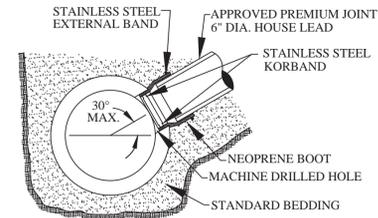
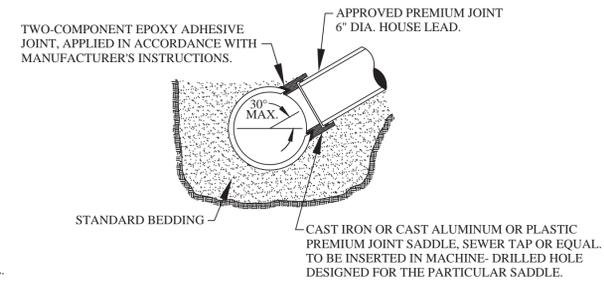


# CITY OF ROCHESTER HILLS GRAVITY BUILDING LEAD REQUIREMENTS AND DETAILS

- ALL BUILDING LEAD WORK MUST BE PERFORMED UNDER THE CITY OF ROCHESTER HILLS INSPECTION.
- FOR ALL CITY OF ROCHESTER HILLS SYSTEMS CALL 248-841-2510 48-HOURS PRIOR TO SCHEDULING INSPECTION.  
FOR ALL OCWRC-OPERATED SYSTEMS, CALL 248-858-1110 48-HOURS IN ADVANCE PRIOR TO SCHEDULING INSPECTION.
- SANITARY SEWER MAY NOT BE USED AS A DE-WATERING OUTLET.
- 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.
- APPROVED BUILDING LEAD PIPE FOR GRAVITY SEWER LEADS:
  - PVC PLASTIC, ASTM D3034, SDR 23.5
  - SOLID WALL PVC SCHEDULE 40, ASTM D-2665
  - ANY DEVIATIONS FROM ABOVE SPECIFICATIONS REQUIRES APPROVAL BY CITY ENGINEER.
- ALLOWABLE TYPES OF SEWER PIPE ADAPTERS: FERNCO STRONGBACK COUPLING OR APPROVED EQUAL.
- 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.

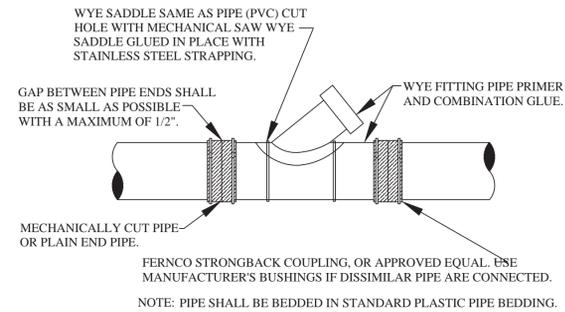


## KOR-N-TEE TAP FOR CONCRETE PIPE



NOTE: SURFACE OF MAIN SEWER SHALL BE CLEANED WITH AN ABRASIVE GRINDER PRIOR TO EPOXY APPLICATION. DUE TO VARIATION OF SET-UP TIME OF EPOXY ADHESIVE WITH TEMPERATURE, ANCHOR STRAPS SHALL BE USED TO SECURE SADDLE IN POSITION IN COLD WEATHER OR WHENEVER WORK IS TO PROCEED PRIOR TO COMPLETE CURE OF EPOXY.

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



NOTE: PIPE SHALL BE BEDDED IN STANDARD PLASTIC PIPE BEDDING.

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

- THE MAXIMUM SCALE SHALL BE ONE (1) INCH EQUALS FIFTY (50) FEET.
- THE SIZE, LENGTH, CLASS AND MANUFACTURER OF PIPE INSTALLED SHALL BE INDICATED.
- THE SIZE, MANUFACTURER AND MODEL NUMBERS OF ALL VALVES AND PUMPS INSTALLED SHALL BE INDICATED.
- A TOTAL AS-BUILT DRAWING QUANTITY LIST SHALL BE INCLUDED.
- THE LOCATIONS SHALL BE SHOWN ON THE PLANS WITH AN ACCURACY OF ONE (1) FOOT.
- THE OFFSET OF THE SANITARY MAIN FROM PROPERTY LINES SHALL BE INDICATED.
- ALL MANHOLES, VALVE WELLS, PUMPS AND ALL SANITARY SYSTEM APPURTENANCES SHALL BE LOCATED FROM TWO FIXED OBJECTS (MANHOLES, BUILDING CORNERS ETC.).
- ALL UNDERGROUND APPURTENANCES, SUCH AS TFC/ARV 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.
- THE ACCURATE LOCATION OF ALL UTILITY CROSSINGS WHERE THE VERTICAL SEPARATION IS LESS THAN 18" SHALL BE NOTED.
- AS-BUILTS SHALL BE PREPARED IN ACCORDANCE WITH CITY OF ROCHESTER HILLS AS-BUILT GUIDELINES AS PROVIDED AT THE PRE-CONSTRUCTION MEETING.

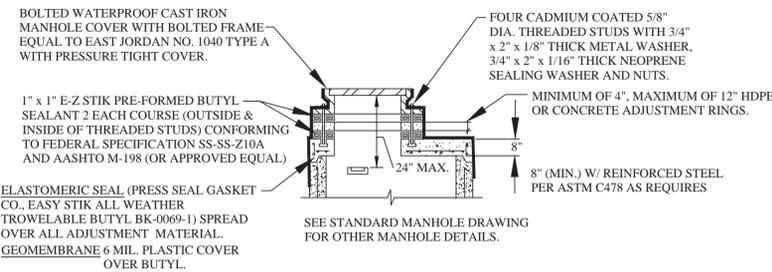
I HEREBY CERTIFY THAT OUR FIRM HAS PREPARED THESE AS-BUILT DRAWINGS OF THE IMPROVEMENTS AS CONSTRUCTED, AND THAT TO THE BEST OF MY KNOWLEDGE THOSE IMPROVEMENTS NOTED AS "AS BUILT" WERE CONSTRUCTED IN SUBSTANTIAL CONFORMANCE WITH THE APPROVED CONSTRUCTION PLANS; AND ALSO THAT THE SANITARY SEWER AND STRUCTURES,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

