

# CONSTRUCTION PLAN FOR CLEAN EXPRESS CAR WASH

## 10 E AUBURN ROAD ROCHESTER HILLS, MI 48307



VICINITY MAP  
1"=2,000'

### PROJECT DESCRIPTION

DEVELOPMENT OF A CAR WASH FACILITY WITH ASSOCIATED PARKING, VACUUM AREAS, DRIVEWAYS, AND UTILITIES.

### LEGAL DESCRIPTION

THE LAND SITUATED IN THE CITY OF ROCHESTER HILLS, COUNTY OF OAKLAND, STATE OF MICHIGAN, IS DESCRIBED AS FOLLOWS:

PART OF THE NORTHWEST 1/4 OF THE NORTHWEST 1/4 OF SECTION 35, TOWN 3 NORTH, RANGE 11 EAST, TOWNSHIP OF AVON, NOW CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS: BEGINNING AT A POINT ON THE NORTH LINE OF SAID SECTION, 458.42 FEET EAST OF THE NORTHWEST CORNER OF SAID SECTION; THENCE WEST ALONG SAID SECTION, 194.42 FEET; THENCE SOUTH PARALLEL WITH THE WEST LINE OF SAID SECTION, 362.45 FEET; THENCE EAST PARALLEL WITH THE NORTH LINE OF SAID SECTION, 198.17 FEET; THENCE NORTH TO THE POINT OF BEGINNING, EXCEPTING THEREFROM THE EAST 80 FEET THEREOF.

ALSO DESCRIBED FOR TAX PURPOSES AS FOLLOWS:

PART OF THE WEST 1/2 OF THE NORTHWEST 1/4 OF SECTION 35, TOWN 3 NORTH, RANGE 11 EAST, CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN, DESCRIBED AS: BEGINNING AT A POINT ON THE NORTH SECTION LINE DISTANCE EAST 264.00 FEET FROM THE NORTHWEST SECTION CORNER; THENCE EAST 114.42 FEET; THENCE SOUTH 00 DEGREES 28 MINUTES 00 SECONDS EAST 362.46 FEET; THENCE WEST 118.17 FEET; THENCE NORTH 00 DEGREES 07 MINUTES 30 SECONDS EAST 362.45 FEET TO THE POINT OF BEGINNING.

### BASIS OF BEARING

NORTH 87°47'36" EAST, BEING THE NORTH LINE OF SECTION 35, PER ADJACENT PROPERTY DESCRIPTION OF RECORD

### BENCH MARKS

ALL BENCH MARKS AND ELEVATIONS SHOWN UPON THIS PLAN ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

B.M. #1  
ARROW ON HYDRANT LOCATED NEAR THE WEST PROPERTY LINE OF SITE, LOCATED APPROXIMATELY 259' ± SOUTH OF THE NORTHWEST CORNER OF PROPERTY.  
ELEV.=756.50'

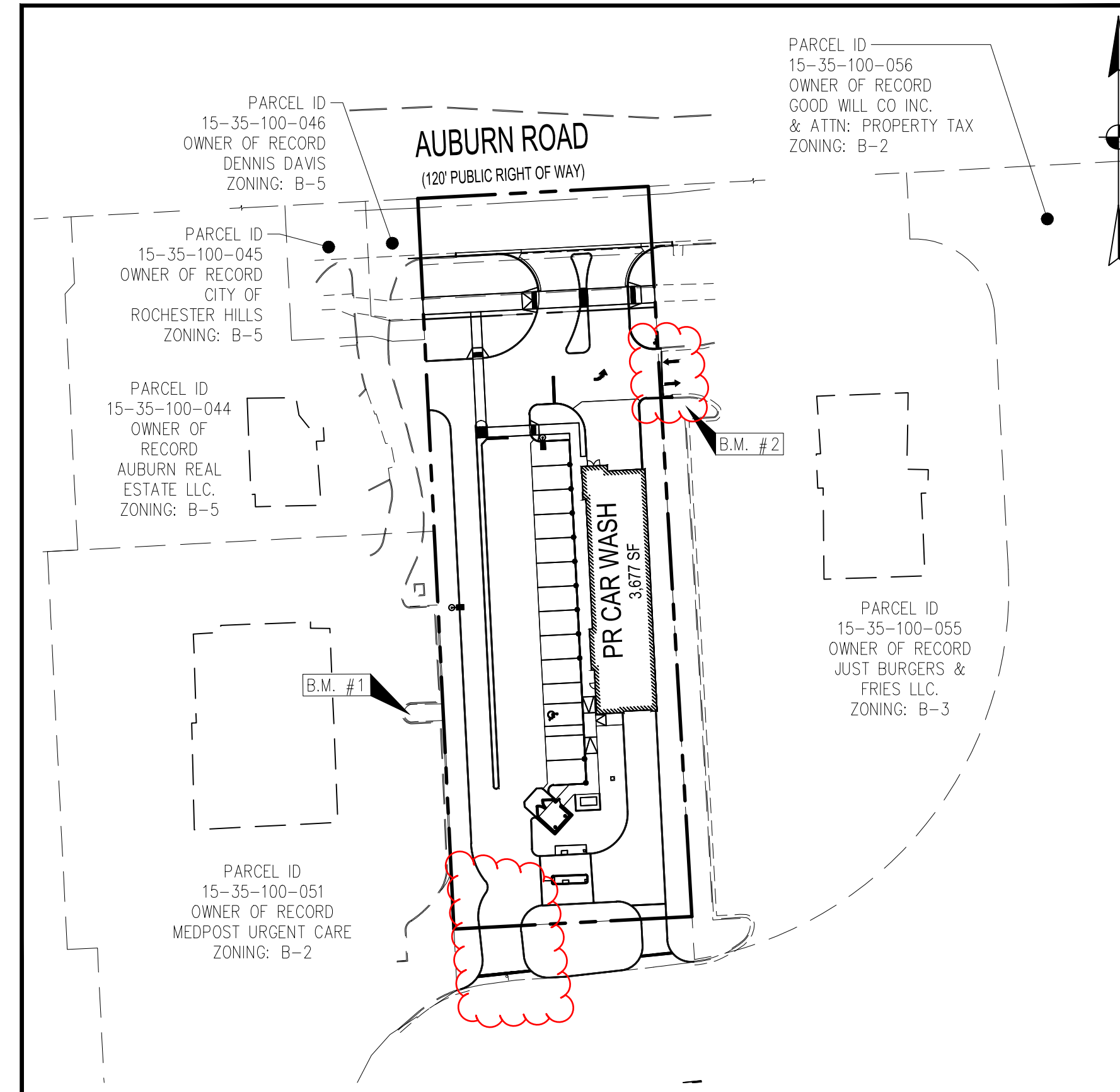
B.M. #2  
A HYDRANT LOCATED NEAR THE EAST PROPERTY LINE OF THE SITE, LOCATED APPROXIMATELY 111' ± SOUTH OF THE NORTHEAST CORNER OF SUBJECT PROPERTY.  
ELEV.=754.02'

### FLOOD ZONE

THE PROPERTY SHOWN HEREIN LIES WITHIN ZONE X, WHICH ARE AREAS DETERMINED TO BE OUTSIDE OF THE 0.2% ANNUAL CHANCE FLOOD HAZARD ZONE, PER NFIP FLOOD INSURANCE RATE MAP 26125C0394F, EFFECTIVE SEPTEMBER 29, 2006.

### SITE DATA

PARCEL NUMBER	15-35-100-003
PARCEL SIZE	0.968 ACRES - 42,152 SQ. FT.
ZONING:	SITE - CB COMMUNITY BUSINESS DISTRICT NORTH - CB COMMUNITY BUSINESS DISTRICT SOUTH - CB COMMUNITY BUSINESS DISTRICT EAST - CB COMMUNITY BUSINESS DISTRICT WEST - NB NEIGHBORHOOD BUSINESS & CB COMMUNITY BUSINESS DISTRICT
EXISTING USE	STONE SHOP
PROPOSED USE	CAR WASH GROUP B PER 2015 MICHIGAN BUILDING CODE
PARKING REQUIRED	1 SPACE PER EMPLOYEE + FOUR STACKING SPACES PER WASH LINE OR BAY + 1 EXIT STACKING SPACE FOR POST-WASH DETAILING.
PARKING PROVIDED	2 SPACES (1 ADA, 1 STANDARD STALL) 22 STACKING SPACES
MINIMUM LOT SIZE	5 AC & 400 FT, MAY BE MODIFIED WITH SHARED ACCESS
MAXIMUM BUILDING HEIGHT	30'
FRONT BUILDING SETBACK	75'
SIDE BUILDING SETBACK	25'-EACH 50'-TOTAL
REAR BUILDING SETBACK	75'
PROPOSED GROSS BUILDING AREA	3677 SQ. FT.
PROPOSED BUILDING HEIGHT	1 STORY - 22' 4"



INDEX MAP  
SCALE: 1" = 60'  
INDEX OF SHEETS

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IRRIGATION PLAN NOTES & DETAILS	I 1.2

**DESIGN CONSULTANT**  
THE MANNIK & SMITH GROUP, INC.  
607 SHELBY ST, SUITE 300  
DETROIT, MI 48226  
CONTACT: KYLE J. WRENTMORE, P.E.  
PHONE: (614) 441-4222  
EMAIL: KWRENTMORE@MANNIKSMITHGROUP.COM

**OWNER/DEVELOPER**  
EXPRESS WASH CONCEPTS  
13375 NATIONAL ROAD, SUITE D  
ETNA, OHIO 43068  
CONTACT: JEFF GILGER  
PHONE: (614) 751-9274  
EMAIL: JEFF@EXPRESSWASHCONCEPTS.COM

**SURVEY**  
KEM-TEC A GROUP OF COMPANIES  
22556 GRATIOT AVE.  
EASTPOINTE, MI 48021  
CONTACT: ANTHONY T. SYCKO, JR., P.S.  
PHONE: (800) 295-7222  
EMAIL: TSYCKO@KEMTEC-SURVEY.COM



JNRNB2022-0013  
PSP2022-0032  
Revision #1 after  
conditions review  
approval  
Received 2/7/24

City of Rochester  
Hills Planning &  
Economic  
Development

### Site Plan Review

Reviewed for compliance with City Ordinance, Building and Fire Codes  
Conditions and mark-ups noted throughout plan set must be addressed prior to final approval

Department	Reviewer	Approved
Assessing	Assessing	Yes
Building	Mark Artinian 248-841-2446 ArtinianM@RochesterHills.org	Yes
Engineering - Utilities	Jason Boughton 248-841-2490 BoughtonJ@RochesterHills.org	Yes
Engineering Legal	Jenny McGuckin 248-841-2494 mcguckinj@rochesterhills.org	YES Date: 02/28/2024
Fire	Lt. Walter Murphy 248-841-2712 MurphyW@RochesterHills.org	Yes
Natural Resources	Matt Einheuser 248-841-2551 EinheuserM@RochesterHills.org	Yes
Planning	Chris McLeod 248-841-2572 mcleodc@RochesterHills.org	Yes
Traffic	Keith Depp 248-841-2503 DeppK@RochesterHills.org	Yes

ENGINEER OF RECORD



EUPONINE S. PIERRE, P.E.  
607 SHELBY ST, SUITE 300  
DETROIT, MI 48226  
(269) 363-9748  
EUPONINE@MANNIKSMITHGROUP.COM  
w/ conditions

TECHNICAL SKILL.  
CREATIVE SPIRIT.



2/06/2024  
REGISTERED PROFESSIONAL ENGINEER DATE

Conditioned on mutual agreement with Culver site and/or Planning Commission/City Council acceptance of joint access to the east

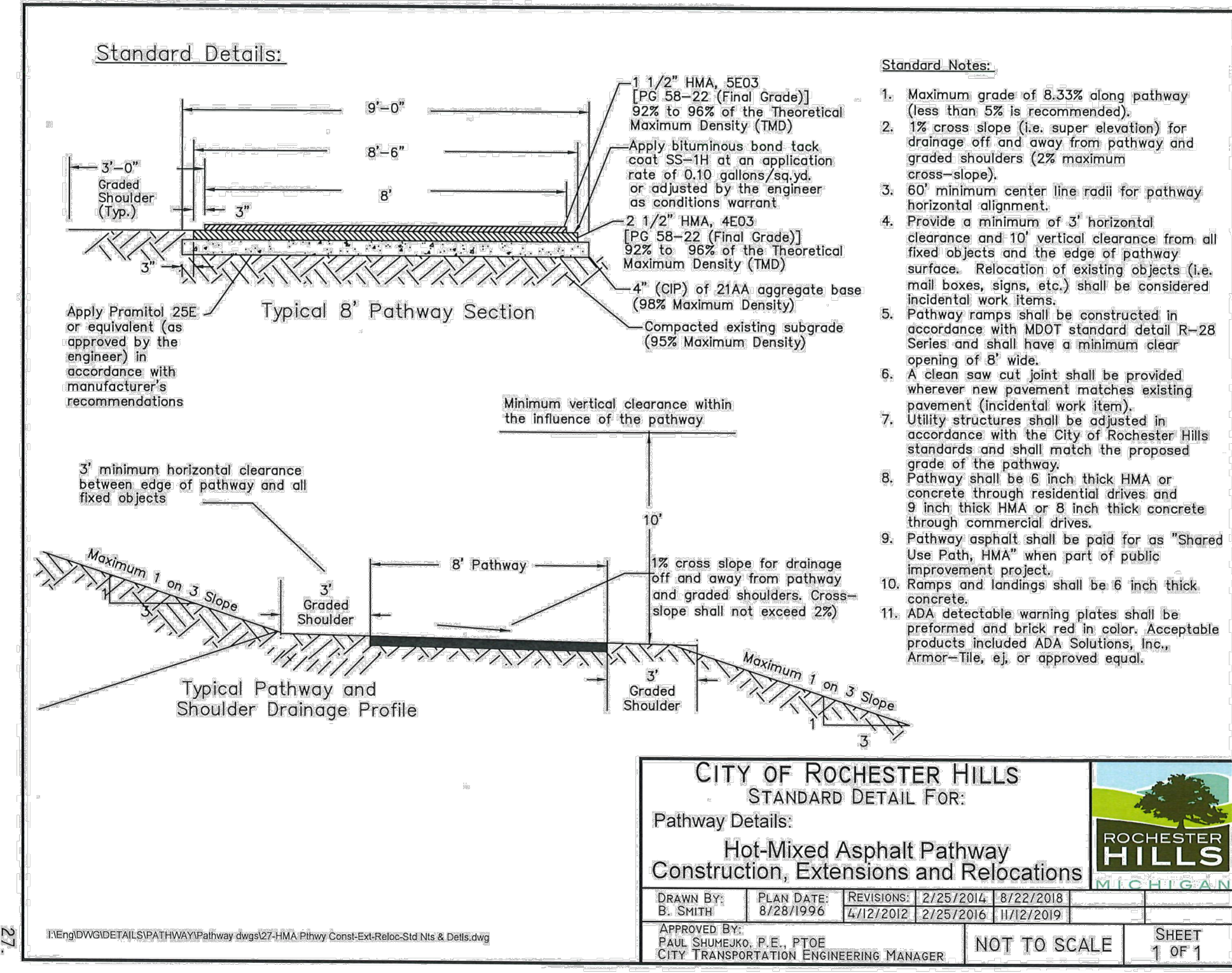
with note that it is highly discouraged to operate with only one driveway entrance as internal traffic at the cross access has been an issue with Culvers already. The previous plan with another entrance point from the Meijers parking lot is a better plan. Another entrance point should be pursued to ease congestion to Auburn Rd and/or internal traffic between Culvers and Clean Express.  
Also, with condition that the cross access to Culvers is closed if traffic issues internally and/or to Auburn Road become problematic.

NOT FOR CONSTRUCTION

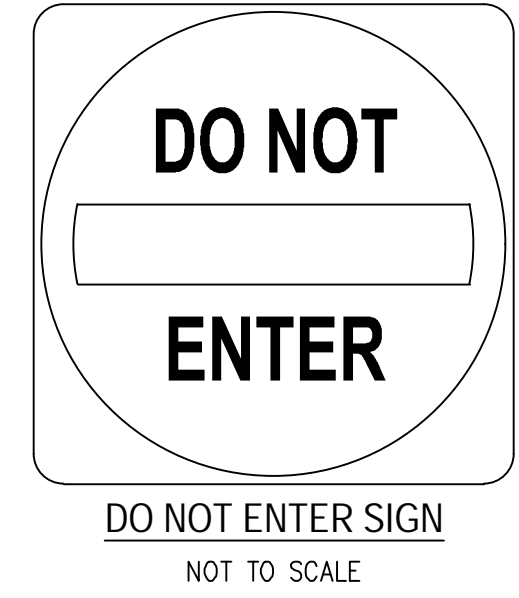
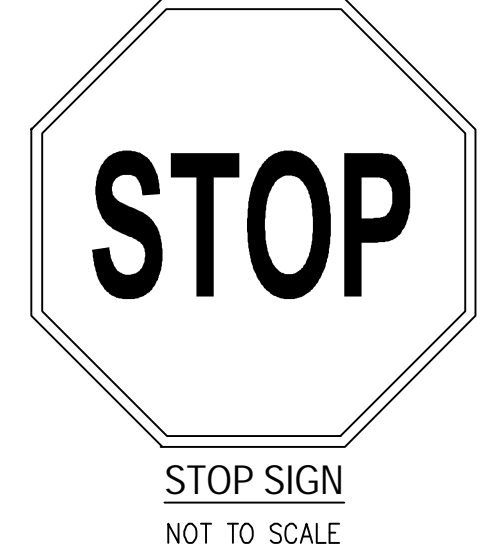
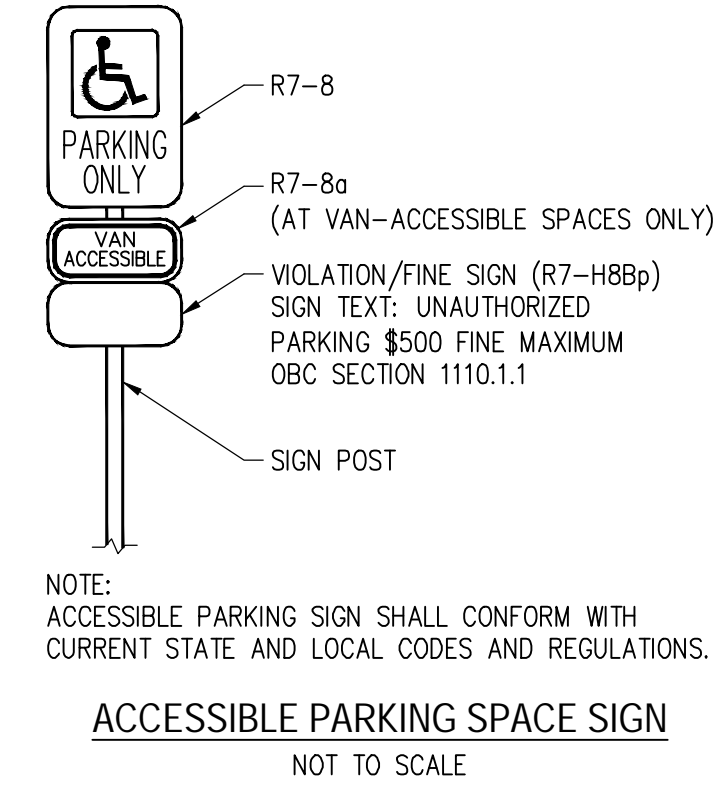
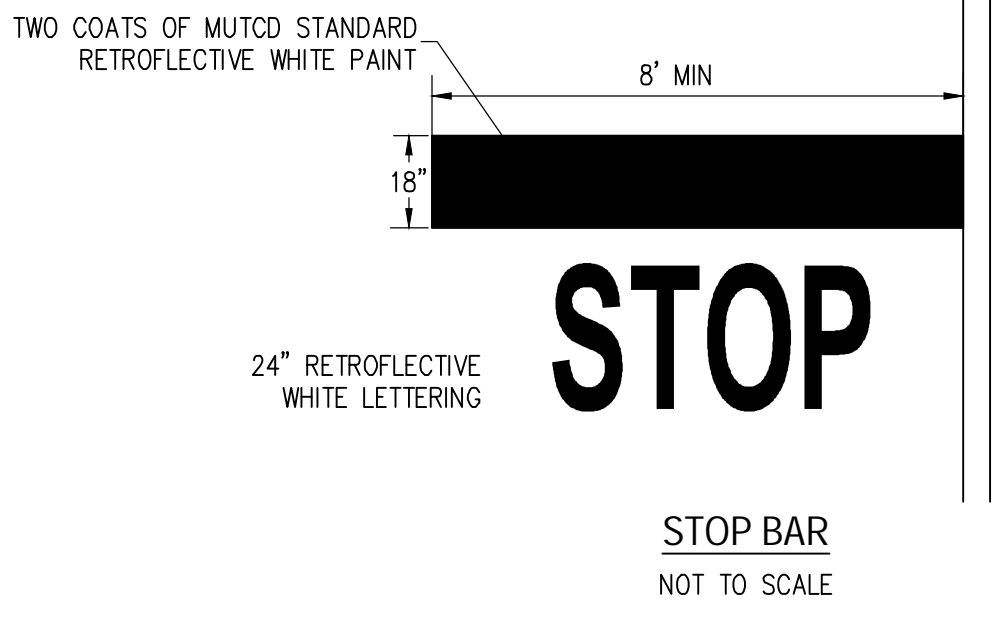
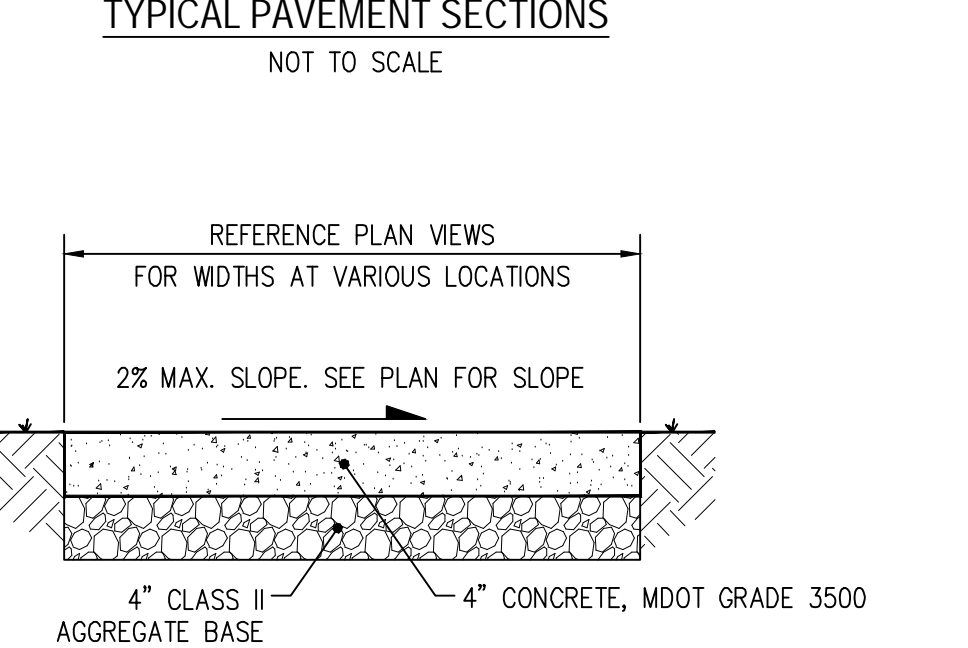
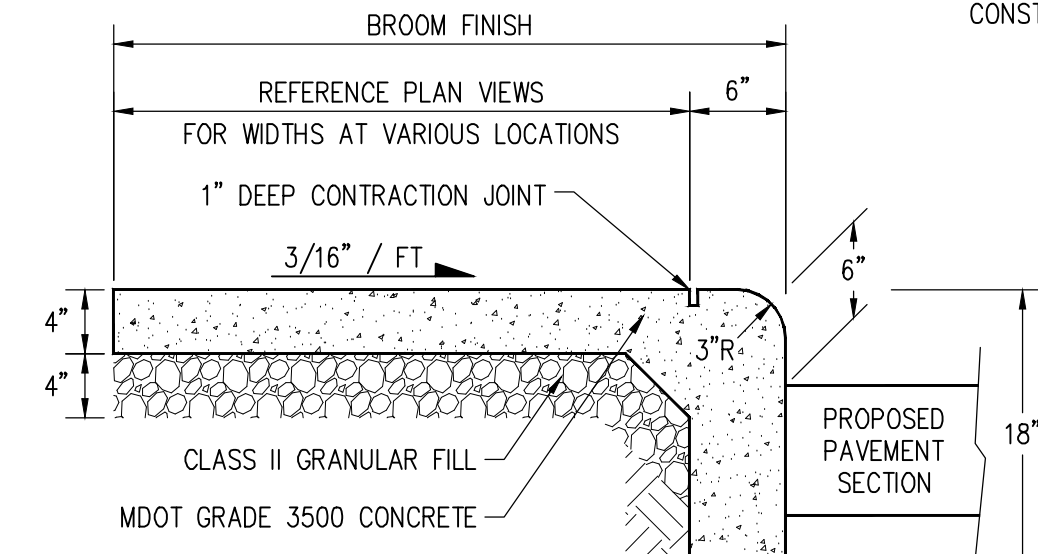
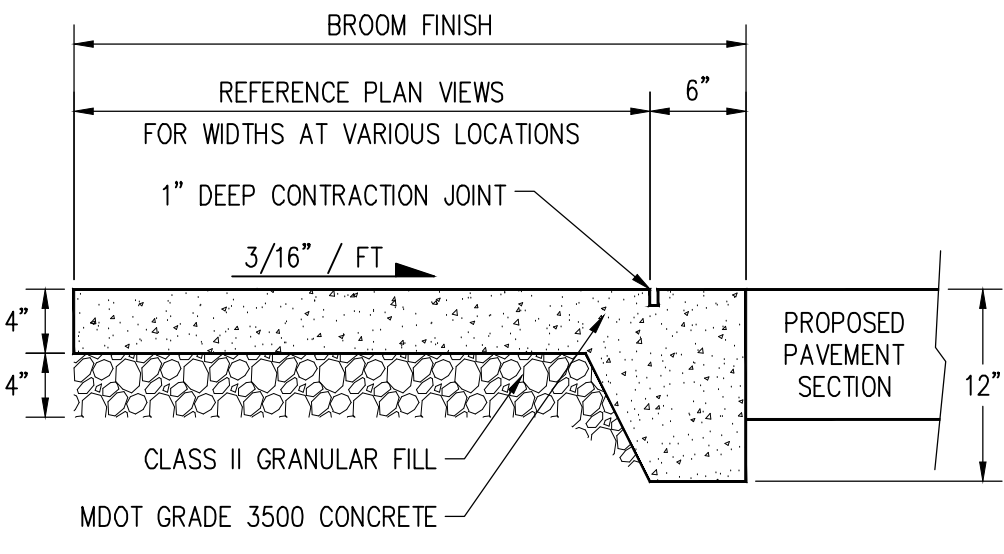
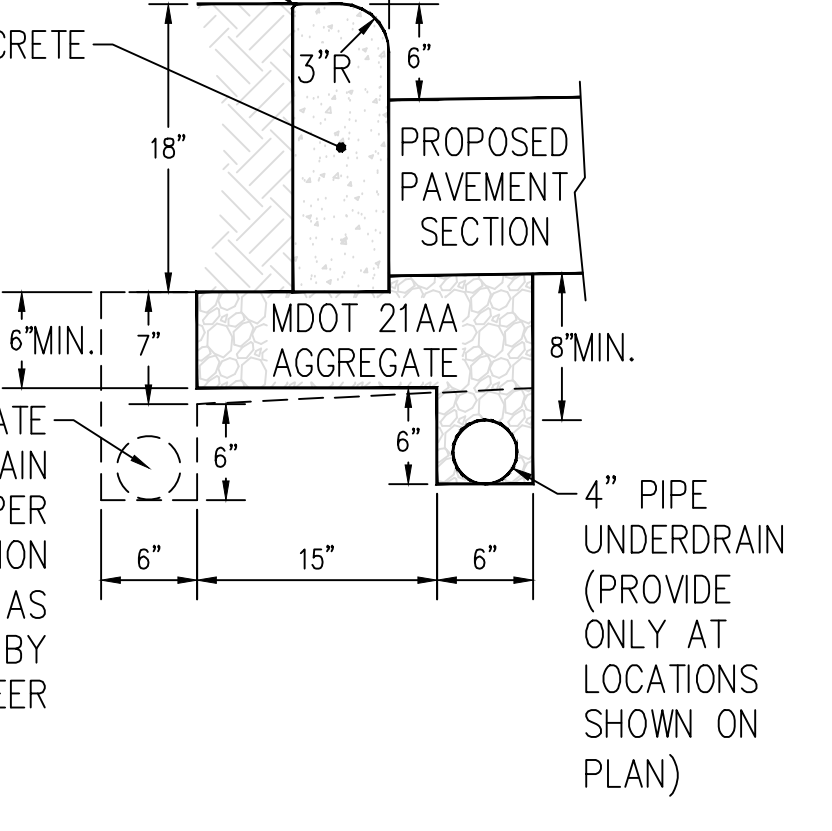
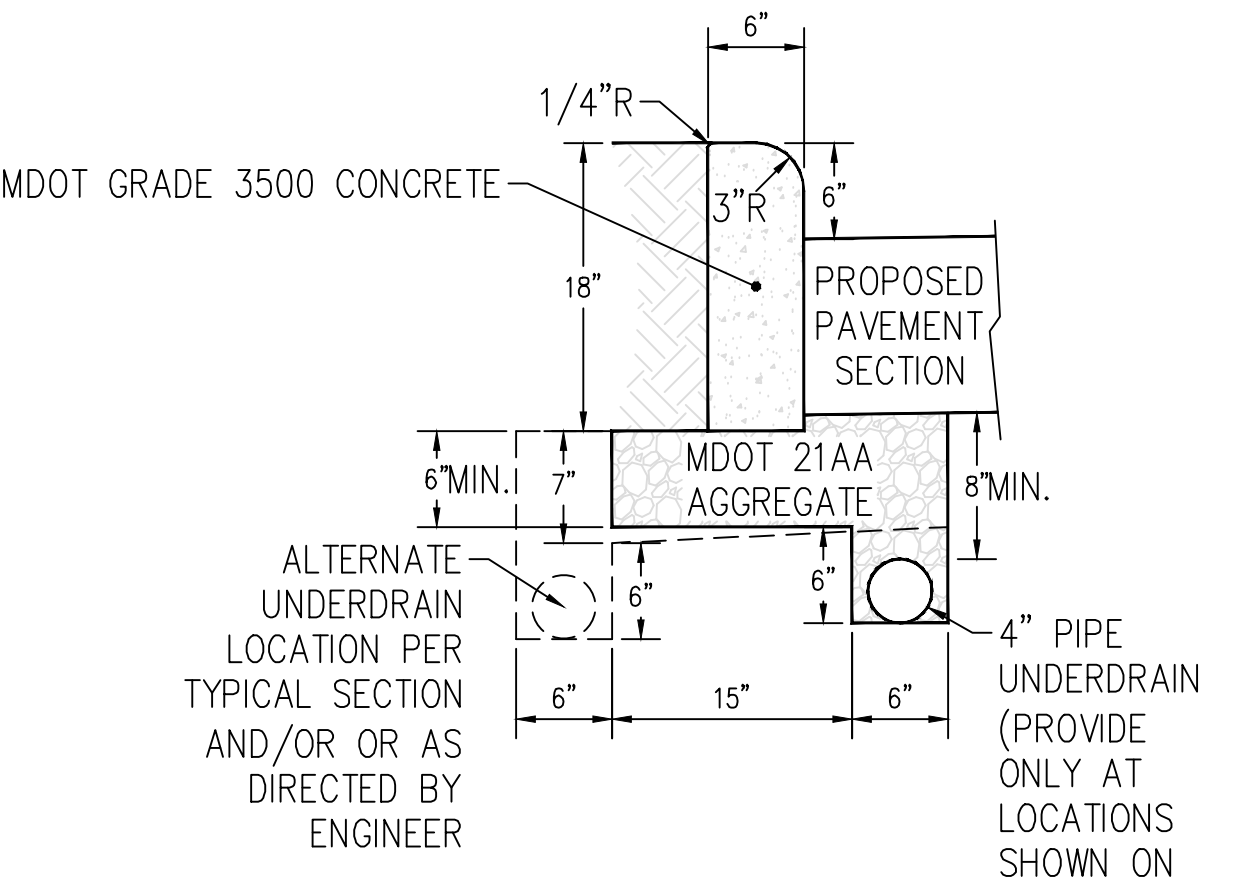
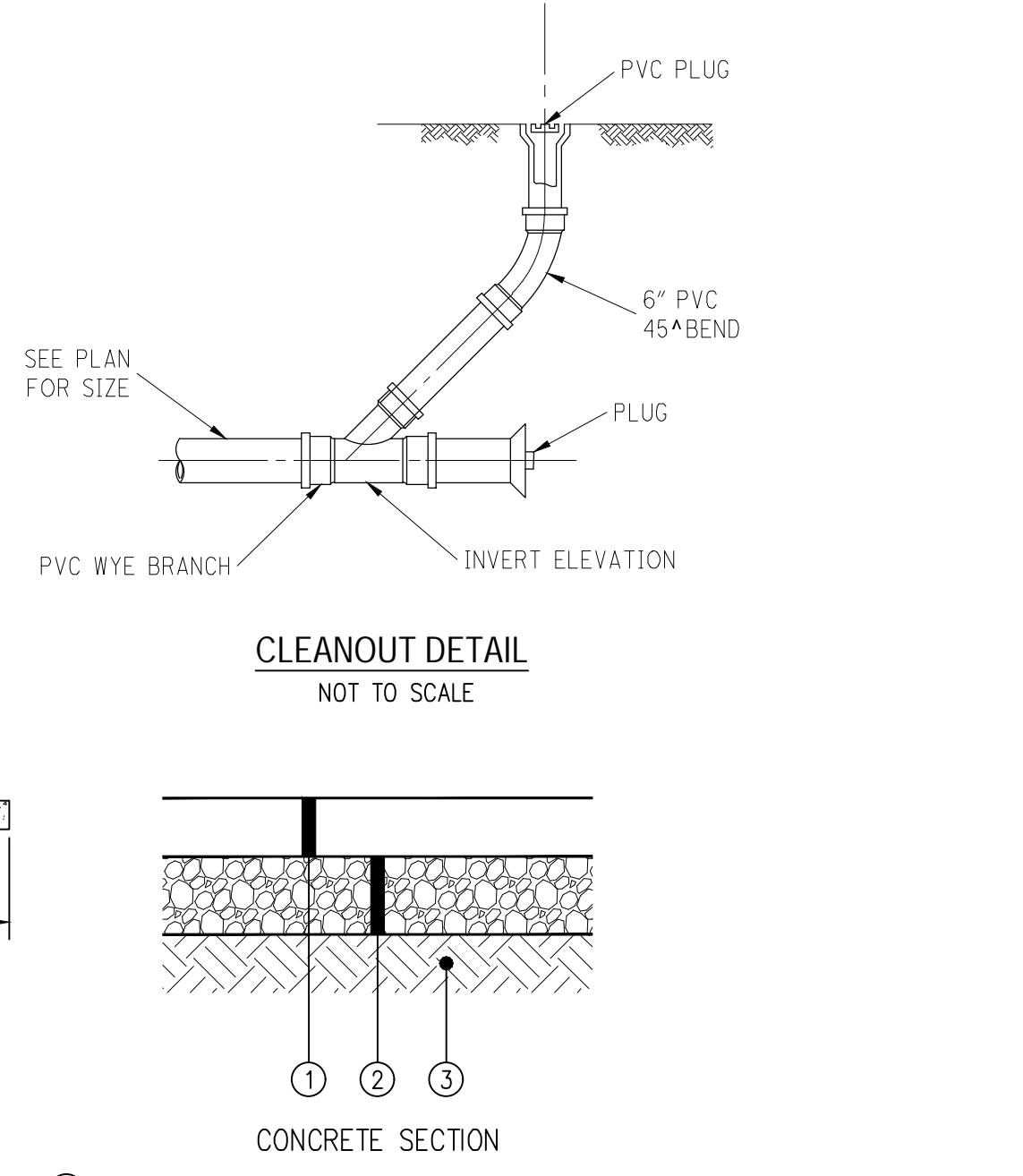
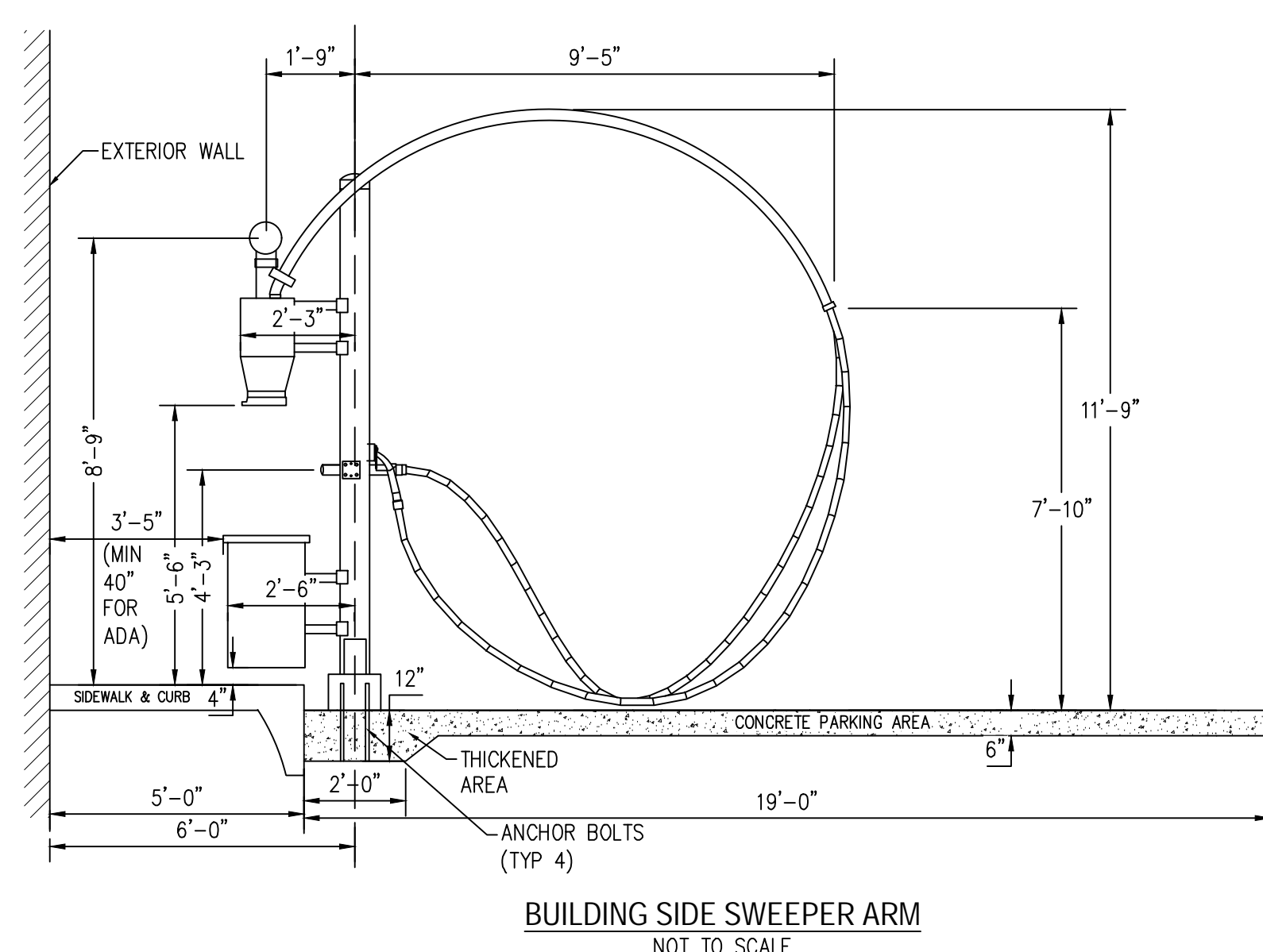
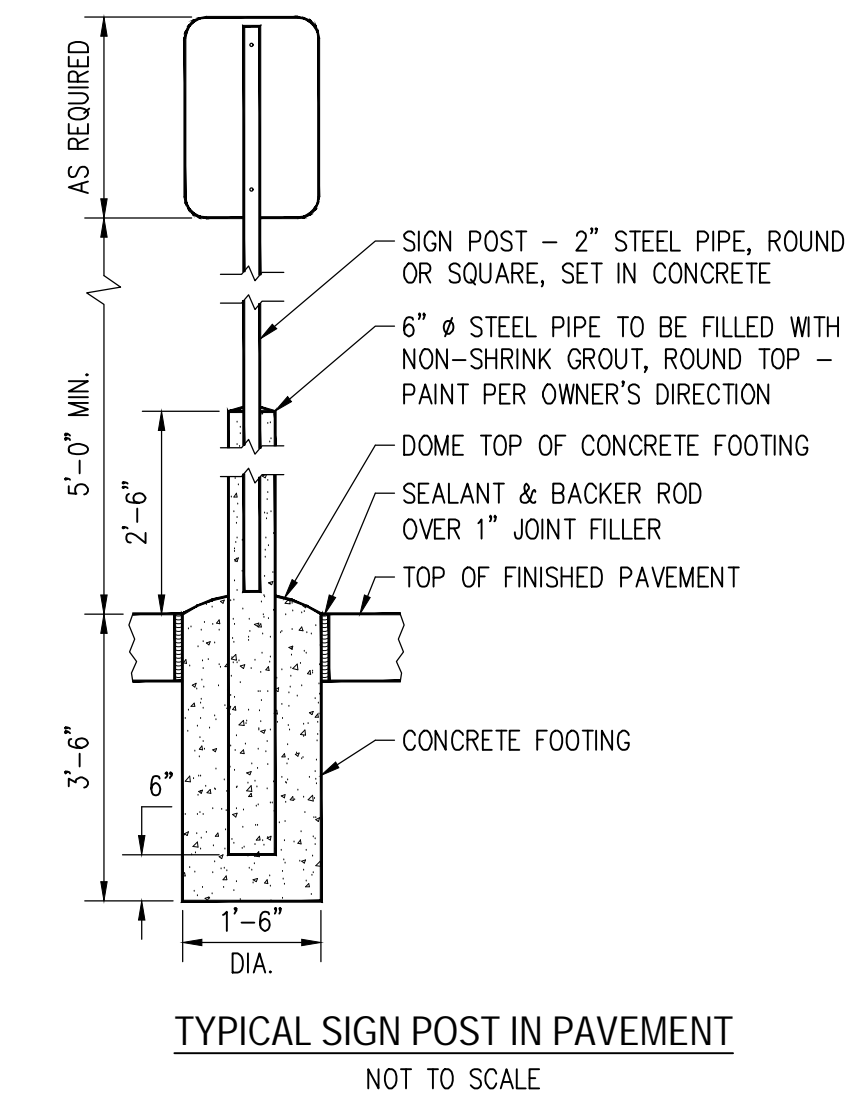
PROJECT DATE: 2/05/24  
PROJECT NO.: M3900020

