



COMMUNITY DEVELOPMENT DEPARTMENT

45175 Ten Mile Road
Novi, MI 48375
(248) 347-0415 Phone
(248) 735-5600 Facsimile
www.cityofnovi.org

ZONING BOARD OF APPEALS STAFF REPORT

FOR: City of Novi Zoning Board of Appeals

ZONING BOARD APPEALS DATE: September 14, 2021

REGARDING: 44244 Twelve Mile Road, Parcel # 50-22-10-400-067 (PZ21-0051)

BY: Larry Butler, Deputy Director Community Development

I. GENERAL INFORMATION:

Applicant

Acquira Realty Holdings

Variance Type

Dimensional Variance

Property Characteristics

Zoning District: Office Service
Location: West of Novi Road and North of Twelve Mile Road
Parcel #: 50-22-10-400-067

Request

The applicant is requesting variance from The City of Novi Zoning Ordinance Sec. 4.19.2.F to allow the placement of two dumpsters in the interior side yard. This property is zoned Office Service (OS-1).

II. STAFF COMMENTS:

III. RECOMMENDATION:

The Zoning Board of Appeals may take one of the following actions:

1. I move that we grant the variance in Case No. **PZ21-0051**, sought by _____, for _____ because Petitioner has shown practical difficulty requiring _____.
 - (a) Without the variance Petitioner will be unreasonably prevented or limited with respect to use of the property because_____.
 - (b) The property is unique because_____.
 - (c) Petitioner did not create the condition because_____.

(d) The relief granted will not unreasonably interfere with adjacent or surrounding properties because_____.

(e) The relief is consistent with the spirit and intent of the ordinance because_____.

(f) The variance granted is subject to:

1._____.

2._____.

3._____.

4._____.

2. I move that we deny the variance in Case No. **PZ21-0051**, sought by _____,
for_____ because Petitioner has not shown
practical difficulty requiring _____.

(a) The circumstances and features of the property including_____ are not unique because they exist generally throughout the City.

(b) The circumstances and features of the property relating to the variance request are self-created because_____.

(c) The failure to grant relief will result in mere inconvenience or inability to attain higher economic or financial return based on Petitioner's statements that _____.

(d) The variance would result in interference with the adjacent and surrounding properties by_____.

(e) Granting the variance would be inconsistent with the spirit and intent of the ordinance to_____.

Should you have any further questions with regards to the matter please feel free to contact me at (248) 347-0417.

Larry Butler
Deputy Director Community Development
City of Novi



cityofnovi.org

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ZONING BOARD OF APPEALS APPLICATION

APPLICATION MUST BE FILLED OUT COMPLETELY

I. PROPERTY INFORMATION (Address of subject ZBA Case)				Application Fee: <u>\$300</u> Meeting Date: <u>9-14-21</u> ZBA Case #: <u>PZ 21-0051</u>	
PROJECT NAME / SUBDIVISION Fountain View Professional Center					
ADDRESS 44244 W. 12 Mile Rd.			LOT/SUITE/SPACE #		
SIDWELL # 50-22-1C - 400 - 057			May be obtain from Assessing Department (248) 347-0485		
CROSS ROADS OF PROPERTY 12 Mile Rd., 300 foot east of Dixon Rd					
IS THE PROPERTY WITHIN A HOMEOWNER'S ASSOCIATION JURISDICTION? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO			REQUEST IS FOR: <input type="checkbox"/> RESIDENTIAL <input checked="" type="checkbox"/> COMMERCIAL <input type="checkbox"/> VACANT PROPERTY <input type="checkbox"/> SIGNAGE		
DOES YOUR APPEAL RESULT FROM A NOTICE OF VIOLATION OR CITATION ISSUED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					
II. APPLICANT INFORMATION					
A. APPLICANT		EMAIL ADDRESS jschimizzi@acquirarealty.com		CELL PHONE NO.	
NAME Joseph Schimizzi		TELEPHONE NO. 888-560-5640			
ORGANIZATION/COMPANY Acquira Realty Holdings		FAX NO.			
ADDRESS 44090 W. 12 Mile Rd.		CITY Novi		STATE MI	ZIP CODE 48377
B. PROPERTY OWNER <input checked="" type="checkbox"/> CHECK HERE IF APPLICANT IS ALSO THE PROPERTY OWNER					
Identify the person or organization that owns the subject property:		EMAIL ADDRESS		CELL PHONE NO.	
NAME		TELEPHONE NO.			
ORGANIZATION/COMPANY		FAX NO.			
ADDRESS		CITY		STATE	ZIP CODE
III. ZONING INFORMATION					
A. ZONING DISTRICT					
<input type="checkbox"/> R-A <input type="checkbox"/> R-1 <input type="checkbox"/> R-2 <input type="checkbox"/> R-3 <input type="checkbox"/> R-4 <input type="checkbox"/> RM-1 <input type="checkbox"/> RM-2 <input type="checkbox"/> MH <input type="checkbox"/> I-1 <input type="checkbox"/> I-2 <input type="checkbox"/> RC <input type="checkbox"/> TC <input type="checkbox"/> TC-1 <input checked="" type="checkbox"/> OTHER <u>OS-1</u>					
B. VARIANCE REQUESTED					
INDICATE ORDINANCE SECTION (S) AND VARIANCE REQUESTED:					
1. Section <u>4.19.2.F</u> Variance requested <u>Dumpsters in side yard</u>					
2. Section _____ Variance requested _____					
3. Section _____ Variance requested _____					
4. Section _____ Variance requested _____					
IV. FEES AND DRAWINGS					
A. FEES					
<input type="checkbox"/> Single Family Residential (Existing) \$200 <input type="checkbox"/> (With Violation) \$250 <input type="checkbox"/> Single Family Residential (New) \$250 <input checked="" type="checkbox"/> Multiple/Commercial/Industrial \$300 <input type="checkbox"/> (With Violation) \$400 <input type="checkbox"/> Signs \$300 <input type="checkbox"/> (With Violation) \$400 <input type="checkbox"/> House Moves \$300 <input type="checkbox"/> Special Meetings (At discretion of Board) \$600					
B. DRAWINGS 1-COPY & 1 DIGITAL COPY SUBMITTED AS A PDF					
<ul style="list-style-type: none"> • Dimensioned Drawings and Plans • Site/Plot Plan • Existing or proposed buildings or addition on the property • Number & location of all on-site parking, if applicable • Existing & proposed distance to adjacent property lines • Location of existing & proposed signs, if applicable • Floor plans & elevations • Any other information relevant to the Variance application 					



ZONING BOARD OF APPEALS APPLICATION

V. VARIANCE

A. VARIANCE (S) REQUESTED

☒ DIMENSIONAL ☐ USE ☐ SIGN

There is a five-(5) hold period before work/action can be taken on variance approvals.

B. SIGN CASES (ONLY)

Your signature on this application indicates that you agree to install a **Mock-Up Sign** ~~ten-(10)~~ days before the schedule ZBA meeting. Failure to install a mock-up sign may result in your case not being heard by the Board, postponed to the next schedule ZBA meeting, or cancelled. A mock-up sign is **NOT** to be actual sign. Upon approval, the mock-up sign must be removed within five-(5) days of the meeting. If the case is denied, the applicant is responsible for all costs involved in the removal of the mock-up or actual sign (if erected under violation) within five-(5) days of the meeting.

C. ORDINANCE

City of Novi Ordinance, Section 3107 – Miscellaneous

No order of the Board permitting the erection of a building shall be valid for a period longer than one-(1) year, unless a building permit for such erection or alteration is obtained within such period and such erection or alteration is started and proceeds to completion in accordance with the terms of such permit.

No order of the Board permitting a use of a building or premises shall be valid for a period longer than one-hundred and eighty-(180) days unless such use is establish within such a period; provided, however, where such use permitted is dependent upon the erection or alteration or a building such order shall continue in force and effect if a building permit for such erection or alteration is obtained within one-(1) year and such erection or alteration is started and proceeds to completion in accordance with the terms of such permit.

D. APPEAL THE DETERMINATION OF THE BUILDING OFFICIAL

PLEASE TAKE NOTICE:

The undersigned hereby appeals the determination of the Building Official / Inspector or Ordinance made

☐ CONSTRUCT NEW HOME/BUILDING ☐ ADDITION TO EXISTING HOME/BUILDING ☐ SIGNAGE

☐ ACCESSORY BUILDING ☐ USE ☐ OTHER _____

VI. APPLICANT & PROPERTY SIGNATURES

A. APPLICANT

[Signature]
Applicant Signature

7/22/21
Date

B. PROPERTY OWNER

If the applicant is not the owner, the property owner must read and sign below:

The undersigned affirms and acknowledges that he, she or they are the owner(s) of the property described in this application, and is/are aware of the contents of this application and related enclosures.

[Signature]
Property Owner Signature

7/22/21
Date

VII. FOR OFFICIAL USE ONLY

DECISION ON APPEAL:

☐ GRANTED

☐ DENIED

The Building Inspector is hereby directed to issue a permit to the Applicant upon the following and conditions:

Chairperson, Zoning Board of Appeals

Date



Community Development Department

45175 Ten Mile Road
Novi, MI 48375
(248) 347-0415 Phone
(248) 735-5600 Facsimile
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REVIEW STANDARDS DIMENSIONAL VARIANCE

The Zoning Board of Appeals (ZBA) will review the application package and determine if the proposed Dimensional Variance meets the required standards for approval. In the space below, and on additional paper if necessary, explain how the proposed project meets each of the following standards. (Increased costs associated with complying with the Zoning Ordinance will not be considered a basis for granting a Dimensional Variance.)

Standard #1. Circumstances or Physical Conditions.

Explain the circumstances or physical conditions that apply to the property that do not apply generally to other properties in the same zoning district or in the general vicinity. Circumstances or physical conditions may include:

- a. **Shape of Lot.** Exceptional narrowness, shallowness or shape of a specific property in existence on the effective date of the Zoning Ordinance or amendment.

☐ Not Applicable ☒ Applicable If applicable, describe below:

The shape of the lot is not a conventional rectangle with obvious rear and side portions. The "side yard" where the dumpster location is proposed is adjacent to the rear yard of the neighboring property (Level One Bank). The proposed dumpster location is directly adjacent to the neighboring property's dumpster location which seems to be a logical location for our dumpster placement.

and/or

- b. **Environmental Conditions.** Exceptional topographic or environmental conditions or other extraordinary situations on the land, building or structure.

☐ Not Applicable ☒ Applicable If applicable, describe below:

The rear of the property is a wetland area. We would like to limit the disturbance of this wetland by limiting the number of dumpster enclosures in the vicinity of the wetlands.

and/or

- c. **Abutting Property.** The use or development of the property immediately adjacent to the subject property would prohibit the literal enforcement of the requirements of the Zoning Ordinance or would involve significant practical difficulties.

☒ Not Applicable ☐ Applicable If applicable, describe below:

Standard #2. Not Self-Created.

Describe the immediate practical difficulty causing the need for the Dimensional Variance, that the need for the requested variance is not the result of actions of the property owner or previous property owners (i.e., is not self-created).

The existing dumpster location of the neighboring property (Level One Bank) is adjacent to this property's side yard and the logical location for the proposed dumpster.

Standard #3. Strict Compliance.

Explain how the Dimensional Variance in strict compliance with regulations governing area, setback, frontage, height, bulk, density or other dimensional requirements will unreasonably prevent the property owner from using the property for a permitted purpose, or will render conformity with those regulations unnecessarily burdensome.

Given the shape of the lot and the multiple buildings proposed, placement of all dumpsters in the rear yard will cause the dumpsters to be located approximately 350 feet away from building 'A', creating a burden for maintenance staff.

Standard #4. Minimum Variance Necessary.

Explain how the Dimensional Variance requested is the minimum variance necessary to do substantial justice to the applicant as well as to other property owners in the district.

The proposed dumpsters are out of the side yard setback and are proposed to be located directly adjacent to the existing dumpster location of the neighboring property (Level One Bank) while giving both buildings 'A' and 'C' close proximity to the dumpsters.

Standard #5. Adverse Impact on Surrounding Area.

Explain how the Dimensional Variance will not cause an adverse impact on surrounding property, property values, or the use and enjoyment of property in the neighborhood or zoning district.

The proposed dumpster location in the side yard is directly adjacent to the location of the dumpster for Level One Bank. Since the same general area serves the same purpose for both properties, there should be no impact.

Owner / Developer

ACQUIRA REALTY HOLDINGS
44090 12 MILE ROAD,
NOVI, MI 48377
CONTACT:
JOSEPH SCHIMIZZI
888.560.5540 PHONE

Architect

THE RON JONA COLLABORATIVE
1066 COMMERCE STREET
BIRMINGHAM, MI 48009-2001
CONTACT:
RON JONA
248.789.2001 PHONE

Civil Engineer

NOWAK & FRAUS, PLLC
46777 WOODWARD AVE.
PONTIAC, MI 48342
CONTACT:
Michael Peterson, P.E.
248-332-7931 PHONE
248-332-8257 FAX

Landscape Architect

NOWAK & FRAUS, PLLC
46777 WOODWARD AVE.
PONTIAC, MI 48342
CONTACT:
MR. GEORGE OSTROWSKI, LLA, LEED AP
248-332-7931 PHONE
248-332-8257 FAX

City of Novi,
Oakland County, Michigan
FINAL SITE PLAN
Prepared For
Acquira Realty Holdings
PART OF THE SE. 1/4 OF SECTION 10,
CITY OF NOVI,
OAKLAND COUNTY, MICHIGAN



SHEET INDEX	
C0	Cover Sheet
C1	Boundary / Topographic Survey
C2	Demolition Plan
C3	Stringer Dimension Plan
C4	Paving and Grading Plan
C4A	Detailed Paving and Grading Plan
C5	Utility Plan
C6	Wetland Plan
C7	Storm Water Management Plan
C8	Storm Water Drainage Area Plan
C9	Storm Calculations and Details Plan
C10	Storm Profile Plan 1
C11	Storm Profile Plan 2
C12	Sanitary Profile Plan
C13	Water Main Profile Plan 1
C14	Water Main Profile Plan 2
C15	Details Plan
C16	Soil Erosion and Sedimentation Control Plan
C17	Soil Boring Logs Plan
C18	Soil Boring Logs Plan
C19	Soil Boring Logs Plan
C20	Soil Boring Logs Plan
C21	Contech Details Plan
C22	Contractor's Duties, Additional Notes and Details Plan
L1	Landscape Plan Tree Preservation
L2	Landscape Plan
L3	Landscape Plan Notes and Details
LP	Lighting Plan
A-1	Building A Floor Plan
A-2	Building A Elevations
A-3	Building B Floor Plan
A-4	Building B Floor Plan
A-5	Building B Elevations
A-6	Building C Floor Plan
A-7	Building C Elevations

Standard Details	
City of Novi Sanitary Sewer Detail (3 Sheets)	
City of Novi Storm Sewer Detail (2 Sheets)	
City of Novi Water Main Detail (5 Sheets)	
City of Novi Paving Standard Details (2 Sheets)	
City of Novi Erosion Control Details (1 Sheet)	

LEGAL DESCRIPTION: PARCEL 1

Land situated in the County of Oakland, City of Novi, State of Michigan, is described as follows:

Part of the Southwest 1/4 of the Southeast 1/4 of Section 10, Town 1 North, Range 8 East, City of Novi, Oakland County, Michigan, described as: Beginning at a point distant East, 264.00 feet and North 00 degrees 52 minutes 00 seconds West, 75.01 feet from the South 1/4 corner; thence North 00 degrees 52 minutes 00 seconds West, 584.99 feet; thence East 332.00 feet; thence South 00 degrees 52 minutes 00 seconds East, 584.99 feet; thence West 332.00 feet to the Point of Beginning.

Commonly known as: 44244 W. 12 Mile Road, Novi, MI 48377
Tax ID: 50-22-10-400-067

Based on a field survey being described as:

Part of the Southwest 1/4 of the Southeast 1/4 of Section 10, Town 1 North, Range 8 East, City of Novi, Oakland County, Michigan, described as: Commencing at the South 1/4 corner of said Section 10; thence along the South line of said Section 10, Due East 264.00 feet; thence North 00 degrees 53 minutes 36 seconds West 75.01 feet to a point on the Northerly Right-of-Way line of 12 Mile Road (width varies) and the point of beginning; thence continuing, North 00 degrees 53 minutes 36 seconds West 584.99 feet; thence Due East 332.00 feet; thence South 00 degrees 53 minutes 36 seconds East 584.99 feet to a point on said Northerly Right-of-Way line of 12 Mile Road; thence along said Northerly Right-of-Way line, Due West 332.00 feet to the point of beginning. Containing 194,193 square feet or 4.458 acres

LEGAL DESCRIPTION: PARCEL 2

Part of the Southwest 1/4 of the Southeast 1/4 of Section 10, Town 1 North, Range 8 East, City of Novi, Oakland County, Michigan, described as: Commencing at the South 1/4 of said Section; thence North 00 degrees 53 minutes 36 seconds West, 330.00 feet along the North-South 1/4 line of said Section 10 to the Point of Beginning; thence continuing along said North-South 1/4 line, North 00 degrees 53 minutes 36 seconds West, 165.00 feet; thence North 90 degrees 00 minutes 00 seconds East, 264.00 feet; thence South 00 degrees 53 minutes 36 seconds East, 165.00 feet; thence North 90 degrees 00 minutes 00 seconds West, 264.00 feet to the point of beginning. Containing 43,555 square feet or 1.000 acre.

Commonly known as: 28000 Dixon Road, Novi, MI 48377
Tax ID: 50-22-10-400-012

Project Name

Fountain View
Professional Center

NOTE:
ALL WORK SHALL CONFORM TO THE CURRENT CITY OF NOVI STANDARDS AND SPECIFICATIONS.

REVISIONS:	
11-13-2020	ISSUED FOR SITE PLAN APPROVAL
04-23-2021	REVISED PER PRELIMINARY SITE PLAN REVIEW
05-10-2021	REVISED PER 2ND PRELIM SITE PLAN REVIEW
07-14-2021	ISSUED FOR FINAL SITE PLAN REVIEW

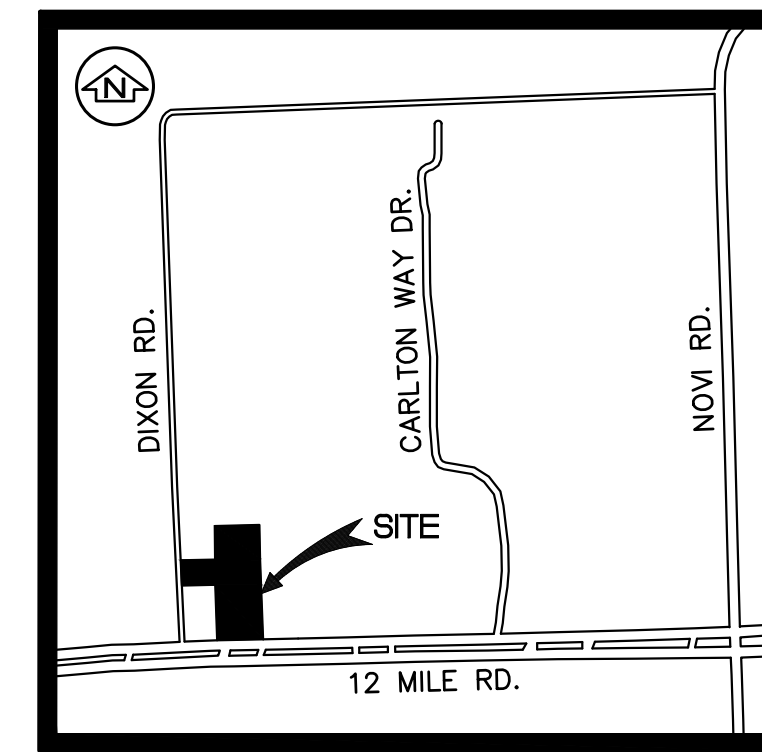
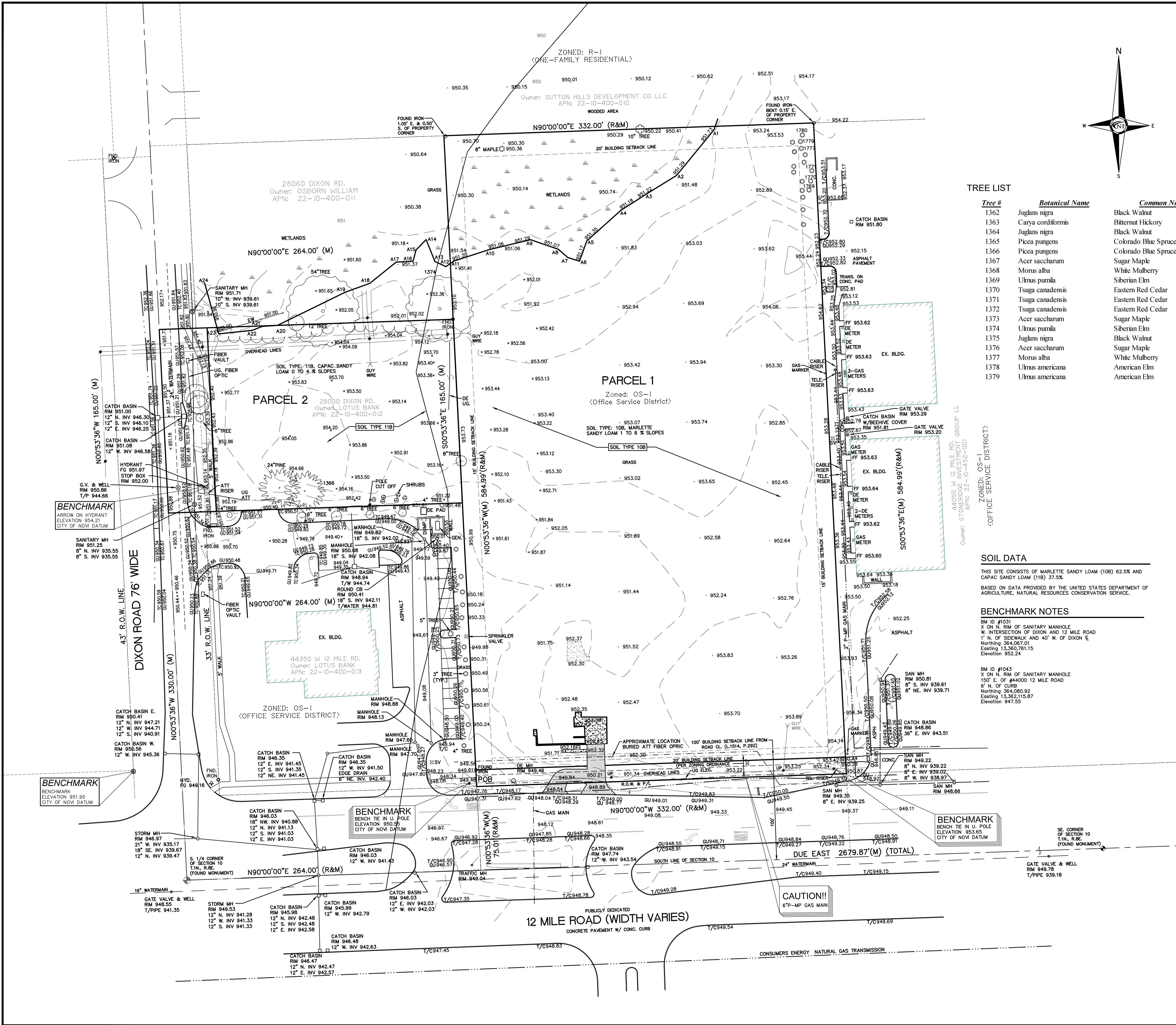


N & F JOB #H046-03

NF
ENGINEERS

CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257



LOCATION MAP

TREE LIST

Tree #	Botanical Name	Common Name
1362	Juglans nigra	Black Walnut
1363	Carya cordiformis	Bitternut Hickory
1364	Juglans nigra	Black Walnut
1365	Picea pungens	Colorado Blue Spruce
1366	Picea pungens	Colorado Blue Spruce
1367	Acer saccharum	Sugar Maple
1368	Morus alba	White Mulberry
1369	Ulmus pumila	Siberian Elm
1370	Tsuga canadensis	Eastern Red Cedar
1371	Tsuga canadensis	Eastern Red Cedar
1372	Tsuga canadensis	Eastern Red Cedar
1373	Acer saccharum	Sugar Maple
1374	Ulmus pumila	Siberian Elm
1375	Juglans nigra	Black Walnut
1376	Acer saccharum	Sugar Maple
1377	Morus alba	White Mulberry
1378	Ulmus americana	American Elm
1379	Ulmus americana	American Elm

Dia.	Type	Other Dia.	Condition
17			Fair
13			Poor
13			Fair
18			Fair
18			Poor
26			Poor
16	Multiple	12,10	Fair
21			Fair
11			Poor
9			Poor
13			Fair
13	Twin	9	Fair
29			Poor
18			Good
32			Good
12			Fair
14			Good
10			Fair

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Commonly known as: 44244 W. 12 Mile Road, Novi, MI 48377

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LEGAL DESCRIPTION: PARCEL 2

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Commonly known as: 28000 Dixon Road, Novi, MI 48377

Tax ID: 50-22-10-400-012

TOPOGRAPHIC SURVEY NOTES

ALL ELEVATIONS ARE EXISTING ELEVATIONS, UNLESS OTHERWISE NOTED.
UTILITY LOCATIONS WERE OBTAINED FROM MUNICIPAL OFFICIALS AND RECORDS OF UTILITY COMPANIES; AND NO GUARANTEE CAN BE MADE TO THE COMPLETENESS, OR EXACTNESS OF LOCATION.
THIS SURVEY MAY NOT SHOW ALL EASEMENTS OF RECORD UNLESS AN UPDATED TITLE POLICY IS FURNISHED TO THE SURVEYOR BY THE OWNER

LEGEND

MANHOLE	EXISTING SANITARY SEWER
HYDRANT	EXISTING SAN. CLEAN OUT
MANHOLE	EXISTING WATER MAIN
CATCH BASIN	EXISTING STORM SEWER
EX. R.Y. CATCH BASIN	
EXISTING BURIED CABLES	
OVERHEAD LINES	
LIGHT POLE	
SIGN	
EXISTING GAS MAIN	



NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL (248) 332-7931
FAX: (248) 332-8257

SEAL



PROJECT

Fountain View
Professional Center
44244 Twelve Mile Road
Novi, MI 48375

CLIENT

Acquia Realty Holdings
44090 12 Mile Road
Novi, MI 48377

Contact: Joseph Schimizzi
Phone: (888) 560-5540

PROJECT LOCATION

Part of the SE 1/4
Section 10
T. 1N, R. 8E
City of Novi,
Oakland County, Michigan

SHEET

Boundary / Topographic /
Tree Survey



REVISIONS

11-13-20 ISSUED FOR SITE PLAN
4-23-21 REV PER PRELIM SP REVIEW
5-10-21 REV PER PRELIM SP REVIEW
7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY:

M. Huhta

DESIGNED BY:

APPROVED BY:

K. Navaroli

DATE:

03-27-2019

SCALE: 1" = 40'

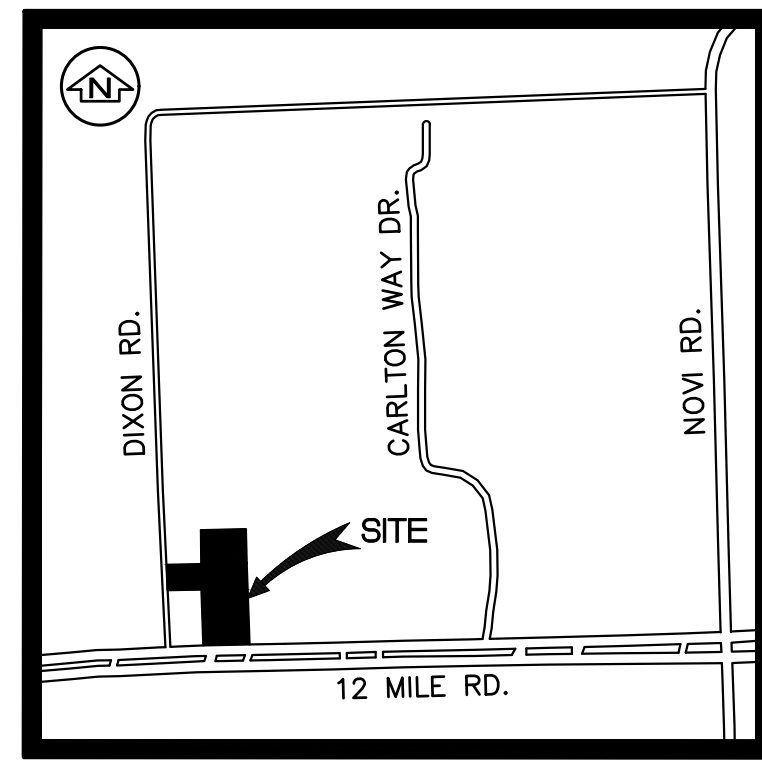
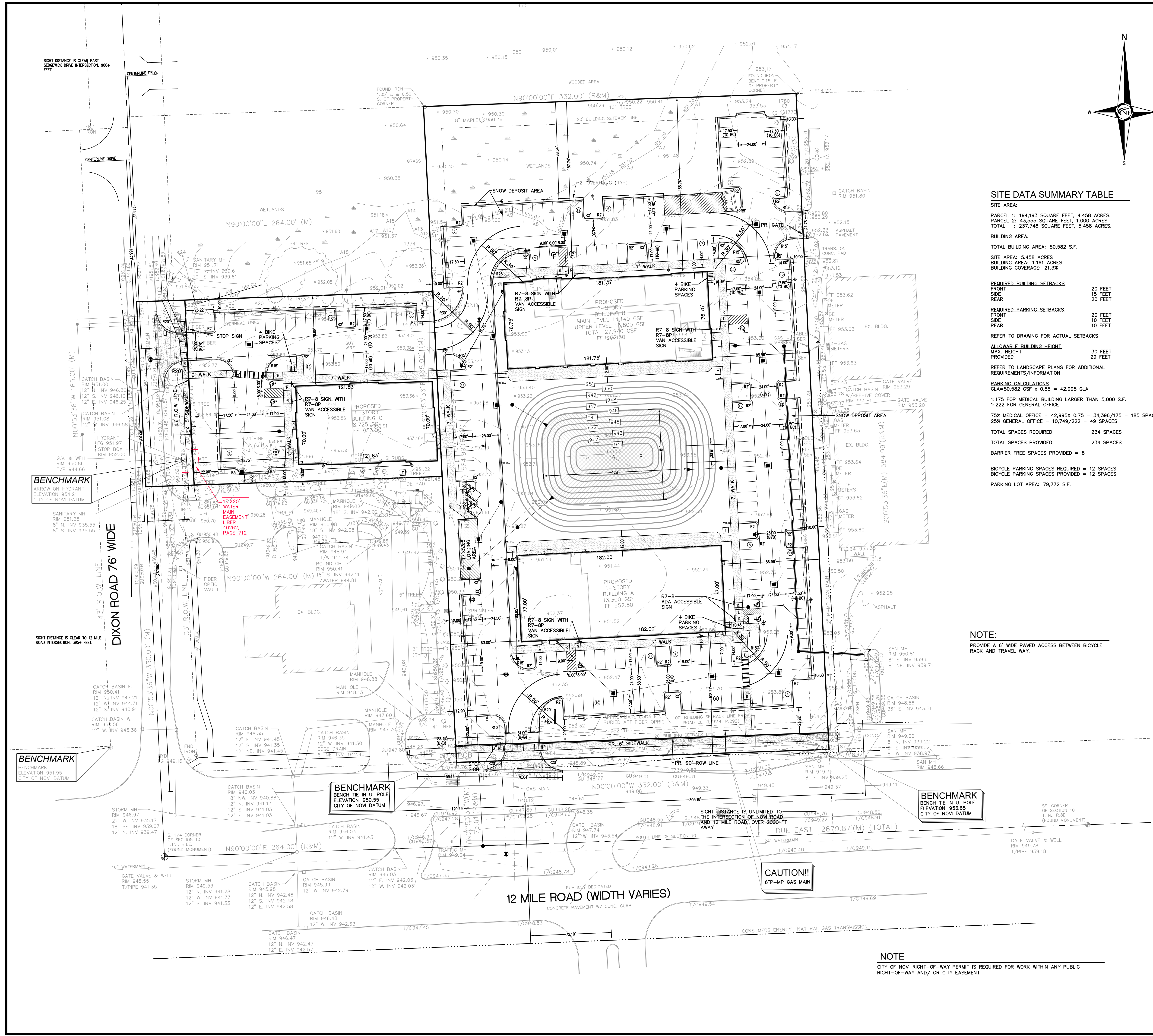
40 20 0 20 40 60

NFE JOB NO.

H046-03

SHEET NO.

C1



SITE DATA SUMMARY TABLE

SITE AREA:
PARCEL 1: 194,193 SQUARE FEET, 4.458 ACRES.
PARCEL 2: 43,555 SQUARE FEET, 1.000 ACRES.
TOTAL : 237,748 SQUARE FEET, 5.458 ACRES.

BUILDING AREA:
TOTAL BUILDING AREA: 50,582 S.F.

SITE AREA: 5,458 ACRES
BUILDING AREA: 1,161 ACRES
BUILDING COVERAGE: 21.3%

REQUIRED BUILDING SETBACKS
FRONT 20 FEET
SIDE 15 FEET
REAR 20 FEET

REQUIRED PARKING SETBACKS
FRONT 20 FEET
SIDE 10 FEET
REAR 10 FEET

REFER TO DRAWING FOR ACTUAL SETBACKS

ALLOWABLE BUILDING HEIGHT
MAX. HEIGHT 30 FEET
PROVIDED 29 FEET

REFER TO LANDSCAPE PLANS FOR ADDITIONAL REQUIREMENTS/INFORMATION

PARKING CALCULATIONS
GLA=50,582 GSF x 0.85 = 42,995 GLA

1:175 FOR MEDICAL BUILDING LARGER THAN 5,000 S.F.
1:222 FOR GENERAL OFFICE

75% MEDICAL OFFICE = 42,995X 0.75 = 34,396/175 = 185 SPACES
25% GENERAL OFFICE = 10,749/222 = 49 SPACES

TOTAL SPACES REQUIRED 234 SPACES
TOTAL SPACES PROVIDED 234 SPACES
BARRIER FREE SPACES PROVIDED = 8

BICYCLE PARKING SPACES REQUIRED = 12 SPACES
BICYCLE PARKING SPACES PROVIDED = 12 SPACES
PARKING LOT AREA: 79,772 S.F.

SIGN TABLE

MM/UTCD DESIGNATION	DESCRIPTION	QUANTITY	SIZE
R1-1	STOP SIGN	2	30"x30"
R7-8	ADA PARKING SIGN	8	12"x18"
R7-8p	ADA PARKING SIGN	6	12"x6"

NOTE

1. NO INTERIOR DISPLAY SHALL BE VISIBLE FROM THE EXTERIOR OF THE BUILDING
2. THE OUTDOOR STORAGE OF GOODS OR MATERIALS SHALL BE PROHIBITED
3. WAREHOUSING OR INDOOR STORAGE OF GOODS OR MATERIAL, BEYOND THAT NORMALLY INCIDENTAL TO THE PERMITTED USES, SHALL BE PROHIBITED
4. TRAFFIC SIGNS IN THE ROAD RIGHT-OF-WAY SHALL BE INSTALLED BY ROAD
5. SIGNAGE, REQUIRES A CITY PERMIT. CONTACT THE BUILDING DIVISION FOR AN ADDRESS PRIOR TO APPLYING FOR A BUILDING PERMIT. CONTACT MAUREN UNDERHILL AT (248)735-5602
6. THE OWNER OF THE PROPERTY SHALL REPORT ANY PROPOSED CHANGE IN USE OR OCCUPANCY FOR FURTHER EVALUATION.
7. LANDBANK SPACES MAY BE INSTALLED PRIOR TO CHANGE IN USE OR OCCUPANCY, IF DETERMINED

SIGNING AND STRIPING NOTE

1. ALL SIGNS SHALL HAVE A MINIMUM BOTTOM MOUNTING HEIGHT OF 7' FROM FINAL GRADE FOR GROUND MOUNTED SIGNS. WALL MOUNTED SIGNS MAY HAVE A BOTTOM MOUNTING HEIGHT OF 5'
2. ALL ROADSIDE SIGNS SHOULD BE INSTALLED TWO FEET FROM THE FACE OF THE CURB TO THE NEAR EDGE OF THE SIGN
3. SINGLE SIGNS WITH NOMINAL DIMENSIONS OF 12"x18" OR SMALLER IN SIZE SHALL BE MOUNTED ON A GALVANIZED 2 LB. U-CHANNEL POST. MULTIPLE SIGNS AND/OR SIGNS WITH A NOMINAL DIMENSION GREATER THAN 12"x18" SHALL BE MOUNTED ON A GALVANIZED 3 LB. OR GREATER U-CHANNEL POST AS DICTATED BY THE WEIGHT OF THE PROPOSED SIGNS
4. TRAFFIC CONTROL SIGNS SHALL USE THE FHWA STANDARD ALPHABET SERIES
5. TRAFFIC CONTROL SIGNS SHALL HAVE HIGH INTENSITY PRISMATIC (HIP) SHEETING TO MEET FHWA RETROREFLECTIVITY REQUIREMENTS
6. THE CROSSWALK PAVEMENT MARKINGS SHALL COMPLY WITH MUTCD
7. PARKING STRIPING MUST BE WHITE. BLUE SHOULD BE USED FOR ACCESSIBLE PARKING SPACES. WHERE A STANDARD PARKING SPACE IS LOCATED NEXT TO AN ACCESSIBLE PARKING SPACE, A WHITE LINE SHALL ABUT A BLUE LINE. PARKING STRIPING SHALL BE 4 INCHES IN WIDTH
8. THE INTERNATIONAL SYMBOL FOR ACCESSIBILITY SHALL BE WHITE OR WHITE WITH A BLUE BACKGROUND

NOTE:

PROVIDE A 6' WIDE PAVED ACCESS BETWEEN BICYCLE RACK AND TRAVEL WAY.

PAVING LEGEND

PROPOSED CONCRETE PAVEMENT

PROPOSED ASPHALT PAVEMENT

LEGEND

MANHOLE EXISTING SANITARY SEWER

HYDRANT GATE VALVE SAN. CLEAN OUT

MANHOLE CATCH BASIN EXISTING WATERMAIN

EXISTING STORM SEWER

EX. R. Y. CATCH BASIN

EXISTING BURIED CABLES

UTILITY POLE GUY POLE OVERHEAD LINES

GUY WIRE LIGHT POLE

EXISTING GAS MAIN

C.O. MANHOLE EXISTING GAS MAIN

HYDRANT GATE VALVE PR. SANITARY SEWER

INLET C.B. MANHOLE PR. WATER MAIN

PR. STORM SEWER

PR. R. Y. CATCH BASIN

PROPOSED LIGHT POLE

PR. TOP OF CURB ELEVATION

PR. GUTTER ELEVATION

PR. TOP OF WALK ELEVATION

PR. TOP OF PWMT. ELEVATION

FINISH GRADE ELEVATION

TC 600.00

GU 600.00

TW 600.00

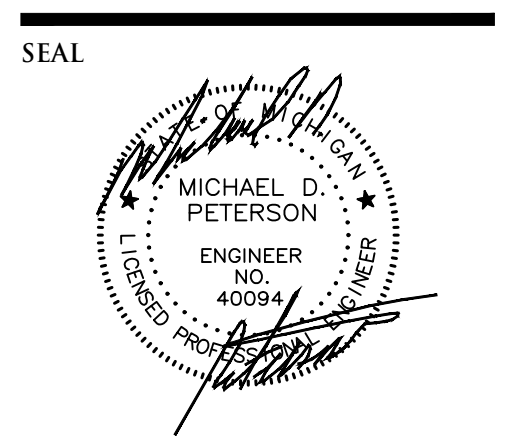
TP 600.00

FG 600.00

NF ENGINEERS

CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257



PROJECT
Fountain View
Professional Center
44244 Twelve Mile Road
Novi, MI 48375

CLIENT
Acquia Realty Holdings
44090 12 Mile Road
Novi, MI 48377

Contact: Joseph Schimizzi
Phone: (888) 560-5540

PROJECT LOCATION
Part of the SE 1/4
Section 10
T. 1N. R. 8E
City of Novi,
Oakland County, Michigan

SHEET
Stringer Dimension Plan

811

Know what's Below
Call before you dig.

REVISIONS
11-13-20 ISSUED FOR SITE PLAN
4-23-21 REV PER PRELIM SP REVIEW
5-10-21 REV PER PRELIM SP REVIEW
7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY:
M. Kurmas

DESIGNED BY:
M. Kurmas

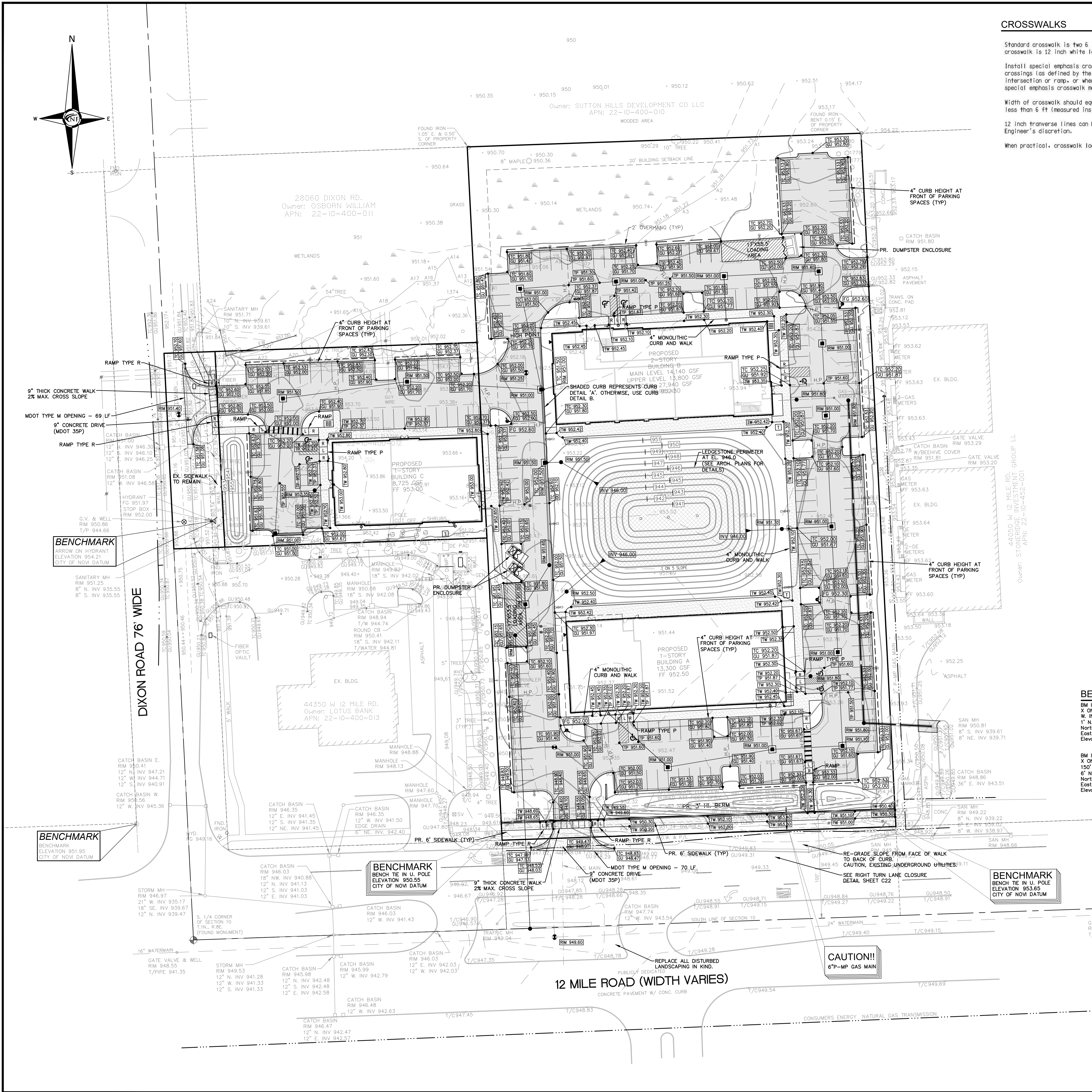
APPROVED BY:
M. Peterson

DATE:
03-27-2019

SCALE: 1" = 40'

NFE JOB NO. H046-03

SHEET NO. C3



CROSSWALKS

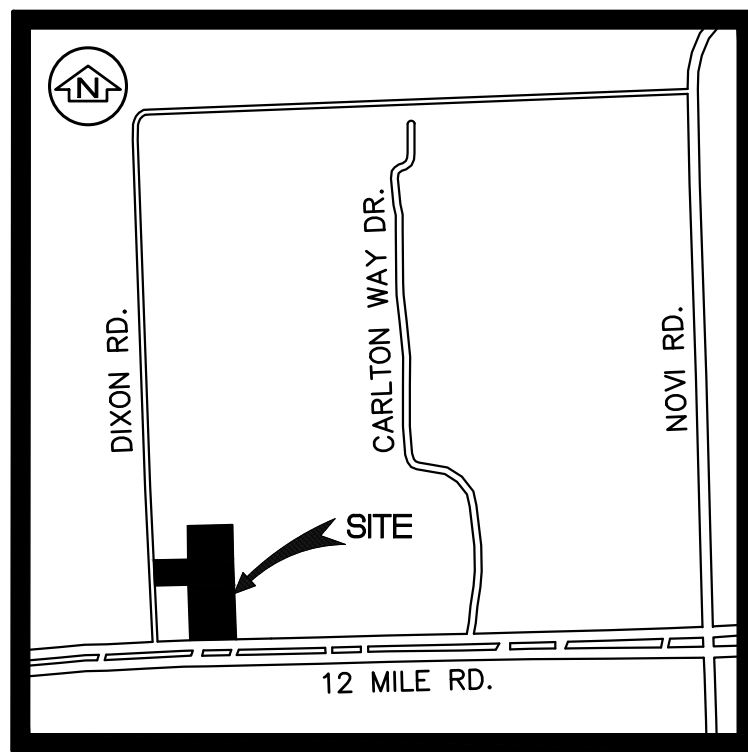
Standard crosswalk is two 6 inch white transverse lines. Special emphasis crosswalk is 12 inch white longitudinal lines.

Install special emphasis crosswalks at mid-block crossings, established school crossings (as defined by the MMUTCD), where crossing uncontrolled traffic at an intersection or ramp, or when directed by the Engineer. See Sheet 3 for detail of special emphasis crosswalk markings.

Width of crosswalk should equal width of the adjacent sidewalk, but shall not be less than 6 ft (measured inside the lines).

12 inch transverse lines can be used in place of 6 inch transverse lines at the Engineer's discretion.

When practical, crosswalk location should avoid conflict with drainage inlets.



LOCATION MAP



NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL (248) 332-7931
FAX: (248) 332-8257

GENERAL PAVING NOTES

PAVEMENT SHALL BE OF THE TYPE, THICKNESS AND CROSS SECTION AS INDICATED ON THE PLANS AND AS FOLLOWS:

- CONCRETE: PORTLAND CEMENT TYPE IA (AIR-ENTRAINED) WITH A MINIMUM CEMENT CONTENT OF SIX SACKS PER CUBIC YARD, MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,500 PSI AND A SLUMP OF 1 1/2 TO 3 INCHES.
- ASPHALT: BASE COURSE - MDOT BITUMINOUS MIXTURE NO. 1100L, 20AA; SURFACE COURSE - MDOT BITUMINOUS MIXTURE NO. 1100T, 20AA; ASPHALT CEMENT PENETRATION GRADE 85-100, BOND COAT - MDOT SS-1H EMULSION AT 0.10 GALLON PER SQUARE YARD; MAXIMUM 2 INCH LIFT.

PAVEMENT BASE SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY (MODIFIED PROCTOR) PRIOR TO PLACEMENT OF PROPOSED PAVEMENT. EXISTING SUB-BASE SHALL BE PROOF-ROLLED IN THE PRESENCE OF THE ENGINEER TO DETERMINE STABILITY.

ALL CONCRETE PAVEMENT, DRIVEWAYS, CURB & GUTTER, ETC., SHALL BE SPRAY CURED WITH WHITE MEMBRANE CURING COMPOUND IMMEDIATELY FOLLOWING FINISHING OPERATION.

ALL CONCRETE PAVEMENT JOINTS SHALL BE FILLED WITH HOT POURED RUBBERIZED ASPHALT JOINT SEALING COMPOUND IMMEDIATELY AFTER SAWCUT OPERATION. FEDERAL SPECIFICATION SS-5164.

ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND SPECIFICATIONS OF THE MUNICIPALITY AND THE MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, CURRENT EDITION.

ALL TOP OF CURB ELEVATIONS, AS SHOWN ON THE PLANS, ARE CALCULATED FOR A 6" CONCRETE CURB UNLESS OTHERWISE NOTED.

ALL SIDEWALK RAMP, CONFORMING TO PUBLIC ACT NO. 8, 1993, SHALL BE INSTALLED AS INDICATED ON THE PLANS.

CONSTRUCTION OF A NEW OR RECONSTRUCTED DRIVE APPROACH CONNECTING TO AN EXISTING STATE OR COUNTY ROADWAY SHALL BE ALLOWED ONLY AFTER AN APPROVED PERMIT HAS BEEN SECURED FROM THE AGENCY HAVING JURISDICTION OVER SAID ROADWAY.

FOR ANY WORK WITHIN THE PUBLIC RIGHT-OF-WAY, THE CONTRACTOR SHALL PAY FOR AND SECURE ALL NECESSARY PERMITS AND LICENSES ARRANGE FOR ALL INSPECTION.

EXISTING TOPSOIL, VEGETATION AND ORGANIC MATERIALS SHALL BE STRIPPED AND REMOVED FROM PROPOSED PAVEMENT AREA PRIOR TO PLACEMENT OF BASE MATERIALS.

EXPANSION JOINTS SHOULD BE INSTALLED AT THE END OF ALL INTERSECTION RADII.

SIDEWALK RAMP, CONFORMING TO PUBLIC ACT NO. 8, 1973, SHALL BE INSTALLED AS SHOWN AT ALL STREET INTERSECTIONS AND AT ALL BARRIER FREE PARKING AREAS AS INDICATED ON THE PLANS.

ALL PAVEMENT AREAS SHALL BE PROOF-ROLLED UNDER THE SUPERVISION OF A GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF BASE MATERIALS AND PAVING MATERIALS.

FILL AREAS SHALL BE MACHINE COMPACTED IN UNIFORM LIFTS NOT EXCEEDING 9 INCHES THICK TO 95% OF THE MAXIMUM DENSITY (MODIFIED PROCTOR) PRIOR TO PLACEMENT OF PROPOSED PAVEMENT.

ROAD COMMISSION OF OAKLAND COUNTY APPROVAL IS REQUIRED FOR ANY WORK WITHIN 12 MILE ROAD RIGHT OF WAY.

NOTE

FINAL PAVEMENT DESIGN SHALL SUPPORT 35 TON FIRE DEPARTMENT TRUCKS.

DATUM NOTE

TO HAVE ELEVATIONS IN THE CITY OF NOVI DATUM, SUBTRACT 0.15' FROM ALL GRADES

NOTE

CITY OF NOVI RIGHT-OF-WAY PERMIT IS REQUIRED FOR WORK WITHIN ANY PUBLIC RIGHT-OF-WAY AND/OR CITY EASEMENT. ROC PERMIT IS REQUIRED.

ESTIMATED QUANTITIES
PAVING

DESCRIPTION	QUANTITY	UNITS
4" ASPHALT ON 8" 21AA BASE	8,810	S.Y.
4" CONCRETE SIDEWALK	1,085	S.Y.
8" NON-REINFORCED CONCRETE (DUMPSTER/APPRONS)	164	S.Y.
9" CONCRETE APPROACH	204	S.Y.
4" MONOLITHIC CURB & WALK	660	S.Y.
6" CONCRETE CURB & GUTTER	1,997	LF
4" CONCRETE CURB & GUTTER	1,186	LF
TRAFFIC SIGNS	10	EA

BENCHMARK NOTES

BM ID #1031
X ON N. RIM OF SANITARY MANHOLE
W. INTERSECTION OF DIXON AND 12 MILE ROAD
1" N. OF SIDEWALK AND 40' W. OF DIXON &
Northing 364,067.01
Easting 13,300,761.15
Elevation 952.24

BM ID #1043
X ON N. RIM OF SANITARY MANHOLE
150' E. OF #44000 12 MILE ROAD
6" N. OF CURB
Northing 364,080.92
Easting 13,362,115.87
Elevation 947.55

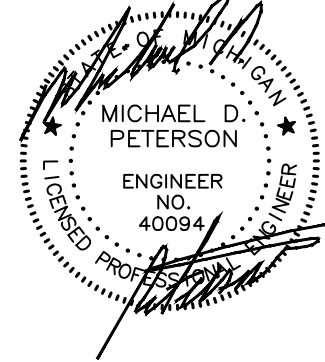
LEGEND

MANHOLE	EXISTING SANITARY SEWER
HYDRANT	SAN. CLEAN OUT
GATE VALVE	EXISTING WATERMAIN
MANHOLE CATCH BASIN	EXISTING STORM SEWER
	EX. R. Y. CATCH BASIN
UTILITY POLE GUY POLE	EXISTING BURIED CABLES
GUY WIRE	OVERHEAD LINES
	LIGHT POLE
	SIGN
C.O. MANHOLE	EXISTING GAS MAIN
HYDRANT	PR. SANITARY SEWER
	PR. WATER MAIN
INLET	PR. STORM SEWER
	PR. R. Y. CATCH BASIN
	PROPOSED LIGHT POLE
TC 600.00	PR. TOP OF CURB ELEVATION
GU 600.00	PR. GUTTER ELEVATION
FW 600.00	PR. TOP OF WALK ELEVATION
TP 600.00	PR. TOP OF PMVT. ELEVATION
FG 600.00	FINISH GRADE ELEVATION

PAVING LEGEND

	PROPOSED CONCRETE PAVEMENT
	PROPOSED CONCRETE SIDEWALK
	PROPOSED ASPHALT PAVEMENT

SEAL



PROJECT

Fountain View
Professional Center
44244 Twelve Mile Road
Novi, MI 48375

CLIENT

Acqira Realty Holdings
44090 12 Mile Road
Novi, MI 48377

Contact: Joseph Schimizzi
Phone: (888) 560-5540

PROJECT LOCATION

Part of the SE 1/4
Section 10
T. 1N, R. 8E
City of Novi,
Oakland County, Michigan

SHEET

Paving & Grading Plan



Know what's below
Call before you dig.

REVISIONS

11-13-20 ISSUED FOR SITE PLAN
4-23-21 REV PER PRELIM SP REVIEW
5-10-21 REV PER PRELIM SP REVIEW
7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY:

M. Kurmas

DESIGNED BY:

M. Kurmas

APPROVED BY:

M. Peterson

DATE:

03-27-2019

SCALE: 1" = 40'

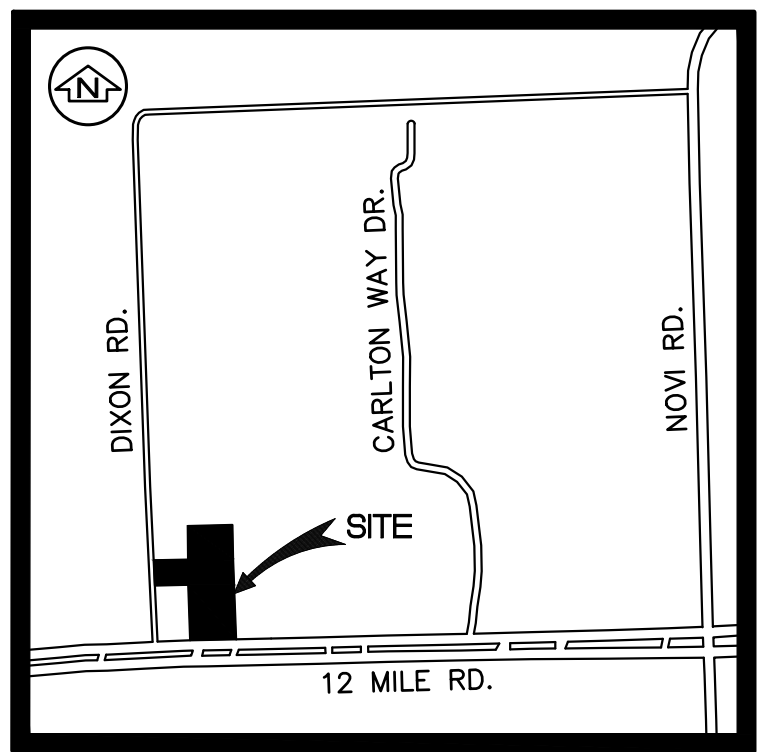
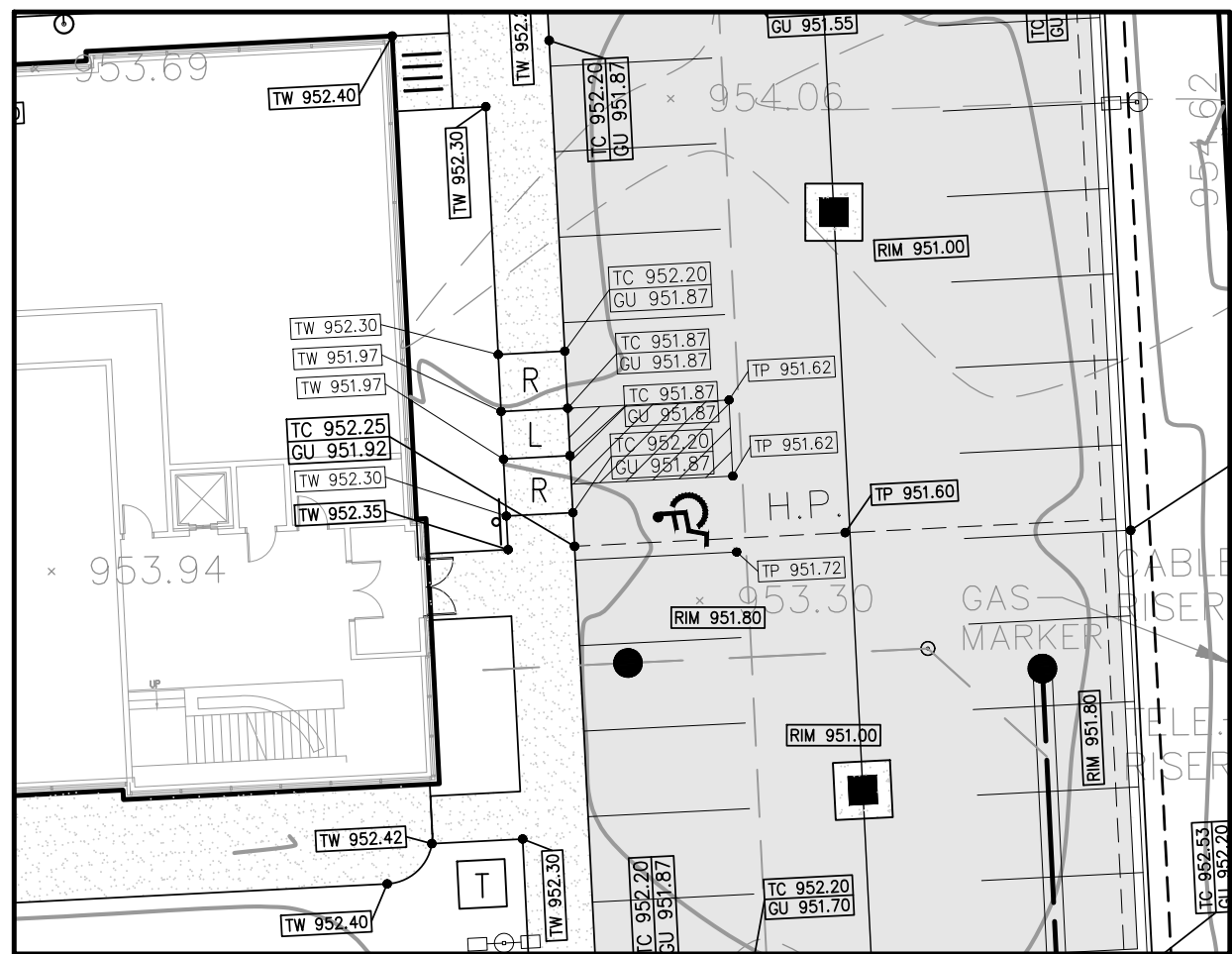
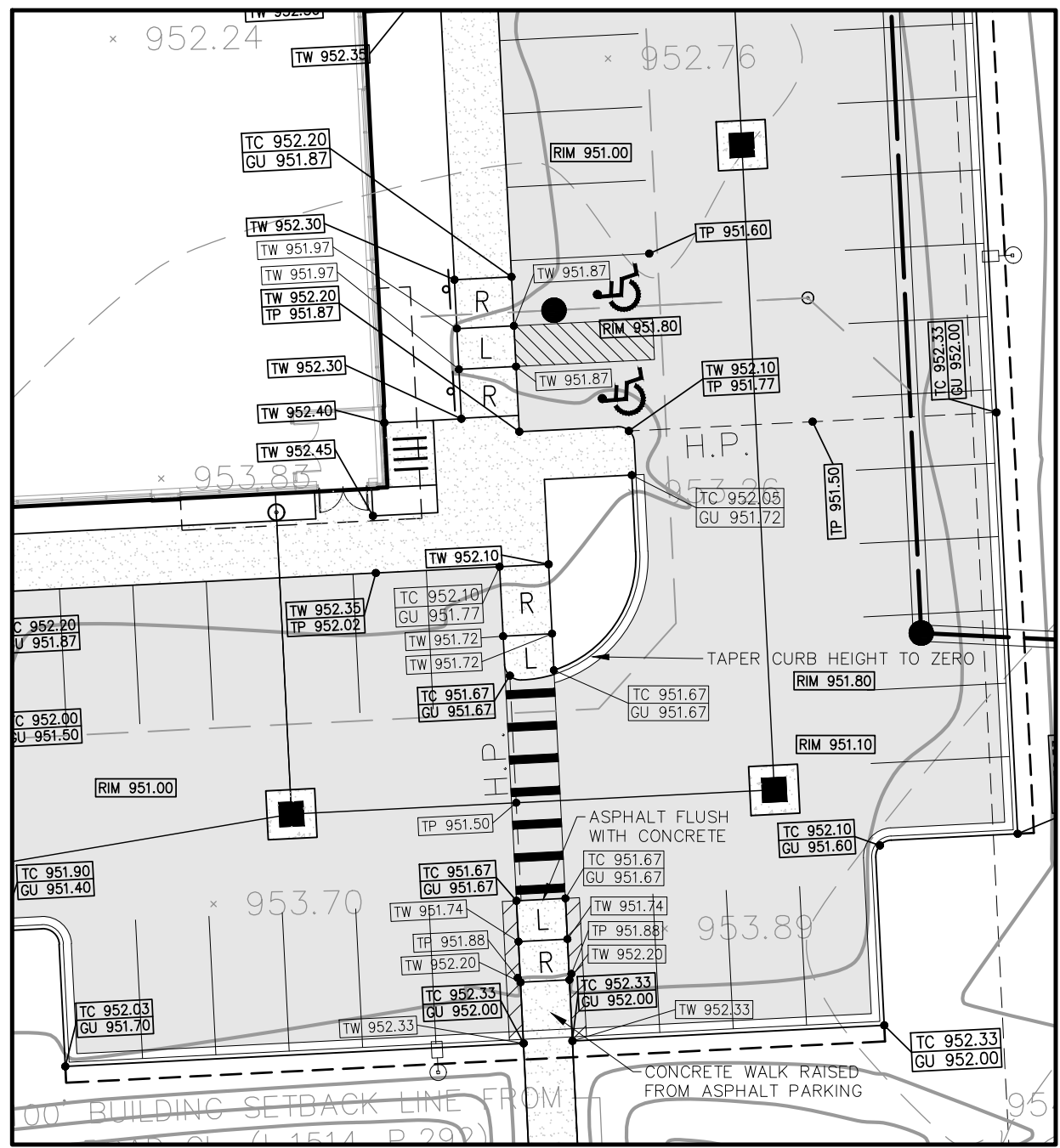
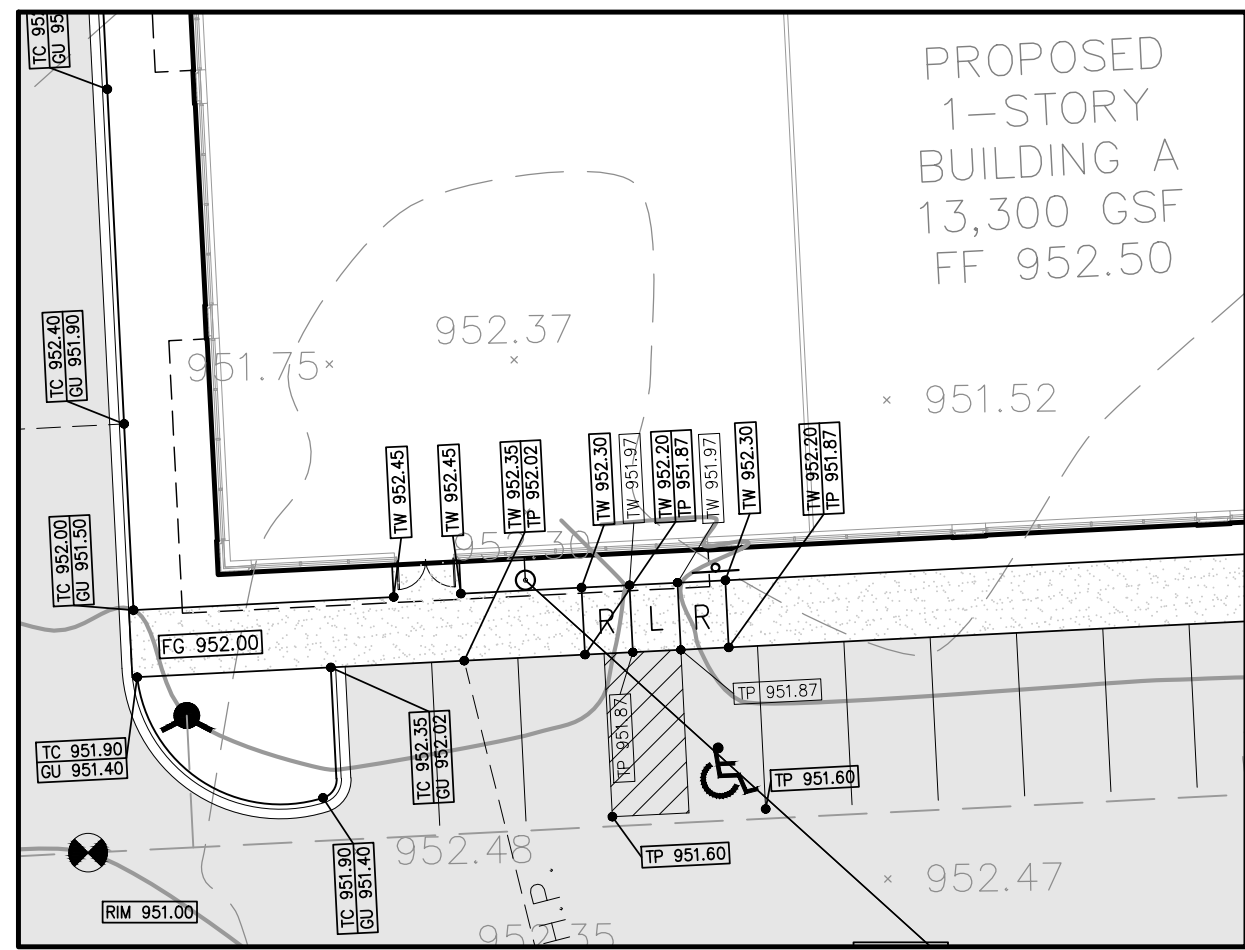
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NFE JOB NO.

