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June 4, 2026

Submitted via electronic mail

Mr. Brian Rath
Land Quality Bureau
Iowa Department of Natural Resources
6200 Park Ave, Suite 200
Des Moines, IA 50321

**Subject: Construction Documentation Report
Groundwater Underdrain Management System Modifications
Interstate Power and Light Company Ottumwa Midland Landfill (OML)
Permit #90-SDP-8-92P**

Dear Mr. Rath,

On behalf of Interstate Power and Light Company (IPL), Alliant Energy is submitting the enclosed documentation report prepared by SCS Engineers (SCS) regarding the re-route of underdrain flows at the Ottumwa Midland CCR Landfill (OML) in Ottumwa, Iowa (Permit #90-SDP-8-92P).

Should the Department require additional information in its review of this request, please contact me at (608) 458-3197.

Sincerely,

A handwritten signature in black ink, appearing to read "Matt Bizjack".

Matt Bizjack
Senior Environmental Specialist
Alliant Energy Corporate Services, Inc.
On behalf of IPL

CC: Matt Loehr (IPL)
Eric Nelson (SCS)

Enclosures

Construction Documentation Report Groundwater Underdrain Management System Modifications

Ottumwa Midland Landfill
15300 130th Street, Ottumwa, Iowa
Permit No. 90-SDP-08-92P

Prepared for:

Interstate Power and Light Company
Ottumwa Midland Landfill
15300 130th Street
Ottumwa, Iowa 52501

SCS ENGINEERS

25224149.00 | June 2026

2839 Dairy Drive
Madison, Wisconsin 53718-6751
(608) 224-2830

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Appendix E Force Main Pressure Test Results
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I:\25224149.00\Deliverables\Forcemain and Treatment System Obs Rpt\2026-06-04_OML Underdrain System Const Doc Rpt_Final.docx

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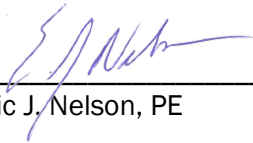
CERTIFICATION PAGE

Eric J. Nelson, a licensed Professional Engineer in the State of Iowa, has overseen the construction of the Groundwater Underdrain Management System Modifications at the Interstate Power and Light Company Ottumwa-Midland Landfill (OML). SCS Engineers has prepared this Construction Documentation Report in general accordance with OML Permit #90-SDP-8-92P and the November 2013 Construction Quality Assurance / Quality Control Plan prepared by SCS Engineers.

Our professional services have been provided using the level of care and skill ordinarily exercised, under similar circumstances, by engineering professionals currently practicing in this locality. No other representation, express or implied, and no warranty or guarantee is included or intended.

Respectfully Submitted,

SCS ENGINEERS

	<p>I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.</p> <p> _____ Eric J. Nelson, PE (date)</p> <p>Iowa License No. <u>23136</u></p> <p>My license renewal date is: <u>12/31/2026</u></p> <p>Pages or sheets covered by this seal: Construction Documentation Report Groundwater Underdrain Management System Modifications</p> <p>_____</p>
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1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

This Construction Documentation Report for the Ottumwa Midland Landfill (OML) has been prepared by SCS Engineers (SCS) on behalf of Interstate Power and Light (IPL) to certify that modifications to the landfill's groundwater underdrain system has been completed in general compliance with the following:

- Permit Number 90-SDP-08-92P issued by the Iowa Department of Natural Resources (DNR).
- Construction Quality Assurance/Quality Control Plan for the Ottumwa Midland Landfill, dated November 2013 (CQA Plan).
- Permit Amendment Request for Underdrain Routing Modifications by Alliant Energy dated August 14, 2025, and supporting Groundwater Underdrain Force Main plan set prepared by SCS dated July 2025, and amended August 25, 2025 (Sheets 3, 4 and 6).

Plan Sheets 1 through **9** accompany this report to document record conditions. **Appendix A** through **Appendix G** include information such correspondence, photographs, test results, and equipment data sheets.

1.2 BACKGROUND

The IPL OML is an active coal combustion residuals (CCR) landfill facility located at 15300 130th Street in Ottumwa, Iowa (**Sheet 1**). The DNR permit number for OML is 90-SDP-08-92P. OML receives CCR for disposal from the Ottumwa Generating Station (OGS) and other IPL facilities.

OML includes a groundwater gradient control system (“underdrain”) below the liner of the landfill to provide safe operation of the landfill. The underdrain system removes groundwater from below the liner for two reasons: to maintain hydraulic separation between the landfill and water table and collect and redirect lateral groundwater flow to mitigate potential slope stability issues. The groundwater underdrain discharge system at OML was constructed in two phases. The first phase of construction occurred during the construction of the Existing Landfill (1995), and the second phase was installed during construction of Phase 1 of the North Expansion (completed in 2015). Both systems are comprised of a geocomposite drainage layer that underlies the landfill's bottom liner. The geocomposite layer drains by gravity to perforated piping installed in aggregate trenches underlying the geocomposite. The existing site conditions prior to construction are shown on **Sheet 3**.

Alliant Energy (parent company of IPL) submitted a permit modification request to DNR via email on August 14, 2025. DNR provided concurrence with the proposed modifications via email on October 3, 2025. Copies of the correspondence are provided in **Appendix A**.

Several parties were involved with the construction of the modifications. Each party and the work performed are listed below:

- Winger Contracting Company (Winger), Ottumwa, Iowa: General contractor, Mechanical work, piping, and plumbing.

- Tri County Construction, Eddyville, Iowa: Excavation.
- Seither & Cherry Co, Keokuk, Iowa: Electrical.
- GPRS, Toledo, Ohio: Record pipe locating/survey.

Construction occurred from September 11 through November 13, 2025.

Mr. Clayton Davis of SCS provided oversight of construction documentation on a part-time (weekly) basis throughout the project.

1.3 SUMMARY OF WORK

Construction activities included the following:

- Installation and maintenance of erosion control measures
- Installation of the North Lift Station, LS-1
- Installation of an underdrain force main including an air/vacuum release manhole
- Installation of a Treatment Building and associated filter equipment
- Installation of an underdrain valve manhole
- Installation of a leachate valve manhole
- Restoration

Each item is discussed below. Photographic documentation of the constructions activities is included in **Appendix B**.

2.0 EROSION CONTROL

Filter sock was installed in the location shown on **Sheet 4** prior to start of construction. A typical detail of the filter sock is shown on **Sheet 5**.

3.0 NORTH LIFT STATION – LS-1

The North Lift Station, LS-1, was installed in the location shown on **Sheet 4**. Tri-County excavated the location to the design elevation. A 6-inch layer of coarse aggregate bedding was placed and compacted at the bottom of the excavation. Winger installed a 5-foot-diameter, pre-cast concrete manhole on the prepared bedding. Four-inch-diameter, epoxy-coated ductile iron gate valves were installed on the two underdrain inlets to LS-1 prior to entering manhole. Valve boxes were installed and extended to the ground surface.

A Hydromatic Model HPG(X)200 submersible pump was installed in the manhole on a guide rail system. The pump is controlled with floats. Seither & Cherry installed the electrical service and control panel.

A detail of LS-1 is shown on **Sheet 6**. Manhole manufacturer's information is provided in **Appendix C**. Pump manufacturer information is included in **Appendix D**.

4.0 GROUNDWATER UNDERDRAIN FORCE MAIN

Groundwater underdrain force main piping consisting of 2-inch-diameter SDR 11 HDPE pipe was installed from LS-1 to an existing lift station, GU-EX, in the location shown on **Sheet 4**.

Tri-County excavated the pipe route to an approximate depth of 5 feet. A 6-inch sand bedding layer was placed in the bottom of the trench. Winger joined individual pipe sections using the butt fusion welding method, attached a tracer wire to the pipe, and placed the pipe in the trench. Sand was placed around the pipe to an approximate depth of 6 inches over the top. The remainder of the trench was backfilled with soil excavated from the trench and compacted in 1-foot vertical lifts. A cleanout riser was installed at LS-1 and capped with a blind flange. A typical trench detail is shown on **Sheet 5**.

An air/vacuum release manhole was installed in the location shown on **Sheet 4**. Tri-County excavated the location to the design elevation. A 6-inch layer of coarse aggregate bedding was placed and compacted at the bottom of the excavation. Winger installed a 4-foot-diameter, pre-cast concrete manhole on the prepared bedding. A 2-inch Val-Matic air/vacuum release valve was installed on a TEE riser in the manhole. Cleanout risers were installed on both sides of the manhole and capped with blind flanges. A detail of the manhole is shown on **Sheet 5**.

The discharge end of the force main was installed into the existing lift station, GU-EX, through a cored opening. The opening around the pipe was sealed with epoxy. A detail of the connection is shown on **Sheet 7**.

The installed transfer pipe was pressure tested on October 10, 2025. The pipeline was pressurized to 150 psi and allowed to stabilize at 138 psi. The pressure held steady for 60 minutes and was deemed to be passing. Pressure test results are provided in **Appendix E**.

Once construction was completed, GPRS provided a comprehensive locate service for the force main and other underground piping and supplied SCS with location data. Record piping locations are shown on **Sheet 4**.

The post-construction groundwater underdrain pipe routing does not allow for sampling of groundwater underdrain GU-EX independent of the Existing Phase 1 and Future Phase 2 underdrains. Related updates to the site monitoring plan will be addressed in a separate submittal.

5.0 TREATMENT BUILDING INSTALLATION

A prefabricated treatment building was installed in the location shown on **Sheet 4**. The building was placed on a concrete foundation and secured with anchor bolts. A thermostatically controlled electric heater was installed in the building.

The existing force main piping from GU-EX was excavated and re-routed into the building prior to pouring the concrete foundation. In addition, a floor drain and piping were installed draining to GU-EX.

A bag filter skid manufactured by PRM Filtration was installed within the building. Piping was installed within the building to route the discharge from GU-EX through the filter bags. A 4-inch-diameter V-port ball valve was installed at the inlet to the filter skid to control the flow rate.

Mekco, Inc. of Newton, Wisconsin, manufactured the building. A detail of the Treatment Building is provided on **Sheet 7**. A detail of the building foundation is shown on **Sheet 9**. Building manufacturer's information is included in **Appendix F**. A detail of the filter skid arrangement is provided on **Sheet 8**. The filter skid operations manual is provided in **Appendix G**.

6.0 VALVE MANHOLES

Two valve manholes were installed on existing gravity leachate and underdrain transfer pipelines to provide additional operation control.

The underdrain valve manhole, VMH-1, was installed in the location shown on **Sheet 4**. Tri-County excavated the location to the design elevation. A 6-inch layer of coarse aggregate bedding was placed and compacted at the bottom of the excavation. Winger installed a 4-foot-diameter, pre-cast concrete manhole on the prepared bedding. A 6-inch-diameter, epoxy-coated ductile iron gate valve was installed inside the manhole. A stem extension was installed to the top of the manhole. An electric actuator will be added in the future to provide remote operation of the valve. Cleanout risers were installed on both sides of the manhole and capped with blind flanges. A detail of the manhole is shown on **Sheet 6**. Manhole manufacturer's information is provided in **Appendix C**.

The leachate valve manhole, LVMH-1, was installed in the location shown on **Sheet 4**. Tri-County excavated the location to the design elevation. A 6-inch layer of coarse aggregate bedding was placed and compacted at the bottom of the excavation. Winger installed a 4-foot-diameter, pre-cast concrete manhole on the prepared bedding. A 6-inch-diameter, epoxy-coated ductile iron gate valve was installed inside the manhole. Cleanout risers were installed on both sides of the manhole and capped with blind flanges. A detail of the manhole is shown on **Sheet 6**. Manhole manufacturer's information is provided in **Appendix C**.

7.0 SITE RESTORATION

Tri-County restored areas disturbed by construction to pre-construction conditions. The areas were graded and topsoiled with materials salvaged during construction. The topsoiled areas were seeded, fertilized, and mulched. Temporary erosion control measures like filter socks will be removed once vegetation is restored in Summer 2026.

8.0 CONCLUSIONS

It is our opinion that the groundwater underdrain management system modifications have been constructed in substantial compliance with the approved permit amendment and CQA Plan. This opinion is based on observations made during construction, results of field testing, and record surveys.

Plan Sheets

Sheet 1 – Title Sheet

Sheet 2 – Legend and Notes

Sheet 3 – Existing Landfill Conditions Prior to
Construction

Sheet 4 – Groundwater Underdrain System
Modifications

Sheet 5 – Details

Sheet 6 – Details

Sheet 7 – Details

Sheet 8 – Details

Sheet 9 – Details

CONSTRUCTION DOCUMENTATION GROUNDWATER UNDERDRAIN SYSTEM MODIFICATIONS

SANITARY DISPOSAL PROJECT PERMIT #90-SDP-08-92P
OTTUMWA MIDLAND LANDFILL
OTTUMWA, IOWA

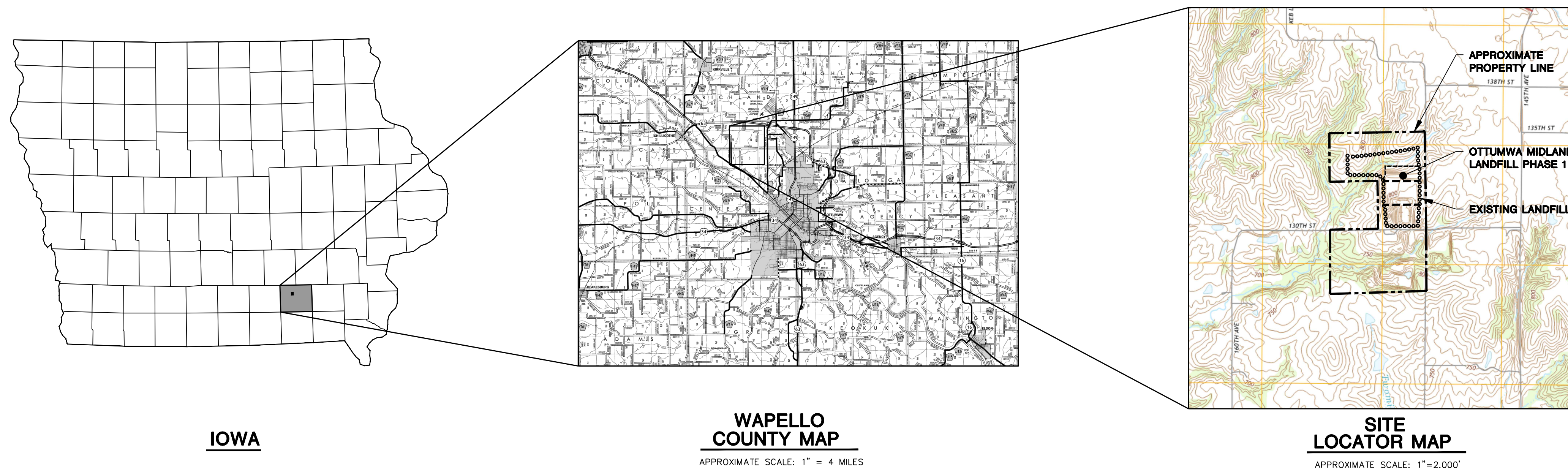
PREPARED FOR: INTERSTATE POWER AND LIGHT COMPANY
OTTUMWA, IOWA

PREPARED BY: SCS ENGINEERS
MADISON, WISCONSIN

DATE: JUNE 2026

INDEX

Sheet Number	Sheet Title
1	TITLE SHEET
2	LEGEND AND NOTES
3	EXISTING LANDFILL CONDITIONS PRIOR TO CONSTRUCTION
4	GROUNDWATER UNDERDRAIN SYSTEM MODIFICATIONS
5	DETAILS
6	DETAILS
7	DETAILS
8	DETAILS
9	DETAILS



LEGEND	
	APPROXIMATE OTTUMWA MIDLAND LANDFILL PROPERTY LINE
	EXISTING GROUND SURFACE (10' CONTOUR)
	EXISTING GROUND SURFACE (2' CONTOUR)
	APPROVED LIMITS OF WASTE
	PHASE LIMIT
	UNPAVED ROAD
	PAVED ROAD
	OML SITE STREAM
	OML SITE DRAINAGE SWALE
	OML SITE WATER
	OML SITE WETLAND
	FENCE
	OVERHEAD UTILITY
	BURIED TELEPHONE LINE
	WATER MAIN
	FORCEMAIN
	LEACHATE GRAVITY LINE
	UNDERDRAIN GRAVITY LINE
	STORM WATER PIPE
	LEACHATE & UNDERGROUND ELECTRICAL
	UNDERGROUND ELECTRIC
	RIPRAP
	CULVERT
	TELEPHONE PEDESTAL
	UTILITY POLE
	WATER VALVE
	MONITORING WELL
	ABANDONED MONITORING WELL
	TEST PIT
	BORING
	STAFF GAUGE
	CONTROL MONUMENT
	LEACHATE HEADWELL
	EXISTING WET WELL DUPLEX PUMPING STATION
	WETLAND
	LIFT STATION
	RECORD UNDERGROUND ELECTRIC
	RECORD ELECTRIC PUMP CONTROL PANEL
	RECORD SILT FENCE/FILTER SOCK
	RECORD UNDERDRAIN GROUNDWATER FORCE MAIN
	RECORD GRAVITY DRAIN PIPE
	RECORD VALVE MANHOLES
	RECORD VALVE MAHOLE

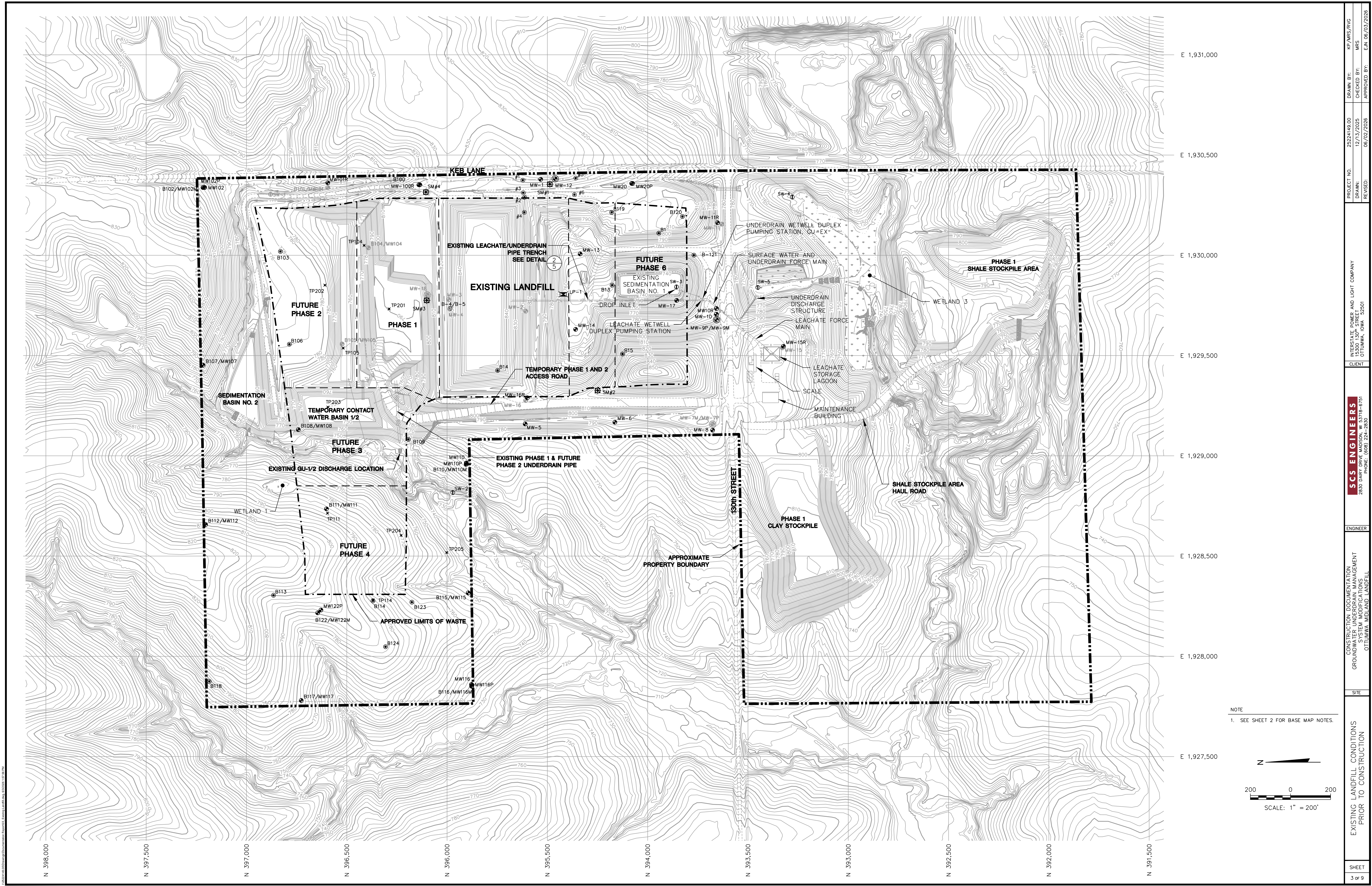
NOTES:

1. TOPOGRAPHIC BASE MAP WAS COMPILED FROM IOWA DEPARTMENT OF NATURAL RESOURCES GENERALIZED TWO FOOT CONTOURS OF WAPELLO COUNTY IOWA DERIVED FROM LIDAR DATA. THE LIDAR DATA WAS ACQUIRED IN THE SPRING OF 2008. THE CONTOUR DATA WAS FIELD VERIFIED BY GLOBAL POSITIONING SURVEY (GPS) IN THE SPRING OF 2012. CONTOUR INTERVAL IS 2 FOOT.
2. TOPOGRAPHIC BASE MAP SUPPLEMENTED WITH SURVEYS PERFORMED BY FRENCH-RENEKER ASSOCIATES, INC., FAIRFIELD, IOWA. DATES OF GROUND SURVEYS ARE FEBRUARY 22, 2011, AND JANUARY 22, 2013, 2015 DOCUMENTATION SURVEYS BY SCS ENGINEERS, RYAN CENTRAL, AND STANTEC, AND LANDFILL GRADES SURVEY BY FRENCH-RENEKER, JUNE 8, 2023.
3. TOPOGRAPHIC BASE, PROPERTY LINES, UTILITIES, ROAD EDGE AND SITE FEATURES ALONG FORCE MAIN ALIGNMENT FROM SURVEY DATA COLLECTED BY MOHN SURVEYING ON JUNE 18 AND 25, 2024 AND AUGUST 8, 2024.
4. ELEVATIONS ARE BASED ON NAVD 88 DATUM.
5. THE GRID SYSTEM IS BASED ON THE IOWA STATE PLANE COORDINATE SYSTEM NAD 83 (2007 ADJUSTMENT) AS DERIVED FROM NATIONAL GEODETIC SYSTEM (NGS) CONTROL MONUMENT DESIGNATION D 6.
6. PROPERTY LINE NORTH OF 130TH STREET FROM PLAT OF SURVEY MAP PREPARED BY SCS ENGINEERS, MADISON, WISCONSIN, DATED FEBRUARY 20, 2013.
7. CONSTRUCTED SITE FEATURE LOCATIONS COMPLETED BY GROUND PENETRATING RADAR SYSTEMS, LLC. (GPRS) COMPLETED ON JANUARY 29, 2026.

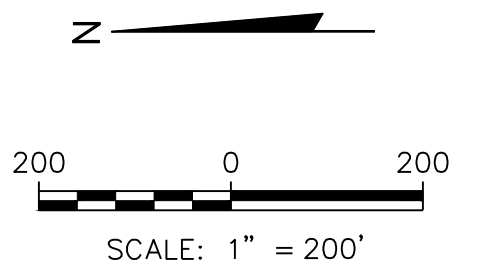
HORIZONTAL AND VERTICAL CONTROL POINTS			
POINT	NORTHING	EASTING	ELEVATION
SM#1	394,487.72	1,930,354.82	820.39
SM#2	394,249.46	1,929,325.84	819.14
SM#3	395,101.57	1,929,775.56	814.05
SM#4	395,105.73	1,930,315.43	820.03

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SCS ENGINEERS <small>2830 DARY DRIVE MADISON, WI 53718-6791 PHONE: (608) 224-2830</small>	INTERSTATE POWER AND LIGHT COMPANY <small>15300 W. 30TH STREET OTTUMWA, IOWA 52501</small>	PROJECT NO. 25224149.00 DRAWN BY: R7/MRS/RVG CHECKED BY: MRS 12/13/2025 06/02/2026 APPROVED BY: EAN 06/03/2026
CONSTRUCTION DOCUMENTATION GROUNDWATER UNDERDRAIN MANAGEMENT SYSTEM MODIFICATIONS OTTUMWA MIDLAND LANDFILL	ENGINEER	LEGEND AND NOTES
SHEET 2 of 9	SITE	



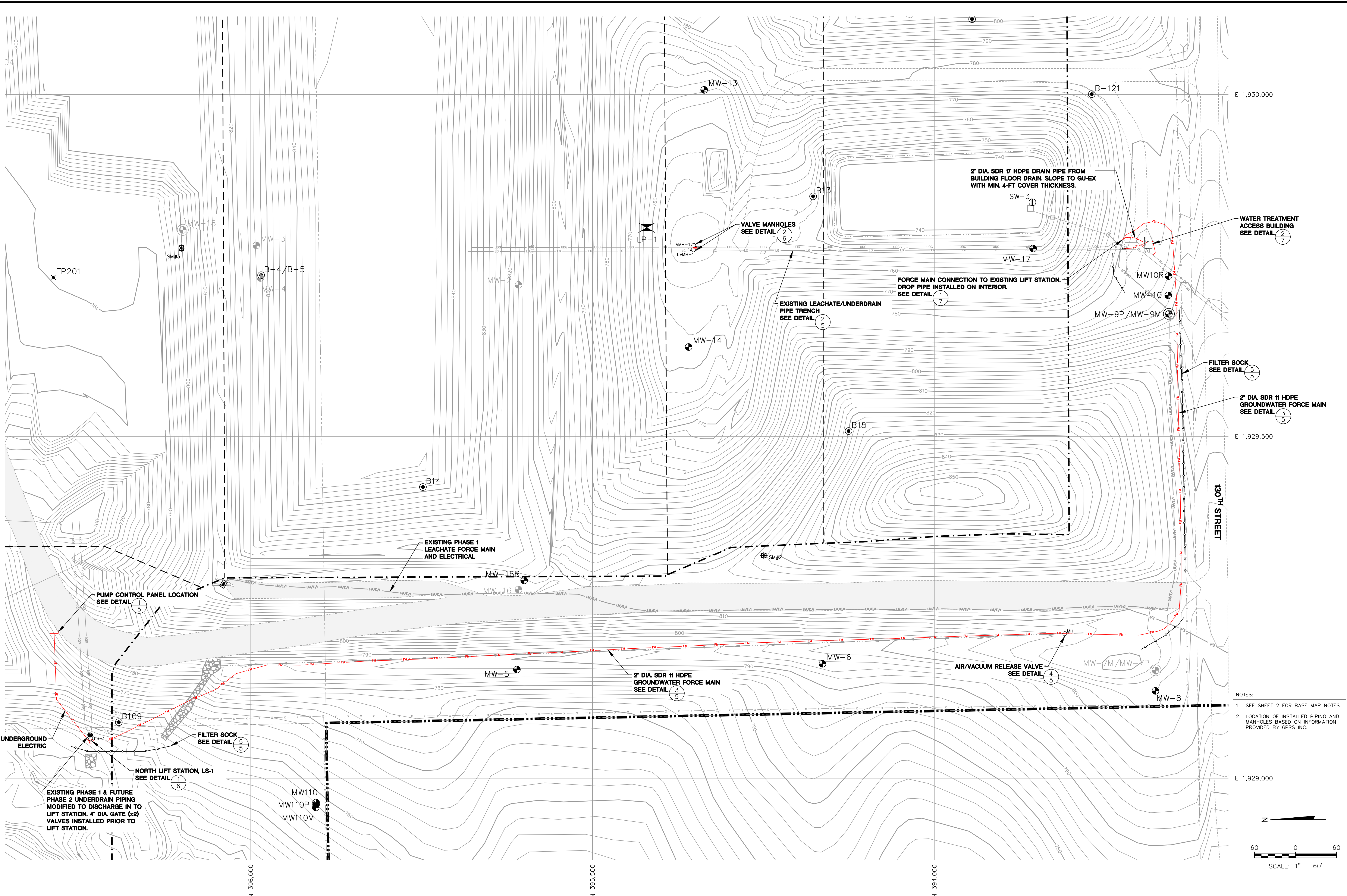
NOTE
 1. SEE SHEET 2 FOR BASE MAP NOTES.



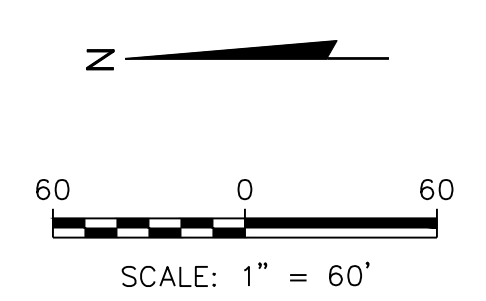
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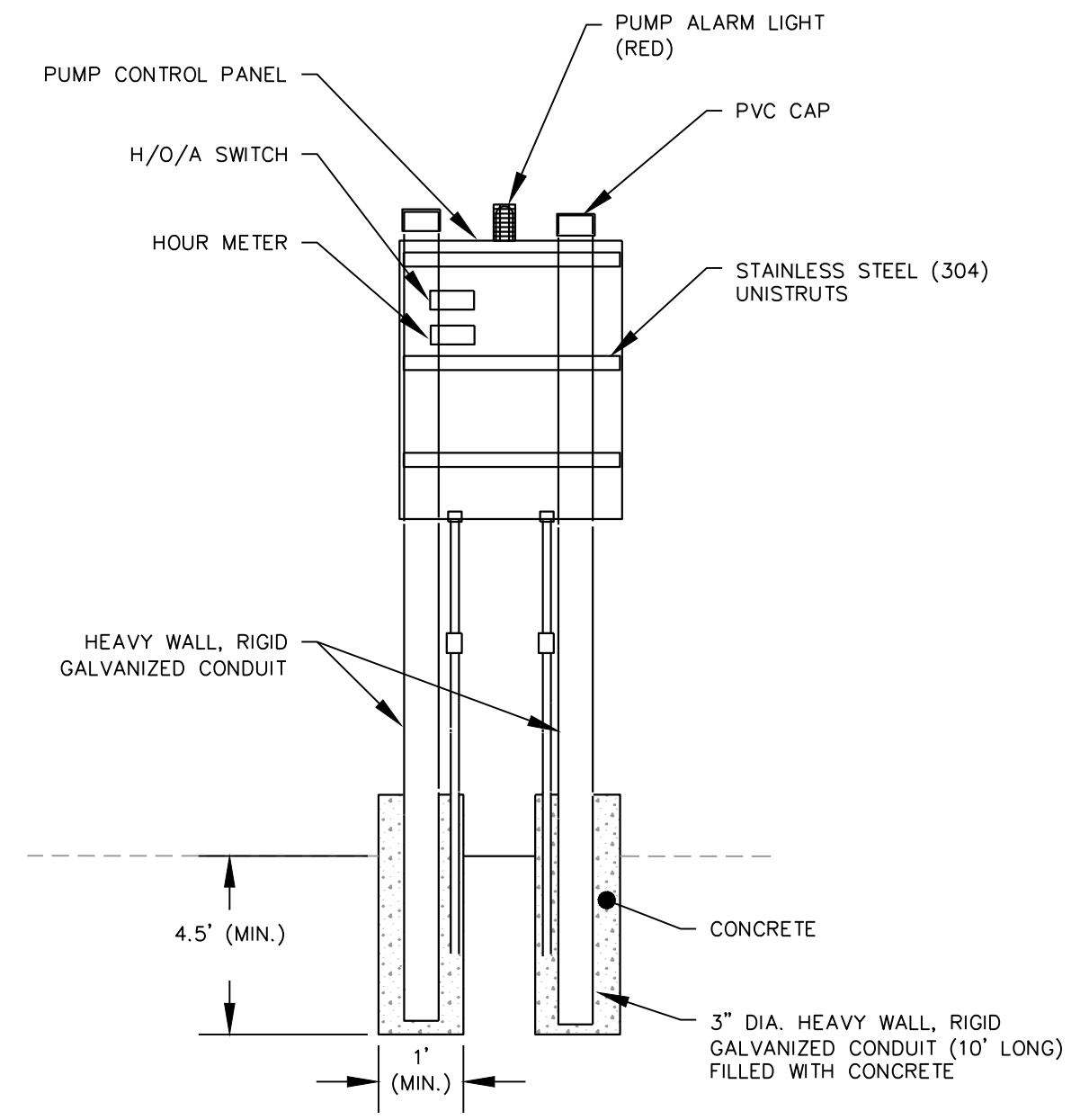
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DRAWN:	12/13/2025	CHECKED BY:	MMS
REVISION:	06/02/2026	APPROVED BY:	EAN 06/03/2026
CLIENT:	INTERSTATE POWER AND LIGHT COMPANY 15300 130th STREET EAST STUMWA, IOWA 52601		
ENGINEER:	SCS ENGINEERS 2830 DARY DRIVE MADISON, WI 53718-0791 PHONE: (608) 224-2830		
SITE:	CONSTRUCTION DOCUMENTATION GROUNDWATER UNDERDRAIN MANAGEMENT SYSTEM MODIFICATIONS OTTUMWA MIDLAND LANDFILL		
SHEET:	EXISTING LANDFILL CONDITIONS PRIOR TO CONSTRUCTION		
	3 of 9		



- NOTES:
- SEE SHEET 2 FOR BASE MAP NOTES.
 - LOCATION OF INSTALLED PIPING AND MANHOLES BASED ON INFORMATION PROVIDED BY GPRS INC.

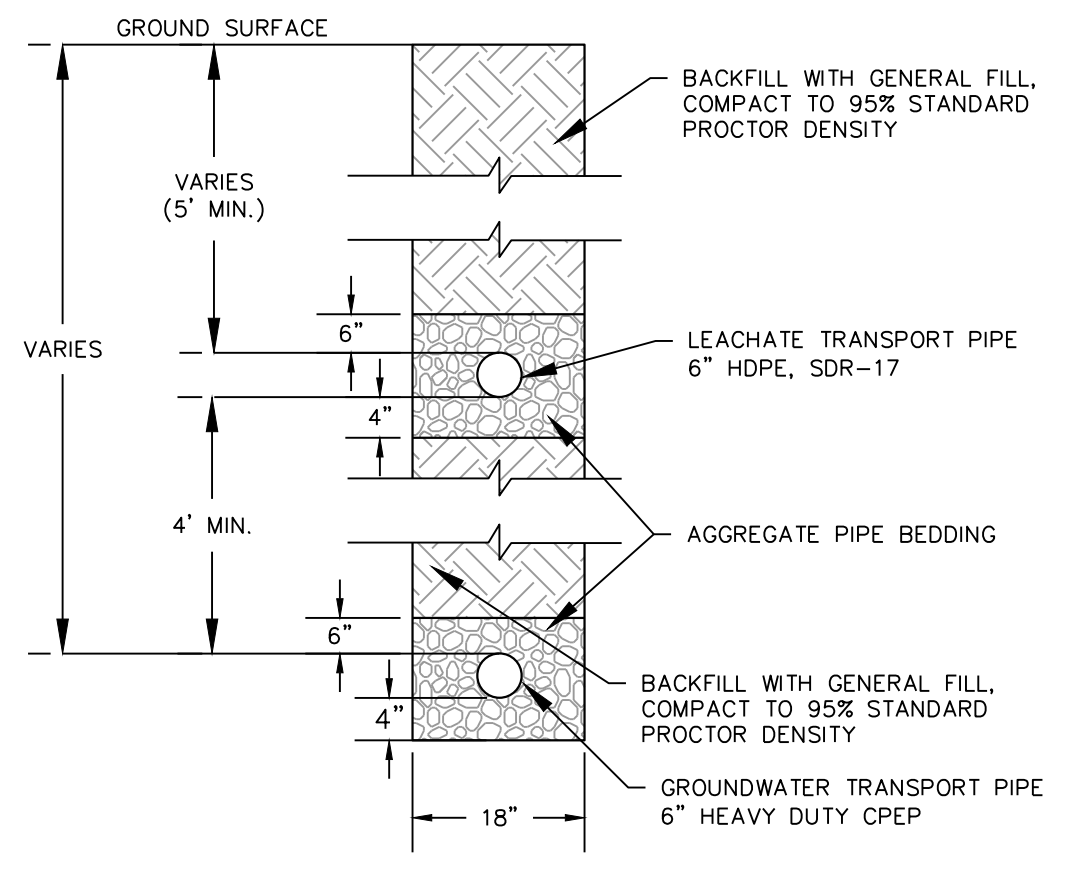


PROJECT NO.	2522449.00	DRAWN BY:	RP/MRS/RVG
DRAWN:	12/13/2025	CHECKED BY:	MRS
REVISION:	06/02/2026	APPROVED BY:	EAN 06/03/2026
CLIENT:	INTERSTATE POWER AND LIGHT COMPANY 15300 130TH STREET, SE OTTUMWA, IOWA 52501	ENGINEER:	SCS ENGINEERS 2830 DARY DRIVE, MADISON, WI 53718-6751 PHONE: (608) 224-2830
CONSTRUCTION DOCUMENTATION GROUNDWATER UNDERDRAIN MANAGEMENT SYSTEM MODIFICATIONS		SITE	
GROUNDWATER UNDERDRAIN SYSTEM MODIFICATIONS		SHEET 4 OF 9	

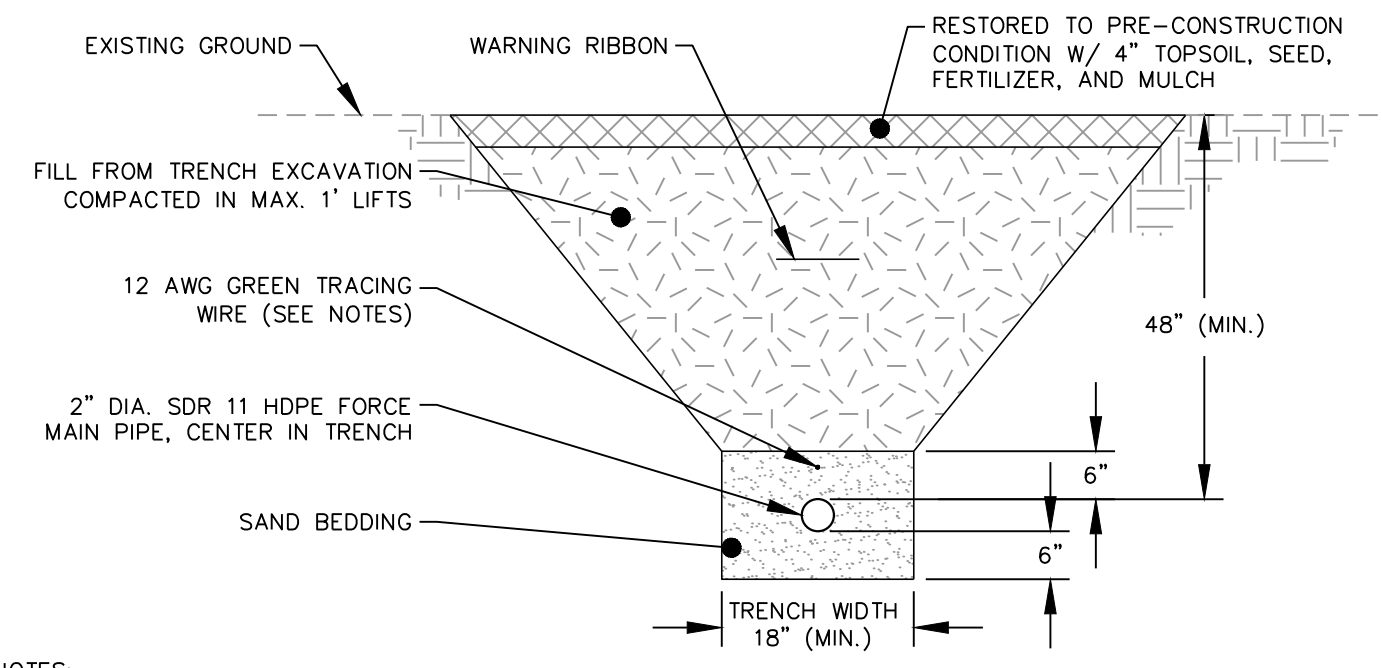


- CONTROL PANEL NOTES:**
1. ALL STAINLESS STEEL (304) HARDWARE.
 2. ALL CONTROLS AND METERS INSTALLED IN STAINLESS STEEL (304) NEMA 4X ENCLOSURES.
 3. PUMP CONTROL PANELS PROVIDED BY PUMP MANUFACTURERS.
 4. ALL ABOVE GROUND CONDUIT IS RIGID GALVANIZED STEEL.
 5. INSTALLED BOLLARDS ON EACH SIDE. SEE SHEET 9 FOR BOLLARD DETAIL.

