENGTH FT - IN	WEIGHT(LBS)			TYPE	LOCATION	
	DESIGN	ORDER			NO.5	NO.4	NO.3			
S T R A I G H T	VAL-1	432	448	3	6	0	0	0	1011	LIMES
	VAL-2	336	350	5	6	0	0	0	2190	35H.BRGG.
	VAL-3	27	28	4	21	6	0	0	402	VAL2 SUPT
	VAL-4	216	224	4	10	0	0	0	1496	35H. LF.
	VAL-5	144	150	3	10	0	0	0	564	35H. DF.
	VAL-6	337	350	4	21	1	0	0	4929	LF. VERT.
	VAL-7	296	297	3	21	7	0	0	2410	DF. VERT.
	VAL-8	24	24	4	6	8	0	0	107	25H. LF.
	VAL-9	18	18	3	6	8	0	0	45	25H. DF.
	VAL-10	42	42	5	4	4	0	0	190	25H. BRGG.
H B E N D	VAL-11	2	2	4	14	4	0	0	19	DF.PANEL
	VAL-12	2	2	4	14	10	0	0	20	DF.PANEL
	VAL-13	12	12	4	1	10	0	0	13	T.M.PANEL
	VAL-14	6	6	4	17	2	0	0	63	T.M.PANEL
	VAL-15	6	6	4	17	9	0	0	71	T.M.PANEL
	VAL-16	7	7	4	15	10	0	0	74	DF.ENCMT
	VAL-17	3	3	4	6	0	0	0	12	DF.ENCMT
	VAL-18	4	4	4	4	11	0	0	13	DF.PANEL
	VAL-19	8	8	4	12	0	0	0	64	T.M.PANEL
	EXTRA	2	5	30	0	0	63	0	0	
L B E N D	EXTRA	4	4	30	0	0	80	0	0	
	EXTRA	4	3	30	0	0	0	0	43	
	TOTAL	XXXXXX	XXXXXX	XXXXX	XXXX - XXXX		2443	7371	4075	

THIS SHOP DRAWING HAS BEEN REVIEWED AND DETERMINED TO BE IN COMPLIANCE WITH THE CONTRACT DOCUMENTS INCLUDING PLANS AND SPECIFICATIONS AS MODIFIED BY ADDENDUM, CHANGE ORDERS AND FIELD ORDERS.

CONTRACTOR: PRELOAD INC.
BY: [Signature]
DATE: 11/1/97

DOME FILLET

DOME FILLET 25 *VENT										
MARK	QUANTITIES		SIZE #	LENGTH FT - IN	WEIGHT(LBS)			TYPE	LOCATION	
	DESIGN	ORDER			NO.5	NO.4	NO.3			
S T R A I G H T	DOM-1	227	232	4	12	0	0	1860	0	BOT.RADIAL
	DOM-2	30	31	4	30	0	0	621	0	RECURTHNG
	DOM-3									
	DOM-4	88	90	4	30	0	0	1804	0	T.CIR.FLT.
	DOM-5	283	289	4	14	0	0	2703	0	TOP RADIAL
	DOM-6	30	31	4	30	0	0	621	0	CIR-403
	DOM-7	10	11	4	30	0	0	220	0	T.CIR.WALL
	DOM-8	10	11	4	30	0	0	220	0	CIRC.WALL
	DOM-9	11	12	4	30	0	0	240	0	CIRCEND
	DOM-10	4	5	4	6	0	0	20	0	HATCH
H B E N D	EXTRA	0	5	30	0	0	0	0	0	
	EXTRA	5	4	30	0	0	100	0	0	
	EXTRA	0	3	30	0	0	0	0	0	
	TOTAL	XXXXXX	XXXXXX	XXXXX	XXXX - XXXX		0	9409	0	
L B E N D	403	283	289	4	4	11	0	949	0	THICK'G
	405	12	13	4	3	6	0	30	0	VENT
	410	4	4	4	12	3	0	33	0	17 HATCH
	411	4	4	4	13	11	0	37	0	17 HATCH
	412	16	17	4	3	7	0	40	0	17 HATCH
	413	283	289	4	4	6	0	969	0	THICK'G
	TOTAL	XXXXXX	XXXXXX	XXXXX	XXXX - XXXX		0	1958	0	

DOME SHELL

DOME SHELL										
MARK	QUANTITIES		SIZE #	LENGTH FT - IN	WEIGHT(LBS)			TYPE	LOCATION	
	DESIGN	ORDER			NO.5	NO.4	NO.3			
S T R A I G H T	SHL-19	250	256	3	30	0	0	0	2888	
	TOTAL	XXXXXX	XXXXXX	XXXXX	XXXX - XXXX		0	0	2888	
H B E N D										
	TOTAL	XXXXXX	XXXXXX	XXXXX	XXXX - XXXX		0	0	2888	

TOTAL BAR WEIGHT

TOTAL BAR WEIGHT										
LOCATION		NO.	NO.5	NO.4	NO.3	TOTAL TYPE OF BARS			TOTAL	
						STR.	H.B.D.	L.B.D.		
F L R	STR.	3724	12348	0		16072				
	H.BEND	0	2767	0			2767	0		
	L.BEND	0	0	0						
V A L	STR.	2443	7371	4075		13889				
	H.BEND	0	117	0			117	0		
	L.BEND	0	0	0						
CURB		0	842	0		842				
D O M	STR.	0	8409	0		8409				
	H.BEND	0	1958	0			1958	99		
	L.BEND	0	99	0						
D.SHELL		0	0	2888		2888				
M S C	STR.	5732	236	4016		9984				
	H.BEND	0	0	0			0			
	L.BEND	0	0	0						
TOTAL		0	11899	34147	11001	52084	4825	99		

LAP LENGTHS

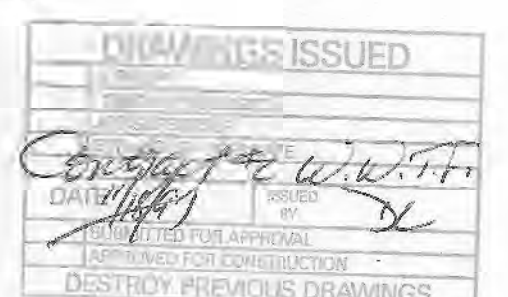
SIZE	ALL BARS EXCEPT AS NOTED	SIZE	WEIGHT (LBS/FT)
#3	1'-1"	#3	.376
#4	1'-5"	#4	.668
#5	1'-9"	#5	1.043
#6	2'-1"	#6	1.502
#7	2'-6"	#7	2.044
#8	3'-3"	#8	2.670

UNIT WEIGHT OF REBARS

BENDING NOTE: HOLD BENDING TOLERANCE TO +0", -1/2" FOR DIMENSIONS SHOWN THUS (*)

NOTES:

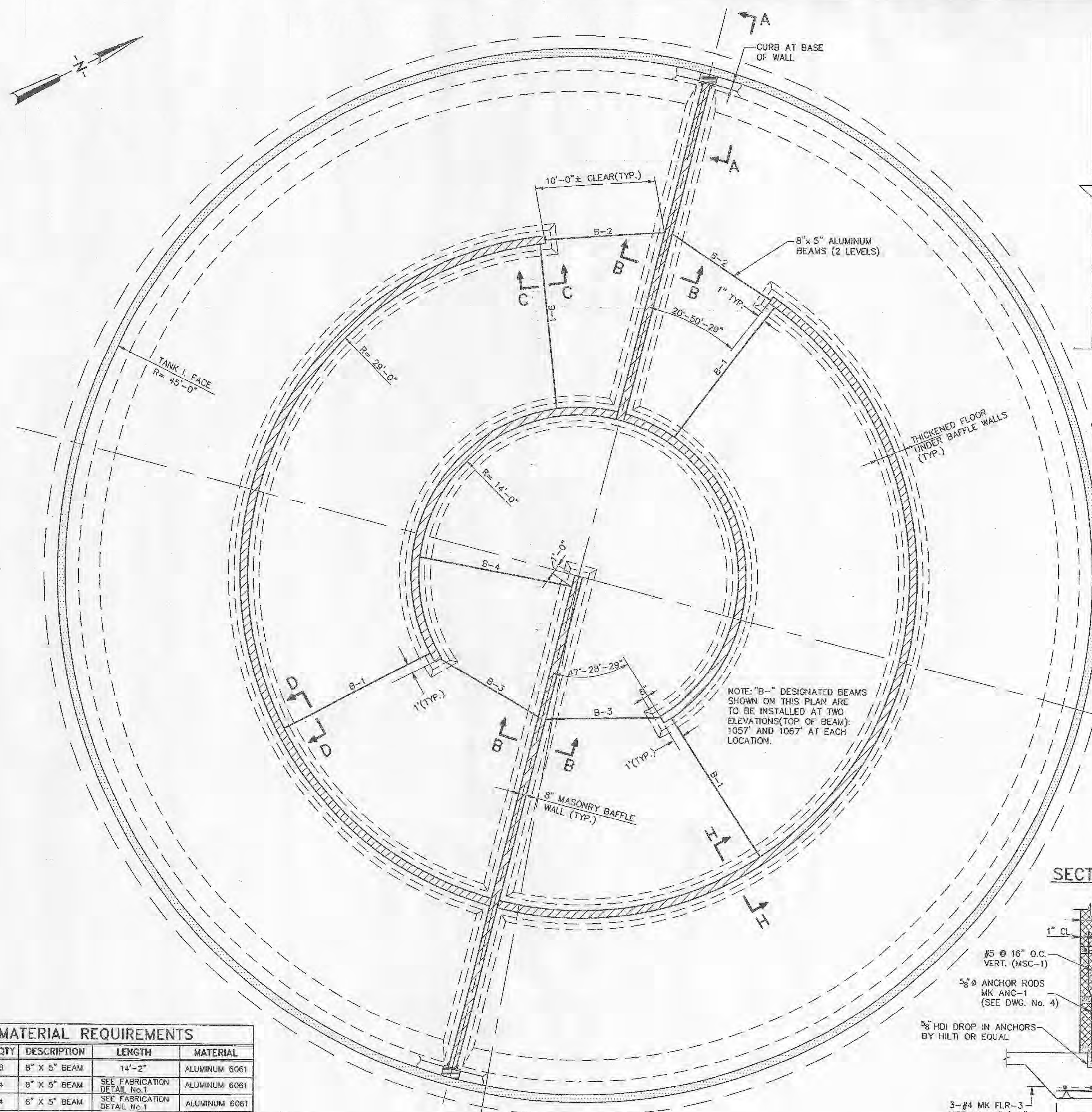
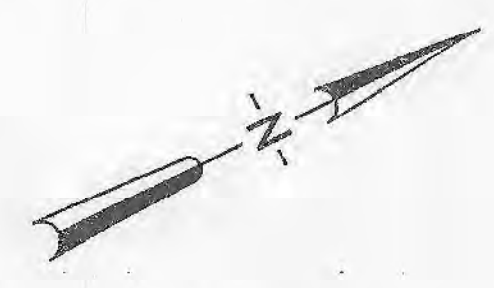
- REBARS ARE TO BE NEW BILLET STEEL, ASTM A-615, GRADE 60, DEFORMED.
- MINIMUM LAP TO BE AS PER LAP LENGTH TABLE.
- WELDED WIRE FABRIC TO BE ASTM A-185-LAPS 1 1/2 SQS.
- DESIGN QUANTITY IS THE NO. OF BARS PLACED IN THE STRUCTURE. ORDER QUANTITY REPRESENTS NO. OF BARS TO BE PURCHASED.