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

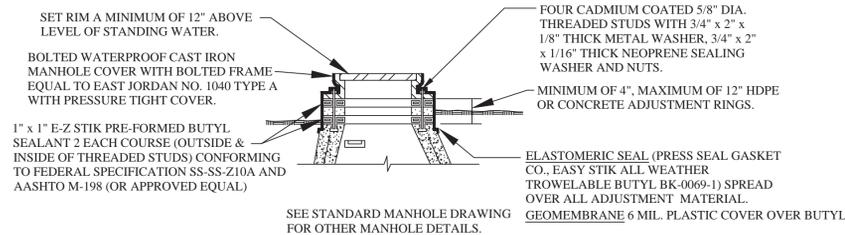
\_\_\_\_\_  
(ENGINEER'S SIGNATURE)

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

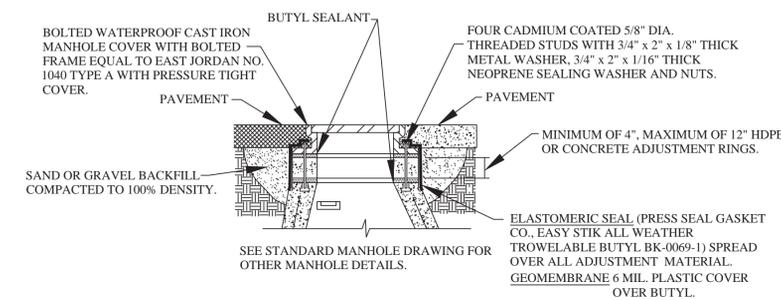
ENGINEER SEAL



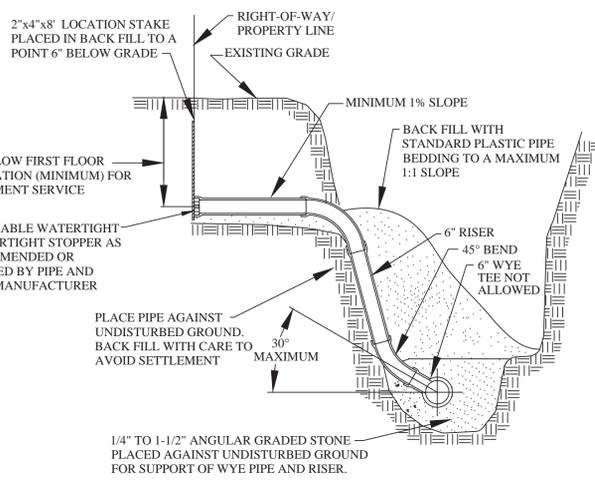
## FLAT TOP MANHOLE



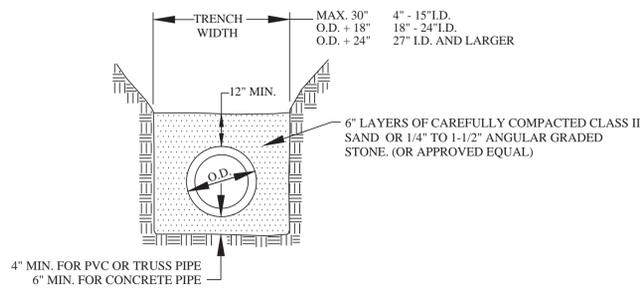
## ADJUSTMENT DETAIL FOR MANHOLE TOPS WITHIN FLOOD PRONE AREAS



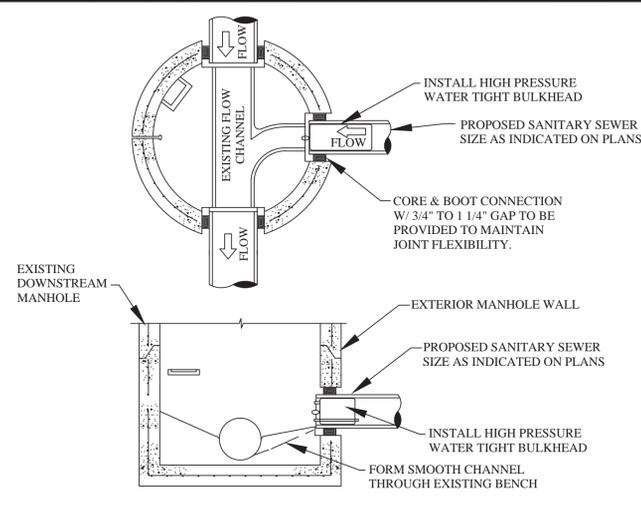
## ADJUSTMENT DETAIL MANHOLE TOPS WITHIN PAVEMENT AREAS



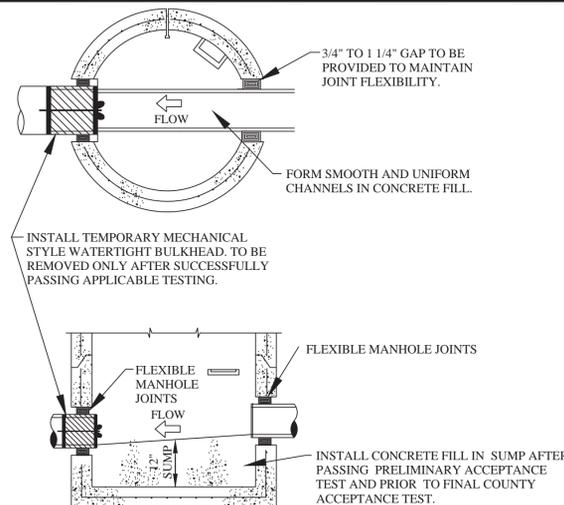
## HOUSE LEAD DETAIL



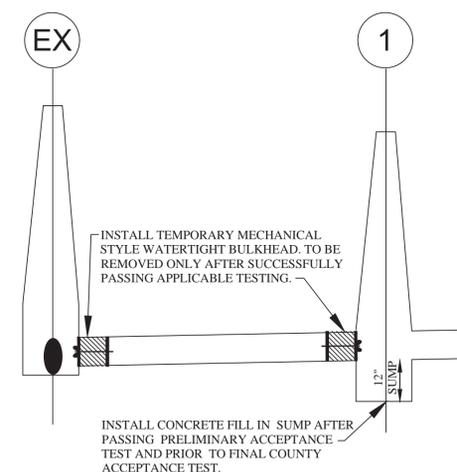
## STANDARD BEDDING (CLASS B)