C000

MICHIGAN  
Utility Notification  
CENTER  
811  
811 or  
1-800-482-7171  
Know What's Below. Call Before You Dig.



- Standard Notes:**
- Maximum grade of 8.33% along pathway (less than 5% is recommended).
  - 1% cross slope (i.e. super elevation) for drainage off and away from pathway and graded shoulders (2% maximum cross-slope).
  - 60' minimum center line radii for pathway horizontal alignment.
  - Provide a minimum of 3' horizontal clearance and 10' vertical clearance from all fixed objects and the edge of pathway surface. Relocation of existing objects (i.e. mail boxes, signs, etc.) shall be considered incidental work items.
  - Pathway ramps shall be constructed in accordance with MDOT standard detail R-28 Series and shall have a minimum clear opening of 8' wide.
  - A clean saw cut joint shall be provided wherever new pavement matches existing pavement (incidental work item).
  - Utility structures shall be adjusted in accordance with the City of Rochester Hills standards and shall match the proposed grade of the pathway.
  - Pathway shall be 8 inch thick HMA or concrete through residential drives and 9 inch thick HMA or 8 inch thick concrete through commercial drives.
  - Pathway asphalt shall be paid for as "Shared Use Path, HMA" when part of public improvement project.
  - Ramps and landings shall be 6 inch thick concrete.
  - ADA detectable warning plates shall be performed and brick red in color. Acceptable products include ADA Solutions, Inc., Armor-III, etc. or approved equal.



**NOT TO BE USED AS CONSTRUCTION DRAWINGS**

**TECHNICAL SKILL. CREATIVE SPIRIT.**  
**Mannik Smith GROUP**  
 www.MannikSmithGroup.com

**EXPRESS**  
 Wash Concepts  
 13375 NATIONAL ROAD SW  
 ETNA, OHIO 43068

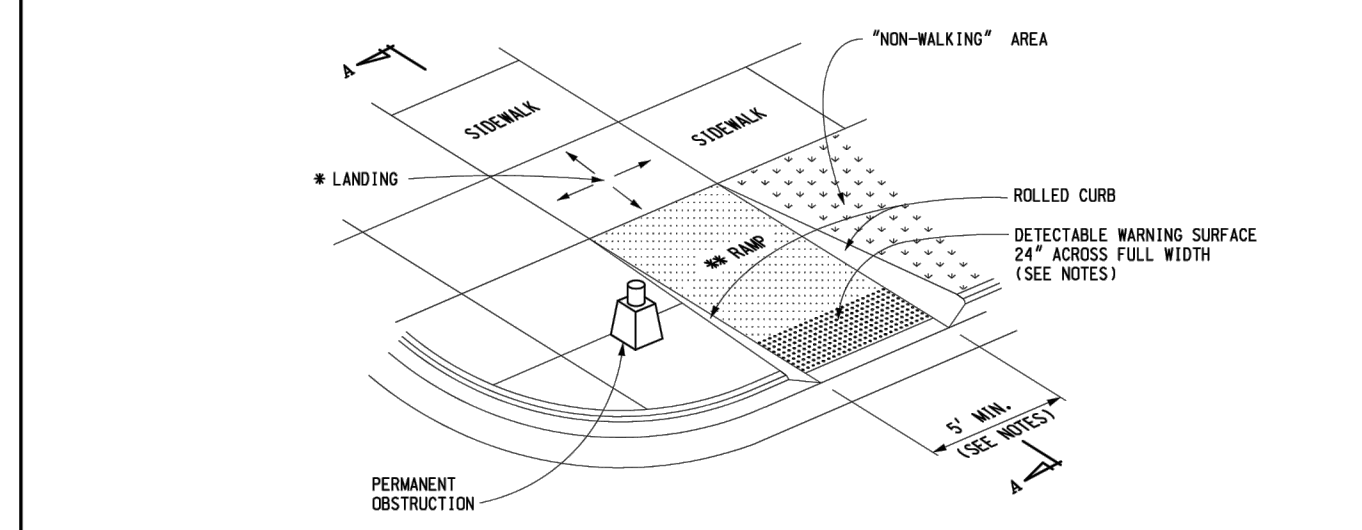
**CLEAN EXPRESS CAR WASH**  
 10 E AUBURN ROAD  
 ROCHESTER HILLS, MI 48307

**GENERAL DETAILS**  
 C001

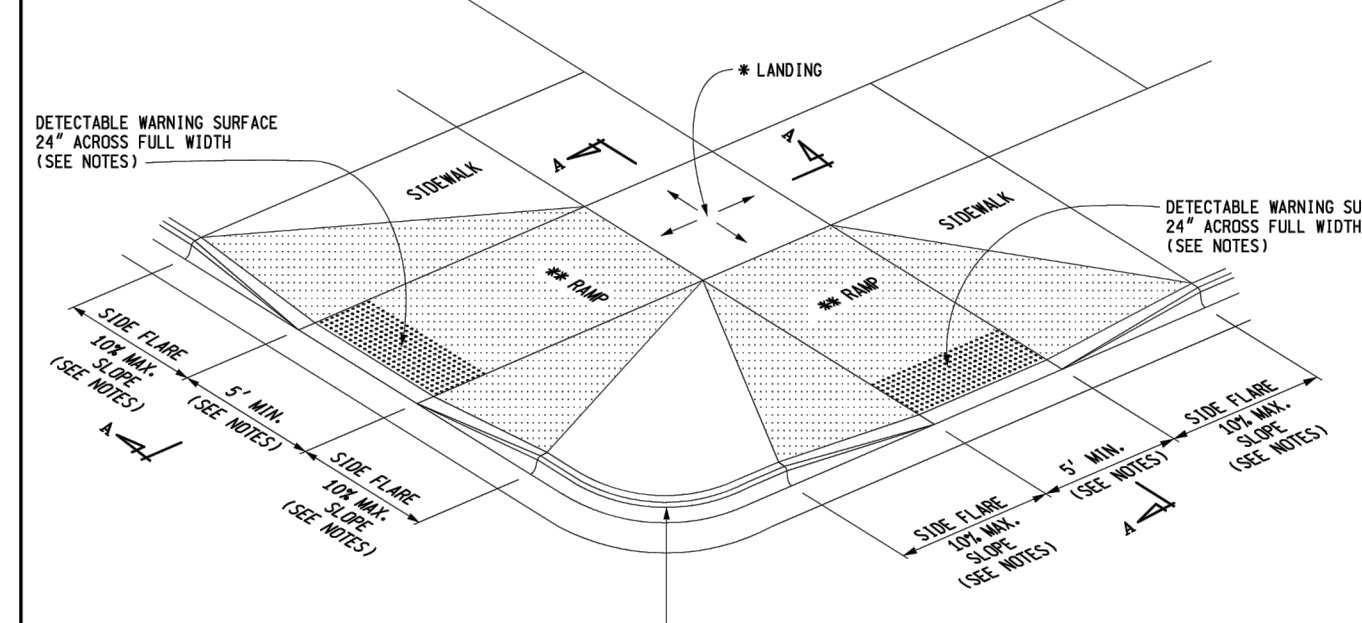
**MICHIGAN Utility Notification CENTER 811**  
 811 or 1-800-482-7171  
 Know What's Below. Call Before You Dig

ROCHESTER HILLS MICHIGAN  
 JNRNB2022-0013  
 PSP2022-0032  
 Revision #1 after conditions approval  
 Received 2/7/2024  
 City of Rochester Hills Planning & Economic Development

MAXIMUM LANDING SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL - LANDING MINIMUM DIMENSIONS 5' x 5' - SEE NOTES.  
 MAXIMUM RAMP CROSS SLOPE IS 2.0% - RUNNING SLOPE 5% - 7% (8.3% MAXIMUM) - SEE NOTES.



**CURB RAMP TYPE R**  
(ROLLED SIDES)



**CURB RAMP TYPE F**  
(FLARED SIDES, TWO RAMPS SHOWN)

DEPARTMENT DIRECTOR Paul C. Anglin  
 PREPARED BY DESIGN DIVISION  
 DRAWN BY: J.L.L.L.  
 CHECKED BY: J.L.L.L.

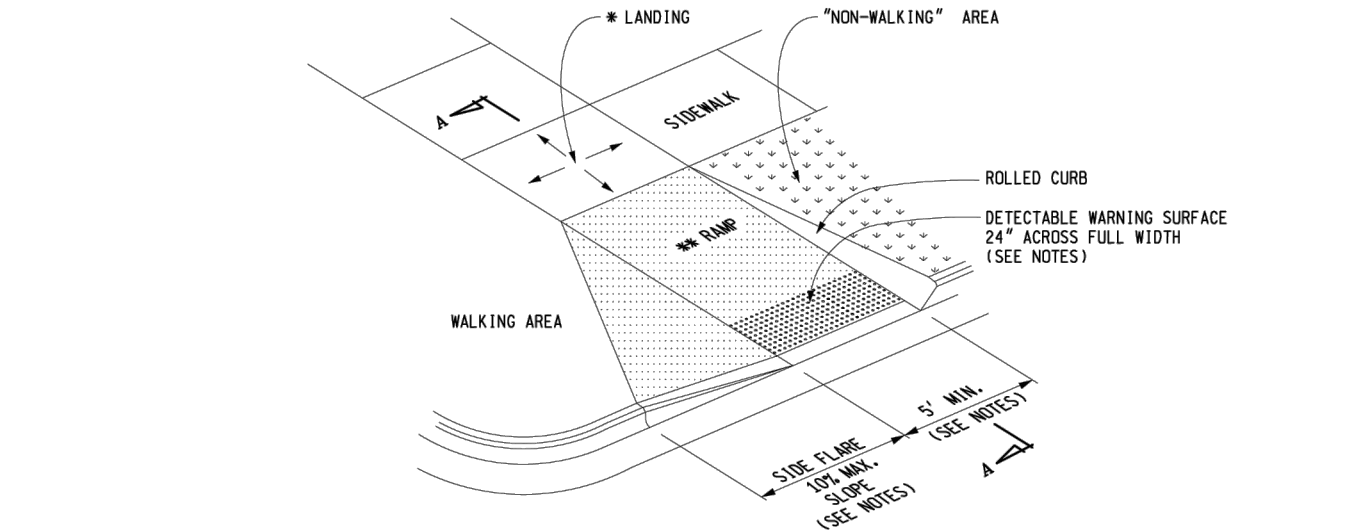
APPROVED BY: [Signature]  
 DIRECTOR, BUREAU OF FIELD SERVICES

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR  
**CURB RAMP AND  
 DETECTABLE WARNING DETAILS**

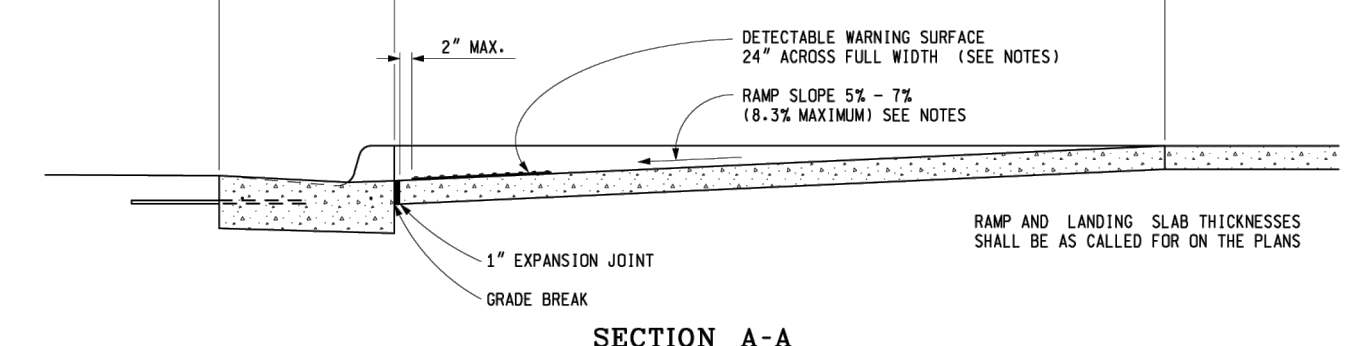
4-7-2022 5-8-2020  
 F.H.W.A. APPROVAL PLAN DATE

**R-28-J** SHEET 1 OF 7

MAXIMUM LANDING SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL - LANDING MINIMUM DIMENSIONS 5' x 5' - SEE NOTES.  
 MAXIMUM RAMP CROSS SLOPE IS 2.0% - RUNNING SLOPE 5% - 7% (8.3% MAXIMUM) - SEE NOTES.



**CURB RAMP TYPE RF**  
(ROLLED / FLARED SIDES)



**SECTION A-A**  
(TYPICAL ALL RAMP TYPES)

\*\*\* TRANSITION ADJACENT GUTTER PAN CROSS SECTION TO PROVIDE 5.0% MAXIMUM COUNTER SLOPE ACROSS THE RAMP OPENING.

RAMP SHALL END FLUSH WITH BACK OF CURB

\*\*\* 5.0% MAX.

LANE TIE AND REINFORCEMENT AS IN ADJACENT CURB & GUTTER SEE STANDARD PLAN R-30-SERIES

CURB TYPE	MAXIMUM RISE (INCHES)	A	B
B1	3/4	1	
B2	3/4	1	
B3	3/4	1	
D1	3/4	1	
D2	3/4	1	
D3	3/4	1	
C1	1/2	1/2	
C2	1/2	1/2	
C3	3/4	1/2	
C4	3/4	1/2	
C5	1	1/2	
C6	1	1/2	
F1	1/2	1/2	
F2	1/2	1/2	
F3	3/4	1/2	
F4	3/4	1/2	
F5	1	1/2	
F6	1	1/2	

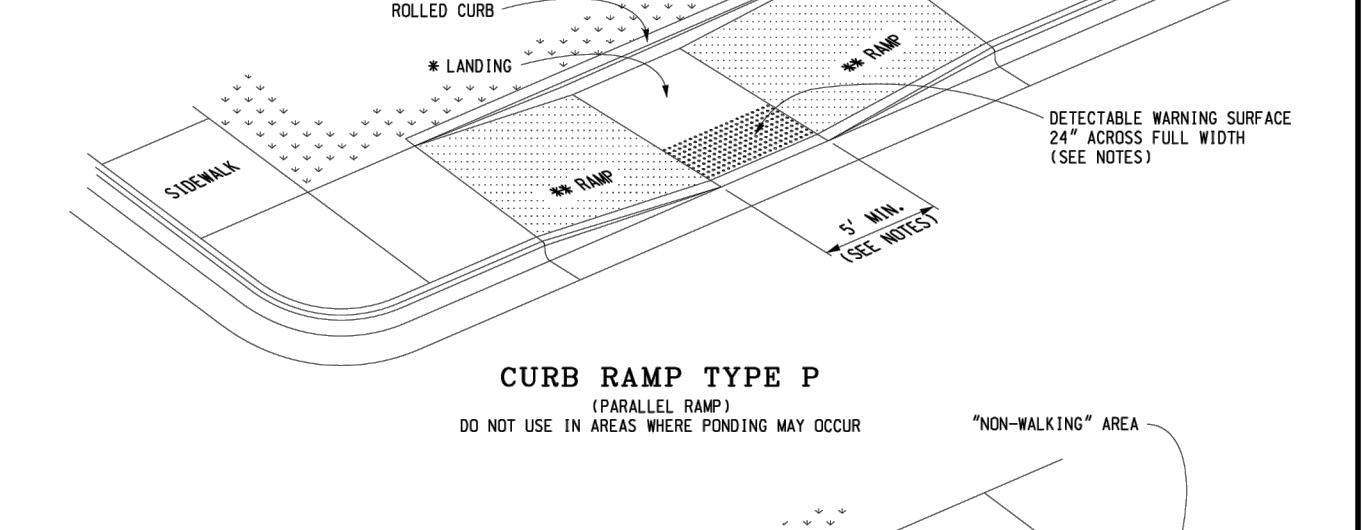
FOR CURB TYPES SEE STANDARD PLAN R-30-SERIES

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR  
**CURB RAMP AND  
 DETECTABLE WARNING DETAILS**

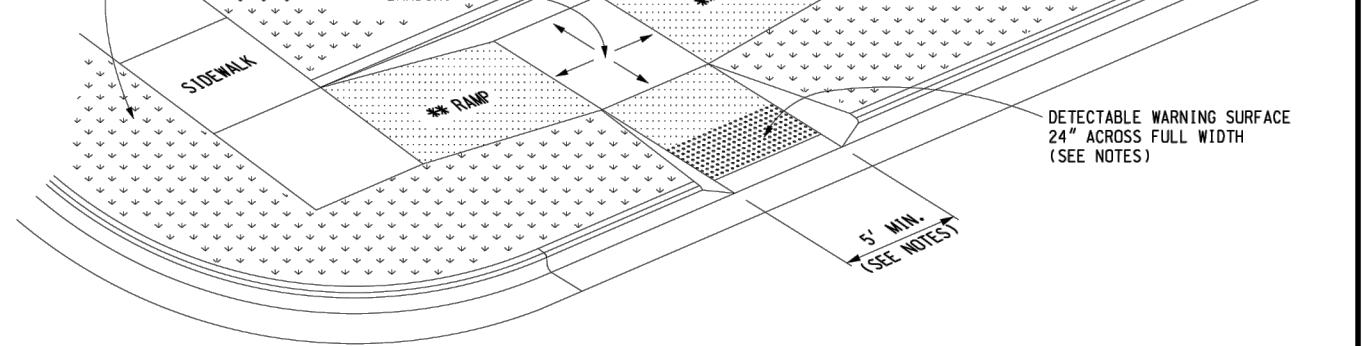
4-7-2022 5-8-2020  
 F.H.W.A. APPROVAL PLAN DATE

**R-28-J** SHEET 2 OF 7

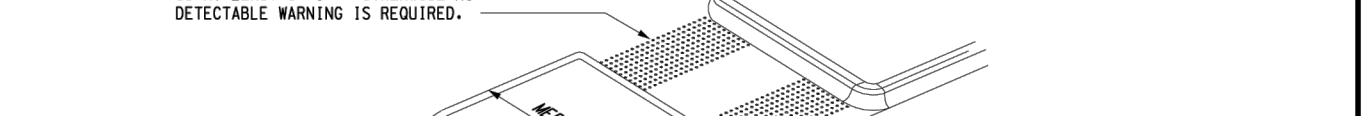
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 MAXIMUM RAMP CROSS SLOPE IS 2.0% - RUNNING SLOPE 5% - 7% (8.3% MAXIMUM) - SEE NOTES.



**CURB RAMP TYPE P**  
(PARALLEL RAMPS)



**CURB RAMP TYPE C**  
(COMBINATION RAMP)



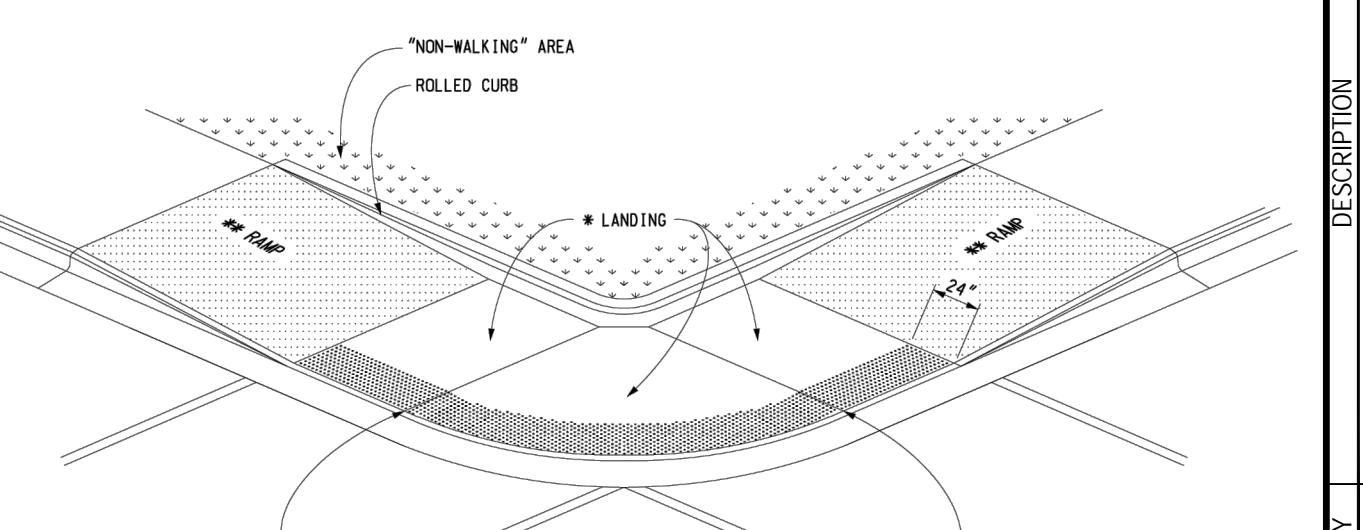
**CURB RAMP TYPE M**  
(MEDIAN ISLAND)

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR  
**CURB RAMP AND  
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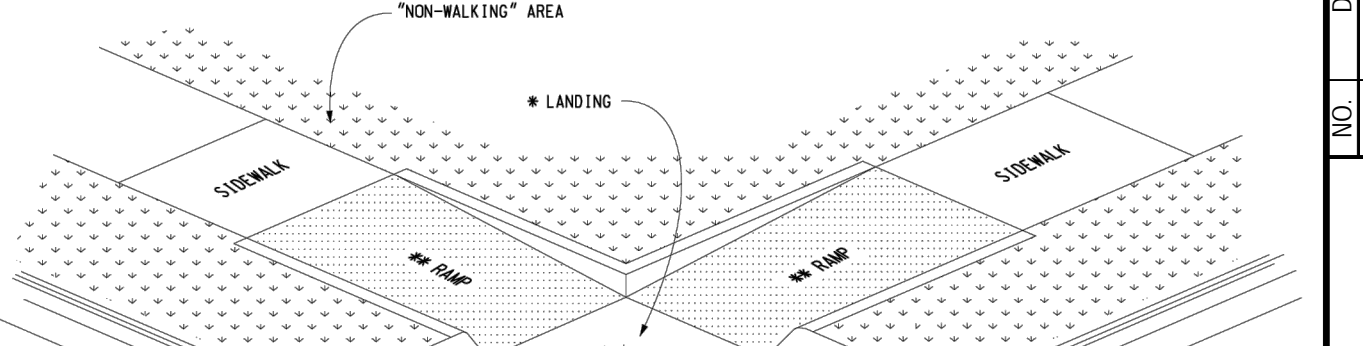
4-7-2022 5-8-2020  
 F.H.W.A. APPROVAL PLAN DATE

**R-28-J** SHEET 3 OF 7

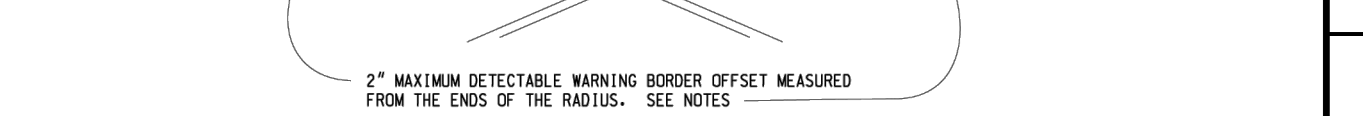
MAXIMUM LANDING SLOPE IS 2.0% IN EACH DIRECTION OF TRAVEL - LANDING MINIMUM DIMENSIONS 5' x 5' - SEE NOTES.  
 MAXIMUM RAMP CROSS SLOPE IS 2.0% - RUNNING SLOPE 5% - 7% (8.3% MAXIMUM) - SEE NOTES.



**CURB RAMP TYPE D**  
(DEPRESSED CORNER)



**CURB RAMP TYPE D**  
(DEPRESSED CORNER)



**CURB RAMP TYPE D**  
(DEPRESSED CORNER)

MICHIGAN DEPARTMENT OF TRANSPORTATION  
 BUREAU OF DEVELOPMENT STANDARD PLAN FOR  
**CURB RAMP AND  
 DETECTABLE WARNING DETAILS**

4-7-2022 5-8-2020  
 F.H.W.A. APPROVAL PLAN DATE

**R-28-J** SHEET 4 OF 7



**DETECTABLE WARNING AT RAILROAD CROSSING**

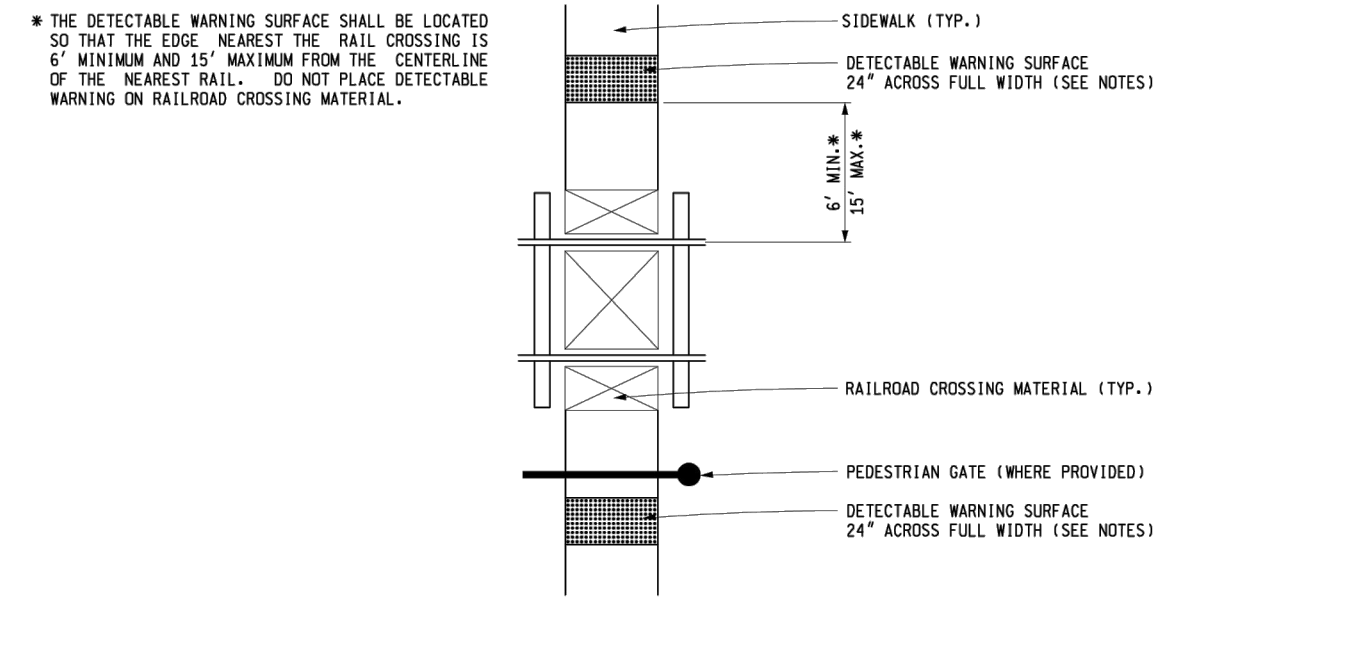


**DETECTABLE WARNING AT FLUSH SHOULDER OR ROADWAY**

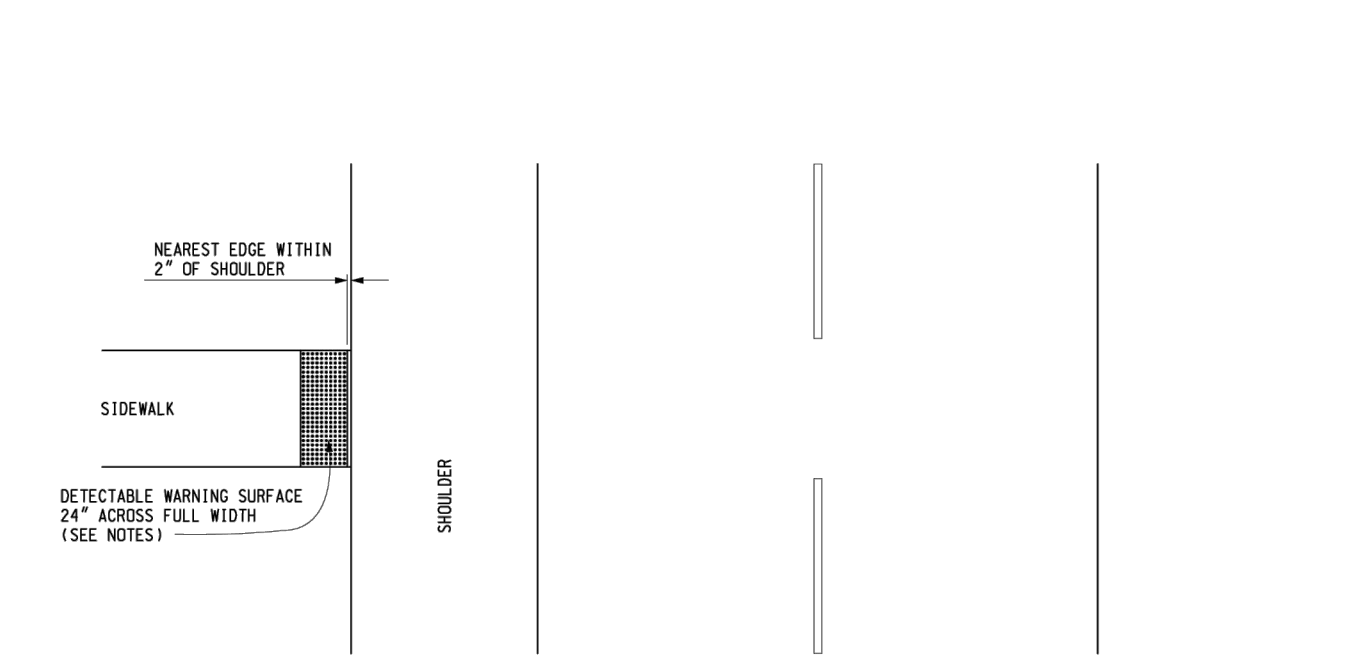
MICHIGAN DEPARTMENT OF TRANSPORTATION  
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**CURB RAMP AND  
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4-7-2022 5-8-2020  
 F.H.W.A. APPROVAL PLAN DATE

