ATTACHMENT F

DEPARTMENT OF TRANSPORTATION

Marc Elrich
County Executive

Christopher R. Conklin
Director

January 28, 2025

Mr. Phillip Estes, Planner III
UpCounty Planning Division
The Maryland-National Capital
Park & Planning Commission
2425 Reedie Dr
Wheaton, MD 20902

RE: Preliminary Plan No. 120250050
2811 14th Street NE Gospel Hall, Inc. Church
Preliminary Plan Letter

Dear Mr. Estes:

This letter replaces MCDOT's Preliminary Plan letter dated January 16, 2025.

We have completed our review of the revised preliminary plan uploaded to eplans on December 18, 2024. A previous version of the plans was reviewed by the Development Review Committee at its November 19, 2024, meeting. This plan is tentatively scheduled for the February 27, 2025, Planning Board meeting. We recommend approval of the plans subject to the following comments:

Significant Comments

1. Ednor Road is classified as an Area Connector with two travel days and a minimum right-of-way (ROW) of 80 feet. According to Plat #3948, the existing ROW is also 80 feet. Currently, Ednor Road functions as an open-section roadway.
2. The 2018 Bicycle Master Plan calls for a 10-foot-wide sidepath along Ednor Road. In coordination with MNCPPC, MCDOT, and SHA, construction of this facility will not be required. Instead, the Applicant is required to:

a. Provide a fee-in-lieu for the total cost of the sidepath construction at the right-of-way permit stage.
b. Grade the area for future construction of the sidepath.
c. Provide a Public Improvement Easement (PIE)/Public Access Easement (PAE) for a section of the sidepath described below under condition 3.
d. Construct a swale, following the design parameters under MC-2004.33.
e. Show transitions at both ends to show how the new frontage improvements will tie into the existing structures.

3. The certified preliminary plan shall reflect an 80-foot ROW with the following proposed frontage improvements extending from the edge of the centerline of the road to the edge of the property line along the entirety of the project's frontage (shown on Plan 07-120240150-003 V3):
    - 11-foot drive lane
    - 6-foot shoulder
    - 19-foot swale
    - 10-foot sidepath
        - 4-foot within the ROW
        - 6-foot within the Public Improvement Easement (PIE)/Public Access Easement (PAE)
    - 1-foot maintenance buffer
4. The applicant is responsible for providing a safe mid-block pedestrian crosswalk that provides access from the graded area intended for the sidepath to the existing sidewalk on the opposite side of Ednor Road. The applicant is responsible for providing receiving ADA ramps on both sides of Ednor Road and bridging the graded area intended for the sidepath to go over the storm drain ditch and connect to the receiving ramp.
    a. Coordination with MCDOT, MNCPPC, and the Planning Department is required to finalize the location of the mid-block crossing at the right of way permit stage.
    b. The crosswalk must be operating and installed prior to the occupancy permit of the building.
5. **Sight Distance:** A copy of the accepted Sight Distances Evaluation certification form is enclosed for your information and reference. The applicant is responsible to ensure sight distance which should be clear of any existing or proposed obstructions within the line of sight (tree trimming and/or removal, relocation of existing utility pole, removal of street parking etc.) to achieve a minimum sight distance in each direction.
6. **Storm Drain Study:** The storm drain analysis was reviewed and is acceptable to MCDOT. No improvements are needed to the downstream public storm drain system for this plan.

Standard Comments

7. All Planning Board Opinions relating to this plan or any subsequent revision, project plans or site plans should be submitted to the Department of Permitting Services (DPS) in the package for record plats, storm drain, grading or paving plans, or application for access permit. Include this letter and all other correspondence from this department.
8. Design all access points and alleys to be at-grade with the sidewalk, dropping down to street level between the sidewalk and roadway.
9. Forest Conservation Easements are NOT ALLOWED to overlap any easement.
10. Stop sign locations, crosswalks and markings will be shown on the signing and marking plans and be reviewed and approved at the right-of-way permit stage.
11. The owner will be required to submit a recorded covenant for the operation and maintenance of any private storm drain systems, and/or open space areas prior to MCDPS approval of the record plat. The deed reference for this document is to be provided on the record plat.
12. Relocation of utilities along existing roads to accommodate the required roadway improvements shall be the responsibility of the applicant.
13. Trees in the County rights of way – spacing and species to be in accordance with the applicable MCDOT standards. Tree planting within the public right of way must be coordinated with DPS Right-of-Way Plan Review Section.
14. Erosion and sediment control measures as required by Chapter 19 and on-site stormwater management where applicable shall be provided by the Developer (at no cost to the County) at such locations deemed necessary by MCDPS and will comply with their specifications. Erosion and sediment control measures are to be built prior to construction of streets, houses and/or site grading and are to remain in operation (including maintenance) as long as deemed necessary by MCDPS.
15. Posting of a right-of-way permit bond is a prerequisite to DPS approval of the record plat. The right-of-way permit will include, but not necessarily be limited to, the following improvements:
    a. Buffers, grading, side drainage ditches and appurtenances, and street trees along Ednor Road per Significant Plan Review Comments.
    b. Enclosed storm drainage and/or engineered channel (in accordance with the MCDOT Storm Drain Design Criteria) within the County rights-of-way and all drainage easements.
    c. Permanent monuments and property line markers, as required by Section 50.4.3(G) of the Subdivision Regulations.

Thank you for the opportunity to review this preliminary plan. If you have any questions or comments regarding this letter, please contact me for this project at brenda.pardo@montgomerycountymd.gov or at (240) 777-7170.

Sincerely,

Brenda M. Pardo, Engineer III
Development Review Team
Office to Transportation Policy

SharePoint\teams\DOT\Director's Office\Development Review\Brenda\Preliminary Plan\PP120240150 Addition to Glen Hills Section\120240150-Addition to Glen Hills Section-DOT Preliminary Plan Letter_1.28.25

Attachments: Approved Sight Distance Study

cc: Correspondence folder FY 2025

cc-e:	Mark Terry	MCDOT DTEO
	Atiq Panjshiri	MCDPS RWPR
	Sam Farhadi	MCDPS RWPR
	Rebecca Torma	MCDOT OTP

MONTGOMERY COUNTY, MARYLAND

DEPARTMENT OF TRANSPORTATION

DEPARTMENT OF PERMITTING SERVICES

SIGHT DISTANCE EVALUATION

Plan Number:

Project Name: Plymouth Brethren Christian Church

ENGINEER/ SURVEYOR CERTIFICATE

I hereby certify that this information is accurate and was collected in accordance with these guidelines.

Signature

29914

PLS/PE MD Reg. №

7/15/24

Date

Montgomery County Review:

[x] Approved

[ ] Disapproved:

By: Brenda M. Pardo

Date: 1/16/2025

Ednor Road			
CLASS	Country Connector		
SPEED (MPH)	35 (Posted)		
VERTICAL	APPROACHING MOTOR VEHICLES		
	TARGET (FT)	MEASURED (FT)	OK?
L	335	571	Yes
R	390	391	Yes

HORIZONTAL	APPROACHING MOTOR VEHICLES			
	Grade	TARGET (FT)	MEASURED (FT)	OK?
L		335	571	Yes
R		390	391	Yes

HORIZONTAL	APPROACHING BIKEWAYS			
	Grade	TARGET (FT)	MEASURED (FT)	OK?
L				
R				

HORIZONTAL	APPROACHING SIDEWALK (IF DIRECTED)			
	Grade	TARGET (FT)	MEASURED (FT)	OK?
L				
R				

COMMENTS

FORM APPROVED 11.8.2023
Date

Chief, Division of Transportation Engineering
Montgomery County Dept. of Transportation

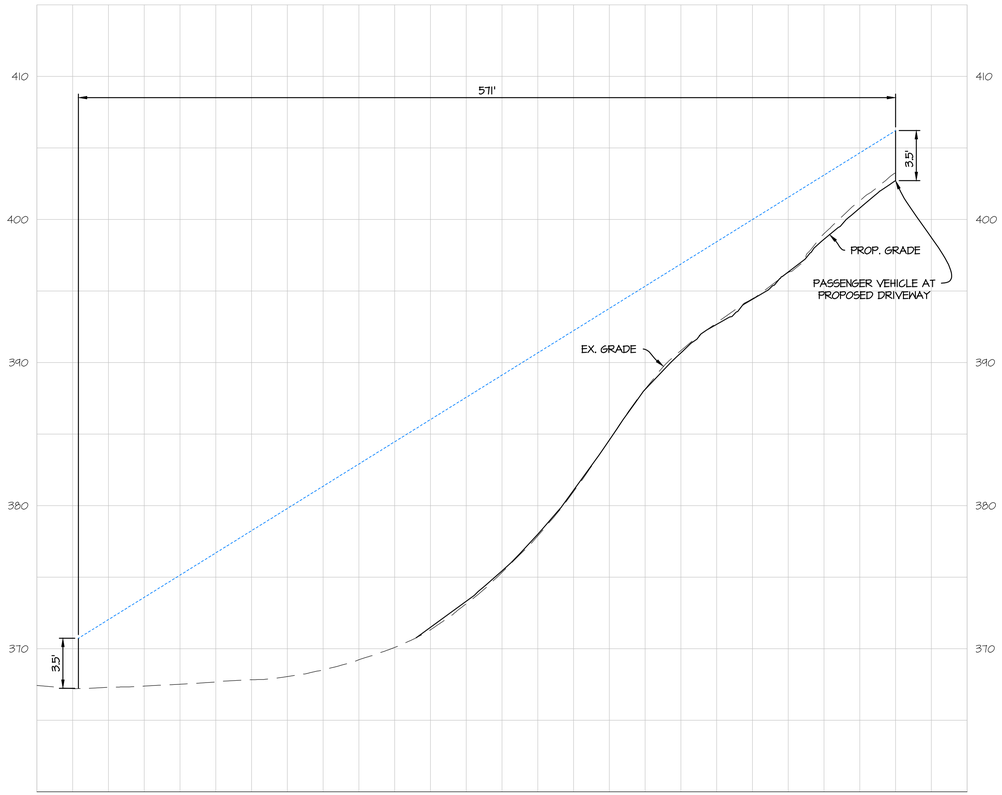
Chief, Land Development
Montgomery County Dept. of Permitting Services

REVISED

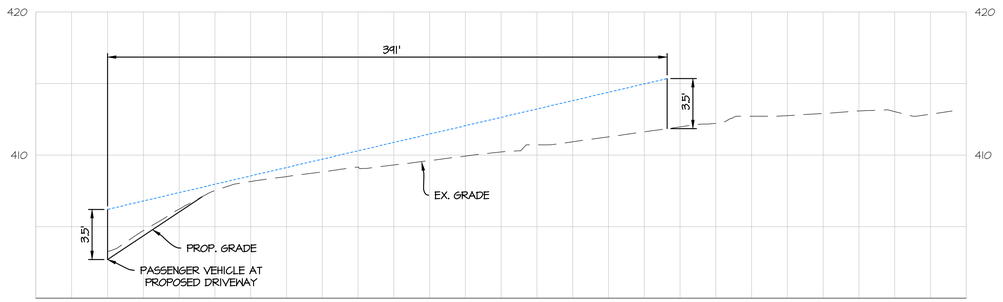
Montgomery County
Department of Transportation

Sight Distance
Review Form

ISD-PRIV DW & EDNOR RD-LEFT



ISD-PRIV DW & EDNOR RD-RIGHT



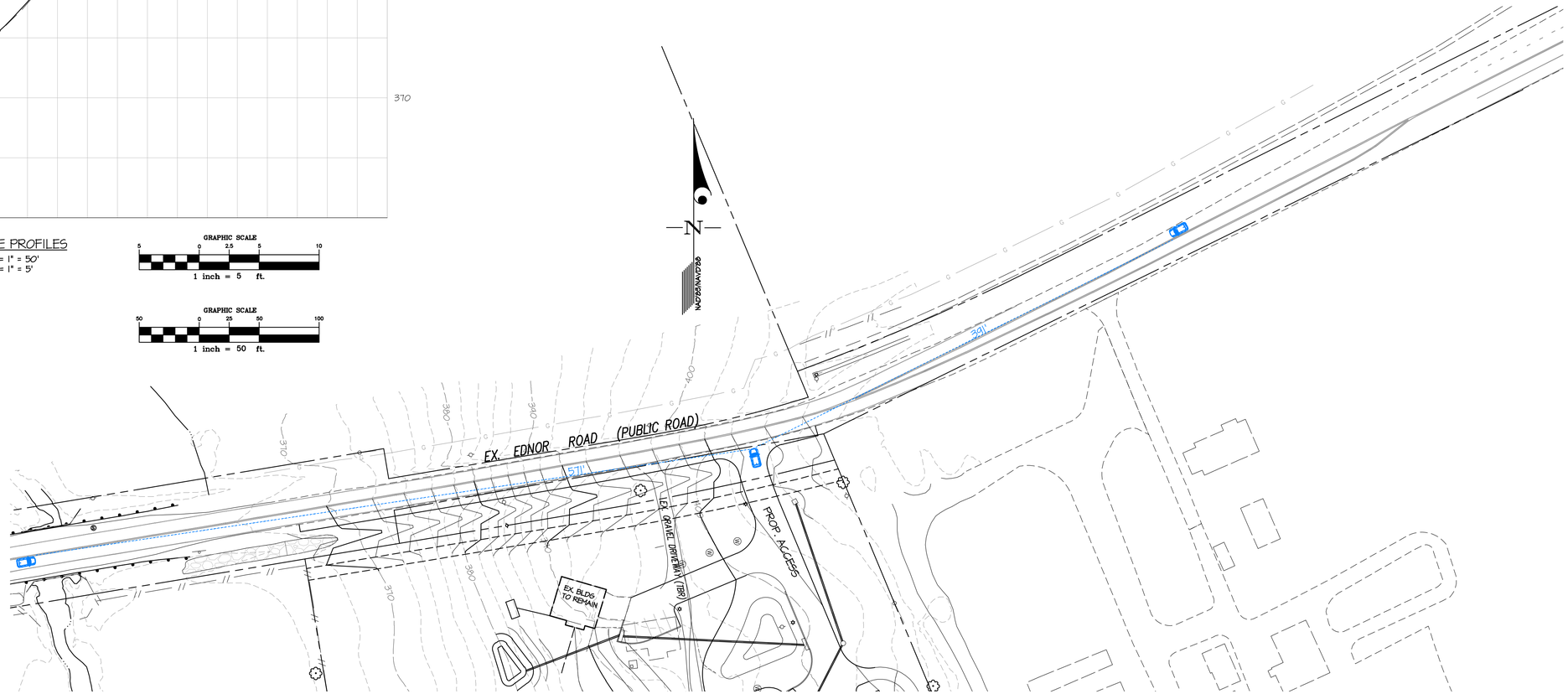
POSTED SPEED = 35 MPH		
	CASE B1	CASE B2
INTERSECTION SIGHT DISTANCE REQUIRED	390 FEET	335 FEET
INTERSECTION SIGHT DISTANCE LEFT AVAILABLE	571 FEET	
INTERSECTION SIGHT DISTANCE RIGHT AVAILABLE	341 FEET	

NOTE: CASE B1 IS A LEFT TURN FROM STOP AND CASE B2 IS A RIGHT TURN FROM STOP.

SIGHT DISTANCE PROFILES
SCALE: HORZ. = 1" = 50'
VERT. = 1" = 5'

GRAPHIC SCALE
5 0 2.5 5 10
1 inch = 5 ft.

GRAPHIC SCALE
50 0 25 50 100
1 inch = 50 ft.



SIGHT DISTANCE PLAN VIEW
SCALE: 1" = 50'

GRAPHIC SCALE
50 0 25 50 100
1 inch = 50 ft.

GLW
PLANNING | ENGINEERING | SURVEYING
3909 NATIONAL DRIVE | SUITE 250 | BURTONSVILLE, MD 20866 | GLWPA.COM
PHONE: 301-421-4024 | BALT: 410-880-1820 | DC&VA: 301-989-2524 | FAX: 301-421-4186

DESIGNED BY: TMS
DRAWN BY: TMS
CHECKED BY: DHC

DATE	REVISION	BY	APP'R.

PREPARED FOR:
WALTER BOWIE
211 EDNOR ROAD
SILVER SPRING, MARYLAND 20905
ATTN: WALTER BOWIE

SCALE	ZONING
AS SHOWN	RE-2
DATE	TAX MAP - GRID
NOV. 2024	JS - 43

SIGHT DISTANCE EXHIBIT

PLYMOUTH BRETHREN CHRISTIAN CHURCH

PARCEL 542
L. 3137, F. 52

ELECTION DISTRICT No. 5 — MONTGOMERY COUNTY, MARYLAND

G. L. W. FILE No. 22159

SHEET 1 OF 1

L:\CADD\DRAWINGS\22159\PLANS BY GLW\EXHIBITS\SIGHT DISTANCE\22159-SIGHT DISTANCE.dwg, 11/27/2024 11:12:31 AM, LAST SAVED 11/27/2024 11:12 AM, PLOTTED BY: Doug Dix

DEPARTMENT OF PERMITTING SERVICES

Marc Elrich
County Executive

Rabbiah Sabbakhan
Director

January 14, 2025

Mr. Timothy Longfellow, P.E.
Gutschick, Little & Weber. P.A.
3909 National Drive, Suite 250,
Burtonsville, MD 20866

Re: **COMBINED STORMWATER MANAGEMENT CONCEPT/*SITE DEVELOPMENT STORMWATER MANAGEMENT PLAN*** for
2811 14th Street NE Gospel Hall, Inc.
Preliminary Plan #: 120250050
SM File #: 295184
Tract Size/Zone: 15 Ac, 653256 Sq Ft/RE-2
Total Concept Area: 6.3 Ac, 275386 Sq Ft
Parcel(s): P542
Watershed: Northwest Branch, Class IV
Redevelopment (Yes/No): NO

Dear Mr. Longfellow:

Based on a review by the Department of Permitting Services Review Staff, the stormwater management concept for the above-mentioned site is **acceptable**. The plan proposes to meet required stormwater management goals via the use of Drywells, Landscape Infiltration, and Micro-Bioretention. The plan proposes overtreating within lots 1 & 2 to account for impervious sidewalk proposed within the public ROW.

The following items will need to be addressed during the detailed sediment control/stormwater management plan stage:

1. A detailed review of the stormwater management computations will occur at the time of detailed plan review.

2. An engineered sediment control plan must be submitted for this project.

3. All filtration media for manufactured best management practices, whether for new development or redevelopment, must consist of MDE approved material.

4. A Floodplain District Permit may be determined necessary to obtain at time of detailed plan review stage.

5. An additional geotechnical soil analysis to support proposed Micro-Bioretention 4 will be necessary, as the original soil bore terminates above the proposed depth of the proposed facility.

This list may not be all-inclusive and may change based on available information at the time.

Payment of a stormwater management contribution in accordance with Section 2 of the Stormwater Management Regulation 4-90 **is not required**.

This letter must appear on the sediment control/stormwater management plan at its initial submittal. The concept approval is based on all stormwater management structures being located outside of the Public Utility Easement, the Public Improvement Easement, and the Public Right of Way unless specifically approved on the concept plan. Any divergence from the information provided to this office; or additional information received during the development process; or a change in an applicable Executive Regulation may constitute grounds to rescind or amend any approval actions taken, and to reevaluate the site for additional or amended stormwater management requirements. If there are subsequent additions or modifications to the development, a separate concept request shall be required.

If you have any questions regarding these actions, please feel free to contact Alex Weintraub at 240-777-6356.

Sincerely,

Mark Etheridge

Mark Etheridge, Manager
Water Resources Section
Division of Land Development Services

cc: Neil Braunstein
SM File # 295184

Lot 1
ESD: Required/Provided 803 cf / 987 cf
PE: Target/Achieved: 1"/1.23"
STRUCTURAL: N/A cf
WAIVED: N/A cf.

Lot 2
ESD: Required/Provided 7352 cf / 7907 cf
PE: Target/Achieved: 1"/1.08"
STRUCTURAL: N/A cf
WAIVED: N/A cf.

ROW
ESD: Required/Provided 307 cf / 0 cf
PE: Target/Achieved: 1"/0"
STRUCTURAL: N/A cf
WAIVED: N/A cf.