## TESTING BULKHEAD IN EXISTING MANHOLE



## FIRST MANHOLE UPSTREAM FROM SANITARY TAP



## PROFILE OF BULKHEADS AND ONE FOOT SUMP

REVISIONS	DATE	APPROVED BY CITY COUNCIL, DATE: _____

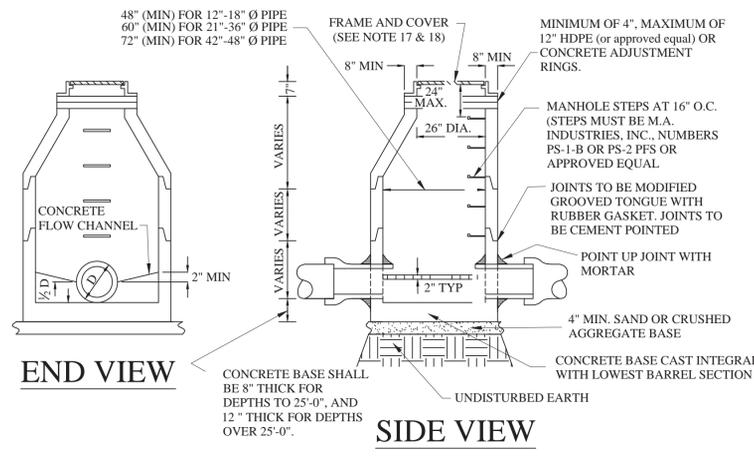
NOTIFY ROCHESTER HILLS  
ENGINEERING DIVISION @  
248-841-2510 48 HRS. PRIOR  
TO START OF  
CONSTRUCTION

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

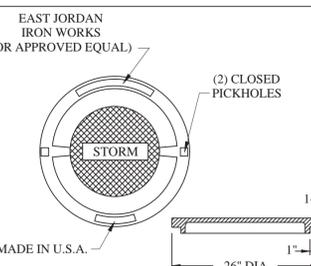
**SANITARY SEWER  
STANDARD DETAILS**

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





**PRE-CAST STORM MANHOLE**



EAST JORDAN IRON WORKS (OR APPROVED EQUAL)

(2) CLOSED PICKHOLES

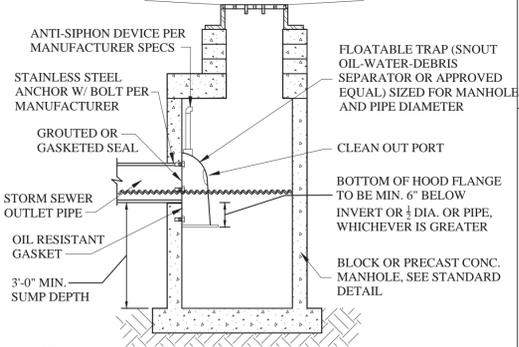
MADE IN U.S.A.

26" DIA.

1-1/2"

1"

EAST JORDAN HEAVY DUTY MATERIAL ASTM A48 CL.35 COVER WT. 150 LBS., CATALOG NO. 1040A PATTERN NO. 1040A, PRODUCT NO. 1040XX OAKCASTD. 2" RAISED LETTERS, 1" RAISED LETTERS ALL RECESSED FLUSH



