

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

. 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	e th	at	we	<u>grant</u>	the	variance	in	Case	No.	PZ21	-0051,	sou	ght	by fo
	 dif	ficulty	requi	iring _						ecause			as shc	wn p	oract	
								er will be ur e			•		r limited	d with	resp	ec
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		(c) F	Petitio	ner d	lid no	t create	the c	condition be	caus	Se				_		

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		(a)	The inclu	uding_			ices								the unique	beca		erty they
			exist	gene	rally t	hroug	hout th	ne Cit	y.									,
		(b)					nd fea								varian —	ce re	quest	are
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		(d)					esult ir				ith th	ie adja	acent	and s	urroun	ding _l	orope	erties
		(e)		_			e woul						-	and in	tent of	the c	ordina	ance
															_			

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



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ZONING BOARD OF APPEALS APPLICATION

APPLICATION MUST BE FILLED OUT COMPLETELY

I. PROPERTY INFORMATION (Addr	ess of subject ZBA Co	ase)	Application Fee:	\$300
PROJECT NAME / SUBDIVISION Fountain View Professional Center			0	
ADDRESS		LOT/SIUTE/SPACE #	Meeting Date:	1-14-21
44244 W. 12 Mile Rd.			7	21 00 51
SIDWELL # 50-22-10 - 400 - 057		otain from Assessing ent (248) 347-0485	ZBA Case #: PZ?	1-00 51
CROSS ROADS OF PROPERTY 12 Mile Rd _ 300 feet east of Dixon Rd		——————————————————————————————————————		
IS THE PROPERTY WITHIN A HOMEOWNER'S ASS	OCIATION JURISDICTION?	REQUEST IS FOR:		
☐ YES 🗹 NO		☐ RESIDENTIAL ☑ COM		operty 🗆 signage
DOES YOUR APPEAL RESULT FROM A NOT	ICE OF VIOLATION OR C	CITATION ISSUED?	es 🗹 no	
II. APPLICANT INFORMATION	ENTAIL ADDDESS			
A. APPLICANT	EMAIL ADDRESS jschimizzi@acquirarealt	ly com	CELL PHONE NO.	
NAME		7	TELEPHONE NO.	
Joseph Schimizzi			888-560-5640	
ORGANIZATION/COMPANY Acquira Realty Holdings	- 10		FAX NO.	
ADDRESS 44090 W. 12 Mile Rd		CITY Novi	STATE MI	ZIP CODE 48377
B. PROPERTY OWNER CHECK HE	ERE 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
JII. ZONING INFORMATION				
A. ZONING DISTRICT				
□ R-A □ R-1 □ R-2	□ R-3 □ R-4	\square RM-1 \square RM-2	□ MH	
□ I-1 □ I-2 □ RC	□ TC □ TC-1	OTHER OS-1		
B. VARIANCE REQUESTED				
INDICATE ORDINANCE SECTION (S) AND	VARIANCE REQUESTED:			
1. Section 4.19.2.F	ariance requested	Dumpsters in side yard		
2. SectionV	ariance requested			
3. SectionV	ariance requested			
4. SectionV	'ariance requested	4		V-10-
IV. FEES AND DRAWNINGS	T. N		- 17 N 18 18 18 18 18 18 18 18 18 18 18 18 18	E 35 Yes 97
A. FEES				
☐ Single Family Residential (Existing	ı) \$200 🗌 (With Viola	tion) \$250 \square Single Fam	ily Residential (New) \$3	250
☑ Multiple/Commercial/Industrial §	300 🔲 (With Viola	tion) \$400 🗆 Signs \$300	☐ (With Violation) \$	400
☐ House Moves \$300	☐ Special Me	eetings (At discretion of Bo	pard) \$600	
	TAL COPY SUBMITTED	AS A PDF		
Dimensioned Drawings and Plans			d distance to adjacen	
Site/Plot PlanExisting or proposed buildings or a	ddition on the press		g & proposed signs, if c	pplicable
Number & location of all on-site per			itions ion relevant to the Var	riance 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 approve	als.
B. SIGN CASES (ONLY) Your signature on this application indicates that you agree to install a Mock-Up Sign is meeting. Failure to install a mock-up sign may result in your case not being heard by schedule ZBA meeting, or cancelled. A mock-up sign is NOT to be actual sign. Upon a removed within five-(5) days of the meeting, if the case is denied, the applicant is reserved of the mock-up or actual sign (if erected under violation) within five-(5) days	the Board, postponed to the next approval, the mock-up sign must be ponsible for all costs involved in the
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 building permit for such erection or alteration is obtained within such period and such proceeds to completion in accordance with the terms of such permit.	longer than one-(1) year, unless a n erection or alteration is started and
No order of the Board permitting a use of a building or premises shall be valid for a period eighty-(180) days unless such use is establish within such a period; provided, however dependent upon the erection or alteration or a building such order shall continue in the for such erection or alteration is obtained within one-(1) year and such erection or alteration in accordance with the terms of such permit.	, where such use permitted is force and effect if a building permit
D. APPEAL THE DETERMINATION OF THE BUILDING OFFICIAL	
PLEASE TAKE NOTICE:	
The undersigned hereby appeals the determination of the Building Official / Inspecto	r or Ordinance made
\square construct new home/building \square addition to existing home/building [_ SIGNAGE
☐ CONSTRUCT NEW HOME/BUILDING ☐ ADDITION TO EXISTING HOME/BUILDING ☐ ☐ ACCESSORY BUILDING ☐ USE ☐ OTHER	
□ ACCESSORY BUILDING □ USE □ OTHER	
VI. APPLICANT & PROPERTY SIGNATURES	
□ ACCESSORY BUILDING □ USE □ OTHER	
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VI. APPLICANT & PROPERTY SIGNATURES A. APPLICANT Applicant Signature	7 2z 2 1 Date
VI. APPLICANT & PROPERTY SIGNATURES A. APPLICANT Applicant Signature B. PROPERTY OWNER If the applicant is not the owner, the property owner must read and sign below	Date Date Date Date Date Date Date Date Date
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NOVI cityofnovi.org

Community Development Department

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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:

а.	 a. Shape of Lot. Exceptional narrowness, shallowned in existence on the effective date of the Zoning ☐ Not Applicable ☑ Applicable 	
	The shape of the lot is not a conventional rectangle with obyard" where the dumpster location is proposed is adjacent property (Level One Bank). The proposed dumpster location property's dumpster location which seems to be a logical location.	to the rear yard of the neighboring on is directly adjacent to the neighboring
	and/or	
b.	 b. Environmental Conditions. Exceptional topograph other extraordinary situations on the land, building Not Applicable Applicable 	
	The rear of the property is a wetland area. We would like to limiting the number of dumpster enclosures in the vicinity of	•
	and/or	
C.	 c. Abutting Property. The use or development of the to the subject property would prohibit the literal of the Zoning Ordinance or would involve signification. ☑ Not Applicable ☐ Applicable 	enforcement of the requirements

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

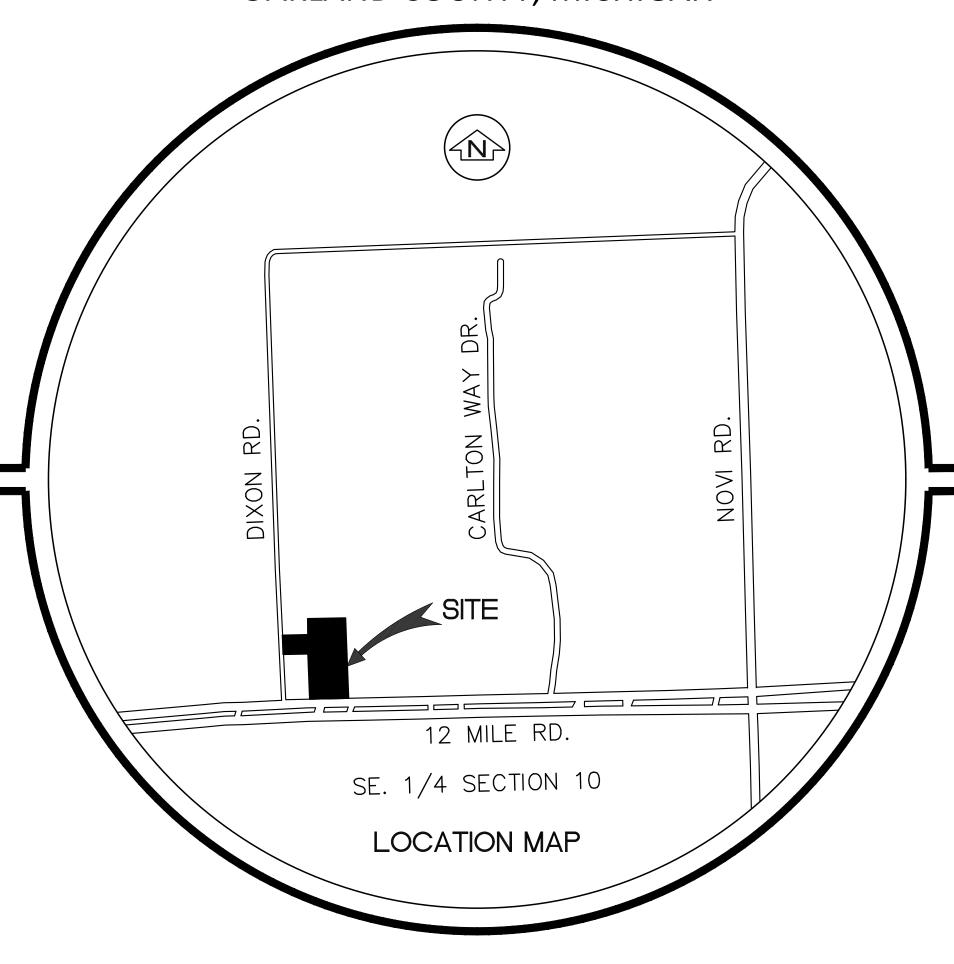
Landscape Architect

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



Project Name

Fountain View Professional Center

SHEET INDEX

- **Cover Sheet**
- Boundary / Topographic Survey
- **Demolition Plan**
- Stringer Dimension Plan
- Paving and Grading Plan
- **Detailed Paving and Grading Plan**
- **Utility Plan**
- Wetland Plan
- Storm Water Management Plan
- Storm Water Drainage Area Plan
- Storm Calculations and Details Plan
- Storm Profile Plan 1
- Storm Profile Plan 2
- Sanitary Profile Plan
- Water Main Profile Plan 1 Water Main Profile Plan 2
- **Details Plan**
- Soil Erosion and Sedimentation Control Plan
- Soil Boring Logs Plan
- Contech Details Plan
- Contractor's Duties, Additional Notes and Details Plan
- Landscape Plan Tree Preservation
- Landscape Plan
- Landscape Plan Notes and Details
- Lighting Plan
- **Building A Floor Plan**
- **Building A Elevations**
- **Building B Floor Plan**
- **Building B Floor Plan**
- **Building B Elevations Building C Floor Plan**
- **Building C Elevations**

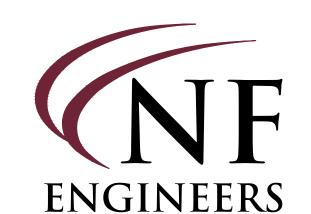
Standard Details

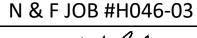
- City of Novi Sanitary Sewer Detail (3 Sheets)
- City of Novi Storm Sewer Detail (2 Sheets)
- City of Novi Water Main Detail (5 Sheets)
- City of Novi Paving Standard Details (2 Sheets)
- City of Novi Erosion Control Details (1 Sheet)

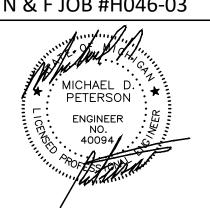
ALL WORK SHALL CONFORM TO THE CURRENT CITY OF NOVI STANDARDS AND SPECIFICATIONS.

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







CIVIL ENGINEERS LAND SURVEYORS LAND PLANNERS

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

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

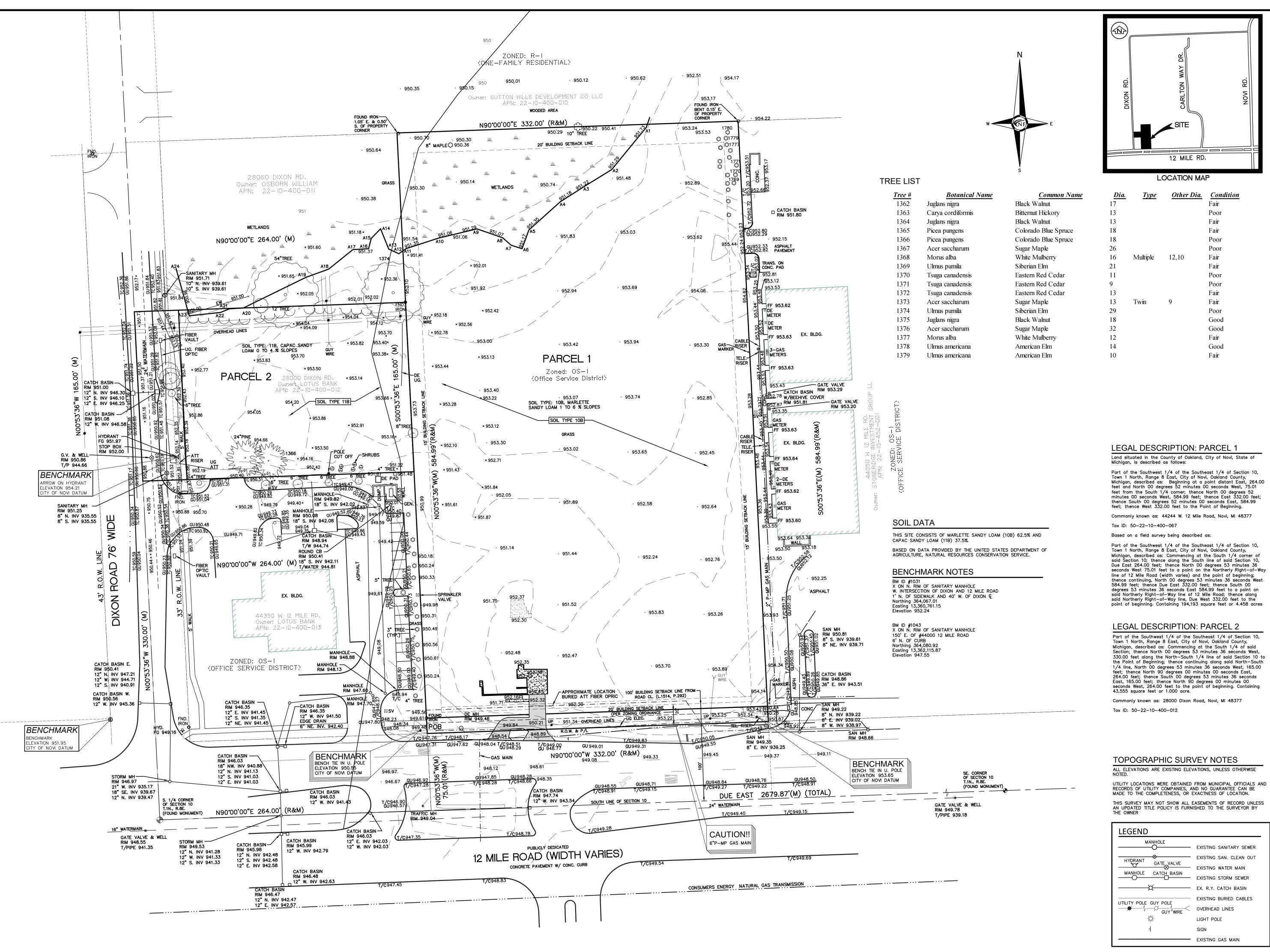
said Northerly Right-of-Way line, Due West 332.00 feet to the point of beginning. Containing 194,193 square feet or 4.458 acres

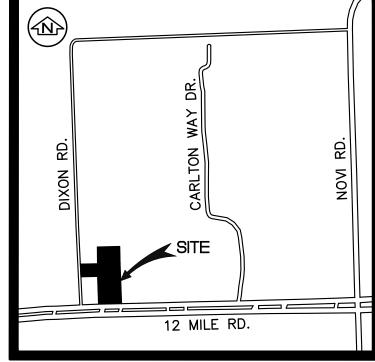
LEGAL DESCRIPTION: PARCEL 2

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





LOCATION MAP

	<u> </u>		
<u>Dia.</u>	<u>Type</u>	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

PONTIAC, MI 48342-5032 TEL. (248) 332-7931 FAX. (248) 332-8257 SEAL

ENGINEERS

CIVIL ENGINEERS

LAND SURVEYORS

LAND PLANNERS

NOWAK & FRAUS ENGINEERS 46777 WOODWARD AVE.

NAVAROLI PROFESSIONAL SURVEYOR

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

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

•	,, OO, 0			J V II	10	. •
L	ELEVATIONS	ARE	EXISTING	ELEVATIONS,	UNLESS	OTHERWISE

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

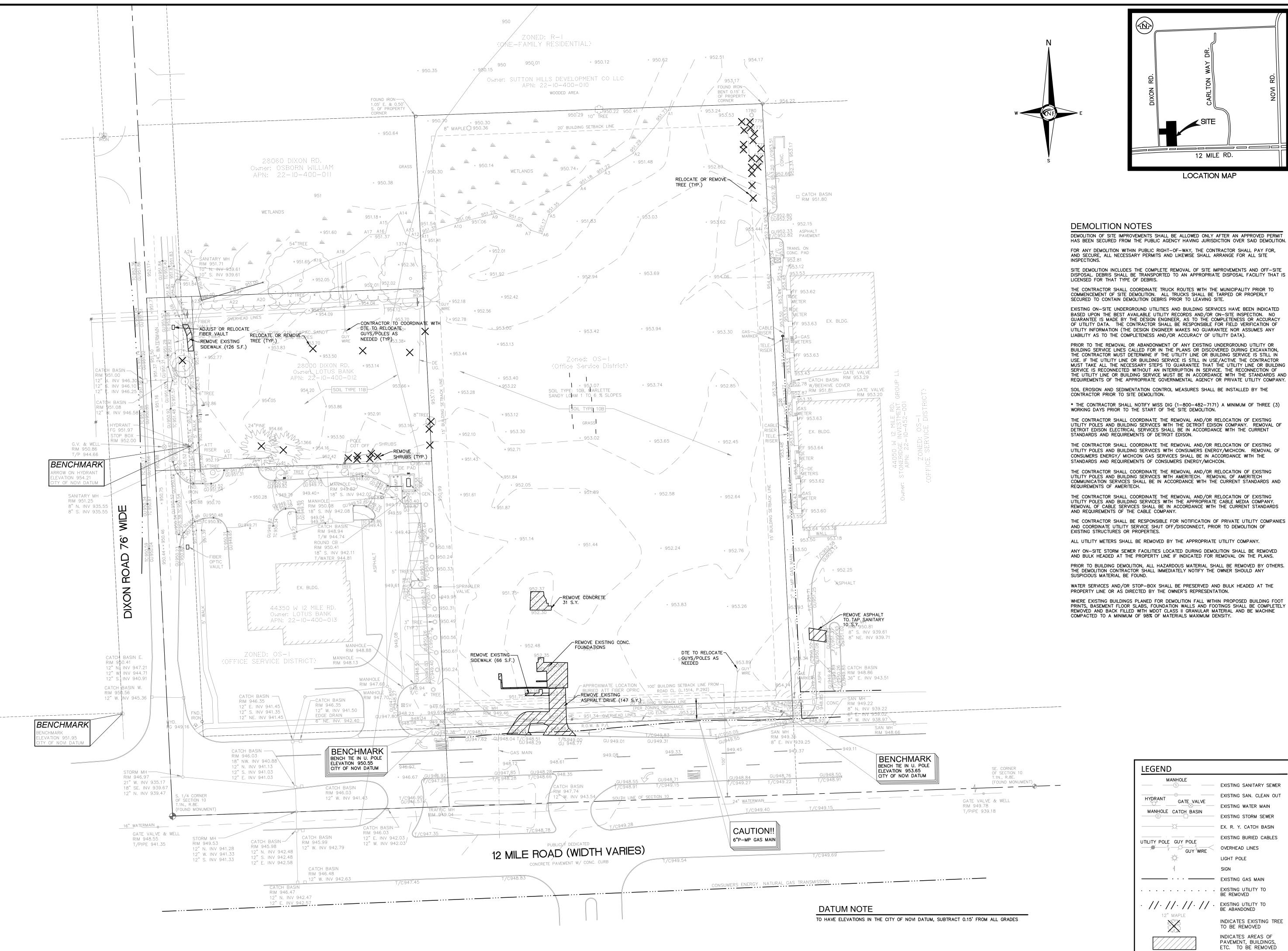
MANHOLE	EXISTING SANITARY SEWER
HYDRANT	EXISTING SAN. CLEAN OUT
GA IE VALVE	EXISTING WATER MAIN
MANHOLE CATCH BASIN	EXISTING STORM SEWER
	EX. R.Y. CATCH BASIN
UTILITY POLE GUY POLE	EXISTING BURIED CABLES
GUY WIRE	OVERHEAD LINES
禁	LIGHT POLE
٩	SIGN
***************************************	EXISTING GAS MAIN

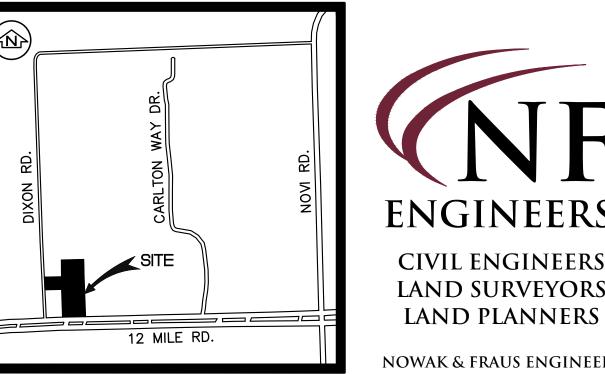
AWN BY:	
. Huhta	
SIGNED BY:	

APPROVED BY: K. Navaroli DATE: 03-27-2019

SCALE: 1'' = 40'

NFE JOB NO. SHEET NO. H046-03





LOCATION MAP



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

DEMOLITION NOTES

DEMOLITION OF SITE IMPROVEMENTS SHALL BE ALLOWED ONLY AFTER AN APPROVED PERMIT HAS BEEN SECURED FROM THE PUBLIC AGENCY HAVING JURISDICTION OVER SAID DEMOLITION. FOR ANY DEMOLITION WITHIN PUBLIC RIGHT-OF-WAY, THE CONTRACTOR SHALL PAY FOR, AND SECURE, ALL NECESSARY PERMITS AND LIKEWISE SHALL ARRANGE FOR ALL SITE

SITE DEMOLITION INCLUDES THE COMPLETE REMOVAL OF SITE IMPROVEMENTS AND OFF-SITE DISPOSAL. DEBRIS SHALL BE TRANSPORTED TO AN APPROPRIATE DISPOSAL FACILITY THAT IS LICENSED FOR THAT TYPE OF DEBRIS.

THE CONTRACTOR SHALL COORDINATE TRUCK ROUTES WITH THE MUNICIPALITY PRIOR TO COMMENCEMENT OF SITE DEMOLITION. ALL TRUCKS SHALL BE TARPED OR PROPERLY SECURED TO CONTAIN DEMOLITION DEBRIS PRIOR TO LEAVING SITE.

EXISTING ON-SITE UNDERGROUND UTILITIES AND BUILDING SERVICES HAVE BEEN INDICATED BASED UPON THE BEST AVAILABLE UTILITY RECORDS AND/OR ON-SITE INSPECTION. NO GUARANTEE IS MADE BY THE DESIGN ENGINEER, AS TO THE COMPLETENESS OR ACCURACY OF UTILITY DATA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFICATION OF UTILITY INFORMATION (THE DESIGN ENGINEER MAKES NO GUARANTEE NOR ASSUMES ANY

PRIOR TO THE REMOVAL OR ABANDONMENT OF ANY EXISTING UNDERGROUND UTILITY OR BUILDING SERVICE LINES CALLED FOR IN THE PLANS OR DISCOVERED DURING EXCAVATION, THE CONTRACTOR MUST DETERMINE IF THE UTILITY LINE OR BUILDING SERVICE IS STILL IN USE. IF THE UTILITY LINE OR BUILDING SERVICE IS STILL IN USE/ACTIVE THE CONTRACTOR MUST TAKE ALL THE NECESSARY STEPS TO GUARANTEE THAT THE UTILITY LINE OR BUILDING SERVICE IS RECONNECTED WITHOUT AN INTERRUPTION IN SERVICE. THE RECONNECTION OF THE UTILITY LINE OR BUILDING SERVICE MUST BE IN ACCORDANCE WITH THE STANDARDS AND

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED BY THE CONTRACTOR PRIOR TO SITE DEMOLITION.

* THE CONTRACTOR SHALL NOTIFY MISS DIG (1-800-482-7171) A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO THE START OF THE SITE DEMOLITION.

THE CONTRACTOR SHALL COORDINATE THE REMOVAL AND/OR RELOCATION OF EXISTING UTILITY POLES AND BUILDING SERVICES WITH THE DETROIT EDISON COMPANY. REMOVAL OF DETROIT EDISON ELECTRICAL SERVICES SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND REQUIREMENTS OF DETROIT EDISON.

THE CONTRACTOR SHALL COORDINATE THE REMOVAL AND/OR RELOCATION OF EXISTING UTILITY POLES AND BUILDING SERVICES WITH CONSUMERS ENERGY/MICHCON. REMOVAL OF CONSUMERS ENERGY/ MICHCON GAS SERVICES SHALL BE IN ACCORDANCE WITH THE STANDARDS AND REQUIREMENTS OF CONSUMERS ENERGY/MICHCON.

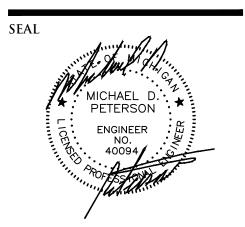
THE CONTRACTOR SHALL COORDINATE THE REMOVAL AND/OR RELOCATION OF EXISTING UTILITY POLES AND BUILDING SERVICES WITH AMERITECH. REMOVAL OF AMERITECH COMMUNICATION SERVICES SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND REQUIREMENTS OF AMERITECH.

THE CONTRACTOR SHALL COORDINATE THE REMOVAL AND/OR RELOCATION OF EXISTING UTILITY POLES AND BUILDING SERVICES WITH THE APPROPRIATE CABLE MEDIA COMPANY. REMOVAL OF CABLE SERVICES SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND REQUIREMENTS OF THE CABLE COMPANY.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFICATION OF PRIVATE UTILITY COMPANIES AND COORDINATE UTILITY SERVICE SHUT OFF/DISCONNECT, PRIOR TO DEMOLITION OF EXISTING STRUCTURES OR PROPERTIES.

ALL UTILITY METERS SHALL BE REMOVED BY THE APPROPRIATE UTILITY COMPANY. ANY ON—SITE STORM SEWER FACILITIES LOCATED DURING DEMOLITION SHALL BE REMOVED AND BULK HEADED AT THE PROPERTY LINE IF INDICATED FOR REMOVAL ON THE PLANS. PRIOR TO BUILDING DEMOLITION, ALL HAZARDOUS MATERIAL SHALL BE REMOVED BY OTHERS. THE DEMOLITION CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER SHOULD ANY SUSPICIOUS MATERIAL BE FOUND.

WATER SERVICES AND/OR STOP-BOX SHALL BE PRESERVED AND BULK HEADED AT THE PROPERTY LINE OR AS DIRECTED BY THE OWNER'S REPRESENTATION. WHERE EXISTING BUILDINGS PLANED FOR DEMOLITION FALL WITHIN PROPOSED BUILDING FOOT PRINTS, BASEMENT FLOOR SLABS, FOUNDATION WALLS AND FOOTINGS SHALL BE COMPLETELY REMOVED AND BACK FILLED WITH MOOT CLASS II GRANULAR MATERIAL AND BE MACHINE COMPACTED TO A MINIMUM OF 98% OF MATERIALS MAXIMUM DENSITY.



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

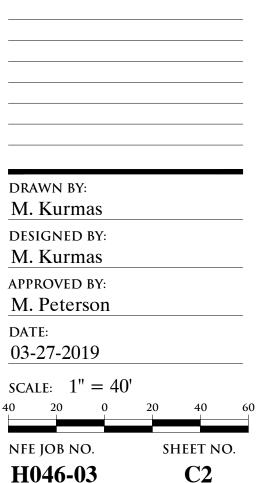
Demolition Plan

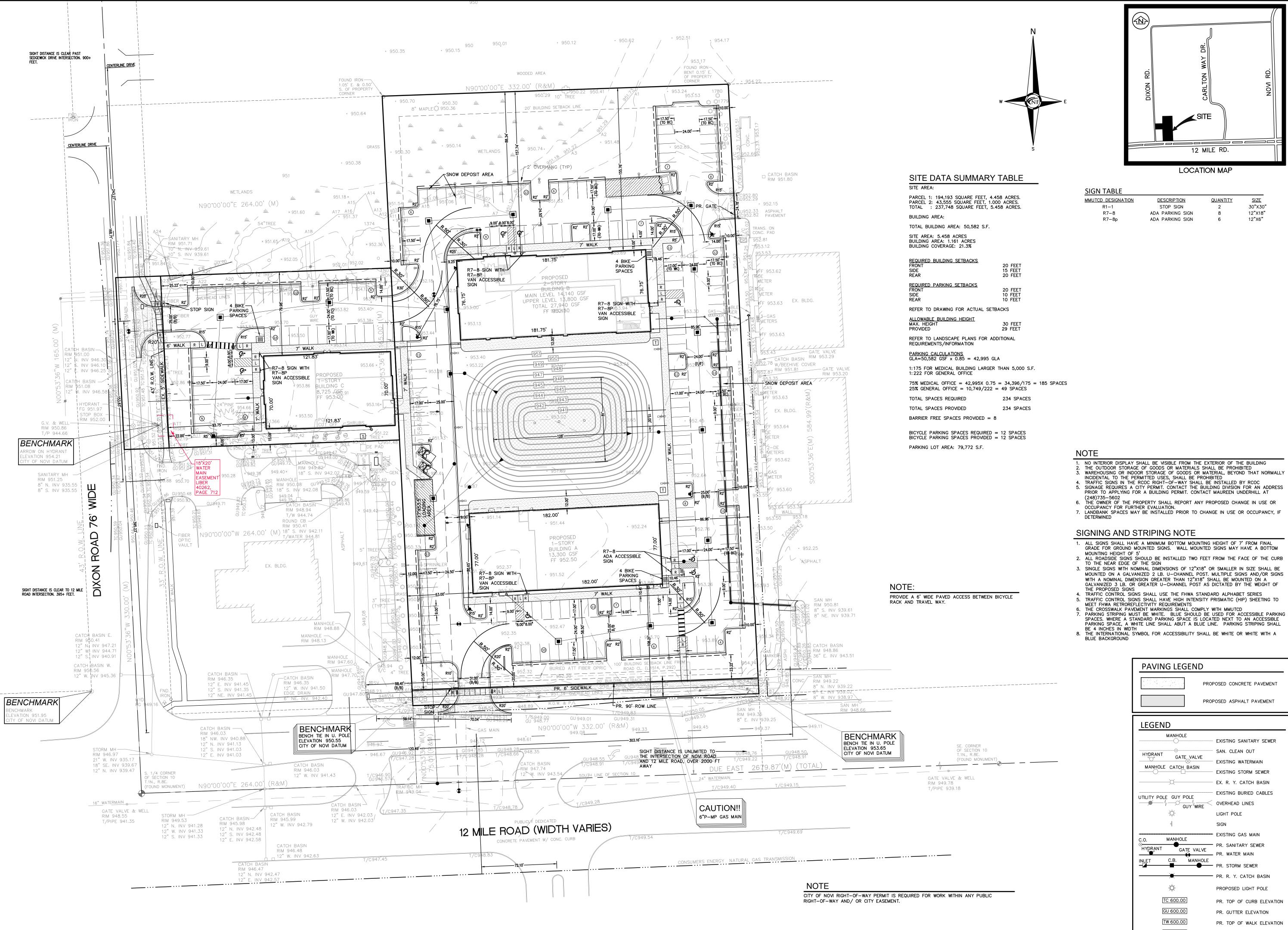


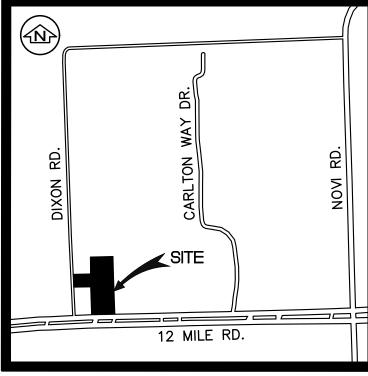
REVISIONS

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

LEGEND	
MANHOLE S	EXISTING SANITARY SEWER
HYDRANT	EXISTING SAN. CLEAN OUT
GATE VALVE	EXISTING WATER MAIN
MANHOLE CATCH BASIN	EXISTING STORM SEWER
X	EX. R. Y. CATCH BASIN
UTILITY POLE GUY POLE	EXISTING BURIED CABLES
GUY WIRE	OVERHEAD LINES
禁	LIGHT POLE
q	SIGN
···	EXISTING GAS MAIN
	EXISTING UTILITY TO BE REMOVED
. //. //. //. // .	EXISTING UTILITY TO BE ABANDONED
12" MAPLE	INDICATES EXISTING TREE TO BE REMOVED
	INDICATES AREAS OF PAVEMENT, BUILDINGS, ETC. TO BE REMOVED







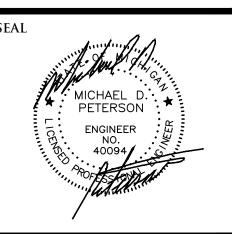
LOCATION MAP

SIGN TABLE			
MMUTCD 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"

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

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

Stringer Dimension Plan

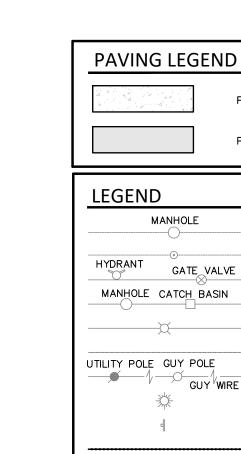


	VISIONS 13-20 Issued for Site Plan
	23-21 REV PER PRELIM SP REVIEW
	10-21 REV PER PRELIM SP REVIEW
7-1	4-21 ISSUED FINAL SP REVIEW

DRAWN BY: M. Kurmas **DESIGNED BY:** M. Kurmas APPROVED BY: M. Peterson DATE: 03-27-2019 SCALE: 1'' = 40'NFE JOB NO. SHEET NO.

H046-03

C3



GATE_VALVE EXISTING WATERMAIN MANHOLE CATCH BASIN EXISTING STORM SEWER EX. R. Y. CATCH BASIN EXISTING BURIED CABLES UTILITY POLE GUY POLE √ GUY WIRE OVERHEAD LINES LIGHT POLE SIGN --- EXISTING GAS MAIN

- PR. SANITARY SEWER HYDRANT GATE VALVE PR. WATER MAIN PR. STORM SEWER

- PR. R. Y. CATCH BASIN PROPOSED LIGHT POLE TC 600.00 GU 600.00 TW 600.00

PR. TOP OF CURB ELEVATION PR. GUTTER ELEVATION TP 600.00 FG 600.00

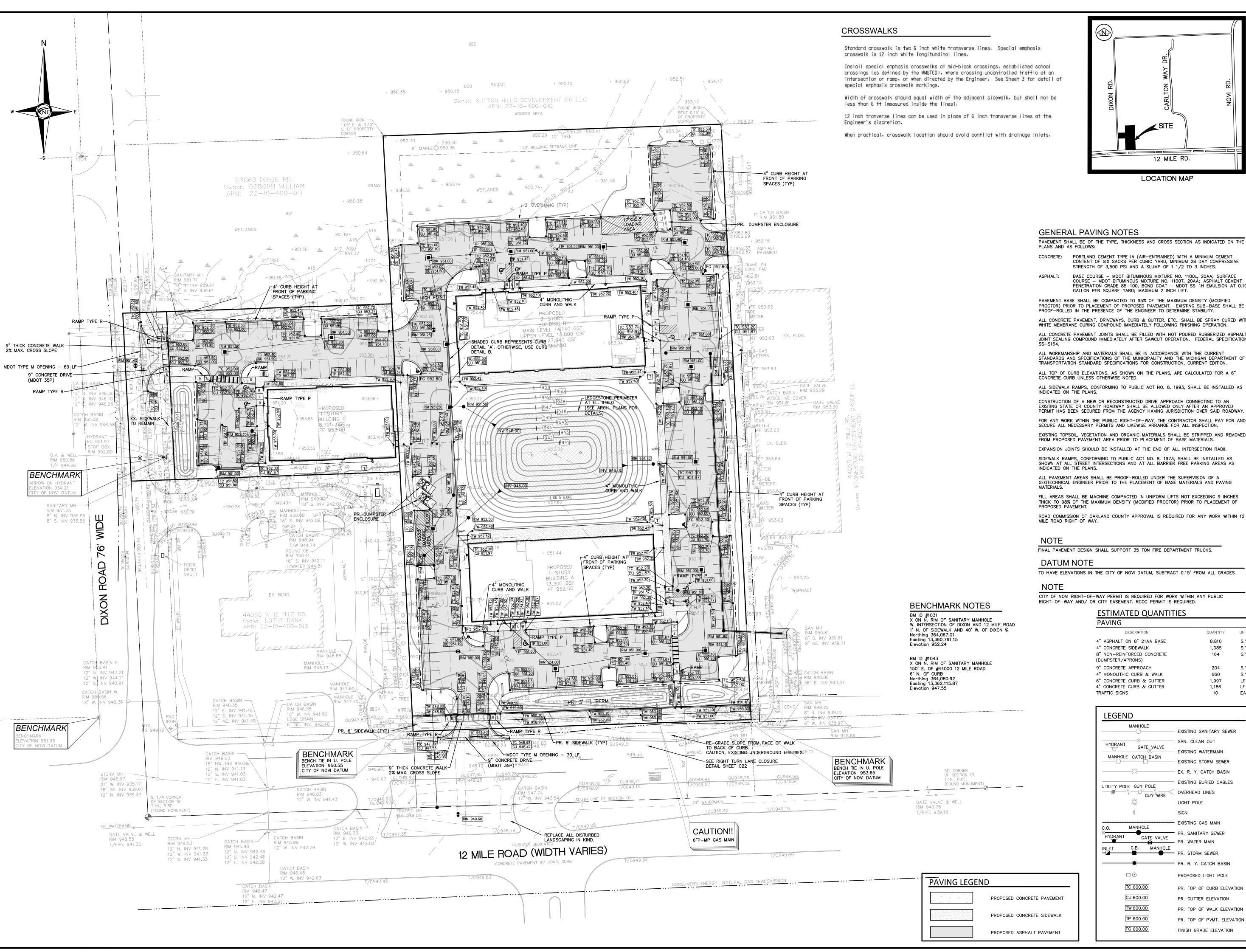
PR. TOP OF WALK ELEVATION PR. TOP OF PVMT. ELEVATION FINISH GRADE ELEVATION

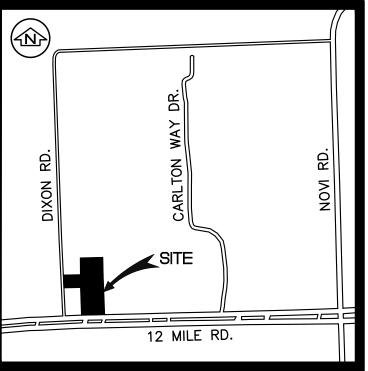
PROPOSED CONCRETE PAVEMENT

PROPOSED ASPHALT PAVEMENT

EXISTING SANITARY SEWER

SAN. CLEAN OUT





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

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.

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.

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

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.

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 LIKEWISE 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.

ALL PAVEMENT AREAS SHALL BE PROOF-ROLLED UNDER THE SUPERVISION OF A GEOTECHNICAL ENGINEER PRIOR TO THE PLACEMENT OF BASE MATERIALS AND PAVING FILL AREAS SHALL BE MACHINE COMPACTED IN UNIFORM LIFTS NOT EXCEEDING 9 INCHES THICK TO 98% OF THE MAXIMUM DENSITY (MODIFIED PROCTOR) PRIOR TO PLACEMENT

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

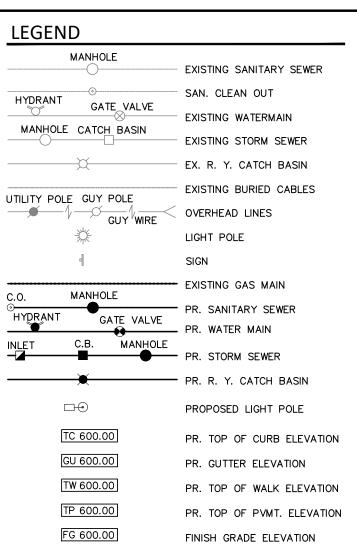
FINAL PAVEMENT DESIGN SHALL SUPPORT 35 TON FIRE DEPARTMENT TRUCKS.

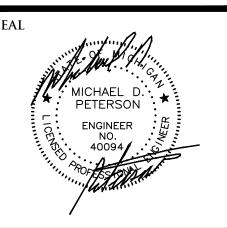
TO HAVE ELEVATIONS IN THE CITY OF NOVI DATUM, SUBTRACT 0.15' FROM ALL GRADES

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

ESTIMATED QUANTITIES

QUANTITY	1U
8,810	S
1,085	S
164	S
204	S
660	S
1,997	L
1,186	L
10	Ε
	10





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

Paving & Grading Plan



REVISIONS

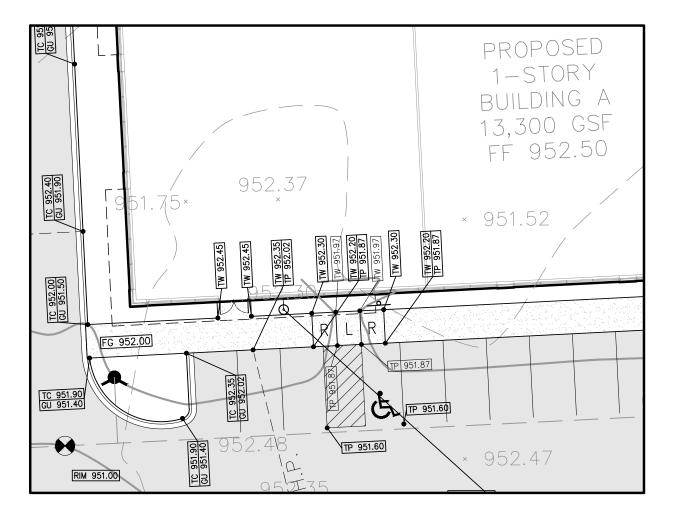
11-13-20 ISSUED FOR SITE PLAN 4-23-21 REV PER PRELIM SP REVIEW 5-10-21 REV PER PRELIM SP REVIEW 7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY: M. Kurmas **DESIGNED BY:** M. Kurmas APPROVED BY: M. Peterson DATE:

03-27-2019 SCALE: 1'' = 40'

40 20 0 NFE JOB NO. SHEET NO.