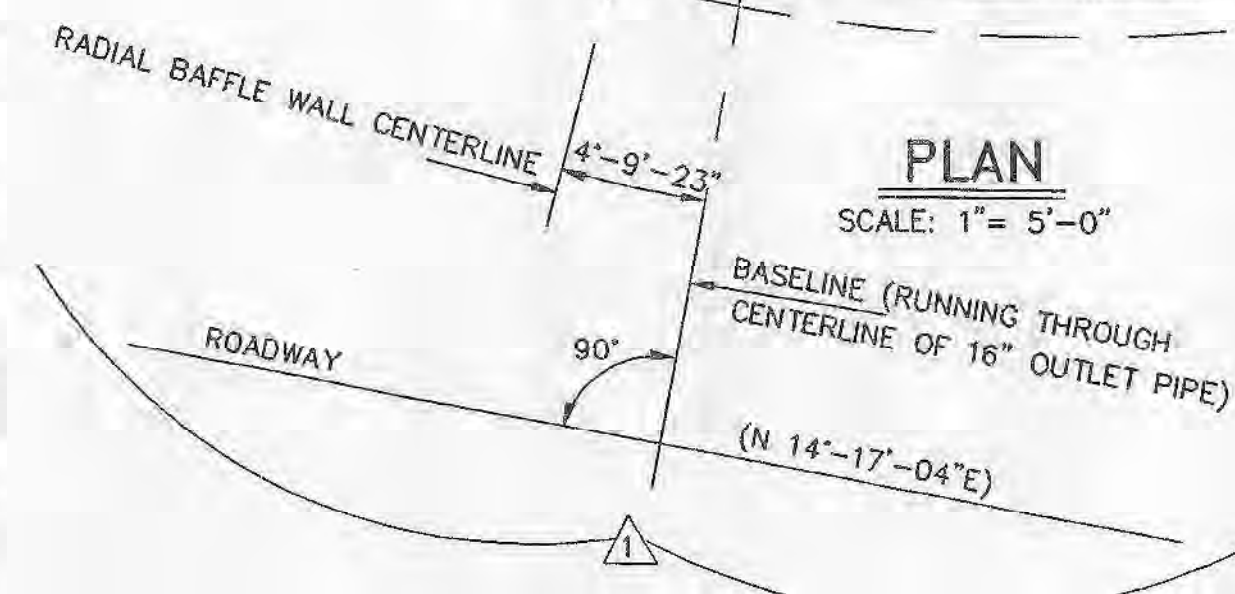
THE DETAILS SHOWN ON THIS DRAWING SHALL BE PRODUCED WITHIN THE GUIDELINES AND REQUIREMENTS SPECIFIED IN PRELOAD CO. "CONSTRUCTION SPECIFICATIONS AND PROCEDURES" (REV'D 1/90)

REVISIONS

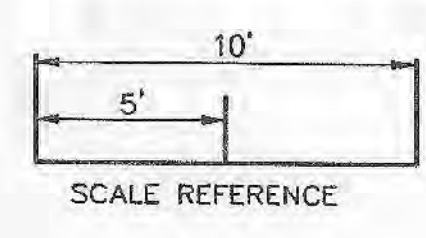
NO.	DATE	DESCRIPTION	BY</
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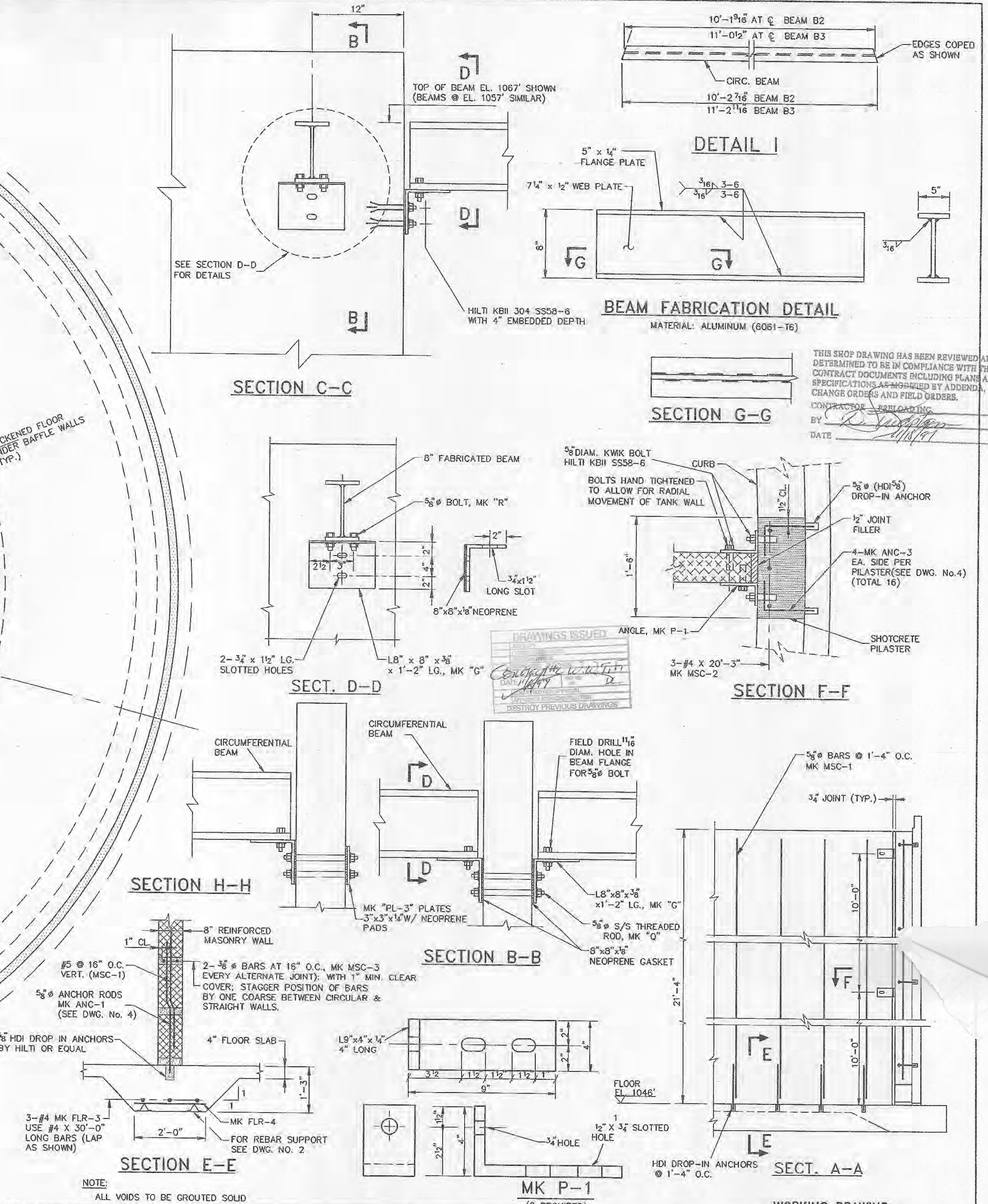
MATERIAL REQUIREMENTS				
MK	QTY	DESCRIPTION	LENGTH	MATERIAL
B-1	8	8" X 5" BEAM	14'-2"	ALUMINUM 6061
B-2	4	8" X 5" BEAM	SEE FABRICATION DETAIL No. 1	ALUMINUM 6061
B-3	4	8" X 5" BEAM	SEE FABRICATION DETAIL No. 1	ALUMINUM 6061
B-4	2	8" X 5" BEAM	13'-5"	ALUMINUM 6061
MK "G"	32	L8" X 6" X 3/8"	1'-2"	ALUMINUM 6061
MK P-1	8	BENT PLATE SEE DETAILS		ALUMINUM 6061
MK "Q"	20	3/8" STAINLESS STEEL THREADED ROD	12"	STAINLESS STEEL TYPE 304
MK "R"	32	5/8" BOLTS	2"	STAINLESS STEEL TYPE 304
MK "PL-2"	66	WASHER PLATES 2 1/2" X 1 1/2" WASHER WITH 1/2" CNTR. HOLE		ALUMINUM 6061
MK "PL-3"	36	PLATES 3 1/2" X 3 1/2" WITH 1/2" CNTR. HOLE		ALUMINUM 6061
	20	HILTI KWK BOLTS KBI 304 SS58-6		STAINLESS 304
	300	HILTI DROP-IN	HDI 5/8"	CARBON STEEL