**R-28-J** SHEET 5 OF 7



**DETECTABLE WARNING AT RAILROAD CROSSING**

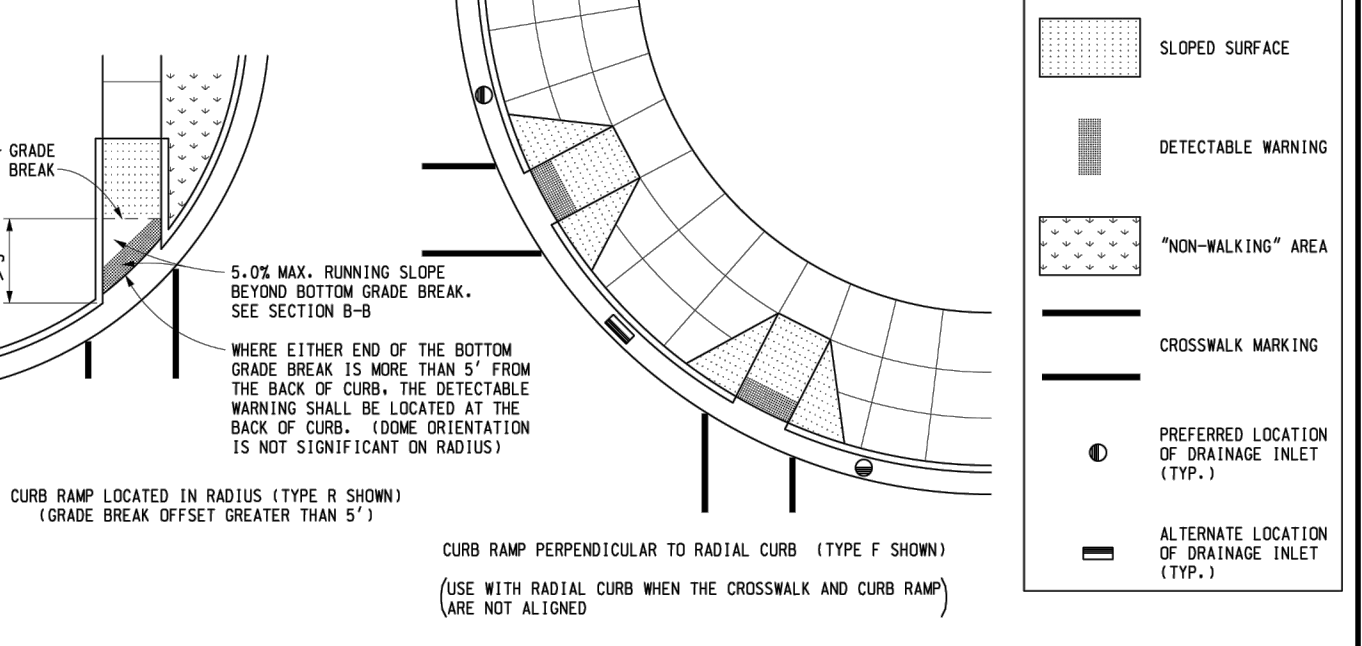


**DETECTABLE WARNING AT FLUSH SHOULDER OR ROADWAY**

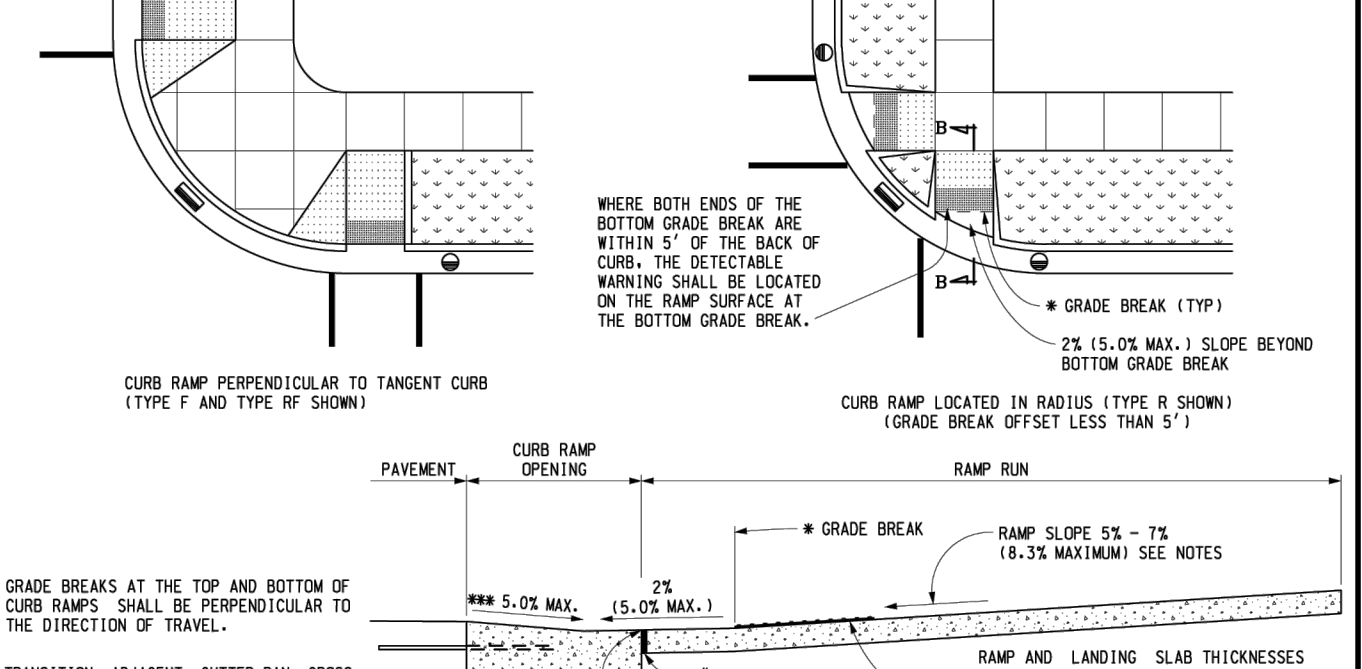
MICHIGAN DEPARTMENT OF TRANSPORTATION  
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4-7-2022 5-8-2020  
 F.H.W.A. APPROVAL PLAN DATE

**R-28-J** SHEET 6 OF 7



**DETECTABLE WARNING AT RAILROAD CROSSING**

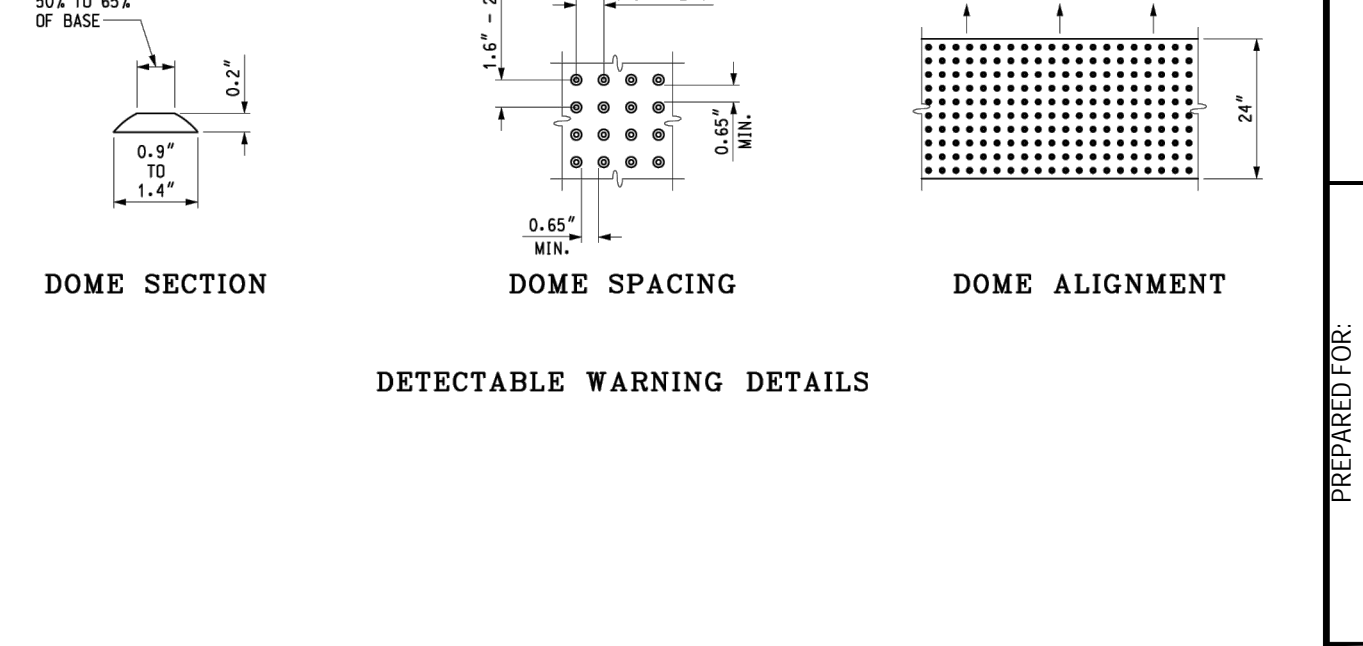


**DETECTABLE WARNING AT FLUSH SHOULDER OR ROADWAY**

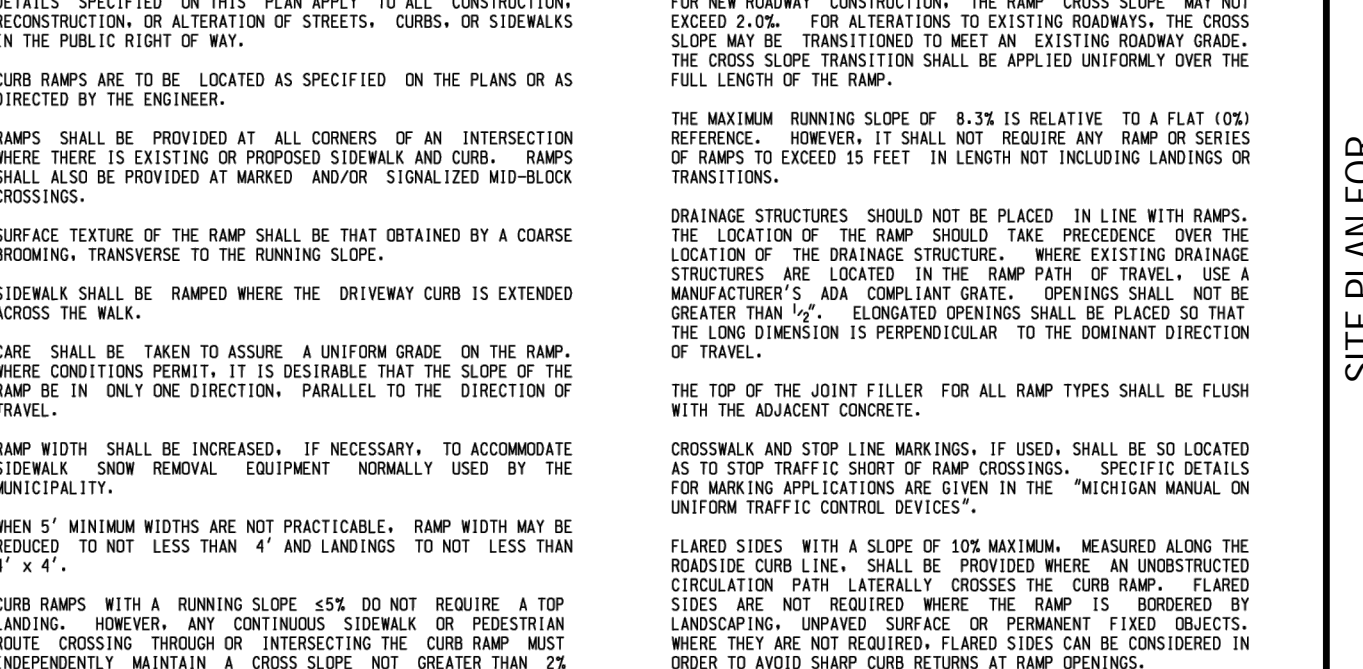
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4-7-2022 5-8-2020  
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**R-28-J** SHEET 7 OF 7



**DETECTABLE WARNING AT RAILROAD CROSSING**



**DETECTABLE WARNING AT FLUSH SHOULDER OR ROADWAY**

MICHIGAN DEPARTMENT OF TRANSPORTATION  
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4-7-2022 5-8-2020  
 F.H.W.A. APPROVAL PLAN DATE

**R-28-J** SHEET 8 OF 7

**NOT TO BE USED AS CONSTRUCTION DRAWINGS**

NO. DATE BY DESCRIPTION  
 607 SHEET 5/8  
 DATE: 12/02/2022  
 TEL: 313.961.9500  
 FAX: 313.961.9509  
 PROJECT NO: M390020  
 DRAWN BY: ESP  
 CHECKED BY: MM

**TECHNICAL SKILL. CREATIVE SPIRIT.**  
**Mannik Smith GROUP**  
 www.MannikSmithGroup.com

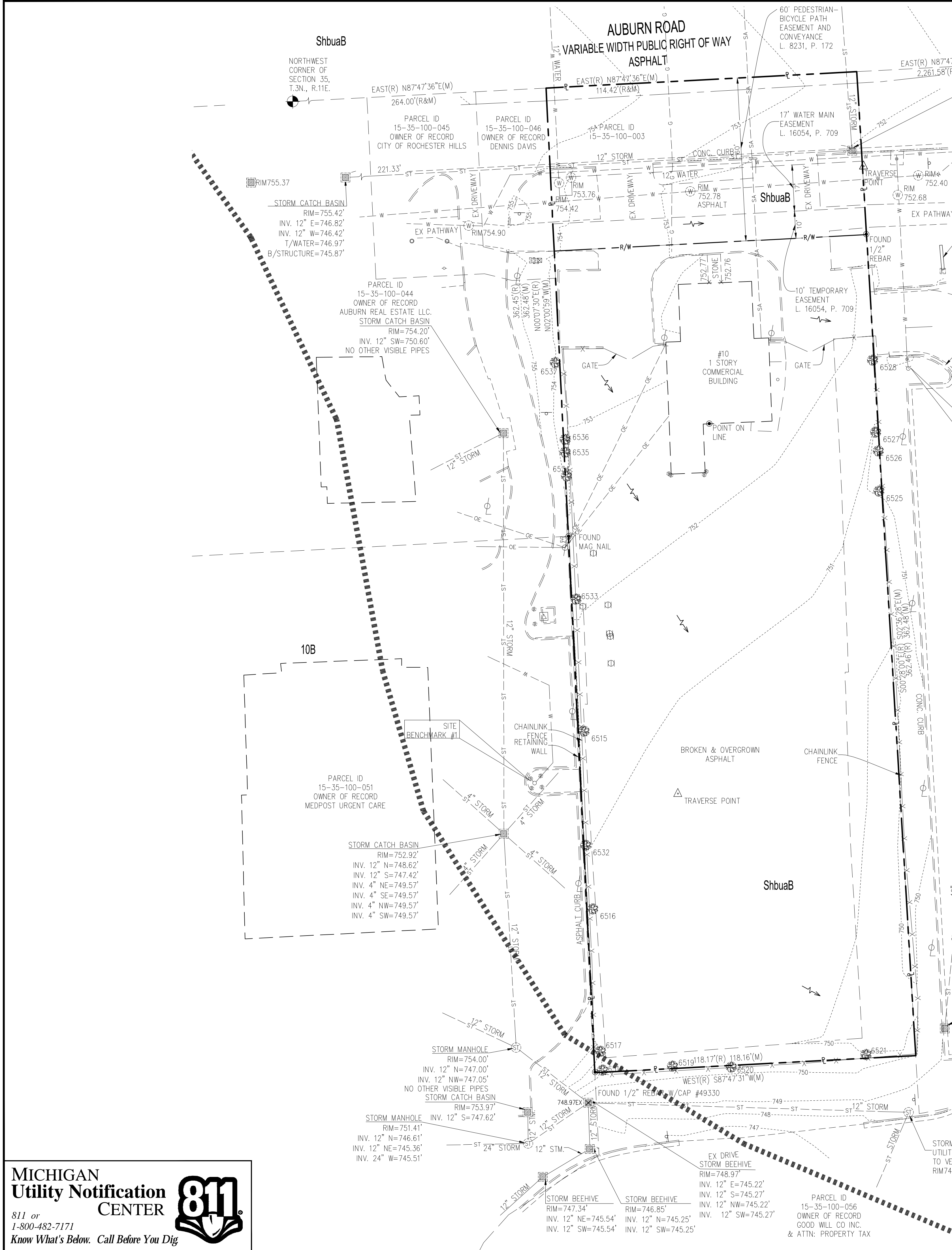
PREPARED FOR:  
**EXPRESS**  
 WASH CONCEPTS  
 13375 NATIONAL ROAD SW  
 ETNA, OHIO 43068

SITE PLAN FOR  
**CLEAN EXPRESS CAR WASH**  
 10 E AUBURN ROAD  
 ROCHESTER HILLS, MI 48307

**MDOT STANDARD DETAILS**  
**C002**

**MICHIGAN Utility Notification CENTER**  
 811  
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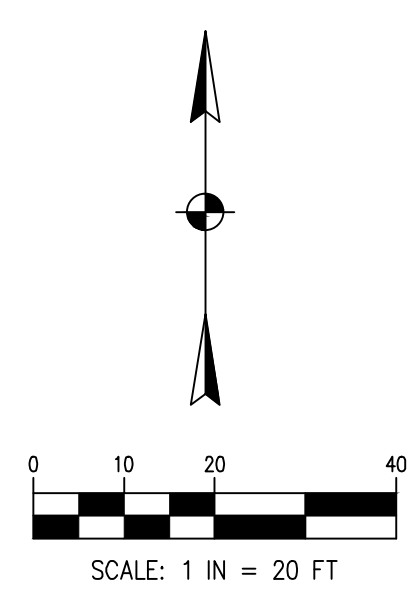


**TREE INVENTORY**  
TREE INVENTORY for: 10 East Auburn Road, Rochester Hills, Michigan

Tree #	d.b.h.	Botanical Name	Common Name	Condition	Comments	(N) Not Regulated (c = condition)	Landmark (L)	Preserved	Total Number of Trees	Total Number of Trees Preserved
6515	10 / 8	Ulmus pumila	Siberian Elm	poor	-Dead bark, dead branches, & grown into fence	N (c)		Yes	19 (6 trees non-regulated due to dead or dying condition)	17 (89%)
6516	11	Ulmus pumila	Siberian Elm	fair	-Dead branch(es)			Yes		
6517	14 / 11	Ulmus pumila	Siberian Elm	fair	-Scarred trunk @ crotch & grown into fence			Yes		
6518	20 / 15	Ulmus pumila	Siberian Elm	fair	-Dead branches & grown into fence			Yes		
6519	14 / 6	Morus spp.	Mulberry	fair	-Poor crotch & grown into fence			Yes		
6520	14	---	---	dead		N (c)		Yes		
6521	17	Populus deltoides	Cottonwood	fair	-Scarred trunk			Yes		
6522	14	Populus deltoides	Cottonwood	fair	-Contorted trunk & grown into fence			Yes		
6523	6	Populus deltoides	Cottonwood	fair	-Contorted trunk & grown into fence			Yes		
6524	7	Ulmus spp.	Elm	fair	-Scarred trunk @ crotch & grown into fence			Yes		
6525	15	Ulmus pumila	Siberian Elm	poor	-Hollow @ base & leaning	N (c)		Yes		
6526	10 / 5	Ulmus pumila	Siberian Elm	fair	-Grown into fence			Yes		
6527	19 / 18	Ulmus pumila	Siberian Elm	fair	-Poor crotch & grown into fence			Yes		
6528	16	Ulmus pumila	Siberian Elm	fair	-Leaning & grown into fence			Yes		
6529	---	---	---	dead	-Re-sprouts from stump(s)			Yes		
6530	---	---	---	dead	-Re-sprouts from stump(s)	N (c)		Yes		
6531	---	---	---	dead	-Re-sprouts from stump(s)	N (c)		Yes		
6532	11	Ulmus pumila	Siberian Elm	fair	-Grown into fence			Yes		
6533	6	Ulmus pumila	Siberian Elm	fair	-Grown into fence			Yes		
6534	8	Ulmus pumila	Siberian Elm	fair	-Dead branches & grown into fence			Yes		
6535	12	Ulmus pumila	Siberian Elm	fair	-Grown into fence			Yes		
6536	10 / 8	Ulmus pumila	Siberian Elm	fair	-Dead branches & grown into fence			Yes		
6537	16 / 13 / 13	Ulmus pumila	Siberian Elm	fair	-Poor crotch & grown into fence			Yes		

update table to reflect all 4 trees proposed as removed.

- LEGEND**
- P — PROPERTY LINE
  - R/W — RIGHT-OF-WAY
  - EX ROAD CENTERLINE
  - SOIL BOUNDARY
  - X-X- FENCE
  - EX ASPHALT PAVEMENT
  - EX FLOW DIRECTION
  - EX PAVEMENT ELEVATION
  - EX GAS LINE
  - EX WATER LINE
  - EX SANITARY LINE
  - EX OVERHEAD LINE
  - EX BUILDING LINE
  - EX POWER/TELEPHONE POLE
  - EX LIGHT POLE
  - EX FIRE HYDRANT
  - EX CATCH BASIN
  - EX STORM MANHOLE
  - EX SANITARY MANHOLE
  - EX WATER WELL
  - EX CLEANOUT
  - EX GAS METER
  - EX GAS LID
  - EX GAS VALVE
  - EX BOLLARD
  - EX SIGN
  - EX WELL
- SOIL TYPE**
- 10B MARLETTE SANDY LOAM, 1 TO 6 PERCENT SLOPES, HYDROLOGIC GROUP C
  - Shbuab SHEBEON-URBAN LAND COMPLEX, 0 TO 4 PERCENT SLOPES, HYDROLOGIC GROUP C
- BASIS OF BEARING**
- NORTH 87°47'36" EAST, BEING THE NORTH LINE OF SECTION 35, PER ADJACENT PROPERTY DESCRIPTION OF RECORD.



**NOT TO BE USED AS CONSTRUCTION DRAWINGS**

607 SHELBY ST.  
ROCHESTER HILLS, MI 48307  
TEL: 313.963.9500  
FAX: 313.961.9509

PROJECT DATE: 12/02/2022  
PROJECT NO: M390020  
DRAWN BY: ESP  
CHECKED BY: MUM

TECHNICAL SKILL.  
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PREPARED FOR:  
**EXPRESS**  
WASH CONCRETE  
13375 NATIONAL ROAD SW  
ETNA, OHIO 43068

SITE PLAN FOR  
**CLEAN EXPRESS CAR WASH**  
10 E AUBURN ROAD  
ROCHESTER HILLS, MI 48307

EXISTING CONDITIONS

C100

CITY FILE #22-038 SECTION #35

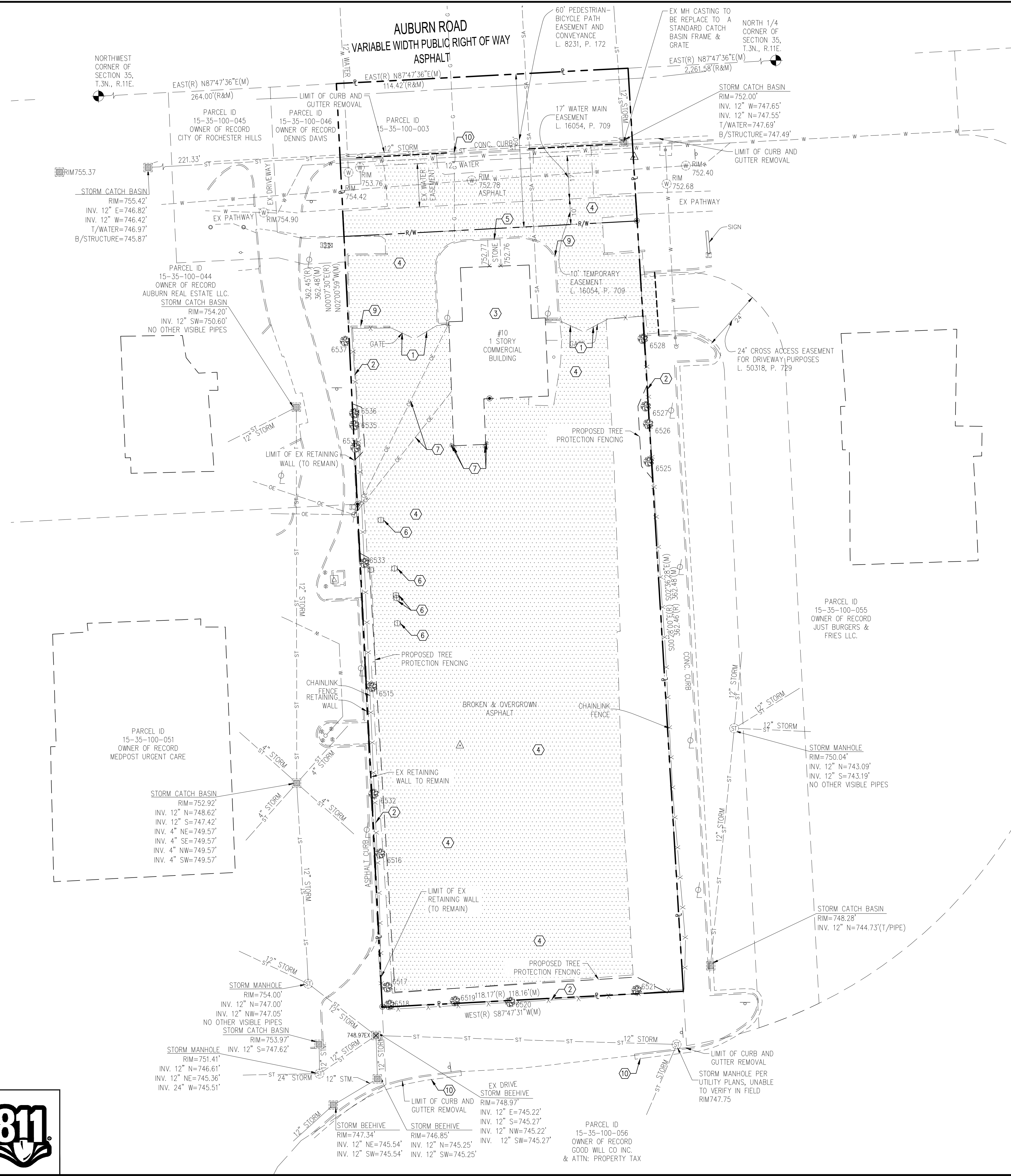
**MICHIGAN**  
**Utility Notification**  
**CENTER**

811 or  
1-800-482-7171  
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ROCHESTER HILLS MICHIGAN

JNRNB2022-0013  
PSP2022-0032  
Revision #1 after conditions approval

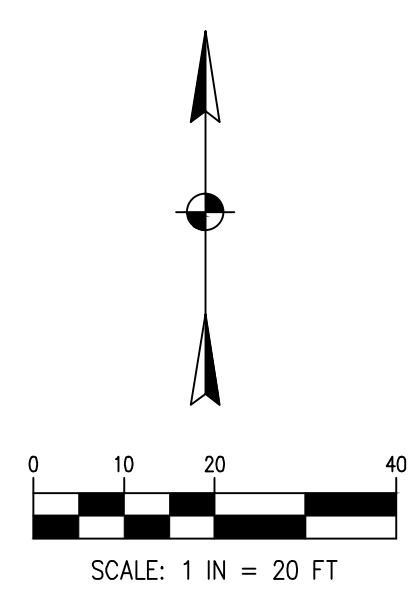
Received 2/7/2024  
City of Rochester Hills  
Planning & Economic Development



**LEGEND**

— P —	PROPERTY LINE
— R/W —	RIGHT-OF-WAY
— EX ROAD CENTERLINE	EX ROAD CENTERLINE
-----	SOIL BOUNDARY
-X-X-	EX FENCE
-----	EX ASPHALT PAVEMENT
-----	LIMIT OF PAVEMENT REMOVAL
-C-	EX GAS LINE
-ST-	EX STORM LINE
-W-	EX WATER LINE
-SA-	EX SANITARY LINE
-OE-	EX OVERHEAD LINE
-E-B-	EX BUILDING LINE
-P-	EX POWER/TELEPHONE POLE
-L-	EX LIGHT POLE
-F-	EX FIRE HYDRANT
-C-	EX CATCH BASIN
-M-	EX STORM MANHOLE
-S-	EX SANITARY MANHOLE
-W-	EX WATER WELL
-C-	EX CLEANOUT
-G-	EX GAS METER
-L-	EX GAS LID
-V-	EX GAS VALVE
-B-	EX BOLLARD
-S-	EX SIGN

- CODED NOTES**
- ① EX GATE TO BE REMOVED (BY OTHERS)
  - ② EX FENCE TO BE REMOVED (BY OTHERS)
  - ③ EX BUILDING TO BE REMOVED (BY OTHERS) INCLUDING BASEMENT, FOUNDATION AND ALL ELECTRIC, AND WATER SERVICES
  - ④ EX ASPHALT TO BE REMOVED (BY OTHERS)
  - ⑤ EX STONE TO BE REMOVED (BY OTHERS)
  - ⑥ EX WATER STRUCTURE TO BE REMOVED (BY OTHERS)
  - ⑦ EX OVERHEAD UTILITY TO BE REMOVED (BY OTHERS)
  - ⑧ EX BOLLARD TO BE REMOVED (BY OTHERS)
  - ⑨ EX CURB AND GUTTER TO BE REMOVED WITHIN PROPERTY LIMITS (BY OTHERS)
  - ⑩ EX CURB AND GUTTER TO BE REMOVED TO ACCOMMODATE PROPOSED DRIVEWAY




**NOT TO BE USED AS CONSTRUCTION DRAWINGS**

607 SHELBY ST.  
 DURHAM, MI 48329  
 TEL: 313.961.9500  
 FAX: 313.961.9509

PROJECT DATE: 12/02/2022  
 PROJECT NO: MS990020  
 DRAWN BY: ESP  
 CHECKED BY: MM



PREPARED FOR:  
  
**EXPRESS**  
 WASH CONCEPTS  
 13375 NATIONAL ROAD SW  
 ETNA, OHIO 43068

SITE PLAN FOR  
**CLEAN EXPRESS CAR WASH**  
 10 E AUBURN ROAD  
 ROCHESTER HILLS, MI 48307

**DEMOLITION PLAN**

C101

**MICHIGAN**  
**Utility Notification**  
**CENTER**

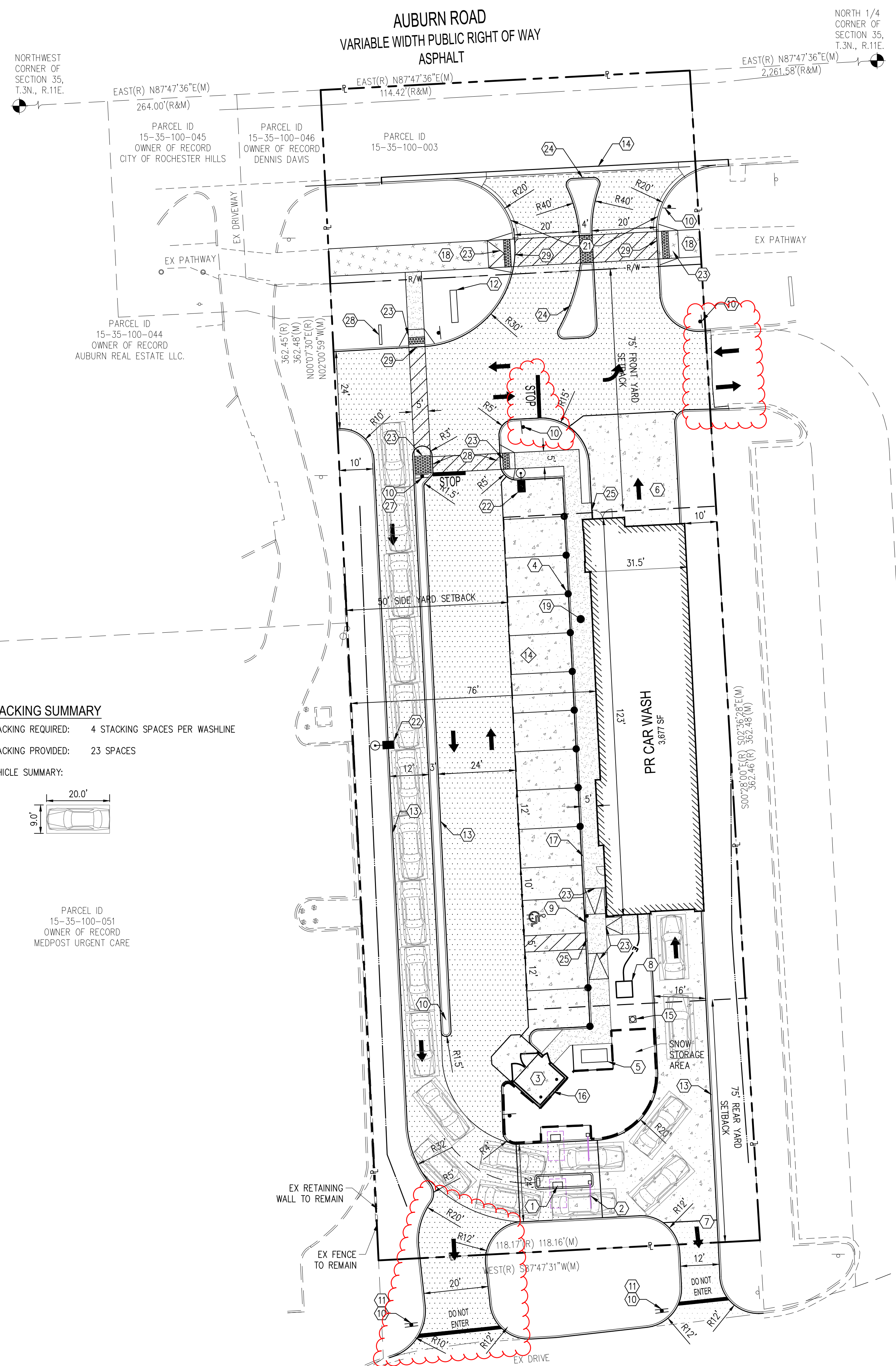
811 or  
 1-800-482-7171  
 Know What's Below. Call Before You Dig



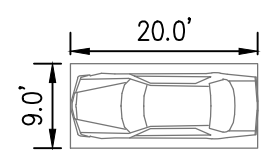
 **ROCHESTER HILLS**  
 MICHIGAN

JNRRB2022-0013  
 PSP2022-0032  
 Revision #1 after  
 conditions  
 approval

Received  
 2/7/2024  
 City of Rochester Hills  
 Planning & Economic  
 Development



**STACKING SUMMARY**  
 STACKING REQUIRED: 4 STACKING SPACES PER WASHLINE  
 STACKING PROVIDED: 23 SPACES  
 VEHICLE SUMMARY:



PARCEL ID 15-35-100-051  
 OWNER OF RECORD MEDPOST URGENT CARE

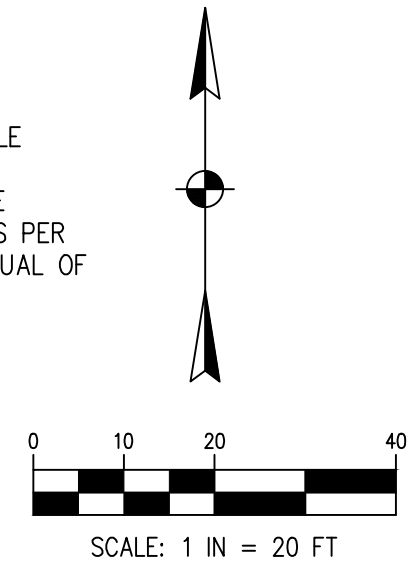
PARCEL ID 15-35-100-055  
 OWNER OF RECORD JUST BURGERS & FRIES LLC.