H046-03



TW 952.10 TW 951.77

× 952.42

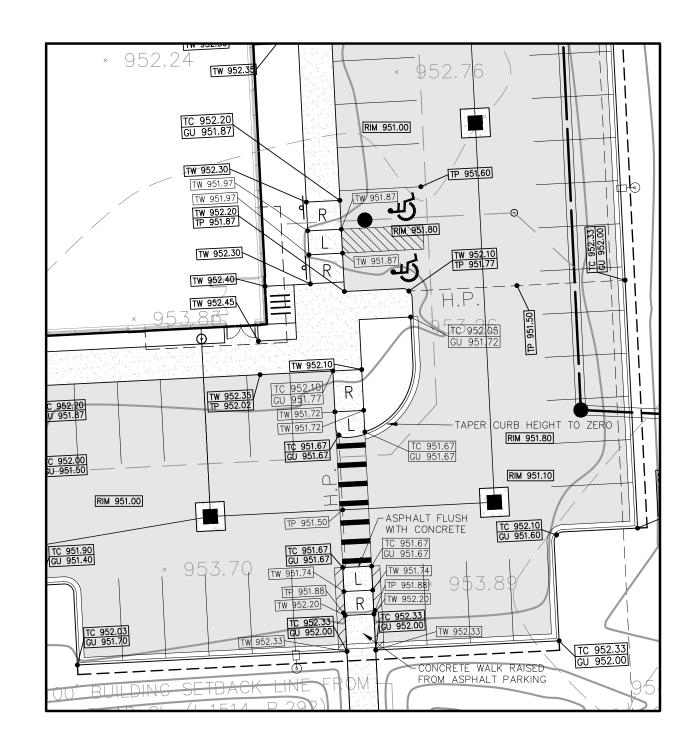
TP 951.50

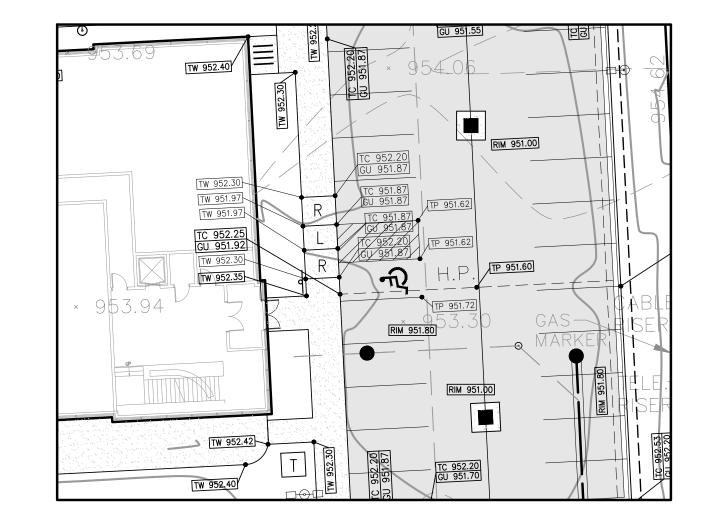
PROPOSED

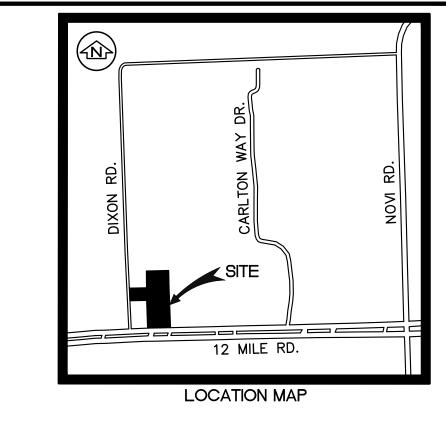
UPPER LEVEL 1\$,800 (

TOTAL 27.940 GSF

TW 952.



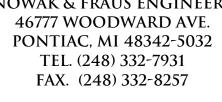


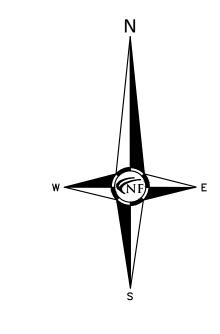


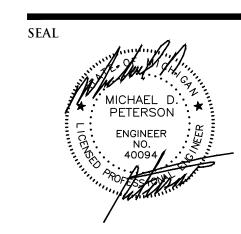


ENGINEERS

CIVIL ENGINEERS







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

PROJECT LOCATION Part of the SE 1/4 Section 10 T. 1N, R. 8E

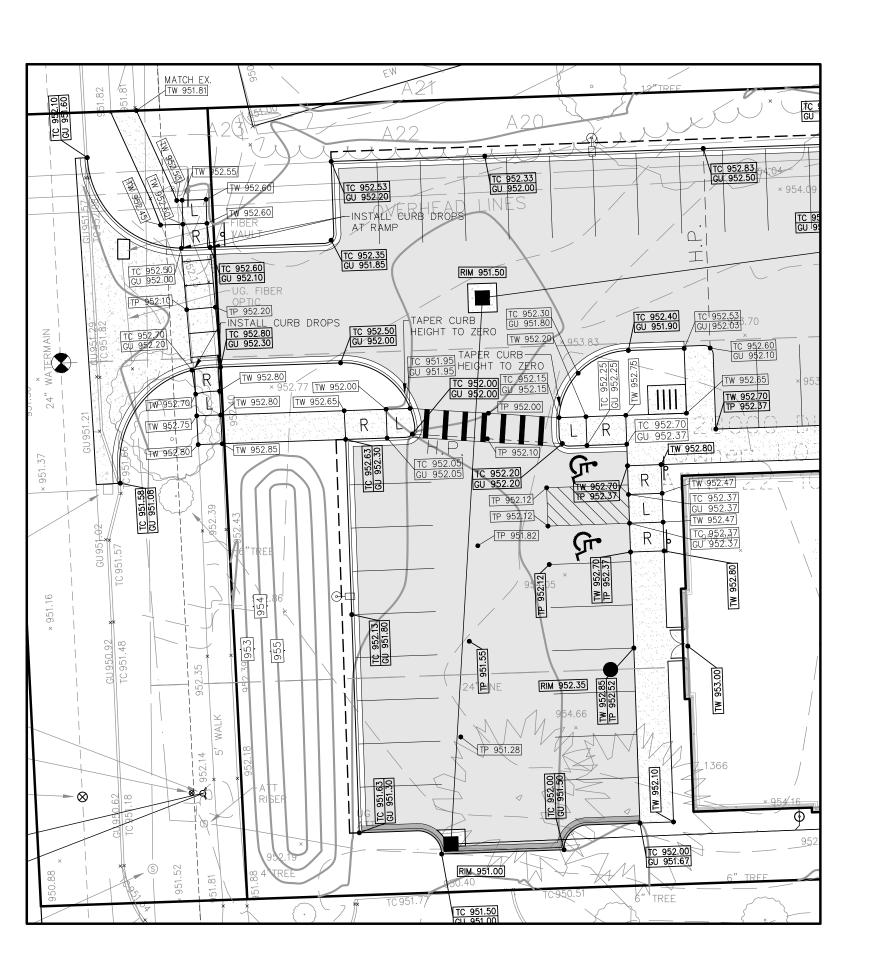
SHEET Detailed Paving &

Phone: (888) 560-5540

City of Novi, Oakland County, Michigan

Grading Plan

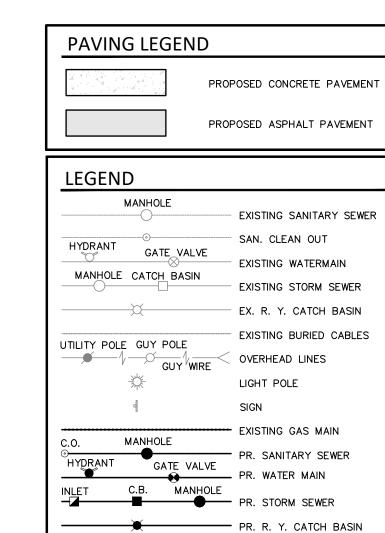




BENCHMARK NOTES

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 13,360,761.15
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



TC 600.00

GU 600.00

TW 600.00

TP 600.00

FG 600.00

PROPOSED LIGHT POLE

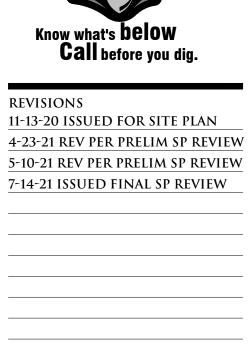
PR. GUTTER ELEVATION

PR. TOP OF CURB ELEVATION

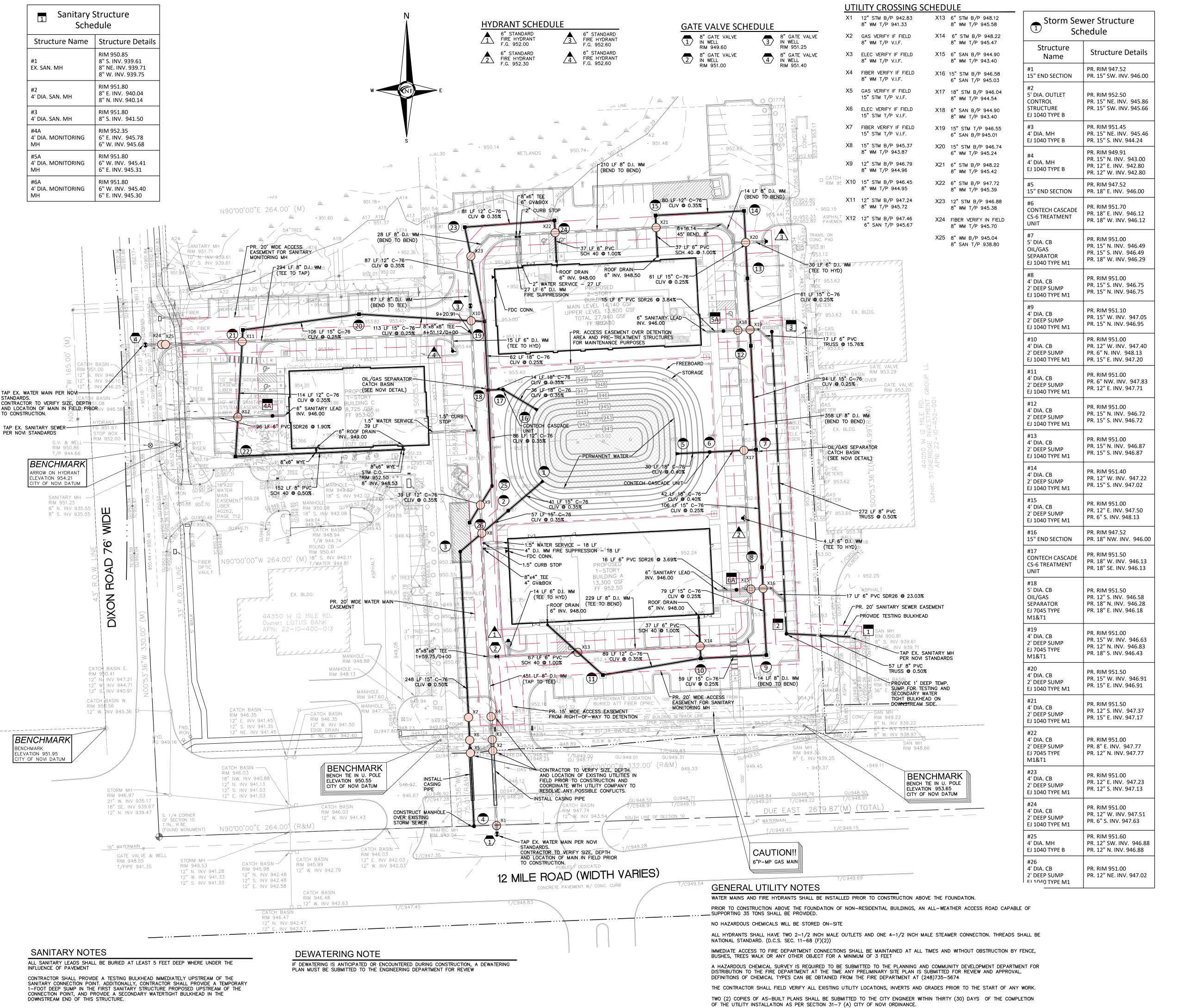
PR. TOP OF WALK ELEVATION

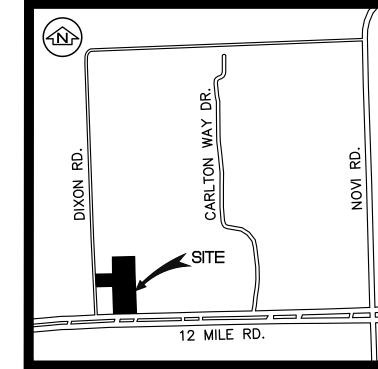
PR. TOP OF PVMT. ELEVATION

FINISH GRADE ELEVATION



SCALE: $1'' = 20'$	10	20	.3
DATE: 03-27-2019			
APPROVED BY: M. Peterson			
M. Kurmas			
DRAWN BY: M. Kurmas			







Date: 6-29	ountain View Professional Center			
Revised:	2021			
	WORMED DAGIC OF BEGGOV			
SANII AF	RY SEWER BASIS OF DESIGN			
Buildings	A & B			
0.40 REU p	er 1,000 sft			
41,240 sft t				
41,240 sft x	0.40 REU per 1,000 sft =		16.50	REU
*Note: 1 RE	U Equals 100 G.P.D.			
	3.5 Persons per REU x Total REU	=	57.736	Persons Total
AVE Q. =	(100 GPD * 3.5 People * Total REU)	=	0.0058	mad
/ (V L Q.	1000000		0.0000	mgu .
Peaking =	18 + (# of Persons/1000) ^ 0.50	=	4.30	
Factor	4 + (# of Persons/1000) ^ 0.50			
PEAK Q =	Ave Flow * Peaking Factor	=	0.0248	mgd
	<u> </u>			
		=	0.0384	cts
	SIZE OF SANITARY SEWER	=	8	inch
	PIPE SLOPE	=	0.50	%
	PIPE CAPACITY	=	0.86	cfs.
Building (
0.40 REU p	er 1,000 sft			
8,725 sft to				
8,725 sft x (0.40 REU per 1,000 sft =		3.49	REU
*Note: 1 RE	U Equals 100 G.P.D.			
	3.5 Persons per REU x Total REU	=	12.215	Persons Total
AVE Q. =	(100 GPD * 3.5 People * Total REU)	=	0.0012	mgd
-	1000000			
Peaking =	18 + (# of Persons/1000) ^ 0.50	=	4.41	
Factor	4 + (# of Persons/1000) ^ 0.50			
PEAK Q =	Ave Flow * Peaking Factor	=	0.0054	mgd
	3			
		=	0.0083	CTS
	SIZE OF SANITARY SEWER	=		inch
	PIPE SLOPE	=	1.00	%
	PIPE CAPACITY	Ħ	0.56	cfs.
WRC REU Ta	ble Assumptions:			

PEAK Q =	Ave Flow * Peaking Factor	=	0.0054	mgd
		=	0.0083	cfs
	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 sft			
FC	TIMATED QUANT	ITIF	c	
	ORM SEWER	<u> </u>	<u> </u>	
	DESCRIPTION			QUANTITY
12"	C-76, CLASS IV, SEWER PIP	E		576
	C-76, CLASS IV, SEWER PIP			1,025
	C-76, CLASS IV, SEWER PIP			184
	IA CATCH BASIN W/ OIL/GAS		ARATOR	2
	IA. CATCH BASIN W/ 2' SUM	Р		15
	IA. MANHOLE			3
	IA. OUTLET JACK & BORE			1 48
	C-76, CLASS IV, END SECTION	N		3
CON	TECH CASCADE UNIT			2
SAI	NITARY SEWER			
	DESCRIPTION			QUANTITY
8" P	VC TRUSS, SDR 26 SEWER N	IAIN		329
6" P	VC, SDR 26, BUILDING LEAD			223
4' DI	A. MANHOLE			2
	ONITORING MANHOLE			3
SEWE	R TAP/CONNECTION			1
WA	ATER MAIN			
	DESCRIPTION			QUANTITY
8"	D.I., CLASS 54, WATER MAIN			1,665
	D.I., CLASS 54, WATER MAIN			90
	D.I., CLASS 54, WATER MAIN			18
	'K' COPPER BUILDING SERVIC			27
	" 'K' COPPER BUILDING SERV	ICE		57
	HYDRANT ASSEMBLY 'TAPPING SLEEVE G.V. & WE	-1 1		4
	TAPPING SLEEVE G.V. & WE TER MAIN CONNECTION	.LL		2 2
	' JACK & BORE			62
	GATE VALVE & WELL			2
	LEGEND			
1 .				

HYDRANT

GATE_VALVE

GUY WIRE

GATE VALVE

SAND BACKFILL

(95 % DENSITY)

PROPOSED LIGHT POLE

MANHOLE CATCH BASIN

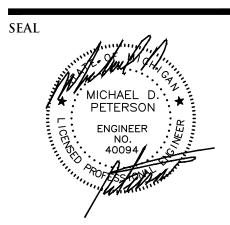
MANHOLE

C.B.

UTILITY POLE GUY POLE



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



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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 Γ. 1N, R. 8E City of Novi, Oakland County, Michigan

Utility Plan



REVISIONS 11-13-20 ISSUED FOR SITE PLAN 4-23-21 REV PER PRELIM SP REVIEW

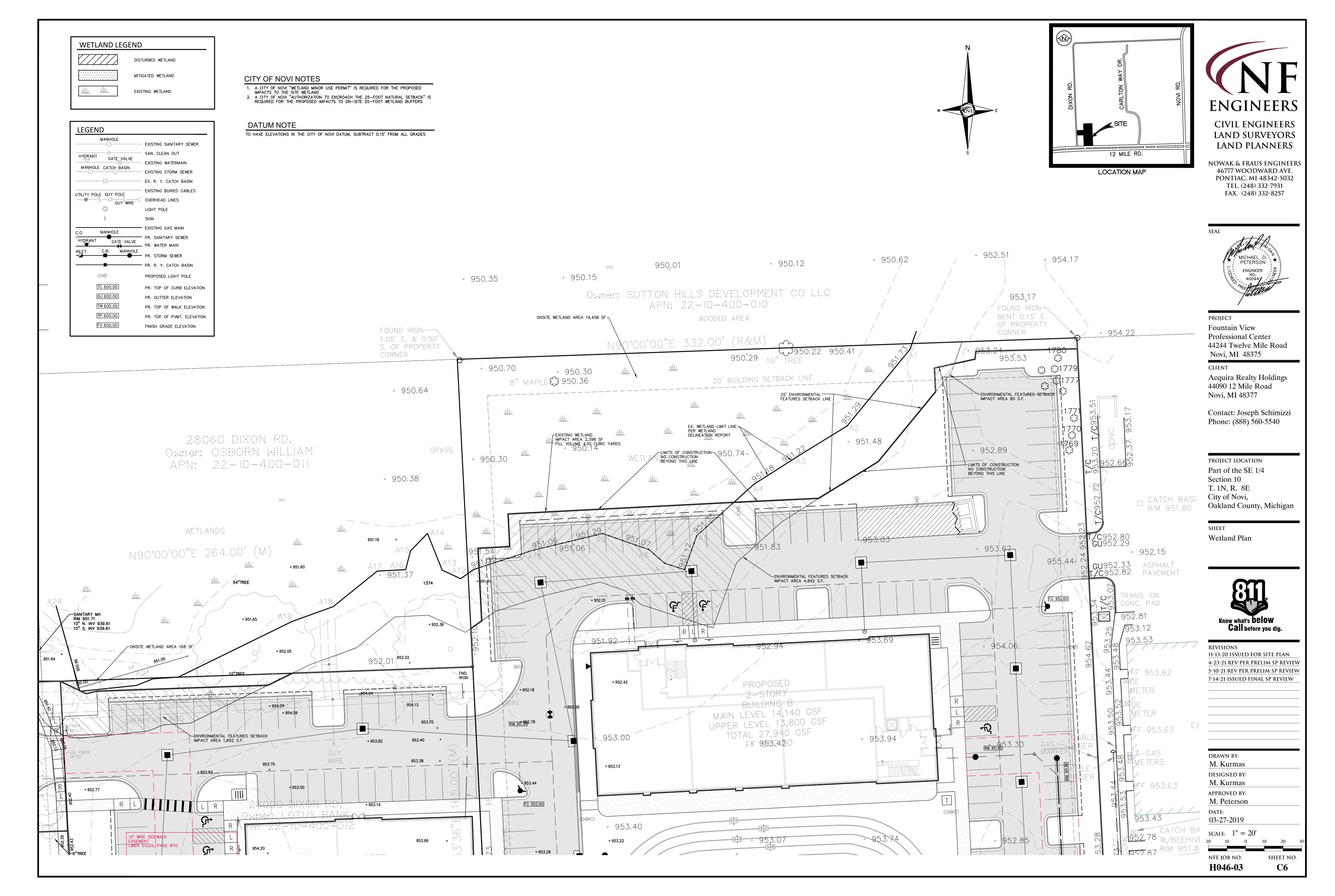
5-10-21 REV PER PRELIM SP REVIEW

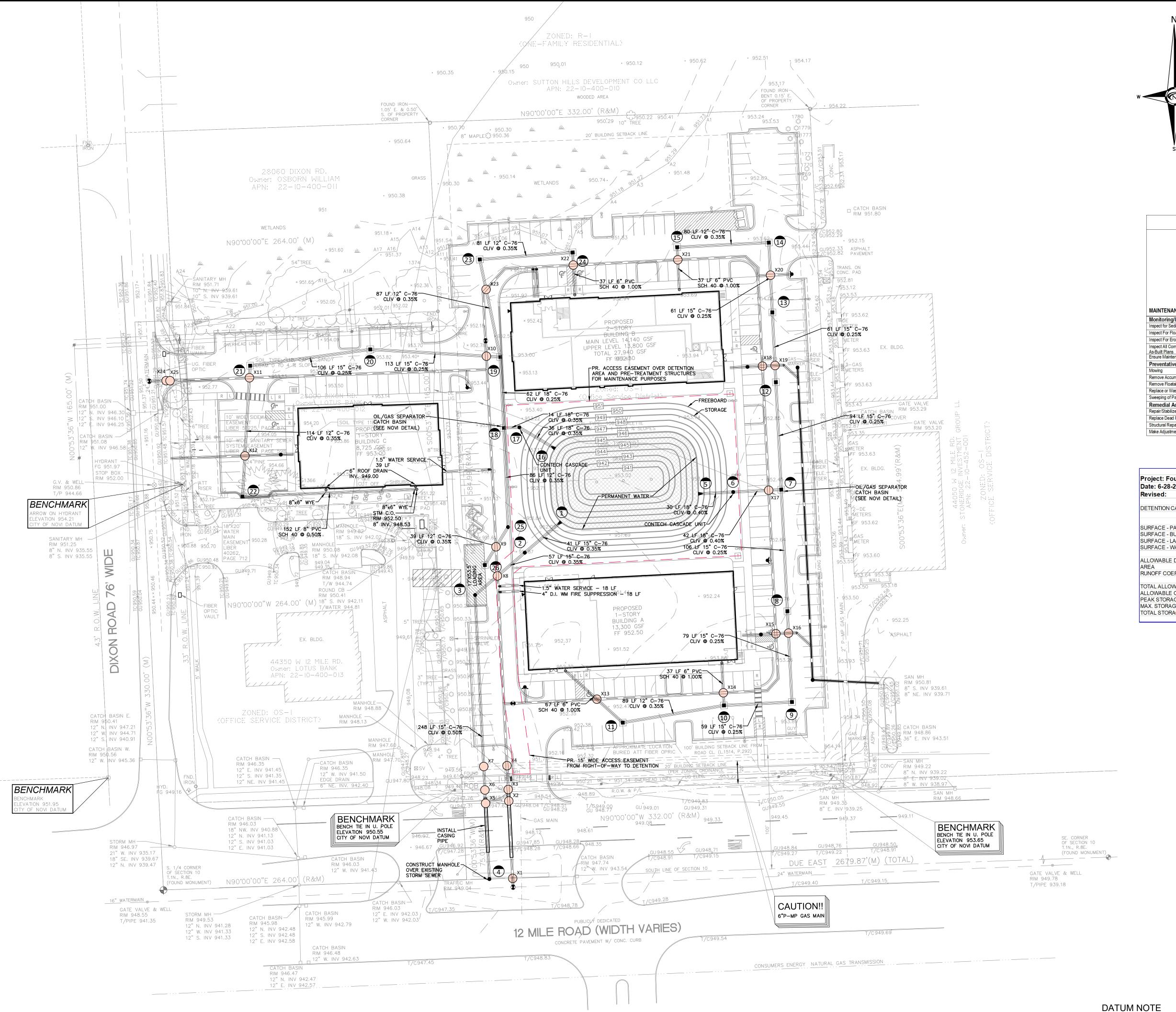
7-14-21 ISSUED FINAL SP REVIEW

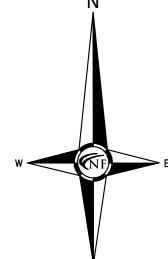
EXISTING SANITARY SEWER SAN. CLEAN OUT EXISTING WATER MAIN EXISTING STORM SEWER DRAWN BY: EX. R. Y. CATCH BASIN M. Kurmas EXISTING BURIED CABLES **DESIGNED BY:** OVERHEAD LINES M. Kurmas LIGHT POLE APPROVED BY: M. Peterson EXISTING GAS MAIN 03-27-2019 SCALE: 1'' = 40'PR. STORM SEWER 20 PR. R. Y. CATCH BASIN

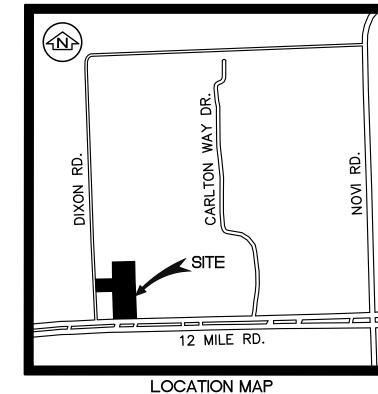
NFE JOB NO.

H046-03









STORM WATER MANAGEMENT	S	TABI STEM		•	ERM	MAIN'	TENA	NCE	SCHEDULE
MAINTENANCE ACTIVITIES	SYSTEM COMPONENTS	Storm Collection System (Sewers, Swales, Catch Basins, Manholes)	Manufactured Treatment System/Forebay	Inlets to Forebay & Detention Basin	Detention Basin	Outlet Control Structures & Outlet Pipe	Buffer Strip, Ripraps	Pavement Areas	FREQUENCY
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		Annually & After Major Events
Inspect All Components During Wet weather & Compare to As-Built Plans		X	X	X	X	Х	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		Χ	X	X	X	X	X		As Needed
Replace or Wash & Reuse Risers 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		Χ					X		As Needed
Replace Dead Plantings, brushes & trees. Reseed Bare Area	IS	X							As needed
Structural Repairs	T	X	Χ	Χ	Χ	X	X		As Needed
Make Adjustments/Repairs to Ensure Proper Functioning		X	Χ	Χ	X	X	X		As Needed

Project: Fountain View			
Date: 6-28-2021			
Revised:			
DETENTION CALCULATION 100 YEAR S	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	$Q0 = QA/(A \times C) =$	0.201	CFS/ACRE
PEAK STORAGE TIME	T=-25+(SQR(10312.5/Q0)) =	201.75	MINUTES
MAX. STORAGE VOLUME/ACRE	$VS = (16500 \times T / (T + 25)) - (40 \times Q0 \times T) =$	13062.25	CU.FT./ACR
TOTAL STORAGE REQUIRED	VT = VS x A x C =	51727.17	CU.FT.

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

PETERSON

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 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'

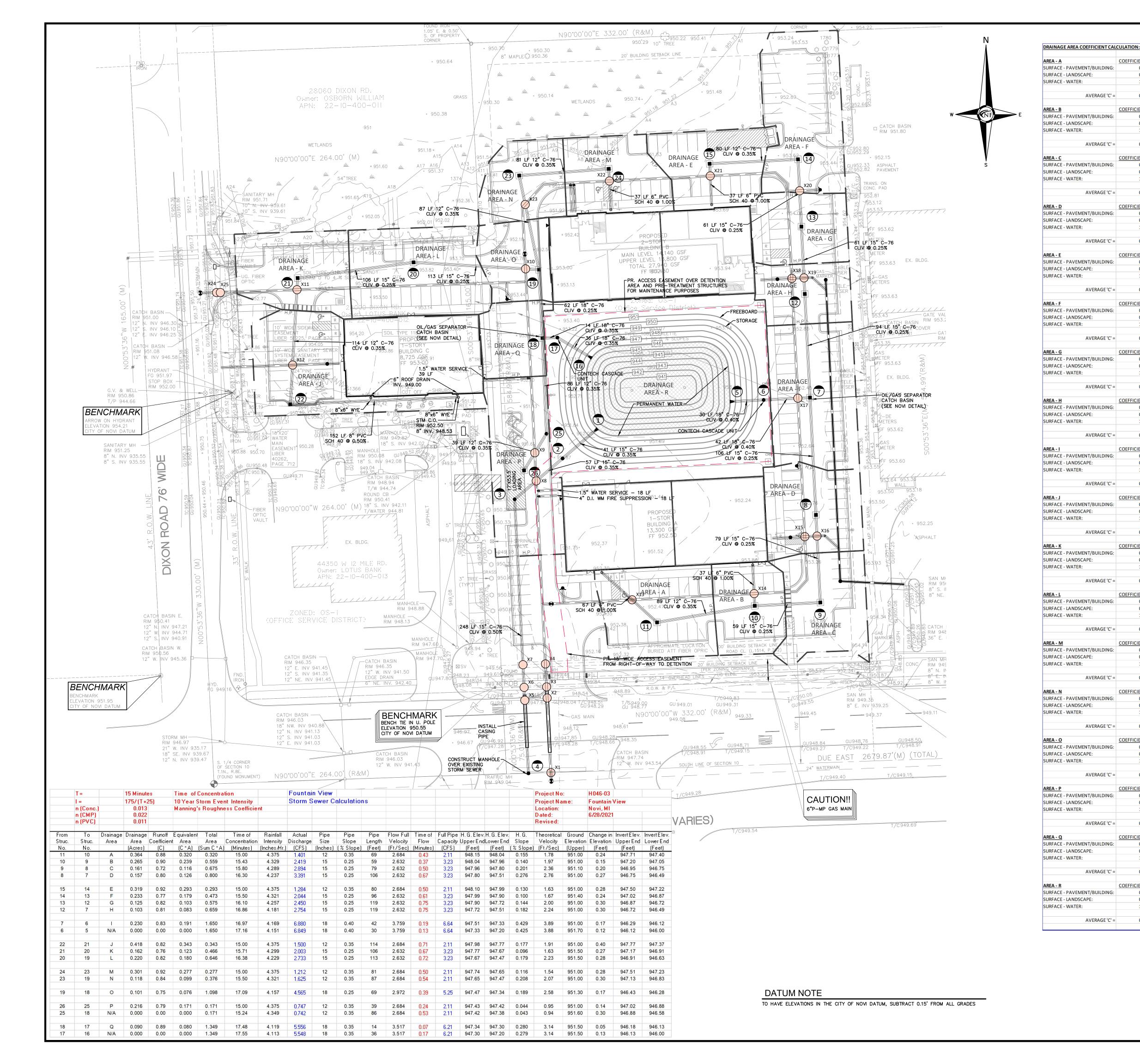
NFE JOB NO. SHEET NO. H046-03

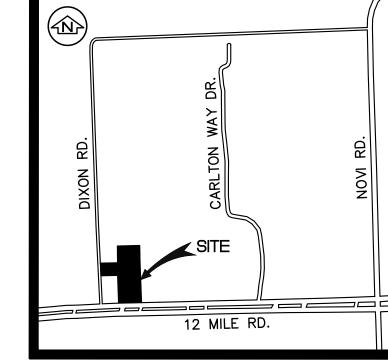
SOIL DATA THIS SITE CONSISTS OF:

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.

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





AREA (AC)

AREA (AC):

AREA (AC):

AREA (AC)

AREA (AC):

AREA (AC)

AREA (AC)

AREA (AC):

AREA (AC)

AREA (AC)

AREA (AC):

AREA (AC)

AREA (AC):

AREA (AC)

AREA (AC):

AREA (AC):

AREA (AC):

0.081

0.009

0.157

0.059

0.068

0.022

0.286

0.171

0.045

0.079

0.098

0.027

0.118

0.061

0.024

AREA (SFT)

12440

664

4191

970

2968

1432

AREA (SFT)

AREA (SFT)

AREA (SFT)

3883

15242

13889

3513

402

6823

2575

7454

2130

2247

14194

8057

1959

3446

1047

7086

3043

4289

1172

13196

5160

1679

10515

1031

4364

2643

0.88 TOTAL AREA (AC)=

0.90 TOTAL AREA (AC)=

0.72 TOTAL AREA (AC)=

0.80 TOTAL AREA (AC)=

0.92 TOTAL AREA (AC)=

0.77 TOTAL AREA (AC)=

0.82 TOTAL AREA (AC)=

0.81 TOTAL AREA (AC)=

0.83 TOTAL AREA (AC)=

0.82 TOTAL AREA (AC)=

0.76 TOTAL AREA (AC)=

0.82 TOTAL AREA (AC)=

0.92 TOTAL AREA (AC)=

0.84 TOTAL AREA (AC)=

0.75 TOTAL AREA (AC)=

0.79 TOTAL AREA (AC)=

0.89 TOTAL AREA (AC)=

0.69 TOTAL AREA (AC)=

14145 1727

COEFFICIENT:

COEFFICIENT:

0.95

0.35

0.95

0.35

0.95

1.00

0.95

0.35

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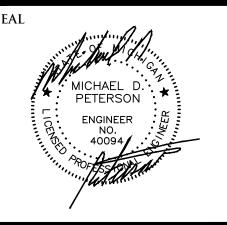
COEFFICIENT:

COEFFICIENT:





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



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

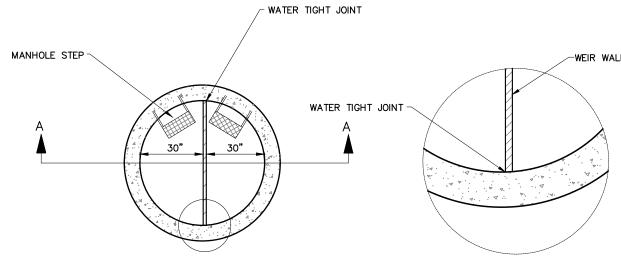
SHEET Storm Water Drainage Area Plan

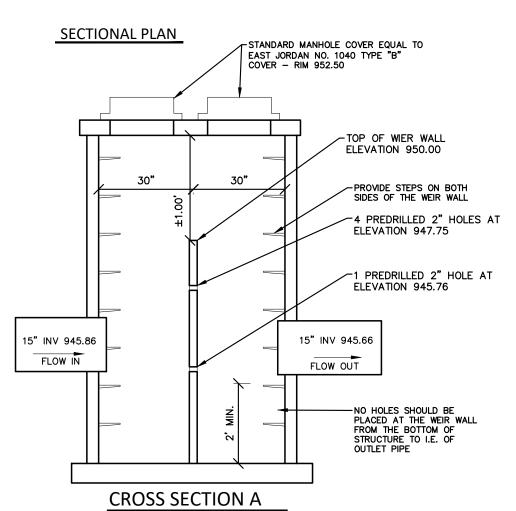


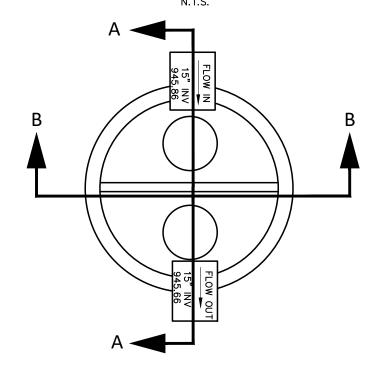
REVISIONS 11-13-20 ISSUED FOR SITE PLAN 4-23-21 REV PER PRELIM SP REVIEW 5-10-21 REV PER PRELIM SP REVIEW 7-14-21 ISSUED FINAL SP REVIEW

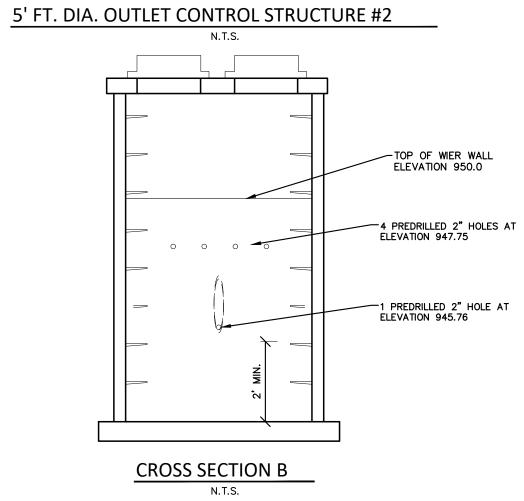
MANHOLE	
MANHULE	EXISTING SANITARY SEWER
HYDRANT 0.75 MANY	SAN. CLEAN OUT
MANHOLE CATCH BASIN	EXISTING WATER MAIN
MANHOLE CATCH BASIN	EXISTING STORM SEWER
$\phantom{aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa$	EX. R. Y. CATCH BASIN
UTILITY POLE GUY POLE	EXISTING BURIED CABLES
GUY WIRE	OVERHEAD LINES
禁	LIGHT POLE
d	SIGN
C.O. MANHOLE	EXISTING GAS MAIN
OHYDRANT GATE VALVE	PR. SANITARY SEWER
OATE VALVE	PR. WATER MAIN
INLET C.B. MANHOLE	PR. STORM SEWER
	PR. R. Y. CATCH BASIN
	SAND BACKFILL (95 % DENSITY)
	(00 /0 DENOTT)
\	PROPOSED LIGHT POLE

DRAWN BY:			
M. Kurmas			
DESIGNED BY:			
M. Kurmas			
APPROVED BY:			
M. Peterson			
DATE:			
03-27-2019			
SCALE: $1'' = 40'$			
40 20 0	20	40	
NFE JOB NO.	SF	HEET N	O
H046-03		C8	









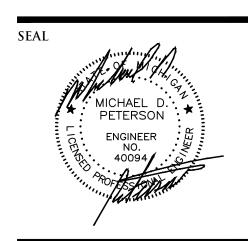
OUTLET CONTROL STRU	ICTURE CALCULATIONS					
O TEL CONTROL STRO	CTORE CALCOLATIONS					
AREA (ACRES)	IMPERVIOUS FACTOR	ACRE IMPERVIOUS				
1.817	0.35	0.636	LAWN			
3.078	0.95	2.924	PVMT, BLDG, SW			
0.400	1.00	0.400	WATER SURFACE			
FACTORED C = Cw =		0.748				
TOTAL DRAINAGE AREA		5.295				
TOTAL DIVAMPAGE ANDA		5.295				
Cw x A =		3.960				
Qout = MAX ALLOW OU	TFLOW (0.15 CFS / ACRE	0.794				
REQUIRED 100 YEAR DE	TENTION VOLUME -	51727	CE			
REQUIRED 100 TEAR DE	TENTION VOLUME =	31727	Ci			
BANKFULL FLOOD VOLU	JME					
V _{BF} = 5160 * A * C =		20434	CF			
FIRST FLUSH VOLUME						
V _{FF} = 1815 * A * C =		7187	CF			
STORAGE PROVIDED						
STORAGET ROVIDED						
ELEV.	AREA (SFT)	DEPTH (FT)	VOLUME (FT ³)	TOTAL VOLUME (FT ³)		
951.0	21163	1	19873	75903	FREE BOARD ELEV	
950.0	18582	1	17370	56030	TOP OF STORAGE	
949.0	16157	1	15024	38661	Committee of the Commit	
948.0	13890	1	12835	23637		
947.0	11779	1	10803	10803		
946.0	9826	0	0	0	EFFECTIVE BOTTOM OF	POND
DOTTOM OF BASIN -		046.00				
BOTTOM OF BASIN =	V _	946.00				
FIRST FLUSH =	X _{FF} =	946.61				
BANKFULL =	X _{BF} =	947.75				
100 YEAR =	X ₁₀₀ =	949.75				
OUTLET CONTROL STRU	ICTUDE					
OUTLET CONTROL STRU	CIORE					
FIRST FLUSH OF RUNOF	F					
THE AVERAGE ALLOWA	BLE RELEASE RATE FOR R	UNOFF IS 0.5" OVER AR	EA OF SITE IN 24 HOURS.			
$Q_{FF} = V_{FF} \times (1/24 \text{ HRS}) \times$	(1 HR/3600 SEC) =	0.083	CFS			
INSTALL ORIFICE IN OU	TLET WEIR WALL AT ELEV	. = X _{ORIFICE FF} =	945.76			
LIEAD II V ODIEI	CE ELEVATION	0.05	FT			
$HEAD = H_{FF} = X_{FF} - ORIFI$	CE ELEVATION =	0.85	FI			
A _{ORIFICE FF} = Q _{FF} / (0.62 *	/2 * 22 2 * ⊔ \ ^{0.5} _	0.0181	CET			
AORIFICE FF - QFF / (U.UZ	(2 32.2 FIFF) -	0.0181	JF I			
REQUIRED DIAMETER O	F ORIFICE =	1.82	INCHES			
THEREFORE, USE A SING	GLE TWO (2) INCH DIAME	TER HOLE IN WEIR WAL	L AT ELEVATION 945.76			
0 1447 64 */2 * 22 2	*/v v \\0.5	0.217	CEC	MAX FLOW THRU FIRST	THISH OBJEICE AT 100	
$Q_{FF}MAX = CA * (2 * 32.2)$	* (X ₁₀₀ - X _{ORIFICE FF})) =	0.217	CFS	YEAR STORM STORAGE		
BANK FULL FLOOD				TENNISTON VIGE		
	ELEASE RATE OF 24-40 HO	DURS, CHECK THE DISCH	ARGE THROUGH THE			
	DETERMINE IF ADDITIO					
$HEAD = H_{BF} = X_{BF} - X_{ORIFIC}$	Œ FF =	1.99	FT			
	FLUSH ORIFICE * (2 * 32.	,	0.153	CFS		
$T_{BF} = (1 SEC / Q_{90.0}) * V_{BF}$	* (1 HOUR / 3600 SEC) =		37.1	HOURS		
HOLDING TIME EQUALS	APPROX. 37 HOURS, NO	ADDITIONAL ORIFICES	IN THE WEIR WALL ARE I	REQUIRED.		
100 VEAR ELOOP						
100 YEAR FLOOD						
Qa = ALLOWABLE OUTF	LOW =	0.794	CFS			
Qu //LLOW/IDLL COIII		0.73				
HAVING PREVIOUSLY CA	ALCULATED THE MAXIMU	JM FLOW THRU FIRST FL	USH ORIFICE AT 100 YEA	R STORM STORAGE ELEV	ATION, SUBTRACT	
Q _{FF} MAX FROM Qa AND	CALCULATE THE ORIFICE	SIZE NEEDED FOR RELEA	ASE OF THE 100 YEAR STO	ORM VOLUME:		
$Qa - (Q_{FF}MAX) = Q_{REMAIN}$	ING =	0.577	CFS			
		05				
$A_{ORIFICE 100} = Q_{REMAINING} /$	(0.62 * (2 * 32.2 * (X ₁₀₀ -	X _{BF})) ^{0.3}) =	0.082	SFT		
A DE A OF A TIMO (2) INC	NI DIAMETER LIQUE A		0.022	CET		
AKEA OF A TWO (2) INC	TH DIAMETER HOLE = $A_{2.0}$	INCH HOLE =	0.022)TI		
REO'D NI IMRER OF TAK	D (2) INCH DIAMETER HO	LES = Approx and / A	u noie =	2 76	EACH	
LEQ D NOIVIDEN OF TWO	(2) INCIT DIAIVIETER HU	— ORIFICE 100 / M2.0 INC	H HULE -	5.76	LACIT	
THEREFORE INSTALL 4 F	ACH OF TWO (2) INCH D	IA. HOLFS AT FLEVATION	N X _{pc} =	947.75		
ONL INSTALL 4 E	, .C. TOT TWO (2) INCH D	HOLLS AT LLEVATION	VRF —	547.75		
SUMMARY OF R	EQUIRED ORIFICES IN OU	JTLET CONTROL STRUCT	URE WEIR WALL:			
ELEVATION	# OF HOLES		R OF HOLES			
947.75	4	2	INCHES			
945.76	1	2	INCHES			
· · · · · · · · · · · · · · · · · · ·						

Project: Fountain View			
Date: 6-28-2021			
Revised:			
DETENTION CALCULATION 100 YEAR S	TORM PER OAKLAND COUNTY STANDARDS		
	COEFFICIENT:	AREA (AC):	
SURFACE - PAVEMENT:	0.95	2.239	
SURFACE - BUILDING:	0.95	0.839	
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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	$Q0 = QA/(A \times C) =$	0.201	CFS/ACRE
PEAK STORAGE TIME	T=-25+(SQR(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./ACR
TOTAL STORAGE REQUIRED	VT = VS x A x C =	51727.17	CU.FT.