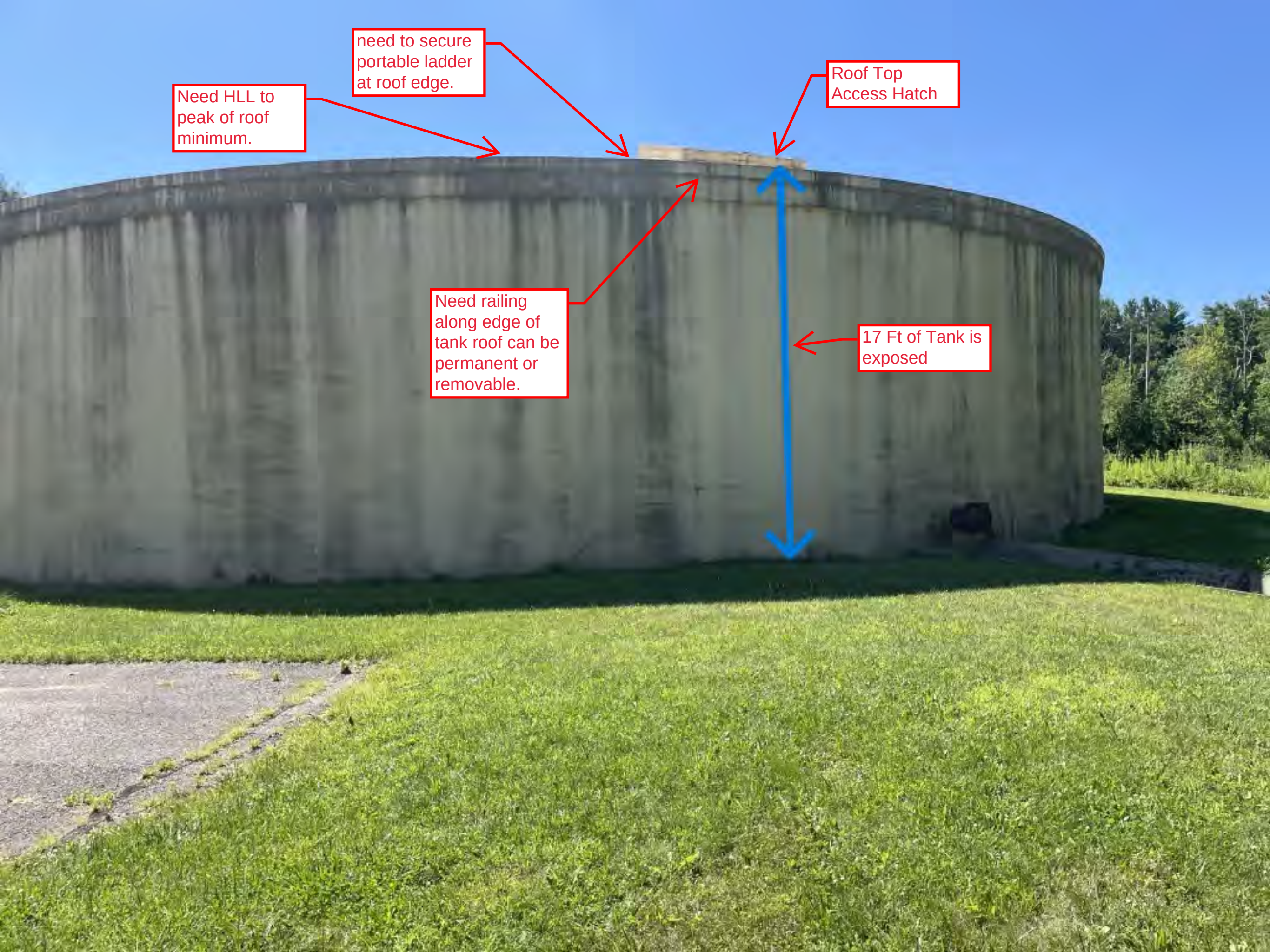
NOTE: 2"x2"x4" WASHER PLATE REQUIRED AT ALL SLOTTED HOLES: FRICTION TYPE BOLTED CONNECTIONS EXCEPT AS NOTED



THE DETAILS SHOWN ON THIS DRAWING SHALL BE PRODUCED WITHIN THE GUIDELINES AND REQUIREMENTS SPECIFIED IN PRELOAD CO. "CONSTRUCTION SPECIFICATIONS AND PROCEDURES" (REV'D 1/90)



REVISIONS				PRELOAD	WORKING DRAWING
NO.	DATE	DESCRIPTION	BY		
1	11/12/97	RELOCATED RADIAL BAFFLE WALL	JD	DM	ONE 1.0 M.G. WATER STORAGE TANK WINSTED, CONNECTICUT
839 STEWART AVENUE, GARDEN CITY, NEW YORK, 11530					BAFFLE WALL DETAILS
THIS DRAWING IS THE PROPERTY OF PRELOAD INC. AND IS SUBJECT TO RETURN ON DEMAND. IT CONTAINS TRADE SECRETS AND CERTAIN FEATURES OF DESIGN WHICH ARE COVERED BY PATENTS. IT IS SUBMITTED FOR USE ONLY IN CONNECTION WITH PROPOSALS OR CONTRACTS OF PRELOAD OR ITS LICENSEES, UPON THE EXPRESS CONDITION THAT IT MAY NOT BE USED FOR ANY PURPOSE WITHOUT APPROVAL OF PRELOAD.					DRAWN: JD SCALE: AS SHOWN CONTRACT NUMBER: 97 PD 018
N.A. Lopez 11/18/97					DESIGNED: RAO CHECKED: TM DATE: 10-22-97 DRAWING NUMBER: CT WNS97-07



Need HLL to peak of roof minimum.

need to secure portable ladder at roof edge.

Roof Top Access Hatch

Need railing along edge of tank roof can be permanent or removable.

17 Ft of Tank is exposed



***INSPECTION AND CLEANING (SEDIMENT REMOVAL) OF THE
CRYSTAL LAKE 1-MILLION GALLON CONCRETE
WATER STORAGE TANK***

***CRYSTAL LAKE WATER TREATMENT PLANT
WINSTED, CONNECTICUT***

JUNE 27 & 28, 2017





***INSPECTION AND CLEANING (SEDIMENT REMOVAL) OF THE
CRYSTAL LAKE 1-MILLION GALLON CONCRETE
WATER STORAGE TANK***

***CRYSTAL LAKE WATER TREATMENT PLANT
WINSTED, CONNECTICUT***

JUNE 27 & 28, 2017

SCOPE:

On June 27 & 28, 2017, Underwater Solutions Inc. conducted an inspection of the Crystal Lake 1-million gallon concrete potable water storage tank to provide information regarding the overall condition and integrity of this structure and removed the sediment accumulation found on the floor.

EXTERIOR INSPECTION:

The entire exterior of this water storage tank and components was inspected, to include walls and coating, overflow, ladder, roof, vent and hatch.

Walls And Coating

These shotcrete coated concrete walls were inspected and were found appearing mostly sound, while tight shrinkage cracks were found throughout approximately 5% of these surfaces and were observed throughout all elevations of the exterior walls.

Two of the shrinkage cracks on the northernmost side of the tank, located approximately 20" and 30" above the ground were found having an accumulation of efflorescence.

These cracks were sounded and appeared to be limited to the surface of the shotcrete and remain free of obvious voids or spalls at this time.

***INSPECTION AND CLEANING (SEDIMENT REMOVAL) OF THE CRYSTAL LAKE
1-MILLION GALLON CONCRETE WATER STORAGE TANK
CRYSTAL LAKE WATER TREATMENT PLANT
WINSTED, CONNECTICUT
JUNE 27 & 28, 2017
PAGE 2***

The protective coating applied to these surfaces was found having good adhesion value, yet no longer seals the shrinkage cracks.

A mild, non-uniform accumulation of mildew throughout all elevations of the exterior walls has declined the overall aesthetics.

Overflow

A 12" inside diameter overflow pipe penetrates the wall on the northernmost side of the tank approximately 20" above the ground.

This metal pipe extends away from the tank and terminates approximately 20" above a concrete splash pad.

This pipe was free of obvious obstructions and was found with a flap-valve and screen installed at its end, preventing access to the interior of the tank.

The protective coating applied to this metal pipe and flap-valve was found having good adhesion value.

Ladder

This potable water storage tank has no exterior ladder, therefore a ladder having a minimum height of 25' is required to access the roof.

Roof

The formed in place concrete roof dome was inspected and found appearing sound and remains free of cracks, spalls or other obvious fatigue of the concrete at this time.

The protective coating applied to these surfaces was found having good adhesion value, providing adequate protection for the concrete.

A mild, non-uniform accumulation of mildew throughout the roof has declined the overall aesthetics.

Vent

The vent is located in the center of the roof, having a 24" inside diameter and stands 20" tall.

***INSPECTION AND CLEANING (SEDIMENT REMOVAL) OF THE CRYSTAL LAKE
1-MILLION GALLON CONCRETE WATER STORAGE TANK
CRYSTAL LAKE WATER TREATMENT PLANT
WINSTED, CONNECTICUT
JUNE 27 & 28, 2017
PAGE 3***

A 42" outside diameter fiberglass cap and associated screen remains securely installed over the vent penetration in the roof, preventing access to the interior of the tank.

Hatch

One 60" by 60" aluminum hatch provides good access to the tank interior through the roof.

This hatch remains in good working condition and was found secured with a lock, preventing unwanted access to the interior of the tank.

INTERIOR INSPECTION:

The entire interior of this water storage tank and components was inspected, to include sediment accumulations, floor, piping, walls, baffle wall, overhead, overflow and aesthetic water quality.

Sediment Accumulations

A uniform layer of precipitate was found on all floor surfaces, averaging 1/16" in depth.