1
5 CONTROL PANEL
NOT TO SCALE

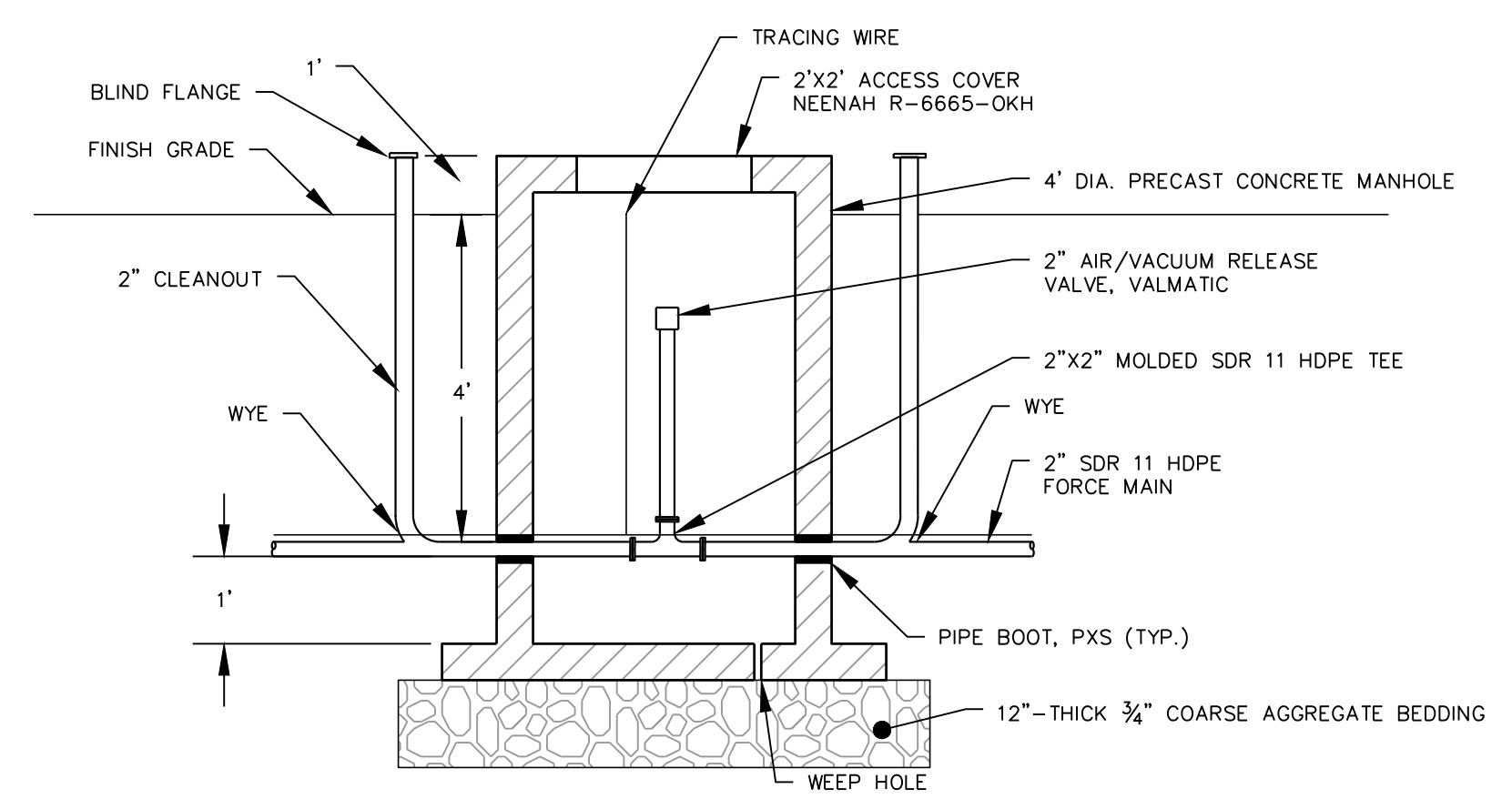


2
5 EXISTING UNDERDRAIN/LEACHATE PIPE TRENCH
NOT TO SCALE

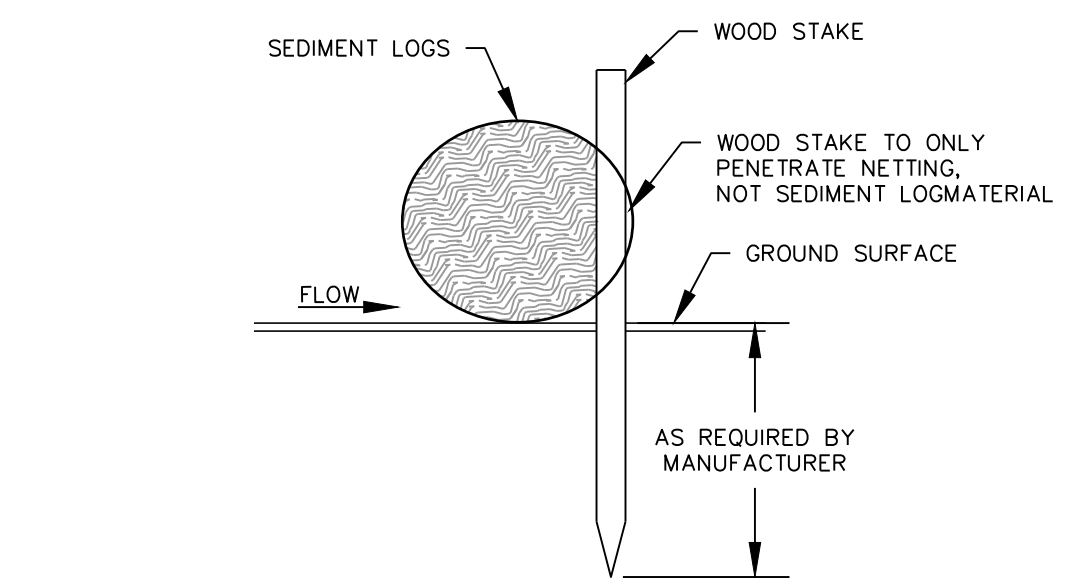
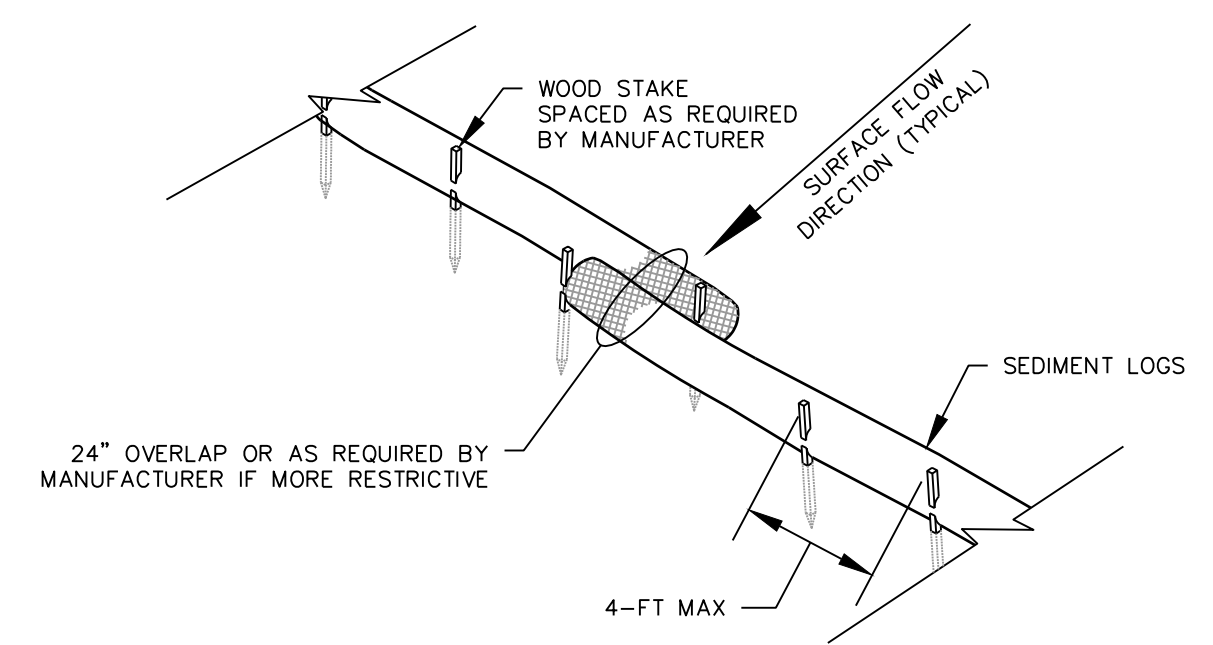


- NOTES:**
1. INSTALLED TRACING WIRE 3 TO 6 INCHES ABOVE TOP OF PIPE.
 2. TERMINATED BOTH ENDS OF TRACING WIRE IN ACCESS BOXES.
 3. INSTALLED GROUNDING ROD AT ONE END OF TRACING WIRE PER MANUFACTURER'S INSTRUCTIONS.

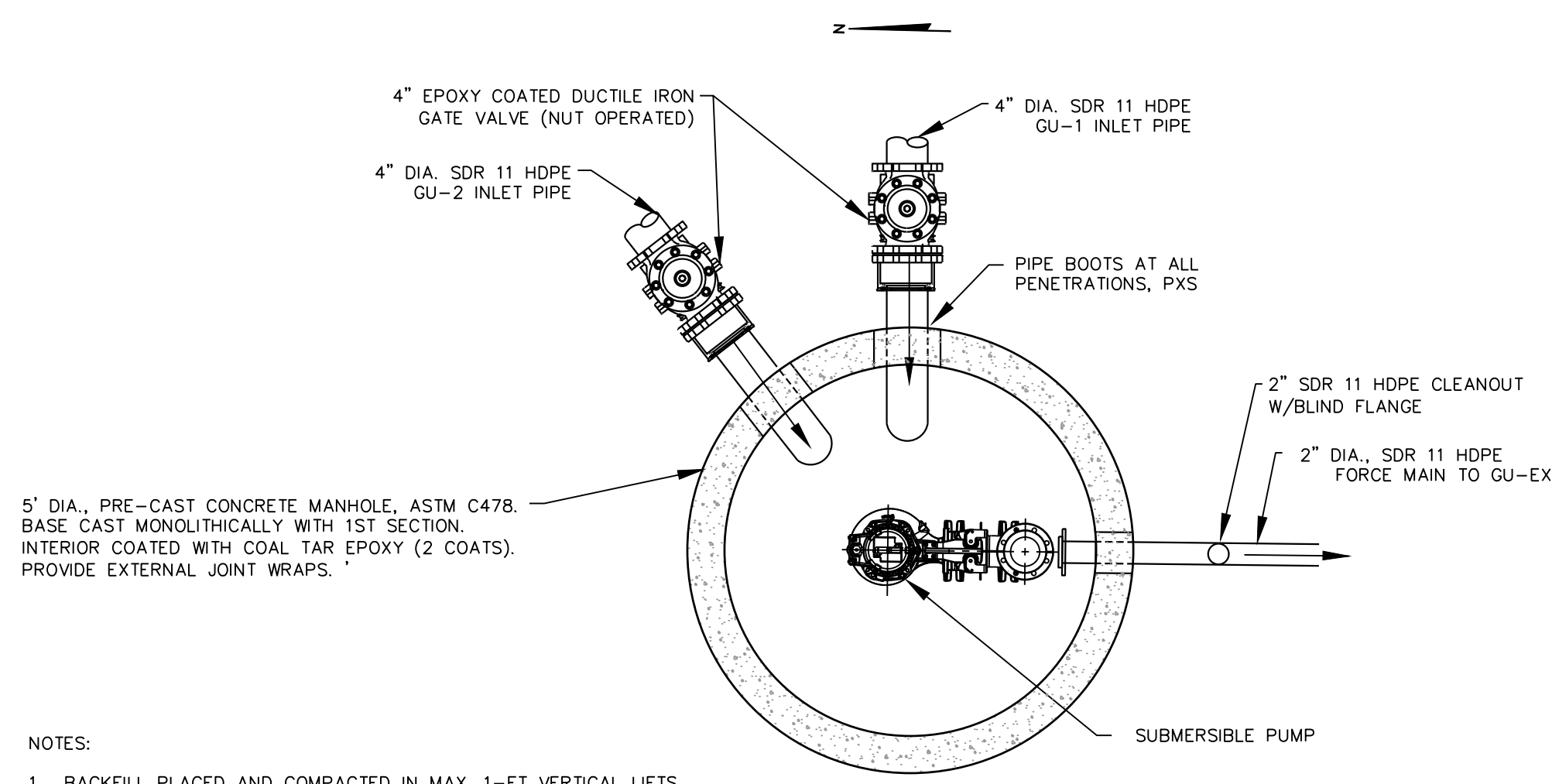
3
5 TYPICAL FORCEMAIN TRENCH
NOT TO SCALE



4
5 TYPICAL AIR-VACUUM RELEASE VALVE
NOT TO SCALE

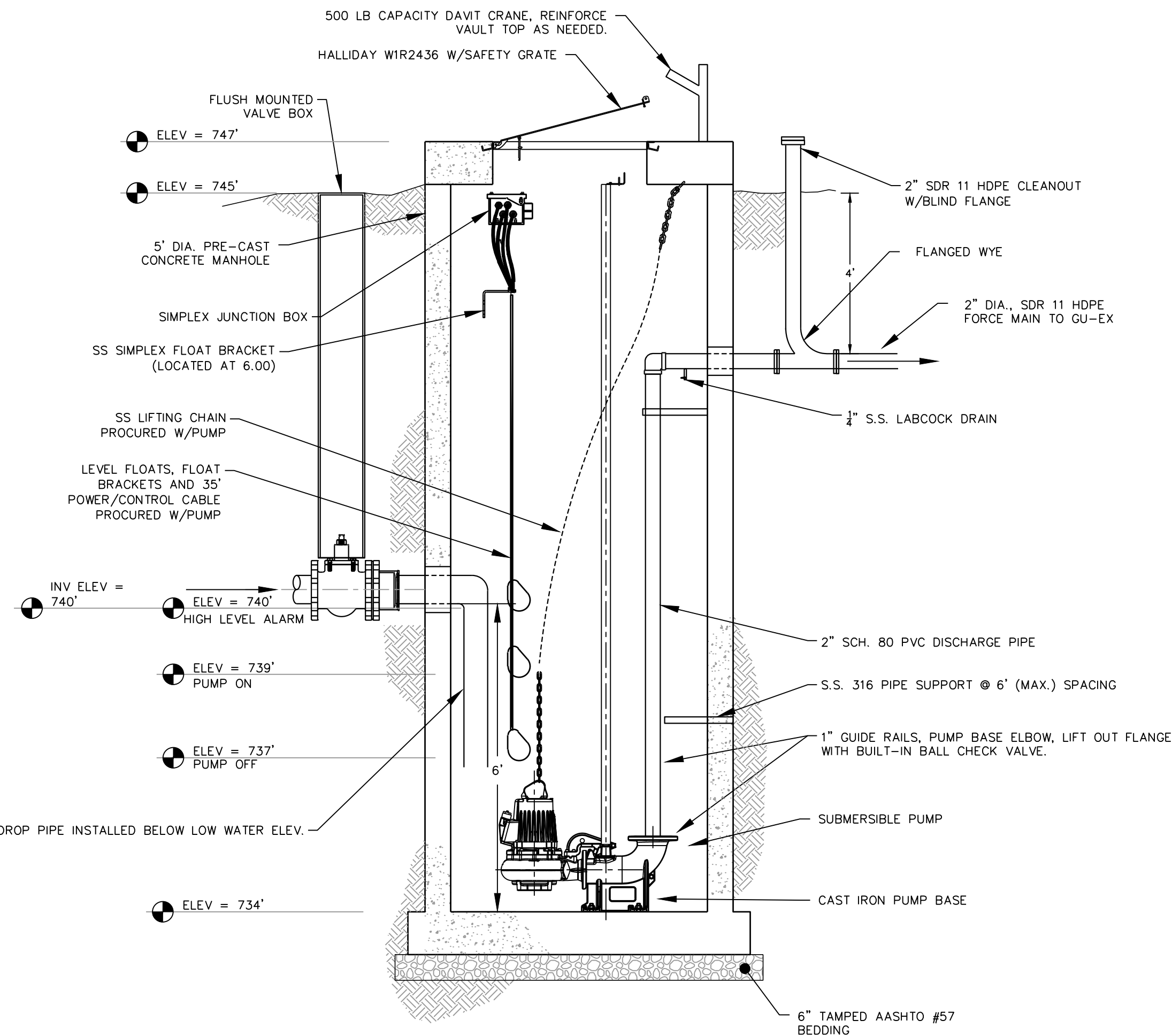


5
5 FILTER SOCK
NOT TO SCALE



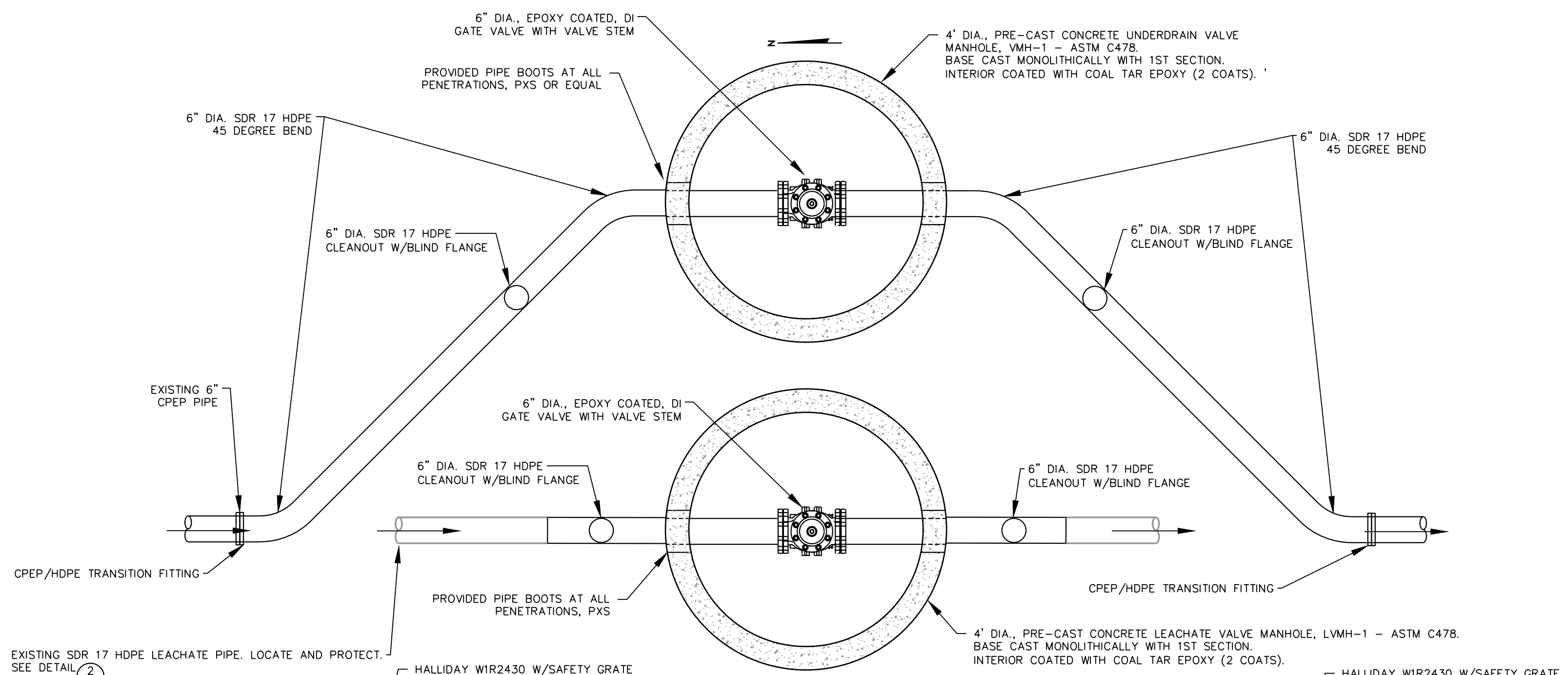
- NOTES:
- BACKFILL PLACED AND COMPACTED IN MAX. 1-FT VERTICAL LIFTS.
 - PUMP MANUFACTURER - HYDRAMATIC HPGX200.
 - PUMP CAPACITY: ~20 GPM @ 60' TDH.

PLAN VIEW

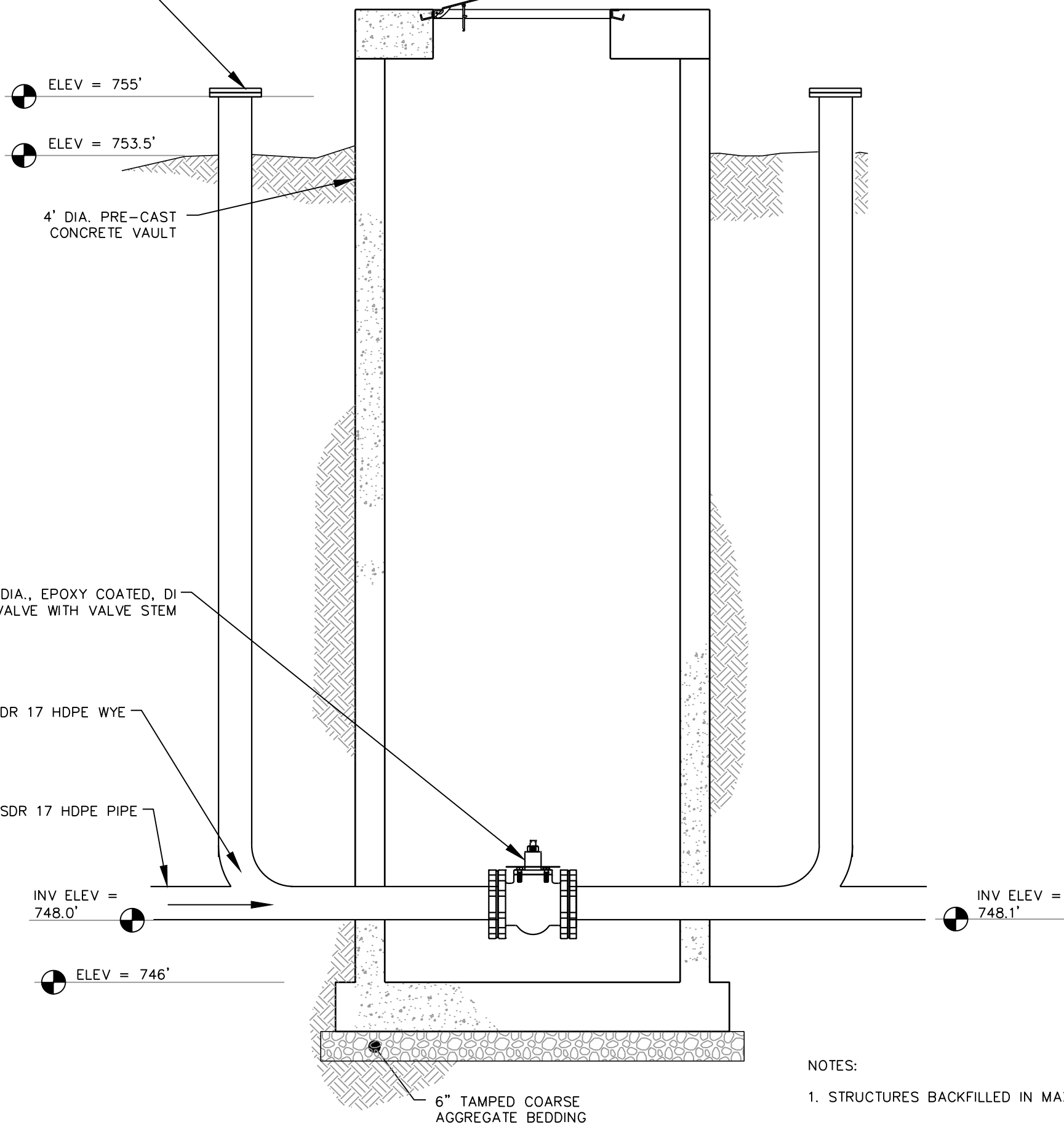


ELEVATION VIEW

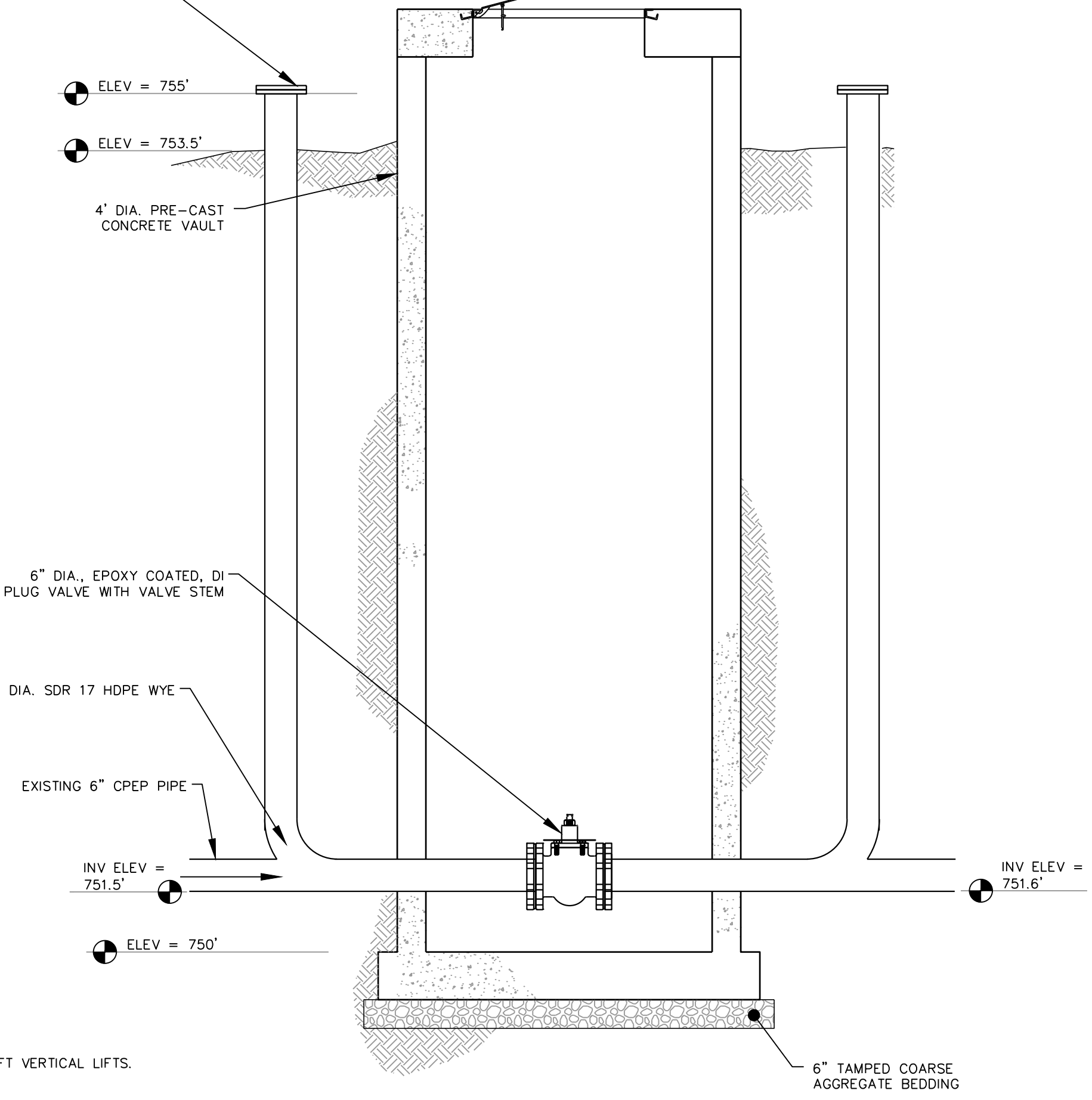
1 NORTH LIFT STATION (LS-1)
NOT TO SCALE



PLAN VIEW



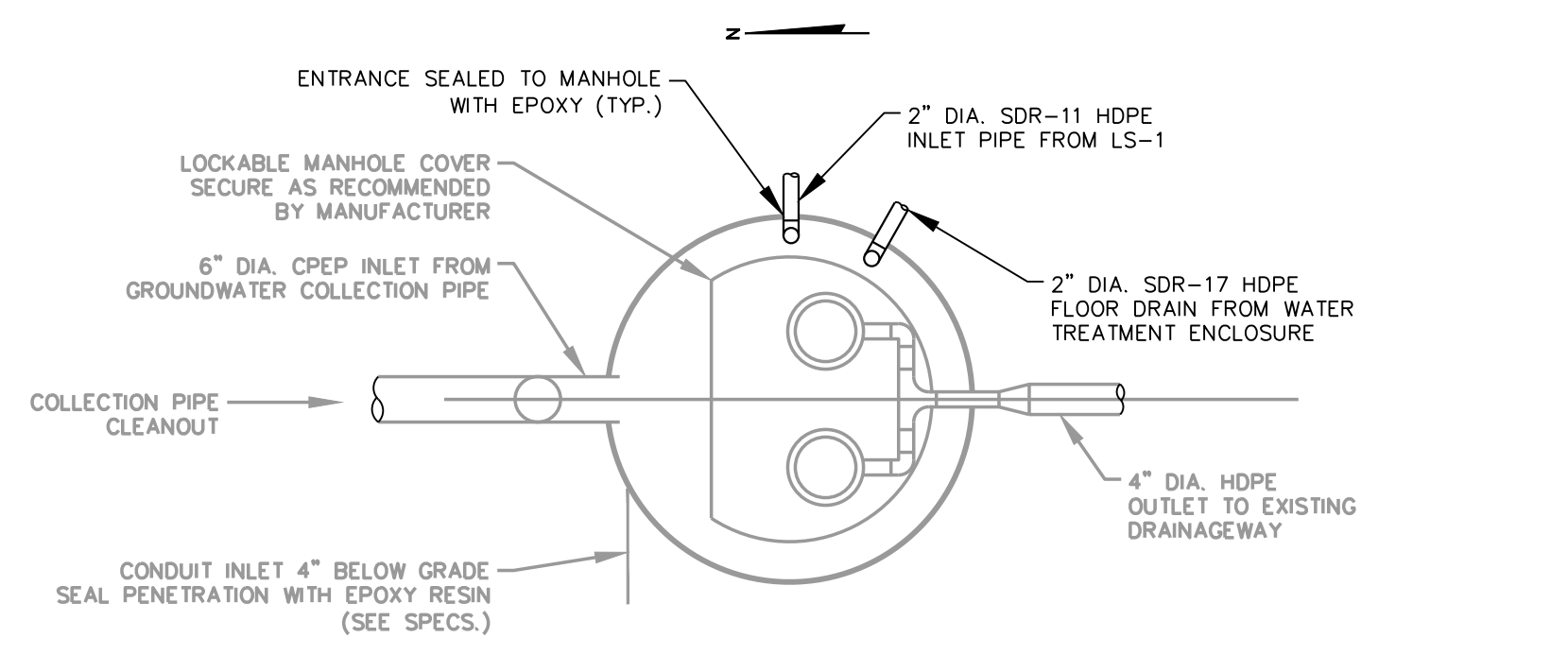
UNDERDRAIN VALVE MANHOLE (VMH-1) ELEVATION VIEW



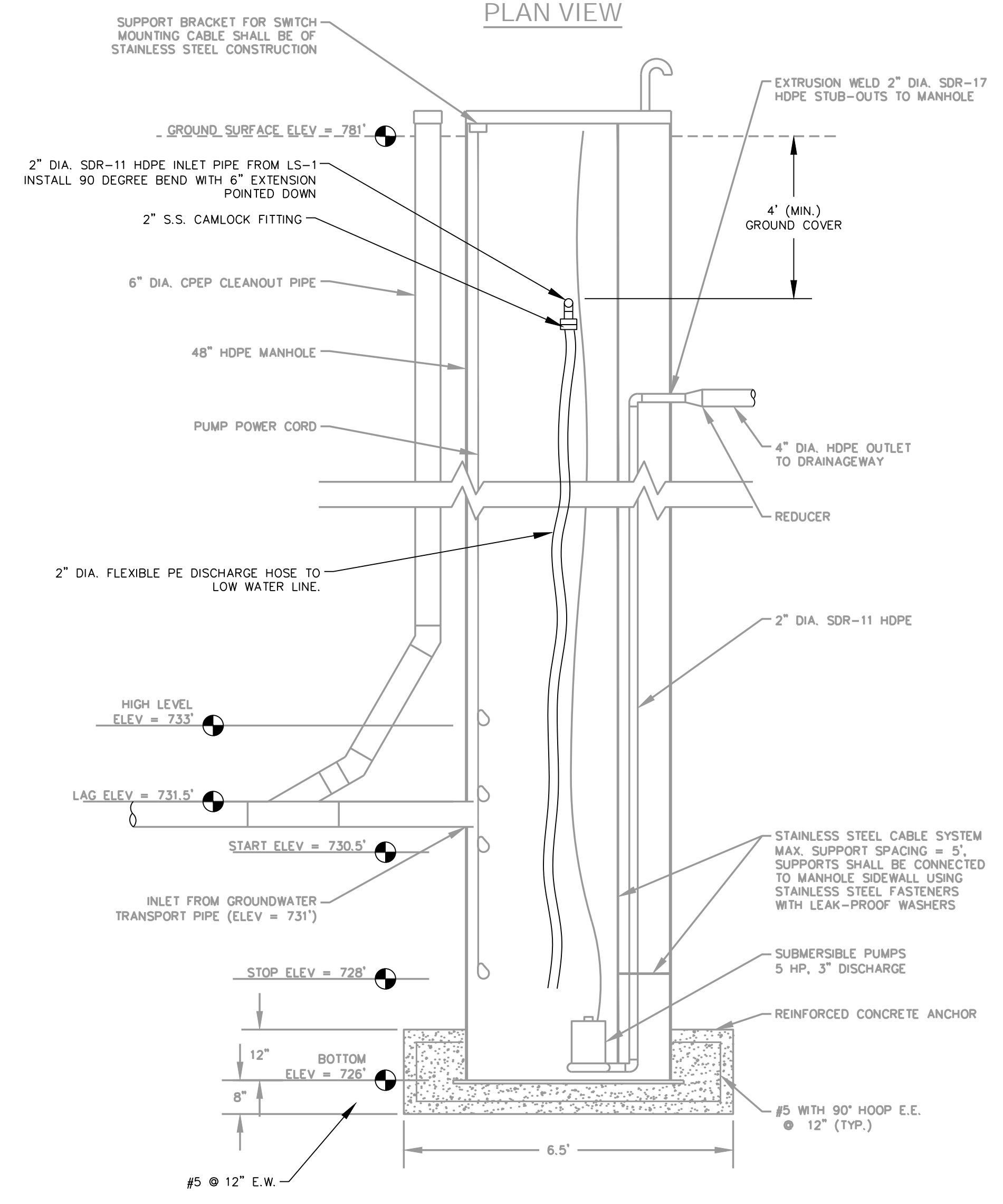
LEACHATE VALVE MANHOLE (LVMH-1) ELEVATION VIEW

- NOTES:
- STRUCTURES BACKFILLED IN MAX. 1-FT VERTICAL LIFTS.