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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

Storm Calculations and Details Plan



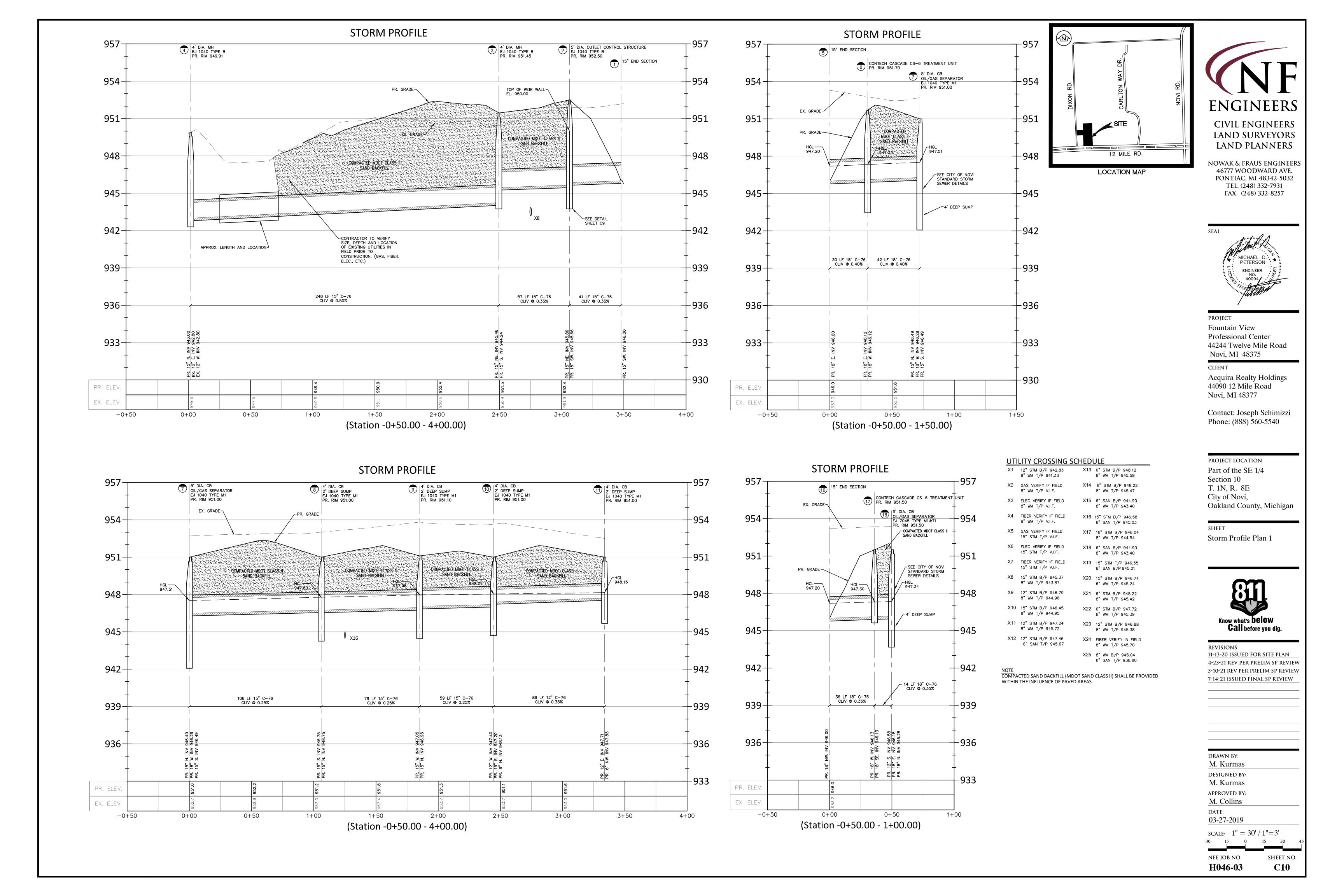
REVISIONS
11-13-20 ISSUED FOR SITE PLAN
4-23-21 REV PER PRELIM SP REVIEW
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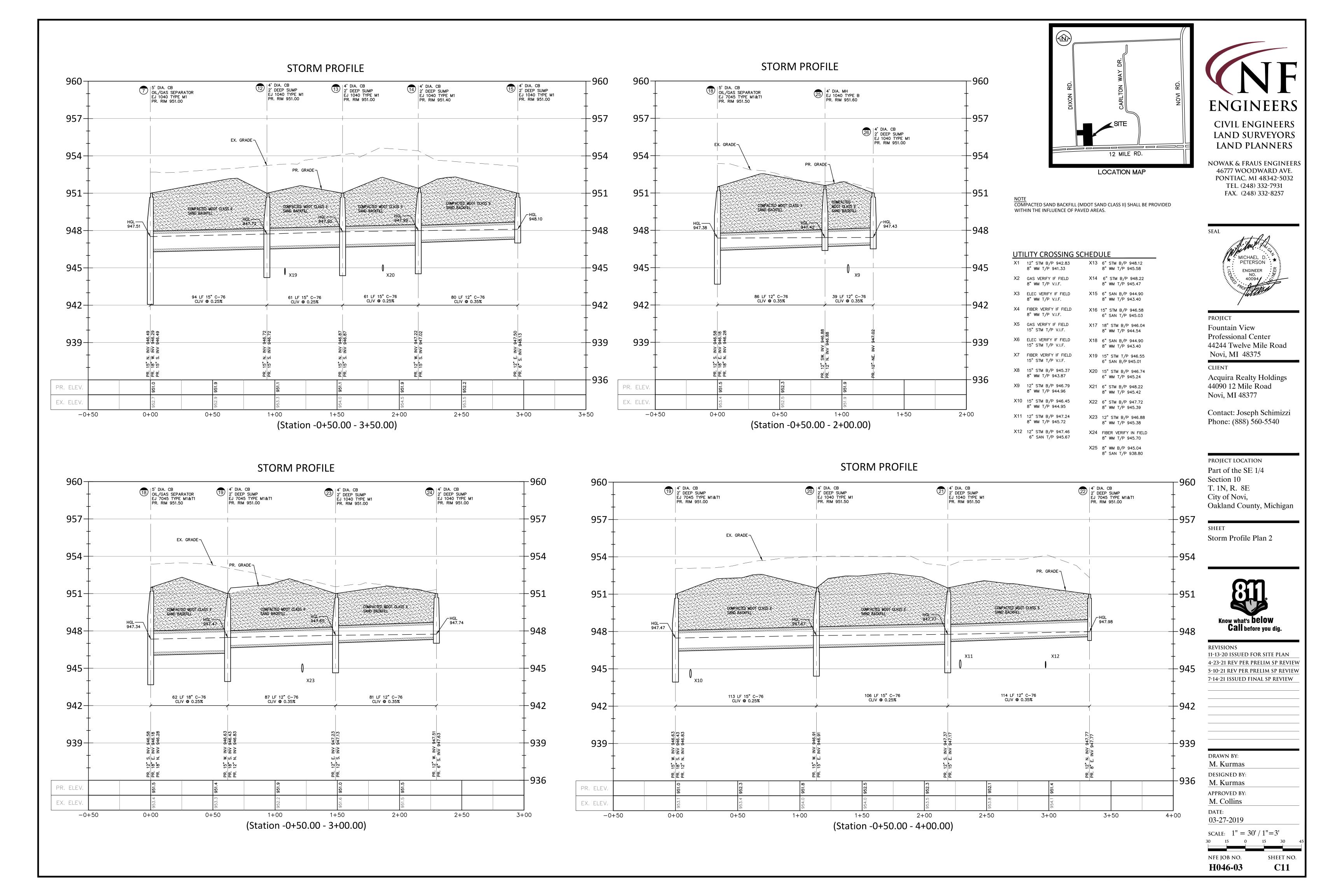
DRAWN BY:
M. Kurmas
DESIGNED BY:
M. Kurmas
APPROVED BY:
M. Peterson
DATE:

03-27-2019

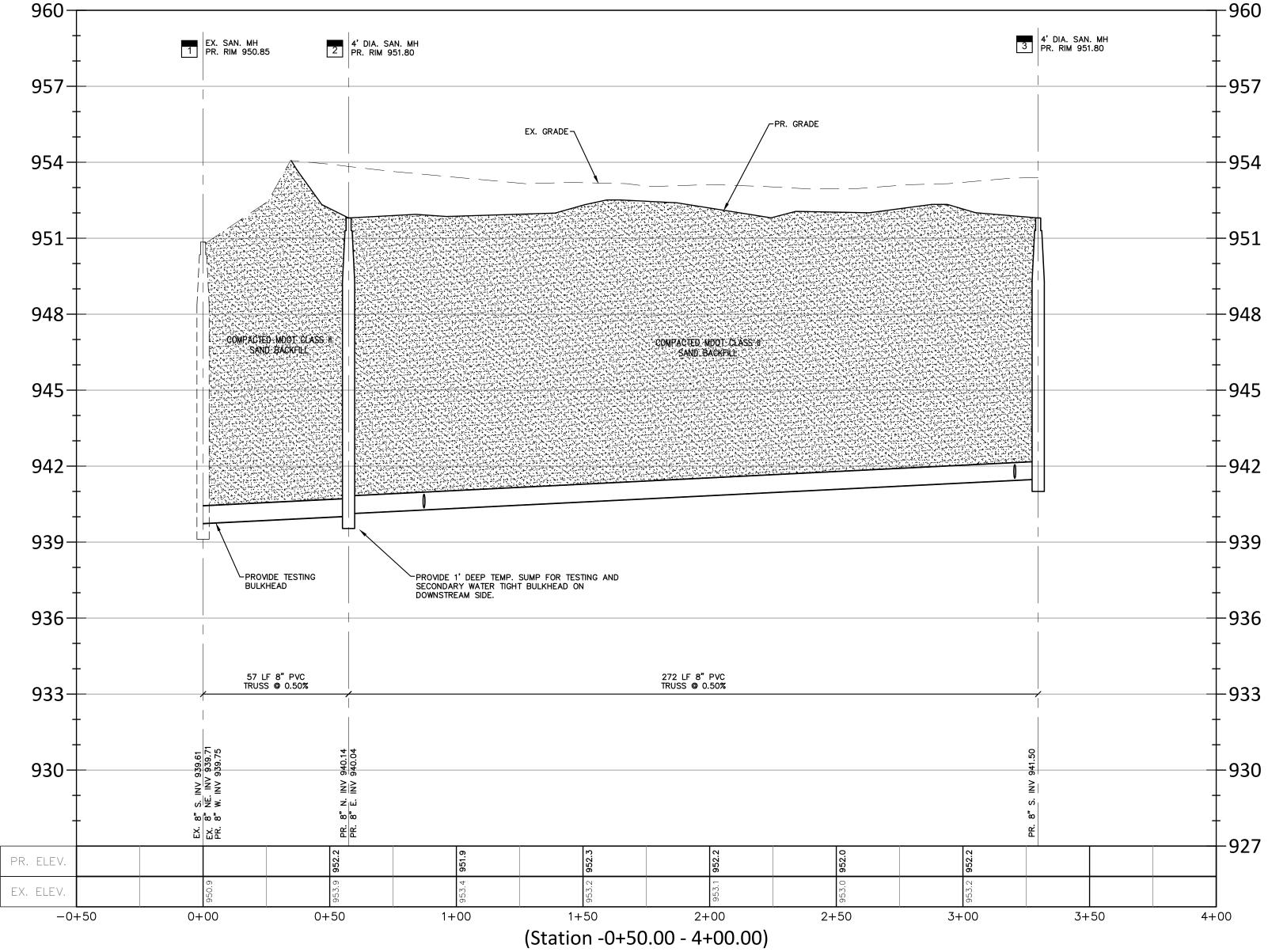
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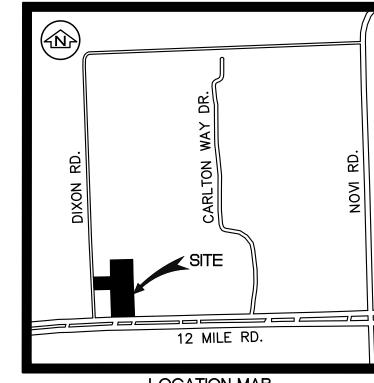
NFE JOB NO. SHEET NO. **C9**





SANITARY PROFILE





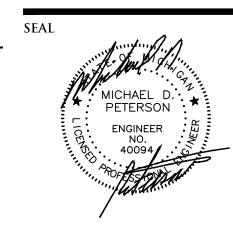




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UTILITY CROSSING SCHEDULE X1 12" STM B/P 942.83 X13 6" STM B/P 948.12

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



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

Sanitary Profile Plan



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

REVISIONS
11-13-20 ISSUED FO
4-23-21 REV PER PR

OR SITE PLAN RELIM 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

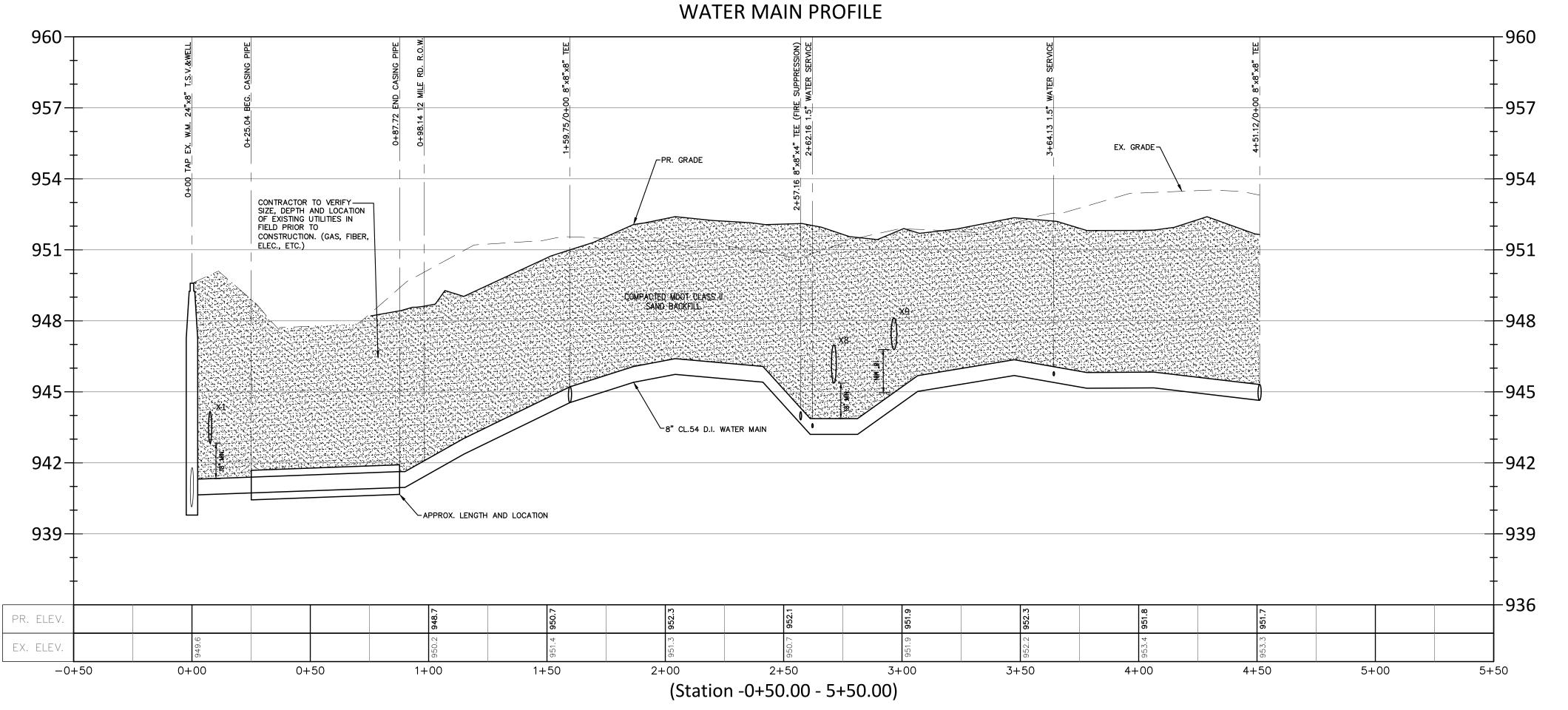
APPROVED BY: M. Peterson

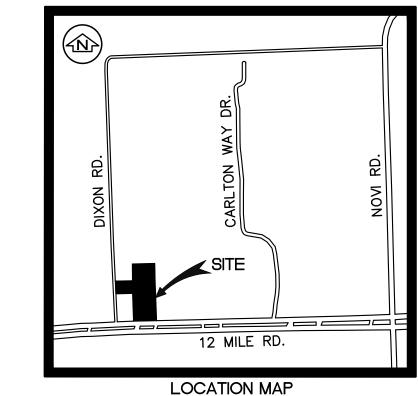
DATE: 03-27-2019

NFE JOB NO. SHEET NO.

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

C12 H046-03

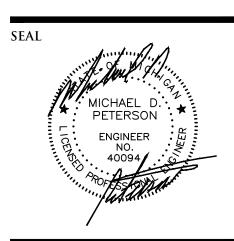








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SHEET

Water Main Profile Plan 1



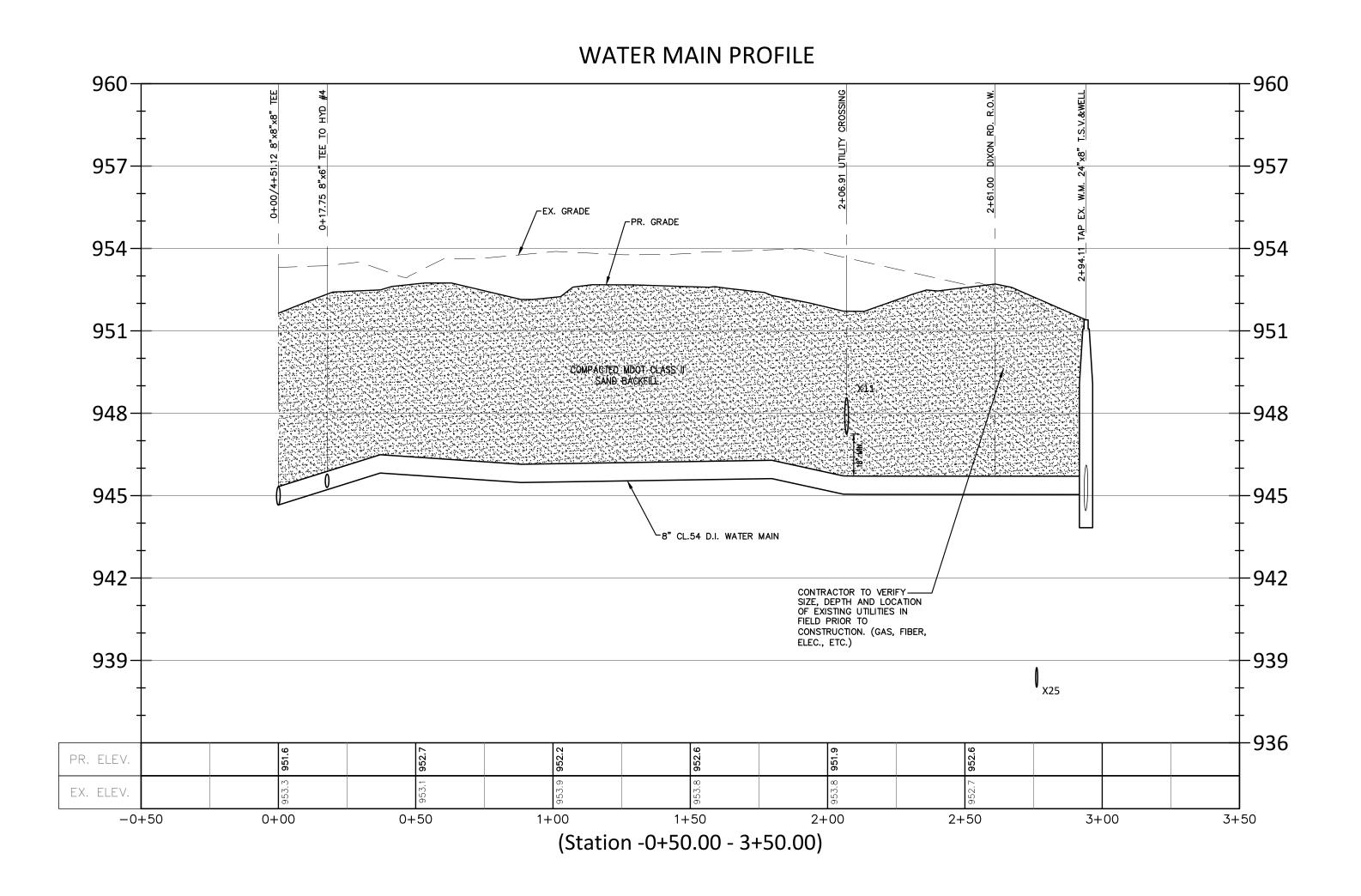
ELIM SP REVI ELIM SP REVI AL SP REVIEW
AL SP REVIEW

DESIGNED BY: M. Kurmas APPROVED BY: M. Peterson

DATE: 03-27-2019

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

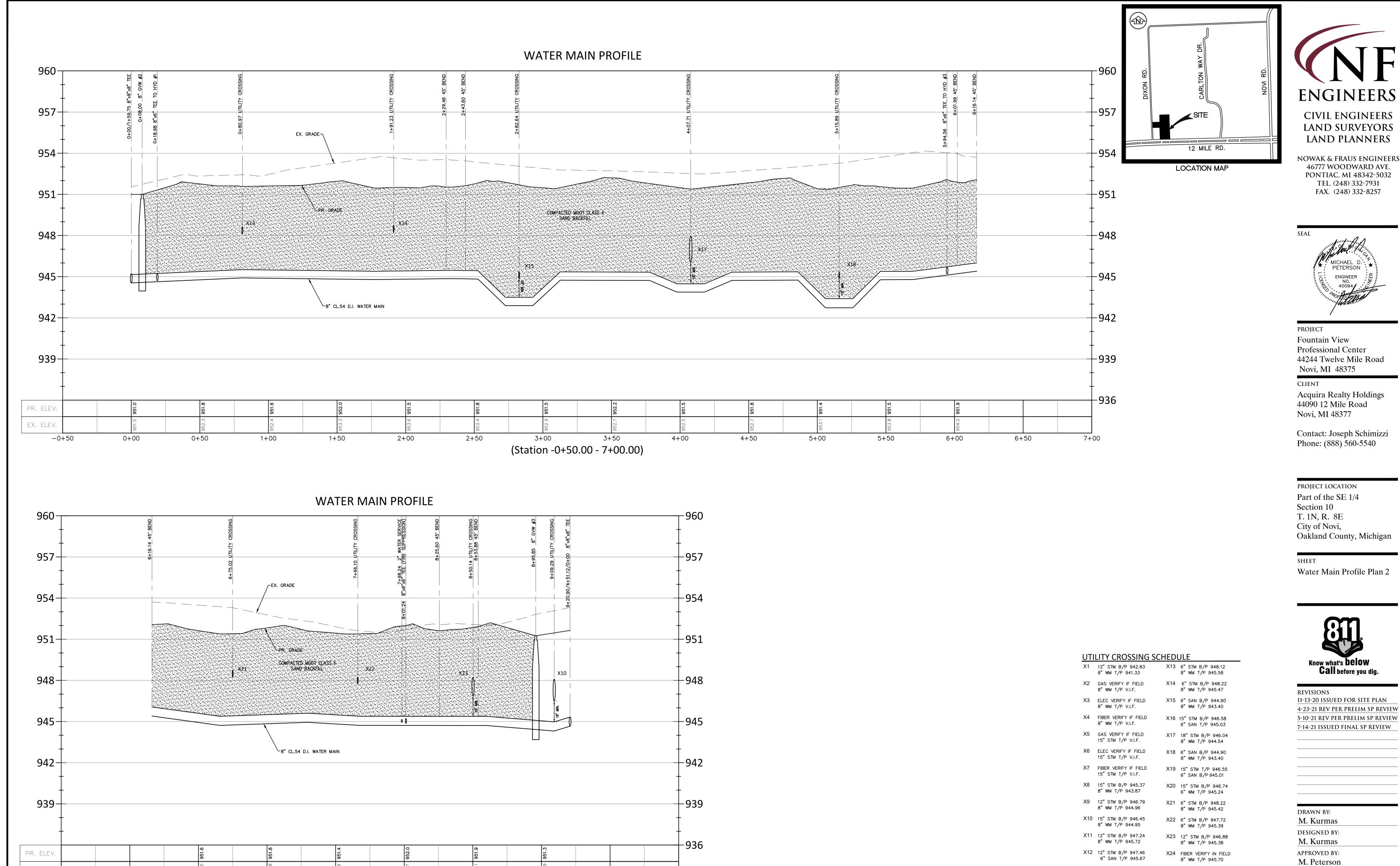
SHEET NO. NFE JOB NO. C13 H046-03



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

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

8" SAN T/P 938.80



EX. ELEV.

5+50

6+00

6+50

7+00

(Station 5+50.00 - 10+00.00)

8+50

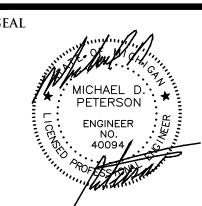
9+00

9+50

10+00

ENGINEERS CIVIL ENGINEERS LAND SURVEYORS

46777 WOODWARD AVE. PONTIAC, MI 48342-5032



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

DATE: 03-27-2019

X25 8" WM B/P 945.04

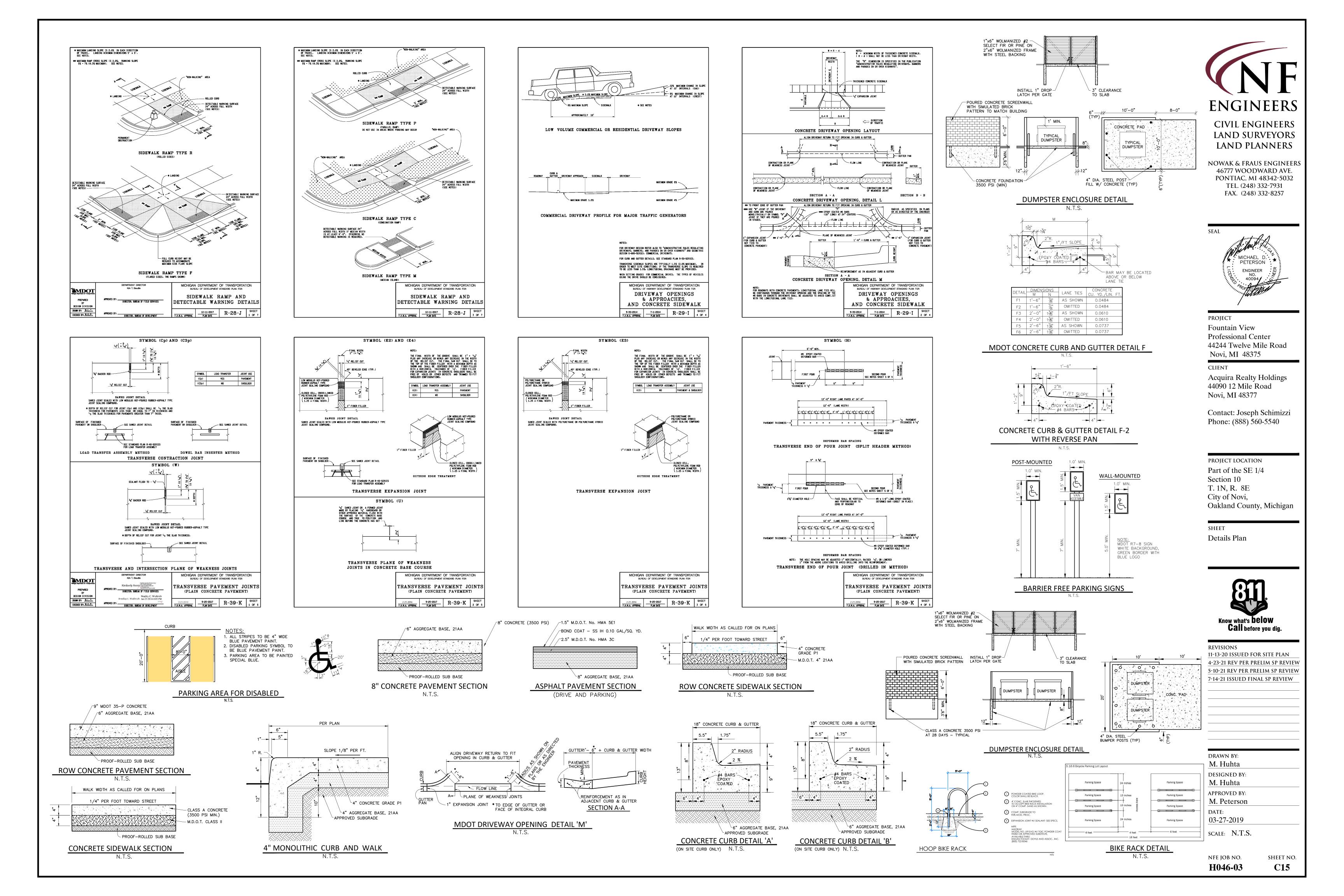
NOTE COMPACTED SAND BACKFILL (MDOT SAND CLASS II) SHALL BE PROVIDED

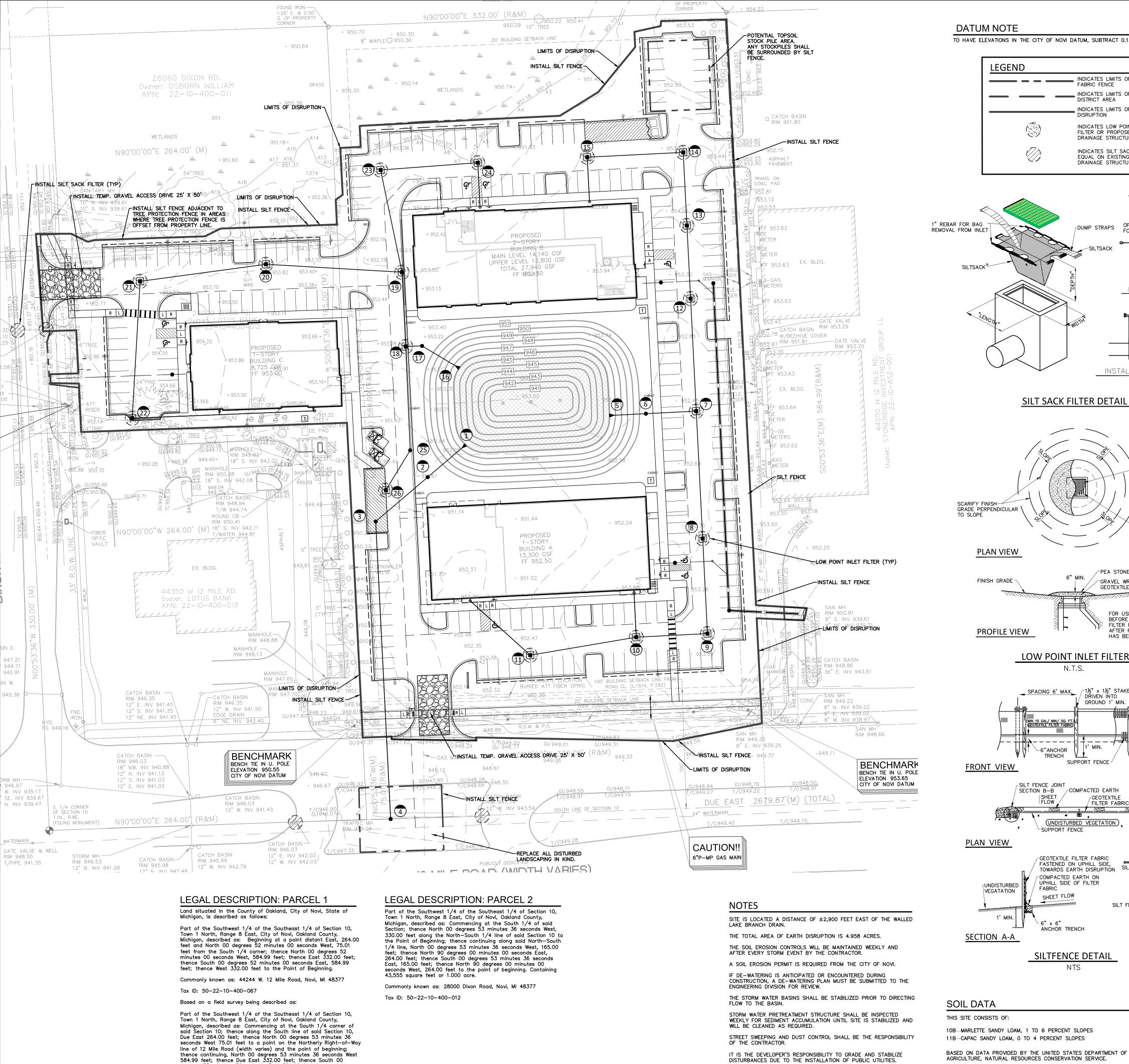
WITHIN THE INFLUENCE OF PAVED AREAS.

8" SAN T/P 938.80

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

SHEET NO. NFE JOB NO. **C14** H046-03



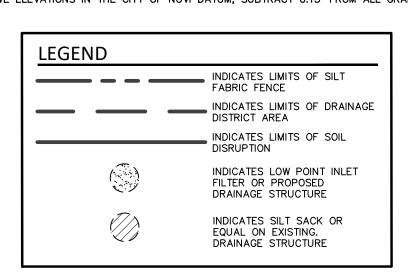


degrees 53 minutes 36 seconds East 584.99 feet to a point on said Northerly Right-of-Way line of 12 Mile Road; thence along

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

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



DUMP STRAPS

SILT SACK FILTER DETAIL

LOW POINT INLET FILTER

SPACING 6' MAX. / 1½" x 1½" STAKES DRIVEN INTO

-6"ANCHOR

SUPPORT FENCE

TRENCH

SECTION B-B

GROUND 1' MIN.

1' MIN.

SUPPORT FENCE

COMPACTED EARTH

UNDISTURBED VEGETATION

GEOTEXTILE FILTER FABRIC

FASTENED ON UPHILL SIDE,

COMPACTED EARTH ON

SHEET FLOW

ANCHOR TRENCH

SILTFENCE DETAIL

TOWARDS EARTH DISRUPTION

GEOTEXTILE | SHEET | FILTER FABRIC | FLOW

SILTSACK®

GRADE PERPENDICULAR \

PLAN VIEW

FINISH GRADE

PROFILE VIEW

FRONT VIEW

PLAN VIEW

-UNDISTURBED VEGATATION

SECTION A-A

3 TO 4 INCHES OF TOPSOIL SHALL BE USED FOR RESTORATION

WHERE VEGETATION IS REQUIRED.

FOR TRAFFIC CONDITIONS

BAG DETAIL

INSTALLATION DETAIL

PEA STONE FILTER MATERIAL

GEOTEXTILE FILTER FABRIC

FOR USE DURING CONSTRUCTION AND

SILT FENCE E

SILT FENCE JOIN

SECTION B-B

SILT FENCE A

SILT FENCE A

FABRIC TO BE

FENCE POST

SILT FENCE B

COUPLER

WRAPPED AROUND

BEFORE PAVING ONLY. GEOTEXTILE

FILTER FABRIC SHALL BE USED AFTER PAVING UNTIL RESTORATION

HAS BEEN ESTABLISHED.

GRAVEL WRAPPED IN

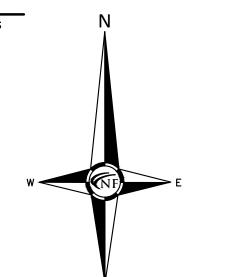
DUMP STRAPS

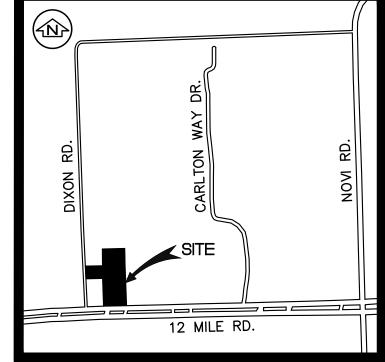
FXPANSION RESTRAINT

(¼"NYLON ROPE,

2"FLAT WASHERS)

(2 EACH)







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.

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

TEMPORARY AND PERMANENT SOIL EROSION CONTROL MEASURES DESIGNED AND CONSTRUCTED

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

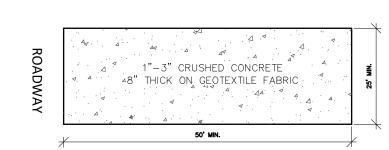
PERMANENT SOIL EROSION CONTROL MEASURES.

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.



TEMPORARY CRUSHED CONCRETE CONSTRUCTION ACCESS ROAD

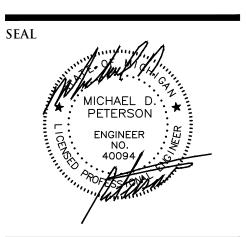
ESTIMATED QUANTITIES

SOIL EROSION		
DESCRIPTION	QUANTITY	UN
SILT FABRIC FENCING INLET FILTER TEMPORARY ACCESS ROAD	2,386 21 277	LF S`

CC	DNSTRUCTION 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-0CT 2021
4.	INSTALL INLET FILTERS ON PROPOSED DRAINAGE STRUCTURES.	SEPT-0CT 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



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

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 City of Novi,

Oakland County, Michigan SHEET

Soil Erosion and Sedimentation Control

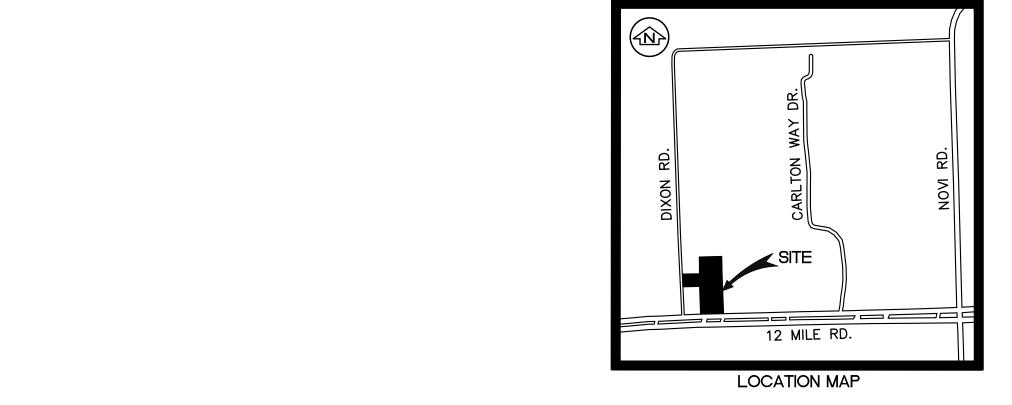


REVISIONS 11-13-20 ISSUED FOR SITE PLAN 4-23-21 REV PER PRELIM SP REVIEW 5-10-21 REV PER PRELIM SP REVIEW 7-14-21 ISSUED FINAL SP REVIEW

DRAWN BY:
M. Kurmas
DESIGNED BY:
M. Kurmas
APPROVED BY:
M. Peterson
DATE:

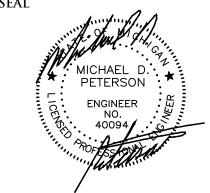
03-27-2019 SCALE: 1'' = 40'

NFE JOB NO. SHEET NO. H046-03





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

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. Naoum **DESIGNED BY:**

APPROVED BY: M. Peterson

DATE: 03-27-2019 SCALE: 1'' = 40'

NFE JOB NO. SHEET NO. **C17** H046-03

, 954.17

BENT 0.15' E. OF PROPERTY CORNER

, 953.24 953.53

× 950.12

Owner: SUTTON HILLS DEVELOPMENT CO LLC

N90°00'00"E 332.00' (R&M)

× 950.70

8" MAPLE₿ 950.36

* 950.30 <u>W</u>

WOODED AREA

20' BUILDING SETBACK LINE

PROPOSED

MAIN LEVEL 14,140 GSF

PROPOSED

1-STORY BUILDING A

13,300 GSF FF 952.50

952.32 APPROXIMATE LOCATION 1
952.32

CATCH BASIN

PUBLICY DEDICATED 12 MILE ROAD (WIDTH VARIES)

CONCRETE PAVEMENT W/ CONC. CURB

RIM 949.04

GU 949.01

N90°00'00"W 332.00' (R&M) 949.33

GU 949.31

APN: 22-10-400-010

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Boring I	No.: 1	Jo	ob No.: 59	229 Project: Stoneridge West II, 4	4244 Twe	lve Mile R	oad
Client: N	Novi Forum	ı, LLC		Location: Novi, Michigan			
Type of	Rig: Truck			Drilled By: R. Favor			
Drilling	Method: S	olid Stem	Augers	Started: 9/8/2018			
Ground	Surface E	levation:	951.5	Completed: 9/8/2018			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
-			1	Moist Dark Brown Sandy TOPSOIL	40.0	407	
2.5	LS	3 5 5	3	Firm Moist Brown CLAY With Some Silt & Trace Of Gravel	10.9	137	
=	LS	4 6		Firm Moist Variegated CLAY With Silt Layers	18.6	116	173
5.0— - -		8			00.0	400	055
7.5	LS	4 6 6			22.8	122	255
-	LS	4 5			21.2	124	206
10.0		6					
- - 12.5			12				
	LS	4 8		Medium Compact Wet Brown Medium SAND With Trace Of Gravel	13.5	127	
15.0		12	15	Bottom of Borehole at 15'			
- - 17.5				BOTTONI OI BOTENDIE AL 13			
-							
20.0							
-							
22.5— - - -							
"N" - Star	dard Penetrat	ion Resistanc	e w-H2O,	% of dry weight Water Enco	ountered:	12'0"	
SS - 2"). LS - Sec ST - She	D. Split Spoor tional Liner Sa lby Tube Sam	n Sample mple	d - Bulk qu - Unco DP - Dire	Density, pcf printed Compression, psf ct Push At Complete			
AS - Aug	er Sample		RC - Roo	k Core Boring No.	4		



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Boring N	lo.: 2 lovi Forum		ob No.: 59					
Type of	Rig: Truck Method: Se		Augers	Location: Novi, Michigan Drilled By: R. Favor Started: 9/8/2018				
Ground	Surface El	levation:	951	Completed: 9/8/2018				
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d		
111	LS	4	1	Moist Dark Brown Clayey TOPSOIL	14.2	126		
2.5		6 8	3.5	Firm Moist Brown Sandy CLAY With Some Silt & Trace Of Gravel				
5.0-	LS	7 10 13	5	Stiff Moist Variegated CLAY With Silt Layers	14.1	136		
7.5—	LS	5 9		Stiff Moist Variegated Oxidized CLAY With Some Silt & Trace Of Gravel	20.5	129		
10.0	LS	3 5 6	8	Firm Moist Variegated CLAY With Some Silt, Trace Of Gravel & Sand Seams	20.8	122		
12.5—			11	Stiff Moist Gray CLAY With Some Silt, Trace Of Gravel & Wet Sand Seams				
15.0	LS	5 6 12	15.5		12.6	153		
17.5				Medium Compact Wet Brown Medium SAND With Trace Of Gravel				
20.0	LS	4 11 11	20		10.4			
- - - - 22.5				Bottom of Borehole at 20'				
22.0 - - - -								
SS - 2").	dard Penetrati D. Split Spoon ional Liner Sal	Sample	a - Bulk i	% of dry weight Density, pcf Infined Compression, psf At Complete		11'0"		
ST - She AS - Aug	by Tube Samp	ole	DP - Dire RC - Roc	ct Push At Complete				



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Boring N	lo.: 3	J	ob No.: 59	Project: Stoneridge West II, 4	14244 TWE	ive Mile R	oad
Client: N	lovi Forum	, LLC		Location: Novi, Michigan			
Type of	Rig: Truck			Drilled By: R. Favor			
Drilling I	Method: S	olid Stem	Augers	Started: 9/8/2018			
Ground	Surface El	levation:	953.5	Completed: 9/8/2018			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
	LS	4	1	Moist Dark Brown Clayey TOPSOIL	15.5	135	
2.5		5 6	3	Firm Moist Variegated CLAY With Some Silt & Trace Of Gravel			
5.0	LS	6 10 13	5.5	Stiff Moist Variegated CLAY With Silt Layers	15.4	134	
7.5—	LS	6 10 12		Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	7.8	132	
10.0	LS	5 7 10	8	Stiff Moist Brown CLAY With Some Silt, Trace Of Gravel & Sand Seams	18.2	128	5270
12.5—	LS	6 9 10	14 15	─_ Medium Compact Wet Brown Fine SAND With Trace Of	12.5	136	
17.5—		10		Gravel Bottom of Borehole at 15'			
20.0—							
"N" - Stan	dard Penetrati D. Split Spoon	on Resistan	ce w - H2O,	Water Enco Density, pcf	ountered:	14'0"	
LS - Sect ST - She	ional Liner Sar lby Tube Samp	mple	qu - Uno DP - Dire	onfined Compression, psf oct Push At Complete	ion: 13'4'	į	
AS - Aug	er Sample		RC - Roo	* Core Boring No.	3		



RIM 949.35

DUE EAST 267 24" WATERMAIN_____

CAUTION!!