Also found throughout the outside perimeter of the floor at the base of the tank walls is an accumulation of concrete that has scoured from the walls.

Floor

After removing all accumulated precipitate, these concrete floor surfaces were inspected and were found to be un-coated, yet appearing sound and free of obvious cracks, spalls or settlement.

A layer of accumulated concrete debris throughout the outer circumference of the floor remains, as the vacuum used to remove precipitate cannot lift these debris due to size and weight.

A heavy stain exists throughout the floor due to the accumulation of precipitate.

Piping

Four pipes were inspected within this potable water storage tank.

The first pipe inspected penetrates the floor of an 18" by 18" by 5" deep sump formed in the tank floor, located 32" in from the wall on the north-easternmost side of the tank. This pipe has a 10" inside diameter and is flush with the floor of the sump. This pipe was free of obvious obstructions and was without flow at the time of this inspection.

**INSPECTION AND CLEANING (SEDIMENT REMOVAL) OF THE CRYSTAL LAKE
1-MILLION GALLON CONCRETE WATER STORAGE TANK
CRYSTAL LAKE WATER TREATMENT PLANT
WINSTED, CONNECTICUT
JUNE 27 & 28, 2017
PAGE 4**

The second pipe inspected penetrates the floor 32" in from the wall on the easternmost side of the tank and on the southernmost side of the baffle wall, having a 16" inside diameter and stands 6" tall. This pipe was free of obvious obstructions and was found with flow entering the tank at the time of this inspection.

The third pipe inspected penetrates the floor of a 30" by 30" by 6" deep sump formed in the tank floor located 28" in from the wall on the easternmost side of the tank and on the southernmost side of the baffle wall. This pipe has a 16" inside diameter and stands 12" tall. This pipe was free of obvious obstructions and was found with flow leaving the tank at the time of this inspection.

The fourth pipe inspected penetrates the floor 32" in from the wall, having a 3" inside diameter. This metal pipe extends up 12" and terminates with a 90° elbow installed at its end. This pipe was free of obvious obstructions and was without flow at the time of this inspection.

This metal pipe is not coated and was found with corrosion on all surfaces, yet this pipe remains sound and free of obvious metal fatigue at this time.

Walls And Coating

The interior walls were inspected beginning at the floor and by spiraling the circumference of the tank up to the water surface.

The interior pre-cast concrete wall panels, to include the concrete filled joints between panels, appeared mostly sound and free of obvious cracks, while a band of concrete scour spans the circumference of the tank, located approximately 70" below overflow level. This band of concrete scour was found having an average width of 32" and an average depth of 1/8" and a maximum depth of 3/4" and appeared to be the result of an ice cap formation.

The surrounding and underlying concrete within this area of scour remains sound, while exposure of the reinforcement steel was found within one wall panel, located approximately 30' east of the interior access hatch.

These exposed sections of reinforcement steel extend vertically and range in length of exposure from 12" to 26" in length and are within an area of scour measuring approximately 12' in width.

Mild corrosion exists on the surfaces of this exposed steel, yet no obvious fatigue or deterioration was evident at this time.

***INSPECTION AND CLEANING (SEDIMENT REMOVAL) OF THE CRYSTAL LAKE
1-MILLION GALLON CONCRETE WATER STORAGE TANK
CRYSTAL LAKE WATER TREATMENT PLANT
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The protective coating applied to the concrete filled wall panel joints was found having mostly good adhesion value, while cracking and lifting of the coating has resulted in exposure of the underlying concrete throughout approximately 5% of the lowest 10' of each concrete filled wall panel joint.

The 11" tall by 10" wide concrete curb located at the base of the walls and spans the circumference of the tank was found to be un-coated, yet appearing sound and free of obvious fatigue of the concrete at this time.

Heavy staining exists throughout the interior walls, beginning approximately 36" below overflow level and extends down to the floor.

Baffle Wall

An 8" wide formed in place circular concrete baffle wall provides contact time within this potable water storage tank.

This baffle wall begins at floor level and extends up and terminates at the same elevations as the tank wall. These concrete surfaces are not coated and appeared sound and free of cracks, spalls or other obvious fatigue of the concrete at this time.

Each of the eighteen, 6" by 8" aluminum support beams that span from the tank wall to the baffle wall were found securely installed and free of obvious fatigue or failures at this time.

Nine of these aluminum supports are located below water level and were found with mild to moderate corrosion on all surfaces, yet no obvious fatigue of the aluminum was evident. The remaining nine aluminum supports are located above the surface of the water were found without corrosion at this time.

Heavy staining exists throughout these surfaces, beginning approximately 40" below the top of the baffle wall and extends down to the floor.

Overhead

The entire overhead was inspected from the water surface.

These formed in place concrete surfaces are not coated and appeared mostly sound, while tight cracks were observed throughout approximately 5% of these surfaces at this time.

***INSPECTION AND CLEANING (SEDIMENT REMOVAL) OF THE CRYSTAL LAKE
1-MILLION GALLON CONCRETE WATER STORAGE TANK
CRYSTAL LAKE WATER TREATMENT PLANT
WINSTED, CONNECTICUT
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PAGE 6***

Efflorescence has accumulated within each crack due to moisture penetration, yet these cracks appeared to be limited to the surfaces and free of spalls or other obvious fatigue of the concrete at this time.

Overflow

The overflow consists of a 12" inside diameter pipe cast within a 36" by 36" concrete box formed to the tank wall.

This concrete box begins approximately 6" below the junction of where the roof and walls meet and extends down 26" and reduces to a concrete box measuring 24" by 24". This concrete box continues down and terminates approximately 52" above the floor.

This concrete box is not coated and was found appearing sound and free of obvious fatigue of the concrete. The 12" inside diameter pipe within the formed concrete box was free of obvious obstructions at the time of this inspection.

Aesthetic Water Quality

The aesthetic water quality was found to be good throughout this tank, allowing unlimited visibility for this inspection.

RECOMMENDATIONS:

It is the opinion of Underwater Solutions Inc. that this concrete potable water storage tank appeared mostly sound and free of obvious leakage.

EXTERIOR:

The exterior shotcrete coated concrete walls appearing mostly sound, while tight shrinkage cracks were observed throughout approximately 5% of all elevations of the exterior walls.

Two of the shrinkage cracks on the northernmost side of the tank located approximately 20" and 30" above the ground were found having an accumulation of efflorescence.

These cracks were sounded and appeared to be limited to the surface of the shotcrete and remain free of obvious voids or spalls at this time.

The protective coating applied to these surfaces was found having good adhesion value, yet no longer seals the shrinkage cracks.

***INSPECTION AND CLEANING (SEDIMENT REMOVAL) OF THE CRYSTAL LAKE
1-MILLION GALLON CONCRETE WATER STORAGE TANK
CRYSTAL LAKE WATER TREATMENT PLANT
WINSTED, CONNECTICUT
JUNE 27 & 28, 2017
PAGE 7***

The formed in place concrete roof dome appeared sound and free of cracks, spalls or other obvious fatigue of the concrete at this time.

The protective coating applied to these surfaces was found having good adhesion value, providing adequate protection for the concrete.

A mild, non-uniform accumulation of mildew throughout all elevations of the exterior walls and roof has declined the overall aesthetics.

It is our recommendation to pressure-wash the exterior wall and roof surfaces at 3,500 P.S.I. and at 3.5 G.P.M. to remove the accumulated mildew. We recommend then re-coating the exterior walls using an epoxy/polyurethane flexible coating in an effort to seal all shrinkage cracks, prevent moisture penetration and to provide good protection for the concrete, while improving the overall aesthetics.

The flap-valve and screen installed at the end of the overflow pipe was found securely installed, preventing access to the interior of the tank.

The fiberglass vent cap and associated screen installed over the vent penetration in the roof was found securely installed, preventing access to the interior of the tank.

The interior access hatch located on the roof remains in good working condition and was found secured with a lock, preventing unwanted access to the interior of the tank.

INTERIOR:

The interior concrete floor surfaces appeared sound and free of obvious cracks, spalls or other obvious fatigue of the concrete at this time.

The formed in place concrete baffle wall appeared sound and free of cracks, spalls or other obvious fatigue of the concrete at this time.

Each of the eighteen, 6" by 8" aluminum support beams that provide support for the baffle wall were found securely installed and free of obvious fatigue or failures at this time.

The nine supports located below the water surface were found with corrosion on all surfaces, yet no obvious fatigue of the aluminum was evident at this time.

It is our recommendation to monitor these supports through future scheduled inspections to ensure that fatigue of the aluminum does not occur.

***INSPECTION AND CLEANING (SEDIMENT REMOVAL) OF THE CRYSTAL LAKE
1-MILLION GALLON CONCRETE WATER STORAGE TANK
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PAGE 8***

The interior pre-cast concrete wall panels and concrete filled joints between panels appeared mostly sound and free of obvious cracks, while a band of concrete scour spans the circumference of the tank, located approximately 70" below overflow level.

This band of concrete scour was found having an average width of 32" and an average depth of 1/8" and a maximum depth of 3/4" at this time.

The surrounding and underlying concrete within this area of scour remains sound, while exposure of the reinforcement steel was found within one wall panel and within an area of scour, having depths to 3/4" and is located approximately 30' east of the interior access hatch.

These exposed sections of reinforcement steel extend vertically and range in length of exposure from 12" to 26" in length and are within an area of scour, measuring approximately 12' in width.

The protective coating applied to the concrete filled wall panel joints was found to be cracked and lifting, resulting in exposure of the underlying concrete throughout approximately 5% of the lowest 10' of each concrete filled wall panel joint.

The formed in place concrete overhead surfaces appeared mostly sound, while tight cracks were observed throughout approximately 5% of these surfaces at this time.

Efflorescence has accumulated within each crack, yet these cracks appeared to be limited to the surfaces and free of spalls or other obvious fatigue of the concrete at this time.