ANTI-SIPHON DEVICE PER MANUFACTURER SPECS

STAINLESS STEEL ANCHOR W/ BOLT PER MANUFACTURER

GROUTED OR GASKETED SEAL

STORM SEWER OUTLET PIPE

OIL RESISTANT GASKET

3"-0" MIN. SUMP DEPTH

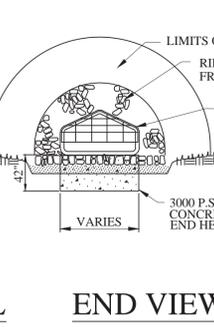
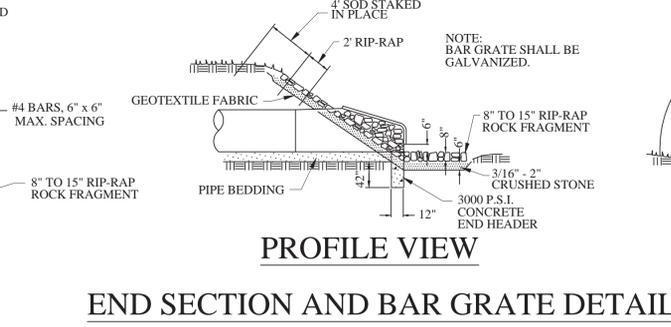
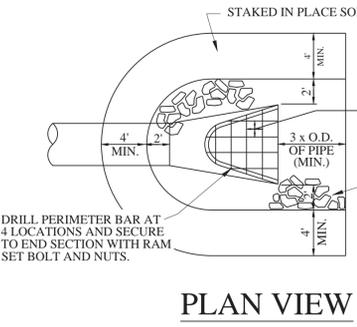
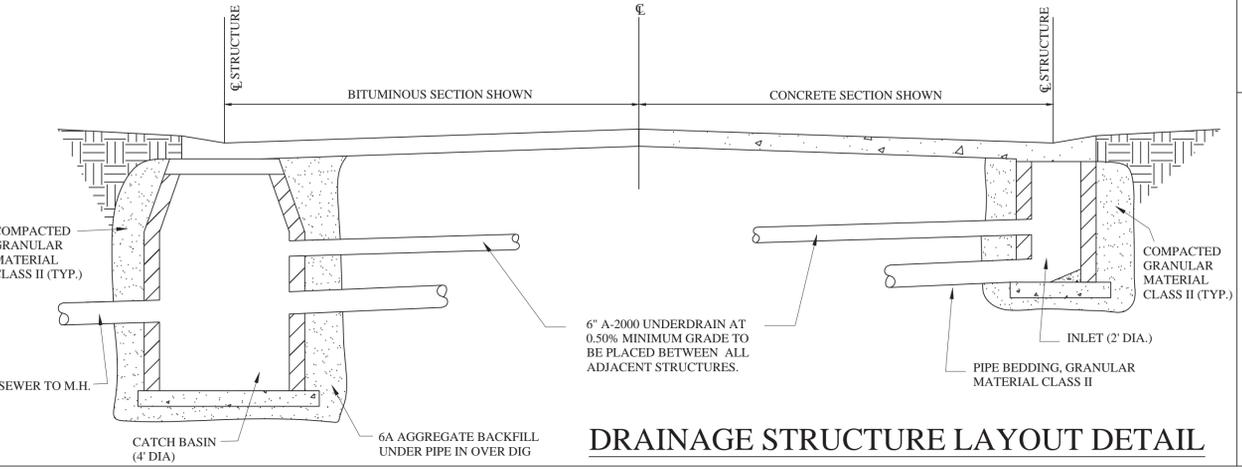
NOTE: QUANTITY OF FLOATABLE TRAPS REQUIRED FOR A SITE IS DEPENDENT ON TRAFFIC AND EXPECTED POLLUTANT LOAD. MINIMUM SUMP DEPTH TO BE 2 1/2 TIMES OUTLET PIPE DIAMETER OR 3 FEET, WHICHEVER IS GREATER. FLOATABLE TRAP AND ANTI-SIPHON DEVICE TO BE SIZED TO MANHOLE STRUCTURE.

FLOATABLE TRAP (SNOUT OIL-WATER-DEBRIS SEPARATOR OR APPROVED EQUAL) SIZED FOR MANHOLE AND PIPE DIAMETER

CLEAN OUT PORT

BOTTOM OF HOOD FLANGE TO BE MIN. 6" BELOW INVERT OR 1/4 DIA. OR PIPE, WHICHEVER IS GREATER

BLOCK OR PRECAST CONC. MANHOLE, SEE STANDARD DETAIL



REVISIONS	DATE	APPROVED BY

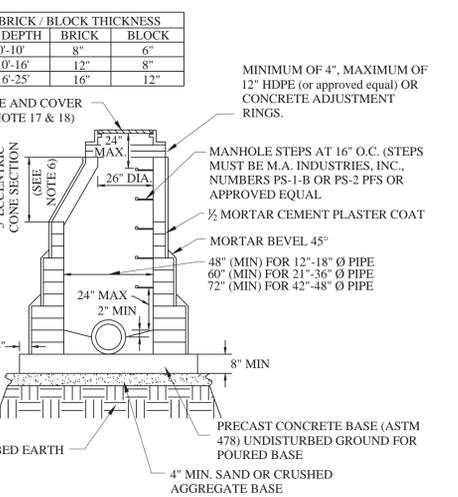
DATE: \_\_\_\_\_

APPROVED BY: \_\_\_\_\_

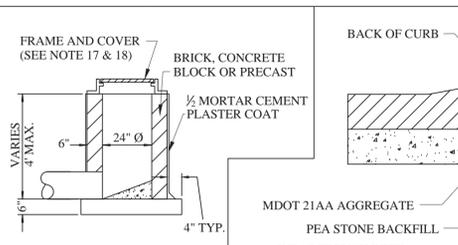
CITY COUNCIL, DATE: \_\_\_\_\_

PREPARED BY: ENGINEERING DIVISION  
DEPARTMENT OF PUBLIC SERVICES

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



**BRICK OR BLOCK MANHOLE**



(NOTE: PERMITTED BY CITY ONLY FOR SPECIAL CIRCUMSTANCES)

FRAME AND COVER (SEE NOTE 17 & 18)

BRICK, CONCRETE BLOCK OR PRECAST

1/2 MORTAR CEMENT PLASTER COAT

4" TYP.