PARCEL ID 15-35-100-056  
 OWNER OF RECORD GOOD WILL CO INC.  
 & ATTN: PROPERTY TAX

- LEGEND**
- EX CONCRETE CURB
  - PR CONCRETE CURB
  - PR CURB LIMIT
  - PR E EX PROPERTY LINE
  - R/W EX RIGHT-OF-WAY LINE
  - PR ASPHALT PAVEMENT
  - PR CONCRETE PAVEMENT
  - PR CONCRETE PATHWAY
  - PR CONCRETE SIDEWALK
  - PR ADA PAINT STRIPING
  - PR DETECTABLE WARNING SURFACE
  - Ⓛ PARKING COUNT

- CODED NOTES**
- ① PAY STATION (TYP OF 3)
  - ② CLEARANCE BAR (TYP OF 3)
  - ③ CONCRETE DUMPSTER PAD
  - ④ VACUUM STATION (TYP OF 12)
  - ⑤ VACUUM CORRELATOR
  - ⑥ HEATED CONCRETE PAVEMENT
  - ⑦ ESCAPE LANE
  - ⑧ TRANSFORMER PAD
  - ⑨ ADA PARKING SIGN
  - ⑩ STOP SIGN
  - ⑪ DO NOT ENTER SIGN
  - ⑫ MONUMENT SIGN, SEE ARCHITECTURAL PLANS
  - ⑬ 18" STRAIGHT CONCRETE CURB
  - ⑭ MDOT DETAIL 'M' CONCRETE DRIVEWAY OPENING, R-29-1
  - ⑮ FLAG POLE
  - ⑯ 7'-4" MASONRY SCREENING WALL, SEE ARCHITECTURAL PLANS
  - ⑰ FLUSH INTEGRAL CURB AND SIDEWALK
  - ⑱ PATHWAY
  - ⑲ ACCESSIBLE ROUTE
  - ⑳ INTEGRAL CURB AND SIDEWALK
  - ㉑ CONCRETE CURB AND GUTTER
  - ㉒ LIGHT POLE
  - ㉓ RAMP
  - ㉔ MOUNTABLE CONCRETE CURB
  - ㉕ FLUSH CURB
  - ㉖ MDOT "M" DETAIL CONCRETE GUTTER
  - ㉗ DIRECTIONAL SIGN
  - ㉘ HISTORICAL SITE MARKER, PENDING FINAL APPROVAL BY HISTORICAL BOARD

- NOTES**
1. SEE PHOTOMETRIC PLAN FOR LIGHT POLE LOCATIONS
  2. ALL PARKING SPACES SHALL BE SINGLE STRIPED WITH FOUR-INCH WIDE STRIPES PER THE STANDARDS IN THE MICHIGAN MANUAL OF UNIFORM TRAFFIC DEVICES.



NO.	DATE	BY	DESCRIPTION
<b>PRELIMINARY NOT FOR CONSTRUCTION</b>			

637 SHEET BY ST  
 DATE: 12/20/2022  
 TEL: 313.961.9650  
 FAX: 313.961.9659  
 PROJECT NO: M390020  
 DRAWN BY: ESP  
 CHECKED BY: MJM

TECHNICAL SKILL.  
 CREATIVE SPIRIT.

www.MannikSmithGroup.com

PREPARED FOR:

EXPRESS  
 WASH CONCEPTS  
 13375 NATIONAL ROAD SW  
 ETNA, OHIO 43068

CONSTRUCTION PLAN FOR  
**CLEAN EXPRESS CAR WASH**  
 10 E AUBURN ROAD  
 ROCHESTER HILLS, MI 48307

**SITE PLAN**

C200

**MICHIGAN  
 Utility Notification  
 CENTER**

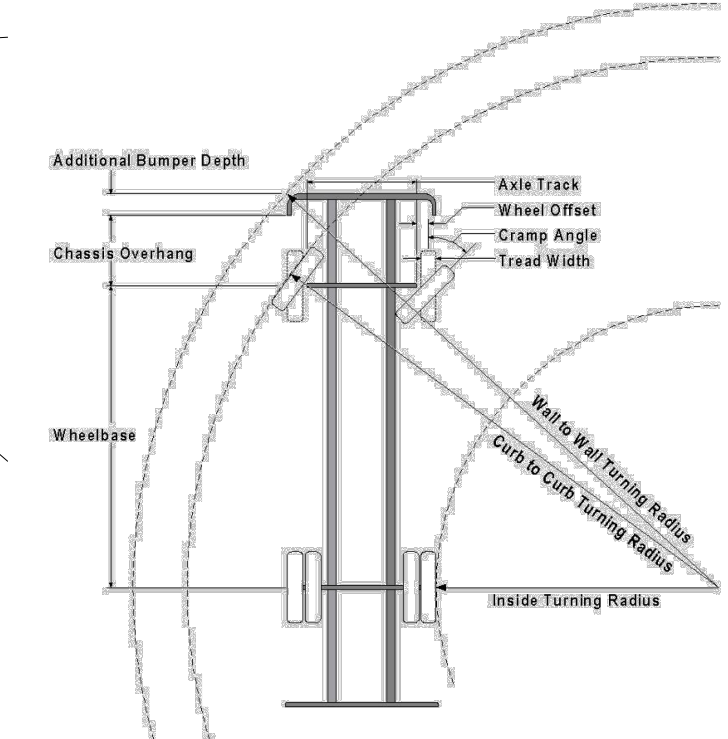
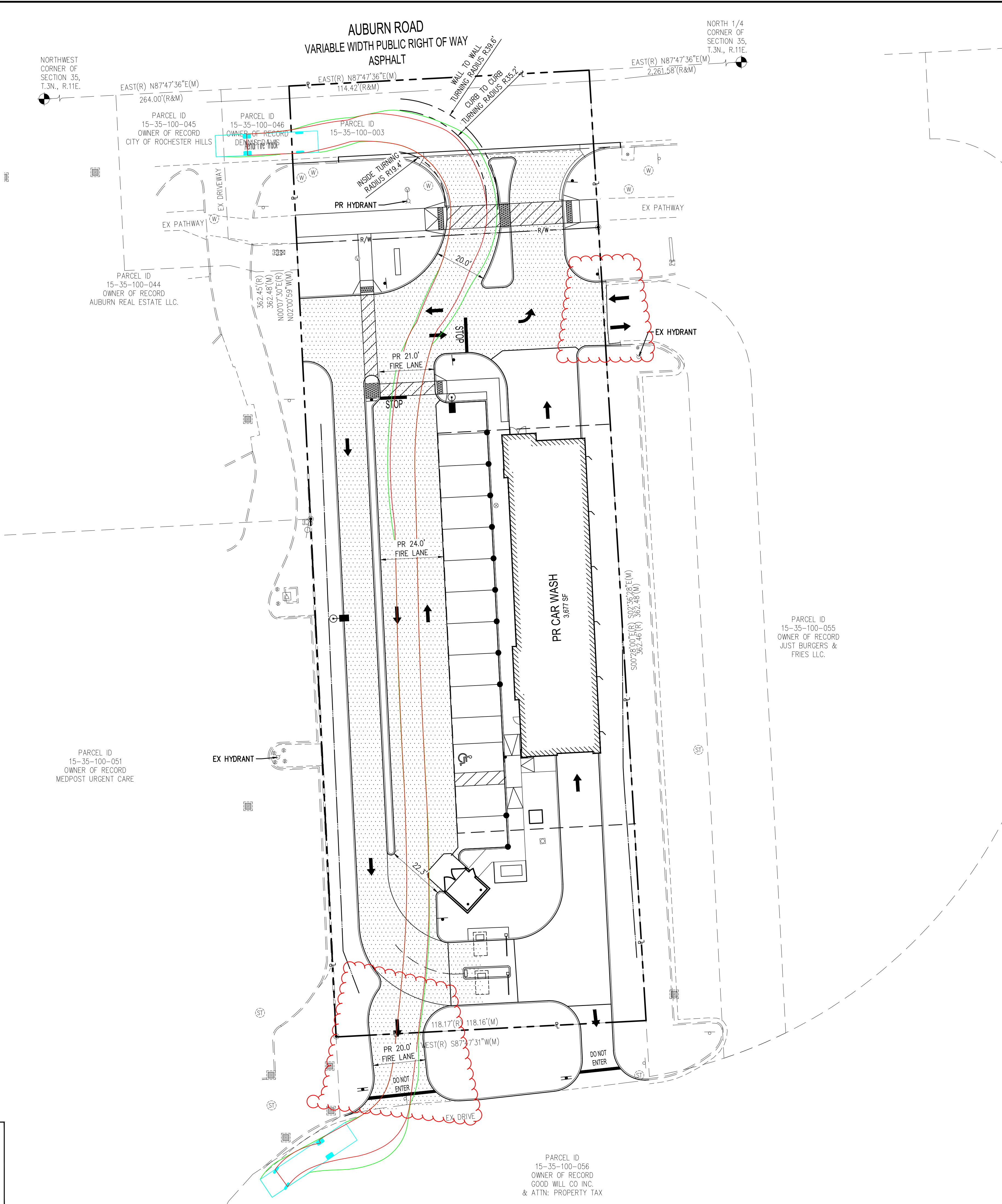
811 or  
 1-800-482-7171  
 Know What's Below. Call Before You Dig.

JNRND2022-0013  
 PSP2022-0032  
 Revision #1 after  
 conditions  
 approval

Received  
 2/7/2024  
 City of Rochester Hills  
 Planning & Economic  
 Development

W:\Projects\Permitting\2022\CAD\2022-0032\CAD\2022-0032-Fire-Protection-Plan.dwg, 11/10/2022 10:57 PM by [redacted] pldwg, 11/10/2022 10:57 PM

**MICHIGAN Utility Notification CENTER 811**  
 811 or 1-800-482-7171  
 Know What's Below. Call Before You Dig.



**Parameters:**

Inside Cramp Angle:	45°
Axle Track:	82.92 in.
Wheel Offset:	4.68 in.
Tread Width:	16.3 in.
Chassis Overhang:	68.99 in.
Additional Bumper Depth:	16 in.
Front Overhang:	84.99 in.
Wheelbase:	245.5 in.

**Calculated Turning Radii:**

Inside Turn:	19 ft. 5 in.
Curb to curb:	35 ft. 3 in.
Wall to wall:	39 ft. 7 in.

**Comments:**  
RHFD 105' turn radius

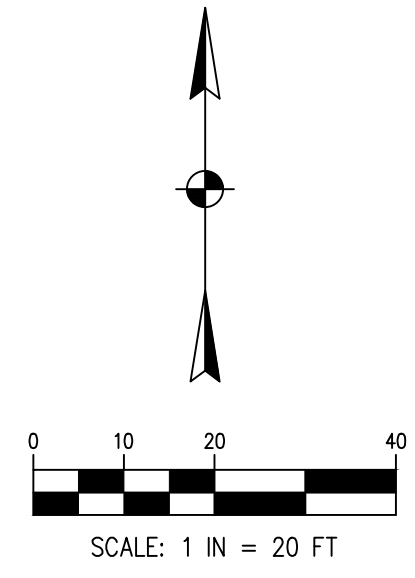
CITY OF ROCHESTER HILLS FIRE TRUCK SPECIFICATIONS  
NOT TO SCALE

**LEGEND**

- EX CONCRETE CURB
- - - PR CONCRETE CURB
- PR CURB LIMIT
- PR R EX PROPERTY LINE
- - - R/W EX RIGHT-OF-WAY LINE
- ▨ PR ADA PAINT STRIPING
- ▨ PR DETECTABLE WARNING SURFACE

**FIRE DEPARTMENT NOTES**

- A KNOX KEY SYSTEM SHALL BE INSTALLED IN A LOCATION APPROVED BY THE FIRE CODE OFFICIAL. ORDERING INFORMATION IS AVAILABLE THROUGH THE KNOX COMPANY AT WWW.KNOXBOX.COM (IFC 2006 SEC.1028.2).
- FIRE LANES SHALL BE DESIGNATED BY THE FIRE CODE OFFICIAL, AND SHALL BE CONSPICUOUSLY POSTED ON BOTH SIDES OF THE FIRE LANE. WITH FIRE LANE SIGNS SPACED NOT MORE THAN 100 FEET APART. FIRE LANE SIGNS SHALL READ "NO STOPPING, STANDING, PARKING, FIRE LANE" AND SHALL CONFORM TO THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (FIRE PREVENTION ORDINANCE CHAPTER 58, SEC. 503).
- CONSTRUCTION SITES SHALL BE SAFEGUARDED IN ACCORDANCE WITH IFC 2006 CHAPTER 14.
- OPEN BURNING IS NOT PERMITTED, INCLUDING THE BURNING OF TRASH, DEBRIS, OR LAND CLEARING. OPEN BURNING FOR WARMING OF SAND AND / OR WATER FOR THE PREPARATION OF MORTAR SHALL BE WITHIN THE CITY OF ROCHESTER HILLS BURN PERMIT GUIDELINES FIRE PREVENTION ORDINANCE CHAPTER 58, SEC. 307.6.2 & 307.6.2.3) MORTAR PERMIT CAN BE APPLIED FOR ONLINE AT WWW.ROCHESTERHILLS.ORG/FIRE IN THE "FOR YOUR BUSINESS" SECTION.
- FIRE APPARATUS ACCESS ROADWAYS SHOULD BE DESIGNED TO SUPPORT THE LOAD OF THE FIRE APPARATUS (75,000 POUNDS) AND BE SURFACED TO PROVIDE ALL WEATHER DRIVING CAPABILITIES.
- FIRE APPARATUS ACCESS ROADS SHALL HAVE AN UNOBSTRUCTED WIDTH OF 20 FEET ACROSS (26 FEET ACROSS WHERE FIRE HYDRANTS ARE PRESENT) AND AN UNOBSTRUCTED HEIGHT OF 13 FEET 6 INCHES.
- A FLOW TEST IS REQUIRED TO EVALUATE THE CAPABILITIES OF THE WATER SUPPLY. THIS CAN BE OBTAINED BY CONTACTING THE ROCHESTER HILLS ENGINEERING DEPARTMENT AT 248-656-4640.
- EXIT DOORS SHALL REMAIN FREE OF OBSTRUCTIONS AT ALL TIMES. PROVIDE GUARD POSTS OR OTHER ACCEPTABLE MEANS OF PROTECTING EXIT DOORS OPENING INTO DRIVES AND PARKING AREAS.



**PRELIMINARY NOT FOR CONSTRUCTION**

NO.	DATE	BY	DESCRIPTION

607 SHEET 07 OF 07  
 DATE: 12/20/22  
 TEL: 313.961.9600  
 FAX: 313.961.9609  
 PROJECT NO: M390020  
 PROJECT DATE: 12/20/2022  
 DRAWN BY: ESP  
 CHECKED BY: MJM

**TECHNICAL SKILL. CREATIVE SPIRIT.**  
**Mannik Smith GROUP**  
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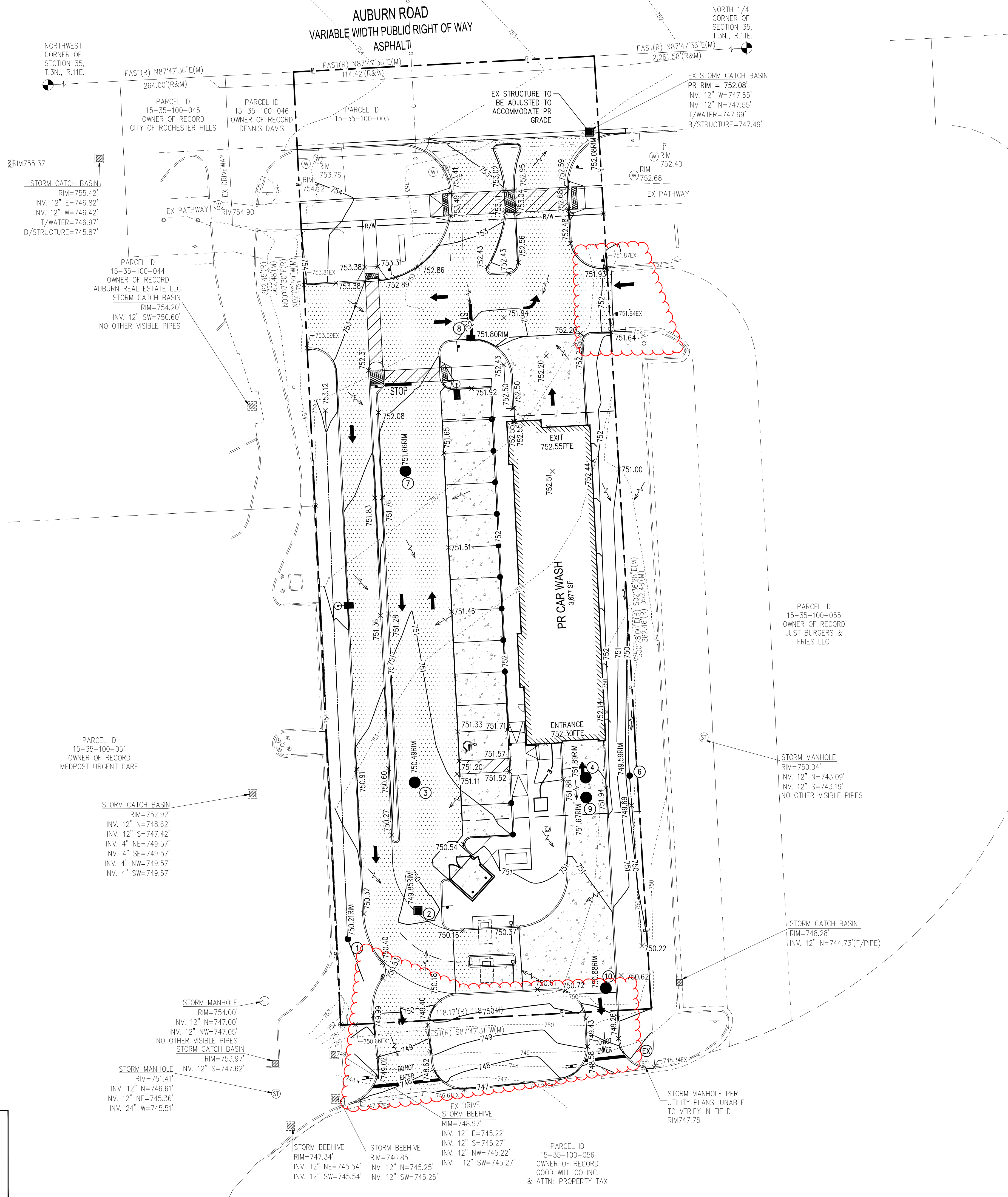
PREPARED FOR:  
**EXPRESS CONCRETE**  
 WASH CONCRETE  
 13375 NATIONAL ROAD SW  
 ETNA, OHIO 43068

CONSTRUCTION PLAN FOR  
**CLEAN EXPRESS CAR WASH**  
 10 E AUBURN ROAD  
 ROCHESTER HILLS, MI 48307

**FIRE PROTECTION PLAN**

C201

CITY FILE #22-038 SECTION #35



- LEGEND**
- 1008 --- EX CONTOUR
  - 1008 — PR CONTOUR
  - ⊕ EX STORM MANHOLE
  - ⊕ EX CATCH BASIN
  - ⊕ EX CURB AND GUTTER INLET
  - PR FLOW DIRECTION
  - ⊕ PR CATCH BASIN
  - ⊕ PR CURB AND GUTTER INLET
  - PR MANHOLE
  - × 1007.50 PR PAVEMENT ELEVATION
  - × 1007.50 TC PR TOP OF CURB ELEVATION
  - × 1007.50 RIM PR STRUCTURE RIM ELEVATION
  - ▨ CONCRETE PAVEMENT
  - ① STRUCTURE LABEL

**NOTES**

- SEE SHEET C301 FOR DETAILED GRADING PLAN

NO.	DATE	DESCRIPTION
<b>PRELIMINARY NOT FOR CONSTRUCTION</b>		

607 SHEET BY ST  
 DATE: 12/02/2022  
 TEL: 313.981.9500  
 FAX: 313.981.9509  
 PROJECT NO: M390020  
 DRAWN BY: ESP  
 CHECKED BY: MJM

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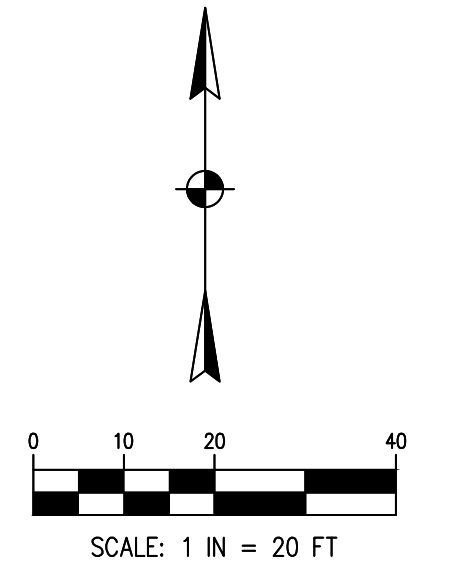
PREPARED FOR:  
  
 EXPRESS  
 WASH CONCEPTS  
 13375 NATIONAL ROAD SW  
 ETNA, OHIO 43068

CONSTRUCTION PLAN FOR  
**CLEAN EXPRESS CAR WASH**  
 10 E AUBURN ROAD  
 ROCHESTER HILLS, MI 48307

**GRADING PLAN**  
 C300

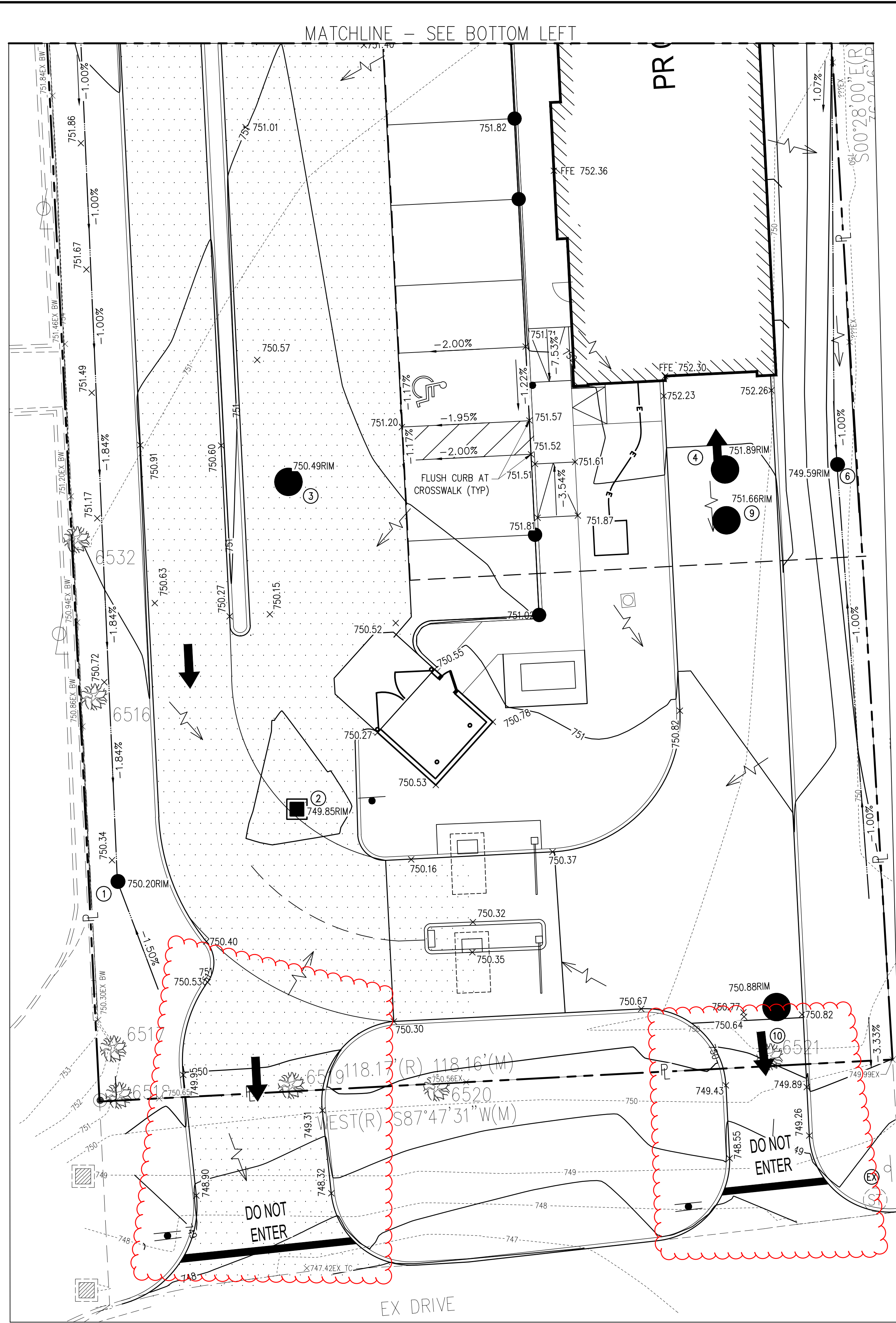
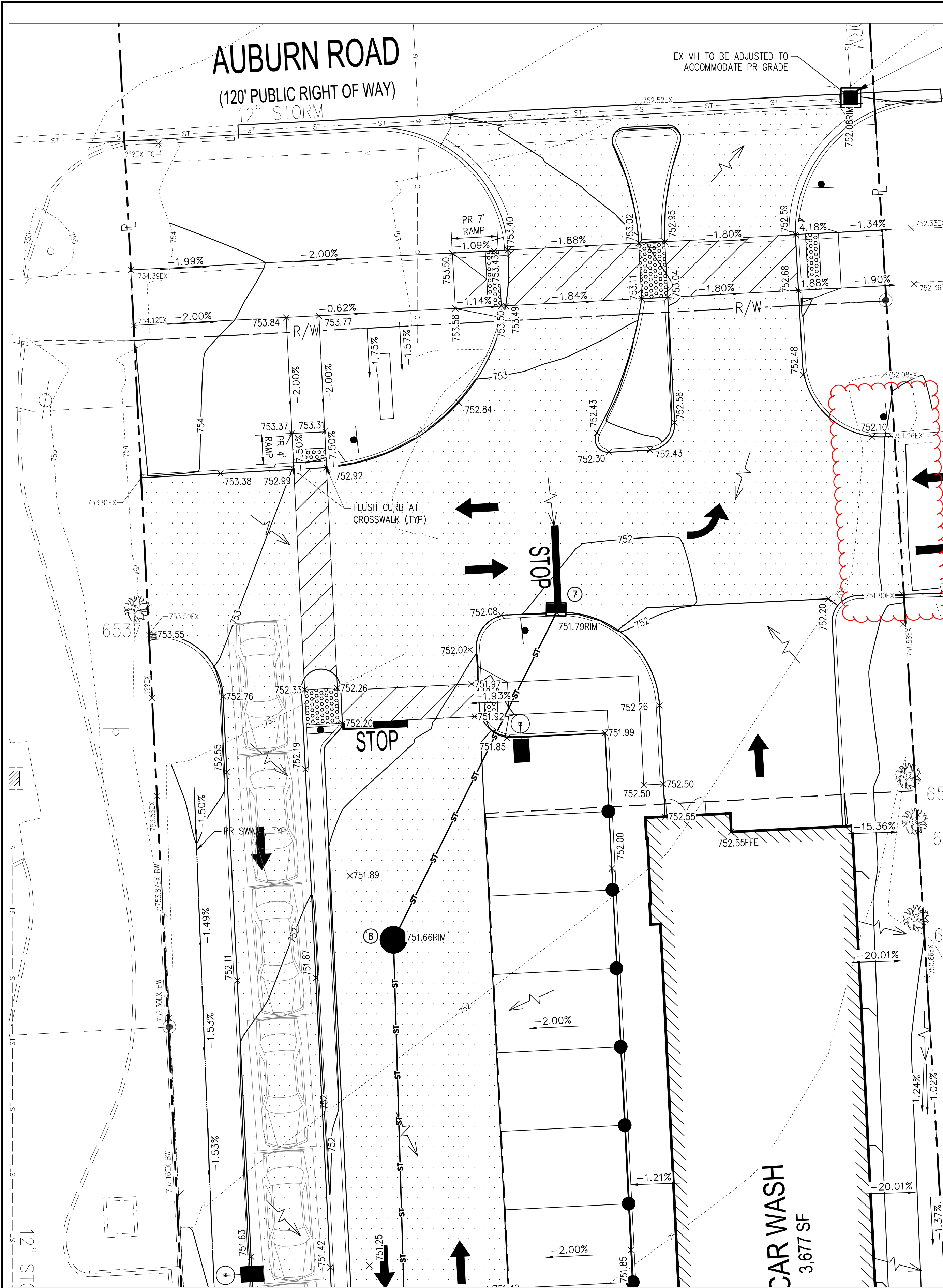
**MICHIGAN  
Utility Notification  
CENTER**  
**811**  
 811 or  
 1-800-482-7171  
 Know What's Below. Call Before You Dig.

JUNRB2022-0013  
 PSP2022-0032  
 Revision #1 after  
 conditions  
 approval  
 Received  
 2/7/2024  
 City of Rochester Hills  
 Planning & Economic  
 Development



W:\Projects\2022\13375 National Road SW\13375 National Road SW.dwg, 1/10/2023, 9:18 PM, User: jmm, Plot: 2/20/24 4:48 PM



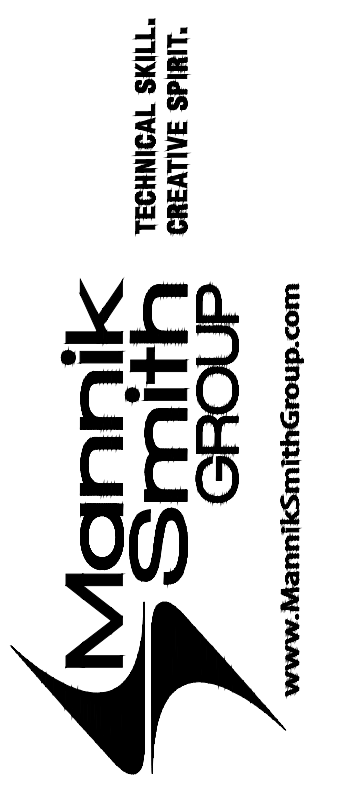


**LEGEND**

1008	EX CONTOUR
1008	PR CONTOUR
	EX STORM MANHOLE
	EX CATCH BASIN
	EX CURB AND GUTTER INLET
	PR FLOW DIRECTION
	PR CATCH BASIN
	PR CURB AND GUTTER INLET
	PR STORM STRUCTURE NUMBER
1007.50	PR PAVEMENT ELEVATION
1007.50 TC	PR TOP OF CURB ELEVATION
1007.50 BW	PR BOTTOM OF WALL ELEVATION
1007.50 FFE	PR FIRST FLOOR ELEVATION
747.58EX	EX ELEVATION
747.58EX BW	EX BOTTOM OF WALL ELEVATION
	CONCRETE PAVEMENT

NO.	DATE	BY	DESCRIPTION

607 SHELF ST  
 DEPT. OF PUBLIC WORKS  
 TEL: 313.981.9500  
 FAX: 313.981.9509  
 PROJECT DATE: 12/02/2022  
 PROJECT NO: M300020  
 DRAWN BY: ESP  
 CHECKED BY: MJM



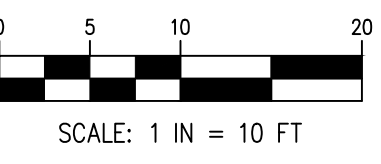
PREPARED FOR:  
  
**EXPRESS**  
 WASH CONCEPTS  
 13375 NATIONAL ROAD SW  
 ETNA, OHIO 43068

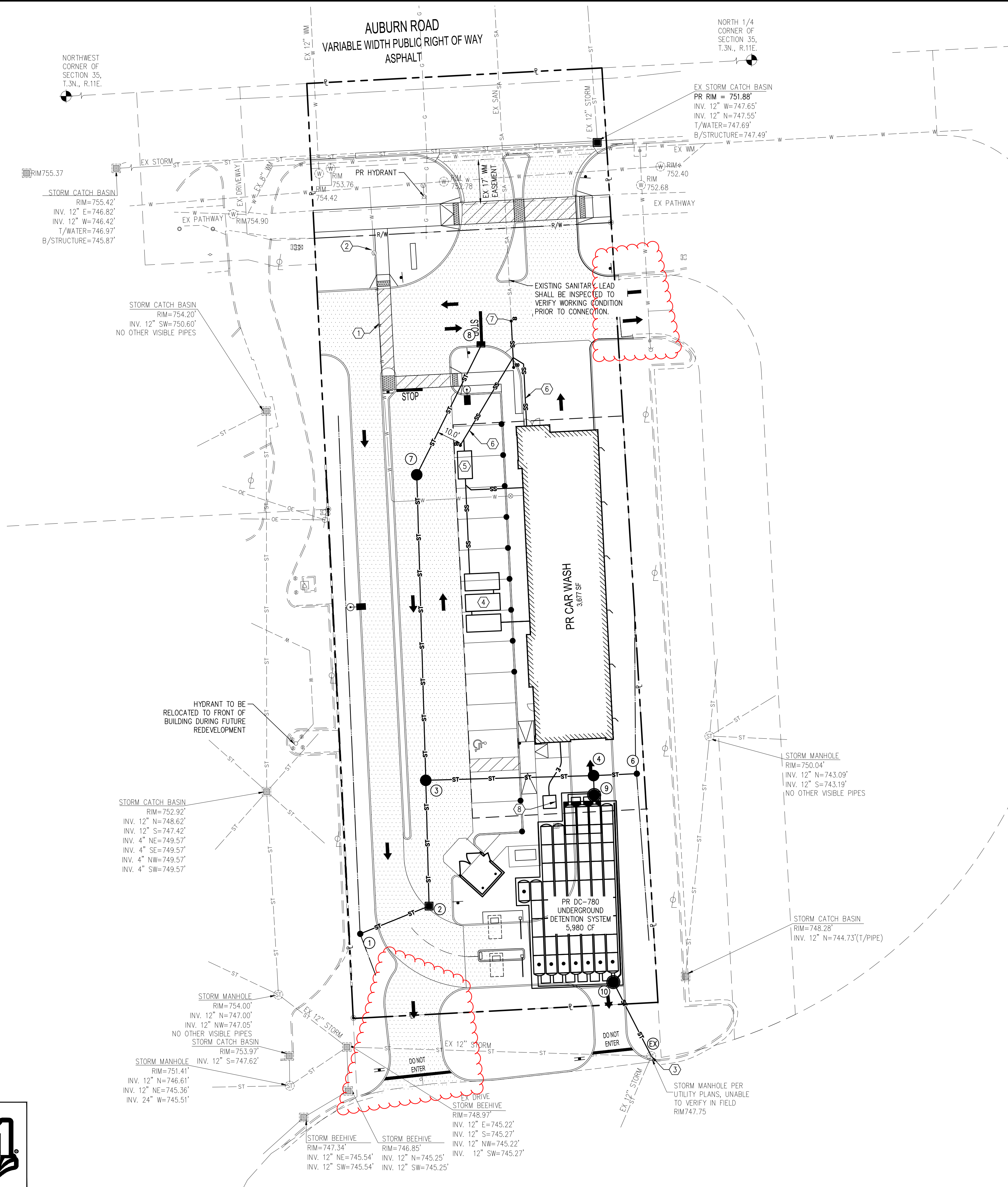
CONSTRUCTION PLAN FOR  
**CLEAN EXPRESS CAR WASH**  
 10 E AUBURN ROAD  
 ROCHESTER HILLS, MI 48307

DETAILED  
 GRADING PLAN  
 C301

**MICHIGAN**  
**Utility Notification**  
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 811 or  
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 Revision #1 after  
 conditions  
 approval  
 Received  
 2/7/2024  
 City of Rochester Hills  
 Planning & Economic  
 Development





**CODED NOTES**

- ① PR 2" DOMESTIC WATER SERVICE
- ② PR TAPPING SLEEVE, VALVE AND WELL
- ③ CONNECT PR STORM SEWER TO EXISTING STORM MANHOLE
- ④ PR WATER RECLAMATION TANKS
- ⑤ PR GREASE INTERCEPTOR
- ⑥ PR 6" SANITARY LEAD AT MIN 1.00% SLOPE
- ⑦ CONNECT PR SANITARY SERVICE TO EXISTING SERVICE ON SITE, PER THE CITY OF ROCHESTER HILLS STANDARDS. EX SANITARY SEWER LEAD TO BE TELEVIEWED PRIOR TO CONNECTION TO VERIFY IT IS IN GOOD WORKING ORDER
- ⑧ PR TRANSFORMER

**NOTES**

- 1. SEE SHEET C401 FOR STORMWATER MANAGEMENT PLAN
- 2. SEE PHOTOMETRIC PLAN FOR LIGHT POLE LOCATIONS

**LEGEND**

- OE — EX OH ELECTRIC LINE
- SA — EX SANITARY LINE
- FO — EX FIBER OPTIC LINE
- W — EX WATER LINE
- ST — EX STORM LINE
- ⊙ EX SANITARY MANHOLE
- ⊙ EX STORM MANHOLE
- ⊙ EX HYDRANT & VALVE
- ⊙ EX UTILITY POLE
- ⊙ EX STORM CURB INLET
- ST — PR STORM
- PR 6" ROOF DRAIN @ 1.0% MIN SLOPE
- W — PR WATER SERVICE
- SS — PR SANITARY SERVICE
- E — PR UNDERGROUND ELECTRIC
- G — PR GAS SERVICE
- PR CATCH BASIN
- PR CURB AND GUTTER INLET
- ⊙ PR CLEANOUT
- ① PR STORM STRUCTURE NUMBER
- ⊙ PR LIGHT POLE SEE PHOTOMETRIC PLANS

**CONNECTION TO EXISTING UTILITIES**

THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF EXISTING SANITARY SEWER AND STORM SEWER COMPONENTS PRIOR TO INSTALLATION OF PROPOSED INFRASTRUCTURE

THE CONTRACTOR SHALL COORDINATE THE SIZE AND ROUTE OF PRIVATE UTILITIES (GAS, ELECTRIC, ETC.) WITH THE APPROPRIATE UTILITY PROVIDER AND VERIFY CONNECTION LOCATIONS AT THE PROPOSED BUILDING WITH THE APPROVED M.E.P. PLANS (BY OTHERS).