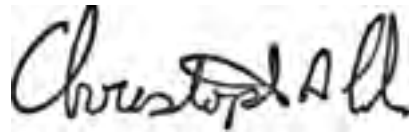
It is our recommendation that the next time this tank is removed from service and de-watered, that the interior floor, wall, baffle wall and overhead surfaces be pressure-washed at 3,500 P.S.I. and at 3.5 G.P.M. to remove the staining from these surfaces in an effort to maintain good aesthetic water quality and to remove the accumulated efflorescence from the cracks found throughout the overhead.

We then recommend coating the interior wall and overhead surfaces using an elastomeric/urethane flexible coating having an A.N.S.I./N.S.F.61 approval for use in structures containing potable water in an effort to seal and protect the concrete and seal and protect the exposed reinforcement steel found with a wall panel on the easternmost side of the tank.

Until such a time this tank can be removed from service to complete this rehabilitation, we recommend monitoring the band of concrete scour the exposed reinforcement steel found within the wall panel on the easternmost side of the tank, to include the cracks found throughout the overhead through future scheduled inspections to ensure that further scour of the concrete, failure of the exposed reinforcement steel or that spall of the concrete does not occur within the cracks found throughout the overhead.

**INSPECTION AND CLEANING (SEDIMENT REMOVAL) OF THE CRYSTAL LAKE
1-MILLION GALLON CONCRETE WATER STORAGE TANK
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PAGE 9**

As always, we recommend re-inspection and cleaning of all water storage facilities in accordance with state and federal mandates, A.W.W.A. standards, and be completed by an experienced and authorized inspection corporation.

A handwritten signature in black ink, appearing to read "Christopher A. Cole". The signature is written in a cursive, flowing style.

UNDERWATER SOLUTIONS INC.
Christopher A. Cole, Project Manager

This report, the conclusions, recommendations and comments prepared by Underwater Solutions Inc. are based upon spot examination from readily accessible parts of the tank. Should latent defects or conditions which vary significantly from those described in the report be discovered at a later date, these should be brought to the attention of a qualified individual at that time. These comments and recommendations should be viewed as information to be used by the Owner in determining the proper course of action and not to replace a complete set of specifications. All repairs should be done in accordance with A.W.W.A. and/or other applicable standards.



1 *Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Mild Mildew*



2 *Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Mild Mildew*



3 *Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Mild Mildew*



4 *Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Mild Mildew*



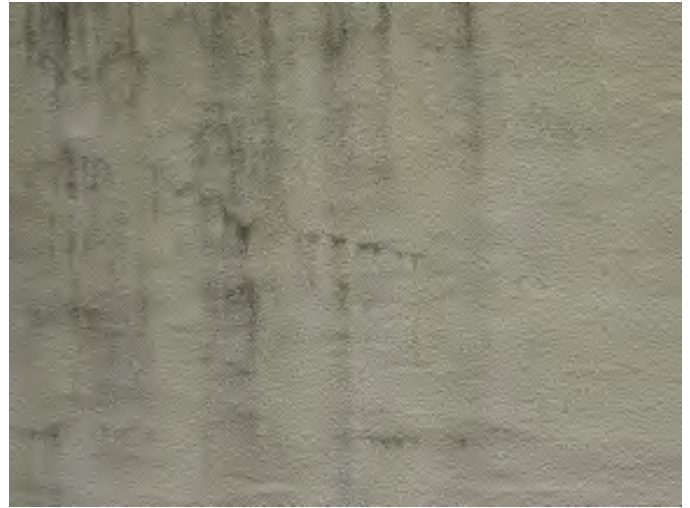
5 *Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Mild Mildew*



6 *Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Mild Mildew*



7 *Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Mild Mildew*



8 *Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Mild Mildew*



9 *Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Mild Mildew*



10 *Exterior Wall With Coating Loss, Tight Shrinkage Cracks And Mild Mildew*



11 *Northernmost Exterior Wall With Coating Loss, Tight Shrinkage Cracks, Efflorescence And Mild Mildew*



12 *Overflow Pipe Terminating Above A Concrete Splash Pad*



13 *Overflow Pipe With A Flap-Valve*



14 *Secure Overflow Screen*



15 *Ladder Utilized To Access The Tank Roof*



16 *Roof Dome With Mild Mildew*



17 *Roof Dome With Mild Mildew*



18 *Roof Dome With Mild Mildew*



19 *Roof Dome With Mild Mildew*



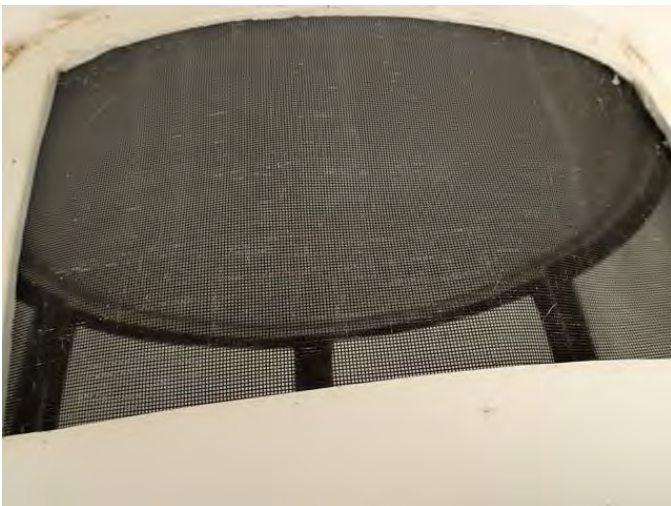
20 *Roof Dome With Mild Mildew*



21 *Roof Dome With Mild Mildew*



22 *Secure Vent Cap*



23 *Secure Vent Screen*



24 *Open Access Hatch*



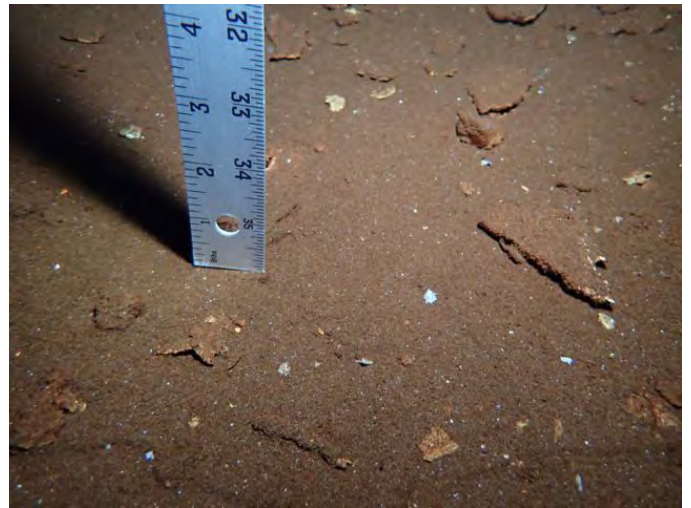
25 *Closed Access Hatch*



26 *Secure Access Hatch*



27 *Layer Of Precipitate*



28 *Layer Of Precipitate*



29 *Layer Of Precipitate*



30 *Layer Of Precipitate*



31 *Floor With Heavy Staining*



32 *Floor With Heavy Staining*



33 *Floor With Heavy Staining*



34 *Floor With Heavy Staining*



35 *Floor With Heavy Staining*



36 *Floor With Heavy Staining*



37 *10" Inside Diameter Pipe - Flush Penetration Within A Deep Sump*



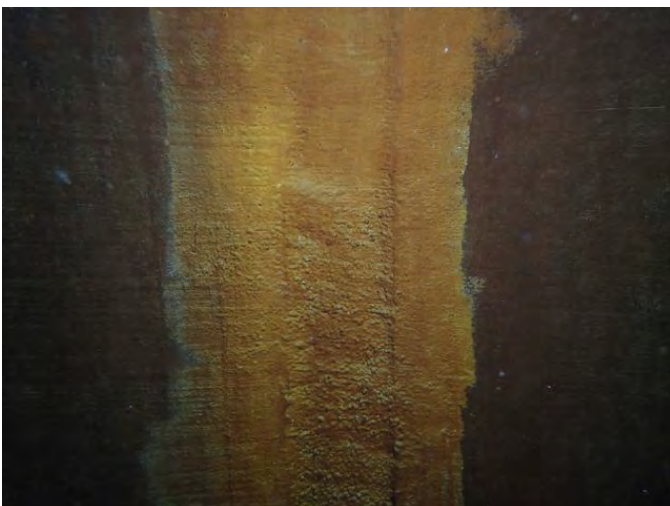
38 *16" Inside Diameter Pipe Penetrating The Tank Floor*



39 *16" Inside Diameter Pipe Penetrating The Tank Floor*



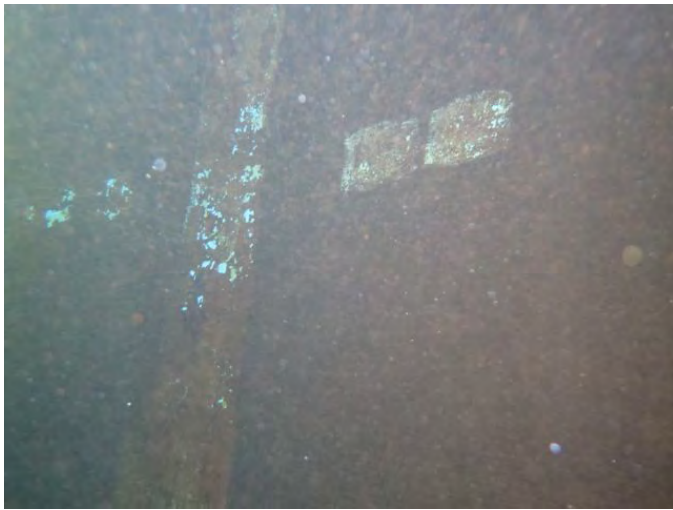
40 *3" Inside Diameter Pipe Penetrating The Tank Floor With Corrosion*