Department of Permitting Services
Fire Department Access and Water Supply Comments

DATE: 18-Apr-25

TO: Tim Longfellow
Gutschick Little & Weber, PA

FROM: Marie LaBaw

RE: 2811 14th St NE Gospel Hall, Inc Church
120250050

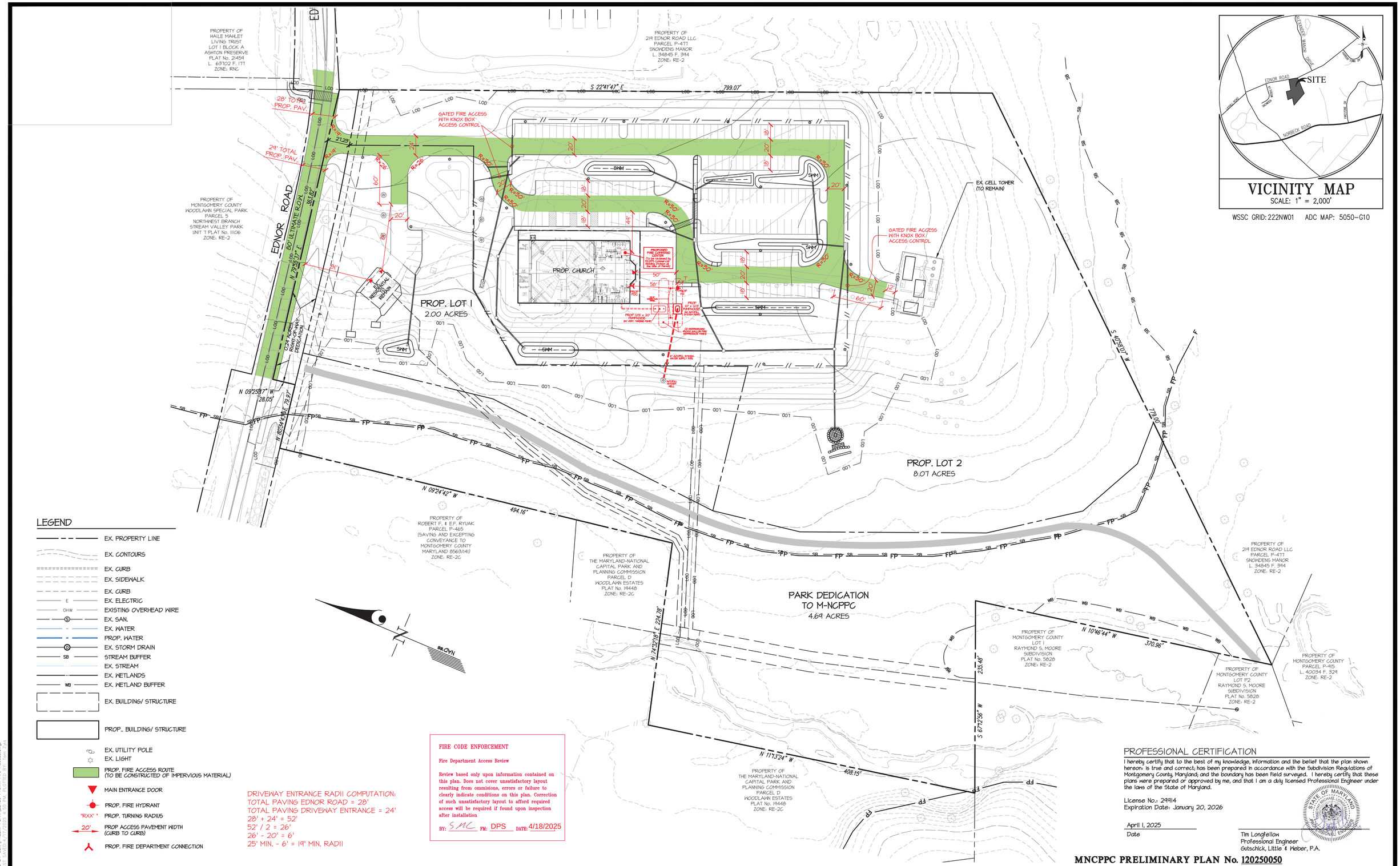
PLAN APPROVED

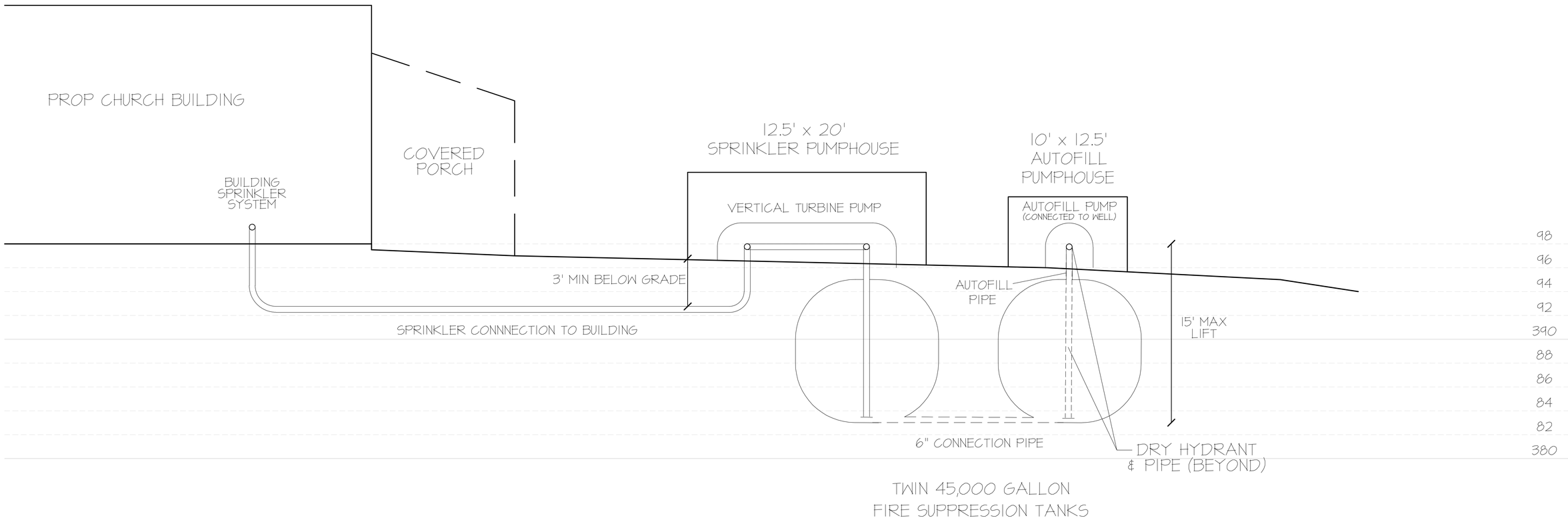
1. Review based only upon information contained on the plan submitted **17-Apr-25** .Review and approval does not cover unsatisfactory installation resulting from errors, omissions, or failure to clearly indicate conditions on this plan.

2. Correction of unsatisfactory installation will be required upon inspection and service of notice of violation to a party responsible for the property.

***** Submit to DPS Commercial Building for fire protection system permit prior to cistern construction. Cistern and dry hydrant installation required prior to occupancy. *****

*****5/20/2025 Update approval package with sealed water supply calculation report *****


PROPERTY OF
HAILE MAHLET
LIVING TRUST
LOT 1 BLOCK A
ASHTON PRESERVE
PLAT No. 21459
L. 63702 F. 177
ZONE: RNC
PROPERTY OF
219 EDNOR ROAD LLC
PARCEL P-477
SNOWDENS MANOR
L. 34845 F. 344
ZONE: RE-2
PROPERTY OF
MONTGOMERY COUNTY
WOODLAWN SPECIAL PARK
PARCEL 5
NORTHWEST BRANCH
STREAM VALLEY PARK
UNIT 7 PLAT No. 11106
ZONE: RE-2
EDNOR ROAD
80' ULTIMATE ROW
S 22°41'47" E
799.07'
28' TO TBD
PROP. PAV.
24' TOTAL
PROP. PAV.
GATED FIRE ACCESS
WITH KNOX BOX
ACCESS CONTROL
EX. CELL TOWER
(TO REMAIN)
PROP. CHURCH
PROPOSED
FIRE COMMAND
CENTER
PROP. LOT 1
2.00 ACRES
PROP. LOT 2
8.07 ACRES
PARK DEDICATION
TO M-NCPPC
4.69 ACRES
0.24 ACRES
RIGHT-OF-WAY
DEDICATION
N 09°25'37" W
28.05'
N 80°34'45" E 79.97'
N 09°24'42" W
494.16'
N 24°32'18" E 224.78'
N 17°13'24" W
408.15'
S 40°39'07" W
779.00'
N 10°46'44" W
370.96'
S 67°12'56" W
235.46'
PROPERTY OF
ROBERT F. & E.F. RYJAK
PARCEL P-465
(SAVING AND EXCEPTING
CONVEYANCE TO
MONTGOMERY COUNTY
MARYLAND 8563/141)
ZONE: RE-2C
PROPERTY OF
THE MARYLAND-NATIONAL
CAPITAL PARK AND
PLANNING COMMISSION
PARCEL D
WOODLAWN ESTATES
PLAT No. 19448
ZONE: RE-2C
PROPERTY OF
MONTGOMERY COUNTY
LOT 1
RAYMOND S. MOORE
SUBDIVISION
PLAT No. 5828
ZONE: RE-2
PROPERTY OF
MONTGOMERY COUNTY
LOT P2
RAYMOND S. MOORE
SUBDIVISION
PLAT No. 5828
ZONE: RE-2
PROPERTY OF
MONTGOMERY COUNTY
PARCEL P-415
L. 40034 F. 329
ZONE: RE-2
PROPERTY OF
219 EDNOR ROAD LLC
PARCEL P-477
SNOWDENS MANOR
L. 34845 F. 344
ZONE: RE-2
PROPERTY OF
THE MARYLAND-NATIONAL
CAPITAL PARK AND
PLANNING COMMISSION
PARCEL D
WOODLAWN ESTATES
PLAT No. 19448
ZONE: RE-2C
PROP. FIRE ACCESS ROUTE
(TO BE CONSTRUCTED OF IMPERVIOUS MATERIAL)
PROP. FIRE HYDRANT
PROP. TURNING RADIUS
PROP. ACCESS PAVEMENT WIDTH
(CURB TO CURB)
PROP. FIRE DEPARTMENT CONNECTION
EXISTING FIRE HYDRANT TO REMAIN
PROP. 12'S x 20' FUMIFROOD
(W/ VENT. MARINE PAPER)
PROP. 6" DOMESTIC
(W/ BACKFLOW PREVENTER)
PROP. 4" HYDRANT
(W/ BACKFLOW PREVENTER)
PROP. 8" DOMESTIC
(W/ BACKFLOW PREVENTER)
PROP. 8" HYDRANT
(W/ BACKFLOW PREVENTER)
PROP. 8" FIRE
(W/ BACKFLOW PREVENTER)
PROP. 4" DOMESTIC
(W/ BACKFLOW PREVENTER)
PROP. 4" FIRE
(W/ BACKFLOW PREVENTER)
PROP. 2" DOMESTIC
(W/ BACKFLOW PREVENTER)
PROP. 2" FIRE
(W/ BACKFLOW PREVENTER)
PROP. 1" DOMESTIC
(W/ BACKFLOW PREVENTER)
PROP. 1" FIRE
(W/ BACKFLOW PREVENTER)
PROP. 1" IRRIGATION



FIRE SUPPRESSION SYSTEM PROFILE

Bowman
FIRE & LIFE SAFETY

PROJECT NAME

Ednor Road Church

NFPA Fire Flow Calculation

211 Ednor Road, Silver Spring, MD

DATE SUBMITTED

February 14, 2025

NFPA Fire Flow Calculation

Prepared for:

Marie Labaw PhD, PE
Fire Department Access and Water Supply
Montgomery County Department of Permitting Services

Bowman
FIRE & LIFE SAFETY

TABLE OF CONTENTS

MARYLAND
9520 Berger Road
Suite 212
Columbia MD 21046
(410) 204-1239
bowman.com

GEORGIA: 10475 Medlock Bridge Road • Suite 520 • Johns Creek GA 30097 • (770) 495-7770
ARIZONA: 1208 E. Broadway Road • Suite 201 • Tempe AZ 85282 • (480) 466-7172
MAINE: 40 Main Street • Suite 13-140 • Biddeford ME 04005 • (207) 442-7200
MICHIGAN: 32729 Grand River Avenue • Suite S • Farmington MI 48336 • (248) 873-0372
VIRGINIA: 317 Office Square Lane • Suite A202 • Virginia Beach VA 23462 • (757) 276-1272

INTRODUCTION

This report has been prepared by Bowman Fire & Life Safety, Inc. (Bowman FLS) to calculate the size of the underground fire water storage tank required at 211 Ednor Road, Silver Spring, Maryland. The project consists of constructing a new church and due to the remoteness of the site location an underground fire water storage tank is required for fire flow.

APPLICABLE CODES

The applicable provisions of the following codes and standards have been reviewed to the degree necessary based on the scope of our work:

- Code of Maryland Regulations (COMAR)
- Code of Montgomery County Regulations (COMCOR)
- ER #14-24, December 10, 2024 which adopts NFPA 1 (2021 edition), NFPA 1142(2017 edition), and NFPA 1141 (2017 edition)
- ER #13-24, December 10, 2024 which adopts the IBC (2021 edition)
- 2021 International Building Code, with Montgomery County Amendments
- 2021 NFPA 1, with Montgomery County Amendments
- 2019 NFPA 13, with Montgomery County Amendments
- 2017 NFPA 1142, with Montgomery County Amendments

APPLICABILITY OF CODES

- COMCOR 22.00.07.81 adopts and modifies NFPA 1 (2021 edition) section 18.3.1.1 to adopt the NFPA 1142, Standard for Fire Protection Infrastructure for Land Development in Suburban and Rural Areas, 2017 edition. These apply to all new community and commercial development or redevelopment projects. Where conflicts exist between NFPA 1 and NFPA 1142, the most stringent requirements apply.

CALCULATION REQUIREMENTS

In accordance with the COMCOR/ER #14-24 and NFPA 1, the most stringent of the following 3 fire flow calculations will determine the size of tank required. Each corresponds to the appropriate calculation in the “CALCULATION” section.

1. NFPA 1, 18.3.1 states that an approved water supply capable of supplying the required fire flow for fire protection shall be provided to all premises.

- 18.3.1.1 is deleted and reworded by COMCOR/ER #14-24 section 22.00.07.97 to state that in non-municipally supplied areas, static water sources must comply with the 2017 edition of NFPA 1142.
- 18.3.1.1(2) goes on to state that if an acceptable water supply does not exist on-site and within 1,000 feet of the structure(s) for any new commercial development or redevelopment, the applicant must install a new, or upgrade an existing, on-site water supply that is acceptable to the Director. Along with this requirement, a dry hydrant in accordance with Chapter 8 of NFPA 1142 must be located along the fire apparatus access road (18.3.1.1(2)(a)) and the approved water supply must comply with NFPA 1, Section 18.4 (Fire Flow Requirements for Buildings) (18.3.1.1(2)(b)).

2. NFPA 1, Chapter 18.4.5 provides the minimum fire flow requirements for a building based on occupancy type, Fire Flow Area, and whether the building is provided with sprinkler protection throughout.

3. NFPA 1, Section 18.4.5.4 requires that the water supply be capable of delivering the larger of the sprinkler flow demand or the fire flow demand.

CALCULATION

Listed below are the three calculations for determining required fire flow in accordance with COMCOR/ER #14-24.

Occupancy Hazard:	Classification Number 6
Type of Construction:	NFPA Type V(000), IBC Type 5-B
Structure Dimensions:	Total Volume = 345,545 ft^3 (see Appendix 2)
Exposures, if any:	None (see Appendix 1)

1. NFPA 1142 Calculation:
    - The building does not have exposures per section 4.1.5 because the closest building will be a single-family dwelling approximately 144' away (see Appendix 1). Calculation in section 4.2 shown below applies:
    - $WS_{min} = \frac{VS_{tot}}{OHC}(CC) = \frac{345{,}545}{6}(1.5) =$ **86,387 gal**
        - $WS_{min} =$ minimum water supply in gal
        - $VS_{tot} =$ total volume of structure in ft^3 = 345,545 ft^3 (see Appendix 2)
        - $OHC =$ occupancy hazard classification number = 6 (NFPA 1142, 5.2.4.2(10))
        - $CC =$ construction classification number = 1.5 (NFPA 1142, Table 6.2.1, for Type V (000))
2. NFPA 1, Chapter 18 Calculation:
    - In accordance with table 18.4.5.2.1, the required fire flow for a Type V(000) building between 11,301-13,400 sf is 3,000 gpm at 20 psi for a duration of 3 hours. Section 18.4.5.3.3 allows the duration to be reduced to 2 hours for fully sprinklered buildings.
        - Section 18.4.5.3.2 allows a 75% reduction in required fire flow for fully sprinklered buildings but no less than 1000 gpm. 1000 gpm over 2 hours results in a minimum tank capacity of 1000 gpm x 120 minutes = **120,000 gallons**.
        - Section 18.4.5.3.2 allows the reduction to be as low as 600gpm where quick response sprinklers are used. A 75% reduction from 3,000 gpm results in 750 gpm over 3 hours. 750 gpm over 2 hours results in a minimum tank capacity of 750 gpm x 120 minutes = **90,000 gallons**.
3. NFPA 13 (Automatic Sprinkler System) high level calculation:

- Typical hazard classification: Light Hazard
  - 0.1 gpm/ft^2 over the most remote 1,500 ft^2 (see remote area changes below)
- System Remote Area Changes:
  - No Quick Response Reduction due to building height
  - Sloped ceiling increase of 30% added to 1,500 ft^2 minimum remote area to increase to 1,950 ft^2
- Estimated sprinkler demand:
  - Minimum flow required: 0.10 gpm/ft^2 * 1,950 ft^2 = 195 gpm
  - Additional flow for balancing: 1.5 * 195 = 293 gpm
  - Hose Stream Allowance: 100 gpm
  - Total required flow: 393 gpm
  - Duration (NFPA 13, table 19.3.3.1.2): 30 minutes
  - Tank capacity required: 393 gpm x 30 minutes = **11,790 gallons**

CONCLUSIONS:

- NFPA 1142 minimum tank capacity: 86,387 gallons
- NFPA 1, Chapter 18 minimum tank capacity: 90,000 gallons
- NFPA 13, Sprinkler minimum tank capacity: 11,790 gallons

NFPA 1, Chapter 18 has the most stringent requirements for fire flow demand and therefore the underground tank must be designed for a minimum of **90,000 gallons** in accordance with the applicable requirements of COMCOR/ER #14-24 section 22.00.07.97.

Report Prepared By:

Brad Hagemann, PE
Fire Protection Engineer

Reviewed By:

Will Higgins, PE
Senior Fire Protection Engineer

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland,
License No. 42244
Expiration Date: 01/18/2027

Bowman
FIRE & LIFE SAFETY

APPENDIX 1

Exposures

PRELIMINARY PLAN No. 120250050

2811 14th Street NE Gospel Hall, Inc Church

211 Ednor Road

SITE DATA

Existing Site Area:...(P.542)..... 15.00 Ac.

Existing Zoning:..... RE-2 (Residential Estate)

Existing Use: ..... Residential
Existing Density: ..... 1 SFD & 1 Accessory Residential Dwelling

Lot 1 (Existing SFD) ..... 2.00 Acres
Lot 2 (Proposed Church) ..... 7.90 Acres
Right of Way Dedication: ..... 0.24 Acres
Parkland Conveyance Parcel: ..... 4.86 Acres

Proposed Use ..... Religious Assembly
Proposed Density: ..... 1 SFD & 1 Church
Existing SFD: ..... 2,400 SF
Proposed Church: ..... 10,544 SF
Sanctuary Level ..... 500 Seats

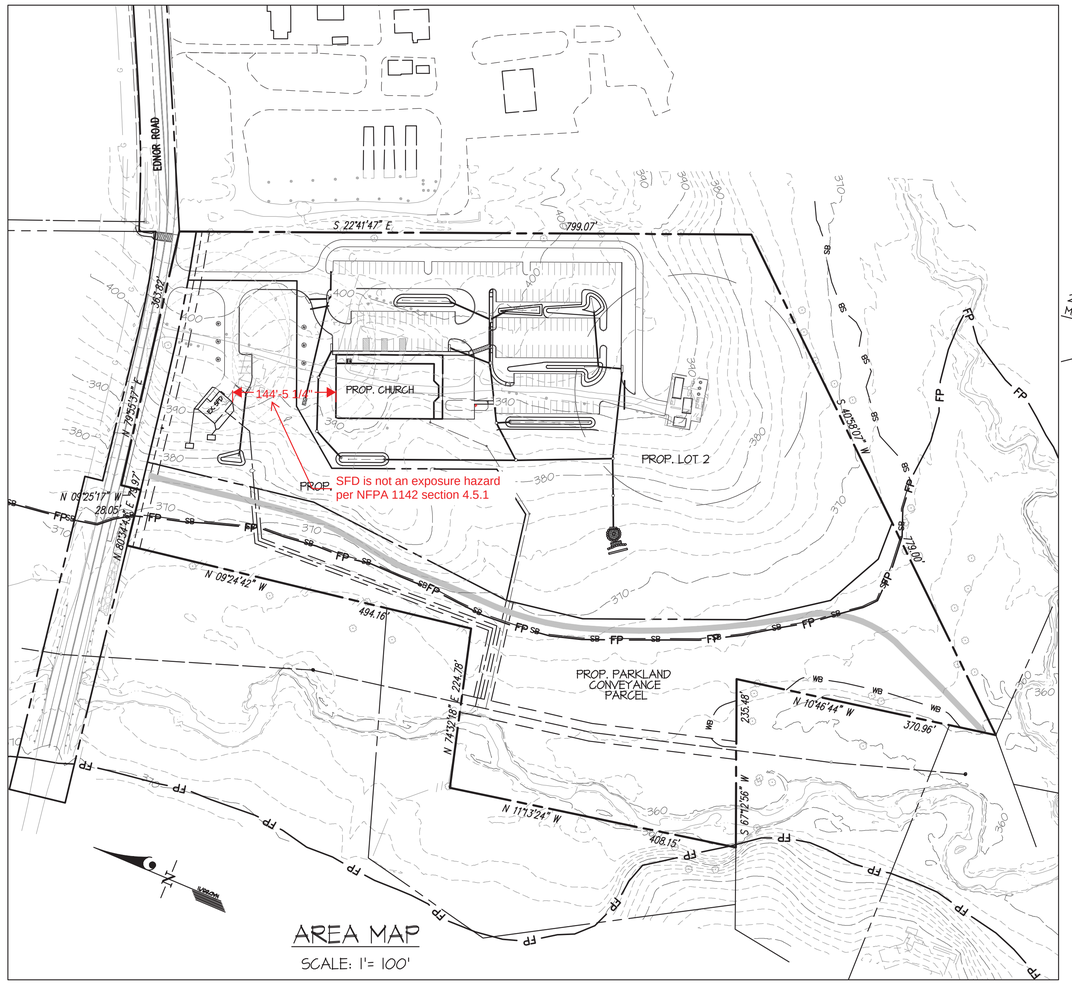
Existing Cell Tower located in the southern portion of the property to remain, associated easements to be reconfigured.