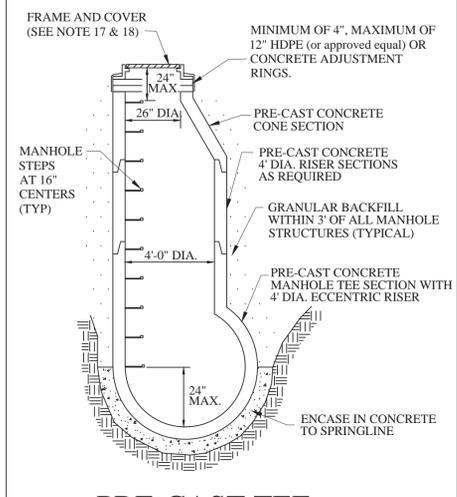
MDOT 21AA AGGREGATE

PEA STONE BACKFILL

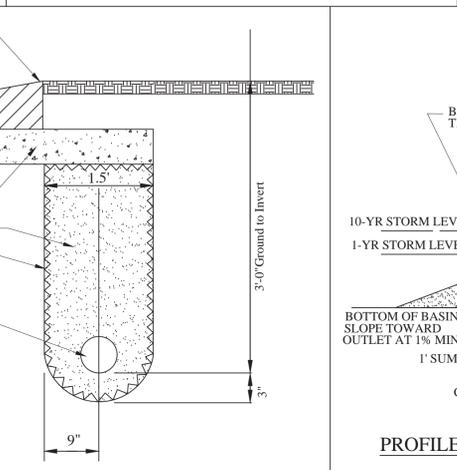
WRAP TRENCH WITH GEOTEXTILE FABRIC, TYPE NW 8 OR APPROVED EQUAL

6 INCH CONTECH A-2000 PERFORATED PIPE OR APPROVED EQUAL

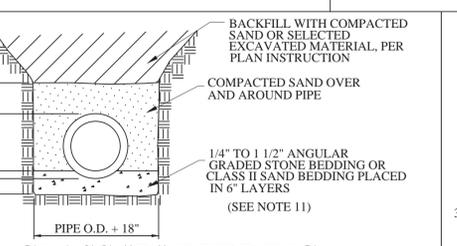
3'-0" Ground to Invert



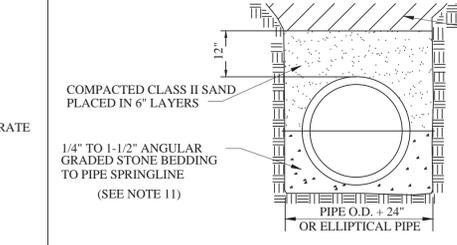
**PRE-CAST TEE MANHOLE DETAIL**



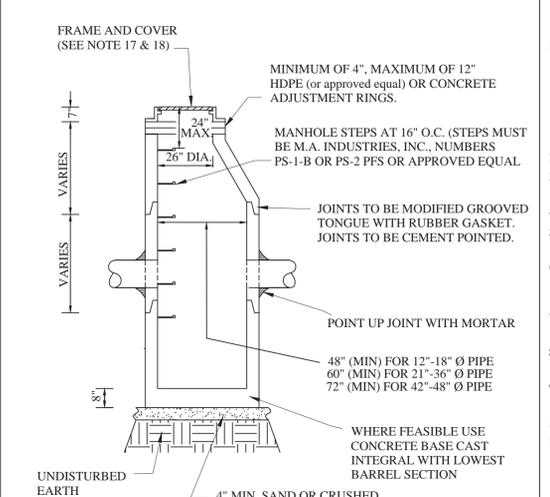
**EDGE DRAIN DETAIL**



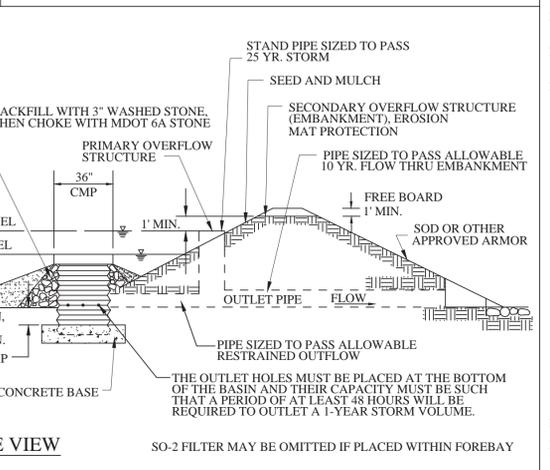
**CLASS "B" BEDDING TRENCH DETAIL FOR 24" DIAMETER AND SMALLER PIPE (CONCRETE OR METAL)**



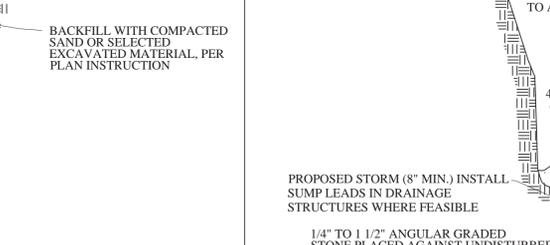
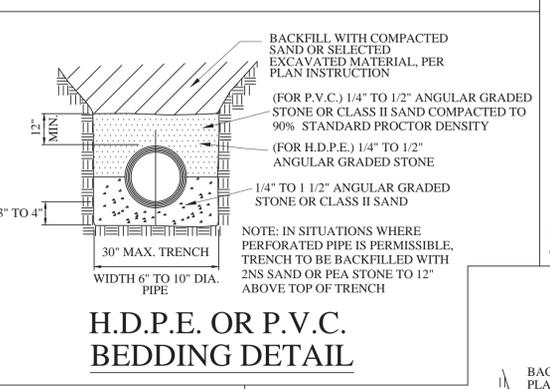
**CLASS "B" BEDDING TRENCH DETAIL FOR ELLIPTICAL OR 27" DIA. AND LARGER PIPE (CONCRETE OR METAL)**