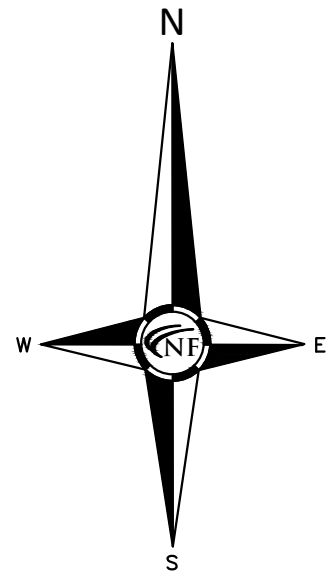
H046-03

SHEET NO.

C4



LOCATION MAP

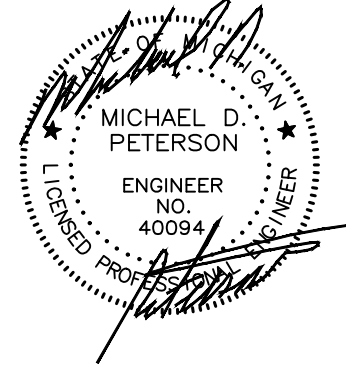


NF
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Acqira Realty Holdings
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Part of the SE 1/4
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T. 1N, R. 8E
City of Novi,
Oakland County, Michigan

SHEET

Detailed Paving &
Grading Plan



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4-23-21 REV PER PRELIM SP REVIEW
5-10-21 REV PER PRELIM SP REVIEW
7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY:

M. Kurmas

DESIGNED BY:

M. Kurmas

APPROVED BY:

M. Peterson

DATE:

03-27-2019

SCALE: 1" = 20'

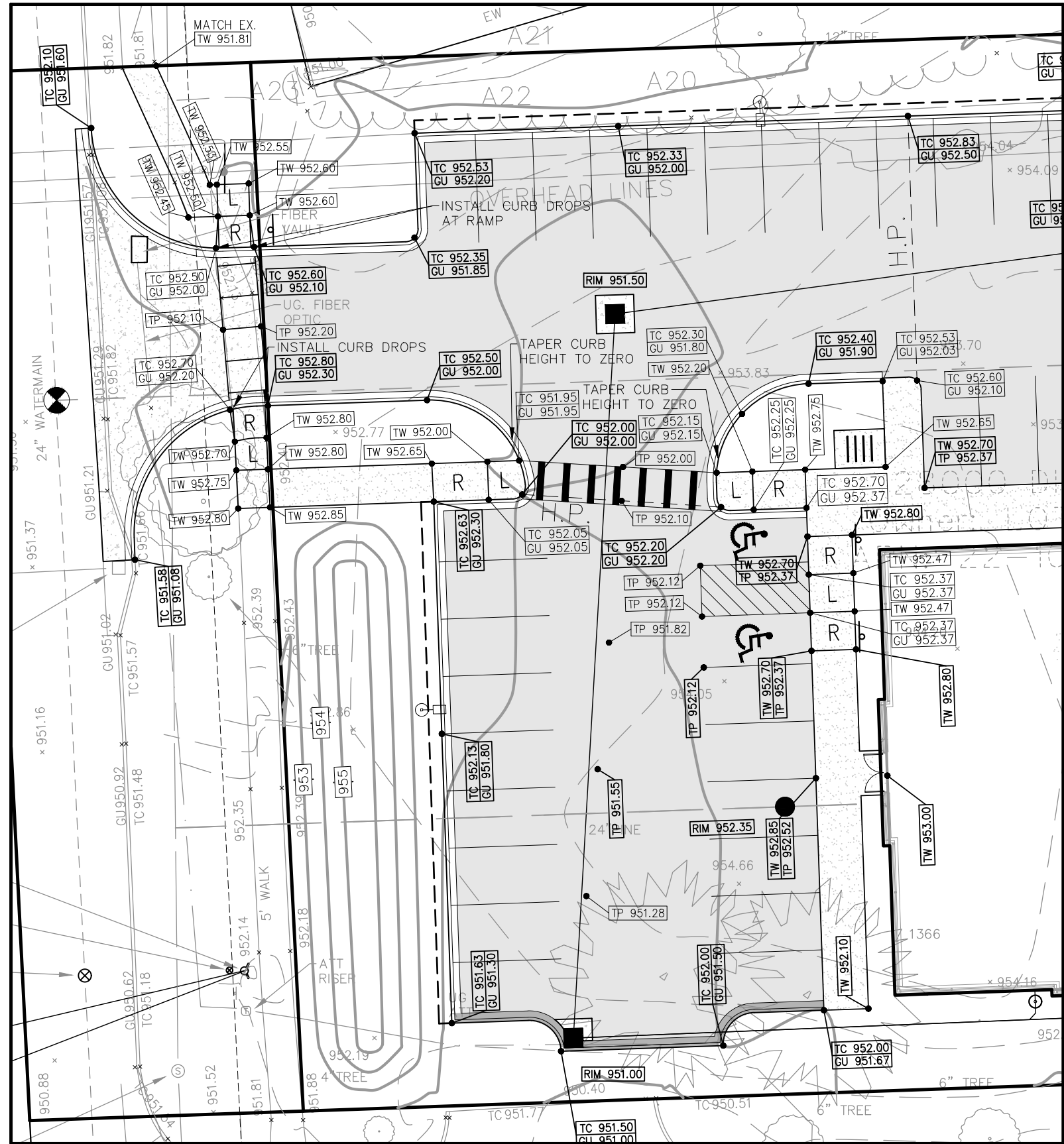
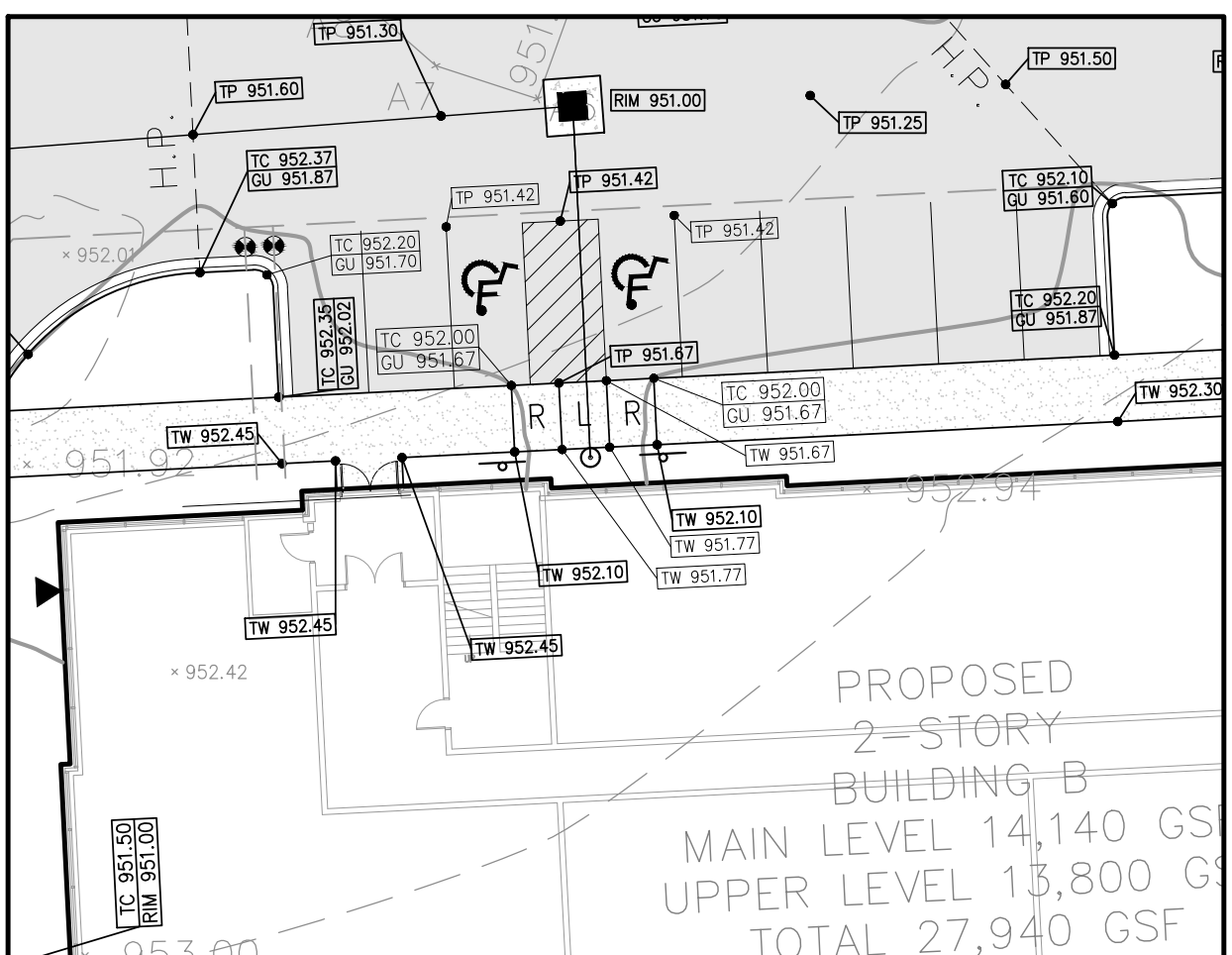
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NFE JOB NO.

H046-03

SHEET NO.

C4A



BENCHMARK NOTES

BM ID #1031
X ON N. RM. OF SANITARY MANHOLE
W. INTERSECTION OF DIXON AND 12 MILE ROAD
1' N. OF SIDEWALK AND 40' W. OF DIXON C.
Northing 364,067.01
Easting 13,300,761.15
Elevation 952.24

BM ID #1043
X ON N. RM. OF SANITARY MANHOLE
150' E. OF #44000 12 MILE ROAD
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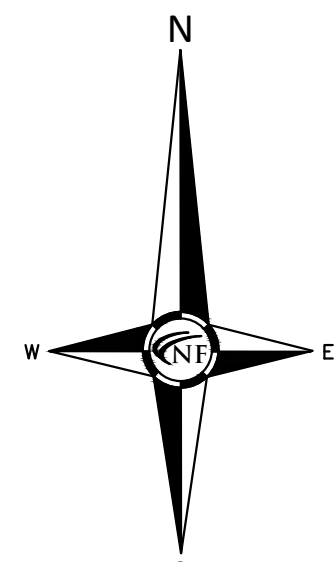
PAVING LEGEND

PROPOSED CONCRETE PAVEMENT
PROPOSED ASPHALT PAVEMENT

LEGEND

MANHOLE
HYDRANT
MANHOLE CATCH BASIN
UTILITY POLE GUY POLE
C.O.
HYDRANT
INLET
PROPOSED LIGHT POLE
TC 600.00
GU 600.00
TW 600.00
PM 600.00
FG 600.00
EXISTING SANITARY SEWER
SAN. CLEAN OUT
EXISTING WATERMAIN
EXISTING STORM SEWER
EX. R. Y. CATCH BASIN
EXISTING BURIED CABLES
OVERHEAD LINES
LIGHT POLE
SIGN
EXISTING GAS MAIN
PR. SANITARY SEWER
PR. WATER MAIN
PR. STORM SEWER
PR. R. Y. CATCH BASIN
PR. TOP OF CURB ELEVATION
PR. GUTTER ELEVATION
PR. TOP OF WALK ELEVATION
PR. TOP OF PMT. ELEVATION
FINISH GRADE ELEVATION

Sanitary Structure Schedule	
Structure Name	Structure Details
#1 EX. SAN. MH	RIM 950.85 8" S. INV. 939.61 8" NE. INV. 939.71 8" W. INV. 939.75
#2 4" DIA. SAN. MH	RIM 951.80 8" E. INV. 940.04 8" N. INV. 940.14
#3 4" DIA. SAN. MH	RIM 951.80 8" S. INV. 941.50
#4A 4" DIA. MONITORING MH	RIM 952.35 6" E. INV. 945.78 6" W. INV. 945.68
#5A 4" DIA. MONITORING MH	RIM 951.80 6" W. INV. 945.41 6" E. INV. 945.31
#6A 4" DIA. MONITORING MH	RIM 951.80 6" W. INV. 945.40 6" E. INV. 945.30



HYDRANT SCHEDULE

1	6" STANDARD FIRE HYDRANT F.G. 952.00	3	6" STANDARD FIRE HYDRANT F.G. 952.60
2	6" STANDARD FIRE HYDRANT F.G. 952.30	4	6" STANDARD FIRE HYDRANT F.G. 952.60

GATE VALVE SCHEDULE

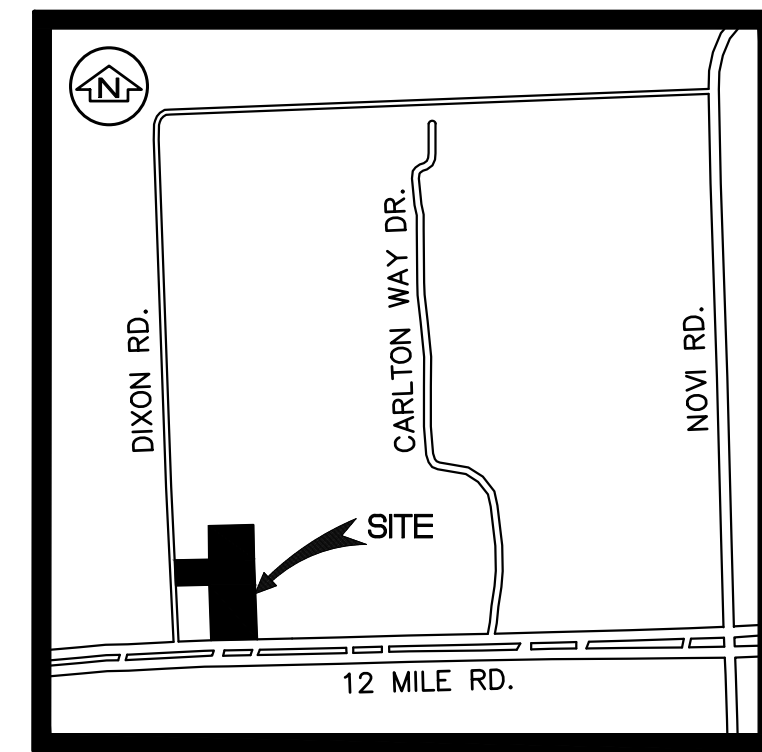
1	8" GATE VALVE IN WELL RIM 951.25	3	8" GATE VALVE IN WELL RIM 951.25
2	8" GATE VALVE IN WELL RIM 951.00	4	8" GATE VALVE IN WELL RIM 951.40

UTILITY CROSSING SCHEDULE

X1	12" STM B/P 942.83 8" WM T/P 941.33	X13	6" STM B/P 948.12 8" WM T/P 945.58
X2	GAS VERIFY IF FIELD 8" WM T/P V.I.F.	X14	6" STM B/P 948.22 8" WM T/P 945.47
X3	ELEC VERIFY IF FIELD 8" WM T/P V.I.F.	X15	6" SAN B/P 944.90 8" WM T/P 943.40
X4	FIBER VERIFY IF FIELD 8" WM T/P V.I.F.	X16	15" STM B/P 946.58 6" SAN T/P 945.03
X5	GAS VERIFY IF FIELD 15" STM T/P V.I.F.	X17	18" STM B/P 946.04 8" WM T/P 944.54
X6	ELEC VERIFY IF FIELD 15" STM T/P V.I.F.	X18	6" SAN B/P 944.90 8" WM T/P 943.40
X7	FIBER VERIFY IF FIELD 15" STM T/P V.I.F.	X19	15" STM T/P 946.55 6" SAN B/P 945.01
X8	15" STM B/P 945.37 8" WM T/P 943.87	X20	15" STM B/P 946.74 6" SAN B/P 945.24
X9	12" STM B/P 946.79 8" WM T/P 944.96	X21	6" STM B/P 948.22 8" WM T/P 945.42
X10	15" STM B/P 946.45 8" WM T/P 944.95	X22	6" STM B/P 947.72 8" WM T/P 945.39
X11	12" STM B/P 947.24 8" WM T/P 945.72	X23	12" STM B/P 946.88 8" WM T/P 945.38
X12	12" STM B/P 947.46 6" SAN T/P 945.67	X24	FIBER VERIFY IN FIELD 8" WM T/P 945.70
X25	8" WM B/P 945.04 8" SAN T/P 938.80		

Storm Sewer Structure Schedule

Structure Name	Structure Details
#1 15" END SECTION	PR. RIM 947.52 PR. 15" SW. INV. 946.00
#2 5" DIA. OUTLET CONTROL STRUCTURE EJ 1040 TYPE B	PR. RIM 952.50 PR. 15" NE. INV. 945.86 PR. 15" SW. INV. 945.66
#3 4" DIA. MH EJ 1040 TYPE B	PR. RIM 951.45 PR. 15" NE. INV. 945.46 PR. 15" S. INV. 944.24
#4 4" DIA. MH EJ 1040 TYPE B	PR. RIM 949.91 PR. 15" N. INV. 943.00 PR. 12" E. INV. 942.80 PR. 12" W. INV. 942.80
#5 15" END SECTION	PR. RIM 947.52 PR. 18" E. INV. 946.00
#6 CONTECH CASCADE CS-6 TREATMENT UNIT	PR. RIM 951.70 PR. 18" E. INV. 946.12 PR. 18" W. INV. 946.12
#7 5" DIA. CB OIL/GAS SEPARATOR EJ 1040 TYPE M1	PR. RIM 951.00 PR. 15" N. INV. 946.49 PR. 15" S. INV. 946.49 PR. 18" W. INV. 946.29
#8 4" DIA. CB 2" DEEP SUMP EJ 1040 TYPE M1	PR. RIM 951.00 PR. 15" N. INV. 946.75 PR. 15" N. INV. 946.75
#9 4" DIA. CB 2" DEEP SUMP EJ 1040 TYPE M1	PR. RIM 951.10 PR. 15" N. INV. 947.05 PR. 15" N. INV. 946.95
#10 4" DIA. CB 2" DEEP SUMP EJ 1040 TYPE M1	PR. RIM 951.00 PR. 12" W. INV. 947.40 PR. 6" N. INV. 948.13 PR. 15" E. INV. 947.20
#11 4" DIA. CB 2" DEEP SUMP EJ 1040 TYPE M1	PR. RIM 951.00 PR. 6" NW. INV. 947.83 PR. 12" E. INV. 947.71
#12 4" DIA. CB 2" DEEP SUMP EJ 1040 TYPE M1	PR. RIM 951.00 PR. 15" N. INV. 946.72 PR. 15" S. INV. 946.72
#13 4" DIA. CB 2" DEEP SUMP EJ 1040 TYPE M1	PR. RIM 951.00 PR. 15" N. INV. 946.87 PR. 15" S. INV. 946.87
#14 4" DIA. CB 2" DEEP SUMP EJ 1040 TYPE M1	PR. RIM 951.40 PR. 12" W. INV. 947.22 PR. 15" S. INV. 947.02
#15 4" DIA. CB 2" DEEP SUMP EJ 1040 TYPE M1	PR. RIM 951.00 PR. 12" E. INV. 947.50 PR. 6" S. INV. 948.13
#16 15" END SECTION	PR. RIM 947.52 PR. 18" NW. INV. 946.00
#17 CONTECH CASCADE CS-6 TREATMENT UNIT	PR. RIM 951.50 PR. 18" W. INV. 946.13 PR. 18" SE. INV. 946.13
#18 5" DIA. CB OIL/GAS SEPARATOR EJ 1045 TYPE M1&T1	PR. RIM 951.50 PR. 12" S. INV. 946.58 PR. 18" N. INV. 946.28 PR. 18" E. INV. 946.18
#19 4" DIA. CB 2" DEEP SUMP EJ 1045 TYPE M1&T1	PR. RIM 951.00 PR. 15" W. INV. 946.63 PR. 12" N. INV. 946.83 PR. 18" S. INV. 946.43
#20 4" DIA. CB 2" DEEP SUMP EJ 1040 TYPE M1	PR. RIM 951.50 PR. 15" W. INV. 946.91 PR. 15" E. INV. 946.91
#21 4" DIA. CB 2" DEEP SUMP EJ 1040 TYPE M1	PR. RIM 951.50 PR. 12" S. INV. 947.37 PR. 15" E. INV. 947.17
#22 4" DIA. CB 2" DEEP SUMP EJ 1045 TYPE M1&T1	PR. RIM 951.00 PR. 8" E. INV. 947.77 PR. 12" N. INV. 947.77
#23 4" DIA. CB 2" DEEP SUMP EJ 1040 TYPE M1	PR. RIM 951.00 PR. 12" E. INV. 947.23 PR. 12" S. INV. 947.13
#24 4" DIA. CB 2" DEEP SUMP EJ 1040 TYPE M1	PR. RIM 951.00 PR. 12" W. INV. 947.51 PR. 6" S. INV. 947.63
#25 4" DIA. MH EJ 1040 TYPE B	PR. RIM 951.60 PR. 12" SW. INV. 946.88 PR. 12" N. INV. 946.88
#26 4" DIA. CB 2" DEEP SUMP EJ 1040 TYPE M1	PR. RIM 951.00 PR. 12" NE. INV. 947.02



LOCATION MAP

Project: Fountain View Professional Center
Date: 8-29-2021
Revised:

SANITARY SEWER BASIS OF DESIGN

Buildings A & B
0.40 REU per 1,000 sq ft
41,240 sq ft total
41,240 sq ft x 0.40 REU per 1,000 sq ft = 16.50 REU

*Note: 1 REU Equals 100 G.P.D.

3.5 Persons per REU x Total REU	= 57.738 Persons Total
AVE Q = $\frac{(100 \text{ GPD} \times 3.5 \text{ People} \times \text{Total REU})}{1000000}$	= 0.0058 mgd
Peaking = $18 + \frac{18 \times (\text{Persons}/1000) \times 0.50}{4 + (\text{Persons}/1000) \times 0.50}$	= 4.30
PEAK Q = Ave Flow x Peaking Factor	= 0.0248 mgd
SIZE OF SANITARY SEWER	= 8 inch
PIPE SLOPE	= 0.50 %
PIPE CAPACITY	= 0.88 cfs

Building C
0.40 REU per 1,000 sq ft
8,725 sq ft total
8,725 sq ft x 0.40 REU per 1,000 sq ft = 3.49 REU

*Note: 1 REU Equals 100 G.P.D.

3.5 Persons per REU x Total REU	= 12.215 Persons Total
AVE Q = $\frac{(100 \text{ GPD} \times 3.5 \text{ People} \times \text{Total REU})}{1000000}$	= 0.0012 mgd
Peaking = $18 + \frac{18 \times (\text{Persons}/1000) \times 0.50}{4 + (\text{Persons}/1000) \times 0.50}$	= 4.41
PEAK Q = Ave Flow x Peaking Factor	= 0.0054 mgd
SIZE OF SANITARY SEWER	= 6 inch
PIPE SLOPE	= 1.00 %
PIPE CAPACITY	= 0.56 cfs

WRC REU Table Assumptions:
Offices General = 0.40 REU per 1,000 sq ft

ESTIMATED QUANTITIES

STORM SEWER

DESCRIPTION	QUANTITY	UNITS
12" C-76, CLASS IV, SEWER PIPE	576	LF
15" C-76, CLASS IV, SEWER PIPE	1,025	LF
18" C-76, CLASS IV, SEWER PIPE	184	LF
5" DIA. CATCH BASIN W/ OIL/GAS SEPARATOR	2	EA.
4" DIA. CATCH BASIN W/ 2" SUMP	15	EA.
4" DIA. MANHOLE	3	EA.
4" DIA. OUTLET	1	EA.
24" JACK & BORE	4	EA.
18" C-76, CLASS IV, END SECTION	3	EA.
CONTECH CASCADE UNIT	2	EA.

SANITARY SEWER

DESCRIPTION	QUANTITY	UNITS
8" PVC TRUSS, SDR 26 SEWER MAIN	329	LF
6" PVC, SDR 26, BUILDING LEAD	223	LF
4" DIA. MANHOLE	2	EA.
4" DIA. MONITORING MANHOLE	3	EA.
SEWER TAP/CONNECTION	1	EA.

WATER MAIN

DESCRIPTION	QUANTITY	UNITS
8" D.I., CLASS 54, WATER MAIN	1,665	LF
6" D.I., CLASS 54, WATER MAIN	90	LF
4" D.I., CLASS 54, WATER MAIN	18	LF
2" K" COPPER BUILDING SERVICE	27	LF
1.5" K" COPPER BUILDING SERVICE	57	LF
6" HYDRANT ASSEMBLY	4	EA.
24" TAPPING SLEEVE G.V. & WELL	2	EA.
WATER MAIN CONNECTION	2	EA.
18" JACK & BORE	62	LF
8" GATE VALVE & WELL	2	EA.

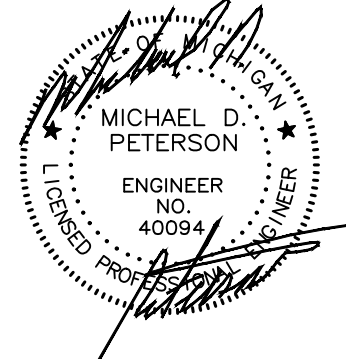
LEGEND

MANHOLE	EXISTING SANITARY SEWER
HYDRANT	SAN. CLEAN OUT
MANHOLE	EXISTING WATER MAIN
CATCH BASIN	EXISTING STORM SEWER
UTILITY POLE	EXISTING BURIED CABLES
GUY POLE	OVERHEAD LINES
GUY WIRE	LIGHT POLE
SIGN	EXISTING GAS MAIN
C.O.	PR. SANITARY SEWER
HYDRANT	PR. WATER MAIN
INLET	PR. STORM SEWER
C.B.	PR. R. Y. CATCH BASIN
MANHOLE	SAND BACKFILL (95% DENSITY)
GATE VALVE	PROPOSED LIGHT POLE



NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
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SEAL



PROJECT

Fountain View
Professional Center
44244 Twelve Mile Road
Novi, MI 48375

CLIENT

Acquia Realty Holdings
44090 12 Mile Road
Novi, MI 48377

Contact: Joseph Schimizzi
Phone: (888) 560-5540

PROJECT LOCATION

Part of the SE 1/4
Section 10
T. 1N, R. 8E
City of Novi,
Oakland County, Michigan

SHEET

Utility Plan



Know what's below
Call before you dig.

REVISIONS

11-13-20 ISSUED FOR SITE PLAN
4-23-21 REV PER PRELIM SP REVIEW
5-10-21 REV PER PRELIM SP REVIEW
7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY:

M. Kurmas

DESIGNED BY:

M. Kurmas

APPROVED BY:

M. Peterson

DATE:

03-27-2019

SCALE: 1" = 40'

40 20 0 20 40 60

NFE JOB NO.

H046-03

SHEET NO.

C5

SANITARY NOTES

ALL SANITARY LEADS SHALL BE BURIED AT LEAST 5 FEET DEEP UNDER THE INFLUENCE OF PAVEMENT

CONTRACTOR SHALL PROVIDE A TESTING BULKHEAD IMMEDIATELY UPSTREAM OF THE SANITARY CONNECTION POINT. ADDITIONALLY, CONTRACTOR SHALL PROVIDE A TEMPORARY 1-FOOT DEEP SUMP IN THE FIRST SANITARY STRUCTURE PROPOSED UPSTREAM OF THE CONNECTION POINT, AND PROVIDE A SECONDARY WATER TIGHT BULKHEAD IN THE DOWNSTREAM END OF THIS STRUCTURE.

DEWATERING NOTE

IF DEWATERING IS ANTICIPATED OR ENCOUNTERED DURING CONSTRUCTION, A DEWATERING PLAN MUST BE SUBMITTED TO THE ENGINEERING DEPARTMENT FOR REVIEW

GENERAL UTILITY NOTES

WATER MAINS AND FIRE HYDRANTS SHALL BE INSTALLED PRIOR TO CONSTRUCTION ABOVE THE FOUNDATION. PRIOR TO CONSTRUCTION ABOVE THE FOUNDATION OF NON-RESIDENTIAL BUILDINGS, AN ALL-WEATHER ACCESS ROAD CAPABLE OF SUPPORTING 35 TONS SHALL BE PROVIDED.

NO HAZARDOUS CHEMICALS WILL BE STORED ON-SITE

ALL HYDRANTS SHALL HAVE TWO 2-1/2 INCH MALE OUTLETS AND ONE 4-1/2 INCH MALE STEAMER CONNECTION. THREADS SHALL BE NATIONAL STANDARD. (D.C.S. SEC. 11-68 (F)(2))

IMMEDIATE ACCESS TO FIRE DEPARTMENT CONNECTIONS SHALL BE MAINTAINED AT ALL TIMES AND WITHOUT OBSTRUCTION BY FENCE, BUSHES, TREES WALK OR ANY OTHER OBJECT FOR A MINIMUM OF 5 FEET

A HAZARDOUS CHEMICAL SURVEY IS REQUIRED TO BE SUBMITTED TO THE PLANNING AND COMMUNITY DEVELOPMENT DEPARTMENT FOR DISTRIBUTION TO THE FIRE DEPARTMENT AT THE TIME THE PRELIMINARY SITE PLAN IS SUBMITTED FOR REVIEW AND APPROVAL. DEFINITIONS OF CHEMICAL TYPES CAN BE OBTAINED FROM THE FIRE DEPARTMENT AT (248)735-5674

THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS, INVERTS AND GRADES PRIOR TO THE START OF ANY WORK.

TWO (2) COPIES OF AS-BUILT PLANS SHALL BE SUBMITTED TO THE CITY ENGINEER WITHIN THIRTY (30) DAYS OF THE COMPLETION OF THE UTILITY INSTALLATION AS PER SECTION 31-7 (A) CITY OF NOVI ORDINANCE.

12 MILE ROAD (WIDTH VARIES)

CAUTION!!

6"MP GAS MAIN

BENCHMARK
BENCH TIE IN U. POLE
ELEVATION 953.65
CITY OF NOVI DATUM

BENCHMARK
BENCH TIE IN U. POLE
ELEVATION 950.55
CITY OF NOVI DATUM

BENCHMARK
BENCH TIE IN U. POLE
ELEVATION 951.95
CITY OF NOVI DATUM

BENCHMARK
ARROW ON HYDRANT
ELEVATION 954.21
CITY OF NOVI DATUM

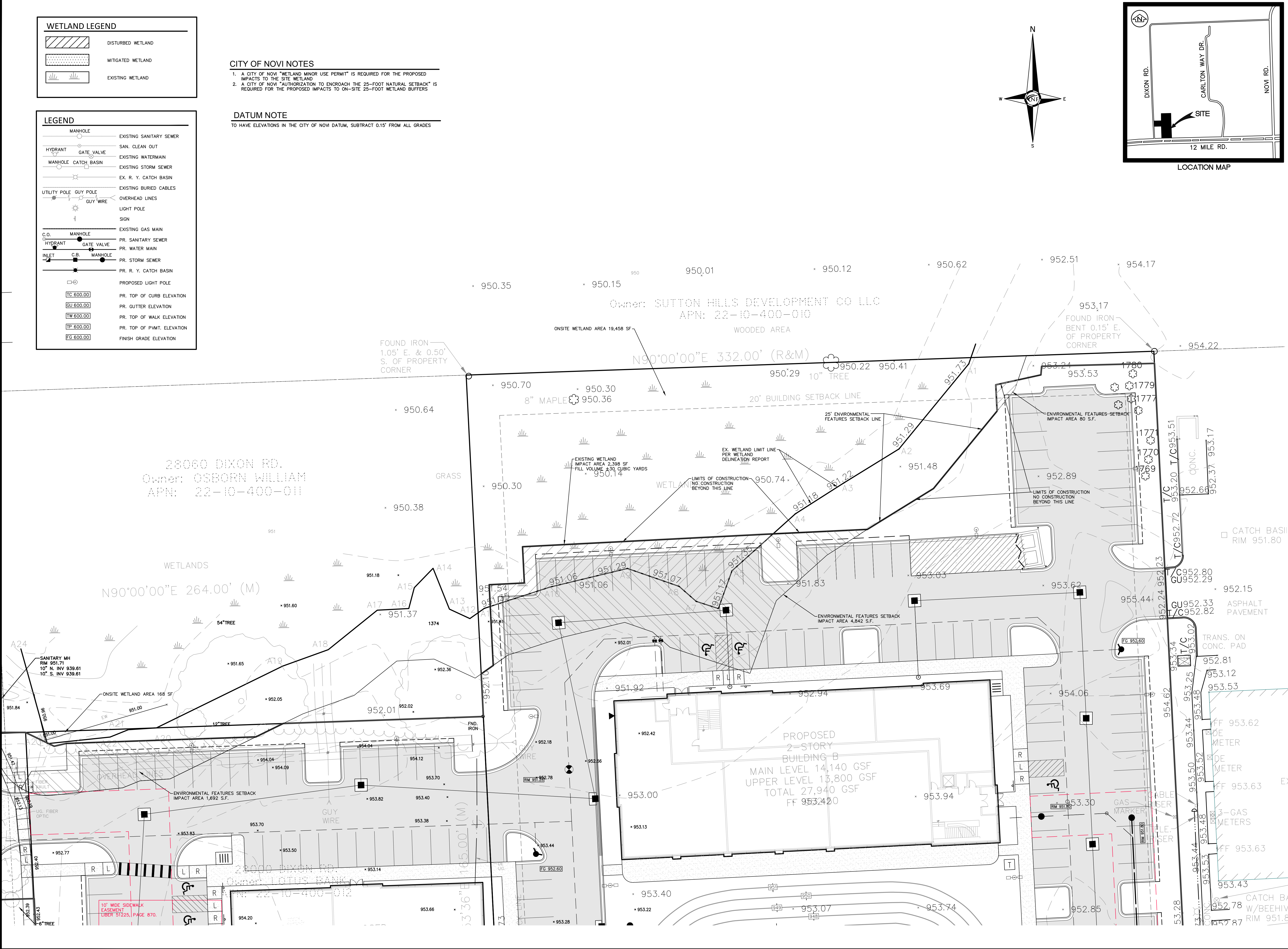
WETLAND LEGEND	
	DISTURBED WETLAND
	MITIGATED WETLAND
	EXISTING WETLAND

LEGEND	
	EXISTING SANITARY SEWER
	SAN. CLEAN OUT
	EXISTING WATERMAIN
	EXISTING STORM SEWER
	EX. R. Y. CATCH BASIN
	EXISTING BURIED CABLES
	OVERHEAD LINES
	LIGHT POLE
	SIGN
	EXISTING GAS MAIN
	PR. SANITARY SEWER
	PR. WATER MAIN
	PR. STORM SEWER
	PR. R. Y. CATCH BASIN
	PROPOSED LIGHT POLE
	PR. TOP OF CURB ELEVATION
	PR. GUTTER ELEVATION
	PR. TOP OF WALK ELEVATION
	PR. TOP OF PWMT. ELEVATION
	FINISH GRADE ELEVATION

CITY OF NOVI NOTES

1. A CITY OF NOVI "WETLAND MINOR USE PERMIT" IS REQUIRED FOR THE PROPOSED IMPACTS TO THE SITE WETLAND
2. A CITY OF NOVI "AUTHORIZATION TO ENDOACH THE 25-FOOT NATURAL SETBACK" IS REQUIRED FOR THE PROPOSED IMPACTS TO ON-SITE 25-FOOT WETLAND BUFFERS

DATUM NOTE
TO HAVE ELEVATIONS IN THE CITY OF NOVI DATUM, SUBTRACT 0.15' FROM ALL GRADES



NF ENGINEERS

CIVIL ENGINEERS
LAND SURVEYORS
LAND PLANNERS

NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257

SEAL

PROJECT
Fountain View
Professional Center
44244 Twelve Mile Road
Novi, MI 48375

CLIENT
Acqira Realty Holdings
44090 12 Mile Road
Novi, MI 48377

Contact: Joseph Schimizzi
Phone: (888) 560-5540

PROJECT LOCATION
Part of the SE 1/4
Section 10
T. 1N, R. 8E
City of Novi,
Oakland County, Michigan

SHEET
Wetland Plan

811

Know what's below
Call before you dig.

REVISIONS
11-13-20 ISSUED FOR SITE PLAN
4-23-21 REV PER PRELIM SP REVIEW
5-10-21 REV PER PRELIM SP REVIEW
7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY:
M. Kurmas

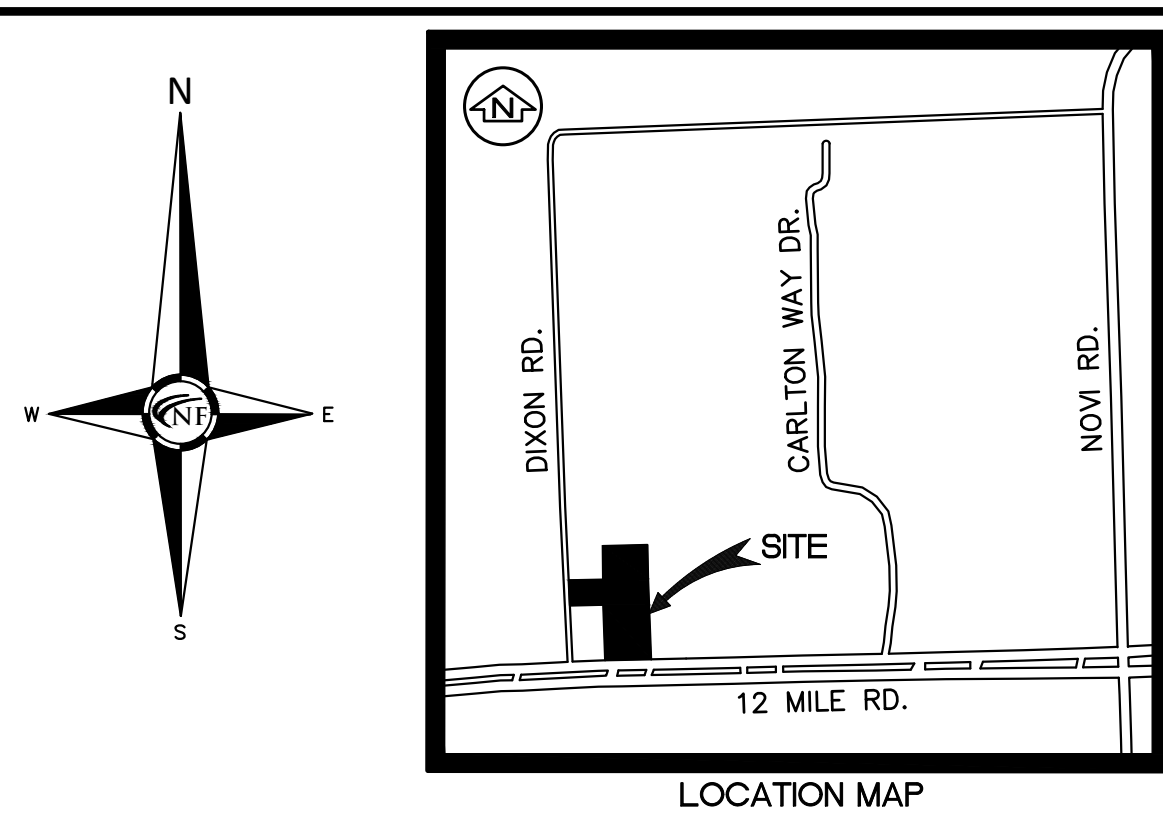
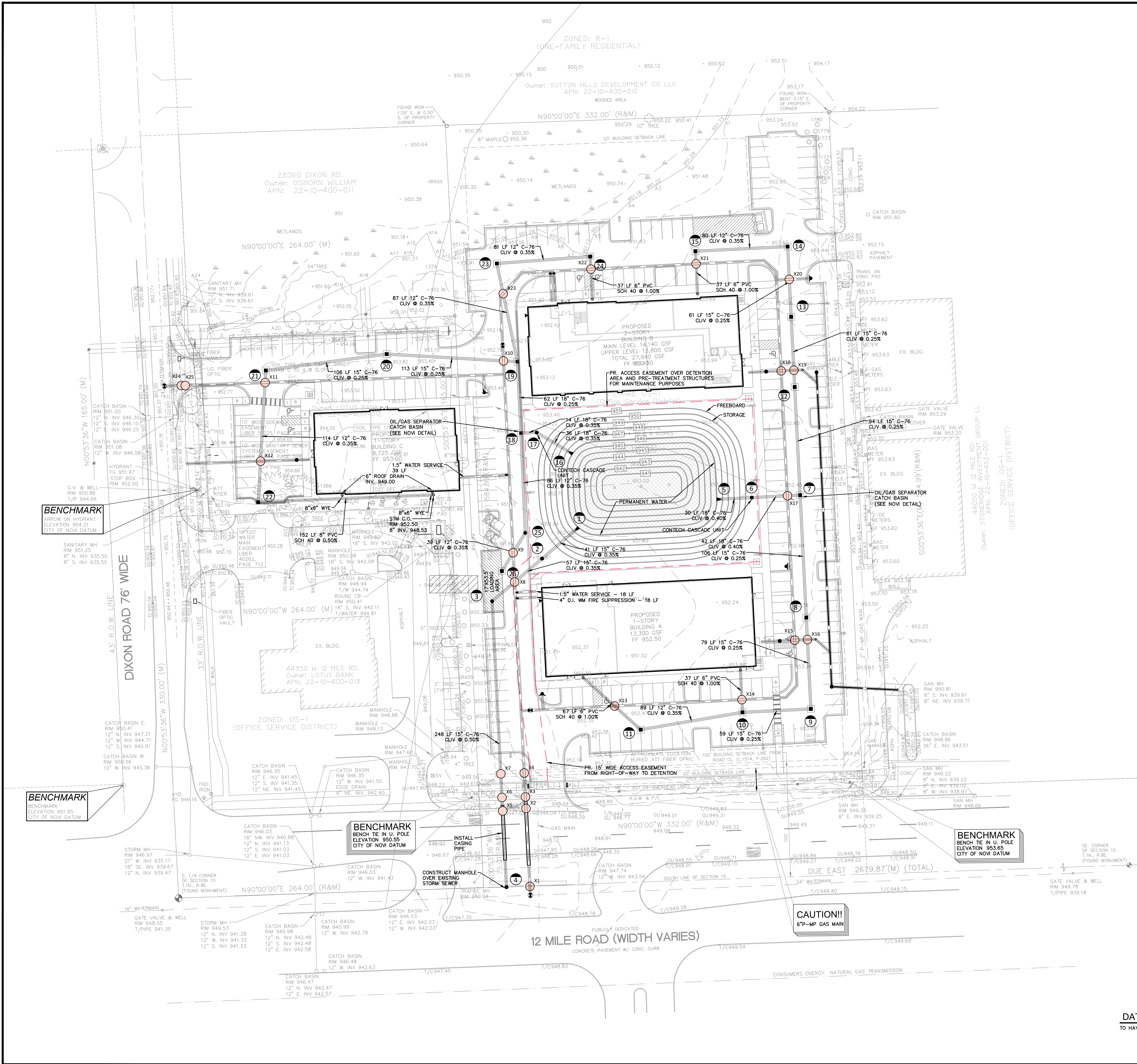
DESIGNED BY:
M. Kurmas

APPROVED BY:
M. Peterson

DATE:
03-27-2019

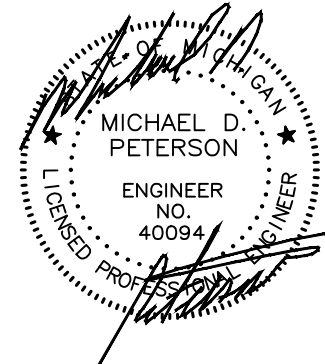
SCALE: 1" = 20'

NFE JOB NO. H046-03 **SHEET NO.** C6



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SEAL



PROJECT

Fountain View
Professional Center
44244 Twelve Mile Road
Novi, MI 48375

CLIENT

Acquia Realty Holdings
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Contact: Joseph Schimizzi
Phone: (888) 560-5540

PROJECT LOCATION

Part of the SE 1/4
Section 10
T. 1N, R. 8E
City of Novi,
Oakland County, Michigan

SHEET

Storm Water
Management Plan



REVISIONS

11-13-20 ISSUED FOR SITE PLAN
4-23-21 REV PER PRELIM SP REVIEW
5-10-21 REV PER PRELIM SP REVIEW
7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY:

M. Kurmas

DESIGNED BY:

M. Kurmas

APPROVED BY:

M. Peterson

DATE:

03-27-2019

SCALE: 1" = 40'

40 20 0 20 40 60

NFE JOB NO.

H046-03

SHEET NO.

C7

TABLE 1 STORM WATER MANAGEMENT SYSTEM LONG-TERM MAINTENANCE SCHEDULE									
MAINTENANCE ACTIVITIES	SYSTEM COMPONENTS								FREQUENCY
	Storm Collection System (Concrete Channels, Catch Basins, Manholes)	Manufactured Treatment System/Forbids Inlets to Forbids & Detention Basin	Detention Basin	Outlet Control Structures & Outlet Pipe	Buffer Strip, Riprap	Paved Areas			
Monitoring/Inspection									
Inspect for Sediment Accumulation/Clogging of stones	X	X	X	X	X			Annually	
Inspect For Floatables, Dead Vegetation & Debris	X	X	X	X	X	X		Annually & After Major Events	
Inspect For Erosion And Integrity of System	X	X	X	X	X	X		Annually & After Major Events	
Inspect All Components During Wet Weather & Compare to As-Built Plans	X	X	X	X	X	X		Annually	
Ensure Maintenance Access Remain Open/Clear	X	X	X	X	X	X		Annually	
Preventative Maintenance									
Mowing				X		X		As Needed, select areas only*	
Remove Accumulated Sediments	X	X	X	X	X			As Needed**	
Remove Floatables, Invasive & Dead Vegetation & Debris	X	X	X	X	X			As Needed	
Replace or Wash & Reuse River Stone Filters					X			Every 3 years, or as needed***	
Sweeping of Paved Surfaces							X	As Needed	
Remedial Actions									
Repair/Stabilize Areas of Erosion, Reseed Bare Areas	X						X	As Needed	
Replace Dead Plantings, brushies & trees. Reseed Bare Areas	X						X	As needed	
Structural Repairs	X	X	X	X	X	X		As Needed	
Make Adjustments/Repairs to Ensure Proper Functioning	X	X	X	X	X	X		As Needed	

Project: Fountain View									
Date: 6-28-2021									
Revised:									
DETENTION CALCULATION 100 YEAR STORM PER OAKLAND COUNTY STANDARDS									
		COEFFICIENT:	AREA (AC)						
SURFACE - PAVEMENT:		0.95	2.239						
SURFACE - BUILDING:		0.95	0.839						
SURFACE - LANDSCAPE:		0.35	1.817						
SURFACE - WATER:		1.00	0.400						
ALLOWABLE DISCHARGE		C1 =	0.15 CFS/ACRE						
AREA		A =	5.30 ACRES						
RUNOFF COEFF		C =	0.75						
TOTAL ALLOWABLE DISCHARGE		QA = C1 x A =	0.794 CFS						
ALLOWABLE OUTFLOW		Q0 = QA / (A x C) =	0.201 CFS/ACRE						
PEAK STORAGE TIME		T = 25 + (SQRT(10312.5 / Q0)) =	201.75 MINUTES						
MAX. STORAGE VOLUME/ACRE		VS = (16500 x T / (T + 25)) - (40 x Q0 x T) =	13062.25 CU FT/ACRE						
TOTAL STORAGE REQUIRED		VT = VS x A x C =	51727.17 CU FT						

SOIL DATA

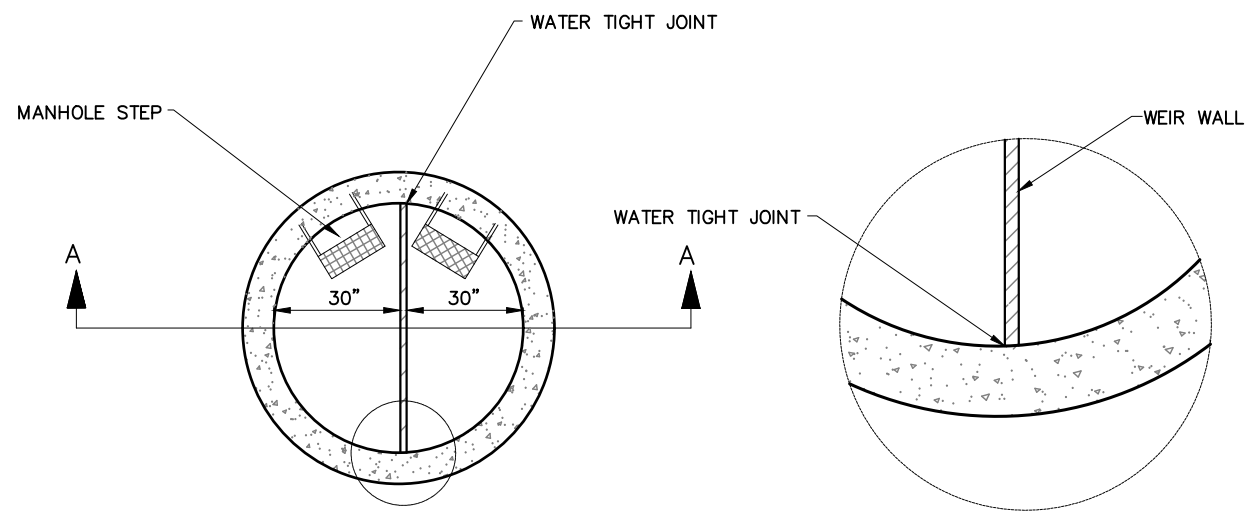
THIS SITE CONSISTS OF:

- 10B-MARLETTE SANDY LOAM, 1 TO 6 PERCENT SLOPES
- 11B-CAPAC SANDY LOAM, 0 TO 4 PERCENT SLOPES

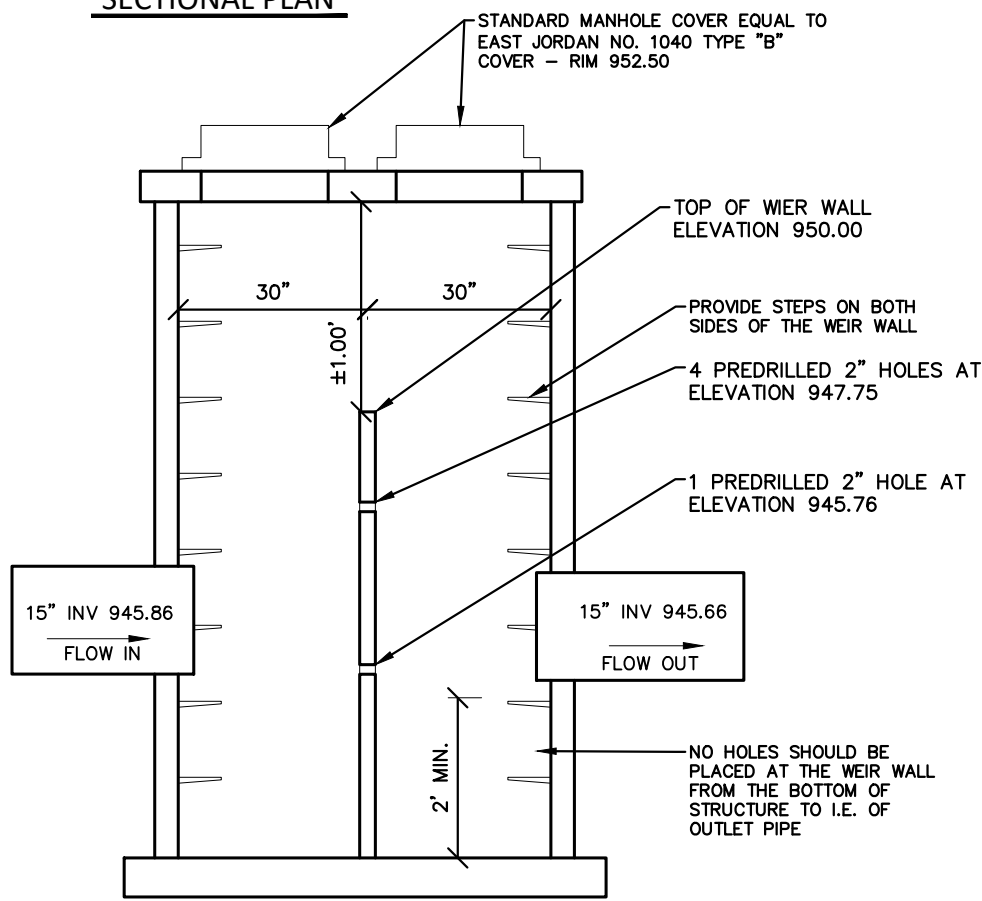
BASED ON DATA PROVIDED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE, NATURAL RESOURCES CONSERVATION SERVICE.

DATUM NOTE

TO HAVE ELEVATIONS IN THE CITY OF NOVI DATUM, SUBTRACT 0.15' FROM ALL GRADES

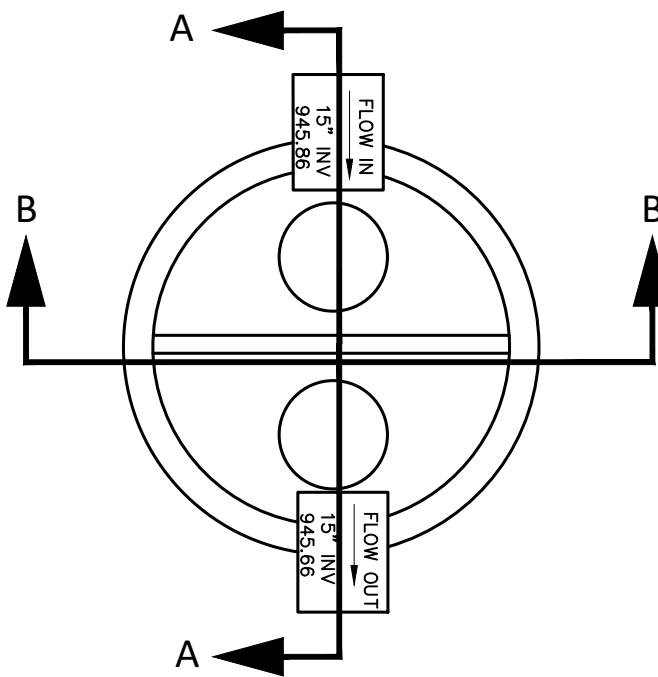


SECTIONAL PLAN



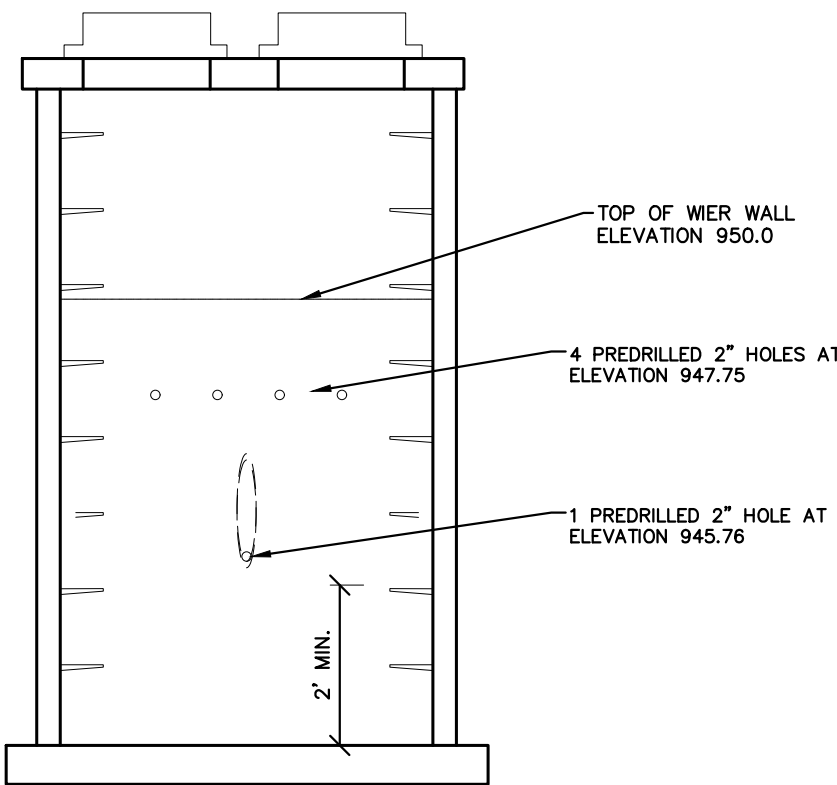
CROSS SECTION A

N.T.S.



5' FT. DIA. OUTLET CONTROL STRUCTURE #2

N.T.S.



CROSS SECTION B

N.T.S.

OUTLET CONTROL STRUCTURE CALCULATIONS

AREA (ACRES)	IMPERVIOUS FACTOR	ACRE IMPERVIOUS
1.817	0.35	0.636
3.078	0.95	2.924
0.400	1.00	0.400

LAWN
PVM/T, BLDG, SW
WATER SURFACE

FACTORED C = Cw = 0.748
TOTAL DRAINAGE AREA: 5.295

Cw x A = 3.960
Qout = MAX ALLOW OUTFLOW (0.15 CFS / ACRE) 0.794

REQUIRED 100 YEAR DETENTION VOLUME = 51727 CF

BANKFULL FLOOD VOLUME

V_{BF} = 5160 * A * C = 20434 CF

FIRST FLUSH VOLUME

V_{FF} = 1815 * A * C = 7187 CF

STORAGE PROVIDED

ELEV.	AREA (SFT)	DEPTH (FT)	VOLUME (FT ³)	TOTAL VOLUME (FT ³)
951.0	21163	1	19873	75903
950.0	18582	1	17370	56030
949.0	16157	1	15024	38661
948.0	13890	1	12835	23637
947.0	11779	1	10803	10803
946.0	9826	0	0	0

FREE BOARD ELEV
TOP OF STORAGE

EFFECTIVE BOTTOM OF POND

BOTTOM OF BASIN = 946.00
FIRST FLUSH = X_{FF} = 946.61
BANKFULL = X_{BF} = 947.75
100 YEAR = X₁₀₀ = 949.75

OUTLET CONTROL STRUCTURE

FIRST FLUSH OF RUNOFF

THE AVERAGE ALLOWABLE RELEASE RATE FOR RUNOFF IS 0.5" OVER AREA OF SITE IN 24 HOURS.

Q_{FF} = V_{FF} x (1/24 HRS) x (1 HR/3600 SEC) = 0.083 CFS

INSTALL ORIFICE IN OUTLET WEIR WALL AT ELEV. = X_{ORIFICE FF} = 945.76

HEAD = H_{FF} = X_{FF} - ORIFICE ELEVATION = 0.85 FT

A_{ORIFICE FF} = Q_{FF} / (0.62 * (2 * 32.2 * H_{FF})^{0.5}) = 0.0181 SFT

REQUIRED DIAMETER OF ORIFICE = 1.82 INCHES

THEREFORE, USE A SINGLE TWO (2) INCH DIAMETER HOLE IN WEIR WALL AT ELEVATION 945.76

Q_{FF} MAX = CA * (2 * 32.2 * (X₁₀₀ - X_{ORIFICE FF}))^{0.5} = 0.217 CFS
MAX FLOW THRU FIRST FLUSH ORIFICE AT 100 YEAR STORM STORAGE LEVEL

BANK FULL FLOOD

FOR THE ALLOWABLE RELEASE RATE OF 24-40 HOURS, CHECK THE DISCHARGE THROUGH THE FIRST FLUSH ORIFICE TO DETERMINE IF ADDITIONAL HOLES ARE NECESSARY.

HEAD = H_{BF} = X_{BF} - X_{ORIFICE FF} = 1.99 FT

Q_{BF} = 0.62 * AREA FIRST FLUSH ORIFICE * (2 * 32.2 * (X_{BF} - X_{ORIFICE FF}))^{0.5} = 0.153 CFS
T_{BF} = (1 SEC / Q_{BF}) * V_{BF} * (1 HOUR / 3600 SEC) = 37.1 HOURS

HOLDING TIME EQUALS APPROX. 37 HOURS, NO ADDITIONAL ORIFICES IN THE WEIR WALL ARE REQUIRED.

100 YEAR FLOOD

Q_B = ALLOWABLE OUTFLOW = 0.794 CFS

HAVING PREVIOUSLY CALCULATED THE MAXIMUM FLOW THRU FIRST FLUSH ORIFICE AT 100 YEAR STORM STORAGE ELEVATION, SUBTRACT Q_{FF} MAX FROM Q_B AND CALCULATE THE ORIFICE SIZE NEEDED FOR RELEASE OF THE 100 YEAR STORM VOLUME:

Q_B - (Q_{FF} MAX) = Q_{REMAINING} = 0.577 CFS

A_{ORIFICE 100} = Q_{REMAINING} / (0.62 * (2 * 32.2 * (X₁₀₀ - X_{BF}))^{0.5}) = 0.082 SFT

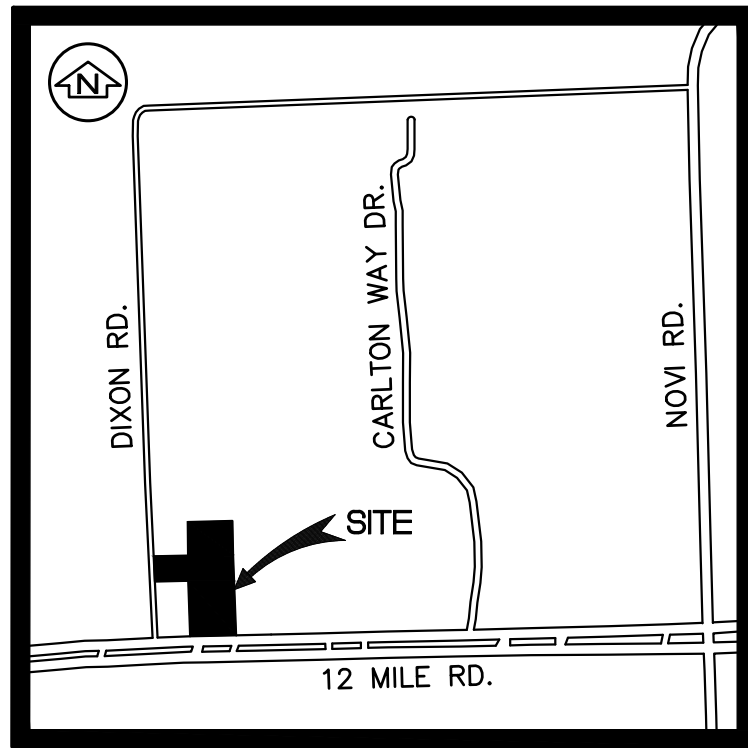
AREA OF A TWO (2) INCH DIAMETER HOLE = A_{2.0 INCH HOLE} = 0.022 SFT

REQ'D NUMBER OF TWO (2) INCH DIAMETER HOLES = A_{ORIFICE 100} / A_{2.0 INCH HOLE} = 3.76 EACH

THEREFORE INSTALL 4 EACH OF TWO (2) INCH DIA. HOLES AT ELEVATION X_{BF} = 947.75

SUMMARY OF REQUIRED ORIFICES IN OUTLET CONTROL STRUCTURE WEIR WALL:		
ELEVATION	# OF HOLES	DIAMETER OF HOLES
947.75	4	2 INCHES
945.76	1	2 INCHES

Project: Fountain View		
Date: 6-28-2021		
Revised:		
DETENTION CALCULATION 100 YEAR STORM PER OAKLAND COUNTY STANDARDS		
	COEFFICIENT:	AREA (AC)
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TOTAL STORAGE REQUIRED	VT = VS x A x C =	51727.17 CU FT.