6"P-MP GAS MAIN

CONSUMERS ENERGY NATURAL GAS

Job No.: 59229

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

Project: Stoneridge West II, 44244 Twelve Mile Road

Type of Drilling	Novi Forum Rig: Truck Method: S Surface E	olid Stem	-	Location: Novi, Michigan Drilled By: R. Favor Started: 9/8/2018 Completed: 9/8/2018			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
- - - 2.5 - -	LS LS	5 10 12	.83 3	Moist Dark Brown Clayey TOPSOIL (10") Stiff Moist Variegated Clay With Some Silt, Trace Of Gravel & Sand Seams-FILL	16.9 15.6	132 128	6760
5.0—		9 13	5.5	Stiff Moist Brown Oxidized Clay With Some Silt & Trace Of Gravel-FILL	13.0	120	0700
7.5 - 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 Medium Compact Wet Brown Fine SAND With Trace Of Gravel	21.2	125	
15.0 — - 15.0 — - -	LS	5 9 13	15	Bottom of Borehole at 15'	17.3	129	
17.5 - - -							
20.0							
22.5— - - - -							
SS - 2"). LS - Sec ST - She	ndard Penetrat D. Split Spoor tional Liner Sa Iby Tube Sam Jer Sample	n Sample mple	e w - H2O, d - Bulk qu - Unc DP - Dire RC - Roo	% of dry weight Water Enco Density, pcf Density, pcf Density pcf Density pcf Density pcf At Complet k Core Boring No.	i on: 8'9"	8'6"	



Boring No.: 5

Client: Novi Forum, LLC

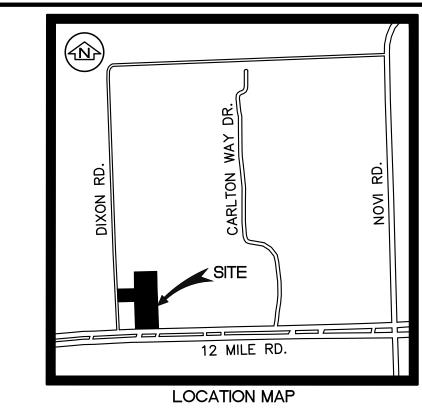
Job No.: 59229

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

Project: Stoneridge West II, 44244 Twelve Mile Road

Location: Novi, Michigan

Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
-	LS	5 9	1	Moist Dark Brown Sandy TOPSOIL	15.1	135	
2.5-		9	3	Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel			
5.0	LS	3 4 8		Firm Moist Variegated CLAY With Some Silt, Trace Of Gravel & Sand Seams	15.5	134	
7.5	LS	4 8 9	6	Firm Moist Brown CLAY With Some Silt & Trace Of Gravel	13.9	128	247
- - - 10.0	LS	5 6 10	10	Extremely Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	11.1	138	923
-		10		Stiff Moist Gray CLAY With Some Silt, Trace Of Gravel & Sand Seams			
12.5- - -							
15.0 —	LS	6 8 12			9.6	142	849
17.5			17.5				
- - 20.0	LS	5 8 10	20	Medium Compact Wet Brown Medium SAND With Trace Of Gravel & Clay Layers	3.8	136	
-		10		Bottom of Borehole at 20'			
22.5 - -							





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	lovi Forum			Location: Novi, Michigan			
	Rig: Truck			Drilled By: R. Favor			
-	Method: S		•	Started: 9/7/2018			
Ground	Surface El	evation:	952.5	Completed: 9/7/2018			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	
111	LS	6	1	Moist Dark Brown Sandy TOPSOIL	15.5	114	
2.5-		7 9	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	5
7.5	LS	8 21 22	6	Extremely Stiff Moist Variegated CLAY With Some Silt, Trace Of Gravel & Sand Seams	14.8	134	14
10.0	LS	8 10 9	10	Stiff Moist Variegated CLAY With Some Silt, Trace Of Gravel & Wet Sand Seams	9.6	139	5
10.0		Ü		Medium Compact Wet Brown Medium SAND With Trace Of Gravel			
12.5— - - -	LS	4			11.4	133	
15.0 <i>-</i>		10 16	15				
-				Bottom of Borehole at 15'			
17.5— - -							
20.0							
22.5 -							
-							
"N" - Stan	dard Penetrati	on Resistan		% of dry weight Water Enco	ountered:	8'0"	
LS - Sect	D. Split Spoon ional Liner Sar Iby Tube Samp	mple	d - Bulk I qu - Unco DP - Dire	Density, pcf infined Compression, psf thush thush	ion: 9'1"		



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Boring N	lo.: 7	Je	ob No.: 59	229 Project: Stoneridge West II, 4	4244 Twe	lve Mile R	.0
Client: N	lovi Forum	ı, LLC		Location: Novi, Michigan			
Type of	Rig: Truck			Drilled By: R. Favor			
Drilling I	Method: S	olid Stem	Augers	Started: 9/7/2018			
Ground	Surface E	levation:	951.5	Completed: 9/7/2018			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	Ī
	LS	9	1	Moist Dark Brown Sandy TOPSOIL	16.1	132	I
2.5—		11 16	3.5	Medium Compact Moist Brown Fine Sand With Trace Of Gravel-FILL			
5.0	LS	8 15 16	5.5	Extremely Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	8.6	119	l
-	LS	7 11	7.5	Extremely Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	10.1	143	
7.5— - -	LS	14 5	7.5	Medium Compact Wet Brown Medium SAND With Trace Of Gravel & Clay Layers	14.9	133	l
10.0	20	9 11	11	Glavel & Clay Layers	11.0	100	
12.5—				Medium Compact Wet Brown Fine SAND With Trace Of Gravel			I
-	LS	6 10			17.9	130	I
15.0 -		11	15	Bottom of Borehole at 15'			
17.5—							
20.0							
-							
22.5— - - -							
"N" - Stan SS - 2").	dard Penetrat D. Split Spoor	ion Resistanc	e w - H2O,	% of dry weight Water Enco	ountered:	7'6"	1
LS - Sect ST - She	ional Liner Sa lbv Tube Sam	ımple	DP - Dire	Density, pof Infined Compression, psf of Push At Complet	ion: 7'10'	i	
AS - Aug	er Sample		RC - Roo	k Core Boring No.	7		



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Boring N	lo.: 8	Jo	bb No.: 59	229 Project: Stoneridge West II, 4	4244 Twe	lve Mile R	oad
Client: N	lovi Forum	, LLC		Location: Novi, Michigan			
Type of I	Rig: Truck			Drilled By: R. Favor			
Drilling I	Method: So	olid Stem	Augers	Started: 9/7/2018			
Ground	Surface El	evation:	951	Completed: 9/7/2018			
1			1	,			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
-	LS	4	1	Moist Dark Brown Sandy TOPSOIL	21.2	115	
2.5	23	6 11	2.5	Stiff Moist Dark Brown Clay With Some Silt & Trace Of Gravel-FILL	21.2	113	
5.0	LS	9 11 14		Extremely Stiff Moist Variegated CLAY With Some Silt & Trace Of Gravel	10.8	140	1030
7.5	LS	9 13 15	6 8	Stiff Moist Variegated CLAY With Some Silt & Trace Of Gravel	10.8	139	420
10.0	LS	7 9 14	,	Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	11.1	127	461
12.5			12.5				
- - 15.0	LS	5 9 10		Stiff Moist Gray CLAY With Some Silt & Trace Of Gravel	10.6	133	404
17.5							
-	LS	6 8	18	Firm Moist Gray CLAY With Some Silt & Trace Of Gravel	11.2	138	240
20.0		11	20	Bottom of Borehole at 20'			
22.5 - - -							
SS - 2").I	dard Penetration D. Split Spoon ional Liner San	Sample	d - Bulk	% of dry weight Density, pcf onfined Compression, psf			
ST - Shell AS - Auge	by Tube Samp	le	DP - Dire	ect Push At Complete	ion: None	9	



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



Know what's below Call before you dig.										
REVISIONS										
11-13-20 ISSUED FOR SITE PLAN										

4-23-21	REV	PER	PREL	IM S	SP R	EVI
5-10-21	REV	PER	PREL	IM S	SP R	EVII
7-14-21	ISSU	ED F	INAI	SP	REV	IEW

DRAWN BY:
N. Naoum
DESIGNED BY:
APPROVED BY:
M. Peterson
DATE:

03-27-2019 SCALE: N.T.S.

SHEET NO. NFE JOB NO. H046-03 **C18**



Boring N	No.: 9	Jo	ob No.: 59	229 Project: Stoneridge West II, 4	4244 IWE	ive iville K	Jau
Client: N	Novi Forum	, LLC		Location: Novi, Michigan			
Type of	Rig: Truck			Drilled By: R. Favor			
Drilling	Method: S	olid Stem	Augers	Started: 9/7/2018			
Ground	Surface E	levation:	951	Completed: 9/7/2018			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
	LS	6	.67	Moist Dark Brown Sandy TOPSOIL (8")	10.5		
2.5—		10 18	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		
5.0 - -	LS	9	5.5	Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	11.4	123	
7.5 -		12 14					
10.0	LS	7 11 14			11.2	141	
-			11.5				
12.5— - -		_		Stiff Moist Gray CLAY With Some Silt & Trace Of Gravel	40.7	400	
15.0	LS	7 10 16	15		10.7	136	
-				Bottom of Borehole at 15'			
17.5— - -							
20.0							
22.5							
-							
SS - 2").	idard Penetrat D. Split Spoor	Sample	d - Bulk l	% of dry weight Water Enco	untered:	None	
LS - Sect ST - She	tional Liner Sa lby Tube Sam er Sample	mple	qu - Unco DP - Dire RC - Roo	onfined Compression, psf ct Push At Complete	i on: None	e	

Boring No. 9



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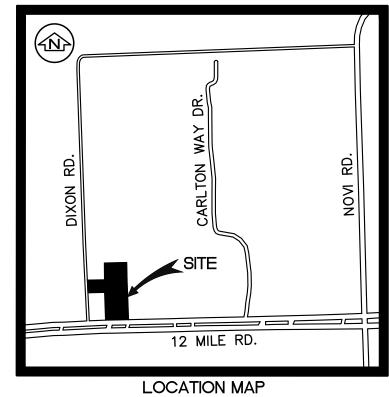
Boring N	lo.: 10	•	Job No.: 5	9229 Project: Stoneridge West II,	477 IWG	I VO IVIIIO IX	Jau
Client: N	lovi Forum	, LLC		Location: Novi, Michigan			
Type of	Rig: Truck			Drilled By: R. Favor			
Drilling I	Method: S	olid Stem	Augers	Started: 9/8/2018			
Ground	Surface E	levation:	953	Completed: 9/8/2018			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	q
-	LS	4	1.5	Moist Dark Brown Clayey TOPSOIL	14.1	114	
2.5—	20	6 10		Stiff Moist Variegated CLAY With Some Silt & Trace Of Gravel	1	114	
-	LS	5 13			13.6		
5.0 -		17	6			455	
7.5	LS	8 9 12		Stiff Moist Brown CLAY With Some Silt, Trace Of Gravel & Sand Seams	11.0	155	52
-	LS	4 7	8.5	Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	13.3	132	21
10.0 - -		10	11				
12.5				Stiff Moist Gray CLAY With Some Silt & Trace Of Gravel			
-	LS	5 7			10.4	154	47
15.0— - -		9	15	Bottom of Borehole at 15'			
17.5							
-							
20.0-							
22.5 22.5							
-							
"N" - Stan	dard Penetrati D. Split Spoon	on Resistano	xe w - H2O, d - Bulk l	% of dry weight Water Enc	ountered:	None	<u> </u>
LS - Sect	ional Liner Sa Iby Tube Samp	mple	qu - Unco DP - Dire RC - Roc	ontined Compression, psr ct Push At Comple	tion: None		

Boring No. 10



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

	Rig: Truck Method: Se		Augers	Drilled By: R. Favor			
_	Surface El			Started: 9/7/2018 Completed: 9/7/2018			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
111	LS	5	1	Moist Dark Brown Sandy TOPSOIL	17.7	129	948
2.5 -		6 10	3	Extremely Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel			
5.0	LS	6 9 15	5.5	Medium Compact Moist Brown Fine SAND & Gravel With Clay Layers	16.7	131	
7.5—	LS	15 19 25		Extremely Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	15.2	136	109
10.0	LS	6 13 15	8.5	Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	13.0	136	651
12.5—			12	Stiff Moist Gray CLAY With Some Silt & Trace Of Gravel			
15.0	LS	8 10 12	15		9.2	136	585
17.5				Bottom of Borehole at 15'			
20.0 - -							
22.5—							
"N" - Stan	dard Penetrati	on Resistano	w - H2O, d - Bulk	% of dry weight Water Enco	ountered:	None	
SS - 2"). LS - Sect	D. Split Spoon ional Liner Sar by Tube Samp	Sample mple	e w - H2O, d - Bulk qu - Uno DP - Dire RC - Roc	Density, pcf Online Compression, psf Online Compression, psf Online Compression At Complet Online Compression At Complete Compression At Compression A	ion: None		



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).: 12	J	l ob No. : 5	9229 Project: Stoneridge West II, 4	4244 Twe	ve Mile Ro	oad
Client: No	vi Forum,	, LLC		Location: Novi, Michigan			
Type of R	ig: Truck			Drilled By: R. Favor			
Drilling M	ethod: So	olid Stem	Augers	Started: 9/8/2018			
Ground S	urface Ele	evation:	951.5	Completed: 9/8/2018			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu
	LS	2	.83	Moist Dark Brown Sandy TOPSOIL (10")	14.6	134	
2.5		3	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	
7.5				Bottom of Borehole at 5'			
7.5 -							
10.0							
12.5							
15.0							
17.5							
20.0							
- - 22.5							
-							
"N" - Standa SS - 2").D.	ard Penetratio	on Resistano Sample		% of dry weight Water Enco	untered:	None	
LS - Section	nal Liner San Tube Samp	nple	qu - Unco	onfined Compression, psf	ion: None		

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

Project: Stoneridge West II, 44244 Twelve Mile Road

Ground Surface Elevation: 953.5			Augers 953.5	Started: 9/8/2018 Completed: 9/8/2018						
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu			
2.5—	LS	5 9 14	1	Moist Dark Brown Sandy TOPSOIL Medium Compact Moist Brown Fine SAND & Clay Layers	6.4	137				
5.0	LS	12 16 17	5	Extremely Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	7.9	137				
7.5—				Bottom of Borehole at 5'						
10.0										
12.5 - - -										
15.0										
17.5— - - -										
20.0-										
-										

Job No.: 59229



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Boring N			Job No.: 5	9229 Project: Stoneridge West II, 4					
	lovi Forum			Location: Novi, Michigan					
	Rig: Truck			Drilled By: R. Favor					
Drilling I	Method: S	olid Stem	Augers	Started: 9/8/2018	Started: 9/8/2018				
Ground	Surface El	levation:	953.5	Completed: 9/8/2018					
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu		
-	LS	4	.75	Moist Dark Brown Sandy TOPSOIL (9")	19.1	130			
2.5	Lo	7 11		Stiff Moist Brown CLAY With Some Silt & Trace Of Gravel	19.1	130			
-	LS	6 10	_		13.9	121	618		
5.0 - -		15	5	Bottom of Borehole at 5'					
7.5 <i>-</i>									
- - 10.0									
10.0									
12.5 -									
- 15.0 <i>-</i>									
-									
17.5— - -									
20.0									
- - - 22.5									
"N" - Stan SS - 2").	dard Penetrati D. Split Spoon	on Resistanc	e w - H2O, d - Bulk	% of dry weight Water Enco	ountered:	None			
LS - Sect	ional Liner Sa by Tube Samp	mple	qu - Unco	Density, pcf onfined Compression, psf off Push At Complet	ion: None	9			



PROJECT: Stoneridge West II

LOCATION: Novi, Michigan

44244 12 Mile Road

Testing Engineers and 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 MECHANICAL ANALYSIS TEST REPORT

TEC REPORT NUMBER: 59229

DATE: Thursday, October 04, 2018

Testing Engineers and Consultants, Inc.

CLIENT: Novi Forum LLC Brown Fine Sand & Gravel With Material Description: Date Sampled: 9/7/18 Clay Layers Sample Source / Depth: Sampled By: R. Favor TEC Lab Sample Number: Sample Location: Intended Use:

Sieve No.	Total Weight Retained	Total Percent Retained	Total Percent Passing	Specification Range	SAMPLE DATA		
3"					Initial Sample Weight (g)	126.8	
2-1/2"					Weight After Wash (g)	114.0	
1-1/2"					Loss in Weight (g)	12.8	
1"		0.0	100.0		Loss by Wash (%)	10.1%	
3/4"	37.1	29.3	70.7				
1/2"	53.1	41.9	58.1				
3/8"	54.2	42.7	57.3				
#4	61.3	48.3	51.7				
#10	67.6	53.3	46.7				
#20	72.6	57.3	42.7				
#30	74.5	58.8	41.2				
#40	77.5	61.1	38.9		Tested By:	R. Pruitt	
#100	98.7	77.8	22.2		Reviewed By:	G. Putt	
#200	114.0	89.9	10.1				
tal Sample	126.8	100.0	0.0		1		
st Method:	ASTM C117/C136		AASHTO T11/T27	,	MTM 108/109 X		
Remarks:			2		24 5		



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Boring N	lo.: 14		Job No.: 5	9229 Project: Stoneridge West II, 4	4244 Twe	Ive Mile R	oad			
Client: N	lovi Forum	, LLC		Location: Novi, Michigan	Location: Novi, Michigan					
Type of	Rig: Truck			Drilled By: R. Favor						
Orilling I	Method: S	olid 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			
1 1 1 1	LS	3 9	1	Moist Dark Brown Sandy TOPSOIL	21.1	123	6020			
2.5— - -		11		Stiff Moist Brown CLAY With Some Silt, Trace Of Gravel, Boulders & Cobbles						
5.0-	LS	5 6 11	5		13.3	139				
-				Bottom of Borehole at 5'						
7.5—										
10.0-										
10.0										
12.5 -										
- - 15.0-										
10.0										
17.5										
20.0-										
-										
22.5-										
"N" - Standard SS - 2").	dard Penetrat D. Split Spoor	ion Resistand	e w - H2O, d - Bulk l	% of dry weight Water Enco	untered:	None				
LS - Sect	D. Split Spoor ional Liner Sa by Tube Sam er Sample	mple ple	qu - Unco DP - Dire RC - Roo	Density, pof onlined Compression, psf ot Push At Completic ct Push	on: None					



Testing Engineers and 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

MECHANICAL ANALYSIS TEST REPORT PROJECT: Stoneridge West II TEC REPORT NUMBER: 59229 44244 12 Mile Road LOCATION: Novi, Michigan DATE: Thursday, October 04, 2018 CLIENT: Novi Forum LLC

Material Description: Brown Fine Sand & Clay Layers Date Sampled: 9/7/18 Sample Source / Depth: Sampled By: R. Favor Sample Location: TEC Lab Sample Number: Intended Use: Remarks:

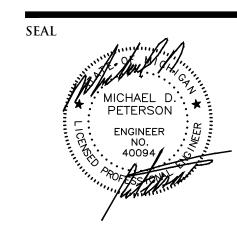
			AGGREGAT	ΓΕ ANALYSIS		
Sieve No.	Total Weight Retained	Total Percent Retained	Total Percent Passing	Specification Range	SAMPLI DATA	•
3"					Initial Sample Weight (g)	207.4
2-1/2"					Weight After Wash (g)	124.2
1-1/2"					Loss in Weight (g)	83.2
1"					Loss by Wash (%)	40.1%
3/4"						
1/2"						
3/8"		0.0	100.0			
#4	1.8	0.9	99.1			
#10	7.4	3.6	96.4			
#20	15.5	7.5	92.5			
#30	19.1	9.2	90.8			
#40	25.1	12.1	87.9		Tested By:	R. Pruitt
#100	67.2	32.4	67.6		Reviewed By:	G. Putt
#200	124.2	59.9	40.1			
otal Sample	207.4	100.0	0.0		1	
est Method:	ASTM C117/C136		AASHTO T11/T27		MTM 108/109 X	

Respectfully Submitted:

Testing Engineers and Consultants, Inc.



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 Acquira Realty Holdings 44090 12 Mile Road Novi, MI 48377

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

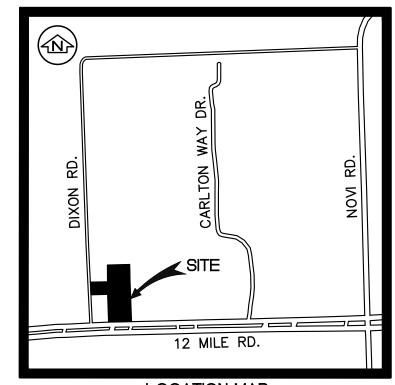
PROJECT LOCATION Part of the SE 1/4 Section 10 T. 1N, R. 8E City of Novi, Oakland County, Michigan

SHEET Soil Boring Logs



REVISIC	ONS
11-13-20	ISSUED FOR SITE PLAN
4-23-21	REV PER PRELIM SP REVIE
5-10-21 I	REV PER PRELIM SP REVIE
7-14-21 I	SSUED FINAL SP REVIEW
DRAWN	BY:
N. Na	
DESIGN	IED DV.
DESIGN	ED B1:
APPROV	/FD RY:
M. Pe	
	1015011
DATE:	
03-27-	2019
SCALE:	N.T.S.

NFE JOB NO. SHEET NO. **C19** H046-03



LOCATION MAP



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

PETERSON ENGINEER

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



REVISIO	NS			
11-13-20	ISSUED	FOR S	ITE PL	۸N
4-23-21 F	REV PER	PRELI	M SP R	EVIEW
5-10-21 R	EV PER	PRELIA	M SP R	EVIEW
7-14-21 I	SSUED I	FINAL S	SP REV	IEW

DRAWN BY: N. Naoum

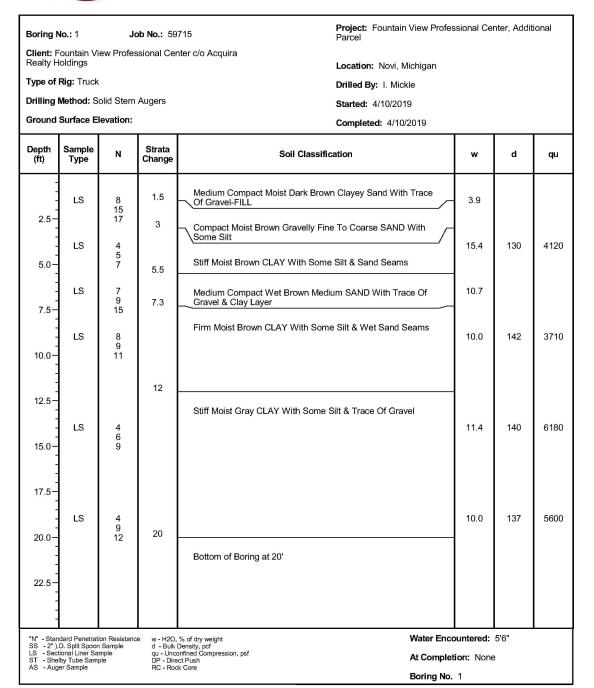
APPROVED BY: M. Peterson

DESIGNED BY:

DATE: 03-27-2019 SCALE: 1'' = 40'

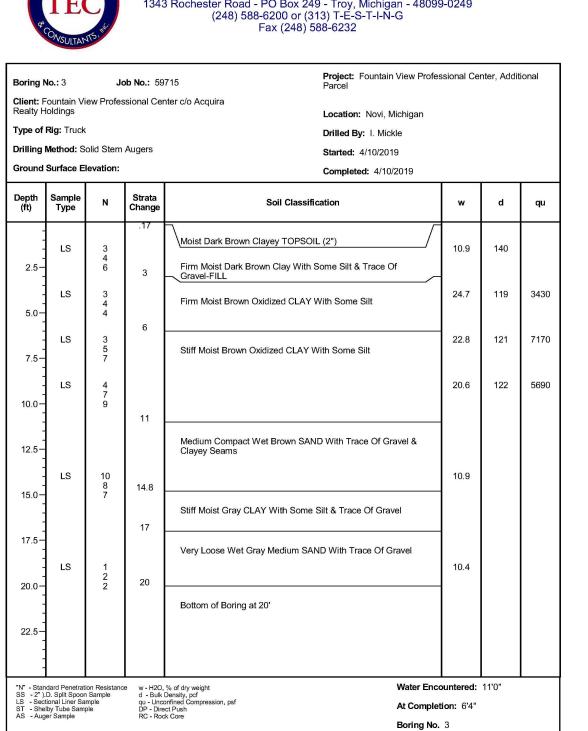
20 40 SHEET NO. NFE JOB NO. H046-03

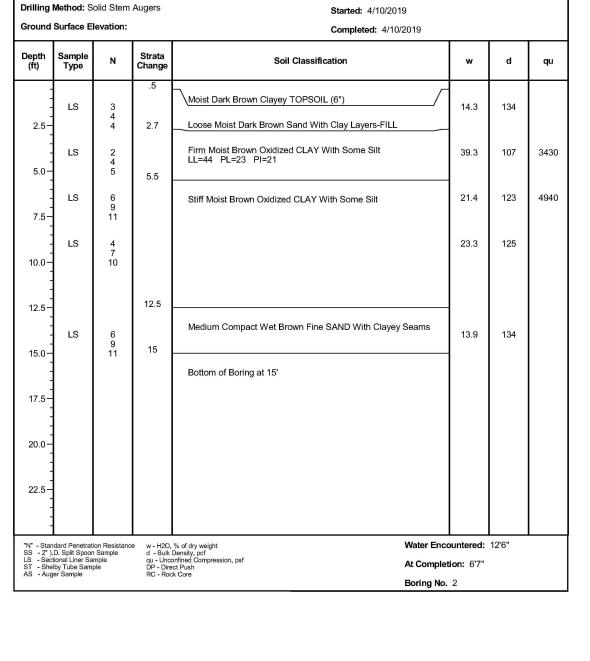






Realty F	_			Location: Novi, Michigan					
	Rig: Truck Method: Se		Augere	Drilled By: 1. Mickle					
_	Surface El		Augers	Started: 4/10/2019					
Completed: 4/10/2019						Completed: 4/10/2019			
Depth (ft)	Sample Type	N	Strata Change	Soil Classification	w	d	qu		
-	LS	3	.17	Moist Dark Brown Clayey TOPSOIL (2")	10.9	140			
2.5		4 6	3	Firm Moist Dark Brown Clay With Some Silt & Trace Of — Gravel-FILL					
5.0 5.0	LS	3 4 4		Firm Moist Brown Oxidized CLAY With Some Silt	24.7	119	3430		
7.5	LS	3 5 7	6	Stiff Moist Brown Oxidized CLAY With Some Silt	22.8	121	7170		
10.0	LS	4 7 9	11		20.6	122	5690		
12.5—				Medium Compact Wet Brown SAND With Trace Of Gravel & Clayey Seams					
- - - 15.0	LS	10 8 7	14.8		10.9				
-			17	Stiff Moist Gray CLAY With Some Silt & Trace Of Gravel					
17.5— - -	LS	1		Very Loose Wet Gray Medium SAND With Trace Of Gravel	10.4				
20.0	Lo	2	20		10.4				
22.5 - - 22.5				Bottom of Boring at 20'					





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

At Completion: 7'4"

Boring No. 4

Fax (248) 588-6232

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

Type of Rig: Truck

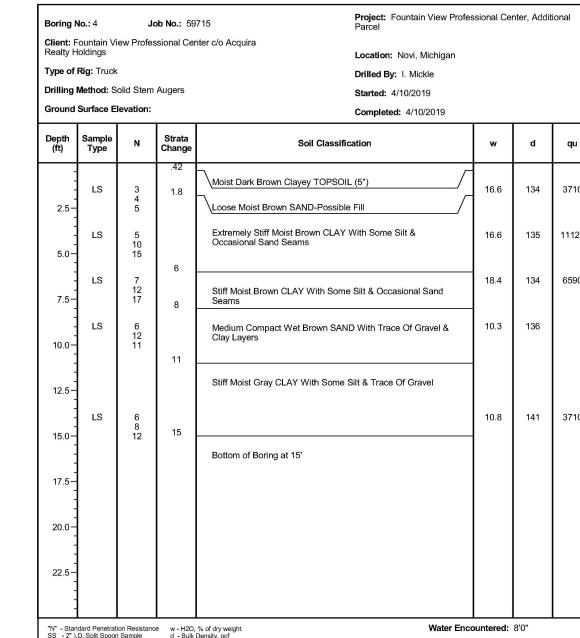
Job No.: 59715

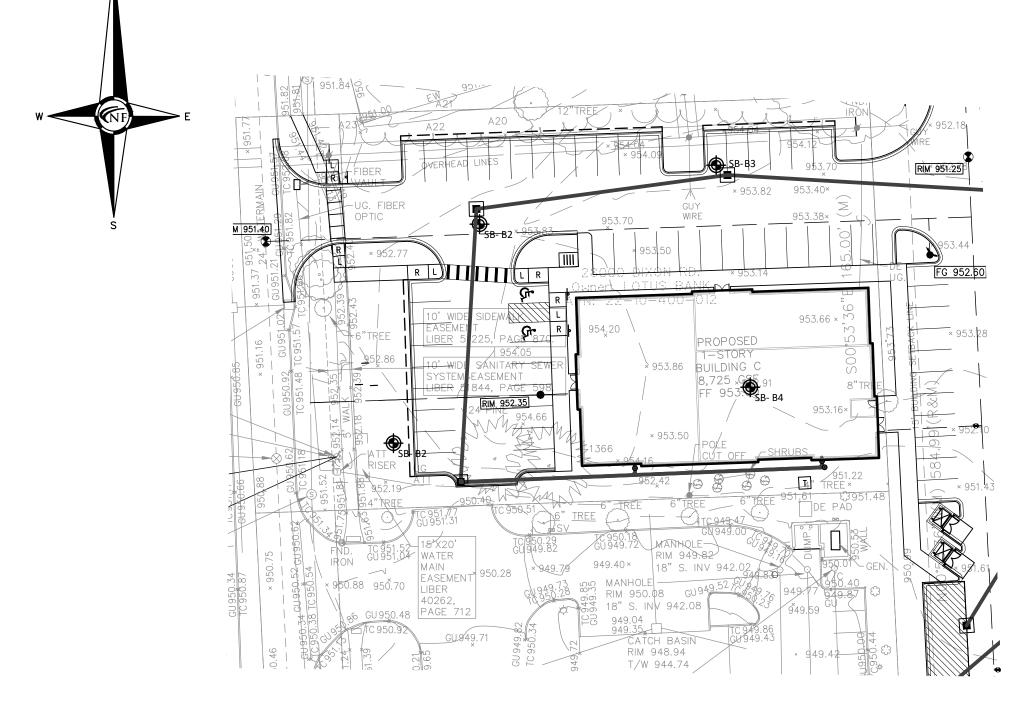
Client: Fountain View Professional Center c/o Acquira Realty Holdings

Project: Fountain View Professional Center, Additional Parcel

Location: Novi, Michigan

Drilled By: I. Mickle







Oakland County 1-Year Peak Flow

Project: Fountain View Professional Center

CS-12

Location: Novi, MI Site ID: Structure #6

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

1-year $I_1 = 30.2/(T_c + 9.17)^{0.81} = 2.14$ in/hr max I₁ = 2.0 inches/hour for smaller sites with Tc ≤ 15 minutes min $I_1 = 1.0$ inches/hour for larger sites with $Tc \ge 1$ hour

1-year Peak Flow = Q_{wq} = $C \times I_1 \times A = 3.53$ cfs

Recommended Model: CS-6

CASCADE SEPARATOR™ MODEL SPECIFICATIONS PER NJDEP CERTIFICATION LETTER

50% Maximum MTFR Sediment Storage Model Diameter Area Volume CS-4 CS-5 CS-6 CS-8 CS-10 58.9

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.

CINTECH ENGINEERED SOLUTIONS

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 $I_1 = 30.2/(T_c + 9.17)^{0.81} = 2.11$ in/hr max I₁ = 2.0 inches/hour for smaller sites with Tc ≤ 15 minutes min $I_1 = 1.0$ inches/hour for larger sites with $Tc \ge 1$ hour

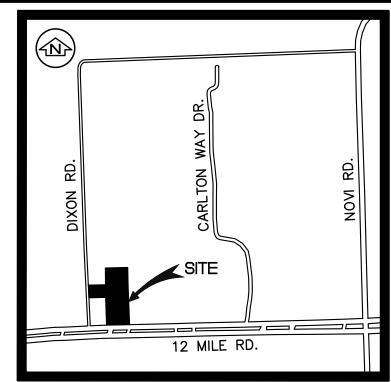
1-year Peak Flow = Q_{wq} = $C \times I_1 \times A = 2.85$ cfs

Recommended Model: CS-6

CASCADE SEPARATOR™ MODEL SPECIFICATIONS PER NJDEP **CERTIFICATION LETTER**

Model	Manhole Diameter (ft)	MTFR (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

SITE SPECIFIC

DATA REQUIREMENTS

INVERT MATERIAL DIAMETER

STRUCTURE ID

RIM ELEVATION

INLET PIPE 1 INLET PIPE 2

OUTLET PIPE

WATER QUALITY FLOW RATE (cfs [L/s])

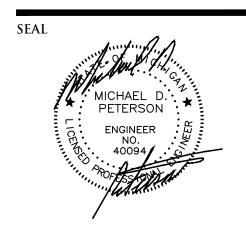
RETURN PERIOD OF PEAK FLOW (yrs)

NOTES / SPECIAL REQUIREMENTS:

PEAK FLOW RATE (cfs [L/s])



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

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

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:

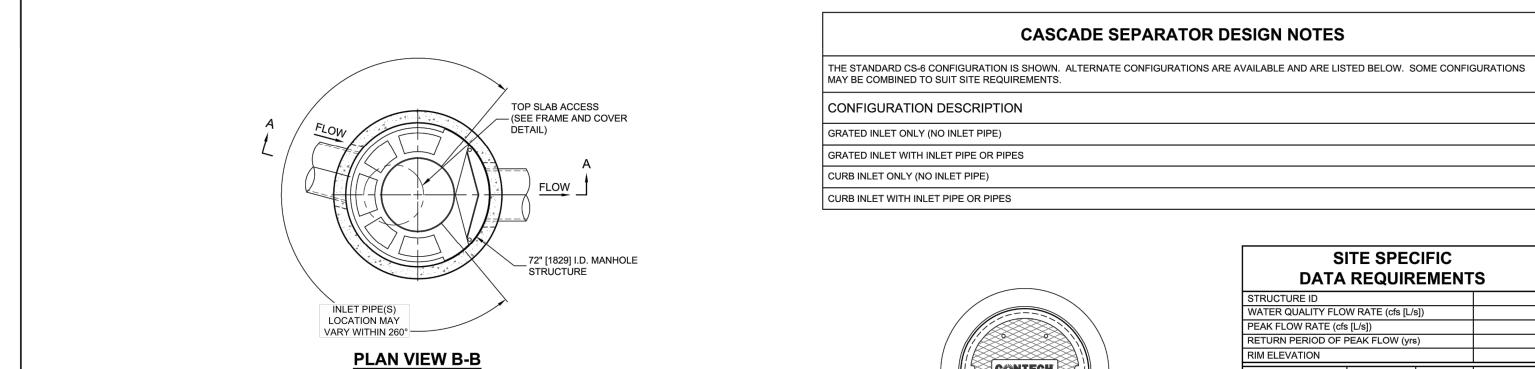
N. Naoum **DESIGNED BY:** M. Kurmas APPROVED BY: M. Peterson

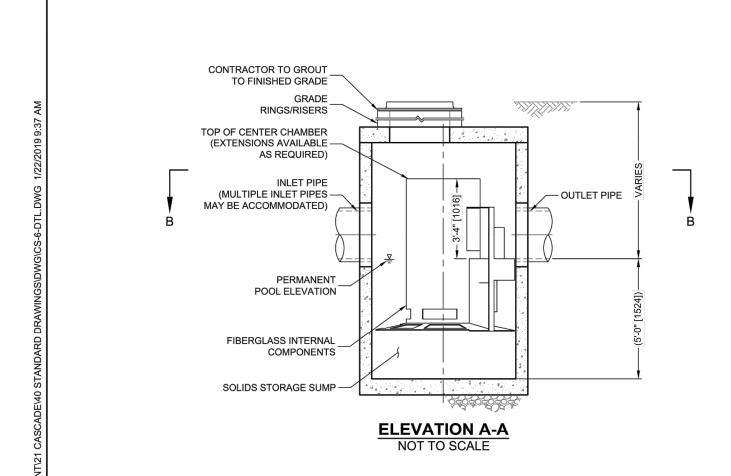
DATE: 03-27-2019

SCALE: N.T.S.

NFE JOB NO.

SHEET NO. **C21** H046-03





NOT TO SCALE

CONTECH FRAME AND COVER (DIAMETER VARIES) NOT TO SCALE

GENERAL NOTES

1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE. 2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com

THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.

4. 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 M306 AND BE CAST WITH THE CONTECH LOGO.

3. CASCADE SEPARATOR WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN

5. CASCADE SEPARATOR STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN

6. ALTERNATE UNITS ARE SHOWN IN MILLIMETERS [mm].

INSTALLATION NOTES

A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.

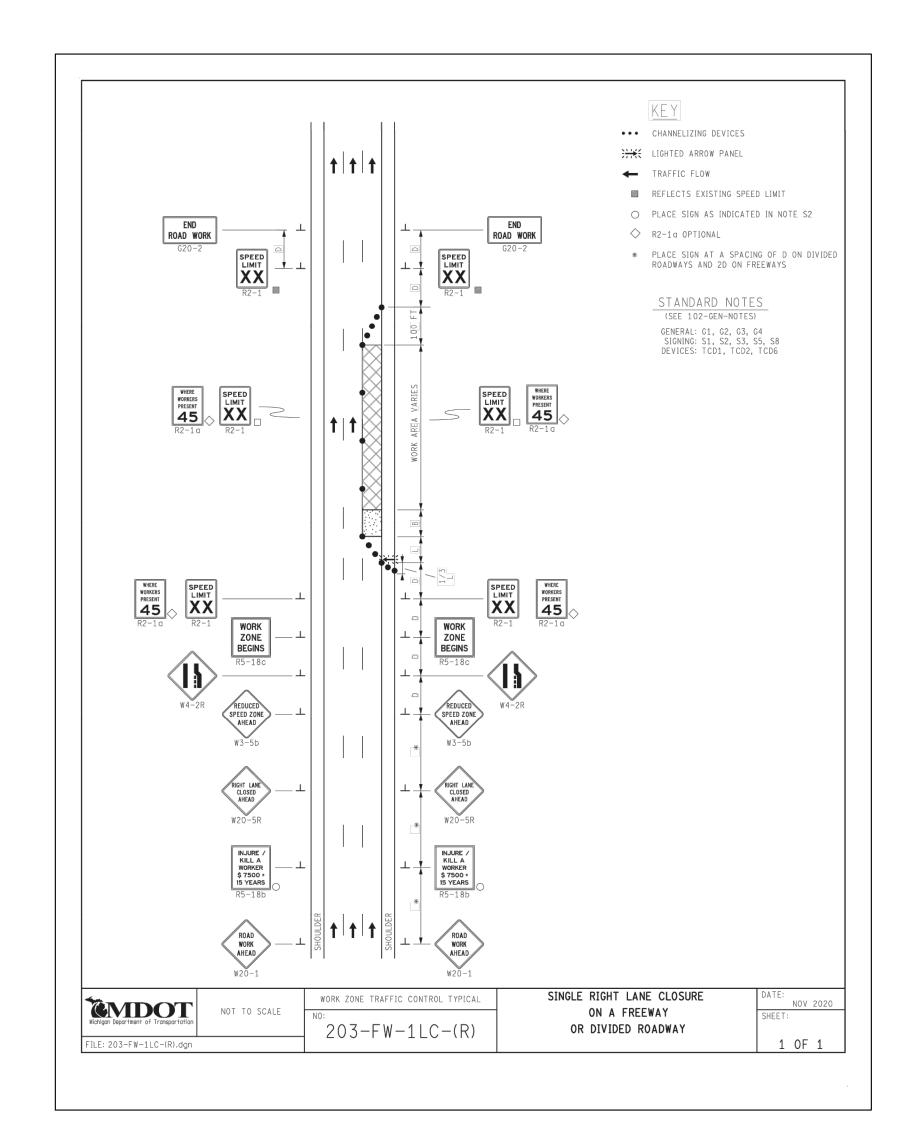
MANHOLE STRUCTURE. C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE

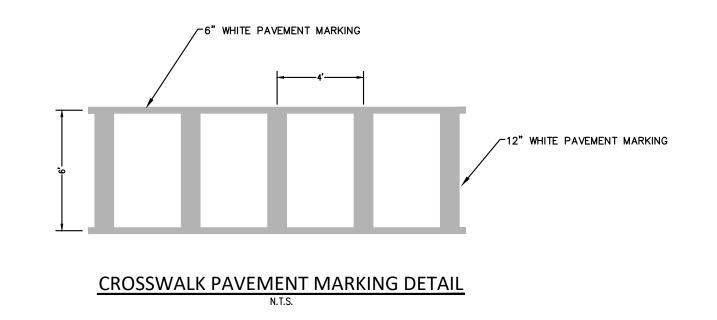
CENTERLINES TO MATCH PIPE OPENING CENTERLINES. E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

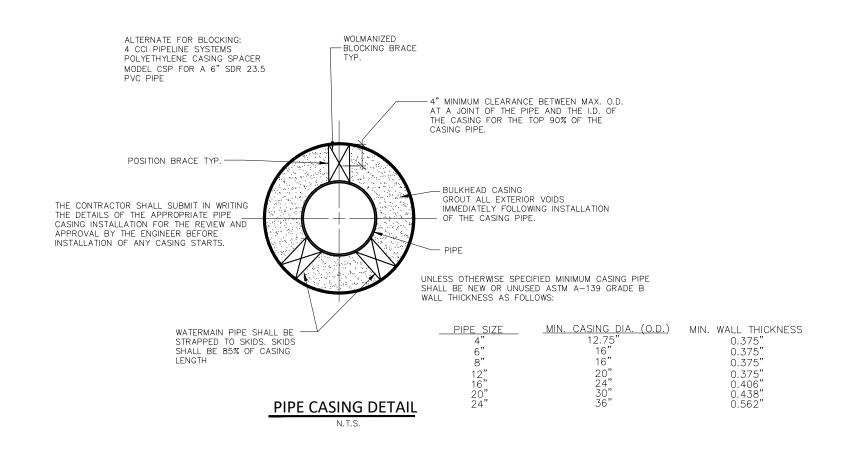
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CASCADE SEPARATOR

CINTECH ENGINEERED SOLUTIONS LLC www.contechES.com 9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069

CS-6 CASCADE SEPARATOR STANDARD DETAIL 800-338-1122 513-645-7000 513-645-7993 FA









AT LEAST 72 HOURS (3 WORKING DAYS) PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY MISS DIG AND THE LOCAL COMMUNITY (WHERE APPLICABLE) TO STAKE LOCATIONS OF EXISTING UTILITIES.

THE CONTRACTOR SHALL EXPOSE AND VERIFY EXISTING UTILITIES FOR LOCATION, SIZE, DEPTH, MATERIAL AND CONFIGURATION PRIOR TO CONSTRUCTION. COSTS FOR EXPLORATORY EXCAVATION IS AN INCIDENTAL COST AND SHALL NOT BE CONSIDERED AN EXTRA TO THE

THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY EXISTING UTILITIES WHICH DO NOT MATCH THE PLANS AND SPECIFICATIONS PRIOR TO COMMENCING WORK. ANY FIELD CHANGES OF THE PROPOSED UTILITIES SHALL BE APPROVED BY THE OWNER AND ENGINEER BEFORE THE

THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES FROM DAMAGE. ANY SERVICE OR UTILITY DAMAGED OR REMOVED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED AT THE EXPENSE OF THE CONTRACTOR, IN CONFORMANCE WITH THE REQUIREMENTS OF THE UTILITY COMPANY PROVIDER.

DAMAGE TO PRIVATE PROPERTY

ALL SIDEWALKS, DRIVEWAYS, LAWNS, FENCING, TREES, SHRUBS, SPRINKLERS, LANDSCAPING, ETC., THAT ARE DAMAGED DURING CONSTRUCTION MUST BE REPAIRED OR REPLACED, IN KIND OR BETTER, BY THE CONTRACTOR. ALL STREET SIGNS, MAIL BOXES, ETC., REMOVED SHALL BE REPLACED IN KIND OR BETTER, BY THE CONTRACTOR. ALL THE REPAIRS OR REPLACEMENTS DUE TO THE CONTRACTOR'S WORK ARE TO BE INCLUDED IN THE CONTRACT PRICE(S) AND SHALL NOT BE AN EXTRA TO THE CONTRACT.

THE CONTRACTOR SHALL SECURE PERMISSION IN WRITING FROM ADJACENT PROPERTY OWNERS PRIOR TO ENTERING UPON ANY ADJOINING PROPERTIES. UNLESS OFFSITE PERMITS HAVE ALREADY BEEN OBTAINED BY THE OWNER AND ARE PART OF THE CONTRACT DOCUMENTS.

DEWATERING OF TRENCH AND EXCAVATIONS

IF NOT SPECIFICALLY PROVIDED FOR IN THE CONSTRUCTION DESIGN DOCUMENTS, THE DESIGN OR QUALITATIVE ANALYSIS OF GROUND WATER DEWATERING SYSTEMS IS BEYOND THE SCOPE OF DESIGN FOR THESE DOCUMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SELECTING AND PROVIDING APPROPRIATE EXCAVATION DEWATERING SYSTEMS FOR USE DURING CONSTRUCTION.

THE DEWATERING METHOD SELECTED BY THE CONTRACTOR WILL NOT ADVERSELY AFFECT ADJACENT PAVEMENTS OR STRUCTURES PRIOR TO BEGINNING DEWATERING CONDITIONS. MEANS AND METHODS OF DEWATERING ARE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR. THE COST OF DEWATERING WILL BE CONSIDERED INCLUDED IN THE WORK OF CONSTRUCTING THE UNDERGROUND UTILITIES UNLESS SPECIFICALLY INDICATED OTHERWISE.