NO.	DATE	DESCRIPTION
PRELIMINARY NOT FOR CONSTRUCTION		

607 SHEET BY ST	12/02/2022	ESP
DATE	M390020	MJM
TEL: 313.981.9500	PROJECT NO.	
FAX: 313.981.9509	DRAWN BY:	
	CHECKED BY:	

TECHNICAL SKILL.  
CREATIVE SPIRIT.

www.MannikSmithGroup.com

PREPARED FOR:

13375 NATIONAL ROAD SW  
ETNA, OHIO 43068

CONSTRUCTION PLAN FOR  
**CLEAN EXPRESS CAR WASH**  
10 E AUBURN ROAD  
ROCHESTER HILLS, MI 48307

**UTILITY PLAN**

C400

**MICHIGAN Utility Notification CENTER 811**  
811 or 1-800-482-7171  
Know What's Below. Call Before You Dig.

ROCHESTER HILLS MICHIGAN  
JNRNB2022-0013  
PSP2022-0032  
Revision #1 after conditions approval

Received 2/7/2024  
City of Rochester Hills  
Planning & Economic Development

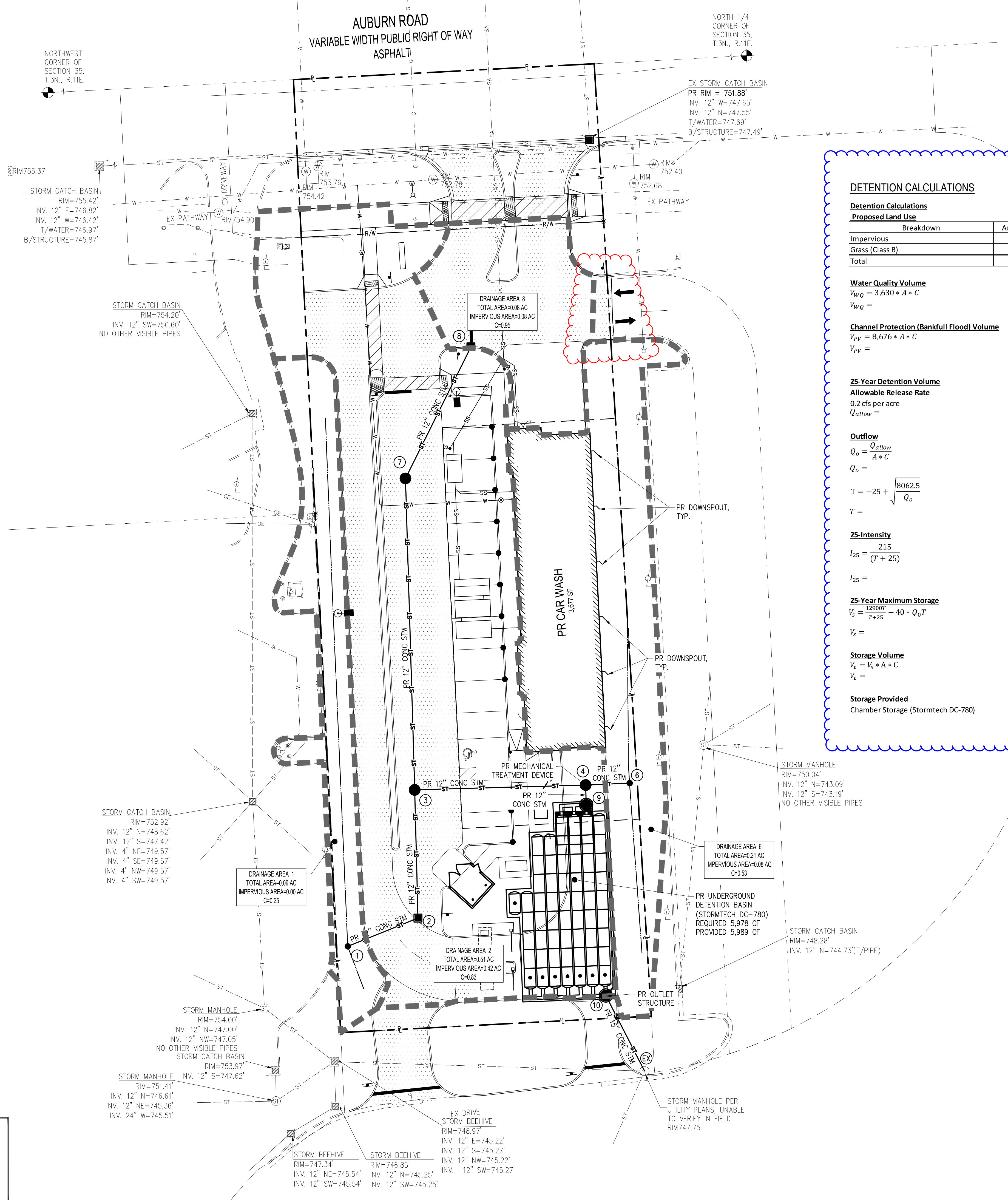


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**STORM SEWER SUMMARY**

STRUCTURE	ELEVATIONS
EX MH*	EX 12" INV 744.47 W EX 12" INV 743.67 SW PR 15" INV 743.70 NW
CB 1 (2' DIA)	RIM 750.21 12" INV 746.04 E
CB 2 (4' DIA)	RIM 749.85 12" INV 745.18 N 12" INV 745.94 SW
MH 3 (4' DIA)	RIM 750.49 12" INV 746.57 N 12" INV 745.02 E 12" INV 745.02 S
MH 4 (4' DIA) MECHANICAL TREATMENT STRUCTURE	RIM 751.89 12" INV 744.81 S 12" INV 745.36 E 12" INV 744.81 E
CB 6 (2' DIA)	RIM 749.59 12" INV 745.42 W
MH 7 (4' DIA)	RIM 751.66 12" INV 746.95 NE 12" INV 746.95 S
CB 8 (2' DIA)	RIM 751.80 12" INV 747.13 SW
MH 9 (4' DIA) INLET STRUCTURE	RIM 751.67 12" INV 744.78 S 12" INV 744.78 N
OC 10 (4' DIA) OUTLET CONTROL DEVICE	RIM 750.88 12" INV 743.78 SE 15" INV 743.78 N
DETENTION BASIN (STORMTECH DC-780)	TOP OF STONE 748.25 TOP OF CHAMBER 747.25 BOTTOM OF CHAMBER 744.78 BOTTOM OF STONE 743.78

\*INVERTS BASED ON RECORD DRAWINGS. STRUCTURE TO BE FIELD VERIFIED.



**DETENTION CALCULATIONS**

**Detention Calculations**  
Proposed Land Use

Breakdown	Area (Ac.)	C
Impervious	0.59	0.95
Grass (Class B)	0.31	0.25
Total	0.90	0.71

**Water Quality Volume**  
 $V_{WQ} = 3,630 * A * C$   
 $V_{WQ} =$  2316 cubic feet

**Channel Protection (Bankfull Flood) Volume**  
 $V_{CP} = 8,676 * A * C$   
 $V_{CP} =$  5535 cubic feet

**25-Year Detention Volume**  
 Allowable Release Rate  
 $Q_{allow} =$  0.180 cfs/acre

**Outflow**  
 $Q_o = \frac{Q_{allow}}{A * C}$   
 $Q_o =$  0.281 cfs

$T = -25 + \sqrt{\frac{8062.5}{Q_o}}$   
 $T =$  144 min

**25-Intensity**  
 $I_{25} = \frac{215}{(T + 25)}$   
 $I_{25} =$  1.27 inch

**25-Year Maximum Storage**  
 $V_s = \frac{129007}{T + 25} - 40 * Q_o * T$   
 $V_s =$  9,371 cf/(A\*C)

**Storage Volume**  
 $V_c = V_s * A * C$   
 $V_c =$  5,978 cubic feet

**Storage Provided**  
 Chamber Storage (Stormtech DC-780)  
 5,980 cubic feet

Update to the Oakland County WRC storm sewer design standard calculations. The new storm sewer standards were adopted in Dec. of 2023 by the City of Rochester Hills.

- LEGEND**
- PR DRAINAGE AREA
  - EX OH ELECTRIC LINE
  - EX SANITARY LINE
  - EX FIBER OPTIC LINE
  - EX WATER LINE
  - EX STORM LINE
  - EX SANITARY MANHOLE
  - EX STORM MANHOLE
  - EX HYDRANT & VALVE
  - EX UTILITY POLE
  - EX STORM CURB INLET
  - PR STORM
  - PR 6" ROOF DRAIN @ 1.0% MIN SLOPE
  - PR WATER SERVICE
  - PR SANITARY SERVICE
  - PR UNDERGROUND ELECTRIC
  - PR GAS SERVICE
  - PR CATCH BASIN
  - PR CURB AND GUTTER INLET
  - PR CLEANOUT
  - PR STORM STRUCTURE NUMBER
  - PR LIGHT POLE SEE PHOTOMETRIC PLANS

**PRELIMINARY NOT FOR CONSTRUCTION**

NO. DATE BY DESCRIPTION

GET SHEET BY ST  
 DTL SHEET NO. 225  
 TEL: 313.981.9500  
 FAX: 313.981.9509

PROJECT NO. M390020  
 DATE: 12/02/2022  
 DRAWN BY: ESP  
 CHECKED BY: MJM

**Mannik Smith GROUP**  
 TECHNICAL SKILL. CREATIVE SPIRIT.  
 www.MannikSmithGroup.com

PREPARED FOR:  
**EXPRESS**  
 WASH CONCEPTS  
 13375 NATIONAL ROAD SW  
 ETNA, OHIO 43068

CONSTRUCTION PLAN FOR  
**CLEAN EXPRESS CAR WASH**  
 10 E AUBURN ROAD  
 ROCHESTER HILLS, MI 48307

**STORMWATER MANAGEMENT PLAN**

C401

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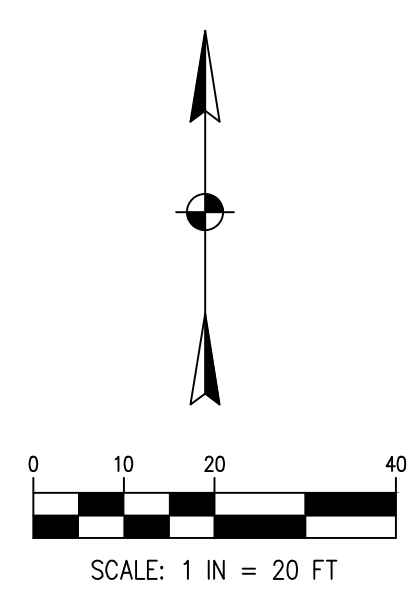
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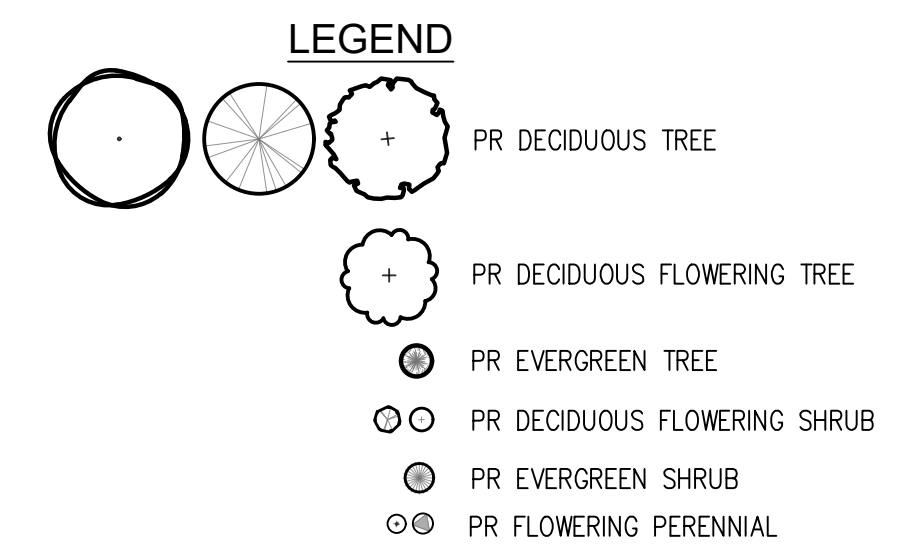
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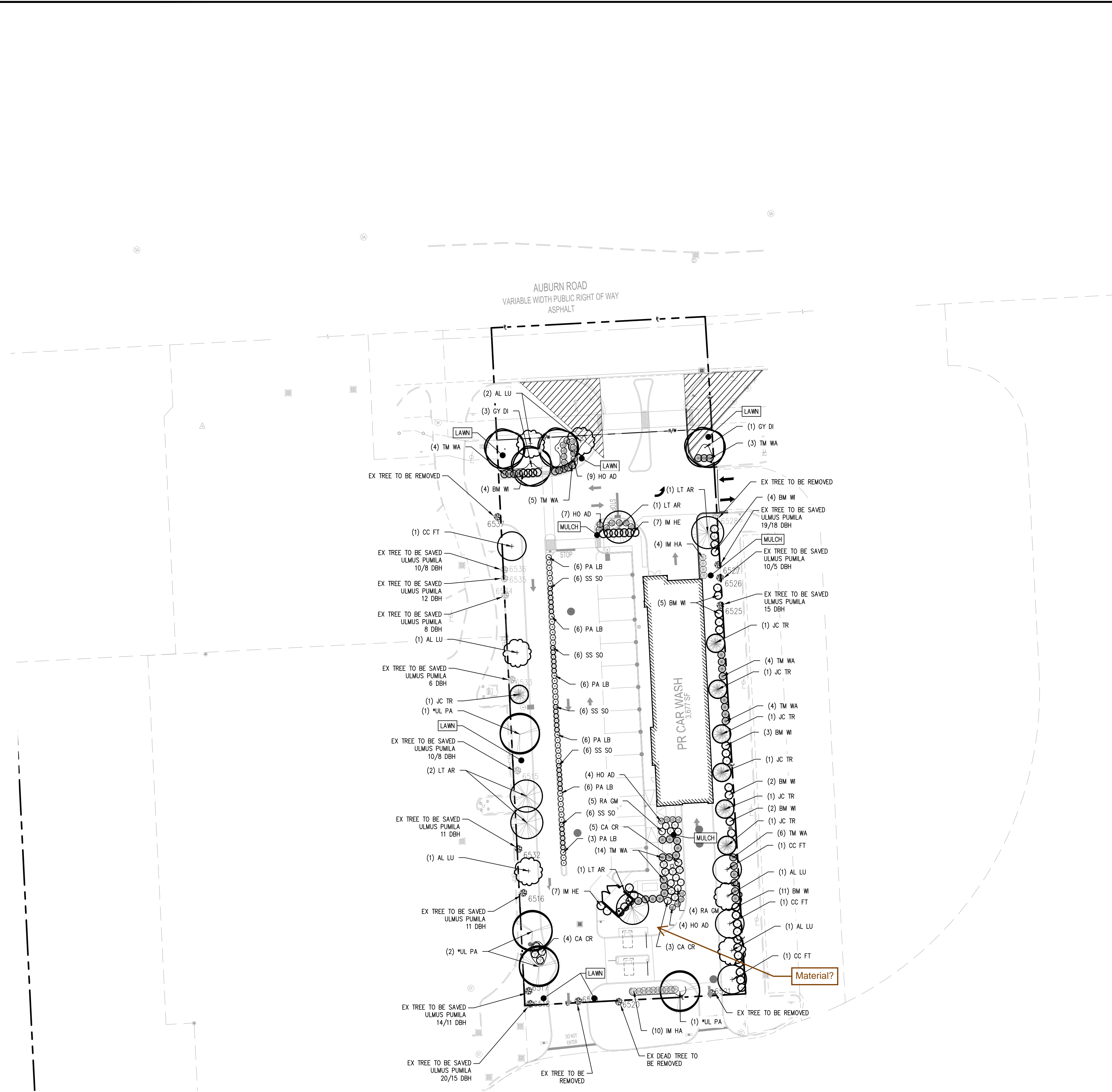
**LANDSCAPE CODE REQUIREMENTS**

REQUIRED:	PROVIDED:
ROCHESTER HILLS CODE OF ORDINANCES – CHAPTER 126 126-397 TREES BEING REMOVED MUST BE REPLACED ON A ONE-FOR-ONE BASIS. DECIDUOUS REPLACEMENT TREES MUST MEASURE 2" IN DIAMETER OR GREATER. 4 EXISTING TREES REMOVED.	4 REPLACEMENT TREES PROVIDED BY *UL PA.
ROCHESTER HILLS ZONING ORDINANCE – ARTICLE 12 138-12.300 A TYPE A BUFFER YARD IS REQUIRED BETWEEN B-2 AND B-5 PARCELS. 1.5 DECIDUOUS TREES, 1 EVERGREEN TREE, AND 4 SHRUBS SHALL BE PROVIDED FOR EVERY 100 LINEAL FEET. 197 LINEAL FEET = 1.5 DECIDUOUS TREES, 1 EVERGREEN TREE, AND 4 SHRUBS ARE REQUIRED ALONG THE WEST PROPERTY LINE. A TYPE B BUFFER YARD IS REQUIRED BETWEEN B-3 AND B-5 PARCELS. 2 DECIDUOUS TREES, 1.5 ORNAMENTAL TREES, 2 EVERGREEN TREES, AND 4 SHRUBS SHALL BE PROVIDED FOR EVERY 100 LINEAL FEET. 362 LINEAL FEET = 6 DECIDUOUS TREES, 5 ORNAMENTAL TREES, 6 EVERGREEN TREES, AND 12 SHRUBS ARE REQUIRED ALONG THE EAST PROPERTY LINE.	FOR THE WEST PROPERTY LINE: 4 EXISTING DECIDUOUS TREES PROVIDED. 1 PROPOSED EVERGREEN TREE AND 4 PROPOSED SHRUBS PROVIDED.  FOR THE EAST PROPERTY LINE: 3 EXISTING DECIDUOUS TREES, 1 PROPOSED DECIDUOUS TREE, 5 ORNAMENTAL TREES, 5 ORNAMENTAL TREES, AND 45 SHRUBS PROVIDED.
138-12.301.A TERMINAL LANDSCAPE ISLANDS SHALL BE PROVIDED AT THE END OF EACH ROW OF PARKING SPACES. EACH LANDSCAPE ISLAND SHALL HAVE A MINIMUM OF 1 SHADE TREE.	2 TERMINAL LANDSCAPE ISLANDS PROVIDED.
138-12.301.B PERIMETER LANDSCAPING SHALL BE PROVIDED ALONG THE EDGE OF ANY PARKING LOT FACING AND LOCATED 100 FEET OF A PUBLIC R/W. THIS SHALL INCLUDE A MINIMUM OF 1 DECIDUOUS SHADE TREE PER EACH 25 LINEAL FEET OR FRACTION THEREOF AND 1 ORNAMENTAL TREE PER EACH 35 LINEAL FEET OR FRACTION THEREOF. WHEREVER A PARKING LOT OR VEHICLE PARKING SPACE IS LOCATED WITHIN 30 FEET OF A PUBLIC STREET OR R/W, THE PERIMETER LANDSCAPING SHALL ALSO INCLUDE A HEDGE SHRUBS PLANTED NOT MORE THAN 30 INCHES ON CENTER BETWEEN THE PARKING AREA AND THE STREET. 115' OF PUBLIC R/W = 5 DECIDUOUS SHADE TREES AND 4 ORNAMENTAL TREES REQUIRED.	CONTINUOUS HEDGE PROVIDED ALONG R/W WITH 30" SPACING. 2 DECIDUOUS TREES AND 3 ORNAMENTAL TREES PROVIDED ALONG THE WEST SIDE, AND 1 ORNAMENTAL TREE PROVIDED IN INTERIOR LANDSCAPED AREA. FUNDS WILL BE PAID INTO THE TREE FUND FOR REMAINING 3 REQUIRED TREES.
138-12.304 STREET TREE PLANTINGS SHALL BE REQUIRED FOR ALL DEVELOPMENT PROJECTS ADJACENT TO OR ALONG THE MARGINS OF STREET RIGHTS-OF-WAY. STREET TREES SHALL CONSIST OF DECIDUOUS SHADE TREES PLANTED AT A MINIMUM CONCENTRATION OF 1 STREET TREE PER 35 LINEAL FEET OF RIGHT-OF-WAY. 1 ORNAMENTAL TREE IS REQUIRED FOR EVERY 60 LINEAL FEET. LINEAR FEET OF RIGHT-OF-WAY FRONTAGE: 115' 4 DECIDUOUS SHADE TREES AND 2 ORNAMENTAL TREES ARE REQUIRED.	4 DECIDUOUS TREES AND 2 ORNAMENTAL TREES PROVIDED ALONG RIGHT-OF-WAY.

**LANDSCAPE PLANT LIST**

ABRV.	QUANTITY	SCIENTIFIC NAME	COMMON NAME	SIZE	REMARKS	TYPE
AL LU	6	AMELANCHIER LAEVIS 'LUSTRE'	LUSTRE ALLEGHENY SERVICEBERRY	2" CALIPER	B&B	ORNAMENTAL TREE
CC FT	3	CERCIS CANADENSIS 'NC2016-2'	FLAME THROWER REDBUD	2" CALIPER	B&B	ORNAMENTAL TREE
GY DI	4	GYMNOCLADUS DIOICUS	KENTUCKY COFFEETREE	3" CALIPER	B&B	DECIDUOUS TREE
*UL PA	4	ULMUS X 'PATRIOT'	PATRIOT ELM	3" CALIPER	B&B	DECIDUOUS TREE
LT AR	5	LIRIODENDRON TULIPIFERA 'ARNOLD'	ARNOLD TULIP POPLAR	3" CALIPER	B&B	DECIDUOUS TREE
PA LB	33	PENNISETUM ALOPECUROIDEDES 'LITTLE BUNNY'	LITTLE BUNNY FOUNTAIN GRASS	1 GALLON	CONTAINER	ORNAMENTAL GRASS
SS SO	30	SCHIZACHYRIUM SCOPARIUM 'STANDING OVATION'	STANDING OVATION LITTLE BLUESTEM	1 GALLON	CONTAINER	ORNAMENTAL GRASS
HO AD	24	HOSTA 'FRAGRANT BOUQUET'	FRAGRANT BOUQUET HOSTA	1 GALLON	CONTAINER	FLOWERING PERENNIAL
RA GM	9	RIBES ALPINUM 'GREEN MOUND'	GREEN MOUND ALPINE CURRANT	30" HEIGHT	CONTAINER	DECIDUOUS SHRUB
CA CR	12	CLETHRA ALNIFOLIA 'CRYSTALINA'	SUGARTINA CRYSTALINA	1 GALLON	CONTAINER	DECIDUOUS SHRUB
JC TR	7	PICEA OMORICA 'BRUNS'	BRUNS UPRIGHT SERBIAN SPRUCE	5" SPREAD	CONTAINER	EVERGREEN TREE
IM HA	14	ILEX X MESERVEAE 'HACHFEE'	CASTLE SPIRE BLUE HOLLY	30" HEIGHT	CONTAINER	EVERGREEN SHRUB
IM HE	14	ILEX X MESERVEAE 'HECKENSTAR'	CASTLE WALL BLUE MALE HOLLY	30" HEIGHT	CONTAINER	EVERGREEN SHRUB
BM WI	31	BUXUS MICROPHYLLA VAR. KOREANA 'WINTERGREEN'	WINTERGREEN KOREAN BOXWOOD	30" HEIGHT	CONTAINER	EVERGREEN SHRUB
TM WA	40	TAXUS MEDIA 'WARDII'	WARDS YEW	30" HEIGHT	CONTAINER	EVERGREEN SHRUB

\*PROPOSED TREES THAT FULFILL THE TREE REPLACEMENT REQUIREMENT.



**CITY OF ROCHESTER PLANTING REPLACEMENT NOTE**

ANY PLANT MATERIAL THAT IS DESIGNATED TO BE MAINTAINED THAT DIES OR IS DAMAGED DURING OR AS A RESULT OF CONSTRUCTION SHALL BE REPLACED IN KIND WITH LIKE SPECIES AND SIZES, PURSUANT TO CITY REQUIREMENTS.

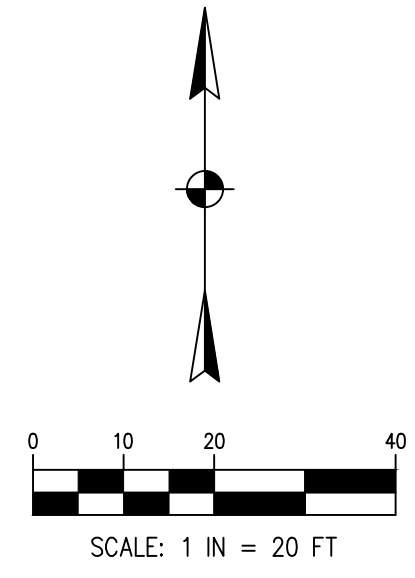
**CITY OF ROCHESTER HILLS PLANTING PLACEMENT NOTES**

PRIOR APPROVAL IS REQUIRED TO PLANT ANY TREE OR SHRUB ON THE PUBLIC RIGHT-OF-WAY. ALL TREES AND SHRUBS MUST BE PLANTED AT LEAST 10' FROM THE EDGE OF THE PUBLIC ROAD. (TREES MUST BE PLANTED AT LEAST 15' AWAY FROM CURB OR ROAD EDGE WHERE THE SPEED LIMIT IS MORE THAN 35 MPH.) SHADE TREES AND SHRUBS MUST BE PLANTED AT LEAST 5' FROM THE EDGE OF THE PUBLIC WALKWAY. EVERGREEN AND ORNAMENTAL TREES MUST BE PLANTED AT LEAST 10' FROM THE EDGE OF THE PUBLIC WALKWAY. NO TREES OR SHRUBS MAY BE PLANTED WITHIN THE TRIANGULAR AREA FORMED AT THE INTERSECTION OF ANY STREET RIGHT-OF-WAY LINES AT A DISTANCE ALONG EACH LINE OF 25' FROM THEIR POINT OF INTERSECTION. NO TREES OR SHRUBS MAY BE PLANTED IN THE TRIANGULAR AREA FORMED AT THE INTERSECTION OF ANY DRIVEWAY WITH A PUBLIC WALKWAY AT A DISTANCE ALONG EACH LINE OF 15' FROM THEIR POINT OF INTERSECTION. ALL TREES AND SHRUBS MUST BE PLANTED AT LEAST 10' FROM ANY FIRE HYDRANT. SHADE AND EVERGREEN TREES MUST BE AT LEAST 15' AWAY FROM THE NEAREST OVERHEAD WIRE. TREES MUST BE PLANTED A MINIMUM OF 5' FROM AN UNDERGROUND UTILITY, UNLESS THE CITY'S LANDSCAPE ARCHITECT REQUIRES A GREATER DISTANCE. PRIOR TO THE RELEASE OF THE PERFORMANCE BOND, THE CITY OF ROCHESTER HILLS FORESTRY UNIT NEEDS TO INSPECT ALL TREES, EXISTING OR PLANTED, TO IDENTIFY ANY THAT POSE A HAZARD TO THE SAFE USE OF THE PUBLIC RIGHT-OF-WAY. FORESTRY MAY REQUIRE THE DEVELOPER TO REMOVE, AND POSSIBLY REPLACE, ANY SUCH TREES. THE ABOVE REQUIREMENTS ARE INCORPORATED INTO THE PLAN.

**LANDSCAPE IRRIGATION SYSTEM**

LANDSCAPE CONTRACTOR TO PROVIDE DESIGN AND INSTALLATION OF A LANDSCAPE IRRIGATION SYSTEM WHICH COVERS THE ENTIRE SITE PROPERTY. LAWNS, TREES AND LANDSCAPE BEDS SHALL BE IRRIGATED ON SEPARATE ZONES. IRRIGATION SYSTEM SHALL INCLUDE A SMART ELECTRONIC CONTROLLER WITH WEATHER SENSOR, RAIN DELAY SEASONAL ADJUST AND WATER BUDGET FEATURES. A SEPARATE IRRIGATION METER AND BACKFLOW PREVENTOR PER CITY REQUIREMENTS AND ANY PERMITS SHALL BE INCLUDED. PROVIDE COMPLETE IRRIGATION DESIGN DRAWINGS AND SPECS FOR OWNER REVIEW PRIOR TO INSTALLATION. A COMPLETE SINGLE SOURCE IRRIGATION SYSTEM FROM HUNTER, RAINBIRD AND TORO WILL ONLY BE ACCEPTED. SITE IRRIGATION MAY ONLY OCCUR DURING 12 AM AND 5 AM. ALL LANDSCAPE AND GRASS AREAS, INCLUDING RIGHTS OF WAY, SHALL BE FULLY IRRIGATED AND COMPLIANT WITH SECTION 138-12.105.

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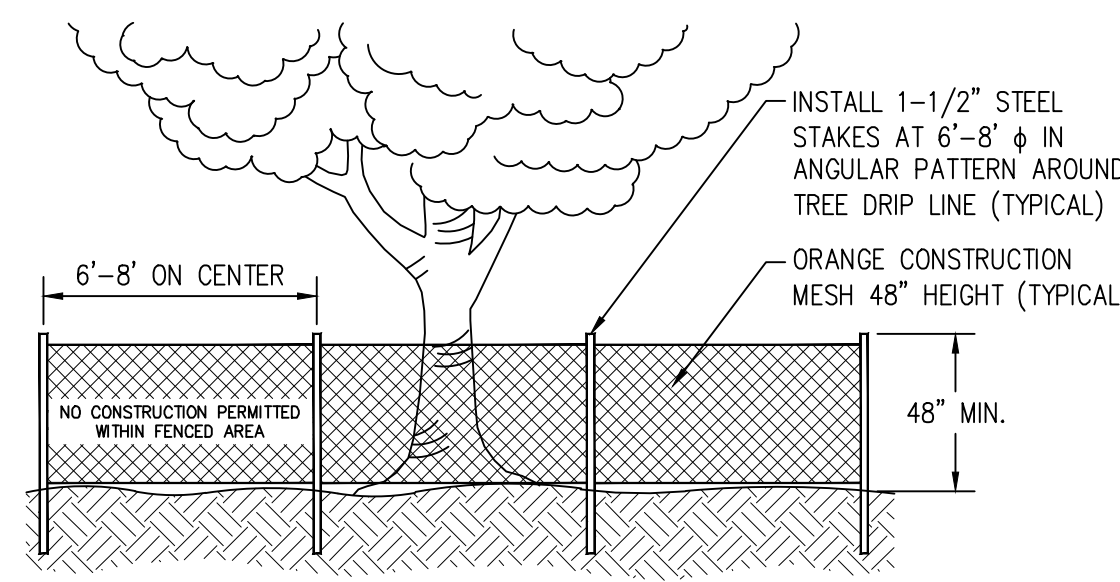
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**LANDSCAPE PLANTING NOTES**