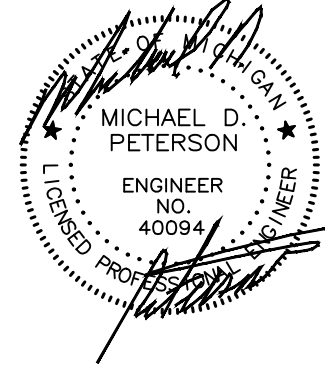


LOCATION MAP



NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
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SEAL



PROJECT

Fountain View
Professional Center
44244 Twelve Mile Road
Novi, MI 48375

CLIENT

Acqira Realty Holdings
44090 12 Mile Road
Novi, MI 48377

Contact: Joseph Schimizzi
Phone: (888) 560-5540

PROJECT LOCATION

Part of the SE 1/4
Section 10
T. 1N, R. 8E
City of Novi,
Oakland County, Michigan

SHEET

Storm Calculations and
Details Plan



REVISIONS

11-13-20 ISSUED FOR SITE PLAN
4-23-21 REV PER PRELIM SP REVIEW
5-10-21 REV PER PRELIM SP REVIEW
7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY:

M. Kurmas

DESIGNED BY:

M. Kurmas

APPROVED BY:

M. Peterson

DATE:

03-27-2019

SCALE: 1" = 40'

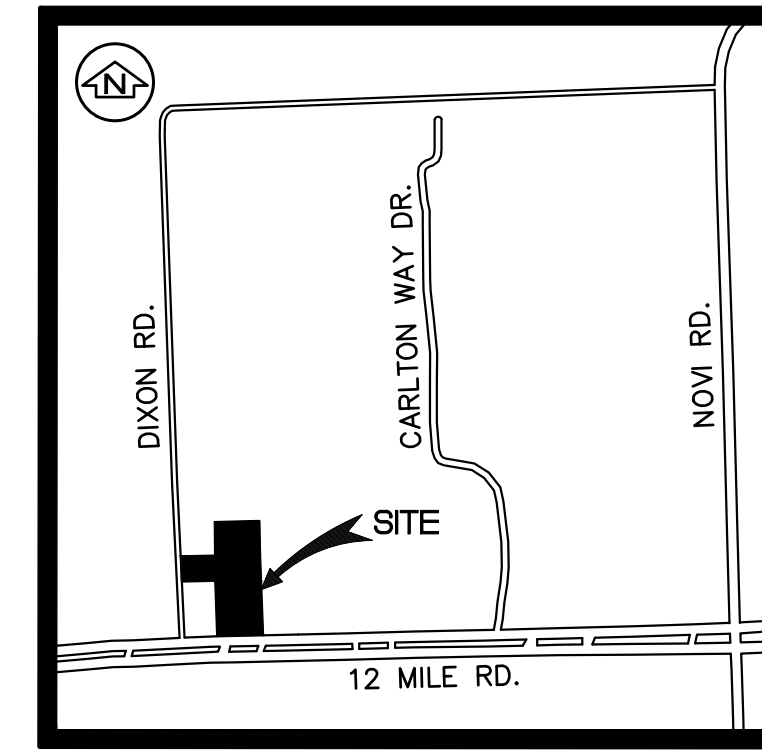
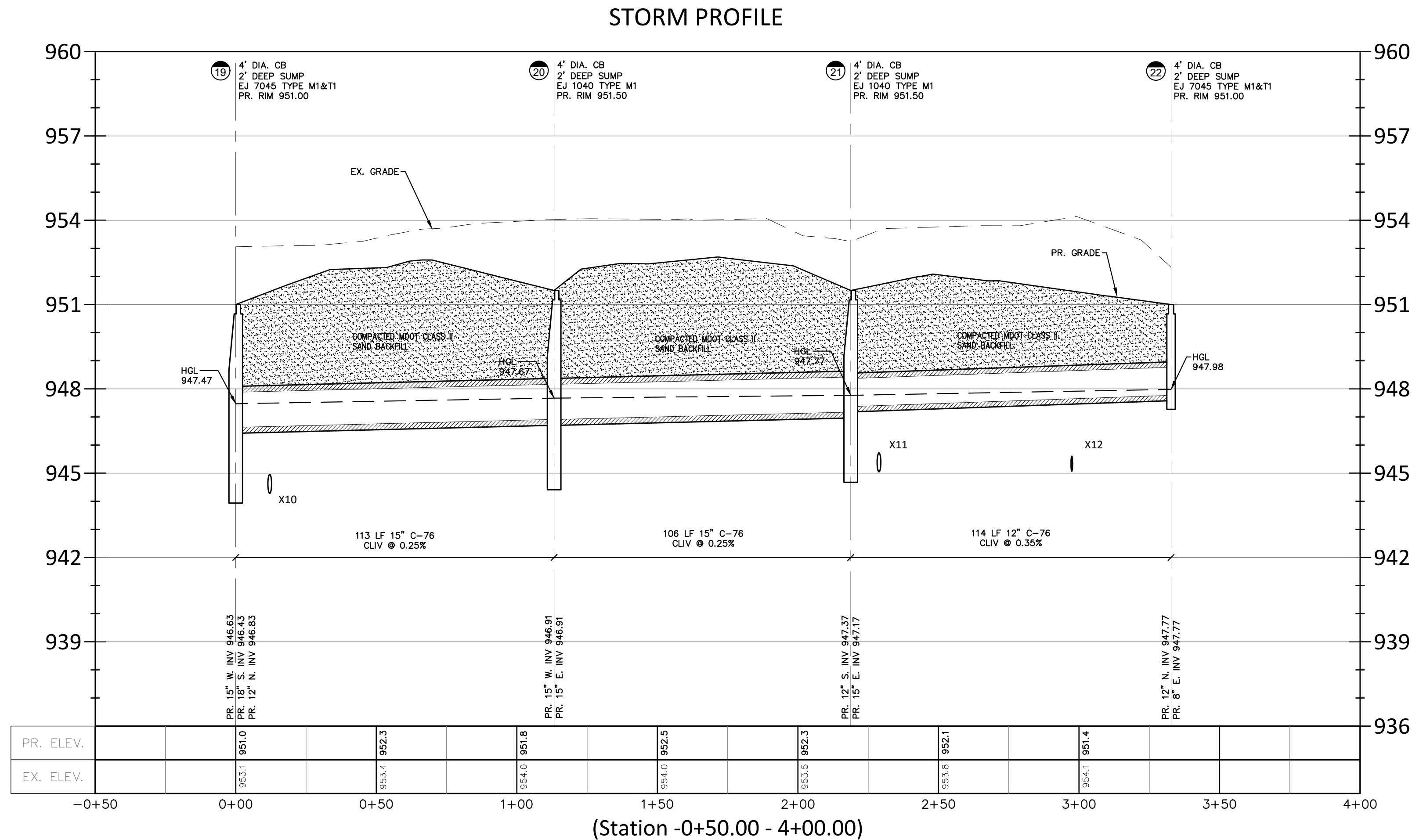
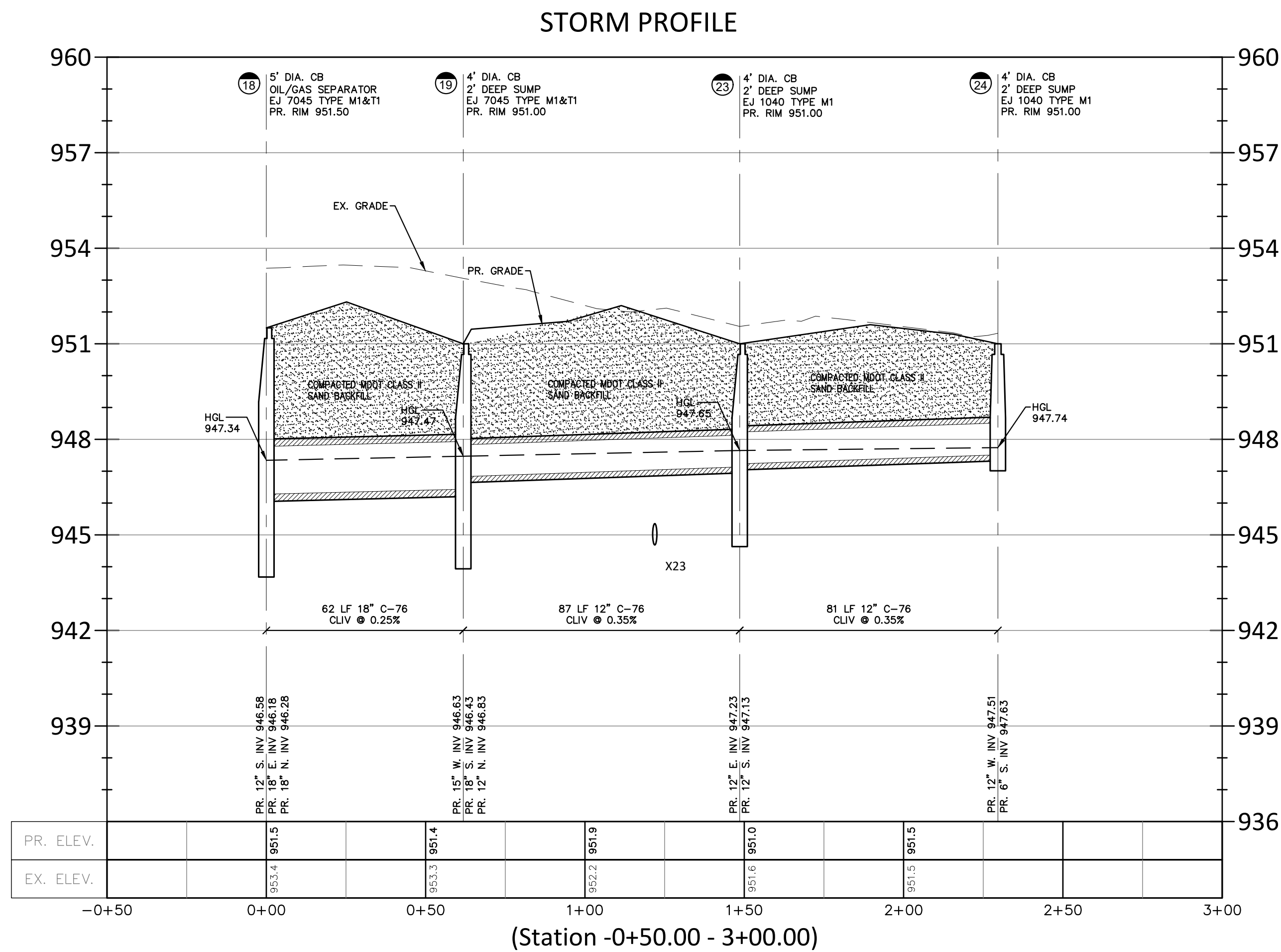
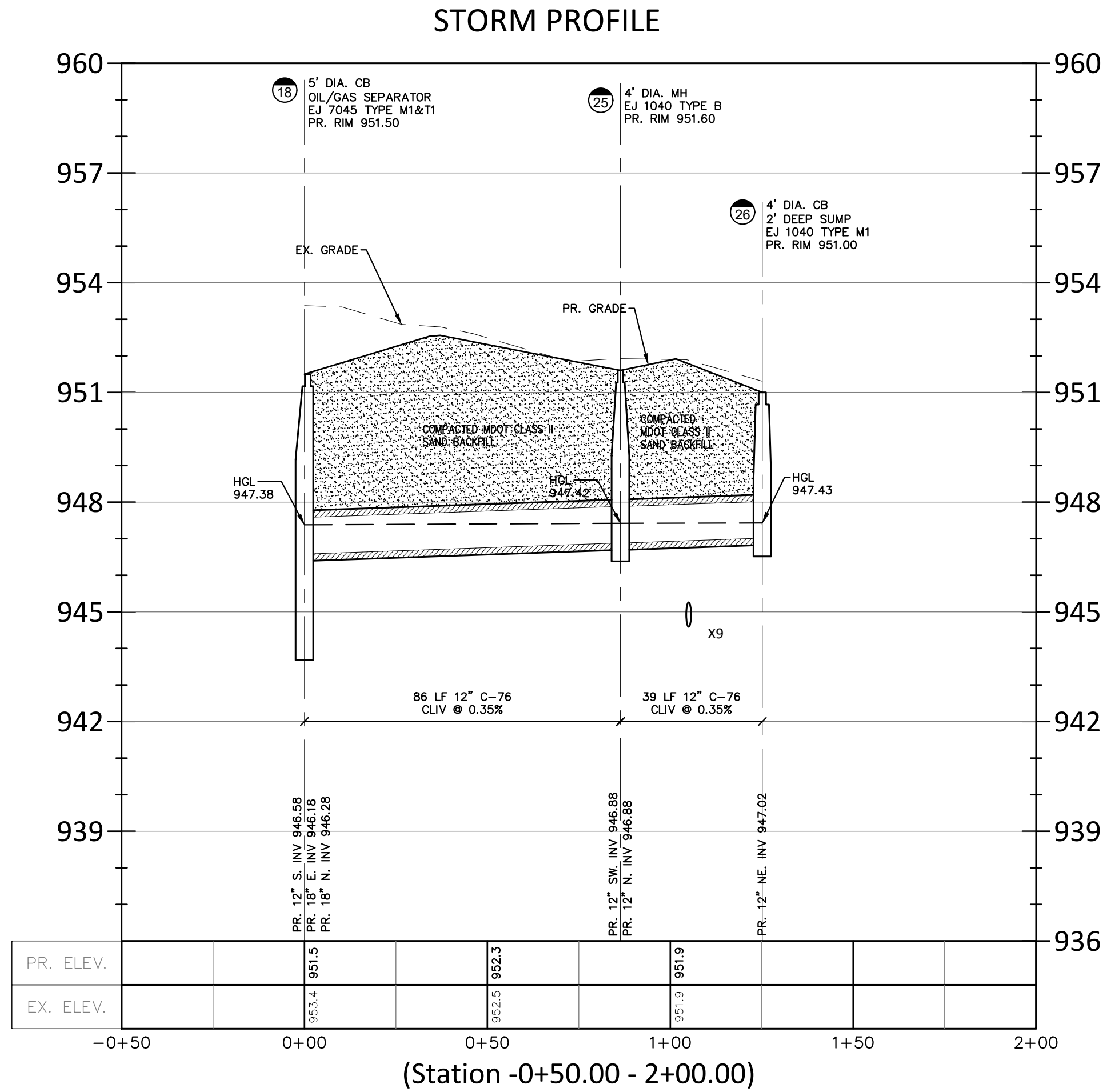
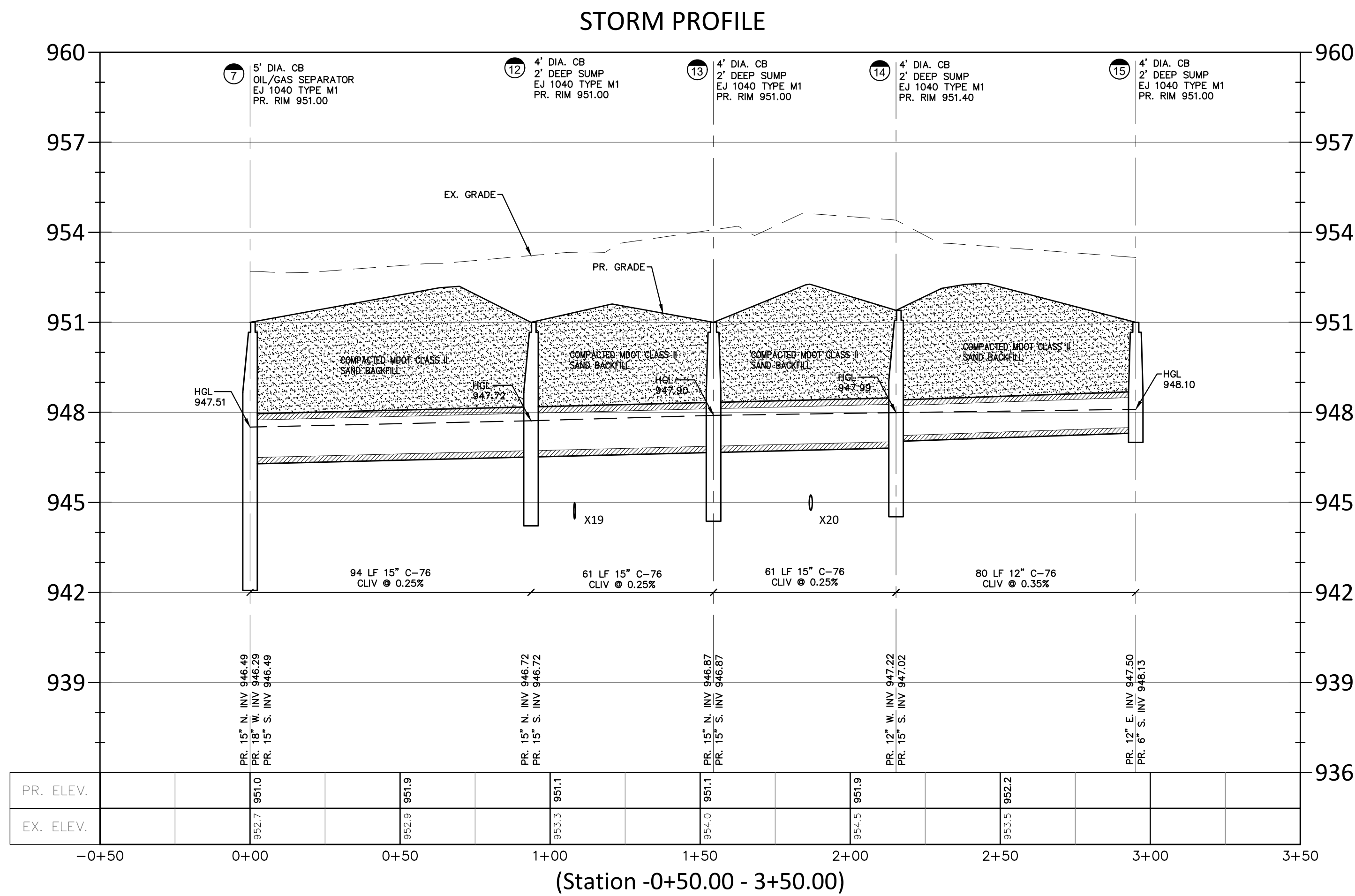
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NFE JOB NO.

H046-03

SHEET NO.

C9



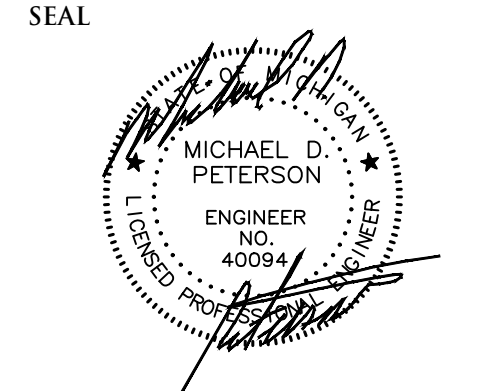
NOTE
COMPACTED SAND BACKFILL (MDOT SAND CLASS II) SHALL BE PROVIDED
WITHIN THE INFLUENCE OF PAVED AREAS.

UTILITY CROSSING SCHEDULE

X1 12" STM B/P 942.83 8" WM T/P 941.33	X13 6" STM B/P 948.12 8" WM T/P 945.58
X2 GAS VERIFY IF FIELD 8" WM T/P V.I.F.	X14 6" STM B/P 948.22 8" WM T/P 945.47
X3 ELEC VERIFY IF FIELD 8" WM T/P V.I.F.	X15 6" SAN B/P 944.90 8" WM T/P 943.40
X4 FIBER VERIFY IF FIELD 8" WM T/P V.I.F.	X16 15" STM B/P 946.58 6" SAN T/P 945.03
X5 GAS VERIFY IF FIELD 15" STM T/P V.I.F.	X17 18" STM B/P 946.04 8" WM T/P 944.54
X6 ELEC VERIFY IF FIELD 15" STM T/P V.I.F.	X18 6" SAN B/P 944.90 8" WM T/P 943.40
X7 FIBER VERIFY IF FIELD 15" STM T/P V.I.F.	X19 15" STM T/P 946.55 6" SAN B/P 945.01
X8 15" STM B/P 945.37 8" WM T/P 943.87	X20 15" STM B/P 946.74 6" WM T/P 945.24
X9 12" STM B/P 946.79 8" WM T/P 944.96	X21 6" STM B/P 948.22 8" WM T/P 945.42
X10 15" STM B/P 946.45 8" WM T/P 944.95	X22 6" STM B/P 947.72 8" WM T/P 945.39
X11 12" STM B/P 947.24 8" WM T/P 945.72	X23 12" STM B/P 946.88 8" WM T/P 945.38
X12 12" STM B/P 947.46 6" SAN T/P 945.67	X24 FIBER VERIFY IN FIELD 8" WM T/P 945.70
	X25 8" WM B/P 945.04 8" SAN T/P 938.80



NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257



PROJECT
Fountain View
Professional Center
44244 Twelve Mile Road
Novi, MI 48375

CLIENT
Acquia Realty Holdings
44090 12 Mile Road
Novi, MI 48377

Contact: Joseph Schimizzi
Phone: (888) 560-5540

PROJECT LOCATION
Part of the SE 1/4
Section 10
T. 1N, R. 8E
City of Novi,
Oakland County, Michigan

SHEET
Storm Profile Plan 2



REVISIONS
11-13-20 ISSUED FOR SITE PLAN
4-23-21 REV PER PRELIM SP REVIEW
5-10-21 REV PER PRELIM SP REVIEW
7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY:
M. Kurmas
DESIGNED BY:
M. Kurmas
APPROVED BY:
M. Collins
DATE:
03-27-2019

SCALE: 1" = 30' / 1"=3'
NFE JOB NO. H046-03
SHEET NO. C11

The diagram shows a cross-section of a bridge deck with two spans. The left span is supported by a pier with a 57 LF 8" PVC TRUSS at a 0.50% slope. The right span is supported by a pier with a 272 LF 8" PVC TRUSS at a 0.50% slope. The bridge deck is filled with compacted #2 sand backfill. The diagram includes labels for existing and proposed grades, and elevations for various points.

Station	P.R. ELEV.	EX. ELEV.
-0+50		
0+00		950.9
0+50	952.2	951.3
1+00	951.9	951.4
1+50	952.3	953.2
2+00	952.2	953.1
2+50	952.0	953.0
3+00	952.2	953.2
3+50		
4+00		



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811
 w what's below
Call before you dig.

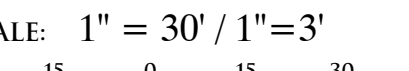
DRAWN BY:
M. Kurmas

DESIGNED BY:
M. Kurmas

APPROVED BY:
M. Peterson

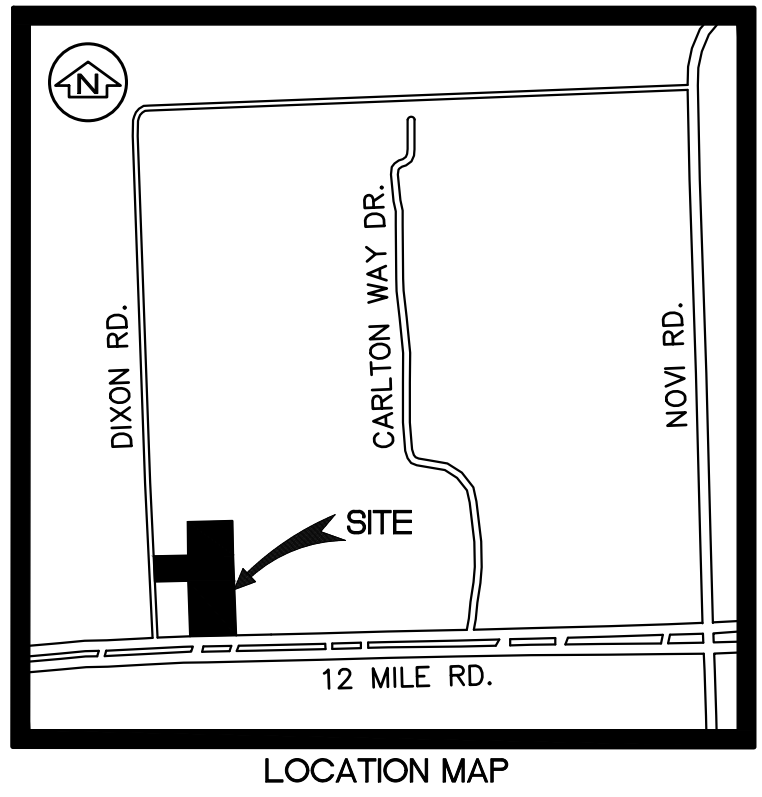
DATE:
03-27-2019

SCALE: $1" = 30' / 1"=3'$



NFF JOB NO. **H046-03**

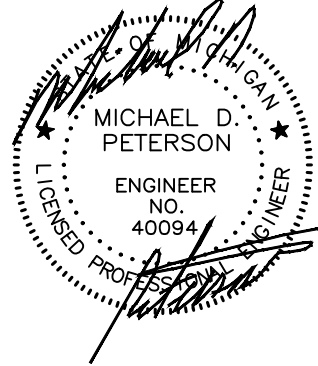
SHEET NO. **C12**



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SEAL



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CLIENT

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Contact: Joseph Schimizza
Phone: (888) 560-5540

PROJECT LOCATION

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Section 10
T. 1N, R. 8E
City of Novi,
Oakland County, Michigan

SHEET

Water Main Profile Plan 1



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4-23-21 REV PER PRELIM SP REVIEW
5-10-21 REV PER PRELIM SP REVIEW
7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY:

M. Kurmas

DESIGNED BY:

M. Kurmas

APPROVED BY:

M. Peterson

DATE: _____

03-27-2019

SCALE: $1'' = 30'$ / $1'' = 3$

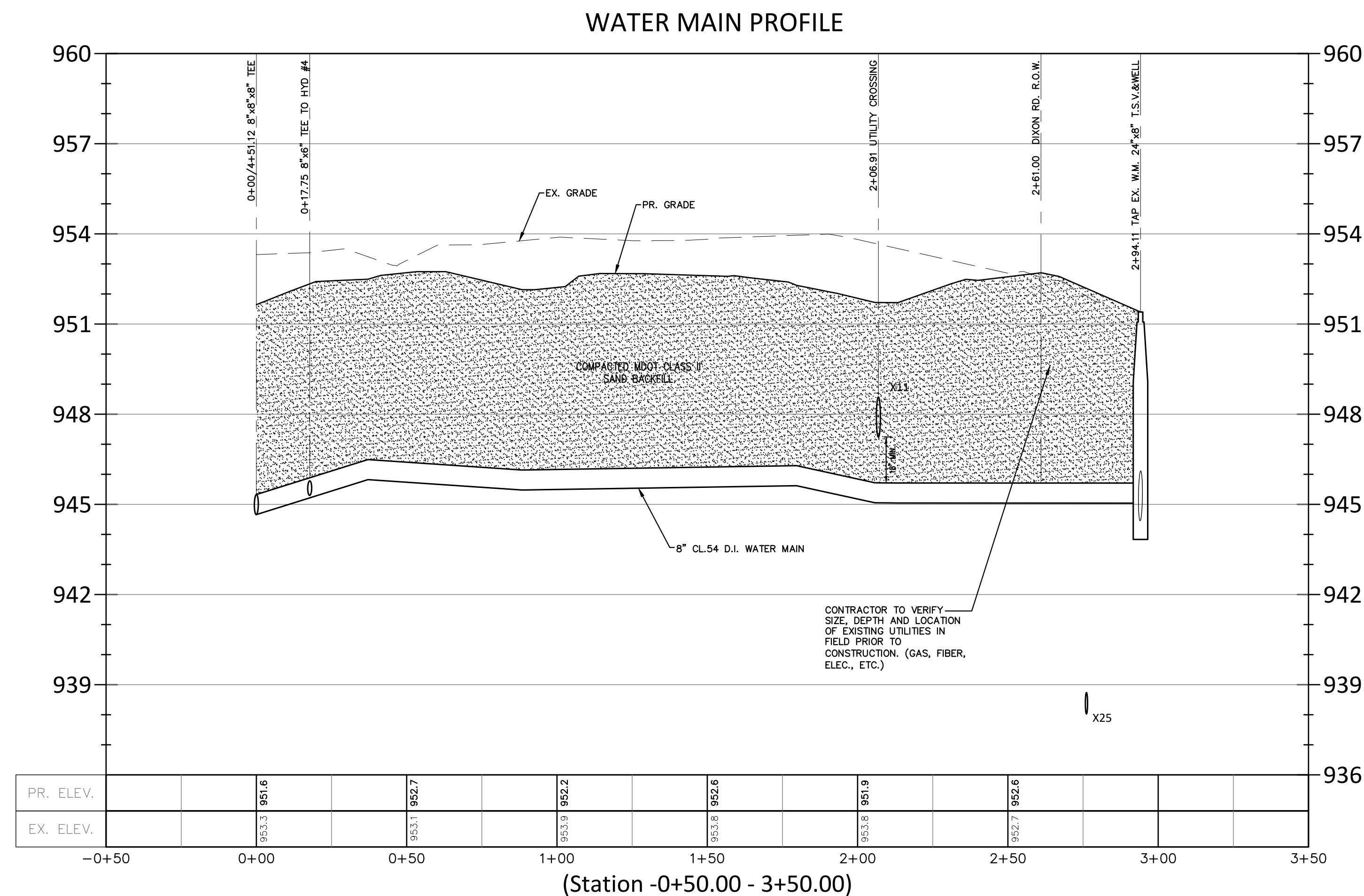
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NFE JOB NO

H046-03

SHEET NO

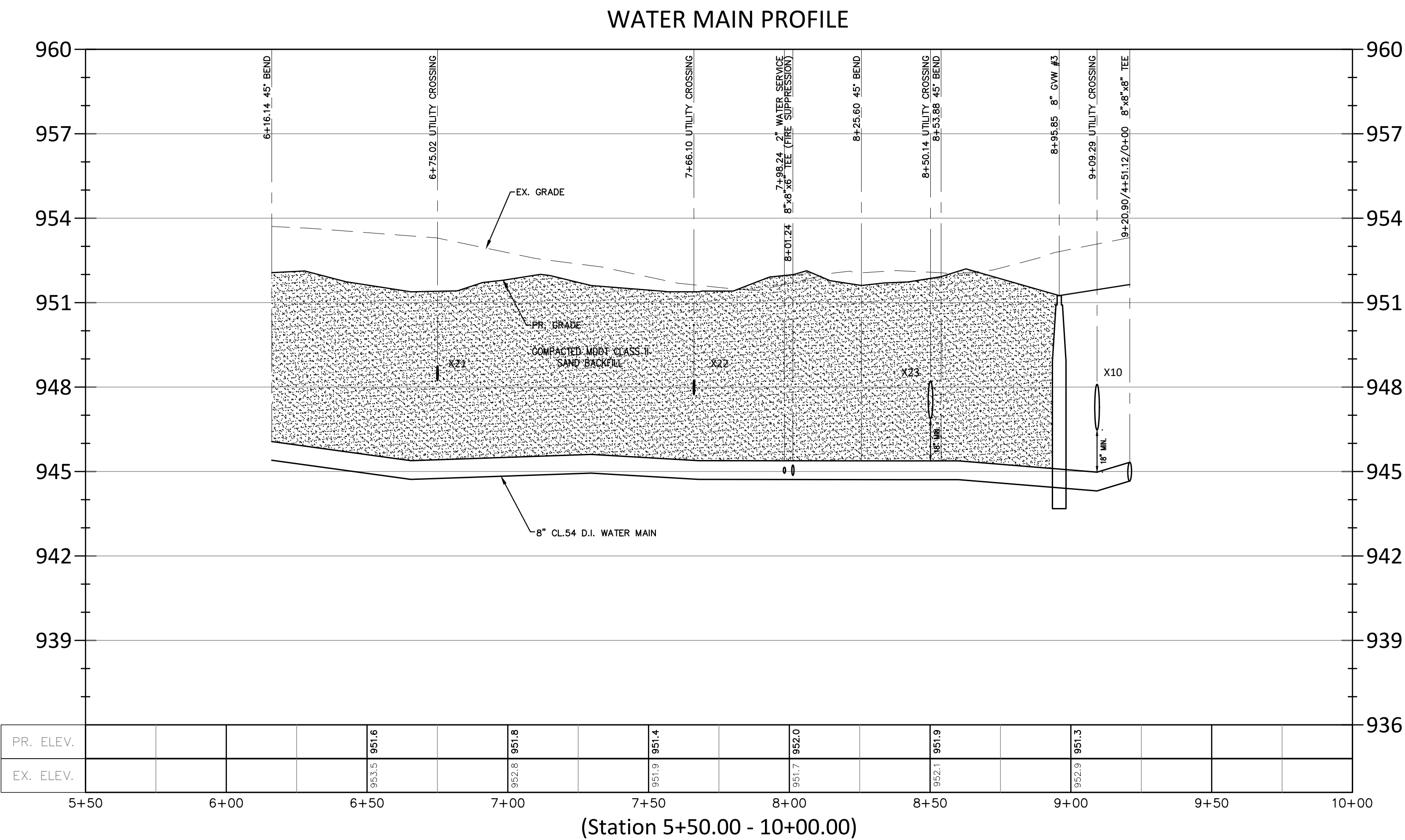
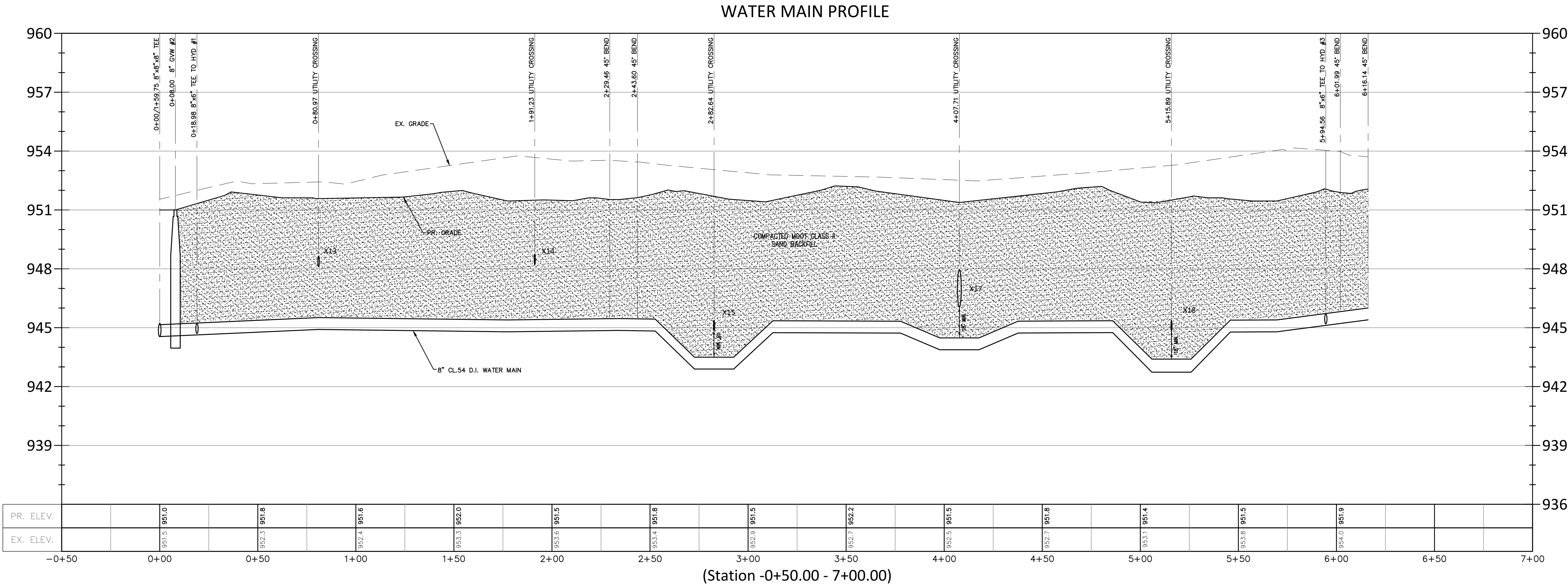
C13



UTILITY CROSSING SCHEDULE

X1	12" STM B/P 942.83 8" WM T/P 941.33	X13	6" STM B/P 945.18 8" WM T/P 945.18
X2	GAS VERIFY IF FIELD 8" WM T/P V.I.F.	X14	6" STM B/P 948.27 8" WM T/P 945.49
X3	ELEC VERIFY IF FIELD 8" WM T/P V.I.F.	X15	6" SAN B/P 943.90 8" WM T/P 943.40
X4	FIBER VERIFY IF FIELD 8" WM T/P V.I.F.	X16	15" STM B/P 946.58 6" SAN T/P 945.03
X5	GAS VERIFY IF FIELD 15" STM T/P V.I.F.	X17	18" STM B/P 946.06 8" WM T/P 944.94
X6	ELEC VERIFY IF FIELD 15" STM T/P V.I.F.	X18	6" SAN B/P 944.50 8" WM T/P 944.50
X7	FIBER VERIFY IF FIELD 15" STM T/P V.I.F.	X19	15" STM T/P 946.50 6" SAN B/P 945.01
X8	15" STM B/P 945.37 8" WM T/P 943.87	X20	15" STM B/P 946.71 6" WM T/P 945.24
X9	12" STM B/P 946.79 8" WM T/P 944.96	X21	6" STM B/P 948.22 6" WM T/P 945.42
X10	15" STM B/P 946.95 8" WM T/P 944.95	X22	6" STM B/P 947.72 8" WM T/P 945.39
X11	12" STM B/P 947.24 8" WM T/P 945.72	X23	12" STM B/P 946.38 8" WM T/P 945.88
X12	12" STM B/P 947.46 6" SAN T/P 945.67	X24	FIBER VERIFY IF FIELD 8" WM T/P 945.70
		X25	8" WM B/P 945.04 8" SAN T/P 938.80

NOTE
COMPACTED SAND BACKFILL (MDOT SAND CLASS II) SHALL BE PROVIDED
WITHIN THE INFLUENCE OF PAVED AREAS.



UTILITY CROSSING SCHEDULE			
X1	12" STM B/P 942.83 8" WM T/P 941.33	X13	6" STM B/P 948.12 8" WM T/P 945.58
X2	GAS VERIFY IF FIELD 8" WM T/P V.I.F.	X14	6" STM B/P 948.22 8" WM T/P 945.47
X3	ELEC VERIFY IF FIELD 8" WM T/P V.I.F.	X15	6" SAN B/P 944.90 8" WM T/P 943.40
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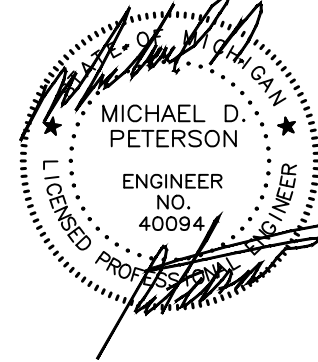
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SHEET

Water Main Profile Plan 2



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M. Peterson

DATE:

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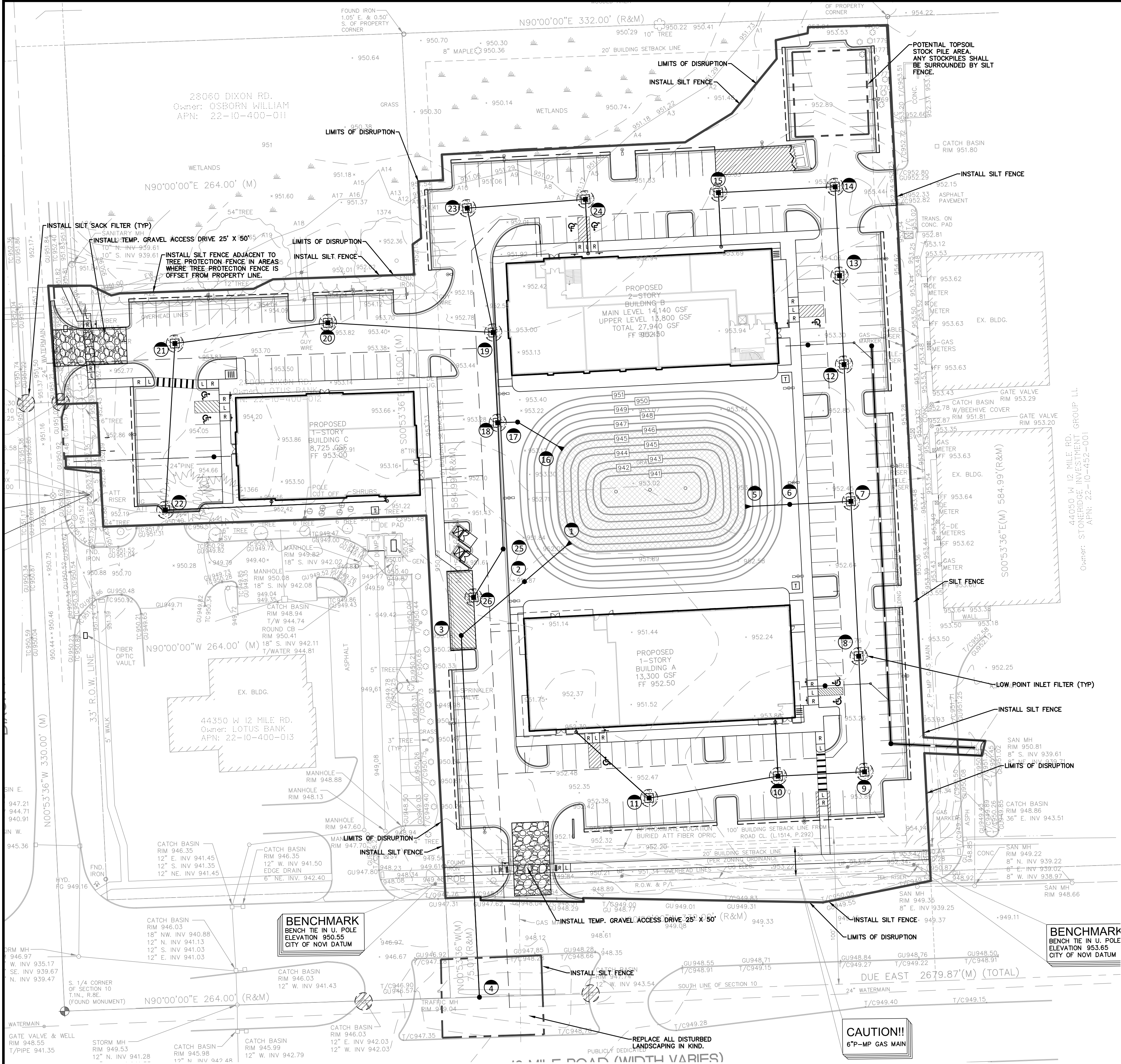
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NFE JOB NO.

H046-03

SHEET NO.

C14



LEGAL DESCRIPTION: PARCEL 1

Land situated in the County of Oakland, City of Novi, State of Michigan, is described as follows:

Part of the Southwest 1/4 of the Southeast 1/4 of Section 10, Town 1 North, Range 8 East, City of Novi, Oakland County, Michigan, described as: Beginning at a point distant East, 264.00 feet and North 00 degrees 52 minutes 00 seconds West, 75.01 feet from the South 1/4 corner; thence North 00 degrees 52 minutes 00 seconds West, 584.99 feet; thence East 332.00 feet; thence South 00 degrees 52 minutes 00 seconds East, 584.99 feet; thence West 332.00 feet to the Point of Beginning.

Commonly known as: 44244 W. 12 Mile Road, Novi, MI 48377

Tax ID: 50-22-10-400-067

Based on a field survey being described as:

Part of the Southwest 1/4 of the Southeast 1/4 of Section 10, Town 1 North, Range 8 East, City of Novi, Oakland County, Michigan, described as: Commencing at the South 1/4 corner of said Section 10; thence along the South line of said Section 10, Due East 264.00 feet; thence North 00 degrees 53 minutes 36 seconds West 75.01 feet to a point on the Northernly Right-of-Way line of 12 Mile Road (width varies) and the point of beginning; thence continuing, North 00 degrees 53 minutes 36 seconds West 584.99 feet; thence Due East 332.00 feet; thence South 00 degrees 53 minutes 36 seconds East 584.99 feet to a point on said Northernly Right-of-Way line of 12 Mile Road; thence along said Northernly Right-of-Way line, Due West 332.00 feet to the point of beginning. Containing 194,193 square feet or 4.458 acres

LEGAL DESCRIPTION: PARCEL 2

Part of the Southwest 1/4 of the Southeast 1/4 of Section 10, Town 1 North, Range 8 East, City of Novi, Oakland County, Michigan, described as: Commencing at the South 1/4 of said Section; thence North 00 degrees 53 minutes 36 seconds West, 330.00 feet along the North-South 1/4 line of said Section 10 to the Point of Beginning; thence continuing along said North-South 1/4 line, North 00 degrees 53 minutes 36 seconds West, 165.00 feet; thence North 90 degrees 00 minutes 00 seconds East, 264.00 feet; thence South 00 degrees 53 minutes 36 seconds East, 165.00 feet; thence North 90 degrees 00 minutes 00 seconds West, 264.00 feet to the point of beginning. Containing 43,585 square feet or 1.000 acre.

Commonly known as: 28000 Dixon Road, Novi, MI 48377

Tax ID: 50-22-10-400-012

NOTES

SITE IS LOCATED A DISTANCE OF \pm 2,900 FEET EAST OF THE WALLED LAKE BRANCH DRAIN.

THE TOTAL AREA OF EARTH DISRUPTION IS 4.958 ACRES.

THE SOIL EROSION CONTROLS WILL BE MAINTAINED WEEKLY AND AFTER EVERY STORM EVENT BY THE CONTRACTOR.

A SOIL EROSION PERMIT IS REQUIRED FROM THE CITY OF NOVI.

IF DE-WATERING IS ANTICIPATED OR ENCOUNTERED DURING CONSTRUCTION, A DE-WATERING PLAN MUST BE SUBMITTED TO THE ENGINEERING DIVISION FOR REVIEW.

THE STORM WATER BASINS SHALL BE STABILIZED PRIOR TO DIRECTING FLOW TO THE BASIN.

STORM WATER PRETREATMENT STRUCTURE SHALL BE INSPECTED WEEKLY FOR SEDIMENT ACCUMULATION UNTIL SITE IS STABILIZED AND WILL BE CLEANED AS REQUIRED.

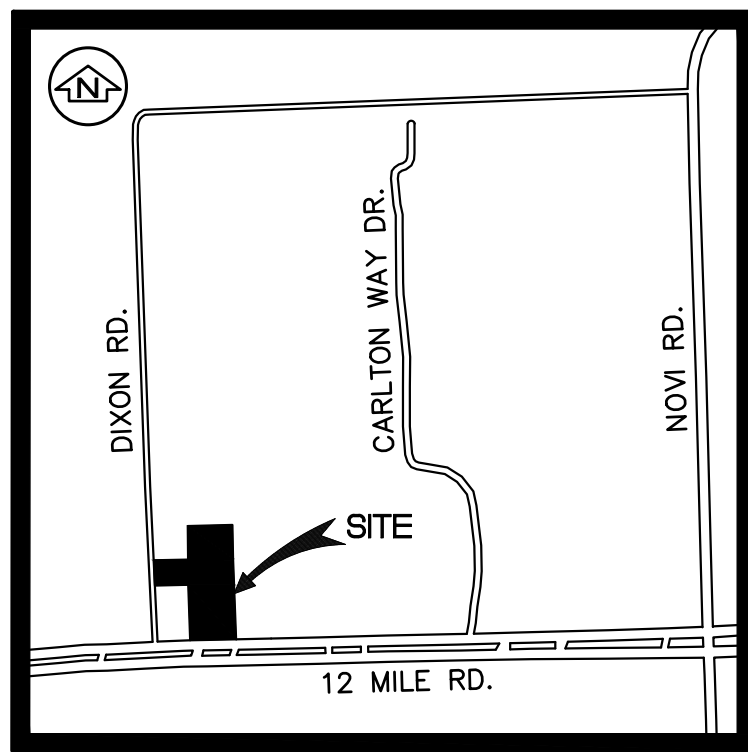
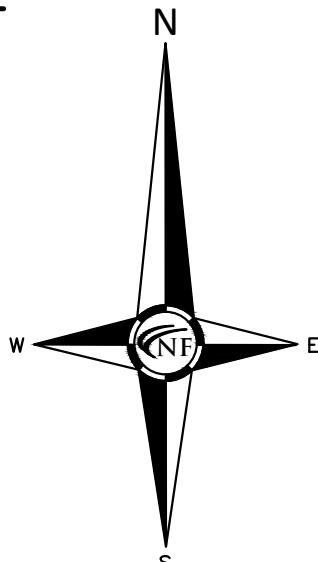
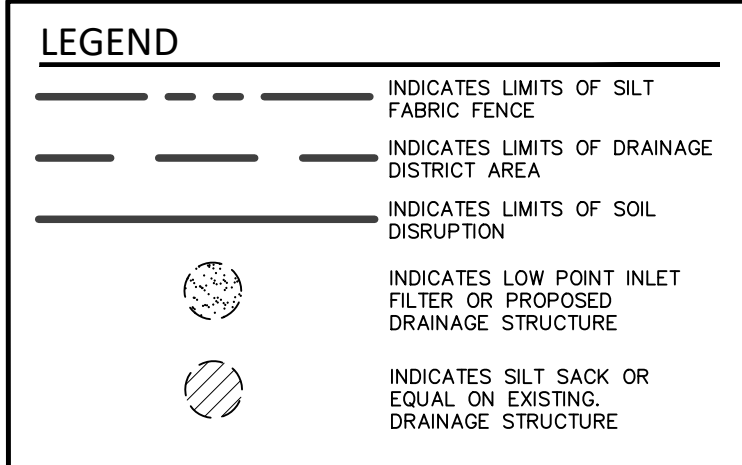
STREET SWEEPING AND DUST CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

IT IS THE DEVELOPER'S RESPONSIBILITY TO GRADE AND STABILIZE DISTURBED AREAS DUE TO THE INSTALLATION OF PUBLIC UTILITIES.

3 TO 4 INCHES OF TOPSOIL SHALL BE USED FOR RESTORATION WHERE VEGETATION IS REQUIRED.

DATUM NOTE

TO HAVE ELEVATIONS IN THE CITY OF NOVI DATUM, SUBTRACT 0.15' FROM ALL GRADES



LOCATION MAP

SOIL EROSION CONTROL - SEQUENCE OF OPERATION (NEW CONSTRUCTION)

INSTALL CRUSHED CONCRETE ACCESS DRIVE AND TEMPORARY CULVERTS AT THE SITE ENTRANCE AS INDICATED ON THE PLANS.

INSTALL SILT FENCE OR SIMILAR APPROVED SILT BARRIER ALONG PROPERTY LINES AND AROUND SENSITIVE NATURAL FEATURES AS INDICATED ON THE PLANS.

EXCAVATE A SHALLOW SWALE/DITCH AROUND PERIMETER OF SITE. GRADE THE TEMPORARY SWALE TO AN EXISTING DRAINAGE FACILITY. PLACE OUTLET FILTER IN EXISTING UPSTREAM STORM SEWER FACILITIES.

IF INDICATED ON CONSTRUCTION PLANS, SEDIMENTATION BASINS, DETENTION POND, ETC., SHALL BE CONSTRUCTED PRIOR TO THE INSTALLATION OF ANY OTHER WORK.

STRIP EXISTING TOPSOIL, VEGETATION AND ORGANIC MATTER FROM BUILDING PAD AND PARKING AREAS. COMMENCE LAND BALANCE AND MASS GRADING OPERATIONS. MAINTAIN A MINIMUM BUFFER OF 15' OF EXISTING VEGETATION WHEREVER POSSIBLE AROUND SITE PERIMETER. STOCK PILES SHOULD BE LOCATED AWAY FROM EXISTING DRAINAGE FACILITIES.

EXCAVATE AND INSTALL UNDERGROUND UTILITIES. INSTALL PEASTONE INLET FILTERS AROUND ALL NEW STORM SEWER FACILITIES AS INDICATED ON THE PLANS. EXISTING AND PROPOSED STORM SEWER FACILITIES SHALL BE PROTECTED FROM EROSION AND SEDIMENT INFILTRATION AT ALL TIMES.

COMMENCE FINAL GRADING AND TRIMMING OPERATIONS. PREPARE SUBGRADE FOR INSTALLATION OF PROPOSED PAVEMENT.

SEED AND MULCH ALL DISTURBED SITE AREAS AND INSTALLED SITE LANDSCAPING.

REMOVE CONSTRUCTION DEBRIS AND JET VAC NEWLY INSTALLED STORM SEWER SYSTEM AS REQUIRED BY THE MUNICIPALITY.

REMOVE ALL REMAINING TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES ONCE PERMANENT MEASURES ARE ESTABLISHED.

WHENEVER POSSIBLE, THE SITE SHALL BE GRADED TO WITHIN SIX INCHES (6") OF THE PROPOSED FINISH GRADE PRIOR TO INSTALLATION OF UNDERGROUND FACILITIES.

STAGING OF PROPOSED WORK SHALL BE COMPLETED BY THE CONTRACTOR AS REQUIRED TO ENSURE PROGRESSIVE STABILIZATION OF DISTURBED AREAS.

SOIL EROSION CONTROL

CUTTING, FILLING AND GRADING SHALL BE MINIMIZED AND THE NATURAL TOPOGRAPHY OF THE SITE SHALL BE PRESERVED TO THE MAXIMUM POSSIBLE EXTENT, EXCEPT WHERE SPECIFIC FINDINGS DEMONSTRATE THAT MAJOR ALTERATIONS WILL STILL MEET THE PURPOSES AND REQUIREMENTS OF THIS ORDINANCE.

DEVELOPMENT SHALL BE STAGED TO KEEP THE EXPOSED AREAS OF SOIL AS SMALL AS PRACTICABLE.

SOIL EROSION CONTROL MEASURES SHALL BE INSTALLED BETWEEN THE DISTURBED AREA AND ANY WATERCOURSES, INCLUDING RIVERS, STREAMS, CREEKS, LAKES, PONDS AND OTHER WATERCOURSES; WETLANDS; OR ROADWAYS ON OR NEAR THE SITE.

SEDIMENT RESULTING FROM ACCELERATED SOIL EROSION SHALL BE REMOVES FROM RUNOFF WATER BEFORE THAT WATER LEAVES THE SITE.

TEMPORARY AND PERMANENT SOIL EROSION CONTROL MEASURES DESIGNED AND CONSTRUCTED FOR THE CONVEYANCE OF WATER AROUND, THROUGH, OR AWAY FROM THE SITE SHALL BE DESIGNED TO LIMIT THE WATER FLOW TO A NON-EROSIVE VELOCITY.

TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE REMOVED AFTER PERMANENT SOIL EROSION CONTROL MEASURES HAVE BEEN IMPLEMENTED. ALL SITES SHALL BE STABILIZED WITH PERMANENT SOIL EROSION CONTROL MEASURES.

IF LAKES, PONDS, CREEKS, STREAMS, OR WETLANDS ARE LOCATED ON OR NEAR THE SITE, EROSION CONTROL MEASURES WHICH DIVERT RUNOFF AND TRAP SEDIMENT MUST BE PROVIDED AT STRATEGIC LOCATIONS. STRAW BALE BERMS MAY BE USED AS TEMPORARY STORMWATER DIVERSION STRUCTURES, BUT WILL NOT BE CONSIDERED SUFFICIENT FOR TRAPPING SEDIMENT. THE USE OF SEDIMENT BASINS, FILTER FABRIC, VEGETATED BUFFER STRIPS, AND ROCK FILTERS IN LIEU OF STRAW BALE BERMS SHALL BE STRONGLY ENCOURAGED. OTHER MEASURES MAY BE REQUIRED IF REASONABLY DETERMINED TO BE NECESSARY TO PROTECT A WATERCOURSE OR WETLAND.

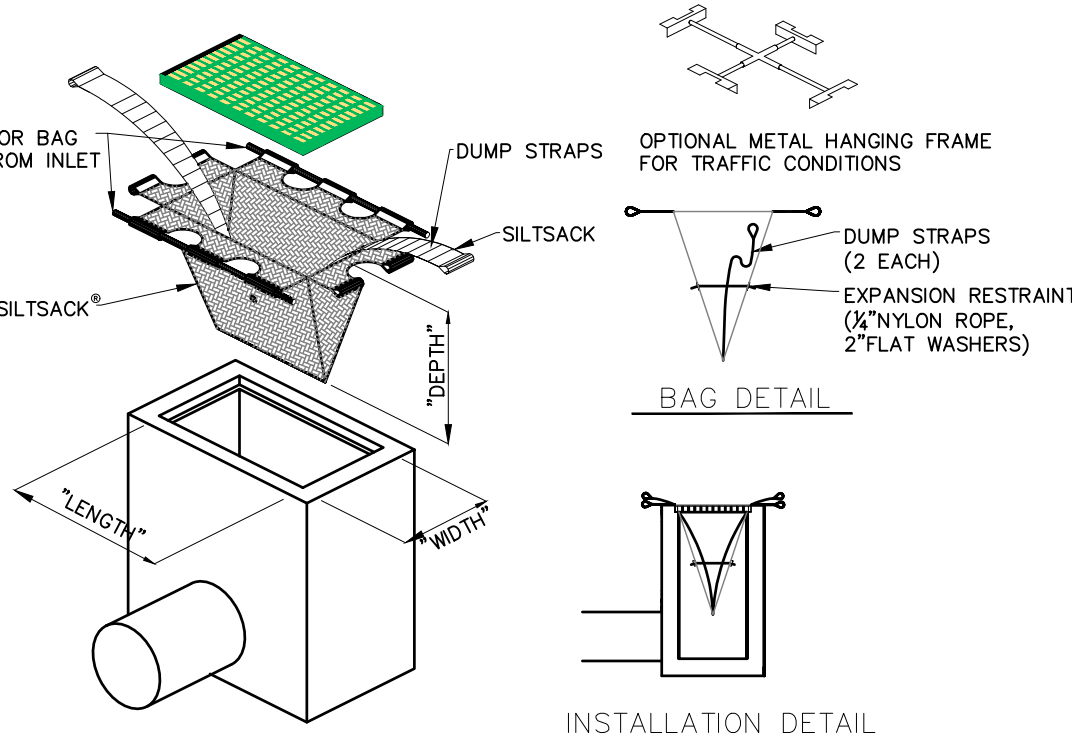
WHEN IT IS NOT POSSIBLE TO PERMANENTLY STABILIZE A DISTURBED AREA AFTER AN EARTH CHANGE HAS BEEN COMPLETED OR WHEN SIGNIFICANT EARTH CHANGE ACTIVITY CEASES, TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE INSTALLED.

PERMANENT EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 15 (FIFTEEN) CALENDAR DAYS AFTER FINAL GRADING OR THE FINAL EARTH CHANGE HAS BEEN COMPLETED. ALL TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED.

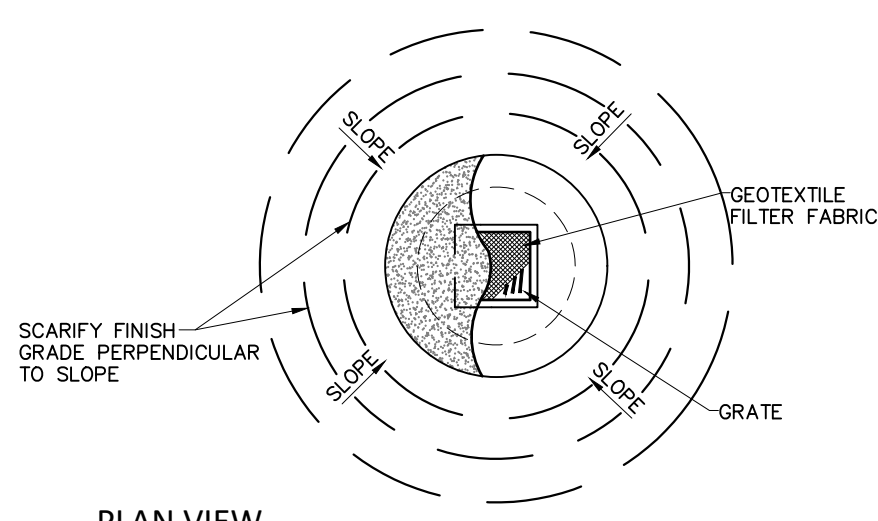
VEGETATED BUFFER STRIPS SHALL BE CREATED OR RETAINED ALONG THE EDGES OF ALL LAKES, PONDS, CREEKS, STREAMS, OTHER WATERCOURSES, OR WETLANDS.

EROSION AND SEDIMENTATION CONTROL MEASURES SHALL RECEIVE REGULAR MAINTENANCE TO ASSURE PROPER FUNCTIONING.

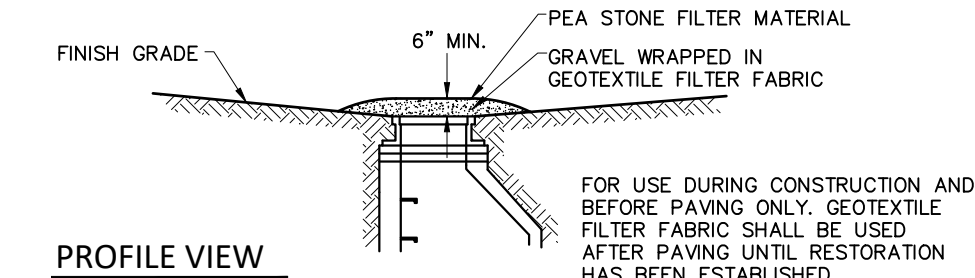
ALL GRADING PLANS AND SPECIFICATIONS, INCLUDING EXTENSIONS OF PREVIOUSLY APPROVED PLANS, SHALL INCLUDE PROVISIONS FOR EROSION AND SEDIMENT CONTROL IN ACCORDANCE WITH, BUT NOT LIMITED TO, THE STANDARDS CONTAINED IN THE "STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL", PUBLISHED BY THE OAKLAND SOIL CONSERVATION DISTRICT.



SILT SACK FILTER DETAIL



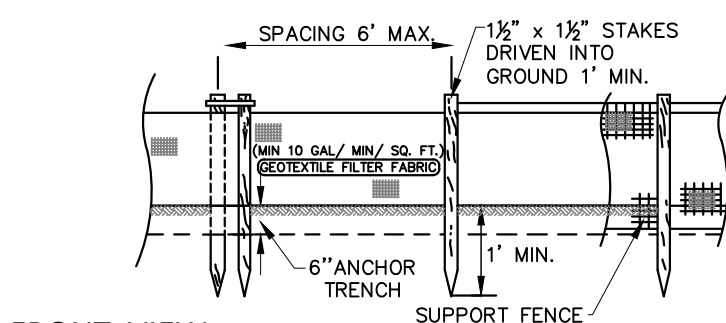
PLAN VIEW



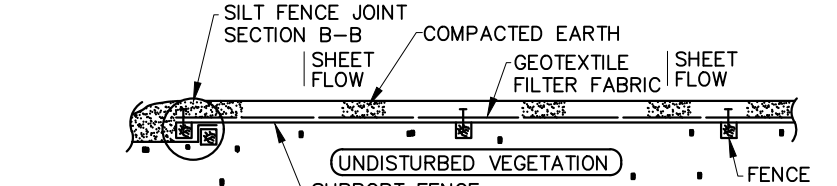
PROFILE VIEW

LOW POINT INLET FILTER

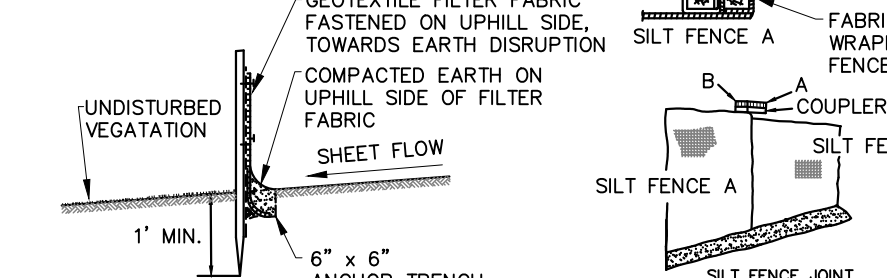
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FRONT VIEW



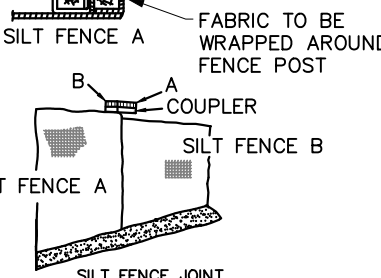
PLAN VIEW



SECTION A-A

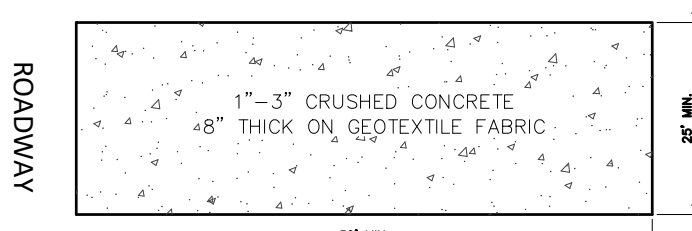
SILT FENCE DETAIL

N.T.S.



SECTION B-B

TEMPORARY CRUSHED CONCRETE CONSTRUCTION ACCESS ROAD



ESTIMATED QUANTITIES

DESCRIPTION	QUANTITY	UNITS
SILT FABRIC FENCING	2,386	LF
INLET FILTER	21	EA
TEMPORARY ACCESS ROAD	277	SY

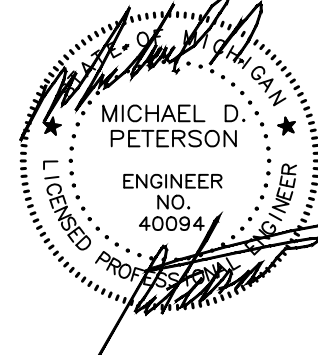
CONSTRUCTION SEQUENCE / TIMING SCHEDULE

1. INSTALL PERIMETER FILTER FABRIC FENCING AND STONE FILTER WHERE REQUIRED.	SEPT 2021
2. GRADE SITE AND ESTABLISH BUILDING PAD.	SEPT 2021
3. COMMENCE UNDERGROUND UTILITY WORK.	SEPT-OCT 2021
4. INSTALL INLET FILTERS ON PROPOSED DRAINAGE STRUCTURES.	SEPT-OCT 2021
5. INSTALL BUILDING FOUNDATIONS	OCT-NOV 2021
6. FILL IN SEDIMENTATION TRAPS AND PAVE SITE.	MAY 2022
7. COMPLETE ALL BUILDINGS AND LANDSCAPE ACTIVITY.	JUNE 2022
8. JET VAC NEW STORM SEWER SYSTEM AS REQUIRED.	JULY 2022
9. REMOVE ALL TEMPORARY SOIL EROSION MEASURES.	JULY 2022



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City of Novi,
Oakland County, Michigan

SHEET

Soil Erosion and
Sedimentation Control
Plan



Know what's below
Call before you dig.

REVISIONS

11-13-20 ISSUED FOR SITE PLAN
4-23-21 REV PER PRELIM SP REVIEW
5-10-21 REV PER PRELIM SP REVIEW
7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY:

M. Kurmas

DESIGNED BY:

M. Kurmas

APPROVED BY:

M. Peterson

DATE:

03-27-2019

SCALE: 1" = 40'

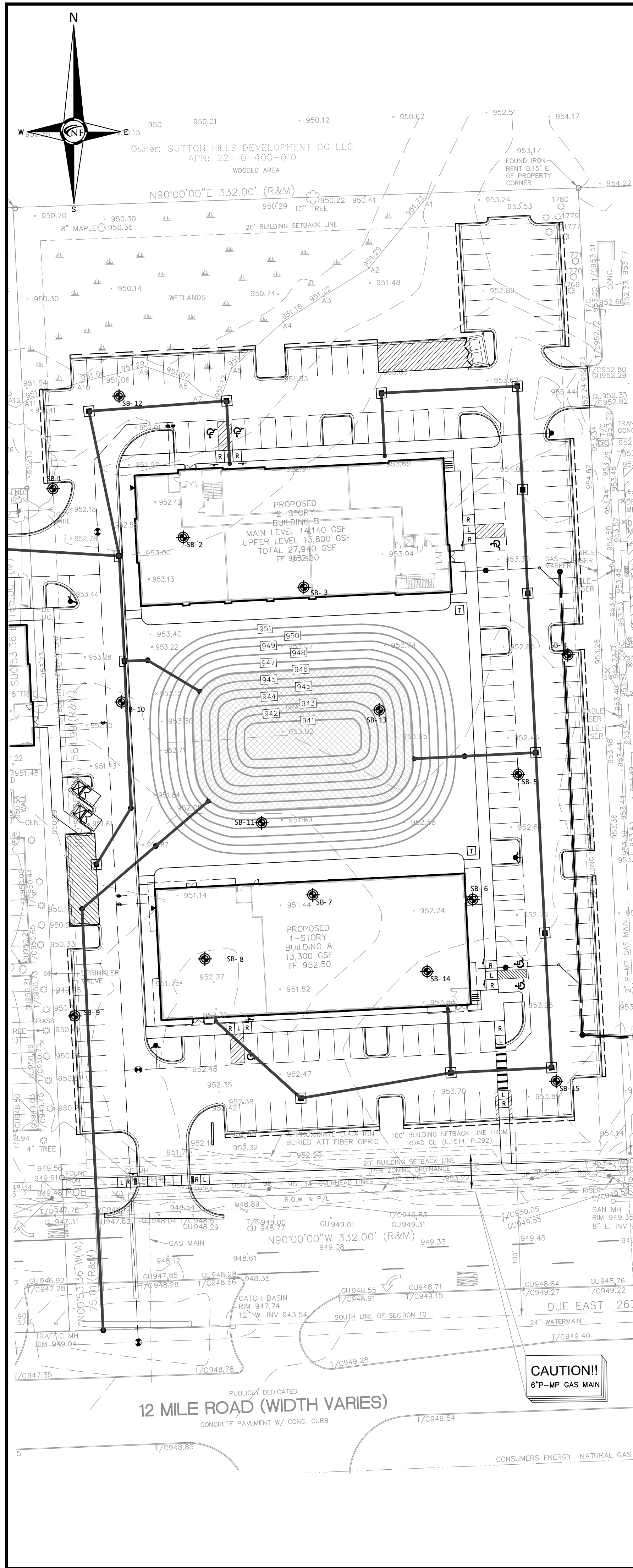
40 20 0 20 40 60

NFE JOB NO.

H046-03

SHEET NO.