BY-PASS PUMPING

FROM TIME TO TIME IT MAY BE NECESSARY FOR THE CONTRACTOR TO BY-PASS PUMP TO COMPLETE THE WORK INDICATED ON THE PLANS. THE COST OF BY-PASS PUMPING, THE METHODS, EQUIPMENT AND MEANS OF PROVIDING THAT WORK ARE REPONSIBILITY OF THE CONTRACTOR AND SHALL BE CONSIDERED PART OF THE WORK WHETHER SPECIFICALLY CALLED OUT ON THE PLANS OR NOT

MEANS AND METHODS FOR PIPE CONSTRUCTION

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE MEANS AND METHODS FOR CONSTRUCTING THE UNDERGROUND PIPE SYSTEMS PROPOSED ON THE PLANS, INCLUDING BUT NOT LIMITED TO THE NEED FOR SHORING/BRACING OF TRENCHES, DEWATERING OF TRENCHES, SCHEDULING THE WORK AT OFF PEAK HOURS, AND/OR MAINTAINING EXISTING FLOWS THAT MAY BE ENCOUNTERED VIA PUMPING, BY—PASS PIPING OR OTHER MEANS. THE CONTRACTOR SHALL NOT BE PAID ANY ADDITIONAL COMPENSATION TO IMPLEMENT ANY MEANS AND METHODS TO SATISFACTORILY COMPLETE THE CONSTRUCTION.

PAVEMENT REMOVAL

THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE THICKNESS OF THE PAVEMENT REMOVAL. PAVEMENT CORE SAMPLES ARE FOR INFORMATIONAL PURPOSES ONLY AS TO THE THICKNESS OF THE PAVEMENT AT THE LOCATION OF THE SAMPLE. THE OWNER AND ENGINEER MAKE NO REPRESENTATION, WARRANTY OR GUARANTY THAT THE SAMPLES ACCURATELY REFLECT THE PAVEMENT THICKNESS ON THE PROJECT. MAINTENANCE OF TRAFFIC

DURING THE PROGRESS OF THE WORK THE CONTRACTOR SHALL ACCOMMODATE BOTH VEHICULAR AND PEDESTRIAN TRAFFIC IN THE ROAD RIGHTS OF WAY. THE CONTRACTOR'S EQUIPMENT AND OPERATIONS ON PUBLIC STREETS SHALL BE GOVERNED BY ALL APPLICABLE LOCAL, COUNTY AND STATE ORDINANCES, REGULATIONS AND LAWS. THE CONTRACTOR SHALL OBTAIN AND SATISFY ANY AND ALL PERMIT REQUIREMENTS BY THE LOCAL, COUNTY AND STATE

GOVERNMENTAL AGENCIES. IN ADDITION, WHERE THE WORK REQUIRES THE CLOSURE OF ONE OR MORE LANES OR IS WITHIN THE INFLUENCE OF THE ROAD OR PEDESTRIAN RIGHT OF WAY, THE CONTRACTOR SHALL PROVIDE ALL SIGNS, BARRICADES, FLAG PERSONS AND OTHER TRAFFIC CONTROL MEASURES AS REQUIRED BY MDOT, THE COUNTY, OR THE COMMUNITY HAVING JURISDICTION OF THE ROAD

COMPENSATION FOR TRAFFIC CONTROL SHALL BE CONSIDERED INCLUDED IN THE CONTRACT PRICE(S) UNLESS SPECIFIC TRAFFIC CONTROL ITEMS ARE INCLUDED IN THE ACCEPTED BID

AND IN CONFORMANCE WITH THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

IRRIGATION

THE CONTRACTOR SHALL MAINTAIN OR REPAIR ANY EXISTING IRRIGATION SYSTEMS WITHIN THE PROJECT AREA UNLESS THE DRAWINGS CALL FOR THE IRRIGATION SYSTEM TO BE REMOVED. THE OWNER AND NFE MAKE NO REPRESENTATIONS, WARRANTY OR GUARANTY AS TO THE LOCATION OF THE IRRIGATION SYSTEM. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PROTECT THE IRRIGATION SYSTEM DURING CONSTRUCTION ACTIVITIES.
COMPENSATION FOR MAINTAINING OR REPAIRING EXISTING IRRIGATIONS SYSTEMS SHALL BE CONSIDERED INCLUDED IN THE CONTRACT PRICE(S) UNLESS SPECIFIC IRRIGATION SYSTEM REPAIR ITEMS ARE INCLUDED IN THE ACCEPTED BID PROPOSAL.

SUB-SOIL CONDITIONS

ANY SOIL BORING PROVIDED BY THE OWNER AND/OR ENGINEER IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THIS INFORMATION IS NOT OFFERED AS EVIDENCE OF GROUND CONDITIONS THROUGHOUT THE PROJECT AND ONLY REFLECT THE GROUND CONDITIONS AT THE LOCATION OF THE BORING ON THE DATE THEY WERE TAKEN.

THE ACCURACY AND RELIABILITY OF THE SOIL LOGS AND REPORT ARE NOT WARRANTED OR GUARANTEED IN ANY WAY BY THE OWNER OR ENGINEER AS TO THE SUB-SOIL CONDITIONS FOUND ON THE SITE. THE CONTRACTOR SHALL MAKE THEIR OWN DETERMINATION AND SUB-SOIL INVESTIGATION AND SECURE OTHER SUCH INFORMATION AS THE CONTRACTOR CONSIDERS NECESSARY TO DO THE WORK PROPOSED AND IN PREPARATION OF THEIR BID.

SUBGRADE UNDERCUTTING AND PREPARTION

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REMOVE ANY AND ALL SOILS WHICH DO NOT CONFORM TO THE PLANS AND SPECIFICATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE A SUBGRADE IN CONFORMANCE WITH THE PROJECT PLANS AND/OR SPECIFICATIONS. THE MEANS AND METHODS USED TO ACHIEVE THE REQUIRÉD RESULT SHALL REST SOLELY WITH THE CONTRACTOR.

ANY AREAS OF UNDERCUTTING THAT RESULT IN ADDITIONAL OR EXTRA WORK BECAUSE THEY COULD NOT BE IDENTIFIED BY THE CONTRACTOR'S PRE-BID SITE OBSERVATION OR ARE NOT SET FORTH IN THE PLANS AND SPECIFICATIONS, SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER BEFORE ANY EXTRA WORK IS PERFORMED. THE CONTRACTOR SHALL MAKE A REQUEST FOR ANY ADDITIONAL COMPENSATION FOR THE UNDERCUTTING IN WRITING AND THE REQUEST SHALL CONFORM TO THE CONTRACT'S CHANGE ORDER PROVISIONS. STRUCTURE BACKFILL

STRUCTURAL BACKFILL SHALL BE PLACED IN CONFORMANCE WITH THE PROJECT PLANS, SPECIFICATIONS OR AS REQUIRED BY THE COMMUNITY, GOVERNMENT AGENCY OR UTILITY THAT HAS JURISDICTION OVER THE WORK. TRENCH BACKFILL

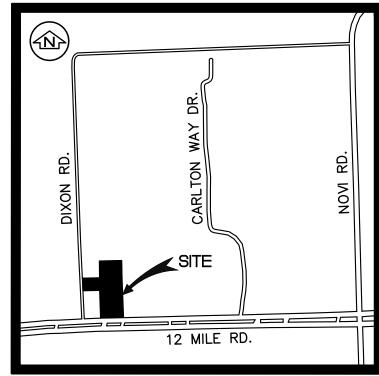
TRENCH BACKFILL SHALL BE PLACED IN CONFORMANCE WITH THE PLANS AND/OR SPECIFICATIONS. TRENCH BACKFILL SHALL ALSO BE INSTALLED IN CONFORMANCE WITH THE COMMUNITY REQUIREMENTS OR AGENCY/UTILITY GOVERNING SAID TRENCH CONSTRUCTION. IN THE CASE OF CONFLICTING REQUIREMENTS, THE MORE STRINGENT SHALL APPLY.

EARTH BALANCE / GRADING

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE WHETHER THE SITE EARTHWORK BALANCES OR NOT. ANY EXCESS CUT MATERIAL SHALL BE DISPOSED OF BY THE CONTRACTOR, IN A LIKE MANNER, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO IMPORT APPROVED FILL MATERIAL AND PLACE IT AS REQUIRED TO ATTAIN THE SITE GRADE AND COMPACTION REQUIREMENTS PER THE ENGINEER'S PLAN AND ALL APPLICABLE GOVERNMENTAL STANDARDS. THE ENGINEER AND OWNER MAKE NO REPRESENTATION AS TO THE QUANTITIES THAT MAY BE NEEDED TO CREATE A BALANCED EARTHWORK CONDITION OR THAT THE SITE EARTHWORK IS BALANCED.

SOIL EROSION / SEDIMENTATION CONTROL

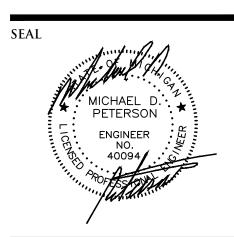
THE CONTRACTOR SHALL OBTAIN THE REQUIRED SOIL EROSION PERMIT AND SATISFY ALL REGULATORY REQUIREMENTS FOR CONTROLLING SOIL EROSION AND SEDIMENT TRANSPORT. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS. THE ENGINEER AND OWNER ARE NOT RESPONSIBLE FOR INSPECTION OR APPROVAL OF THE CONTRACTOR'S WORK IN CONNECTION WITH SATISFYING THE SOIL EROSION PERMIT REQUIREMENTS UNLESS SPECIFICALLY STATED IN THE CONTRACT DOCUMENTS.



LOCATION MAP



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

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

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

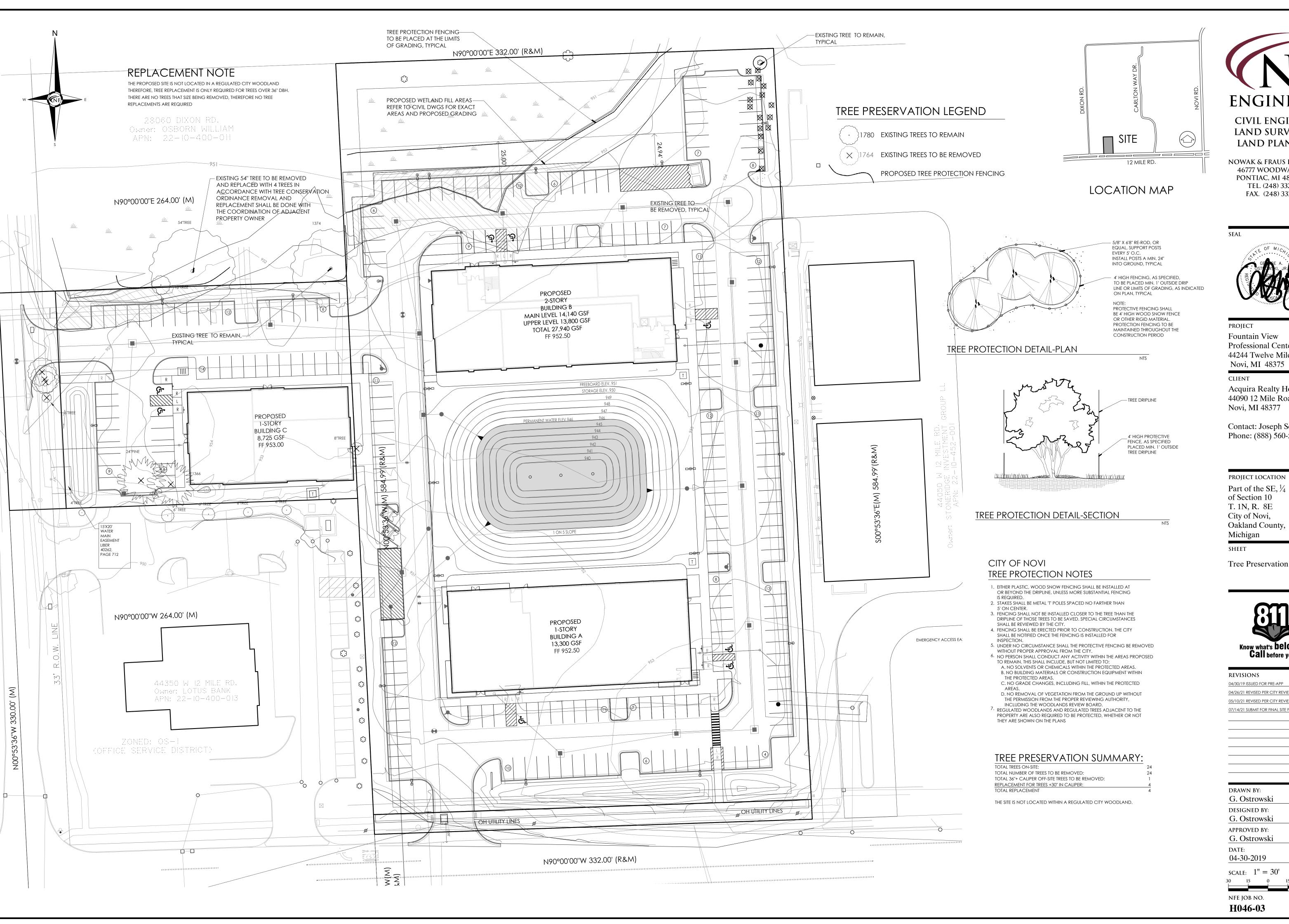
7-14-21 ISSUED FINAL SP REVIEW

PRAWN BY:
N. Naoum
DESIGNED BY:
M. Kurmas
PPROVED BY:
M. Peterson
DATE:

SCALE: N.T.S.

03-27-2019

NFE JOB NO. H046-03



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



Fountain View **Professional Center** 44244 Twelve Mile Road

Acquira Realty Holdings 44090 12 Mile Road

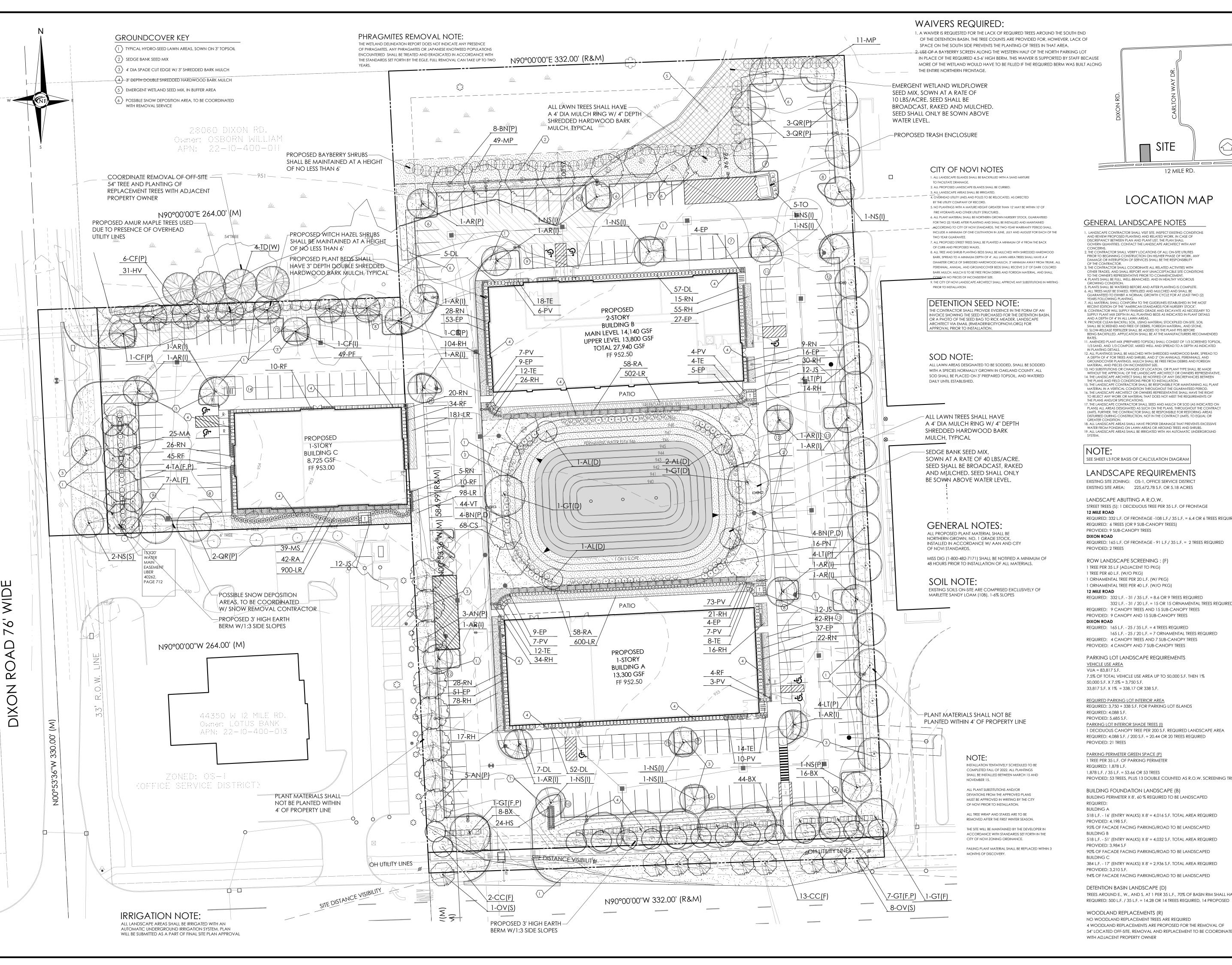
Contact: Joseph Schimizzi Phone: (888) 560-5540

PROJECT LOCATION Part of the SE, $\frac{1}{4}$ of Section 10 T. 1N, R. 8E City of Novi,

Tree Preservation Plan



REVISIO	ONS
04/30/19 ISS	SUED FOR PRE-APP
04/26/21 RE	VISED PER CITY REVIEW
05/10/21 RE	VISED PER CITY REVIEW
07/14/21 SU	BMIT FOR FINAL SITE PLAN REVIEW
DRAWN	BY:
	BY: trowski
	trowski
G. Ost	trowski
G. Ost DESIGN G. Ost	trowski IED BY: trowski
G. Ost DESIGN G. Ost APPROV	trowski IED BY: trowski
G. Ost DESIGN G. Ost APPROV	trowski IED BY: trowski YED BY:





LOCATION MAP

GENERAL LANDSCAPE NOTES

 LANDSCAPE CONTRACTOR SHALL VISIT SITE, INSPECT EXISTING CONDITIONS AND REVIEW PROPOSED PLANTING AND RELATED WORK, IN CASE OF DISCREPANCY BETWEEN PLAN AND PLANT LIST, THE PLAN SHALL OVERN QUANTITIES. CONTACT THE LANDSCAPE ARCHITECT WITH ANY CONCERNS.

2. THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL ON-SITE UTILITIES PRIOR TO BEGINNING CONSTRUCTION ON HIS/HER PHASE OF WORK, ANY DAMAGE OR INTERUPTION OF SERVICES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. 3. THE CONTRACTOR.

3. THE CONTRACTOR SHALL COORDINATE ALL RELATED ACTIVITIES WITH OTHER TRADES, AND SHALL REPORT ANY UNACCEPTACBLE SITE CONDITIONS TO THE OWNER'S REPRESENTATIVE PRIOR TO COMMENCEMENT.

4. PLANTS SHALL BE FULL, WELL-BRANCHED, AND IN HEALTHY VIGOROUS S. PLANTS SHALL BE WATERED BEFORE AND AFTER PLANTING IS COMPLETE.

 ALL TREES MUST BE STAKED, FERTILIZED AND MULCHED AND SHALL BE
GUARANTEED TO EXHIBIT A NORMAL GROWTH CYCLE FOR AT LEAST TWO (2) YEARS FOLLOWING PLANTING.

7. ALL MATERIAL SHALL CONFORM TO THE GUIDELINES ESTABLISHED IN THE MOST RECENT EDITION OF THE "AMERICAN STANDARDS FOR NURSERY STOCK".

8. CONTRACTOR WILL SUPPLY FINISHED GRADE AND EXCAVATE AS NECESSARY TO SUPPLY PLANT MIX DEPTH IN ALL PLANTING BEDS AS INDICATED IN PLANT DETAILS AND A DEPTH OF 4" IN ALL LAWN AREAS.

9. PROVIDE CLEAN BACKFILL SOIL, USING MATERIAL STOCKPILED ON-SITE, SOIL SHALL BE SCREENED AND FREE OF DEBRIS, FOREIGN MATERIAL, AND STONE.

KAIES.

11. AMENDED PLANT MIX (PREPARED TOPSOIL) SHALL CONSIST OF 1/3 SCREENED TOPSOIL,
1/3 SAND, AND 1/3 COMPOST, MIXED WELL AND SPREAD TO A DEPTH AS INDICATED
IN PLANTING DETAILS. 12. ALL PLANTINGS SHALL BE MULCHED WITH SHREDDED HARDWOOD BARK, SPREAD TO A DEPTH OF 4" FOR TREES AND SHRUBS, AND 2" ON ANNUALS, PERENNIALS, AND GROUNDCOVER PLANTINGS, MULCH SHALL BE FREE FROM DEBRIS AND FOREIGN MATERIAL, AND PIECES ON INCONSISTENT SIZE. MAIERIAL, AND PIECES ON INCONSITENT SIZE.

13. NO SUBSTITUTIONS OR CHANGES OF LOCATION, OR PLANT TYPE SHALL BE MADE
WITHOUT THE APPROVAL OF THE LANDSCAPE ARCHITECT OR OWNERS REPRESENTATIV.

14. THE LANDSCAPE ARCHITECT SHALL BE NOTIFIED OF ANY DISCREPANCIES BETWEEN
THE PLANS AND FIELD CONDITIONS PRIOR TO INSTALLATION. 15. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL PLANT MATERIAL IN A VERTICAL CONDITION THROUGHOUT THE GUARANTEED PERIOD.

16. THE LANDSCAPE ARCHITECT OR OWNERS REPRESENTATIVE SHALL HAVE THE RIGHT TO REJECT ANY WORK OR MATERIAL THAT DOES NOT MEET THE REQUIREMENTS OF THE PLANS AND/OR SPECIFICATIONS.

17. THE LANDSCAPE CONTRACTOR SHALL SEED AND MULCH OR SOD (AS INDICATED ON

PLANS) ALL AREAS DESIGNATED AS SUCH ON THE PLANS, THROUGHOUT THE CONTRACT LIMITS. FURTHER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING AREAS DISTURBED DURING CONSTRUCTION, NOT IN THE CONTRACT LIMITS, TO EQUAL OR 18. ALL LANDSCAPE AREAS SHALL HAVE PROPER DRAINAGE THAT PREVENTS EXCESSIVE WATER FROM PONDING ON LAWN AREAS OR AROUND TREES AND SHRUBS.

19. ALL LANDSCAPE AREAS SHALL BE IRRIGATED WITH AN AUTOMATIC UNDERGROUND

SEE SHEET L3 FOR BASIS OF CALCULATION DIAGRAM

LANDSCAPE REQUIREMENTS EXISTING SITE ZONING: OS-1, OFFICE SERVICE DISTRICT EXISTING SITE AREA: 225,672.78 S.F. OR 5.18 ACRES

STREET TREES (S): 1 DECIDUOUS TREE PER 35 L.F. OF FRONTAGE REQUIRED: 332 L.F. OF FRONTAGE -108 L.F./ 35 L.F. = 6.4 OR 6 TREES REQUIRED REQUIRED: 6 TREES (OR 9 SUB-CANOPY TREES) PROVIDED: 9 SUB-CANOPY TREES

REQUIRED: 165 L.F. OF FRONTAGE - 91 L.F./ 35 L.F. = 2 TREES REQUIRED

ROW LANDSCAPE SCREENING: (F) 1 TREE PER 35 L.F (ADJACENT TO PKG) 1 TREE PER 60 L.F. (W/O PKG) 1 ORNAMENTAL TREE PER 20 L.F. (W/ PKG) 1 ORNAMENTAL TREE PER 40 L.F. (W/O PKG)

REQUIRED: 332 L.F. - 31 / 35 L.F. = 8.6 OR 9 TREES REQUIRED 332 L.F. - 31 / 20 L.F. = 15 OR 15 ORNAMENTAL TREES REQUIRED REQUIRED: 9 CANOPY TREES AND 15 SUB-CANOPY TREES PROVIDED: 9 CANOPY AND 15 SUB-CANOPY TREES REQUIRED: 165 L.F. - 25 / 35 L.F. = 4 TREES REQUIRED

REQUIRED: 4 CANOPY TREES AND 7 SUB-CANOPY TREES PROVIDED: 4 CANOPY AND 7 SUB-CANOPY TREES PARKING LOT LANDSCAPE REQUIREMENTS

7.5% OF TOTAL VEHICLE USE AREA UP TO 50,000 S.F. THEN 1% 50,000 S.F. X 7.5% = 3,750 S.F. 33,817 S.F. X 1% = 338.17 OR 338 S.F.

REQUIRED PARKING LOT INTERIOR AREA REQUIRED: 3,750 + 338 S.F. FOR PARKING LOT ISLANDS

PARKING LOT INTERIOR SHADE TREES (I) 1 DECIDUOUS CANOPY TREE PER 200 S.F. REQUIRED LANDSCAPE AREA REQUIRED: 4,088 S.F. / 200 S.F. = 20.44 OR 20 TREES REQUIRED

1 TREE PER 35 L.F. OF PARKING PERIMETER REQUIRED: 1,878 L.F. 1,878 L.F. / 35 L.F. = 53.66 OR 53 TREES

PROVIDED: 53 TREES, PLUS 13 DOUBLE COUNTED AS R.O.W. SCREENING TREES BUILDING FOUNDATION LANDSCAPE (B)

BUILDING PERIMETER X 8', 60 % REQUIRED TO BE LANDSCAPED 518 L.F. - 16' (ENTRY WALKS) X 8' = 4,016 S.F. TOTAL AREA REQUIRED

95% OF FACADE FACING PARKING/ROAD TO BE LANDSCAPED 518 L.F. - 51' (ENTRY WALKS) X 8' = 4,032 S.F. TOTAL AREA REQUIRED

90% OF FACADE FACING PARKING/ROAD TO BE LANDSCAPED 384 L.F. - 17' (ENTRY WALKS) X 8' = 2,936 S.F. TOTAL AREA REQUIRED

DETENTION BASIN LANDSCAPE (D) TREES AROUND E., W., AND S. AT 1 PER 35 L.F., 70% OF BASIN RIM SHALL HAVE SHRUBS

WOODLAND REPLACEMENTS (R) NO WOODLAND REPLACEMENT TREES ARE REQUIRED 4 WOODLAND REPLACEMENTS ARE PROPOSED FOR THE REMOVAL OF 54" LOCATED OFF-SITE. REMOVAL AND REPLACEMENT TO BE COORDINATED WITH ADJACENT PROPERTY OWNER



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 Acquira Realty Holdings 44090 12 Mile Road Novi, MI 48377

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

PROJECT LOCATION Part of the SE, $\frac{1}{4}$ of Section 10 T. 1N, R. 8E City of Novi, Oakland County,

Michigan SHEET

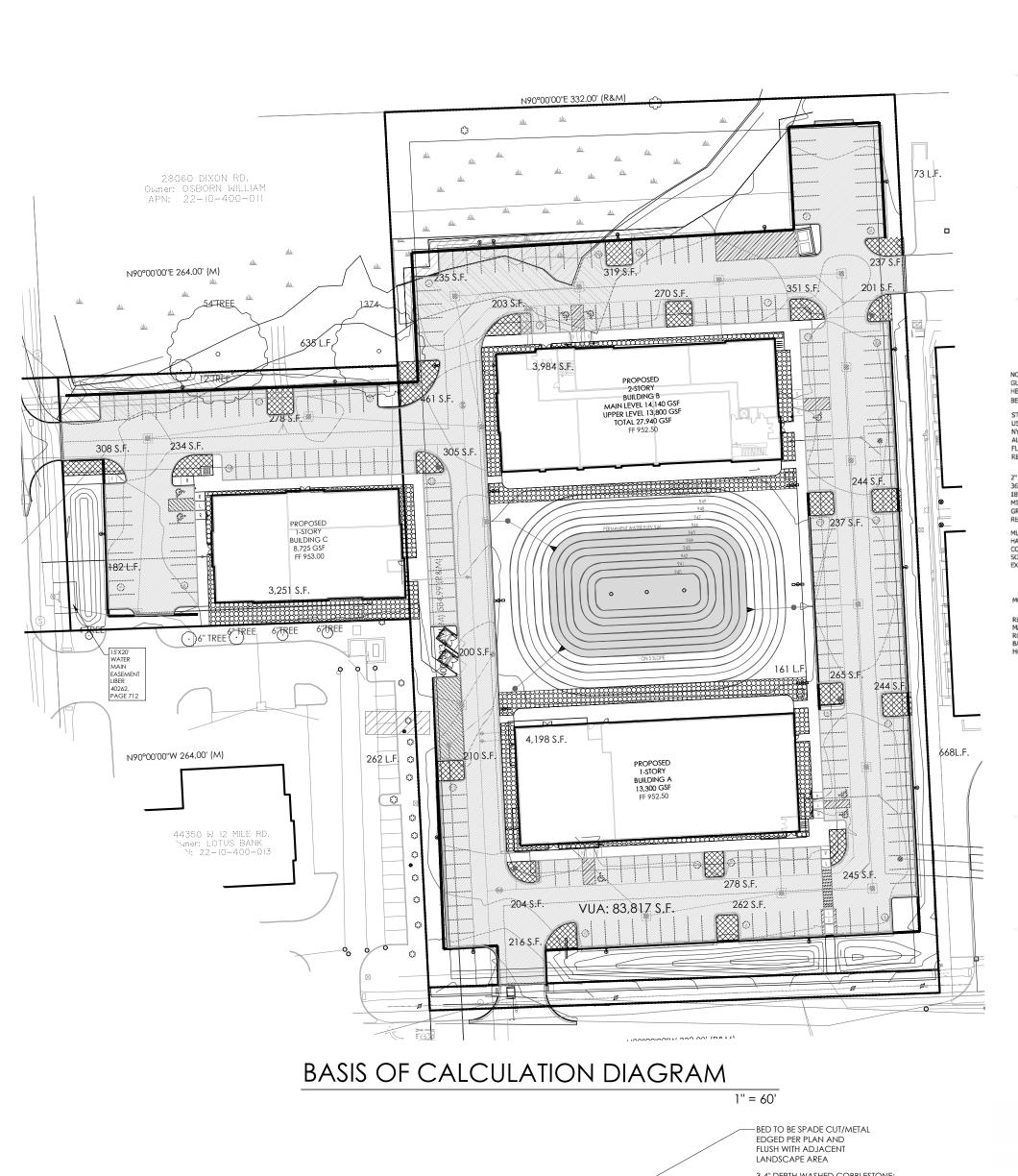
Landscape Plan

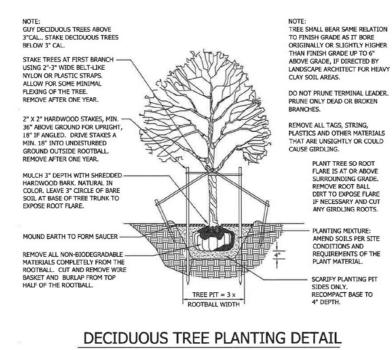


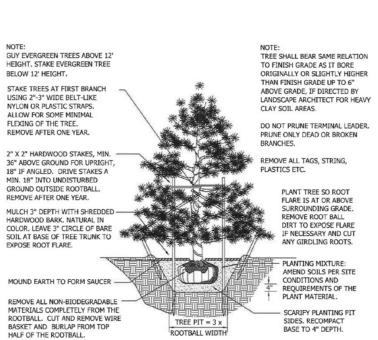
REVISION	S
04/30/19 ISSUED	FOR PRE-APP
04/23/21 REVISE	ED PER CITY REVIEW
05/10/21 REVISE	ED PER CITY REVIEW
07/14/21 SUBMI	T FOR FINAL SITE PLAN REVIEW
DRAWN B'	Y:
drawn b' G. Ostro	
G. Ostro	owski
G. Ostro	owski O BY:
G. Ostro Designed G. Ostro	owski O BY: owski
G. Ostro Designed G. Ostro Approved	owski O BY: Owski O BY:
	owski O BY: Owski O BY:

SCALE: 1'' = 30'

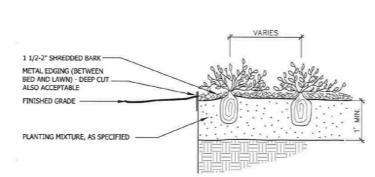
H046-03







EVERGREEN TREE PLANTING DETAIL



STAKING/GUYING LOCATION

GUYING DETAIL

TRANSFORMER/ IRRIGATION BOX (TYP.) —

SHRUB (TYP.) ____

2"-3" WIDE BELT-LIKE NYLON OR

PERENNIAL PLANTING DETAIL

TREE STAKING DETAIL

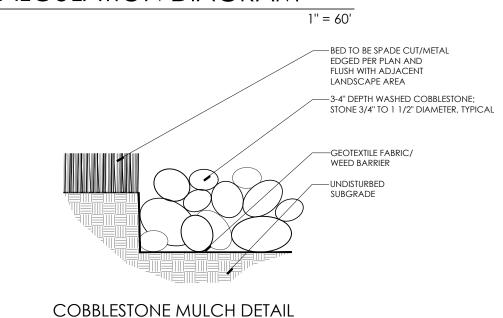
TRANSFORMER SCREENING DETAIL

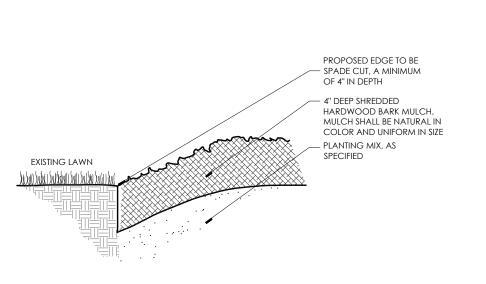
ORIENT STAKING/GUYING TO PREVAILING WINDS, EXCEPT ON SLOPES GREATER THAN 3:1 ORIENT TO SLOPE.

FOR ALL PLANTS WITHIN EACH GROUPING OR

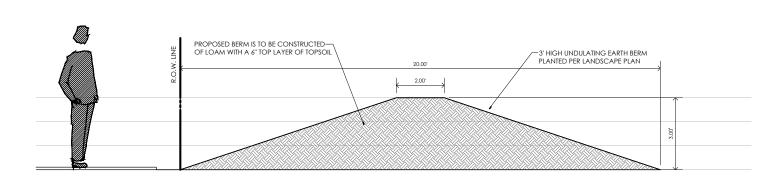
- 2"-3" WIDE BELT-LIKE NYLON OR

STAKING DETAIL
STAKES AS SPECIFIED 3 PER TREE









POWDER COATED BIKE LOOP. COLOR SHALL BE BLACK.

HOOP BIKE RACK

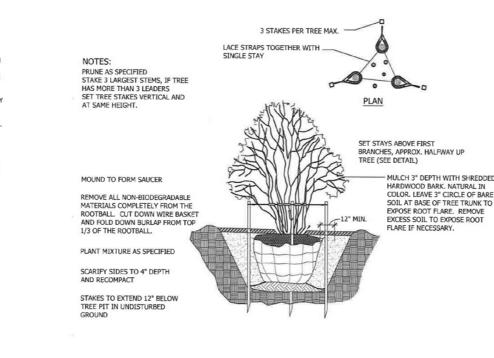
4" CONC. SLAB THICKENED TO ACCEPT BIKE RACK INSTALLATION ON 4" COMP. SAND AS SHOWN.

(4) EXPANSION JOINT W/ SEALANT- SEE SPECS.

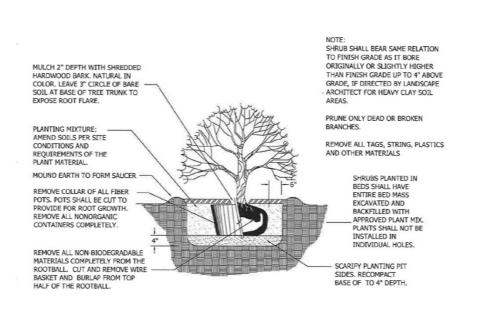
MADIKAX MODEL NO. U190-IG W/TGIC POWDER COAT FINISH OR APPROVED SUBSTITUTE.

AVAILABLE THRU: ENGAN-TOOLEY- DOYLE AND ASSOC., INC. (800) 722-8546

TYPICAL BERM CROSS-SECTION



MULTI-STEM TREE PLANTING DETAIL



SHRUB PLANTING DETAIL

PRAIRIE SEED MIX PLANTING PROCEDURES SOIL PREPARATION PROPER SOIL PREPARATION IS CRITICAL TO THE SUCCESS OF ANY PRAIRIE PLANTING. REMOVE EXISTING VEGETATION BY HERBICIDING, CULTIVATING, OR A COMBINATION OF THE TWO.

A) HERBICIDING. USE A NON-PERSISTENT HERBICIDE SUCH AS "ROUND-UP". FOLLOW MANUFACTURER'S INSTRUCTIONS.

-APPLY ONCE IN PREVIOUS FALL, OR IN MID-SPRING, FOR SPRING PLANTINGS. -APPLY ONCE IN EARLY FALL FOR FALL PLANTING.
-TILL SOIL AND PLANT. REMOVE DEAD SOD TO CREATE SMOOTH SEEDBED. B) CULTIVATION. CULTIVATE 2-3 TIMES TO KILL GRASS AND TO WORK UP SOIL. REMOVE DEAD SOD TO CREATE SMOOTH SEEDBED. C) SOD REMOVAL. USE A SOD-CUTTER TO REMOVE THE SOD, AND THEN TILL THE EXPOSED SOIL TO PREPARE THE SEEDBED.

A) HERBICIDING. MOW IN EARLY SPRING, THEN SPRAY 3 TIMES. ONCE IN MID TO LATE SPRING, ONCE IN MID SUMMER, & ONCE IN EARLY FALL. TILL SOIL AFTER FINAL SPRAYING AND PLANT, OR USE NO-TILL SEEDER AND PLANT DIRECTLY INTO DEAD SOD. B) CULTIVATION, CULTIVATE 4-6 INCHES DEEP ALL SEASON LONG, EVERY TWO WEEKS TO KILL RHIZOMATOUS PERENNIAL WEEDS. AFTER THE FINAL CULTIVATION LATE IN THE YEAR A DORMAN FALL SEEDING CAN OCCUR. IF FURTHER WEED CONTROL IS DESIRED. THE PLANTING CAN BE DON IN THE FOLLOWING SPRING, ALLOWING FOR LIGHT SURFACE CULTIVATION TO KILL WEEDS PRIOR TO

SPRING PLANTING.

EXISTING AGRICULTURAL FIELDS

DO NOT PLANT FIELDS TREATED WITH ATRAZINE WITHIN THE LAST 2 YEARS.

A) HERBICIDING. SPRAY ONCE IN MID-SPRING FOR SPRING PLANTING, OR ONCE IN EARLY FALL AFTER REMOVAL OF CROP FOR FALL PLANTING, TILL SOIL AND PLANT, OR USE NO-TILL SEEDER AND PLANT DIRECTLY INTO SOIL WITH NO SOIL TILLAGE. B) CULTIVATION. WORK UP SEEDBED AS FOR ANY OTHER CROP. IF RHIZOMATOUS PERENNIALS ARE PRESENT, WORK UP SOIL ALL YEAR, SAME AS OLD FIELD. AFTER THE EXISTING VEGETATION IS REMOVED, THE SEEDBED SHOULD BE PREPARED BY TILLING OR DISKING, AND THEN DRAGGING OR RAKING SMOOTH. PROPERLY PREPARED SEEDBEDS WILL BE SMOOTH AND FREE OF LARGE CLUMPS. IF WORKING ON HEAVY CLAY SOILS LOW IN ORGANIC MATTER, THE ADDITION OF 2-3 INCHES OF CLEAN TOPSOIL GREATLY IMPROVED THE SEEDBED. GERMINATION AND SEEDLING SURVIVAL WILL BE ENHANCED.

PLANTING

FALL PLANTING - PLANT FROM LATE SEPTEMBER TO FREEZE-UP. SEED OVER WINTERS AS IT WOULD IN NATURE AND COMES UP IN SPRING ON ITS OWN SCHEDULE, WHEN CONDITIONS ARE RIGHT. a) RECOMMENDED FOR PLANTING ON SANDY SOILS BECAUSE SEED GERMINATES WHEN SOIL MOISTURE LEVELS

FARLY SPRING PLANTING - PLANT FROM MARCH TO APRIL 1) FORBS WILL GERMINATE BETTER THAN IF PLANTED IN LATE SPRING.) IF USING WET STRATIFIED SEED (SEE PRAIRIE SEED PROPAGATION), WATER IS NOT CRITICAL. 3) GRASS SEED WILL GERMINATE BETTER THAN IF PLANTED IN FALL.

4) SANDY SOILS SHOULD BE PLANTED AS SOON AS POSSIBLE IN SPRING IF IT IS NOT POSSIBLE TO PLANT IN FALL. LATE SPRING PLANTING - PLANT FROM MAY TO JUNE

a) MORE TIME FOR SOIL PREPARATION. THIS IS IMPORTANT FOR PLANTING ON HEAVY SOILS. b) LONGER TIME FOR WEED CONTROL. c) BEST TIME TO PLANT WARM SEASON GRASSES.

PLANTING METHODS

MULCH THE PLANTING.

1) MIX SEED WITH A MUCH LARGER VOLUME OF SLIGHTLY MOIST SAWDUST, VERMICULITE, PERLITE, OR SAND. DILUTING THE SEED ASSURES GOOD SEED DISTRIBUTION.

2) PREPARE SOIL FOR PLANTING BY TILLING, RAKING, OR BY DRAGGING WITH A DRAG OR A SECTION OF CHAIN-LINK FENCE. THIS WILL LOOSEN THE SOIL TO ALLOW INCORPORATION OF THE SEED INTO THE SURFACE SOIL. 3) INOCULATE LEGUME SEEDS PRIOR TO PLANTING. PLACE SEED IN BOWL AND MOISTEN WITH WATER UNTIL JUST DAMP. ADD INOCULUM AND MIX THOROUGHLY. THE INOCULUM IS A BENEFICIAL BACTERIUM THAT WORKS WITH THE PLANT ROOTS

AMIX INOCULATED LEGUME SEEDS WITH WILDFLOWER SEEDS. THESE CAN BE MIXED TOGETHER WITH THE PRAIRIE GRASS SEED TO FORM A UNIFORM MIX, OR CAN BE PLANTED IN DRIFTS WITHIN THE GRASSES. GRASS SEED SHOULD BE PLANTED ACROSS THE ENTIRE AREA. THE GRASSED HELP SQUEEZE OUT WEEDS, WHILE THE FLOWERS ALONE USUALLY CANNOT.

5) SOW SEEDS USING ONE-HALF OF THE SEED MIX MATERIAL TO COVER THE ENTIRE AREA. THEN SOW THE OTHER HALF BY

WALKING PERPENDICULAR TO THE FIRST LINE OF TRAVEL. THIS ENSURES GOOD COVERAGE ACROSS THE ENTIRE AREA. 6) RAKE SEED IN, OR DRAG LIGHTLY. $\dot{\gamma}$ firm with a roller or cultipacker, or drive across seeded area with tractor tires or vehicle tires. Never 8) COVER WITH MULCH OR PLANT A NURSE CROP. ON STEEP SLOPES, IT IS OFTEN BENEFICIAL TO PLANT A NURSE CROP AND

-USE SEED-FREE MULCH, SUCH AS MARSH HAY, OR CLEAN WINTER WHEAT STRAW. OAT STRAW IS OK, BUT HIGHER -A MECHANICAL STRAW CHOPPER AND BLOWER MAKE THE STRAW LESS SUSCEPTIBLE TO REMOVAL BY WIND. -SOIL SURFACE SHOULD BE COVERED, BUT NOT BURIED (APPROX. 1 INCH DEPTH). SOME SOIL SHOULD JUST SHOW -ON SLOPES OR ON WINDY SITED, STABILIZE HAY BY COVERING IT WITH NETTING AND STAKING IT DOWN.

MULCH -A CLEAN STRAW MULCH HELPS TO HOLD MOISTURE IN THE SOIL, REDUCE SOIL TEMPERATURES, AND PREVENT EROSION.

NURSE CROPS - NURSE CROPS ARE ANNUALS OR SHORT-LIVED PERENNIALS THAT PROVIDE RAPID SOIL STABILIZATION, AND HELP KEEP WEEDS SOWN WITHOUT COMPETING WITH THE PRAIRIE SEEDLINGS. NURSE CROPS CAN BE PLANTED AT THE SAME TIME AS THE PRAIRIE SEED. THEY CAN BE MIXED WITH THE PRAIRIE SEED AND HAND-BROADCASTED TOGETHER.