2 VALVE MANHOLES (VMH-1 & LVMH-1)
NOT TO SCALE



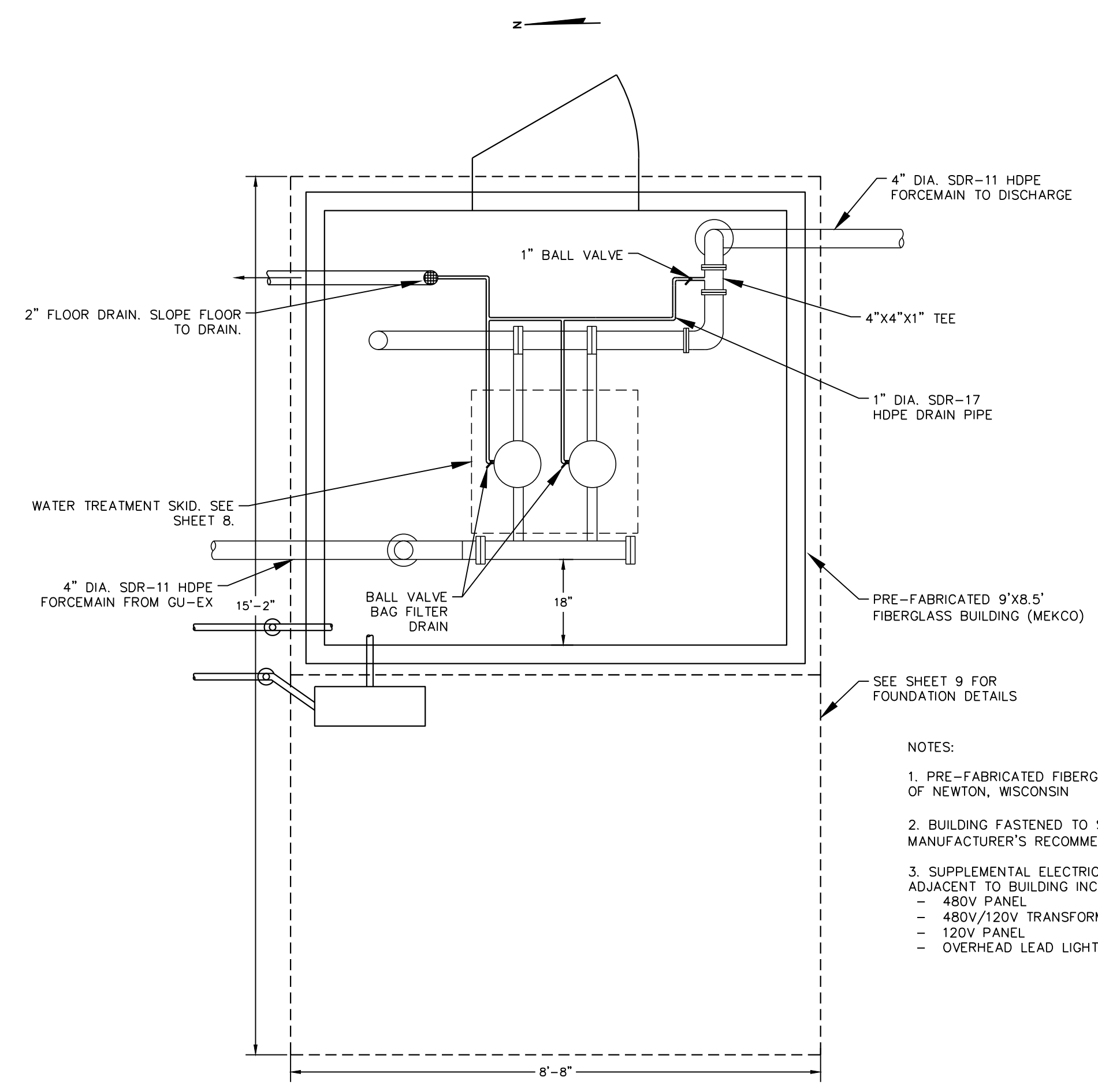
PLAN VIEW



ELEVATION VIEW

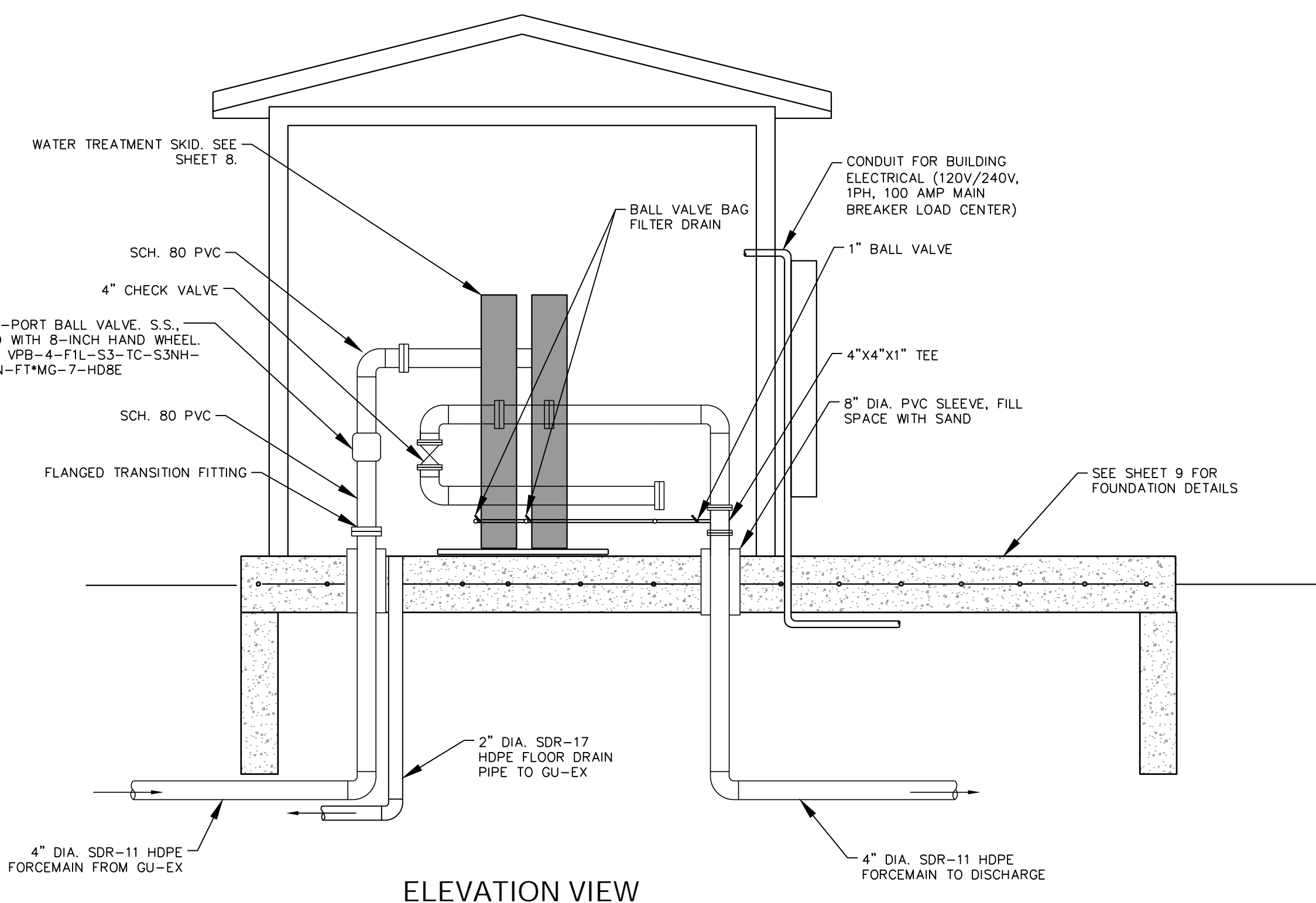
1
7

CONNECTION TO EXISTING GU-EX LIFT STATION
NOT TO SCALE



PLAN VIEW

- NOTES:
1. PRE-FABRICATED FIBERGLASS BUILDING MANUFACTURED BY MEKCO, INC. OF NEWTON, WISCONSIN
 2. BUILDING FASTENED TO SLAB WITH DRILLED $\frac{3}{8}$ " WEDGE ANCHORS PER MANUFACTURER'S RECOMMENDATIONS
 3. SUPPLEMENTAL ELECTRICAL EQUIPMENT INSTALLED ON FOUNDATION ADJACENT TO BUILDING INCLUDING THE FOLLOWING:
 - 480V PANEL
 - 480V/120V TRANSFORMER
 - 120V PANEL
 - OVERHEAD LEAD LIGHT

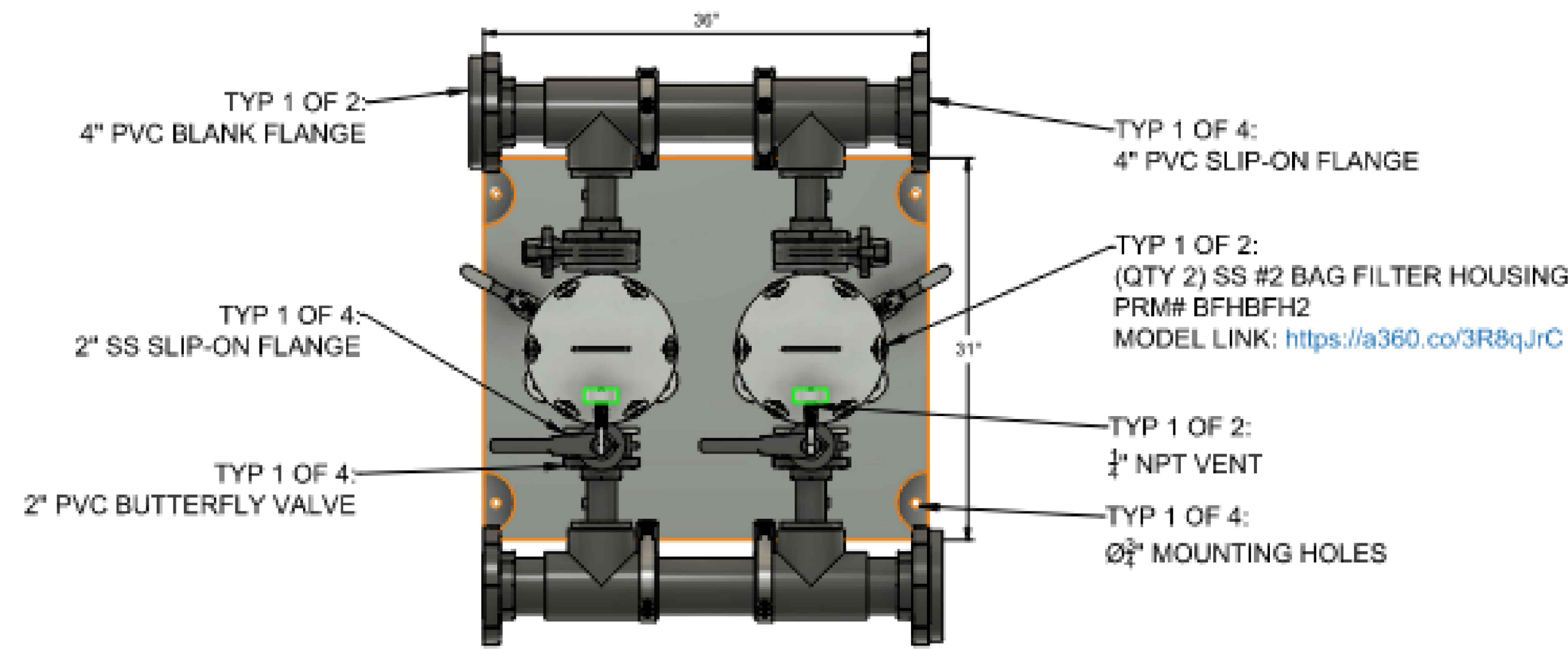


ELEVATION VIEW

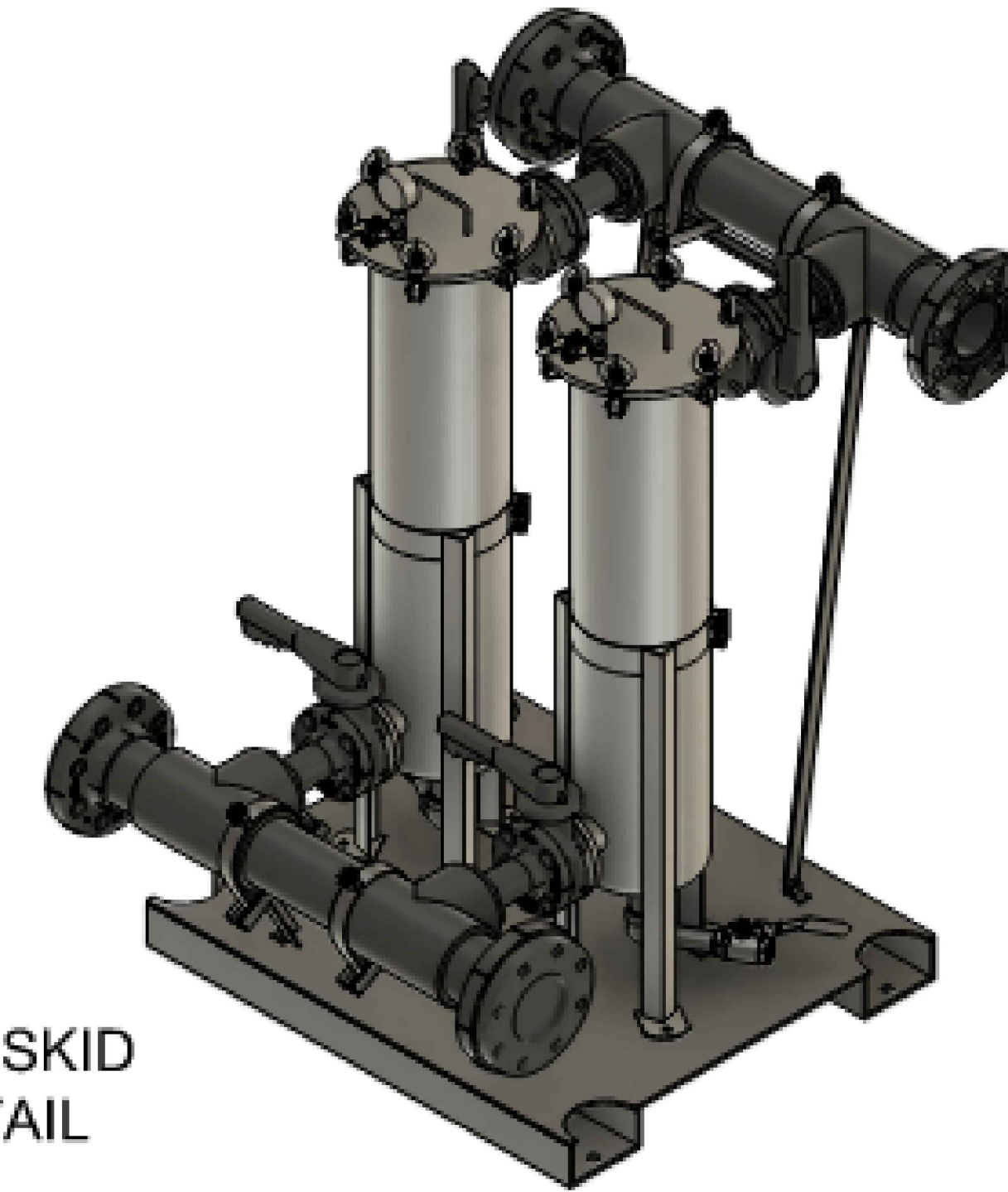
2
7

WATER TREATMENT ENCLOSURE
NOT TO SCALE

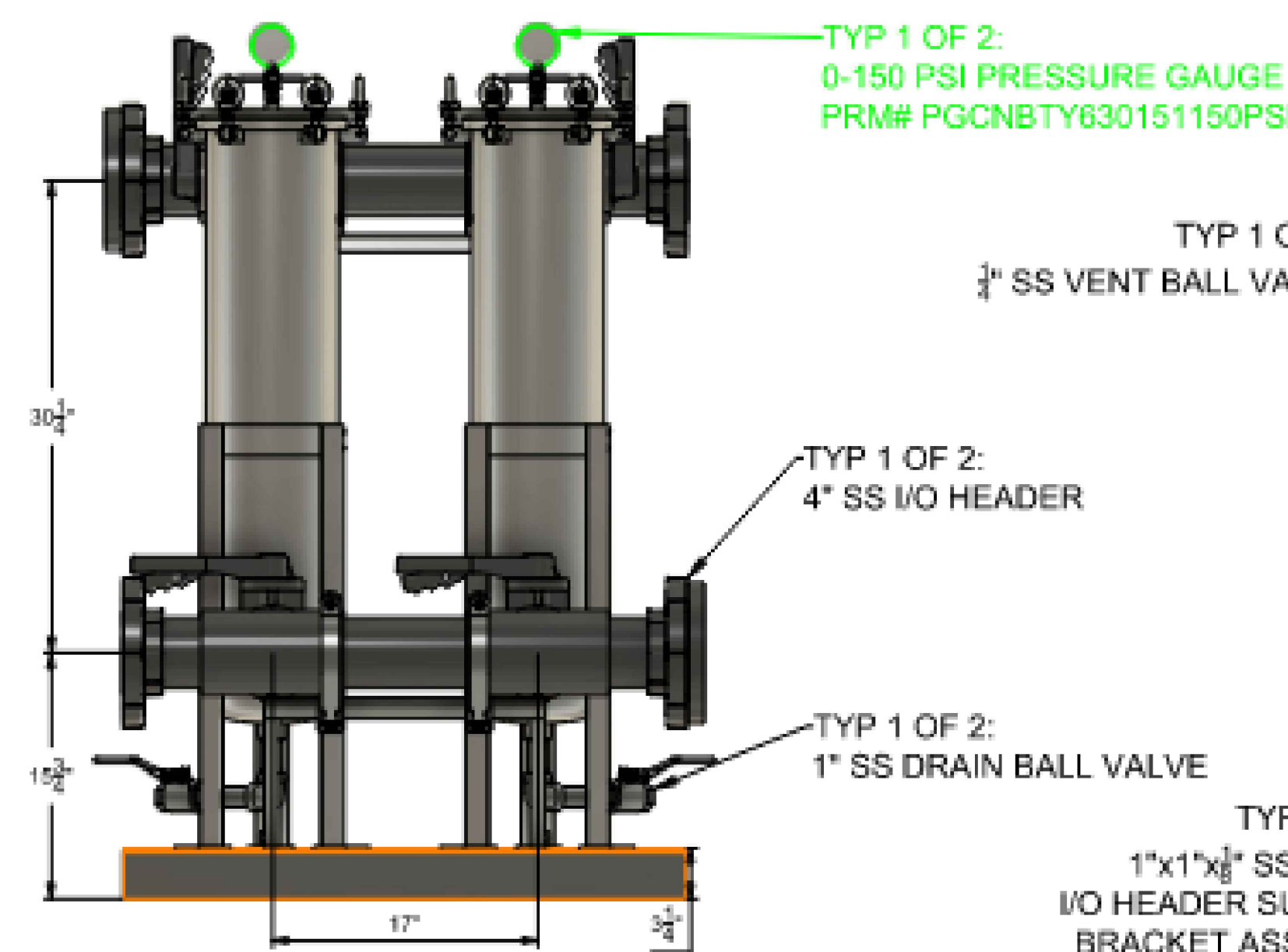
PVC HEADER DUAL BFH SKID PLAN DETAIL



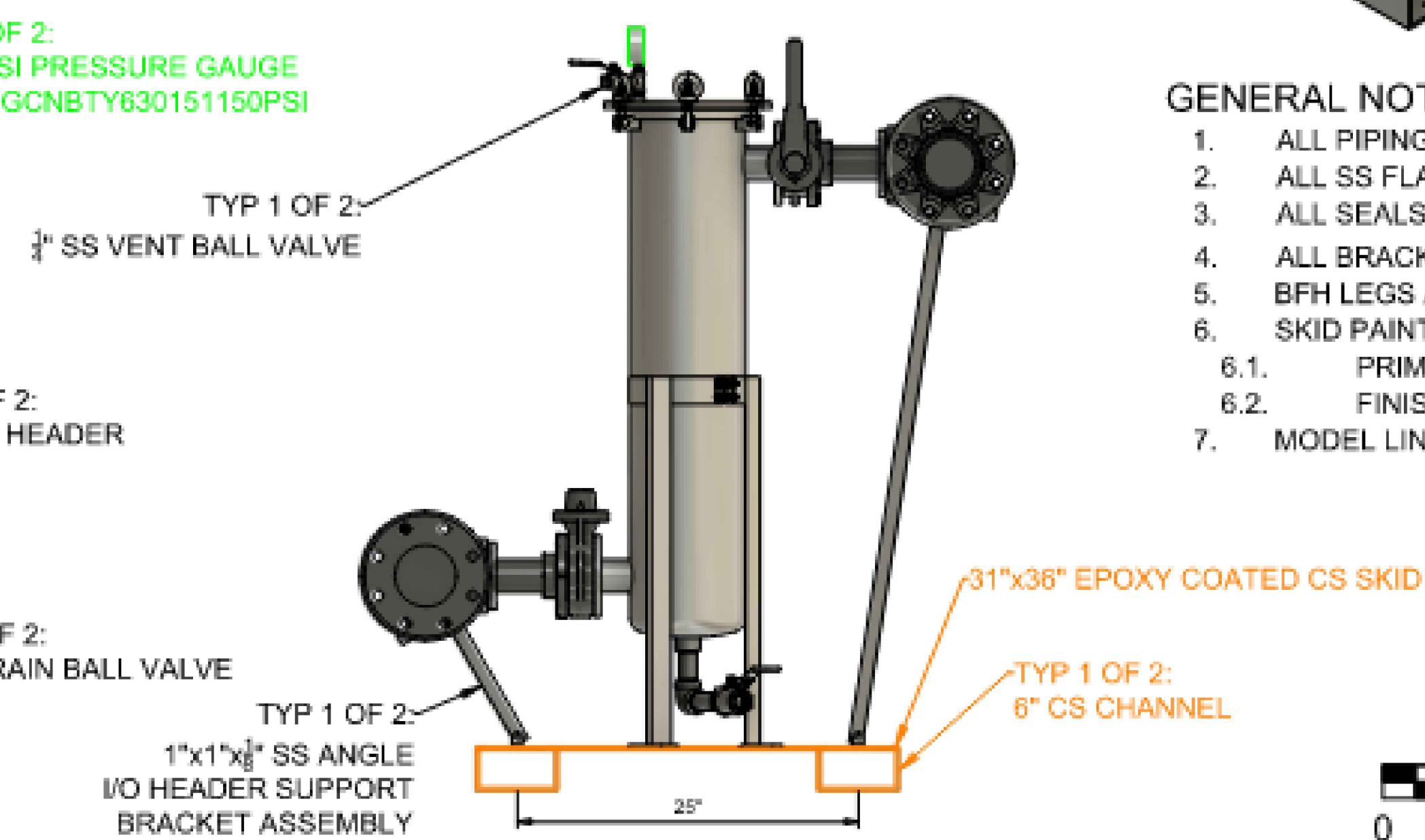
PVC HEADER DUAL BFH SKID ISOMETRIC DETAIL



PVC HEADER DUAL BFH SKID FRONT ELEVATION DETAIL



PVC HEADER DUAL BFH SKID RIGHT ELEVATION DETAIL



GENERAL NOTES:

1. ALL PIPING IS SCH-80 PVC
2. ALL SS FLANGES ARE SLIP-ON
3. ALL SEALS AND GASKETS ARE VITON
4. ALL BRACKETS BOLTED IN PLACE WITH 3/8" BOLTS
5. BFH LEGS ARE BOLTED TO SKID PLATE
6. SKID PAINT DETAILS:
 - 6.1. PRIMER: EPOXY PRIMER (HBE-400)
 - 6.2. FINISH: GRAY URETHANE FINISH (AUE-100)
7. MODEL LINK: <https://a360.ca/3VprWO3>

Scale (ft.)



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CLIENT: PRM

PROJECT TITLE:

SHEET TITLE:
BFSGX2HBFH2PVC - (QTY 2) #2
BAG FILTER HOUSING SKID

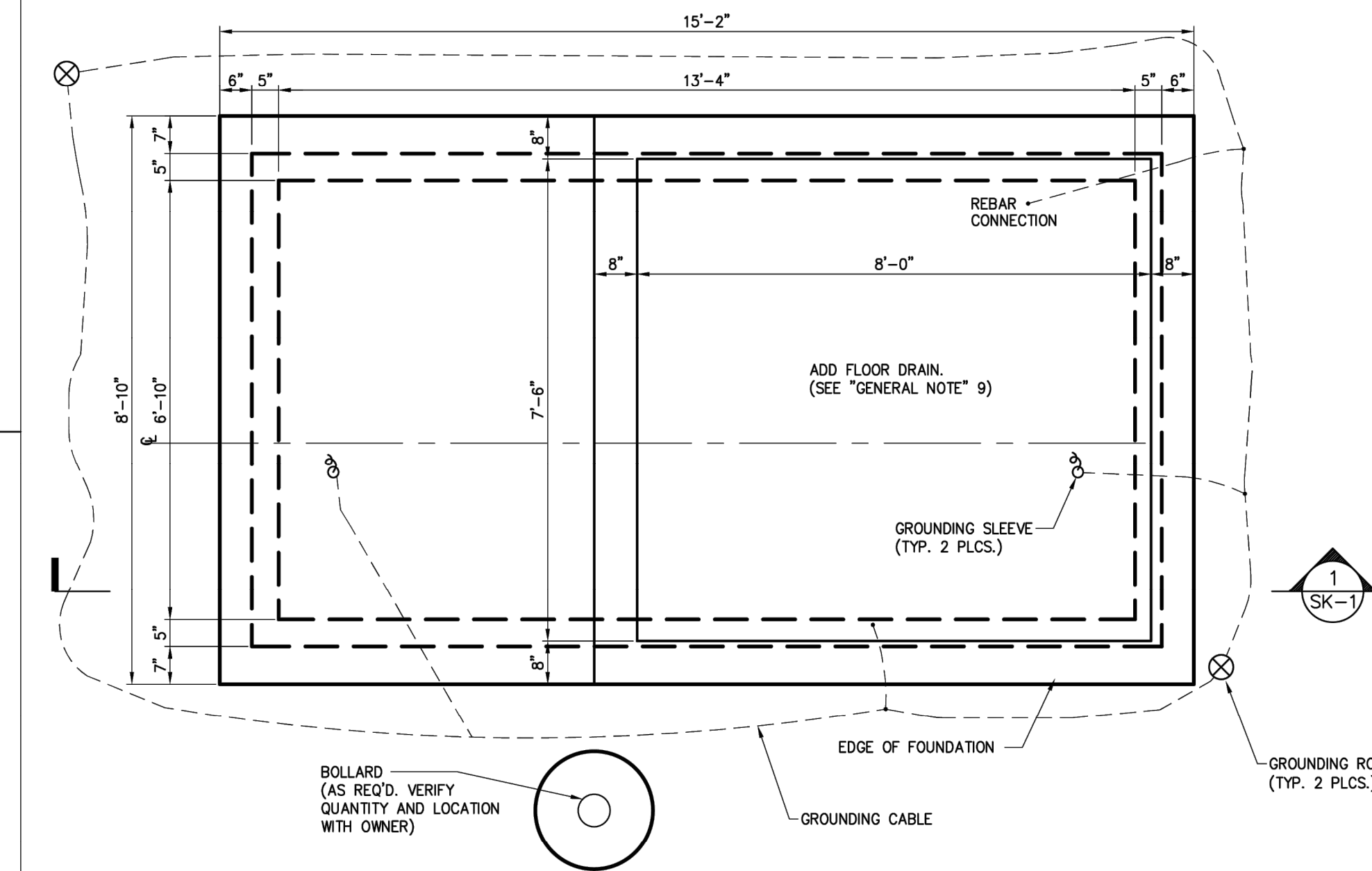
QUOTE NUMBER:
DATE: 03/14/2023

NO.	REVISION	DATE

DRAWING NUMBER:
M-1

1 WATER TREATMENT SKID DETAIL
8 NOT TO SCALE

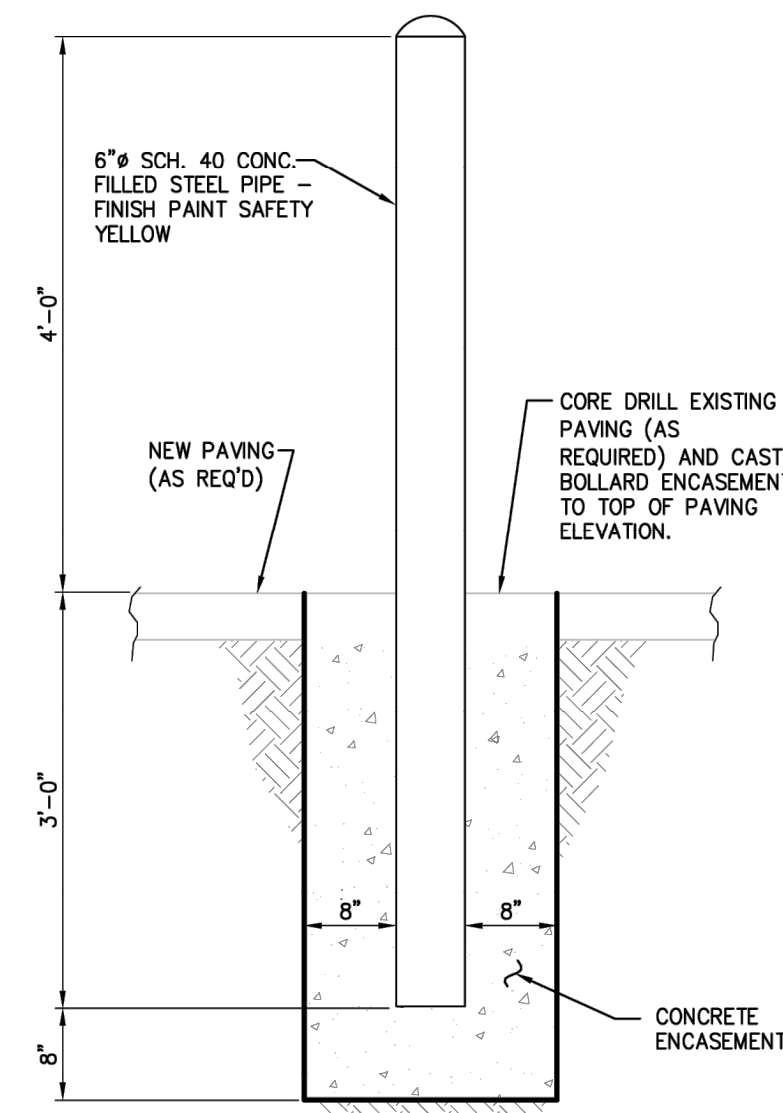
PROJECT NO. 25224149.00
 DRAWN BY: R7/MRS/RVC
 CHECKED BY: MRS
 DATE: 12/13/2025
 APPROVED BY: EAN 06/03/2026
 INTERSTATE POWER AND LIGHT COMPANY
 15300 130th STREET
 STUMBAK, ONT. L5G0T
 CLIENT: INTERSTATE POWER AND LIGHT COMPANY
 2830 DARY DRIVE MADISON, WI 53718-6791
 PHONE: (608) 224-2830
 ENGINEER: SCS ENGINEERS
 CONSTRUCTION DOCUMENTATION
 GROUNDWATER INVESTIGATION
 SYSTEM MODIFICATIONS
 OTTUMWA, MIDLAND, LANDELL
 SHEET: 8 of 9
 DETAILS



FOUNDATION PLAN-EL. 100'-0"

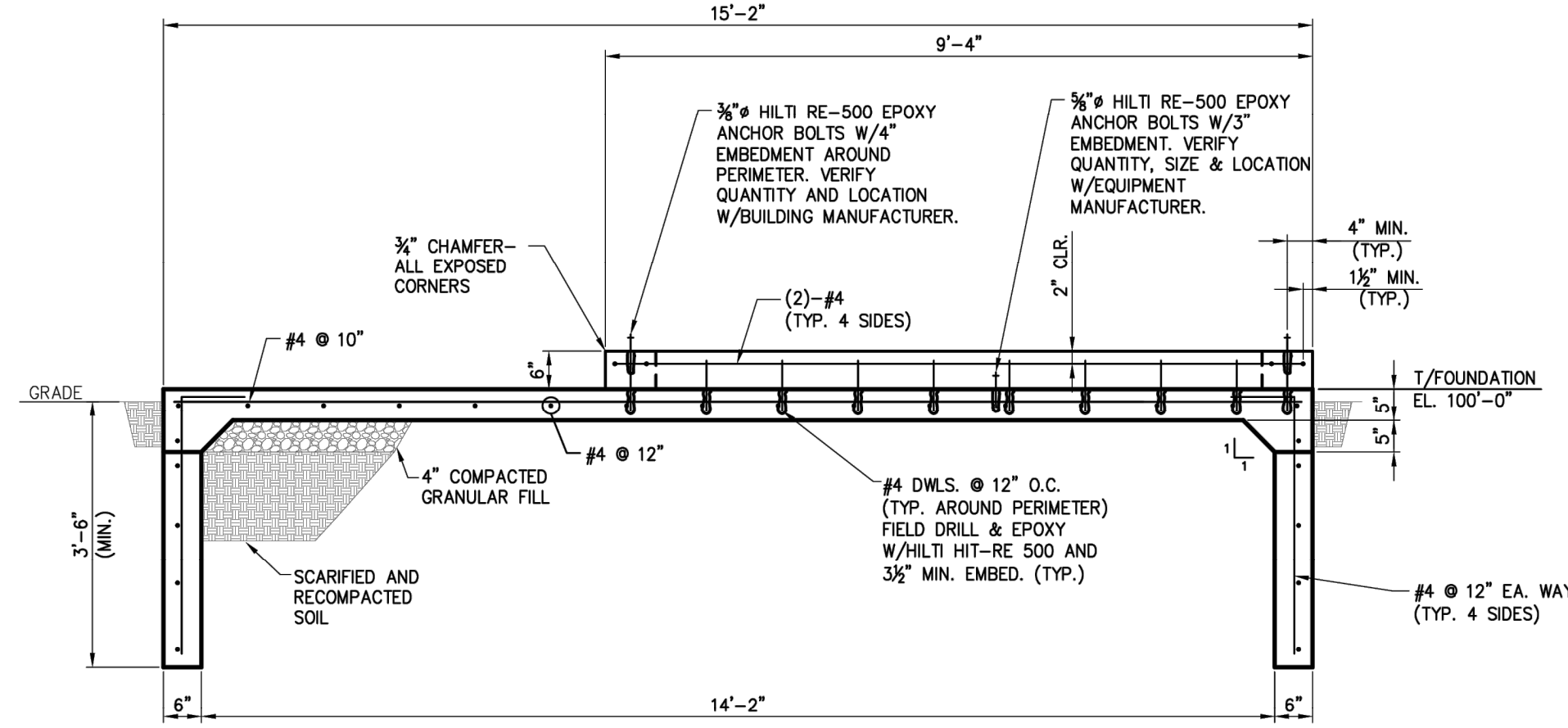
SCALE: 1/2" = 1'-0"

- NOTES:
- 1) ORIENTATION AND LOCATION OF FOUNDATION TO BE DETERMINED IN FIELD.
 - 2) POWER TO COME UP THRU THE SLAB. LOCATION TO BE SET BY CONTRACTOR.



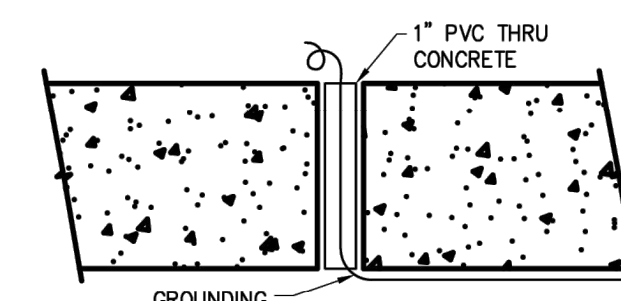
TYPICAL BOLLARD

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



SECTION 1

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



GROUNDING SLEEVE DETAIL

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

- NOTES:
- 1) VERIFY REQUIREMENTS WITH EQUIPMENT MANUFACTURER AND OWNER.
 - 2) TO BE LOCATED BY CONTRACTOR.

GROUNDING SPECIFICATIONS:

1. GROUND RODS:
 - a. COPPER-CLAD STEEL OR COPPER ALLOY RODS.
 - b. ONE END POINTED TO FACILITATE DRIVING INTO GROUND.
 - c. 3/4-INCH DIAMETER AND 10'-0" LENGTH.
 - d. DRIVE TO A DEPTH SUCH THAT TOP OF RODS WILL BE APPROXIMATELY 30" BELOW FINAL GRADE OR SUB-GRADE AND CONNECT TO THE BURIED GRID GROUND CONDUCTORS.
2. CONNECTION MATERIALS:
 - a. BURNDY "HYGROUND" COMPRESSION-TYPE CONNECTORS.
 - b. TYPE: "HYLUG (YHA) FOR BOLT ON APPLICATIONS.
 - c. TYPE: "C" HYTAP (YHC-C) CONNECTOR FOR JUMPER/TAILO CONNECTIONS.
 - d. TYPE: "B" HYTAP (YHB-C) CONNECTOR FOR GRID TO REBAR CONNECTIONS.
 - e. TYPE: GRIDLOK (YGLR-C) CONNECTOR FOR GRID TO GROUND ROD CONNECTIONS.
3. MAIN GRID GROUNDING CONDUCTOR SHALL BE BARE, MEDIUM SOFT DRAWN COPPER CABLES AT A DEPTH BELOW EARTH SURFACE FROST LEVEL BUT NOT LESS THAN 30" BELOW GRADE.
4. MAIN GROUND LOOP OR GRID, NO. 4/0 AWG MINIMUM.
5. GROUNDING CONNECTION SHALL BE MADE ONLY TO SURFACES THAT ARE CLEAN AND DRY. STEEL SURFACES SHALL BE CLEANED TO REMOVE SCALE, RUST, GREASE, PAINT AND DIRT. WHERE PAINT IS REMOVED FOR GROUNDING PURPOSES, IT SHALL BE REPAINTED AFTER THE CONNECTION IS MADE.
6. INSTALL NO. 2 AWG BONDING JUMPER/TAILS.
7. GROUND GRID SHALL CONNECT TO REBAR IN TWO (2) LOCATIONS.

DESIGN DATA:

1. DESIGN SOIL PRESSURE USED: 1500 PSF (ASSUMED)

GENERAL NOTES:

1. THE CONTRACTOR SHALL REVIEW AND VERIFY ALL DIMENSIONS.
2. ELEVATIONS GIVEN THUS (-3'-0") ARE TO BE THE TOP (UNLESS NOTED (U.N.)) OF BEAMS, COLUMNS, SLABS, LINTELS, ETC. WITH REFERENCE TO THE FINISH FLOOR LINE = (100'-0").
3. CONTRACTOR SHALL COORDINATE WORK SCHEDULES WITH THE OWNER TO ESTABLISH CONSTRUCTION SEQUENCING OF OCCUPIED AREA. CONTRACTOR SHALL NOT PROCEED TO OCCUPIED AREAS UNTIL AUTHORIZED BY OWNER.
4. CONTRACTOR TO VERIFY UNDERGROUND UTILITY LOCATIONS PRIOR TO EXCAVATION WORK AND PAVING REMOVAL. CARE SHALL BE TAKEN TO AVOID DAMAGE TO ANY UNDERGROUND UTILITY.
5. REMOVE THE SUBGRADE AND UNDERLYING SOIL TO A SUFFICIENT DEPTH FOR NEW CONSTRUCTION WHERE APPLICABLE.
6. COMPACT SUBGRADE SURFACES TO THE DENSITY REQUIREMENTS FOR BACKFILL MATERIAL.
7. BEFORE STARTING BACKFILL WORK, REMOVE FORMING DEBRIS, WOOD, WATER, ICE, SNOW AND FROZEN SOIL.
8. IF CONTRACTOR ENCOUNTERS CONDITIONS CONTRARY TO THE DRAWINGS THEY SHALL INFORM THE OWNER OR HIS REPRESENTATIVE OF THE DISCREPANCY.
9. CONTRACTOR TO ADD 1/2" SLOPE TO FLOOR. SLOPE TO WATTS FLOOR DRAIN ITEM 1WX3 MODEL FD-104 BY GRANGER. FIELD LOCATE AND PIPE AWAY FROM SLAB.

GENERAL CONCRETE NOTES:

1. DESIGN, MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE FOLLOWING STANDARDS UNLESS OTHERWISE MODIFIED ON THE DESIGN DRAWINGS OR IN THE SPECIFICATIONS:
 - ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE"
 - ACI 315, "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT"
 - ACI 301, "SPECS. FOR STRUCTURAL CONCRETE FOR DETAILING"
 - CRSI, "RECOMMENDED PRACTICES FOR PLACING REINFORCING BARS"
2. CONCRETE SHALL DEVELOP 4000 PSI COMPRESSIVE STRENGTH IN 28 DAYS (U.N.).
3. REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-185 (FLAT SHEETS ONLY).
4. PROVIDE A MINIMUM CLEAR COVER OF 3 INCHES FOR REINFORCING STEEL WHEN CONCRETE IS CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH.
5. PROVIDE A MINIMUM CLEAR COVER OF 2 INCHES FOR BARS LARGER THAN #5, AND 1 1/2 INCHES FOR #5 BARS AND SMALLER IF AFTER REMOVAL OF FORMS THE CONCRETE IS EXPOSED TO WEATHER OR EARTH.
6. PROVIDE A MINIMUM CLEAR COVER ~~WITH NOT EXPOSED TO WEATHER OR EARTH~~ FOR #4 & #8 SLABS AND WALLS: 1 1/2" BEAMS, COLUMNS, AND PIERS:
7. EMBEDMENT AND LAP SPlice LENGTHS FOR REINFORCING STEEL SHALL CONFORM TO ACI 318, UNLESS SHOWN ON THE DESIGN DRAWINGS. BARS SHOULD CONTINUE AT SIZE AND SPACING IN CORNERS.
8. ALL EXPOSED EDGES OF CONCRETE SHALL HAVE 1/2" RADIUS TROWEL FINISH.
9. FOUNDATION TO HAVE BROOM FINISH.

ISSUED AS "AS BUILTS"

BY: TOM KAZMIERCZAK

DATE: 3/4/26

REVISION: 0

LICENSED PROFESSIONAL ENGINEER

THOMAS A. KAZMIERCZAK

18811

IOWA

I HEREBY CERTIFY THAT THE PORTION OF THIS TECHNICAL SUBMISSION DESCRIBED BELOW WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION. I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

SIGNATURE: THOMAS A. KAZMIERCZAK

NAME: THOMAS A. KAZMIERCZAK

DATE: 3-4-26

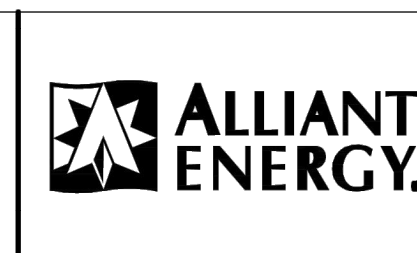
LICENSE RENEWAL DATE: DEC. 31, 2026

PAGES OR DIVISIONS COVERED BY THIS CERTIFICATION: THIS SHEET ONLY

NO.	DATE	REVISION	BY	CHK'D BY
0	3/4/26	ISSUED AS "AS BUILTS"	TK	TK

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CONCRETE AND GROUNDING CONCRETE PAD
OUTFALL REROUTE BUILDING PAD

Scale: NTS

SK-1-6-26-25

Appendix A

Correspondence

From: Rath, Brian <brian.rath@dnr.iowa.gov>
Sent: Friday, October 3, 2025 3:13 PM
To: Bizjack, Matthew
Cc: Wilkey, Matt; Maxted, Jeffrey; Ashmore, Zachary; Lamb, Martin (Danny);
Loehr, Matt; Nelson, Eric
Subject: Re: Re: Re: IPL Ottumwa Midland Landfill (#90-SDP-8-92P) - Permit
Amendment Request for Underdrain Routing

Categories: Filed by Newforma

This email originated from outside of SCS Engineers. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Matt - As we discussed, the DNR's solid waste section concurs with your plan to manage underdrain water and leachate in the leachate management pond. Have a good weekend.

Brian

Brian Rath, P.E.
Environmental Engineer Senior
Solid Waste and Contaminated Sites Section
Iowa Department of Natural Resources
6200 Park Ave, Suite 200
Des Moines, IA 50321
515-537-4051
brian.rath@dnr.iowa.gov
www.iowadnr.gov



On Fri, Oct 3, 2025 at 1:37 PM Bizjack, Matthew <MatthewBizjack@alliantenergy.com> wrote:

Hi Brian,

Thanks for chatting with me today about the underdrain at OML. As we discussed, IPL continues to seek permit coverage to discharge underdrain water through the NPDES and wastewater construction groups at IDNR. In the meantime, IPL continues to haul underdrain water and leachate to the City POTW.

As we look towards means of making this water management simpler with coming freezing weather, IPL will begin managing underdrain water along with leachate in the existing onsite leachate management pond. Inflows of each waste stream into the pond will be tracked for reporting to the City POTW. Based on observed flows, there is sufficient room in the leachate management pond to accommodate both leachate and underdrain flows for this interim management period.

IPL requests your concurrence with the plan to manage underdrain water and leachate in the leachate management pond until an individual NPDES permit is finalized for the site. Please give me a call at the number below if you have any questions or concerns with this plan.

Thanks,

Matt Bizjack | Senior Environmental Specialist

Alliant Energy

Office: (608) 458-3197

From: Rath, Brian <brian.rath@dnr.iowa.gov>
Sent: Monday, August 25, 2025 4:06 PM
To: Maxted, Jeffrey <JeffreyMaxted@alliantenergy.com>
Cc: Bizjack, Matthew <MatthewBizjack@alliantenergy.com>; Wilkey, Matt <MattWilkey@alliantenergy.com>; Ashmore, Zachary <ZacharyAshmore@alliantenergy.com>; Lamb, Martin (Danny) <DannyLamb@alliantenergy.com>; Loehr, Matt <MattLoehr@alliantenergy.com>; Nelson, Eric <enelson@scsengineers.com>; Nathi, Emmanuel <emmanuel.nathi@dnr.iowa.gov>; Jolly, Becky [DNR] <becky.jolly@dnr.iowa.gov>
Subject: [EXTERNAL] Re: Re: IPL Ottumwa Midland Landfill (#90-SDP-8-92P) - Permit Amendment Request for Underdrain Routing

Jeff - Thank you. We have no comments on the provided drawings.