**PRECAST STORM CATCH BASIN**



**SO-2 FOREBAY OUTLET FILTER (CMP)**

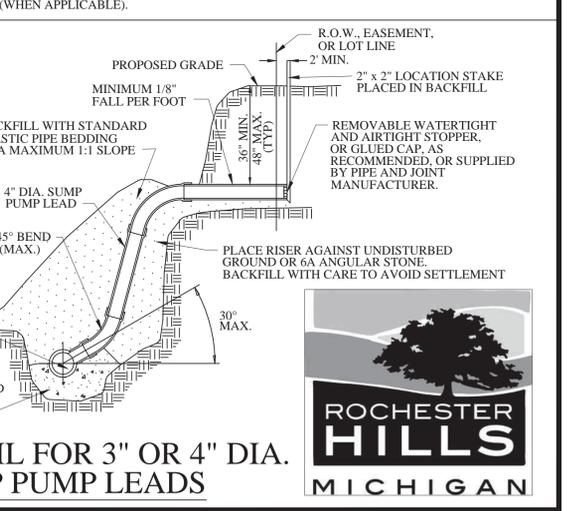


**H.D.P.E. OR P.V.C. BEDDING DETAIL**

- GENERAL NOTES:**
- 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 TILES, SEWER LATERALS AND CULVERTS SHALL BE REPAIRED EXPEDITIOUSLY. DEBRIS COLLECTED SHALL BE DISPOSED IN A COMMERCIAL LANDFILL OR OTHER APPROVED LOCATION.
  - STORM SEWER PIPE SHALL BE OF SIZE AND TYPE NOTED ON THE APPROVED PLANS. REINFORCED CONCRETE PIPE (RCP) SHALL BE MODIFIED GROOVED TONGUE JOINTS WITH O-RING TYPE RUBBER GASKET, PER ASTM C443.
  - ALL CATCH BASIN LEADS AND INLET LEADS SHALL BE ASTM C76-CLASS IV PIPE.
  - MINIMUM PIPE SIZE FOR SEWERS, CATCH BASINS LEADS, AND INLET LEADS SHALL BE 12" NOMINAL INTERNAL DIAMETER.
  - ECCENTRIC CONES SHALL BE PROVIDED ON ALL STRUCTURES, REGARDLESS OF THE MATERIAL USED. PRECAST REINFORCED CONCRETE MANHOLE, BLOCK, OR BRICK TO PROVIDE A TRUE VERTICAL FACE FOR PLACEMENT OF MANHOLE STEPS.
  - THE INSIDE JOINTS OF PIPES SIZES 42" AND LARGER DIAMETER SHALL BE POINTED UP WITH MORTAR UPON COMPLETION OF BACKFILLING OPERATIONS.
  - ALL PIPES SHALL HAVE CLASS, LOT NUMBER, AND DATE OF MANUFACTURE CONSPICUOUSLY MARKED ON EACH LENGTH BY MANUFACTURER.
  - ALL END SECTIONS 18" AND LARGER SHALL BE PROVIDED WITH A GALVANIZED BAR SCREEN.
  - PRECAST REINFORCED CONCRETE SECTIONS SHALL CONFORM TO ASTM 2478.
  - IN DRY, STABLE SOILS, PEASTONE (EQUIVALENT TO M.D.O.T. 34R SPECIFICATIONS) MAY BE SUBSTITUTED FOR THE STANDARD BEDDING. IF THE TRENCH IS WET OR UNSTABLE A GEOTEXTILE FABRIC MUST BE USED TO LINE THE TRENCH PRIOR TO THE PLACEMENT OF THE 2NS SAND, PEASTONE, OR 1/4" - 1-1/2" ANGULAR GRADED STONE.
  - SCHEDULE INSPECTIONS 48 HOURS PRIOR TO START OF CONSTRUCTION BY CALLING THE CITY'S INSPECTION LINE AT 248-841-2510. FULL TIME INSPECTION SHALL BE REQUIRED FOR ALL UNDERGROUND STORM SEWER CONSTRUCTION.
  - THE CONTRACTOR SHALL CONTACT MISS DIG 72 HOURS BEFORE CONSTRUCTION AT (811) TO LOCATE EXISTING UNDERGROUND UTILITIES.
  - PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL HAVE IN HIS POSSESSION A CURRENT SOIL EROSION CONTROL PERMIT AS ISSUED BY THE OCWRC.
  - MINIMUM SUMP DEPTH IS 2' FOR CATCH BASINS, MINIMUM SUMP DEPTH IS 3' FOR CATCH BASINS WITH FLOATABLE TRAP INSTALLATIONS.
  - AS A MEANS OF INSURING PROPER INSTALLATION OF THE STORM SEWER PIPE, AT THE DISCRETION OF THE CITY ENGINEER, THE CONTRACTOR SHALL VIDEO INSPECT, ACCORDING TO THE CITY OF ROCHESTER HILLS VIDEO INSPECTION STANDARDS, 100% OF THE STORM SEWER PIPE 12" AND LARGER IN DIAMETER. IF VIDEO INSPECTION IS REQUIRED BY THE CITY ENGINEER 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 VIDEO INSPECTION STANDARDS.
- PROJECTS THAT THE CITY ENGINEER MAY IMPOSE THESE REQUIREMENTS ARE:
- ALL PUBLIC PROJECTS OR PROJECTS BEING CONSTRUCTED ON PUBLIC PROPERTY.
  - ANY PROJECT INVOLVING A DEVELOPMENT, SUBDIVISION, SITE CONDOMINIUM, OR ASSOCIATION.
  - ANY PROJECT THAT WILL RESULT IN MORE THAN ONE OWNER RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF THE COMPLETE STORM DRAINAGE SYSTEM.