DEVELOPMENT STANDARDS - RE-2 ZONE

	REQUIRED	LOT 1 PROVIDED	LOT 2 PROVIDED
MINIMUM LOT AREA	2.00 Ac.	2.00 Ac.	7.90 Ac.
LOT WIDTH AT FRONT BUILDING LINE	150'	312'	330'
LOT WIDTH AT FRONT LOT LINE	25'	301'	69'
MAXIMUM LOT COVERAGE	25%	4.2%	3.8%
PRINCIPAL BUILDING SETBACKS			
FRONT	50' min./150' min. width	50'	150' min width
SIDE	17' min./ 35' total	17.5'	17.5'/30'
REAR	35' min.	50'/35'	35'
ACCESSORY SETBACKS			
FRONT	80' min.	80'	80'
SIDE	15' min.	15'	15'
REAR	12' min.	12'	12'
MAXIMUM HEIGHT			
PRINCIPAL BUILDING	50' max	50'	50'
ACCESSORY STRUCTURE	50' max	50'	50'
PARKING CALCULATIONS			
CHURCH			
1 SPACE REQUIRED PER 4 SEATS (500 SEATS)	125 Spaces	-	156 Spaces (6 ADA)
EX. SINGLE FAMILY DWELLING	0 Spaces	5 Spaces	-
PARKING LOT LANDSCAPE & TREE CANOPY REQUIREMENTS			
CHURCH			
LANDSCAPED AREA	5%	-	17,551 SF / 26%
TREE CANOPY (20 YRS GROWTH)	25%	-	26,349 SF / 36%
EX. SINGLE FAMILY DWELLING			
LANDSCAPED AREA	N/A (10 Spaces)	0	-
TREE CANOPY (20 YRS GROWTH)	N/A (10 Spaces)	0	-

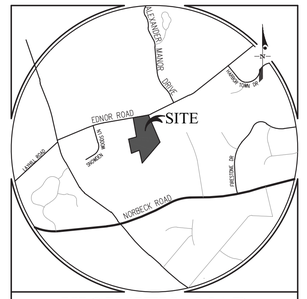
GENERAL NOTES

1. OWNER: EDNOR LAND, LLC
   7501 WISCONSIN AVENUE, #1000W
   BETHESDA, MD 20405
2. SITE ADDRESS: 211 EDNOR ROAD
   SILVER SPRING, MD 20405
3. TAX ID: 03-00275561
   PARCEL: 542
4. WATERSHED: NORTHWEST BRANCH - RIGHT FORK
   12-DIGIT HYDROLOGIC UNIT CODE: 021402050828
   WATERSHED USE CLASS: IV
3. BOUNDARY SURVEY BY: GLW, MARCH 2024.
4. TOPOGRAPHY: MCKENZIE-SNYDER, AERIAL FLOWN, MARCH 2024.
5. WETLAND/ STREAM DELINEATION: AMERICAN LAND CONCEPTS, MARCH, 2024.
6. WATER AND SEWER SERVICE CATEGORY:W-5/S-6
7. FLOODPLAIN ON SITE, M-NCPPC FLOODPLAIN STUDY PER MCATLAS WEBSITE.
8. NRI/FSD BY: GLW NO.420242480, APPROVED 10/3/2024.
9. STORMWATER CONCEPT BY: GUTSCHICK LITTLE AND WEBER, SWM CONCEPT NO.:245184, SUBMITTED 10/8/2024, PENDING APPROVAL.
10. THERE ARE NO KNOWN RARE, THREATENED OR ENDANGERED SPECIES ON SITE.
11. THE PROPERTY IS NOT LISTED ON THE LOCATIONAL ATLAS AND INDEX OF HISTORIC SITES.
12. THIS SITE IS NOT LOCATED IN A SPECIAL PROTECTION AREA.
13. THE SITE IS LOCATED WITHIN THE PLANNING BOUNDARIES OF THE CLOVERLY MASTER PLAN.
14. M-NCPPC STAFF MUST INSPECT ALL TREE-SAVE AREAS AND PROTECTION DEVICES BEFORE CLEARING AND GRADING.
15. STREET TREES AND STREET LIGHTS WILL BE REVIEWED AND APPROVED BY MCDPS-ROW SECTION AT THE TIME OF ROW PERMIT.
16. ALL ITEMS IN SWM FACILITIES WILL BE REVIEWED, APPROVED AND INSPECTED BY DPS WATER RESOURCE SECTION.



AREA MAP

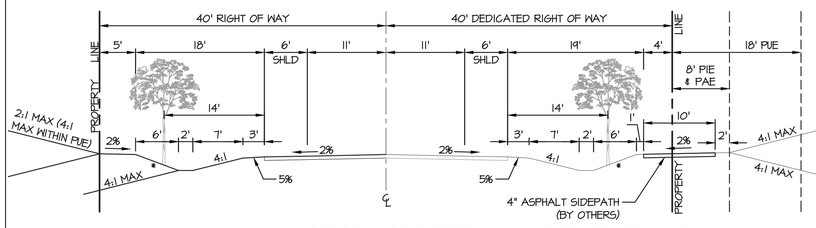
SCALE: 1"= 100'



VICINITY MAP

SCALE: 1" = 2,000'

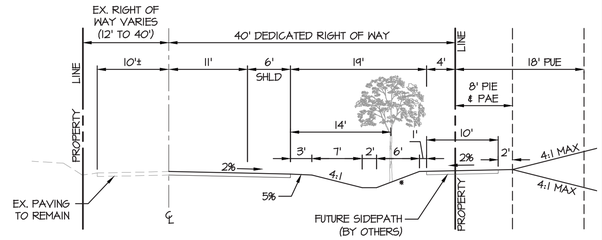
WSSC GRID: 222NW01 ADC MAP: 5050-G10



ULTIMATE ROAD SECTION

EDNOR ROAD
COUNTRY CONNECTOR
80' WIDTH ULTIMATE RIGHT-OF-WAY
(OPEN SECTION)
MODIFIED STANDARD MC-2004.33

* BACKSLOPES ARE APPROXIMATELY 2.8:1



PROPOSED ROAD SECTION

EDNOR ROAD
COUNTRY CONNECTOR
80' WIDTH ULTIMATE RIGHT-OF-WAY
(OPEN SECTION)
MODIFIED STANDARD MC-2004.33

* BACKSLOPES ARE APPROXIMATELY 2.8:1

SHEET INDEX

LEGEND

- EX. PROPERTY LINE
- EXISTING TREELINE
- STEEP SLOPES GREATER THAN 25%
- EX. CONTOURS
- EX. CURB
- EX. SIDEWALK
- EX. CURB
- E — EX. ELECTRIC
- EXISTING OVERHEAD WIRE
- EX. GAS
- S — EX. SAN.
- W — EX. WATER
- D — EX. STORM DRAIN
- // — EX. FENCE
- SB — STREAM BUFFER
- EX. STREAM
- EX. WETLANDS
- WB — EX. WETLAND BUFFER
- EX. BUILDING/ STRUCTURE
- PROP. BUILDING/ STRUCTURE
- EX. UTILITY POLE
- PROP. LIGHT

An on-site pre-construction meeting is required to be set up with the MNCPPC inspection staff before any demo, clearing, or grading occurs on-site. The owner or his designee who has signature authority, and the general contractor must attend the pre-construction meeting with the MNCPPC inspector. A copy of the approved Certified Preliminary Plan is required to be on-site at all times. To schedule an inspection with MNCPPC staff, please contact Josh Kaye at 301-495-4722.

MNCPPC PRELIMINARY PLAN No. 120250050

GLW PLANNING | ENGINEERING | SURVEYING
3909 NATIONAL DRIVE | SUITE 250 | BURTONSVILLE, MD 20866 | GLWPA.COM
PHONE: 301-421-4024 | BALT: 410-880-1820 | DC&VA: 301-989-2524 | FAX: 301-421-4186

DESIGNED BY:	DRAWN BY:	CHECKED BY:
TSZ	RLG	TSZ

DATE	REVISION	BY	APP'R.

SCALE: 1" = 100'

0' 50' 100' 200' 400'

PREPARED FOR:
EDNOR LAND, LLC
C/O: WALTER BOWIE
7501 WISCONSIN AVENUE, #1000W
BETHESDA, MARYLAND 20814

SCALE	ZONING
1" = 100'	RE-2
DATE	TAX MAP - GRID
JUNE 2024	JS-43

COVER SHEET

2811 14th Street NE Gospel Hall, Inc. Church
211 EDNOR ROAD
PARCEL 542
L. 3137 F. 52

ELECTION DISTRICT No. 05 MONTGOMERY COUNTY, MARYLAND

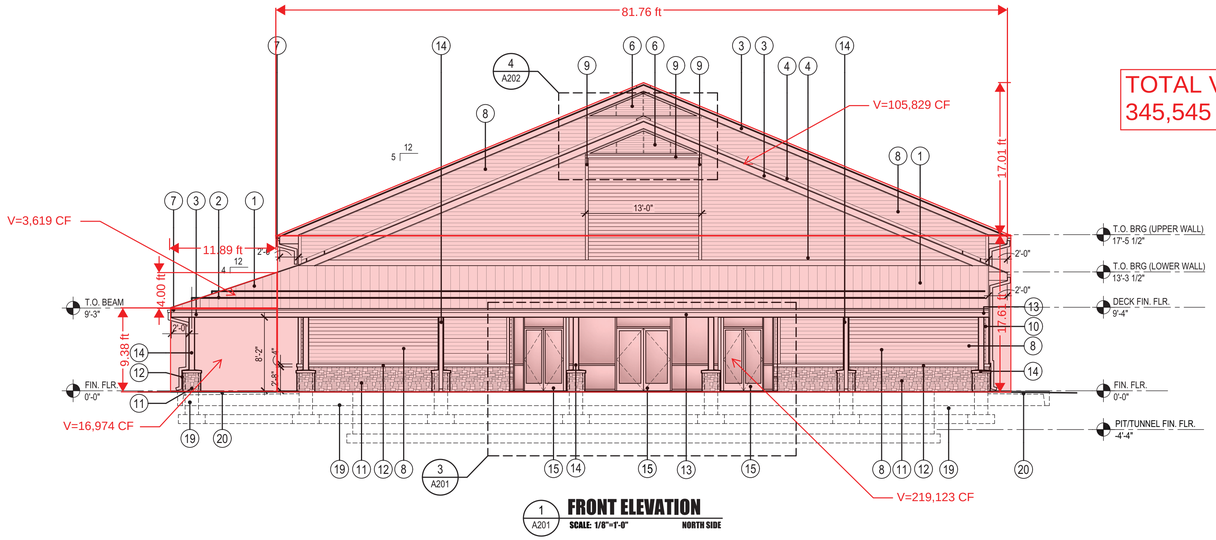
G. L. W. FILE No. 22159

SHEET 1 OF 5

Bowman
FIRE & LIFE SAFETY

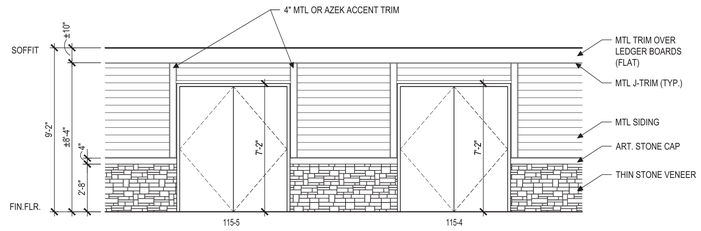
APPENDIX 2

Sample Building Elevation – Building Volume

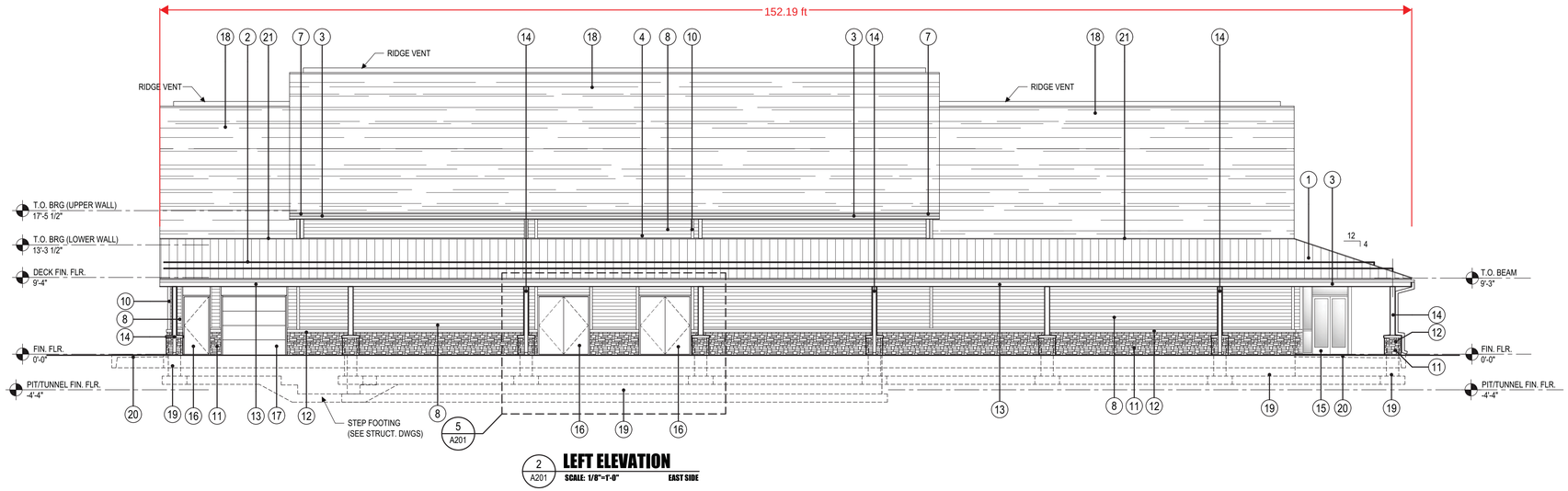


1 A201 **FRONT ELEVATION**
SCALE: 1/8"=1'-0" NORTH SIDE

TOTAL VOLUME =
345,545 CUBIC FEET



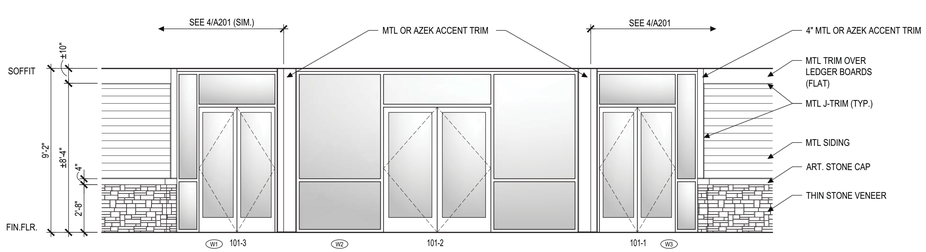
5 A201 **ENLARGED ELEVATION**
SCALE: 1/4"=1'-0"



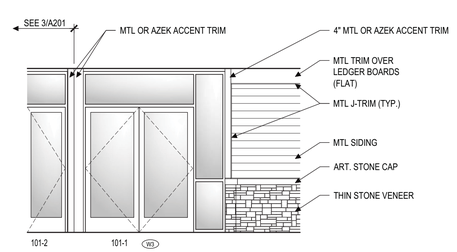
2 A201 **LEFT ELEVATION**
SCALE: 1/8"=1'-0" EAST SIDE

ELEVATIONS KEY NOTES

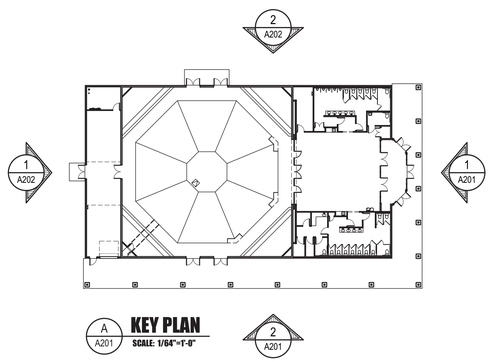
1	STANDING SEAM METAL ROOF (MANUF. AND COLOR T.B.D.)
2	SNOW/ICE RAIL (DBL ROWS) (MANUF. AND COLOR T.B.D.)
3	METAL WRAPPED FASCIA/RACK BOARD, 24 GA. (MANUF. AND COLOR T.B.D.)
4	METAL WALL FLASHING (MANUF. AND COLOR T.B.D.)
5	3'x3' METAL WALL LOUVERS (HVAC)
6	METAL LOUVER (ATTIC VENTING) (MANUF. AND COLOR T.B.D.)
7	METAL GUTTER AND DOWNSPOUT (EXTEND TO ROOF, GRADE, OR RAINWATER COLLECTOR) (MANUF. AND COLOR T.B.D.)
8	METAL SIDING (MANUF. AND COLOR T.B.D.)
9	4" METAL ACCENT TRIM (MANUF. AND COLOR T.B.D.)
10	4" METAL ACCENT/CORNER TRIM (MANUF. AND COLOR T.B.D.)
11	THIN STONE (MANUF. AND COLOR T.B.D.)
12	STONE CAP (MANUF. AND COLOR T.B.D.)
13	METAL WRAPPED BEAM, 24 GA. (MANUF. AND COLOR T.B.D.)
14	METAL WRAPPED COLUMN OR AZEK (MANUF. AND COLOR T.B.D.)
15	STOREFRONT ENTRANCE DOOR SYSTEM (SEE DOOR SCHEDULE DWG A401) (ANODIZED, KAWNEER OR EQUAL)
16	HOLLOW METAL DOOR AND FRAME (SEE DOOR SCHEDULE A601) (MANUF. AND COLOR T.B.D.)
17	OVERHEAD GARAGE DOOR (SEE DOOR SCHEDULE A601) (MANUF. AND COLOR T.B.D.)
18	ASPHALT SHINGLE ROOF
19	FOOTING & FOUNDATION/PIER WALL (SEE STRUCT. DRAWINGS)
20	CONC. SLAB (SEE SECTIONS)
21	METAL ROOF FLASHING



3 A201 **ENLARGED ELEVATION**
SCALE: 1/4"=1'-0"



4 A201 **ENLARGED ELEVATION**
SCALE: 1/4"=1'-0"



A A201 **KEY PLAN**
SCALE: 1/64"=1'-0"

PRELIMINARY CODE REVIEW

HEX 9 ARCHITECTS
An LLC Company
5427 Woodside Drive
Gap, PA 17527
(717) 442-9034
(717) 283-0097 fx
JOSEPH TURNOWCHYK, AIA, NCARB

REVISIONS

NUMBER	DATE	REVISED BY

DATE SEPTEMBER 05, 2023
DRAWN BY CC
PROJECT NUMBER 23104

NEW FACILITY FOR:
PHILADELPHIA MEETING GROUP
47 N. MIDDLETOWN RD.
MEDIA, PA 19063

MIDDLETOWN TOWNSHIP
DELAWARE COUNTY

EXTERIOR ELEVATIONS

A201
DRAWING NUMBER

Tank Submittals

Ednor Road Church
Montgomery County, MD

Prepared for:

GLW
Phone: 301-421-4024
Attention: Thomas Zyla

Prepared By:

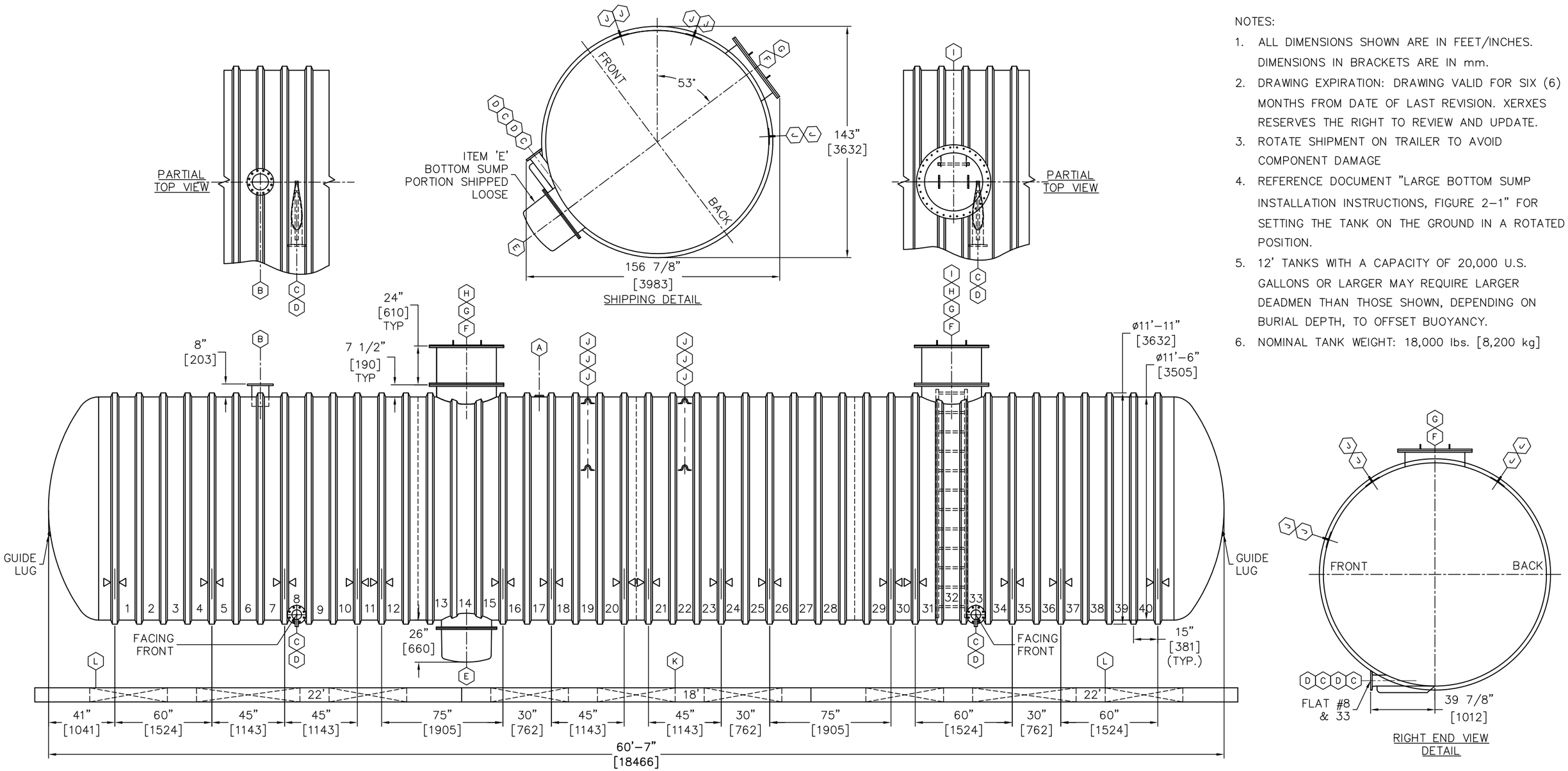
Tanks Direct
8580 Laureldale Drive
Laurel, MD 20724
Eileen Grant
Phone: 301-395-7506
Eileen.Grant@tanksdirect.com

Documents Included:

- **Xerxes – 45,000 Gallon SW MTO UST – Tank Drawing**
- **Xerxes – 45,000 Gallon SW MTO UST – Installation Instructions**
- **Xerxes – 45,000 Gallon SW MTO UST – Back fill Guidelines**
- **Xerxes – 45,000 Gallon SW MTO UST – Anchoring System**
- **36" Manway w/Manway Extension**
- **FRP Ladders**
- **6” Full Coupling w/PVC Down Pipe and Anti-Vortex Plate**
- **10” Flange – Vent**
- **Tank Fittings**
- **42” Watertight Manhole Cover at Grade**
- **6” Dry Hydrant Connection**
- **8” Cistern Vent w/Sight Assembly**
- **4” Fill Connection**

Xerxes – (2) 45,000 Gallon SW MTO UST's

Tank Drawings



NOTES:

1. ALL DIMENSIONS SHOWN ARE IN FEET/INCHES. DIMENSIONS IN BRACKETS ARE IN mm.
2. DRAWING EXPIRATION: DRAWING VALID FOR SIX (6) MONTHS FROM DATE OF LAST REVISION. XERXES RESERVES THE RIGHT TO REVIEW AND UPDATE.
3. ROTATE SHIPMENT ON TRAILER TO AVOID COMPONENT DAMAGE
4. REFERENCE DOCUMENT "LARGE BOTTOM SUMP INSTALLATION INSTRUCTIONS, FIGURE 2–1" FOR SETTING THE TANK ON THE GROUND IN A ROTATED POSITION.
5. 12' TANKS WITH A CAPACITY OF 20,000 U.S. GALLONS OR LARGER MAY REQUIRE LARGER DEADMEN THAN THOSE SHOWN, DEPENDING ON BURIAL DEPTH, TO OFFSET BUOYANCY.
6. NOMINAL TANK WEIGHT: 18,000 lbs. [8,200 kg]

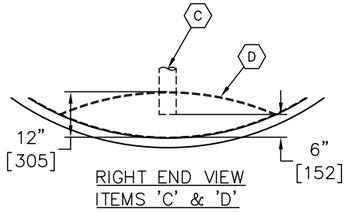
ITEM	QTY	DESCRIPTION	PART NO.
A	1	4"NPT SERVICE FITTING	C310103
B	1	10" FRP FLANGED VERTICAL NOZZLE	C270009
C	2	6"DIA FRP FLANGED & GUSSETED TANGENTIAL NOZZLE	C600048
D	2	FLANGE BOTTOM SUPPORT	C600055
E	1	30"DIA x 26"DEEP FLANGED BOTTOM SUMP	–
F	2	36"DIA MANWAY	C600011
G	2	36"DIA MANWAY BLANK COVER & 2 HANDLES	C330082
H	2	36"DIA x 24"HIGH MANWAY EXTENSION	C530110
I	1	FIBERGLASS LADDER (16" WIDE, TANK MOUNTED) FOR 12FT TANK	C380024
J	6	LIFTING LUG (10" x 10" HD) 41" , 41" , 46"	C340001
K	2	18' PREFABRICATED CONCRETE DEADMEN KIT	–
L	4	22' PREFABRICATED CONCRETE DEADMEN KIT	–
▷◁	16	HOLD DOWN STRAP LOCATION	–

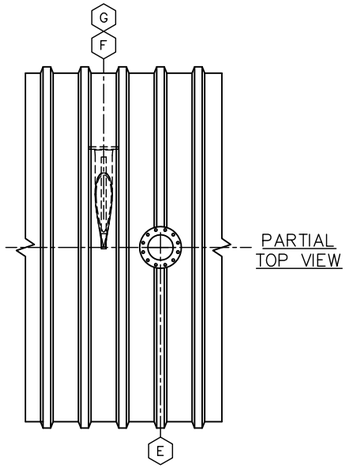
CUSTOMER DESIGNATION;
TANK 2

00	REVISION DESCRIPTION					
DRN	DATE	CHK'D	DATE	APPR'D	DATE	
–	–	–	–	–	–	

XERXES®

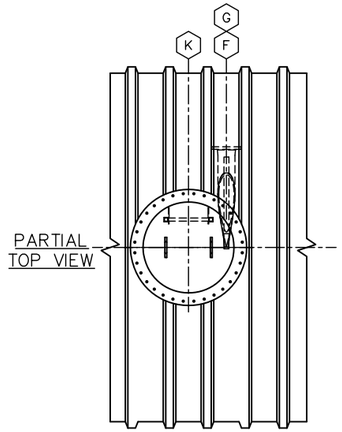
DRN	DATE	TITLE
OJ	04–11–25	12FT DIA SW CAP. 45,000 GALLONS EDNOR CHURCHROAD TANK 2
CHK'D: LJB	DATE: 04–11–25	
APPR'D: –	DATE: –	
SALES MANAGER: LOUIS CLENDANIEL	DR. SIZE: B	DR. NUMBER: XS–009208
	REV: 00	
	SCALE: N.T.S.	SHT 1 OF 1
INDUSTRY TYPE: M207 FIRE PROTECTION		

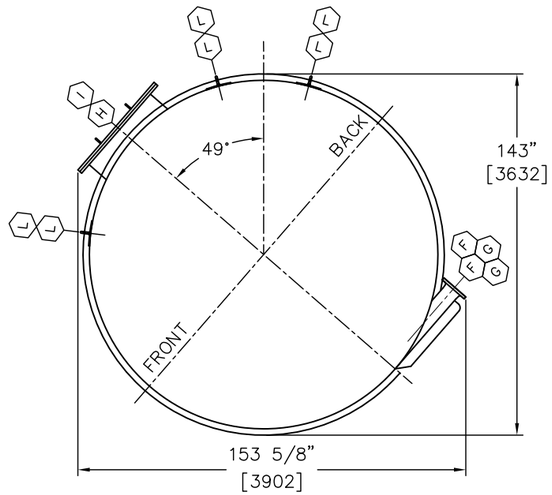




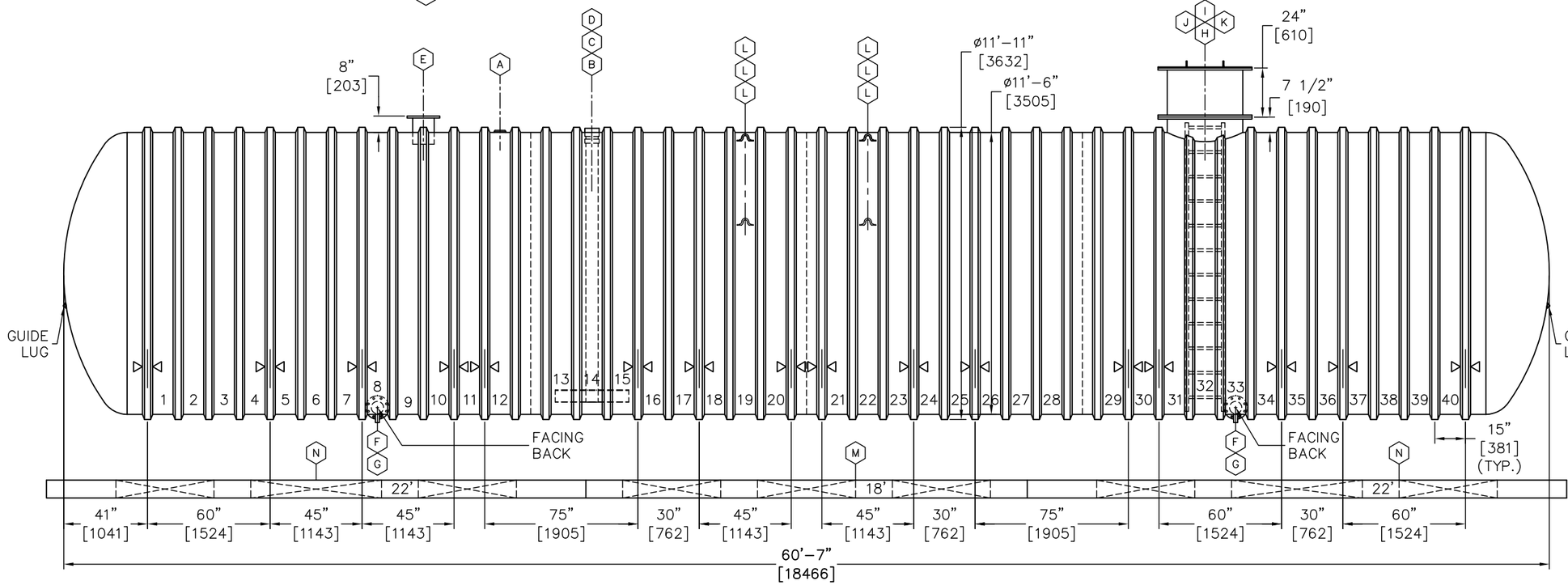
NOTES:

1. ALL DIMENSIONS SHOWN ARE IN FEET/INCHES. DIMENSIONS IN BRACKETS ARE IN mm.
2. DRAWING EXPIRATION: DRAWING VALID FOR SIX (6) MONTHS FROM DATE OF LAST REVISION. XERXES RESERVES THE RIGHT TO REVIEW AND UPDATE.
3. ROTATE SHIPMENT ON TRAILER TO AVOID COMPONENT DAMAGE
4. 12' TANKS WITH A CAPACITY OF 20,000 U.S. GALLONS OR LARGER MAY REQUIRE LARGER DEADMEN THAN THOSE SHOWN, DEPENDING ON BURIAL DEPTH, TO OFFSET BUOYANCY.
5. NOMINAL TANK WEIGHT: 18,000 lbs. [8,200 kg]

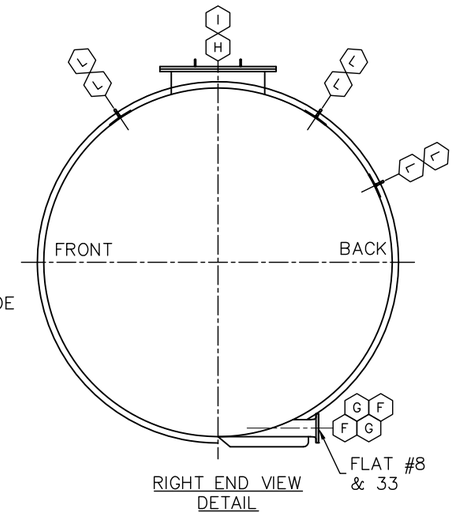




SHIPPING DETAIL



FRONT VIEW



RIGHT END VIEW
DETAIL

ITEM	QTY	DESCRIPTION	PART NO.
A	1	4"NPT SERVICE FITTING	C310103
B	1	6"NPT FULL COUPLING SERVICE FITTING	C310110
C	1	6"DIA SCH40 PVC DOWN PIPE WITH MALE THREADED ADAPTER	–
D	1	ANTI–VORTEX FOR 6"DIA VERTICAL PIPE	C260008
E	1	10" FRP FLANGED VERTICAL NOZZLE	C270009
F	2	6"DIA FRP FLANGED & GUSSETED TANGENTIAL NOZZLE	C600048
G	2	FLANGE BOTTOM SUPPORT	C600055

H	1	36"DIA MANWAY	C600011
I	1	36"DIA MANWAY BLANK COVER & 2 HANDLES	C330082
J	1	36"DIA x 24"HIGH MANWAY EXTENSION	C530110
K	1	FIBERGLASS LADDER (16" WIDE, TANK MOUNTED) FOR 12FT TANK	C380024
L	6	LIFTING LUG (10" x 10" HD) 41" , 41" , 36"	C340001
M	2	18' PREFABRICATED CONCRETE DEADMEN KIT	–
N	4	22' PREFABRICATED CONCRETE DEADMEN KIT	–
▷◁	16	HOLD DOWN STRAP LOCATION	–

CUSTOMER DESIGNATION;
TANK 1

00	REVISION DESCRIPTION					
DRN	DATE	CHK'D	DATE	APPR'D	DATE	
–	–	–	–	–	–	

XERXES®

DRN	DATE	TITLE
OJ	04–11–25	12FT DIA SW CAP. 45,000 GALLONS EDNOR CHURCHROAD TANK 1
CHK'D: LJB	DATE: 04–11–25	
APPR'D: –	DATE: –	
SALES MANAGER: LOUIS CLENDANIEL	DR. SIZE: B	DR. NUMBER: XS–009207
	SCALE: N.T.S.	REV: 00
		SHT 1 OF 1

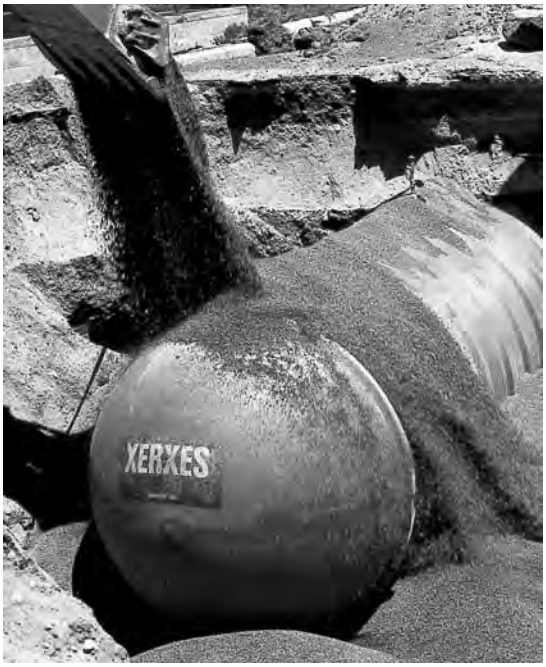
INDUSTRY TYPE: M207 FIRE PROTECTION

Xerxes – (2) 45,000 Gallon SW MTO UST's

Backfill Guidelines

Backfill Guidelines

The backfill material surrounding an underground storage tank (UST) is a critical part of a proper tank installation. This document gives guidelines for choosing the best material to use when installing Xerxes fiberglass tanks. The Xerxes Installation Manual and Operating Guidelines (Installation Manual) specifies that rounded gravel or crushed stone be used as backfill material.



Materials that meet Xerxes' specifications for backfill material

Coarse aggregate is a technical term for the material (rounded gravel and crushed stone) that meets Xerxes' backfill size requirements. The American Society for Testing and Materials (ASTM) and The American Association of State Highway Transportation Officials (AASHTO) have specifications for standard sizes of coarse aggregate. The tables in this document give the standard sizes of coarse aggregate that meet Xerxes' backfill material specifications. The following descriptions of rounded gravel and crushed stone are taken from the Xerxes Installation Manual.

Rounded Gravel

When using rounded gravel, the material is to be a mix of rounded particles, sizes between 1/8 inch and 3/4 inch. The rounded gravel must conform to the specifications of ASTM C-33, paragraph 9.1, sizes 6, 67 or 7. No more than 5% (by weight) of the backfill may pass through a #8 sieve. The material is to be washed, free-flowing, and free of ice, snow and debris. See Table 1 on other side of this document for more information.

Crushed Stone

When using crushed stone, the material is to be a mix of angular particles, sizes between 1/8 inch and 1/2 inch. The crushed stone must conform to the specifications of ASTM C-33, paragraph 9.1, sizes 7 or 8. No more than 5% (by weight) of the backfill may pass through a #8 sieve. The material is to be washed, free-flowing, and free of ice, snow and debris. See Table 2 on other side of this document for more information.

Some material suppliers may produce materials that meet Xerxes' requirements but are not identified by a standard coarse aggregate size number. The supplier should be able to provide a specification that identifies the size or gradation of the material. If a specification for the material is not available, an independent testing laboratory can provide a sieve analysis performed on a sample of the backfill material according to ASTM C-136 specifications. The sieve analysis or material specification can then be compared against Xerxes' size requirements for the rounded gravel or crushed stone.

Another important characteristic of good backfill material is hardness or stability when exposed to water or loads. Most materials have no problems meeting the hardness requirement. Materials like soft limestone, sandstone, sea shells or shale should not be used as backfill because they break down over time.

XERXES® CORPORATION
a subsidiary of ZCL Composites Inc.
7901 Xerxes Avenue South, Minneapolis, MN 55431-1288 ■ (952) 887-1890 ■ Fax (952) 887-1882 ■ www.xerxes.com

These tables identify standard sizes of coarse aggregate that meet Xerxes' specifications for rounded gravel (Table 1) and crushed stone (Table 2). Each table identifies standard sieve sizes used to grade aggregate material. For each aggregate size, the amount of material finer than each laboratory sieve (square openings) is given as a percentage of the total weight of the sample.

These percentages give an indication of the particle size distribution or gradation within a given aggregate size. With aggregate size number 6 of rounded gravel, for example, 20-55% of the sample (measured by weight) should pass through a 1/2-inch sieve. And, with aggregate size number 7 of crushed stone, 0-15% of the sample (measured by weight) should pass through a No. 4 sieve.

Table 1 Standard Sizes of Coarse Aggregate[1] Meeting Xerxes' Rounded Gravel Specifications

Grade Number	Amount of material passing through each laboratory sieve given as percentage of total weight.					
6	100%	90-100%	20-55%	0-15%	0-5%	—
67	100%	90-100%	—	20-55%	0-10%	0-5%
7	—	100%	90-100%	40-70%	0-15%	0-5%
						
Sieve Size	1 inch 25.0 mm	3/4 inch 19.0 mm	1/2 inch 12.5 mm	3/8 inch 9.5 mm	0.187 inch 4.75 mm No. 4	0.094 inch 2.36 mm No. 8

Note: 1. Standard sizes of coarse aggregate per ASTM D-448, ASTM C-33 and AASHTO M 43.