Becky - Please place the drawings in the file, note that these address our request for revisions in our 8/14/25 email, and mark as RWNAR on my worklist.

Thanks,

Brian

Brian Rath, P.E.

Environmental Engineer Senior

Solid Waste and Contaminated Sites Section

Iowa Department of Natural Resources

6200 Park Ave, Suite 200

Des Moines, IA 50321

515-537-4051

brian.rath@dnr.iowa.gov

www.iowadnr.gov



On Mon, Aug 25, 2025 at 3:49 PM Maxted, Jeffrey <JeffreyMaxted@alliantenergy.com> wrote:

Hi Brian,

Please see the attached drawing set in response to the first condition listed in the Department's approval email on August 14, 2025. Also, please note two minor amendments in this version of the drawing set, in addition to the revisions requested by the Department:

1. Sheets 3, 4 – Added a drain line from the underdrain water treatment enclosure back to the GU-EX lift station for ease of maintenance (i.e. draining vessels) on filter bag changeout.

2. Sheet 6, Detail 2 – We would like to add an automated isolation valve and manhole to the parallel leachate line to supplement the existing manual isolation valve upstream. This would mimic the work scope of the parallel GU-EX underdrain and both lines could be completed during the same excavation.

Please let us know if you have any questions or concerns with the revised figures.

Thank you,

Jeff

Jeff Maxted | Manager – Environmental Services & Corporate Sustainability

Pronouns: He/him/his

Alliant Energy

4902 N Biltmore Lane | Madison, WI 53718

Office: (608) 458-3853

alliantenergy.com | jeffreymaxted@alliantenergy.com

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From: Rath, Brian <brian.rath@dnr.iowa.gov>

Sent: Thursday, August 14, 2025 3:47 PM

To: Maxted, Jeffrey <JeffreyMaxted@alliantenergy.com>

Cc: Bizjack, Matthew <MatthewBizjack@alliantenergy.com>; Wilkey, Matt <MattWilkey@alliantenergy.com>; Ashmore, Zachary <ZacharyAshmore@alliantenergy.com>; Lamb, Martin (Danny) <DannyLamb@alliantenergy.com>; Loehr, Matt <MattLoehr@alliantenergy.com>; Nelson, Eric <enelson@scsengineers.com>; Nathi, Emmanuel <emmanuel.nathi@dnr.iowa.gov>; Jolly, Becky [DNR] <becky.jolly@dnr.iowa.gov>

Subject: [EXTERNAL] Re: IPL Ottumwa Midland Landfill (#90-SDP-8-92P) - Permit Amendment Request for Underdrain Routing

Jeff,

This email is for conditional approval of your request to construct as outlined in your submittal. The conditions are as follows:

- Please revise Sheets 3 and 4 to show the existing groundwater underdrain piping for GU-1 as it only shows the rock protection for the outfall.
- Within 45 days of completion of construction, please submit a construction observation report documenting that the system was constructed in general accordance with approved documents.

Meanwhile, please let me know if you have any questions.

Thanks,

Brian

Brian Rath, P.E.

Environmental Engineer Senior

Solid Waste and Contaminated Sites Section

Iowa Department of Natural Resources

6200 Park Ave, Suite 200

Des Moines, IA 50321

515-537-4051

brian.rath@dnr.iowa.gov

www.iowadnr.gov



On Thu, Aug 14, 2025 at 2:10 PM Maxted, Jeffrey <JeffreyMaxted@alliantenergy.com> wrote:

Hi Brian,

Please see the attached request to amend Permit #90-SDP-8-92P for the Ottumwa Midland Landfill. We are requesting that the attached document be incorporated into the permit documents as a new item within Special Provision X.2.

We respectfully request an expedited review of this information. Our contractors have indicated they will be ready to mobilize as early as August 25, 2025.

Thank you in advance for your review of this information. If you have any questions or concerns, please don't hesitate to give me a call.

Regards,

Jeff

Jeff Maxted | Manager – Environmental Services & Corporate Sustainability

Pronouns: He/him/his


Alliant Energy

4902 N Biltmore Lane | Madison, WI 53718

Office: (608) 458-3853

alliantenergy.com | jeffreymaxted@alliantenergy.com

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Appendix B
Photographic Documentation

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 1: Force main trench along north side of 130th Street..

Date: 9/11/25

Direction: Looking southwest

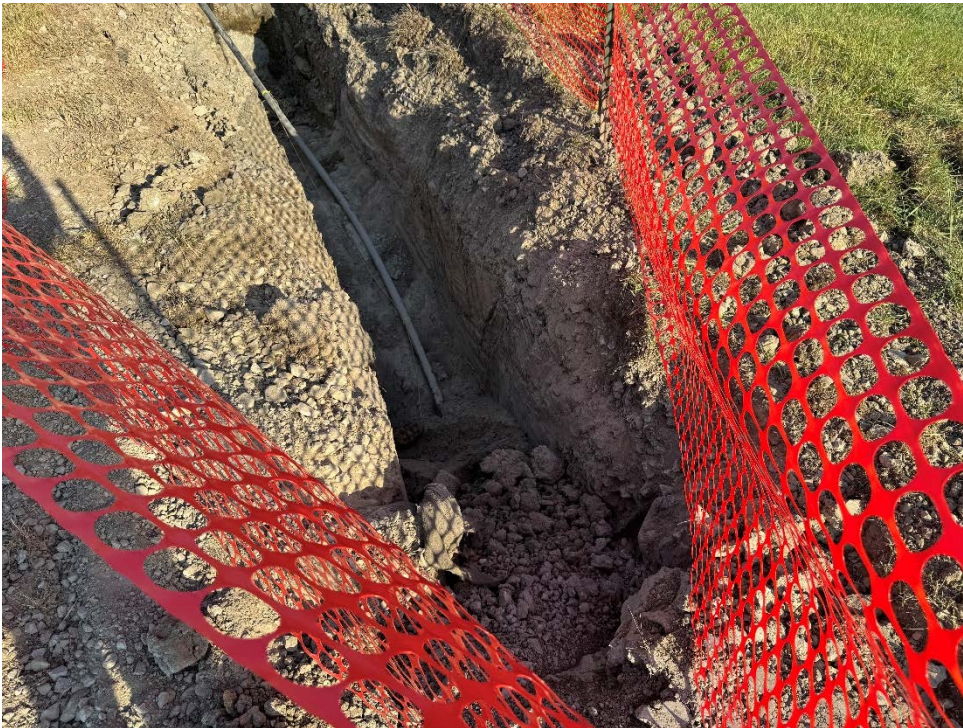


Photo 2: Force main installation in trench with tracer wire.

Date: 9/11/25

Direction: Looking northeast

**IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00**



Photo 3: Fusion welding force main pipe.

Date: 9/11/25

Direction: South



Photo 4: Force main trench backfilling and grading.

Date: 9/11/25

Direction: West

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 5: Treatment building floor drain piping to GU-EX.

Date: 9/11/25

Direction: West



Photo 6: Force main pipe installation west of landfill haul road.

Date: 9/11/25

Direction: West

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 7: Valve manhole (VMH-1) installation north of Sedimentation Pond. Exposed leachate transfer pipe in foreground.

Date: 9/18/25

Direction: Looking southeast



Photo 8: Air/vacuum release valve manhole and force main installation in trench with tracer wire.

Date: 9/18/25

Direction: Looking north

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 9: Air/vacuum release manhole and cleanout installation.

Date: 9/25/25

Direction: Looking northwest



Photo 10: Force main fusion welding in the north section.

Date: 9/25/25

Direction: Looking west

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 11: Foundation excavation for the Filter Bag Building.

Date: 9/25/25

Direction: West



Photo 12: Rebar caging installation in footing for treatment building.

Date: 9/25/25

Direction: Northeast

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 13: Finished rebar installation treatment building foundation.

Date: 9/25/25

Direction: South



Photo 14: Finished rebar installation treatment building foundation.

Date: 9/25/25

Direction: South

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 15: Leachate valve manhole, LVMH-1 manhole installation north of sedimentation pond.

Date: 10/02/25

Direction: Looking west



Photo 16: Valve manhole area backfilling and compacting.

Date: 10/02/25

Direction: Looking north

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 17: Concrete pad and curbs installed for treatment building foundation.

Date: 10/02/25

Direction: Southwest



Photo 18: Valve manhole installation.

Date: 10/02/25

Direction: East

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 19: North Lift Station, LS-1 installation.

Date: 10/09/25

Direction: Looking north



Photo 20: Pump installation in North Lift Station, LS-1.

Date: 10/09/25

Direction: Looking east

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 21: Cleanout and force main installation at discharge from North Lift Station, LS-1.

Date: 10/09/25

Direction: South



Photo 22: Interior of LS-1 prior to pump installation.

Date: 10/09/25

Direction: N/A

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 23: Completed foundation for treatment building.

Date: 10/09/25

Direction: West



Photo 24: Installation of gate valves on inlet piping to LS-1.

Date: 10/09/25

Direction: West

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 25: Installation of Treatment Building.

Date: 10/16/25

Direction: Looking south



Photo 26: Installation of Treatment Building.

Date: 10/16/25

Direction: Looking north

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 27: Filter bag skid installed in Treatment Building.

Date: 10/16/25

Direction: Looking west



Photo 28: Piping installation in Treatment Building.

Date: 10/16/25

Direction: Looking west

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 29: Installation of electrical to the Treatment Building

Date: 10/23/25

Direction: Looking east



Photo 30: Completion of valve manholes, VMH-1 & LVMH-1.

Date: 10/23/25

Direction: Looking south

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 31: Final grading and seeding near Treatment Building.

Date: 11/18/25

Direction: Looking east

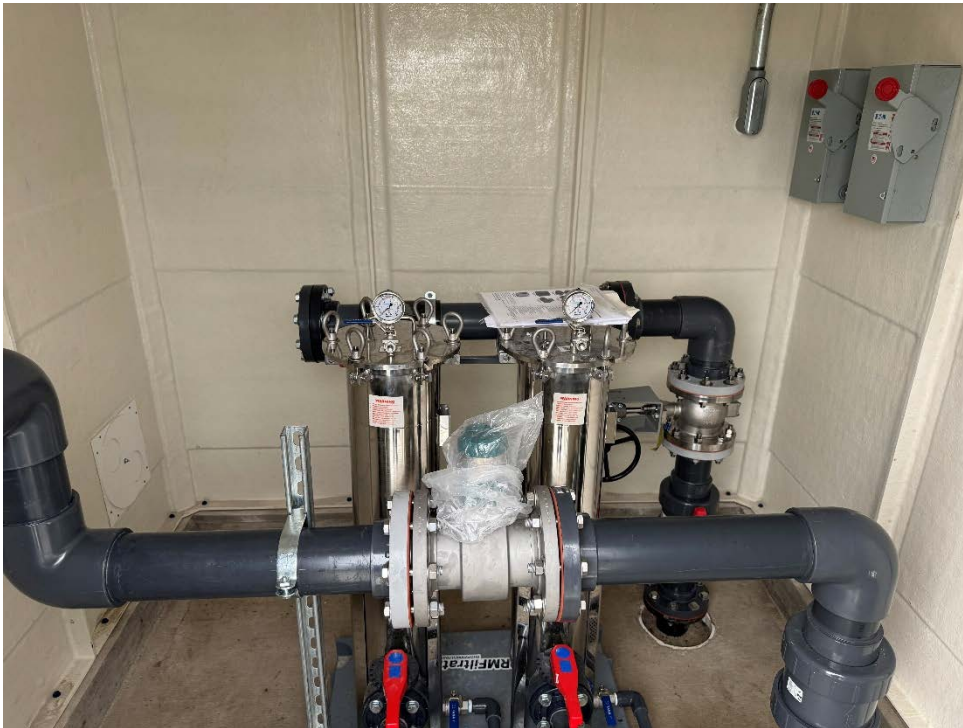


Photo 32: Completed interior of Treatment Building

Date: 11/18/25

Direction: Looking west

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 33: Final grading and seeding around valve manholes area.

Date: 11/18/25

Direction: Looking northwest



Photo 34: Final grading and seeding along west force main route.

Date: 11/18/25

Direction: Looking north

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 35: North Lift Station, LS-1 final grading and restoration.

Date: 11/18/25

Direction: Looking west

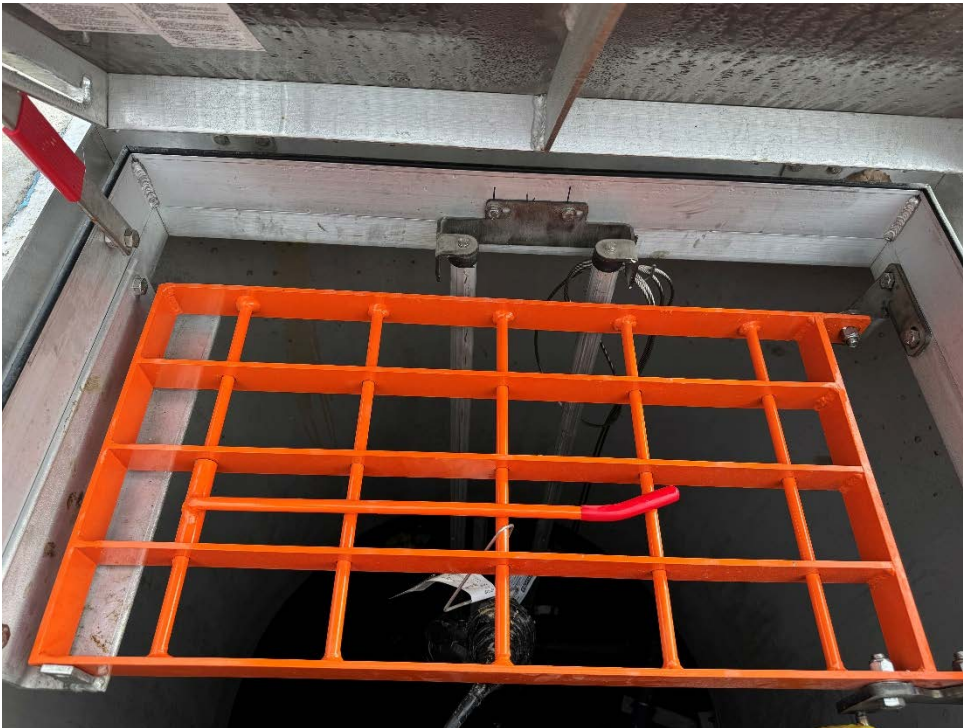


Photo 36: Safety grate in LS-1 hatch.

Date: 11/18/25

Direction: N/A

IPL – Ottumwa Midland Landfill
Underdrain Management System Installation
SCS Engineers Project #25224149.00



Photo 37: Completed air/vacuum release manhole.

Date: 11/18/25


Direction: N/A



Photo 38: Discharge area final grading and seeding.

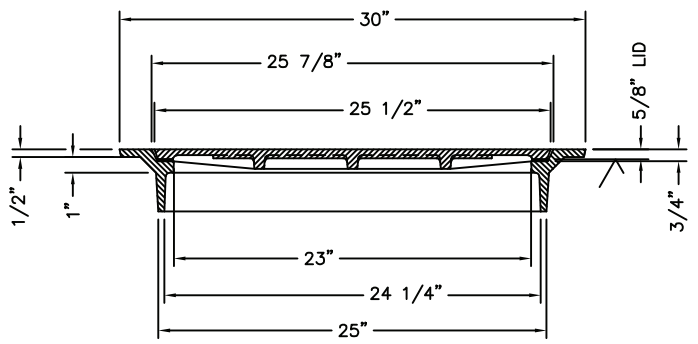
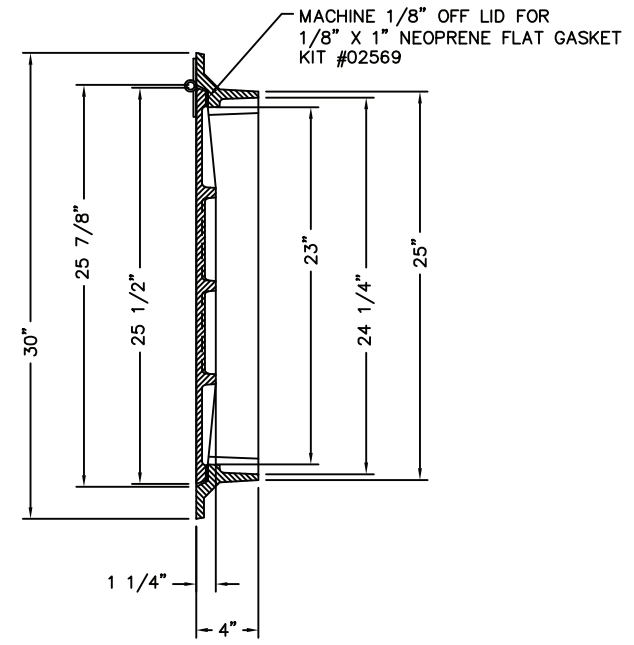
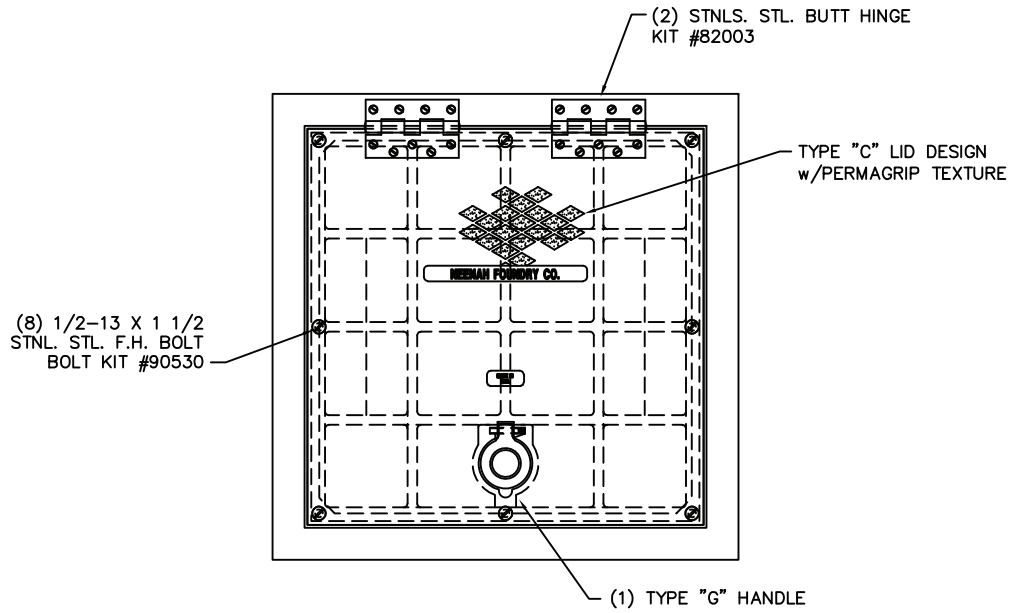
Date: 11/18/25

Direction: Looking northeast



Appendix C
Manhole Manufacturer's Information

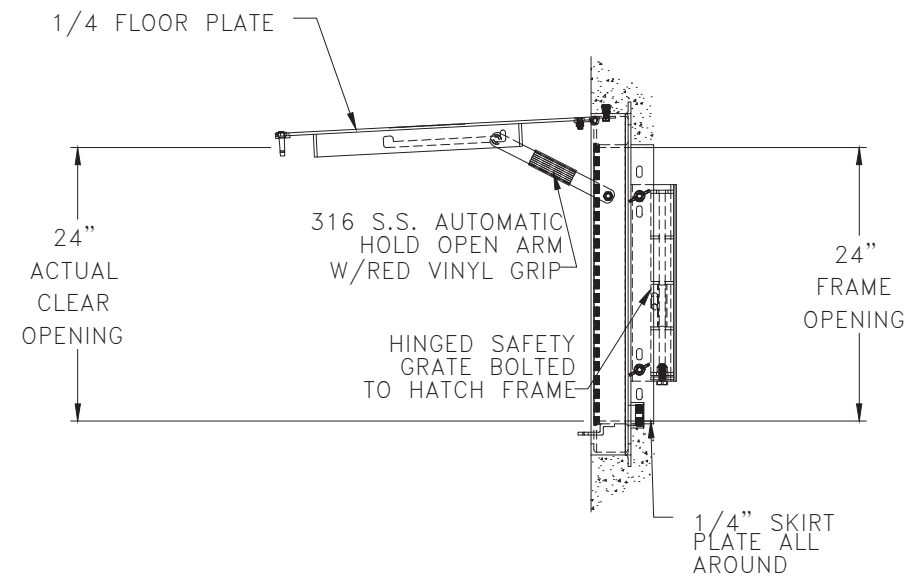
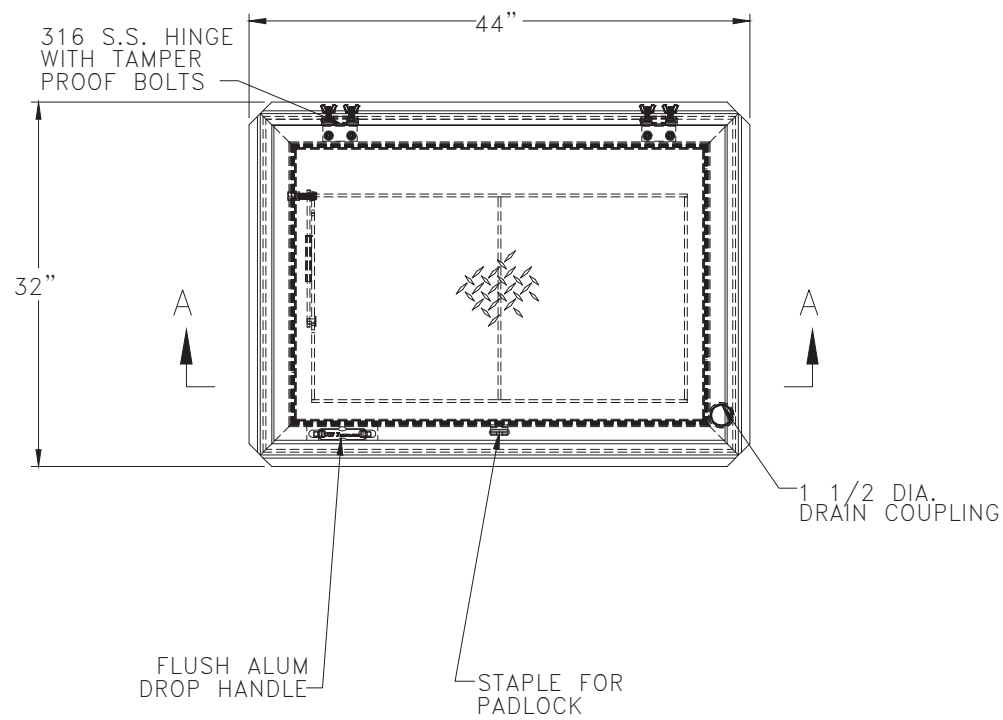
DRAWING CONTROL: CONTROLLED DRAWINGS ON NFCO SERVER. ALL OTHER COPIES, ELECTRONIC OR PRINTED ARE FOR REFERENCE ONLY



- NOTES:
- ALL DIMENSIONS SHOWN ARE IN ENGLISH.
 - COMPONENT NO.'S: FRAME 6665-0003, LID 6660-0023
 - FRAME EQUIPMENT NO'S: D99999779, K99999778
 - LID EQUIPMENT NO'S: D99999443, K99999220
 - MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
 - FINISH: NO PAINT
 - WEIGHT: FRAME ≈96#, LID ≈126#

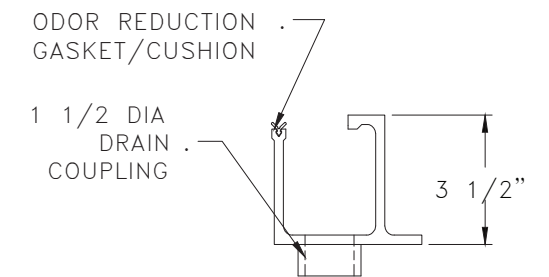
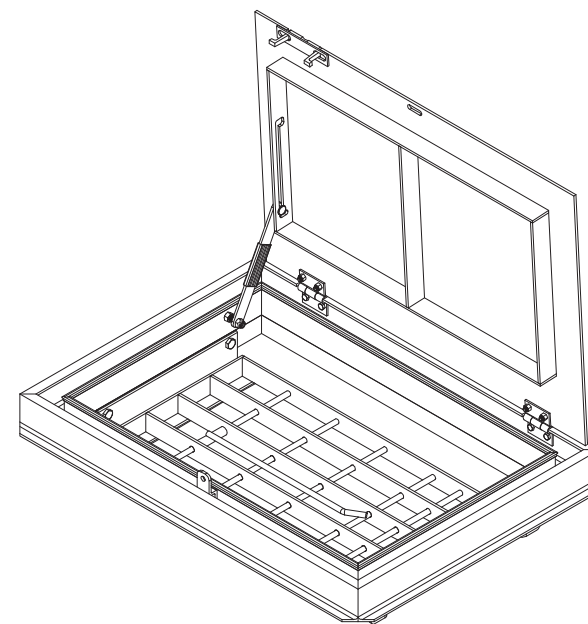
DR. E. NIVER	SCALE 1/8"=1"	TITLE: R-6665-OKH
CH. RKB		FRAME WITH BOLTED AND GASKETED LID
APP. HSH	NEENAH FOUNDRY NEENAH WISCONSIN 54956 PHONE 800-558-5075 LINCOLN, NEBRASKA 68529 PHONE 800-234-7466	
DATE 09-25-2020		
www.nfco.com		NF-6665130

REV	DATE	DESCRIPTION	DR	CHK	APP



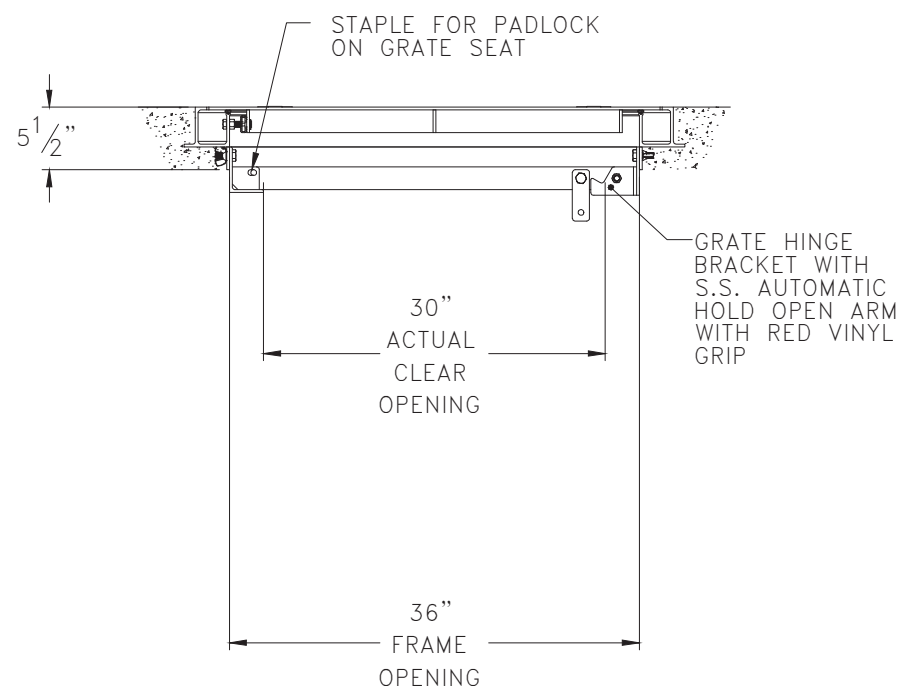
- OPTIONS:
- 1-EXTERIOR STAPLE
 - 2-ODOR REDUCTION GASKET
 - 3-SINGLE SAFETY GRATE COLOR ORANGE
 - 4-MILL FINISH
 - 5-2" FRAME EXTENSION REQUIRED
 - 6-***SAFETY GRATE HANGS BELOW FRAME***

- NOTES:
- 1-MATERIAL: ALUMINUM
 - 2-LOADING: 300 PSF
 - 3-APPROXIMATE WEIGHT: 108.39 LBS.



1/4" EXTRUDED TROUGH SECTION W/INTEGRAL CONT. ANCHOR FLANGE & GROOVE FOR GASKET/CUSHION
 FRAME MAT'L: ALUMINUM 6063-T5

FRAME DETAIL



UNLESS OTHERWISE NOTED ON THIS DRAWING, CLEARANCE BETWEEN FRAME AND COVER(S) IS DESIGNED NOT TO EXCEED 3/8".

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INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M

BREAK ALL SHARP CORNERS & EDGES

TOLERANCES UNLESS OTHERWISE SPECIFIED: INCHES AND FRACTIONS:

<10' = ± 1/8
 >10' = ± 1/4

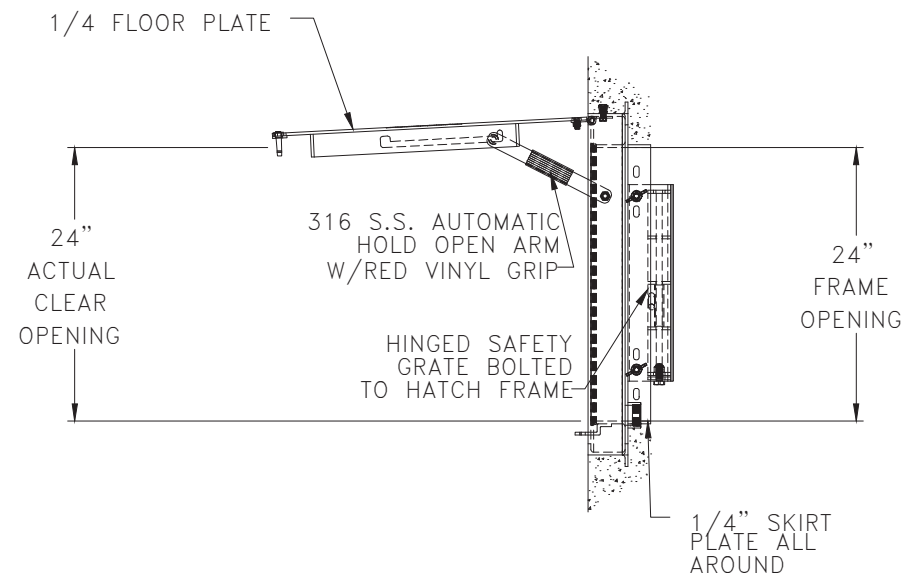
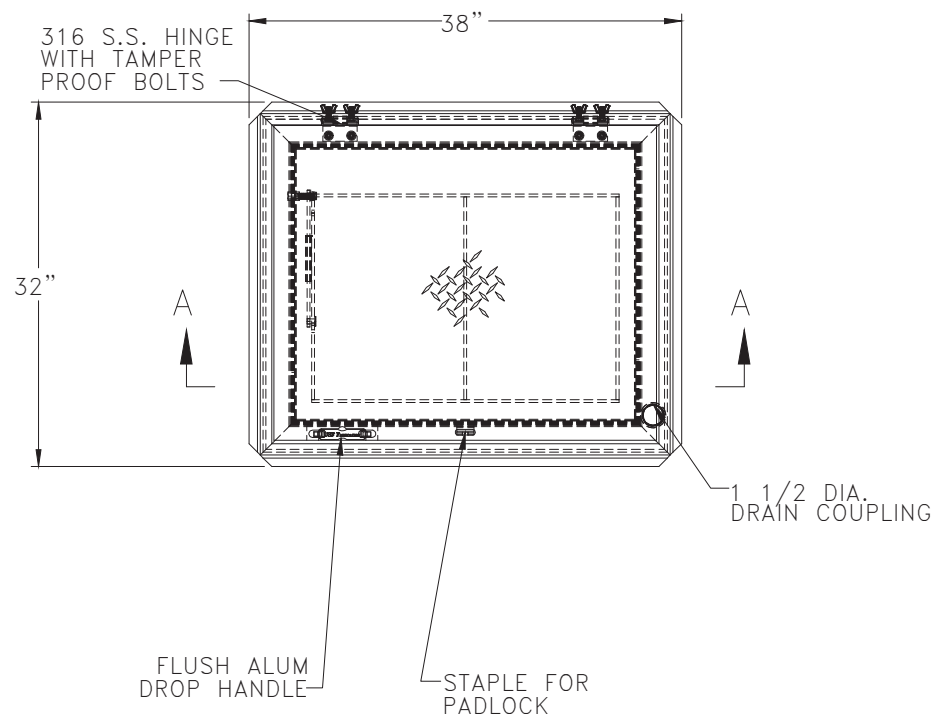
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U.S.F. FABRICATION INC.
 HIALEAH, FLORIDA

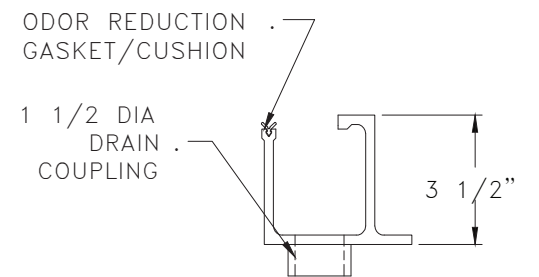
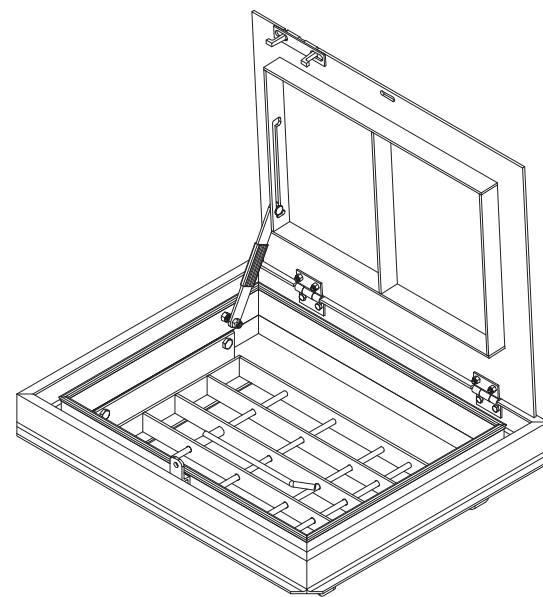
HATCH TPS 24X36 D1fj1n1
 GENERAL ARRANGEMENT

DRAWN BY: SBOB	SCALE: 1 : 16	SHEET 1 OF 1	DATE: 07/17/25
APP'D BY: SBOB	DWG. NO: 1000285665	SHEET SIZE: B	REV: 0



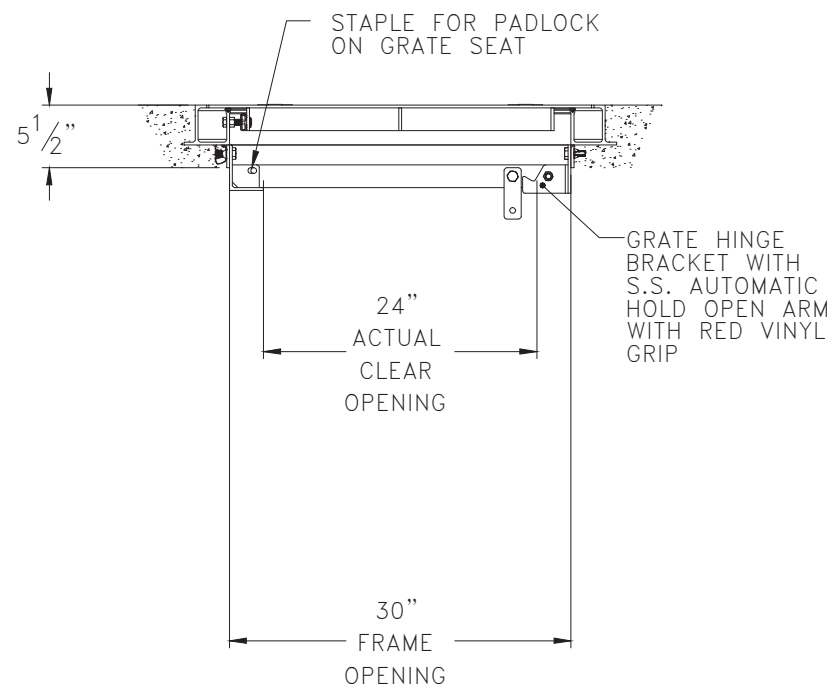
- OPTIONS:
- 1-EXTERIOR STAPLE
 - 2-ODOR REDUCTION GASKET
 - 3-SINGLE SAFETY GRATE COLOR ORANGE
 - 4-MILL FINISH
 - 5-2" FRAME EXTENSION REQUIRED
 - 6-***SAFETY GRATE HANGS BELOW FRAME***

- NOTES:
- 1-MATERIAL: ALUMINUM
 - 2-LOADING: 300 PSF
 - 3-APPROXIMATE WEIGHT: 97.63 LBS.



1/4" EXTRUDED TROUGH SECTION W/INTEGRAL CONT. ANCHOR FLANGE & GROOVE FOR GASKET/CUSHION
 FRAME MAT'L: ALUMINUM 6063-T5

FRAME DETAIL



UNLESS OTHERWISE NOTED ON THIS DRAWING, CLEARANCE BETWEEN FRAME AND COVER(S) IS DESIGNED NOT TO EXCEED 3/8".