- THE CONTRACTOR SHALL PROVIDE A ONE YEAR WARRANTY ON ALL PLANTS AND VEGETATION PROPOSED ON THE LANDSCAPING PLAN. ANY TREES, SHRUBS, GROUND COVER OR OTHER VEGETATION PLANTED AS PART OF THIS PROJECT THAT DO NOT SURVIVE ONE YEAR FROM PLANTING SHALL BE REPLACED AT THE EXPENSE OF THE CONTRACTOR.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING AND COORDINATING WITH ALL PERTINENT UTILITY COMPANIES THREE WORKING DAYS IN ADVANCE OF ANY DIGGING. THE CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR ANY COST INCURRED DUE TO DAMAGE OF ANY UTILITIES.
- REFER TO THE LANDSCAPE PLAN FOR ADDITIONAL NOTES. LANDSCAPE IMPROVEMENTS SHALL CONFORM TO THE LATEST EDITION OF MDOT CONSTRUCTION SPECIFICATIONS.
- ALL PLANTING MATERIALS: SHALL BE PLANTED PER MDOT SPECIFICATIONS. EXISTING TREES TO REMAIN SHALL BE PRUNED TO REMOVE BROKEN, LOW HANGING AND OTHER UNDESIRABLE GROWTH TO ENSURE HEALTHY AND SYMMETRICAL NEW GROWTH.
- PLANTING BEDS: ONE MONTH BEFORE CULTIVATION AND AFTER DAYTIME TEMPERATURES HAVE WARMED TO 60° CONSISTENTLY, TREAT ALL PLANTING BEDS THAT ARE TO BE DEVELOPED IN AREAS OF EXISTING TURF WITH PRE-EMERGENT AND POST-EMERGENT TYPE HERBICIDES. USE A STATE-LICENSED PESTICIDE APPLICATOR TO APPLY THE HERBICIDE. REPEAT HERBICIDE APPLICATION TWO WEEKS LATER AND UNTIL ALL HERBACEOUS MATERIALS HAVE BEEN KILLED. BEFORE PLANTING, TOP DRESS ALL PLANTING BEDS WITH A MINIMUM OF 6 INCHES OF BACKFILL MIX, THEN CULTIVATE PLANTING AREA TO A DEPTH OF 6 INCHES USING A PLOW, DISC, OR ROTO-TILLER.
- BACKFILL MIX: FOR ALL PLANTINGS, USE BACKFILL MIX CONSISTING OF THE FOLLOWING:
  - ONE PART EXCAVATED SOIL.
  - ONE PART TOPSOIL.
  - ONE PART EPA RATED CLASS IV COMPOST.
  - A SLOW RELEASE COMMERCIAL FERTILIZER (0-20-20 OR EQUAL) ADDED AT A RATE OF 5 POUNDS PER CUBIC YARD TO THE BACKFILL MIX.
  - IF SOIL AREAS ARE OF HIGH PH (GREATER THAN 6.5), APPLY 1.25 POUNDS OF ELEMENTAL SULFUR PER CUBIC YARD OF BACKFILL MIX.
 NOTE: CONTRACTOR SHALL SUPPLY A DETAILED SOIL ANALYSIS PRIOR TO ALL PLANT BED PREPARATION. ANALYSIS SHALL INDICATE SOIL PH, TEXTURE, MAJOR NUTRIENTS, SALTS, ETC. SOIL ANALYSIS SHALL BE FROM A REPUTABLE, INDEPENDENT LAB. SOIL AMENDMENTS SHALL BE INCORPORATED INTO BACKFILL/PLANT MIX AS RECOMMENDED BY THE INDEPENDENT LAB.
- MULCH: SMOOTH AND SHAPE THE BACKFILL MIX TO FORM A SHALLOW BASIN SLIGHTLY LARGER THAN THE PLANTING HOLE. MULCH ALL PLANTING AREAS WITH A LAYER OF FINELY SHREDDED HARDWOOD BARK OF UNIFORM TEXTURE & SIZE. PLANTS GROUPED IN MASSES SHALL HAVE THE ENTIRE CONTIGUOUS PLANTING BED OR ISLAND MULCHED. USE SHREDDED HARDWOOD BARK AGED MIN. ONE YEAR. RAKE AND SMOOTH THE ENTIRE AREA OF THE PLANTING BEDS, MULCH TO A DEPTH OF 3 INCHES. AFTER MULCHING AND BEFORE WATERING, ADD A SLOW RELEASE COMMERCIAL FERTILIZER (12-12-12 OR EQUAL), IN GRANULAR FORM, TO THE TOP OF THE MULCH AT A RATE OF 5 POUNDS PER 1000 SQUARE FEET. DO NOT ALLOW FERTILIZER TO CONTACT THE STEMS, BRANCHES, ROOTS OR LEAVES.
- PERIOD OF ESTABLISHMENT. BEFORE FINAL INSPECTION, PLACE ALL PLANTS AND CARE FOR THEM FOR A PERIOD OF ESTABLISHMENT. THE PERIOD OF ESTABLISHMENT BEGINS IMMEDIATELY UPON COMPLETION OF THE PLANTING OPERATIONS AND CONTINUES UNTIL OCTOBER 1. THE MINIMUM PERIOD OF ESTABLISHMENT IS ONE GROWING SEASON, JUNE 1 THROUGH OCTOBER 1. DURING THE PERIOD OF ESTABLISHMENT, FOLLOW STANDARD HORTICULTURAL PRACTICES TO ENSURE THE VIGOR AND GROWTH OF THE TRANSPLANTED MATERIAL. WATER, REMULCH, RESTAKE, GUY, AND CULTIVATE AS NECESSARY. PERFORM AT LEAST TWO WEEDING AND MOWING PROGRAMS (AROUND TREES, GUY STAKES, SHRUBS, AND BED EDGES) OF SUCH INTENSITY AS TO COMPLETELY RID THE PLANTED AND MULCHED AREAS OF WEEDS AND GRASSES. BEGIN THE FIRST PROGRAM ON OR ABOUT JUNE 15 AND THE SECOND APPROXIMATELY 8 WEEKS LATER. ON OR ABOUT AUGUST 15, THE ENGINEER WILL INSPECT THE PLANTING AND SUPPLY THE CONTRACTOR WITH A LIST OF MISSING AND DEAD PLANTS AND THOSE THAT HAVE DIED BACK BEYOND NORMAL PRUNING LINES. REPLANT AS REQUIRED ACCORDING TO THE SPECIFICATIONS OF THE ORIGINAL MATERIAL. REPLACEMENT PLANTS ARE SUBJECT TO A NEW PERIOD OF ESTABLISHMENT. IMMEDIATELY REPLACE PLANTS PLANTED INITIALLY IN THE FALL THAT HAVE DIED BEFORE THE SPRING PLANTING SEASON. CARE FOR THE REPLACEMENT PLANTS DURING THE NEW ESTABLISHMENT PERIOD.
- RESTORATION OF DISTURBED AREAS FOR NEW LAWN: ALL DISTURBED AREAS NOT COVERED BY BUILDING, PAVEMENT OR LANDSCAPE PLANTING BEDS SHALL BE PREPARED FOR GRASS SEED AND SEEDED. LOOSEN RUTS AND WORK THE SOIL AREAS TO A MINIMUM OF 6" DEEP PRIOR TO FINE GRADING AND SEEDING WORK. AREAS TO RECEIVE GRASS SEED SHALL HAVE A MIN. 4" TOPSOIL PLACED, SEEDED AND A STRAW/MULCH BLANKET COVER PLACED OVER THE SEEDED AREAS PER ODOT SPECIFICATIONS. FERTILIZE WITH ONE POUND OF ACTUAL NITROGEN PER 1000 SQUARE FEET WITH A SLOW RELEASE COMMERCIAL STARTER FERTILIZER (LESCO 18-24-12 OR EQUAL).
- LANDSCAPE TREES, SHRUBS AND PERENNIAL WATERING: THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING, DELIVERING, APPLYING, MEASURING AND SCHEDULING A SUFFICIENT AMOUNT OF WATER NECESSARY TO KEEP EACH PLANT IN A HEALTHY GROWING CONDITION THROUGHOUT THE PERIOD OF ESTABLISHMENT. THE CONTRACTOR SHALL APPLY 1" OF WATER PER WEEK TO ALL NEW PLANTS. THE CONTRACTOR SHALL INSTALL & MAINTAIN SUPPLEMENTAL DRIP WATERING TREE BAGS (SUCH AS 20 GALLON TREE GATOR WATER BAG) TO PROVIDE ADEQUATE, SLOW RELEASE OF WATER. WATER BAGS SHALL BE REMOVED AT THE END OF THE SECOND GROWING SEASON. WATERING WILL ONLY OCCUR BETWEEN THE HOURS OF 12:00 A.M. AND 5:00 A.M.
  - TURF GROUNDCOVER (SODDING, SEEDING AND SEED MULCHING): ALL SEEDING INSTALLATION SHALL CONFORM TO ODOT SPECIFICATIONS AND NOTE 9 ABOVE. SEED AT 6 LBS/1000 SF WITH THE FOLLOWING SEED MIXTURE (ODOT LAWN BLEND):
 

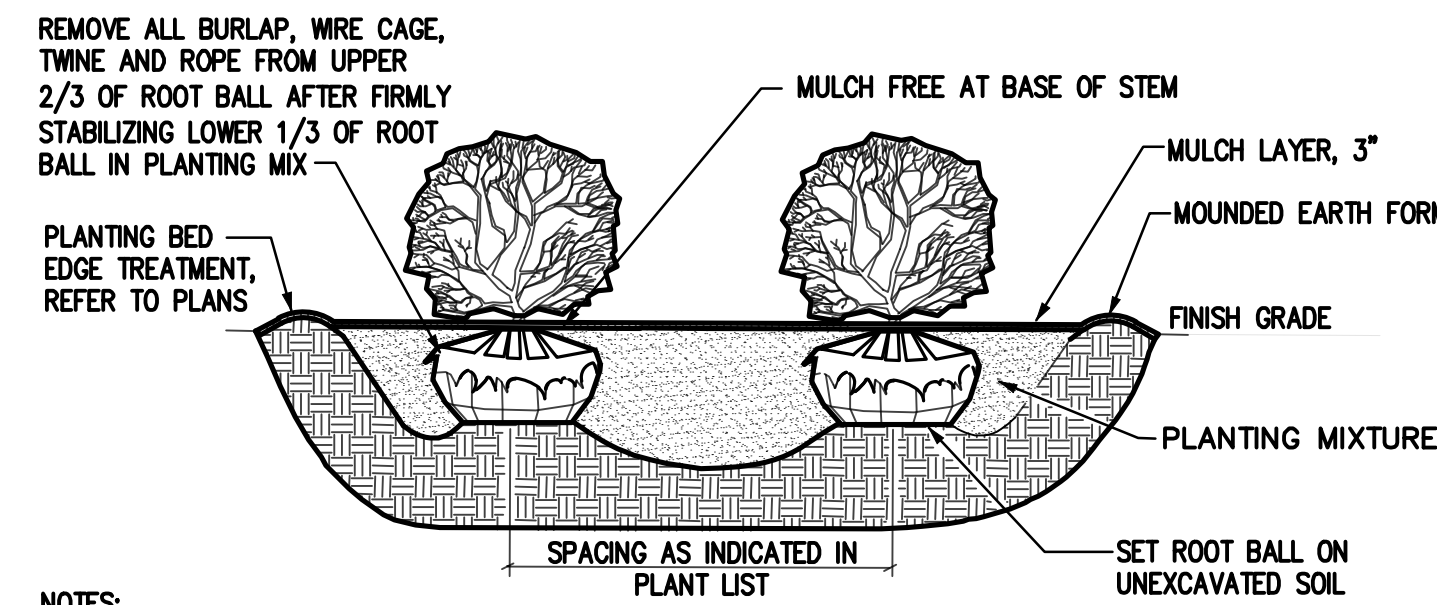
KENTUCKY 31 TALL FESCUE	40%
PERENNIAL RYE	30%
KENTUCKY BLUEGRASS	30%
  - MAINTENANCE:
    - FERTILIZATION PROGRAM  
FERTILIZE LAWNS UP TO 6 TIMES PER YEAR USING THE STANDARD RECOMMENDED FERTILIZER FOR THAT TIME OF YEAR. THE FOLLOWING PROGRAM IS A GUIDE:
 

EARLY SPRING - PRE-EMERGENT CRABGRASS CONTROL AND BALANCED FERTILIZER
SPRING - BROADLEAF WEED CONTROL AND BALANCED FERTILIZER
EARLY SUMMER - SLOW RELEASE SUMMER FERTILIZER
MID SUMMER - SLOW RELEASE TURF BUILDING FERTILIZER
FALL - BROADLEAF WEED CONTROL AND BALANCED FERTILIZER
LATE FALL - LATE FALL/WINTER BLEND FERTILIZER
    - MOWING  
NEWLY SEEDED LAWNS NEED TO BE KEPT MOIST AND SEED GERMINATION CAN TAKE FROM 2-4 WEEKS. NO WEED CONTROL OR PRE-EMERGENT SHOULD BE USED UNTIL THE LAWN HAS BEEN MOWED FOR 2 MONTHS TO ENSURE ALL OF THE SEED HAS GERMINATED AND HAS HAD TIME TO HARDEN OFF.
      - MOWING SHOULD NOT REMOVE MORE THAN 1/3 THE TOTAL LEAF SURFACE GRASS BLADE AT ANY ONE MOWING. THIS MAY REQUIRE MOWING TWICE PER WEEK IN THE SPRING AND FALL DUE TO INCREASED GROWTH, AND NORMALLY ONCE PER WEEK THROUGH THE SUMMER. REMOVING MORE THAN 1/3 OF THE LEAF SURFACE CAN SEVERELY SHOCK THE GRASS PLANT. IT IS RECOMMENDED TO BAG CLIPPINGS FOR THE FIRST FEW MOWINGS.
      - BED CARE  
IT IS IMPORTANT TO MAINTAIN ADEQUATE MULCH COVER, USUALLY TO A MINIMUM DEPTH OF 2" AN ORGANIC DOUBLE OR TRIPLE PROCESSED MULCH IS SUGGESTED. MULCH COVER ASSISTS IN MAINTAINING AND RETAINING MOISTURE FOR EXTENDED PERIODS OF TIME AND INSULATING THE ROOT ZONES FROM EXTREME HEAT AND COLD. ADDITIONALLY, A GOOD MULCH COVER WILL HELP TO DETER THE GERMINATION OF WEEDS.
        - MULCHING IS NOT REQUIRED YEARLY, A THIN COAT, PURELY TO ADD COLOR MAY BE APPLIED YEARLY TO KEEP UP APPEARANCES AS DESIRED. SHOULD THE MULCH DEPTH EXCEED 4", TURN THE MULCH OVER TO PROMOTE THE MULCH BREAKING DOWN. TOO MUCH MULCH CAN BE DETRIMENTAL TO THE HEALTH OF PLANTS.
        - TO MAINTAIN BED LINES, EDGE THEM PERIODICALLY. EDGING BEDS LIGHTLY 2-3 TIMES PER YEAR WILL PREVENT THE LAWN FROM INVADING THE BEDS WHICH GIVES A JAGGED APPEARANCE TO THE EDGE. THIS IS BEST DONE USING A ROUND POINT SHOVEL AND DIGGING A SHALLOW TRENCH ALONG THE BED LINE.
      - PRUNING  
PRUNING TIMES FOR TREES AND SHRUBS VERY DEPENDING ON WHEN THEY FLOWER.
        - SHRUBS AND TREES THAT DEVELOP BLOSSOMS ON NEW GROWTH IN LATE SPRING OR SUMMER SHOULD BE PRUNED IN EITHER EARLY SPRING, OR THE LAST FEW WEEKS OF WINTER
        - SHRUBS AND TREES THAT BEAR BLOSSOMS ON LAST YEAR'S WOOD SHOULD BE PRUNED SOON AFTER BLOOMING. FLOWER BUDS, IN THIS GROUP, ARE FORMED LATE IN THE PREVIOUS GROWING SEASON. HEAVY PRUNING IN THE WINTER OR EARLY SPRING WILL DRAMATICALLY LESSEN THEIR FLOWERING POTENTIAL IN THE SPRING.
        - MOST TREES CAN BE PRUNED AT ANY TIME DURING THE GROWING SEASON. IF PRUNING IS TO BE SEVERE, TRY TO SPREAD THE PRUNING OUT OVER MULTIPLE GROWING SEASONS TO LIMIT STRESS ON THE TREES.
  - FOR MOST PERENNIALS, THE VEGETATION DRIES AND DIES IN THE FALL AND SHOULD BE REMOVED IN THE LATE AUTUMN OR WINTER MONTHS TO PREPARE FOR THE NEXT GROWING SEASON. THIS INCLUDES BULBS WHICH SHOULD BE CUT BACK WHEN THE FOLIAGE BEGINS TO DISCOLOR. USE EXTRA CARE WITH SEMI-EVERGREEN PERENNIALS SO AS TO NOT DAMAGE THE PLANT.
  - PRIOR TO THE RELEASE OF THE PERFORMANCE BOND, THE CITY OF ROCHESTER HILLS MUST INSPECT ALL LANDSCAPING PLANTINGS.
  - ANY PLANT MATERIAL THAT IS DESIGNATED TO BE MAINTAINED THAT DIES OR IS DAMAGED DURING OR AS A RESULT OF CONSTRUCTION SHALL BE REPLACED IN KIND WITH LIKE SPECIES AND SIZES.
  - ALL LANDSCAPE AREAS MUST BE IRRIGATED.
  - ALL LANDSCAPING REQUIRED PURSUANT TO CITY OF ROCHESTER CODES AND ORDINANCES SHALL BE MAINTAINED IN PERPETUITY.
  - CITY OF ROCHESTER HILLS MAINTENANCE NOTES (SECTION 138-12.109)
    - THE OWNER OF THE PROPERTY SHALL BE RESPONSIBLE FOR ALL MAINTENANCE OF SITE LANDSCAPING, AS FOLLOWS:
      - LANDSCAPING SHALL BE KEPT IN A NEAT, ORDERLY AND HEALTHY GROWING CONDITION, FREE FROM DEBRIS AND REFUSE.
      - PRUNING SHALL BE MINIMAL AT THE TIME OF INSTALLATION, ONLY TO REMOVE DEAD OR DISEASED BRANCHES. SUBSEQUENT PRUNING SHALL ASSURE PROPER MATURATION OF PLANTS TO ACHIEVE THEIR APPROVED PURPOSE.
      - ALL DEAD, DAMAGED, OR DISEASED PLANT MATERIAL SHALL BE REMOVED IMMEDIATELY AND REPLACED WITHIN SIX MONTHS AFTER IT DIES OR IN THE NEXT PLANTING SEASON, WHICHEVER OCCURS FIRST. FOR PURPOSES OF THIS SECTION, THE PLANTING SEASON FOR DECIDUOUS PLANTS SHALL BE BETWEEN MARCH 1 AND JUNE 1 AND FROM OCTOBER 1 UNTIL THE PREPARED SOIL BECOMES FROZEN. THE PLANTING SEASON FOR EVERGREEN PLANTS SHALL BE BETWEEN MARCH 1 AND JUNE 1. PLANT MATERIAL INSTALLED TO REPLACE DEAD OR DISEASED MATERIAL SHALL BE AS CLOSE AS PRACTICAL TO THE SIZE OF THE MATERIAL IT IS INTENDED TO REPLACE. THE CITY MAY NOTIFY PROPERTY OWNERS OF THE NEED TO REPLACE DEAD, DAMAGED, OR DISEASED MATERIAL.
      - THE APPROVED LANDSCAPE PLAN SHALL BE CONSIDERED A PERMANENT RECORD AND INTEGRAL PART OF THE SITE PLAN APPROVAL, UNLESS OTHERWISE APPROVED IN ACCORDANCE WITH THE AFOREMENTIONED PROCEDURES, ANY REVISIONS TO OR REMOVAL OF PLANT MATERIALS, OR NON-COMPLIANCE WITH THE MAINTENANCE REQUIREMENTS OF THIS SECTION 138-12.109 WILL PLACE THE PARCEL IN NON-COMPLIANCE WITH THE APPROVED LANDSCAPE PLAN AND BE A VIOLATION OF THIS ORDINANCE.
      - IF PROTECTED TREES ARE DAMAGED, A FINE SHALL BE ISSUED ON AN INCH-BY-INCH BASIS AT A MONETARY RATE AS DEFINED BY THE FORESTRY DEPARTMENT.

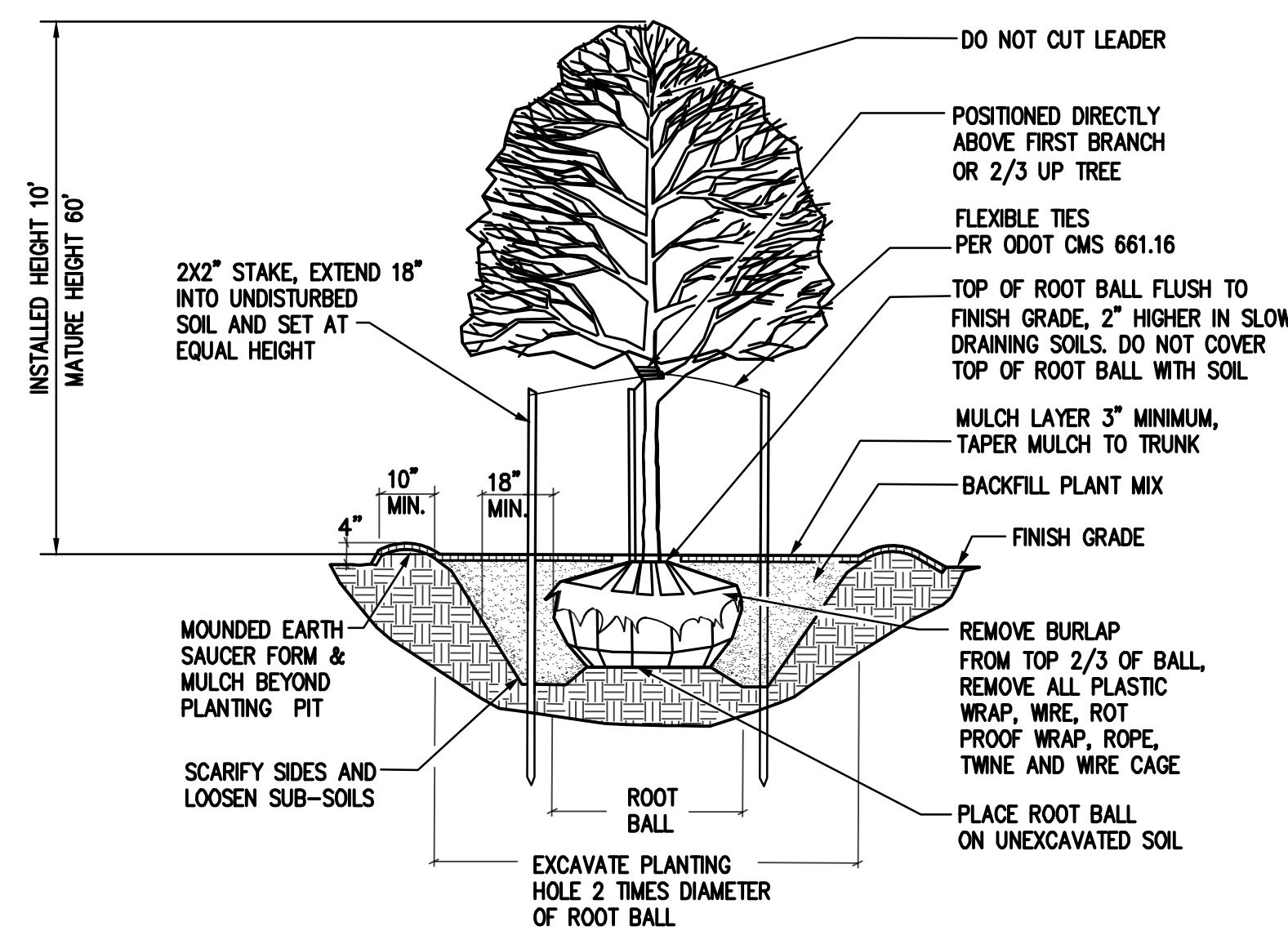


**TREE PROTECTION DETAIL**  
NOT TO SCALE

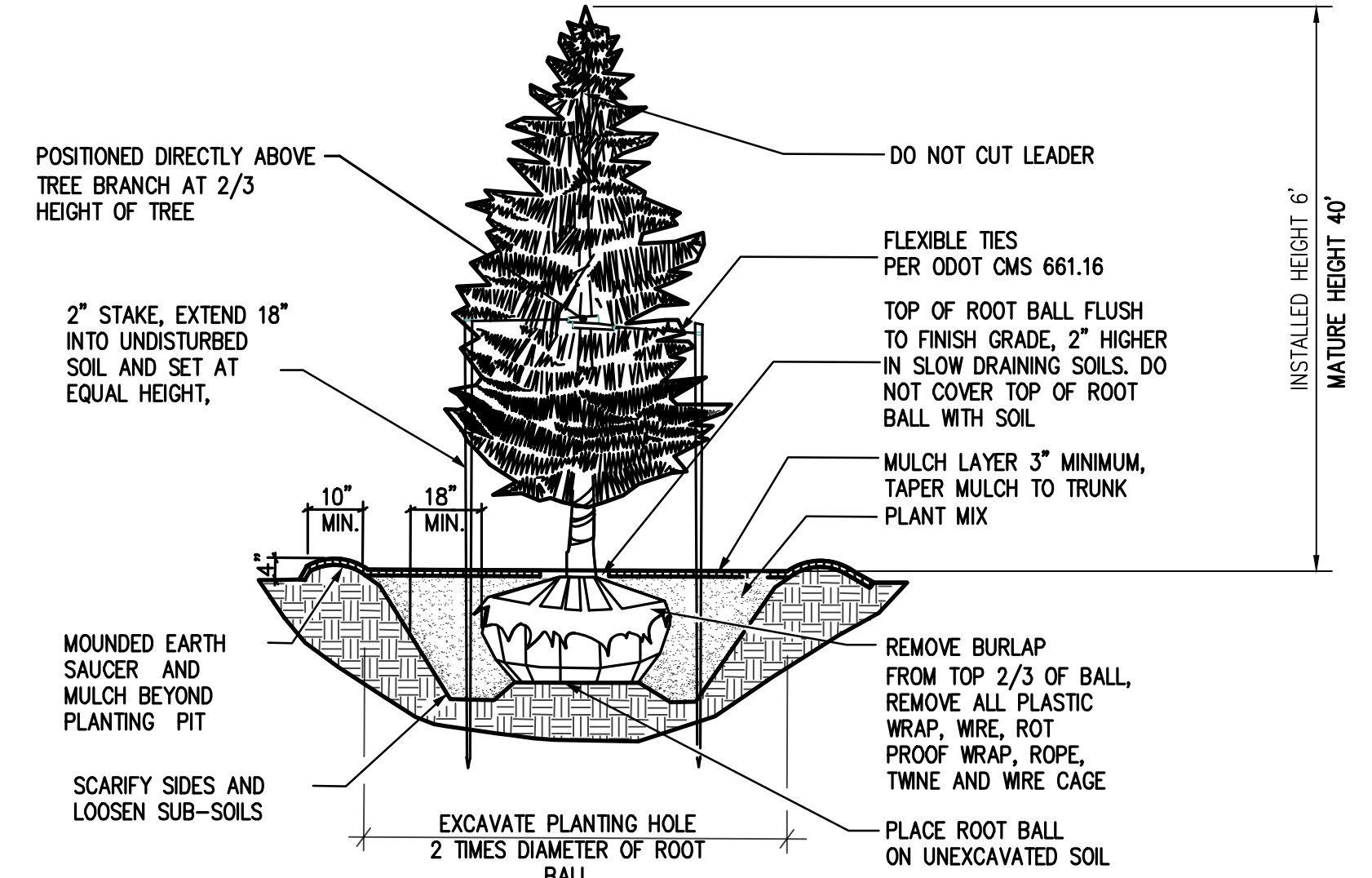
- TREE PROTECTION NOTES**
- TREE PROTECTION MEASURES SHALL BE INSTALLED PER THIS PLAN SHEET AT THE CRITICAL ROOT ZONE OF TREES TO BE PRESERVED PRIOR TO THE START OF ANY CLEARING, GRADING OR OTHER CONSTRUCTION ACTIVITY.
  - NO STORAGE OF ANY KIND IS PERMITTED WITHIN THE TREE PROTECTION ZONE. ANY ROOTS EXPOSED BY CONSTRUCTION ACTIVITY SHALL BE PRUNED FLUSH WITH THE SOIL AND BACKFILLED WITH TOPSOIL WITHIN THE SAME DAY.
  - ALL VEGETATION THAT IS NOT DESIGNATED ON THE PLANS TO BE REMOVED SHALL BE PROTECTED FROM DAMAGE. TREES THAT ARE DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.



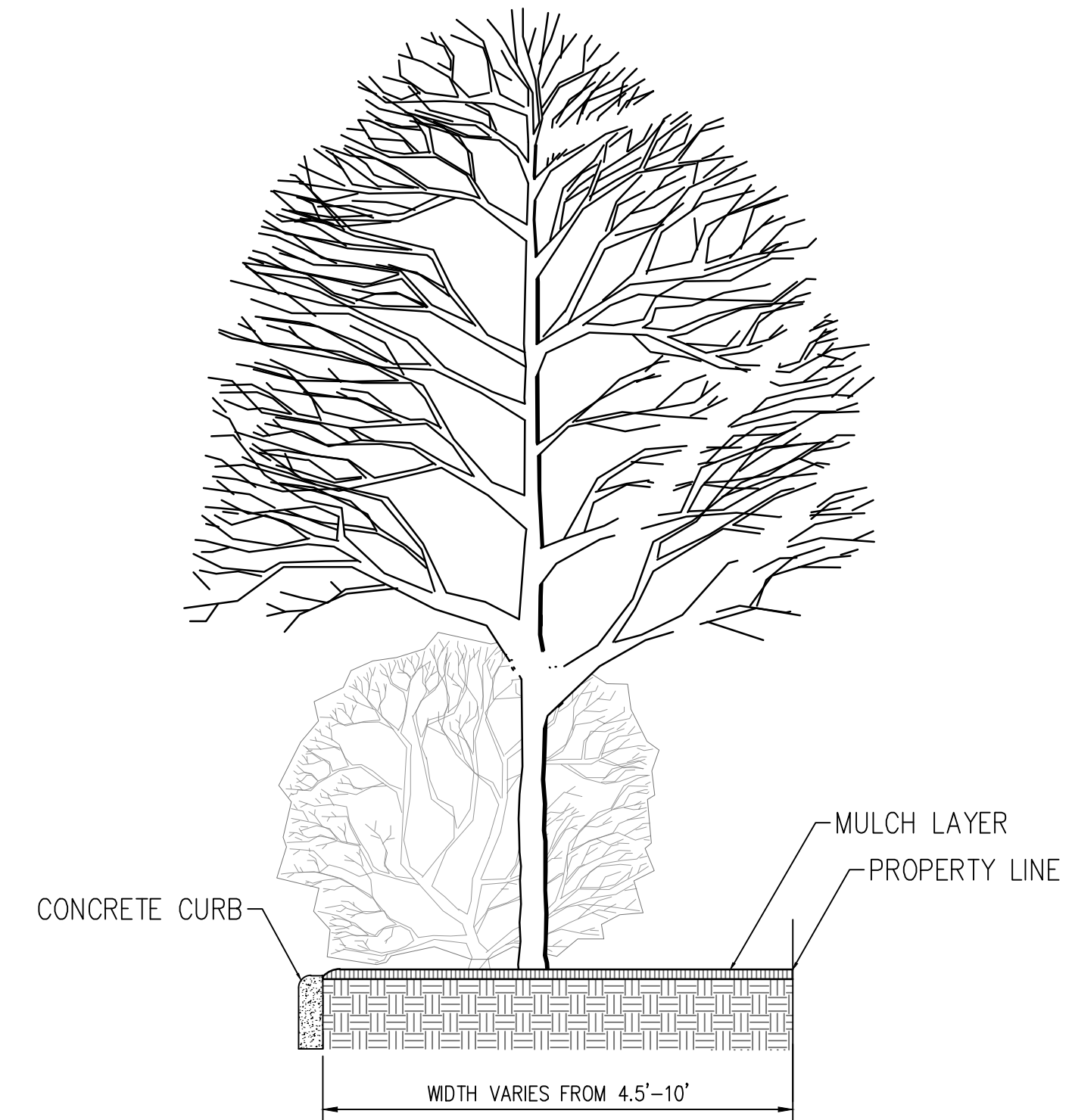
- NOTES:**
- ALL SHRUBS PLANTED IN ROWS OR MASSES SHALL BE MATCHED IN SIZE AND FORM.
  - SHRUBS SHALL BEAR SAME RELATION TO FINISH GRADE AS THEY BORE TO EXISTING GRADE IN THE PREVIOUSLY PLANTED CONDITION.
- MASS SHRUB PLANTING DETAIL [B] B OR CONTAINER**  
NO SCALE



**DECIDUOUS TREE PLANTING DETAIL**  
NO SCALE



**EVERGREEN TREE PLANTING DETAIL**  
NO SCALE



**BUFFER YARD SECTION**  
NO SCALE

NOTE: SEE ORIGINAL LANDSCAPE PLANS FOR PLANTING DETAILS.

LANDSCAPE PLAN CONSTRUCTION COST ESTIMATE				
NO.	DESCRIPTION	QUANTITY	UNIT COST	TOTAL
<b>LANDSCAPE</b>				
1	Deciduous Tree	11	\$500	\$5,500
2	Evergreen Tree	7	\$500	\$3,500
3	Ornamental Tree	8	\$300	\$2,400
4	Deciduous Shrub	34	\$150	\$5,100
5	Evergreen Shrub	97	\$250	\$24,250
6	Ornamental Grass	63	\$50	\$3,150
7	Flowering Perennial	36	\$50	\$1,800
8	Irrigation System	1	\$25,000	\$25,000
			<b>TOTAL:</b>	<b>\$70,700</b>

**NOT TO BE USED AS CONSTRUCTION DRAWINGS**

607 SHEET BY: DT  
DATE: 12/01/2022  
PROJECT NO: M390020  
DRAWN BY: ESP  
CHECKED BY: MM

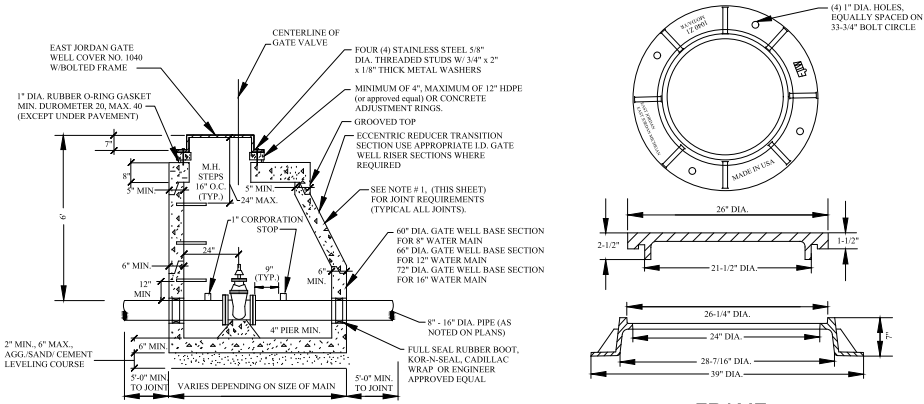
**Mannik Smith GROUP**  
www.MannikSmithGroup.com

**EXPRESS**  
13375 NATIONAL ROAD SW  
ETNA, OHIO 43068

**CLEAN EXPRESS CAR WASH**  
10 E AUBURN ROAD  
ROCHESTER HILLS, MI 48307

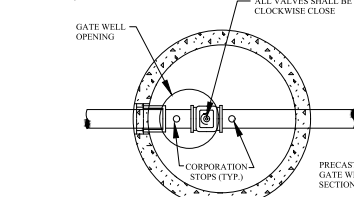
**LANDSCAPE NOTES AND DETAILS**

L101

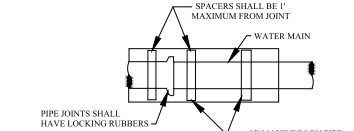


**ALL GATE WELLS**

MANHOLE STEPS TO BE PLASTIC COATED STEEL MEETING THE REQUIREMENTS IN ASTM D 2146, TYPE II, GRADE #108, MA. INDUSTRIES P.S.I. POLYPROPYLENE OR APPROVED EQUAL. STEPS TO BE INSTALLED DURING MANHOLE MANUFACTURE, PLACED AT 16\"/>



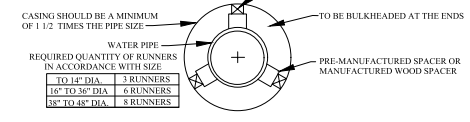
**GATE WELL (TYPICAL)**



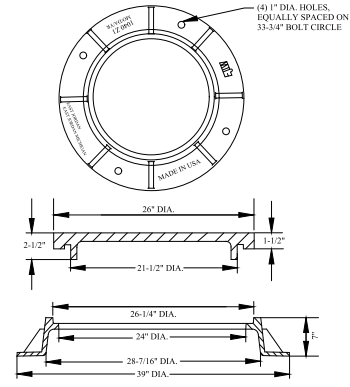
**WATER MAIN IN CASING SECTION**

UNLESS OTHERWISE SPECIFIED, MINIMUM CASING PIPE SHALL BE ASTM A-139 GRADE B, WALL THICKNESS AS FOLLOWS:

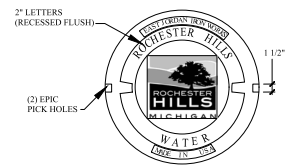
NOMINAL SIZE	MINIMUM WALL THICKNESS
8"-42"	0.375
48"-60"	0.500



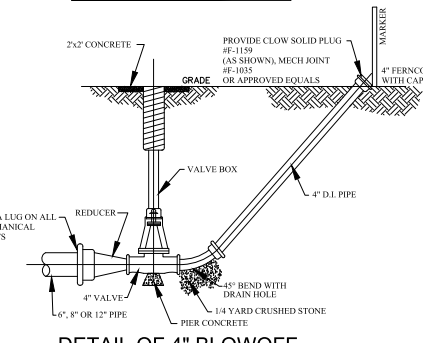
**SUPPORT FOR WATER MAIN CONSTRUCTED IN CASING PIPE**



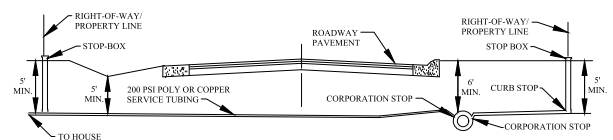
**FRAME**



**LETTERING LAYOUT FOR GATE WELL COVERS**

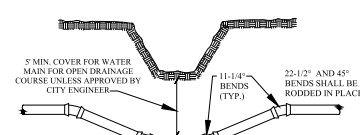


**DETAIL OF 4\"/>**

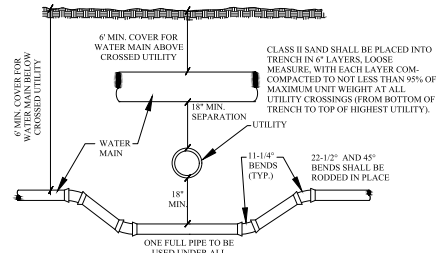


**TYPICAL PUBLIC ROAD WATER SERVICE CONNECTION**

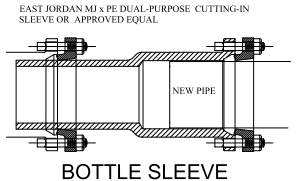
NOTES:  
 1. WATER SERVICE SHUT-OFF TO BE PLACED AT PROPERTY LINE.  
 2. LATERAL LOCATION SHALL BE AS REQUESTED BY THE ADJUTING PROPERTY OWNER.  
 3. ROCHESTER HILLS DPS PERFORMS SERVICE LEAD TAPS UP TO 2\"/>



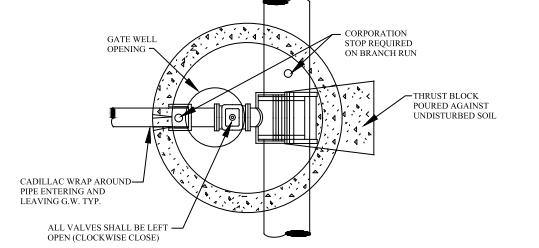
**DITCH CROSSING**



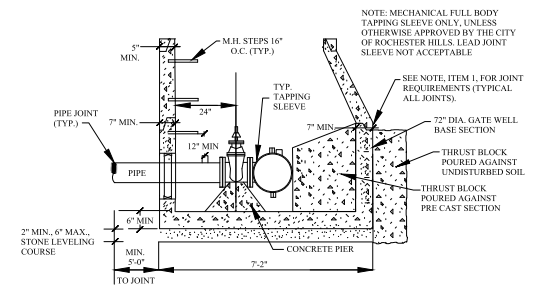
**UTILITY CROSSING**



**BOTTLE SLEEVE**

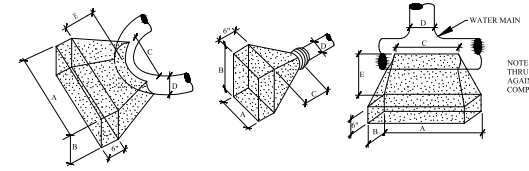


**PLAN TAPPING SLEEVE VALVE & WELL (TYPICAL)**



**TAPPING SLEEVE, VALVE AND WELL (TYPICAL)**

- NOTES:**
- ALL PRECAST CONCRETE GATE WELL SECTIONS SHALL BE MANUFACTURED TO CONFORM WITH A.S.T.M. C478, STANDARD SPECIFICATIONS FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS, EXCEPT WALL THICKNESS SHALL BE AS SHOWN ON THESE DETAILS. ALL JOINTS FOR PRECAST CONCRETE GATE WELL SECTIONS SHALL BE "MODIFIED GROOVE TONGUE" WITH GASKET MANUFACTURED TO CONFORM WITH A.S.T.M. C 443, STANDARD SPECIFICATION FOR JOINTS FOR CIRCULAR CONCRETE SEWER AND CULVERT PIPE USING RUBBER GASKETS.
  - CONTRACTOR SHALL INSTALL VALVES, TAPPING SLEEVES AND GATE WELL STRUCTURES IN STRICT COMPLIANCE WITH MEASUREMENTS PROVIDED ON SHEET 10.6. 2" BETWEEN GATE WELL WALL & CENTERLINE OF OPERATING NUT) TO ALLOW PROPER OPERATION OF VALVE THROUGH GATE WELL OPENING. FAILURE TO DO SO WILL REQUIRE CONTRACTOR TO CORRECT AT HIS EXPENSE.
  - TAPPING SLEEVES SHALL BE MANUFACTURED BY ROMAC INDUSTRIES, FULLER, EAST JORDAN, SMITH-BLAIR OR APPROVED EQUAL AND APPROVED BY THE CITY OF ROCHESTER HILLS. MULL BODY SLEEVES MUST BE USED EXCEPT FOR REINFORCED CONCRETE PRESSURE PIPE OR A.C. PIPE.
  - FOR ALL PIPE USE A 1" CORPORATION STOP. NO CORPS SHALL BE USED IN CONCRETE PRESSURE PIPE.
  - RUBBER O-RINGS SHALL NOT BE USED IN PAVEMENT.