C16



Testing Engineers & Consultants, Inc.
1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: 1			Job No.: 59229	Project: Stoneridge West II, 44244 Twelve Mile Road			
Client: Novi Forum, LLC				Location: Novi, Michigan			
Type of Rig: Truck				Drilled By: R. Favor			
Drilling Method: Solid Stem Augers				Started: 9/8/2018			
Ground Surface Elevation: 951.5				Completed: 9/8/2018			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
2.5	LS	3 5 5	1	Moist Dark Brown Sandy TOPSOIL	10.9	137	
			3	Firm Moist Brown CLAY With Some Silt & Trace Of Gravel			
5.0	LS	4 6 8		Firm Moist Variegated CLAY With Silt Layers	18.6	116	1730
7.5	LS	4 6 6			22.8	122	2550
10.0	LS	4 5 6			21.2	124	2060
12.5	LS	4 6 12	12		13.5	127	
				Medium Compact Wet Brown Medium SAND With Trace Of Gravel			
15.0			15				
				Bottom of Borehole at 15'			
17.5							
20.0							
22.5							
Water Encountered: 120"							
At Completion: 89"							
Boring No. 1							



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Boring No.: 4			Job No.: 59229	Project: Stoneridge West II, 44244 Twelve Mile Road			
Client: Novi Forum, LLC				Location: Novi, Michigan			
Type of Rig: Truck				Drilled By: R. Favor			
Drilling Method: Solid Stem Augers				Started: 9/8/2018			
Ground Surface Elevation: 953				Completed: 9/8/2018			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
			83	Moist Dark Brown Clayey TOPSOIL (10')			
2.5	LS	5 10 12	3	Stiff Moist Variegated Clay With Some Silt, Trace Of Gravel & Sand Seams-FILL	16.9	132	
5.0	LS	5 9 13	5.5	Stiff Moist Brown Oxidized Clay With Some Silt & Trace Of Gravel-FILL	15.6	128	6760
7.5	LS	5 7 8	8.5	Stiff Moist Variegated Clay With Some Silt, Trace Of Gravel & Sand Seams-FILL	16.2	131	4940
10.0	LS	2 2 1	10	Soft Moist Brown Clay With Some Silt, Trace Of Gravel, Wet Sand Seams & Crushed Asphalt-FILL	21.2	125	
12.5				Medium Compact Wet Brown Fine SAND With Trace Of Gravel			
15.0	LS	5 9 13	15	Bottom of Borehole at 15'	17.3	129	
17.5							
20.0							
22.5							
*N = Standard Penetration Resistance 20 = 125 lbs. blow/penetration LS = Sectional Line Sample 17 = Shelby Case Sample AS = Auger Sample					Water Encountered: 86"		
g = H2O, % of dry weight s = Silts, % of dry weight cl = Clay, % of dry weight gr = Unconsolidated Compaction, pf gc = Gravel, % RC = Rock Core					At Completion: 89"		
Boring No. 4							



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Boring No.: 2		Job No.: 59229		Project: Stoneridge West II, 44244 Twelve Mile Road			
Client: Novi Forum, LLC				Location: Novi, Michigan			
Type of Rig: Truck				Drilled By: R. Favor			
Drilling Method: Solid Stem Augers				Started: 9/8/2018			
Ground Surface Elevation: 951				Completed: 9/8/2018			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
2.5	LS	4	1	Moist Dark Brown Clayey TOPSOIL	14.2	126	
		6		Firm Moist Brown Sandy CLAY With Some Silt & Trace Of Gravel			
5.0	LS	7	3.5	Stiff Moist Variegated CLAY With Silt Layers	14.1	136	
		10		Stiff Moist Variegated Oxidized CLAY With Some Silt & Trace Of Gravel			
7.5	LS	5	5	Stiff Moist Variegated Oxidized CLAY With Some Silt & Trace Of Gravel	20.5	129	
		9					
10.0	LS	3	8	Firm Moist Variegated CLAY With Some Silt, Trace Of Gravel & Sand Seams	20.8	122	
		5					
12.5	LS	5	11	Stiff Moist Gray CLAY With Some Silt, Trace Of Gravel & Wet Sand Seams	12.6	153	
		6					
15.0	LS	5	15.5	Medium Compact Wet Brown Medium SAND With Trace Of Gravel	10.4		
		12					
20.0	LS	4	20	Bottom of Borehole at 20'			
		11					
22.5							
7d* - Standard Penetration Resistance bl - 2" (50 mm) SPT blow count LS - Sectioned Line Sample S - Shallow Test Sample AS - Auger Sample				w - H2O, % of dry weight p - Bulk Density, pcf qc - Unconfined Compression, pcf C - Cohesion, pcf NC - Rock Core			
				Water Encountered: 110"			
				At Completion: 98"			
				Boring No. 2			



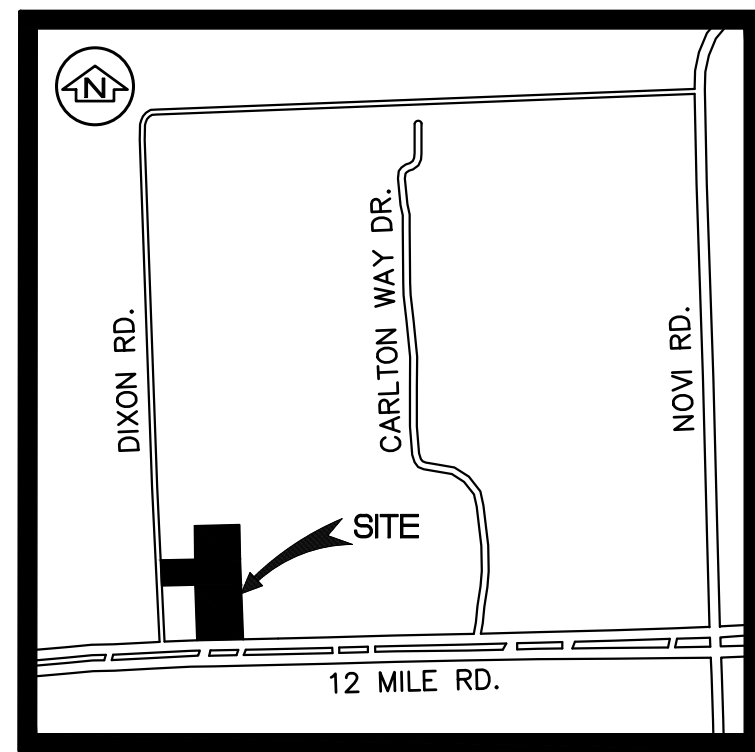
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Boring No.: 5		Job No.: 59229		Project: Stoneridge West II, 44244 Twelve Mile Road			
Client: Novi Forum, LLC				Location: Novi, Michigan			
Type of Rig: Truck				Drilled By: R. Favor			
Drilling Method: Solid Stem Augers				Started: 9/7/2018			
Ground Surface Elevation: 953				Completed: 9/7/2018			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
2.5	LS	5 9	1	Moist Dark Brown Sandy TOPSOIL	15.1	135	
			3	Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel			
5.0	LS	3 4 8	6	Firm Moist Variegated CLAY With Some Silt, Trace Of Gravel & Sand Seams	15.5	134	
				8			
7.5	LS	4 8 9	8	Extremely Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	11.1	138	9230
				10			
10.0	LS	5 6 10	10		9.6	142	8490
12.5	LS	6 8 12	12				
15.0	LS	5 8 10	15		3.8	136	
17.5	LS	5 8 10	17.5				
20.0			20	Bottom of Borehole at 20'			
22.5							
74" - Standard Penetration Resistance 50' - 100' - 150' - 200' - 250' - 300' - 350' - 400' - 450' - 500' - 550' - 600' - 650' - 700' - 750' - 800' - 850' - 900' - 950' - 1000' - 1050' - 1100' - 1150' - 1200' - 1250' - 1300' - 1350' - 1400' - 1450' - 1500' - 1550' - 1600' - 1650' - 1700' - 1750' - 1800' - 1850' - 1900' - 1950' - 2000' - 2050' - 2100' - 2150' - 2200' - 2250' - 2300' - 2350' - 2400' - 2450' - 2500' - 2550' - 2600' - 2650' - 2700' - 2750' - 2800' - 2850' - 2900' - 2950' - 3000' - 3050' - 3100' - 3150' - 3200' - 3250' - 3300' - 3350' - 3400' - 3450' - 3500' - 3550' - 3600' - 3650' - 3700' - 3750' - 3800' - 3850' - 3900' - 3950' - 4000' - 4050' - 4100' - 4150' - 4200' - 4250' - 4300' - 4350' - 4400' - 4450' - 4500' - 4550' - 4600' - 4650' - 4700' - 4750' - 4800' - 4850' - 4900' - 4950' - 5000' - 5050' - 5100' - 5150' - 5200' - 5250' - 5300' - 5350' - 5400' - 5450' - 5500' - 5550' - 5600' - 5650' - 5700' - 5750' - 5800' - 5850' - 5900' - 5950' - 6000' - 6050' - 6100' - 6150' - 6200' - 6250' - 6300' - 6350' - 6400' - 6450' - 6500' - 6550' - 6600' - 6650' - 6700' - 6750' - 6800' - 6850' - 6900' - 6950' - 7000' - 7050' - 7100' - 7150' - 7200' - 7250' - 7300' - 7350' - 7400' - 7450' - 7500' - 7550' - 7600' - 7650' - 7700' - 7750' - 7800' - 7850' - 7900' - 7950' - 8000' - 8050' - 8100' - 8150' - 8200' - 8250' - 8300' - 8350' - 8400' - 8450' - 8500' - 8550' - 8600' - 8650' - 8700' - 8750' - 8800' - 8850' - 8900' - 8950' - 9000' - 9050' - 9100' - 9150' - 9200' - 9250' - 9300' - 9350' - 9400' - 9450' - 9500' - 9550' - 9600' - 9650' - 9700' - 9750' - 9800' - 9850' - 9900' - 9950' - 10000' - 10050' - 10100' - 10150' - 10200' - 10250' - 10300' - 10350' - 10400' - 10450' - 10500' - 10550' - 10600' - 10650' - 10700' - 10750' - 10800' - 10850' - 10900' - 10950' - 11000' - 11050' - 11100' - 11150' - 11200' - 11250' - 11300' - 11350' - 11400' - 11450' - 11500' - 11550' - 11600' - 11650' - 11700' - 11750' - 11800' - 11850' - 11900' - 11950' - 12000' - 12050' - 12100' - 12150' - 12200' - 12250' - 12300' - 12350' - 12400' - 12450' - 12500' - 12550' - 12600' - 12650' - 12700' - 12750' - 12800' - 12850' - 12900' - 12950' - 13000' - 13050' - 13100' - 13150' - 13200' - 13250' - 13300' - 13350' - 13400' - 13450' - 13500' - 13550' - 13600' - 13650' - 13700' - 13750' - 13800' - 13850' - 13900' - 13950' - 14000' - 14050' - 14100' - 14150' - 14200' - 14250' - 14300' - 14350' - 14400' - 14450' - 14500' - 14550' - 14600' - 14650' - 14700' - 14750' - 14800' - 14850' - 14900' - 14950' - 15000' - 15050' - 15100' - 15150' - 15200' - 15250' - 15300' - 15350' - 15400' - 15450' - 15500' - 15550' - 15600' - 15650' - 15700' - 15750' - 15800' - 15850' - 15900' - 15950' - 16000' - 16050' - 16100' - 16150' - 16200' - 16250' - 16300' - 16350' - 16400' - 16450' - 16500' - 16550' - 16600' - 16650' - 16700' - 16750' - 16800' - 16850' - 16900' - 16950' - 17000' - 17050' - 17100' - 17150' - 17200' - 17250' - 17300' - 17350' - 17400' - 17450' - 17500' - 17550' - 17600' - 17650' - 17700' - 17750' - 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62600' - 62650' - 62700' - 62750' - 62800' - 62850' - 62900' - 62950' - 63000' - 63050' - 63100' - 63150' - 63200' - 63250' - 63300' - 63350' - 63400' - 63450' - 63500' - 63550' - 63600' - 63650' - 63700' - 63750' - 63800' - 63850' - 63900' - 63950' - 64000' - 64050' - 64100' - 64150' - 64200' - 64250' - 64300' - 64350' - 64400' - 64450' - 64500' - 64550' - 64600' - 64650' - 64700' - 64750' - 64800' - 64850' - 64900' - 64950' - 65000' - 65050' - 65100' - 65150' - 65200' - 65250' - 65300' - 65350' - 65400' - 65450' - 65500' - 65550' - 65600' - 65650' - 65700' - 65750' - 65800' - 65850' - 65900' - 65950' - 66000' - 66050' - 66100' - 66150' - 66200' - 66250' - 66300' - 66350' - 66400' - 66450' - 66500' - 66550' - 66600' - 66650' - 66700' - 66750' - 66800' - 66850' - 66900' - 66950' - 67000' - 67050' - 67100' - 67150' - 67200' - 67250' - 67300' - 67350' - 67400' - 67450' - 67500' - 67550' - 67600' - 67650' - 67700' - 67750' - 67800' - 67850' - 67900' - 67950' - 68000' - 68050' - 68100' - 68150' - 68200' - 68250' - 68300' - 68350' - 68400' - 68450' - 68500' - 68550' - 68600' - 68650' - 68700' - 68750' - 68800' - 68850' - 68900' - 68950' - 69000' - 69050' - 69100' - 69150' - 69200' - 69250' - 69300' - 69350' - 69400' - 69450' - 69500' - 69550' - 69600' - 69650' - 69700' - 69750' - 69800' - 69850' - 69900' - 69950' - 70000' - 70050' - 70100' - 70150' - 70200' - 70250' - 70300' - 70350' - 70400' - 70450' - 70500' - 70550' - 70600' - 70650' - 70700' - 70750' - 70800' - 70850' - 70900' - 70950' - 71000' - 71050' - 71100' - 71150' - 71200' - 71250' - 71300' - 71350' - 71400' - 71450' - 71500' - 71550' - 71600' - 71650' - 71700' - 71750' - 71800' - 71850' - 71900' - 71950' - 72000' - 72050' - 72100' - 72150' - 72200' - 72250' - 72300' - 72350' - 72400' - 72450' - 72500							



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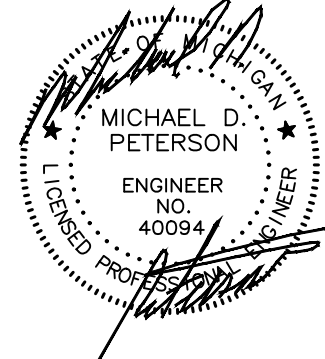
Boring No.: 3			Job No.: 59229		Project: Stoneridge West II, 44244 Twelve Mile Road		
Client: Novi Forum, LLC			Location: Novi, Michigan				
Type of Rig: Truck			Drilled By: R. Favor				
Drilling Method: Solid Stem Augers			Started: 9/8/2018				
Ground Surface Elevation: 953.5			Completed: 9/8/2018				
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
2.5	LS	4	1	Moist Dark Brown Clayey TOPSOIL	15.5	135	
		5	3	Firm Moist Variegated CLAY With Some Silt & Trace Of Gravel			
5.0	LS	6	5.5	Stiff Moist Variegated CLAY With Silt Layers	15.4	134	
		10					
7.5	LS	6	8	Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	7.8	132	
		10					
10.0	LS	5		Stiff Moist Brown CLAY With Some Silt, Trace Of Gravel & Sand Seams	18.2	128	5270
		7					
12.5	LS	10					
		7					
15.0	LS	6	14	Medium Compact Wet Brown Fine SAND With Trace Of Gravel	12.5	136	
		9					
17.5		10	15	Bottom of Borehole at 15'			
20.0							
22.5							
Water Encountered: 140"					At Completion: 134"		
Boring No. 3							



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NOWAK & FRAUS ENGINEERS
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PONTIAC, MI 48342-5032
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FAX. (248) 332-8257

SEAL



PROJECT

Fountain View
Professional Center
44244 Twelve Mile Road
Novi, MI 48375

CLIENT

Acquia Realty Holdings
44090 12 Mile Road
Novi, MI 48377

Contact: Joseph Schimizzi
Phone: (888) 560-5540

PROJECT LOCATION

Part of the SE 1/4
Section 10
T. 1N, R. 8E
City of Novi,
Oakland County, Michigan

SHEET

Soil Boring Logs



REVISIONS

11-13-20 ISSUED FOR SITE PLAN
4-23-21 REV PER PRELIM SP REVIEW
5-10-21 REV PER PRELIM SP REVIEW
7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY:

N. Naoom

DESIGNED BY:

APPROVED BY:

M. Peterson

DATE:

03-27-2019

SCALE: 1" = 40'

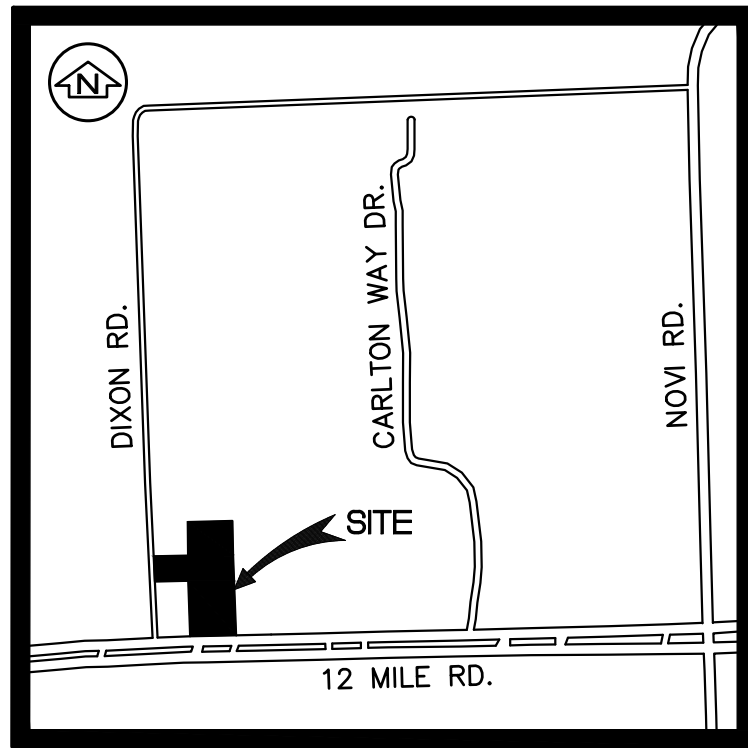
40 20 0 20 40 60

NFE JOB NO.

H046-03

SHEET NO.

C17



LOCATION MAP



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Boring No.: 6			Job No.: 59229		Project: Stoneridge West II, 44244 Twelve Mile Road			
Client: Novi Forum, LLC			Location: Novi, Michigan					
Type of Rig: Truck			Drilled By: R. Favor					
Drilling Method: Solid Stem Augers			Started: 9/7/2018					
Ground Surface Elevation: 952.5			Completed: 9/7/2018					
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu	
2.5	LS	6 7 9	1	Moist Dark Brown Sandy TOPSOIL	15.5	114		
			3.5	Stiff Moist Brown CLAY With Some Silt, Trace Of Gravel & Sand Seams				
5.0	LS	8 14 16		Stiff Moist Brown CLAY With Silt Layers & Trace Of Gravel	11.7	122	5690	
			6					
7.5	LS	8 21 22		Extremely Stiff Moist Variegated CLAY With Some Silt, Trace Of Gravel & Sand Seams	14.8	134	14500	
			8					
10.0	LS	8 10 9		Stiff Moist Variegated CLAY With Some Silt, Trace Of Gravel & Wet Sand Seams	9.6	139	5770	
			10					
12.5				Medium Compact Wet Brown Medium SAND With Trace Of Gravel				
15.0	LS	4 10 16			11.4	133		
			15					
17.5				Bottom of Borehole at 15'				
20.0								
22.5								
"N" - Standard Penetration Resistance			v - H ₂ O, % of dry weight			Water Encountered: 870"		
SD - 12" ID Split Barrel Sampler			LS - Liquid Shrinkage, per			At Completion: 91"		
LS - Shallow Line Sample			qu - Uncorrected Compression, psf			Boring No. 6		
SC - Shelby Tube Sample			GR - Gravel Fraction					
AG - Auger Sample			HC - Rock Core					

"N" - Standard Penetration Resistance
SS - 2" ID Split Spoon Sample
LS - Section Line Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H₂O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, pcf
SP - Direct Push
RC - Rock Core



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Boring No.: 7			Job No.: 59229			Project: Stoneridge West II, 44244 Twelve Mile Road		
Client: Novi Forum, LLC			Location: Novi, Michigan			Drilled By: R. Favor		
Type of Rig: Truck			Started: 9/7/2018			Completed: 9/7/2018		
Drilling Method: Solid Stem Augers			Ground Surface Elevation: 951.5					
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu	
2.5	LS	9 11 16	1	Moist Dark Brown Sandy TOPSOIL	16.1	132		
			3.5	Medium Compact Moist Brown Fine Sand With Trace Of Gravel-FILL				
5.0	LS	9 15 16		Extremely Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	8.6	119		
			5.5					
7.5	LS	7 11 14		Extremely Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	10.1	143	9810	
			7.5					
10.0	LS	5 9 11		Medium Compact Wet Brown Medium SAND With Trace Of Gravel & Clay Layers	14.9	133		
			11					
12.5				Medium Compact Wet Brown Fine SAND With Trace Of Gravel				
15.0	LS	6 10 11			17.9	130		
			15					
17.5				Bottom of Borehole at 15'				
20.0								
22.5								
76" - Standard Penetration Resistance 25 - 12" x 12" Split Barrel Sampler S1 - Sectioned Lead Seals S2 - Shelby Tube Sampler A3 - Auger Sample w = H2O, % of dry weight d = 2.4 x 10 ⁻³ in./gr ³ qu = Unconfined Compression, psf C _u = Area Push HC = Rock Core								
Water Encountered: 76"								
At Completion: 710"								
Boring No. 7								

"N" - Standard Penetration Resistance
SS - 2" ID Split Spoon Sample
LS - Section Line Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H₂O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, pcf
SP - Direct Push
RC - Rock Core



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Boring No.: 8			Job No.: 59229			Project: Stoneridge West II, 44244 Twelve Mile Road		
Client: Novi Forum, LLC			Location: Novi, Michigan			Drilled By: R. Favor		
Type of Rig: Truck			Started: 9/7/2018			Completed: 9/7/2018		
Drilling Method: Solid Stem Augers			Ground Surface Elevation: 951					
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu	
2.5	LS	4 6 11	1	Moist Dark Brown Sandy TOPSOIL	21.2	115		
			2.5	Stiff Moist Dark Brown Clay With Some Silt & Trace Of Gravel-FILL				
5.0	LS	9 11 14		Extremely Stiff Moist Variegated CLAY With Some Silt & Trace Of Gravel	10.8	140	10300	
			6					
7.5	LS	9 13 15		Stiff Moist Variegated CLAY With Some Silt & Trace Of Gravel	10.8	139	4200	
			8					
10.0	LS	7 9 14		Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	11.1	127	4610	
12.5	LS	5 9 10		Stiff Moist Gray CLAY With Some Silt & Trace Of Gravel	10.6	133	4040	
15.0								
17.5								
20.0	LS	6 8 11		Firm Moist Gray CLAY With Some Silt & Trace Of Gravel	11.2	138	2400	
22.5				Bottom of Borehole at 20'				
<div><div><div>7d = Standard Penetration Resistance (lb / ft²) (60 kN / m²)</div><div>LS = Standard Line Sample</div><div>LS1 = Standard Line Sample</div><div>AS = Auger Sample</div></div><div><div>w = H₂O, % of dry weight</div><div>d = Rock Density, pcf</div><div>qu = Unconfined Compression, psi</div><div>SPC = Standard Penetration Count</div><div>HC = Rock Core</div></div></div>								
Water Encountered: None								
At Completion: None								
Boring No. 8								

"N" - Standard Penetration Resistance
SS - 2" ID Split Spoon Sample
LS - Section Line Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H₂O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, pcf
SP - Direct Push
RC - Rock Core



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Boring No.: 9			Job No.: 59229		Project: Stoneridge West II, 44244 Twelve Mile Road			
Client: Novi Forum, LLC			Location: Novi, Michigan					
Type of Rig: Truck			Drilled By: R. Favor					
Drilling Method: Solid Stem Augers			Started: 9/7/2018					
Ground Surface Elevation: 951			Completed: 9/7/2018					
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu	
2.5	LS	6 10 18	67	Moist Dark Brown Sandy TOPSOIL (8")	10.5			
			3.5	Stiff Moist Variegated CLAY With Some Silt, Trace Of Gravel & Sand Seams				
5.0	LS	15 24 24		Extremely Stiff Moist Variegated CLAY With Some Silt & Trace Of Gravel	9.2			
			5.5					
7.5	LS	9 12 14		Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	11.4	123		
10.0	LS	7 11 14			11.2	141		
			11.5					
12.5				Stiff Moist Gray CLAY With Some Silt & Trace Of Gravel				
15.0	LS	7 10 16			10.7	136		
			15					
17.5				Bottom of Borehole at 15'				
20.0								
22.5								
<div>70" - Standard Penetration Resistance 23 - 2" to 10" Bulk Sample Depth LS - Sectioned Line Sample SPT - Shelby Tube Sample AS - Auger Sample</div> <div>v - H2O, % of dry weight R - Rock Sampling, psi qc - Uncorrected Compression, psi qP - Corrected qP RC - Rock Core</div>								
Water Encountered: None								
At Completion: None								
Boring No. 9								

"N" - Standard Penetration Resistance
SS - 2" ID Split Spoon Sample
LS - Section Line Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H₂O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, pcf
SP - Direct Push
RC - Rock Core



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Boring No.: 10			Job No.: 59229			Project: Stoneridge West II, 44244 Twelve Mile Road		
Client: Novi Forum, LLC			Location: Novi, Michigan			Drilled By: R. Favor		
Type of Rig: Truck			Started: 9/8/2018			Completed: 9/8/2018		
Drilling Method: Solid Stem Augers			Ground Surface Elevation: 953					
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu	
2.5	LS	4 6 10	1.5	Moist Dark Brown Clayey TOPSOIL	14.1	114		
				Stiff Moist Variegated CLAY With Some Silt & Trace Of Gravel				
5.0	LS	5 13 17	6		13.6			
7.5	LS	8 9 12	8.5	Stiff Moist Brown CLAY With Some Silt, Trace Of Gravel & Sand Seams	11.0	155	5270	
10.0	LS	4 7 10	11	Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	13.3	132	2140	
12.5				Stiff Moist Gray CLAY With Some Silt & Trace Of Gravel				
15.0	LS	5 7 9	15		10.4	154	4700	
17.5				Bottom of Borehole at 15'				
20.0								
22.5								
<div>HC - Standard Penetration Resistance LS - 2" x 10" Split Stem Sample LN - Standard L-rod Sample SL - Shelby Tube Sample AS - Auger Sample</div> <div>w = H₂O, % of dry weight d = Bulk Density, pcf q_u - Unconfined Compression, pcf C_u - Consolidated NC - Rock Core</div>								
Water Encountered: None								
At Completion: None								
Boring No. 10								

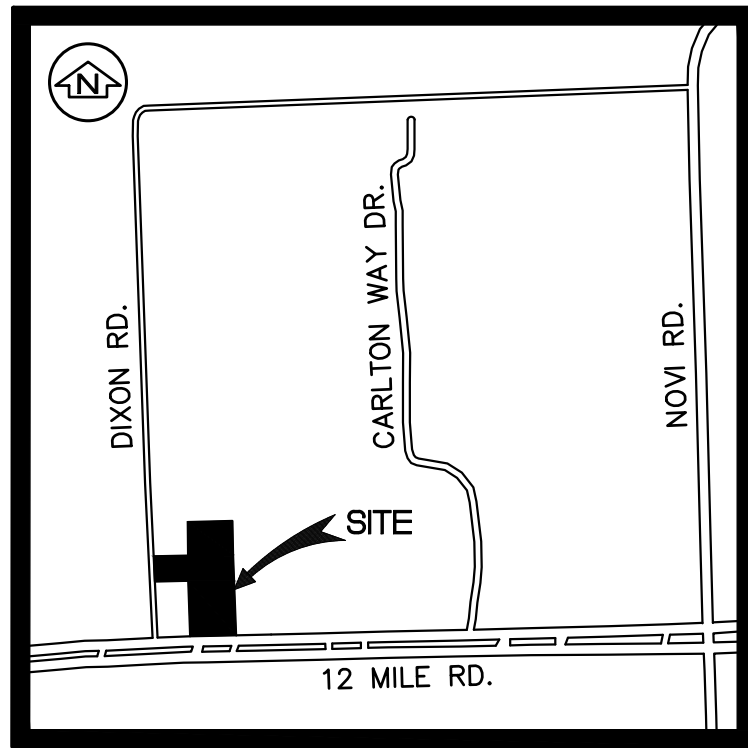
"N" - Standard Penetration Resistance
SS - 2" ID Split Spoon Sample
LS - Section Line Sample
ST - Shelby Tube Sample
AS - Auger Sample

w - H₂O, % of dry weight
d - Bulk Density, pcf
qu - Unconfined Compression, pcf
SP - Direct Push
RC - Rock Core



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Boring No.: 11		Job No.: 59229		Project: Stoneridge West II, 44244 Twelve Mile Road			
Client: Novi Forum, LLC				Location: Novi, Michigan			
Type of Rig: Truck				Drilled By: R. Fawor			
Drilling Method: Solid Stem Augers				Started: 9/7/2018			
Ground Surface Elevation: 953				Completed: 9/7/2018			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
2.5 ft	LS	5 6 10	1	Moist Dark Brown Sandy TOPSOIL	17.7	129	9480
			3	Extremely Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel			
5.0 ft	LS	6 9 15	5.5	Medium Compact Moist Brown Fine SAND & Gravel With Clay Layers	16.7	131	
				Extremely Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel			
7.5 ft	LS	15 19 25	8.5	Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	15.2	136	10970
10.0 ft	LS	6 13 15	12	Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	13.0	136	6510
12.5 ft	LS	8 10 12	15	Stiff Moist Gray CLAY With Some Silt & Trace Of Gravel	9.2	136	5850
15.0 ft				Bottom of Borehole at 15'			
17.5 ft							
20.0 ft							
22.5 ft							
24" - Standard Penetration Resistance (59 - 121 Blows Per Foot) LS - Sectional Layer Sample SL - Shelby Tube Sample AS - Auger Sample				a = H ₂ O, % of dry weight p = Rock Density, pcf qu = Unconfined Compression, pcf SPT = Standard Penetration HC = Rock Core			
				Water Encountered: None			
				At Completion: None			
				Boring No. 11			



NOWAK & FRAUS ENGINEERS
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PONTIAC, MI 48342-5032
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Boring No.: 12		Job No.: 59229		Project: Stoneridge West II, 44244 Twelve Mile Road	
Client: Novi Forum, LLC		Location: Novi, Michigan			
Type of Rig: Truck		Drilled By: R. Favor			
Drilling Method: Solid Stem Augers		Started: 9/8/2018		Completed: 9/8/2018	
Ground Surface Elevation: 951.5					
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w d qu
2.5	LS	2 3 3	.83	Moist Dark Brown Sandy TOPSOIL (10")	14.6 134
			3.5	Loose Moist Brown Clayey SAND With Some Silt & Trace Of Gravel	
5.0	LS	6 6 8	5	Stiff Moist Brown CLAY With Silt Layers	12.6 135
				Bottom of Borehole at 5'	
7.5					
10.0					
12.5					
15.0					
17.5					
20.0					
22.5					
				Water Encountered: None	
				At Completion: None	
				Boring No. 12	



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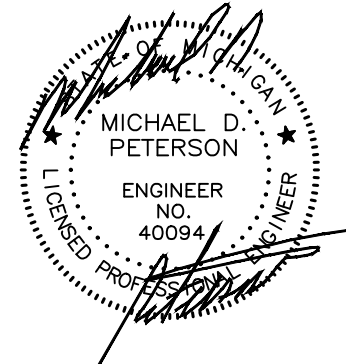
Boring No.: 13		Job No.: 59229		Project: Stoneridge West II, 44244 Twelve Mile Road	
Client: Novi Forum, LLC		Location: Novi, Michigan			
Type of Rig: Truck		Drilled By: R. Favor			
Drilling Method: Solid Stem Augers		Started: 9/8/2018		Completed: 9/8/2018	
Ground Surface Elevation: 953.5					
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w d qu
2.5	LS	4 7 11	.75	Moist Dark Brown Sandy TOPSOIL (10")	19.1 130
				Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	
5.0	LS	6 10 15	5	Bottom of Borehole at 5'	13.9 121 6190
7.5					
10.0					
12.5					
15.0					
17.5					
20.0					
22.5					
				Water Encountered: None	
				At Completion: None	
				Boring No. 13	



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Boring No.: 14		Job No.: 59229		Project: Stoneridge West II, 44244 Twelve Mile Road	
Client: Novi Forum, LLC		Location: Novi, Michigan			
Type of Rig: Truck		Drilled By: R. Favor			
Drilling Method: Solid Stem Augers		Started: 9/8/2018		Completed: 9/8/2018	
Ground Surface Elevation: 953.5					
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w d qu
2.5	LS	3 9 11	1	Moist Dark Brown Sandy TOPSOIL	21.1 123 6020
				Stiff Moist Brown CLAY With Some Silt, Trace Of Gravel, Boulders & Cobbles	
5.0	LS	5 6 11	5	Bottom of Borehole at 5'	13.3 139
7.5					
10.0					
12.5					
15.0					
17.5					
20.0					
22.5					
				Water Encountered: None	
				At Completion: None	
				Boring No. 14	

SEAL



PROJECT

Fountain View
Professional Center
44244 Twelve Mile Road
Novi, MI 48375

CLIENT

Acquira Realty Holdings
44090 12 Mile Road
Novi, MI 48377

Contact: Joseph Schimizzi
Phone: (888) 560-5540

PROJECT LOCATION

Part of the SE 1/4
Section 10
T. 1N, R. 8E
City of Novi,
Oakland County, Michigan

SHEET

Soil Boring Logs



REVISIONS

11-13-20 ISSUED FOR SITE PLAN
4-23-21 REV PER PRELIM SP REVIEW
5-10-21 REV PER PRELIM SP REVIEW
7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY:

N. Naoom

DESIGNED BY:

APPROVED BY:

M. Peterson

DATE:

03-27-2019

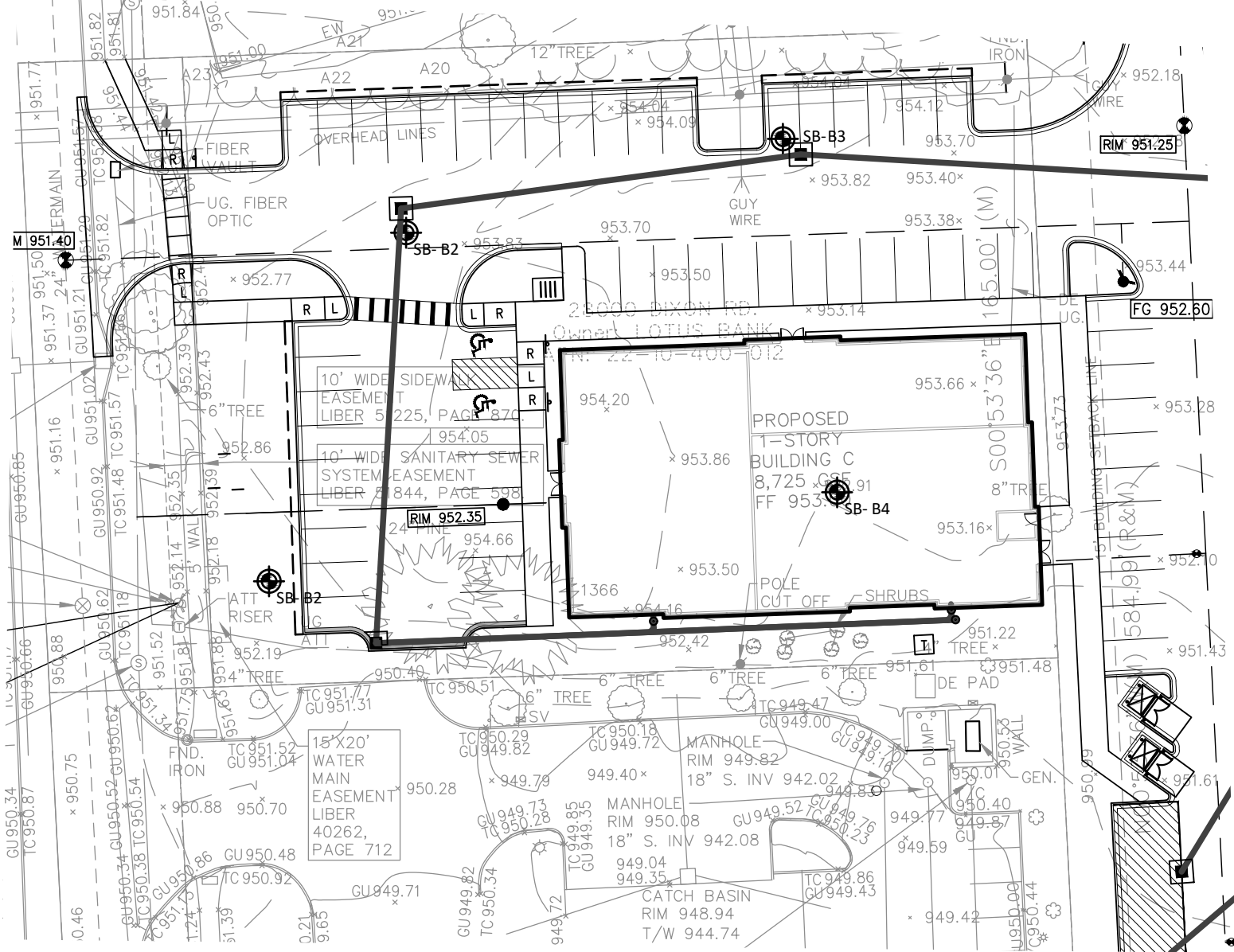
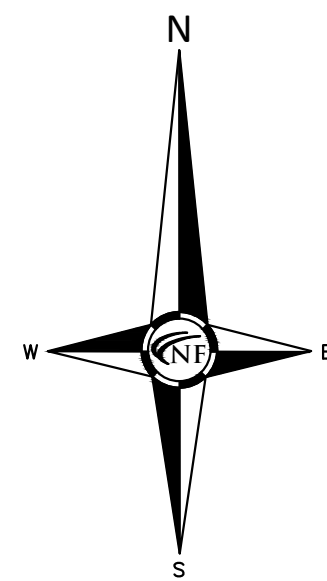
SCALE: N.T.S.

NFE JOB NO.

H046-03

SHEET NO.

C19



Testing Engineers & Consultants, Inc.
1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: 1			Job No.: 59715			Project: Fountain View Professional Center, Additional Parcel		
Client: Fountain View Professional Center c/o Acqura Realty Holdings						Location: Novi, Michigan		
Type of Rig: Truck						Drilled By: I. Mickie		
Drilling Method: Solid Stem Augers						Started: 4/10/2019		
Ground Surface Elevation:						Completed: 4/10/2019		
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu	
2.5	LS	8 15 17	1.5	Medium Compact Moist Dark Brown Clayey Sand With Trace Of Gravel-FILL	3.9			
			3	Compact Moist Brown Gravelly Fine To Coarse SAND With Some Silt				
5.0	LS	4 5 7	5.5	Stiff Moist Brown CLAY With Some Silt & Sand Seams	15.4	130	4120	
			7.3	Medium Compact Wet Brown Medium SAND With Trace Of Gravel & Clay Layer				
7.5	LS	7 9 15		Firm Moist Brown CLAY With Some Silt & Wet Sand Seams	10.7			
10.0	LS	8 9 11			10.0	142	3710	
12.5	LS	4 6 9	12	Stiff Moist Gray CLAY With Some Silt & Trace Of Gravel	11.4	140	6180	
15.0	LS	4 9 12			10.0	137	5600	
17.5	LS	4 9 12						
20.0	LS	4 9 12	20	Bottom of Boring at 20'				
22.5	LS	4 9 12						
TY - Standard Penetration Resistance SS - 2" U.S. Split Stem Samples LS - Sectional Line Samples ST - Shelby Tube Samples AS - Auger Samples				w - H2O, % of dry weight d - Bulk Density, pcf qu - Uncorrected Compression, pcf SP - Shear Push RC - Rock Core				
				Water Encountered: 5'6"				
				At Completion: None				
				Boring No. 1				

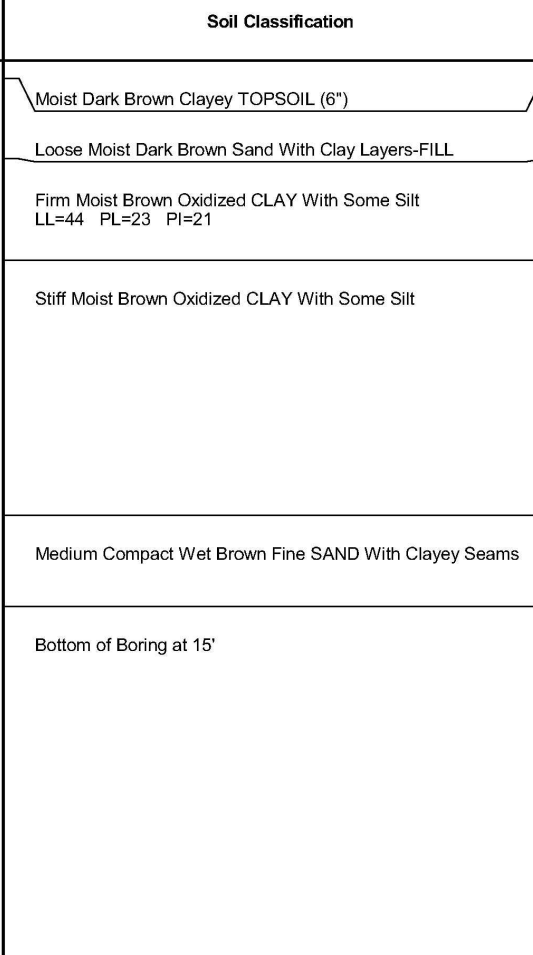


Testing Engineers & Consultants, Inc.
1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: 3		Job No.: 59715		Project: Fountain View Professional Center, Additional Parcel			
Client: Fountain View Professional Center c/o Acqura Realty Holdings				Location: Novi, Michigan			
Type of Rig: Truck				Drilled By: I. Mickie			
Drilling Method: Solid Stem Augers				Started: 4/10/2019			
Ground Surface Elevation:				Completed: 4/10/2019			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
2.5	LS	3 4 6	.17	Moist Dark Brown Clayey TOPSOIL (2")	10.9	140	
			3	Firm Moist Dark Brown Clay With Some Silt & Trace Of Gravel-FILL			
			6	Firm Moist Brown Oxidized CLAY With Some Silt			
5.0	LS	3 4 4			24.7	119	3430
			6	Stiff Moist Brown Oxidized CLAY With Some Silt			
7.5	LS	3 5 7			22.8	121	7170
			11	Stiff Moist Brown Oxidized CLAY With Some Silt			
10.0	LS	4 7 9			20.6	122	5690
			11	Medium Compact Wet Brown SAND With Trace Of Gravel & Clayey Seams			
12.5	LS	10 8 7			10.9		
			14.8	Stiff Moist GRAY CLAY With Some Silt & Trace Of Gravel			
15.0	LS	10 8 7			10.9		
			17	Stiff Moist GRAY CLAY With Some Silt & Trace Of Gravel			
17.5	LS	1 2 2			10.4		
			20	Very Loose Wet Gray Medium SAND With Trace Of Gravel			
20.0	LS	1 2 2			10.4		
			20	Bottom of Boring at 20'			
22.5	LS	1 2 2			10.4		
			20	Bottom of Boring at 20'			
<div>TY - Standard Penetration Resistance SS - 2" U.S. Split Stem Samples LS - Sectional Line Samples ST - Shelby Tube Samples AS - Auger Samples</div> <div>w - H₂O, % of dry weight d - Bulk Density, pcf qu - Uncorrected Compression, pcf SP - Shear Push RC - Rock Core</div>							
					Water Encountered: 11'0"		
					At Completion: 6'4"		
					Boring No. 3		



Testing Engineers & Consultants, Inc.
1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: 2				Job No.: 59715				Project: Fountain View Professional Center, Additional Parcel			
Client: Fountain View Professional Center c/o Acqura Realty Holdings								Location: Novi, Michigan			
Type of Rig: Truck								Drilled By: I. Mickie			
Drilling Method: Solid Stem Augers								Started: 4/10/2019			
Ground Surface Elevation:								Completed: 4/10/2019			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification				w	d	qu	
2.5	LS	3 4 4	.5					14.3	134		
			2.7								
			4								
5.0	LS	2 4 5	5.5					39.3	107	3430	
			6								
7.5	LS	6 9 11						21.4	123	4940	
			9								
10.0	LS	4 7 10						23.3	125		
			7								
12.5	LS	6 9 11	12.5					13.9	134		
			9								
15.0	LS	6 9 11	15								
			11								
17.5	LS	6 9 11									
			6								
20.0	LS	6 9 11									
			9								
22.5	LS	6 9 11									
			11								
TY - Standard Penetration Resistance w - H2O, % of dry weight											
SS - 2" U.S. Split Stem Samples d - Bulk Density, pcf											
LS - Sectional Line Samples qu - Uncorrected Compression, pcf											
ST - Shelby Tube Samples SP - Shear Push											
AS - Auger Samples RC - Rock Core											
								Water Encountered: 12'6"			
								At Completion: 67"			
								Boring No. 2			



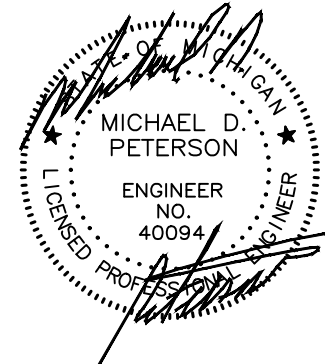
Testing Engineers & Consultants, Inc.
1343 Rochester Road - PO Box 249 - Troy, Michigan - 48099-0249
(248) 588-6200 or (313) T-E-S-T-I-N-G
Fax (248) 588-6232

Boring No.: 4			Job No.: 59715			Project: Fountain View Professional Center, Additional Parcel		
Client: Fountain View Professional Center c/o Acqura Realty Holdings						Location: Novi, Michigan		
Type of Rig: Truck						Drilled By: I. Mickie		
Drilling Method: Solid Stem Augers						Started: 4/10/2019		
Ground Surface Elevation:						Completed: 4/10/2019		
Depth (ft)	Sample Type	N	Strata Change	Soil Classification		w	d	qu
2.5	LS	3 4 5	.42	Moist Dark Brown Clayey TOPSOIL (5")		16.6	134	3710
			1.6					
			5.0	LS	5 10 15			
7.5	LS	7 12 17	6	Stiff Moist Brown CLAY With Some Silt & Occasional Sand Seams		18.4	134	6590
			8					
10.0	LS	6 12 11	11	Stiff Moist Gray CLAY With Some Silt & Trace Of Gravel		10.3	136	
12.5	LS	6 8 12	15	Bottom of Boring at 15'		10.8	141	3710
15.0	LS	6 8 12						
17.5	LS	6 8 12						
20.0	LS	6 8 12						
22.5	LS	6 8 12						
"N" - Standard Penetration Resistance SS - 2" U.S. Split Stem Samples LS - Sectional Line Samples ST - Shelby Tube Samples AS - Auger Samples						w - H2O, % of dry weight d - Bulk Density, pcf qu - Uncorrected Compression, pcf SP - Shear Push RC - Rock Core		
						Water Encountered: 8'0"		
						At Completion: 7'4"		
						Boring No. 4		



NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257

SEAL



PROJECT

Fountain View
Professional Center
44244 Twelve Mile Road
Novi, MI 48375

CLIENT

Acqura Realty Holdings
44090 12 Mile Road
Novi, MI 48377

Contact: Joseph Schimizzi
Phone: (888) 560-5540

PROJECT LOCATION

Part of the SE 1/4
Section 10
T. 1N,



Oakland County 1-Year Peak Flow

Project: Fountain View Professional Center
Location: Novi, MI
Site ID: Structure #6

Area (acres): 1.957
Runoff Coefficient, C: 0.843
T_c (min): 17.05

1-year I₁ = 30.2/(T_c+9.17)^{0.81} = 2.14 in/hr
max I₁ = 2.0 inches/hour for smaller sites with T_c ≤ 15 minutes
min I₁ = 1.0 inches/hour for larger sites with T_c ≥ 1 hour

1-year Peak Flow = Q_{avg} = C x I₁ x A = 3.53 cfs

Recommended Model: CS-6

CASCADE SEPARATOR™ MODEL SPECIFICATIONS PER NJDEP
CERTIFICATION LETTER

Model	Manhole Diameter (ft)	MITR (cfs)	50% Maximum Sediment Storage Area Volume (ft³)
CS-4	4	1.80	9.4
CS-5	5	2.81	14.7
CS-6	6	4.05	21.2
CS-8	8	7.20	37.7
CS-10	10	11.3	58.9
CS-12	12	16.2	84.8

The NJDEP certifies the use of the Cascade Separator™ Stormwater Treatment Device by Contech Engineered Solutions, LLC at a TSS removal rate of 50% when designed, operated, and maintained in accordance with the information provided in the certification report dated October 1, 2019.



Oakland County 1-Year Peak Flow

Project: Fountain View Professional Center
Location: Novi, MI
Site ID: Structure #17

Area (acres): 1.626
Runoff Coefficient, C: 0.83
T_c (min): 17.54

1-year I₁ = 30.2/(T_c+9.17)^{0.81} = 2.11 in/hr
max I₁ = 2.0 inches/hour for smaller sites with T_c ≤ 15 minutes
min I₁ = 1.0 inches/hour for larger sites with T_c ≥ 1 hour

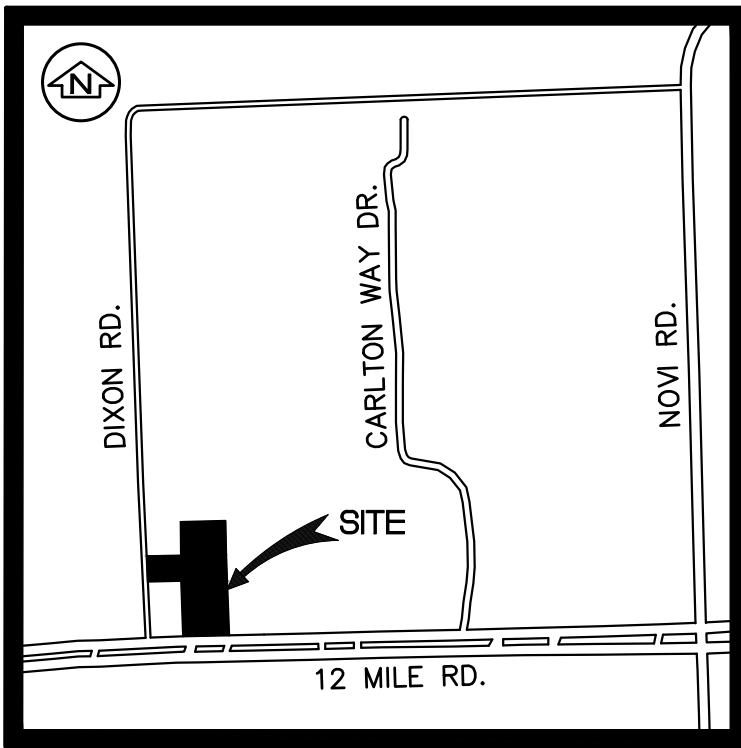
1-year Peak Flow = Q_{avg} = C x I₁ x A = 2.85 cfs

Recommended Model: CS-6

CASCADE SEPARATOR™ MODEL SPECIFICATIONS PER NJDEP
CERTIFICATION LETTER

Model	Manhole Diameter (ft)	MITR (cfs)	50% Maximum Sediment Storage Area Volume (ft³)
CS-4	4	1.80	9.4
CS-5	5	2.81	14.7
CS-6	6	4.05	21.2
CS-8	8	7.20	37.7
CS-10	10	11.3	58.9
CS-12	12	16.2	84.8

The NJDEP certifies the use of the Cascade Separator™ Stormwater Treatment Device by Contech Engineered Solutions, LLC at a TSS removal rate of 50% when designed, operated, and maintained in accordance with the information provided in the certification report dated October 1, 2019.

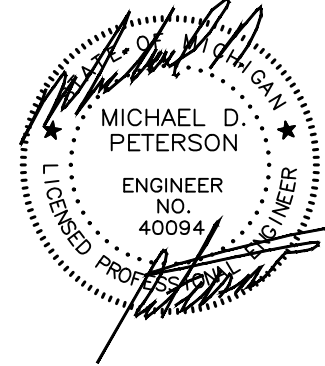


LOCATION MAP



NOWAK & FRAUS ENGINEERS
46777 WOODWARD AVE.
PONTIAC, MI 48342-5032
TEL. (248) 332-7931
FAX. (248) 332-8257

SEAL



PROJECT

Fountain View
Professional Center
44244 Twelve Mile Road
Novi, MI 48375

CLIENT

Acqira Realty Holdings
44090 12 Mile Road
Novi, MI 48377

Contact: Joseph Schimizzi
Phone: (888) 560-5540

PROJECT LOCATION

Part of the SE 1/4
Section 10
T. 1N, R. 8E
City of Novi,
Oakland County, Michigan

SHEET

Contech Details Plan



REVISIONS

11-13-20 ISSUED FOR SITE PLAN
4-23-21 REV PER PRELIM SP REVIEW
5-10-21 REV PER PRELIM SP REVIEW
7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY:

N. Naoom

DESIGNED BY:

M. Kurmas

APPROVED BY:

M. Peterson

DATE:

03-27-2019

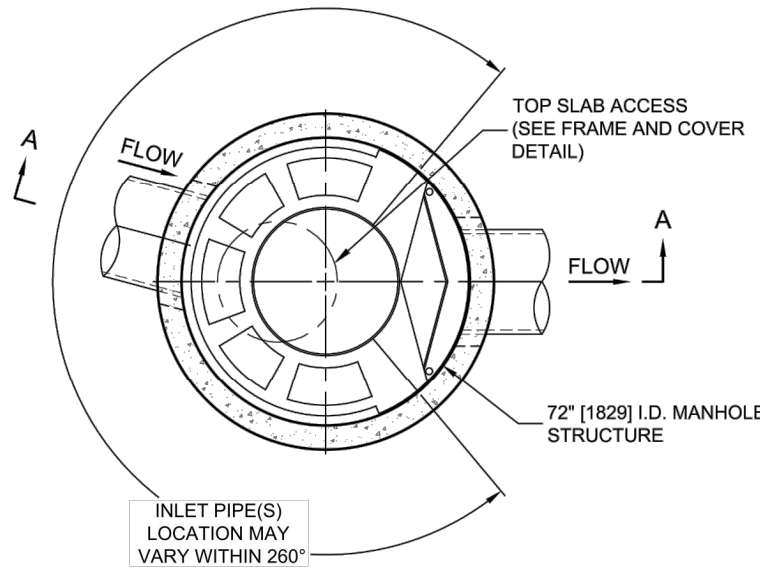
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NFE JOB NO.

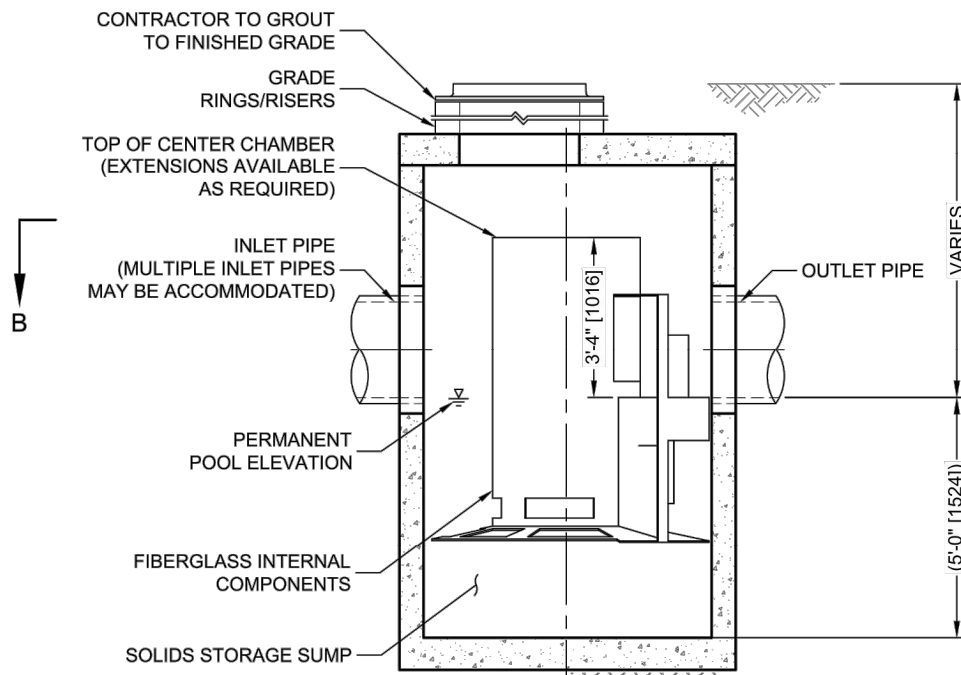
H046-03

SHEET NO.

C21



PLAN VIEW B-B
NOT TO SCALE



ELEVATION A-A
NOT TO SCALE

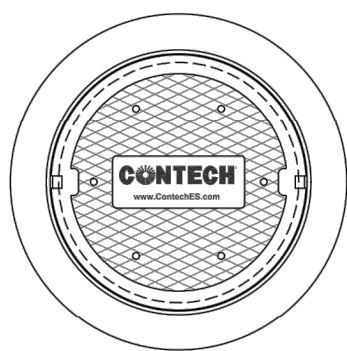
CASCADE
separator™

CASCADE SEPARATOR DESIGN NOTES

THE STANDARD CS-6 CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION

GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES



FRAME AND COVER
(DIAMETER VARIES)
NOT TO SCALE

GENERAL NOTES

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.contechES.com
- CASCADE SEPARATOR WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
- CASCADE SEPARATOR STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2' (610), AND GROUNDWATER ELEVATION AT OR BELOW THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M250 AND BE CAST WITH THE CONTECH LOGO.
- CASCADE SEPARATOR STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.
- ALTERNATE UNITS ARE SHOWN IN MILLIMETERS [mm].

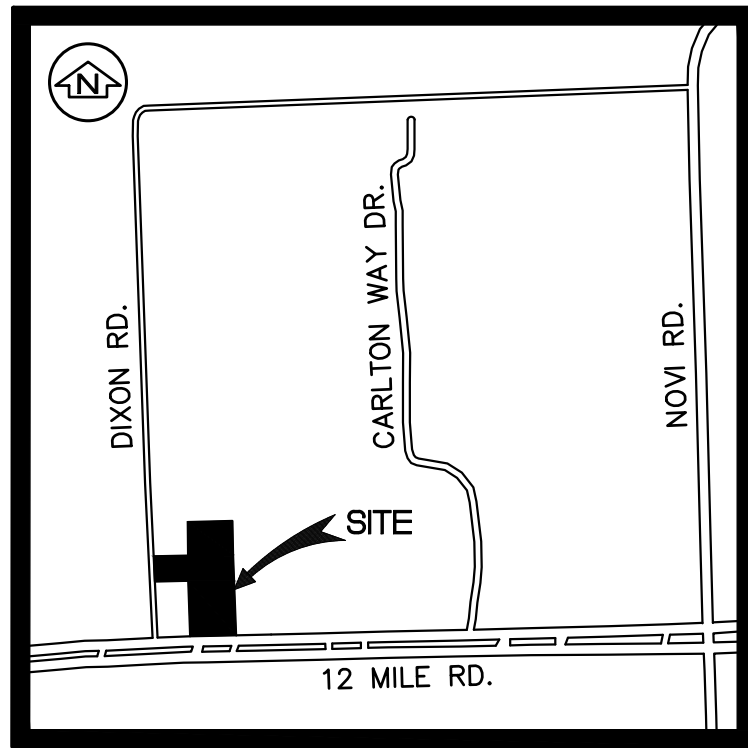
INSTALLATION NOTES

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CASCADE SEPARATOR MANHOLE STRUCTURE.
- CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

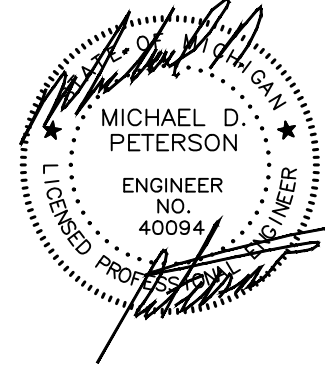


www.contechES.com
9024 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7893 FAX

CS-6
CASCADE SEPARATOR
STANDARD DETAIL



SEAL



PROJECT

Fountain View
Professional Center
44244 Twelve Mile Road
Novi, MI 48375

CLIENT

Acqira Realty Holdings
44090 12 Mile Road
Novi, MI 48377

Contact: Joseph Schimizzi
Phone: (888) 560-5540

PROJECT LOCATION

Part of the SE 1/4
Section 10
T. 1N, R. 8E
City of Novi,
Oakland County, Michigan

SHEET

Contractor's Duties,
Additional Notes and
Details Plan



REVISIONS

11-13-20 ISSUED FOR SITE PLAN
4-23-21 REV PER PRELIM SP REVIEW
5-10-21 REV PER PRELIM SP REVIEW
7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY:

N. Naoum

DESIGNED BY:

M. Kurmas

APPROVED BY:

M. Peterson

DATE:

03-27-2019

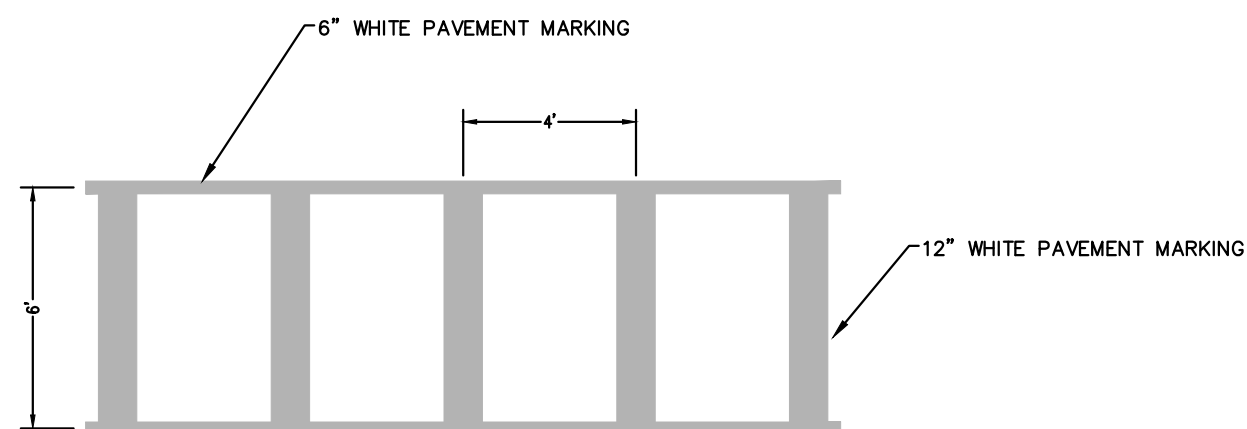
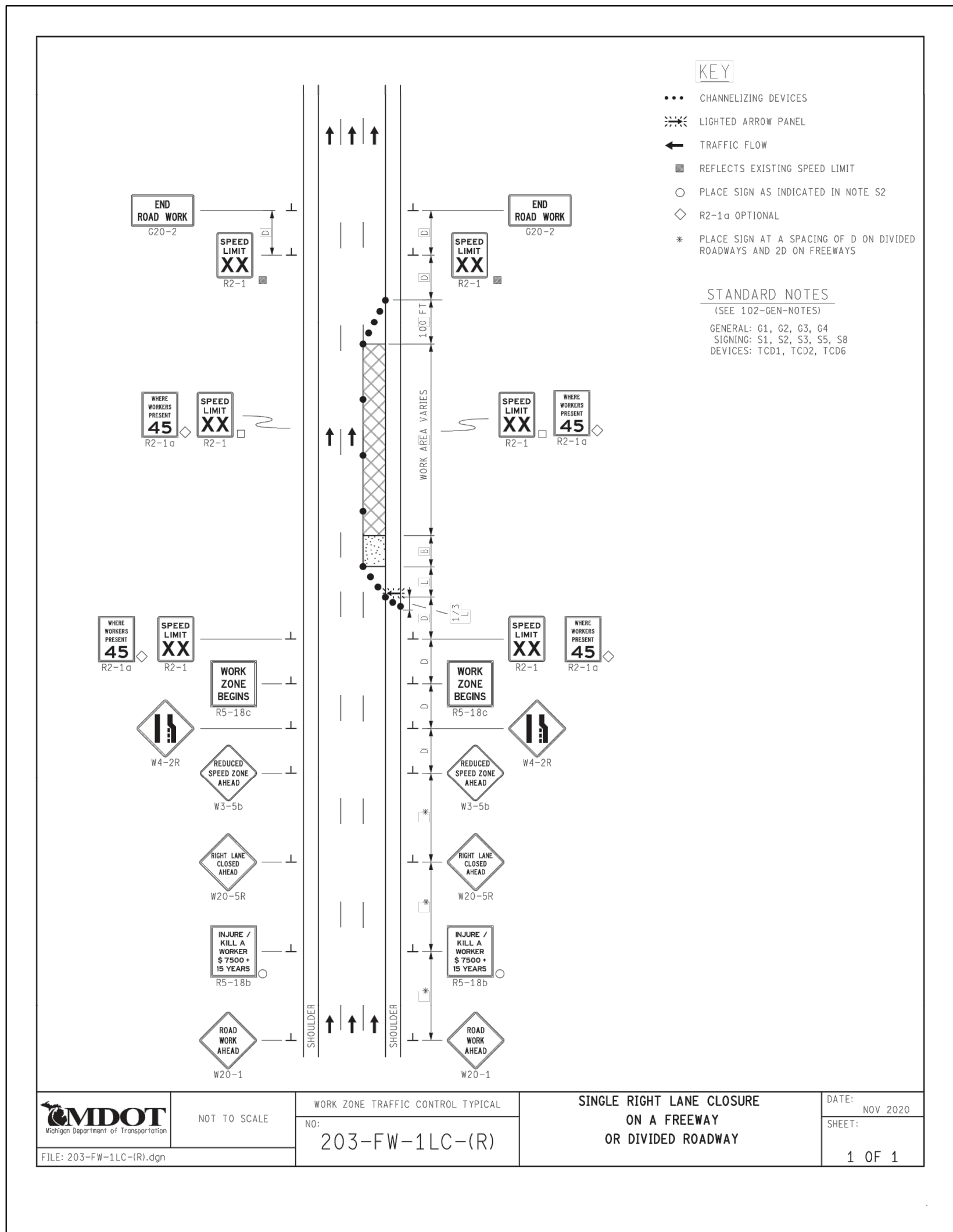
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NFE JOB NO.

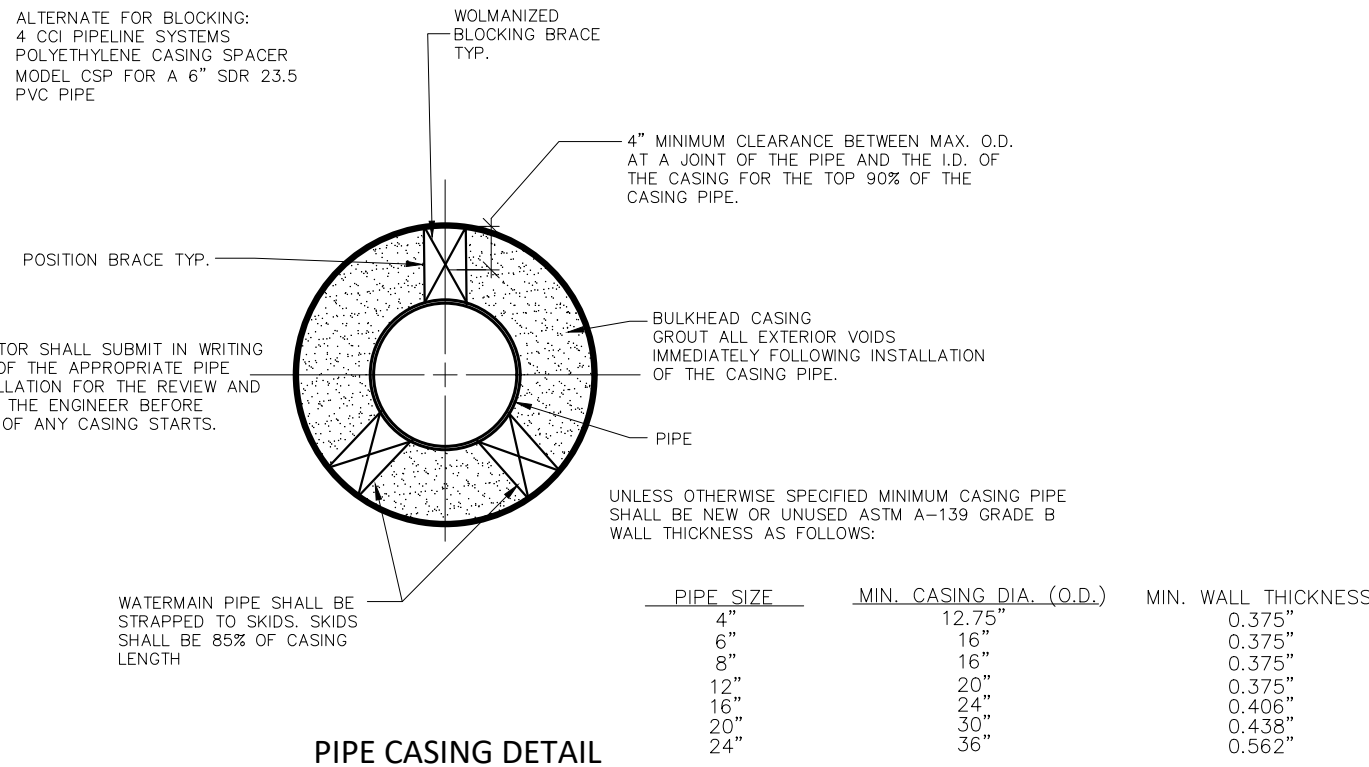
H046-03

SHEET NO.