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INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M

BREAK ALL SHARP CORNERS & EDGES

TOLERANCES UNLESS OTHERWISE SPECIFIED: INCHES AND FRACTIONS:

<10' = ± 1/8
 >10' = ± 1/4

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U.S.F. FABRICATION INC.
 HIALEAH, FLORIDA

HATCH TPS 24X30 D1fj1n1
 GENERAL ARRANGEMENT

DRAWN BY: SBOB	SCALE: 1 : 16	SHEET 1 OF 1	DATE: 07/17/25
APP'D BY: SBOB	DWG. NO: 1000285667	SHEET SIZE: B	REV: 0



2340 Hubbell Avenue SW
Bondurant, IA 50035-4444

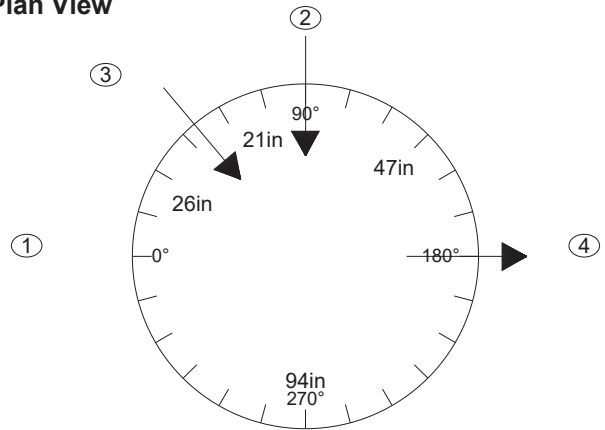
Customer: Tri-County Inc.
Job Name: Ottumwa, IA - Groundwater Underdrain Force Main
 Ottumwa, IA 52501
Sales Order: 25-559
Type: SW-301 Sanitary MH (60")
Structure: LS-01 **Station:**

Take Off By: bskartvedt

Revision: NA **Date:**

Build Height		Stack Height	
Top of Casting	+ 747.00'	Adjustment	+ -0.08'
Outlet Invert	- 734.00'	Rim Height	+ 0.00'
Design Height	= 13.00'	Top Height(s)	+ 1.08'
Floor Height	+ 0.67'	Riser Height(s)	+ 7.00'
Sump Height	+ 0.00'	Base Height	+ 5.00'
Overall Height	= 13.67'	Sump	- 0.00'
Adjustment	- -0.08'	Stack Height	= 13.00'
Displayed Hgt	= 13.75'		
Rim Height	- 0.00'		
Floor Height	- 0.67'		
Precast Height	= 13.08'		

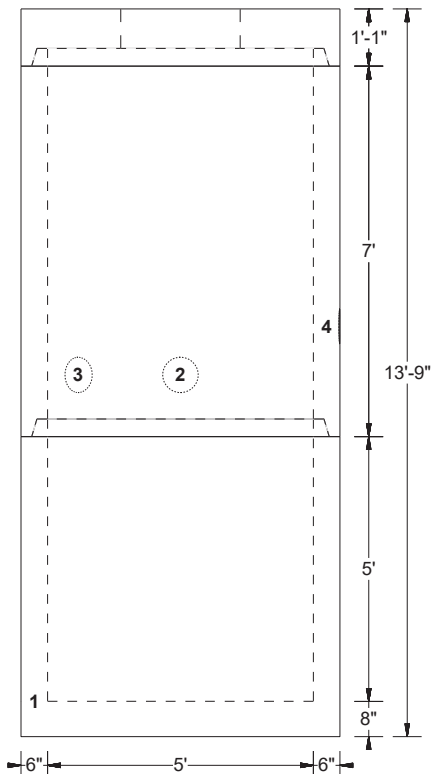
Plan View



Openings

PipeNum	Elevation	Angle	Pipe Type	Hole Type	Hole Height	Hole Width	Item	Inches Up
(1)	734	0	Bottom of Well - No Hole	HOLE	0.001	0.001	Base	0
(2)	740	90	4 SDR 11	14200	8	8	Item 1	10
(3)	740	50	4 SDR 11	14200	8	8	Item 1	10
(4)	741	180	2 PVC	14200	8	8	Item 1	21

Elevation



BOM of Structure

Ref	Description	Quantity	Weight
A	60" Manhole Type 2B Cover Slab w/Cas	1	3,050
B	60" x 7' Riser w/Hole and Gasket	1	8,882
C	60" x 5' Sanitary Base	1	6,400
	60" Integral Base Slab	1	2,830
	8 QRS PSX:DD (2" PVC/4" SDR35/40/8)	3	
	Hatch - TPS 24x36 (Ped rating)	1	
	Total Structure		21,162

Specifications / Notes

Manhole Steps: NO

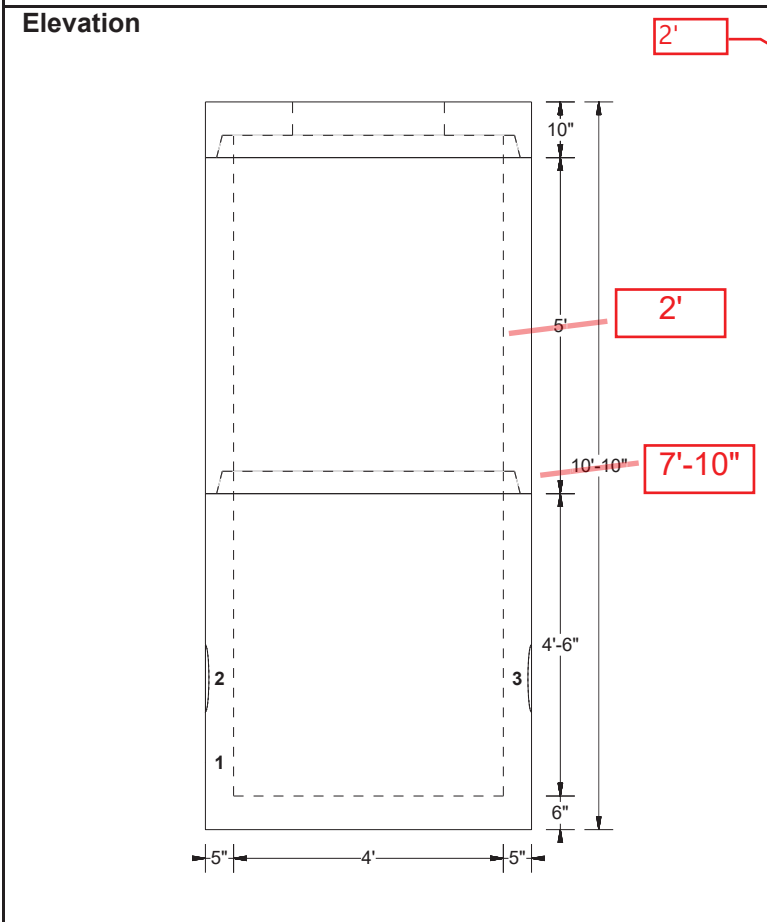


2340 Hubbell Avenue SW
Bondurant, IA 50035-4444

Customer: Tri-County Inc.
Job Name: Ottumwa, IA - Groundwater Underdrain Force Main
 Ottumwa, IA 52501
Sales Order: 25-559
Type: SW-301 Sanitary MH (48")
Structure: LVMH-01 **Station:**

Take Off By: bskartvedt		Plan View	
Revision: NA	Date:		
Build Height	Stack Height		
Top of Casting + 758.00'	Adjustment + -0.13'		
Outlet Invert - 748.30'	Rim Height + 0.00'		
Design Height = 9.70'	Top Height(s) + 0.83'		
Floor Height + 0.50'	Riser Height(s) + 5.00'		
Sump Height + 0.50'	Base Height + 4.50'		
Overall Height = 10.70'	Sump - 0.50'		
Adjustment - -0.13'	Stack Height = 9.70'		
Displayed Hgt = 10.83'			
Rim Height - 0.00'			
Floor Height - 0.50'			
Precast Height = 10.33'			
Openings			

PipeNum	Elevation	Angle	Pipe Type	Hole Type	Hole Height	Hole Width	Item	Inches Up
(1)	748.3	0	Bottom of Well - No Hole	HOLE	0.001	0.001	Base	6
(2)	749.3	0	6 SDR 17	14202	12	12	Base	15
(3)	749.3	180	6 SDR 17	14202	12	12	Base	15



BOM of Structure

Ref	Description	Quantity	Weight
A	48" Manhole Type 2B Cover Slab w/Cas	1	1,525
B	48" x 5' Riser w/Gasket	1	4,280
C	48" VH Sanitary x 4.5'	1	3,862
	48" Integral Base Slab	1	1,380
	12-06 PSX:DD (6" Truss/SDR26/35/40/	2	
	HALLIDAY W1R2430 W/ SAFETY GRAT	1	
	Total Structure		11,047

Specifications / Notes

Manhole Steps: NO



2340 Hubbell Avenue SW
Bondurant, IA 50035-4444

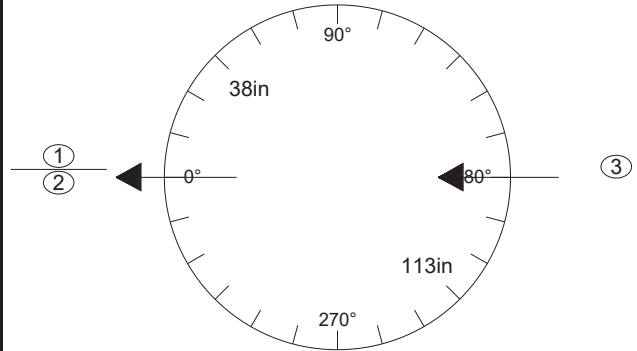
Customer: Tri-County Inc.
Job Name: Ottumwa, IA - Groundwater Underdrain Force Main
 Ottumwa, IA 52501
Sales Order: 25-559
Type: SW-301 Sanitary MH (48")
Structure: VMH-01 **Station:**

Take Off By: bskartvedt

Revision: NA **Date:**

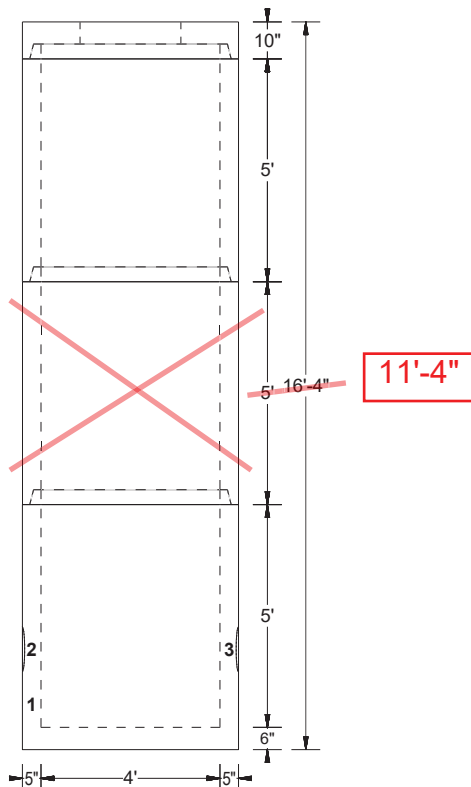
Build Height		Stack Height	
Top of Casting	+ 758.00'	Adjustment	+ -0.13'
Outlet Invert	- 742.80'	Rim Height	+ 0.00'
Design Height	= 15.20'	Top Height(s)	+ 0.83'
Floor Height	+ 0.50'	Riser Height(s)	+ 10.00'
Sump Height	+ 0.50'	Base Height	+ 5.00'
Overall Height	= 16.20'	Sump	- 0.50'
Adjustment	- -0.13'	Stack Height	= 15.20'
Displayed Hgt	= 16.33'		
Rim Height	- 0.00'		
Floor Height	- 0.50'		
Precast Height	= 15.83'		

Plan View



PipeNum	Elevation	Angle	Pipe Type	Hole Type	Hole Height	Hole Width	Item	Inches Up
(1)	742.8	0	Bottom of Well - No Hole	HOLE	0.001	0.001	Base	6
(2)	743.8	0	6 SDR 17	14202	12	12	Base	15
(3)	743.8	180	6 SDR 17	14202	12	12	Base	15

Elevation




BOM of Structure

Ref	Description	Quantity	Weight
A	48" Manhole Type 2B Cover Slab w/Cas	1	1,525
B	48" x 5' Riser w/Gasket	1	4,280
C	48" x 5' Riser w/Gasket	1	4,280
D	48" x 5' Sanitary Base	1	4,182
	48" Integral Base Slab	1	1,380
	12-06 PSX:DD (6" Truss/SDR26/35/40/	2	
	HALLIDAY W1R2430 W/ SAFTEY GRAT	1	
	Total Structure		15,647

Specifications / Notes

Manhole Steps: NO



Appendix D
Pump Manufacturer's Information



MODEL HPG(X)200

SUBMERSIBLE SEWAGE GRINDER PUMP

ALSO AVAILABLE FOR HAZARDOUS LOCATION



HPG200 PUMP FEATURES

A. TWO BARRIER SEALS

One epoxy barrier and one compression fitting for maximum protection against wicking and water seepage into the motor housing.

B. BEARINGS

The heavy-duty ball bearings, upper (radial) and lower (thrust), are continuously lubricated by oil to ensure long service life.

C. MOTOR

Electrical design combines the advantages of high torque output with optimum running efficiency engineered specifically for grinder operation.

D. STATOR BOLTS

The stator is secured to the motor housing by means of stator bolts which ensure ease of maintenance if the need ever arises.

E. SHAFT

Standard stainless steel shaft in grinder pump

F. DUAL SEALS

Dual seals for maximum moisture protection

G. MOISTURE PROBE

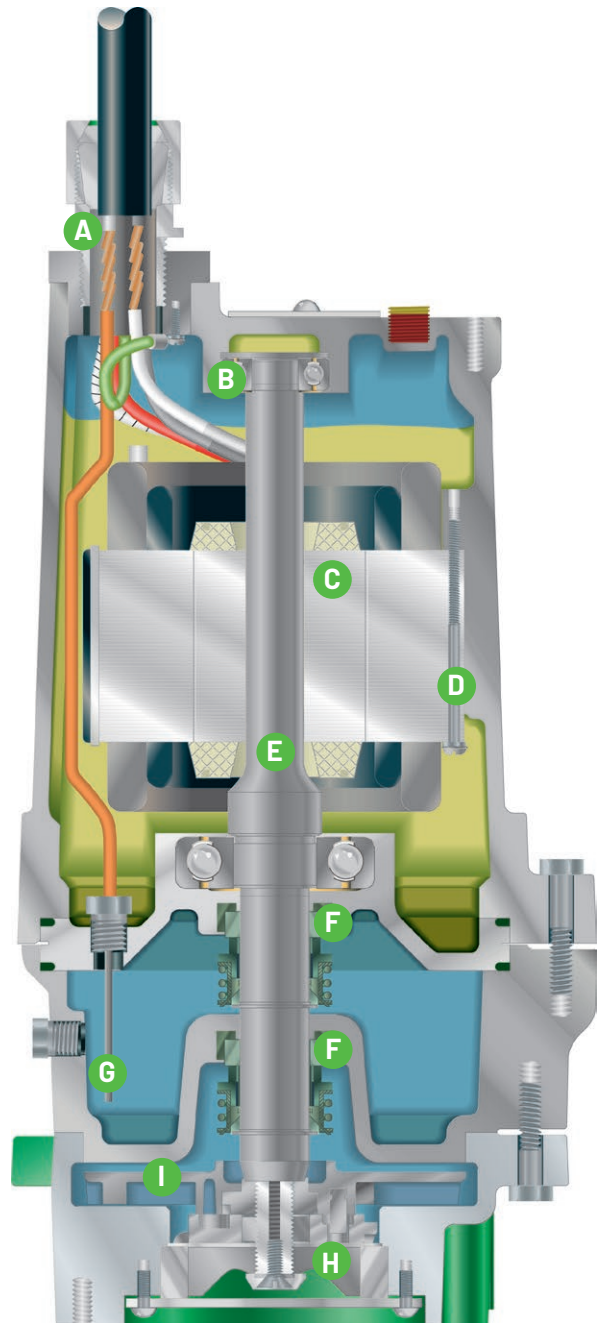
Moisture detection probe

H. CUTTERS

Exclusive "Dual Cutter" design cuts solids to smallest particle size thereby greatly reducing clogging, roping, or binding.

I. IMPELLER

Engineered non-metallic semi-open impeller molded to a bronze insert for greatest torque driving capabilities. Impeller made of high strength Valox® which provides highest level of corrosion resistance and maximum toughness from impact for a wide variety of slurry pumpage. Pump-out vanes preclude material build-up around shaft and seal. Bronze impeller available.



APPLICATIONS

Commercial, residential, resort area

HPG(X)200 PUMP FEATURES

A. TWO BARRIER SEALS

One epoxy barrier and one compression fitting for maximum protection against wicking and water seepage into the motor housing

B. THREE BEARINGS SYSTEM

The heavy-duty ball bearings, upper (radial) and lower (thrust), are continuously lubricated by oil to ensure long service life, along with a lower sleeve bearing

C. MOTOR

Electrical design combines the advantages of high torque output with optimum running efficiency engineered specifically for grinder operation

D. STATOR BOLTS

The stator is secured to the motor housing by means of stator bolts which ensure ease of maintenance if the need ever arises

E. SHAFT

Standard stainless steel shaft in grinder pump

F. DUAL SEALS

Dual seals for maximum moisture protection

G. TWO MOISTURE PROBES

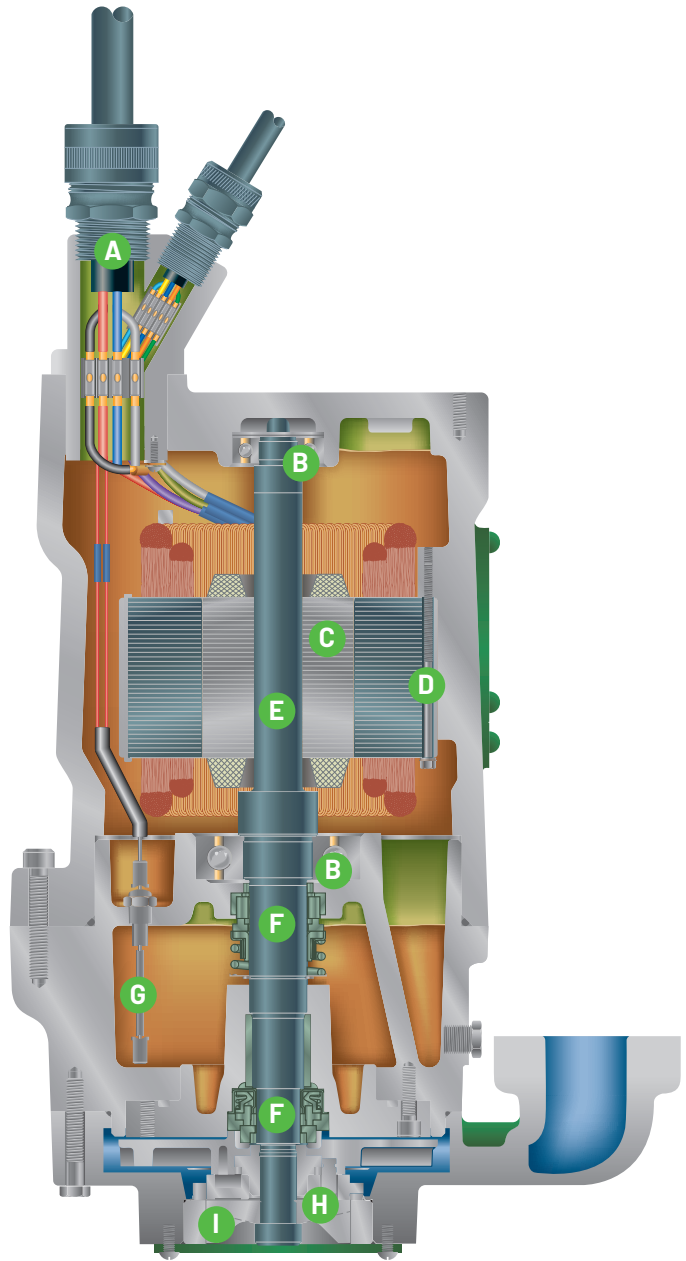
Moisture detection probe located in seal chamber

H. CUTTERS

Exclusive "Dual Cutter" design cuts solids to smallest particle size thereby greatly reducing clogging, roping, or binding

I. IMPELLER

The multivane, semi-open impeller is cast bronze and noncorrosive to provide long life



APPLICATIONS

Municipal, commercial, residential, resort area



1101 Myers Parkway | Ashland, OH 44805 | USA | PH: 855.274.8947 | pentair.com/hydromatic



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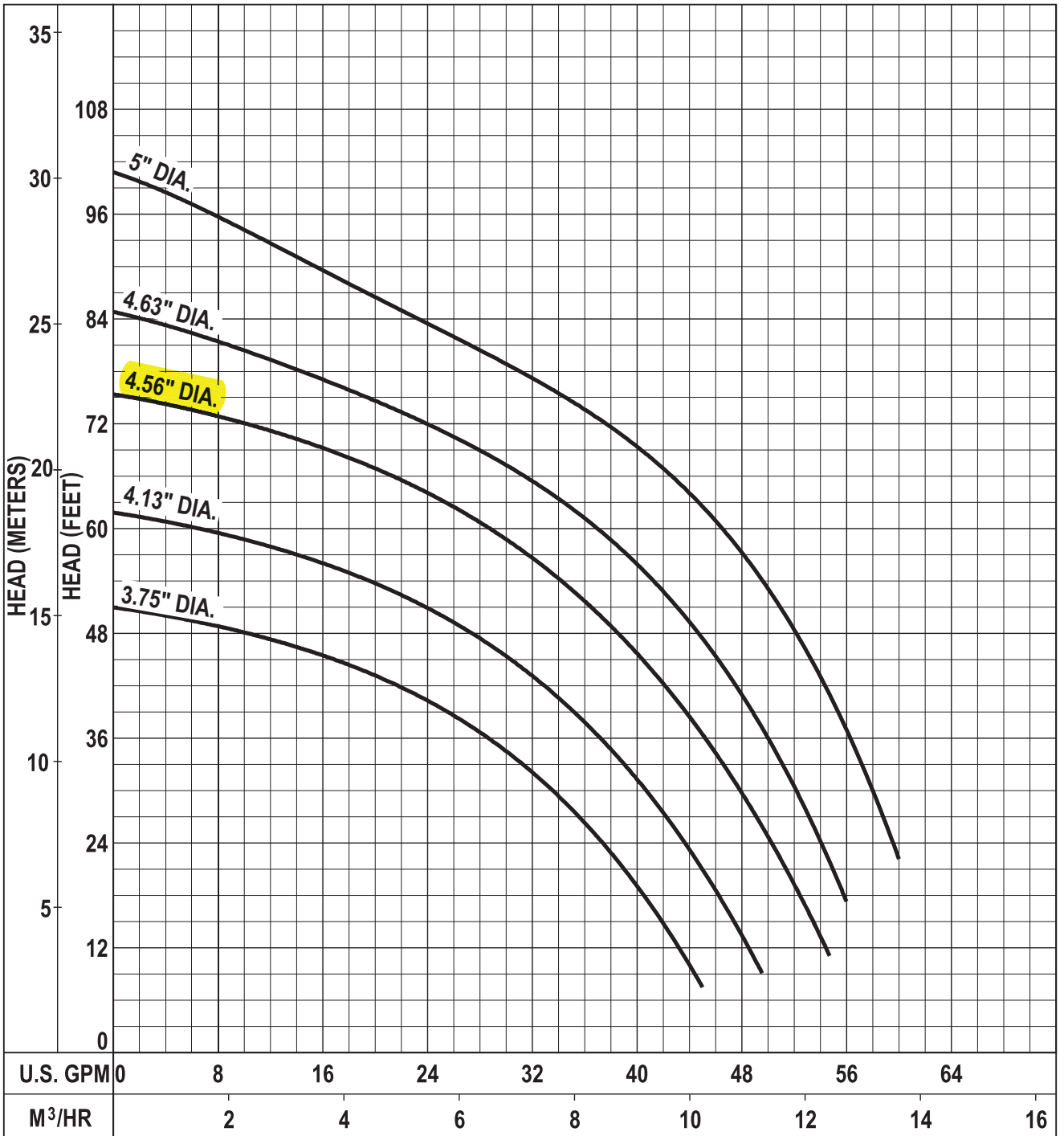
Performance Curve

HPGX

Section **GRINDER** Page **105**
 Dated **AUGUST 2013**
 Supersedes **MAY 2013**

RPM: **3450**

Discharge: **1 1/4"**



The curves reflect maximum performance characteristics without exceeding full load (Nameplate) horsepower. All pumps have a service factor of 1.2. Operation is recommended in the bounded area with operational point within the curve limit. Performance curves are based on actual tests with clear water at 70° F and 1280 feet site elevation.

Conditions of Service:

GPM: _____ TDH: _____

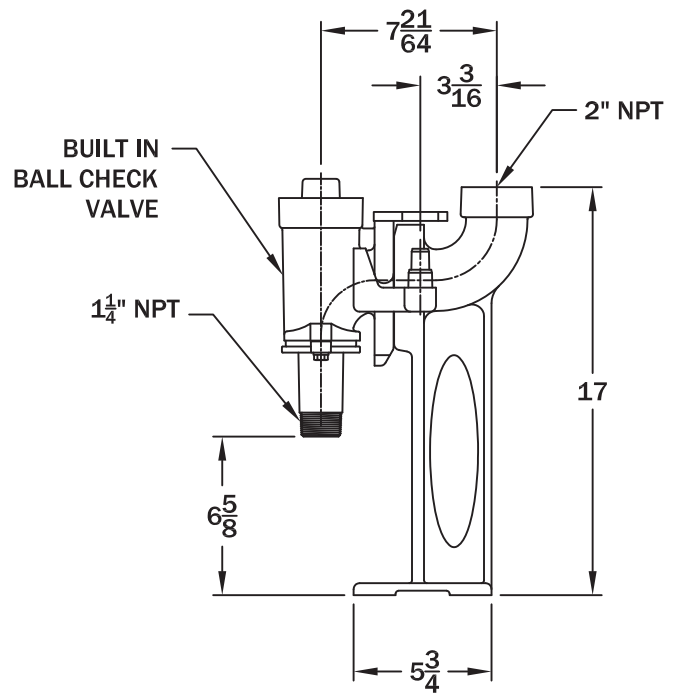
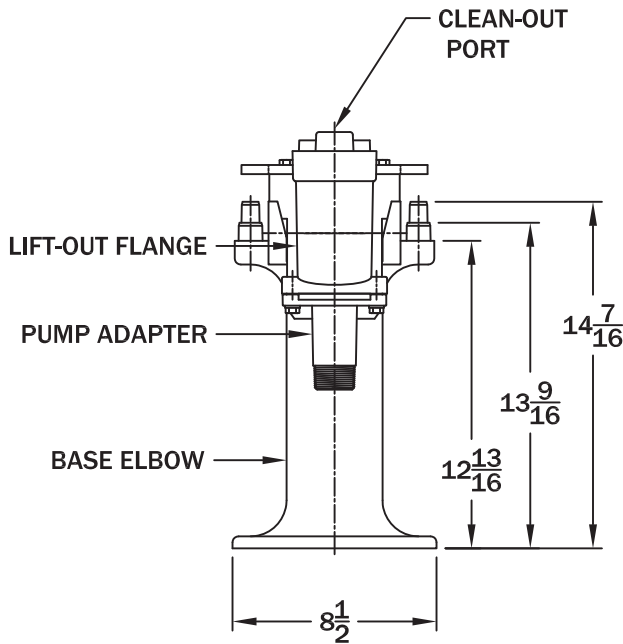
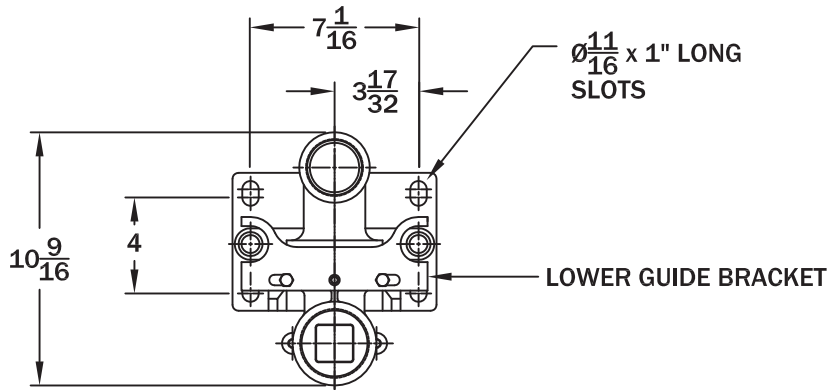
NOTE: ALL DIMENSIONS ARE IN INCHES.

MATERIALS OF CONSTRUCTION:

- PUMP ADAPTER: 304 SST
- BASE ELBOW: CAST DUCTILE IRON
- LIFT-OUT FLANGE: CAST DUCTILE IRON
- LOWER GUIDE BRACKET: 304 SST
- ALL FASTENERS ARE 304 SERIES SST
- USABLE RAIL SIZES: $\frac{3}{4}$ " & 1"
- MAXIMUM WEIGHT ALLOWANCE: 250 lbs

BERS-0125CV

PAGE
1



ALL INFORMATION CONTAINED IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY TO CONERY MFG, INC.



CHANGES	TOLERANCES	DRAWN BY	DATE
F	DECIMALS	D. MIDDLETON	03/05/04
E	.XXX = ±.005	MATERIAL SPECIFICATION: AS NOTED	
D	.XX = ±.010		
C	FRACTIONAL		
B	X/X = ±.1/64		
A	ANGLES		
	X° = ±1/2°		

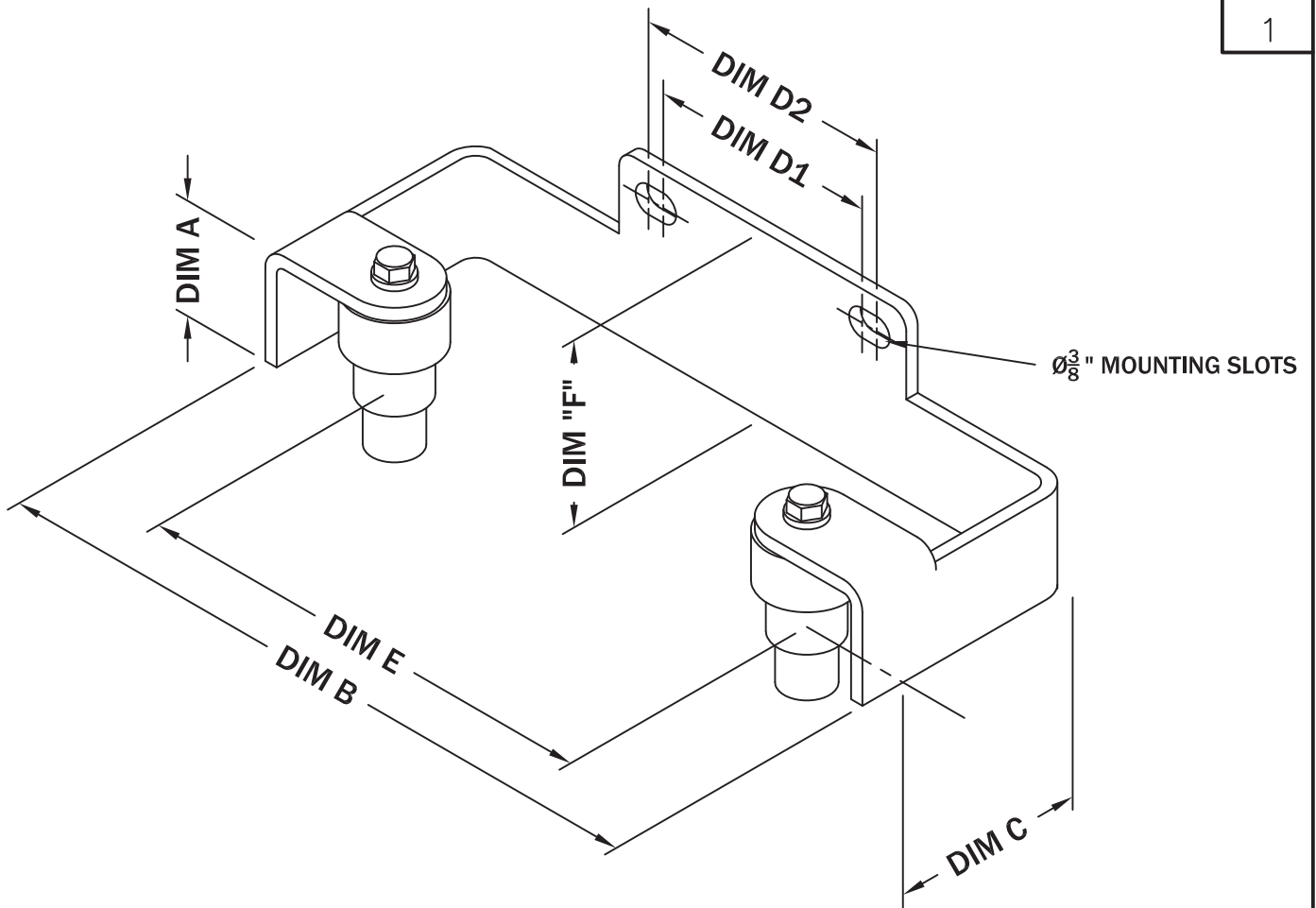
SPECIFICATION SHEET
DIMENSIONAL DATA

SCALE:	PART NO.
1/8	1-1/4" LIFT OUT DIM

NOTE: BRACKET CAN BE USED FOR $\frac{3}{4}$ " , 1" , $1\frac{1}{4}$ " GUIDE RAILS.

GUIDE BRACKET

PAGE
1



MODEL NO.	DIA. "A"	DIM "B"	DIM "C"	DIM "D1 + D2"	DIM "E"	DIM "F"
UGB-STNLS	1 3/4"	10 1/8"	2 11/16"	2 7/8"-3 7/8"	7"	2 3/4"

ALL INFORMATION CONTAINED IN THIS DRAWING IS CONFIDENTIAL AND PROPRIETARY TO CONERY MFG, INC.



CHANGES	TOLERANCES	DRAWN BY	DATE	SPECIFICATION SHEET DIMENSIONAL DATA	
F	DECIMALS .XXX = ±.005 .XX = ±.010 FRACTIONAL X/X = ±.1/64 ANGLES X' = ±1/2'	D. MIDDLETON	03/22/04	SCALE:	PART NO.
E				MATERIAL SPECIFICATION: 300 SERIES SST	NONE
D					
C					
B					
A					

Name	Customer	Proposal#	Due/Bid Date
Ottumwa, IA - Midland Landfill Alliant Energy - REV 1	Allied Systems, Inc.	20255976 Q-46967	9/4/2025, 2:30 PM

Scope

(1) Ottumwa, IA - Midland Landfill Alliant Energy - REV 1 - EX - ARA

REV 1 - 9/4/2025 - Change to Simplex
 Change FLA to 15.6 Amps
 Change Pump Circuit Breakers

Quote is based on email from Suzie Eddy on 8/19/2025.

PUMPS:: Hydromatic HPGX200

The simplex panel with three floats - Stop, Run, High level..
 Simplex Municipal Wastewater Pumping Control Panel for operation on 230V 1Ø incoming power. To control 1 - 2 hp 15.6 F.L.A. Submersible Pump. To Include:

- NEMA Type 4X - 304 Stainless Steel Enclosure, with back panel
- Aluminum Dead-front Inner Door
- Circuit breaker cutouts with mounting bracket
- Incoming Power Terminal Block
- Control Power Circuit Breaker
- Alarm Power Circuit Breaker
- 1 - Circuit Breakers (QOU)
- 1 - IEC Contactor with IEC Overload
- 1 - Anti-condensation heater w/ adjustable thermostat
- 1 - Macromatic seal fail and overtemp relay - Mounted on inner door
- 1 - 22mm Hand Off Auto Switch
- 1 - 22mm Run Pilot Light
- 1 - Elapsed Time Meter
- 1 - 22mm High Level Pilot Light , Alarm Activation , and Aux Contact
- 1 - 22mm Motor Overload Manual Reset Pushbutton, and Aux Contact
- 1 - 22mm Motor Heat Sensor Aux Contact
- 1 - 22mm Seal Failure Aux Contact
- Fault output Aux Contact
- 1 - LED Alarm Light
- 1 - Piezo Audible Alarm
- 1 - 22mm Alarm Silence Pushbutton
- 1 - 22mm Alarm Test Pushbutton
- Engraved Nameplates
- UL Label 508
- Self Laminating Wire Numbers
- Control Relays as required
- Terminal Blocks and Ground Lugs as Required

CUSTOMER SUPPLIED ITEMS ::

- CAP KITS


SHIP LOOSE ITEMS::

- (3) MGM 50FT BAG
- (1) FLOAT BKT 4 FLOAT W/MTG

Pricing Breakouts

MGM 50FT BAG	3
FLOAT BKT 4 FLOAT W/MTG	1
Engineered Panels: Copy of C-59331	1





Appendix E
Force Main Pressure Test Results

PIPE PRESSURE TESTING FORM



Project Name: OML Underdrain Management System Installation	
Project No.: 2522 41 49.00	CQA Contractor: SCS Engineers
Contractor: Winger	Date Tested: 10-10-2025
Contractor Tester Name: Jesse Fine	Contractor Tester Signature: <i>Jesse Fine</i>
CQA Representative Name: ERIC NELSON	CQA Representative Signature: <i>E. Nelson</i>

LOCATION:

Alliant Energy Midland Landfill

MATERIAL AND USE DESCRIPTION:

HDPE SDR 11 2" used for pumping ground water

PRESURE TEST (PER SPECIFICATIONS/COA PLAN – CHECK TEST CONDUCTED):

		Test Conducted
Low Air Pressure Testing 3 1/2 - 4 psi	Acceptance Criteria <1 psi loss over test period	
Hydraulic Testing minimum 150 psi or 10 psi less than pressure rating	Acceptance Criteria 5% of target psi over 2 hours	✓

Start				End			
Pressure (PSI)	Time (hh:mm)	Temp. (°F)	Flow Rate (gal/hour)	Pressure (PSI)	Time (hh:mm)	Temp. (°F)	Flow Rate (gal/hour)
150 PSI	9:55 AM	59°		138 PSI	12:55	69°	

TEST RESULTS (CIRCLE ONE): PASS / FAIL

COMMENTS:

stabilized @ 138 PSI added extra hour of pressure time.

Appendix F

Treatment Building Manufacturer's Information

- WHITE , HIGH GLOSS GEL COAT EXTERIOR COLOR, VISUALLY AESTHETIC, UV STABLE AND MAINTENANCE FREE.

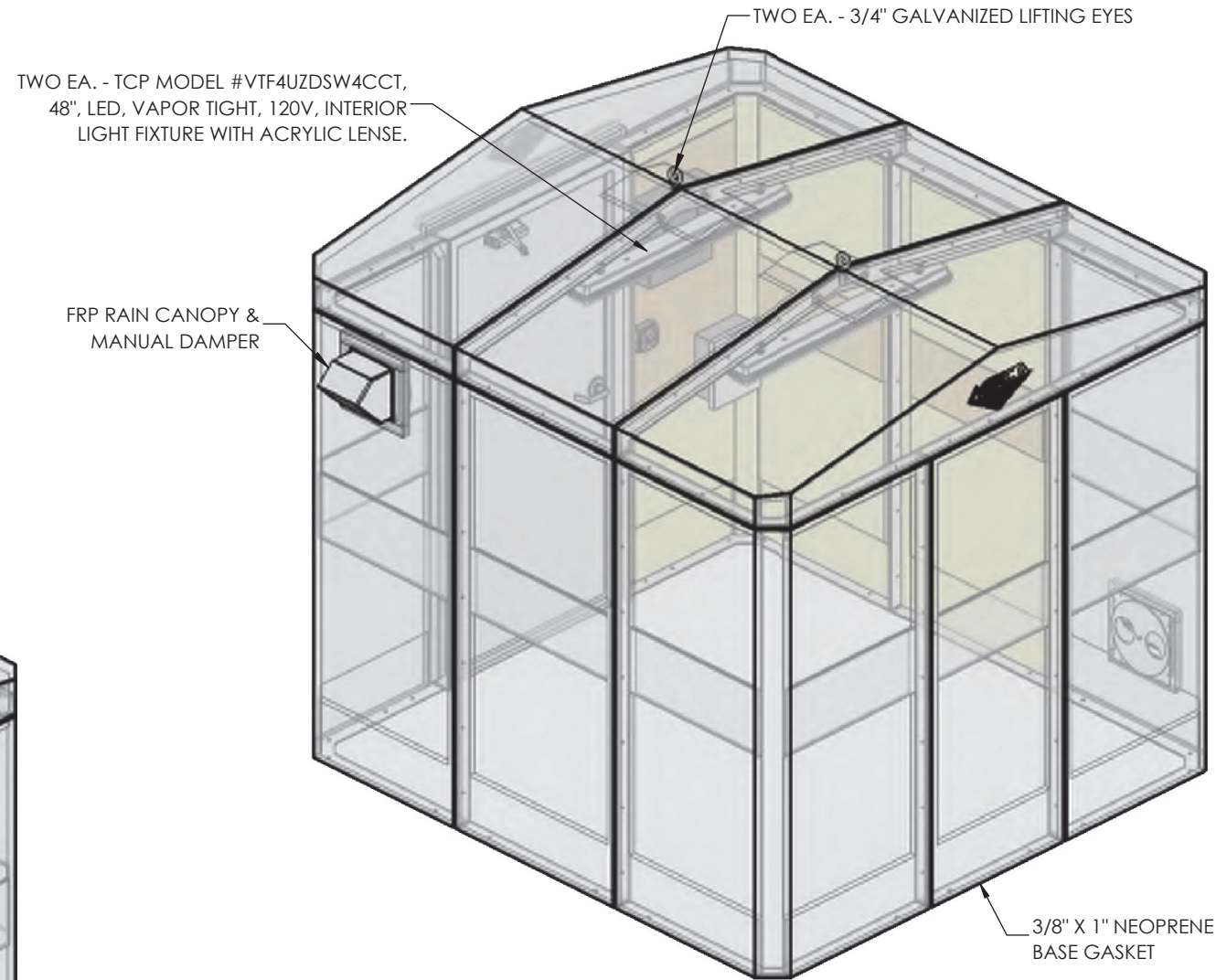
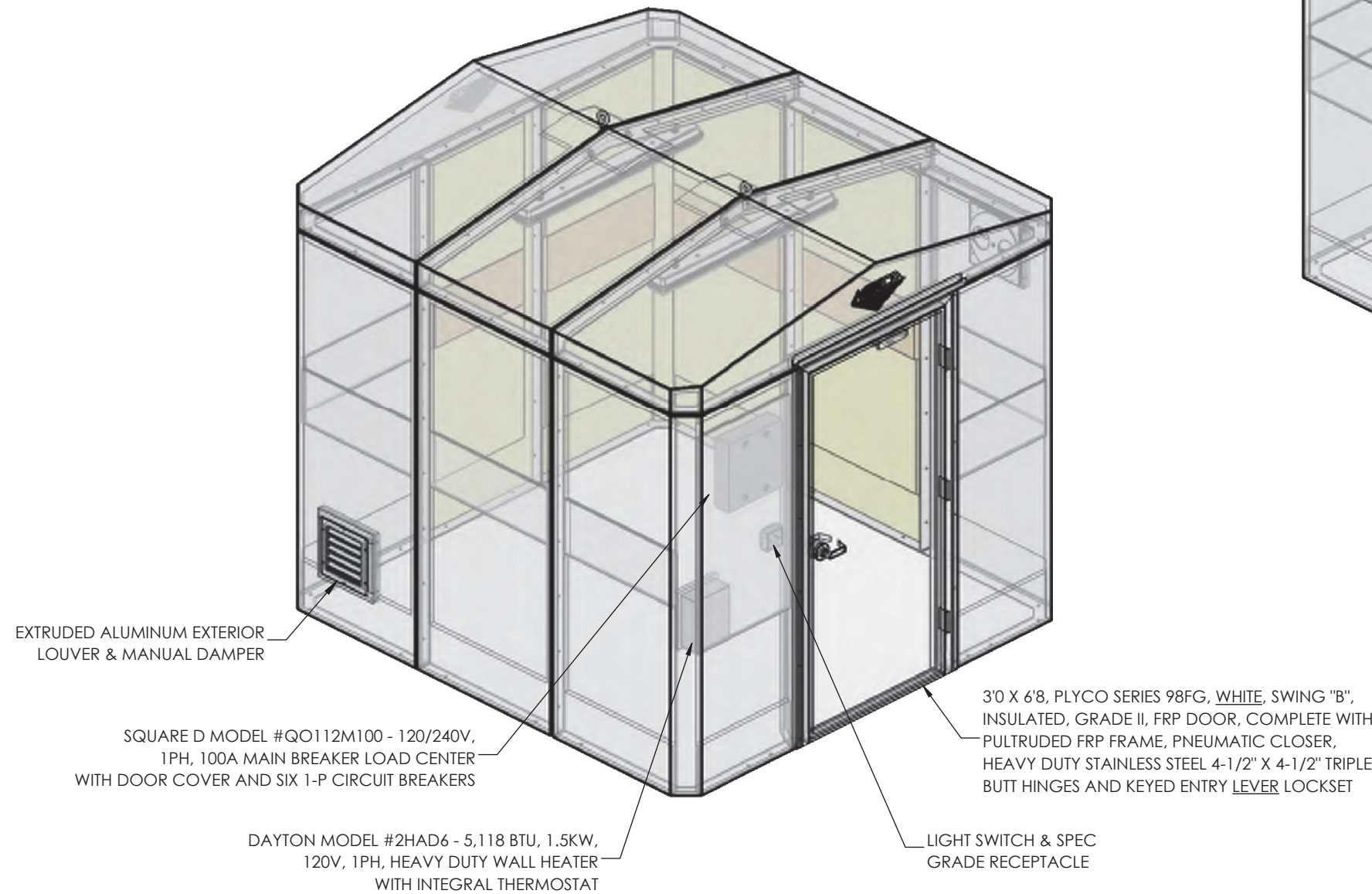
- WHITE CORROSION RESISTANT GENERAL PURPOSE RESIN INTERIOR SURFACES, ALL WALLS AND ROOF.