ON LARGE PLANTINGS, OATS CAN BE DRILLED IN PRIOR TO, OR AFTER THE PRAIRIE SEEDING. SELECTED NURSE CROPS -OATS: APPLY AT A RATE OF 50 POUNDS/ACRE (20Z/100 SQ FT) IN SPRING PLANTINGS. USE 100 POUNDS/ACRE (4 OZ/100 SQ FT) IN MID-AUTUMN PLANTINGS, AS IT WILL WINTERKILL AND HEAVIER SEEDING RATES ASSURE BETTER SOIL HOLDING ABILITY
-ANNUAL RYE: PLANT AT A RATE OF 5 POUNDS/ACRE.

PLANTING IN PROBLEM AREAS SANDY SOILS: THESE SOILS HAVE LITTLE MOISTURE-HOLDING CAPACITY. IT IS STRONGLY RECOMMENDED THAT MULCH OR A NURSE CROP BE USED TO CONSERVE MOISTURE, UNLESS THE AREA IS TO BE WATERED REGULARLY.

CLAY SOILS: MULCH IS CRITICAL TO SEEDLING SURVIVAL.

-CANADA WILD RYE: A SHORT-LIVED PERENNIAL PRAIRIE GRASS THAT GROWS RAPIDLY. APPLY AT A RATE OF 3-4 POUNDS/ACRE.

1) PREVENTS SOIL FROM DRYING AND CRACKING WHICH DAMAGES TENDER SEEDLING ROOTS. 2) MULCH IS BETTER THAN A COVER CROP. IT IS DIFFICULT FOR ROOTS TO PENETRATE THE HARD SOIL

POST PLANTING MAINTENANCE

REGULAR WATERING IN THE FIRST TWO MONTHS OF A SPRING OR SUMMER PLANTING IS THE SINGLE MOST IMPORTANT FACTOR IN SUCCESS. WATER ONLY DURING THE MORNING, NEVER AT NIGHT, AS THIS ENCOURAGES FUNGAL DISEASES THAT CAN KILL YOUNG SEEDLINGS. WEED CONTROL

IF MULCH IS USED, CONTROL ANNUAL WEEDS BY MOWING 4-6 INCHES IN THE FIRST YEAR. WEEDS CAN OUT COMPETE THE PRAIRIE SEEDLINGS, BY DEPRIVING THEM OF WATER, LIGHT, AND SPACE. DO NOT LET WEEDS GET HIGHER THAN 12 TO 14 INCHES BEFORE MOWING. CUTTING DOWN TALL WEEDS CAN SMOTHER THE SMALL SEEDLINGS BELOW. IF A NURSE CROP IS USED, DO NOT NOW IN THE FIRST YEAR, UNLESS WEEDS BECOME A SERIOUS PROBLEM. IF WEEDS ARE DENSE AND BEGIN TO GROW UP TO 16 INCHES CUT THEM DOWN ALONG WITH THE NURSE CROP TO PREVENT SHADING OUT OF PRAIRIE SEEDLINGS.

MOW TO 12 TO 18 INCHES IN EARLY SUMMER IF WEEDS ARE A PROBLEM. MOWING LOWER COULD HARM YOUR PLANTS,

MOW AND RAKE, OR BURN, EVERY OTHER YEAR. PLANTINGS CAN BE DIVIDED INTO TWO SECTIONS, AND BURNED IN ALTERNATING YEARS.
BURN, OR MOW AND RAKE IN MID-SPRING WHEN LAWNS HAVE GREENED UP AND BEGUN ACTIVE GROWTH. THIS HELPS TO CONTROL UNDESIRABLE COOL SEASON GRASSES AND REMOVES EXCESS PLANT LITTER, ENCOURAGING SOIL WARMING AND EARLIER PLANT GROWTH.



LOCATION MAP

EMERGENT WETLAND WILDFLOWER MIX

*CONTAINS AT LEAST 10 WILDFLOWERS AND 4 GRASSES GRASSES/SEDGES WETLAND SEDGES SWAMP ASTER JOE PYE WEED CANADA WILD RYE DARK GREEN BULRUSH BONESET COW PARSNIP WOOL GRASS SWAMP ROSE MALLOW INDIAN GRASS PRAIRIE CORD GRASS BLUE FLAG IRIS GREAT BLUE LOBELIA CARDINAL FLOWER PICKERAL WEED

WATER PARSNIP OHIO GOLDENROD SWAMP GOLDENROD BLUE VERVAIN

RECOMMENDED SEEDING RATE: 10 LBS/ACRI SEED MIX AVAILABLE: NATIVESCAPE, LLC PO BOX 122 MANCHESTER, MI 48158

SEDGE BANK SEED MIX

*CONTAINS 10 NATIVE GRASSES AND 2 TEMPORARY GRASSES 30% NATIVE GRASSES 70% TEMPORARY GRASSES COSMOS SEDGE SEED OATS AMERICAN SLOUGH GRASS FRINGED SEDGE ANNUAL RYE

LRID SEDGE FOX SEDGE CREEPING SPIKE RUSH FOWL MANNA GRASS COMMON RUSH HARDSTEM BULRUSH GREEN BULRUSH WOOL GRASS SOFT-STEM BULRUSH GIANT BUR REED

RECOMMENDED SEEDING RATE: SEED MIX AVAILABLE:

NATIVESCAPE, LLC PO BOX 122 MANCHESTER, MI 48158 T 517.456.9696

PLANT SCHEDULE

CUPPLANT

KEY	QTY	BOTANICAL/COMMON NAME	SIZE	SPACING	ROOT	COMMENT	UNIT/TOTAL COSTS
TREES	8	Acer nigrum 'Greencolumn'	2" CAI	CEE DI ANI	D.O.D.	FULL MATCHED HEADS	¢4007¢3 300
AN AR	13	Green Column Black Maple Acer rubrum	3" CAL	SEE PLAN	B&B B&B	FULL, MATCHED HEADS FULL, MATCHED HEADS	\$400/\$3,200
		Red Maple Amelanchier laevis		-		·	\$400/\$5,200
AL	11	Allegheny Serviceberry Betula nigra	6-7' HT	SEE PLAN	B&B	CLUMP FORM, 3 CANES	\$375/\$2,750
BN	16	River Birch Cercis canadensis	14' HT	SEE PLAN	B&B	CLUMP FORM, 3 CANES	\$400/\$6,400
CC	15	Eastern Redbud Cornus florida	2.5" CAL	SEE PLAN	B&B	FULL, MATCHED HEADS	\$375/\$3,750
CF	9	Flowering Dogwood	2.5" CAL	SEE PLAN	B&B	FULL, MATCHED HEADS	\$375/\$2,250
GT	11	Gledistsia triacanthos 'Street Keeper' Street Keeper Honey Locust	3" CAL	SEE PLAN	B&B	FULL, MATCHED HEADS	\$400/\$4,400
LT	12	<u>Liriodendron tulipifera</u> 'Emerald City' Emerald City Tulip Tree	3" CAL	SEE PLAN	B&B	FULL, MATCHED HEADS	\$400/\$4,800
NS	11	Nyssa sylvatica Black Tupelo	3" CAL	SEE PLAN	B&B	FULL, MATCHED HEADS	\$400/\$4,400
OV	9	Ostrya virginiana American Hophornbeam	2.5" CAL	SEE PLAN	B&B	FULL, MATCHED HEADS	\$375/\$2,250
QR	8	Quercus rubra Red Oak	3" CAL	SEE PLAN	B&B	FULL, MATCHED HEADS	\$400/\$3,200
TD	4	Taxodium disticum Bald Cypress	3" CAL	SEE PLAN	B&B	FULL, MATCHED HEADS	\$400/\$1,600
TA	4	Tilia americana 'McSentry' American Sentry Linden	3" CAL	SEE PLAN	B&B	FULL, MATCHED HEADS	\$400/\$1,600
SHRUBS							
ВХ	68	Buxus x 'Wintergreen' Wintergreen Boxwood	30" HT	30" OC	B&B	MAINTAIN AS HEDGE	\$50/\$3,400
CS	68	<u>Cornus sericea</u> 'Baileyii' Bailey Red Twig Dogwood	36" HT	36" OC	B&B		\$50/\$3,400
DL	114	<u>Diervilla Ionicera</u> 'Michigan Sunset' <u>Michigan Sunset</u> Bronzeleaf Honeysuckcle	24" HT	30" OC	CONT		\$50/\$5,750
HV	31	Hamamelis vernalis Vernal Witch Hazel	48" HT	6' OC	B&B	MAINTAIN AT 6' HT MIN	\$50/\$1,550
MA	25	Mahonia aquifolium Oregon Grape Holly	30" HT	30" OC	B&B	MAINTAIN AS HEDGE	\$50/\$1,250
MP	60	Myrica pennsylvanica Bayberry	48" HT	8' OC	B&B	MAINTAIN AT 8' HT MIN	\$50/\$3,000
PN	16	Physocarpus opulus 'Diablo' Diablo Ninebark	30" HT	30" OC	B&B		\$50/\$800
PF	49	Potentilla fruticosa 'Gold Drop' Gold Drop Potentilla	24" HT	30" OC	B&B		\$50/\$2,900
RA	158	Ribes alpinum 'Green Mound' Green Mound Currant	30" HT	30" OC	B&B	MAINTAIN AS HEDGE	\$50/\$7,900
RN	146	Rosa 'Nearly Wild' Nearly Wild Rose	3 GAL	30" OC	CONT		\$50/\$7,600
TE	68	Taxus x m. 'Everlow' Everlow Yew	18" HT	24" OC	B&B	MAINTAIN AS HEDGE	\$50/\$3,200
TO	5	Thuja occidntalis 'Nigra' Dark Green Arborvitae	5' HT	48" OC	B&B		\$50/\$250
VT	44	Viburnum trilobum 'Compactum' Compact American Cranberrybush	36" HT	36" OC	B&B		\$50/\$2,200
PERENN	ials/grou	NCOVERS	I	<u> </u>			
EP	215	Echinacea purpurea 'Pixie Meadowbrite' Pixire Meadowbrite Coneflower	1 GAL	15" OC	CONT	WELL-ROOTED	\$15/\$3,240
HS	24	Hemerocallis 'Stella D'Oro' Stella D'Oro Daylily	2 GAL	18" OC	CONT	WELL-ROOTED	\$15/\$360
LR	2,281	<u>Liriope spicata</u> <u>Creeping Lilyturf</u>	1 GAL	15" OC	CONT	TRIANGULAR SPACING	\$7.50/\$17,108
MS	39	Miscanthus sinensis 'Morning Light' Morning Light Maiden Grass	5 GAL	SEE PLAN	CONT	WELL-ROOTED	\$15/\$585
PV	117	Panicum virgatum 'Heavy Metal' Heavy Metal Switch Grass	3 GAL	30" OC	CONT	WELL-ROOTED	\$15/\$1,815
RH	338	Rhus aromatica Fragrant Sumac	2 GAL	24" OC	CONT	TRIANGULAR SPACING	\$15/\$5,340
RF	111	Rudbeckia fulgida 'Goldstrum' Black-Eyed Susan	2 GAL	24" OC	CONT	WELL-ROOTED	\$15/\$1,380
MISCELL	.ANEOUS	·	1			1	
	4,941	HYDRO-SEED AND MULCH ON 3" FINE GRAI	DED TOPSOIL	SY			\$3/\$14,823
	1,703	SEDGE BANK SEED MIX		SY			\$5/\$8,515
	364	EMERGENT WETLAND WILDFLOWER SEED M	IX	SY			\$5/\$1,820
	135	3" DOUBLE SHREDDED HARDWOOD BARK N	MULCH	CY			\$35/\$4,725
		1		l	1	1	L

TYPICAL SEEDED LAWN MIX:

IRRIGATION SYSTEM, COMPLETE

ALL LAWN AREAS DESIGNATED TO BE SEEDED, SHALL BE HYDROSEEDED WITH TYPICAL DROUGHT TOLERANT, DURABLE BLENDED SEED MIX, AT A RATE OF 220 LBS PER ACRE MIX IS COMPRISED OF 30% NITE HAWK PERENNIAL RYE 30% KENTUCKY BLUEGRASS 20% CREEPING RED FESCUE 10% MERIT KENTUCKY BLUEGRASS

10% NEWPORT KENTUCKY BLUEGRASS

GENERAL SEED NOTE:

FALL: AUGUST 15 TO OCTOBER 15

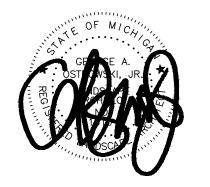
ALL LAWN AREAS DESIGNATED TO BE SEEDED, SHALL BE HYDRO-SEEDED WITH SPECIFIED BLENDS, AND STABILIZED WITH WOOD CELLULOSE FIBER MULCH (2,000 LBS PER ACRE) . IN AREAS SUBJECT TO EROSION, SEEDED LAWN SHALL BE FURTHER STABILIZED WHERE NECESSARY WITH BIODEGRADABLE EROSION BLANKET AND STAKED UNTIL ESTABLISHED. ALL SEED SHALL BE APPLIED OVER A MINIMUM 3" PREPARED TOPSOIL, AND SHALL BE KEPT MOIST AND WATERED DAILY UNTIL ESTABLISHED. SEEDING INSTALLATION SHALL OCCUR ONLY: SPRING: APRIL1 TO JUNE1

LS

\$25,000



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

Acquira Realty Holdings 44090 12 Mile Road Novi, MI 48377

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

PROJECT LOCATION

Part of the SE, $\frac{1}{4}$ of Section 10 T. 1N, R. 8E City of Novi, Oakland County, Michigan

SHEET

Landscape Notes

and Details



	Gall before you dig.
REVISI	ONS
04/30/19 1	SSUED FOR PRE-APP
04/23/21 R	REVISED PER CITY REVIEW
05/10/21 R	REVISED PER CITY REVIEW
07/14/21 S	SUBMIT FOR FINAL SITE PLAN REVIEW
DRAW	N BY:
G. Os	strowski
DESIG	NED BY:
G. Os	strowski
APPRO	VED BY:
G. Os	strowski

04-30-2019 SCALE: 1'' = 30'

NFE JOB NO. SHEET NO. H046-03

Symbol	Label	Qua ntity	Manufacturer	Description	Lamp	Mounting Height
	Α	6	U.S. ARCHITECTURAL LIGHTING	LED AREA LUMINAIRE EMBEDDED WITH WIRELESS CONTROLS FOR SECURITY PURPOSES	LED	25'-0"
	Е	5	U.S. ARCHITECTURAL LIGHTING	LED AREA LUMINAIRE EMBEDDED WITH WIRELESS CONTROLS FOR SECURITY PURPOSES	LED	25'-0"
	Н	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	1						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min	Avg/Ma
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.

SIGHT DISTANCE IS CLEAR PAST SEDGEWICK DRIVE INTERSECTION. 900+ FEET.

T/P 944.66

SANITARY MH -

76'

RIM 951.25 8" N. INV 935.55 8" S. INV 935.55

SIGHT DISTANCE IS CLEAR TO 12 MILE

ROAD INTERSECTION. 395+ FEET.

BENCHMARK ARROW ON HYDRAN ELEVATION 954.21 CENTERLINE DRIVE

WETLANDS

Shed top too 100 too too to to MAIN 1 to 1 9501.28 to 1 *+6.49.769 to 1.949.40 *+0.1 to 8" to 1 IN to 1 948-102+0-102 to 2 to 8 CTE. N. to

11/1//

General Note

- 1. SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.
- 2. SEE LUMINAIRE SCHEDULE FOR LIGHT LOSS FACTOR. 3. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: 0' - 0".
- 4. HOURS OF OPERATION: FALL AND WINTER 7:00 PM TO 9:00 AM; SPRING AND SUMMER 9:00 PM TO 8:00
- 5. ELECTRICAL SERVICE TO LIGHT FIXTURES SHALL BE PLACED UNDERGROUND.
- 6. FLASHING LIGHT SHALL NOT BE PERMITTED.
- 7. ONLY NECESSARY LIGHTING FOR SECURITY PURPOSES & LIMITED OPERTIONS SHALL BE PERMITTED.

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 ANDLIGHTING QUALITY COMPLIANCE.

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

Ordering Note

OPTICAL HOUSING

rotatable in 90° increments.

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

RAZAR SERIES-LED

SPECIFICATIONS

Heavy cast low copper aluminum (A356 alloy; <0.2% copper)

assembly with integral cooling fins. The Optical Panel mounting surface is milled flat (surface variance <± .002*) 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

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

separates optical and electrical compartments. The optical compartment and electrical compartment with the

Minimum wall thickness is .188". Cast and hinged driver

each emitter located on a copper thermal transfer pad and

enclosed by an LED refractor. 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 site/area distributions. Panels are field replaceable and field

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

blocks facilitate wiring between the driver and optical arrays. 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

High output LED's are utilized with drive currents ranging from

350mA to 1050mA. 70CRI Minimum. LED's are available in standard Neutral White (4000K), or optional Cool White (5000K) or Warm White (3000K). Consult Factory for other LED

Electrostatically applied TGIC Polyester Powder Coat on

substrate prepared with 20 PSI 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

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

U.S. Architectural Lighting 600 (861) 233-2001 For (661) 233-2001 Week Average C. Polmdalle, CA 93551 Phone (661) 233-2001 For (661) 233-2001

MAST ARM FITTER/ELECTRICAL HOUSING

hardware is stainless steel.

with 20KV surge protector for field accessible installation.)

Electrical Housing to facilitate thermal transfer, held down by universal clamps to facilitate easy removal. In-line terminal

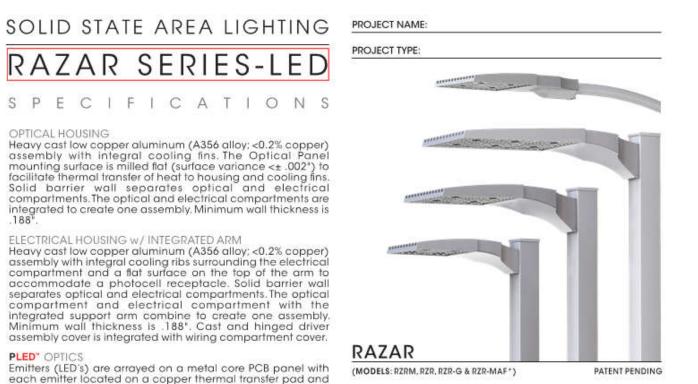
assembly cover is integrated with wiring compartment cover

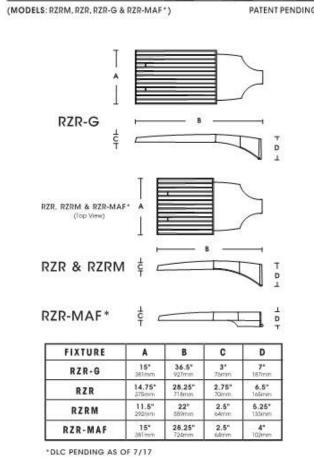
ELECTRICAL HOUSING w/ INTEGRATED ARM

integrated to create one assembly. Minimum wall thickness is

Alternates Note

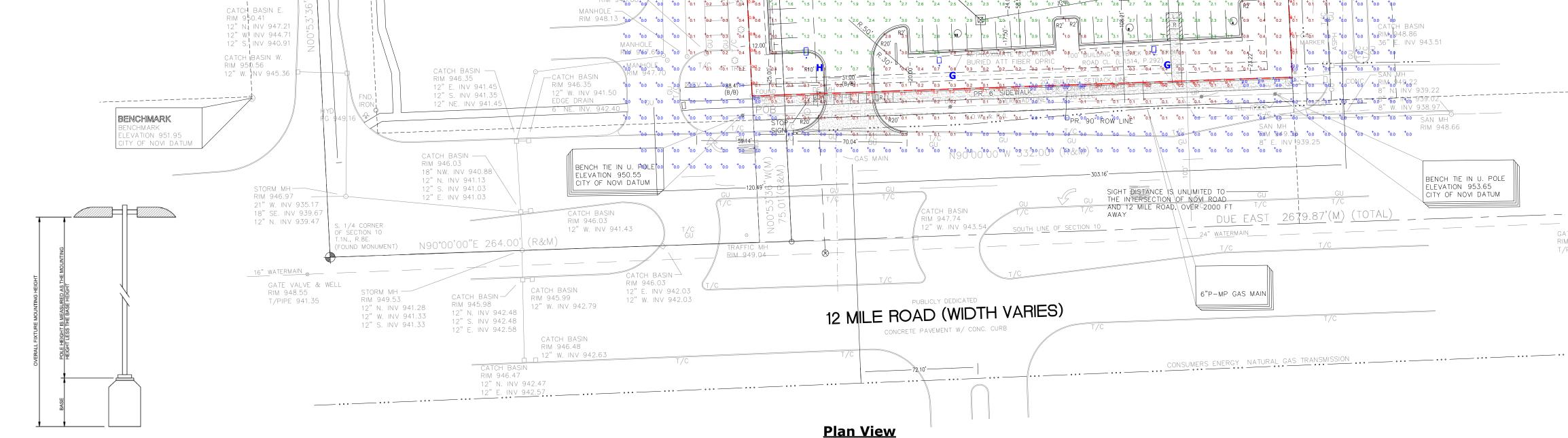
THE USE OF FIXTURE ALTERNATES MUST BE RESUBMITTED TO THE CITY FOR APPROVAL.





2017193

U.S. ARCHITECTURAL



MAIN LEVEL 14,140 GSF UPPER LEVEL 15,800 GSF

182.00'

Scale - 1'' = 40ft

BUILDING A

13.300 GSF

FF 952.50

182.00'

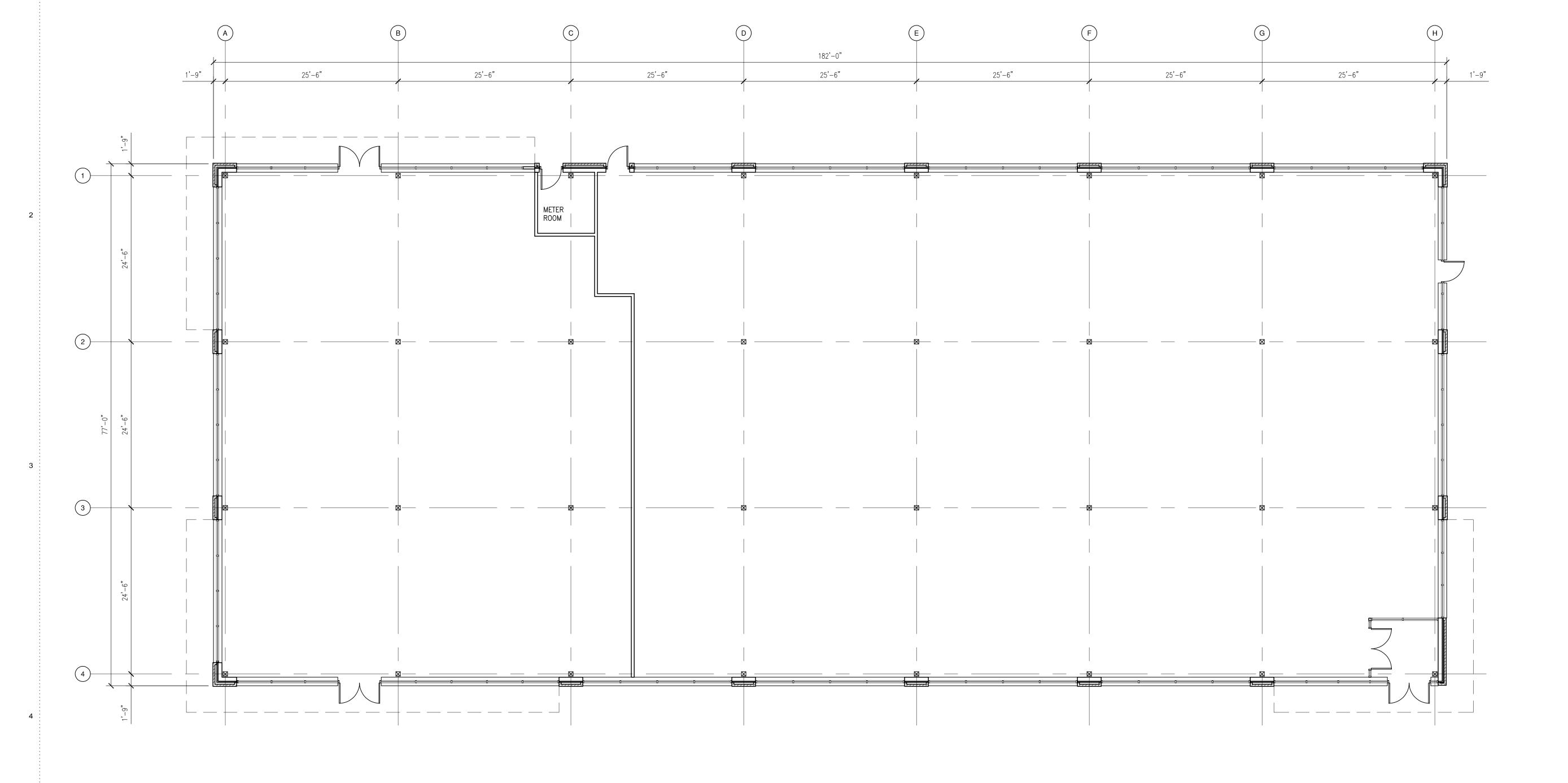
PARKING

SPACES

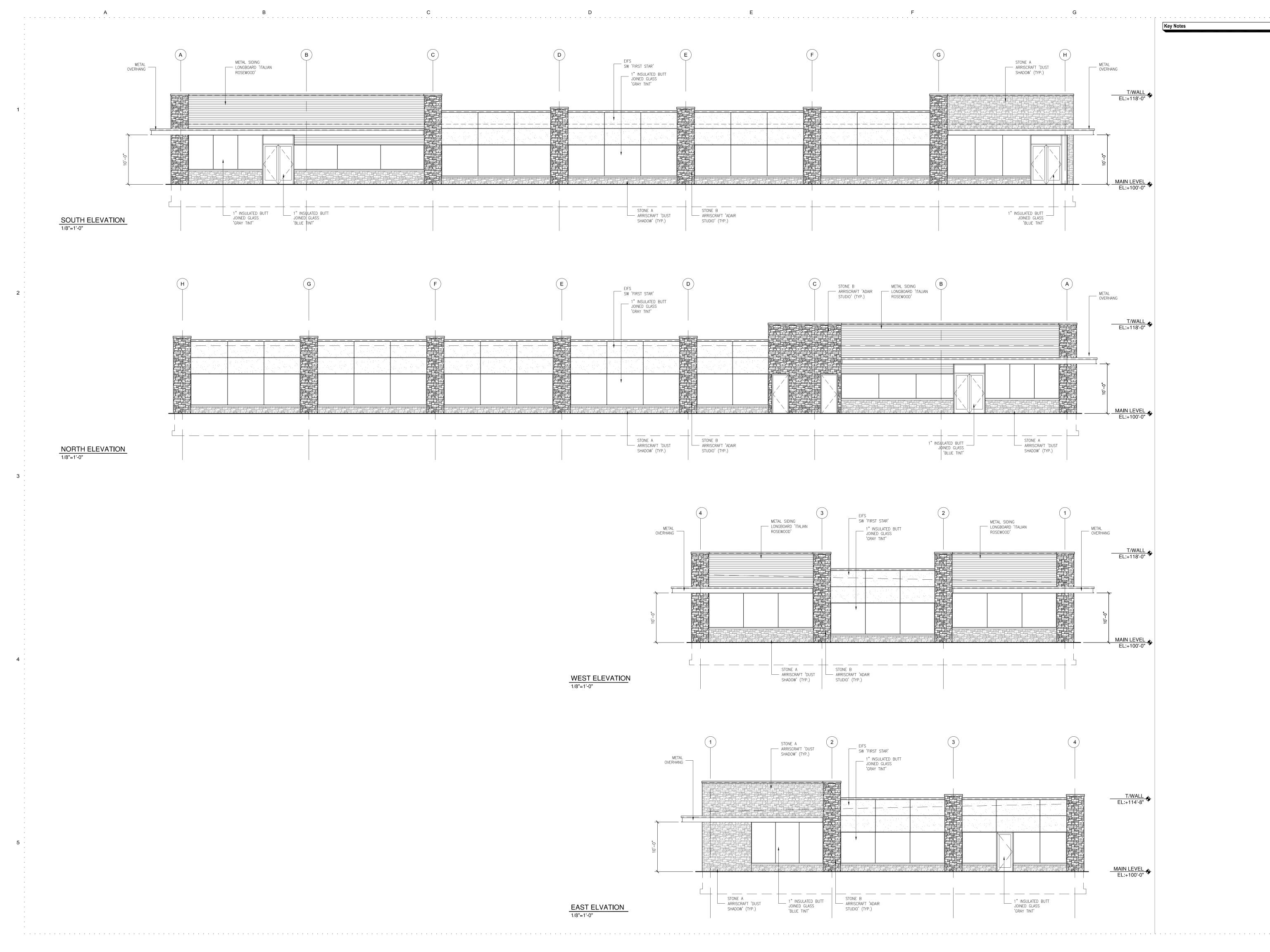
12 MILE RD. LOCATION MAP EMERGENCY ACCESS 1 EASEMENT PROVIDE A 6' WIDE PAVED ACCESS BETWEEN RACK AND TRAVEL WAY. BENCH TIE IN U. POLE ELEVATION 953.65 OF SECTION 10 T.1N., R.8E. CITY OF NOVI DATUM (FOUND MONUM GATE VALVE & WELL RIM 949.78 T/PIPE 939.18

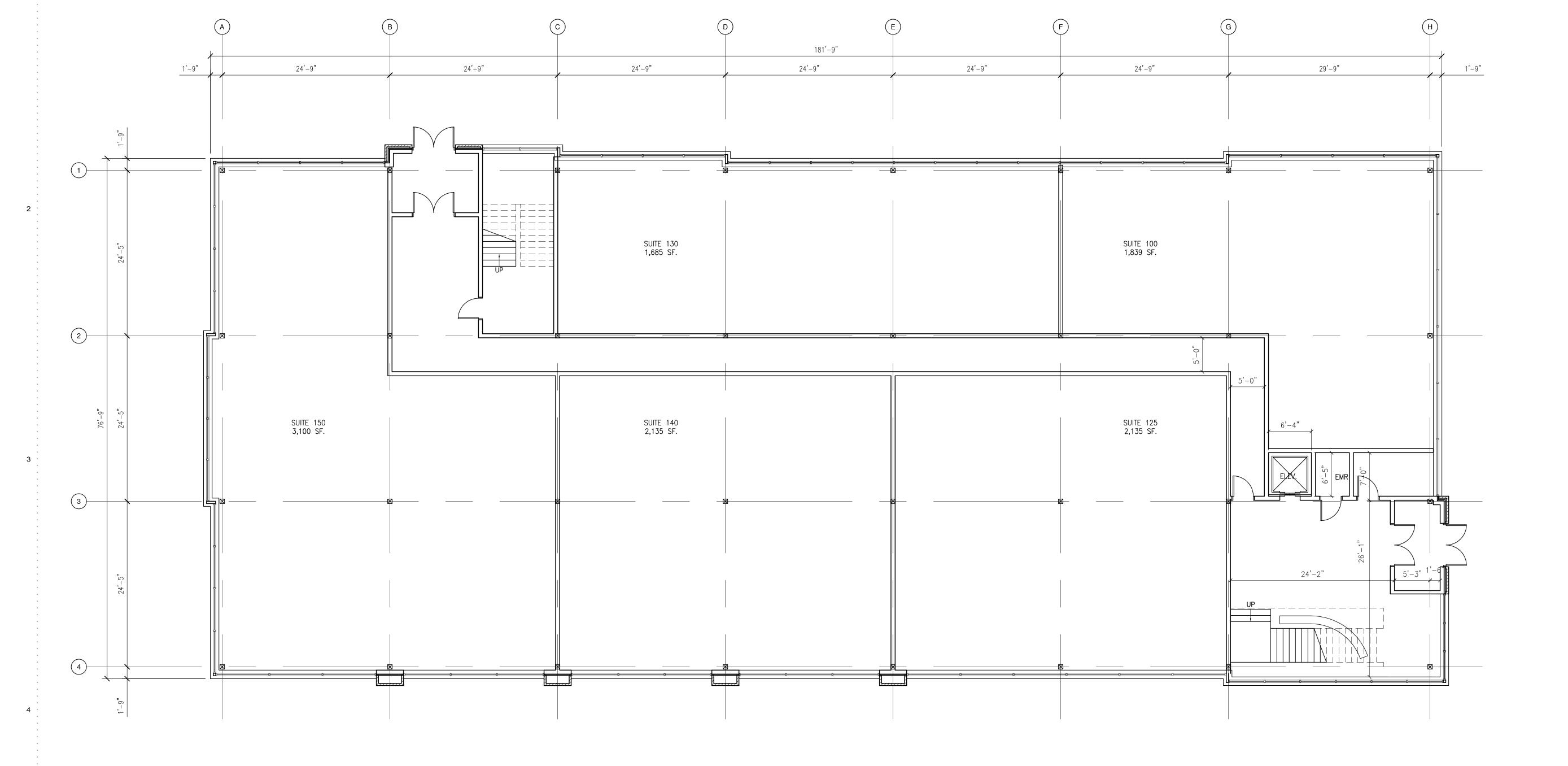
Designer TV/KB Date 3/26/2018 rev. 7/15/2021 Scale Not to Scale **Drawing No.** #18-13996-V7

1 of 1



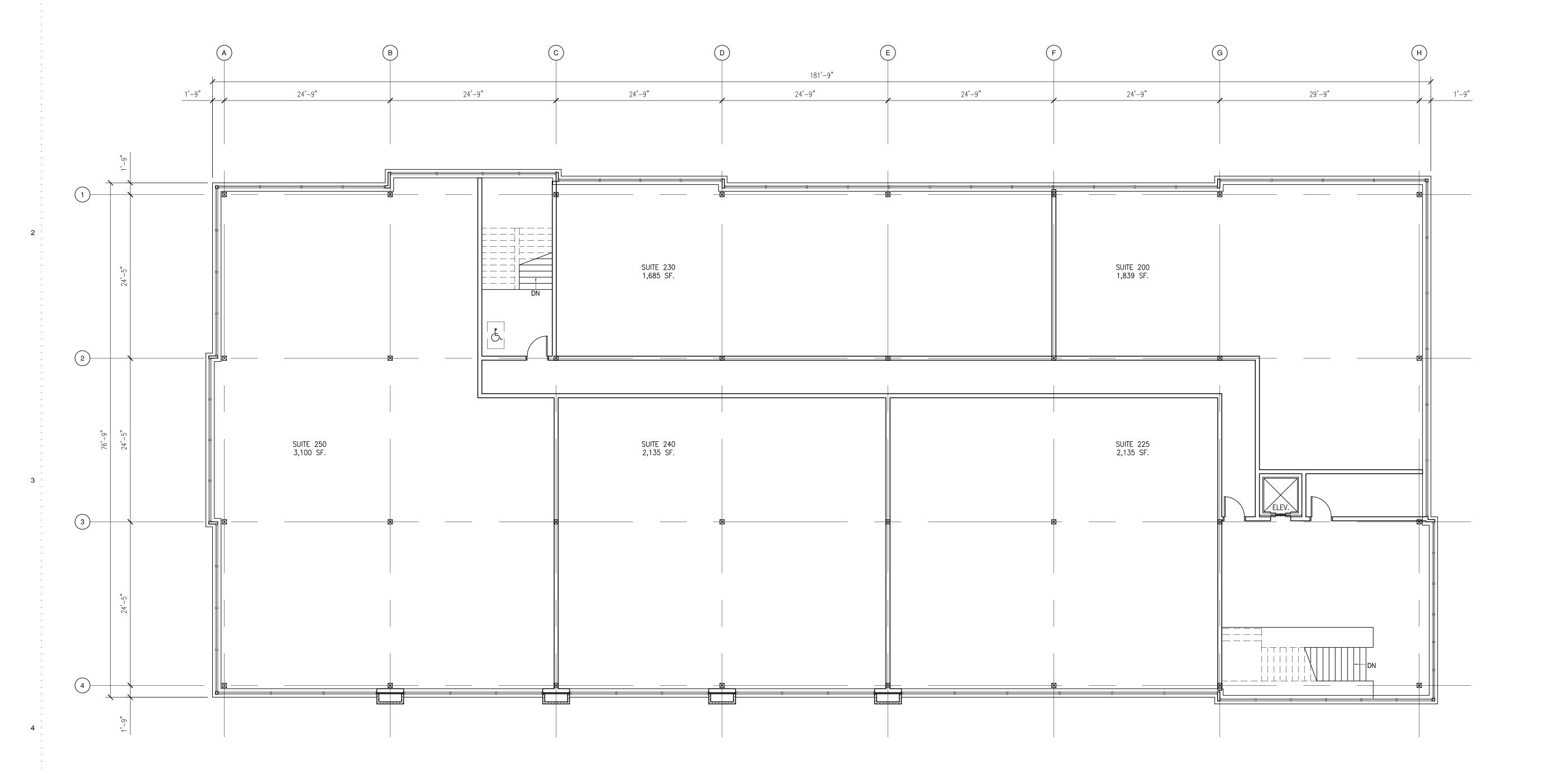






A5 MAIN LEVEL FLOOR PLAN - BUILDING B

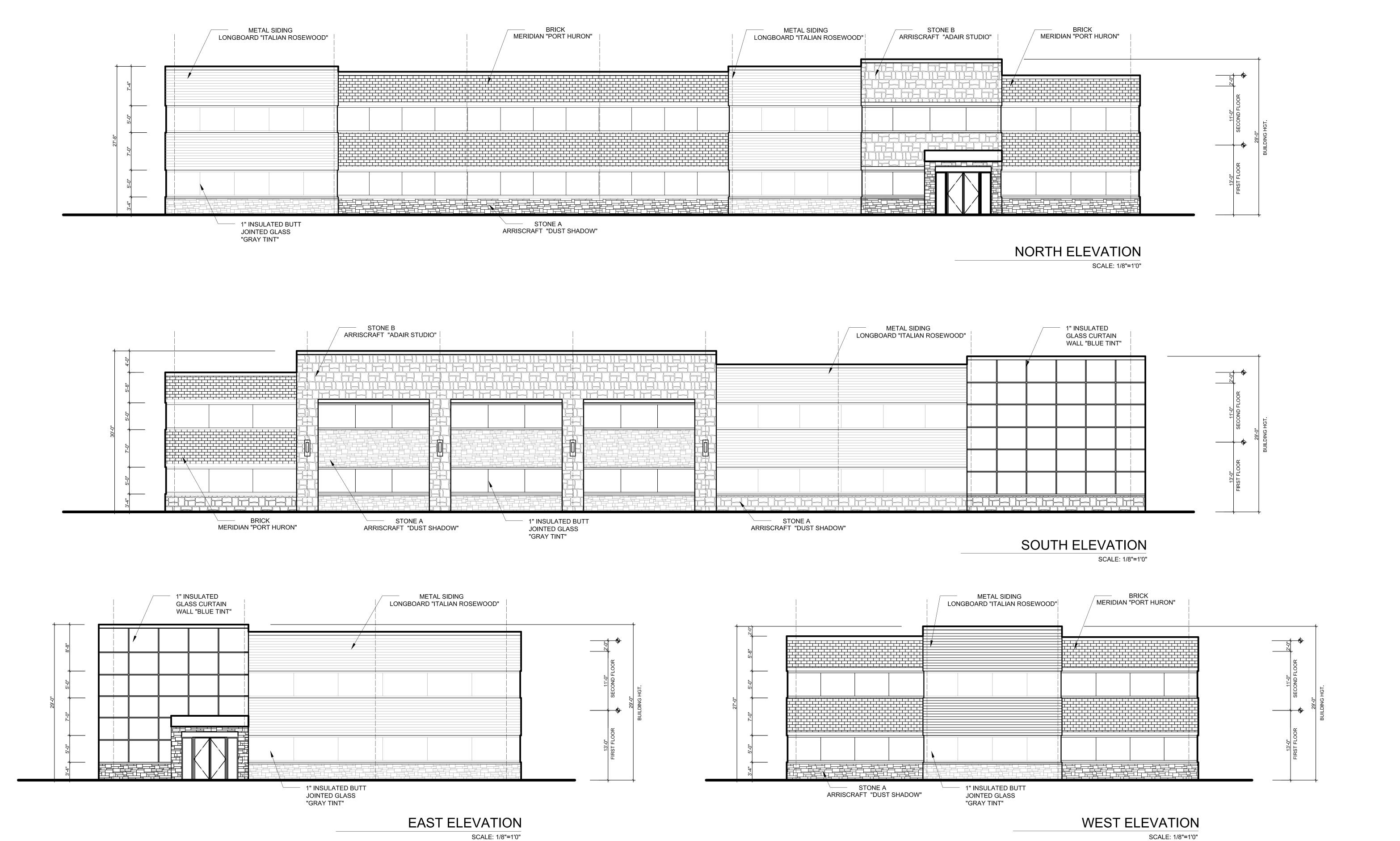
1/8"=1'-0"



Proposed New Construction for:
FOUNTAIN VIEW
ROFESSIONAL CENTER
44244 12 Mile Road

PGA: 20015 designed: drawn : checked:

UPPER LEVEL FLOOR PLAN



THE RON JONA COLLABORATIVE

1066 COMMERCE STREET BIRMINGHAM MI. 48009 C.248.789.2001 O.248.357.3600



PROJECT:

FOUNTAIN VIEW PROFESSIONAL CENTER

FOUNTAIN VIEW BLDG. A,B,C

44244 12 MILE RD, NOVI, MI 48377

SHEET TITLE:

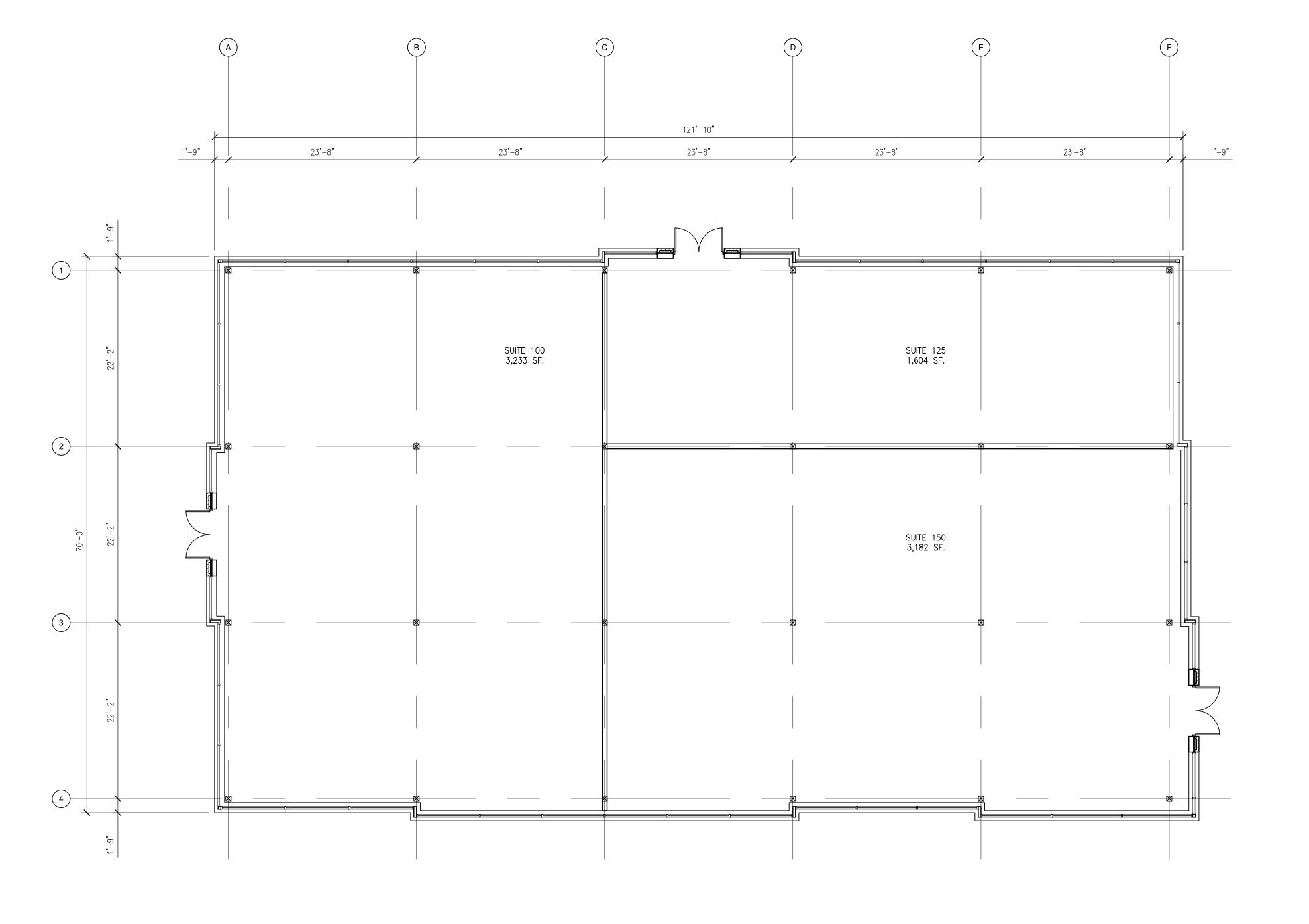
ELEVATIONS BLDG. B

DO NOT SCALE DRAWINGS USE FIGURED DIMENSIONS ONLY

DATE:	ISSUE:	
11.13.20		

SHEET NO:

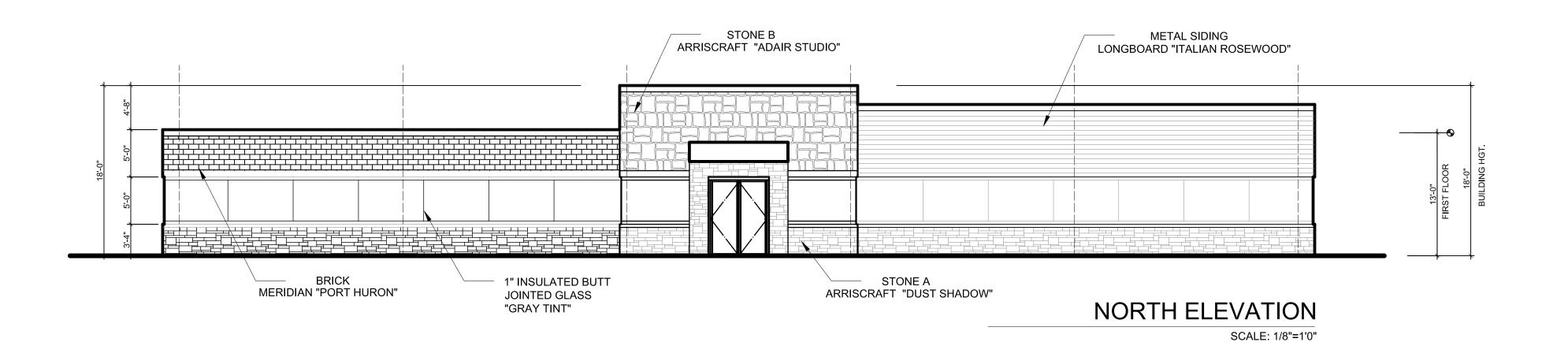


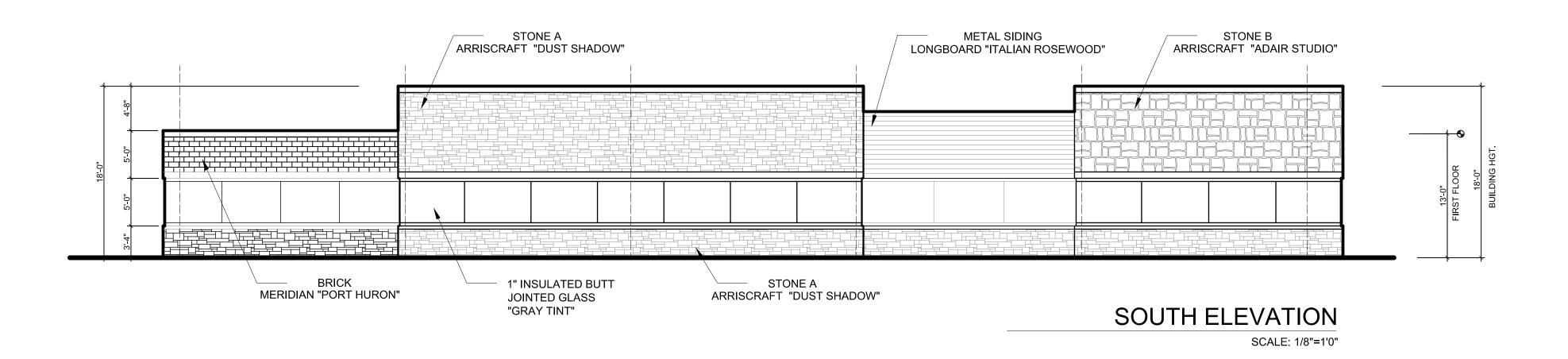


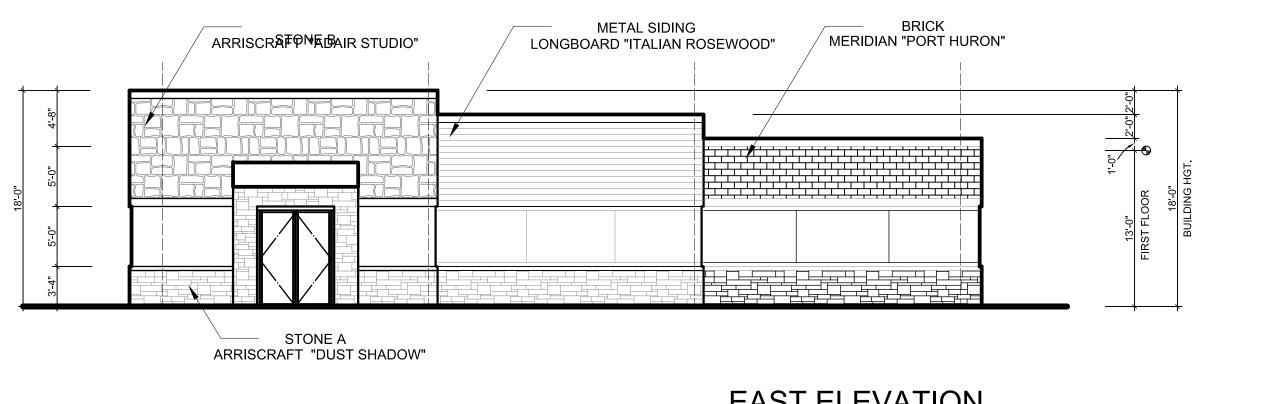
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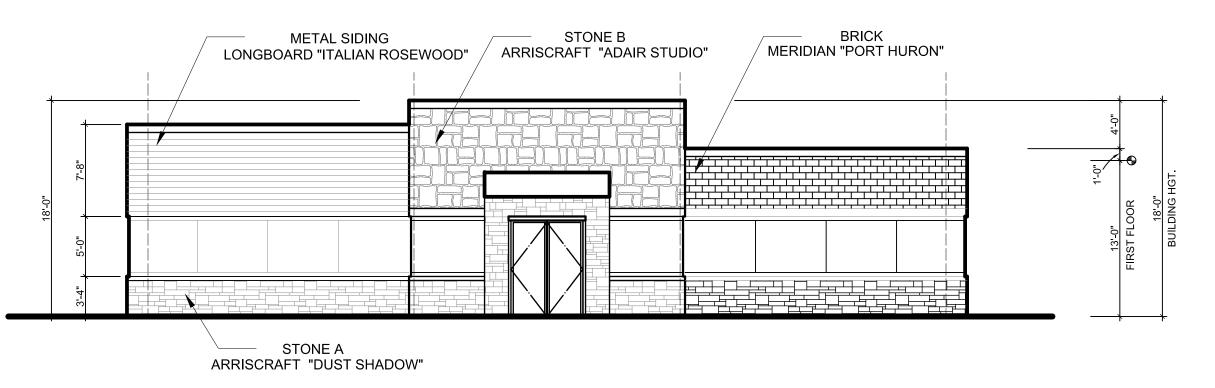
A5 MAIN LEVEL FLOOR PLAN - BUILDING C

1/8"=1'-0"









EAST ELEVATION

SCALE: 1/8"=1'0"

WEST ELEVATION

SCALE: 1/8"=1'0"

THE RON JONA COLLABORATIVE

1066 COMMERCE STREET BIRMINGHAM MI. 48009 C.248.789.2001 O.248.357.3600



PROJECT:

FOUNTAIN VIEW PROFESSIONAL CENTER

FOUNTAIN VIEW BLDG. A,B,C

44244 12 MILE RD, NOVI, MI 48377

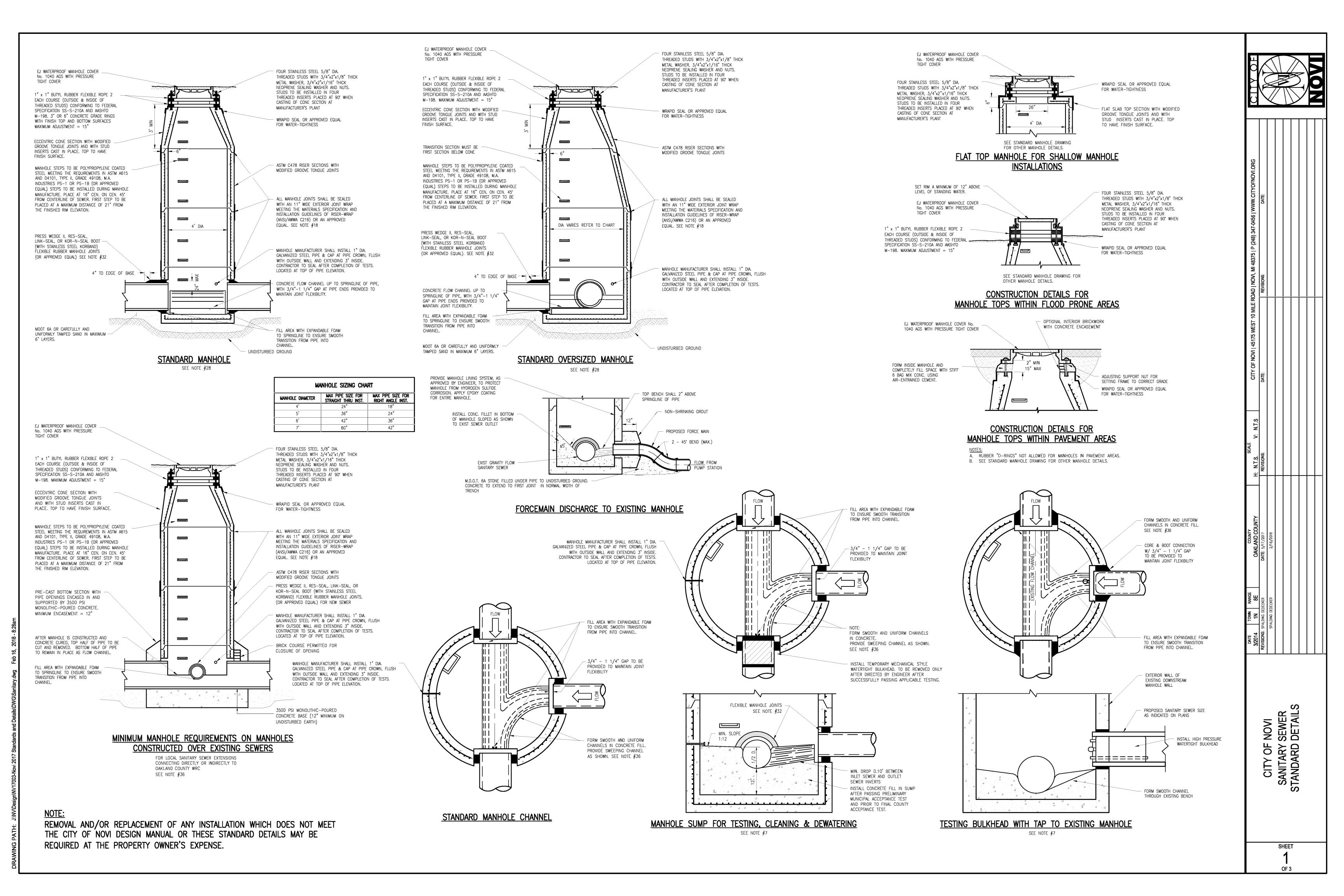
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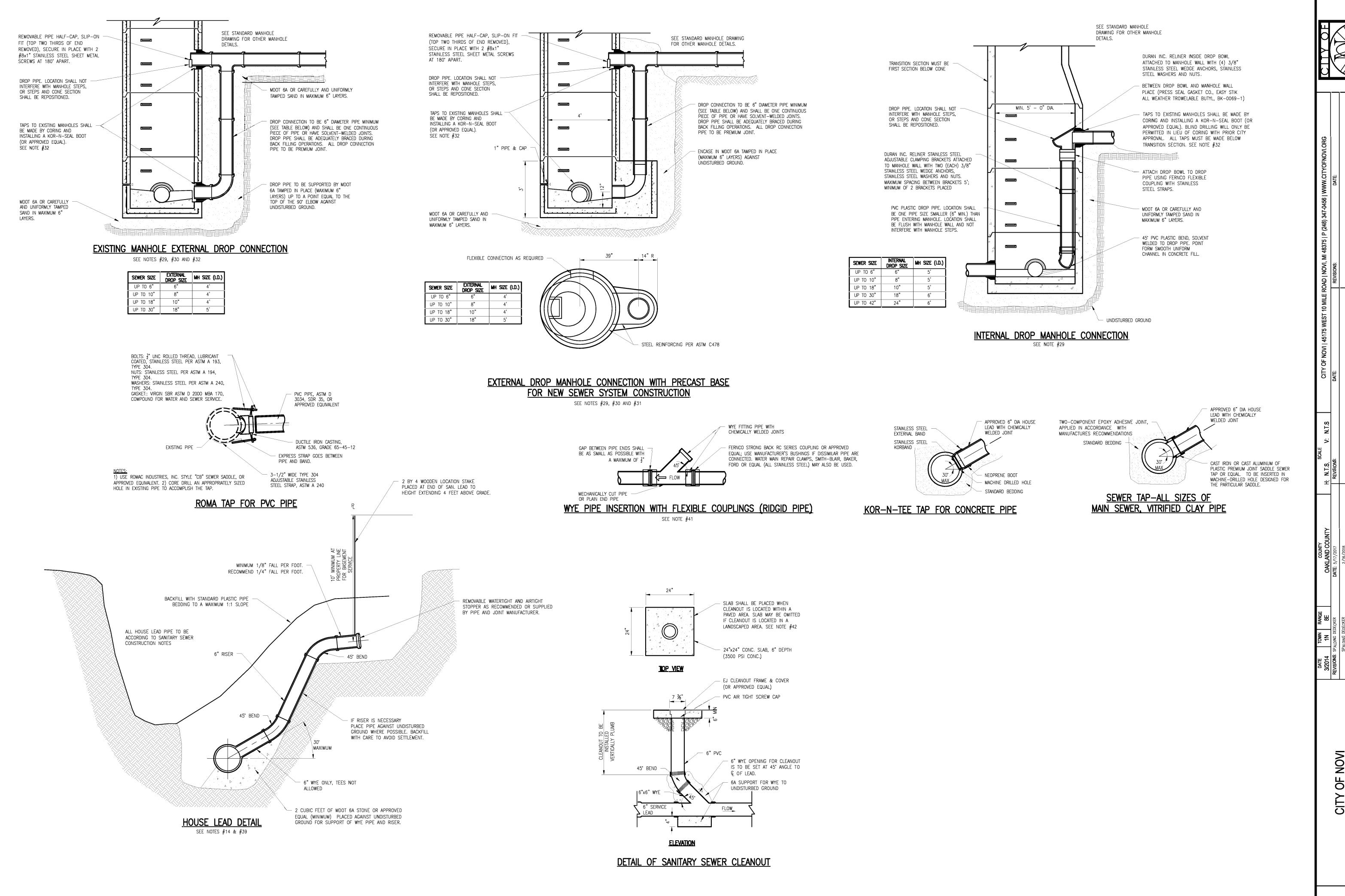
ELEVATIONS BLDG. C

DO NOT SCALE DRAWINGS USE FIGURED DIMENSIONS ONLY

DATE:	ISSUE:
11.13.20	

SHEET NO:

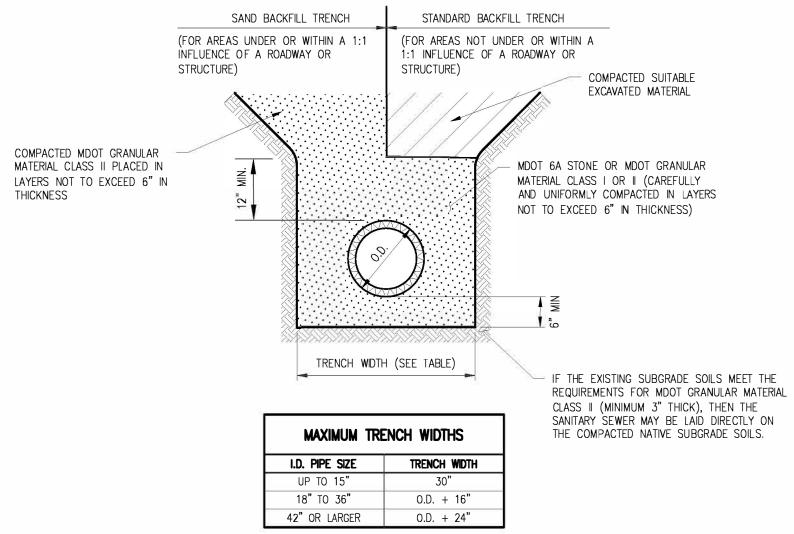




CITY OF NOVI SANITARY SEWER STANDARD DETAILS

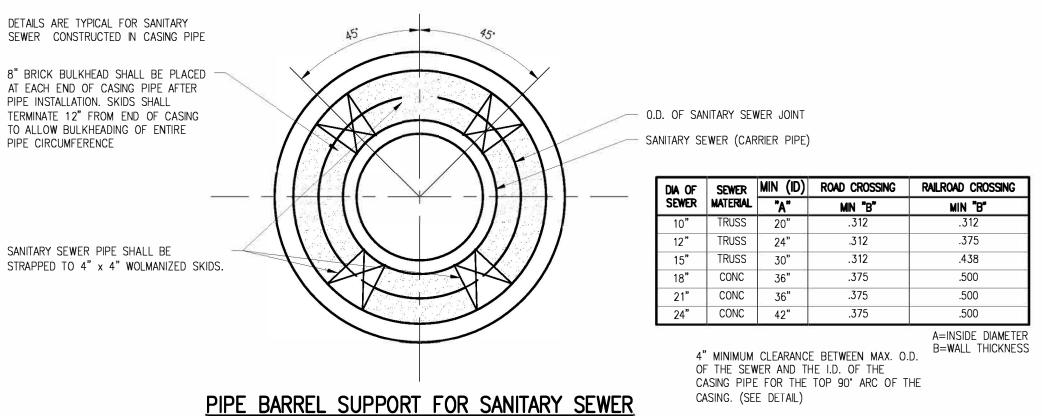
SHEET 2 OF 3

SAND OR GRAVEL BACKFILL DETAILS FOR SEWERS UNDER GRAVEL, CONCRETE OR ASPHALT PAVEMENTS, SIDEWALKS, DRIVEWAYS AND PARKING AREAS



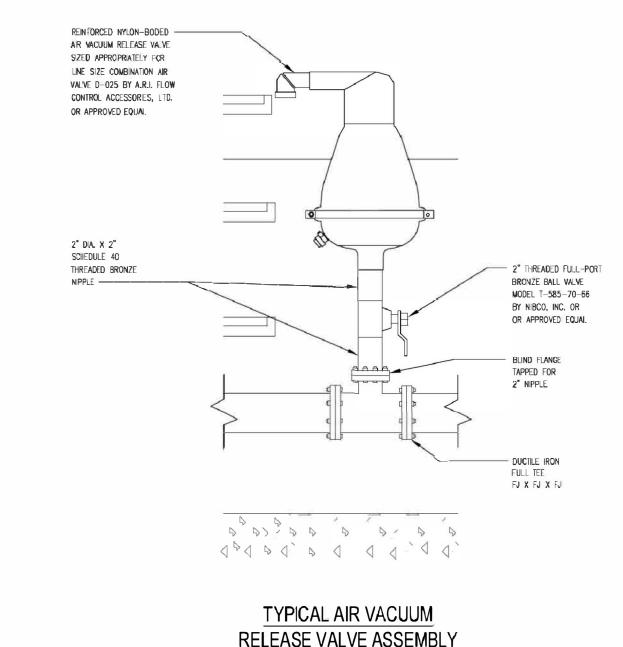
BEDDING AND TRENCH BACKFILL DETAIL

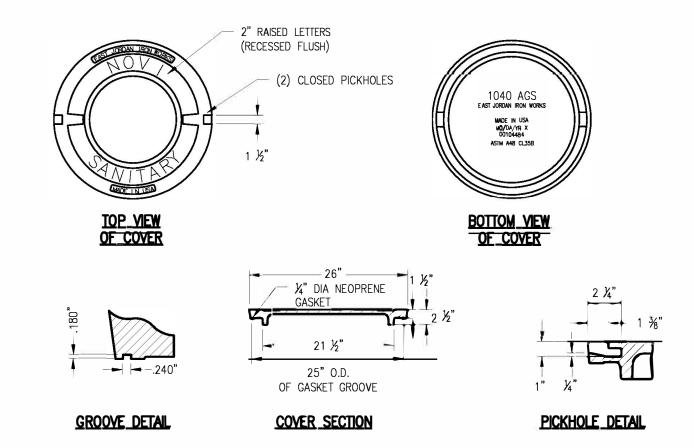
SEE NOTES #20 THRU #25

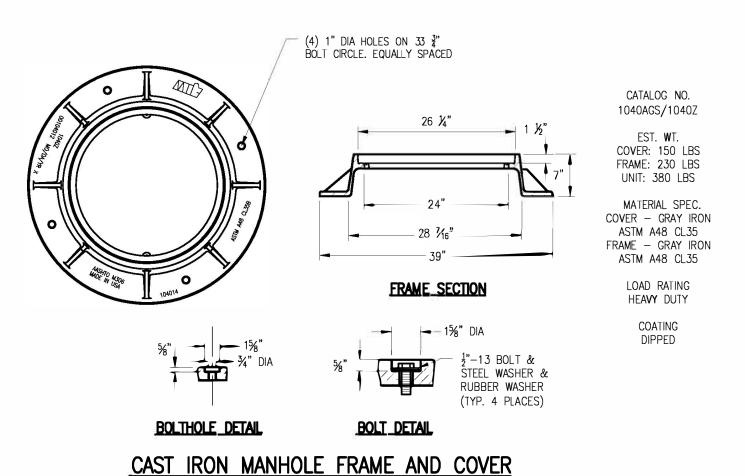


PLACE WOLMANIZED SKIDS ALONG THE TOP OF THE CARRIER PIPE THE CONTRACTOR SHALL SUBMIT IN WRITING THE DETAILS OF IN ORDER TO PREVENT THE CARRIER PIPE FROM ROLLING OVER THE APPROPRIATE PIPE CASING INSTALLATION FOR THE REVIEW OR FLOATING. GROUT PLACEMENT MUST BE ACHIEVED BY MEANS AND APPROVAL BY THE ENGINEER BEFORE INSTALLATION OF OF PRESSURE GROUTING; GRAVITY FLOW INSTALLATION OF GROUT ANY CASING STARTS. ALTERNATE METHODS OF SUPPORTING AND WILL NOT BE PERMITTED. MAINTAINING THE POSITION OF THE CARRIER PIPE WITH RESPECT TO THE CASING PIPE (IN LIEU OF THE USE OF TIMBERS) WILL BE CONSIDERED. = 8" BRICK BULKHEAD END OF CASING WOLMANIZED SKIDS WIRED TO SANITARY SEWER WILL BE NOTCHED TO PREVENT STEEL CASING PIPE SHALL BE WIRE FROM RIDING AGAINST CASING PIPE. ASTM A139 GRADE B STANDARD CASING SECTION

CONSTRUCTED IN CASING PIPE







SANITARY SEWER CONSTRUCTION NOTES

GENERAL NOTES:

1. 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 sonitary 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.

- 2. 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 ony construction. Final air test must be witnessed by the O.C.W.R.C. personnel and must be scheduled in advance.
- 3. Three (3) working days prior to construction, the Contractor shall telephone MISS DIG (811 or 1-80D-482-7171) for underground facilities locations and shall also notify representatives of other utilities located in the vicinity of the work.
- 4. No ground water, storm water, construction water, downspout drainage or weep tile drainage shall be allowed to enter any sanitary sewer.
- 5. 18 inch minimum vertical separation and 10 foot minimum horizontal separation must be maintained between sanitary sewer and water main.
- 6. 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 sholl 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, Amvit, Nobel, Ring-Tite, Fluid-Tite or equal, as approved by O.C.W.R.C./City of Novi may be used for sewer joints. All joints sholl meet requirements of ASTM C425 or C443.
- At all connections to an existing sewer or to extensions there to, 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 sump and a watertight mechanical bulkhead shall be installed on the first manhole upstream of the proposed connection. The temporary sump shall be filled in ofter successful completion of any infiltration test up to the standard fillet provided for the flow chonnel, 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 tap 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.
- 9. A NASSCO PACP formatted video of the interior of sanitory sewer 8" or greater in diameter (with log and lead locations) sholl 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 NASSCO PACP Certified CCTV Contractor. Typical items to be reviewed on the videotape will include pipe deflections, pipe settlement, lead connections, joints 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.
- 10. 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
- 12. The materials specified below may be substituted with on approved equal as determined by the City. It is at the sole discretion of the City to determine if a material is acceptable and con be utilized. Written authorization must be obtained prior to ordering or installing the opproved equal.

SANITARY_SEWER_NOTES:

- MATERIALS AND CERTIFICATIONS Truss Pipe and Fittings shall be as described under the current ASTM D2680. Appendix XI of said specification shall be as modified by the bedding requirements
- 14. 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.
- 15. Pipe material utilized for force main shall submitted to and approved by the City
- 16. 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 nome, location, Contractor, and test lot number. Lot sizes sholl be acceptable to
- 17. 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" mork. Truss Pipe with an absence of filler material at the ends greater than 1/4" deep shall be subject to rejection or acceptable repair.
- 18. 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 mode to existing manholes, o rubber waterstop shall be used around the pipe.
- 19. No clay pipe will be allowed for main line sanitary sewer or for sanitary sewer

- 20. Bedding for Truss Pipe and solid wall pipe shall be in accordance with the current ASTM D2321, except, (1) only MDOT Class I ond Class II granulor materials or MDOT 6A stone may be used, (2) embedment sholl 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 unyielding side support and complete bedding contact under pipe haunches. Bedding material must 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.
- 21. 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 tap of the pipe caused by the sheeting, plates, or box withdrawol shall be completely filled or the supports left in place below the top of the pipe.
- 22. 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.

23. Care shall be taken during bedding compoction 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 hos been placed.

24. Backfill shall be compacted above pipe or as indicated on construction drawings. Trench backfill shall be o 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 comported in layers not to exceed 6" in thickness to a density of 95% as determined by AASHTO T99. All backfill placed within a 1:1 influence of structures sholl 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 atherwise approved by the city.

25. 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 sholl 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 ond held together in the "home" position during any grade or line adjustments.

CUTTING AND HANDLING

26. Cutting of pipe lengths, where required, shall be performed with tools or equipment that will provide o neat, perpendicular cut without damage to the plastic or the filler material. All burrs shall be removed by the use of a file, knife, ar abrosive poper. Spigat 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 12'6" or longer pipe lengths having deviations from straight greater than 1", as measured along a straight line, shall not be used.

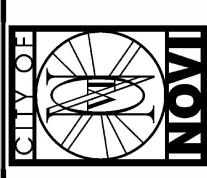
- 28. All new manholes shall have O.C.W.R.C./City of Novi approved flexible, watertight seals where pipes pass through walls. Manholes shall be precast sections with modified tongue and groove joints with rubber gaskets and shall conform to ASTM C478. Precost manhole sections shall be O.C.W.R.C./City of Novi approved modified eccentric cone type. All manholes shall be provided with watertight covers.
- 29. At all connections to manholes on O.C.W.R.C. sewers or extensions thereto, interior drop connections will be required when there is o difference in invert elevations.
- 30. 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 on 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 tapped, the tap shall be made by coring. The contractor sholl place a KOR-N-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.
- 33. 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
- 36. A proper channel shall be constructed within the existing structure at the connection point to the existing system. Channel sholl be constructed to create the least amount of turbulence. Any portion of the existing structure which would 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 Deportment conducts inspection of lead from ROW line to building connection.

38. 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.
- 40. 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 adapter. Allowable types of sewer pipe adapters are the Fernco Adopter or the Fernco Flexible
- Field tops of existing sanitary sewers shall be mode by installing o wye fitting for house connections. Fernco fittings with stainless steel bands sholl 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 cleanauts fall within a poved area (porking lot, service drive area, etc.), the cleonout shall have a cast iron cover that is centered in a 2'x2'x6" (min.) concrete slab hoving a compressive strength of 3000 psi at



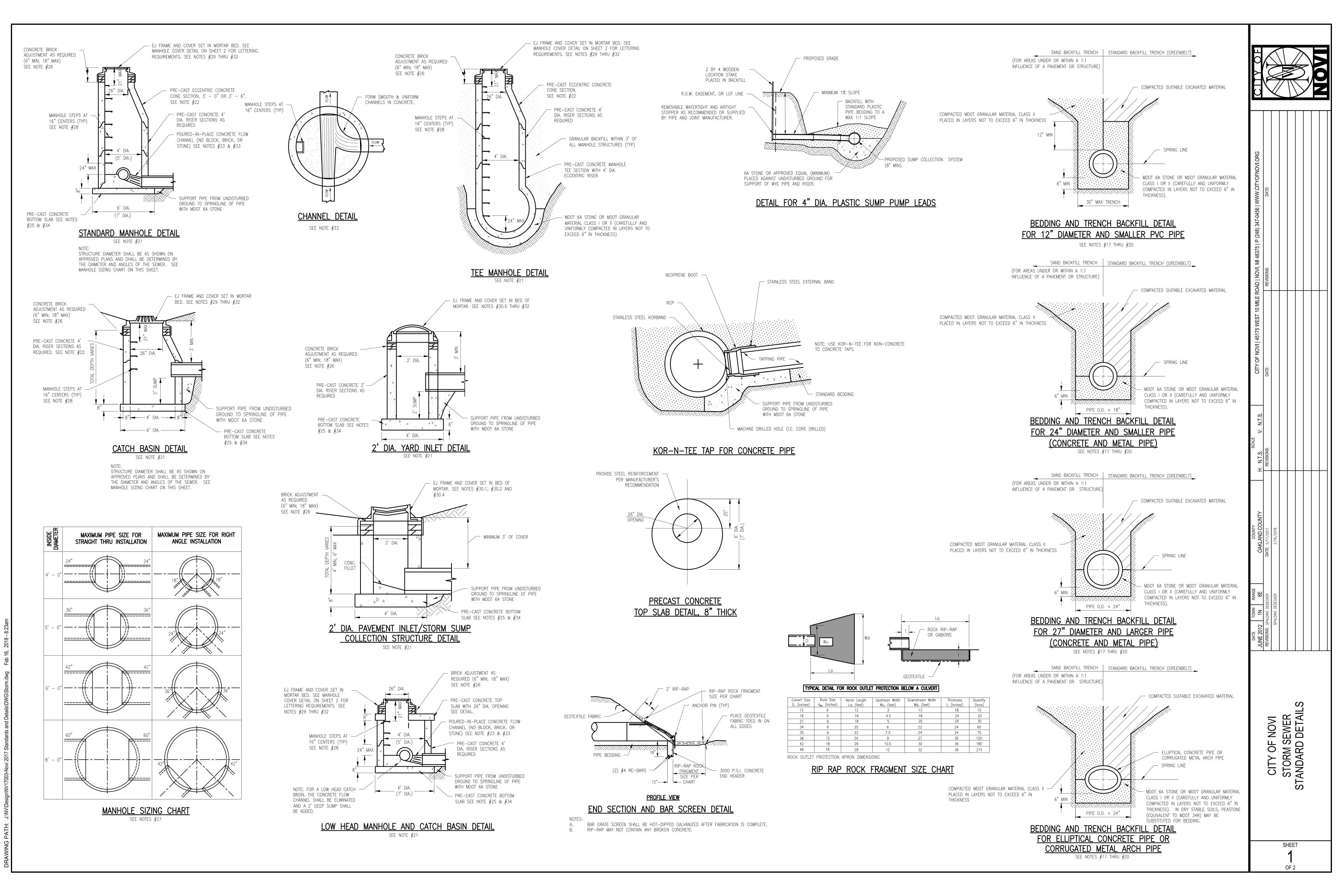
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REVISIONS: SPALDING DEDECKER	SPALDING DEDECKER						
	DATE: 5/17/2017 REVISIONS: DATE:	DATE: 5/17/2017 REVISIONS: DATE: 2/16/2018 2/16/2018	DATE: 5/17/2017 REVISIONS: DATE: 2/16/2018 1	DATE: 5/17/2017 REVISIONS: DATE: 2/16/2018 (1/10/2018)	DATE: 5/17/2017 REVISIONS: DATE: 2/16/2018 ()	DATE: 5/17/2017 REVISIONS: DATE: 2/16/2018 (A)	DATE: 5/17/2017 REVISIONS: DATE: 2/16/2018

SHEET OF 3

NOVI SEWER DETAIL

P

SANITARY (TANDARD



GROUND TO SPRINGLINE OF PIPE

WITH MDOT 6A STONE

─ PRE-CAST CONCRETE BOTTOM SLAB

PROFILE VIEW - SECTION A-A

(WEIR PLATE)

TYPICAL UNDERGROUND DETENTION AND OUTLET MANHOLE DETAILS

SEE NOTE #21

SUBGRADE UNDERDRAIN, 6"

SECTION 909.07. METAL PIPE SHALL NOT BE USED.

CLOSE TO THE STRUCTURE INVERT AS PRACTICAL.

ALL UNDERDRAIN SHALL OUTLET TO DRAINAGE STRUCTURE

UNDERDRAIN CONNECTIONS (AT LOW POINTS) SHALL BE MADE AS

STORM SEWER CONSTRUCTION NOTES

GENERAL NOTES: 1. All materials and workmanship shall be in accordance with the standards and specifications of the City of Novi.

- 2. No storm sewer is to be installed without the City's inspector present.
- 3. 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 representative of other utilities located in the vicinity of the work.
- 4. Trenches that are to be left open overnight shall be enclosed with suitable fencing and lighted barricades.
- 5. 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.

STORM SEWER NOTES: 6. Type and class of pipe shall be as specified on plans.

- Concrete Pipe Requirements
- 7. All round reinforced concrete pipe (RCP) shall meet the requirements of ASTM C76 with modified tongue and groove joints with rubber gaskets manufactured to meet the requirements of ASTM C443. Catch basin sewers shall be Class IV RCP.
- 8. The inside joint of pipe over 36" diameter shall be pointed with mortar upon completion of backfilling operations.
- 9. All elliptical reinforced concrete pipe shall meet the requirements of ASTM C507 with tongue and groove joints with bituminous (DeWitt #10) joint material meeting the requirements of C443. Elliptical concrete pipe joints shall also be wrapped per ASTM C877. In addition, elliptical concrete pipe of 42" equivalent size and larger shall require inside concrete pointing.
- Plastic Pipe Requirements

 10. Per City standards, the maximum allowable pipe size for plastic storm sewer is 12" diameter. Larger diameter plastic storm sewer may be approved by the City,
- depending on site conditions.

 11. All plastic storm sewer pipe shall have a smooth interior.
- 12. PVC pipe shall meet the requirements of ASTM D3034 and F949 with push—on type joints meeting the requirements of ASTM D3212 and F477.
- 13. HDPE pipe shall meet the requirements of AASHTO M294 and ASTM D3350 with push—on type joints meeting the requirements of ASTM D3212 and F477. ADS pipe shall meet the requirements of AASHTO M294 and ASTM F2306 with joints meeting the requirements of AASHTO M252, M294, or F2306.
- 14. Plastic pipe will not be permitted in the right-of-way.

Bedding Requirements 15. Bedding shall be used as called for on the details.

16. Where unstable ground conditions are encountered, stone bedding shall be used as directed by the Engineer in order to provide a stable foundation for pipe and mapples

Backfill Requirements

- 17. Backfill shall be compacted above pipe or as indicated on construction drawings. Trench backfill shall be of a suitable material and shall be free of any organic materials and rocks larger than 3" in size. Backfill shall be ramped into trench and compacted with a small dozer or other approved method.
- 18. Where trench is within a 1:1 influence of streets, alleys, sidewalks, driveways, parking areas and structures, 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 AASHTO T99.
- 19. When backfilling trench of PVC or HDPE pipe, manufacturer's specifications must be strictly adhered to.
- 20. No frozen material shall be buried more than 4' below the final elevation of the ground.

<u>DRAINAGE STRUCTURE REQUIREMENTS:</u> 21. Shop drawings shall be submitted to and approved by the City's Consultant for

smooth finish at its intersection with the structure wall.

- each proposed structure prior to installation.

 22. Precast reinforced concrete sections with modified tongue and groove joint and
- rubber gaskets shall conform to ASTM C-478. Cone section shall be eccentric and have stud inserts cast in place with a flush top surface.

 23. Pipe shall be flush with the inside wall of structure and shall not protrude more than 4" into the structure. Pipe shall be pointed up inside and outside with a
- 24. No openings shall be made in precast units which would leave less than 6" of undisturbed precast structure wall between pipes (as measured between outside pipe

- walls) or would remove more than 40% of the circumference along any horizontal
- 25. Precast riser placed on the concrete base shall be set in a full bed of mortar.

 All joints & liftholes shall be pointed up with mortar on the outside and inside.
- 26. Plaster all outside masonry surfaces with 1:2½ masonry cement (type II) 1/2"
- 27. All manholes and catch basins shall be 4' or 5' in diameter unless otherwise indicated on construction drawings. Larger diameter drainage structures (6', 7', 8', 10', and 12' diameter) may be needed for large storm sewer pipe or for situations where the angles between entering pipes require a larger diameter structure in order to maintain at least 6" of structure wall between the pipes. 2' diameter catch basins and inlets may be used where approved by the City Engineer.
- 28. Structure steps are to be installed at the plant by the manufacturer of the structure. The steps are to be 16 inches on center located 90° from the centerline of the main sewer line. The steps shall be made of No. 4 deformed steel rod encased with copolymer polypropylene plastic and meet the requirements of ASTM D4101, Type II, Grade 49108 or approved equal.
- 29. Manhole frame and cover shall be EJ 1040, type "B" 16 Hole Cover or as per construction drawings. Lettering shall be per detail this sheet.

30. Catch Basin and Inlet frame and cover shall be:

minimum of 2% slope on the benches.

- 30.1. EJ 7045, type "M1" cover and type "T1" back set (with "Dump No Waste" logo) with straight face curb and gutter.
 30.2. EJ 7065, type "M1" cover and 7060 "T1" back set (with "Dump No Waste"
- Logo) with mountable curb and gutter and integral curb and gutter.

 30.3. EJ 1040, type "02" cover (beehive grate) to be used on structures located in ditches, swales and rear yard catch basins. If within 8' of road, type "N" cover (oval grate) shall be used. If 1040 casting is used in pavement, Type
- M1 grate must be provided.

 30.4. EJ 1030, type "A" solid cover to be used on all 2' cleanouts and structures not located at storm water collection points. EJ 1060, type "A" solid cover
- may also be used on sump pump cleanout structures.

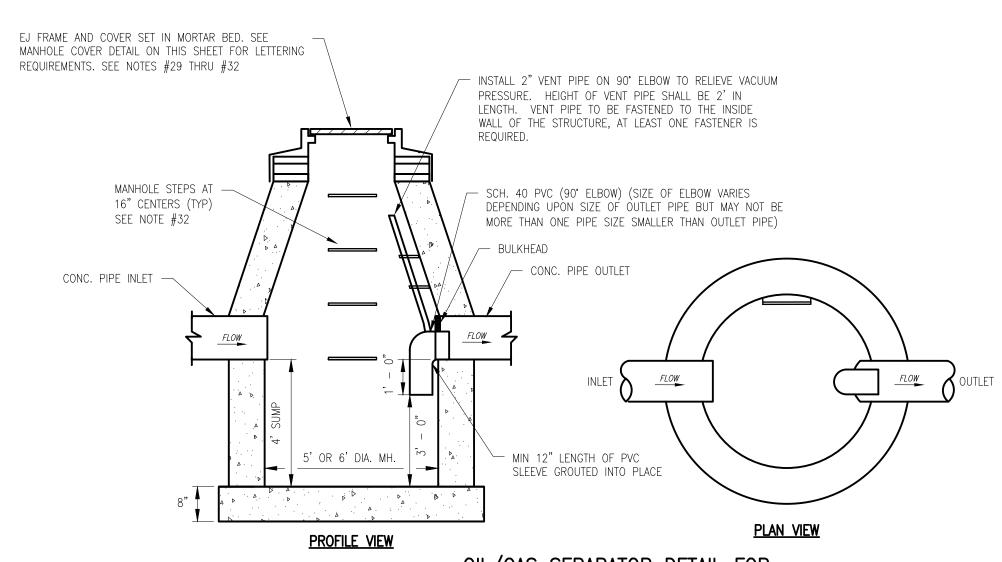
 30.5. EJ 1030, type "01" cover (beehive grate) to be used on all 2' structures located in ditches, swales and rear yard catch basins.
- 31. The City reserves the right to require a change in structure covers upon final grade and walk—through inspection if deemed necessary due to site conditions.
- 32. Frames shall be set in full bed of mortar and the side shall be overlapped to
- 33. A proper channel shall be constructed within the existing manhole or other structure at which the connection is to be made to direct the flow to the existing outlet in a manner that will tend to create the least amount of turbulence. The channel shall be constructed to the same size as the inside diameter of the
- 34. Concrete base for manhole, catch basin, and inlet shall be MDOT grade 30P, 8" thick, 3000 psi.

existing pipes, and shall be built to height of 1/3 the existing pipe diameter with a

- 35. When tapping into an existing structure a brick collar shall be placed 12" thick around the pipe and extended 12" beyond the opening. If pre—cast section is tapped, bend mesh and use as reinforcement with brick collar. Taps through structure joints or cone sections are prohibited unless approved by the City.
- 36. The final accessible structure prior to discharge into a forebay or detention basin shall contain a permanent 4' deep sump.
- 37. A 4' diameter Oil/Gas Separator Structure shall be installed prior to discharge into a forebay, detention basin or open drainage course as directed by the City.

SUMP PUMP LEAD REQUIREMENTS: 38. All sump pump leads connected to a drain shall be pre-manufactured.

- 39. Sump pump leads shall be (1) PVC Sch. 40 (2) PVC Truss Pipe, or (3) approved equal, with premium joints.
- 40. Sump collection system pipes shall be connected at drainage structures and shall be cored or precast. Taps to 12" storm sewer may be made with a Fernco EZ Tap or approved equal. Taps to other size storm sewer may be made with a Romac saddle, KOR—N—TEE lateral connector for concrete pipe, or approved equal.
- 41. Ends of all 4" sump pump leads shall be temporarily capped and their location staked, witnessed and recorded.
- 42. All sump pump leads are to be taken to the property line, easement line or as indicated on the plan.
- 43. Sump pump cleanouts shall be a minimum inside diameter of 2' and be constructed at changes of alignment ends of sump pump mains or as indicated on approved plans.