Table 2 Standard Sizes of Coarse Aggregate[2] Meeting Xerxes' Crushed Stone Specifications

Grade Number	Amount of material passing through each laboratory sieve given as percentage of total weight.					
7	—	100%	90-100%	40-70%	0-15%	0-5%
8	—	—	100%	85-100%	10-30%	0-10%
						
Sieve Size	1 inch 25.0 mm	3/4 inch 19.0 mm	1/2 inch 12.5 mm	3/8 inch 9.5 mm	0.187 inch 4.75 mm No. 4	0.094 inch 2.36 mm No. 8

Note: 2. Standard sizes of coarse aggregate per ASTM D-448, ASTM C-33 and AASHTO M 43.

Anchoring System:

Deadmen

Hold Down Straps

Turnbuckles

Prefabricated Deadmen Installation Instructions

For Fiberglass Underground Storage Tanks and Oil/Water Separators

1. GENERAL

1.1. These instructions supplement the Anchoring Tanks section of the Xerxes Installation Manual and Operating Guidelines (subsequently referred to as "Installation Manual"). They apply to pre-engineered, prefabricated deadmen supplied by Xerxes.

1.2. It is important to follow the procedures and instructions in the Installation Manual in order to safely and properly install a Xerxes underground storage tank and accessories. Failure to follow those instructions may void the tank warranty and cause tank failure, death, serious personal injury or property damage.

1.3. Deadmen help anchor tanks in installations in which there is potential for a high water table or trapped water.

1.4. Deadmen come in various lengths. Generally, there are 1 to 4 deadman sections per side of the tank, with both sides having an equal number.

2. ANCHORING TANKS

2.1. Xerxes Prefabricated Deadmen

2.1.1. Xerxes-supplied prefabricated deadmen are pre-engineered and sized to the tank ordered and include galvanized adjustable anchor points (subsequently referred to as "anchor points"). As with any deadman, water-table height, number of attached collar risers and burial depth must be considered in sizing the deadman system.

2.2. Placement of deadmen

2.2.1. The minimum spacing between tanks must be increased as needed to accommodate deadmen.

2.2.2. Always provide sufficient clearance to allow the deadmen to be set outside of the tank "shadow." See Tank Spacing subsection in the Excavation Parameters section of the Installation Manual. *(See FIGURE 2-1.)*

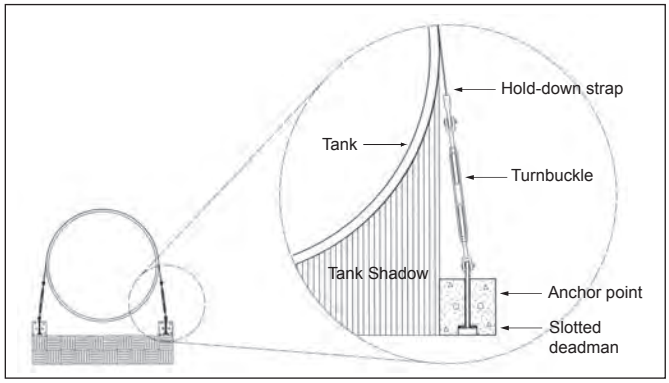


FIGURE 2-1

2.2.3. When multiple sections are used, the deadmen are to be butted together end-to-end on each side of the tank.

⚠ WARNING

Only use the anchor points when lifting and positioning the deadmen. A spreader bar may be required to lift longer sections of deadmen. Use guy ropes to guide the deadmen when lifting. Failure to do so could result in death or serious injury.

2.3. Positioning of anchor points

2.3.1. Xerxes deadmen are supplied with 3/4-inch-diameter anchor points. These anchor points protrude up through the slots in the deadmen and are temporarily supported with cotter pins. *(See FIGURE 2-2.)*

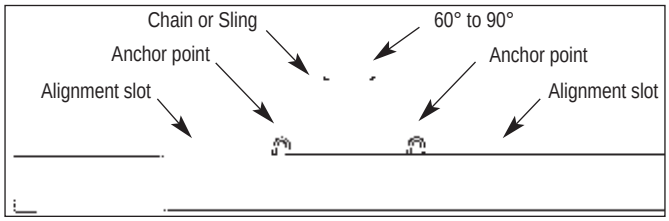


FIGURE 2-2

2.3.2. Use only one strap per anchor point.

2.3.3. Align the anchor points with the hold-down strap locations on the tank (marked by arrowhead ▶◀ symbols). See Anchoring Tanks section of the Installation Manual.

2.3.4. When using deadmen in man-out-of-hole strapping applications, align the anchor points with the proper ribs before setting the deadmen in the hole.

2.3.5. Care should be taken to keep backfill from entering the alignment slots until final adjustment is made. Placing something (for example, a piece of wood) over the slots during backfill placement may help keep backfill from entering the alignment slots.

2.4. Installation of deadmen

2.4.1. The top of the deadmen should be aligned to the bottom of the tank.

2.4.2. The deadmen are typically placed directly on the excavation floor.

2.4.3. If Xerxes 18-inch wide low-profile deadmen are used as a construction guide, they may need to be elevated. This can be accomplished by putting 3-1/2 inch of backfill or a wood 4x4 (or equivalent) underneath, so that the top of the deadmen are 12 inches off of the bottom of the excavation. *(See FIGURE 2-3.)*

2.4.4. Make sure the anchor points are positioned correctly.

2.4.5. Some contractors use the deadmen as a guide for proper depth of bedding. (Note that low-profile deadmen are not 12 inches high.)

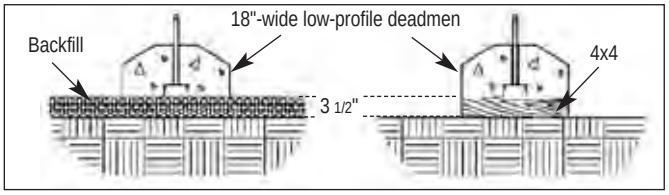


FIGURE 2-3

3. OPTIONAL TURNBUCKLES

3.1. General

3.1.1. Xerxes also offers a turnbuckle *(See FIGURE 3-1.)* that will connect the deadman anchor point to the Xerxes FRP hold-down strap. When the deadman is properly positioned, this will eliminate the use of cables and cable clamps. See Hold-down Straps subsection in the Anchoring Tanks section of the Installation Manual for more detail. *(Also see FIGURE 2-1.)*

FIGURE 3-1

XERXES® CORPORATION

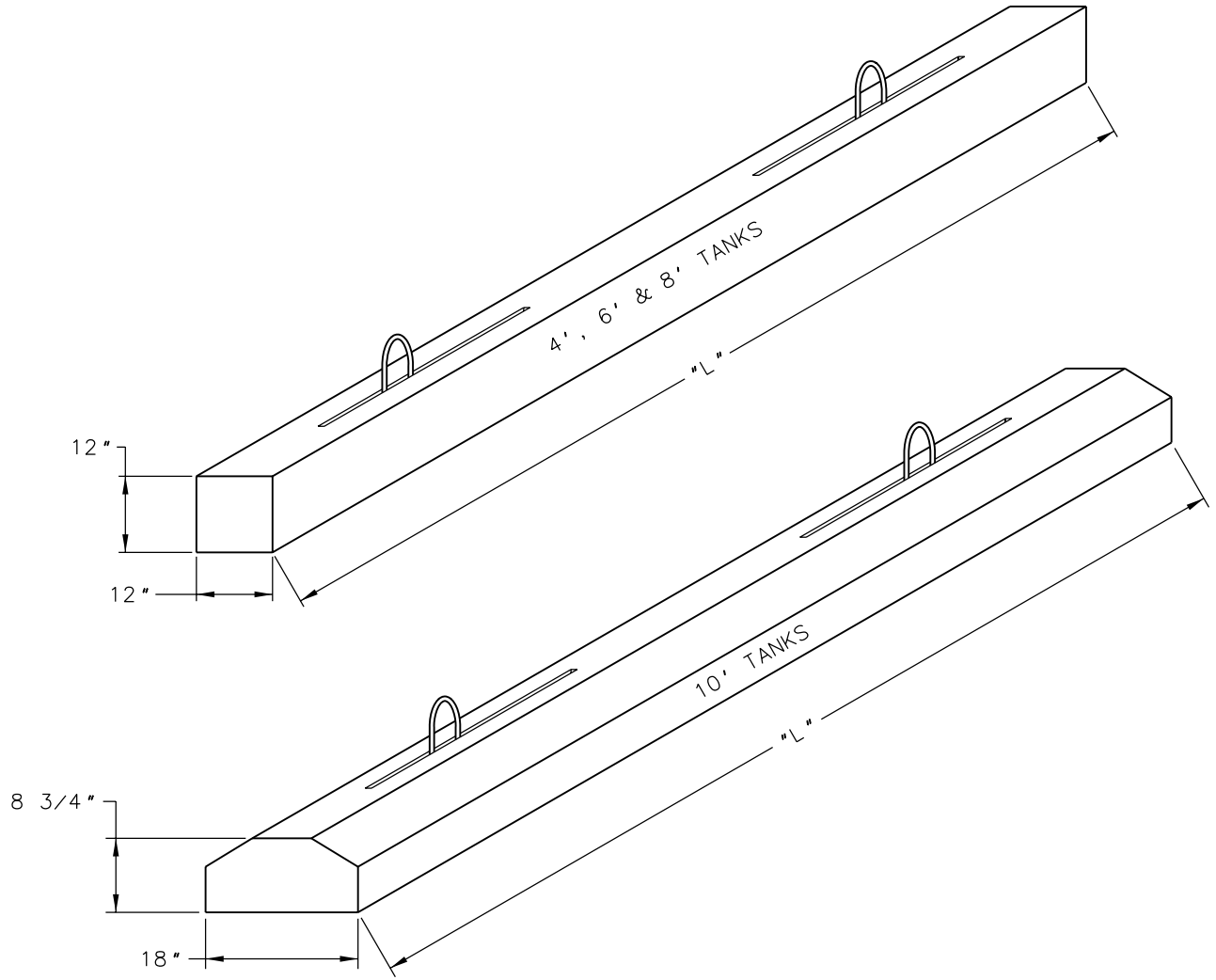
7901 Xerxes Avenue South, Minneapolis, MN 55431-1288 ■ (952) 887-1890 ■ Fax (952) 887-1882 ■ www.xerxescorp.com

Deadmen Dimensions

Nominal Tank Capacity (Gallons)	Number of Deadmen	Width x Depth of a Deadman (Inches)	Length of a Deadman (Feet)	Weight of a Deadman (Pounds/each)	Number of Straps Required
4' - 600	2	12 x 12	12	1,800	2
4' - 1,000	2	12 x 12	12	1,800	2
4' - 1,500	2	12 x 12	12	1,800	2
6' - 1,500	2	12 x 12	12	1,800	2
6' - 2,000	2	12 x 12	12	1,800	2
6' - 3,000	2	12 x 12	16	2,400	2
6' - 4,000	2	12 x 12	18	2,700	2
6' - 5,000	4	12 x 12	12	1,800	4
6' - 6,000	4	12 x 12	16	2,400	4
8' - 2,000	2	12 x 12	12	1,800	2
8' - 3,000	2	12 x 12	12	1,800	2
8' - 4,000	2	12 x 12	12	1,800	2
8' - 5,000	2	12 x 12	16	2,400	2
8' - 6,000	2	12 x 12	18	2,700	2
8' - 7,000	4	12 x 12	12	1,800	4
8' - 8,000	4	12 x 12	12	1,800	4
8' - 9,000	2 2	12 x 12	16 12	2,400 1,800	4
8' - 10,000	4	12 x 12	16	2,400	4
8' - 11,000	4	12 x 12	16	2,400	4
8' - 12,000	4	12 x 12	18	2,700	4
8' - 13,000	4 2	12 x 12	16 12	2,400 1,800	6
8' - 14,000	4 2	12 x 12	16 12	2,400 1,800	6
8' - 15,000	6	12 x 12	16	2,400	6
10' - 10,000	2	18 x 8 3/4	22	3,000	4
10' - 11,000	2	18 x 8 3/4	22	3,000	4
10' - 12,000	2	18 x 8 3/4	22	3,000	4
10' - 13,000	4	18 x 8 3/4	14	1,900	4
10' - 14,000	4	18 x 8 3/4	14	1,900	4
10' - 15,000	4	18 x 8 3/4	14	1,900	4
10' - 16,000	2 2	18 x 8 3/4	18 14	2,400 1,900	4
10' - 17,000	2 2	18 x 8 3/4	18 14	2,400 1,900	4
10' - 18,000	4	18 x 8 3/4	18	2,400	4
10' - 19,000	4	18 x 8 3/4	18	2,400	4
10' - 20,000	4	18 x 8 3/4	18	2,400	6
10' - 22,000	4	18 x 8 3/4	22	3,000	8
10' - 25,000	4 2	18 x 8 3/4	14 18	1,900 2,400	8
10' - 30,000	6	18 x 8 3/4	18	2,400	10
10' - 35,000	4 2	18 x 8 3/4	22 18	3,000 2,400	12
10' - 40,000	8	18 x 8 3/4	18	2,400	14

XERXES DEADMAN

TANK SIZE	QTY	"L"	APPROX. WEIGHT EACH
4'-600	2	12'	1,800 LBS
4'-1,000	2	12'	1,800 LBS
6'-2,000	2	12'	1,800 LBS
6'-3,000	2	16'	2,400 LBS
6'-4,000	2	18'	2,700 LBS
6'-5,000	4	12'	1,800 LBS
6'-6,000	4	16'	2,400 LBS
8'-3,000	2	12'	1,800 LBS
8'-4,000	2	12'	1,800 LBS
8'-5,000	2	16'	2,400 LBS
8'-6,000	2	18'	2,700 LBS
8'-8,000	4	12'	1,800 LBS
8'-10,000	4	16'	2,400 LBS
8'-12,000	4	18'	2,700 LBS
8'-15,000	6	16'	2,400 LBS
10'-10,000	2	22'	3,000 LBS
10'-12,000	2	22'	3,000 LBS
10'-15,000	4	14'	1,900 LBS
10'-20,000	4	18'	2,400 LBS
10'-25,000	4	14'	1,900 LBS
	2	18'	2,400 LBS
10'-30,000	6	18'	2,400 LBS
10'-35,000	2	18'	2,400 LBS
	4	22'	3,000 LBS
10'-40,000	8	18'	2,400 LBS



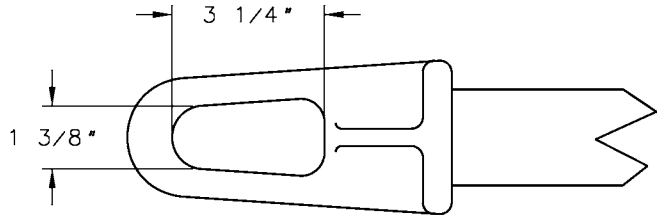
NOTE:

- XERXES DEADMEN ARE ENGINEERED AND DESIGNED TO BE USED WITH XERXES TANKS.
- IN MULTIPLE TANK INSTALLATIONS, EACH TANK REQUIRES ITS OWN SET OF DEADMEN.
- FOR CAST IN PLACE OR DEADMAN CONSTRUCTED OFF SITE, REFER TO XERXES INSTALLATION MANUAL AND OPERATING GUIDELINES FOR PROPER SIZING AND ANCHOR POINT SPECIFICATIONS.

XERXES®
a ZCL company

TITLE
XERXES PRECAST DEADMEN

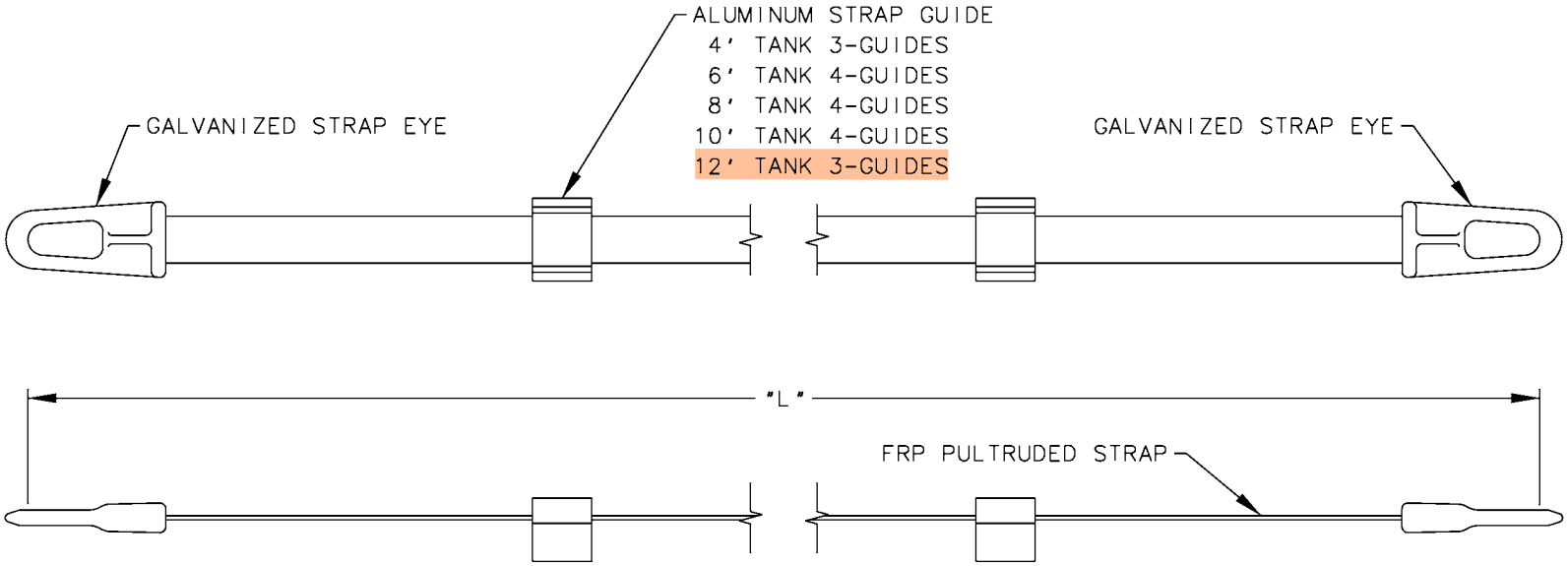
DATE 4-11 | DR. NO. S11-376.01

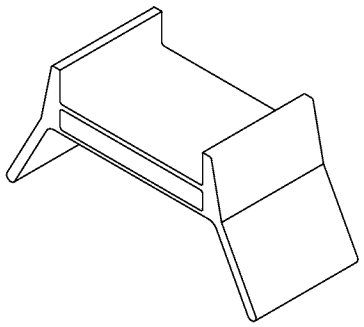


GALVANIZED STRAP EYE

HOLD-DOWN STRAPS	
TANK SIZE	STRAP LENGTH "L"
4' DIA.	8'-4 1/4"
6' DIA.	12'-1"
8' DIA.	15'-1"
10' DIA.	18'-8 3/4"
12' DIA.	22'-6 3/4"

NOTE: STRAPS ARE RATED AT MINIMUM 25,000 LBS.