- SANDWICHED COMPOSITE STRUCTURAL INSULATION SYSTEM YIELDING A NOMINAL R11, ALL WALLS AND ROOF.

- ONE PIECE, PERMANENTLY FUSED, FACTORY ASSEMBLED WATERTIGHT STRUCTURE.

- NO FLOOR IS PROVIDED. OPEN BOTTOM FOR DROP OVER PLACEMENT AND REMOVAL.

- ESTIMATED WEIGHT: 1,100#



UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ±1/16"
ALL EXTERIOR DIMENSION MEASUREMENTS TO BE BASED ON EXTERIOR SURFACE

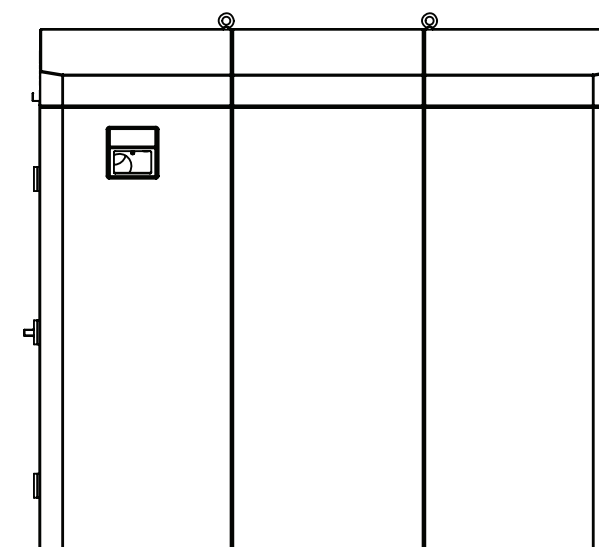
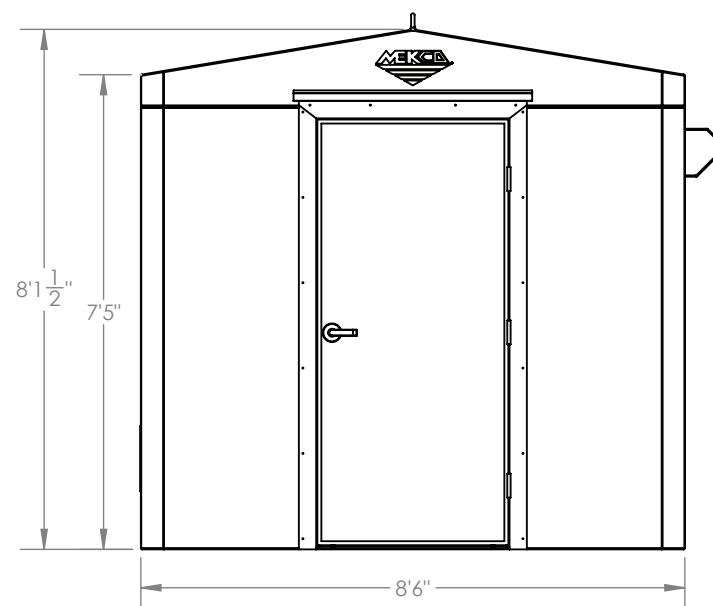
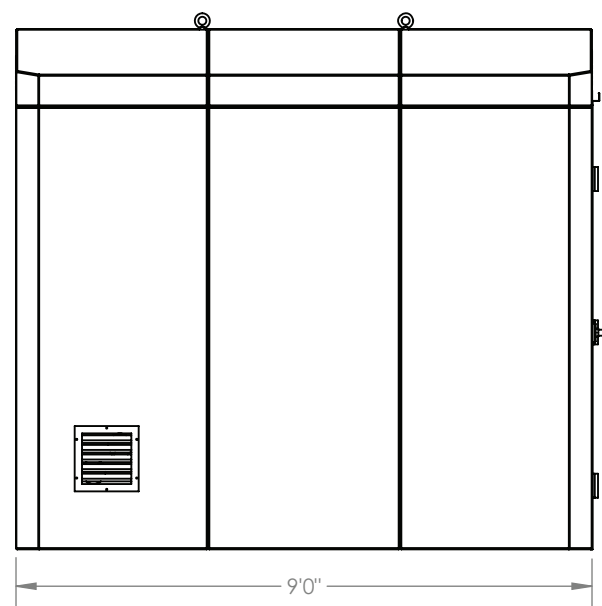
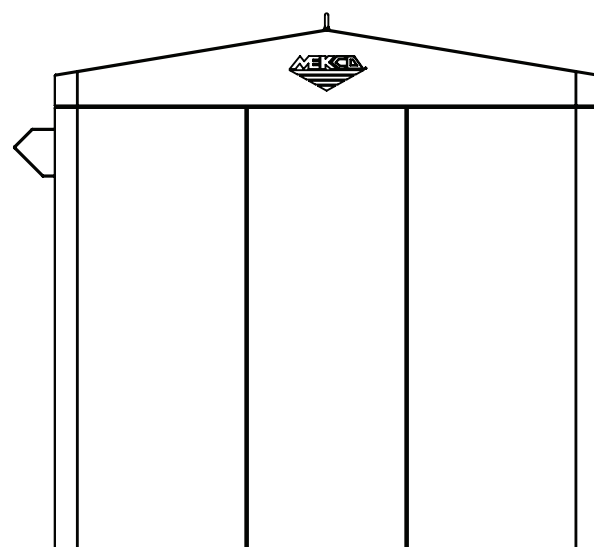
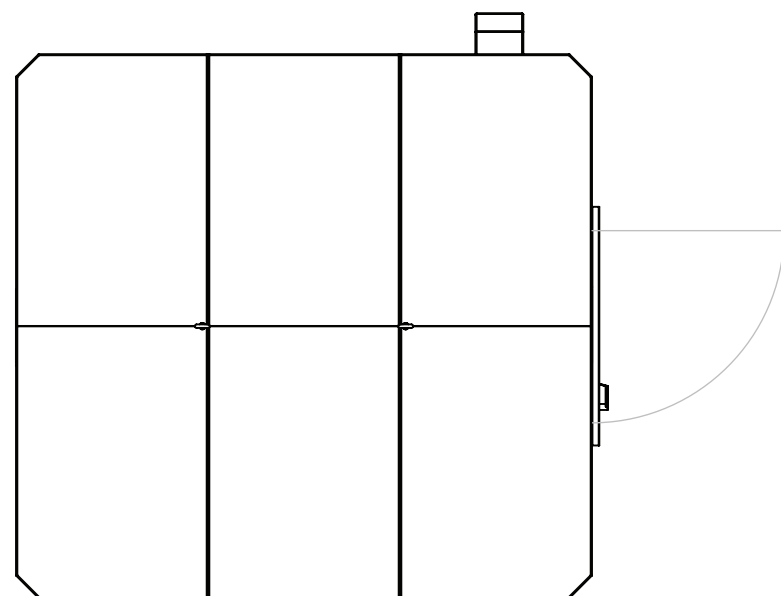
REVISION
GEL COAT LHM2900 WHITE
RESIN GP COR61-AA-545
CUSTOMER ALLIANT ENERGY
DO NOT SCALE DRAWING



MEKCO, INC.
11110 HIGHWAY 42
NEWTON, WI 53063

DESCRIPTION:
9'L X 8'6"W BUILDING

DWG. NO. 804244	SIZE B
CREATED DATE 1/24/2025	PRINT DATE 7/28/2025
SCALE: 1:28	SHEET 1 OF 5



UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN INCHES
 TOLERANCES:
 FRACTIONAL ±1/16"
 ALL EXTERIOR DIMENSION
 MEASUREMENTS TO BE BASED
 ON EXTERIOR SURFACE

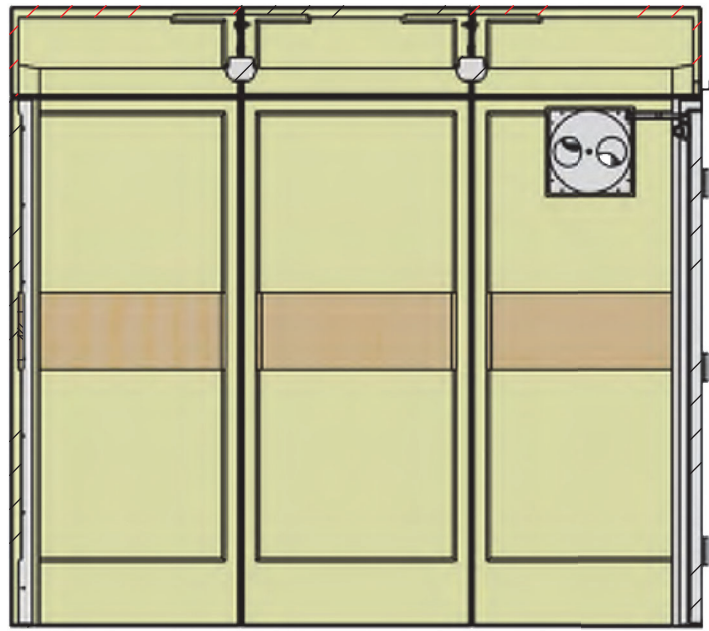
REVISION
GEL COAT LHM2900 WHITE
RESIN GP COR61-AA-545
CUSTOMER ALLIANT ENERGY
DO NOT SCALE DRAWING



MEKCO, INC.
 11110 HIGHWAY 42
 NEWTON, WI 53063

DESCRIPTION:
9'L X 8'6"W BUILDING

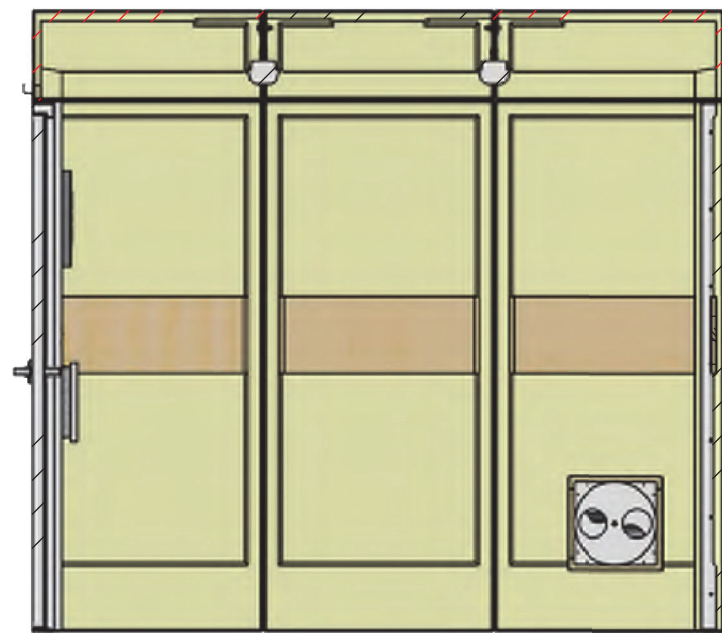
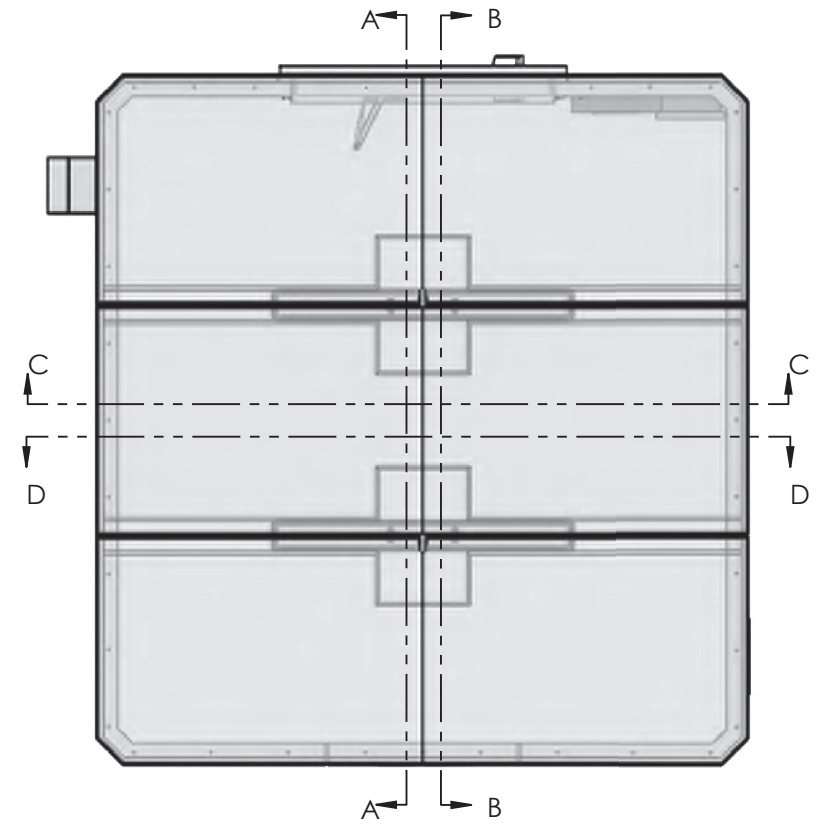
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CREATED DATE 1/24/2025	PRINT DATE 7/28/2025
SCALE: 1:36	SHEET 2 OF 5



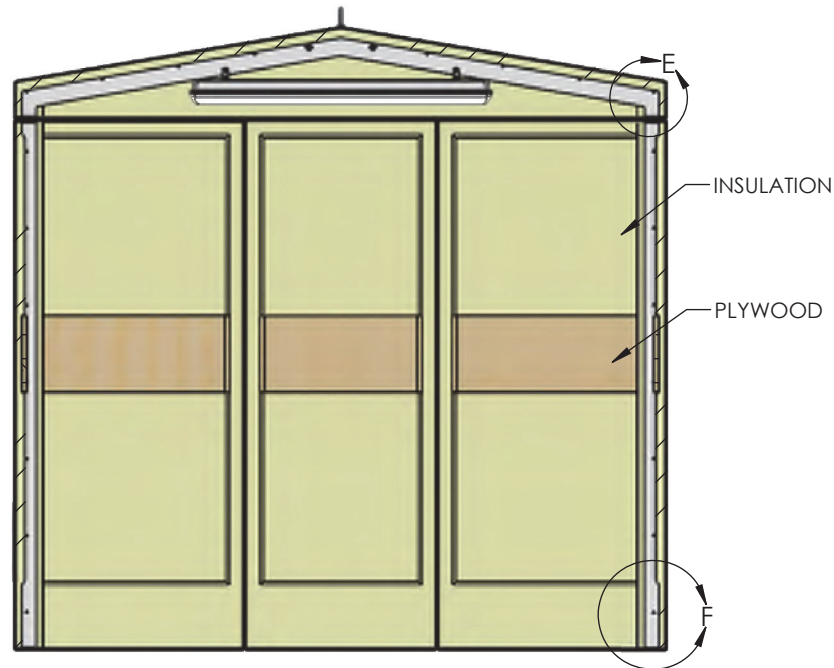
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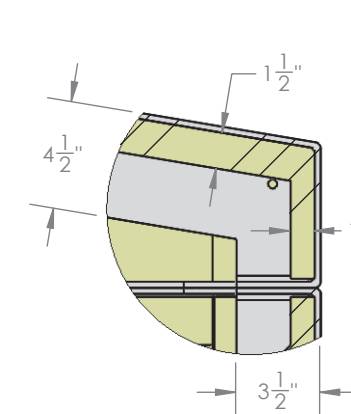
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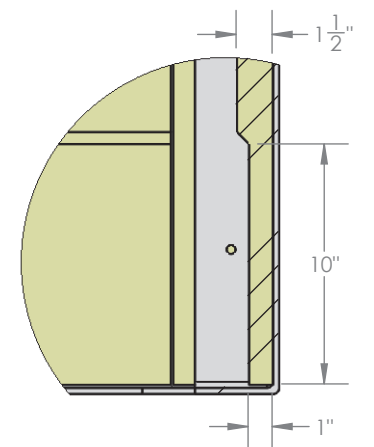
SECTION B-B



SECTION D-D



DETAIL E
SCALE 1 : 8



DETAIL F
SCALE 1 : 8

VIEWS ON THIS PAGE ARE FROM THE INSIDE OF THE BUILDING

IDENTIFY AREAS WHERE ITEMS WILL BE ATTACHED TO THE WALL
AND ADDITIONAL EMBEDDED PLYWOOD WILL BE PROVIDED

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16$ "
ALL EXTERIOR DIMENSION
MEASUREMENTS TO BE BASED
ON EXTERIOR SURFACE

REVISION
GEL COAT
LHM2900 WHITE
RESIN
GP COR61-AA-545
CUSTOMER
ALLIANT ENERGY
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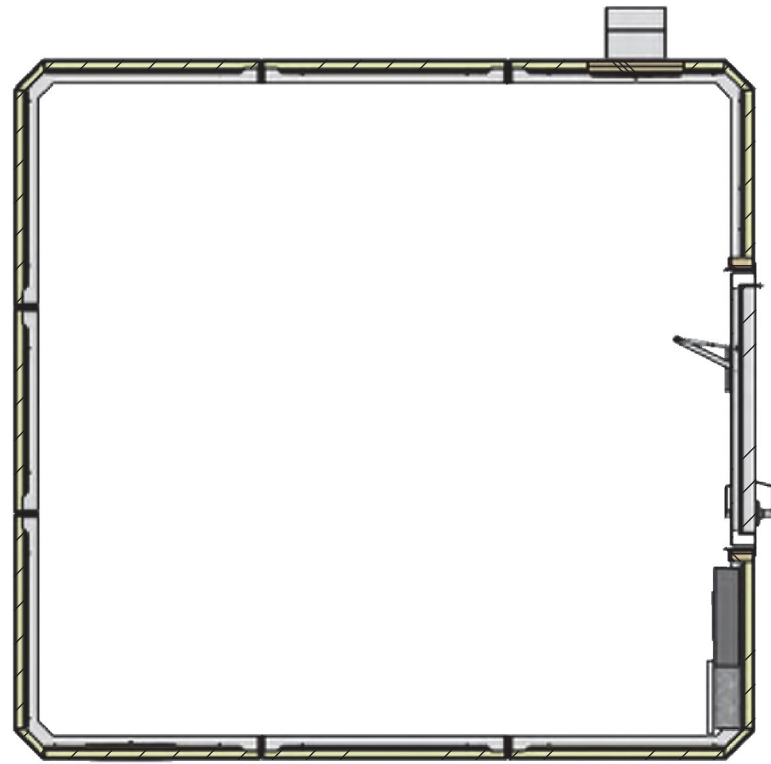
MEKCO, INC.
11110 HIGHWAY 42
NEWTON, WI 53063

DESCRIPTION:
9'L X 8'6"W BUILDING

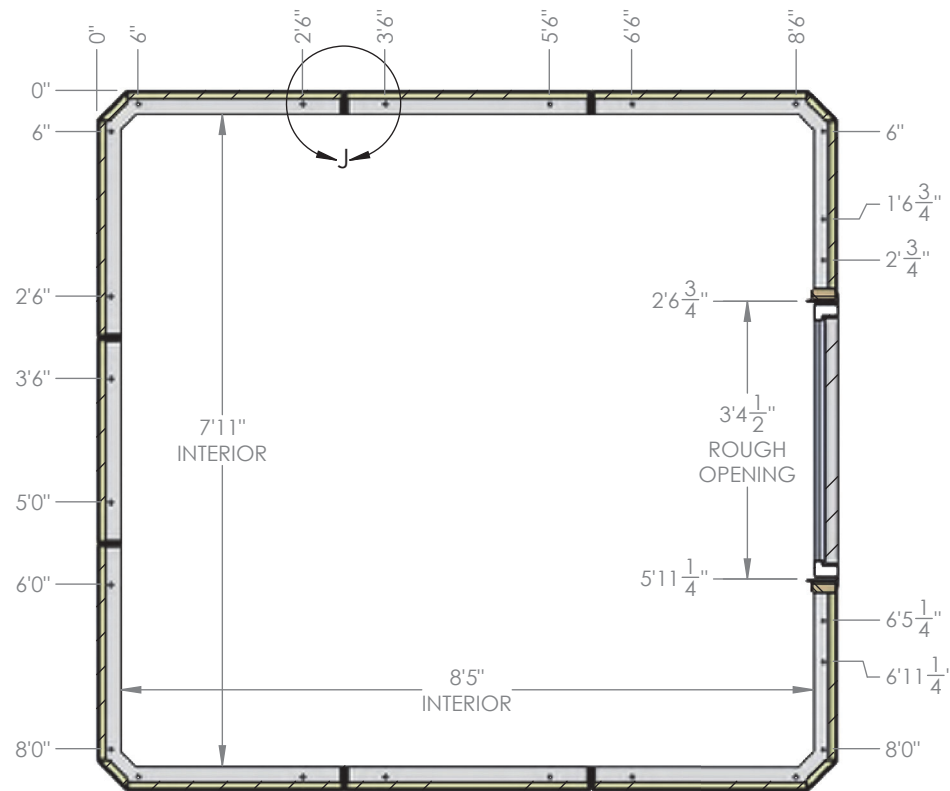
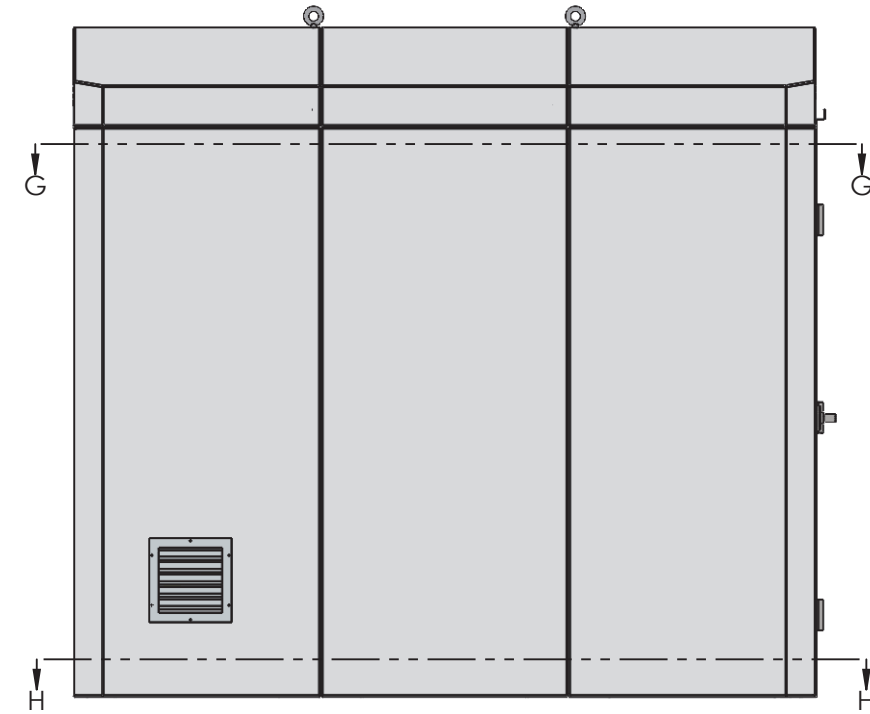
DWG. NO.
804244

SIZE
B

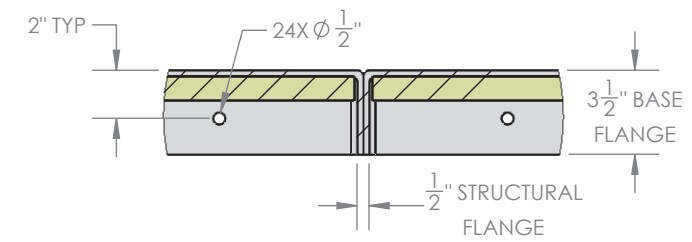
CREATED DATE 1/24/2025 PRINT DATE 7/28/2025 SCALE: 1:30 SHEET 3 OF 5



SECTION G-G



SECTION H-H



DETAIL J
SCALE 1 : 8

ANCHOR BOLT INFO

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL $\pm 1/16"$
ALL EXTERIOR DIMENSION
MEASUREMENTS TO BE BASED
ON EXTERIOR SURFACE

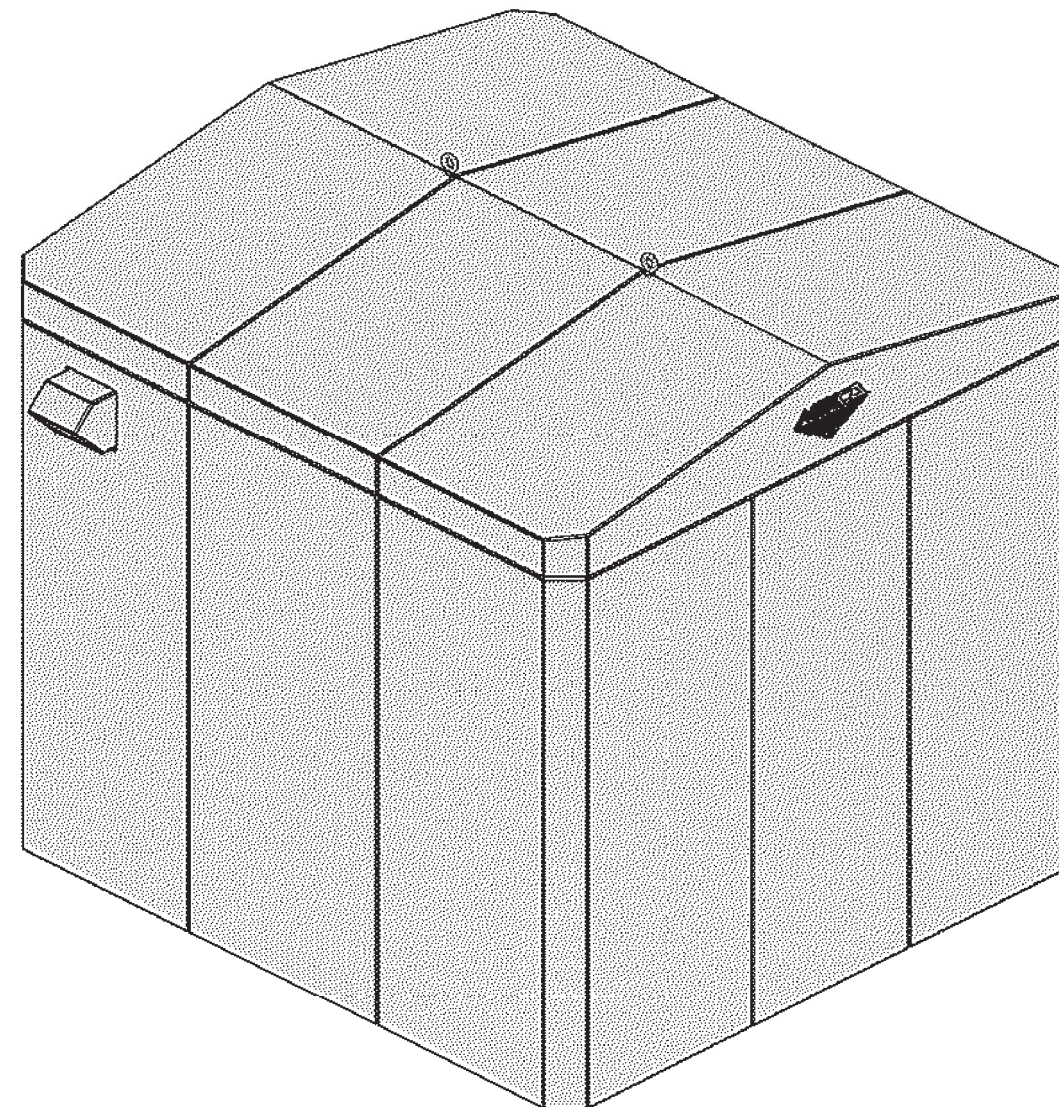
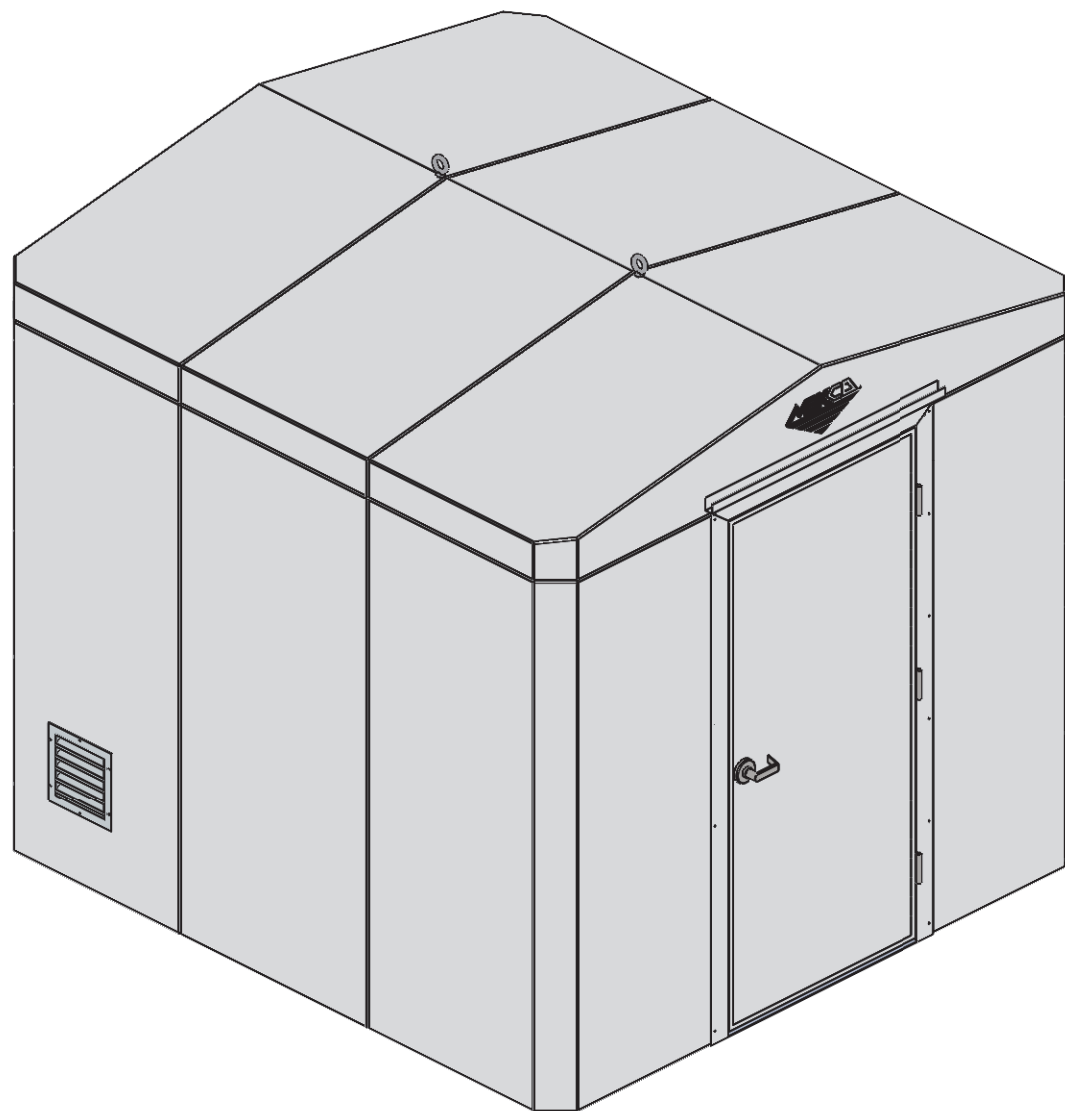
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GEL COAT	LHM2900 WHITE
RESIN	GP COR61-AA-545
CUSTOMER	ALLIANT ENERGY
DO NOT SCALE DRAWING	



MEKCO, INC.
11110 HIGHWAY 42
NEWTON, WI 53063

DESCRIPTION:
9'L X 8'6"W BUILDING

DWG. NO.	804244	SIZE	B
CREATED DATE	1/24/2025	PRINT DATE	7/28/2025
SCALE:	1:28	SHEET	4 OF 5



UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN INCHES
 TOLERANCES:
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 ALL EXTERIOR DIMENSION
 MEASUREMENTS TO BE BASED
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REVISION
GEL COAT LHM2900 WHITE
RESIN GP COR61-AA-545
CUSTOMER ALLIANT ENERGY
DO NOT SCALE DRAWING



MEKCO, INC.
 11110 HIGHWAY 42
 NEWTON, WI 53063

DESCRIPTION:
9'L X 8'6"W BUILDING

DWG. NO. 804244	SIZE B
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CREATED DATE 1/24/2025	PRINT DATE 7/28/2025	SCALE: 1:26	SHEET 5 OF 5
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Advantage Door Closer 3000 Series

**COMMERCIAL
GRADE 2**

GRADE 2

Factory tested to meet
ANSI Grade 2 durability



UL10C Positive Pressure
Rated. Conforms to UBC
7-2 (1997). (Uniform
Building Code Standard)



Features

- Power Size #3
- Tri-Packed For All Types of Installation

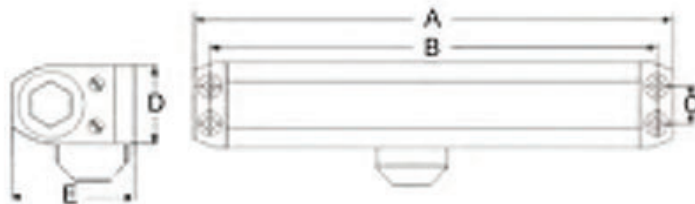


Specifications

Material	Aluminum Alloy Body, Forged Steel Arm, Heat Treated Forged Steel Piston, Double Heat Treated Steel Pinion
Valves	Staked Valve For Adjustments Dual Valve Control – Closing Speed & Latching Speed
Arms & Brackets	Standard With Regular Arm and Parallel Bracket
Screws	Standard With Self Tapping Wood Screws & Machines Screws
Model	3000 – Power Size #3
Finish	ALUM (689), DURO (695), GOLD (696), BLACK (693)

Technical Dimensions

- A.) Length of Closer Body – 8-3/4"
- B.) Horizontal Mounting Holes – 8-3/16"
- C.) Vertical Mounting Holes – 3/4"
- D.) Height of Closer Body – 1-3/4"
- E.) Projection From Door – 2-7/8"



RH Series TUBULAR LEVERSET

ANSI GRADE 2

ANSI GRADE 2
ANSI/BHMA A156.2-2003
Series 4000, Grade 2
Exceeds 400,000 cycles



LISTED

3 hours Fire rating
UL10C/UBC 7-2(1997)
Positive Pressure Rated



ADA compliant
ANSI A117.1
Barrier Free
Accessibility

LIFETIME Warranty

**CALIFORNIA STATE
REFERENCE CODE**

Formerly Title 19,
California State Fire Marshal (CSFM)
levers return to within 1/2" of door face

Features

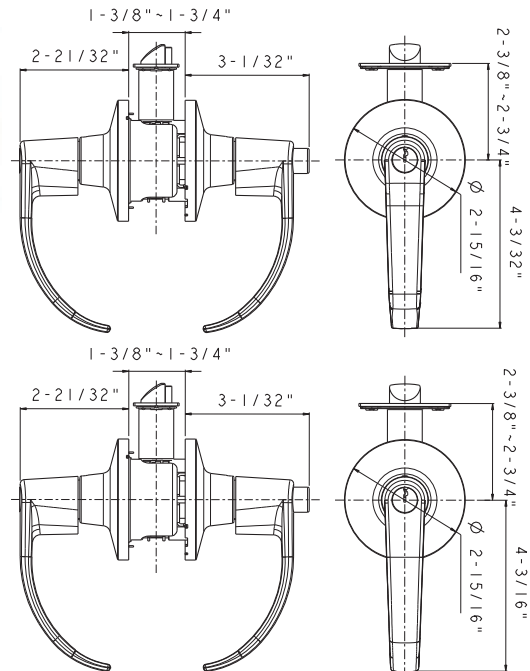
SC4 6-pin Standard
Concealed Mounting Screws
Fast and Easy Installation
Panic Proof (inside always free)
Push Button for Entrance
and Privacy Function



500RH-CT
Charlotte (CT) Lever



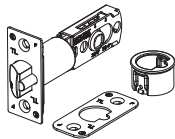
500RH-SD
San Diego (SD) Lever



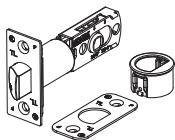
Specifications

Door Fitting	1-3/8" ~ 1-3/4" door thick. 2" available.
Lock Chassis	Heavy gauge dichromated steel. Zinc dichromated for corrosion resistance.
Exposed Trim	Wrought brass or stainless steel. Pressure cast zinc lever.
Cylinder	Solid brass SC4 6-pins standard. KW1 5-pins optional.
Latch	1/2" throw stainless steel latch bolt 6-way adjustable latch for mortise square corner, mortise round corner, and drive-in application.
Strike	T-Strike standard (9106) ASA Strike optional (9109)
Handing	Universal, non-handing.
Screws	Combination screws for both metal and wood doors.
Keys	2 brass keys per set. Key as requested (KA, KD, MCK, MK, GMK).

Latch & Parts



T90A0TS
6-way Adjustable Dead Latch
for 2-3/8" or 2-3/4" backset



T90A3TS
6-way Adjustable Spring Latch
for 2-3/8" or 2-3/4" backset



1180
Faceplate Adapter
Use on 1" width for
1-1/8" width requirement

Strike

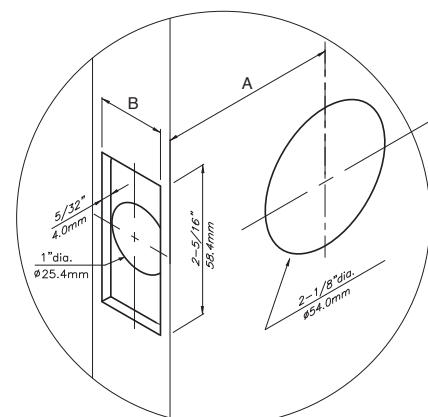


9109 ASA Strike
1-1/4" x 4-7/8", 5/8" lip



9106 T-Strike
1-1/8" x 2-3/4"

Door Preparation



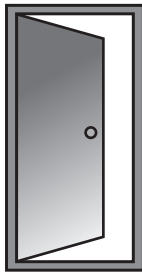
Backset	2-3/4"	2-3/8"
A	2-3/4"	2-3/8"
B	1-3/16"	1-1/16"

ADVANTAGE[®]
by PHILADELPHIA HARDWARE GROUP

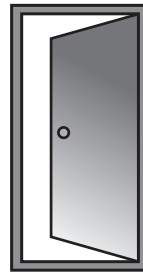
DOOR HANDING

To determine the handing of a door, **face it from the outside or key side**. There are 8 available options to choose from. All doors greater than 60" in width include double doors.