C22



CROSSWALK PAVEMENT MARKING DETAIL
N.T.S.





LOCATION MAP

SEAL



PROJECT

Fountain View
Professional Center
44244 Twelve Mile Road
Novi, MI 48375

CLIENT

Acquia Realty Holdings
44090 12 Mile Road
Novi, MI 48377

Contact: Joseph Schimizz
Phone: (888) 560-5540

PROJECT LOCATION

Part of the SE 1/4
of Section 10
T. 1N. R. 8E
City of Novi,
Oakland County,
Michigan

SHEET

Landscape Notes
and Details



Know what's below
Call before you dig.

REVISIONS

04/30/19 REVISED FOR PRE-APP

04/23/21 REVISED PER CITY REVIEW

05/10/21 REVISED PER CITY REVIEW

07/14/21 SUBMIT FOR FINAL SITE PLAN REVIEW

DRAWN BY:

G. Ostrowski

DESIGNED BY:

G. Ostrowski

APPROVED BY:

G. Ostrowski

DATE:

04-30-2019

SCALE: 1" = 30'

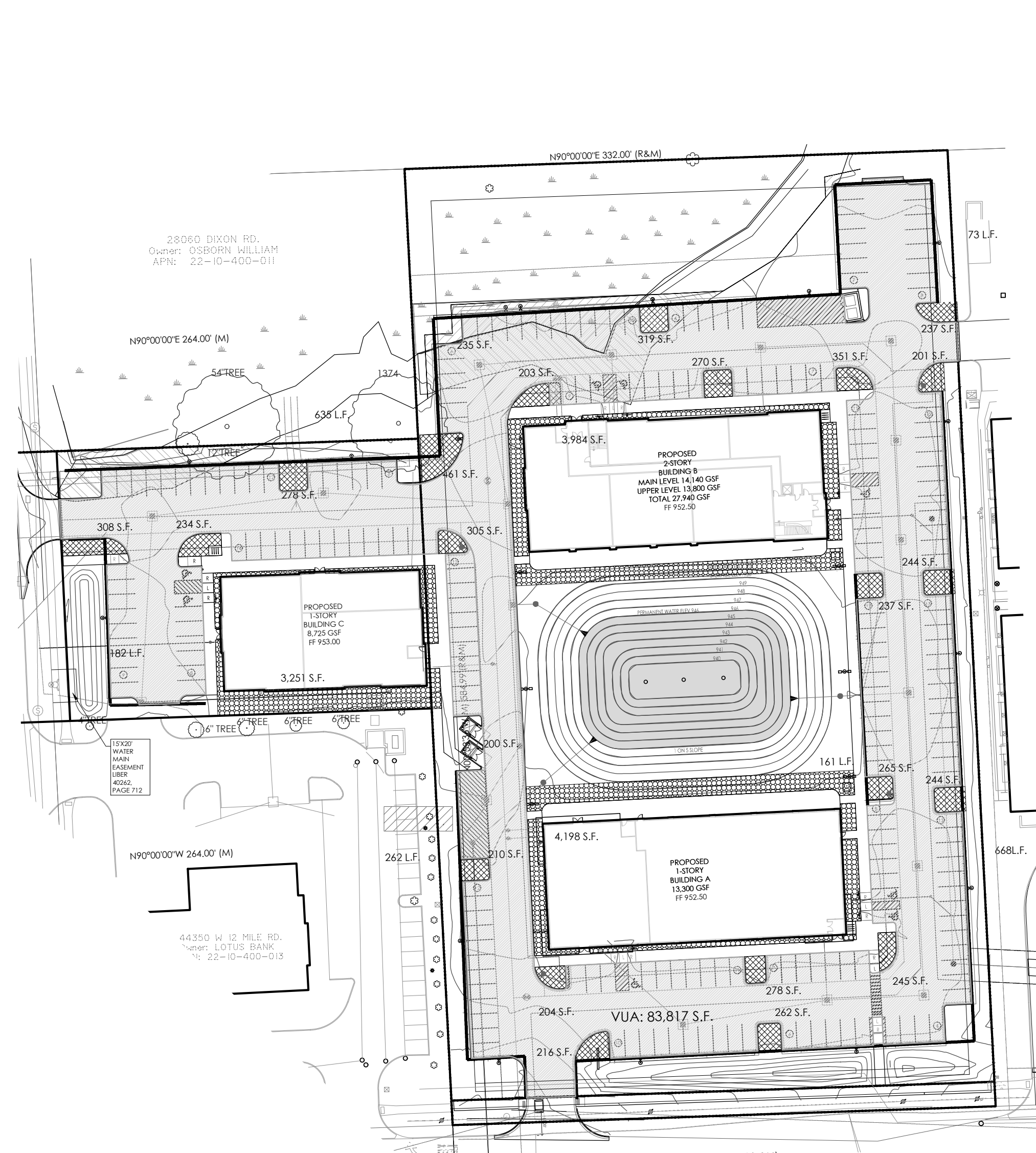
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H046-03

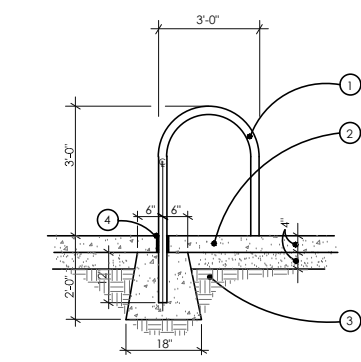
SHEET NO.

L3



BASIS OF CALCULATION DIAGRAM

1" = 60'



HOOP BIKE RACK

COBBLESTONE MULCH DETAIL

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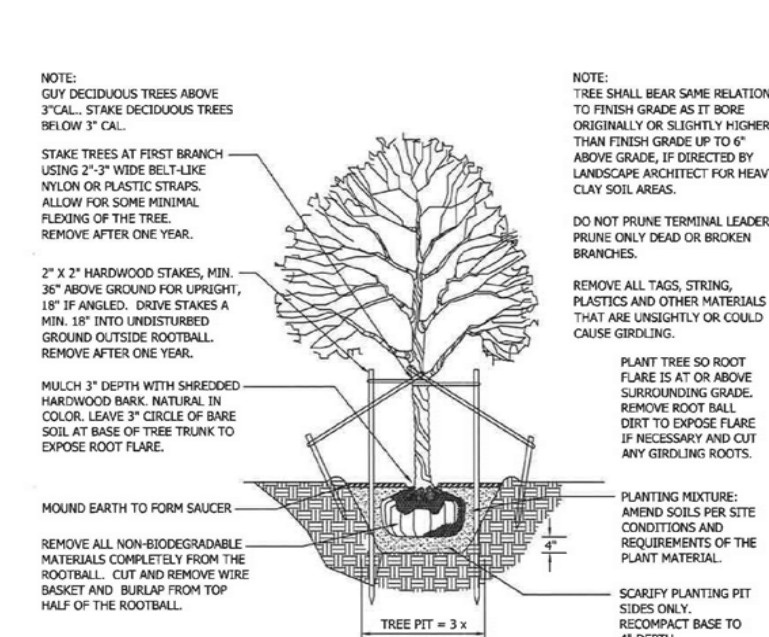
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DECIDUOUS TREE PLANTING DETAIL

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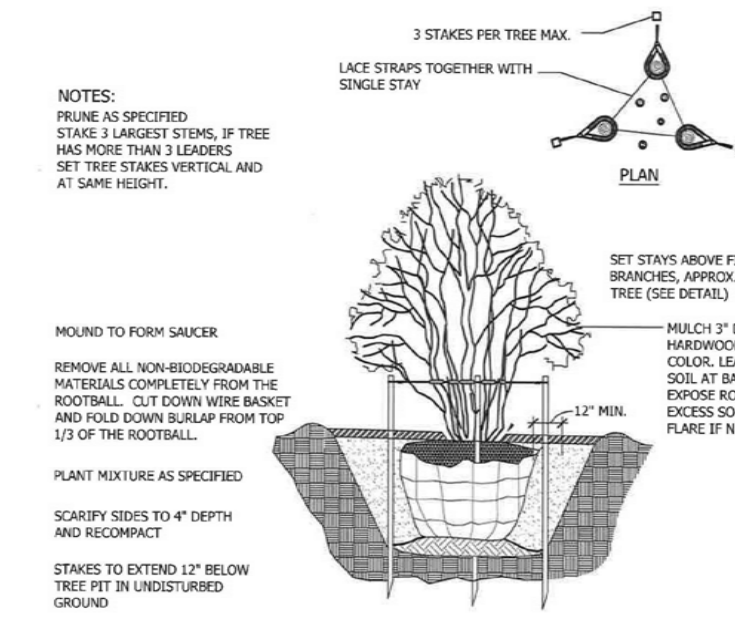
1/2" = 60'

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MULTI-STEM TREE PLANTING DETAIL

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SHRUB PLANTING DETAIL

1/2" = 60'

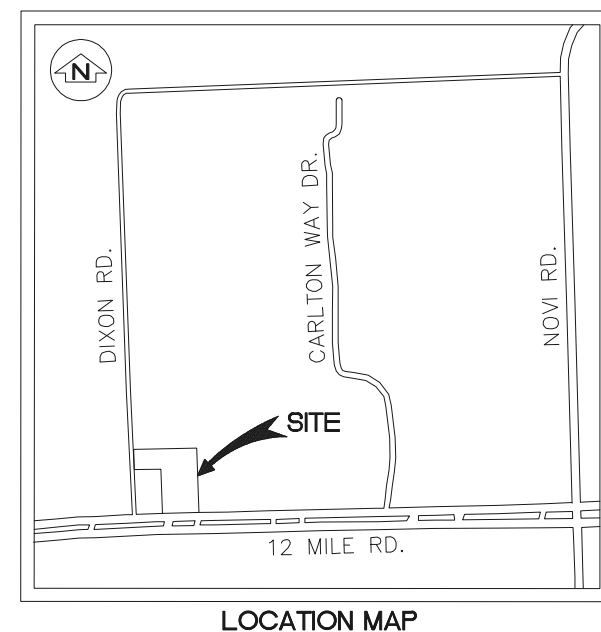
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Schedule	Symbol	Label	Quantity	Manufacturer	Description	Lamp	Mounting Height
		A	6	U.S. ARCHITECTURAL LIGHTING	LED AREA LUMINAIRE EMBEDDED WITH WIRELESS CONTROLS FOR SECURITY PURPOSES	LED	25'-0"
		E	5	U.S. ARCHITECTURAL LIGHTING	LED AREA LUMINAIRE EMBEDDED WITH WIRELESS CONTROLS FOR SECURITY PURPOSES	LED	25'-0"
		H	1	U.S. ARCHITECTURAL LIGHTING	LED AREA LUMINAIRE EMBEDDED WITH WIRELESS CONTROLS FOR SECURITY PURPOSES	LED	25'-0"
		G	9	U.S. ARCHITECTURAL LIGHTING	LED AREA LUMINAIRE EMBEDDED WITH WIRELESS CONTROLS FOR SECURITY PURPOSES	LED	25'-0"

Statistics	Symbol	Avg	Max	Min	Max/Min	Avg/Min	Avg/Max
LOADING AREA	+	1.9 fc	3.3 fc	0.6 fc	5.5:1	3.2:1	0.6:1
PARKING LOT	+	2.0 fc	4.3 fc	0.5 fc	8.6:1	4.0:1	0.5:1
PROPERTY LINE	+	0.2 fc	0.5 fc	0.0 fc	N/A	N/A	0.4:1
TYPICAL WALKWAY	+	1.5 fc	2.6 fc	0.6 fc	4.3:1	2.5:1	0.6:1
BUILDING 'A' ENTRANCE - FREQUENT USE	+	1.4 fc	1.6 fc	1.1 fc	1.5:1	1.3:1	0.9:1
BUILDING 'B' ENTRANCE - FREQUENT USE	+	1.2 fc	2.1 fc	1.0 fc	2.1:1	1.2:1	0.6:1
BUILDING 'C' ENTRANCE - FREQUENT USE	+	1.3 fc	1.6 fc	1.0 fc	1.6:1	1.3:1	0.8:1

Mounting Height Note

MOUNTING HEIGHT IS MEASURED FROM GRADE TO FACE OF FIXTURE. POLE HEIGHT SHOULD BE CALCULATED AS THE MOUNTING HEIGHT LESS BASE HEIGHT.

Drawing Note

THIS DRAWING WAS GENERATED FROM AN ELECTRONIC IMAGE FOR ESTIMATION PURPOSE ONLY. LAYOUT TO BE VERIFIED IN FIELD BY OTHERS.

General Note

- SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.
- SEE LUMINAIRE SCHEDULE FOR LIGHT LOSS FACTOR.
- CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: 0' - 0".
- HOURS OF OPERATION: FALL AND WINTER - 7:00 PM TO 9:00 AM; SPRING AND SUMMER - 9:00 PM TO 8:00 AM.
- ELECTRICAL SERVICE TO LIGHT FIXTURES SHALL BE PLACED UNDERGROUND.
- FLASHING LIGHT SHALL NOT BE PERMITTED.
- ONLY NECESSARY LIGHTING FOR SECURITY PURPOSES & LIMITED OPERATIONS SHALL BE PERMITTED.

THE ENGINEER AND/OR ARCHITECT MUST DETERMINE APPLICABILITY OF THE LAYOUT TO EXISTING / FUTURE FIELD CONDITIONS. THIS LIGHTING LAYOUT REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS. ACTUAL PERFORMANCE OF ANY MANUFACTURER'S LUMINAIRE MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER VARIABLE FIELD CONDITIONS. MOUNTING HEIGHTS INDICATED ARE FROM GRADE AND/OR FLOOR UP.

THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SUITABILITY AND SAFETY. THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE TO REVIEW FOR MICHIGAN ENERGY CODE AND LIGHTING QUALITY COMPLIANCE.

UNLESS EXEMPT, PROJECT MUST COMPLY WITH LIGHTING CONTROLS REQUIREMENTS DEFINED IN ASHRAE 90.1 2013. FOR SPECIFIC INFORMATION CONTACT GBA CONTROLS GROUP AT ASG@GASSERBUSH.COM OR 734-266-6705.

Ordering Note

FOR INQUIRIES CONTACT GASSER BUSH AT QUOTES@GASSERBUSH.COM OR 734-266-6705.

Alternates Note

THE USE OF FIXTURE ALTERNATES MUST BE RESUBMITTED TO THE CITY FOR APPROVAL.

SOLID STATE AREA LIGHTING

RAZAR SERIES-LED

SPECIFICATIONS

OPTICAL HOUSING
Heavy cast low copper aluminum (A356 alloy, <0.2% copper) assembly with integral cooling ribs surrounding the electrical compartment and a flat surface on the top of the arm to facilitate thermal transfer of heat to housing and cooling fins. Solid barrier wall separates optical and electrical compartments. The optical and electrical compartments are integrated to create one assembly. Minimum wall thickness is .188".

ELECTRICAL HOUSING w/ INTEGRATED ARM
Heavy cast low copper aluminum (A356 alloy, <0.2% copper) assembly with integral cooling ribs surrounding the electrical compartment and a flat surface on the top of the arm to accommodate a photocell receptacle. Solid barrier wall separates optical and electrical compartments. The optical compartment and electrical compartment with the integrated support arm combine to create one assembly. Minimum wall thickness is .188". Cast and hinged driver assembly cover is integrated with wiring compartment cover.

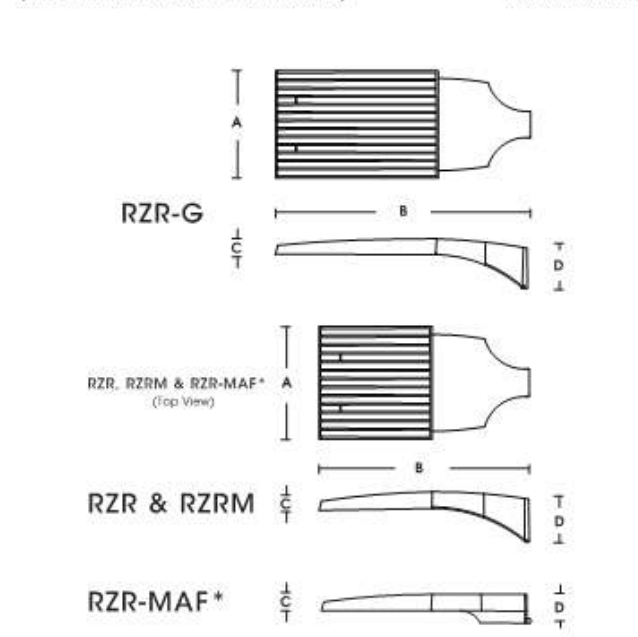
LED OPTICS
Emitters (LED's) are arrayed on a metal core PCB panel with each emitter located on a copper thermal transfer pad and enclosed by an LED reflector. In asymmetric distributions, a micro-reflector inside the refractor re-directs the house side emitter output towards the street side and functions as a house side shielding element. Refractors are injection molded H12 acrylic. Each LED refractor is sealed to the PCB over an emitter and all refractors are retained by an aluminum frame. Any one Panel, or group of Panels in a luminaire, have the same optical pattern. LED refractors produce standard silhouetted distributions. Panels are field replaceable and field rotatable in 90° increments.

LED DRIVER(S)
Constant current electronic with a power factor of > .90 and a minimum operating temperature of -40°F. Driver(s) is/are UL and cUL recognized and mounted directly against the Electrical Housing to facilitate thermal transfer held down by universal clamps to facilitate easy removal. In-line terminal blocks facilitate wiring between the driver and optical array. Drivers accept an input of 120-277V, 50/60Hz, or 347V-480V, 50/60Hz (0 - 10V dimmable driver is standard. Driver has a minimum of 3KV internal surge protection. Luminaire supplied with 20KV surge protector for field accessible installation.)

LED EMITTERS
High output LED's are utilized with drive currents ranging from 350mA to 1080mA. 70CR Minimum LED's are available in standard Neutral White (4000K), or optional Cool White (5000K) or Warm White (3000K). Consult factory for other LED options.

FINISH
Electrostatically applied TGIC Polyester Powder Coat on substrate prepared with 20 PPS power wash at 140°F. Four step media blast and iron phosphate pretreatment for protection and paint adhesion. 400°F bake for maximum hardness and durability.

MAST ARM FITTER/ELECTRICAL HOUSING
Replaces standard Electrical Housing. Fits standard 2 3/8" O.D. horizontal tenon. Two (2) straps with two (2) bolts each encircle the lower half of the tenon. Upper half of the tenon rests on self-centering steps that position the angle of the luminaire at 0°, +1.5°, +1.5° or +3° up from the horizontal. All hardware is stainless steel.



FIXTURE	A	B	C	D
RZR-G	15"	34.5"	3"	7"
RZR	14.75"	29.25"	2.75"	6.5"
RZR-MAF	11.87"	22"	2.87"	5.87"
RZR-MAF*	15"	28.25"	2.87"	4"

*DLC PENDING AS OF 7/17

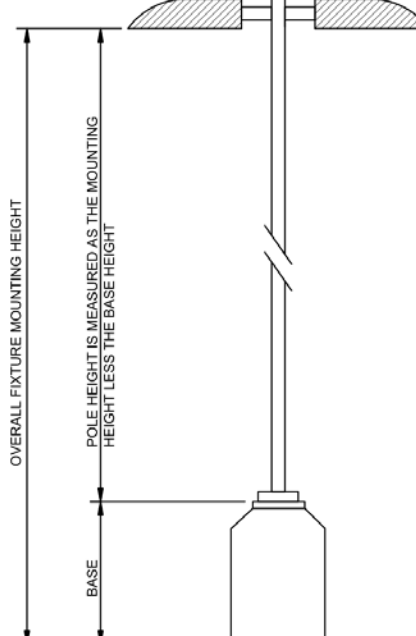


U.S. Architectural Lighting

840 West Avenue G, Fremont, CA 94531
Phone: (415) 222-2299 Fax: (415) 222-2298
www.usalighting.com

2017193

U.S. ARCHITECTURAL LIGHTING



SIGHT DISTANCE IS CLEAR PAST SIDEWALK DRIVE INTERSECTION, 900+ FEET.

CENTERLINE DRIVE

CENTERLINE DRIVE

WETLANDS

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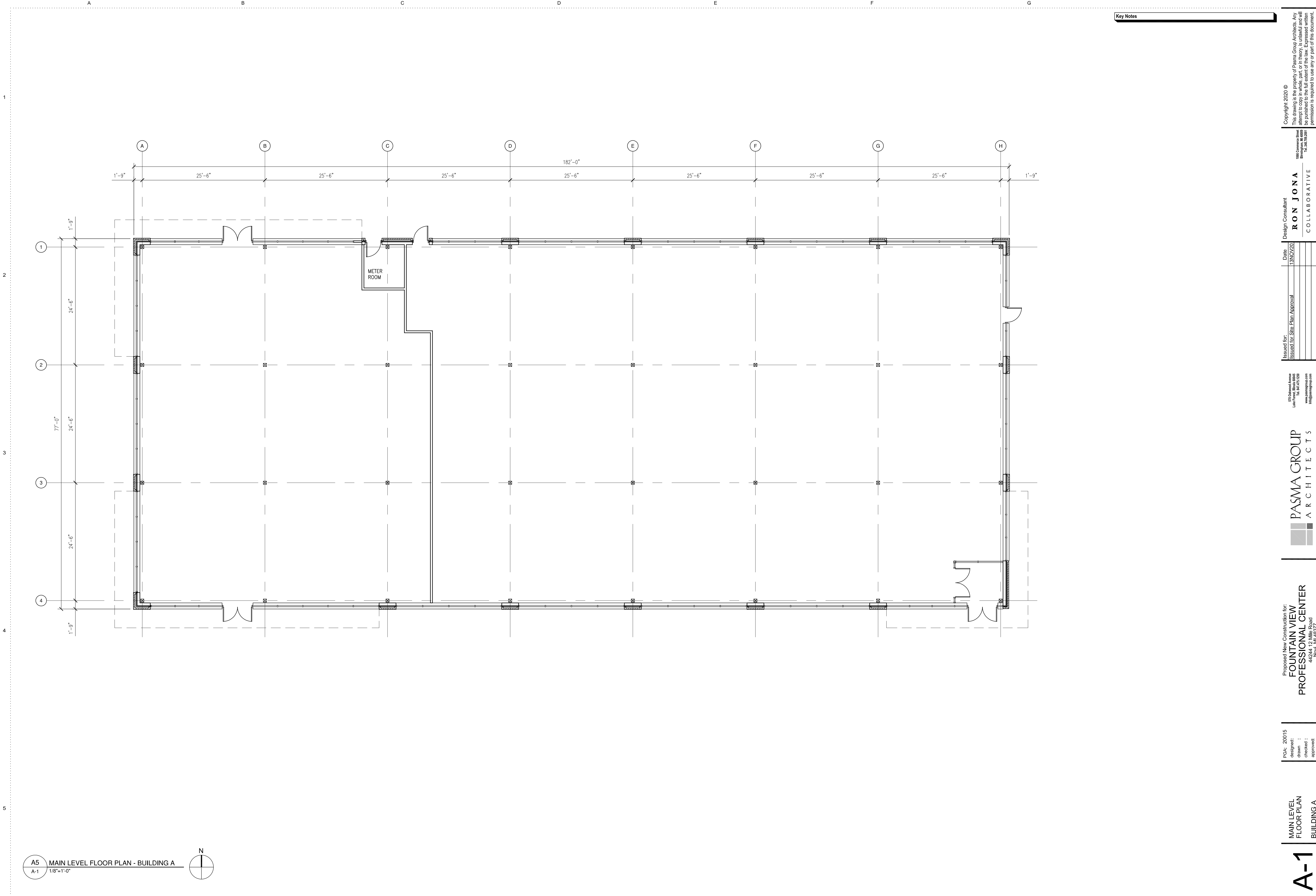
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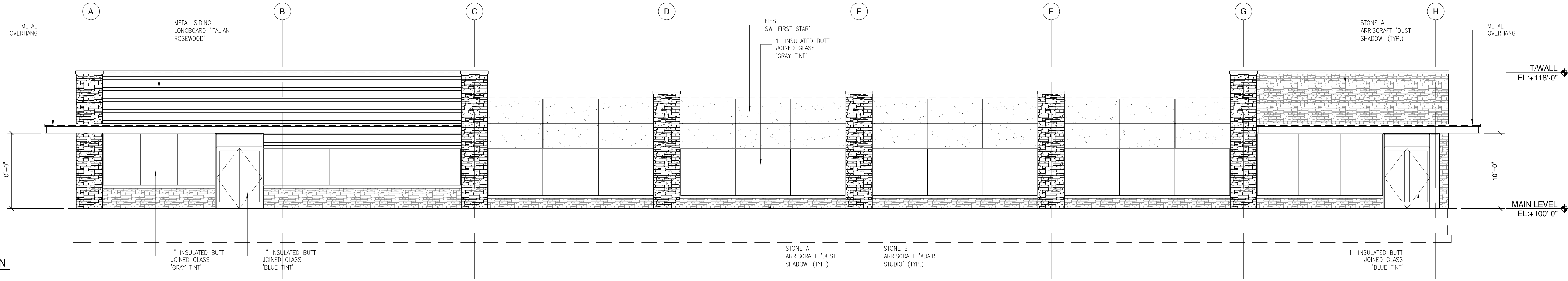
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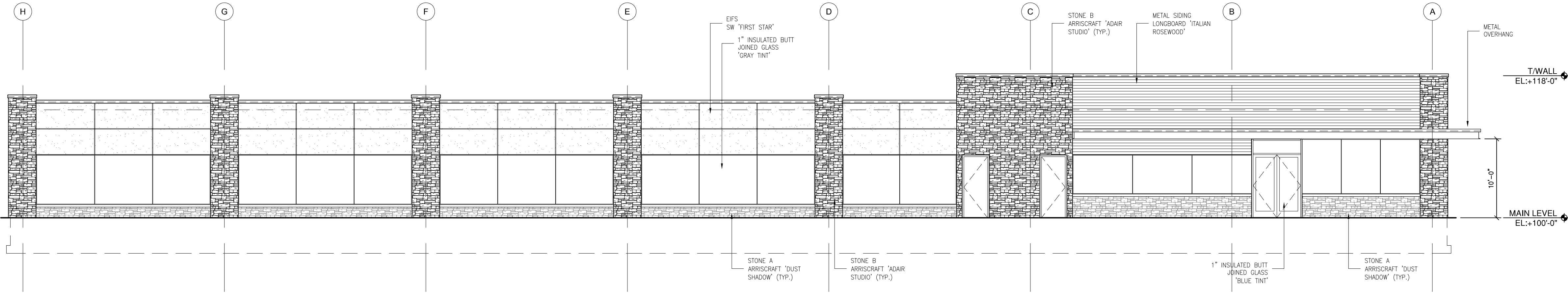


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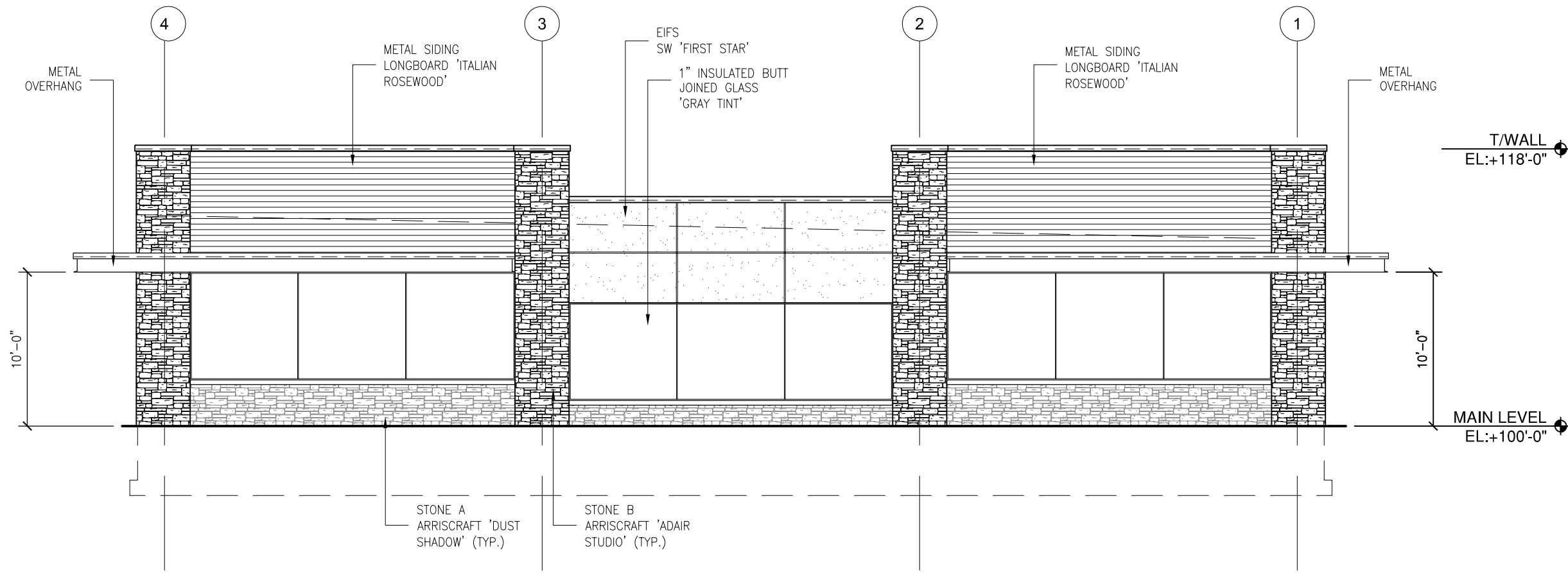
SOUTH ELEVATION
1/8"=1'-0"



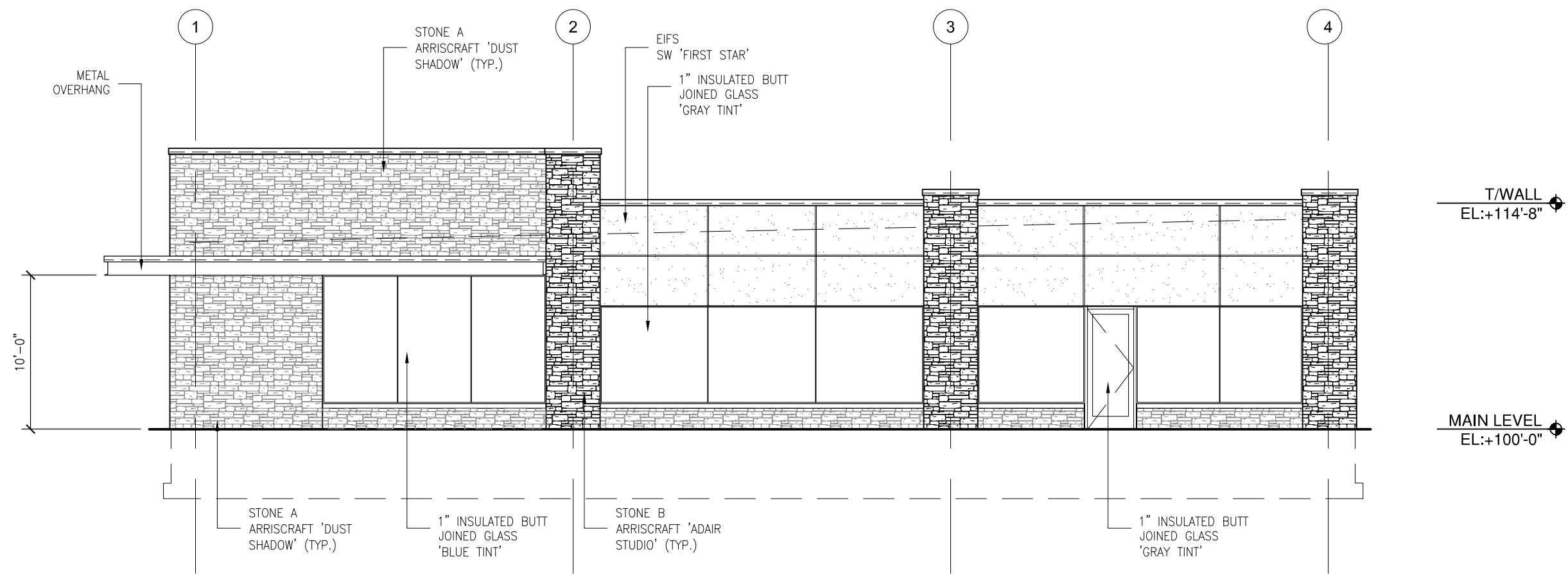
NORTH ELEVATION
1/8"=1'-0"



WEST ELEVATION
1/8"=1'-0"



EAST ELVATION
1/8"=1'-0"



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11/14/2020

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RON JONA
COLLABORATIVE

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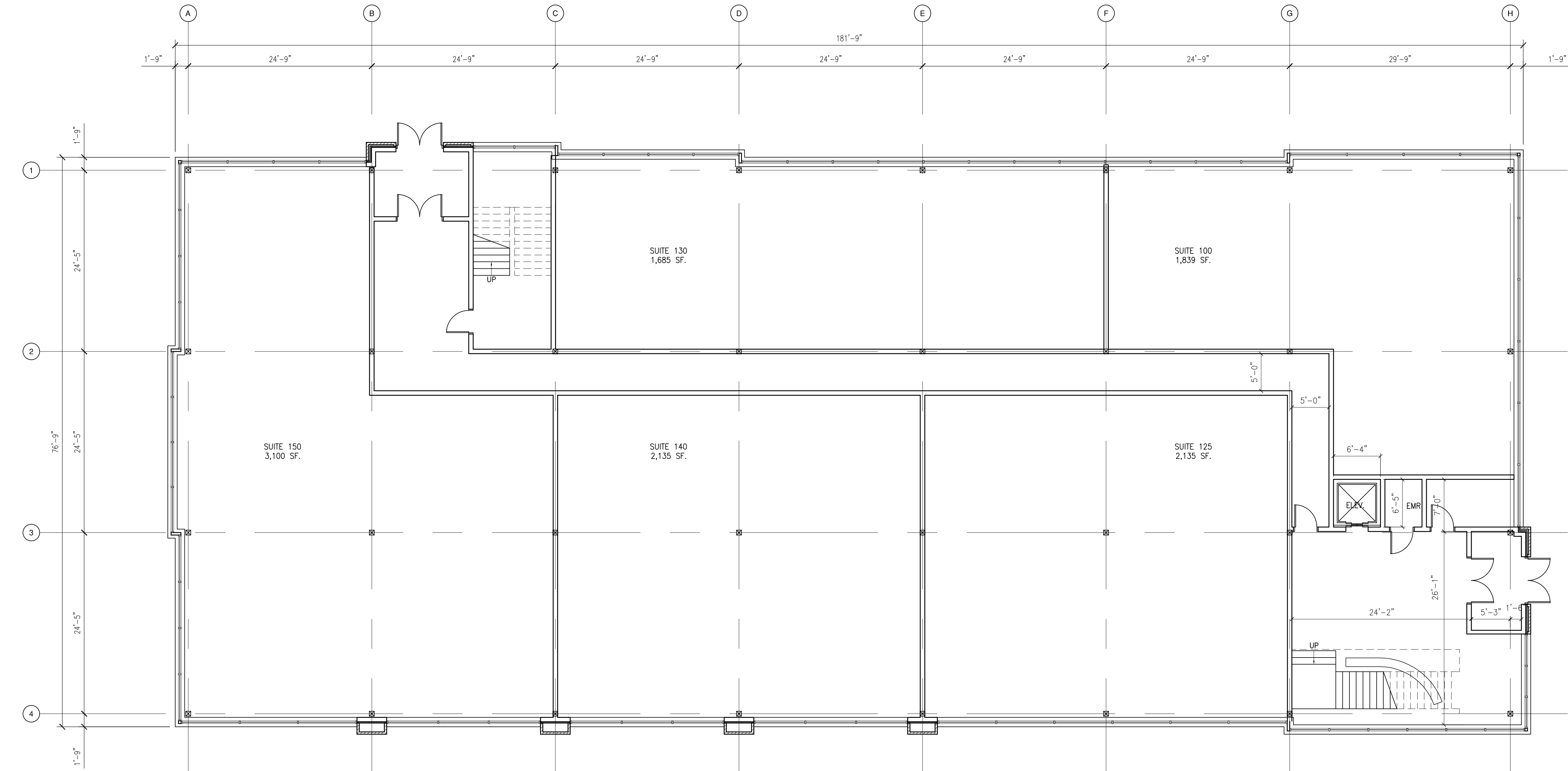
Proposed New Construction for
**FOUNTAIN VIEW
PROFESSIONAL CENTER**
44244 12 Mile Road
Nov, MI 48377

PKA - 20016
Designed:
Checked:
Approved:

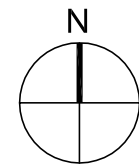
BUILDING ELEVATIONS
BUILDING A

A-2

1
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A5 MAIN LEVEL FLOOR PLAN - BUILDING B
A-3 1/8"=1'-0"



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ISSUED FOR: Site Plan Approval	13/03/2020

1001 Summit Avenue
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Fax: 205.466.4666
info@psamagroup.com

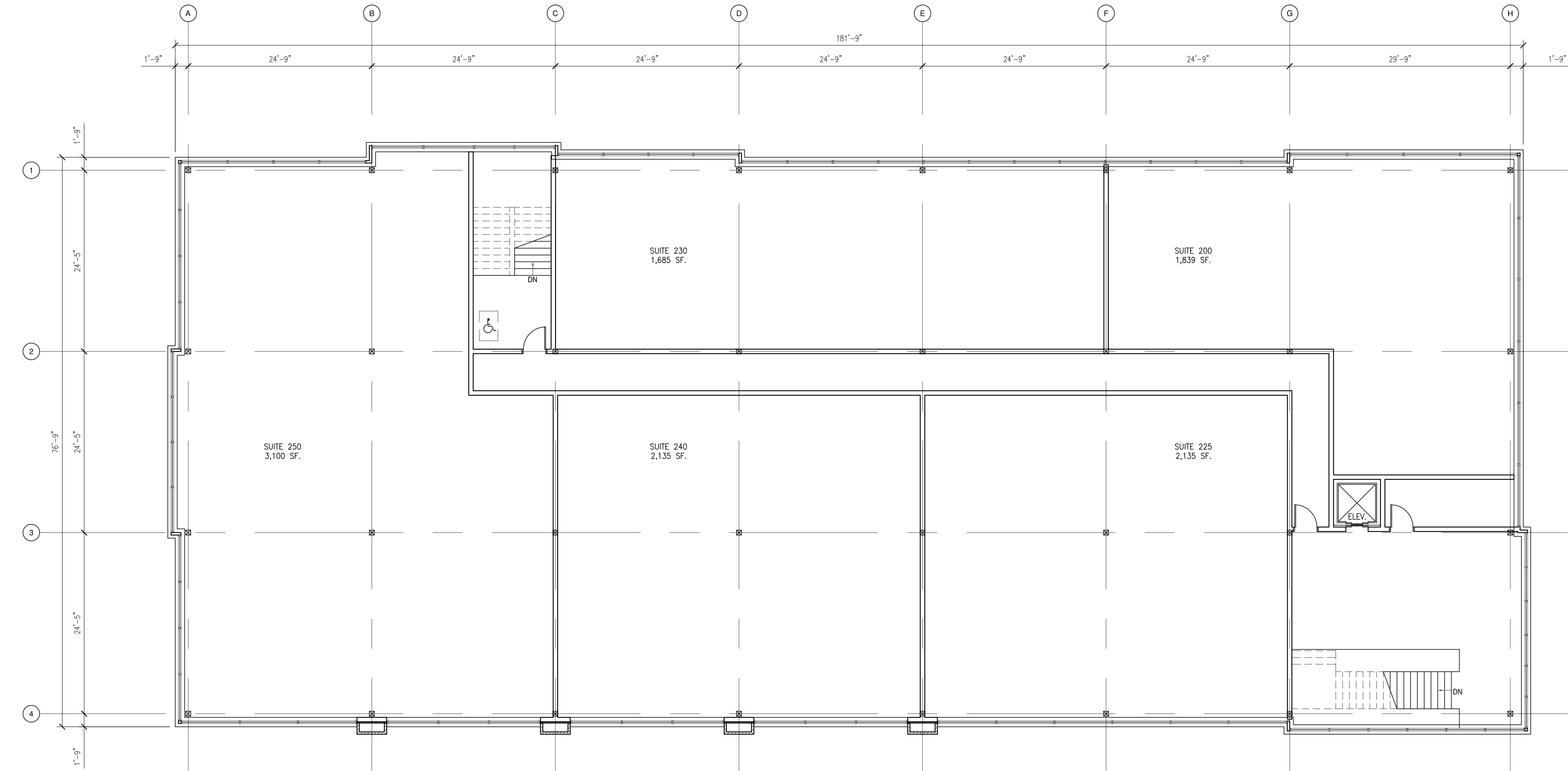
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Proposed New Construction for
FOUNTAIN VIEW
PROFESSIONAL CENTER
44244 12 Mile Road
Nov, MI 48377

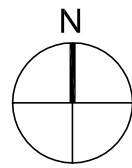
FOA - 20016
Designed:
Checked:
Approved:

MAIN LEVEL
FLOOR PLAN
BUILDING B
A-3

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A5 UPPER LEVEL FLOOR PLAN - BUILDING B
A-4 1/8"=1'-0"



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PASMA GROUP
ARCHITECTS

Proposed New Construction for
**FOUNTAIN VIEW
PROFESSIONAL CENTER**
44244 12 Mile Road
Nov, MI 48377

PKA - 20016
Designed:
Checked:
Approved:

A-4
UPPER LEVEL
FLOOR PLAN
BUILDING B

6 COMMERCE STREET
BIRMINGHAM MI. 48009
C.248.789.2001
O.248.357.3600

VIVID DESIGN
STUDIO
C .248.520.5357

PROJECT:
FOUNTAIN VIEW
PROFESSIONAL CENTER

FOUNTAIN VIEW
BLDG. A,B,C
44244 12 MILE RD.,
NOVI, MI 48377

SHEET TITLE:

ELEVATIONS

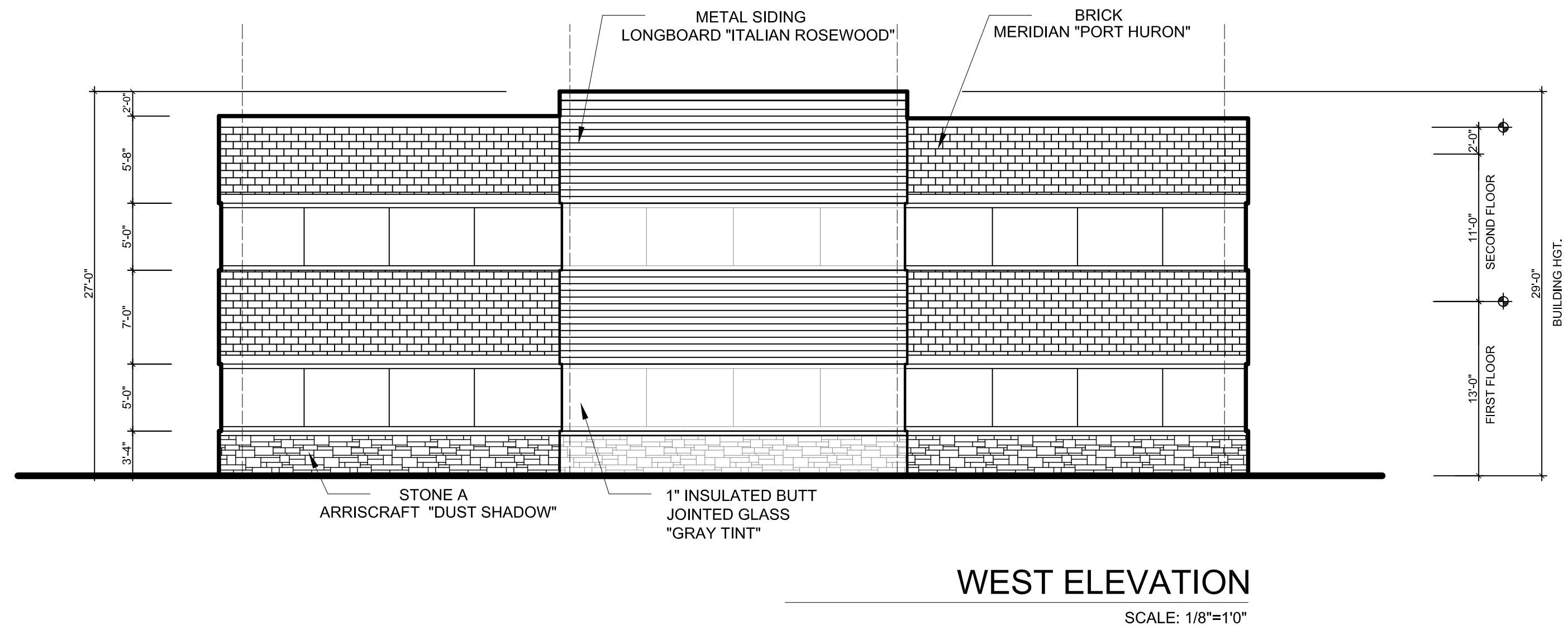
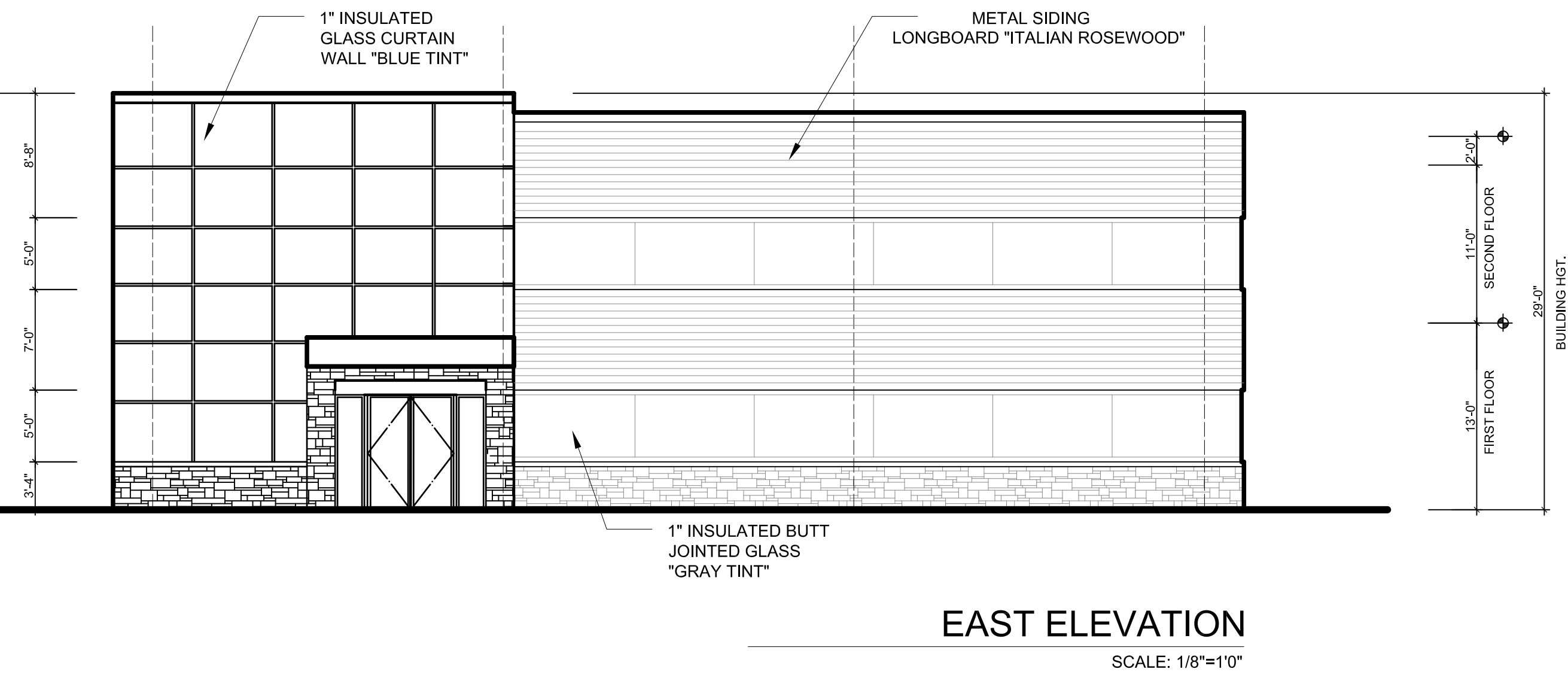
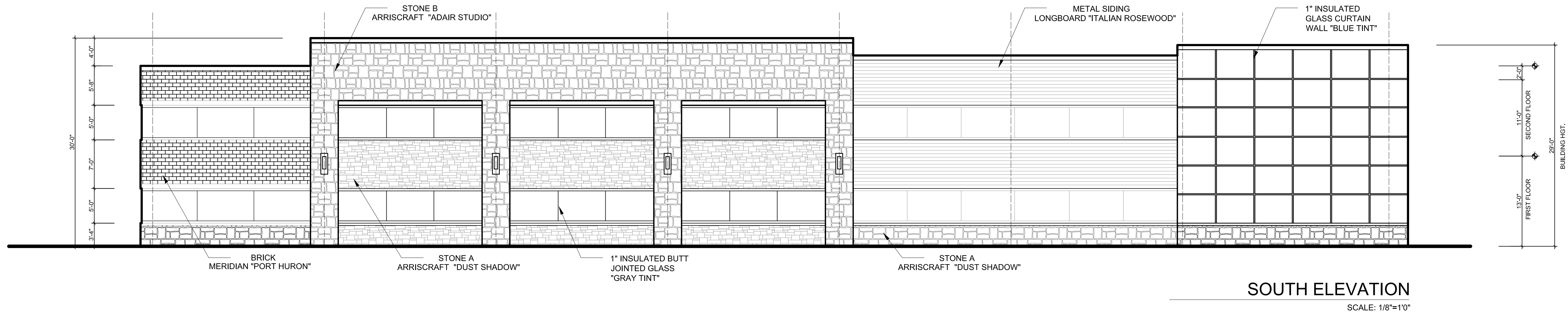
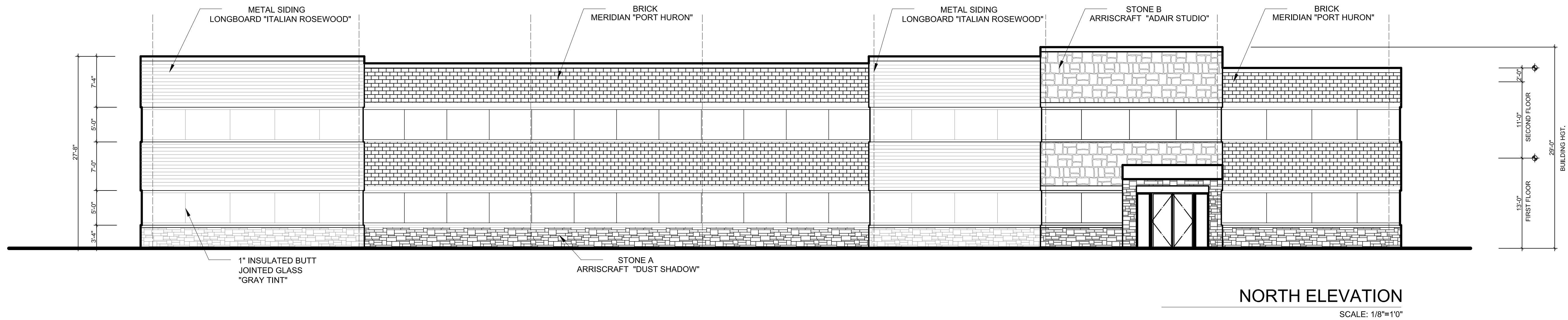
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DO NOT SCALE DRAWINGS
USE FIGURED DIMENSIONS ONLY

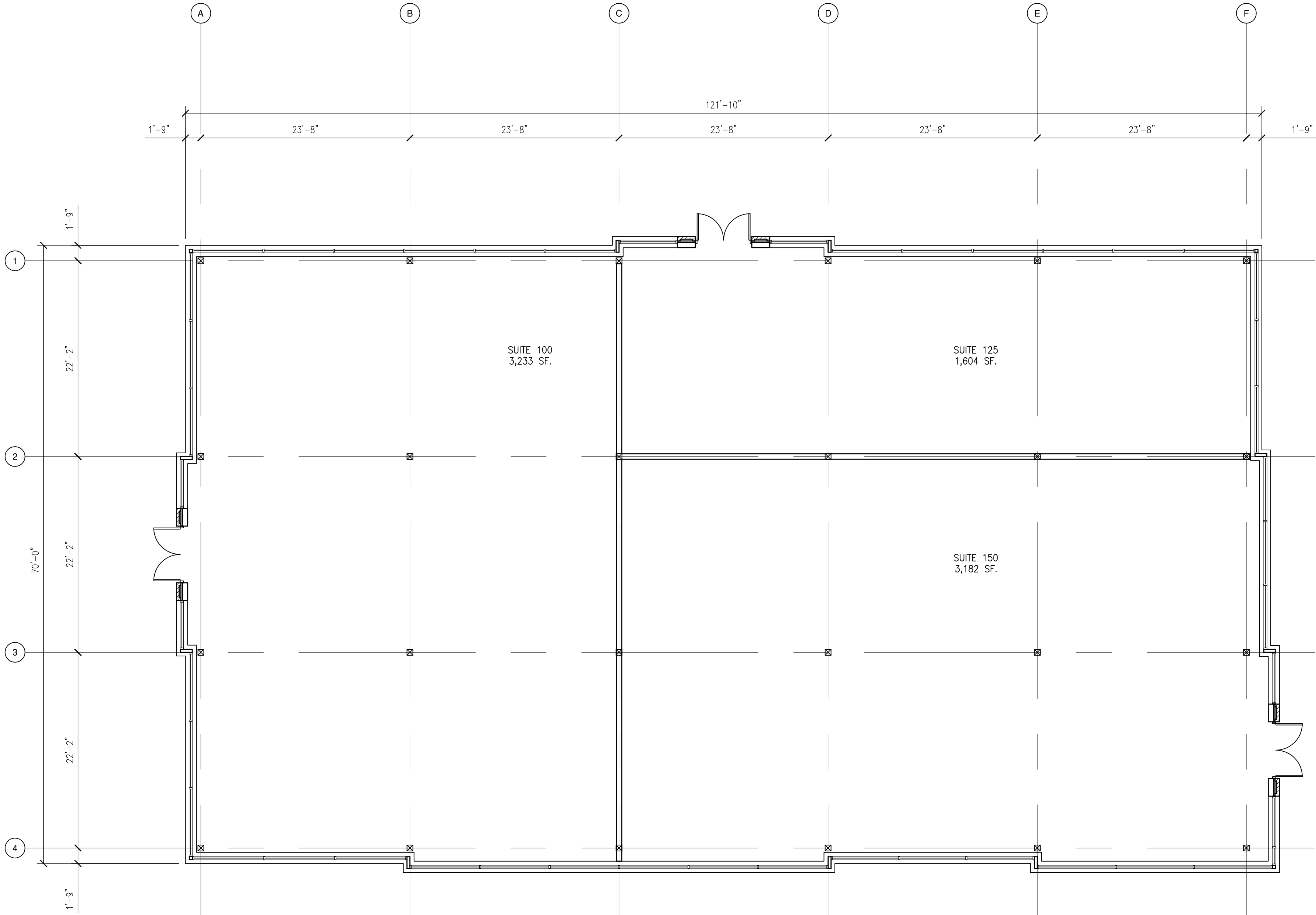
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SHEET NO: A-5



1
2
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5



Key Notes

SUBJECT:

MOUNTAIN VIEW
PROFESSIONAL CENTER

OUNTAIN VIEW
G. A,B,C

44 12 MILE RD,
VI, MI 48377

HEET TITLE:

EVALUATIONS

DG. C

NOT SCALE DRAWINGS
FIGURED DIMENSIONS ONLY

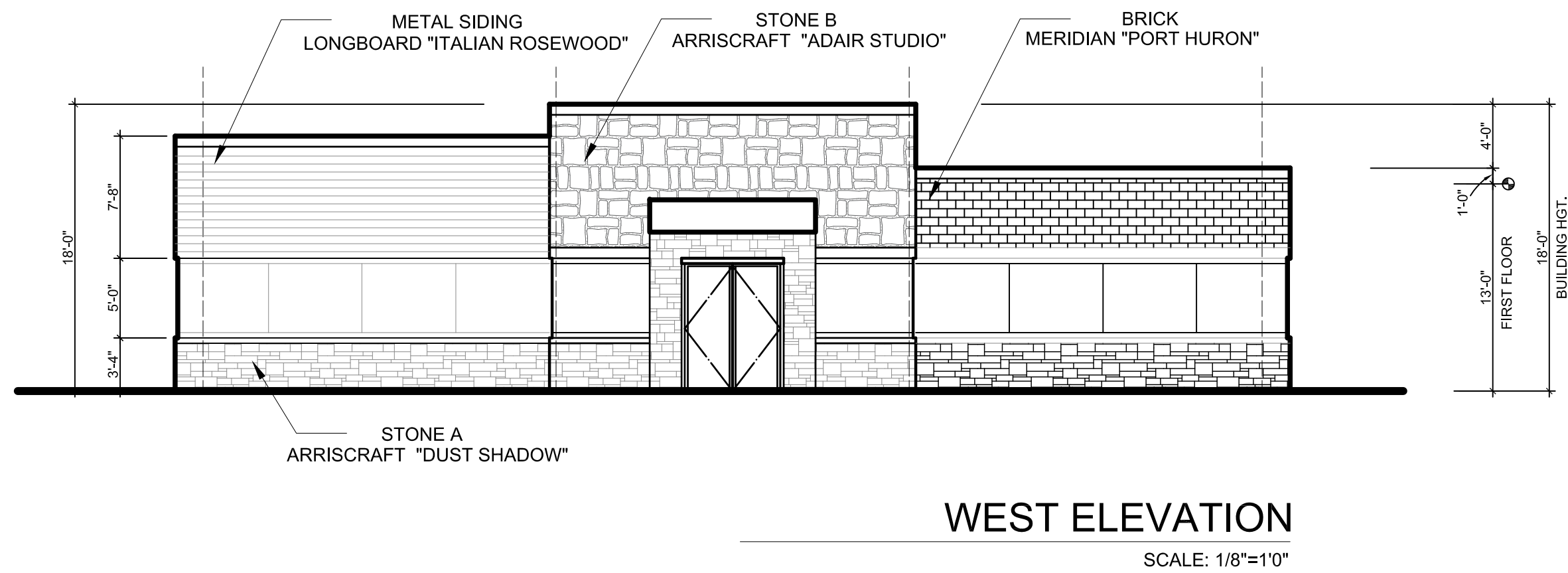
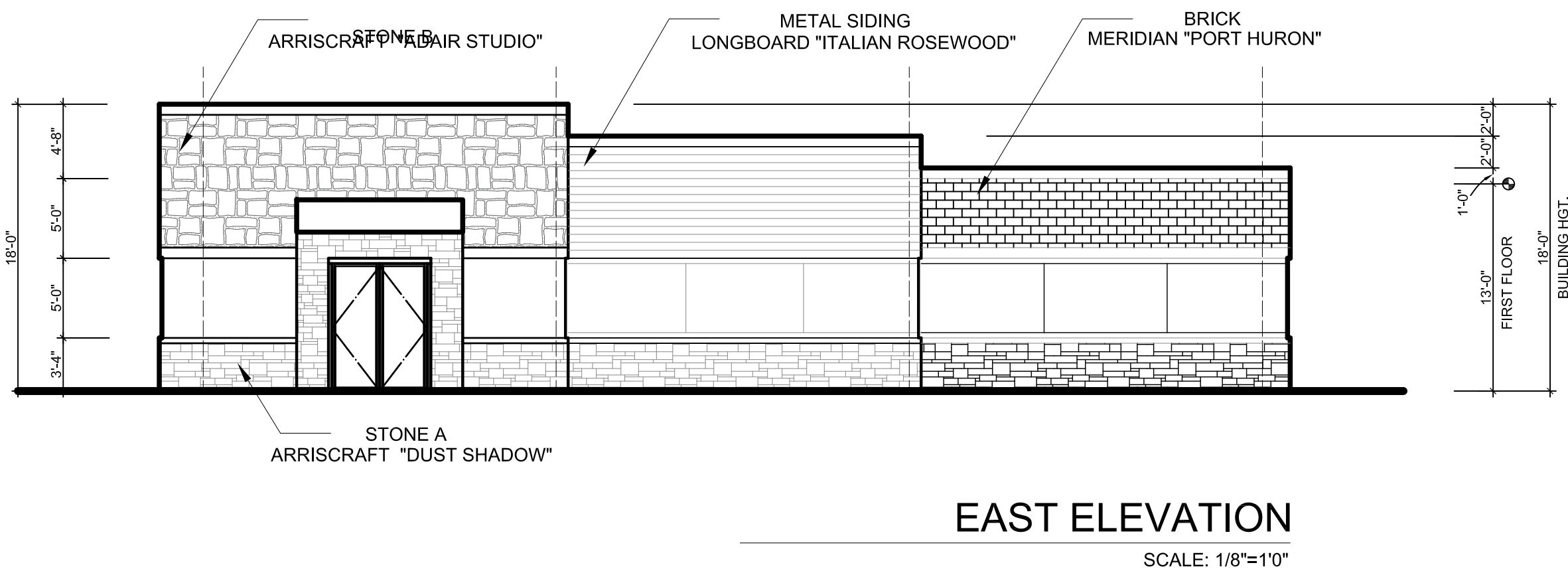
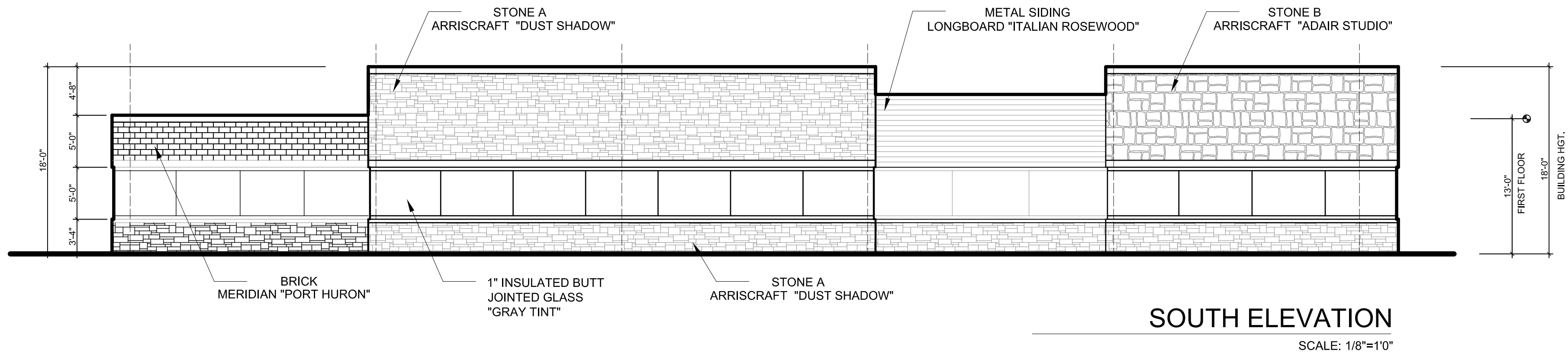
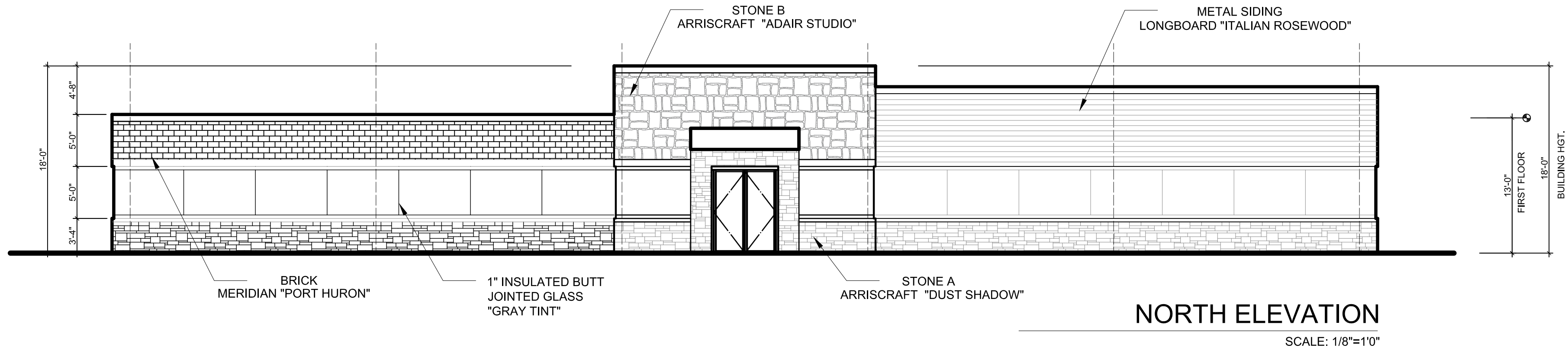
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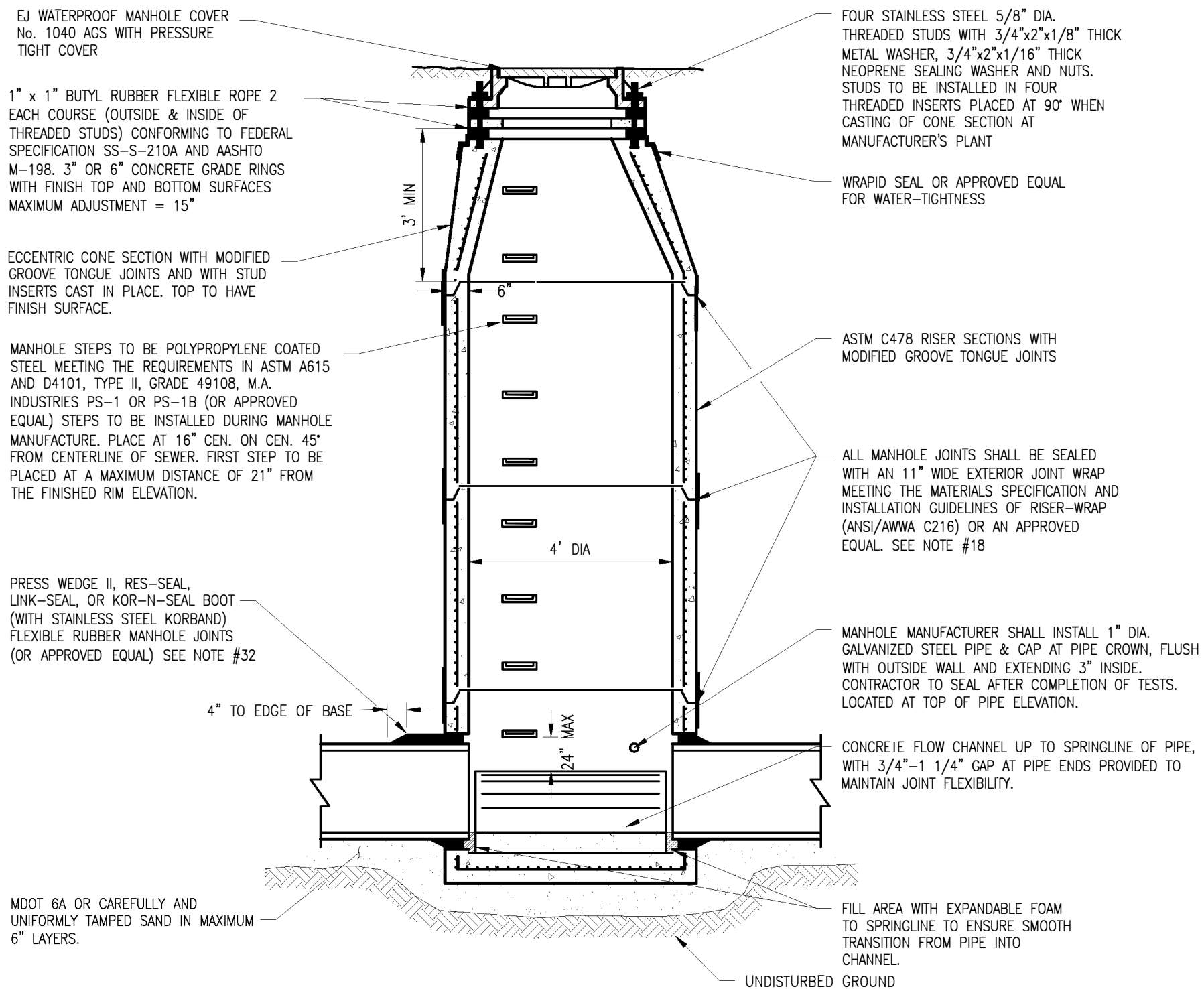
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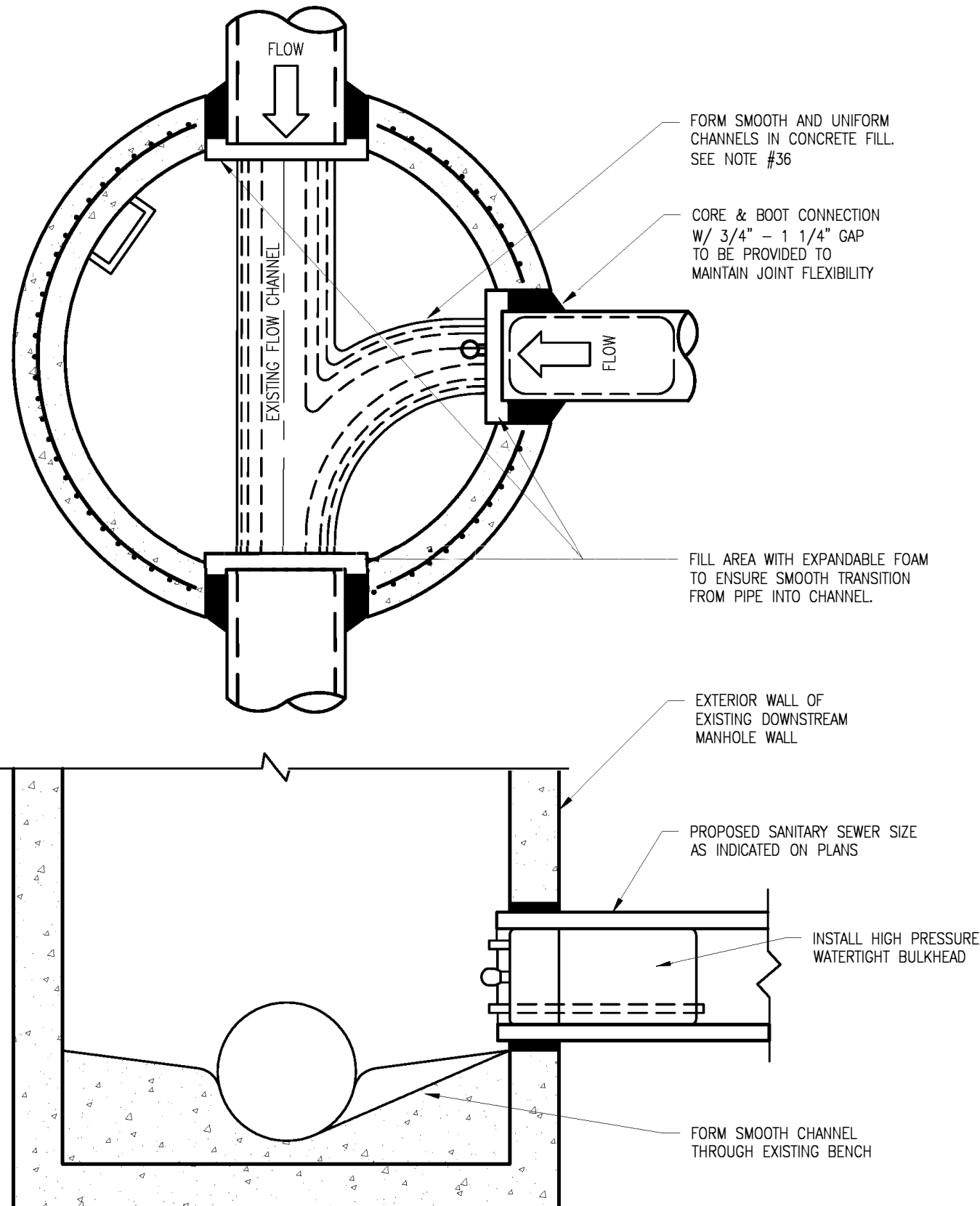
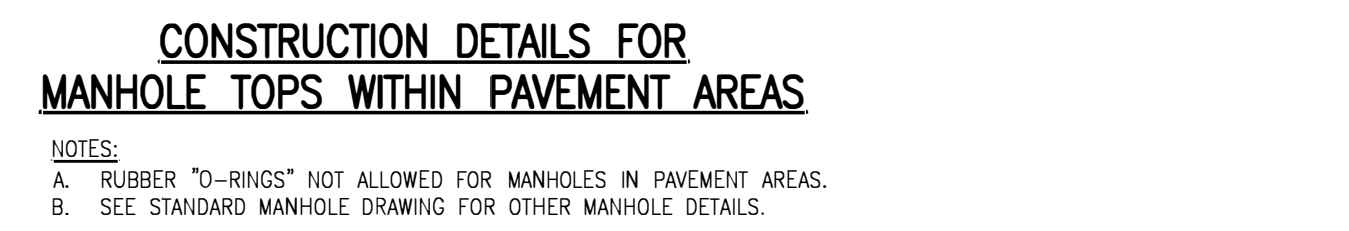
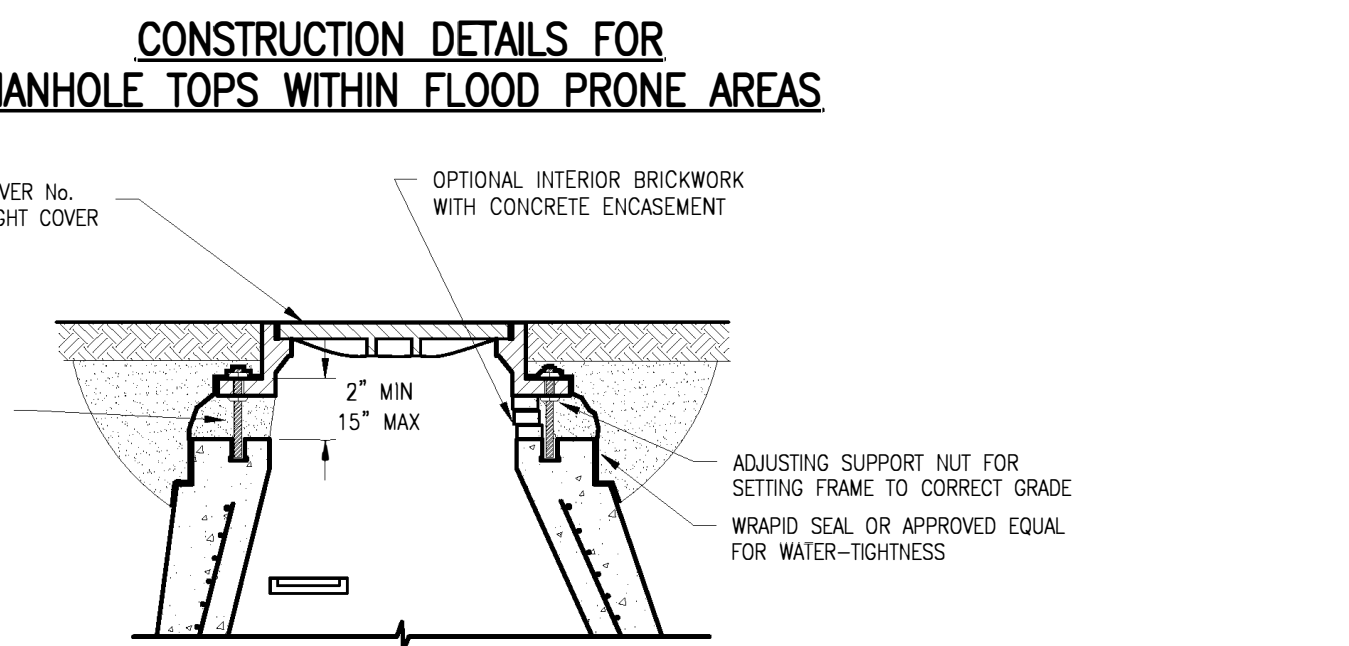
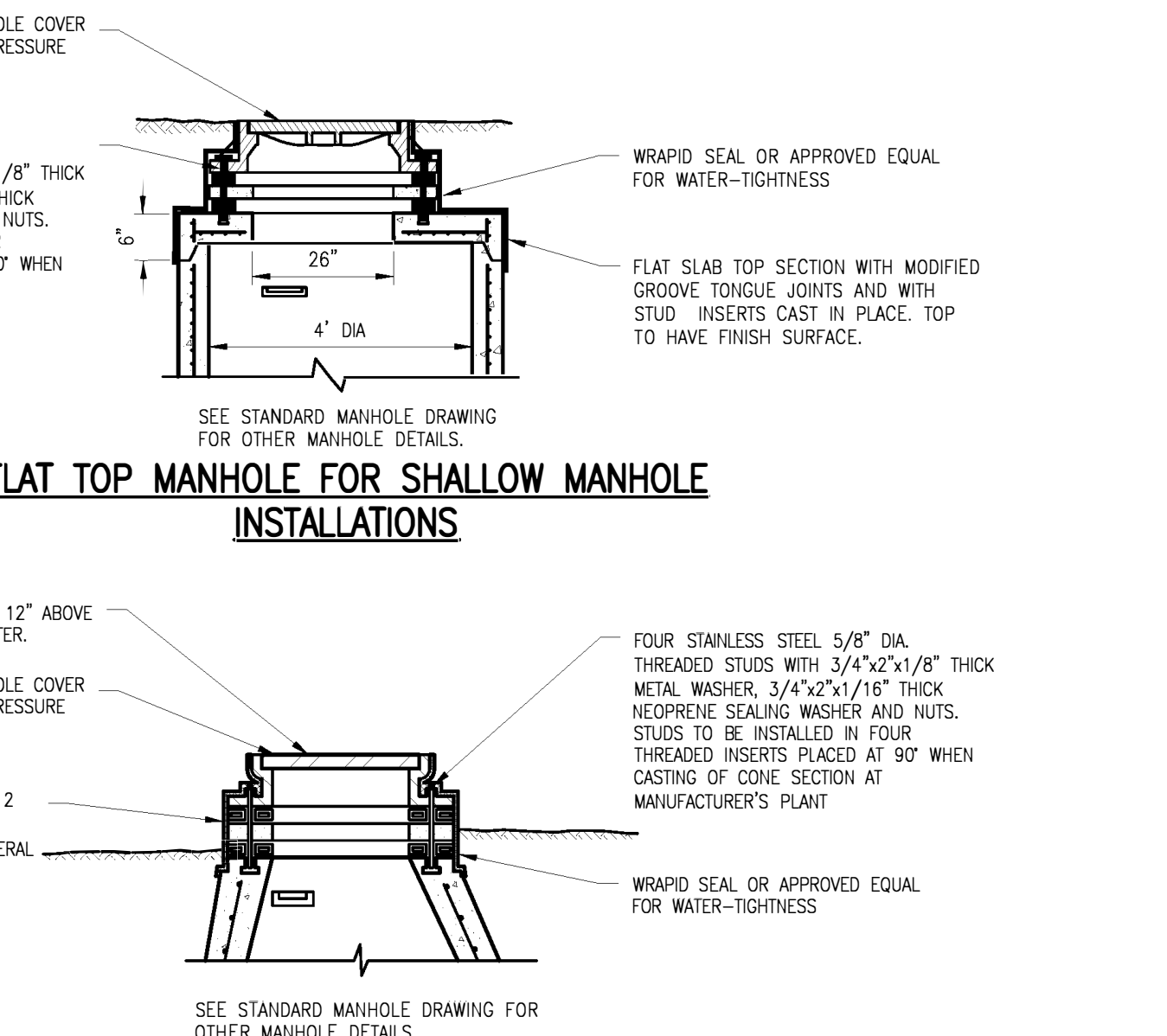
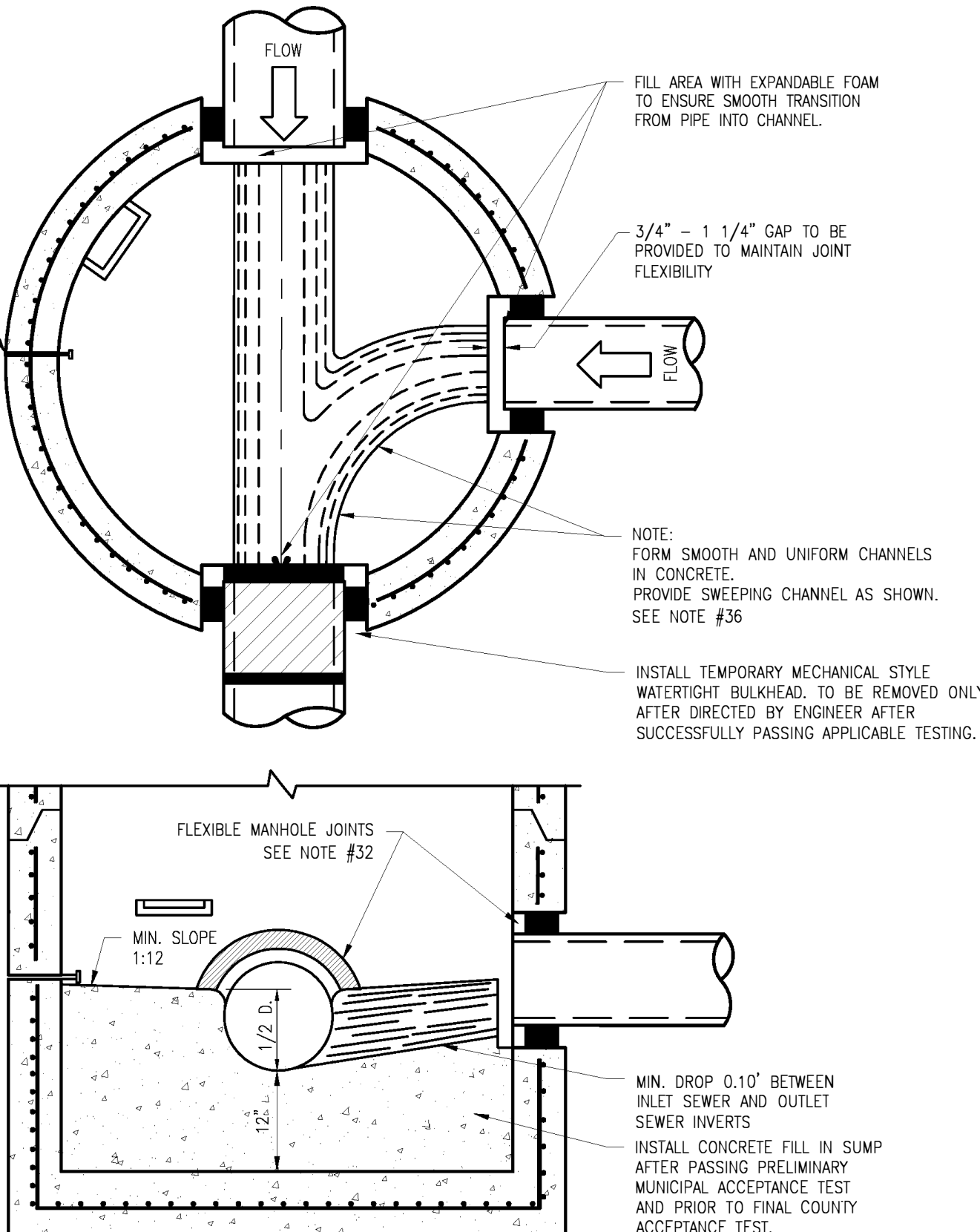
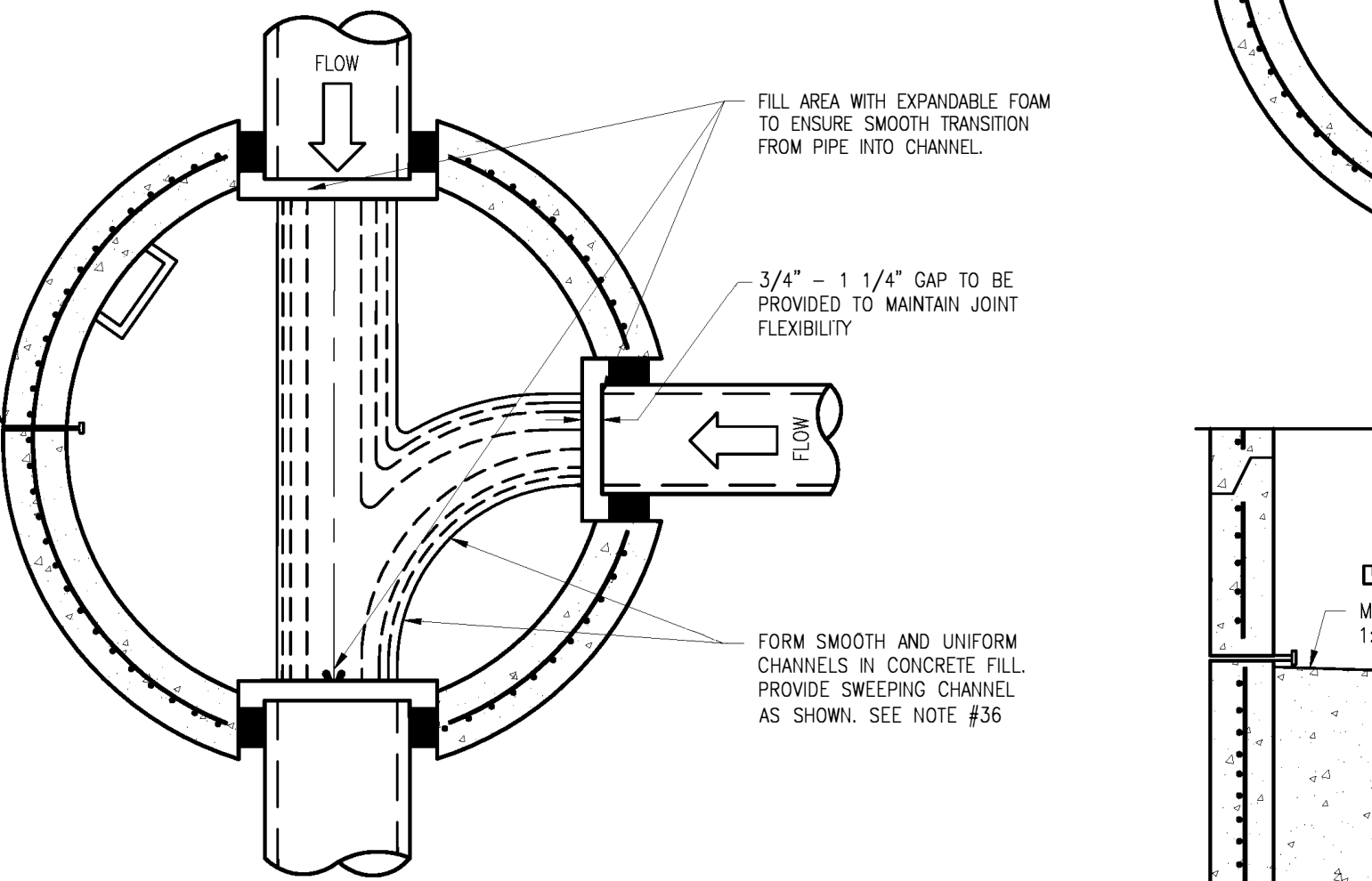
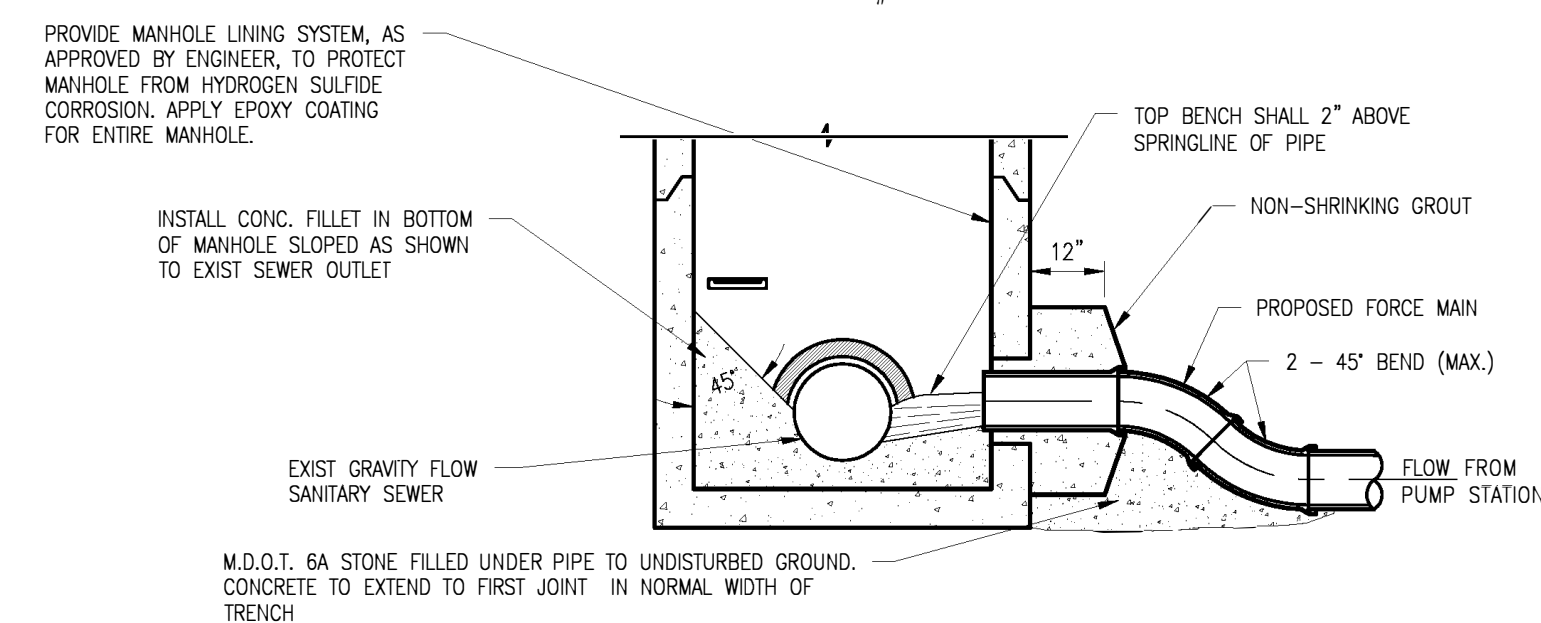
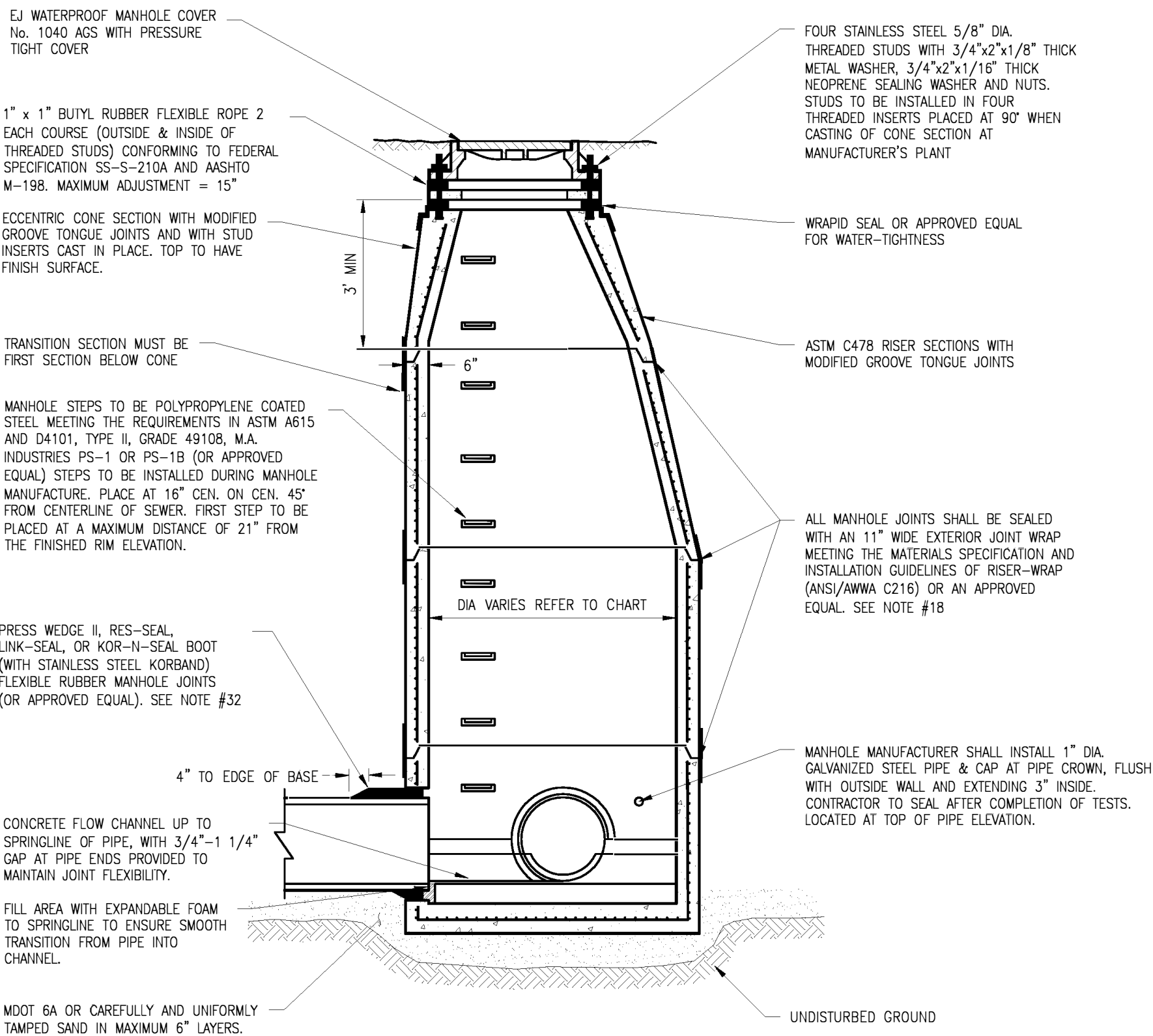
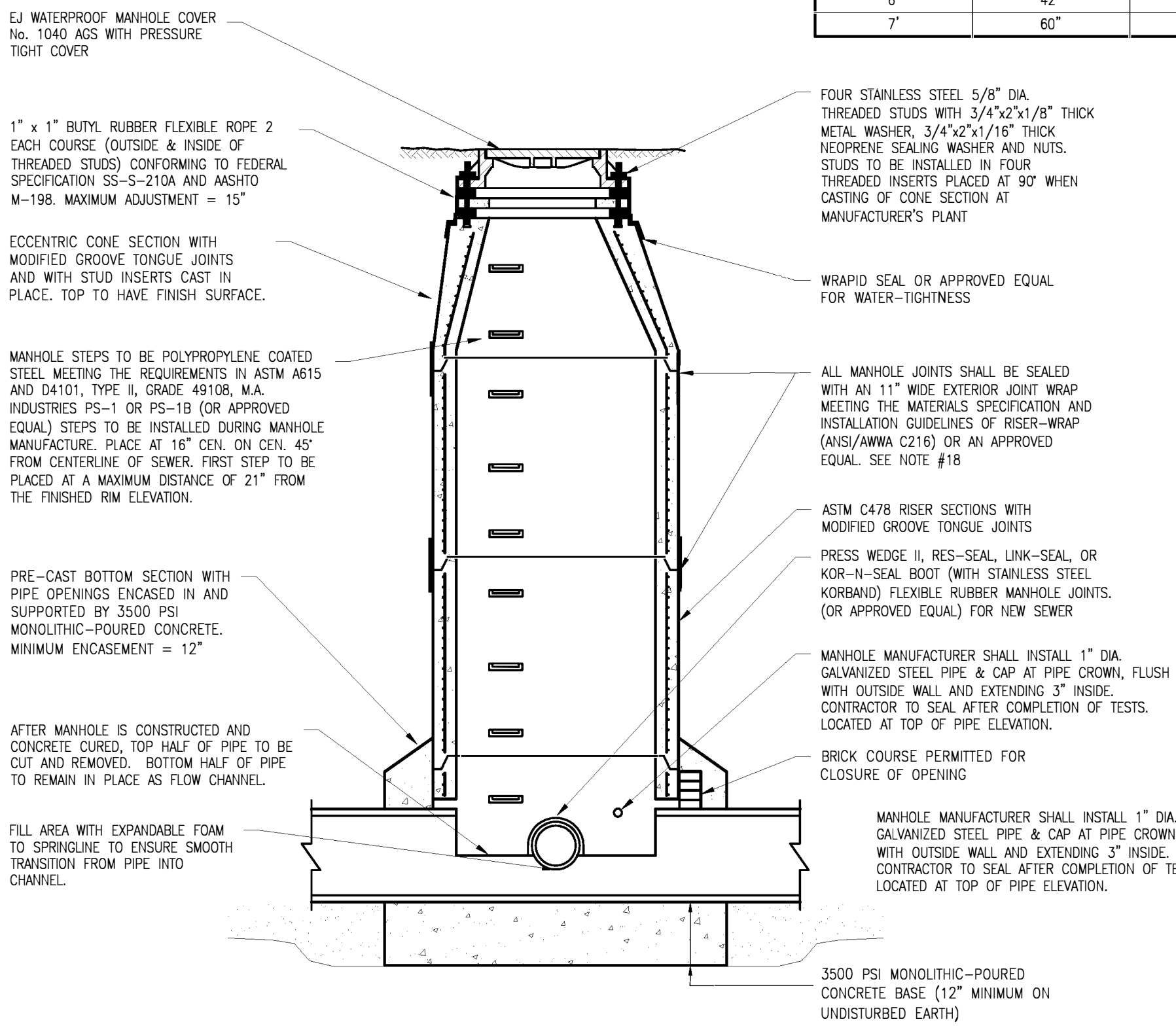
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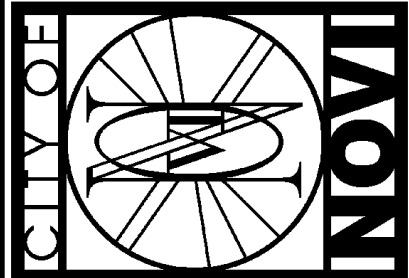
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MANHOLE SIZING CHART		
MANHOLE DIAMETER	MAX PIPE SIZE FOR STRAIGHT THRU INST.	MAX PIPE SIZE FOR RIGHT ANGLE INST.
4'	24"	18"
5'	36"	24"
6'	42"	36"
7'	60"	42"



NOTE:
REMOVAL AND/OR REPLACEMENT OF ANY INSTALLATION WHICH DOES NOT MEET THE CITY OF NOVI DESIGN MANUAL OR THESE STANDARD DETAILS MAY BE REQUIRED AT THE PROPERTY OWNER'S EXPENSE.



CITY OF NOVI 145175 WEST 10 MILE ROAD | NOVI, MI 48075 | P (248) 347-3456 | WWW.CITYOFNOVI.ORG

DATE: 2/16/2018

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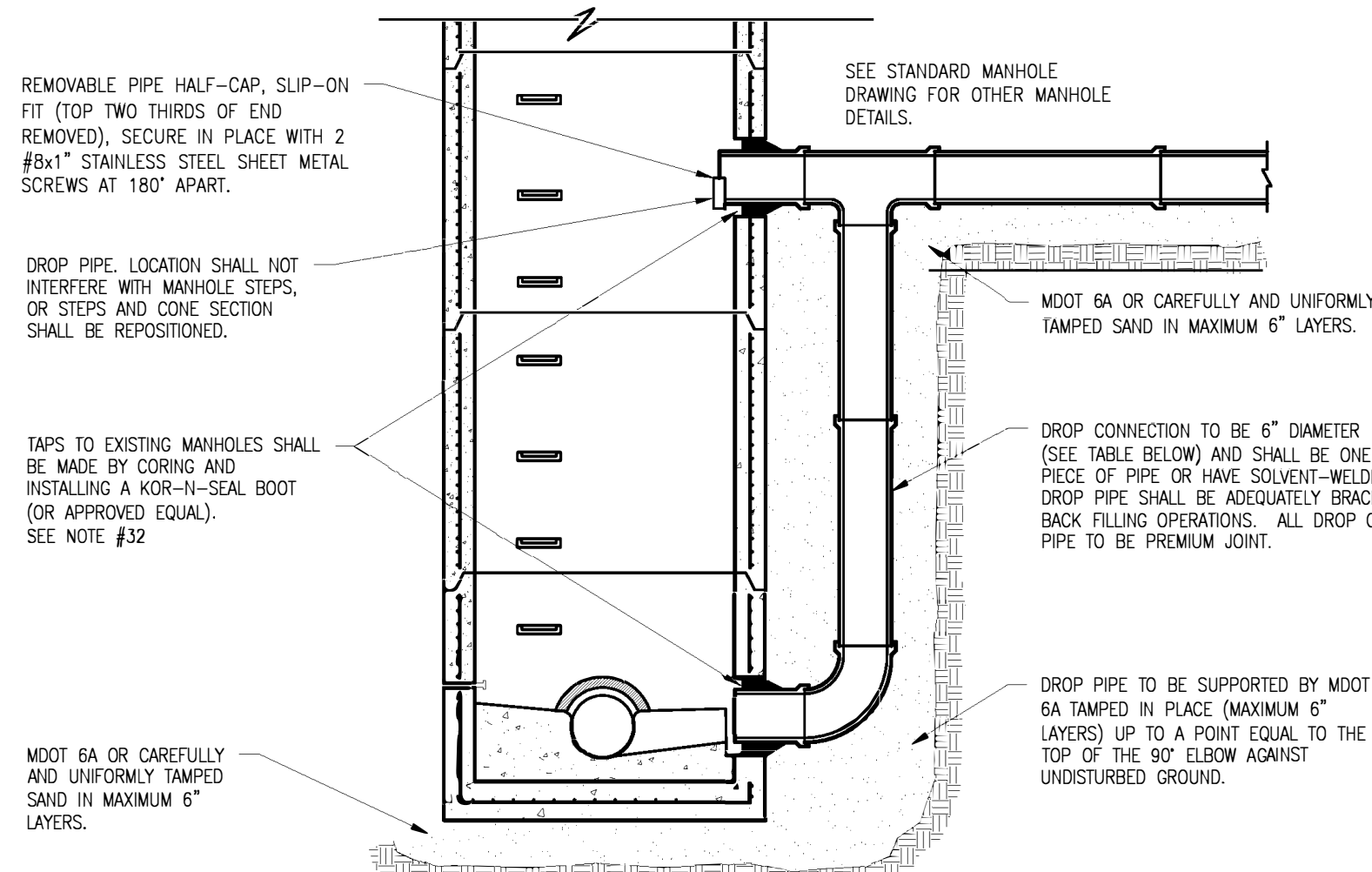
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CITY OF NOVI
SANITARY SEWER
STANDARD DETAILS

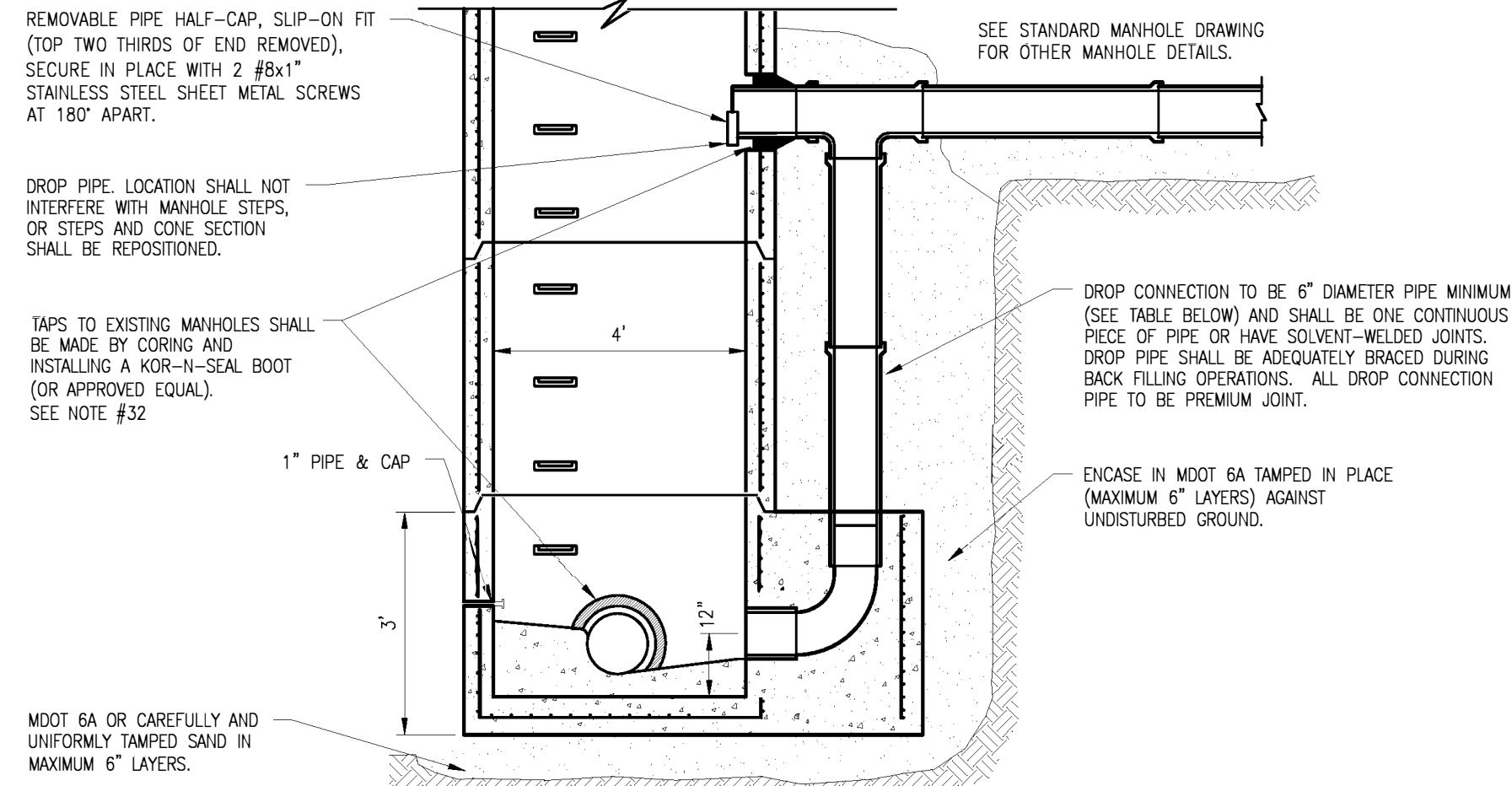
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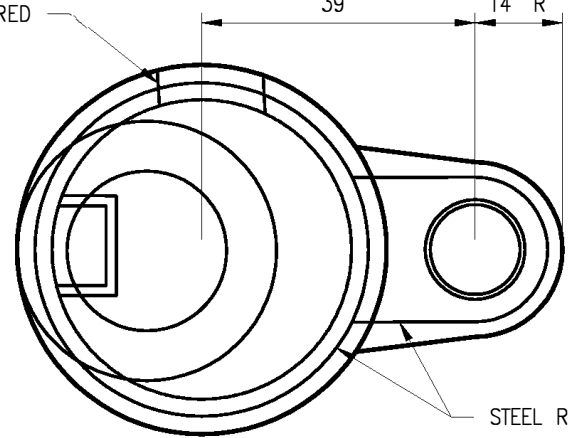
EXISTING MANHOLE EXTERNAL DROP CONNECTION

SEE NOTES #29, #30 AND #32

SEWER SIZE	EXTERNAL DROP SIZE	MH SIZE (L.D.)
UP TO 6"	6"	4'
UP TO 10"	8"	4'
UP TO 18"	10"	4'
UP TO 30"	18"	5'

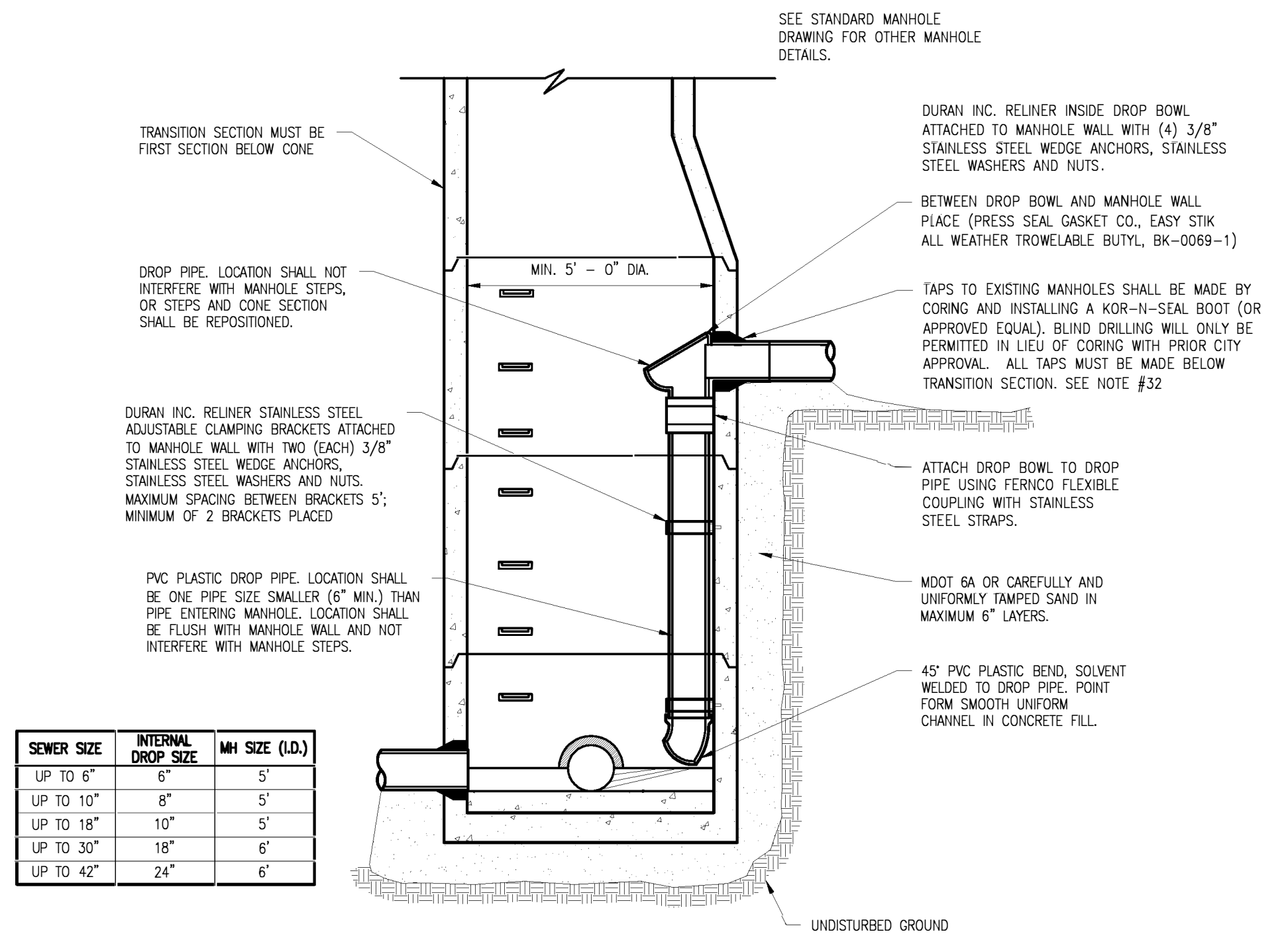


SEWER SIZE	EXTERNAL DROP SIZE	MH SIZE (L.D.)
UP TO 6"	6"	4'
UP TO 10"	8"	4'
UP TO 18"	10"	4'
UP TO 30"	18"	5'



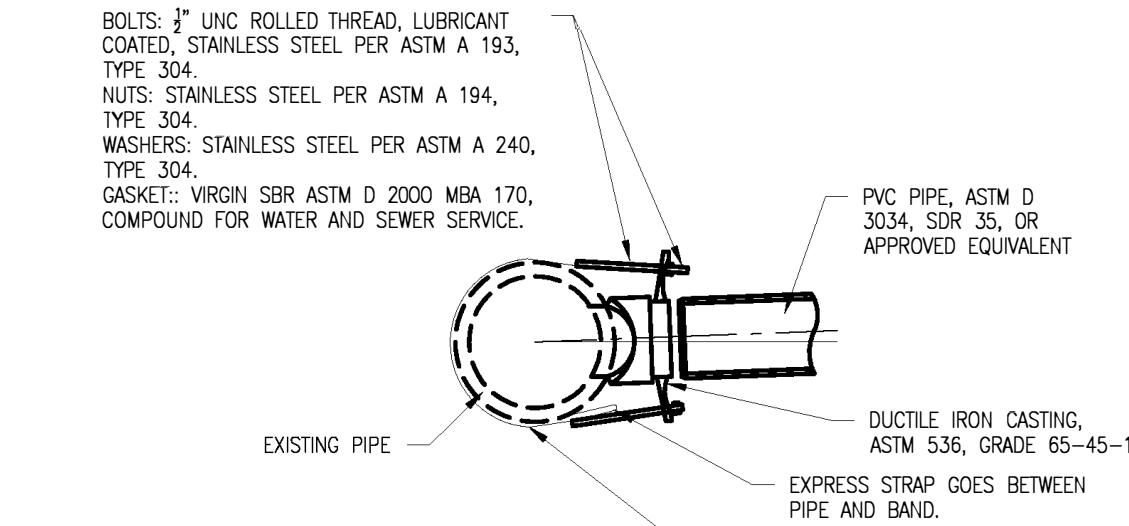
EXTERNAL DROP MANHOLE CONNECTION WITH PRECAST BASE FOR NEW SEWER SYSTEM CONSTRUCTION

SEE NOTES #29, #30 AND #31



INTERNAL DROP MANHOLE CONNECTION

SEE NOTE #29

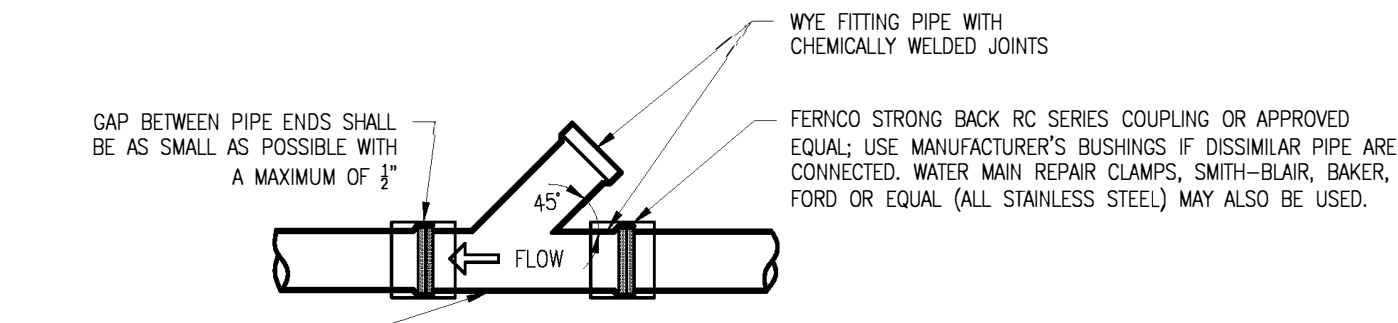


ROMA TAP FOR PVC PIPE

NOTES:

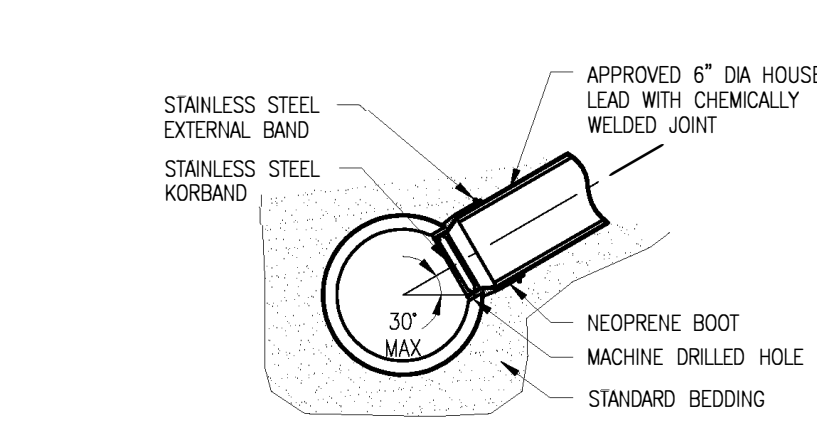
1) USE ROMAC INDUSTRIES, INC. STYLE "28" SEWER SADDLE, OR APPROVED EQUIVALENT. 2) CORE DRILL AN APPROPRIATELY SIZED HOLE IN EXISTING PIPE TO ACCOMPLISH THE TAP.

2 BY 4 WOODEN LOCATION STAKE PLACED AT END OF SAN. LEAD TO HEIGHT EXTENDING 4 FEET ABOVE GRADE.

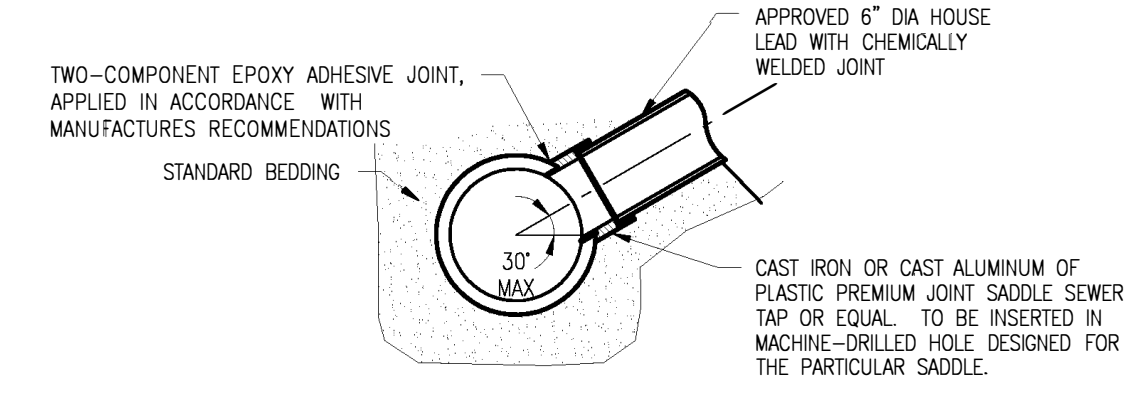


WYE PIPE INSERTION WITH FLEXIBLE COUPLINGS (RIGID PIPE)