41 *Interior Wall With Heavy Staining*



42 *Interior Wall With Heavy Staining*



43 *Interior Wall With Heavy Staining*



44 *Interior Wall With Heavy Staining*



45 *Interior Wall With Heavy Staining*



46 *Interior Wall With Heavy Staining*



47 *Interior Wall With Heavy Staining*



48 *Interior Wall With Heavy Staining*



49 *Interior Wall Concrete Filled Joints With Heavy Staining*



50 *Interior Wall Concrete Filled Joints With Heavy Staining*



51 *Interior Wall Concrete Filled Joints With Coating Loss/Cracking/Lifting, Exposed Underlying Concrete And Heavy Staining*



52 *Interior Wall Concrete Filled Joints With Coating Loss/Cracking/Lifting, Exposed Underlying Concrete And Heavy Staining*



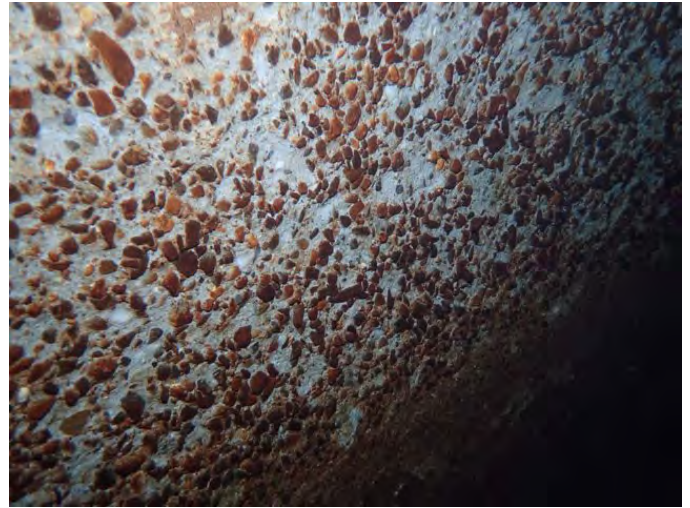
53 *Concrete Curb*



54 *Concrete Curb*



55 *Interior Wall With Concrete Scour And Heavy Staining*



56 *Interior Wall With Concrete Scour And Heavy Staining*



57 *Interior Wall With Concrete Scour And Heavy Staining*



58 *Easternmost Interior Wall With Concrete Scour, Exposed Reinforcement Steel, Mild Corrosion And Heavy Staining*



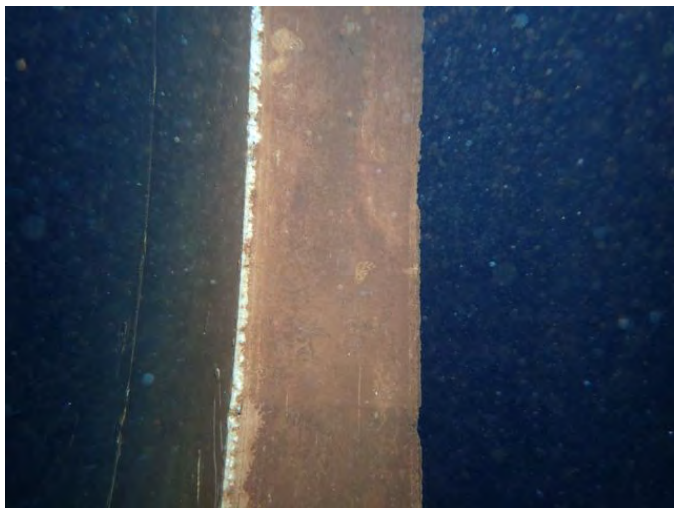
59 *Easternmost Interior Wall With Concrete Scour, Exposed Reinforcement Steel, Mild Corrosion And Heavy Staining*



60 *Easternmost Interior Wall With Concrete Scour, Exposed Reinforcement Steel, Mild Corrosion And Heavy Staining*