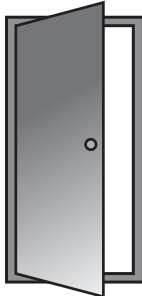
Left Hand Inswing
Hinges on Left
Opens Inward
Swing "AI"



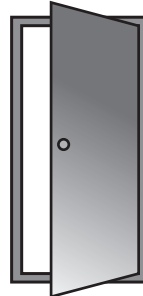
Right Hand Inswing
Hinges on Right
Opens Inward
Swing "BI"



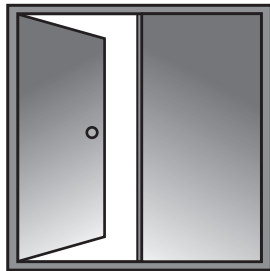
Left Hand Outswing
Hinges on Left
Opens Outward
Swing "A"



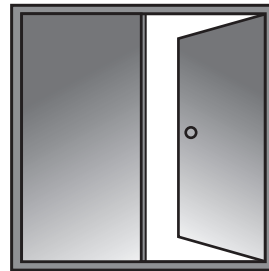
Right Hand Outswing
Hinges on Right
Opens Outward
Swing "B"



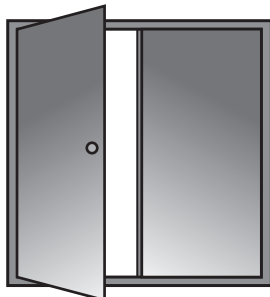
Left Hand Inswing
Active Panel
Hinges on Left
Opens Inward
Swing "CI"



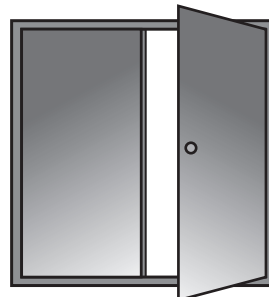
Right Hand Inswing
Active Panel
Hinges on Right
Opens Inward
Swing "DI"



Left Hand Outswing
Active Panel
Hinges on Left
Opens Outward
Swing "C"



Right Hand Outswing
Active Panel
Hinges on Right
Opens Outward
Swing "D"



If you have questions or are uncertain, PLEASE call your representative BEFORE ordering.

USA-CANADA-MEXICO
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FAX 800-257-5926

INTERNATIONAL
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FAX 920-876-3527

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STAINLESS STEEL HINGES STANDARD FROM PLYCO



4" x 4" Loose Pin
Nominal up-charge on
Series 99 Doors.



NOW STANDARD
4" x 4" Fixed Pin
on Series 88 and 94 Doors



**All hinges are
#304 Stainless
Steel with Brass
Hinge Pins.**



NOW STANDARD
4 1/2" x 4 1/2" Fixed Pin
on Series 92 and 55TB Doors



#316 Stainless T-Hinge
with Brass Fixed Pin.

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CORPORATION

Elkhart Lake, WI 53020

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Fax 920-876-3527

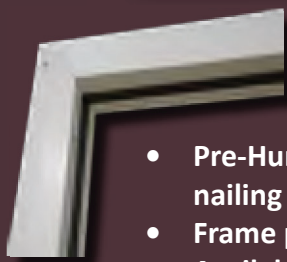
98FG

Fiberglass Panel

Series 98FG is a full fiberglass door designed for corrosive environments.

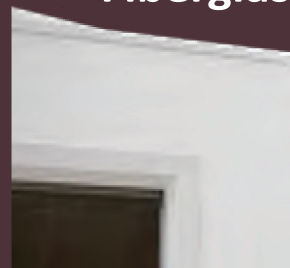


- Fiberglass Frame & Panel Perimeter
- Non-corrosive design
- Heavy 1/8" Thick Pebbled Fiberglass Reinforced Plastic Skin
- 2" Thick Foam Insulation
- Optional 16" x 16" & 20" x 24" Lite Kit Available
- Lockset, Deadbolt & Barn Style Latch (Sure-Latch) Options Available
- Stainless Steel Butt Hinge and Stainless Steel Strap Hinge Options Available
- Fiberglass Trim Kit Available



Quick Mount Nailing Flange

- Pre-Hung with fiberglass nailing flange
- Frame pre-drilled for mounting
- Available in right or left hand swing
- Quick installation with mounting screws supplied



Fiberglass Picture Frame

- No Paint
- UV Inhibitors
- Strong Impact Resistant
- Fiberglass Reinforced Plastic Skin
- Fiberglass Picture Frame makes custom size doors possible

PLYCO Series 98FG (Fiberglass Panel)

SIZES	<p>Single Doors: Available widths are 2/0 x 6/8, 2/6 x 6/8, 2/8 x 6/8, 3/0 x 6/8, 3/4 x 6/8, 3/8 x 6/8, 4/0 x 6/8, 3/0 x 7/0 3/8 x 7/0, and 4/0 x 7/0</p> <p>Double Doors: Standard sizes 6/0 x 6/8, 6/0 x 7/0, 7/0 x 7/0. Custom sizes available in any combination up to 7/4 x 7/0. Double door has astragal attached to inactive panel. Surface mounted head and foot bolts included. Right side active panel is standard, may request left side active.</p>
HINGES	(3) 6" 304 stainless steel strap T-hinges or (3) 4-1/2" 304 stainless steel butt (fixed pin) hinges are available.
THRESHOLD	Heavy rubber sweep is standard. Thermally broken, aluminum thresholds are available as an option. Standard is ADA approved.
BOTTOM SEALS	Heavy rubber sweep is standard. Heavy duty used without thresholds; (Optional) Aluminum holder with Alcryn PVC sweep with threshold
HARDWARE	Standard locksets and deadbolt options available. Heavy duty sure-latch optional
DOOR PANEL	
THICKNESS	1 15/16"
SKIN	.120" pebble-textured FRP (i.e., fiberglass) skin is standard. UV stabilized protective material is an available option.
EDGES	Fiberglass perimeter surrounds captures the fiberglass skin
BLOCKING	HD sure-latch blocking is standard. When deadbolt is ordered, door is blocked and bored for deadbolt. Closer blocking is optional. Special blocking may be ordered as an option.
INSULATION	Panel core is polyurethane injected foam
COLORS	Polar White
LOCK FACE PREP	Standard blocking for HD sure-latch. Panel can be ordered prepped for bored lockset.
DEADBOLT	Deadbolt hardware blocking is optional
SWEEP	Bulb & fin sweep with aluminum holder (used w/threshold) or heavy duty sweep (w/o threshold)
LITE KITS	<p>Thermal pane tempered glass lite is standard</p> <p>Lites often requested are:</p> <ul style="list-style-type: none"> 1 LE 16x16 no grids - Insulated 1 LI 20x24 no grids - Insulated <p>Additional lite kits are available, see the accessory pages for other lite sizes.</p>
JAMB	
TYPE	PREHUNG
MATERIAL	Non-corrosion pultruded fiberglass
FEATURES	Nailing flange and kerf weather seals.
FRAME DEPTHS	3 1/2"



Series 98FG Insulated Non-Corrosion Heavy-Duty Door System

SIZES	2/0 x 6/8 2/6 x 6/8 2/8 x 6/8 3/0 x 6/8 3/6 x 6/8 3/8 x 6/8 4/0 x 6/8 2/8 x 7/0 3/0 x 7/0 3/6 x 7/0 4/0 x 7/0 Dbl. 5/4 x 6/8 6/0 x 6/8 6/0 x 7/0 7/0 x 6/8 7/0 x 7/0 7/4 x 6/8 8/0 x 6/8 8/0 x 7/0
OVERALL DIMENSIONS	3068: 39-3/4" x 82-5/8" recommended rough opening 40-1/4 x 83") Special Sizes Available
HINGES	(3) 6" stainless steel strap hinges <u>or</u> (3) 4-1/2" X 4 1/2" stainless steel butt (NRP) hinges are available.
THRESHOLD	Thermally broken, aluminum is available when using butt hinges. Standard handicapped approved.
BOTTOM SEALS	(Optional) Heavy duty used without thresholds; Aluminum holder with Alcryn PVC sweep with threshold.
HARDWARE	Heavy duty Sure-Latch, Standard Sure-Latch, Advantage Locksets , or Whitcomb "D" handle barn latch style.

DOOR PANEL

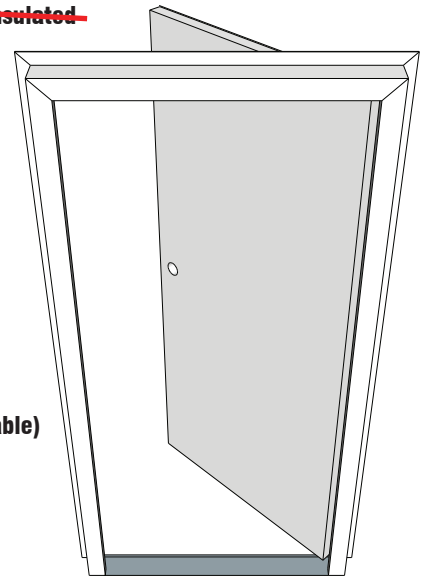
THICKNESS	1-29/32" (1.91") - Fiberglass Picture Frame Standard, Stainless Steel Picture Frame (SSPF) optional.
COLORS	Polar White
SKIN	1/8" pebbled fiberglass (.12" thickness) - UV Resistive available as an option on 3/0 x 6/8 & 3/0 x 7/0 only.
BLOCKING	S - Strap hinges-shurlatch blocking; B - Butt hinges-blocking and drilled for lockset; Dead bolt-blocked and prepped OPTIONAL . Closer blocking is OPTIONAL
INSULATION	Polyurethane Foam filled
R-VALUE - Panel	R-13
LOCK FACE PREP	STD with lockset bore at 2-1/8" and backset of 2-3/4"
DEAD BOLT	Dead bolt hardware blocking is optional.
SWEEP	Bulb and fin sweep with aluminum holder (used with threshold), or heavy duty synthetic rubber sweep (without threshold)
LITE KITS	1-LE-2 16 x 16 (no grids) insulated 1-LT-2 7 x 30 (no grids) insulated 1-LH-2 20 x 24 Single Pane 1-LB-2 22 x 36 (no grids) insulated 1-LI-2 20 x 24 (no grids) insulated 9-LB-2 22 x 36 (with grids) insulated
	- see Plyco Lite kit page

JAMB

TYPE	Pre-hung
MATERIAL	Pultruded Fiberglass
FEATURES	Nailing flange and kerf weather seals with 300 series SS fasteners
TRIM KIT	Optional 3x3 or 3x4 angle surround.
HINGE REINFORCEMENT	Solid wood 2x2 blocking.
THERMAL BREAK	Fiberglass throughout

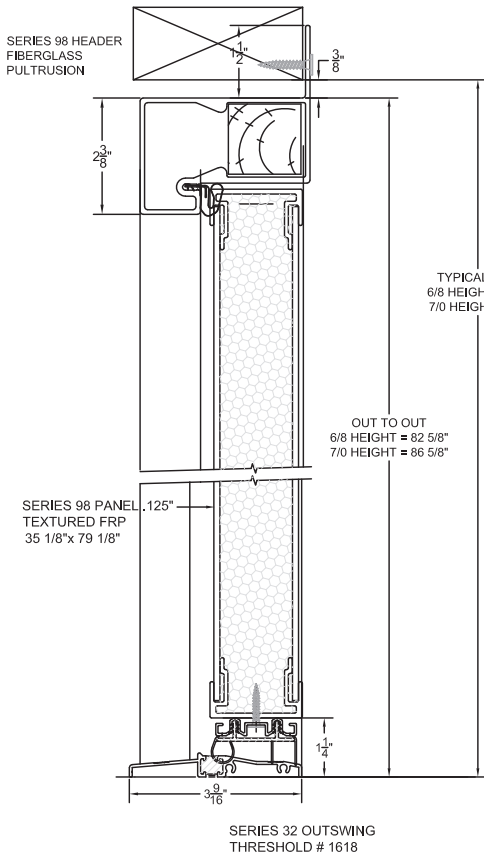
STANDARD SIZES • **3'0" x 6'8" ROUGH OPNG. 40-1/4" x 83-1/16"** (Special sizes available)

• 2'0" x 6'8"	R.O. 28-1/4" x 83"	• 2'8" x 7'0"	R.O. 36-1/4" x 87" (w/butt hinge)
• 2'6" x 6'8"	R.O. 24-1/4" x 83"	• 3'0" x 7'0"	R.O. 40-1/4" x 87" "
• 2'8" x 6'8"	R.O. 36-1/4" x 83"	• 3'6" x 7'0"	R.O. 46-1/4" x 87" "
• 3'6" x 6'8"	R.O. 46-1/4" x 83"	• 4'0" x 7'0"	R.O. 52-1/4" x 87" "
• 3'8" x 6'8"	R.O. 48-1/4" x 83"	• 6'0" x 6'8"	R.O. 76-1/2" x 83" "
• 4'0" x 6'8"	R.O. 52-1/4" x 83"	• 6'0" x 7'0"	R.O. 76-1/2" x 87" "



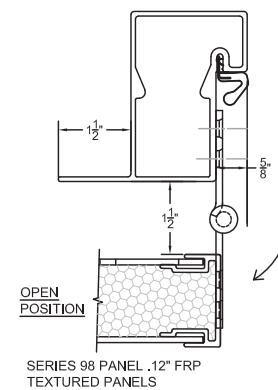
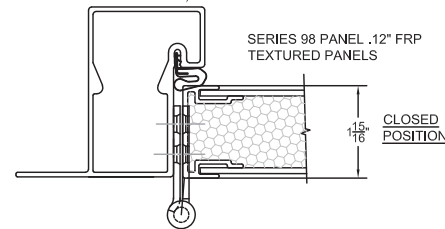
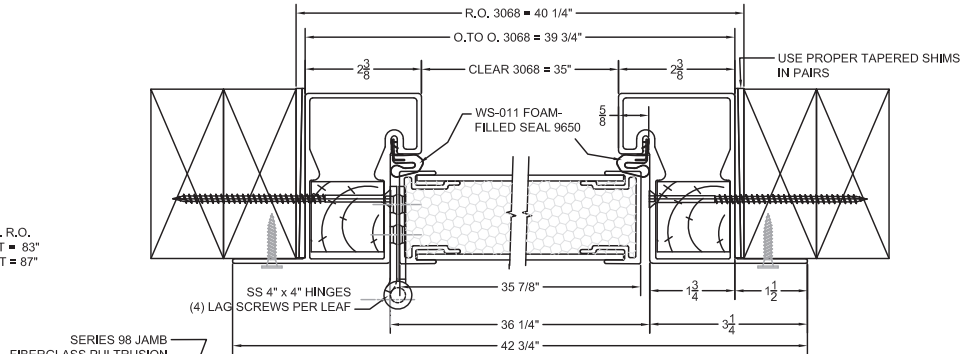
Series 98FG Insulated Non-Corrosion Heavy-Duty Door System

Series 98 B Door Frame Details / Butt Hinge

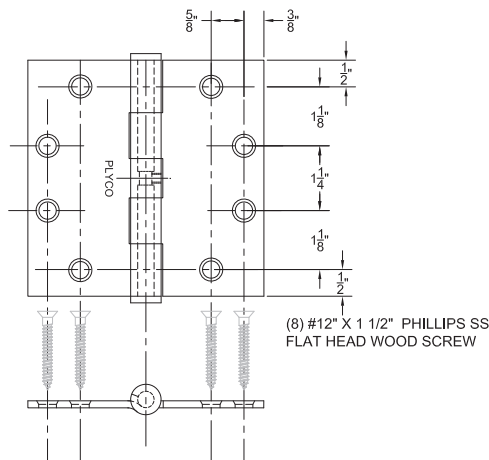


**VERTICAL SECTION -
OUT/IN SWING DOOR**

SHOWN ABOVE WITH
OPTIONAL THRESHOLD



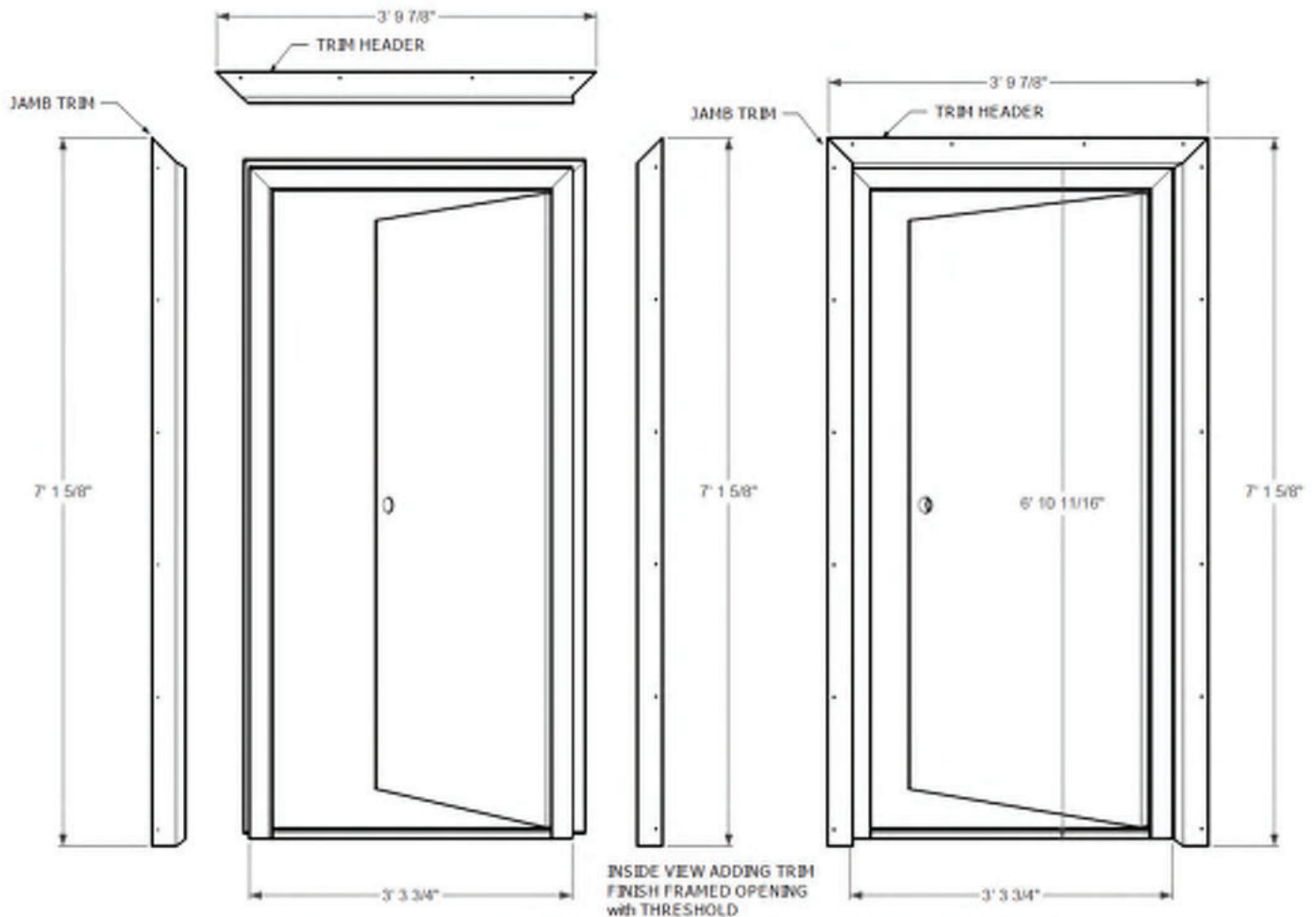
**HORIZONTAL SECTION -
CLEAR SWING DOOR**



**HINGE DETAIL - 4 1/2" X 4 1/2"
PLAIN BEARING HINGE**

Series 98FG Insulated Non-Corrosion Heavy-Duty Door System Trim Option

Series 98 Door 3068 View



RoHS: Yes
CSA Listing Info: C22.2 No. 42
CSA Standard: Yes

cURus: No
Federal Spec: Yes
UL Listing No: UL498
UL Standard: Yes



Affordable durability for a wide range of applications.

CSB15AC1, CSB15AC2, CSB15AC3, CSB15AC4, CSB20AC1, CSB20AC2, CSB20AC3, CSB20AC4

These switches offer excellent value while meeting federal specification standards. External screw-pressure-plate back wiring enables fast installation and superior electrical connections. Rugged construction shrugs off hard use and abuse.

Features & Benefits

One-piece plated steel strap for corrosion resistance

Heavy-duty bumpers for quiet, smooth operation

Oversized silver-alloy contacts for long life and better heat dissipation

Heavy-duty, brass alloy, one-piece contact arm virtually eliminates contact bounce

Shallow design for easier installation



Glass-reinforced nylon back body for durability and strength

Locking support provides resistance to face and back body separation

Side and external screw-pressure-plate back wire with #14 – #10 AWG copper or copper-clad wire

Cam control and spring actuator for positive “makes and breaks” with a minimum of arcing

CSB20AC1LA

3rd Party Compliance



UL Listed, File Number E140597, Standard UL20, General Use Snap Switches. Federal Specification WS896. cULus Listed, File Number LR17446, Standard CSA-C22.2 No. 111, General Use Snap Switches. Conforms to NEMA WD-1 and WD-6.

Technical Information
Performance
Electrical

Dielectric Withstand Voltage	1500V Minimum
Maximum Working Voltage	277VAC
Overload	Minimum 4.8 times rated current for 100 cycles
Temperature Rise	30°C maximum at rated current
Maximum Continuous Current	277VAC
Endurance	50,000 cycles minimum, resistive, inductive, tungsten filament lamp load (Fed Spec)

Mechanical

Terminal Accommodations	#14 AWG – #10 AWG
-------------------------	-------------------

Environmental

Flammability	UL94 V2
Operating Temperature	Maximum continuous +115°C, minimum -40°C

Materials

Back Body	Glass-Reinforced Nylon
Front Body	Nylon
Toggle	Thermoplastic Polycarbonate
Terminals	Brass
Terminal Screws	Tri-Drive Brass-Plated Steel
Strap	Plated Steel
Pressure Plate	Brass
Contacts	Silver Cadmium Oxide
Spring Arm	Brass
Bumper	Rubber
Spring	Zinc-Plated Steel
Ground Terminal	Brass
Ground Screw	Tri-Drive Zinc-Plated Steel

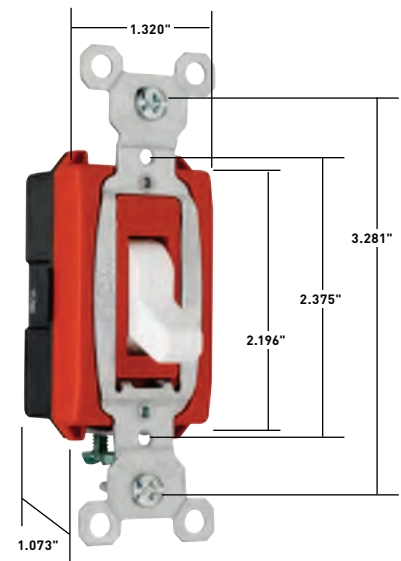
HP Conversion Table – Switches

15 Amp	1/2 Horsepower at 120VAC; 2 Horsepower at 240VAC
20 Amp	1 Horsepower at 120VAC; 2 Horsepower at 240VAC

15 Amp Cover Blue
 20 Amp Cover Red

Warranty

1 Year


**Dimensions for
 15 & 20 Amp**

Ordering Information

Hard Use Switches


Catalog Number				Rating		
Single Pole	Double Pole	Three-Way	Four-Way	A	VAC	Color
CSB15AC1I	CSB15AC2I	CSB15AC3I	CSB15AC4I	15	120/277	Ivory
CSB15AC1W	CSB15AC2W	CSB15AC3W	CSB15AC4W	15	120/277	White
CSB15AC1	CSB15AC2	CSB15AC3	CSB15AC4	15	120/277	Brown
CSB15AC1GRY	CSB15AC2GRY	CSB15AC3GRY	CSB15AC4GRY	15	120/277	Gray
CSB15AC1LA	CSB15AC2LA	CSB15AC3LA	CSB15AC4LA	15	120/277	Light Almond
CSB20AC1I	CSB20AC2I	CSB20AC3I	CSB20AC4I	20	120/277	Ivory
CSB20AC1W	CSB20AC2W	CSB20AC3W	CSB20AC4W	20	120/277	White
CSB20AC1	CSB20AC2	CSB20AC3	CSB20AC4	20	120/277	Brown
CSB20AC1GRY	CSB20AC2GRY	CSB20AC3GRY	CSB20AC4GRY	20	120/277	Gray
CSB20AC1BK		CSB20AC3BK		20	120/277	Black
CSB20AC1LA	CSB20AC2LA	CSB20AC3LA	CSB20AC4LA	20	120/277	Light Almond

Vertical Markets

- Education
- Institutional
- Hospitality/Lodging
- Retail
- Multiple Dwelling
- Office

Also available

- Plug Load Control Devices
- Hospital Grade Devices
- PlugTail® Devices
- Plug Load Solutions
- SPD & Isolated Ground Devices
- Ground Continuity Monitoring Devices (GCM)
- Straight Blade Plugs & Connectors
- Turnlok® Locking Devices
- IEC 309 Industrial Products
- Flexcor® Wire Mesh Grip
- USB Charging Devices

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60 Woodlawn Street
West Hartford, CT 06110
1.877.BY.LEGRAND (295.3472)
www.legrand.us
905.738.9195
www.legrand.ca



Product data sheet

Characteristics

QO112M100P

Load center, QO, 1 phase, 12 spaces, 24 circuits, 100A convertible main breaker, NEMA1, UL

Product availability : Non-Stock - Not normally stocked in distribution facility



Price* : 346.36 USD



Main

Marketing Trade Name	QO
Product Type	Load Center

Complementary

Tightening Torque	Cover: 20 lb.in
Load Center Type	Main breaker
Rated Current	100 A
Number of Spaces	12
Max Short Circuit Current Rating	22 kA
Maximum Number of Single Pole Circuits	24
Maximum Number of Tandem Breakers	12
Number of Phases	1 phase
Ground Bar	Grounding bar (ordered separately)
Box Number	5
Height	14.92 in (378.97 mm)
Width	14.25 in (361.95 mm)
Depth	3.75 in (95.25 mm)

Environment

Enclosure Rating	NEMA 1 for indoor
Ambient Air Temperature for Operation	23 °F (-5 °C) 104 °F (40 °C)
Product Certifications	UL Listed

* Price is "List Price" and may be subject to a trade discount – check with your local distributor or retailer for actual price.

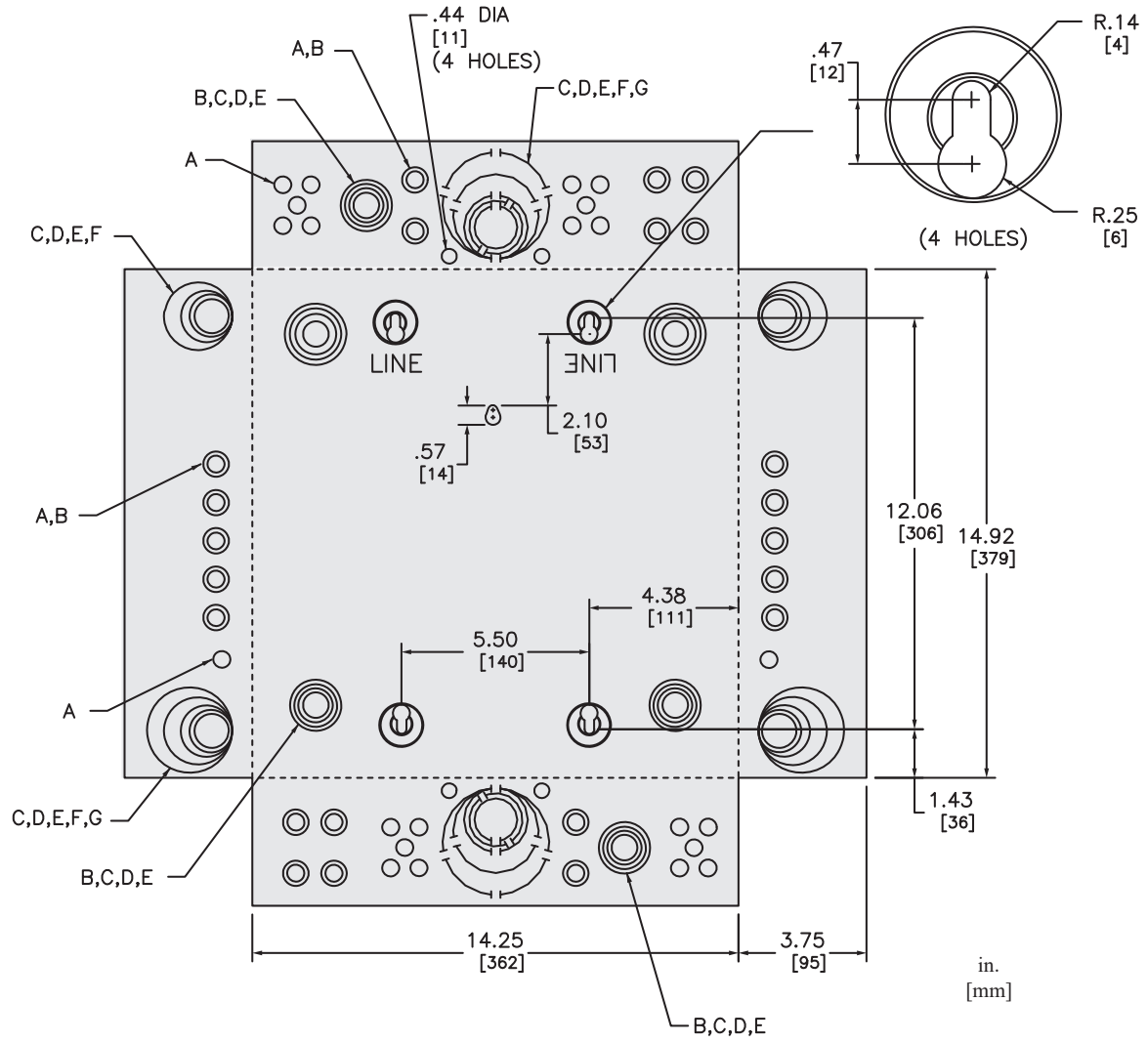
Ordering and shipping details

Category	10001 - QO PON 1PH LC,12-60 CKT, MB N1
Discount Schedule	DE3A
GTIN	00785901595878
Nbr. of units in pkg.	1
Package weight(Lbs)	1 lb(US) (0.45 kg)
Returnability	Yes
Country of origin	US

Offer Sustainability

California proposition 65	WARNING: This product can expose you to chemicals including: Lead and lead compounds, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov
REACH Regulation	REACH Declaration
REACH free of SVHC	Yes
EU RoHS Directive	Compliant EU RoHS Declaration
Toxic heavy metal free	Yes
Mercury free	Yes
RoHS exemption information	Yes
China RoHS Regulation	China RoHS declaration Pro-active China RoHS declaration (out of China RoHS legal scope)

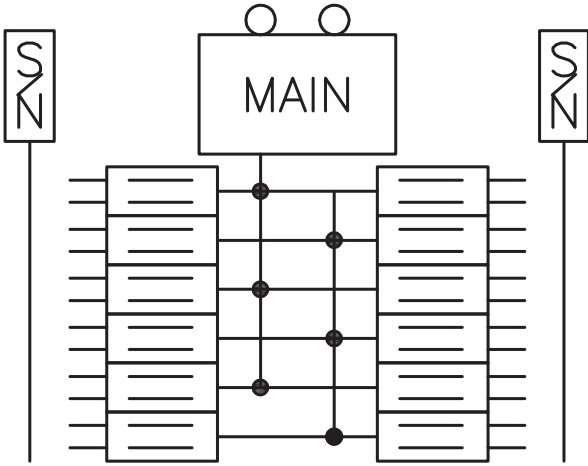
Dimensions



KNOCKOUTS							
SYMBOL	A	B	C	D	E	F	G
IN	.50	.75	1.00	1.25	1.50	2.00	2.50
MM	13	19	25	32	38	51	64

All dimensions are approximate. Also refer to technical drawings and documentation.

Wiring Diagram



QO112M100P
QO112M100PC

Product data sheet

Specifications

SQUARE D



Mini circuit breaker, QO, 20A, 1 pole, 120/240VAC, 10kA, plug in

QO120

Product availability: Stock - Normally stocked in distribution facility

Price*: 29.10 USD

Main

Product	Miniature circuit-breaker
Range	QO
Current Rating	20 A
Voltage Rating	120/240 V AC 120 V AC
Mounting Type	Plug-in
Number of Poles	1P
Circuit Breaker Type	Standard
Ratings	HACR and Switching Duty rated
Electrical Connection	Pressure plate

Complementary

Interrupt Rating	10 kA 120/240 V AC 10 kA 120 V AC
Number of Panel Spaces	1
Wire Size	AWG 14...AWG 8 copper or aluminium
Tightening Torque	35.4 lbf.in (4 N.m)
Height	3.0 in (76 mm)
Width	0.7 in (19 mm)
Depth	2.9 in (74 mm)
Net Weight	0.249 lb(US) (0.113 kg)

Environment

Certifications	UL Listed CSA
Ambient Rating	104 °F (40 °C)

Ordering and shipping details

Category	US1DE2A00004
Discount Schedule	DE2A
GTIN	785901400103
Returnability	Yes
Country of origin	US

Price is "List Price" and may be subject to a trade discount – check with your local distributor or retailer for actual price.

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	0.70 in (1.778 cm)
Package 1 Width	3.00 in (7.62 cm)
Package 1 Length	3.30 in (8.382 cm)
Package 1 Weight	4.32 oz (122.47 g)
Unit Type of Package 2	BB1
Number of Units in Package 2	10
Package 2 Height	3.20 in (8.128 cm)
Package 2 Width	3.40 in (8.636 cm)
Package 2 Length	7.70 in (19.558 cm)
Package 2 Weight	2.820 lb(US) (1.279 kg)
Unit Type of Package 3	CAR
Number of Units in Package 3	100
Package 3 Height	6.80 in (17.272 cm)
Package 3 Width	8.10 in (20.574 cm)
Package 3 Length	17.20 in (43.688 cm)
Package 3 Weight	28.700 lb(US) (13.018 kg)

Contractual warranty

Warranty	18 months
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Environmental Data

Schneider Electric aims to achieve Net Zero status by 2050 through supply chain partnerships, lower impact materials, and circularity via our ongoing “Use Better, Use Longer, Use Again” campaign to extend product lifetimes and recyclability.

[Environmental Data explained >](#)

[How we assess product sustainability >](#)

Environmental footprint

Carbon footprint (kg CO2 eq, Total Life cycle)	22
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Environmental Disclosure	Product Environmental Profile
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Use Better

Materials and Substances

Packaging made with recycled cardboard	No
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Packaging without single use plastic	Yes
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EU RoHS Directive	Compliant
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SCIP Number	Af42fb01-813d-40c0-ae28-b8b3299dbc99
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REACH Regulation	REACH Declaration
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China RoHS Regulation	China RoHS declaration
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Use Again

Repack and remanufacture

Circularity Profile	No need of specific recycling operations
---------------------	--

Halogen content performance

Halogen free product

Take-back

No

Image of product / Alternate images

Alternative

Technical Benefits
Thermal Magnetic Breaker



- Miniature circuit breaker rated at 20A**
- Protects against overloads and short-circuits**
- Easy plug on circuit breaker that's compatible with Square D™ QO Loadcenters**
- The current capacity that this circuit breaker is able to interrupt before breaking is 10kA**
- Quickly identify tripped breakers with our Kill Trip indicator**
- Compatible with QO electrical panels and CSEDs with 1 space**

QO™
QO120
20A
120/240 VAC ~ 50/60Hz
10,000 AIR/KA reset I

1 Pole
Pole
Pôle

Plug-On
Enchufable
Enfichable





Main

Product	Miniature circuit-breaker
Range	QO
Current Rating	20 A
Voltage Rating	120/240 V AC 120 V AC 48 V DC
Mounting Type	Plug-in
Number of Poles	2P
Circuit Breaker Type	Standard
Ratings	HACR rated
Electrical Connection	Pressure plate

Complementary

Interrupt Rating	10 kA 120/240 V AC 50/60 Hz 10 kA 120 V AC 50/60 Hz 5 kA 48 V DC
Number of Panel Spaces	2
Wire Size	AWG 14...AWG 8 copper or aluminium
Tightening Torque	44.25 lbf.in (5 N.m) 0.02...0.04 in ² (10...25 mm ²) (AWG 8...AWG 2)
Height	3 in (76.20 mm)
Width	1.5 in (38.10 mm)
Depth	2.91 in (73.91 mm)

Environment

Certifications	UL Listed CSA
Ambient Rating	104 °F (40 °C)

Ordering and shipping details

Category	00004 - QO,QOT 10-30A 1P;10-60A 2P
Discount Schedule	DE2A
GTIN	00785901400363
Nbr. of units in pkg.	50
Package weight(Lbs)	50 lb(US) (22.68 kg)
Returnability	Yes
Country of origin	MX

Packing Units

Unit Type of Package 1	PCE
Package 1 Height	1.50 in (3.81 cm)
Package 1 width	3.30 in (8.382 cm)
Package 1 Length	3.00 in (7.62 cm)
Unit Type of Package 2	BB1
Number of Units in Package 2	5
Package 2 Weight	2.75 lb(US) (1.247 kg)
Package 2 Height	3.50 in (8.89 cm)
Package 2 width	2.70 in (6.858 cm)

Package 2 Length	8.00 in (20.32 cm)
Unit Type of Package 3	CAR
Number of Units in Package 3	50
Package 3 Weight	28.00 lb(US) (12.701 kg)
Package 3 Height	8.40 in (21.336 cm)
Package 3 width	7.30 in (18.542 cm)
Package 3 Length	17.30 in (43.942 cm)

Offer Sustainability

Sustainable offer status	Green Premium product
REACH Regulation	REACH Declaration
REACH free of SVHC	Yes
EU RoHS Directive	Compliant EU RoHS Declaration
Toxic heavy metal free	Yes
Mercury free	Yes
RoHS exemption information	Yes
China RoHS Regulation	China RoHS Declaration
Environmental Disclosure	Product Environmental Profile
Halogen content performance	Halogen free product

Contractual warranty

Warranty	18 months
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COR61-AA-545

DCPD Laminating Resin

Technical Data Sheet

COR61-AA-545 is a low profile, low shrink, DCPD, unsaturated polyester laminating resin. This resin is promoted, thixotropic, and formulated to be initiated with MEKP only. COR61-AA-545 is used in the manufacture of glass fiber reinforced composites. This product is not recommended for use in composites that will have prolonged exposure to water, e.g. large marine craft.

FEATURES	BENEFITS
• Low Laminate Exotherm	• Good cosmetic surface and minimal glass print
• Moderate Trim Time	• Good cycle times and moderate Barcol development
• Excellent Fiberglass Wet-Out	• Easy roll-out and high laminate physical properties
• Excellent Toughness	• High resistance to cracking and torsional stress
• Less Than 29% HAP (Styrene)	• Less odor and lower emissions in the shop

RELATED PRODUCTS	GEL TIME
COR61-AA-545W	12-17 Minutes
COR61-AA-545S	23-30 Minutes
COR61-AA-545SS	30-36 Minutes
COR61-AA-545D	40-47 Minutes

LIQUID PROPERTIES	RESULTS
Viscosity, Brookfield Model LV #3 Spindle @ 60 rpm, 77°F (25°C), cps	400-525
Thixotropic Index	2.75-3.40
100 grams resin @ 77°F (25°C), initiated with 1.0% DDM-9 by volume *	
Gel Time, min:sec	18:00-23:00
Gel to Peak Exotherm Time, min:sec	7:00-12:00
Peak Exotherm	260-300°F (127-149°C)
Non-Volatile Content, %	66.0-70.0
Hazardous Air Pollutant (Styrene) Content, %	25.0-29.0
Specific Gravity	0.96-1.20

TYPICAL PROPERTIES				
Thickness	1/8 inch (3.2 mm) Casting		1/8 inch (3.2 mm) Laminate	
Construction	Not Applicable		4 Plies 1.5 oz/ft ² , 33% Glass Mat	
Flexural Strength, ASTM D790	11,700 psi	80 MPa	20,000 psi	140 MPa
Flexural Modulus, ASTM D790	5.22 x 10 ⁵ psi	3,600 MPa	12.0 x 10 ⁵ psi	8,280 MPa
Tensile Strength, ASTM D638	6,750 psi	46 MPa	10,900 psi	75 MPa
Tensile Modulus, ASTM D638	4.84 x 10 ⁵ psi	3,340 MPa	12.4 x 10 ⁵ psi	8,550 MPa
Tensile Elongation, ASTM D638	1.5 %	1.5 %	1.24 %	1.24 %
Barcol Hardness, 934-1 gauge, ASTM D2583	35	35	48-52	48-52
Heat Distortion Temperature, ASTM D648	182 °F	83 °C	-- °F	-- °C
* The gel time and reactivity will vary due to the type and concentration of Free Radical Initiator (catalyst), shop temperature, humidity, and type of fillers used. In order to meet your individual needs consult our technical sales representative for assistance.				
Testing conducted at 77°F (25°C) and 50% relative humidity. Results may depend on postcure and batch variations within nominal blend component compositions.				
The air-curing capabilities of DCPD laminating resins are well documented. Ambient temperature, catalyst level, laminate thickness and configuration can all contribute to accelerating and surface cure. Care must be taken to ensure that secondary laminates have good adhesion. Cured surfaces should be sanded between laminates.				

All specifications and properties specified above are approximate. Specifications and properties of material delivered may vary slightly from those given above. Interplastic Corporation makes no representations of fact regarding the material except those specified above. No person has any authority to bind Interplastic Corporation to any representation except those specified above. Final determination of the suitability of the material for the use contemplated is the sole responsibility of the Buyer. The Thermoset Resins Division's technical sales representatives will assist in developing procedures to fit individual requirements.