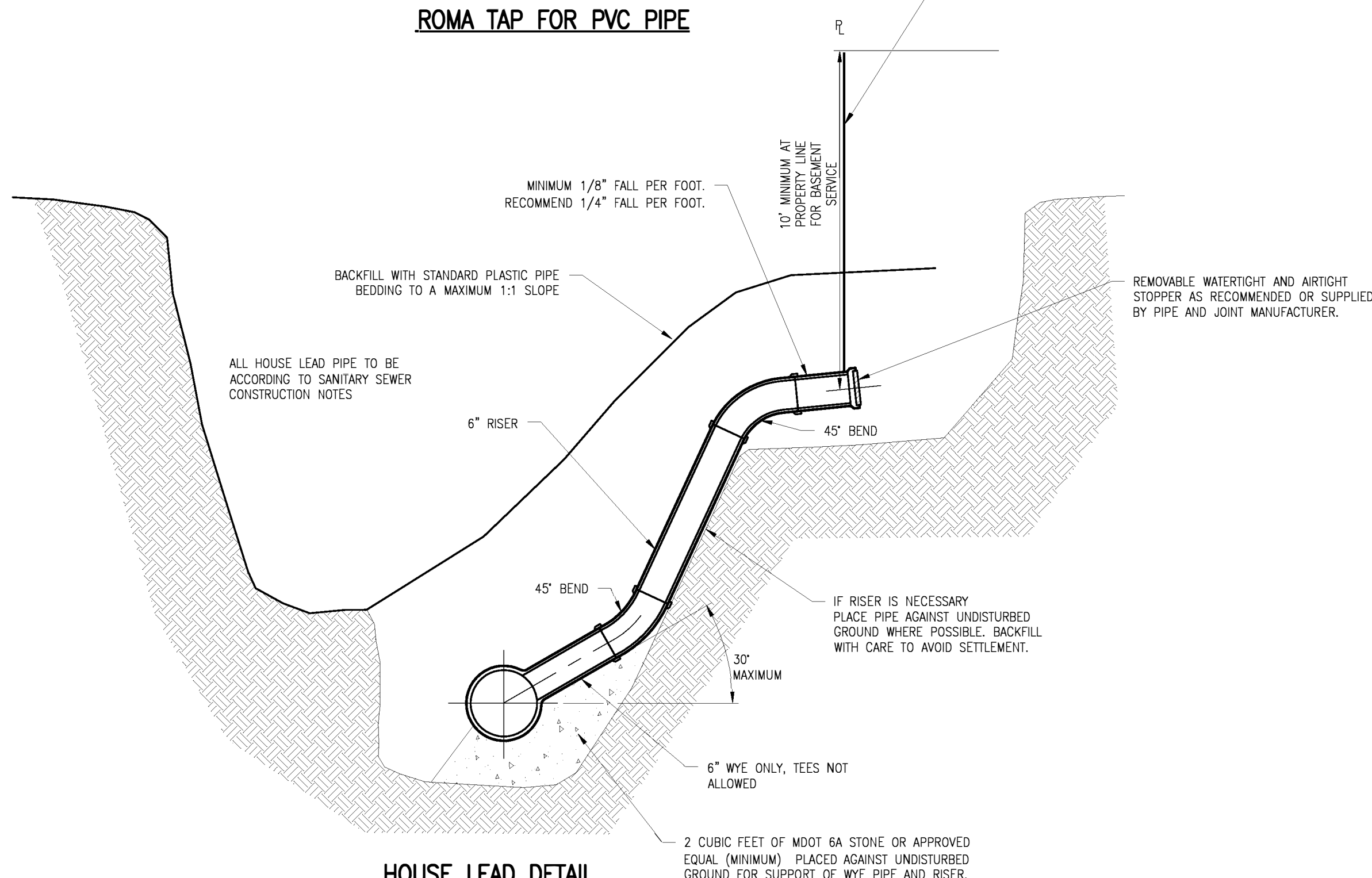
SEE NOTE #41



KOR-N-TEE TAP FOR CONCRETE PIPE

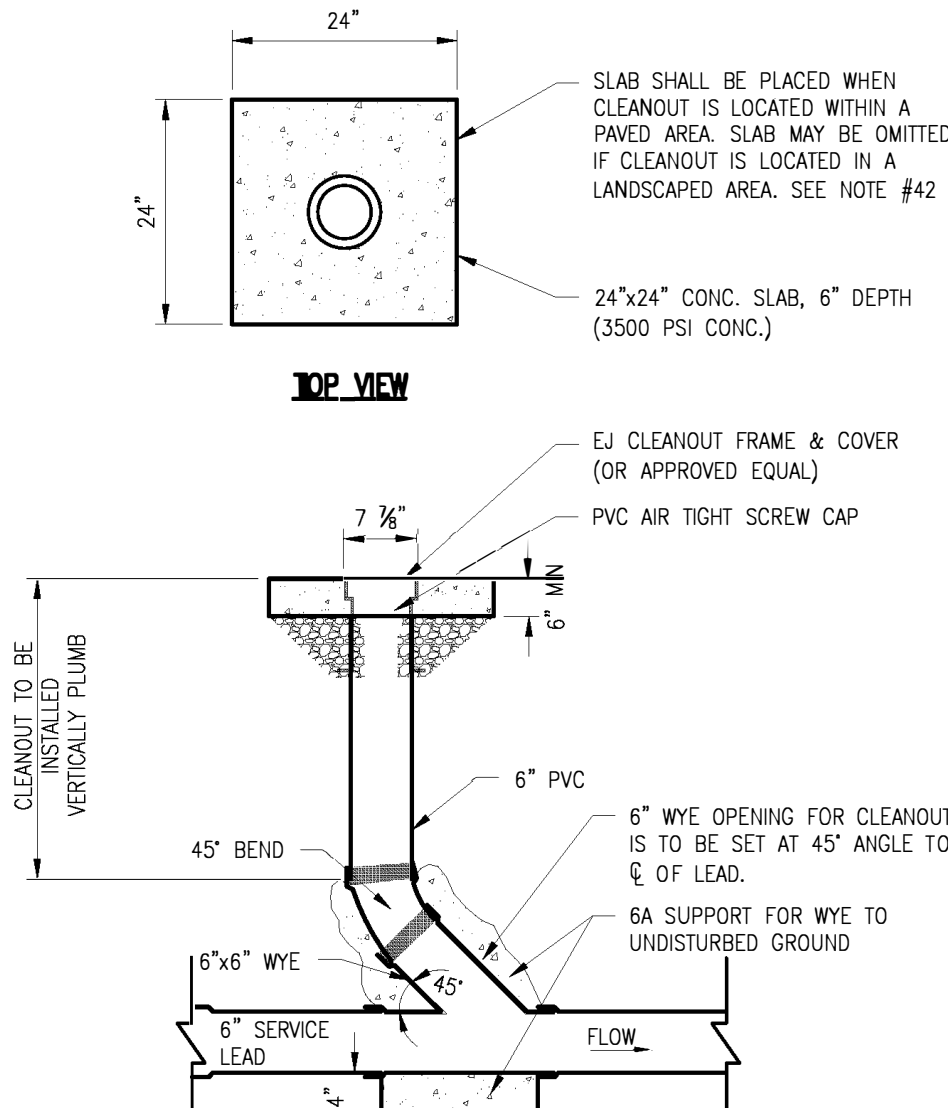


SEWER TAP-ALL SIZES OF MAIN SEWER, VITRIFIED CLAY PIPE

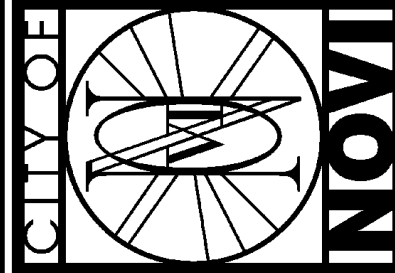


HOUSE LEAD DETAIL

SEE NOTES #14 & #39



DETAIL OF SANITARY SEWER CLEANOUT



CITY OF NOVI | 45175 WEST 10 MILE ROAD | NOVI, MI 48375 | P (248) 347-0456 | WWW.CITYOFNOVI.ORG

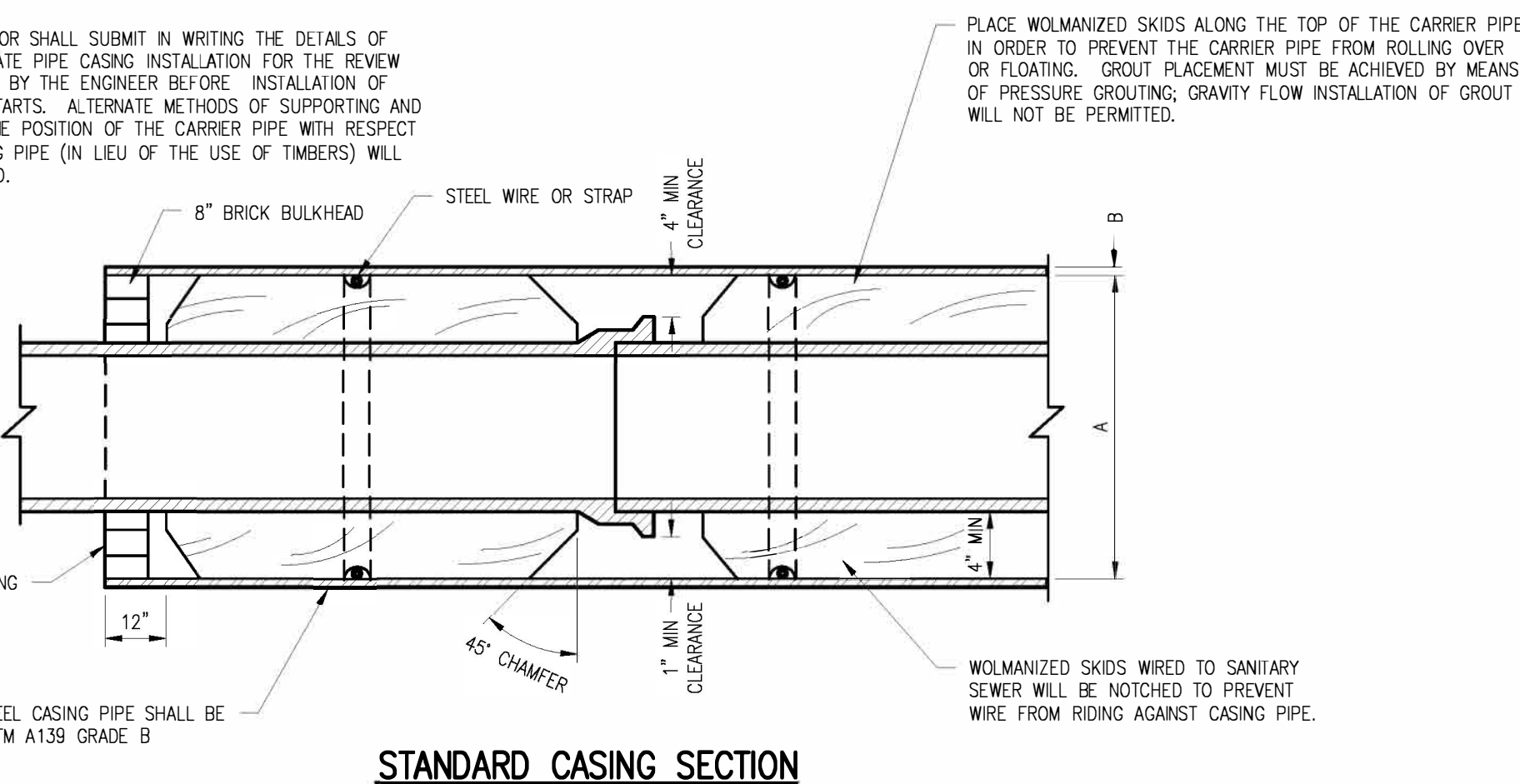
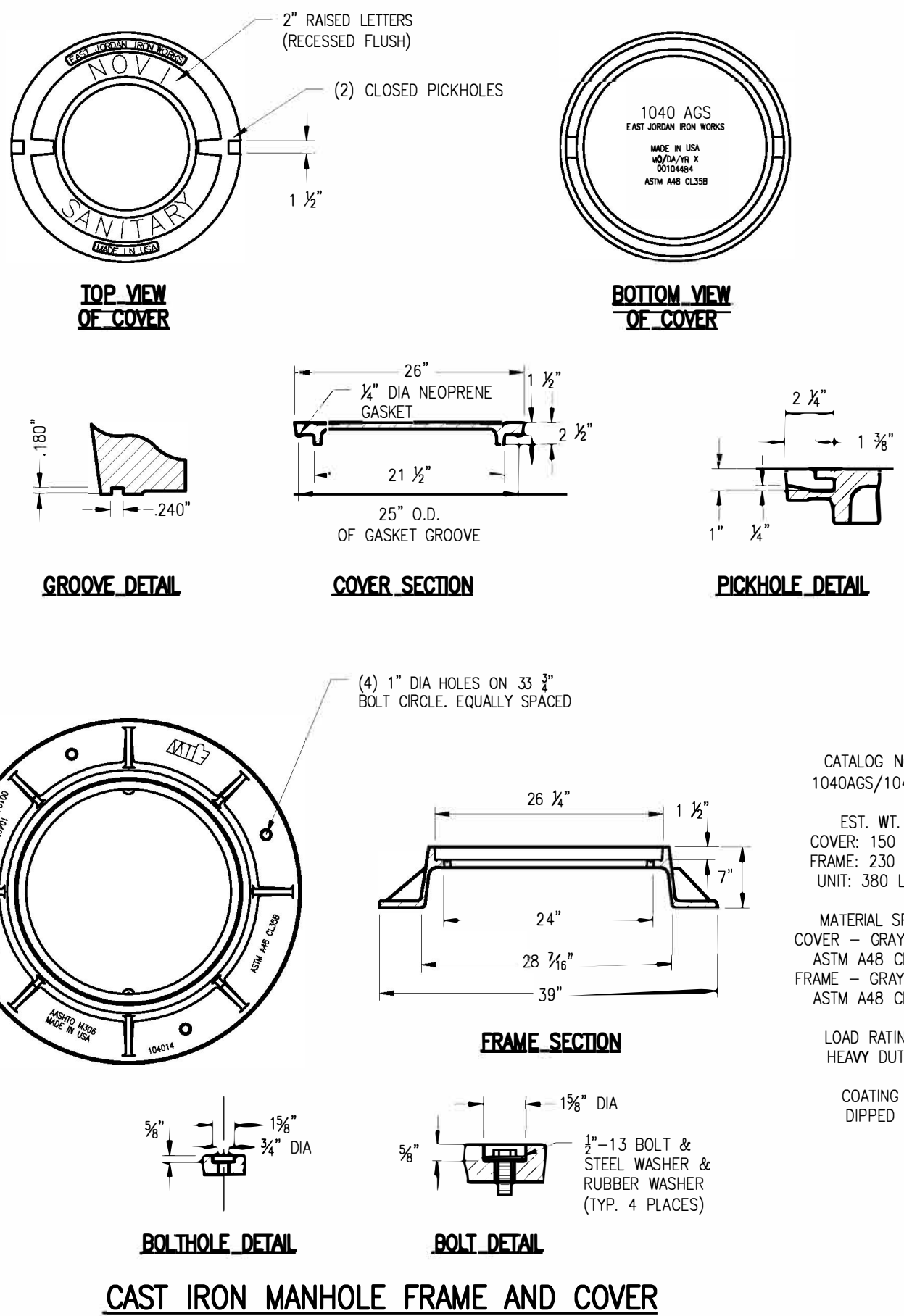
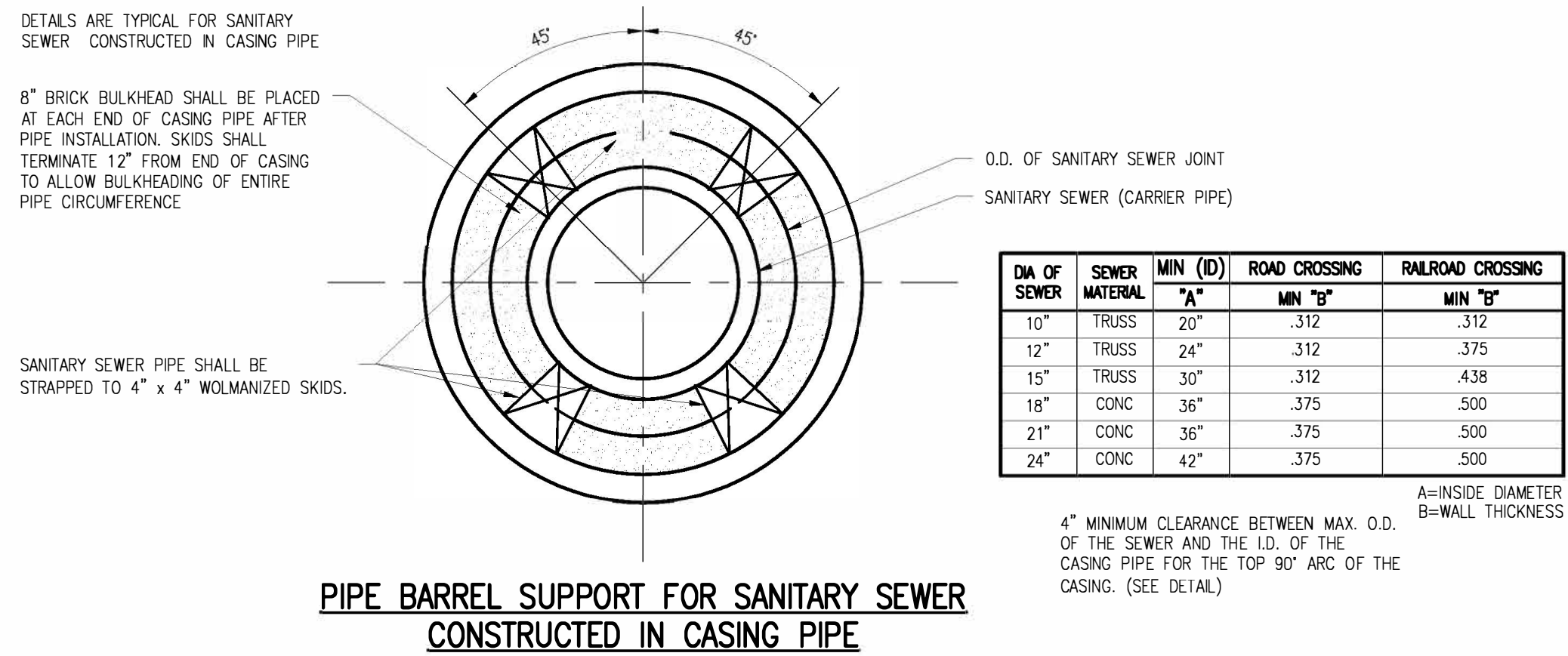
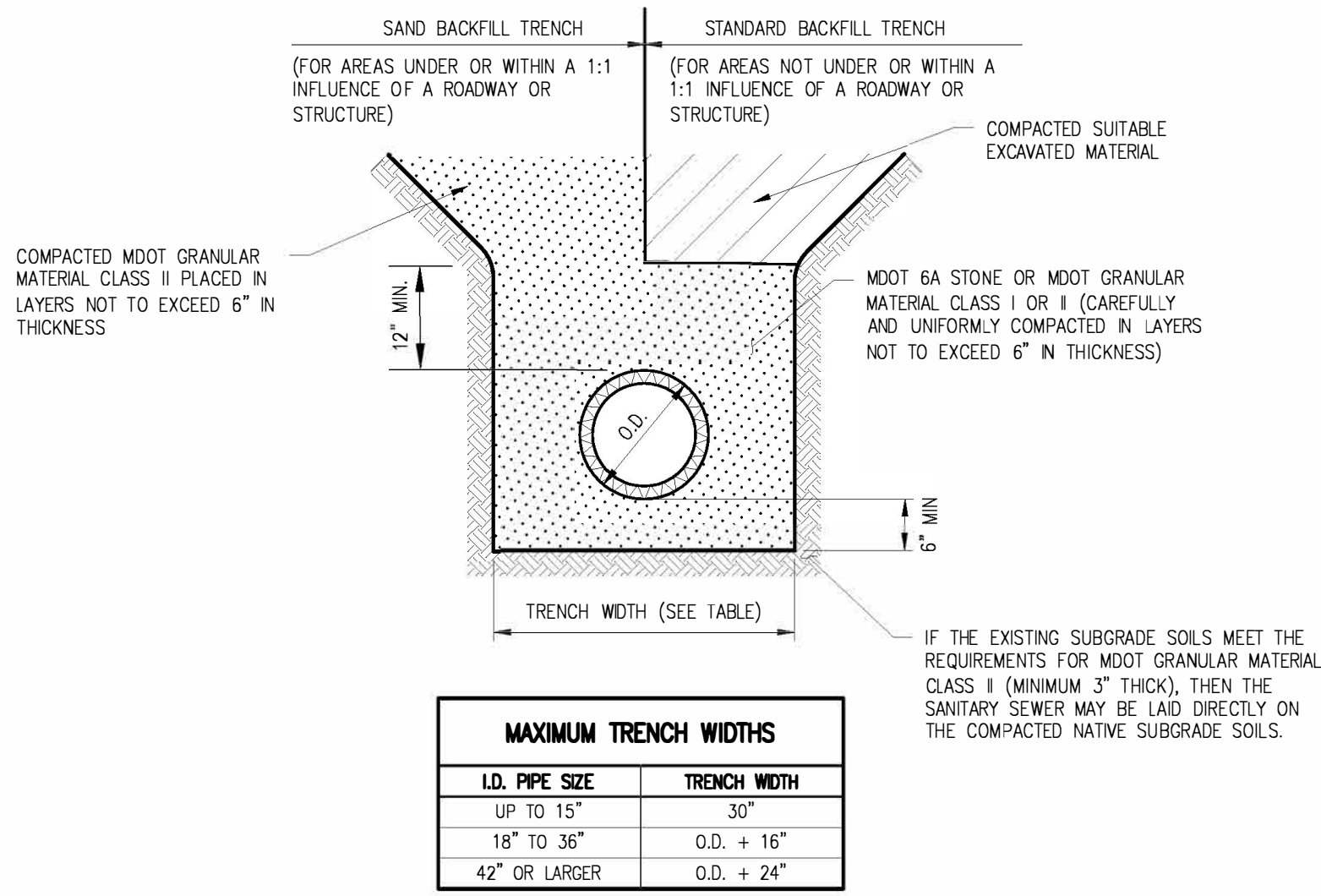
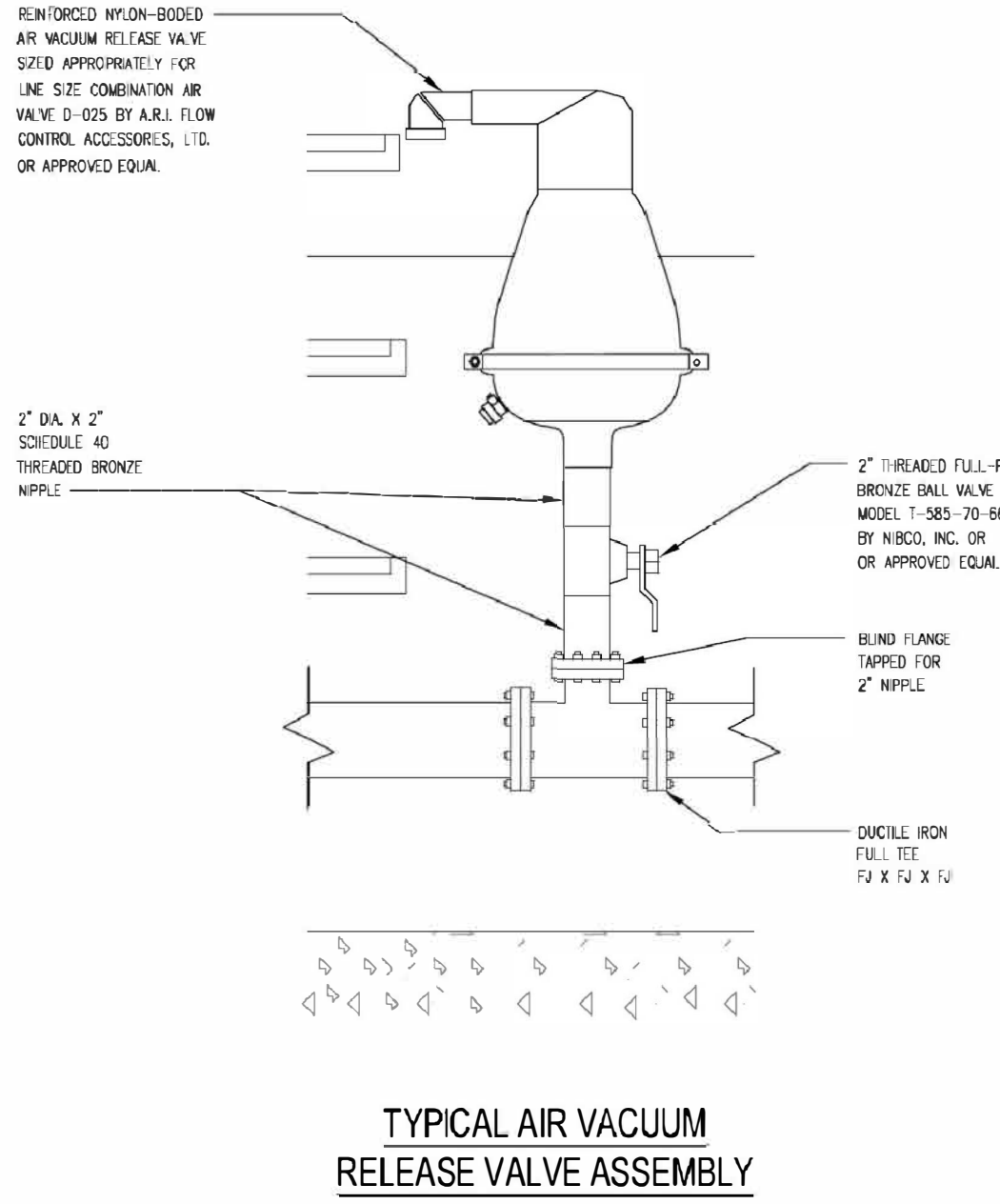
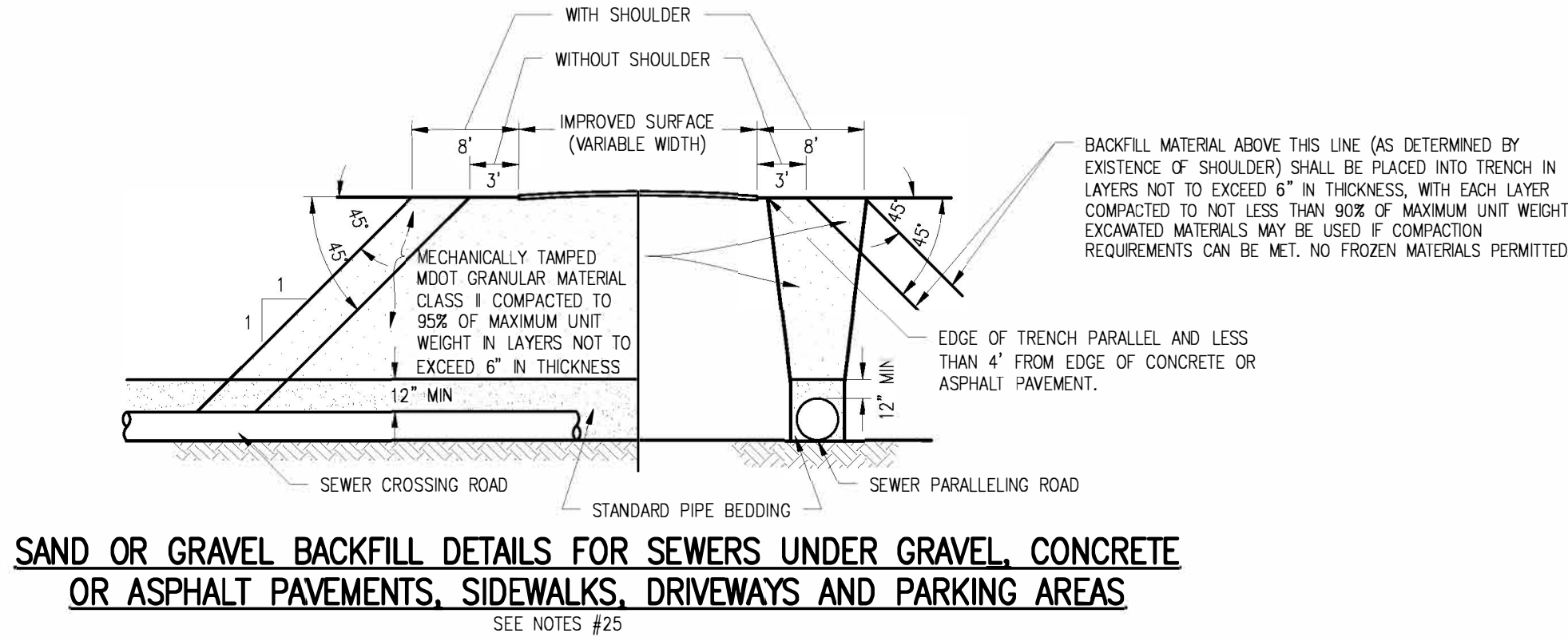
SCALE: V. N.T.S.

COUNTY: OAKLAND COUNTY

TOWN: TOWNSHIP OF NOVI

CITY OF NOVI
SANITARY SEWER
STANDARD DETAILS

DRAWING PATH: J:\NWD\design\N17003-Nov1 2017 Standards and Details\DWG\Sanitary.dwg Feb 16, 2016 - 1:38pm



SANITARY SEWER CONSTRUCTION NOTES

GENERAL NOTES:

- All construction shall conform to the current standards and specifications of the City of Novi and the Oakland County Water Resource Commissioner (O.C.W.R.C.). All sanitary sewer construction shall have full-time inspection supervised by a State of Michigan professional engineer provided by, or caused to be provided by, the City of Novi. The Contractor shall contact the City Consultant to schedule inspection Two (2) full working days prior to the start of construction.
- At all connections to O.C.W.R.C. sewers or to extensions thereto, and before the start of construction, the Contractor must request and have in his possession an approved Sewer Inspection Permit issued by the O.C.W.R.C. The Contractor shall be responsible for all O.C.W.R.C. charges and shall contact O.C.W.R.C. for their fees, bonds and deposit requirements. The Contractor shall notify the City's Consultant and the O.C.W.R.C. (248) 858-1110 three (3) full working days prior to the beginning of any construction. Final test must be witnessed by the O.C.W.R.C. personnel and must be scheduled in advance.
- Three (3) working days prior to construction, the Contractor shall telephone MISS DIG (811 or 1-800-482-7171) for underground facilities locations and shall also notify representatives of other utilities located in the vicinity of the work.
- No ground water, storm water, construction water, downspout drainage or weep tile drainage shall be allowed to enter any sanitary sewer.
- 18 inch minimum vertical separation and 10 foot minimum horizontal separation must be maintained between sanitary sewer and water main.
- No sewer installation shall have an infiltration exceeding 100 gallons per inch diameter per mile of pipe per 24 hour period and no single run of sewer between manholes shall exceed 100 gallons per inch diameter per mile. Air tests in lieu of infiltration tests shall be as specified in O.C.W.R.C. Standards. All testing gauges shall be calibrated every six (6) months, with the last certification date provided to O.C.W.R.C. prior to testing. Only Modified Groove Tongue, O-Ring, Uniloc, Armit, Nobel, Ring-Title, Fluid-Tite or equal, as approved by O.C.W.R.C./City of Novi may be used for sewer joints. All joints shall meet requirements of ASTM C425 or C443.
- At all connections to an existing sewer or to extensions thereto, a temporary watertight bulkhead with a threaded, capped or valved 1 inch diameter pipe to permit measuring infiltration shall be provided to be removed only after directed by the engineer. A 12 inch temporary pump and a watertight mechanical bulkhead shall be installed on the first manhole upstream of the proposed connection. The temporary pump shall be filled in after successful completion of any infiltration test up to the standard fillet provided for the flow channel, and the bulkhead shall be removed after directed by engineer. Infiltration testing is required for all sewers twenty-four (24) inch diameter and greater, or for all sewer pipe diameters where the ground water level is seven (7) feet above the top of the sewer pipe.
- When connections are made to sewers carrying fluids, special care must be taken that no part of the work is built under water. A flume or dam must be installed and pumping maintained, if necessary, and the new work kept dry until completed and any concrete or mortar has set up.
- A NASCO PACP formatted video of the interior of sanitary sewer 8" or greater in diameter (with log and lead location) shall be submitted to and approved by the City's Consultant prior to final acceptance. Said video shall be obtained a minimum of 30 days after construction is completed and by a NASCO PACP Certified CCTV Contractor. Typical items to be reviewed on the videotape will include pipe deflections, pipe settlements, joint and pipe cleanliness. If the video review reveals unsatisfactory conditions, the Contractor shall correct the condition at his own cost and shall then re-video the affected pipe for review by the City's Consultant.
- The completed installation shall at no point have out-of-round pipe deflections greater than 5%. Deflectometer or go/no-go gauging tests will be required prior to sewer acceptance.
- The materials specified below may be substituted with an approved equal as determined by the City. It is at the sole discretion of the City to determine if a material is acceptable and can be utilized. Written authorization must be obtained prior to ordering or installing the approved equal.

SANITARY SEWER NOTES:

MATERIALS AND CERTIFICATIONS

- Truss Pipe and Fittings shall be as described under the current ASTM D2860. Appendix XI of said specification shall be as modified by the bedding requirements outlined below.
- Solid wall pipe for 6" house connection sewers shall be PVC SDR 23.5 conforming to ASTM D3034 or ASTM D2665. Solid wall pipe shall be installed in accordance with bedding requirements outlined below.
- Pipe material utilized for force main shall submitted to and approved by the City prior to installation.
- All pipe shall be certified by the manufacturer to meet the applicable ASTM specification requirements. Certification forms, together with a report of the test results, shall be provided to the inspector with pipe deliveries and copies shall be forwarded to the Engineer or the Owner. Certification forms shall include project name, location, Contractor, and test lot number. Lot sizes shall be acceptable to the Engineer.
- All pipe and fittings shall be suitably marked to provide manufacturer's name, extrusion code (including date and location of manufacture), ASTM designation, type of plastic, nominal diameter, and SDR number, where applicable. Fittings however, need not contain the extrusion code. Pipe shall have a "home" mark. Truss Pipe with an absence of filler material at the ends greater than 1/4" deep shall be subject to rejection or acceptable repair.
- O.C.W.R.C./City of Novi approved flexible manhole joints shall be used. Where adaptors to other materials are required, only approved adaptors and joints may be used. Where the connections are made to existing manholes, a rubber waterstop shall be used around the pipe.
- No day pipe will be allowed for main line sanitary sewer or for sanitary sewer leads.

BEDDING

- Bedding for Truss Pipe and solid wall pipe shall be in accordance with the current ASTM D2321, except, (1) only MDOT Class I and Class II granular materials or MDOT 6A stone may be used, (2) embedment shall extend to minimum 12" above top of pipe, and (3) flooding or puddling shall not be used. The use of flexible and semi-flexible pipe requires that the bedding provide yielding side support and complete bedding contact. Under bedding material shall be properly placed and compacted to provide lateral restraint against deflection in the pipe diameter. Pipe must be bedded to the true line and grade throughout its length. Bell holes shall be provided where required.
- Where unstable bottoms are encountered, the Contractor shall undercut to stable ground and construct a foundation consisting of MDOT 6A stone to act as an impervious mat to prevent migration or vertical movement of unstable soils or bedding materials. Where trench sheeting, plates, or a trench box are used due to severe ground conditions, all voids to the side and below the top of the pipe caused by the sheeting, plates, or box withdrawal shall be completely filled or the supports left in place below the top of the pipe.
- Due to potential damage to exterior walls of Truss Pipe or solid wall pipe, particularly under cold weather conditions, if rocks, frozen material, or large objects strike the pipe, the Contractor shall carefully avoid dumping any materials other than approved bedding sand or stone on the pipe until 12" cover is placed on it, particularly under cold weather conditions. Pipe walls and ends shall also be protected from abrasion and damage during handling, and shall be fully inspected just prior to placing in the trench.

- Care shall be taken during bedding compaction to avoid distorting the shape of the pipe or damaging its exterior wall. Mobile equipment shall not be used over the pipe trench until 48" of cover has been placed.

BACKFILL

- Backfill shall be compacted above pipe or as indicated on construction drawings. Trench backfill shall be a suitable material and shall be free of any organic materials and rocks larger than 3" in size. Under road surfaces, pavement, sidewalks, curbs, driveways and areas where trench is within a 1:1 influence of the pavement, sand backfill shall be used which shall consist of MDOT granular material Class II compacted in layers not to exceed 6" in thickness to a density of 95% as determined by MSHD T99. All backfill placed within a 1:1 influence of structures shall be approved sand, placed in 6" layers and compacted. Trenches which are to be left open overnight shall be enclosed with suitable fencing and lighted barricades, unless otherwise approved by the city.

JOINTS

- Joints for PVC Truss Pipe, PVC solid wall pipe and fittings shall be of the elastomeric gasket push-on type. Such joints shall conform to the current ASTM D3212 and the pipe manufacturer shall file with the O.C.W.R.C. a copy of certified test results of its jointing system prior to use. Gasket joints shall be installed in accordance with procedures specified by the pipe manufacturer, such that the gasket will be compressed (not displaced) in the joint to form a positive seal. Care shall be taken to insure all joints be pushed to the full "home" position and held together in the "home" position during any grade or line adjustments.

CUTTING AND HANDLING

- Cutting of pipe lengths, where required, shall be performed with tools or equipment that will provide a neat, perpendicular cut without damage to the plastic or the filler material. All burrs shall be removed by the use of a file, knife, or abrasive paper. Spigot ends on cut pipe shall be beveled similar to factory beveling to prevent gasket damage.

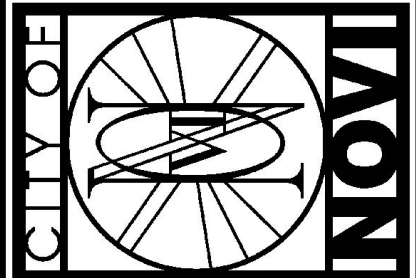
- Bowing or warping of Truss Pipe or solid wall pipe can occur with temperature fluctuations. The Contractor shall store and protect the pipe to minimize bowing. Nominal 126" or longer pipe lengths having deviations from straight greater than 1", as measured along a straight line, shall not be used.

STRUCTURE NOTES:

- All new manholes shall have O.C.W.R.C./City of Novi approved flexible, watertight seals where pipes pass through walls. Manholes shall be precast sections with modified tongue and groove joints with rubber gaskets and shall conform to ASTM C478. Precast manhole sections shall be O.C.W.R.C./City of Novi approved modified eccentric cone type. All manholes shall be provided with watertight covers.
- At all connections to manholes on O.C.W.R.C. sewers or extensions thereto, interior drop connections will be required when there is a difference in invert elevations.
- The difference in the invert elevations at a drop connection must be a minimum of 18". If an 18" minimum cannot be obtained, the sewer must be made steeper in order to achieve matching invert elevations for all incoming and outgoing sewers.
- All new manholes requiring an exterior drop connection shall be constructed using a manhole base with a precast drop as shown on sheet 2 of these details.
- Wherever existing manholes are to be topped, the top shall be made by coring. The contractor shall place a KOR-IN-SEAL boot (or approved equal) after coring is completed. Blind drilling will only be permitted in lieu of coring with prior approval from both O.C.W.R.C. and City of Novi.
- All manholes constructed or adjusted as part of the system maintained by the City of Novi shall be provided with watertight covers as depicted on this detail sheet.
- New manholes constructed directly on O.C.W.R.C. sewers shall be provided with covers reading "Oakland County Water Resources Commissioner - Sanitary" in raised letters per detail in the O.C.W.R.C. specifications.
- New manholes built over any existing sanitary sewers shall have monolithic poured bottoms.
- A proper channel shall be constructed within the existing structure at the connection point to the existing system. Channel shall be constructed to create the least amount of turbulence. Any portion of the existing structure which would interfere with such construction shall be removed. When forming a concrete channel in a precast structure that utilizes a flexible joint pipe connector, the channel shall be placed so as not to interfere in any way with the flexibility of the joint. The channel shall be constructed the same size as the inside diameter of the existing pipe.

SANITARY SEWER LEAD NOTES:

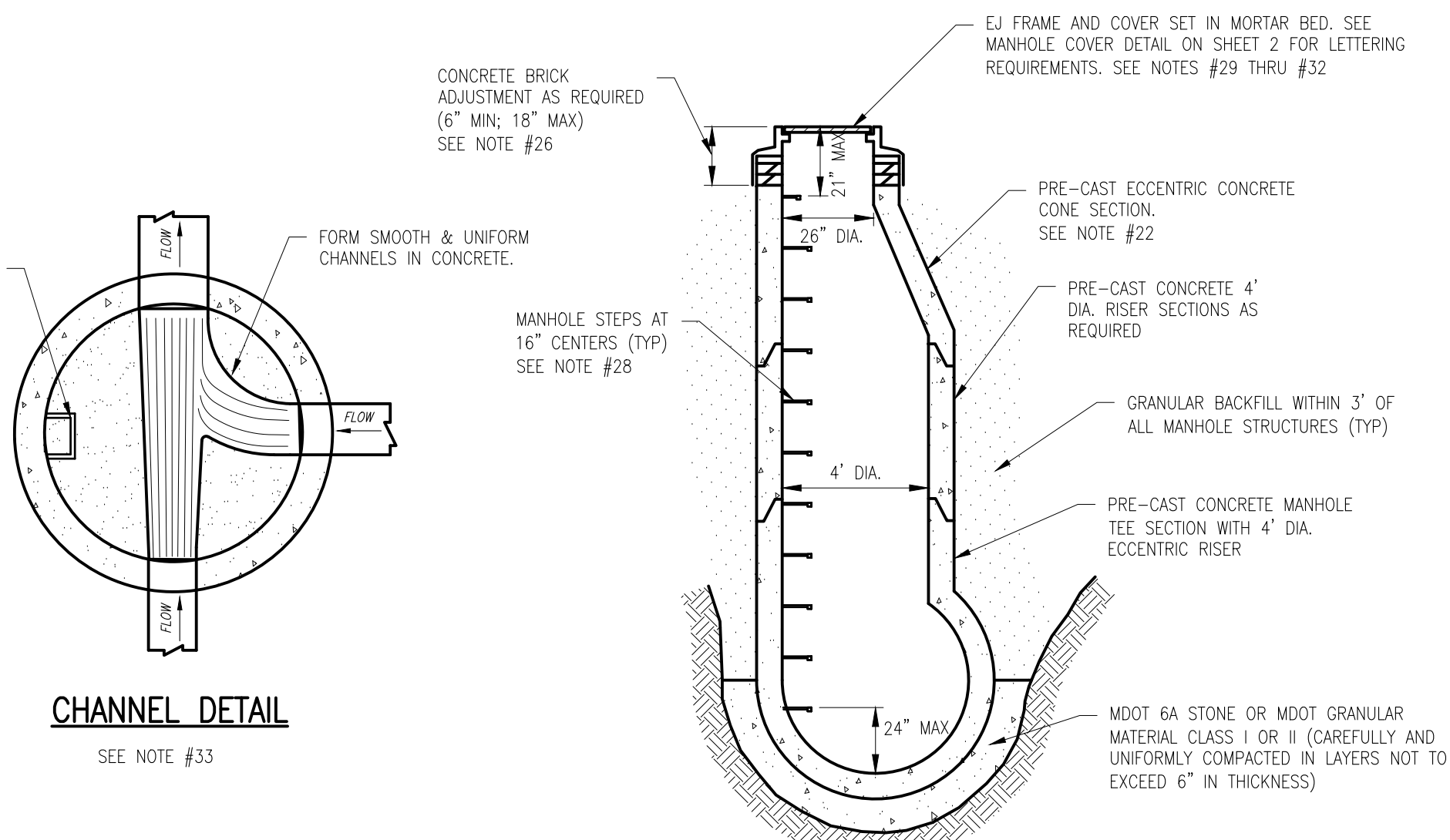
- All building lead work must be performed under City of Novi inspection. The Department of Public Service conducts inspection of lead from main sewer to ROW line. The Building Department conducts inspection of lead from ROW line to building connection.
- No sanitary sewer may be used as a dewatering outlet.
- All building leads and risers shall be 6" SDR 23.5 PVC with rubber gasket joint (ASTM D2665), or a City of Novi approved equal pipe and joint. Sewer pipe wye openings shall contain factory installed premium joint material of the type identical to that of the building lead pipe used. Building leads to be furnished with removable airtight and watertight stoppers. Taps to existing PVC or Truss Pipe shall be made with wye saddle taps.
- Where an existing building lead is being extended, dissimilar types and sizes of pipe shall be joined using an O.C.W.R.C./City of Novi approved adaptor. Allowable types of sewer pipe adaptors are the Femco Adaptor or the Femco Flexible Coupling.
- Field taps of existing sanitary sewers shall be made by installing a wye fitting for house connections. Femco fittings with stainless steel bands shall be used to secure the wye fitting to the sanitary sewer pipe. Bedding for house connection sewers shall be equal to that of the main sewer bedding. Risers in deep and unstable trenches should be bedded in MDOT 6A stone, or an approved equal, to avoid settlement. Concrete shall not be used for bedding. End caps or plugs shall be braced or anchored to withstand air test pressures. Caps or plugs shall not be chemically welded in place.
- Where sanitary sewer cleanouts fall within a paved area (parking lot, service drive area, etc.), the cleanout shall have a cast iron cover that is centered in a 2'x2' (min.) concrete slab having a compressive strength of 3000 psi at 28-day cure time.



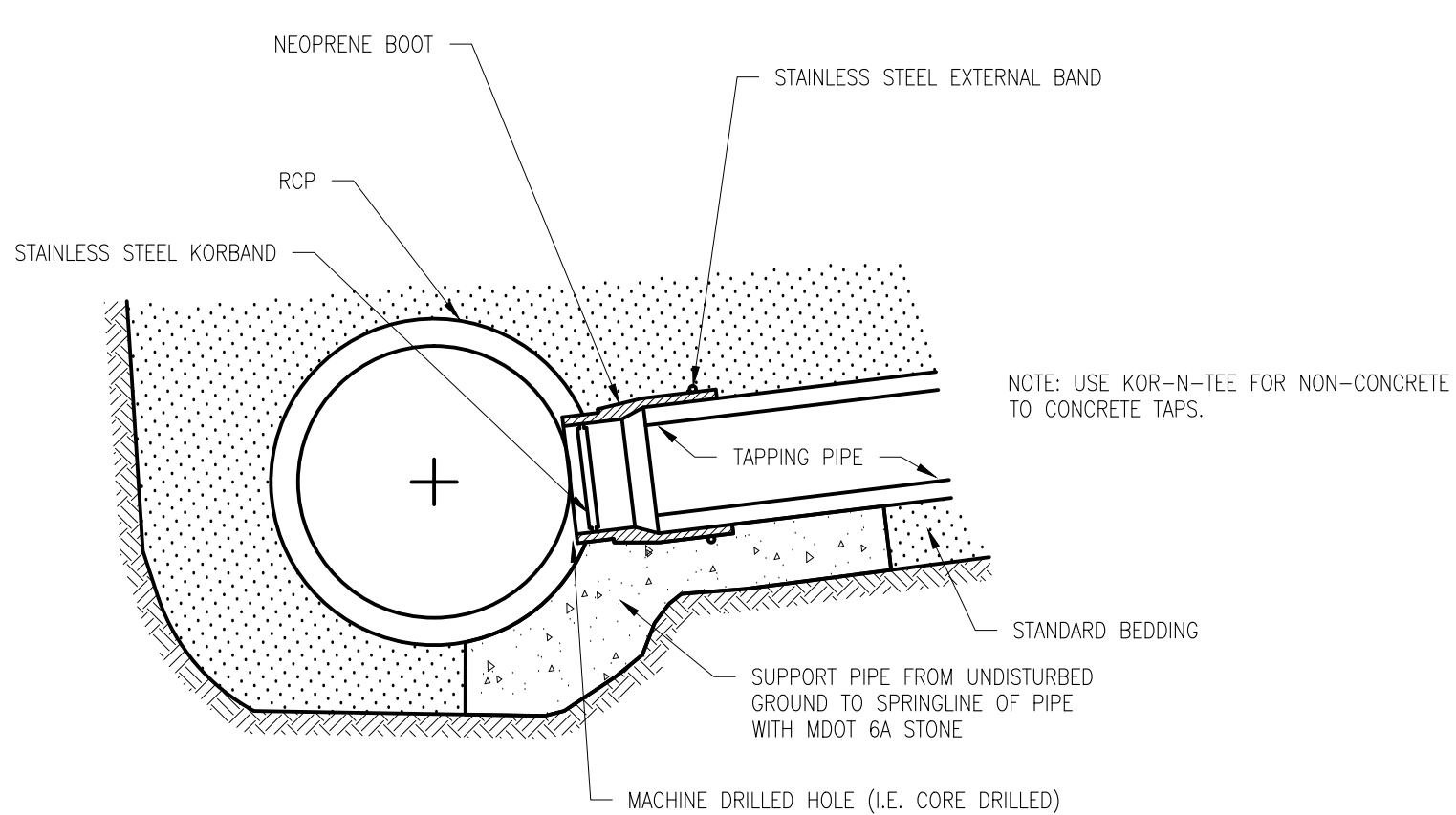
CITY OF NOVI 4515 WEST 10-MILE ROAD NOVI, MI 48075 | P (248) 347-0456 | WWW.CITYOFNOVI.ORG

CITY OF NOVI
SANITARY SEWER
STANDARD DETAILS

SHEET
3
OF 3



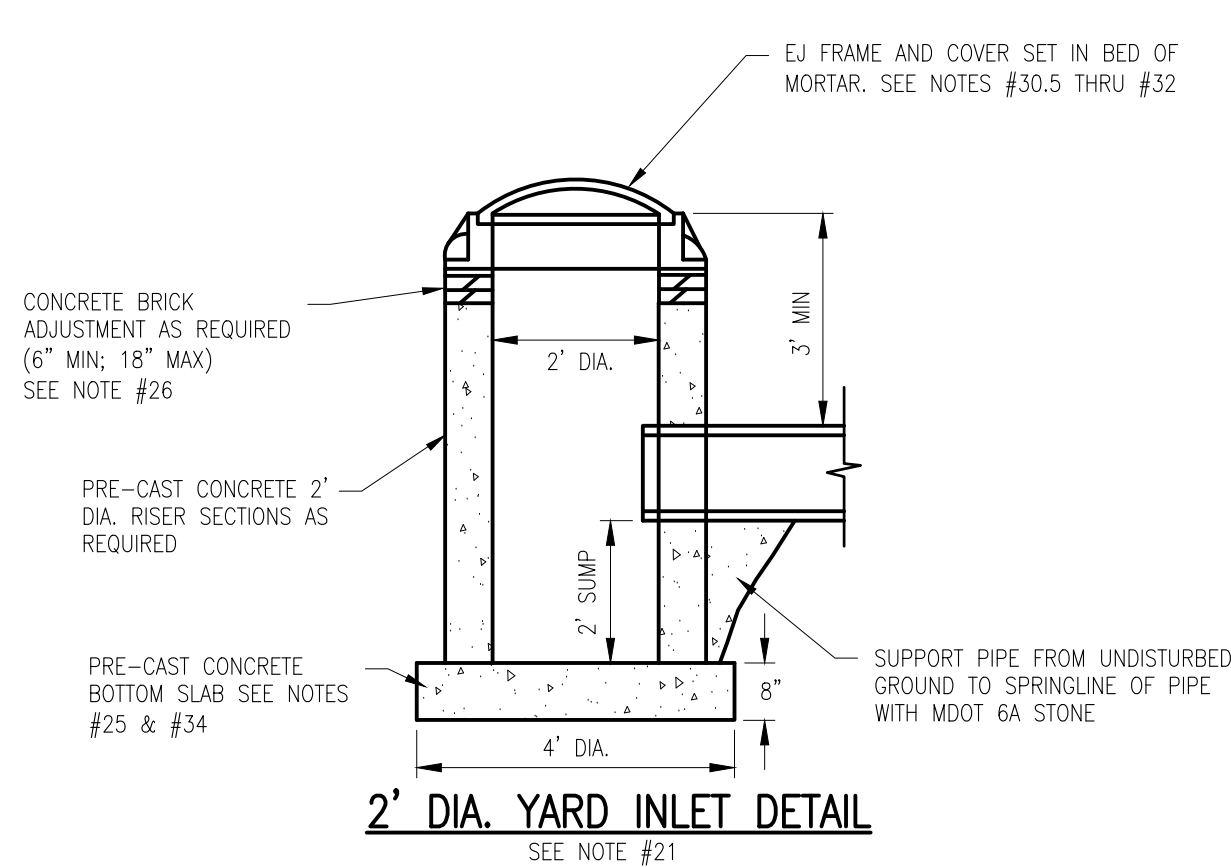
CHANNEL DETAIL



KOR-N-TEE TAP FOR CONCRETE PIPE

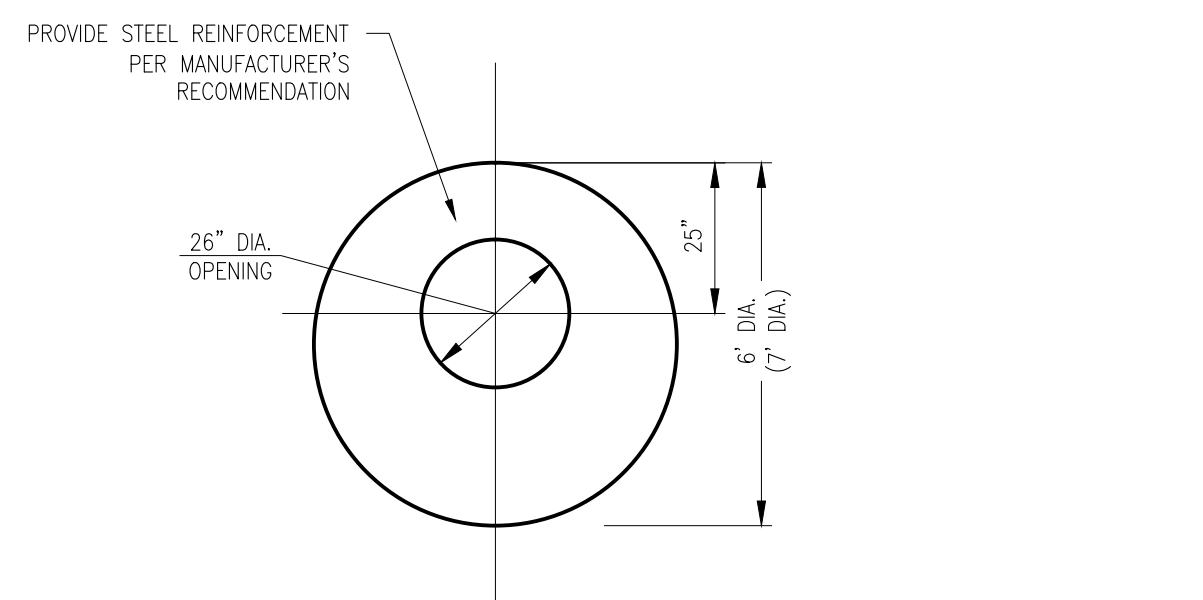


BEDDING AND TRENCH BACKFILL DETAIL
FOR 12" DIAMETER AND SMALLER PVC PIPE

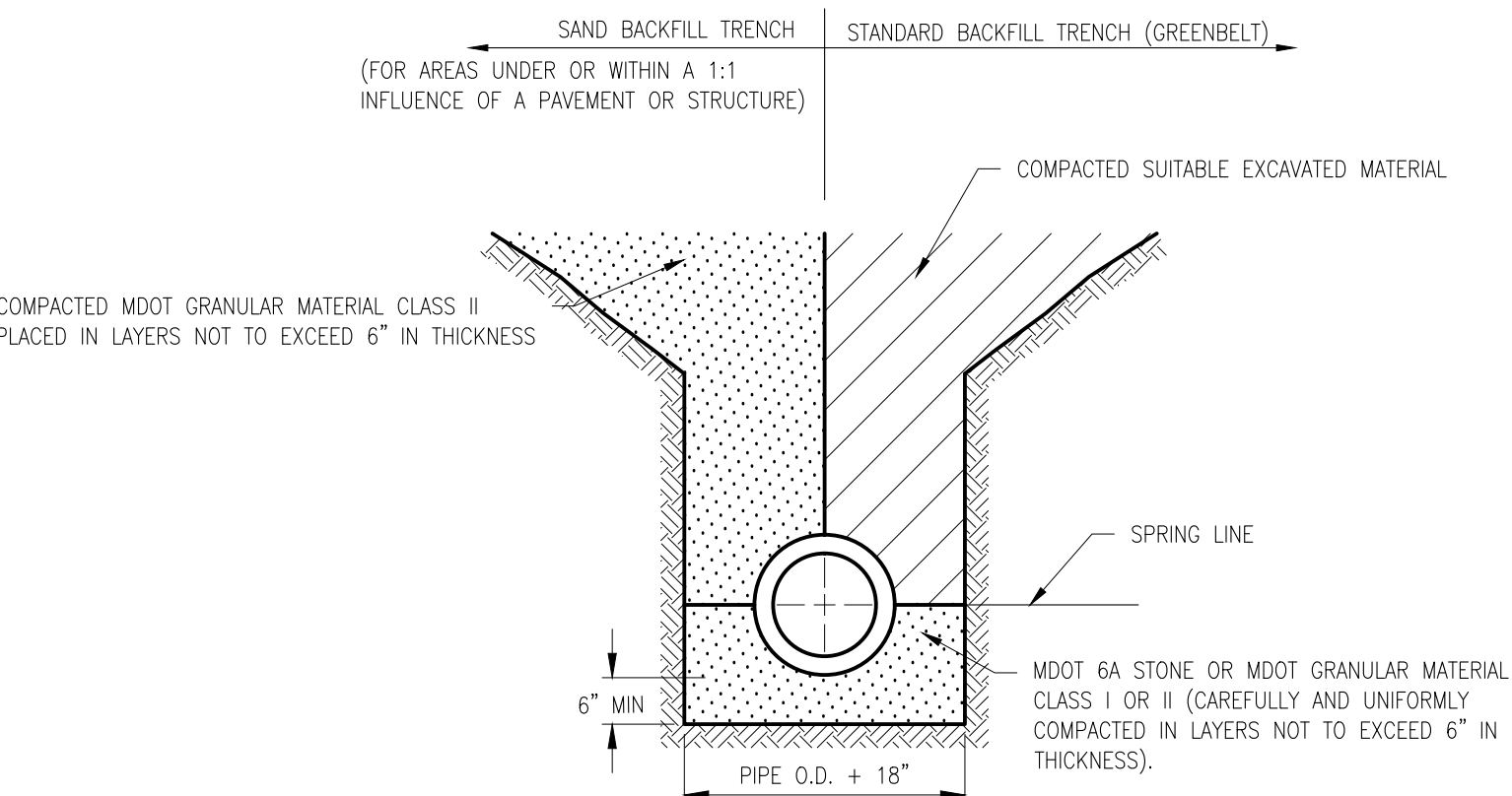


CATCH BASIN DETAIL
SEE NOTE #21

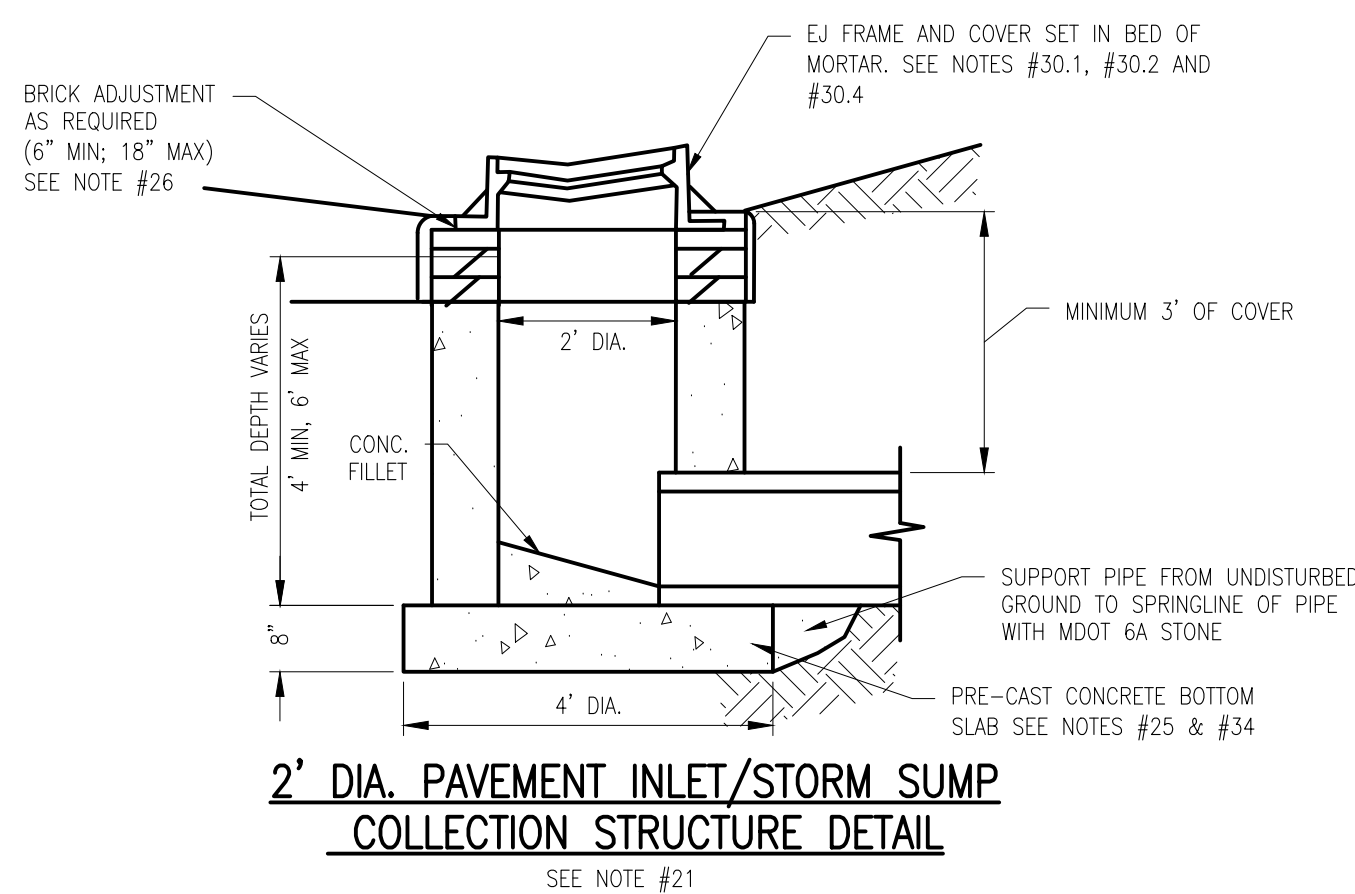
2' DIA. YARD INLET DETAIL
SEE NOTE #21



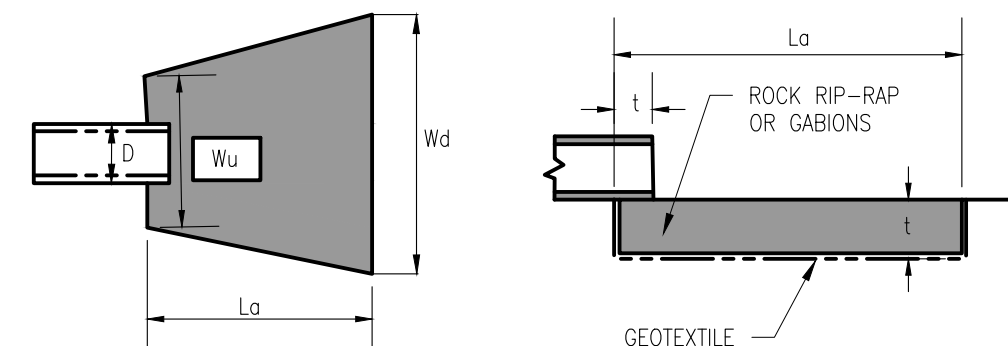
PRECAST CONCRETE
TOP SLAB DETAIL, 8" THICK



BEDDING AND TRENCH BACKFILL DETAIL
FOR 24" DIAMETER AND SMALLER PIPE
(CONCRETE AND METAL PIPE)



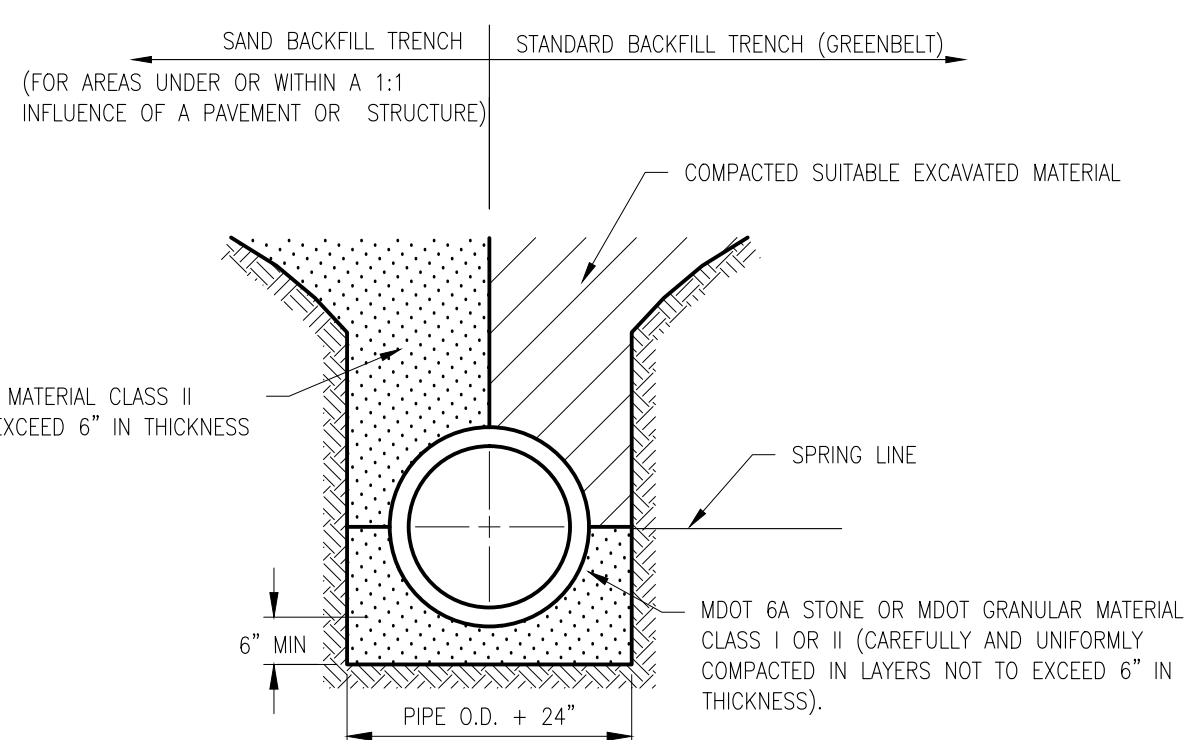
2' DIA. PAVEMENT INLET/STORM SUMP
COLLECTION STRUCTURE DETAIL



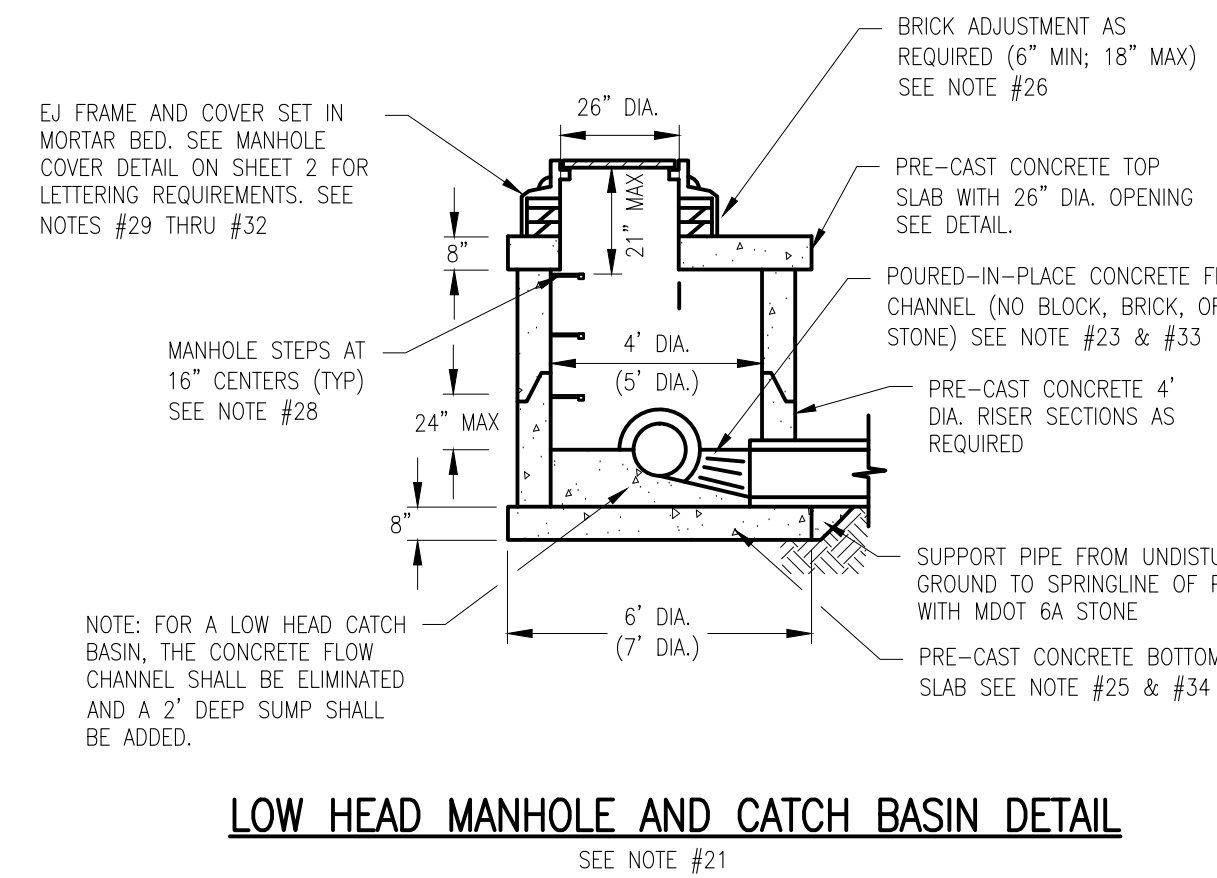
TYPICAL DETAIL FOR ROCK OUTLET PROTECTION BELOW A CULVERT

Culvert Size D, (inches)	Rock Size S ₆₀ , (inches)	Apron Length L, (feet)	Upstream Width W _u , (feet)	Downstream Width W _d , (feet)	Thickness t, (inches)	Quantity (lineal)
12	9	16	3	13	18	15
18	9	12	4.5	13	24	20
21	9	18	5	20	24	35
24	9	20	6	22	24	60
30	9	22	7.5	24	24	75
36	12	24	9	27	30	120
42	18	26	10.5	30	36	180
48	18	28	12	32	36	215

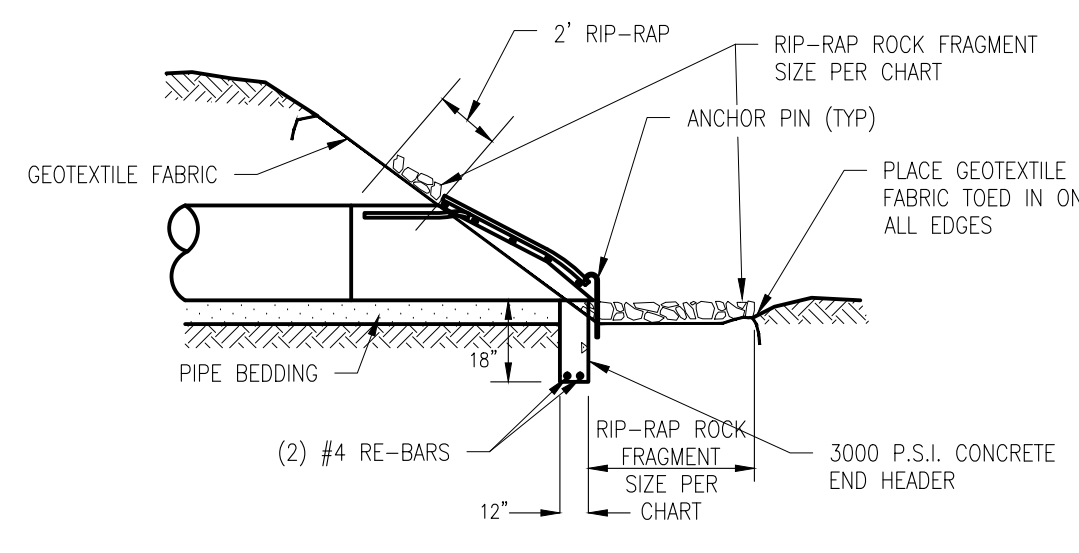
RIP RAP ROCK FRAGMENT SIZE CHART



BEDDING AND TRENCH BACKFILL DETAIL
FOR 27" DIAMETER AND LARGER PIPE
(CONCRETE AND METAL PIPE)

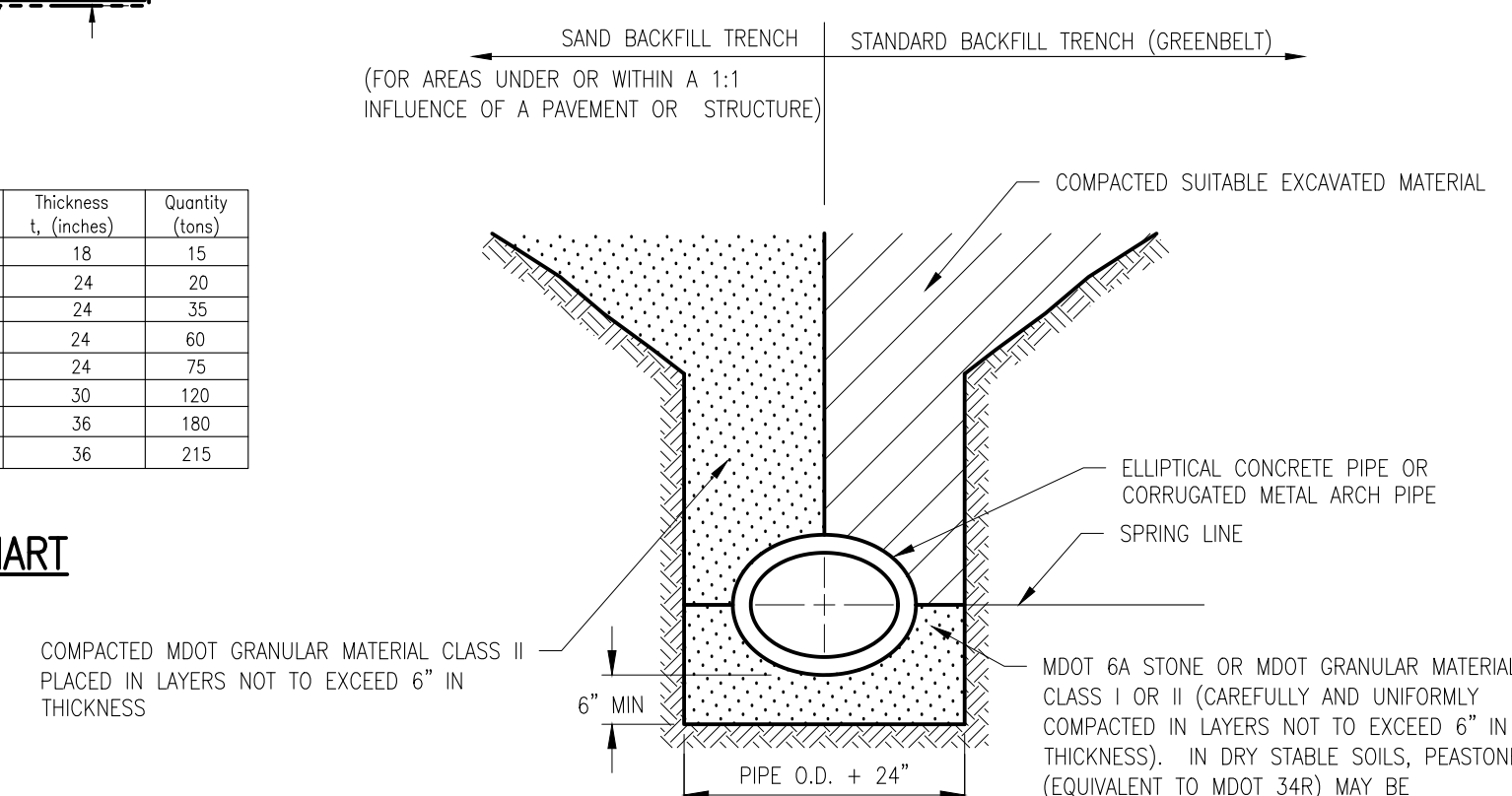


LOW HEAD MANHOLE AND CATCH BASIN DETAIL
SEE NOTE #21

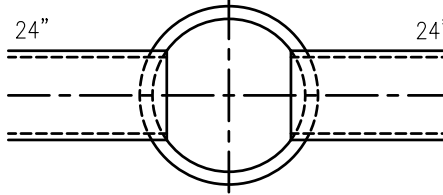
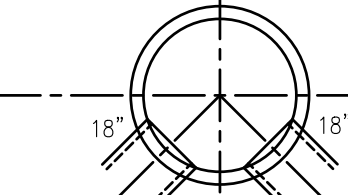
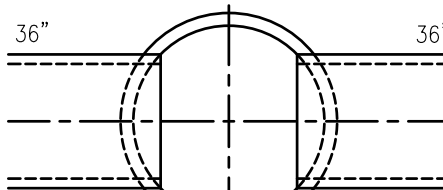
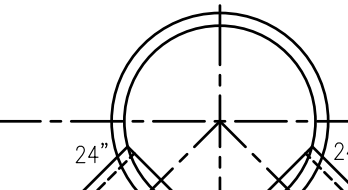
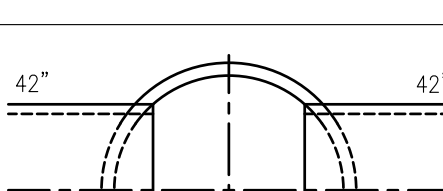
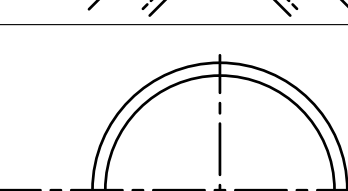
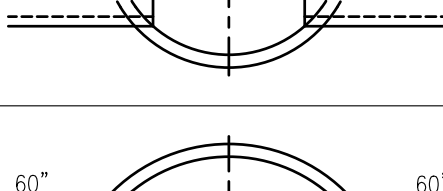
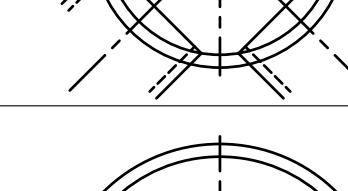


PROFILE VIEW

END SECTION AND BAR SCREEN DETAIL

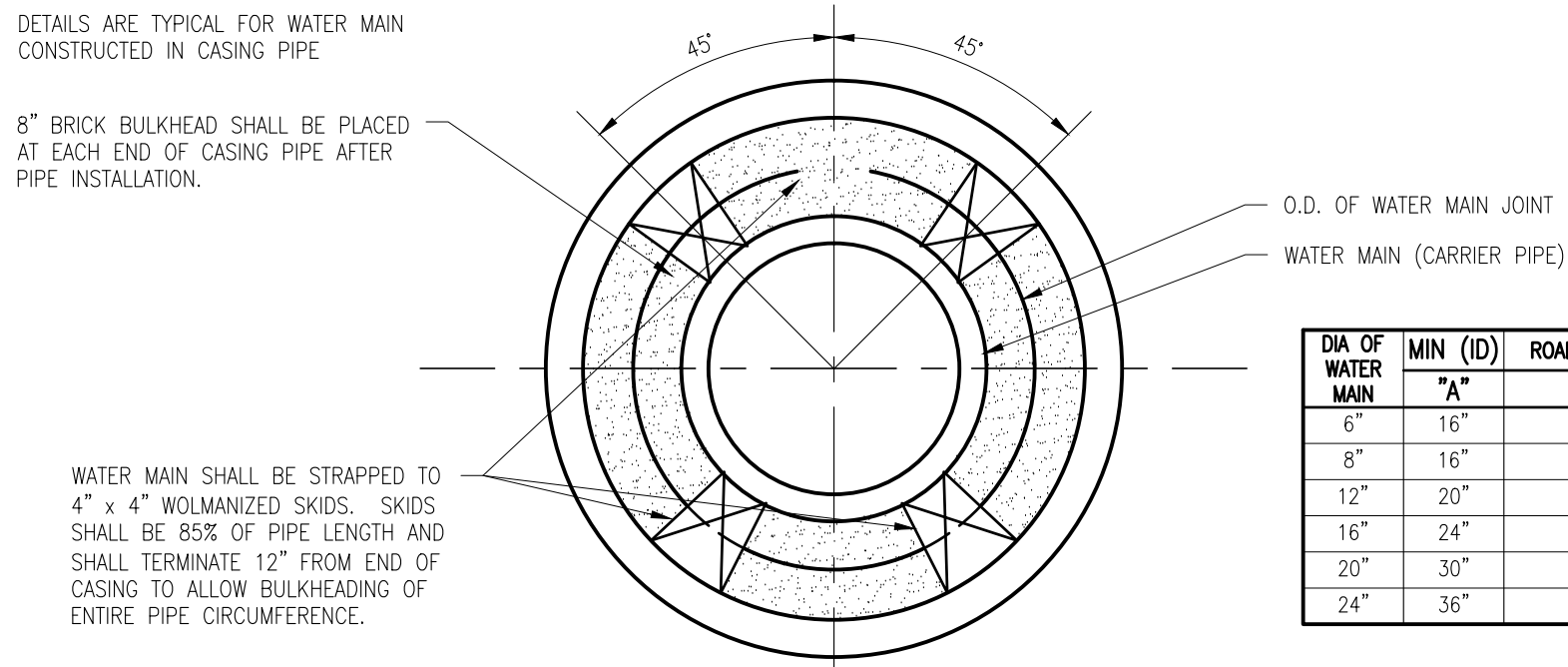


BEDDING AND TRENCH BACKFILL DETAIL FOR ELLIPTICAL CONCRETE PIPE OR CORRUGATED METAL ARCH PIPE

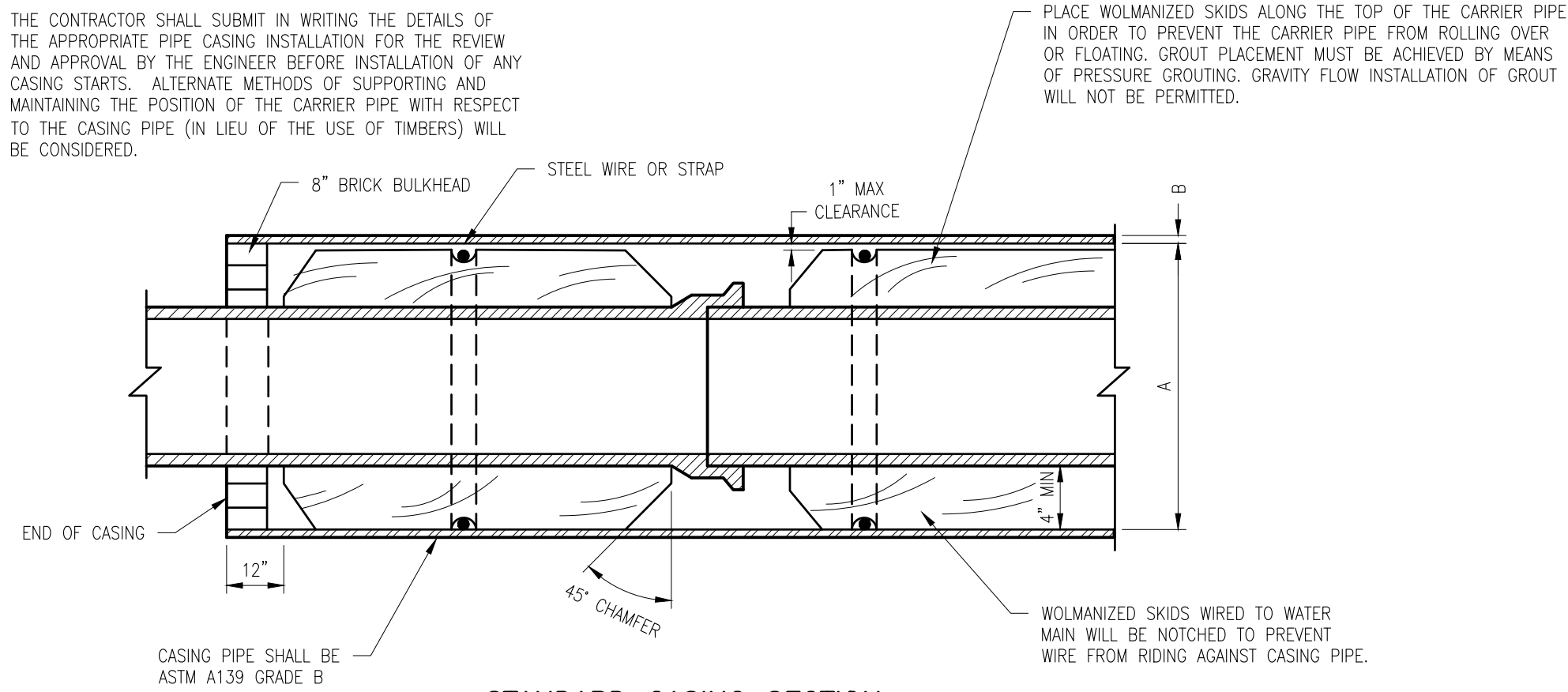
INSIDE DIAMETER	MAXIMUM PIPE SIZE FOR STRAIGHT THRU INSTALLATION	MAXIMUM PIPE SIZE FOR RIGHT ANGLE INSTALLATION
4" - 0"		
5" - 0"		
6" - 0"		
8" - 0"		