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

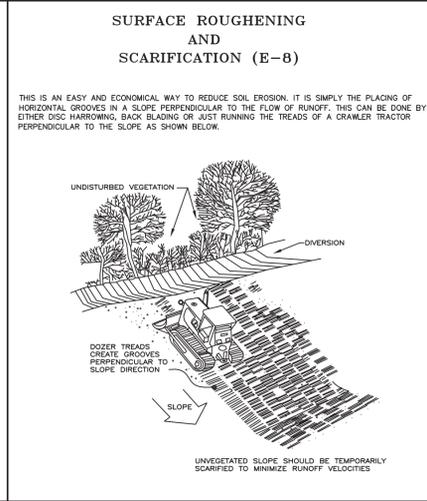
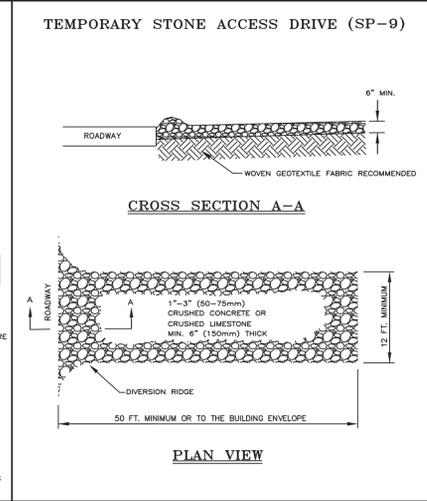
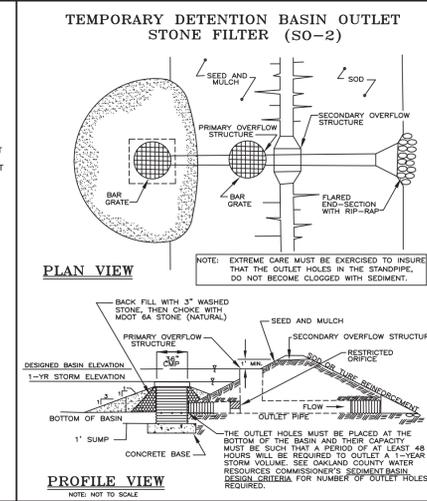
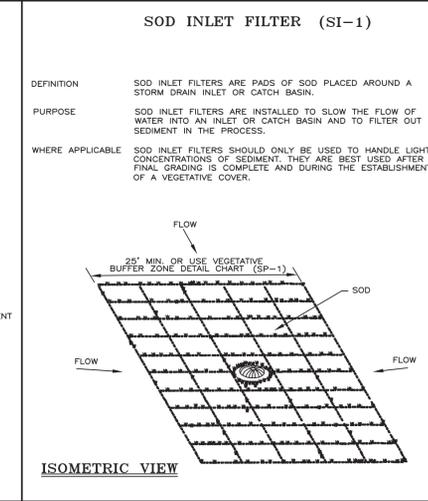
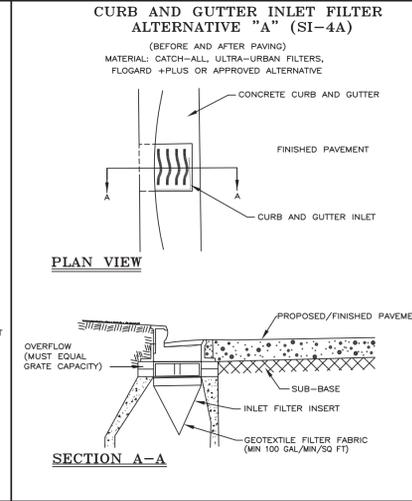
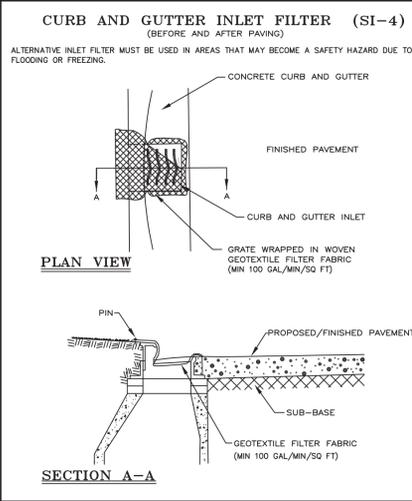
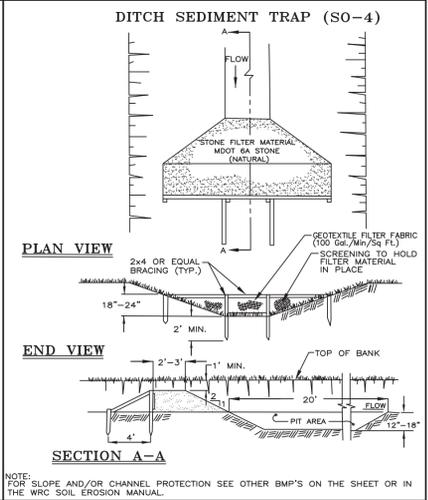
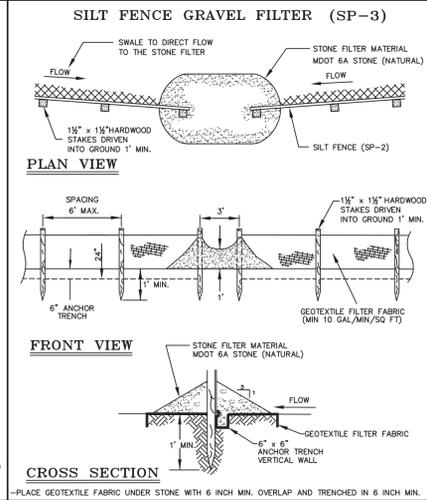
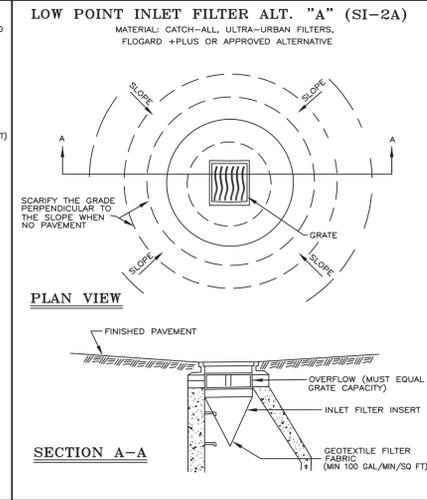