INTERPLASTIC CORPORATION
 2015 Northeast Broadway Street
 Minneapolis, Minnesota 55413-1775
 651.481.6860 Fax 612.331.4235
www.interplastic.com

BIRCH

Far East American Lamination Grade Birch

Plywood embedded between layers of internal/external fiberglass for attaching basic electrical components to wall.

Highlights:

- Lamination grade uses only the best available A grade poplar core veneer. The core veneer is without dead knots, without patches and is uniform in color.
- We use a two step drying process. The core veneers are hot pressed individually to achieve flatness and lower moisture content. The veneers are then dried once again via a state of the art kiln drying machine.
- Then a three step lay-up process is used. The inside layers are repaired and calibrated before cross grain veneers under the face and back are added.
- Using the most advanced glue from Taiwan ensures glue bonding and tight formaldehyde emission control. Only the best quality glues are used to ensure no delamination after cutting with a CNC router.
- All panels are suitable for lamination with a variety of laminates such as 30 gram paper, HPL, MDO, etc.
- Panels have a tighter thickness tolerance than what is normally sold in the market.
- Our panels are only produced at FEA's highest quality factories.
- All panels are inspected by FEA quality control personnel.

Specifications:

Thickness	9mm, 12mm, and 18mm
Dimension	4x8; Available in 48.5"x 96.5"
Face/Back	Available in Natural and White Birch
Core	Machine Composed Poplar and Combi Cores
Grade	Available in C-2, D/D and D/E
Glue	Available in E-1 and CARB 2
Tolerance	Minus .3mm/Plus .2mm
Moisture Content	8-12%

ELFOAM[®] P200

POLYISOCYANURATE FOAM

Product Description

Elfoam P200 is a 2.0 lb/ft³ (32 kg/m³), rigid, unfaced, closed cell polyisocyanurate foam supplied as blocks, sheets, shapes and custom parts for a variety of insulation, core material and carving applications. Polyisocyanurate foam (*polyiso*) is similar to polyurethane foam but offers greater dimensional stability over a wider service temperature range.

Elfoam P200 is manufactured in bunstock form 25" (64cm) thick with a 48" (122cm) width in 72", 96", 108", 120", and 144" (183cm, 244cm, 274cm, 305cm, and 396cm) lengths. Cut sheets are offered in thicknesses from 1/8" to 12" (.32cm to 30cm) in 1/32" (.08cm) increments. Custom sizes and fabricated parts up to 25" (64cm) thick and 192" (488cm) in length are available for customers wanting to eliminate in-house cutting, handling, piecing and scrap disposal. Contact the Indianapolis Sales Office for additional information.

Design Considerations

Elfoam P200 is designed for use in environments where temperatures range from -60°F to +300°F (-51°C to +149°C). However, in non-laminated applications where P200 is exposed to temperatures exceeding 140°F (60°C) and/or relative humidity in excess of 70%, allowances for foam expansion may need to be incorporated into the engineering design. Regardless of operating conditions, a qualified design engineer should review all foam applications.

Elfoam, like all cellular plastics, will degrade upon prolonged exposure to sunlight. Cover foam material in order to block ultraviolet radiation and prevent degradation. Other coverings to protect exposed foam surfaces from the elements and to meet applicable fire regulations may also be required.

Applications*

- Refrigerated food service equipment
- Laminated wall and roof panels
- Commercial and industrial doors
- FRP panels, tanks and shelters
- Truck/Trailer bodies, shipping containers and railcars
- Plugs, patterns and carved products

Environmental Data

Elfoam P200 is specifically formulated to provide excellent physical properties without the use of chlorofluorocarbon (CFC) or hydrochlorofluorocarbon (HCFC) blowing agents. In compliance with the Montreal Protocol and the Clean Air Act, Elfoam P200 is manufactured with hydrocarbon blowing agents which have no ozone depletion and no global warming potential.

Safety

All persons who work with Elfoam products should follow proper handling procedures. The Elfoam Material Safety Data Sheet (MSDS) contains information on the proper handling, storage and use of this material. A copy of this MSDS may be downloaded at www.elliottfoam.com or obtained by calling the Indianapolis Sales Office.

Availability

All Elfoam product support, samples, pricing and orders are coordinated by the Indianapolis Sales Office. Please call **(800) 545-1213** for details. Additional Elfoam product data sheets may also be downloaded at www.elliottfoam.com.

* Application testing is often required to determine suitability of the foam for a specific application. The potential user should perform pertinent testing to determine the suitability of the product for the intended application. Final determination of fitness of the product for any particular use is the responsibility of the buyer.

NOTE: Elliott Company of Indianapolis Inc. (Elliott) believes the information and recommendations herein to be accurate and reliable as of date of publication. However, since any assistance furnished by Elliott with reference to the proper use and disposal of its products is provided without charge and since use conditions are not within its control, Elliott assumes no obligation or liability for such assistance. No warranty, expressed or implied, regarding accuracy or correctness is given and Elliott expressly disclaims any implied warranties including the implied warranties of merchantability or fitness for a particular use. Since use conditions and government regulations may vary from one location to another and may change with time, it is the buyer's responsibility to determine whether Elliott products are appropriate for buyer's use, and to assure the buyer's workplace and disposal procedures are in compliance with law, regulations, ordinances, and other government enactments applicable in the jurisdiction having authority over the buyer's operations.



Family Owned Since 1958
OF INDIANAPOLIS INC.

Manufacturer/Fabricator of ELFOAM Polyiso & Polyurethane Products

Product Description

Elfoam P200 is a rigid, unfaced, closed cell polyisocyanurate foam material (*polyiso*). This CFC and HCFC free product provides outstanding physical properties at service temperature environments between -60°F to +300°F (-51°C to 149°C). Elfoam P200 is supplied in standard and custom blocks, sheets and fabricated shapes.

Physical Properties (1)(2)(3)	ASTM Method	Typical Values(4)	
		English	Metric
Density, Average	D1622	2.0 lb/ft ³	32 kg/m ³
k-factor(5)	C518		
Initial at 75°F (24°C)		0.165 BTU•in/hr•ft ² •°F	.024 W/m•°C
Aged 10 days at 158°F (70°C)		0.185 BTU•in/hr•ft ² •°F	.027 W/m•°C
R-value/inch			
Aged 10 days at 158°F (70°C)		5.4 Hr•ft ² •°F/BTU	0.96 m ² •°C/W
Compressive Strength	D1621		
Parallel		27 lb/in ²	186 kPa
Perpendicular		20 lb/in ²	138 kPa
Compressive Modulus	D1621		
Parallel		700 lb/in ²	4,823 kPa
Perpendicular		506 lb/in ²	3,486 kPa
Shear Strength	C273		
Parallel		22 lb/in ²	151 kPa
Perpendicular		16 lb/in ²	110 kPa
Shear Modulus	C273		
Parallel		220 lb/in ²	1,516 kPa
Perpendicular		177 lb/in ²	1,219 kPa
Tensile Strength	D1623		
Parallel		41 lb/in ²	283 kPa
Perpendicular		26 lb/in ²	179 kPa
Tensile Modulus	D1623		
Parallel		1,225 lb/in ²	8,440 kPa
Perpendicular		463 lb/in ²	3,190 kPa
Closed Cell Content(6)	D2856		92%
Water Absorption (by volume)	C272		1.27%
Water Vapor Transmission	E96	1.8 perms/in	3.3 ng/Pa•S•m
Dimensional Stability (volume change)	D2126		
158°F (70°C) + 97% R.H./7 days			+3.0%
212°F (100°C) + Ambient R.H./7 days			+1.0%
-40°F (-40°C) + Ambient R.H./7 days			-0.5%
Surface Burning Characteristics(7)	E84-03		
Flame Spread up to 6" (15.23 cm) .			<25
Smoke Developed up to 6" (15.23 cm)			<185

- (1) Data shown are average values obtained from representative production samples, unless otherwise indicated.
- (2) The suitability of this product for any particular application is the responsibility of the user. The potential user is responsible for performing any pertinent test required to determine the product's suitability for the intended application.
- (3) All properties measured at 74°F (23°C) unless otherwise indicated.
- (4) To be used only as a guide for engineering.
- (5) k-factors will vary with age and use conditions.
- (6) Freeze-thaw cycling in wet environments may cause destruction of unprotected foam's closed cell structure, resulting in the deterioration of physical properties.
- (7) Numerical "Flame Spread" and "Smoke Developed" ratings are not intended to reflect hazards presented by this or any other material under actual fire conditions. This material is combustible and will burn when exposed to large fire sources.

NOTE: The information presented herein is offered in good faith as accurate, but without warranty, expressed or implied, regarding accuracy or correctness. Conditions of use and suitability of the product for particular uses are beyond the control of Elliott Company of Indianapolis Inc., therefore all risks of the use of this product are assumed by the user.

FOR MORE INFORMATION OR PRODUCT SAMPLES CALL

1-800-545-1213

OR VISIT

www.elliottfoam.com



Family Owned Since 1958
OF INDIANAPOLIS INC.

9200 Zionsville Road in Indianapolis, Indiana 46268
Phone: (317) 291-1213 • Fax: (317) 291-1219

Product Data



908 LENOIR ROAD • POST OFFICE BOX 1809
HICKORY, NORTH CAROLINA • 28603-1809
TELEPHONE (828) 328-1721
TOLL FREE (800) 334-5975
FAX (828) 328-4572

LHM-2900 LOW HAP WHITE HydroShield® LITE NPG/ISO MARINE GEL COAT

- **LOW STYRENE (HAP) LEVEL - LESS THAN 30%**
- **NPG/ISOPHTHALIC FOR EXCELLENT BLISTER RESISTANCE**
- **EXCELLENT UV RESISTANCE**
- **HIGH STRENGTH AND HARDNESS**
- **EXCELLENT APPLICATION PROPERTIES**
- **USES NEW CHEMISTRY TO ACHIEVE UNIQUE PROPERTIES**

HK Research Corporation's White NPG-ISO Gel Coats are unsurpassed in the Marine Industry for their superior properties. The 100% NPG-Isophthalic resin backbone provides this hybrid product with unique physical characteristics. These unsurpassed Gel Coat systems provide the Marine Industry with a hard stain and abrasion resistant surface.

PROCESSING PROPERTIES

The handling characteristics of HK Research White NPG-Isophthalic gel coats are unmatched for their ease of application, quick leveling, air release, and rapid cure.

HK Research manufactures a series of White Marine Gel Coats that allows the use of this exceptional material under most conditions. To establish the correct material for your manufacturing equipment and conditions, please contact our representative or our technical service laboratories at 1-800-334-5975 or 828-328-1721. You may also e-mail us at www.hkresearch.com.

TYPICAL PROPERTIES OF LIQUID GEL COAT

LHM-2900

Weight/Gallon @ 77°F:	11.00 pounds
Specific Gravity @ 77°F:	1.32
Viscosity, Brookfield	
@ 77°F @ 6 rpm:	18,000-20,000 cp.
@ 60 rpm:	2,200-3,200 cp.
Thixotropic Index:	5.5 – 7.0
Gel Time, 100 Grams	
@ 77°F, 2% MEKP:	22 - 28 minutes
Shelf Life -	
Uncatalyzed, @ 77°F:	3 months minimum

TYPICAL MECHANICAL PROPERTIES OF CURED GEL COAT (Polymer Base)

Tensile strength	11600 psi
Tensile modulus	547,000 psi
% Tensile elongation	3.8%
Flexural strength	18,450 psi
Flexural modulus	545,000 psi
Heat Distortion Temp, F	174 degrees

APPLICATION

HK Research Corporation's "LHM" series White Gel Coats are formulated for standard conventional spray application as well as "air-less" application. Most of the systems are suitable for use in standard "air-less equipment" or the currently available "low pressure-air assisted" airless type equipment. These high performance Gel Coats require careful application in order to maximize the properties in the cured gel coat film. Poor application of the "LHM" series White Gel Coat systems will cause a reduction in the properties of the cured gel coat film.

MIXING

Prior to removal from the shipping container and catalyzation, it is recommended that the materials be mixed thoroughly to reincorporate any "settled" or "stratified" material. It is further recommended that the material in the shipping container be mixed at least once a week during its use period. The mixing procedure would assure the most uniform properties during application of the gel coat. Mechanical mixing is recommended and should be sufficient to "turn" the material 10 times. Most common gel coat mixing equipment will accomplish an adequate blend in less than 1/2 hour.

DO NOT MIX MATERIAL CONTINUOUSLY!---*As this may cause loss of thixotropic properties. If the gel coat is inadvertently over-mixed, hold material for 4 hours without agitation before application.*

MIXING
(continued)

It is suggested that the catalyst concentration used in the application of the "LHM" series NPG-ISO White Gel Coats not exceed 3.0% or fall below 1.5% to retain maximum properties. The recommended range for the catalyst concentration within the applied film is 1.8 to 2.2% at 77°F.

Recommended catalysts are NORAC MEKP-9, Superox 46-702 and Cadox L-50a. Call HK's Lab for other recommendations.

SAFETY CONSIDERATIONS

"LHM" series NPG-ISO White gel coats are based on a resin that contains styrene monomer, which is a flammable liquid. Keep away from sparks, heat and open flame (including pilot lights). Electrical equipment should be vapor-proof and protected from breakage.

Styrene vapors are heavier than air and will tend to concentrate in the low areas of molds and in pockets immediately above the floor area. To keep vapors within a safe limit in all areas, adequate ventilation or suction fans should be used that will remove these styrene monomer vapors.

All equipment must be grounded - including spray guns and molds.

Both the polyester gel coat and the catalyst may cause burns to eyes and skin. Do not get in the eyes! Avoid breathing vapors! Gel coat applicators should wear a NIOSH approved respirator effective for vapors, spray mist and dust. In case of accidental contact, remove the contaminated clothing and wash affected skin areas with soap and copious quantities of water. Contact a physician if persistent skin irritation occurs. For eyes, immediately flush with plenty of water for at least 15 minutes; call a physician immediately. Wash contaminated clothing before reusing.

OPTISPRAY® F ROVING

FOR FAST WET OUT SPRAY-UP IN COMPLEX MOLDS



DESCRIPTION

- **OptiSpray® F** reinforcement is a multi-end roving using Advantex® glass fiber, which combines the electrical and mechanical properties of traditional E-glass with the acid corrosion resistance of E-CR glass
- This Advantex® glass roving has a sizing system with a silane coupling agent, designed to provide optimal performance for spray-up applications where fast wet-out speed is preferred

BENEFITS

- Easy chopping, good mechanical properties
- Low fuzz, flat lay down and uniform dispersion
- Great surface quality, excellent conformability, no spring back
- Best performance on vertical parts, optimal resin consumption
- Good mechanical properties
- Flat lay down and uniform dispersion
- Excellent conformability, no spring back
- Optimal resin consumption



APPLICATIONS

Variety of applications including boats, truck caps, vehicle body parts, bath tubs/showers/spas, tanks and applications with complex molds or sharp curvatures.

TECHNICAL CHARACTERISTICS (NOMINAL VALUES) – Other Tex may be available upon request

Linear weight of roving (Tex)	Yield (Yds/Lb)	Loss on Ignition (%) ISO 1887 : 1995
2400	207	1.25
3000	165	1.25



OPTISPRAY® F ROVING

FOR FAST WET OUT SPRAY-UP IN COMPLEX MOLDS

PRODUCT AVAILABILITY (STANDARD REFERENCE)

Doff characteristics	Internal diameter (mm)	External diameter (mm)	Height (mm)	Net weight (kg)
OptiSpray® F Roving	77	280 – 303	260 – 265	23 – 20

PACKAGING (STANDARD REFERENCE)

Each OptiSpray® F doff is protected by a tack-wrap polythene film and identified by an individual label. Please do not remove film during use. Creel-pack® packaging is available upon request. Customer specific packaging requirements may be available upon request.

Manufacturing Region	Product	Doff Ø (mm)	Pallet dimensions L x W (mm)	Layers per pallet	Doffs per layer	Total number of doffs	Creel-pack®	Pallets	
							Number of ends	Approx. height (cm)	Net weight* (kg)
North America	OptiSpray® F Roving Creel-pack® 2E 2400, Bulk Pack	280	1140 x 1140	3	16	48	2	98	960
North America	OptiSpray® F Roving Close Top 2400	303	1295 x 965	4	12	48	Individual Boxes	126	1120
Europe	OptiSpray® F Roving	290	1200 x 1200 1200 x 900	4	16 or 12	48 or 64	From 1 to 16 and bulkpack	120	1000 to 1200
Latin America	Optispray® F Roving	280 300	1150 x 1150 1290 x 970	3 4	16 or 12	48 or 64	16 or 12	90 or 120	1000 to 1200

*Add 35 to 45 kg to obtain gross weight

LABELING

Each doff has a self-adhesive identification label, showing the product reference and the production date. Each pallet has two identification labels detailing the product reference, pallet net and gross weights, production date and pallet production code.

STORAGE

The OptiSpray® F product should be stored in its original packaging in a dry and cool place. Best conditions are at temperature from 10 to 35°C (50 to 95°F) and humidity between 35 and 85%. If you store the product at lower temperatures, please move the soon-to-be-processed pallets to the production area 24 hours ahead of time. You can stock pallets one on one with a plywood plank between the two.

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P8100, P8200 & P8300 Series

Neoprene / EPDM / SBR Closed Cell Foam Tapes

TECHNICAL DATA

- Absorb shock and dampen sound and vibrations
- Provide a tight, long-lasting seal against moisture, dust, and air leaks
- Pass FMVSS302, CAN/CSA C22.2 #017-92, and UL 94 HF1 for flammability
- Resist acids, alkali, ozone, and oxidation

Product Description

Pres-On P8100, P8200 and P8300 are specification grade, black closed cell Neoprene/EPDM/SBR blend tapes featuring a high-tack rubber based pressure sensitive adhesive (PSA) on one side with easy-to-use release liner.

P8100: Medium density **P8200:** Soft density **P8300:** Firm density

NOTE: Also available with acrylic PSA on one-side (minimums may apply)

Applications

P8100, P8200 and P8300 are general application tapes recommended for gasketing and weatherproofing windows and doors.

STANDARD ROLL SIZE	SERIAL NUMBER	THICKNESS	LENGTH
P8100 is 42/54 inches wide	P8106	1/16"	100'
P8200 is 54 inches wide	P8112	1/8"	75'
P8300 is 42/54 inches wide	P8118	3/16"	50'
	P8125	1/4"	50'
	P8137	3/8"	25'
	P8150	1/2"	25'
	P8206	1/16"	100'
	P8212	1/8"	75'
	P8218	3/16"	50'
	P8225	1/4"	50'
	P8237	3/8"	25'
	P8250	1/2"	25'
	P8262	5/8"	25'
	P8275	3/4"	25'
	P821	1"	25'
	P8306	1/16"	100'
	P8312	1/8"	50'
	P8318	3/16"	50'
	P8325	1/4"	50'
	P8337	3/8"	25'
	P8350	1/2"	25'

ADHESION PROPERTIES	TEST	TYPICAL PERFORMANCE	TEST METHOD
High-tack pressure sensitive rubber based adhesive. One sided with release liner.	Loop Tack	115 oz/in typical	TLM1 LIB1
	Adhesion to Steel @ 72°F		
	Steel immediate	7 lbs/inch width or foam tear	PSTC-1
	Steel after 24 hours	8 lbs/inch width or foam tear	PSTC-1
	Adhesion to Steel, 20 minute dwell	10 lbs/in width minimum	PSTC-1
	Static Shear @ 72°F 1 x 1 x 500 grams	1000 hours minimum	PSTC-7
	Static Shear @ 72°F 1 x 1 x 1000 grams	200 hours minimum	PSTC-7
	Optimum Application Temperature	50°F to 80°F	Pres-On PTM-1
	Functional Temperature	0°F to 140°F	Pres-On PTM-2
	Shelf Life	1 year stored at room temperature	

P8100, P8200 & P8300 Series

Neoprene / EPDM / SBR Closed Cell Foam Tapes

PHYSICAL PROPERTIES	P8100 TAPE (MEDIUM DENSITY)	TEST METHOD	UNIT OF MEASURE	RESULT
	Density (PCF)	ASTM D1056	PSI kPa	5-9 34.4 - 62
	ASTM-D-1056-67 & 68, Grade #	--	--	SCE 42
	ASTM-D-1056-91 & 07 SAE J18-R7/92	--	--	2C2
	Temperature Resistance*	--	F	-40F to +250F
	Water Absorption (Max)	ASTM D1056	%	5
	Tensile Strength (Min)	ASTM D412 (DIE A)	PSI kPa	100 689.5
	Elongation (Min)	ASTM D412 (DIE A)	%	150
	Compression Set (Max)	ASTM D1056	%	25
	Flammability (UL 94 HF1, FMVSS302)	UL E208679	Pass/Fail	Pass
	UL 50, UL 50E, UL 157, UL 508	UL JMLU2, MH10200	Pass/Fail	Pass
PHYSICAL PROPERTIES	P8200 TAPE (SOFT DENSITY)	TEST METHOD	UNIT OF MEASURE	RESULT
	Density (PCF)	ASTM D1056	lbs/ft ²	6±2
	ASTM-D-1056-67 & 68, Grade #	--	--	SCE 41
	ASTM-D-1056-91 & 07 SAE J18-R7/92	--	--	2C1
	Compression Set (25% Max)	--	Pass/Fail	Pass
	Compression Deflection (25%)	ASTM D1056	PSi	2-5
	Water Absorption (by weight)	ASTM D1056	%	5 (10 allowed)
	Temperature Resistance*	--	F	-40F to +250F
	Elongation (Min)	ASTM D1056	%	150
	Heat Aging (7 days @ 158°F, ±30 max change)	--	Pass/Fail	Pass
	Tensile Strength (Min)	ASTM D1056	PSI	75
	Ozone (20% Stress 72hrs @ 100 PPHM)	ASTM-D-1171-94**	Pass/Fail	Pass
	Oil Resistance (7 days @ 74°F)	Fluid Emersion E1	Pass/Fail	Pass
	Flammability (UL 94 HF1, FMVSS302)	UL E208679	Pass/Fail	Pass
	Flammability (Canada CAN/CSA C22.2#07-92)	UL E208679	Pass/Fail	Pass
	UL 50, UL 50E, UL 157, UL 508	UL JMLU2, MH10200	Pass/Fail	Pass
PHYSICAL PROPERTIES	P8300 TAPE (FIRM DENSITY)	TEST METHOD	UNIT OF MEASURE	RESULT
	Density (PCF)	ASTM D1056	lbs/ft ²	9±2
	ASTM-D-1056-67 & 68, Grade #	--	--	SCE 43
	ASTM-D-1056-91 & 07 SAE J18-R7/92	--	--	2C3
	Compression Set (25% Max)	--	Pass/Fail	Pass
	Compression Deflection (25%)	ASTM D1056	PSi	9-13
	Water Absorption (by weight)	ASTM D1056	%	5 (10 allowed)
	Temperature Resistance*	--	F	-40F to +250F
	Elongation (Min)	ASTM D1056	%	150
	Heat Aging (7 days @ 158°F, ±30 max change)	--	Pass/Fail	Pass
	Tensile Strength (Min)	ASTM D1056	PSI	100
	Ozone (20% Stress 72hrs @ 100 PPHM)	ASTM-D-1171-94	Pass/Fail	Pass
	Oil Resistance (7 days @ 74°F)	Fluid Emersion E1	Pass/Fail	Pass
	Flammability (UL 94 HF1, FMVSS302)	UL E208679	Pass/Fail	Pass
	Flammability (Canada CAN/CSA C22.2#07-92)	UL E208679	Pass/Fail	Pass
	UL 50, UL 50E, UL 157, UL 508	UL JMLU2, MH10200	Pass/Fail	Pass
	*For temperature resistance lower and or higher than the above figures, please contact customer service. Under certain conditions, values greater than -40/+250 are possible.			

Application Notes

Ensure bonding surfaces are well unified, clean, dry and free of dirt and oils. Apply firm and even pressure to improve adhesive-to-surface contact. Allow proper temperature and time to enhance bond strength as adhesive flows onto the surface.

**SG600 Series
Methacrylate Adhesives**

Adhesive used to bond fiberglass panels together creating a one piece, permanently fused, factory assembled watertight structure.

DESCRIPTION

SCIGRIP™ SG600 Series Methacrylate Adhesives are two-component, 10:1 mix ratio products for bonding thermoplastics¹, composites and metals². Minimal surface preparation is required on most composites and plastics^{1,2}. Parts can be cross-bonded with metals. Packaging options include 50 and 490 ml cartridges and 5 or 50 gallon (19 and 189 liters) bulk containers for application with meter-mix dispense equipment.

PERFORMANCE BENEFITS

• Choice of 5, 10 and 20 minute working times	→	Selection to fit application and process requirements
• Minimal surface preparation ^{1,2}	→	Reduced labor cost and throughput times
• Non-sag application characteristics	→	Facilitates application on non-level surfaces
• Permanent toughness and high elongation	→	Excellent fatigue, impact and shock load resistance
• Excellent flow characteristics	→	High flow at low pressure, improved flow rate

TYPICAL ADHESIVE CHARACTERISTICS @ 75°F (24°C)

Characteristics	Part A (Adhesive)	Part B (Activator)	Mix (Part A + B)
Color	Off White	Black or Off White	Black or Off White
Mix ratio by volume	10	1	-----
Mix ratio by weight	8.44	1	-----
Density, g/cc	0.97	1.15	0.99
Density, lb/gallon	8.10	9.60	8.24
Viscosity, cps	150,000 – 250,000	80,000 – 120,000	-----

TYPICAL PHYSICAL PROPERTIES @ 75°F (24°C)

Tensile Strength psi (MPa)	2,600 – 3,000 (18 – 21)	Lap Shear Strength ⁴ psi (MPa)	2,700 – 3,200 (19 – 22)
Maximum Tensile Elongation (%)	>140	Service Temperatures °F (°C)	-40 to 180 (-40 to 82)
Tensile Modulus ³ psi (MPa)	60,000 – 75,000 (413 – 517)		

RECOMMENDED SUBSTRATES

Composites	Metals ²	Thermoplastics ¹
✓ Epoxy	✓ Aluminum	✓ ABS
✓ Polyester & DCPD Modified	✓ Carbon Steel	✓ Acrylics
✓ Vinyl Ester	✓ Stainless Steel	✓ PVC/CPVC
✓ Gelcoats	✓ Coated Metals	✓ Styrenics

PRODUCT PROPERTIES @ 75°F (24°C) – Fixture Time (time to achieve 200 psi or 1.4 MPa strength in lap shear)⁴

Cartridge	Adhesive / Activator	Working Time (minutes)	Fixture Time (minutes)
SG600-05	SG605 A / SG605 B	4 – 6	>15
SG600-10	SG610 A / SG605 B	8 – 12	>25
SG600-20	SG620 A / SG605 B	15 – 20	>35

NOTES:

1. Polyolefins, thermoplastic polyesters, fluorocarbon plastics and other low surface energy plastics are generally not bondable.
2. Prepare metal for bonding by removing all dust, loose scale, rust, and other surface residue including oil and grease. Use of MP100 Metal Primer is a necessity and strongly recommended for stainless steel and aluminum bonding. Heavy grinding or sanding may interfere with the chemical action of MP100 and is not recommended, especially with aluminum and stainless steel. For maximum bond strength on steel, abrade the mating surfaces prior to bonding. See notes a, b and c on reverse side. Value will depend on strength and stiffness of substrate.
3. Tensile modulus as measured in the linear portion of the stress strain curve.
4. Lap shear strength of aluminum to aluminum bond pretreated with MP-100 primer and based on ASTM D1002 method.



SAFETY AND HANDLING

Read Material Safety Data Sheet before handling or using this product. Adhesive component A contains methyl methacrylate monomer and is flammable. Always use in a well-ventilated area. Floor-level extraction and large quantities of moving air greatly facilitate ventilation. Activator component B contains peroxide. Both materials must be stored in a cool place away from sources of heat and open flames or sparks. Keep containers closed when not in use. Prevent contact with skin and eyes. In case of skin contact, wash with soap and water. In case of eye contact, flush with water for 15 minutes and seek immediate medical attention. Harmful if swallowed. Keep out of reach of children.

MIXING AND APPLICATION

EXOTHERM: The chemical curing reaction that occurs when components A and B are mixed generates heat. The amount of heat generated is dependent on the mass and thickness of the mixed product. Large masses over 1.5 inch (39 mm) thick can develop heat in excess of 250°F (121°C) and can generate vapors that should be avoided from direct personal contact.

CURING

Open working time is the approximate time after mixing components A and B that the adhesive remains fluid and bondable. Fixture time is the approximate time after mixing components A and B required for the adhesive to develop sufficient strength to allow careful movement, unclamping or de-molding of assembled parts. Parts can generally be put in service when 80 percent of full strength is developed. The time to achieve 80% cure is approximately 2-3 times that required for fixturing. The working and fixture times presented in this bulletin are based on laboratory tests performed at 75°F (24°C). Higher temperatures speed the curing reaction, which reduces open working time and speeds the development of strength. The reverse is true for lower temperatures. If significant variation in temperatures or application at very high or low temperatures is anticipated, contact your SCIGRIP representative for technical assistance.

DISPENSING EQUIPMENT

Dispensing directly from disposable cartridges or meter-mix dispense equipment is strongly recommended. Both methods employ convenient static motionless mixer technology. Product supplied in pre-measured cartridges is dispensed from approved manual or pneumatic powered guns. While using pneumatic dispensing guns, it is mandatory to use the gun's regulator to regulate the air pressure. Manufacturers recommended maximum operating pressure and maximum compressed air supply pressure are 85 and 120 psi respectively. Removal of the regulator from the dispensing unit can lead to over pressurizing and rupture of the cartridge cylinder. Contact your SCIGRIP representative for information and availability.

When meter-mix dispense systems are used, care must be taken to assure compatibility between the adhesive components and the materials in the equipment that they contact. All wetted metal components should be constructed of stainless steel or aluminum or have a sufficient thickness of chemically resistant material that prevents contact between the adhesive components and the base metal. Contact with copper, zinc, brass or other alloys containing these materials must be strictly prevented. All non-metallic seals and gaskets should be fabricated from Teflon® or UHMW polyethylene based materials. Natural rubber, nitrile rubber (BUNA), neoprene and Viton® are not acceptable. Ethylene-propylene rubbers, such as Nordel® may be used for ram follower plate o-rings, but a polyethylene sheet must be used to prevent direct contact with the adhesive.

APPLICATION

Follow instructions provided or contact your SCIGRIP representative for proper preparation of dispensing equipment and substrates prior to starting the bonding process. Always dispense a quantity of adhesive at start-up to assure that the adhesive exiting the tip of the mixer is the proper color and is uniform, without streaks. If previously opened or aged material is being used, allow the

purged material to cure to assure quality before proceeding. Carefully dispense a sufficient quantity of adhesive on the substrate to assure that the bond gap will be completely filled when the parts are mated. Allow for squeeze-out at the edges of the bond to assure filling. Carefully secure or clamp parts to prevent joint movement while the adhesive sets. Do not apply excessive pressure that can cause excessively thin gaps and starve the bond line. If in doubt, use shims or spacers to set the gap. A minimum gap of 0.02 inch (0.50 mm) is recommended for these products. Test the curing adhesive at the edges for fingernail hardness before removing clamps or fixtures. If clean up of the adhesive from the bonded area is required, carefully wipe with alcohol or other preferred industrial solvent while the adhesive is still wet or soft, taking care not to disturb or move the mated parts. Partially cured adhesive can be carefully removed with a sharp knife. Cured adhesive must be sanded or scraped, using a suitable solvent to remove remaining traces.

CLEAN UP

Adhesive components and mixed adhesive should be removed from mixing and application equipment with a suitable industrial solvent or cleaner before the mixed adhesive cures. Once the adhesive cures, soaking in a strong solvent or paint remover will be required to soften the adhesive for removal. If the bonds are exposed to UV rays then use of plasticizers such as Benzoflex 2088 is recommended, or contact your SCIGRIP representative for additional information. Any clean-up of the bonded assembly using industrial solvents is not recommended as it could affect the cure.

STORAGE AND SHELF LIFE

The shelf life of components A and B in unopened containers is approximately six months from the date the product is shipped from SCIGRIP facilities. Shelf life is based on steady state storage between 55°F and 80°F (13°C and 27°C). Exposure, intermittent or prolonged, above 80°F (27°C) will result in a reduction of the stated shelf life. Exposures above 100°F (38°C) during shipping or storage can quickly degrade component B in cartridges or bulk containers, and must be prevented. Shelf life of both components can be extended by air-conditioned or refrigerated storage between 50°F and 65°F (10°C and 18°C). KEEP FROM FREEZING.

IMPORTANT NOTES

- SUBSTRATE AND APPLICATION COMPATIBILITY.** The user must determine the suitability of a selected adhesive for a given substrate and application. SCIGRIP strongly recommends laboratory, shop and end-use testing that simulates the actual manufacturing and end-use environment.
- SURFACE PREPARATION.** The need for surface preparation must be determined by comparative testing of prepared and unprepared substrates to assure that unprepared bonding is equivalent to or acceptable for the application relative to prepared bonding. Initial bonding tests must be followed up with simulated or actual durability tests to assure that surface conditions do not lead to degradation of the bond over time under service conditions. Subsequent changes in substrates or bonding conditions will require re-testing.
- TECHNICAL ASSISTANCE.** Contact your SCIGRIP representative for questions or assistance with the selection of adhesives and methods for evaluating adhesives for your intended application.

NOTE: This product is intended for use by skilled individuals at their own risk. Recommendations contained herein are based on information we believe to be reliable. The properties and strength values presented above are typical properties obtained under controlled conditions at the SCIGRIP laboratory. They are intended to be used only as a guide for selection for end-use evaluation. The ultimate suitability for any intended application must be verified by the end user under anticipated test conditions. Since specific use, materials and product handling are not controlled by SCIGRIP, our warranty is limited to the replacement of defective SCIGRIP products.

Appendix G
Filter Bag Skid Operation Manual

Bag Filter Housings Operations Manual



USE OF BAG FILTER HOUSINGS THAT ARE NOT COMPLIANT WITH THESE INSTRUCTIONS INDEMNIFY PRM FROM ANY DAMAGES THAT MAY RESULT FROM THEIR MISUSE. PLEASE READ AND UNDERSTAND THIS MANUAL AND ONLY USE THE EQUIPMENT AS SPECIFIED. IF YOU HAVE ANY QUESTIONS, PLEASE CONTACT A REPRESENTATIVE AT PRODUCT RECOVERY MANAGEMENT.

SECTION 1. General Safety Instructions



Please read the instruction book before using



Ensure the connections to the housing are secure and without leaks



Always close the isolation valves, vent and drain the housing before opening. Opening the housing while it is under pressure may result in the contents spraying out, potentially causing damage to equipment and personal injury.



Housings are only for water filtration. Processing anything other than water indemnifies Product Recovery Management, Inc. from any liability of any problems or damages that may arise.youtube

SECTION 2. Summary

Bagfilters.com is a wholly owned Trade Name of Product Recovery Management, Inc. (PRM). PRM is proud to be able to supply a variety of Bag Filter Housing models to accommodate your treatment needs. Available as bare housings or predesigned, packaged skids and ready to go when it reaches the project site. PRM supplies a wide variety of replaceable bag filter elements for the housings.

Bag Filter Housings are one of the most common and efficient technologies implemented for filtration of water where it is desirable to capture insoluble particles cost effectively. The operator simply selects the bag filter element that goes in the housing by gauging its level of necessary filtration sizing. Bags are rated in micron sizes typically 1000micron to 1micron in size where smaller numbers mean more aggressive filtration.

Solids are captured on the interior lining of the filter bag and replaced as the solids collection causes the differential pressure (dp) across the housing to increase. It is typically that bag elements are replaced when the dp get between 5 and 10psig. Greater pressures can cause damage where the bags retaining basket can rupture and cause failure. If critical systems are being utilized, it is recommended that differential pressure transmitters or switches be implemented to ensure that the pump feeding the system is turned off before damage can occur.

It is common for bag filter housings to be installed in series where larger micron ratings are implemented in the first housings and smaller micron rated bags are implemented downstream. This method can be implemented to extend the effectiveness of filtration over time and to minimize O&M activities.

Please consult with PRM for design assistance questions or for quotations for packaged filtration systems to meet your needs.

SECTION 3. Single Bag Model Features:

The standard features for the single bag filter housings are shown below. Each style can be made in a variety of configurations. For the full breadth of housings we offer and their specifications, visit shop.prmfiltration.com:

High Pressure Bolt Plate Housing NPT

- 150 PSI Maximum Working Pressure
- 100 GPM Flow Rate
- 304 Stainless Steel Construction
- 8"x 30" Trade Size # 2 Housing
- Available with NPT or Flanged connections
- Also available in Trade Size #4



Low Pressure Banded Top Housing

- 100 PSI Maximum working pressure
- 100 GPM Flow Rate
- 304 Stainless Steel Construction
- 8"x30" Trade Size #2 Housing
- Available with NPT or Flanged connections
- Quick opening clap top



Carbon Steel High Pressure Bolt Plate Top

- 150 PSI Maximum Working Pressure
- 100 GPM Flow Rate
- Carbon Steel Construction 8"x 30" Trade Size # 2 Housing
- Available with NPT or Flanged connections
- Epoxy Coated
- 8"x 30" Trade Size # 2 Housing



Single Bag Filter Options

Each Bag Filter has the following options available:

- Skid mounting, pre-plumbed filter array
- Steel, Stainless Steel, or PVC Piping with valves
- Custom Integration Into Existing Systems
- Optional connection styles of NPT and Flanged are available
- Replacement Bag Filters available in stock
 - ❖ 5, 10, 25, 50, and 100 Micron rated filters
- Custom modifications are available, contact a representative at bagfilters.com for more details!



SECTION 4. Instructions

Step 1. Connecting a Bag Filter Housing

When installing the Bag Filter Housing loosen the bolts on the stand so the height of the housing can be adjusted by sliding the cylinder up or down. Tighten the bolts once the desired height is achieved. Before bolting the legs to the surface on which it is placed, ensure that the housing is as level as possible.

Isolation valves should be used before and after the housing to allow for safe filter replacement.

If the connection style is flanged, the provided gaskets should be used to ensure a good seal is made between the Housing and the inline pre and post isolation valves.

When connecting an NPT fitted Housing thread sealant should be applied to ensure a watertight seal is achieved.

Step 2. Accessing the interior of the Bag Filter Housing

Always release the pressure within the Housing before opening, by closing the inlet isolation valve and opening the vent. Once the internal pressure has normalized, close the outlet isolation valve. With both isolation valves closed and the pressure released the lid can be safely opened.

For bolt plate lid (high-pressure) models:

Loosen the eye nuts in diagonal pairs so that it is evenly loosened and fold the hinge bolts down. When preparing to fasten the lid back on the housing, inspect the O-ring for damage or debris before putting the lid in place. The bolts should be tightened in an alternating star pattern to ensure a tight and even seal.

For banded lid (low-pressure) models:

Filter Housings with banded lids are opened by loosening the banding bolt that holds the lid's band in place. Once the band has been loosened enough the lid can be removed. When reassembling the lid, inspect the O-ring for damage or debris before the lid is properly aligned, then tighten the banding bolt.



Step 3. Releasing the filter bag

PRM bag filter housings use one of two mechanisms to ensure that the filter remains snug inside the filter basket. These retainers vary by housing.

Lever Retainers:

To release the filter bag, loosen the bracket bolt on the interior of the housing. Rotate the bracket counterclockwise out of the slots and remove the bracket.



When the bracket has been taken out the housing the plate that holds the bag filters in place can be removed along with the bags.

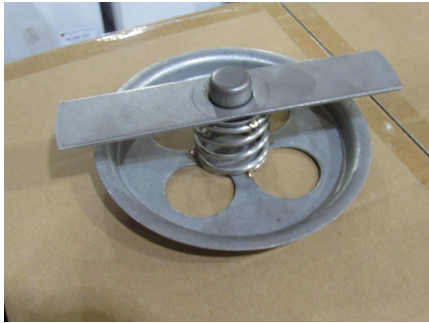


Spring Retainers:

A spring retainer is placed in a bag filter according to this photo:



Press down on the retaining bar, and turn it counter clockwise until it is released from its groove. The retaining ring can now be removed from the housing,



Step 4: Replacing the filter bag

With the restraining ring removed, the filter bag may now be removed, and properly disposed of. Then, a replacement bag may be fitted, and the restraining ring twisted back into place.



SECTION 5. Replacement Filters

PRM proudly carries liquid filter bags made with the highest grade material to offer you quality and efficiency in each bag.

Polyester Felt Bags

- Filters are available in #2 and #4 Industry Sizes
- Cases are sold in 10, 25 or 50 bag quantities
- Polypropylene Bag Handles are standard on bags at no additional cost
- The maximum temperature of the filters is 300°F
- The bags are Sewn Seam using 5 line system
- The filters come in a 1, 5, 10, 25, 50, 100, and 200 micron mesh
- Oil absorbing bag filter elements