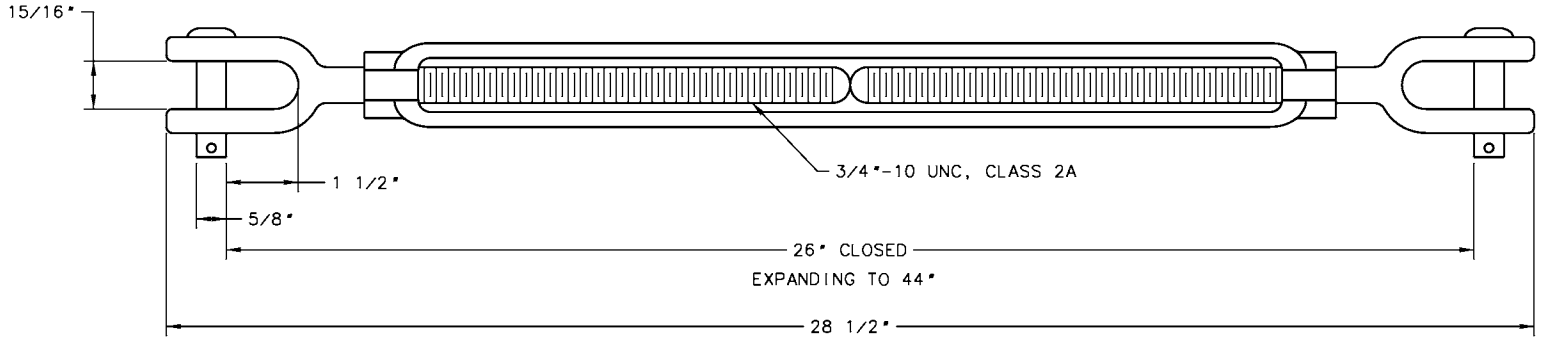


ALUMINUM STRAP GUIDE

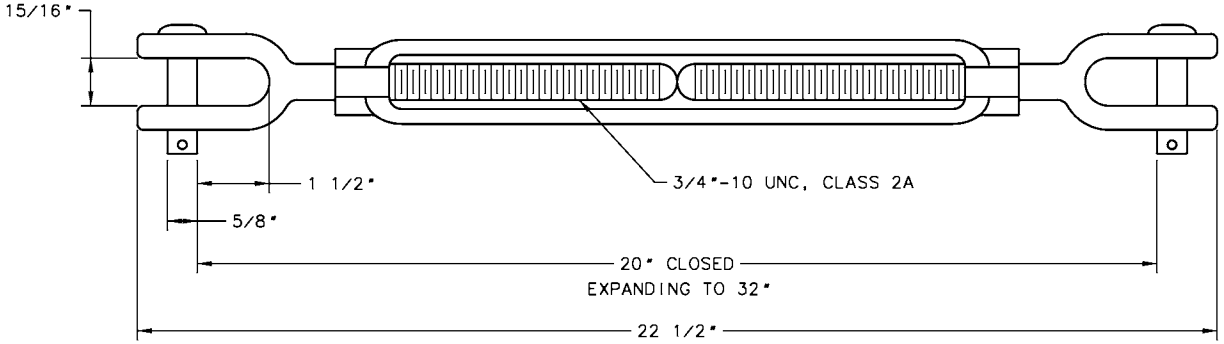
XERXES®
a ZCL company

TITLE
DOUBLE D-LUG
HOLD-DOWN STRAPS

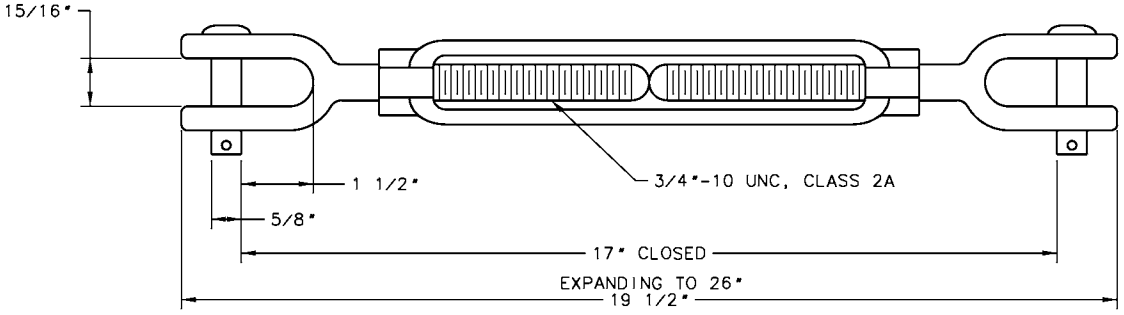
DATE 4-11 | DR. NO. S10-798.02



GALVANIZED 3/4" x 18" JAW TO JAW TURNBUCKLE
FOR USE WITH 10' DIA TANK HOLD DOWN STRAPS



GALVANIZED 3/4" x 12" JAW TO JAW TURNBUCKLE
FOR USE WITH 8' DIA TANK HOLD DOWN STRAPS



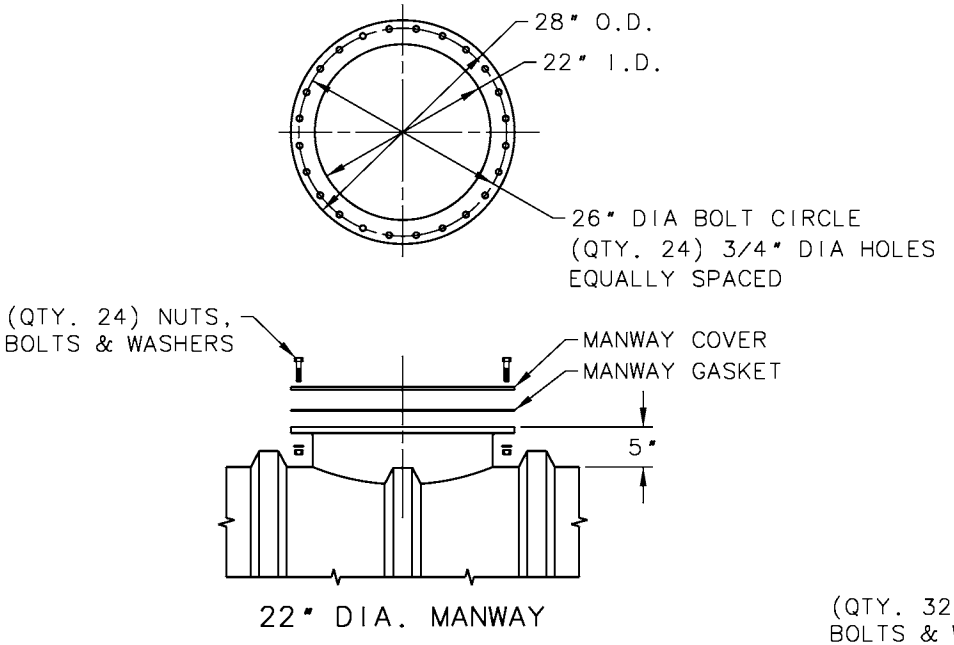
GALVANIZED 3/4" x 9" JAW TO JAW TURNBUCKLE
FOR USE WITH 6' DIA TANK HOLD DOWN STRAPS

XERXES®
a ZCL company

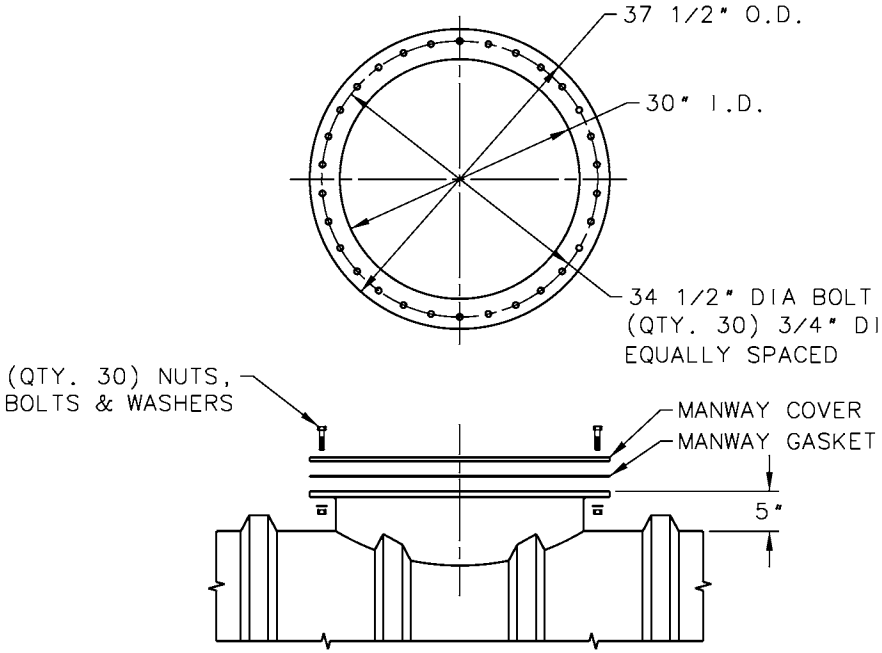
TITLE
JAW TO JAW TURNBUCKLES

DATE 1-14 | DR. NO. S11-375.02

36" Manway w/Manway Extension – Cut Sheets

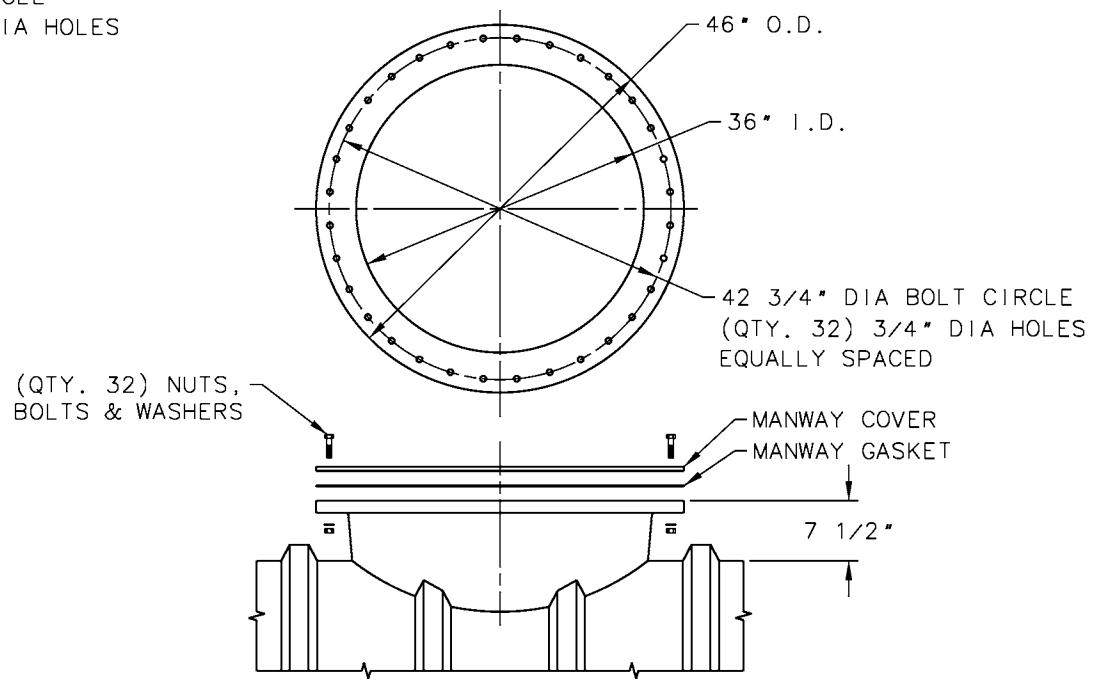


22" DIA. MANWAY



30" DIA. MANWAY

NOTE: 22" MANWAYS ARE CENTERED ON A RIB.
30" AND 36" MANWAYS ARE CENTERED ON A FLAT.

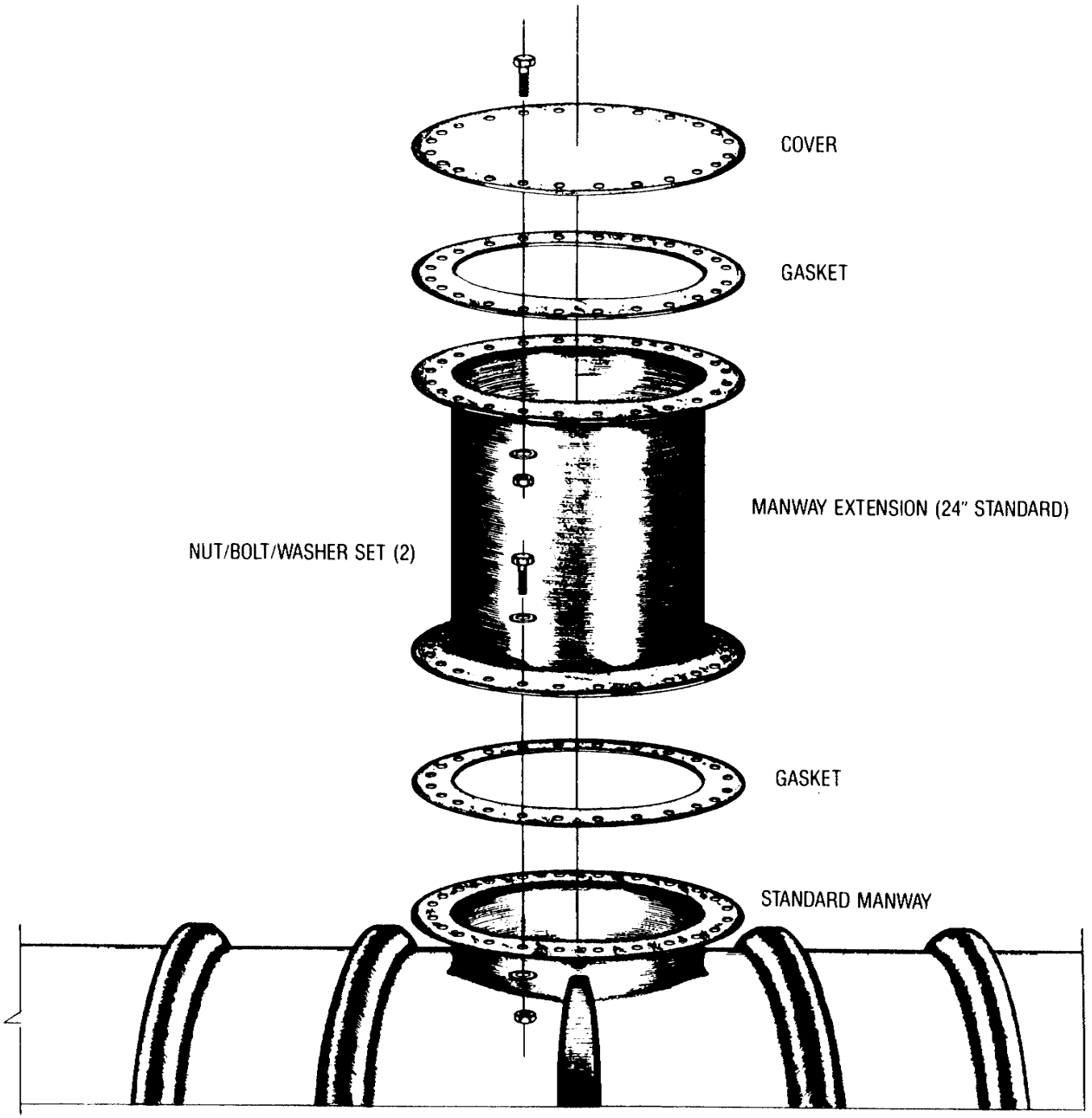


36" DIA. MANWAY

XERXES®
a ZCL company

TITLE
22", 30" & 36" MANWAY
SW & DW TANKS

DATE 1-14 | DR. NO. S11-369.02



DRAWING NO: S	TITLE: MANWAY EXTENSION DETAIL
DATE: / /	
XERXES® CORPORATION	CATALOG NO. (IF AVAILABLE)

FRP Ladders – Cut Sheet

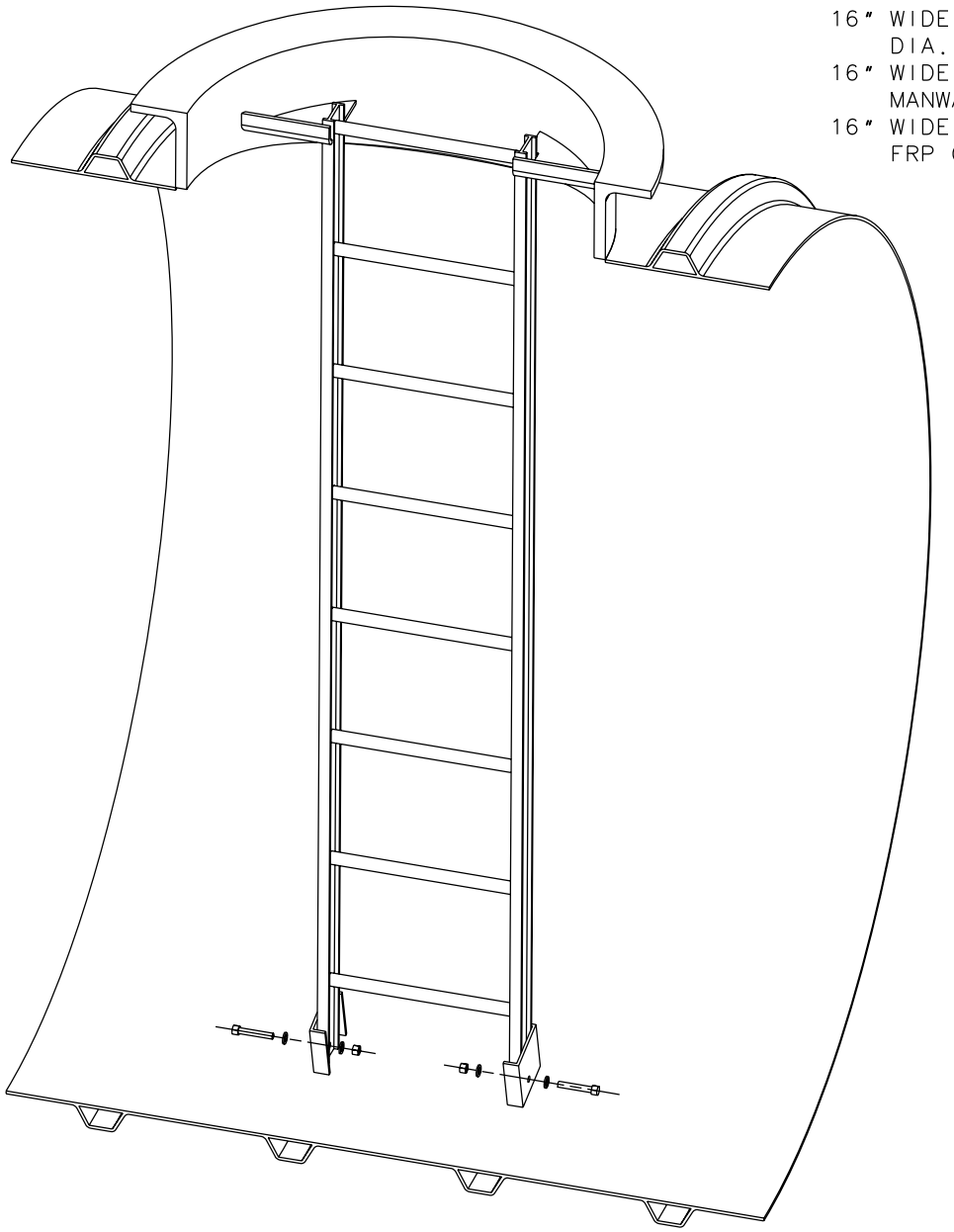
NOTE:

12" WIDE LADDERS ONLY CAN BE USED IN A TANK WITH A 22" DIA MANWAY. NO LADDERS FACTORY INSTALLED IN 22" DIA MANWAY EXTENSIONS.

16" WIDE LADDERS ARE FIXED TO THE TANK IN 30" & 36" DIA. MANWAYS.

16" WIDE LADDERS ARE FIXED INSIDE OF 30" & 36" DIA. MANWAY EXTENSIONS.

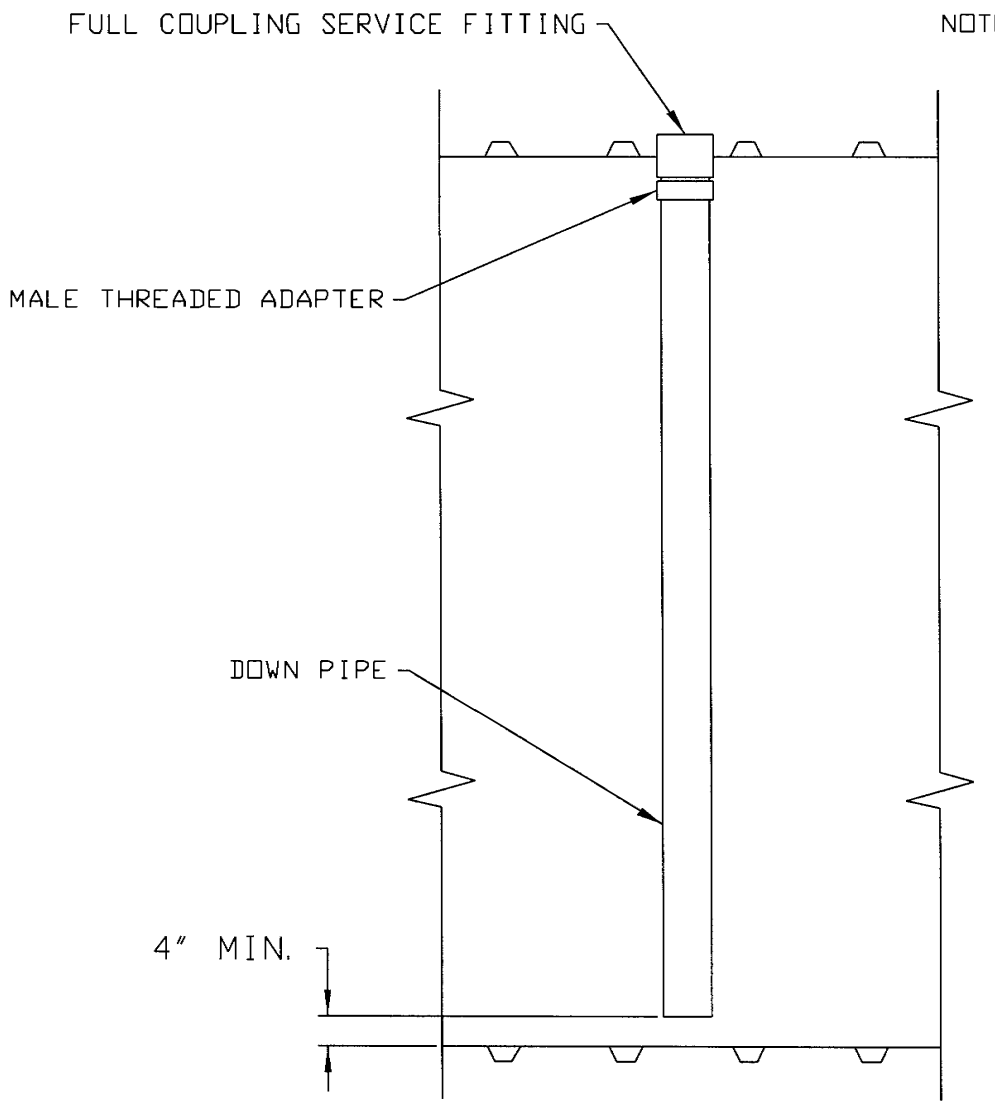
16" WIDE LADDERS MAY ALSO BE FIXED TO INSIDE WALL OF FRP CONTAINMENT SUMPS AND RISERS 30" DIA. OR LARGER.