MANHOLE SIZING CHART
SEE NOTES #27

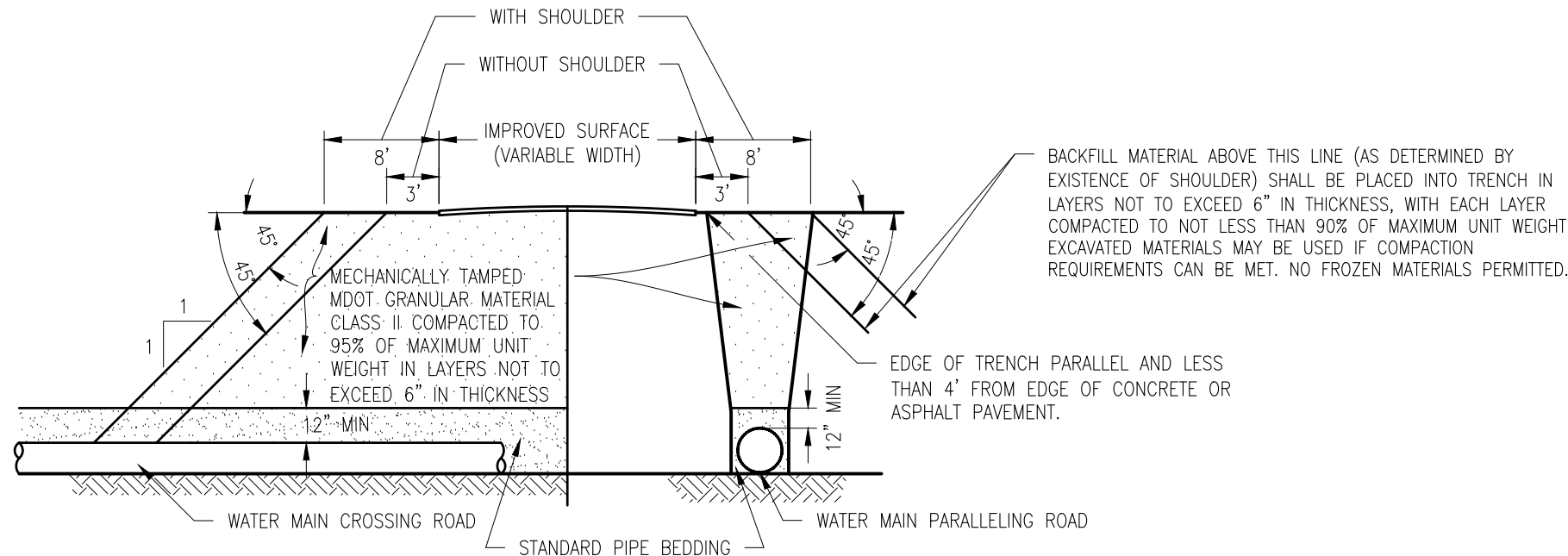
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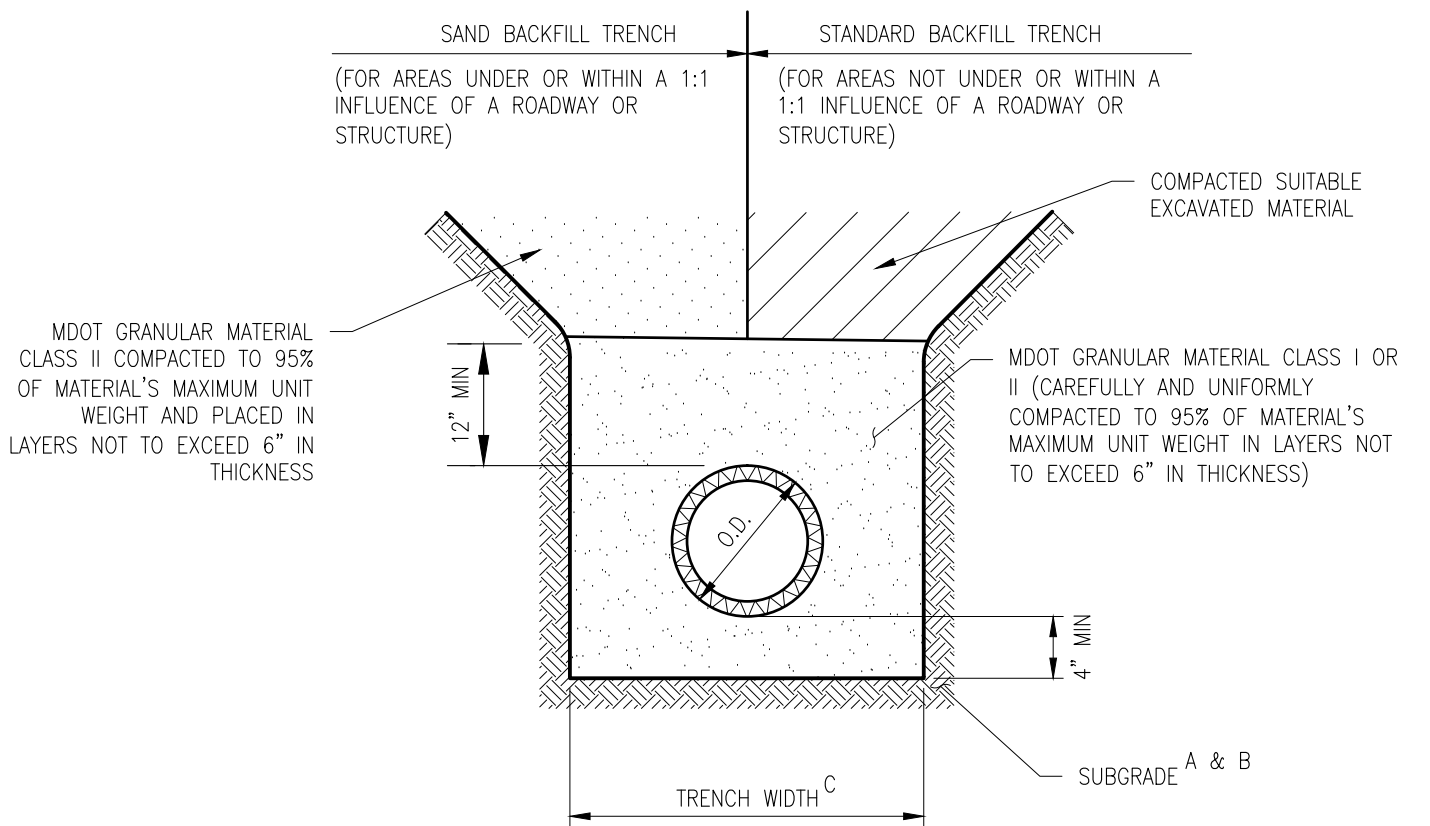
PIPE BARREL SUPPORT FOR WATER MAIN
CONSTRUCTED IN CASING PIPE



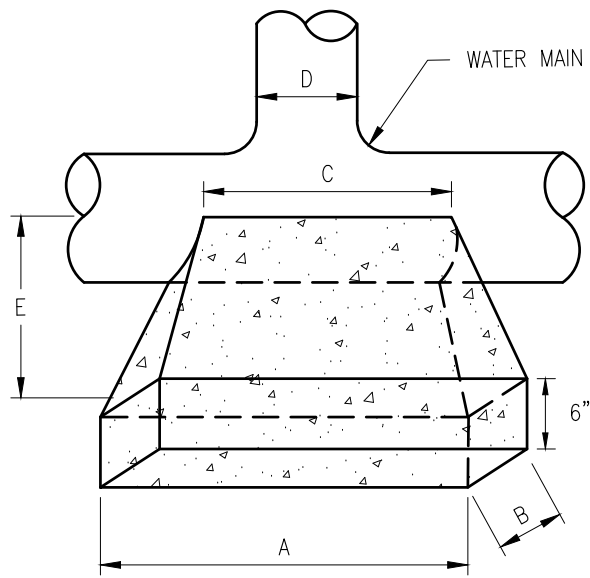
STANDARD CASING SECTION



SAND OR GRAVEL BACKFILL DETAILS FOR WATER MAINS UNDER GRAVEL, CONCRETE
OR ASPHALT PAVEMENTS, SIDEWALKS, DRIVEWAYS AND PARKING AREAS
(SEE NOTE #24)



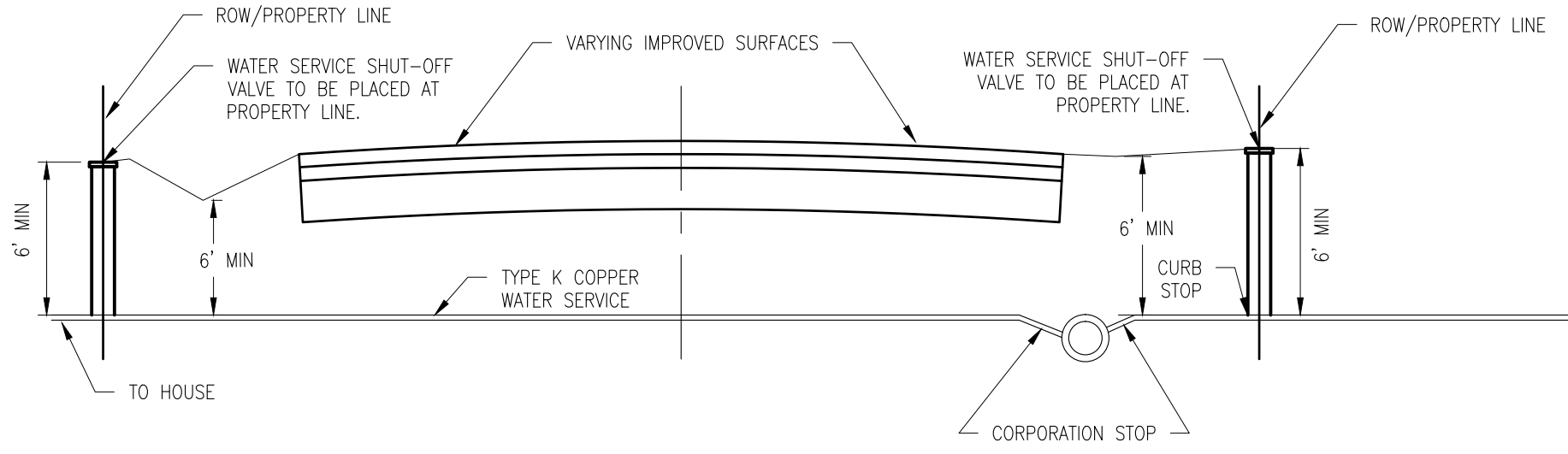
BEDDING AND TRENCH BACKFILL DETAIL
(SEE NOTE #24)



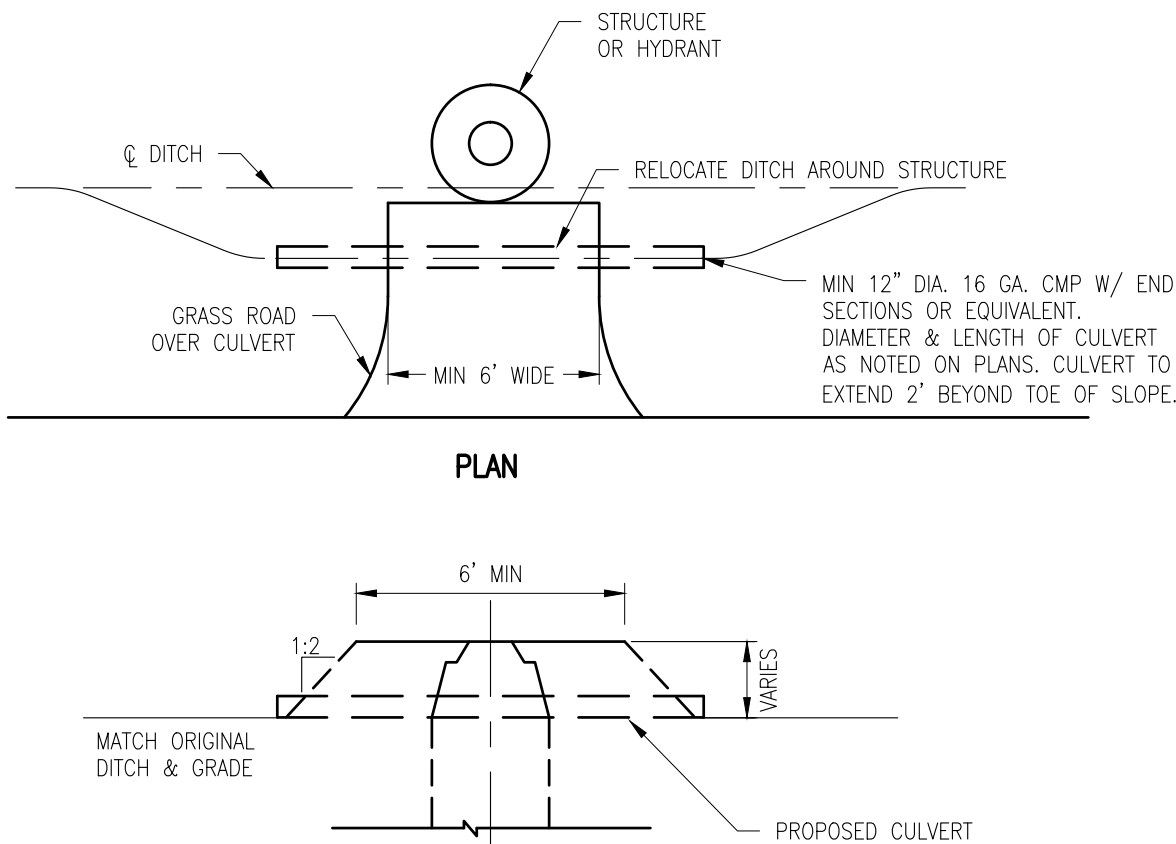
THRUST BLOCK DETAILS

FOR TEES AND TAPPING SLEEVES					
D	A	B	C	E	MIN
20"	6.5'	4.5'	3.5'	3'	
16"	4'-8"	4'-8"	2.5'	2.75'	
12"	4'	3'	2.5'	2.5'	
10"	3'	2'	2'	2.25'	
8"	2'-6"	2'	2'	2.25'	
6"	2'	2'	2'	2.25'	

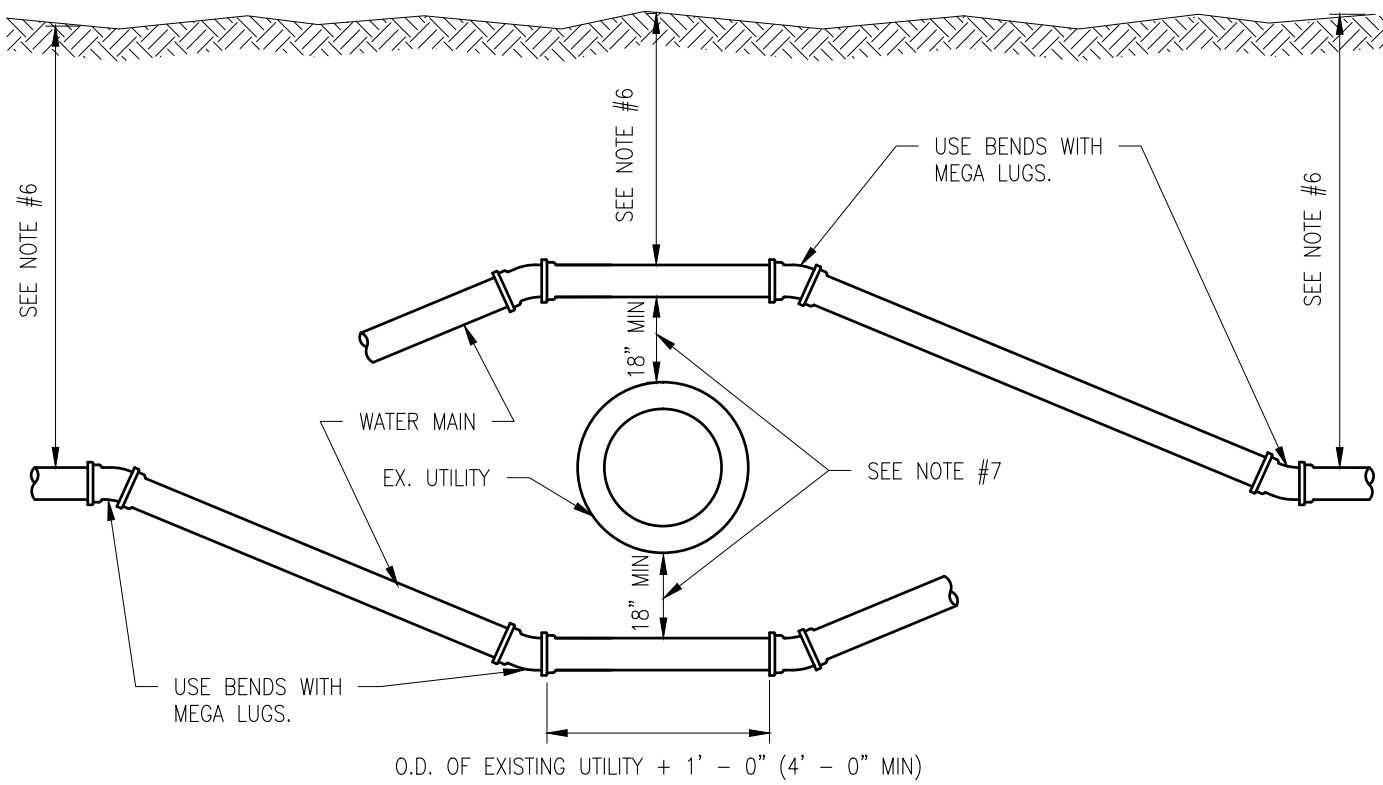
- NOTE:
- 3000 PSI CONCRETE TO BE USED. THRUST BLOCK TO ABUT & REST AGAINST UNDISTURBED SOIL OR EARTH COMPACTED TO 95% MODIFIED PROCTOR.
 - THRUST BLOCKS NOT PERMITTED ON THEIR OWN, MUST BE USED IN COMBINATION WITH MEGALUG RESTRAINTS. SEE NOTE #19.
 - TO BE USED AT THE DISCRETION OF THE CITY'S CONSULTANT.



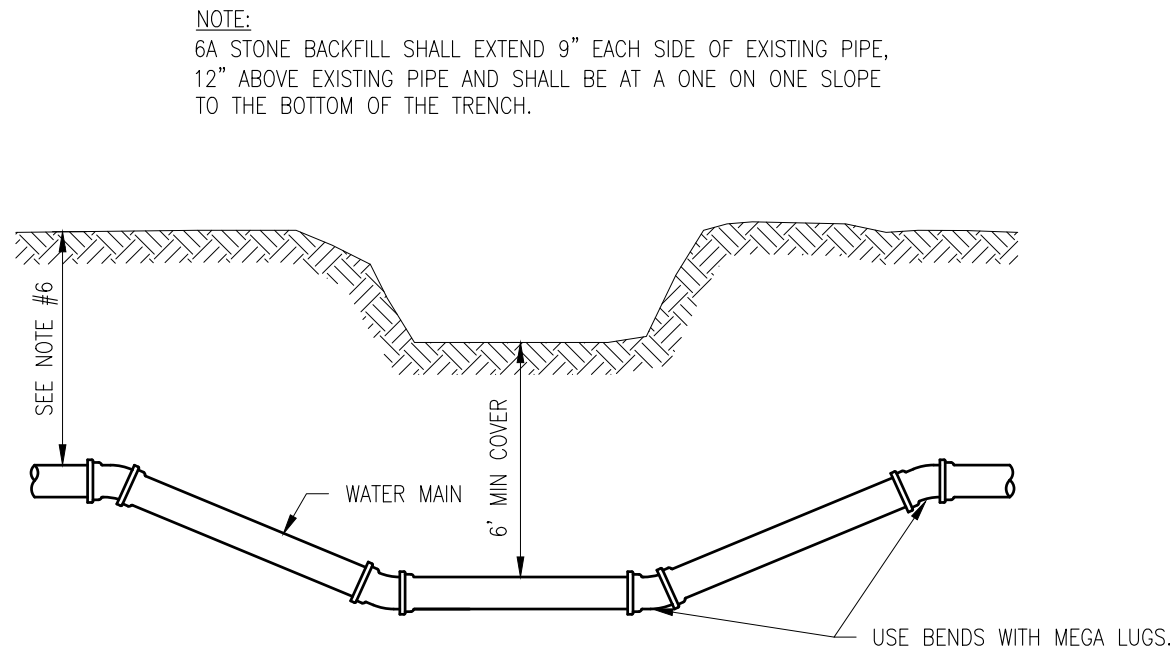
TYPICAL PUBLIC ROAD WATER SERVICE CONNECTION
(SEE NOTES #27, #29)



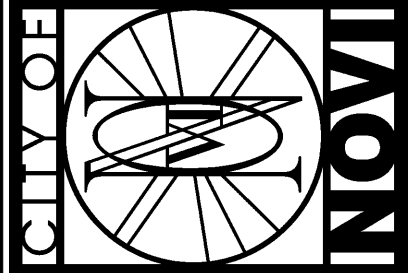
DITCH ENCLOSURE AT GATE WELL OR HYDRANT



TYPICAL WATER MAIN UTILITY CROSSING
(SEE NOTE #17)



DITCH, STREAM OR WETLAND CROSSING



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REVISIONS

V. N.T.S.

SCALE

COUNTY

RANGE

DATE

CITY OF NOVI

WATER MAIN

STANDARD DETAILS

DRAWING PATH: J:\NV\Design\NV17003-Nov 2017 Standards and Details\DWG\Water.dwg
Dec 13, 2018 - 11:14am

TABLE 23.6.5.A DUCTILE IRON WATER MAIN PIPE THRUST RESTRAINT LENGTH FOR HORIZONTAL BENDS															
		PIPE DIAMETER (inches)													
		3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"	42"
BEND ANGLES (degrees)	11.25°	1	2	2	3	4	4	5	6	7	7	9	11	13	15
	22.5°	3	3	5	6	8	9	10	12	13	15	17	21	25	29
	30°	4	4	6	8	10	12	14	16	18	20	23	29	34	40
	45°	6	7	10	13	16	19	22	25	28	31	36	45	53	61
	60°	8	10	14	18	22	26	30	34	39	43	51	62	74	85
	90°	14	17	24	31	38	46	53	60	67	74	88	108	128	148
Unit Frictional Force (ft/lbs)		124	151	217	284	349	415	481	547	613	679	811	1,005	1,203	1,398
Unit Bearing Resistance (ft/lbs)		152	185	268	354	437	523	611	699	789	879	1,064	1,344	1,639	1,939

Assumptions: Cover = 6.0 feet
Design Pressure = 150 psi
Safety Factor = 1.5
Laying Condition = Type 3
Soil Designation = Clay 1
Non-Polywrapped Pipe

* Data Table acquired from the Ductile Iron Pipe Research Association (DIPRA)

TABLE 23.6.5.B DUCTILE IRON WATER MAIN PIPE THRUST RESTRAINT LENGTH FOR VERTICAL UP BENDS															
		PIPE DIAMETER (inches)													
		3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"	42"
BEND ANGLES (degrees)	11.25°	1	2	2	3	4	4	5	6	7	7	9	11	13	15
	22.5°	3	3	5	6	8	9	10	12	13	15	17	21	25	29
	30°	4	4	6	8	10	12	14	16	18	20	23	29	34	40
	45°	6	7	10	13	16	19	22	25	28	31	36	45	53	61
	60°	8	10	14	18	22	26	30	34	39	43	51	62	74	85
	90°	14	17	24	31	38	46	53	60	67	74	88	108	128	148
Unit Frictional Force (ft/lbs)		124	151	217	284	349	415	481	547	613	679	811	1,005	1,203	1,398
Unit Bearing Resistance (ft/lbs)		152	185	268	354	437	523	611	699	789	879	1,064	1,344	1,639	1,939

Assumptions: Cover = 6.0 feet
Design Pressure = 150 psi
Safety Factor = 1.5
Laying Condition = Type 3
Soil Designation = Clay 1
Non-Polywrapped Pipe

* Data Table acquired from the Ductile Iron Pipe Research Association (DIPRA)

TABLE 23.6.5.C DUCTILE IRON WATER MAIN PIPE THRUST RESTRAINT LENGTH FOR VERTICAL DOWN BENDS															
		PIPE DIAMETER (inches)													
		3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"	42"
BEND ANGLES (degrees)	11.25°	2	3	4	5	6	7	8	10	11	12	14	18	21	25
	22.5°	4	5	8	10	12	15	17	19	22	24	29	36	43	50
	30°	6	7	10	14	17	20	23	26	29	33	39	48	58	67
	45°	9	11	16	21	26	31	36	41	45	50	60	75	89	104
	60°	13	16	22	29	36	43	50	57	63	70	84	104	124	145
	90°	22	27	39	51	62	74	86	98	110	122	145	180	215	250
Unit Frictional Force (ft/lbs)		124	151	217	284	349	415	481	547	613	679	811	1,005	1,203	1,398
Unit Bearing Resistance (ft/lbs)		152	185	268	354	437	523	611	699	789	879	1,064	1,344	1,639	1,939

Assumptions: Cover = 6.0 feet
Design Pressure = 150 psi
Safety Factor = 1.5
Laying Condition = Type 3
Soil Designation = Clay 1
Non-Polywrapped Pipe

* Data Table acquired from the Ductile Iron Pipe Research Association (DIPRA)

TABLE 23.6.5.D DUCTILE IRON WATER MAIN PIPE THRUST RESTRAINT LENGTH FOR TEES																	
		PIPE DIAMETER OF MAIN PIPE RUN (inches)															
		3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"	42"		
PIPE DIAMETER OF BRANCH RUN (inches)	3"	8	7	6	4	2	1	0	0	0	0	0	0	0	0	0	0
	4"		10	9	8	6	5	3	2	0	0	0	0	0	0	0	0
	6"			16	15	14	13	12	11	10	9	7	4	1	0	0	0
	8"				22	22	21	20	19	19	18	16	14	11	8		
	10"					28	27	27	26	25	24	22	19	17			
	12"						34	33	33	32	31	29	27	25			
	14"							40	39	39	38	37	36	35	33		
	16"								46	45	45	44	43	41	40		
	18"									52	51	51	49	48	47		
	20"										58	57	56	55	54		
	24"											69	68	68	67		
	30"												87	86	85		
	36"													104	104		
	42"														122		
Unit Frictional Force (ft/lbs)		249	302	434	569	697	829	961	1,093	1,225	1,357	1,621	2,011	2,406	2,796		
Unit Bearing Resistance (ft/lbs)		152	185	268	354	437	523	611	699	789	879	1,064	1,344	1,639	1,939		

Assumptions: Cover = 6.0 feet
Design Pressure = 150 psi
Safety Factor = 1.5
Laying Condition = Type 3
Soil Designation = Clay 1
Non-Polywrapped Pipe

* Data Table acquired from the Ductile Iron Pipe Research Association (DIPRA)

TABLE 23.6.5.E DUCTILE IRON WATER MAIN PIPE THRUST RESTRAINT LENGTH FOR REDUCERS															
		DIAMETER OF LARGER PIPE (inches)													
		3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"	42"
DIAMETER OF SMALLER PIPE (inches)	3"		4	13	21	27	34	40	46	53	59	71	89	107	124
	4"			10	18	25	32	39	45	52	58	70	88	106	124
	6"				11	19	27	34	41	48	55	67	86	104	122
	8"					11	20	29	37	45	50	64	83	102	120
	10"						11	20	29	37	45	59	79	99	114
	12"							21	30	38	54	75	95	117	
	14"								11	21	30	47	69	91	110
	16"									11	21	40	63	85	106
	18"										11	31	57	80	101
	20"											22	49	73	96
	24"												31	59	83
	30"													33	60
	36"														32
	42"														
Unit Frictional Force (ft/lbs)			302	434	569	697	829	961	1,093	1,225	1,357	1,621	2,011	2,406	2,796

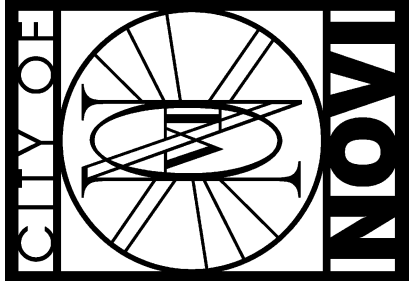
Assumptions: Cover = 6.0 feet
Design Pressure = 150 psi
Safety Factor = 1.5
Laying Condition = Type 3
Soil Designation = Clay 1
Non-Polywrapped Pipe

* Data Table acquired from the Ductile Iron Pipe Research Association (DIPRA)

TABLE 23.6.5.F DUCTILE IRON WATER MAIN PIPE THRUST RESTRAINT LENGTH FOR DEAD ENDS															
Pipe Diameter (inches)	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"	42"	
Restraint Length (feet)	11	14	19	25	31	37	43	49	55	61	73	90	108	125	
Unit Frictional Force (ft/lbs)	249	302	434	569	697	829	961	1,093	1,225	1,357	1,621	2,011	2,406	2,796	

Assumptions: Cover = 6.0 feet
Design Pressure = 150 psi
Safety Factor = 1.5
Laying Condition = Type 3
Soil Designation = Clay 1
Non-Polywrapped Pipe

* Data Table acquired from the Ductile Iron Pipe Research Association (DIPRA)



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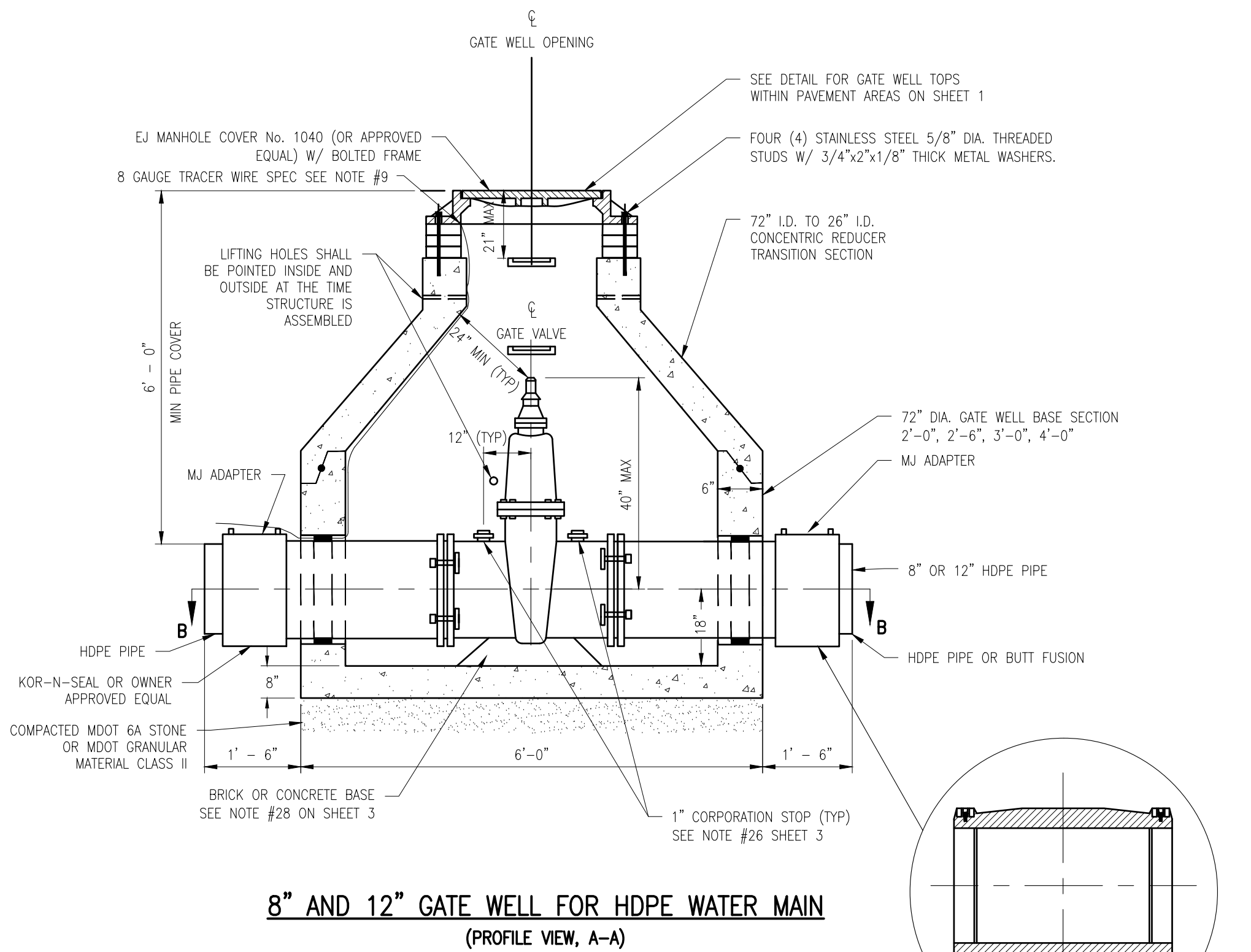
COUNTY: OAKLAND COUNTY

TOWN: IN RANGE: 8E

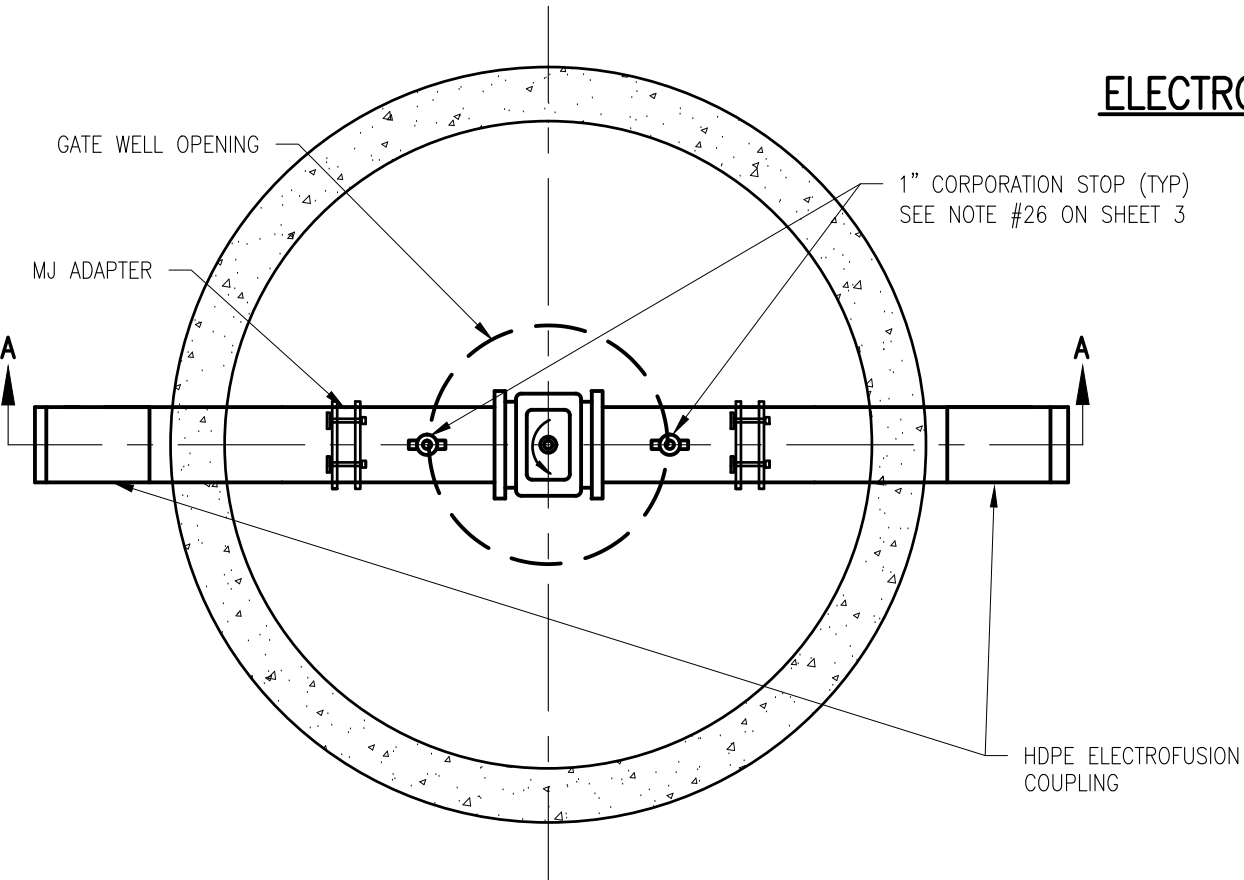
DATE: 3/2014

REVISIONS: SPALLING DETECTOR

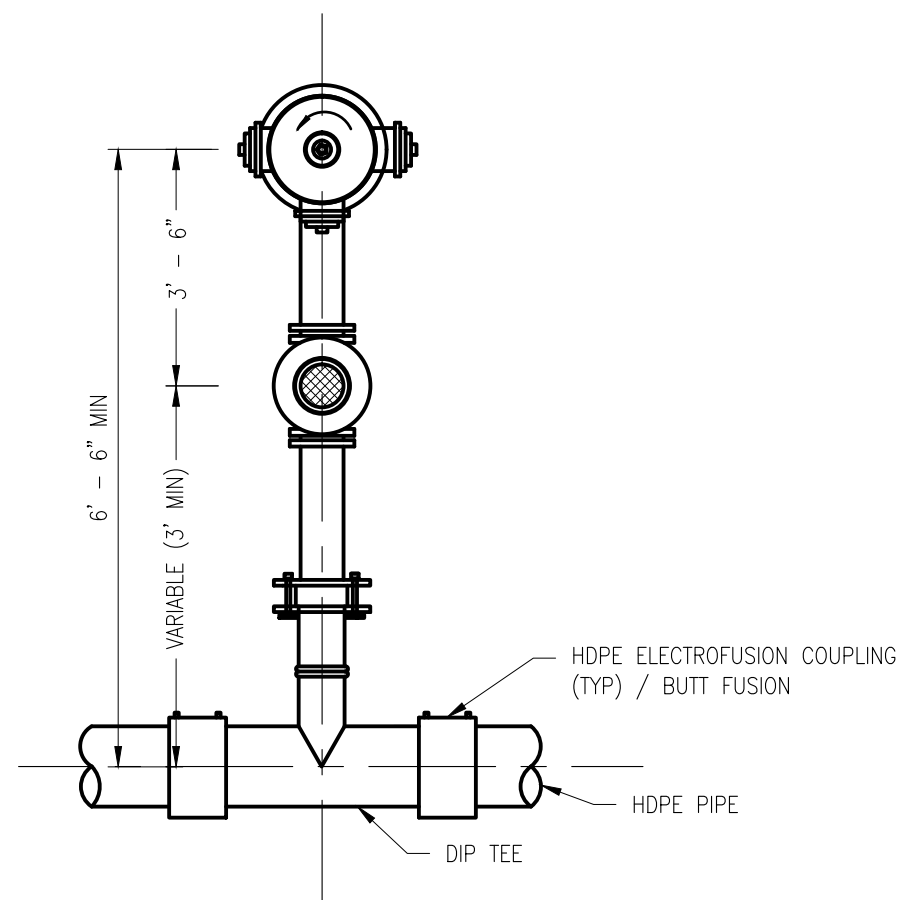
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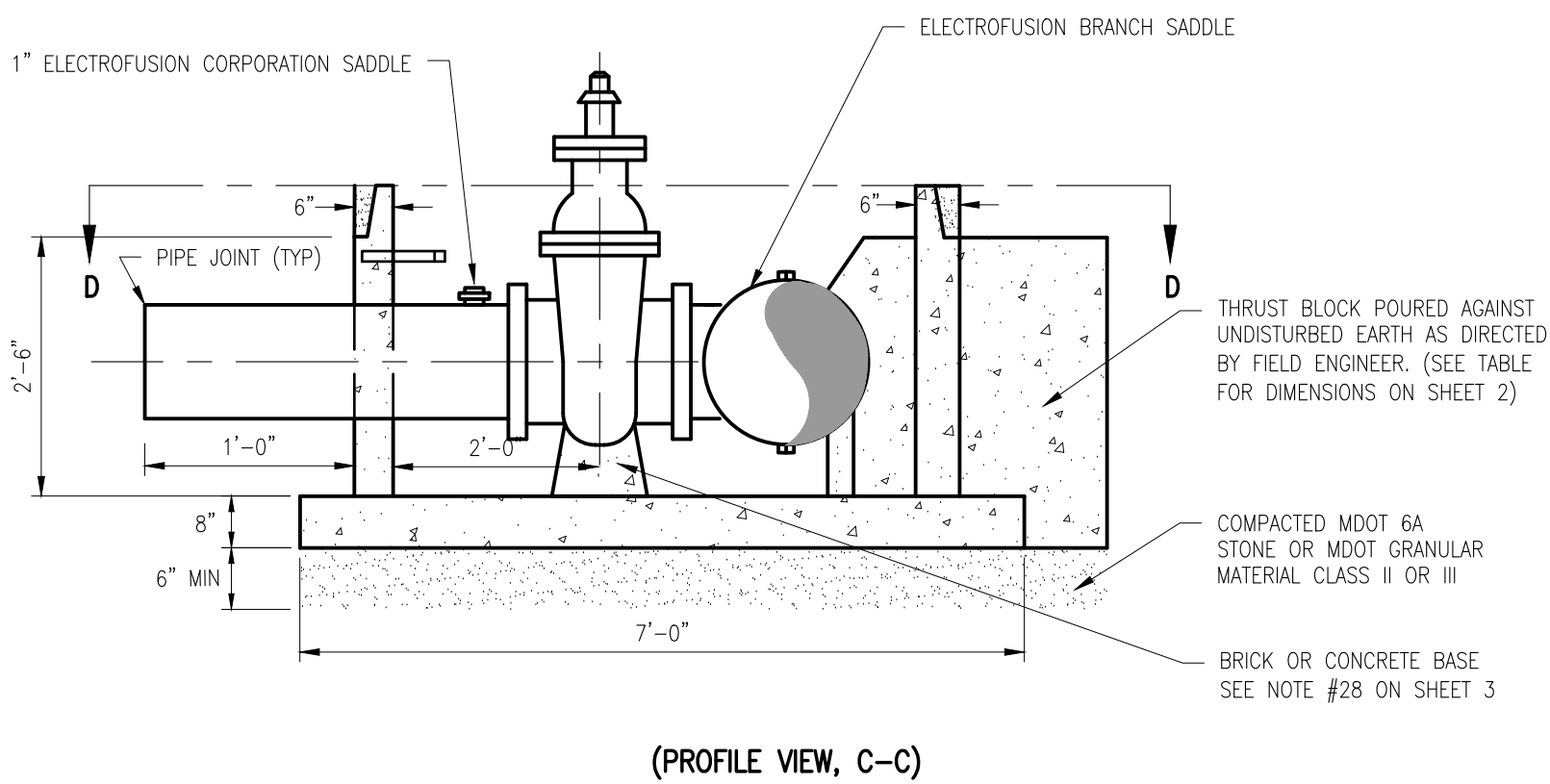
ELECTROFUSION DIPS COUPLINGS



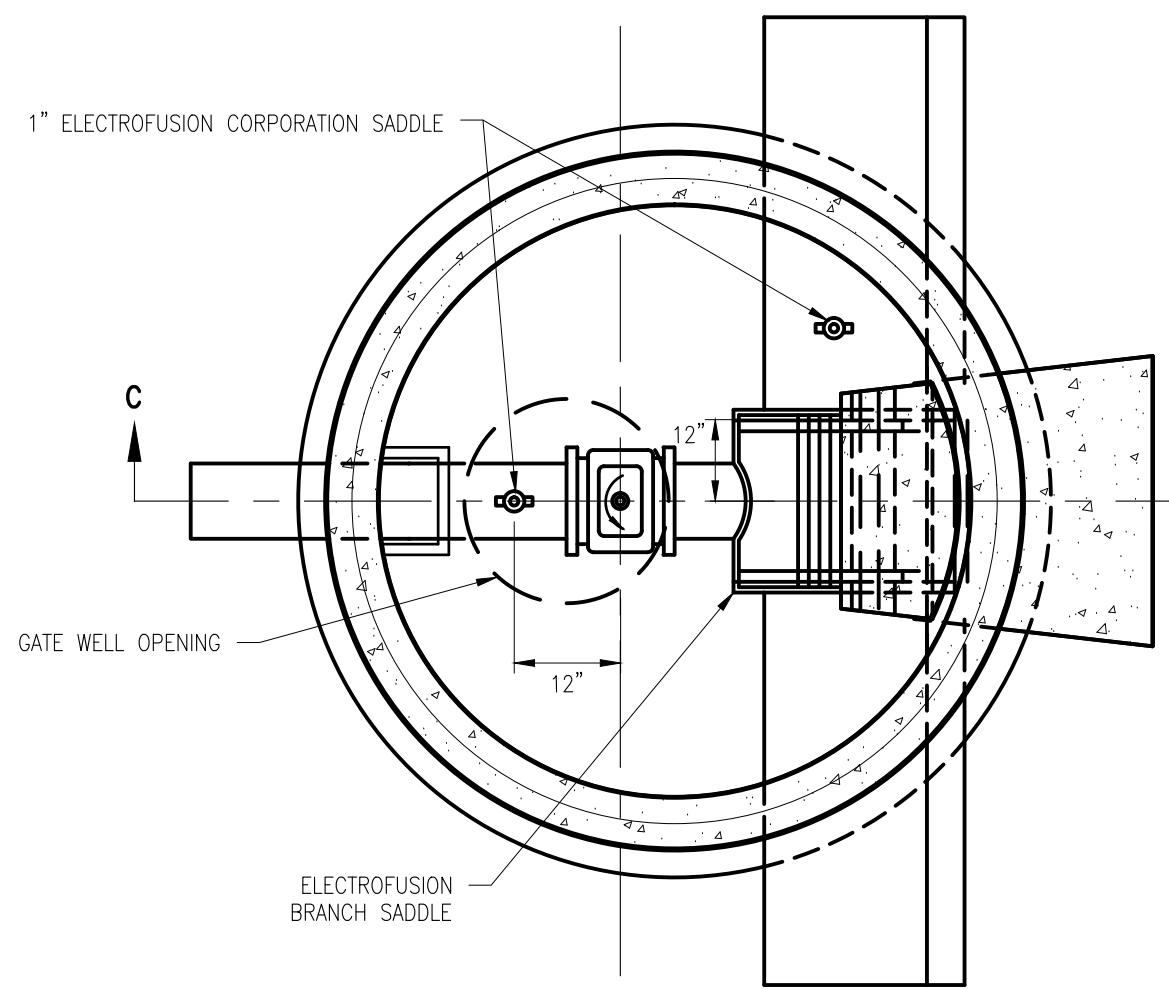
8" AND 12" GATE WELL TYPICAL FOR HDPE WATER MAIN
(PLAN VIEW, B-B)



FIRE HYDRANT ASSEMBLY
WITH HDPE PRE-MANUFACTURED TEE

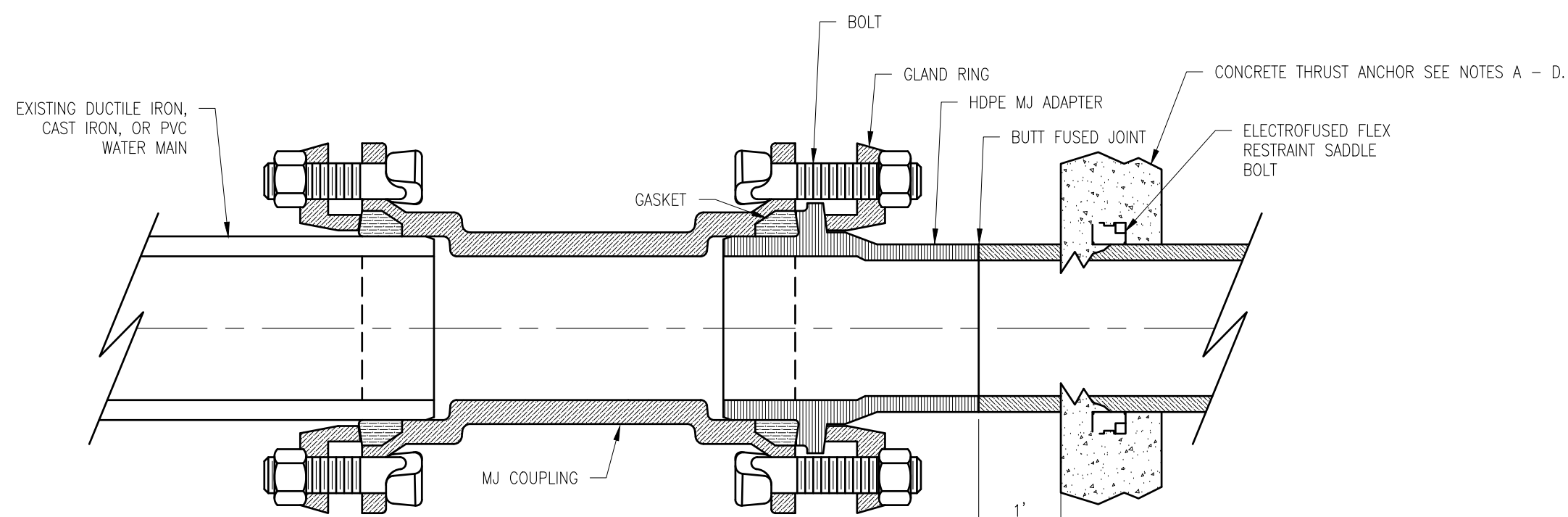


(PROFILE VIEW, C-C)

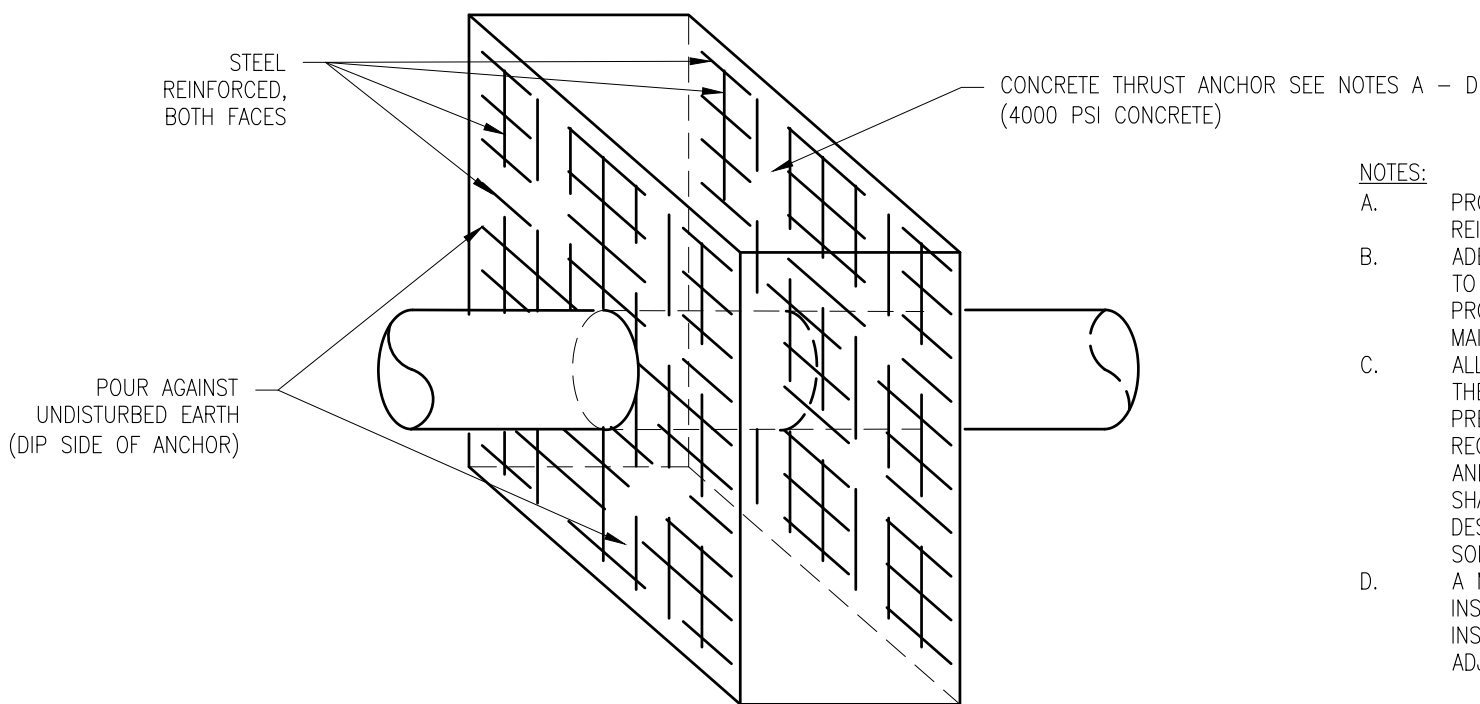


(PLAN VIEW, D-D)

HDPE BRANCH SADDLE
VALVE & WELL TYPICAL



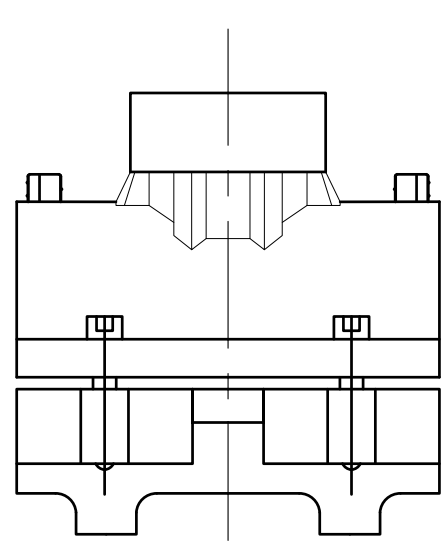
MJ ADAPTER FOR HDPE PIPE



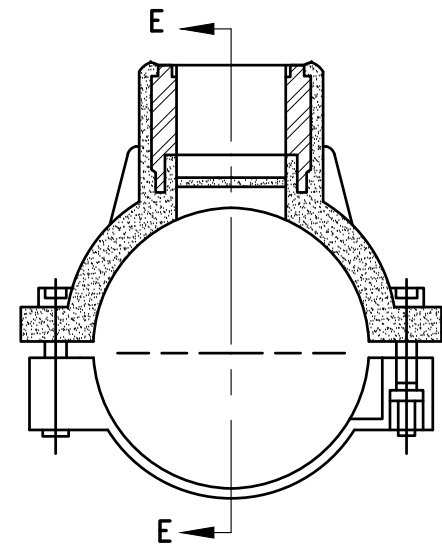
CONCRETE THRUST ANCHOR FOR HDPE PIPE

HDPE WATER MAIN JOINT RESTRAINT
(FOR CONNECTING HDPE PIPE TO DUCTILE IRON PIPE)

EQUIVALENT DUCTILE IRON PIPE SIZES (DIPS)				
NOMINAL PIPE SIZE (DIPS)	O.D. SIZE (INCHES)	MIN WALL THICKNESS SDR 11 (160 PSI) (INCHES)		
6"	6.90	0.627		
8"	9.05	0.823		
12"	13.20	1.200		
16"	17.40	1.582		
20"	21.60	1.964		
24"	25.60	2.345		



SECTION E-E



ELECTROFUSION BRANCH SADDLE DETAIL

HIGH-DENSITY POLYETHYLENE (HDPE) WATER MAIN NOTES

In addition to the water main notes listed on sheet 3 of the standard details, the following notes will apply to construction projects using HDPE water main:

MATERIALS
1. HDPE pipe, appurtenances, and installation methods shall conform to the most current edition of AWWA standard C906.

2. HDPE pipe shall be manufactured out of virgin material as defined in ASTM D3350. The pipe shall be made from high density PE 3408 polyethylene resin and the materials used must be listed and approved for use under NSF/ANSI Standard 14 and 61. HDPE pipe shall have a standard dimension ratio (SDR) of 11 or less, a hydrostatic design basis (HDB) of 1600 psi for water at 73.4°F and a minimum working pressure rating of 160 psi. No rework except that obtained from the manufacturer's own production of the same formulation shall be used. The pipe shall be homogeneous throughout and shall be free of visible cracks, holes, foreign materials, blisters, or other deleterious faults. A "Certificate of Compliance" shall be furnished for all materials supplied.

3. The physical appearance of the pipe having deformities such as concentrated ridges, discoloration, excessive spot roughness, pitting, varying wall thickness, etc., shall constitute sufficient basis for rejection. Pipe with gashes, nicks, abrasions or any physical damage that occurred during storage and/or handling which are wider or deeper than 10% of the wall thickness shall not be used and must be removed from the construction site. Any pipe that has been damaged or does not meet the City's approval shall be replaced at the Contractor's expense.

4. Mechanical fittings used with HDPE pipe shall be specifically designed for or tested and found to be acceptable for use with HDPE by the fitting manufacturer. Mechanical fittings designed for other materials shall not be used.

5. Water service saddles on HDPE water main shall be "VA" Electrofusion Service Saddles by Friatec, Inc. or approved equal.

6. The mechanical joint fittings must conform to outside diameter requirements of ANSI/AWWA C111/A21 or ANSI/AWWA C153/A21.53 depending size. Butt fusion fittings shall meet AWWA C906 dimensional requirements.

7. Bolts, nuts, gaskets, and glands meeting ANSI/AWWA C111/A21.11 and ANSI/AWWA C153/A21.53 are required. Mechanical joint components shall be installed in accordance with manufacturer's recommendations.

8. Pipe and fittings must be marked as prescribed by AWWA C906 and NSF. Pipe markings shall include nominal size, OD base, dimension ratio, pressure class, working pressure rating, AWWA C906, material code designation, PE 3408, manufacturer's name, manufacturer's production code including day, month, year extruded, manufacturer's plant and extrusion line and NSF logo. Permanent identification of piping shall be provided by co-extruding longitudinal blue stripes into the outside surface of the pipe (stripes printed or painted shall not be acceptable) or the pipe material shall be black with a blue shell.

INSTALLATION

9. Tracing wire shall be provided for all water main, regardless of pipe material. Brass wedges are not permitted. Wire shall be copper, 8-gauge stranded, blue insulated per City requirements, or Copperhead Industries #8 AWG Blue Coated solid shot extra strength tracer wire. Connection is required at all service leads, hydrants, and gate wells. Wire shall be brought through each gate well and connected to the top step. All wire exposed above ground surface shall be encased in 1/2" metal conduit. The conduit should extend 12" below the ground surface. Conductivity shall be tested by the contractor prior to acceptance of the main. All splices shall be made using a gel-cap product which provides a water proof seal, such as Wet's Direct Bury Splice Kit or approved equal. Sanitary Sewer Force Main, Directional Drilled Water Main and Bore & Jack Water Main must be provided with two tracer wires per above specifications. For sanitary sewer force main applications the tracer wire must be installed up the side of the sanitary structure, to inside the structure by placing the tracer wire between the casting and adjustment.

10. Personnel trained in the use of butt-fusion equipment shall perform the joining of polyethylene pipe by methods recommended for new pipe connections. Personnel directly involved with installing the new pipe shall have received training in the proper methods for handling and installing the HDPE pipe by a qualified representative and certification of this training shall be provided to the City.

11. Connections to HDPE pipe shall not be made immediately after the pipe has been installed. The fused pipe should be laid in the trench and be allowed to reach an equilibrium temperature overnight (24-hour period) in its surrounding environment.

12. The HDPE pipe must be properly aligned at all transitions to conventional or HDPE water main and appurtenances.

TESTING

13. The polyethylene pipe shall be pressure tested after the line and all fittings and valves have been installed. Connections may be left exposed for visual leak inspection. Under no circumstances shall HDPE pipe be pressure tested when the temperature of the pipe is above 80°F.

10. Connection to an existing water main shall be made only after pressure and bacteriological test have been successfully completed. The city consultant must be present for the test and review the results. Testing and disinfection procedures shall meet the requirements of ANSI/AWWA-C600/C651. The water main shall pass a test of 150 psi for a two (2) hour period. Water loss shall not exceed a rate of 11.65 U.S. gallons per inch diameter per mile of water main in twenty-four (24) hours. Bacteria sample (24) hours back to back.

PIPE BURSTING PROJECTS

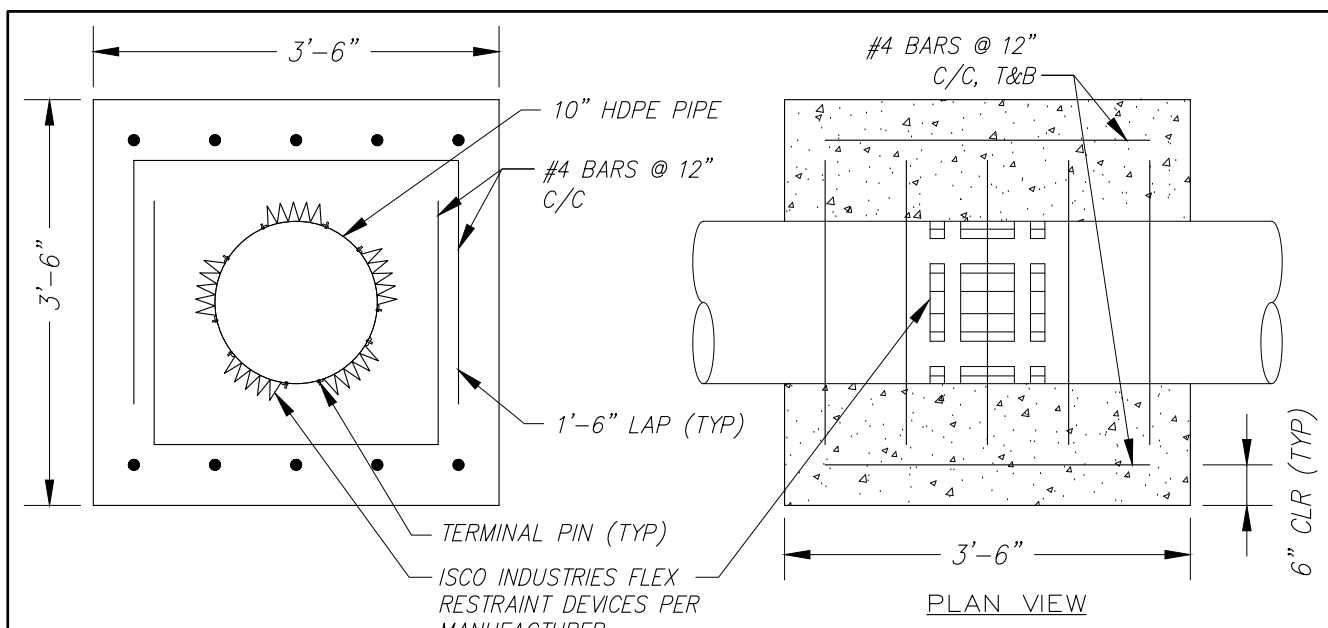
11. The method approved for rehabilitation of existing water mains by pipe bursting and installation of new HDPE pipe is T.I. Technologies GRUNDORACK SYSTEMS, 8(00-533-2078) or approved equal. All contractors must be licensed to use the particular technology proposed for this work.

12. The pipe-bursting tool shall be designed and manufactured to force its way through existing pipe materials by fragmenting the pipe and compressing the old pipe sections into the surrounding soil as it progresses. The bursting unit shall be pneumatic and shall generate enough force to burst and compact the existing pipeline.

13. The Manufacturer's specifications shall dictate what size tool should be used in what diameter pipe, as well as parameters of what size tool for percentage of upsized allowed.

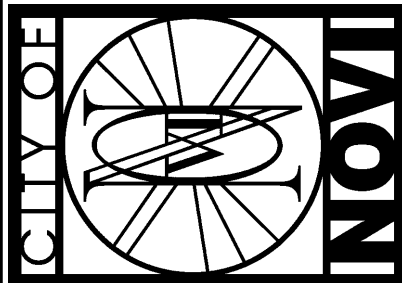
14. Prior to construction, the Contractor shall develop and provide to the City of Novi for review and approval a temporary water system plan to supply water services to area residents and businesses during pipe bursting operations. It is anticipated that the temporary system will be fed from existing fire hydrants. The temporary system and hydrants shall have passed bacteriological testing prior to use.

15. All service connections on the existing water main that is to be burst, or will be taken out of service, shall be connected to the temporary water system prior to mainline bursting, disinfection, testing and service reconnection operations. Temporary service connections shall be made at the water service stop box by disconnecting the existing water service and connecting the temporary water line to the stop box.



- NOTES
1. BEARING AREA SHALL BE AGAINST UNDISTURBED SOIL.
2. CONCRETE SHALL HAVE A MIN. 28 DAY COMP. STRENGTH OF 3,500 PSI.
3. ALL BARS SHALL BE EPOXY COATED.

HDPE FORCE MAIN / WATER MAIN PIPE RESTRAINT
SCALE: NONE



CITY OF NOVI 145175 WEST 10 MILE ROAD NOVI, MI 48375 P (248) 341-0465 WWW.CITYOFNOVI.ORG

H: N.T.S. V: N.T.S. SCALE

COUNTY OAKLAND COUNTY DATE: 5/7/2017

TOWN IN RANGE 8E

DATE 3/20/14

CITY OF NOVI

WATER MAIN
STANDARD DETAILS

SHEET
5
OF 5