61 *Baffle Wall With Heavy Staining*



62 *Baffle Wall With Heavy Staining*



63 *Baffle Wall With Heavy Staining*



64 *Baffle Wall With Heavy Staining*



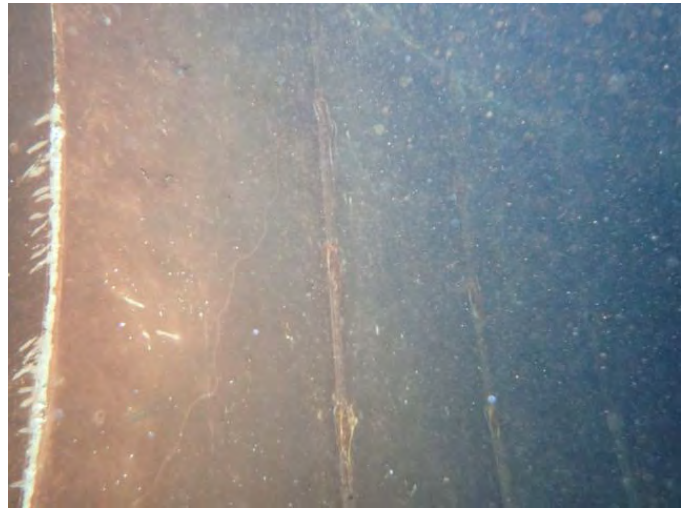
65 *Baffle Wall With Heavy Staining*



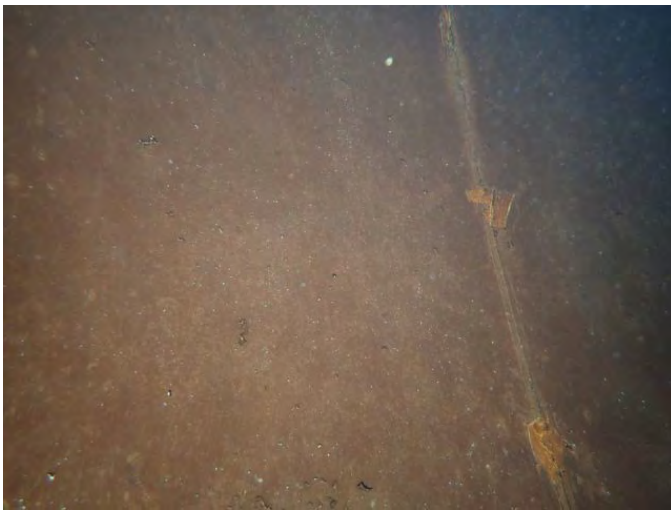
66 *Baffle Wall With Heavy Staining*



67 *Baffle Wall With Heavy Staining*



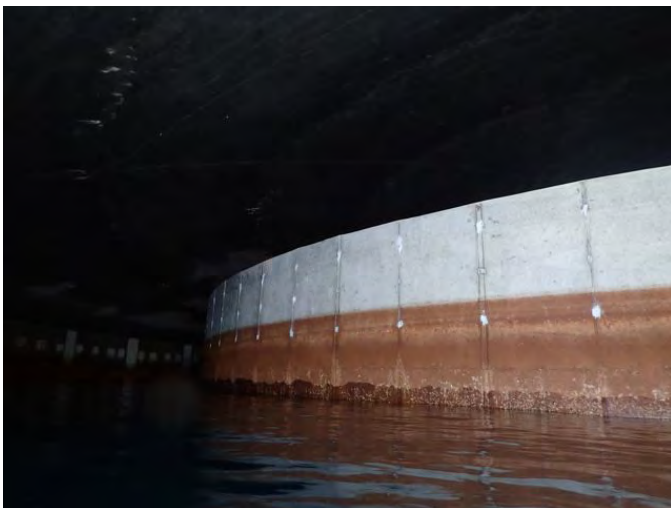
68 *Baffle Wall With Heavy Staining*



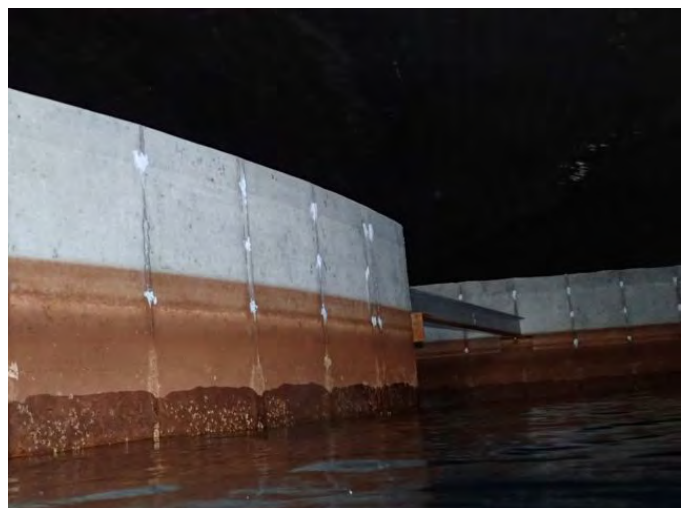
69 *Baffle Wall With Heavy Staining*



70 *Baffle Wall With Heavy Staining*



71 *Baffle Wall With Heavy Staining*



72 *Baffle Wall With Heavy Staining*



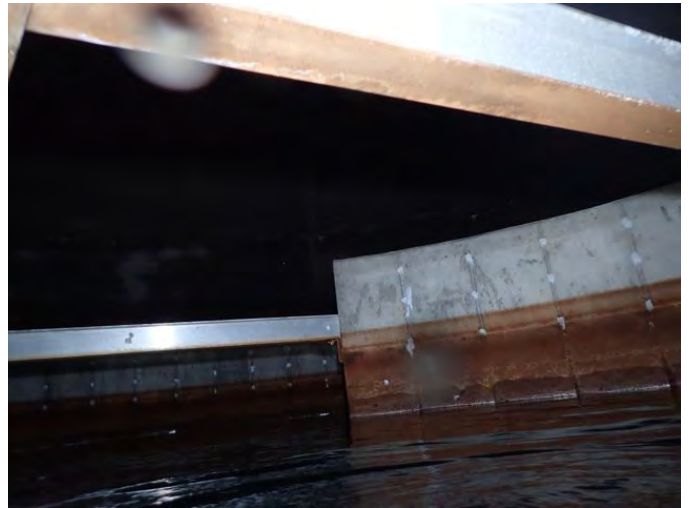
73 *Aluminum Support Beams*



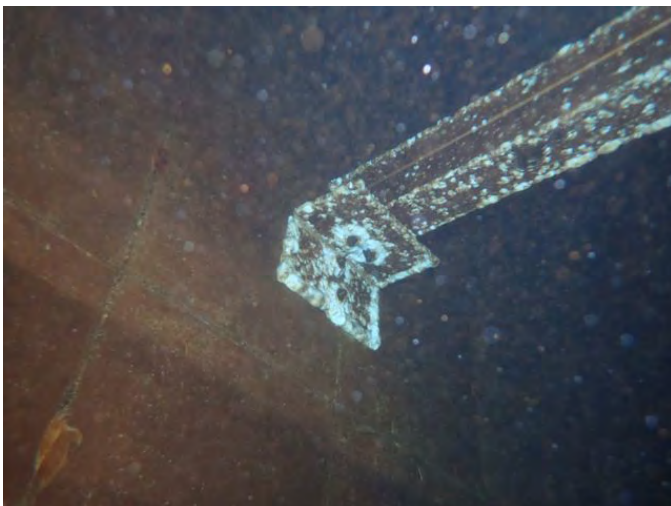
74 *Aluminum Support Beams*



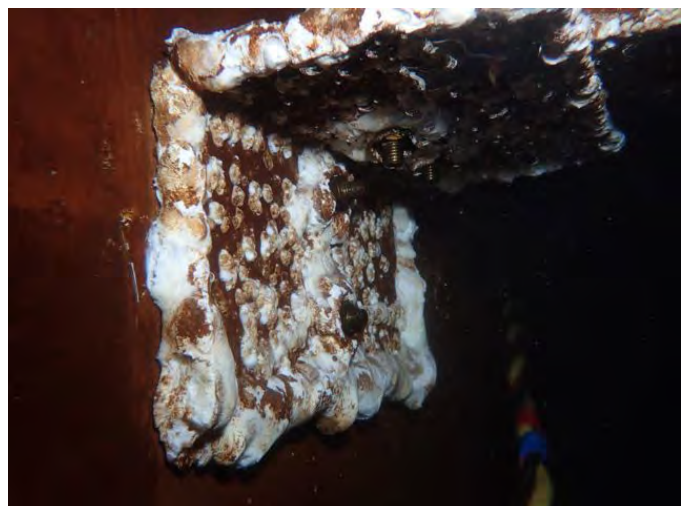
75 *Aluminum Support Beams*



76 *Aluminum Support Beams*



77 *Aluminum Support Beams With Corrosion*



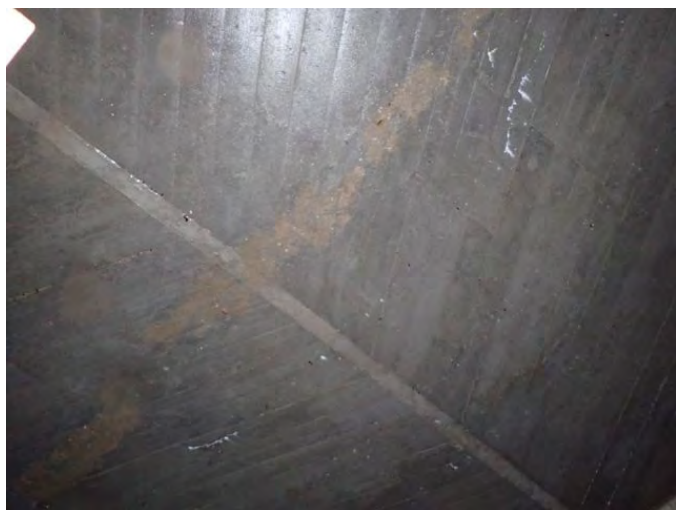
78 *Aluminum Support Beams With Corrosion*



79 *Aluminum Support Beams With Corrosion*



80 *Overhead With Tight Cracks And Efflorescence*



81 *Overhead With Tight Cracks And Efflorescence*



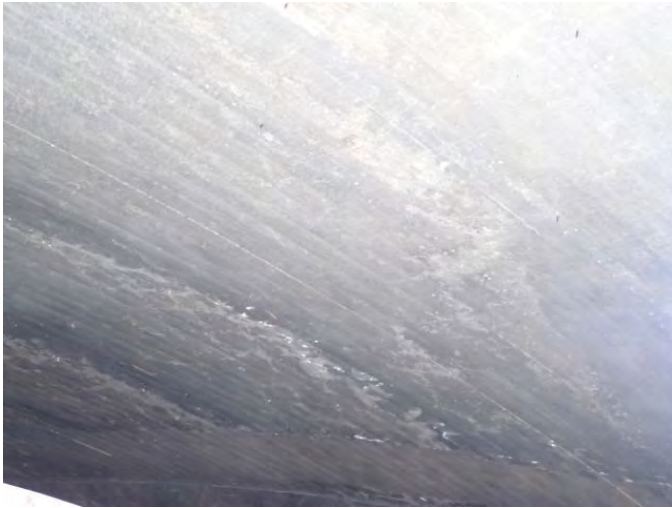
82 *Overhead With Tight Cracks And Efflorescence*



83 *Overhead*



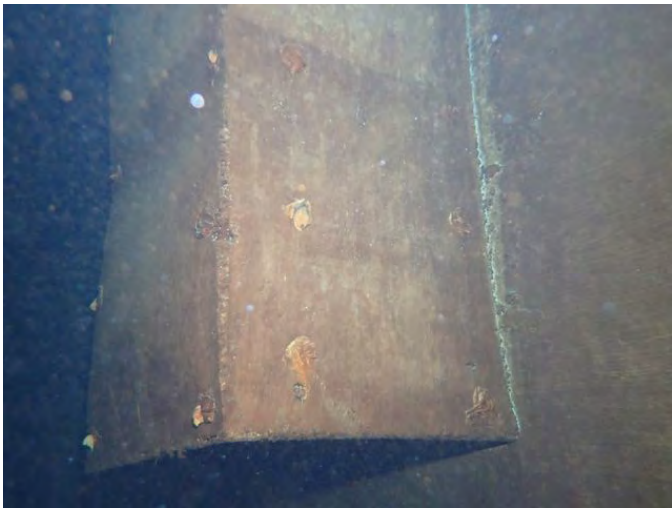
84 *Overhead*



85 *Overhead*



86 *Overhead*



87 *Concrete Overflow Box*



88 *Concrete Overflow Box*



89 *Overflow Pipe*

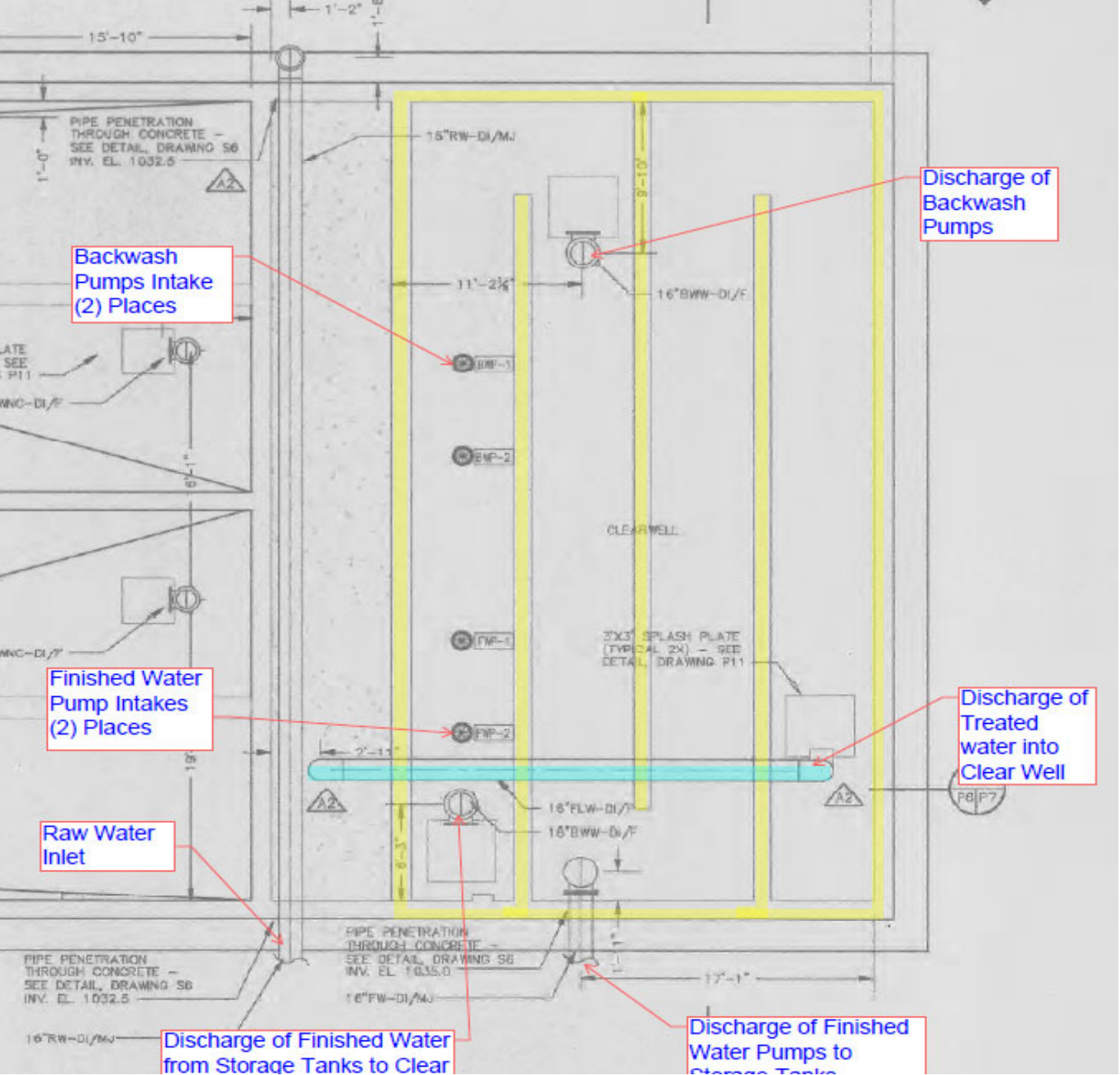


90 *Discharge During Cleaning*

Volume calculations for Clear Well in Treatment Plant

	Length	Width			
Overall Tank	27 ft	51.667 ft	Area = LxW	1395.0 sq ft	
3 baffles	45.667 ft	1 ft	Area = 3*L*W	137.0 sq ft	
Tank Area less Baffles				1258.0 sq ft	
Volume/ft of Depth				1258.0 CF	9409.9 Gallons
Baffle Factor	0.5				

Design flow rate produced by Finished Water Pumps 4200 gpm
Finished water pumps are disabled during backwash
The backwash pumps discharge/recycle water back into the clear well when the backwash is in low rate



Well for Backwash water
make-up if needed.