FOR 90° BENDS OR SMALLER					FOR PLUGS			FOR TEES					
D	A	B	C	E MIN.	D	A	B	C	D	A	B	C	E MIN.
20"	8"	6.5"	3.5"	2.5"	20"	7"	5"	2.5"	20"	6.5"	4.5"	3.5"	3"
16"	6"	4"	2.5"	2"	16"	4-10"	4-10"	2"	16"	4-8"	4-8"	2.5"	2.75"
12"	4"	3"	2"	1.75"	12"	4-4"	3"	1-9"	12"	4"	3"	2.5"	2.5"
10"	3"	3"	2"	1.75"	10"	3"	2"	1-6"	10"	3"	2"	2"	2.25"
8"	3"	2"	1.5"	1.5"	8"	2-10"	2-6"	1-6"	8"	2-6"	2"	2"	2.25"
6"	2"	1.5"	2"	1.25"	6"	1-6"	1-6"	3"	6"	2"	2"	2"	2.25"

**THRUST BLOCK DETAILS**



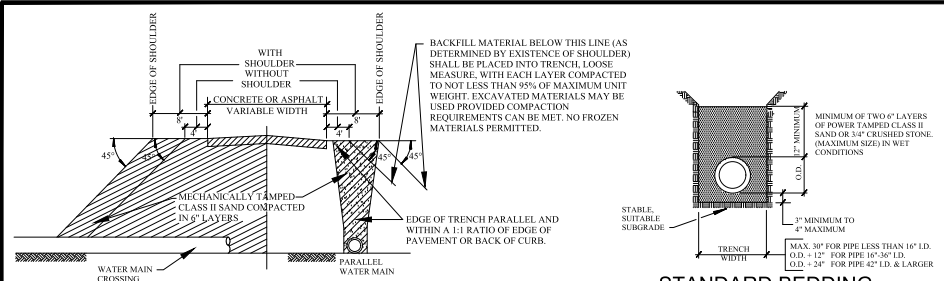
REVISIONS	DATE	APPROVED BY
		CITY COUNCIL, DATE: SEPTEMBER 23, 2019

NOTIFY ROCHESTER HILLS ENGINEERING DIVISION @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION.

**City of Rochester Hills**  
 1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

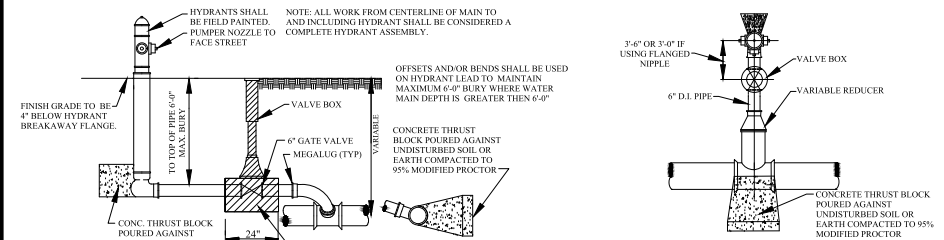
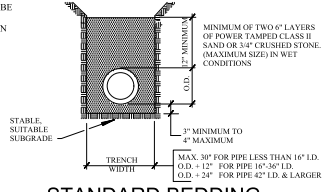
**WATER MAIN STANDARD DETAILS**

NOT TO SCALE	DATE: 1/10/2018
SHEET 1 OF 2	REV 04/22/2022



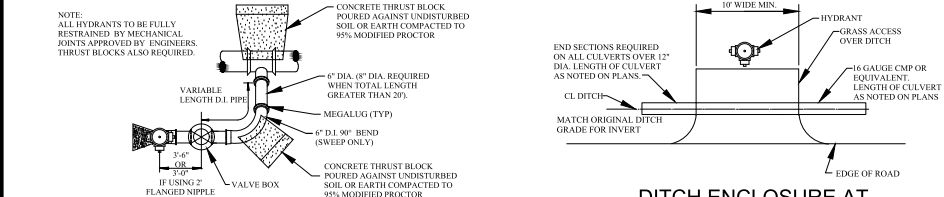
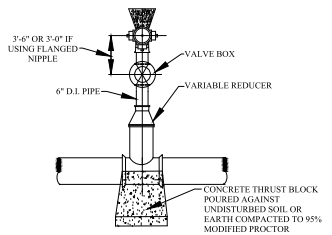
**MINIMUM BACKFILL UNDER OR WITHIN PAVEMENT INFLUENCE**

**STANDARD BEDDING FOR WATER MAIN**



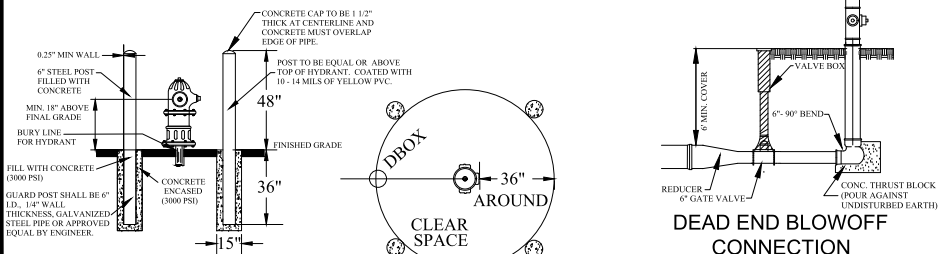
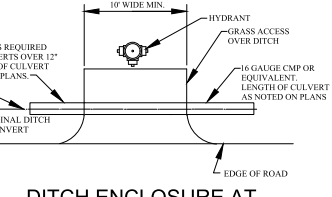
**HYDRANT SIDE OUTLET OPTION**

**HYDRANT CONNECTION (TYPICAL)**



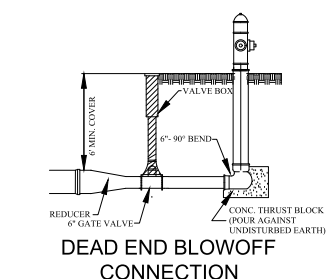
**HYDRANT SIDE OUTLET OPTION**

**DITCH ENCLOSURE AT HYDRANT/ GATE WELL**



**GUARD POST**

**HYDRANT & BLOWOFF DETAILS**



**DEAD END BLOWOFF CONNECTION**

**GENERAL NOTES**

1. ALL CONSTRUCTION PROCEDURES AND MATERIALS SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF ROCHESTER HILLS.
2. A PRE-CONSTRUCTION MEETING SHALL BE SCHEDULED BY THE CITY OF ROCHESTER HILLS AND HELD PRIOR TO THE START OF CONSTRUCTION.
3. CONTRACTOR MUST CONTACT MISS DIG (811) AT LEAST THREE WORKING DAYS PRIOR TO THE START OF CONSTRUCTION FOR UNDERGROUND UTILITY LOCATIONS. ALL UTILITIES SHALL BE STAKED BEFORE CONSTRUCTION BEGINS.
4. ALL WATER MAIN EASEMENTS SHALL BE PROVIDED PRIOR TO CONSTRUCTION AND ACCEPTANCE OF THE WATER DISTRIBUTION SYSTEM.
5. WATER MAINS SHALL BE CONSTRUCTED WITH A MINIMUM COVER OF 6 FEET BELOW FINISHED GRADES, INCLUDING OPEN DRAINAGE GRADES.
6. ALL TRENCHES UNDER OR WITHIN A 1:1 RATIO OF EXISTING OR PROPOSED PAVEMENT OR DRIVEWAYS, SHALL BE BACKFILLED WITH COMPACTED CLASS II SAND TO GRADE (95% MAXIMUM UNIT DENSITY).
7. WHERE TWO UTILITIES CROSS, PROVIDE CLASS II BACKFILL MATERIAL IN SIX (6) INCH COMPACTED LAYERS TO TOP OF HIGHEST UTILITY.
8. WHERE WATER MAINS DPO UNDER OTHER UTILITIES, THE SECTIONS WHICH ARE DEEPER THAN NORMAL SHALL BE CONSTRUCTED WITH 11-1/4" VERTICAL BENDS, 23 1/2" OR 45" BENDS MUST BE RODDED AND PROPERLY ANCHORED.
9. ALL PRECAST CONCRETE GATE WELL SECTIONS SHALL BE IN ACCORDANCE WITH A.S.T.M. C78, STANDARD SPECIFICATIONS FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS. WALL THICKNESS SHALL BE AS SHOWN ON THESE DETAILS. ALL JOINTS FOR PRECAST CONCRETE GATE WELL SECTIONS SHALL BE "MODIFIED GROOVE TORQUE" WITH GASKET MANUFACTURED TO CONFORM WITH A.S.T.M. E 443, STANDARD SPECIFICATION FOR JOINTS FOR CIRCULAR CONCRETE SEWER AND CULVERT PIPE USING RUBBER GASKETS.
10. CONTRACTOR SHALL INSTALL VALVES, TAPPING SLEEVES AND GATE WELL STRUCTURES IN STRICT COMPLIANCE WITH MEASUREMENTS PROVIDED ON SHEET 1 (2-0" BETWEEN GATE WELL WALL & CENTERLINE OF OPERATING NET) TO ALLOW PROPER OPERATION OF VALVE THROUGH GATE WELL OPENING.
11. ALL CROSS-CONNECTION CONTROL DEVICES SHALL BE INSTALLED AS REQUIRED BY THE ROCHESTER HILLS PLUMBING INSPECTOR AND IN ACCORDANCE WITH THE STANDARDS OF THE OAKLAND COUNTY WATER RESOURCE COMMISSIONER OPERATIONS AND MAINTENANCE DIVISION AND THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF DRINKING WATER AND RADIOLOGICAL PROTECTION.
12. ALL WATER SERVICE CONNECTIONS TWO (2) INCHES AND SMALLER SHALL BE MADE BY THE CITY OF ROCHESTER HILLS, DEPARTMENT OF PUBLIC SERVICES AFTER WATER MAIN ACCEPTANCE AND APPLICABLE PERMITS ARE OBTAINED.
13. ALL FITTINGS AND BENDS SHOULD BE BLOCKED IN ACCORDANCE WITH THRUST BLOCK DETAILS, UNLESS ALTERNATE THRUST AS INDICATED IN THESE PLANS AND SPECIFICATIONS, IS APPROVED BY THE CITY OF ROCHESTER HILLS DEPARTMENT OF PUBLIC SERVICE.

**WATER MAIN MATERIALS NOTES**

1. TEMPORARY CONNECTIONS, WHICH MAY BE MADE FOR CHLORINATING AND FLUSHING PURPOSES, SHALL INCLUDE A TESTABLE DOUBLE CHECK VALVE AND FLOW PREVENTER WITH CURRENT CERTIFICATION.
2. CORROSION STOPS USED FOR INSERTION INTO MAINS SHALL BE FIBRE TYPE P-44. ALL STOPS SHALL HAVE BRONZE CAST BODIES, KEYS, STEM WASHERS AND NUTS. INLET THREADS SHALL CONFORM TO THE LATEST EDITION OF AWWA C900.
3. ALL DUCTILE IRON PIPE (D.I.P.) WATER MAIN SHALL BE DESIGNED FOR 150 PSI MINIMUM WORKING PRESSURE. A ZINC COATING WITH CLASS 52 MAY BE PROPOSED AND IS SUBJECT TO FINAL SPECIFICATION FOR APPROVAL BY THE CITY ENGINEER.
4. THE DUCTILE IRON PIPE TO BE FURNISHED AND DELIVERED UNDER THIS SPECIFICATION SHALL MEET ALL THE REQUIREMENTS OF THE CURRENT AWWA C111 (ANSI A21.5), EXCEPT AS OTHERWISE SPECIFIED HEREIN. PIPE SHALL BE DOUBLE CEMENT-LINED AND SEAL COATED WITH AN APPROVED BITUMENOUS SEAL COAT IN ACCORDANCE WITH AWWA C111 (ANSI A21.5).
5. DUCTILE IRON PIPE SHALL BE CLASS 54 FOR SIZES THREE (3) INCH THROUGH TWENTY (20) INCHES SIZE, TWENTY-FOUR (24) INCH AND LARGER SHALL BE CLASS 55 DUCTILE IRON PIPE.
6. PIPES TWENTY-FOUR (24) INCHES AND LARGER IN NOMINAL DIAMETER SHALL MEET ALL THE REQUIREMENTS OF THE CURRENT AWWA C100 FOR DUCTILE IRON WATER PIPE.
7. MECHANICAL JOINTS FOR DUCTILE IRON WATER MAIN SHALL BE IN ACCORDANCE WITH AWWA C111 (ANSI A21.11).
8. FLANGE JOINTS FOR DUCTILE IRON WATER MAIN SHALL BE IN ACCORDANCE WITH AWWA C110 (ANSI A21.10).
9. FITTINGS FOR DUCTILE IRON PIPE SHALL BE DUCTILE IRON AND SHALL MEET REQUIREMENTS OF AWWA C110 (ANSI A21.10) OR AWWA C151 (ANSI A21.5). DUCTILE IRON FITTINGS SHALL BE RATED FOR 150 PSI PIPE SIZES TWENTY-FOUR (24) INCH DIAMETER AND LESS, AND 250 PSI FOR PIPE SIZES OVER TWENTY-FOUR (24) INCH DIAMETER. DUCTILE IRON FLANGE FITTINGS SHALL BE RATED FOR 250 PSI FOR ALL PIPE DIAMETERS.
10. ALL DUCTILE IRON PIPE FITTINGS AND HYDRANTS SHALL BE ENCASED WITH POLYETHYLENE ENCASEMENT IN ACCORDANCE WITH THE REQUIREMENTS OF A.S.A. A.W.W.A. STANDARD SPECIFICATION D248 AND AWWA C105. POLYETHYLENE TUBE MATERIAL SHALL HAVE A THICKNESS OF .008" (8-MILS). ADHESIVE TAPE SHALL BE A GENERAL PURPOSE ADHESIVE TAPE 2" WIDE AND APPROXIMATELY 16-MILS THICK, SUCH AS SCOTCHTAPE, NO.30, POLYKEN NO.90, OR TAPECOAT.

**VALVE AND SLEEVE NOTES**

1. GATE VALVES, SIZES THREE (3) INCH THROUGH SIXTEEN (16) INCH AND TAPPING VALVES SHALL MEET THE CITY OF ROCHESTER HILLS STANDARD AS DETAILED WITH NON-RISING STEM, (EAST JORDAN, AMERICAN FLOW CONTROL, MUELLER)
2. ALL 16 INCH GATE VALVES EIGHT (8) INCH AND LARGER SHALL BE IN WELLS. SPECIFICATIONS SHALL INCLUDE THE DIRECTION OF OPERATION OF ALL VALVES (CLOCKWISE CLOSED). VALVE BOX USE TO BE APPROVED BY ENGINEERING DIVISION.
3. ALL GATE WELL COVERS SHALL BE THE CITY OF ROCHESTER HILLS STANDARD AS DETAILED.
4. ALL GATE VALVES WITH OPERATING NUTS AT A DISTANCE GREATER THAN FIVE (5) FEET BELOW GROUND SURFACE SHALL BE PROVIDED WITH AN EXTENSION STEM. THE LENGTH OF THE EXTENSION STEM SHALL REACH WITHIN FIVE (5) FEET FROM THE GROUND SURFACE. WHEN AN EXTENSION STEM IS USED, IT SHALL BE HELD IN PLACE BY AN EXTENSION STEM GUIDE SUITABLY FASTENED TO THE WALL OF THE GATE WELL. THE EXTENSION STEM SHALL BE MECHANICALLY ATTACHED TO THE OPERATING NUT. DETAILS OF THE EXTENSION SYSTEM AND THE METHOD OF INSTALLATION SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
5. BUTTERFLY VALVES SHALL BE USED FOR VALVES GREATER THAN 16-INCH DIAMETER AND SHALL BE MODEL 2F11 AS MANUFACTURED BY HENRY PRATT COMPANY OR APPROVED EQUAL.
6. TAPPING VALVES SHALL BE SERIES "A" AS MANUFACTURED BY EAST JORDAN OR RESILIENT SEATED GATE VALVES AS APPROVED BY THE CITY OF ROCHESTER HILLS ENGINEERING SERVICES.
7. TAPPING SLEEVES SHALL BE MANUFACTURED BY ROMAC INDUSTRIES, MUELLER, EAST JORDAN, SMITH-BLAIR OR APPROVED EQUAL, AND APPROVED BY THE CITY OF ROCHESTER HILLS. FULL BODY SLEEVES MUST BE USED EXCEPT FOR REINFORCED CONCRETE PRESSURE PIPE OR A.C. PIPE.

**HYDRANT REQUIREMENTS**

1. ALL HYDRANTS SHALL BE CONSTRUCTED WITH A SIX (6) INCH COMPANION GATE VALVE IN A THREE (3) PIECE, ADJUSTABLE DUCTILE IRON VALVE BOX, WHICH SHALL INCLUDE A FIVE AND ONE-QUARTER (5-1/4) INCH SCREW SHAFT. VALVE BOXES SHALL BE SERIES 6860 AS MANUFACTURED BY TYLER PIPE OR APPROVED EQUAL.
2. ALL HYDRANTS SHALL BE EAST JORDAN NO. 48R-250 TRAFFIC MODEL, OR CITY APPROVED EQUAL. SELF-DRAINING HYDRANTS SHALL NOT BE USED. HYDRANTS SHALL HAVE BREAKAWAY FLANGE.
3. ALL HYDRANTS SHALL BE PAINTED RED ABOVE GROUND WITH A FINISH COAT OF RUST-OLEUM SAFETY RED OR APPROVED EQUAL. HYDRANT CAPS SHALL BE PAINTED SAME COLOR AS THE HYDRANT.
4. ALL FIRE HYDRANT JOINTS SHALL BE TOTALLY RESTRAINED BY THE USE OF RESTRAINED JOINT, THRUST BLOCKS ARE ALSO REQUIRED.

**ACCEPTANCE OF NEW WATER MAINS**

1. PRIOR TO WATER MAIN ACCEPTANCE THE FOLLOWING CONDITIONS MUST BE MET: 1) PRESSURE TESTING AND BACTERIA TESTING MUST BE COMPLETED IN ACCORDANCE WITH THE CITY OF ROCHESTER HILLS 2) ALL EASEMENT AND RIGHT-OF-WAY ACQUISITION MUST BE ACCEPTED BY THE CITY OF ROCHESTER HILLS ENGINEERING SERVICES 3) THE CITY OF ROCHESTER HILLS MUST BE PROVIDED WITH THE BILL OF SALE AND 4) ALL MYLAR "AS-BUILT DRAWINGS" MUST BE ACCEPTED AND APPROVED BY THE CITY OF ROCHESTER HILLS ENGINEERING SERVICES. THE CITY OF ROCHESTER HILLS INSPECTION DIVISION MUST WITNESS THE CONNECTION OF THE WATER MAIN TO THE EXISTING WATER MAIN, AFTER WHICH RESIDENTIAL AND COMMERCIAL TAPS WILL BE ALLOWED.
2. THE CONTRACTOR SHALL NOTIFY THE CITY OF ROCHESTER HILLS, INSPECTION DEPARTMENT (248.841.2510) FOR PRESSURE TESTING, BACTERIOLOGICAL SAMPLING, CONNECTIONS TO EXISTING WATER MAINS AND FINAL FIELD REVIEW. A FORTY-EIGHT (48) HOUR ADVANCE NOTICE IS REQUIRED.
3. THE CONTRACTOR SHALL DISINFECT AND PRESSURE TEST ALL NEW WATER MAIN IN ACCORDANCE WITH ROCHESTER HILLS STANDARDS. THE WATER MAIN SHALL PASS A 150 PSI PRESSURE TEST 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.
4. WHERE CONTRACTOR SUPPLIED GAUGES ARE REQUIRED, MINIMUM SIZE SHALL BE 1/2" DIAMETER OR LARGER GRADUATED IN ONE (1) OR TWO (2) POUND INCREMENTS FROM 1 TO 160 P.S.I. OR HIGHER AND HAVE CURRENT CERTIFICATION.
5. PRESSURE TESTING AND BACTERIA TESTING MUST BE COMPLETED AND APPROVED PRIOR TO CONNECTING TO THE EXISTING WATER MAIN.

**CITY OF ROCHESTER HILLS WATER SYSTEMS AS-BUILT DRAWING SPECIFICATIONS**

IN AREAS WHERE WATER SYSTEMS ARE OPERATED AND MAINTAINED BY THE CITY OF ROCHESTER HILLS DEPARTMENT OF PUBLIC SERVICES, FINAL ACCEPTANCE OF THE WATER SYSTEM MUST BE RENDERED BY THE DEPARTMENT OF PUBLIC SERVICES, BEFORE THE SYSTEM CAN BE USED FOR THE SERVICE INTENDED.

ONE ITEM REQUIRED FOR FINAL ACCEPTANCE SHALL BE THE SUBMISSION OF AS-BUILT DRAWINGS TO THE CITY OF ROCHESTER HILLS, DPS, BY THE DESIGN ENGINEER. AS-BUILT DRAWINGS SHALL BE DEFINED AS AND CONTAIN THE FOLLOWING INFORMATION:

1. FINAL AS-BUILT DRAWINGS SHALL BE PROVIDED IN REPRODUCIBLE PDF FORMAT VIA DIGITAL STORAGE MEDIA, XEROX OR ANY HEAT PROCESS REPRODUCTION WHICH WILL NOT BE ACCEPTED.
2. ALONG WITH THE PDF PLAN SET PROVIDE TWO (2) SETS OF BLACK-LINED DRAWINGS AND THE PLANS ON ELECTRONIC MEDIA IN AUTOCAD FORMAT (LATEST VERSION).
3. EACH AND EVERY SHEET SHALL BE SEALED BY THE DESIGN ENGINEER, ALONG WITH THE FOLLOWING CERTIFICATION STATEMENT ON THE COVER SHEET:

I HEREBY CERTIFY THAT OUR FIRM HAS PREPARED THESE AS-BUILT DRAWINGS OF THE IMPROVEMENTS AS CONSTRUCTED, AND THAT TO THE BEST OF MY KNOWLEDGE THOSE IMPROVEMENTS NOTED AS "AS-BUILT" WERE CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE APPROVED CONSTRUCTION PLANS, AND ALSO THAT THE WATER MAIN AND STRUCTURES, AS CONSTRUCTED, FIT WITHIN THE EASEMENT DESCRIPTIONS REQUIRED BY THE CITY OF ROCHESTER HILLS.

(COMPANY NAME)

(ENGINEER'S SIGNATURE)

PROFESSIONAL ENGINEER NO. \_\_\_\_\_

ENGINEER SEAL

4. THE MAXIMUM SCALE SHALL BE ONE (1) INCH EQUALS FIFTY (50) FEET.
5. THE SIZE, LENGTH, CLASS AND MANUFACTURER OF PIPE INSTALLED SHALL BE INDICATED.
6. THE SIZE, BRAND AND MODEL NUMBERS OF ALL VALVES AND HYDRANTS INSTALLED SHALL BE INDICATED.
7. A TOTAL AS-BUILT DRAWING QUANTITY LIST SHALL BE INCLUDED, AS WELL AS AN AS-BUILT DRAWING QUANTITY LIST ON EACH INDIVIDUAL SHEET.
8. THE LOCATIONS SHALL BE SHOWN ON THE PLANS WITH AN ACCURACY OF ONE (1) FOOT.
9. THE OFFSET OF THE WATER MAIN FROM PROPERTY LINES SHALL BE INDICATED.
10. ALL GATE VALVE WELLS, HYDRANTS AND ALL WATER SYSTEM APPURTENANCES SHALL BE LOCATED FROM TWO FIXED OBJECTS (MANHOLES, BUILDING CORNERS ETC).
11. ALL UNDERGROUND APPURTENANCES, SUCH AS GATE VALVE WELLS, METER PITS, PRESSURE REDUCING VALVE PITS, ETC. SHALL BE LOCATED FROM THE NEAREST HYDRANT THAT IS CONNECTED TO THE SAME WATER MAIN AS THE APPURTENANCE.
12. THE LOCATION AND SIZE OF EVERY RESTRAINED JOINT SHALL BE NOTED.
13. THE ACCURATE LOCATION OF ALL UTILITY CROSSINGS WHERE THE VERTICAL SEPARATION, IS LESS THAN 18" SHALL BE NOTED.
14. AS-BUILT SHALL BE PREPARED IN ACCORDANCE WITH THE CITY OF ROCHESTER HILLS AS-BUILT GUIDELINES AS PROVIDED AT THE PRE-CONSTRUCTION MEETING.

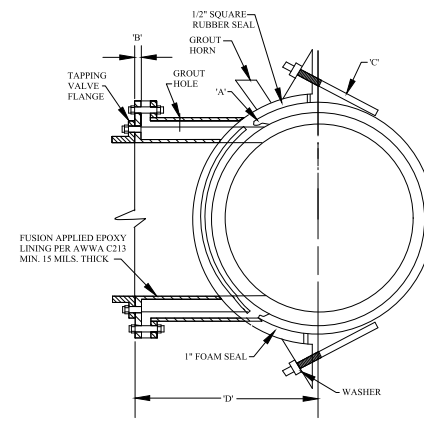
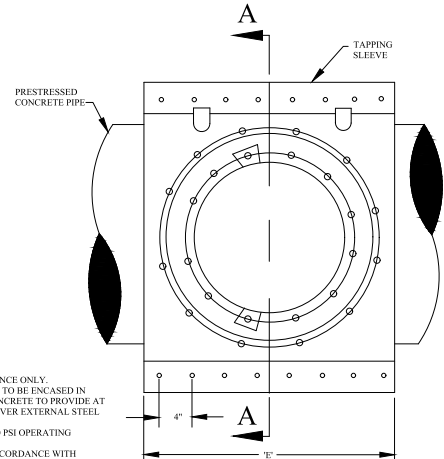
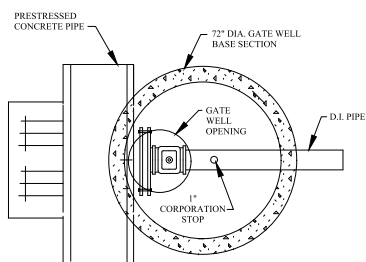
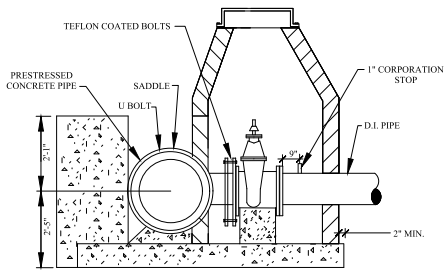


REVISIONS	DATE	APPROVED BY
		CITY COUNCIL, DATE: SEPTEMBER 23, 2019

NOTIFY ROCHESTER HILLS ENGINEERING DIVISION @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION

**City of Rochester Hills**  
1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

**WATER MAIN STANDARD DETAILS**  
NOT TO SCALE DATE: 1/10/2019  
SHEET 2 OF 2

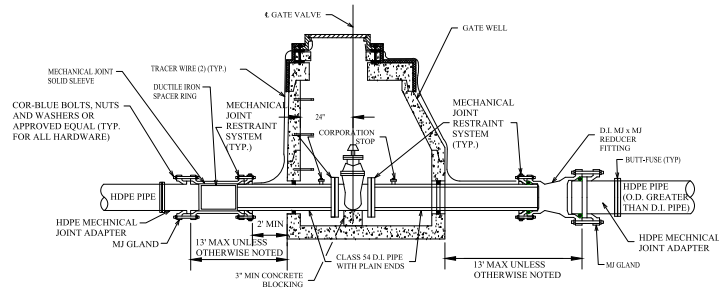


PIPE SIZE X TAP SIZE	A	B	C	D	E
16" X 4"	1/4"	7/8"	6	14-1/16"	24"
16" X 6"	1/4"	1-3/8"	6	14-5/16"	24"
16" X 8"	1/4"	1-7/8"	6	14-5/16"	24"
16" X 10"	1/4"	1-3/8"	7	14-9/16"	28"
16" X 12"	1/4"	1-3/8"	8	14-9/16"	32"
20" X 4"	1/4"	7/8"	6	16-1/2"	24"
20" X 6"	1/4"	1-1/8"	6	16-1/2"	24"
20" X 8"	1/4"	1-1/8"	6	16-1/2"	24"
20" X 10"	1/4"	1-3/8"	7	17"	28"
20" X 12"	1/4"	1-3/8"	8	17"	32"
24" X 4"	1/4"	7/8"	6	18-3/4"	24"
24" X 6"	1/4"	1-1/8"	6	19"	24"
24" X 8"	1/4"	1-1/8"	6	19"	24"
24" X 10"	1/4"	1-3/8"	7	19-1/4"	28"
24" X 12"	1/4"	1-3/8"	8	19-1/4"	32"
30" X 4"	1/4"	7/8"	6	22-1/8"	24"
30" X 6"	1/4"	1-1/8"	6	22-3/8"	24"
30" X 8"	1/4"	1-1/8"	6	22-3/8"	24"
30" X 10"	1/4"	1-3/8"	7	22-5/8"	28"
30" X 12"	1/4"	1-3/8"	8	22-5/8"	32"
36" X 4"	1/4"	7/8"	6	25-1/2"	24"
36" X 6"	1/4"	1-1/8"	6	25-3/4"	24"
36" X 8"	1/4"	1-1/8"	7	25-3/4"	28"
36" X 10"	1/4"	1-3/8"	8	26"	32"
36" X 12"	1/4"	1-3/8"	9	26"	36"
42" X 4"	1/4"	7/8"	6	28-7/8"	24"
42" X 6"	1/4"	1-1/8"	7	29-1/8"	28"
42" X 8"	1/4"	1-1/8"	8	29-1/8"	32"
42" X 10"	3/8"	1-3/8"	9	29-3/8"	36"
42" X 12"	3/8"	1-3/8"	10	29-3/8"	40"
48" X 4"	3/8"	7/8"	7	32-1/4"	28"
48" X 6"	3/8"	1-1/8"	7	32-1/2"	28"
48" X 8"	3/8"	1-1/8"	7	32-1/2"	28"
48" X 10"	3/8"	1-3/8"	7	32-3/4"	28"
48" X 12"	3/8"	1-3/8"	9	32-3/4"	36"

- NOTES:
- 1) THESE DIMENSIONS ARE FOR REFERENCE ONLY.
  - 2) ENTIRE SADDLE, INCLUDING STRAPS, TO BE ENCASED IN PORTLAND CEMENT MORTAR OR CONCRETE TO PROVIDE AT LEAST ONE (1) INCH OF THICKNESS OVER EXTERNAL STEEL SURFACES PRIOR TO BACKFILLING.
  - 3) TAP SADDLES ARE DESIGNED FOR 150 PSI OPERATING PRESSURE.
  - 4) FLANGE DRILLED AND TAPPED IN ACCORDANCE WITH AWWA C207 CLASS D, CENTERING RING CONFORMS TO MSS- SP 60.
  - 5) GROUT SHALL SET A MINIMUM OF TWENTY-FOUR (24) HOURS PRIOR TO PRESSURE TESTING.

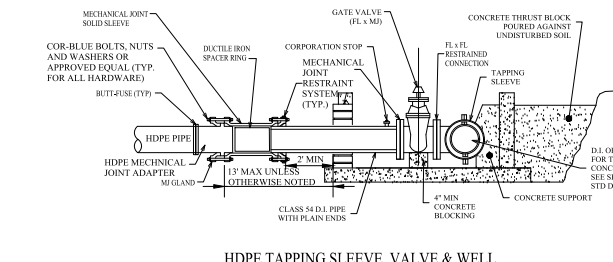
**CONCRETE PRESSURE TAP VALVE & WELL ASSEMBLY W/ CONCRETE ENCASEMENT**

**CONCRETE TAPPING SLEEVE DETAILS**



**TYPICAL HDPE CONNECTION TO GATE VALVE**

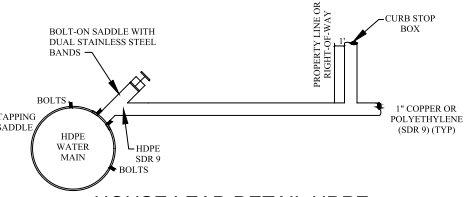
- NOTES:
1. WHERE GATE VALVE IS IN LINE WITH THE HDPE WATER MAIN, INSTALL D.I. PIPE THROUGH GATE WELL MAKING CONNECTION TO HDPE PIPE OUTSIDE OF GATE WELL AS SHOWN.
  2. TRACER WIRES SHALL BE INSTALLED ALONG THE OUTSIDE OF THE GATE WELL AND BENEATH THE FRAME AND COVER.



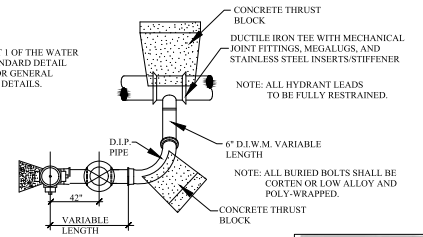
**HDPE TAPPING SLEEVE, VALVE & WELL**

- NOTES:
1. SEE SHEET 1 OF THE WATER MAIN STANDARD DETAIL SHEETS FOR GENERAL TAPPING SLEEVE VALVE AND WELL DETAILS.
  2. TAPPING SLEEVES FOR HDPE PIPE REQUIRE AN OUTLET SEAL GASKET AND SPRING WASHERS IN ADDITION TO THE REQUIREMENTS DETAILED IN SHEET 2, CCM 42, ROMAC S3TH OR APPROVE EQUAL.