XERXES®
CORPORATION

TITLE	LADDERS FIBERGLASS, STEEL OR ALUMINUM
DATE 12-09	DR. NO. S11-579.00

6” Full Coupling w/Down Pipe and Anti-Vortex Plate
Cut Sheets



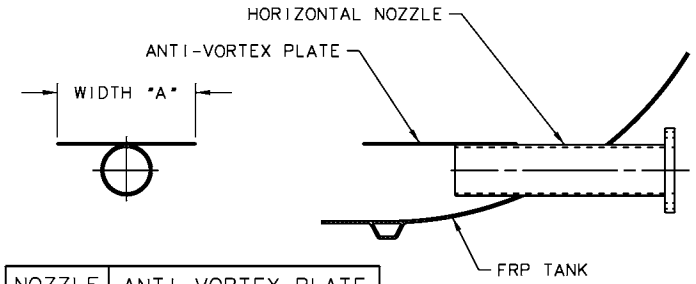
NOTE:
- AVAILABLE IN 2", 4" AND 6" SIZES.

XERXES® CORPORATION

TITLE
FIBERGLASS OR PVC
DOWN PIPE PIPE

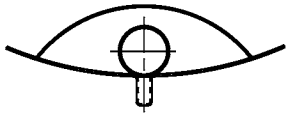
DATE 4-04 | DR. NO. S11-327

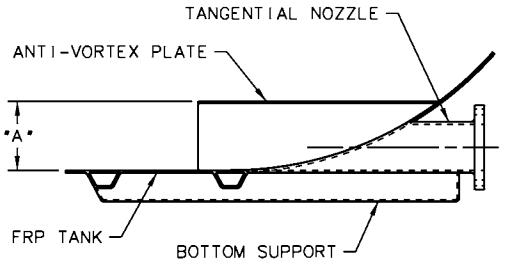
HORIZONTAL NOZZLE



NOZZLE SIZE	ANTI-VORTEX PLATE WIDTH "A"
2"DIA	14"
4"DIA	16"
6"DIA	18"
8"DIA	20"
10"DIA	22"
12"DIA	24"

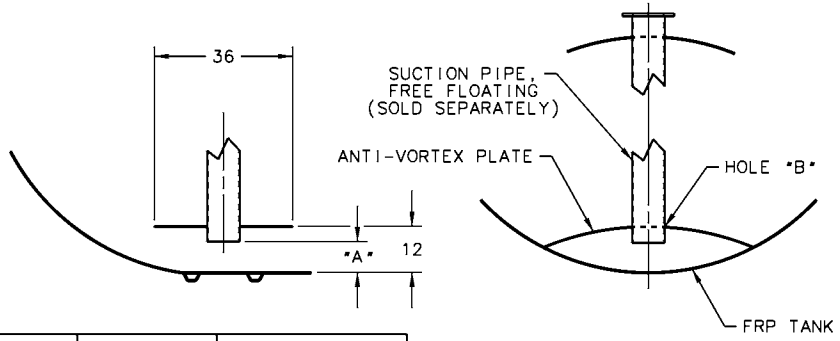
TANGENTIAL NOZZLE





NOZZLE SIZE	ANTI-VORTEX PLATE HEIGHT "A"
2"DIA	5"
4"DIA	7"
6"DIA	9"
8"DIA	14"
10"DIA	16"
12"DIA	18"

VERTICAL NOZZLE

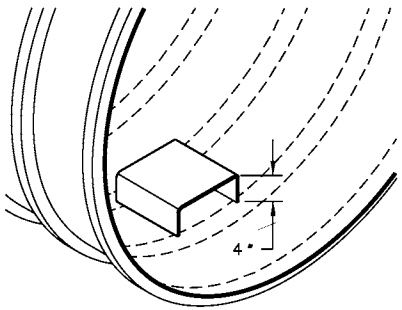


PIPE DIA	"A" HIGH	"B" HOLE
4"	6"	4 5/8"
6"	6"	6 3/4"
8"	8"	8 3/4"
10"	10"	10 3/4"
12"	10"	12 3/4"

PUMP PLATFORM

NOTE:

- PUMP PLATFORMS ARE USED FOR PUMPS UP TO 300 LBS.
- STANDARD PLATFORM SIZES AVAILABLE ARE 24" x 24", 24" x 36" & 36" x 36".
- FOR CUSTOM SIZED PLATFORM REQUIREMENTS, CONSULT A XERXES SALES REPRESENTATIVE.



XERXES®
a ZCL company

TITLE
ANTI-VORTEX OPENINGS & PUMP PLATFORM

DATE 1-14

DR. NO. S11-372.02

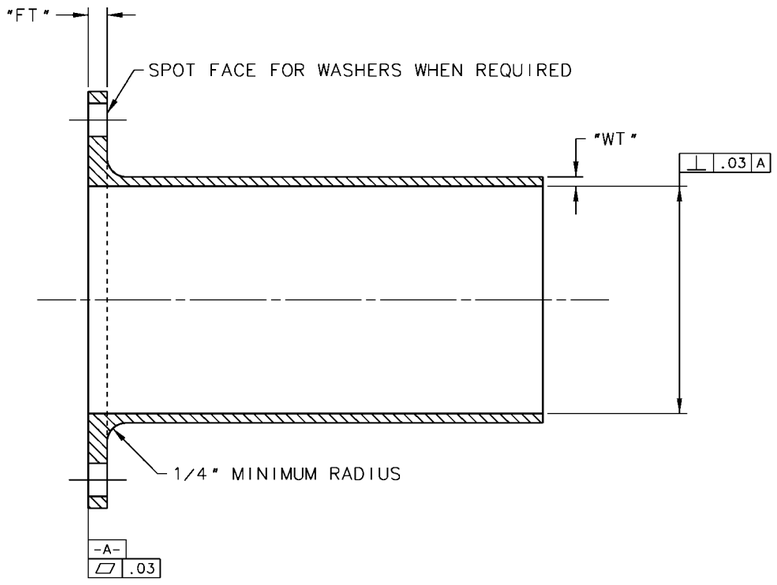
10” Flange for Vent – Cut Sheet

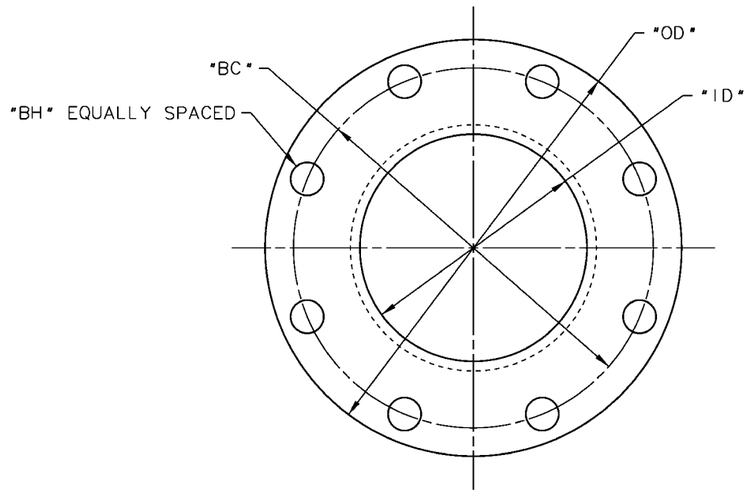
FLANGED NOZZLE DATA

NOMINAL NOZZLE DIAMETER	OUTSIDE DIAMETER "OD"	INSIDE DIAMETER "ID"	FLANGE THICKNESS "FT"	WALL THICKNESS "WT"	DIA BOLT CIRCLE "BC"	DIA BOLT HOLE "BH"	NUMBER OF HOLES
2"	6"	2"	1/2"	1/4"	4 3/4"	3/4"	4
3"	7 1/2"	3"	1/2"	1/4"	6"	3/4"	4
4"	9"	4"	1/2"	1/4"	7 1/2"	3/4"	8
6"	11"	6"	1/2"	1/4"	9 1/2"	7/8"	8
8"	13 1/2"	8"	9/16"	1/4"	11 3/4"	7/8"	8
10"	16"	10"	11/16"	1/4"	14 1/4"	1"	12
12"	19"	12"	3/4"	1/4"	17"	1"	12
14"	21"	14"	13/16"	1/4"	18 3/4"	1 1/8"	12

NOTE:

1 - FLANGED NOZZLES CONFORM TO ANSI B16.5 150 LBS. BOLTING PATTERN.





2	ADD 3" NOZZLE DATA -	DAG 7-6-11
1	ADD 14" NOZZLE DATA -	DAG 11-28-05

CHK'D	DATE	STD'S	DATE	APPR'D	DATE
-	-	-	-	JWL	7-6-11
-	-	-	-	JWL	11-28-05

XERXES® CORPORATION

DRN	DAG	10-19-99
CHK'D	KM	10-19-99
STD'S		
APPR'D	RB	10-19-99

TITLE: FLANGED NOZZLE DATA

DR. SIZE	DR. NUMBER	REV
D	619-058	02

SCALE: NONE | NEXT ASS'Y: - | SHT 1 OF 1

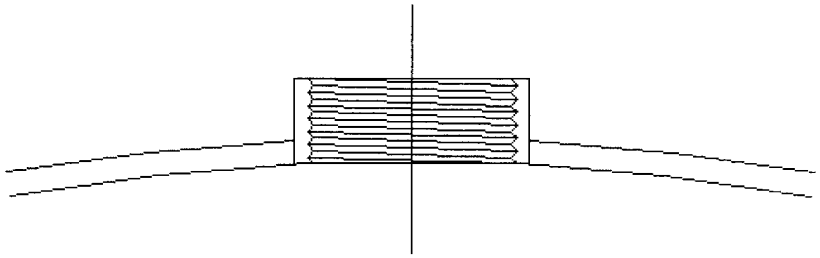
TOLERANCES UNLESS OTHERWISE SPECIFIED

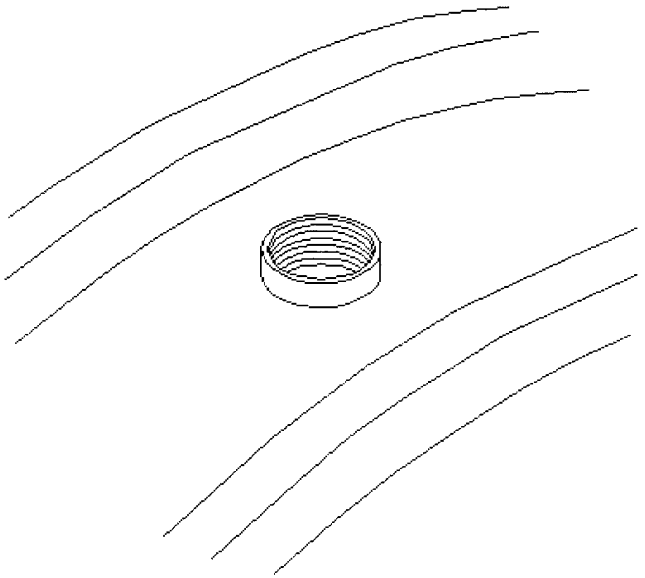
X.	±.120	FRACTIONAL	±1/32
X.X	±.060	ANGULAR	±1/2°
X.XX	±.030	BREAK EDGES	.03R
X.XXX	±.010		

Tank Fittings – Cut Sheet

NOTE:

- ALL FITTINGS MUST BE POSITIONED ON THE TOP CENTERLINE OF THE TANK.
- AVAILABLE IN 2", 4" AND 6" SIZES.





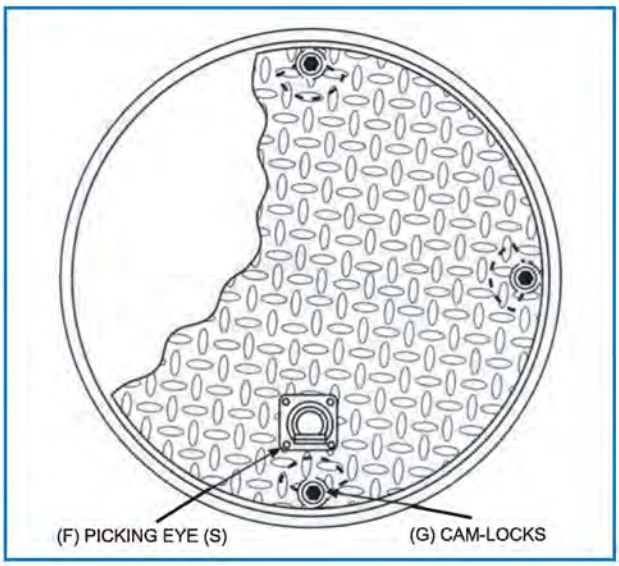
XERXES® CORPORATION

TITLE	FITTING TANK-WALL DETAIL HALF COUPLING
DATE 5-00	DR. NO. S10-841-1

42” Watertight Manhole Cover at Grade – Cut Sheet

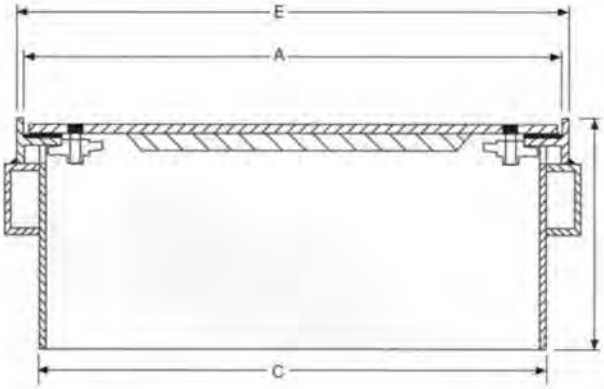
WTL SERIES

WATERTIGHT MANHOLES



CAM-LOCK FEATURES

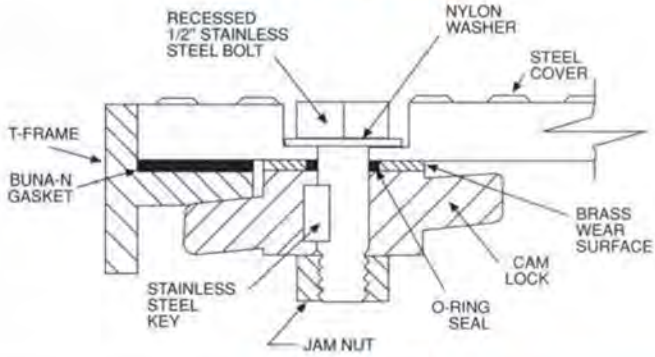
- CAM-LOCK BOLT DOWN DESIGN ALLOWS FOR 1/3rd TURN TO FASTEN COVERS TO FRAMES.
- CAM-LOCKS REMAIN ATTACHED TO MANHOLE COVER, NO MORE LOSING BOLTS.
- CAM-LOCKS ARE O-RING SEALED FOR BETTER WATERPROOFING.
- CAM-LOCKS ARE LOCK INDICATED AND ALLOW COVER REPLACEMENT IN ANY POSITION. NO MORE LOCATING BOLT LOCATIONS.
- CAM-LOCKS ARE OPTIONAL AND CAN BE ADDED TO ANY MANHOLE FOR WATERTIGHT OR RESTRICTED ACCESS. ADD SUFFIX "L" TO MODEL NUMBER.
- LOCK MERCHANISMS ARE CONSTRUCTED OF STAINLESS STEEL, CAST IRON AND BRASS WEAR SURFACED TO INSURE LONG TERM RELIABILITY.



STANDARD FEATURES

- REINFORCED DIAMOND PLATE STEEL COVERS WITH H-20 TRUCKLOAD RATING.
- 1/8" BUNA-N GASKET.
- 14 GUAGE SKIRTS.
- RECESSED WATERTIGHT PICKED EYE(S) FOR EASY COVER REMOVAL.
- CONCRETE CHANNEL ANCHORS.
- ALL STEEL COATED WITH RUST PREVENTIVE PAINT.
- OPTIONAL INTERNAL ACCESS PORTS AVAILABLE. SEE OUR DUAL AND TRIPLE ACCESS SERIES MANHOLES.

SECTION AA



SOLID COVER CAM-LOCKED WATERTIGHT MANHOLES							
MODEL	A	B	C	D	E	F	G
240 WTL	24"	13"	22 1/4"	3/8"	24 3/4"	1	2
300 WTL	29 3/4"	13"	28 3/4"	3/8"	30 3/4"	1	4
360 WTL	35 3/4"	13"	35"	3/8"	36 1/2"	2	4
380 WTL	38"	13"	37 1/2"	3/8"	38 1/2"	2	4
420 WTL	42"	13"	41 1/2"	1/2"	43"	2	4
480 WTL	48"	13"	46 1/2"	1/2"	49"	2	6

MODEL NO: WTL

DWG NO: WTL

WTL
WATERTIGHT
SOLID COVER
MANHOLES

9/23/08 Rev: 1

FAIRFIELD INDUSTRIES, INC.
4483 CHOPPEE ROAD, SC 29440
PHONE: 843-461-3894 FAX: 843-461-3907
www.fairfield-industries.com

6” Dry Hydrant Connection – Cut Sheet

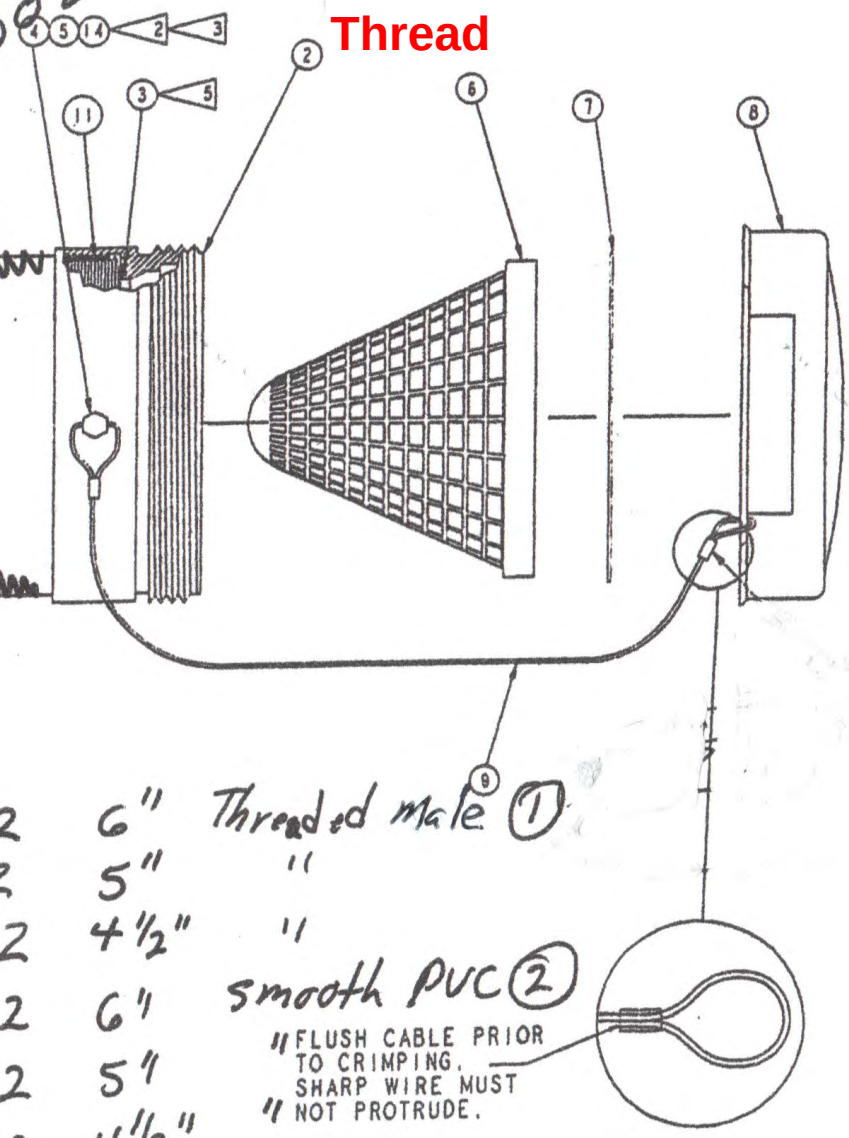
(2)

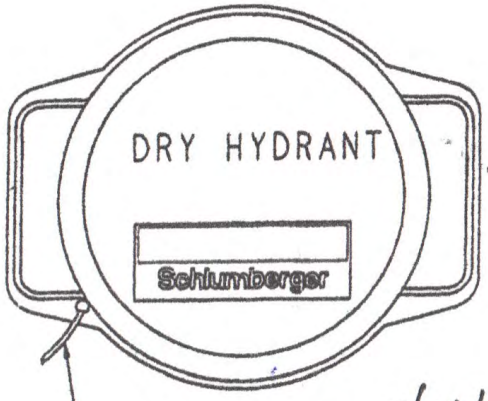
(3) without PVC Sleeve
metal Piece has 6" Straight
Female Pipe Thread
with O'ring.