OIL/GAS SEPARATOR DETAIL FOR

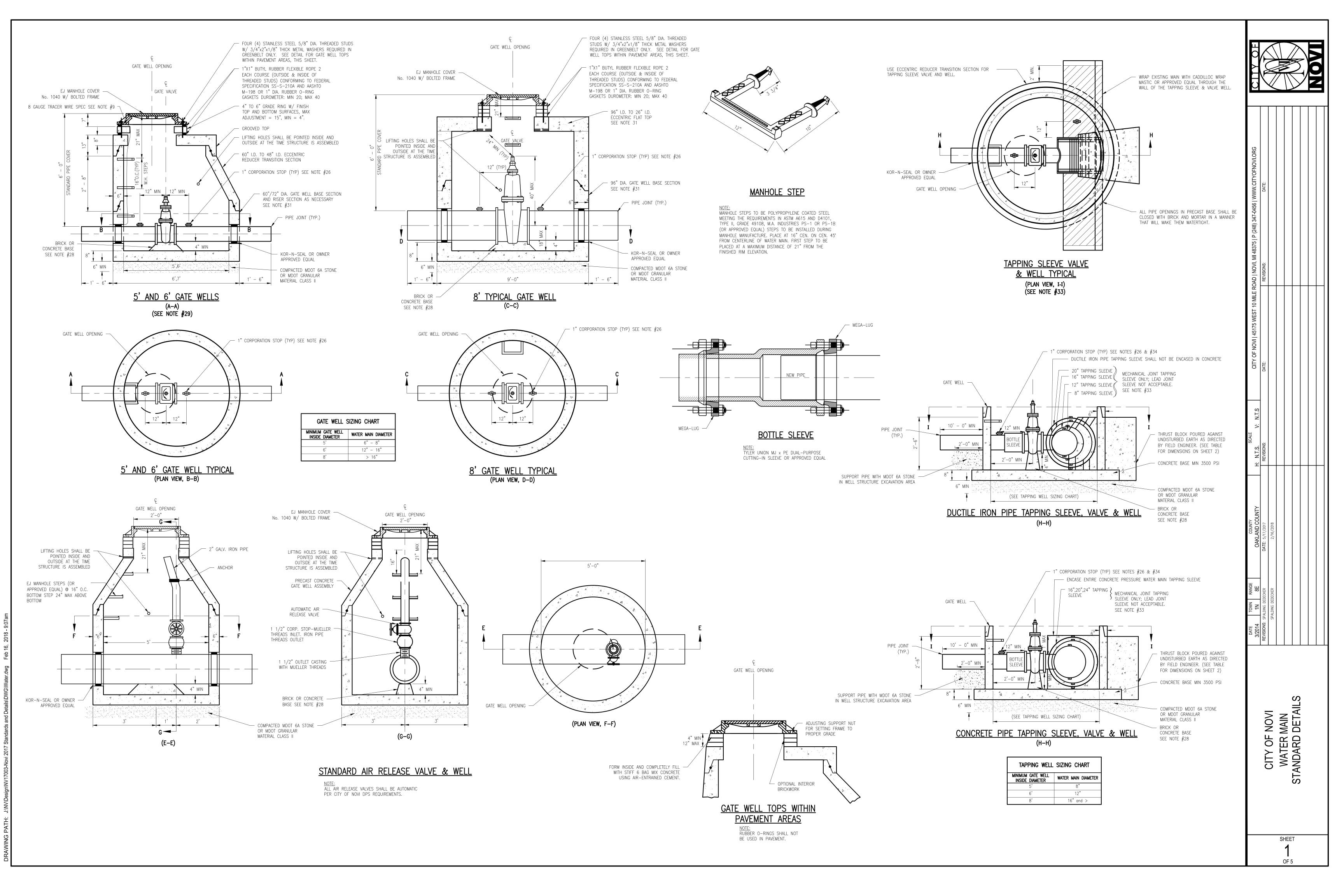
18" DIAMETER AND SMALLER OUTLET PIPE

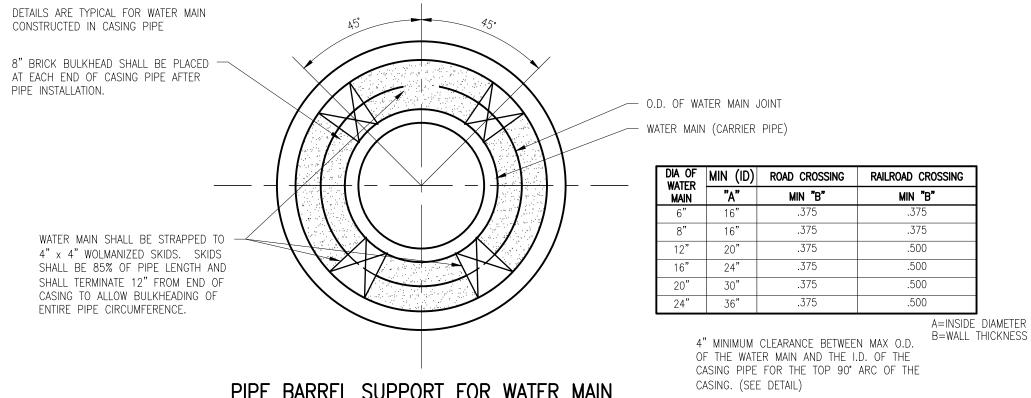
(FOR OUTLET PIPES LARGER THAN 18" IN DIAMETER AN

ALTERNATE DESIGN MUST BE APPROVED BY THE CITY ENGINEER)
SEE NOTE #37

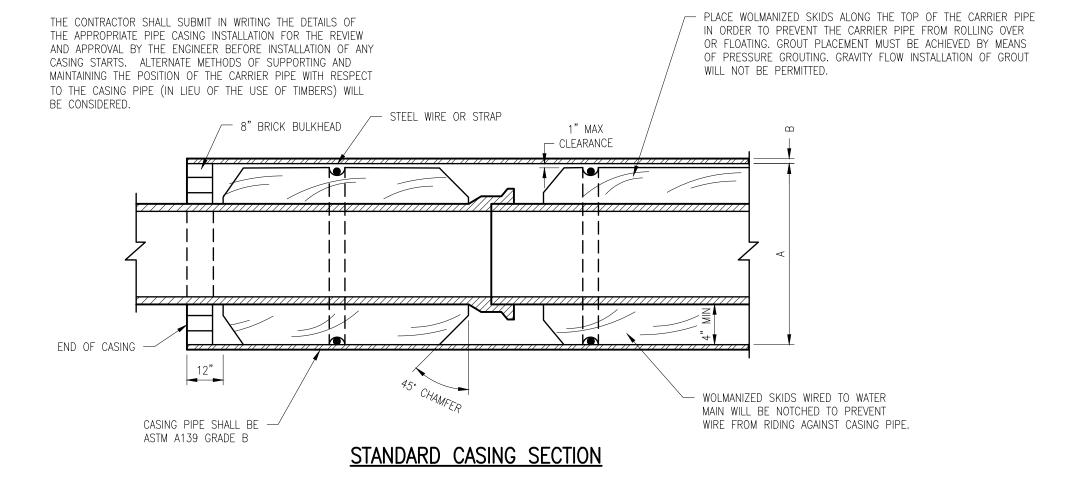
STORM SEWER STANDARD DETAILS

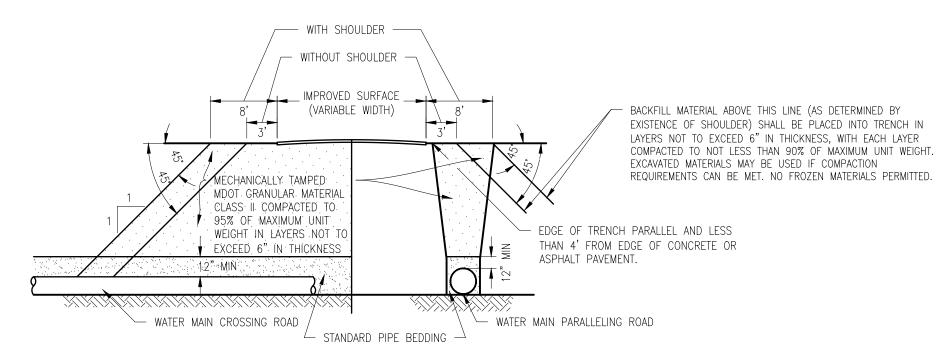
SHEET 2 OF 2



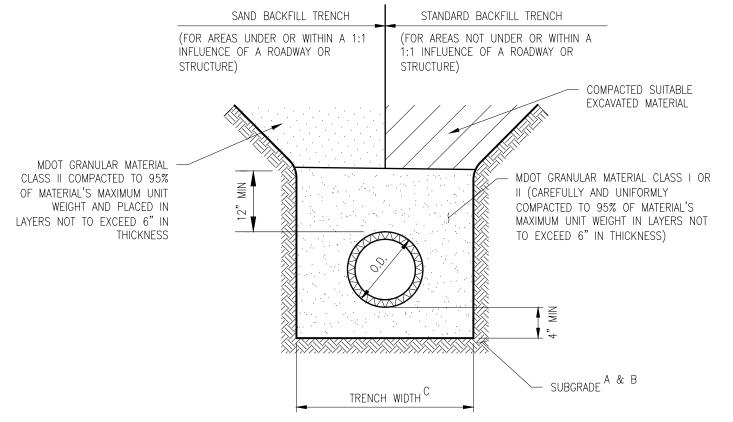


PIPE BARREL SUPPORT FOR WATER MAIN CONSTRUCTED IN CASING PIPE





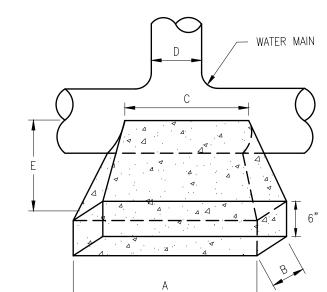
SAND OR GRAVEL BACKFILL DETAILS FOR WATER MAINS UNDER GRAVEL, CONCRETE OR ASPHALT PAVEMENTS, SIDEWALKS, DRIVEWAYS AND PARKING AREAS (SEE NOTE #24)



A. IF THE EXISTING SUBGRADE SOILS MEET THE REQUIREMENTS FOR MDOT GRANULAR MATERIAL CLASS II (MINIMUM 4" THICK), THEN THE WATER MAIN MAY BE LAID DIRECTLY ON THE COMPACTED NATIVE SUBGRADE SOILS. B. FIELD CONDITIONS MAY REQUIRE UP TO 18" OF MDOT 6A STONE IN ORDER TO SECURE A FIRM TRENCH BOTTOM. ADDITIONAL DEPTH OF TRENCH UNDERCUT SHALL BE DIRECTED BY A GEOTECHNICAL ENGINEER AND SHALL BE REFILLED WITH 1" X 3" STONE.

MAXIMUM TRI	ENCH WIDTHS
I.D. PIPE SIZE	TRENCH WIDTH
UP TO 12"	30"
15" TO 36"	O.D. + 12"
42" OR LARGER	O.D. + 24"

BEDDING AND TRENCH BACKFILL DETAIL (SEE NOTE #24)

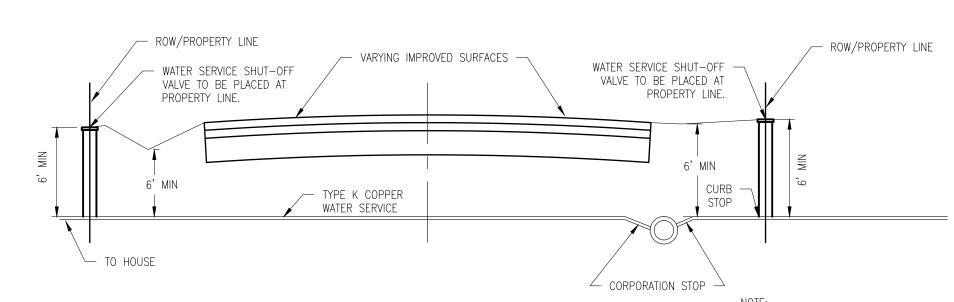


FOR	TEES A	AND TAPI	PING SLI	EEVES
D	Α	В	С	E MIN
20"	6.5	4.5'	3.5'	3'
16"	4'-8"	4'-8"	2.5'	2.75
12"	4'	3'	2.5'	2.5'
10"	3'	2'	2'	2.25
8"	2'-6"	2'	2'	2.25
6"	2'	2'	2'	2.25

THRUST BLOCK DETAILS

A. 3000 PSI CONCRETE TO BE USED. THRUST BLOCK TO ABUT & REST AGAINST UNDISTURBED SOIL OR

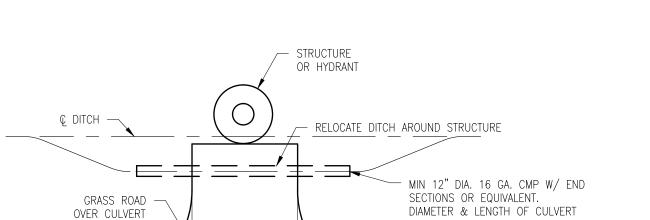
- EARTH COMPACTED TO 95% MODIFIED PROCTOR. B. THRUST BLOCKS NOT PERMITTED ON THEIR OWN, MUST BE USED IN COMBINATION WITH MEGALUG
- RESTRAINTS. SEE NOTE #19 C. TO BE USED AT THE DISCRETION OF THE CITY'S CONSULTANT.



LATERAL LOCATION SHALL BE AS TYPICAL PUBLIC ROAD WATER SERVICE CONNECTION REQUESTED BY THE ABUTTING PROPERTY (SEE NOTES #27, #29)

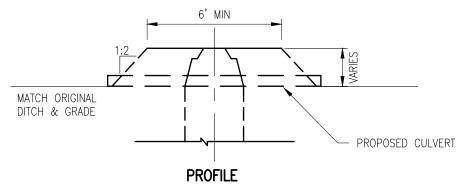
AS NOTED ON PLANS. CULVERT TO

EXTEND 2' BEYOND TOE OF SLOPE.

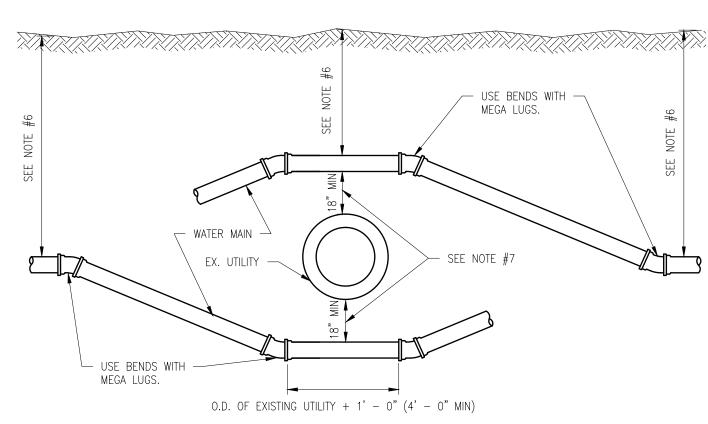


∕├── MIN 6'WIDE →

OVER CULVERT

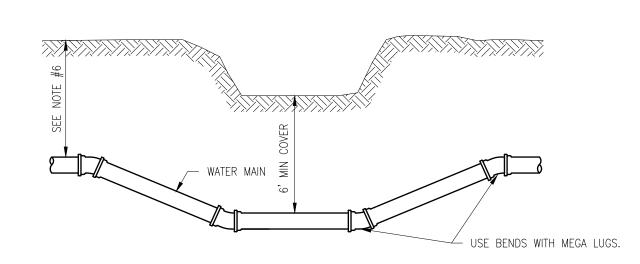


DITCH ENCLOSURE AT GATE WELL OR HYDRANT

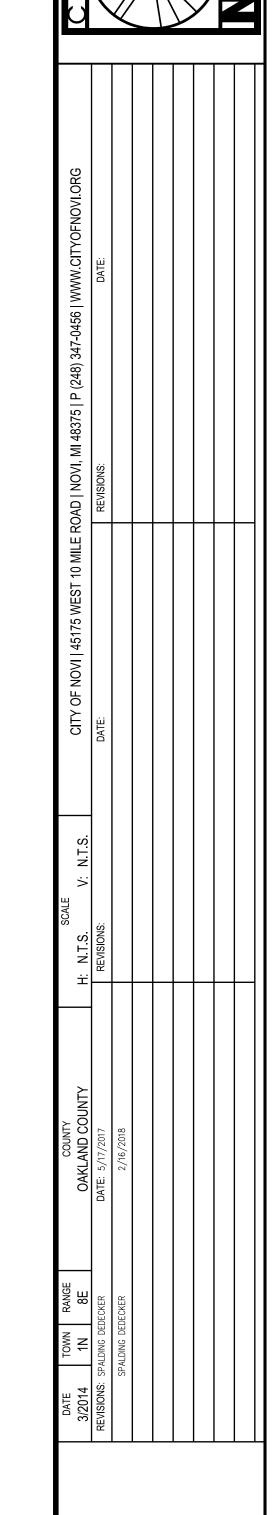


TYPICAL WATER MAIN UTILITY CROSSING (SEE NOTE #17)

6A STONE BACKFILL SHALL EXTEND 9" EACH SIDE OF EXISTING PIPE, 12" ABOVE EXISTING PIPE AND SHALL BE AT A ONE ON ONE SLOPE TO THE BOTTOM OF THE TRENCH.

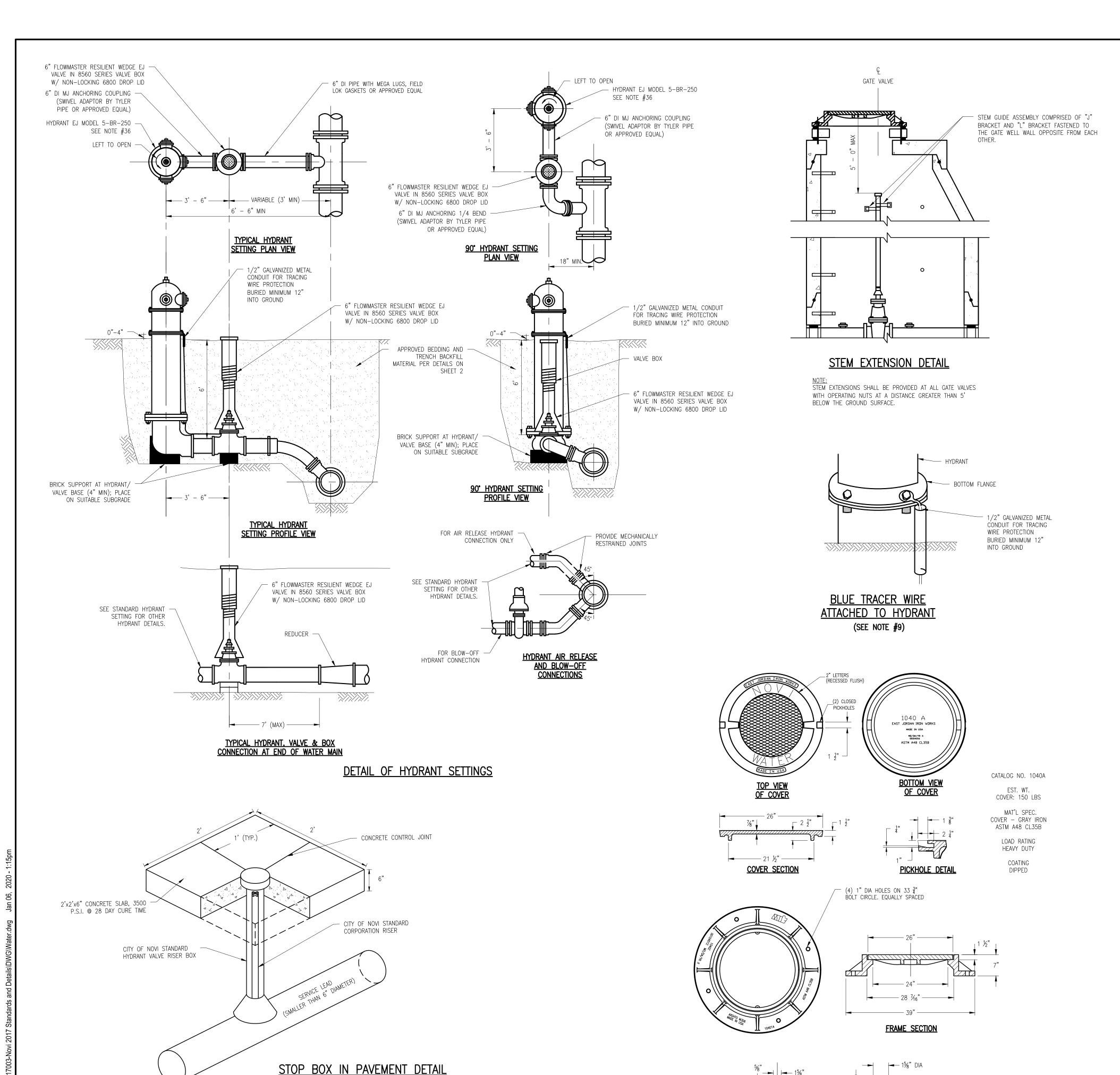


DITCH, STREAM OR WETLAND CROSSING



CITY OF NOVI WATER MAIN STANDARD DETAILS

SHEET OF 5



WHERE WATER SERVICE CORPORATION BOX FALLS WITHIN A PAVED AREA (PARKING LOT,

SERVICE DRIVE AREA, ETC.) THE STOP BOX SHALL BE PLACED IN A STANDARD HYDRANT VALVE BOX. THE VALVE BOX SHALL BE CENTERED IN A 2'x2'x6" CONCRETE SLAB.

CONCRETE CONTROL JOINTS SHALL BE PLACED IN SLAB AT 1' INTERVALS.

WATER MAIN CONSTRUCTION NOTES

- . All construction procedures and materials used on all water main projects shall conform to AWWA and The City of Novi current Standards and Specifications.
- 2. No water main is to be installed without City inspection.
- 3. 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.
- 4. Where work is to be performed in the vicinity of a City of Detroit water main. contractor shall notify the GLWA three (3) working days prior to start of construction and request an inspection of the job.
- 5. All pipe and all pipe fittings shall be made in the U.S.A.
- 6. Unless otherwise specified on plans, top of all water mains shall be six (6) feet below existing or proposed gravel, concrete or asphalt pavements, sidewalks. driveways and parking areas. A minimum cover of six (6) feet shall be maintained when crossing a ditch; water mains shall have a minimum of 5.5 feet of cover when in greenbelt.
- 7. Whenever a water main is installed under existing utility line, 6A stone shall be used to properly support or distribute any concentrated loads to avoid any settlement and all possible failure of the lower main. A vertical separation of at least 18 inches between the utility and the water main shall be provided (measured barrel to barrel).
- 8. All required cross connection devices shall be installed as required by the local plumbing code and in accordance with the standards of the Michigan Department of Environmental Quality Water Resources Division and the Michigan Department of Public
- 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 3M's Direct Bury Splice kit or approved equal.
- 10. Connection to an existing water main shall be made only after pressure and bacteriological tests have been successfully completed. The city consultant must be present for the tests 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)
- 10a. All watermain 8" or larger shall be cleaned with a poly pig.
- 11. The city consultant must witness the connection of the water main to the existing water main. After the city consultants' approval letter has been issued, residential and commercial taps will be allowed. All water service connections two (2) inches and smaller shall be made by the City of Novi DPS.
- 12. Contractor supplied gauges are required for testing. The minimum size shall be 3.5" diameter graduated in one (1) or two (2) pound increments from 1 to 160 psi (minimum range).
- 13. When temporary water main jumpers are used during water main construction, a testable RPZ backflow preventer with current test report shall be placed on the jumper hose that is connected to the new water main.
- 14. 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.

WATER MAIN NOTES:

- 15. All water main shall be ductile iron or concrete. HDPE water main may be permitted upon city approval. Water main shall be per the following specifications: 15.a. Ductile Iron pipe shall be ANSI/AWWA C151/A21.51 cement lined with bituminous seal coat Class 54 for sizes 3" through 16" and Class 55 for 20" through 24" pipe. Ductile Iron pipe shall be designed for a minimum working pressure of
- 15.b. Pre-stressed Concrete Cylinder pipe (P.C.C.P.) shall be AWWA C-301
- specification for sizes larger than 24". 15.c. High Density Polyethylene (HDPE) SDR 9 or 11 pipe shall meet the requirements of AWWA C906 (SDR 11) with blue shell or blue stripe.
- 16. Water services up to 2" shall be either Type K soft copper or HDPE DR9 with tracing wire meeting the requirements of ANSI/AWWA C909 for a pressure class of 200 psi. If HDPE is used, a tracing wire shall be run from the meter setup to the curb box (See Item #9 for tracing wire requirements). All water services greater than 2" shall follow the standards listed in Item #15.
- 17. The maximum allowable deflection at joints for ductile iron water main shall be per manufacturers standards (i.e. 4" - 36" water main - 5" per 20').
- 18. Poly-wrap may be required by the city and shall be placed around the water main per manufacturers specifications.
- 19. MEGALUG shall be placed at all valves, bends, tees, plugs, hydrants and mechanical fittings. Surrounding joints shall be restrained using U.S. Pipe Field Lok gaskets or approved equal and shall be per the manufacturer's joint restraining schedule and the latest edition of DIPRA's Thrust Restraint Design for Ductile Iron Pipe.
- 20. Water main joints shall be Tyton, Fastite, Mechanical, or approved equal in accordance with ANSI/AWWA C111/A21.11.
- 21. Restrained joints are required in lieu of thrust blocks. Restrained joints for pipe sizes up to 16" shall be Fast Grip Gaskets, Mega Lug or approved equal.

- Restrained joints for pipe sizes over 16" shall be American Ductile Iron Flex-Ring Joint Pipe or approved equal boltless system.
- 22. Thrust restraint design shall be per the Ductile Iron Pipe Research Association's Manual of Thrust Restraint Design for Ductile Iron Pipe, current edition.
- All bolts on all flanged and mechanical joint fittings shall be domestic origin high strength, low alloy COR-BLUE steel bolts or approved equal. These bolts shall meet the current provisions of American National Standard ANSI/AWWA C111/A21.11 for rubber gasket joints for ductile iron pressure pipes and fittings. Bolt manufacturer's certificate of compliance must accompany each shipment.
- 24. Backfill shall be compacted above pipe 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 and shall be compacted in layers not to exceed six (6) inches in thickness to a density of 95% as determined by AASHTO T99. Where water main is to be placed on fill material, all fill material below the pipe must also be compacted to 95% maximum unit density. All backfill placed within a 1:1 influence of structures shall be approved sand, placed in six (6) inch layers and compacted. Trenches that are to be left open overnight shall be enclosed with suitable fencing and lighted barricades.

VALVE & SLEEVE NOTES:

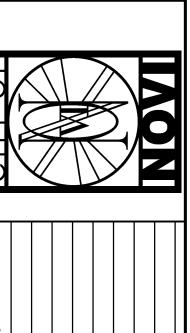
- 25. All Gate Valves less than 16" shall be EJ ductile iron body, fully bronze-mounted, resilient-wedge, non-rising stem (ANSI/AWWA C509), opening counterclockwise.
- 26. Corporation Stops shall be 1-inch Mueller #H-15000, or approved equal. Corporation stops shall be securely capped after testing. Must use lead free corps.
- 27. All service lead corporation stops installed outside of gate wells 1" or less may be direct tapped to main. For corporation stops larger than 1" use bronze double strap
- 28. Gate valves and fittings shall be supported by formed concrete or mortared brick bearing on the floor (minimum four (4) inches of clearance between floor and bottom of gate valve).
- 29. All gate valves 6" or larger shall be placed in a well with the exception of a hydrant shut off valve. A valve shall be placed in a box for water main smaller than 6". A stop box and rod is required for services up to 2" and a hydrant valve box is required for services less than 6". If the box falls within a paved area, a hydrant valve box is required for all service sizes.
- 30. Butterfly valves shall be used for valves 16" and larger in diameter and shall be Dezurik AWWA style, or approved equal, manufactured in accordance with ANSI/AWWA C504 and conforming to NSF Standard 61.
- 31. All precast concrete gate well sections shall be manufactured to conform with ASTM C478, except wall thickness shall be as shown on these details. Precast concrete gate well sections shall be modified tongue and groove with premium rubber gasket—type joints manufactured to conform with ASTM C443.
- 32. All gate well covers shall be EJ #1040A with bolted frame and with lettering per detail on this sheet. All cover bolts shall be stainless steel.
- 33. Tapping sleeves shall be manufactured by JCM Industries, Romac Industries, Mueller, EJ, Smith-Blair or approved equal and shall be mechanical joint with DWS Mechanical Joint Tapping Gate Valve. Lead joint sleeves shall not be used. Like size tapping sleeves can only be used when the existing main is ductile iron and equal to/less than 12-inch in diameter. For like size connections greater than 12-inch, a cut-in-tee is required. All tapping sleeves must be mechanical tapping sleeves.

34. No tapping of any water main fitting will be permitted.

35. No water main fittings or water service fittings shall contain lead.

HYDRANT NOTES:

- 36. All hydrants shall be 6' bury EJ #5BR-250-Traffic Model and shall conform to ANSI/AWWA C502, and shall have a minimum 5 1/4" valve opening that closes with the water pressure. Hydrants shall be traffic style with breakable flange and
- 37. Hydrants shall have a swivel flange to allow bonnet to be turned 360 degrees without removing the bonnet, and barrel flanges shall be integrally cast with the barrel. Inlet shoe shall have a bronze valve seat, which can be removed without
- 38. Inlet connection shall be 6" mechanical joint, conforming to AWWA C111 and ASA-A21.11. Stem threads shall be sealed with double "0" rings and shall be permanently lubricated with all weather grease.
- 39. Hose connections: One (1) 4 1/2" pumper nozzle and two (2) 2 1/2" hose nozzles, with National Standard Thread (NST) threads. Final orientation of the hydrant steamer connection to be determined by City consultant or Fire Department.
- 40. Operating Nut: (1) 1 1/8" P-F pentagon, open left.
- 41. Hydrants shall be factory painted by spray application red above the ground and black below, with a finish coat of Glamortex 501 enamel, color 314 Vermillion, or approved equal.
- 42. Prior to acceptance, hydrants shall be charged, tested and any leaks are to be repaired. Hydrants and valve boxes shall be plumbed and set to finished grade. Valve boxes shall be in line with the valve.



CITY OF NOVI 45175 WEST 10 MILE ROAD NOVI, MI 48375 P (248) 347-0456 WWW.CITYOFNOVI.ORG	DATE:					
OAD NOVI, MI 48375 P	REVISIONS:					
CITY OF NOVI 45175 WEST 10 MILE F	DATE:					
H: N.T.S. V: N.T.S.	REVISIONS:					
YTNL		2/16/2018	1/6/2020			
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MAIN DETAIL CITY OF WATER NATER NA

SHEET

CAST IRON GATE WELL FRAME AND COVER

BOLT DETAIL

<u>1</u>"−13 BOLT & STEEL WASHER & RUBBER WASHER

(TYP. 4 PLACES)

(SEE NOTE #32)

34" DIA

BOLTHOLE DETAIL

						TA	ABLE 23.	6.5.A							
					DU	CTILE IR	ON WAT	ER MAIN	PIPE						
				THRUS	ST REST	RAINT L	ENGTH F	OR HOP	RIZONTA	L BEND	S				
							P	PE DIAME	TER (inche	es)					
		3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"	42"
	11.25°	1	2	2	3	4	4	5	6	7	7	9	11	13	15
ES	22.5°	3	3	5	6	8	9	10	12	13	15	17	21	25	29
ANGLES grees)	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
BEND BEND	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
							1								
Unit Frictional	Force (ft/lbs)	124	151	217	284	349	415	481	547	613	679	811	1,005	1,203	1,398
Unit Bearing Resis	tance (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

Non-Polywrapped Pipe

Design Pressure = 150 psi Safety Factor = 1.5 Laying Condition = Type 3 Soil Designation = Clay 1 = Not Permitted (for 60°, use two 30° bends; for 90°, use two 45° bends)

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

						T/	ABLE 23.	6.5.B							
					DU	CTILE IR	ON WAT	ER MAIN	I PIPE						
				THRUS	T REST	RAINT LI	ENGTH F	OR VER	TICAL U	P BEND	S				
							Р	PE DIAME	TER (inche	es)					
		3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"	42"
	11.25°	1	2	2	3	4	4	5	6	7	7	9	11	13	15
LES	22.5°	3	3	5	6	8	9	10	12	13	15	17	21	25	29
ANGL grees)	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
BEND (dec	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 F	orce (ft/lbs)	124	151	217	284	349	415	481	547	613	679	811	1,005	1,203	1,398
Unit Bearing Resist	ance (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 = Not Permitted (for 60°, use two 30° bends; for 90°, use two 45° bends)

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

					DU		ABLE 23.	6.5.C ER MAIN	I PIPE						
	_		7	THRUST				R VERTI		WN BEN	DS				
					1			IPE DIAME			1				
		3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"	42"
	11.25°	2	3	4	5	6	7	8	10	11	12	14	18	21	25
ES	22.5°	4	5	8	10	12	15	17	19	22	24	29	36	43	50
ANGLES grees)	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
BEND (de	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
				_	1				1	•	1			1	
Unit Frictional I	Force (ft/lbs)	124	151	217	284	349	415	481	547	613	679	811	1,005	1,203	1,398
Unit Bearing Resist	tance (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 = Not Permitted (for 60°, use two 30° bends; for 90°, use two 45° bends)

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

							BLE 23.6								
							ON WATI								
					THRUS	TRESTR	RAINT LE	NGTH F	OR TEES						
						Р	IPE DIAME	TER OF M	AIN PIPE F	RUN (inche	es)				
		3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"	42"
	3"	8	7	6	4	2	1	0	0	0	0	0	0	0	0
RUN	4"		10	9	8	6	5	3	2	0	0	0	0	0	0
<u> </u>	6"			16	15	14	13	12	11	10	0	7	4	1	0
BRANCH	8"				22	22	21	20	19	19	18	16	14	11	8
₹ [10"					28	27	27	26	26	25	24	22	19	17
<u> </u>	12"						34	33	33	32	32	31	29	27	25
rER OF (inches)	14"							40	39	39	38	37	36	35	33
띪	16"								46	45	45	44	43	41	40
DIAMETER (inc	18"									52	51	51	49	48	47
₹ [20"										58	57	56	55	54
<u>a</u>	24"											69	68	68	67
PPE	30"												87	86	85
≣ [36"													104	104
	42"														122
Unit Frictional Fo	rce (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 Resista	nce (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 = Not Applicable

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

						1	ABLE 23	3.6.5.E							
					Dl	JCTILE I	RON WA	TER MA	IN PIPE						
				1	THRUST	RESTRA	INT LEN	IGTH FO	R REDU	CERS					
	DIAMETER OF LARGER PIPE (inches)														
		3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"	30"	36"	42"
es)	3"		4	13	21	27	34	40	46	53	59	71	89	107	124
(inches)	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
PIPE	8"					11	20	29	37	45	50	64	83	102	120
	10"						11	20	29	37	45	59	79	99	117
<u> </u>	12"							11	21	30	38	54	75	95	114
[≒	14"								11	21	30	47	69	91	110
SMA	16"									11	21	40	63	85	106
	18"										11	31	57	80	101
<u>"</u>	20"											22	49	73	96
Ħ [24"												31	59	83
AMETER	30"													33	60
] A ≤	36"														32
	42"														
Unit Frictional Fo	rce (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 = Not Probable

= Not Applicable

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

					TA	BLE 23.0	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

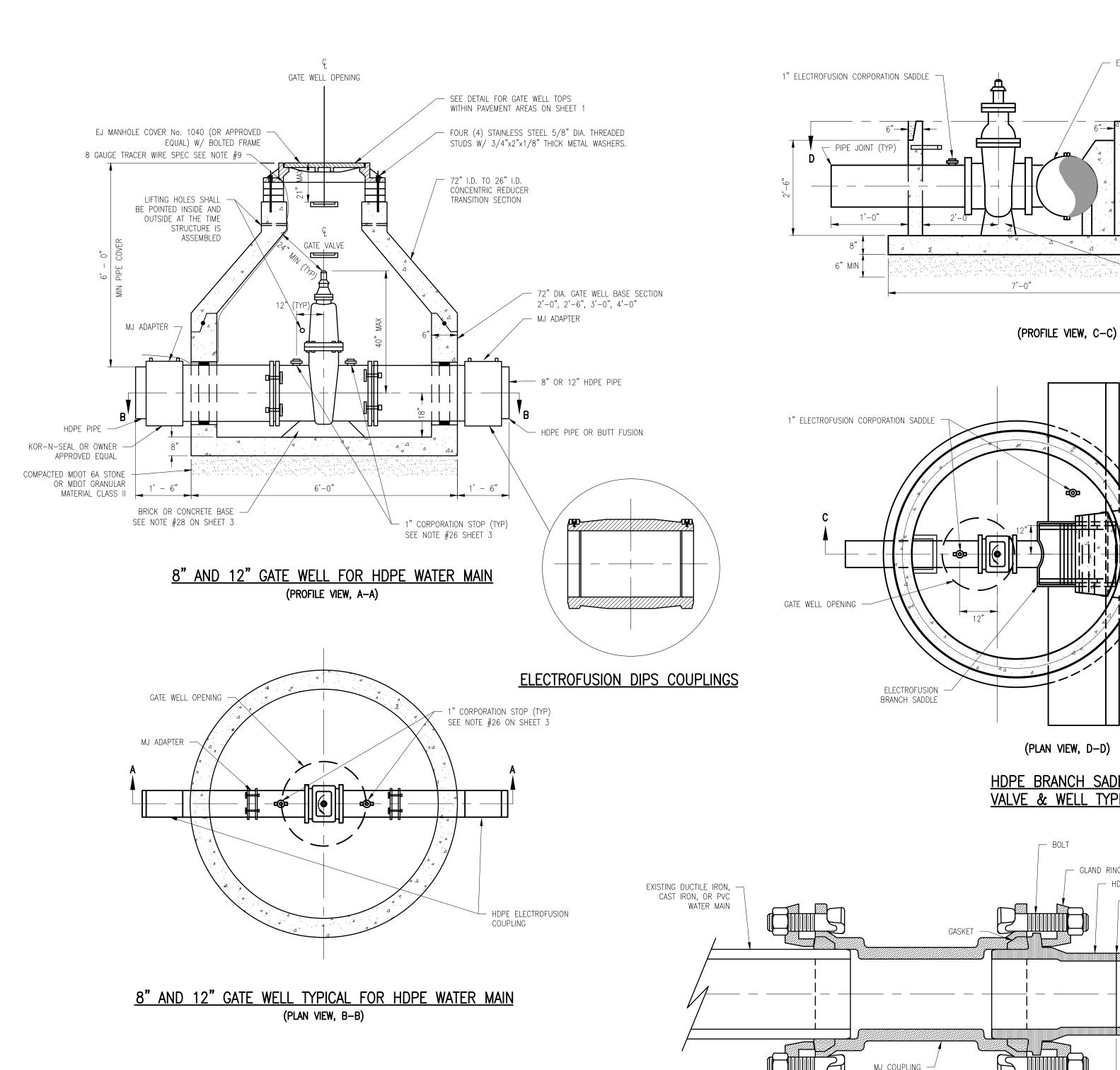
Design Pressure = 150 psi
Safety Factor = 1.5
Laying Condition = Type 3
Soil Designation = Clay 1
Non-Polywrapped Pipe

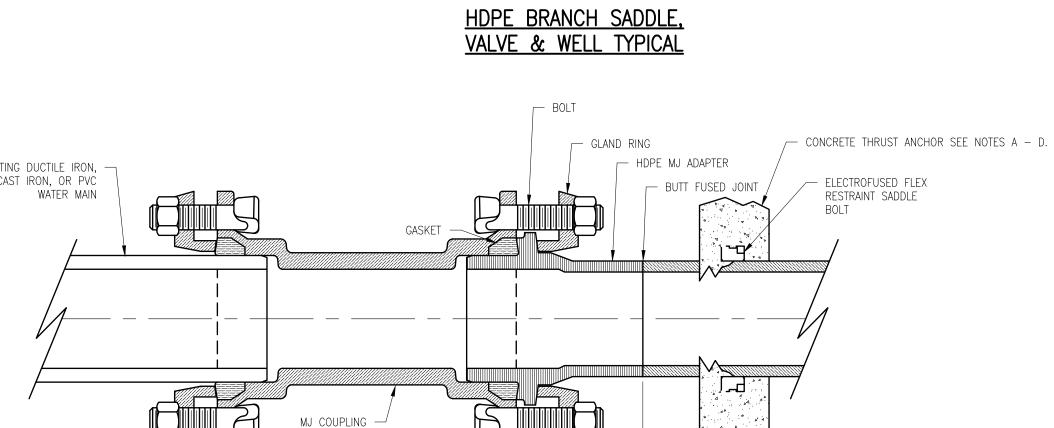
* Data Table acquired from the Ductile Iron Pipe Research Association (DIPRA)

CITY OF NOVI WATER MAIN STANDARD DETAILS

SHEET 4

OF 5





MJ ADAPTER FOR HDPE PIPE

(PLAN VIEW, D-D)

CONCRETE THRUST ANCHOR SEE NOTES A - D

PROVIDE 2" MINIMUM CONCRETE COVER OVER ALL

ADEQUATE CURING TIME OR USE OF HIGH EARLY CONCRETE TO ACHIEVE THE REQUIRED 4,000 PSI STRENGTH SHALL BE PROVIDED FOR ALL THRUST ANCHORS PRIOR TO TESTING

ALL CONCRETE THRUST ANCHORS MUST BE DESIGNED FOR

REQUIRED TO SUBMIT CALCULATIONS SUPPORTING THE SIZE

AND REINFORCEMENT. DIMENSIONS OF THE THRUST ANCHOR SHALL BE SPECIFIED BY THE DESIGN ENGINEER AND

DESIGNED BASED ON WATER MAIN PRESSURE AND SIZE AND

A MINIMUM OF 48 HOURS TIME SHALL BE PROVIDED AFTER

INSTALLATION IS COMPLETE PRIOR TO CONSTRUCTING AND

INSTALLING THE THRUST ANCHORS TO ALLOW HDPE PIPE TO

THE SITE SPECIFIC SOIL, GROUNDWATER AND SYSTEM

PRESSURE CONDITIONS. THE DESIGN ENGINEER WILL BE

REINFORCING STEEL.

SOIL CONDITIONS.

ADJUST TO GROUND TEMPERATURE.

(4000 PSI CONCRETE)

- ELECTROFUSION BRANCH SADDLE

THRUST BLOCK POURED AGAINST

UNDISTURBED EARTH AS DIRECTED

BY FIELD ENGINEER. (SEE TABLE

FOR DIMENSIONS ON SHEET 2)

COMPACTED MDOT 6A

STONE OR MDOT GRANULAR

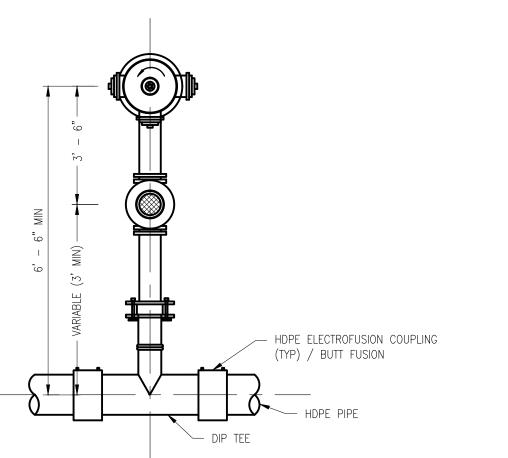
MATERIAL CLASS II OR III

- BRICK OR CONCRETE BASE

SEE NOTE #28 ON SHEET 3

SECTION E-E

ELECTROFUSION BRANCH SADDLE DETAIL



FIRE HYDRANT ASSEMBLY WITH HDPE PRE-MANUFACTURED TEE

CONCRETE THRUST ANCHOR FOR HDPE PIPE

REINFORCED,

BOTH FACES

POUR AGAINST

UNDISTURBED EARTH

(DIP SIDE OF ANCHOR)

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

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:

AWWA standard C906.

EQUIVALENT DUCTILE IRON PIPE SIZES (DIPS)

OMINAL PIPE SIZE O.D. SIZE (INCHES) MIN WALL THICKNESS S

9.05

13.20

17.40

21.60

25.60

11 (160 PSI) (INCHES)

0.823

1.200

1.582

1.964

2.345

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

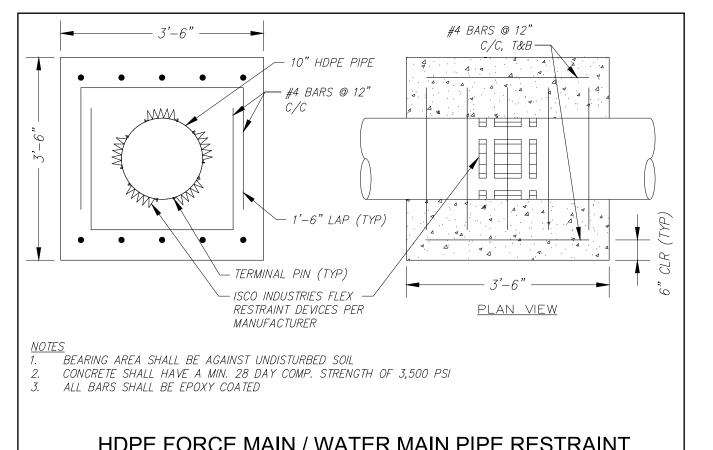
- 2. HDPE pipe shall be manufactured out of virgin material as defined in ASTM D3350. The pipe shall be made from high density PE 3408 polyethylene resin and the materials used must be listed and approved for use under NSF/ANSI Standard 14 and 61. HDPE pipe shall have a standard dimension ratio (SDR) of 11 or less, a hydrostatic design basis (HDB) of 1600 psi for water at 73.4LF 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" Eletrofusion 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
- 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, and 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.

- 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 3M'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
- 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.

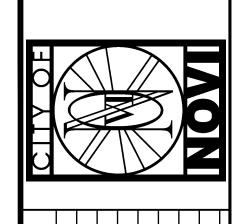
- 13. The polyethylene pipe shall be pressure tested after the line and all fittings and valves have been installed. Connections may be left exposed for visual leak inspection. Under no circumstances shall HDPE pipe be pressure tested when the temperature of the pipe is above 80°F.
- 10. Connection to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



HDPE FORCE MAIN / WATER MAIN PIPE RESTRAINT SCALE: NONE



\Box	<u> </u>	<u>/</u>		/	_
CITY OF NOVI 45175 WEST 10 MILE ROAD NOVI, MI 48375 P (248) 347-0456 WWW.CITYOFNOVI.ORG	DATE:				
	REVISIONS:				
CITY OF NOVI 45175 WEST 10 MILE R	DATE:				
SCALE H: N.T.S. V: N.T.S.	REVISIONS:				
COUNTY OAKLAND COUNTY	DATE: 5/17/2017	2/16/2018			
3/2014 1N 8E	REVISIONS: SPALDING DEDECKER	SPALDING DEDECKER			

MAIN DET WATER N STANDARD I OF

> SHEET OF 5