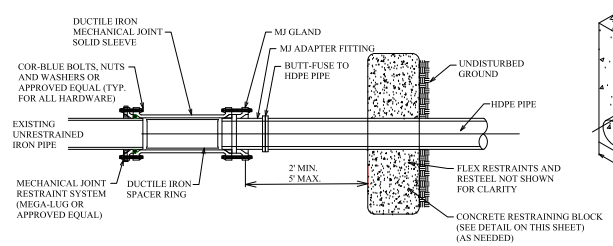
**HOUSE LEAD DETAIL HDPE TO COPPER OR POLYETHYLENE (SDR 9)**



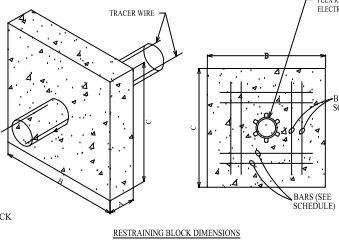
- NOTE: SEE SHEET 1 OF THE WATER MAIN STANDARD DETAIL SHEETS FOR GENERAL HYDRANT DETAILS.



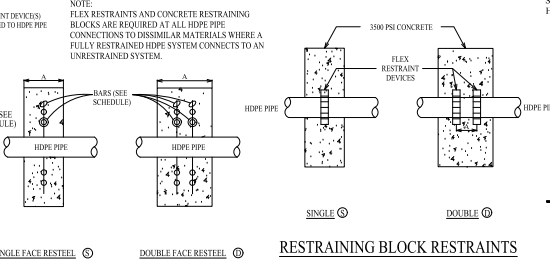
**PLAN HYDRANT SIDE OUTLET**



**HDPE TO DUCTILE IRON TRANSITION**



**RESTRAINING BLOCK RESTEEL**



**RESTRAINING BLOCK RESTRAINTS**

**DETAILS FOR HIGH DENSITY POLYETHYLENE PIPE (HDPE)**



REVISIONS	DATE	APPROVED BY
		CITY COUNCIL, DATE: SEPTEMBER 23, 2019
		PREPARED BY: ENGINEERING DIVISION, DEPARTMENT OF PUBLIC SERVICES

NOTIFY ROCHESTER HILLS ENGINEERING DIVISION @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION.

**City of Rochester Hills**  
1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

**WATER MAIN SPECIAL DETAILS**

NOT TO SCALE	DATE: 1/10/2019
SHEET 1 OF 1	REV 12/10/2021

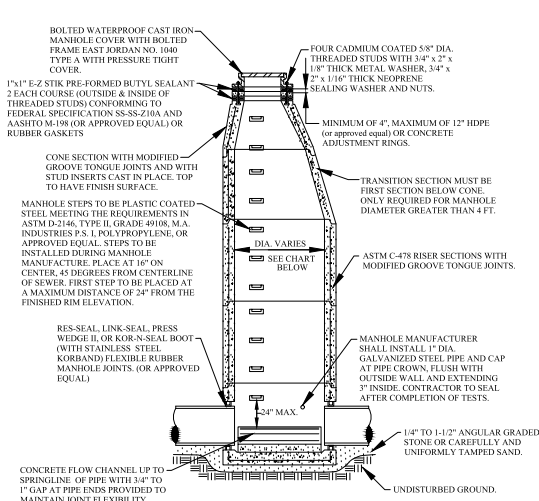


## SANITARY SEWER CONSTRUCTION NOTES

- ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF ROCHESTER HILLS AND THE OAKLAND COUNTY WATER RESOURCES COMMISSIONER (OCWRC). ALL SANITARY SEWER CONSTRUCTION SHALL HAVE FULL-TIME INSPECTION SUPERVISED BY THE CITY OF ROCHESTER HILLS INSPECTION SERVICES.
- NO SEWER INSTALLATION SHALL HAVE AN INFILTRATION EXCEEDING 100 GALLONS PER INCH DIAMETER PER MILE OF PIPE IN A 24 HOUR PERIOD, AND NO SINGLE RUN OF SEWER BETWEEN MANHOLES SHALL EXCEED 100 GALLONS PER INCH DIAMETER PER MILE. AIR TESTS IN LIEU OF INFILTRATION TESTS SHALL BE AS SPECIFIED IN THE OAKLAND COUNTY WATER RESOURCES COMMISSIONER STANDARDS. PRELIMINARY-AIR TESTS ARE WITNESSED BY THE CITY AND FINAL AIR TESTS ARE WITNESSED BY BOTH THE CITY AND THE OCWRC. ONLY PIPE AND PIPE JOINTS APPROVED BY THE CITY MAY BE USED FOR SANITARY SEWER CONSTRUCTION.
- LOCATED IN THE FIRST MANHOLE UPSTREAM FROM THE POINT OF ALL CONNECTIONS TO AN EXISTING SEWER OR EXTENSION, A TEMPORARY 12-INCH DEEP SUMP SHALL BE PROVIDED IN THE FIRST MANHOLE ABOVE THE CONNECTION WHICH WILL BE FILLED IN AFTER SUCCESSFUL COMPLETION OF ANY ACCEPTANCE TEST UP TO THE STANDARD FILLET PROVIDED FOR THE FLOW CHANNEL. A WATER TIGHT BULKHEAD SHALL BE PROVIDED ON THE DOWNSTREAM SIDE OF THE SUMP MANHOLE.
- AT ALL TIMES WHEN LAYING OF NEW PIPE IS NOT ACTUALLY IN PROGRESS, THE UPSTREAM OPEN END OF THE PIPE SHALL BE CLOSED BY TEMPORARY WATER TIGHT PLUGS OR BY OTHER APPROVED MEANS. IF WATER IS IN THE TRENCH WHEN WORK IS RESUMED, THE PLUG SHALL NOT BE REMOVED UNTIL THE DANGER OF WATER ENTERING THE PIPE HAS PASSED. ALL MAIN LINE PIPE SHALL BE LAID WITH A PIPE LASER BEAM FOR LINE AND GRADE. A TARGET MUST BE INSTALLED AT THE END OF THE PIPE BEING LAYED.
- SELF-LEVELING CONCRETE ASSEMBLY STRUCTURES SHALL BE USED FOR ADJUSTING STRUCTURES WITHIN ASPHALT AND CONCRETE PAVEMENT.
- ALL SEWER PIPE SHALL BE INSTALLED IN CLASS "B" BEDDING OR BETTER.
- ALL NEW MANHOLES SHALL HAVE CITY APPROVED FLEXIBLE, WATER TIGHT SEALS WHERE PIPES PASS THROUGH WALLS. MANHOLES SHALL BE OF PRE-CAST SECTIONS WITH MODIFIED GROOVE TONGUE AND BUTYL TYPE JOINTS. PRE-CAST MANHOLE CONE SECTIONS SHALL BE CITY APPROVED MODIFIED ECCENTRIC CONE TYPE. ALL MANHOLES SHALL BE PROVIDED WITH BOLTED, WATER TIGHT COVERS.
- AT ALL CONNECTIONS TO MANHOLES IN ALL SEWERS, OR EXTENSIONS, DROP CONNECTIONS WILL BE REQUIRED WHEN THE DIFFERENCE IN INVERT ELEVATIONS EXCEEDS 18 INCHES.
- GROUND WATER, STORM WATER, CONSTRUCTION WATER, DOWN SPOUT DRAINAGE OR WEEP TILE DRAINAGE SHALL NOT BE ALLOWED TO ENTER ANY SANITARY SEWER INSTALLATION.
- PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL CONTACT MISS DIG THREE (3) DAYS IN ADVANCE (811) FOR THE LOCATION OF UNDERGROUND PIPELINE AND CABLE FACILITIES AND SHALL ALSO NOTIFY REPRESENTATIVES OF OTHER UTILITIES LOCATED IN THE VICINITY OF THE WORK.
- AS IS INCH MINIMUM VERTICAL SEPARATION AND A 10 FOOT MINIMUM HORIZONTAL SEPARATION MUST BE MAINTAINED BETWEEN SANITARY SEWER AND ALL OTHER UTILITIES.
- AS A MEANS OF INSURING PROPER INSTALLATION OF THE SANITARY SEWER PIPE, THE CONTRACTOR SHALL VIDEO INSPECT, ACCORDING TO THE CITY OF ROCHESTER HILLS VIDEO INSPECTION STANDARDS, 100% OF THE SANITARY SEWER PIPE. THE CONTRACTOR SHALL PROVIDE 24 HOURS NOTICE TO THE CITY OF ROCHESTER HILLS PRIOR TO VIDEO INSPECTION, SO A REPRESENTATIVE MAY BE PRESENT. ROCHESTER HILLS WILL BE PROVIDED WITH A DIGITAL COPY OF THE VIDEO INSPECTION AND LOG IN ACCORDANCE WITH THE CITY OF ROCHESTER HILLS INSPECTION STANDARDS.

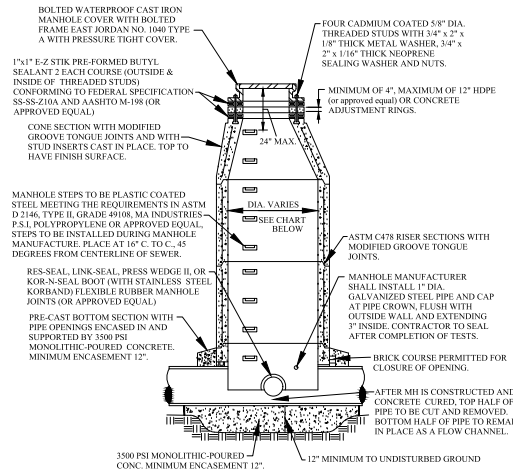
## SANITARY SEWER MATERIALS

- THE FOLLOWING MATERIALS MAY BE USED FOR PUBLIC SANITARY SEWER CONSTRUCTION, APPROVED PIPE MATERIALS MUST CONFORM TO STANDARDS ADOPTED BY THE OFFICE OF THE OAKLAND COUNTY WATER RESOURCES COMMISSIONER:
  - FOR SEWERS 8" TO 15" TO BE PVC TRUSS PIPE, ASTM D-2680, WITH GASKET JOINTS, OTHER TYPES OF PIPE AS APPROVED BY CITY ENGINEER.
  - FOR 6" SEWER LEADS SHALL BE SOLID WALLED PVC, SDR 23.5, ASTM D-3034 OR PVC SCHEDULE 40 SOLID WALLED, ASTM D-2665 PIPE SHALL HAVE A MINIMUM PIPE STIFFNESS OF 150 P.S.I., AND A MINIMUM DEFLECTION OF 1% AT FAILURE. THE SEWER LEAD MATERIAL SHALL BE COMPATIBLE WITH SEWER MAIN MATERIAL.
  - FOR SEWERS GREATER THAN 15" TO BE REINFORCED CONCRETE PIPE (RCP) SHALL CONFORM TO THE CURRENT ASTM D C76 WALL B JOINTS SHALL BE SYNTHETIC RUBBER AND MEET OR EXCEED THE REQUIREMENTS ESTABLISHED BY ASTM 361.



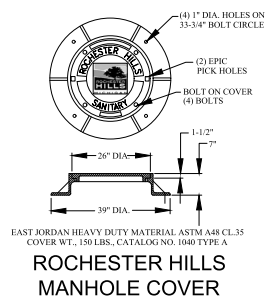
### STANDARD MANHOLE

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

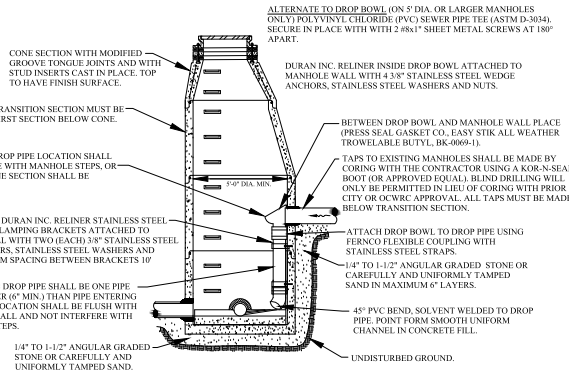


### MANHOLE CONSTRUCTED OVER EXISTING SEWER

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



### ROCHESTER HILLS MANHOLE COVER



### INTERIOR DROP CONNECTION

NOTE: INTERIOR DROP CONNECTION PERMITTED ONLY WHEN APPROVED BY CITY ENGINEER.

REVISIONS	DATE	APPROVED BY CITY COUNCIL, DATE:

PREPARED BY ENGINEERING DIVISION  
DEPARTMENT OF PUBLIC SERVICES

NOTIFY ROCHESTER HILLS  
ENGINEERING DIVISION @  
248-841-2510 48 HRS. PRIOR  
TO START OF  
CONSTRUCTION

**City of Rochester Hills**  
1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

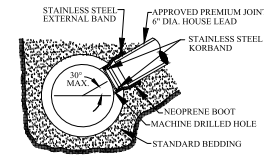
**SANITARY SEWER  
STANDARD DETAILS**

NOT TO SCALE	DATE: 1/10/2019
SHEET 1 OF 2	

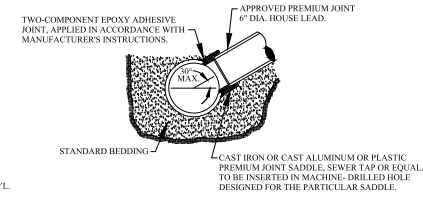


## CITY OF ROCHESTER HILLS GRAVITY BUILDING LEAD REQUIREMENTS AND DETAILS

1. ALL BUILDING LEAD WORK MUST BE PERFORMED UNDER THE CITY OF ROCHESTER HILLS INSPECTION. BE JOINED USING A CITY OF ROCHESTER HILLS APPROVED ADAPTER.
2. FOR ALL CITY OF ROCHESTER HILLS SYSTEMS CALL 248-841-2510 48-HOURS PRIOR TO SCHEDULING INSPECTION.
3. FOR ALL OCWC-OPERATED SYSTEMS, CALL 248-858-1110 48-HOURS IN ADVANCE PRIOR TO SCHEDULING INSPECTION.
4. SANITARY SEWER MAY NOT BE USED AS A DE-WATERING OUTLET.
5. WHERE AN EXISTING BUILDING LEAD IS BEING EXTENDED, DISSIMILAR TYPES AND SIZES OF PIPE SHALL BE JOINED USING A CITY OF ROCHESTER HILLS APPROVED ADAPTER.
6. APPROVED BUILDING LEAD PIPE FOR GRAVITY SEWER LEADS:
  - A. PVC PLASTIC, ASTM D3034, SDR 35.5
  - B. SOLID WALL PVC SCHEDULE 40, ASTM D-2665
  - C. ANY DEVIATIONS FROM ABOVE SPECIFICATIONS REQUIRES APPROVAL BY CITY ENGINEER.
7. ALLOWABLE TYPES OF SEWER PIPE ADAPTERS: FERRO-CEMENT STRONGBACK COUPLING OR APPROVED EQUAL.
8. FOR 6" LEADS A CLEANOUT MUST BE INSTALLED EVERY 100 FT. FOR 4" LEADS A CLEANOUT MUST BE INSTALLED EVERY 50 FT. 90° BENDS NOT ALLOWED EXCEPT FROM THE HORIZONTAL TO THE VERTICAL WITHIN 5 FEET OF THE BUILDING.



### KOR-N-TEE TAP FOR CONCRETE PIPE



## CITY OF ROCHESTER HILLS SANITARY SEWER SYSTEM AS-BUILT DRAWING SPECIFICATIONS

IN AREAS WHERE SANITARY SEWER SYSTEMS ARE OPERATED AND MAINTAINED BY THE CITY OF ROCHESTER HILLS DEPARTMENT OF PUBLIC SERVICES, PRELIMINARY ACCEPTANCE OF THE SANITARY SEWER SYSTEM MUST BE RENDERED BY THE DEPARTMENT OF PUBLIC SERVICES, BEFORE THE SYSTEM CAN BE USED FOR THE SERVICE INTENDED.

- ONE ITEM REQUIRED FOR PRELIMINARY ACCEPTANCE SHALL BE THE SUBMISSION OF AS-BUILT DRAWINGS TO THE CITY OF ROCHESTER HILLS ENGINEERING DIVISION, BY THE DESIGN ENGINEER. AS-BUILT DRAWINGS SHALL BE DEFINED AS AND CONTAIN THE FOLLOWING INFORMATION:
1. FINAL AS-BUILT DRAWINGS SHALL BE PROVIDED IN REPRODUCIBLE PDF FORMAT VIA DIGITAL STORAGE MEDIA. XEROX OR ANY HEAT PROCESS REPRODUCTIONS WILL NOT BE ACCEPTED.
  2. ALONG WITH THE PDF PLAN SET PROVIDE TWO (2) SETS OF BLACK-LINED DRAWINGS AND THE PLANS ON ELECTRONIC MEDIA IN AUTOCAD FORMAT (LATEST VERSION).
  3. THE COVER SHEET SHALL BE SEALED BY THE PROJECT DESIGN ENGINEER, ALONG WITH THE FOLLOWING CERTIFICATION STATEMENT:

I HEREBY CERTIFY THAT OUR FIRM HAS PREPARED THESE AS-BUILT DRAWINGS OF THE IMPROVEMENTS AS CONSTRUCTED, AND THAT TO THE BEST OF MY KNOWLEDGE THOSE IMPROVEMENTS NOTED AS "AS-BUILT" WERE CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE APPROVED CONSTRUCTION PLANS; AND ALSO THAT THE SANITARY SEWER AND STRUCTURES, AS CONSTRUCTED, LIE WITHIN THE EASEMENT DESCRIPTIONS REQUIRED BY THE CITY OF ROCHESTER HILLS.

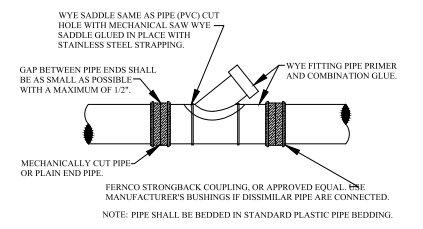
(COMPANY NAME) \_\_\_\_\_

(ENGINEER'S SIGNATURE) \_\_\_\_\_

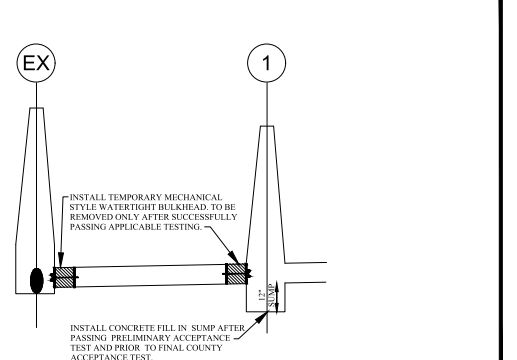
PROFESSIONAL ENGINEER NO. \_\_\_\_\_

ENGINEER SEAL

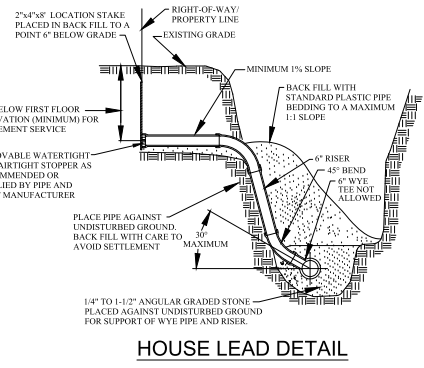
### SEWER TAP-OVER 12" MAIN SEWER PIPES VITRIFIED CLAY



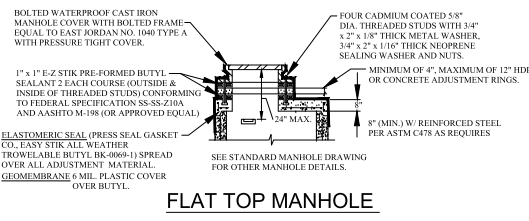
### WYE SADDLE OR WYE PIPE INSERTION WITH FLEXIBLE COUPLINGS (RIGID PIPE)



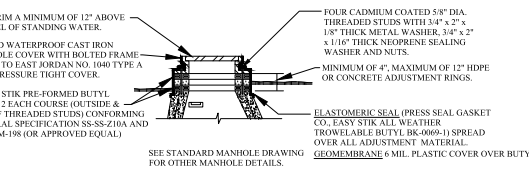
4. THE MAXIMUM SCALE SHALL BE ONE (1) INCH EQUALS FIFTY (50) FEET.
5. THE SIZE, LENGTH, CLASS AND MANUFACTURER OF PIPE INSTALLED SHALL BE INDICATED.
6. THE SIZE, MANUFACTURER AND MODEL NUMBERS OF ALL VALVES AND PUMPS INSTALLED SHALL BE INDICATED.
7. A TOTAL AS-BUILT DRAWING QUANTITY LIST SHALL BE INCLUDED.
8. THE LOCATIONS SHALL BE SHOWN ON THE PLANS WITH AN ACCURACY OF ONE (1) FOOT.
9. THE OFFSET OF THE SANITARY MAIN FROM PROPERTY LINES SHALL BE INDICATED.
10. ALL MANHOLES, VALVE WELLS, PUMPS AND ALL SANITARY SYSTEM APPURTENANCES SHALL BE LOCATED FROM TWO FIXED OBJECTS (MANHOLES, BUILDING CORNERS ETC.).
11. ALL UNDERGROUND APPURTENANCES, SUCH AS TYPICAL WELLS, METER PITS, GRINDER PUMPS AND PUMP STATION PITS, ETC. SHALL BE LOCATED FROM THE NEAREST MANHOLE THAT IS CONNECTED TO THE SAME SANITARY MAIN AS THE APPURTENANCE.
12. THE ACCURATE LOCATION OF ALL UTILITY CROSSINGS WHERE THE VERTICAL SEPARATION IS LESS THAN 18" SHALL BE NOTED.
13. AS-BUILTS SHALL BE PREPARED IN ACCORDANCE WITH CITY OF ROCHESTER HILLS AS-BUILT GUIDELINES AS PROVIDED AT THE PRE-CONSTRUCTION MEETING.



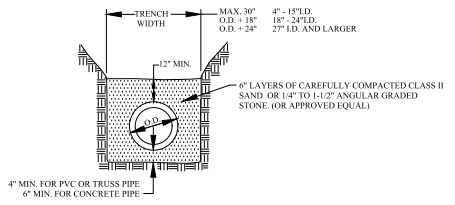
### HOUSE LEAD DETAIL



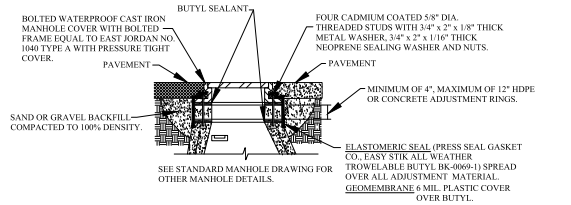
### FLAT TOP MANHOLE



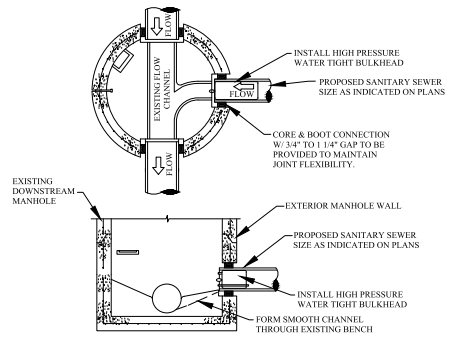
### ADJUSTMENT DETAIL FOR MANHOLE TOPS WITHIN FLOOD PRONE AREAS



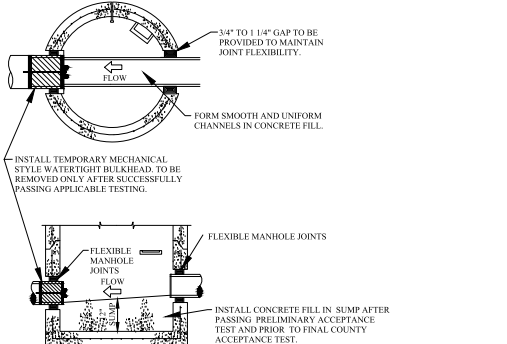
### STANDARD BEDDING (CLASS B)



### ADJUSTMENT DETAIL MANHOLE TOPS WITHIN PAVEMENT AREAS



### TESTING BULKHEAD IN EXISTING MANHOLE



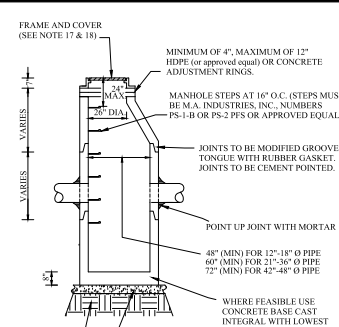
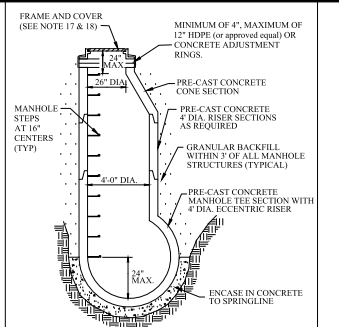
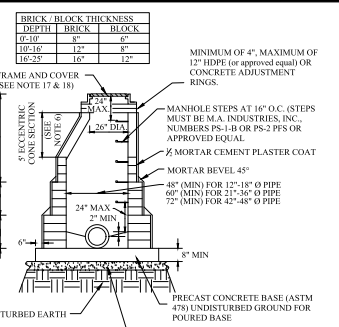
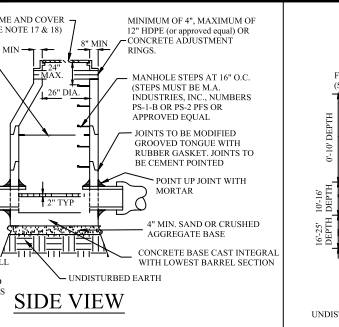
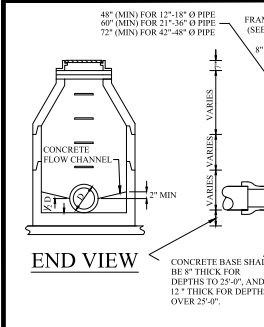
### FIRST MANHOLE UPSTREAM FROM SANITARY TAP

REVISIONS	DATE	APPROVED BY CITY COUNCIL, DATE:	NOTIFY ROCHESTER HILLS ENGINEERING DIVISION @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION

**City of Rochester Hills**  
1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

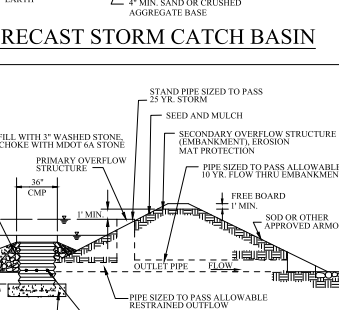
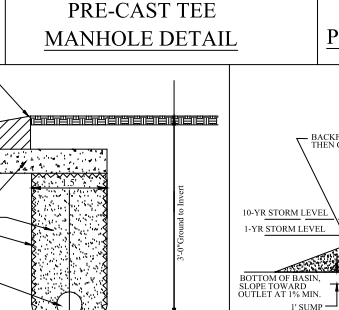
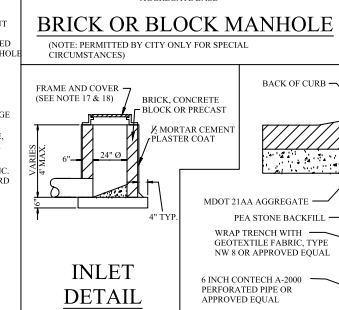
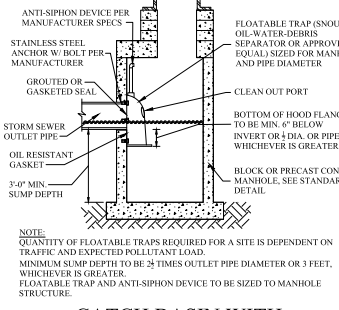
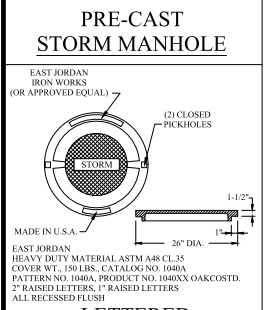
## SANITARY SEWER STANDARD DETAILS

NOT TO SCALE	DATE: 1/10/2019
SHEET 2 OF 2	



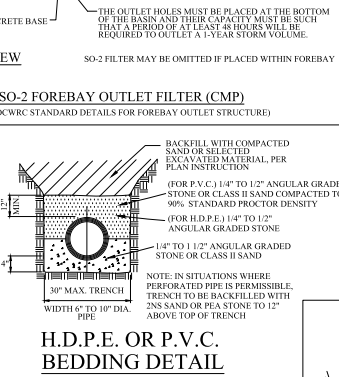
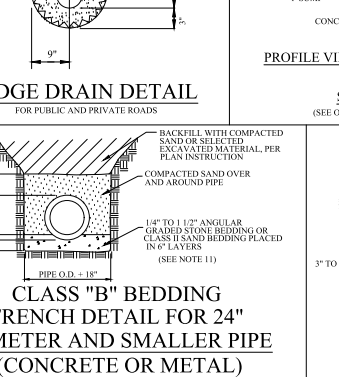
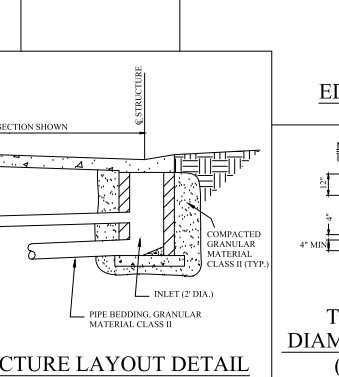
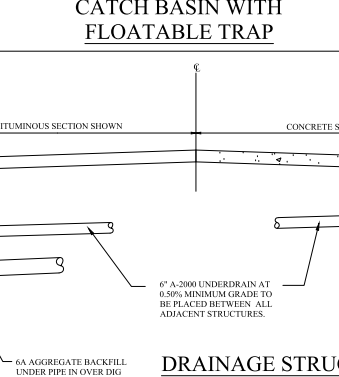
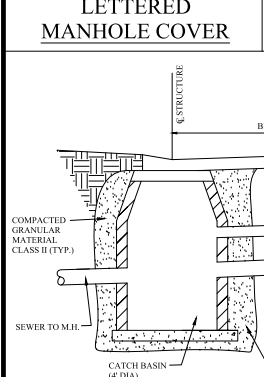
**GENERAL NOTES:**

1. ALL EXISTING AND NEW STORM SYSTEMS SHALL BE CLEANED AND FLUSHED ONCE SITE IS 90% BUILT OUT AND VEGETATED. SEDIMENT, ROCK, AND OTHER DEBRIS SHALL BE COLLECTED AND DISPOSED OF IN A PROPER MANNER. IN NO CASE SHALL DEBRIS BE FLUSHED DOWN A STORM OR SANITARY SEWER FOR DISPOSAL. ALL DAMAGED IRRIGATION AND HOUSE DRAINAGE PIPE, DRAIN TIES, SEWER LATERALS AND CULVERTS SHALL BE REPAIRED IMMEDIATELY. DEBRIS COLLECTED SHALL BE DISPOSED IN A COMMERCIAL LANDFILL OR OTHER PROPER LOCATION.
2. STORM SEWER PIPE SHALL BE OF SIZE AND TYPE NOTED ON THE APPROVED PLANS.
3. REINFORCED CONCRETE PIPE (RCP) SHALL BE MODIFIED GROOVED TONGUE JOINTS WITH 0-RING TYPE RUBBER GASKET, PER ASTM C443.
4. ALL CATCH BASIN LEADS AND INLET LEADS OR 14\"/>



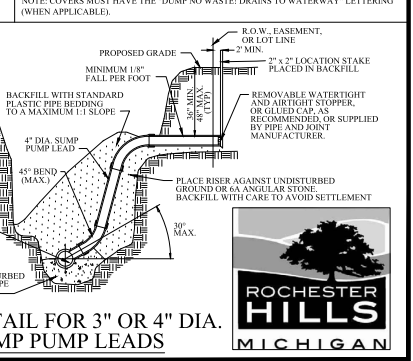
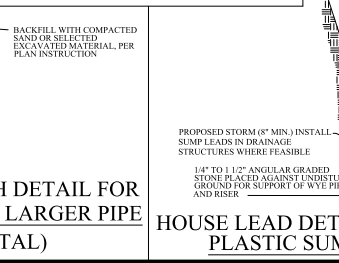
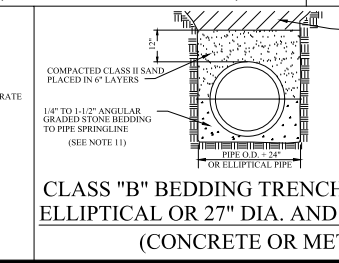
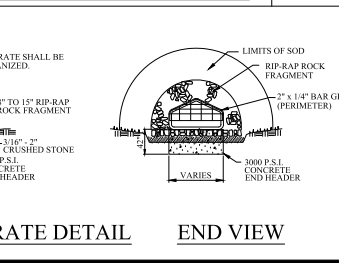
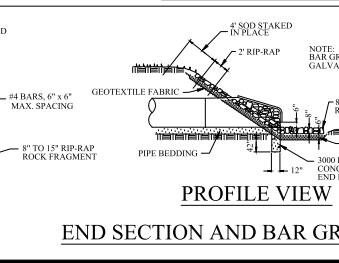
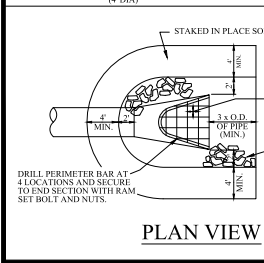
**COVERS FOR MANHOLES, CATCH BASINS, AND INLETS**

17. MANHOLE FRAME AND COVER SHALL BE 7180, TYPE A COVER OR EQUIVALENT.
18. CATCH BASIN AND INLET FRAME AND COVER SHALL BE AS FOLLOWS:
  - a. E1 7045 WITH TYPE M1 GRATE AND 7050 T2 ADJUSTABLE BACK, OR EQUAL, FOR USE WITH CONCRETE CURB AND GUTTER, (STRAIGHT CURB M.D.O.T. F CURB) AND WITH CONCRETE PAVEMENT WITH INTEGRAL CURB.
  - b. E1 7055 WITH TYPE M1 GRATE OR EQUAL, FOR USE WITH CONCRETE B-2 MODIFIED CURB AND GUTTER, AND WITH CONCRETE WITH B-2 MODIFIED INTEGRAL CURB.
  - c. E1 7065 WITH TYPE M1 GRATE AND 7060 T1 DRIVE OVER CURB BACK, OR EQUAL, FOR USE WITH MOUNTABLE CURB AND GUTTER, AND WITH CONCRETE PAVEMENT WITH MOUNTABLE INTEGRAL CURB.
  - d. E1 FRAME 106 WITH TYPE N OVAL GRATE OR TYPE 02 BEEHIVE GRATE, OR EQUAL, FOR USE ON OPEN DITCH STRUCTURES AND ON CATCH BASINS LOCATED IN SWALES, AND IN EASEMENTS OUTSIDE THE PUBLIC STREET RIGHT-OF-WAY.
  - e. E1 FRAME 7062 WITH TYPE M4 VANE STYLE INLET GRATE (RIGHT HAND FLOW OR LEFT HAND FLOW) AND 7060 T1 BACK OR 7060 T2 BACK DEPENDING ON CURB STYLE, OR EQUAL, FOR USE WITH RELIEF BASINS WHICH ARE ON LONGITUDINAL ROAD SLOPES OF 4% OR GREATER.
  - f. E1 FRAME 510 WITH TYPE M1 SPHUSDODAL GRATE, OR EQUAL, FOR USE IN NON-CURB PAVEMENT AREAS.



**COVERS THAT WILL RESULT IN MORE THAN ONE OWNER RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF THE COMPLETE STORM DRAINAGE SYSTEM**

1. ALL PUBLIC PROJECTS OR PROJECTS BEING CONSTRUCTED ON PUBLIC PROPERTY.
2. ANY PROJECT INVOLVING A DEVELOPMENT, SUBDIVISION, SITE CONDOMINIUM, CONDOMINIUM OR ASSOCIATED DEVELOPMENT.
3. ANY PROJECT THAT WILL RESULT IN MORE THAN ONE OWNER RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF THE COMPLETE STORM DRAINAGE SYSTEM.



REVISIONS	DATE	APPROVED BY

APPROVED BY CITY COUNCIL, DATE: \_\_\_\_\_  
 PREPARED BY ENGINEERING DIVISION DEPARTMENT OF PUBLIC SERVICES

NOTIFY ROCHESTER HILLS ENGINEERING DEPARTMENT @ 248.841.2510 48 HRS. PRIOR TO START OF CONSTRUCTION

**City of Rochester Hills**  
 1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

**STORM SYSTEM STANDARD DETAILS**  
 NOT TO SCALE DATE: 1/10/2019  
 SHEET 1 OF 1