Storage tanks

**STATE OF CONNECTICUT DEPARTMENT OF PUBLIC HEALTH
DRINKING WATER SECTION**

10 YEAR ATMOSPHERIC STORAGE TANK INSPECTION GUIDELINES

Effective Date: June 29, 2009

Authority: Section 19-13-B102(f)(5)(C) of the Regulations of Connecticut State Agencies (RCSA) requires that all atmospheric finished water storage tanks, basins and clearwells be inspected at a minimum of once every ten years for sanitary conditions and structural integrity. The inspection report shall be retained for reference and submitted to the department upon request.

Purpose: This document is intended to clarify the requirements of the Regulations of Connecticut State Agencies (RCSA) Section 19-13-B102 (f)(5)(C) related to the required and recommended components of 10 year atmospheric finished water storage tank inspections.

Applicable Regulation: RCSA Section 19-13-B102(f)(5)(C).

Definitions: "Atmospheric finished water storage tanks, basins and clearwells" include all finished water storage facilities of any volume or material that are not pressurized. The term "tank" will be used for the remainder of this document and includes all finished water atmospheric storage facilities.

Guidelines: The Drinking Water Section (DWS) expects all inspections to minimally incorporate the elements outlined in the following section to assess "sanitary conditions and structural integrity":

- A qualified inspector should conduct the inspection (refer to Qualifications on last page).
- A detailed inspection of all overflows, vents, fill pipes, drain lines, and hatches must be conducted to ensure that the tank is protected from contamination in accordance with RCSA Section 19-13-B102(f)(5)(A). An investigation of any other appurtenances associated with the tank must be performed to ensure that the entrance of contaminants is not possible. This includes, but is not limited to, cathodic access plates, cell phone towers mounted on tanks, level probe/sensor wiring, site tubes, etc. The most critical components of a tank inspection are a thorough investigation of the tank vent(s), overflows, and roof hatches regardless of their inaccessibility.
- The exterior of the tank should be inspected for corrosion, cracks, holes, deterioration of paint/exterior coating, pitting, spalling, etc., that may create the potential for contamination per RCSA Section 19-13-B102(f)(5)(A) or loss of structural integrity of the tank.
- The interior of the tank should be inspected for corrosion, cracks, holes, pitting, spalling etc. that may create the potential for contamination per RCSA Section 19-13-B102(f)(5)(A) or loss of structural integrity of the tank. The interior coating of the tank should be analyzed by a qualified individual to determine its condition and estimated useful life. This analysis should include measurements of the depth and rate of corrosion of steel tanks. The sediment in the tank should be evaluated, and removed, as necessary. Under normal conditions, the tank should be emptied for this portion of the inspection. If the water system is incapable of taking the tank off line, a diver or ROV (remote operated vehicle) may be used, provided that adequate sanitary procedures are in place to prevent contamination. In which case, the quality and quantity of water to the system should be maintained during the tank inspection.
- The controls, probes, alarms, sensors, etc. associated with a tank should be inspected and tested to ensure proper, reliable operation.

**STATE OF CONNECTICUT DEPARTMENT OF PUBLIC HEALTH
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10 YEAR ATMOSPHERIC STORAGE TANK INSPECTION GUIDELINES

- For steel tanks on concrete foundations, an inspection of the juncture between the tank and base should be performed to ensure structural integrity. A check for excessive and/or differential foundation settlement should be performed.
- An inspection of the seams on concrete tanks should be performed to ensure structural integrity.
- An assessment of the appropriateness of the volume and detention time of the tank should be performed. A tank that is too large may cause stagnant water and/or loss of chlorine residual. Accumulated sediment may consume some or all of the available free chlorine and promote bacteria growth. An analysis of flow through the tank (turnover) should be performed, including assessments of any baffles, mechanical mixing systems, or separate inlet/outlets. If none exist, an evaluation should be conducted to determine if such an installation would be beneficial. The DWS has created Storage Tank Design And Construction Guidelines that may aid in this analysis. The document is available at: <http://ct.gov/dph/>.
- An analysis of the water quality should be conducted as part of the tank inspection, including test results for total coliform bacteria, total and free chlorine residual, physical parameters, and volatile organic chemicals collected from or near the tank.
- The tank inspection must include verification that the tank is at least fifty (50) feet from any part of the nearest subsurface sewage disposal system and twenty-five (25) feet from the nearest watercourse or storm drain or other source of pollution, in accordance with RCSA Section 19-13-B102(f)(5)(B). Tanks must be at least fifty (50) feet from the nearest sanitary sewer unless the sewer is constructed in accordance with the technical standards for subsurface sewage disposal systems pursuant to section 19-13-B103d of the RCSA, in which case it may be no closer than twenty-five (25) feet.
- An assessment of any cathodic protection systems, if they are installed, should be performed by an inspector who has experience with their installation and maintenance. Acceptable certifications include NACE International's Cathodic Protection certifications (CP1, CP2, CP3, and CP4) or equivalent.
- The tank inspection must include an evaluation of the valves associated with the tank in accordance with RCSA Section 19-13-B102(q). All valves associated with the tank must be regularly exercised to ensure proper operation.
- An assessment of the tank's vulnerability to tampering, vandalism, terrorism and other security issues should be performed. This information should be kept secure and need not be provided to the DWS. Any deficiencies should be addressed. Water systems should regularly assess ways to make security improvements at or around the tank, including fencing, surveillance, and patrolling. This also includes an assessment of tank ladders and access to hatches, vents, etc.
- In accordance with RCSA Section 19-13-B102(r), the tank inspection should include an assessment of the operations and maintenance necessary to ensure continued sanitary conditions and structural integrity, including: necessary repairs, who will perform the repairs, a timetable for the repairs, and a schedule of the routine maintenance.
- Subsequent to emptying the tank and performing an inspection, RCSA Section 19-13-B47 requires that the tank be effectively disinfected. The disinfection should be in accordance with the latest revision of AWWA C-652 – Disinfection of Water Storage Facilities. This document also contains information on

**STATE OF CONNECTICUT DEPARTMENT OF PUBLIC HEALTH
DRINKING WATER SECTION**

10 YEAR ATMOSPHERIC STORAGE TANK INSPECTION GUIDELINES

the disinfection procedure for inspecting a full tank.

- In accordance with RCSA Section 19-13-B102(f)(5)(C), an inspection report must be completed. The report should include a detailed description of the inspection process, the findings, actions that were taken as a result of the inspection, and photographs and/or video. The report should also include a completed checklist that includes a signed acknowledgement of the certification. If the inspection finds that the tank has deficiencies related to sanitary conditions or structural integrity, a plan of correction that includes a timetable for repairs of the deficiencies should be included. The DWS may request this report after completion of the inspection, and it is standard practice to review this document as part of the routine sanitary survey. It is advisable to submit the report and plan of correction to the DWS any time deficiencies are found. Please note that RCSA Section 19-13-B102(d)(2) requires DWS approval before making changes of “sanitary significance”. This would include replacement of, or significant modifications to, the inspected tank.

Qualifications

The term “qualified” inspector/individual, as used above, includes some or all of the following:

American Petroleum Institute (API) API 653 Certified Tank Inspector;

NACE International Certified Coating Inspector;

A Professional Engineer that has documented experience with atmospheric tank, clearwell and basin inspections; and/or,

A Certified Operator that has documented experience inspecting atmospheric tanks, clearwells and basins.

Safety

Individuals entering tanks or any other confined space should be compliant with guidelines of the Occupational Safety & Health Administration (29 CFR - 1910.146). OSHA, in the Dec. 1, 1998 revision to their regulations, defines a confined space as a space that:

- (1) Is large enough and so configured that an employee can bodily enter and perform assigned work; and*
- (2) Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry.); and,*
- (3) Is not designed for continuous employee occupancy.*

The OSHA website should be reviewed for the most recent definitions of confined spaces and associated precautions.

Inspection Frequency

Although required only once every ten years by regulation, it is strongly recommended that all atmospheric storage tanks, clearwells and basins be inspected at least once every 3-5 years. It is also strongly recommended that all storage tanks (hydropneumatic, etc.) be inspected on a 3-5 year frequency. A routine check of the vents, vent screens, overflow screens, hatches, and drain line screens should be conducted at least quarterly.

Useful References and Links

American Water Works Association Manual of Water Supply Practices – Steel Water-Storage Tanks (AWWA M42). Chapter 9 and Appendix C (formerly AWWA D101-53 (R1986)) provide recommendations for the inspection of steel tanks.

<http://www.awwa.org/>

<http://www.nace.org/nace/index.asp>

<http://10statesstandards.com/waterstandards.html>

<http://api-ep.api.org/certifications/>

<http://www.osha.gov/Publications/osh3138.html>