ETT, L.L.C.
751 Moon Branch Dr.
Dadeville, AL 36853
Ph/Fax (Toll Free) 877-827-2797

ol
Male (1)
read
2

6" NST Thread





Snap Cap as shown Threaded Rocker Lug 9140-202

Customer Special	
9142-101	STRAINER, FLAT, 6", PLASTIC
9142-102	STRAINER, FLAT, 5", PLASTIC
9142-103	STRAINER, FLAT, 4 1/2", PLASTIC
9741-XXX	SL-14 CAP, ROCKER LUG SCREW-ON TYPE w/ CHAIN

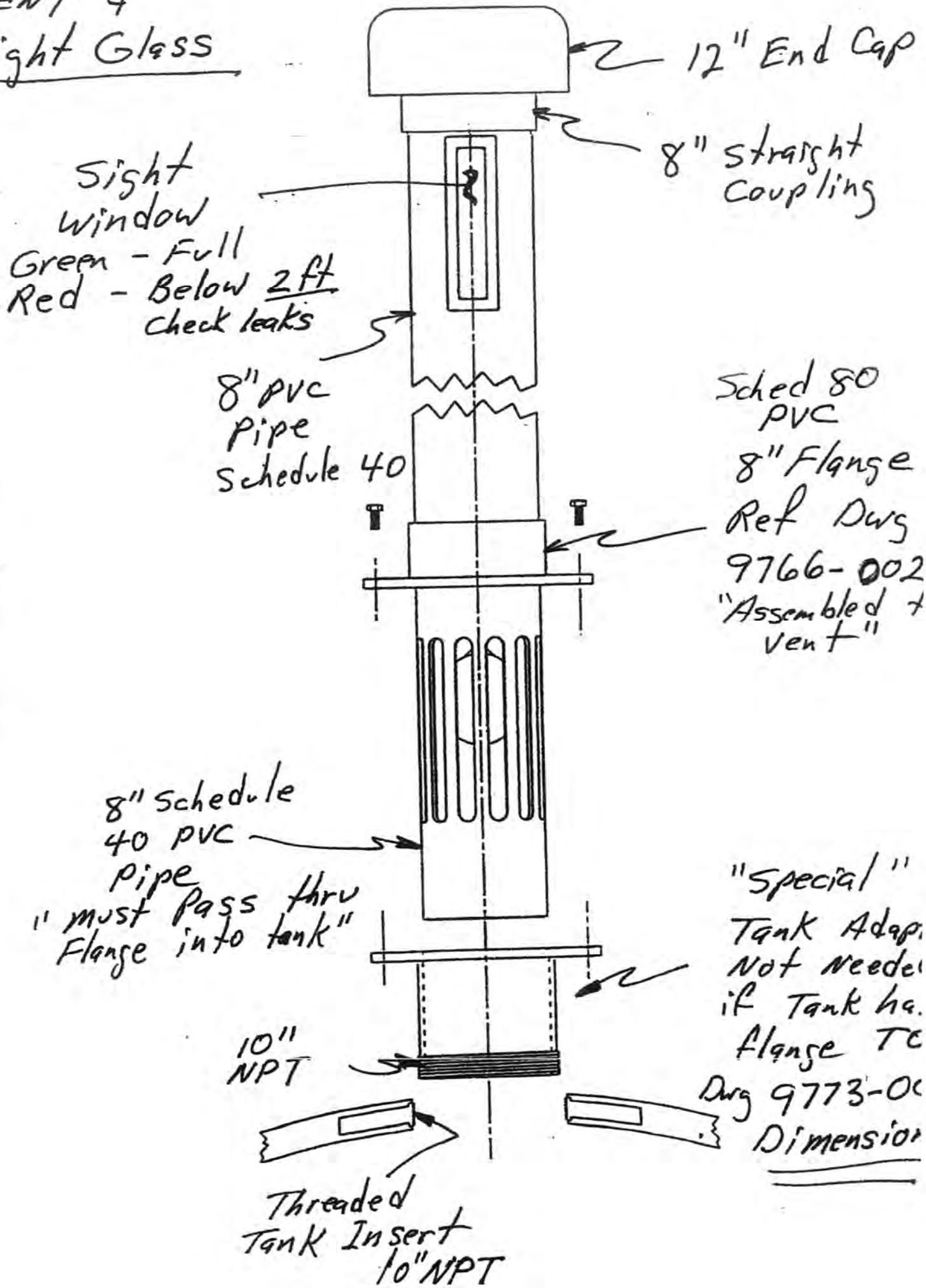
2 6" Threaded male (1)
2 5" "
2 4½" "
2 6" smooth PVC (2)
2 5" "
2 4½" "
2 6" without PVC (3)
2 5" "
2 4½" "

"FLUSH CABLE PRIOR TO CRIMPING. SHARP WIRE MUST NOT PROTRUDE.

Dry Hydrant
6" NST x 6"
Double Male
9140-2XX

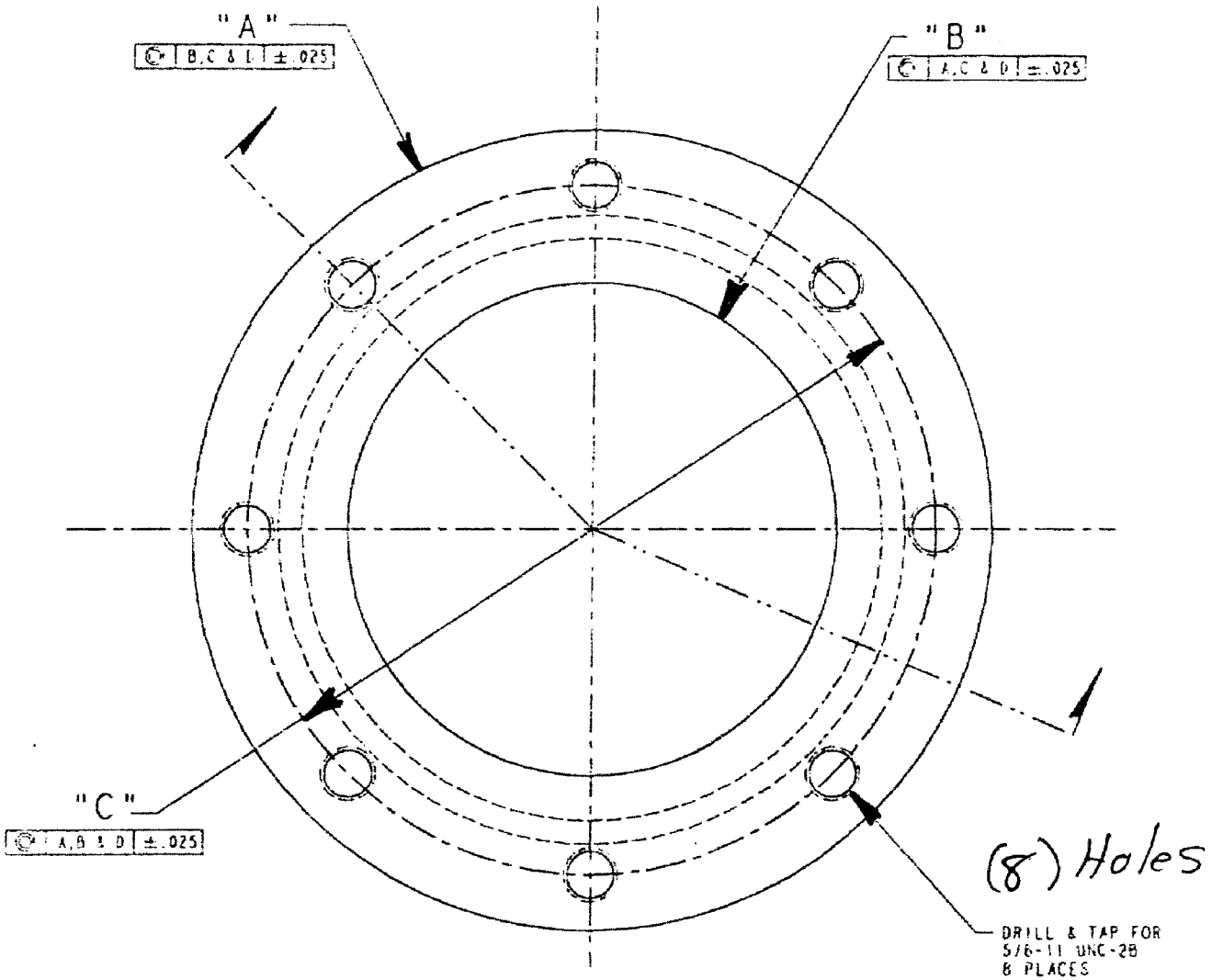
8” Cistern Vent W/Sight Assembly – Cut Sheets

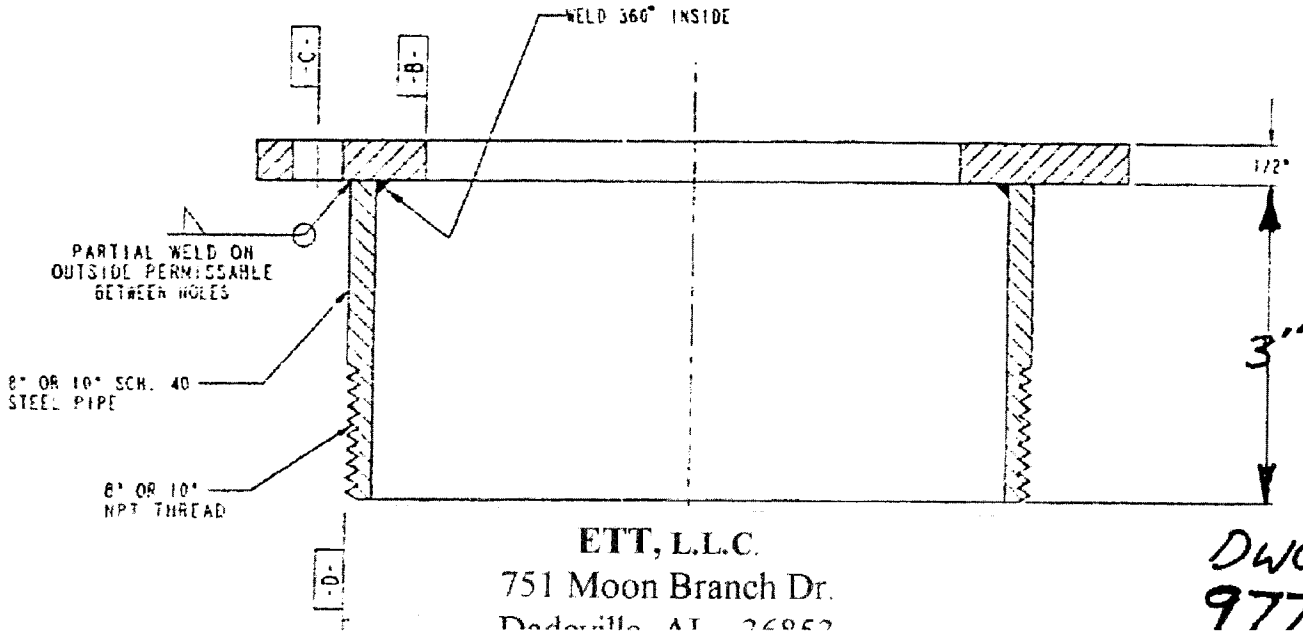
VENT & Sight Glass



Dadeville, AL 36853
Ph/Fax (Toll Free) 877-827-2797

-001	8" X 6" SUPPORT FLANGE	11.00 DIA.	6.75 DIA	9.50 DIA
-002	10" X 8" SUPPORT FLANGE	13.50 DIA.	8.75 DIA	11.75 DIA





ETT, L.L.C.
751 Moon Branch Dr.
Dadeville, AL 36853

DWG# 9773-00X

4” Fill Connection – Cut Sheets

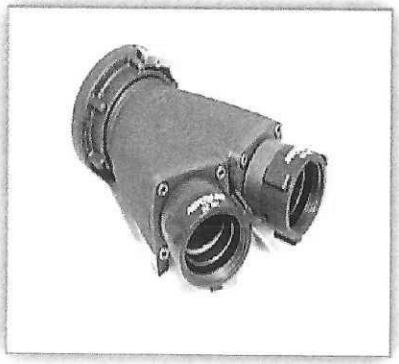
Fill Assemblies

Storz

MSA3-440 4" Storz Fill x 30 Deg Elbow
Flat Plate Strainer included

SC 400 4" Storz Fill Cap w/Chain

2 Way Siamese



FSSV 4025 – 2 Way Siamese
4" MNPT x (2) 2 ½" FNH
Flat Plate Strainers included
(Shipped without Plugs unless specified)

9138-403 - 2 ½" M Plug

Double Siamese

DCS 4025F - Single Clapper
4" FNPT x (2) 2 ½" FNH
4" Bottom Feed - Swing Check
Flat Plate Strainers included
(Price includes 2 Plugs w/Chain)

Aluminum 4" Storz Cap with Cable

Made In USA
Cap Size: 4 inches
Inside Distance Between Lugs: 4 1/2 inches (115mm)
Material: Aluminum
Cable Length: 18 inches
Locking Cap: Yes
Maximum Operating Pressure: 150 PSI
This cap will only connect to another 4 inch storz fitting
Gasket Pressure

Description
Aluminum storz cap with cable. Machined from forged 6061 - T6 aluminum and anodized. Buna-N gaskets to resist most hydrocarbons, oils, gasoline, acids and greases. Complies with DIN standards which require that Storz heads must be forged when used in firefighting applications.
A Storz fitting enables a quarter turn sexless connection, no female or male side, with another Storz fitting. Connection features hooks and flanges with seal made by built-in included gaskets.

Specifications
4" (100mm) Storz Adapter
-Inside Distance Between Lugs - 4 1/2 in (115mm)
-Number of Lugs - 2

SECTION 33 16 00
STORAGE TANKS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Underground Water Tanks:
1. Tank installations in the following locations:
a. United States.
2. For the following applications:
a. Fire Protection Standby Water Storage.

1.2 RELATED SECTIONS

A. Section 02200 - Earthwork.

B. Section 03300 - Concrete.

1.3 REFERENCES

A. Underground Water Tanks in the United States:
1. American Concrete Institute (ACI) standard ACI 318, Building Code Requirements for Structural Concrete.
2. ANSI/AWWA D120 - Thermosetting Fiberglass-Reinforced Plastic Tanks.
3. NFPA 22: Standard for Water Tanks for Private Fire Protection.
4. NFPA 1142: Standard for Water Supplies for Suburban and Rural Fire Fighting.
5. Tank manufacturer shall be recognized by Underwriters Laboratories as a manufacturer of tanks listed to the UL-1316 standard.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300 - Administrative Requirements.

B. Product Data: Submit manufacturer's data sheets on each product to be used, including, but not limited to, the following:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation manual and operating guidelines.

C. Shop Drawings: Tank manufacturer shall submit the following for review and approval prior to fabrication of the tanks:
1. Detailed shop drawings of each tank complete with all accessories supplied by the manufacturer.
2. Detailed shipping, handling and installation instructions.

1.5 QUALITY ASSURANCE

A. Tank installations in the United States:
1. Regulatory Requirements: Comply with applicable requirements of the laws, codes,

ordinances, and regulations of Federal, State, and local authorities having jurisdiction.

1.6 DELIVERY, STORAGE, AND HANDLING

A. General: Comply with tank manufacturer's Installation and Operating Guidelines recommendations for delivery, storage, and tank handling.

1.7 WARRANTY

A. Warranty: Provide manufacturer's standard limited warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS:

A. Tank installations in the United States:
1. Acceptable Manufacturer: Xerxes Corporation, which is located at: 7901 Xerxes Ave. S.; Minneapolis, MN 55431; Tel: 952-887-1890; Fax: 952-887-1882; Email:info@xerxes.com; Web:www.xerxes.com

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600 - Product Requirements.

2.2 UNDERGROUND WATER TANKS

A. Tank Design - Fiberglass reinforced plastic (FRP) tanks:
1. The tank size, fittings and accessories shall be as shown on the drawings.
2. Tank shall be manufactured with structural ribs which are fabricated as in integral part of the tank wall.
3. Tank shall be manufactured with a laminate consisting of resin and glass fiber reinforcement only. No sand/silica fillers or resin extenders shall be used.
4. Tank shall be vented to atmospheric pressure.
5. Tank shall be capable of handling liquids with specific gravity up to 1.1
6. Tank shall be compatible with liquids identified in the manufacturer's standard limited warranty.

B. Loading Conditions - Tank shall meet the following design criteria:
1. Internal Load - Tank shall be designed to withstand a 5-psig (35 kPa) air-pressure test with a 5:1 safety factor.
2. Surface Loads - Tank shall be designed to withstand surface H-20 and HS-20 axle loads when properly installed according to manufacturer's current Installation Manual and Operating Guidelines.
3. External Hydrostatic Pressure - Tank shall be designed for 7 feet (2.1 m) of overburden over the top of the tank, the hole fully flooded, and a safety factor of 5:1 against general buckling.

C. Fire Protection Standby Water Storage Applications:
1. Governing Standards, as applicable:
a. ANSI/AWWA D120 - Thermosetting Fiberglass-Reinforced Plastic Tanks.
b. American Concrete Institute (ACI) standard ACI 318, Building Code Requirements for Structural Concrete.
c. NFPA 22: Standard for Water Tanks for Private Fire Protection.
d. NFPA 1142: Standard for Water Supplies for Suburban and Rural Fire Fighting.
e. Tank manufacturer shall be recognized by Underwriters Laboratories (UL) as a manufacturer of tanks listed to the UL-1316 standard.
2. Tank Design: Single-Wall or Double-Wall vessel as specified and shown on the

Drawings.

a. Interstitial Space (Double-Wall Tanks only):
   1) The interstitial space between the primary and secondary walls shall be constructed with a glass reinforcement material such as Parabeam, which provides a structural bond between the two tank walls, while creating a defined interstice that allows for free flow of liquid.
   2) A tank top fitting shall be provided to allow for a monitoring sensor to be installed at the bottom of the interstice.
   3) The interstice of the tank shall be designed to withstand 20-psig (138 kPa) pressure.

3. Tank Accessories - Fire Protection Standby Water Storage Applications:
   a. Tank Anchoring
      1) Anchor straps shall be as supplied by tank manufacturer and designed for a maximum load of 25,000 lbs (11340 kg).
      2) Galvanized turnbuckles shall be supplied by the tank manufacturer.
      3) Prefabricated concrete anchors shall be supplied by the tank manufacturer, designed to the ACI 318 standard, manufactured with 4,000 psi concrete and shall have adjustable anchor points.
   b. Access Openings:
      1) All access openings shall have a diameter of 24 inches or 30 inches, complete with riser, lid and necessary hardware.
   c. Attached Access Risers:
      1) Attached access risers shall be PVC or FRP as supplied by tank manufacturer.
      2) Attached access risers shall be 32" min diameter
      3) Access risers shall be attached to access openings during installation utilizing adhesive or FRP bonding kits as supplied by the tank manufacturer.
   d. Piping and Fittings:
      1) Tank shall be equipped with factory-installed threaded fittings, or pipe stubs.
      2) PVC piping shall at a minimum meet the requirements of ANSI Schedule 40.
      3) All flanged nozzles shall be flanged and flat-faced, and conform to Class 150 bolting patterns as specified in ANSI/ASME/ B16.5.
      4) Carbon steel and stainless steel NPT fittings shall withstand a minimum of 150 foot-pounds (203 NM) of torque and 1,000 foot-pounds (1356 NM) of bending, both with a 2:1 safety factor.
   e. Manway Openings:
      1) The standard manway shall be flanged, 32" min I.D. and complete with gaskets, bolts and cover.
      2) Manway openings shall be designed to withstand 5-psig (35 kPa) test pressure with a 5:1 safety factor.
   f. Ladders:
      1) Ladders shall be the standard FRP ladder as supplied by tank manufacturer.
   g. Pump Platforms:
      1) FRP pump platforms shall be supplied by tank manufacturer.
   h. Internal Piping
      1) All internal piping shall be supplied by tank manufacturer.
      2) All FRP nozzles for fire pump supply shall have an anti-vortex plate factory installed.
   i. Suction/Fill tubes:
      1) Vertical draft/fill tubes shall be a minimum of PVC SCH 40 or FRP.
      2) Vertical draft /fill tubes shall be factory installed.
      3) Vertical draft /fill tubes shall terminate 4 inches (102 mm) above the

bottom of tank.

4) Vertical draft tubes shall have anti-vortex plate factory installed.

PART 3 EXECUTION

3.1 TESTING

A. Tank shall be tested according to the tank manufacturer's Installation Manual and Operating Guidelines in effect at time of installation.

3.2 INSTALLATION

A. Tank shall be installed according to the tank manufacturer's Installation Manual and Operating Guidelines in effect at time of installation.

END OF SECTION