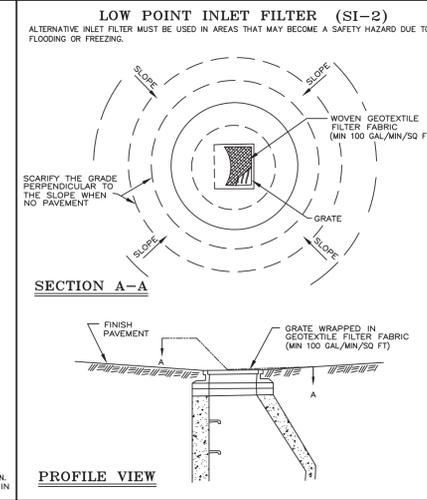
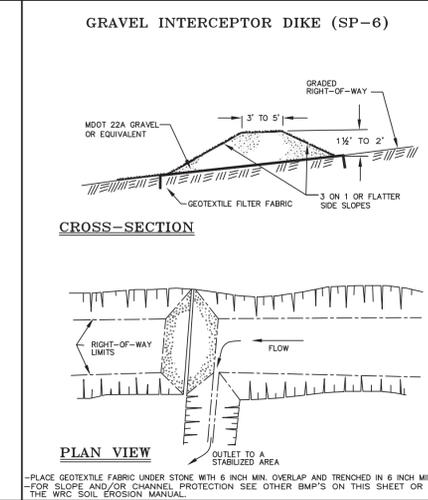
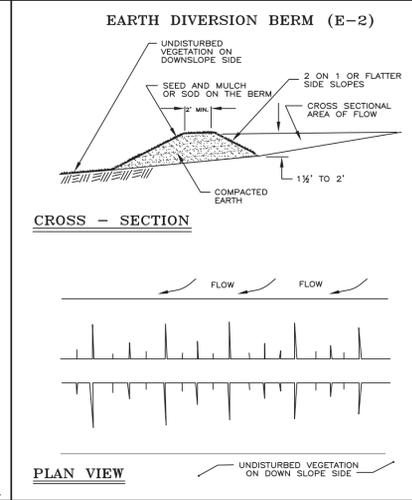
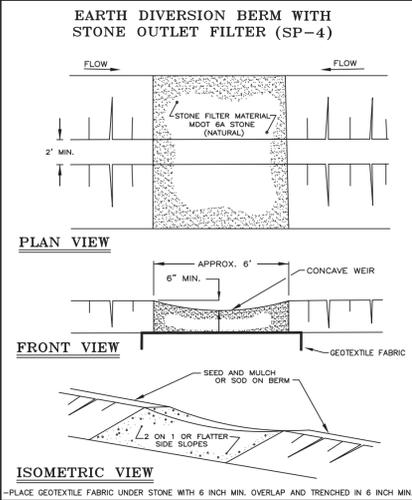
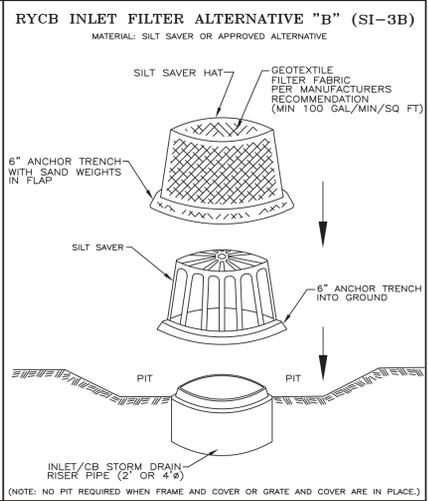
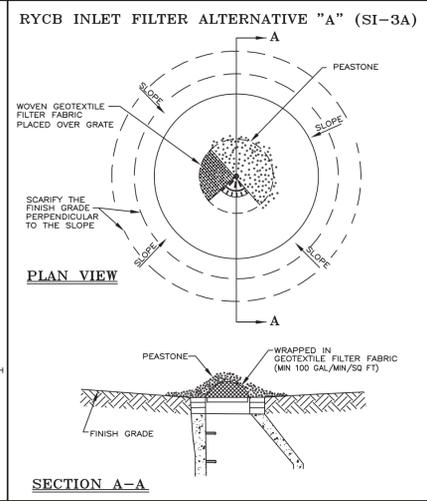
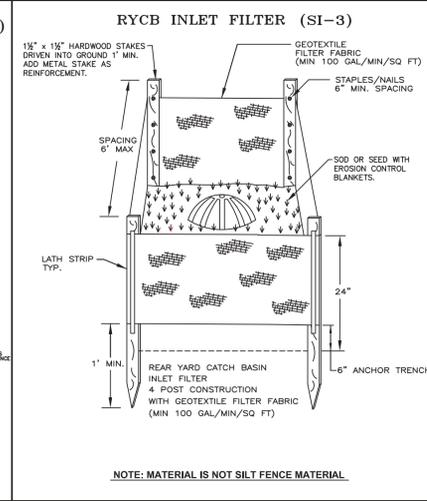
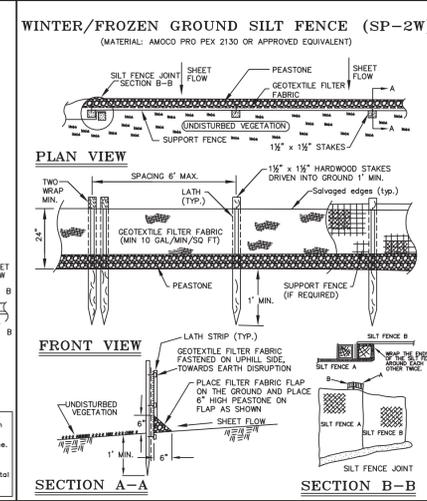
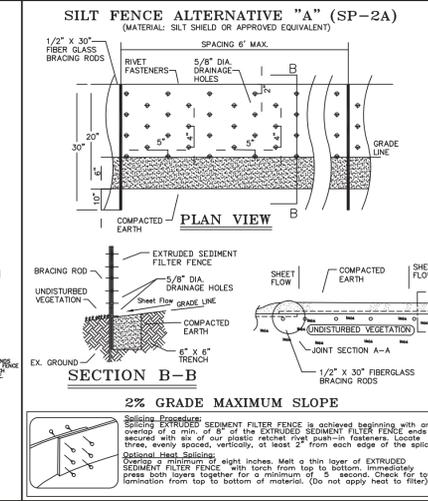
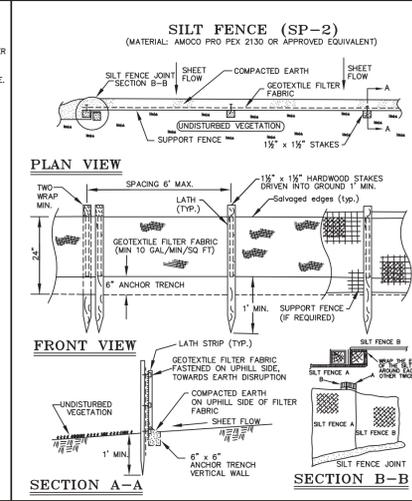
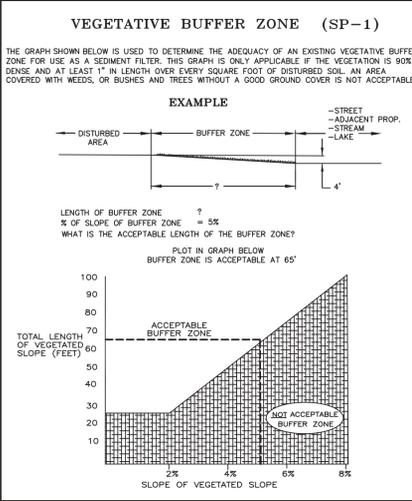
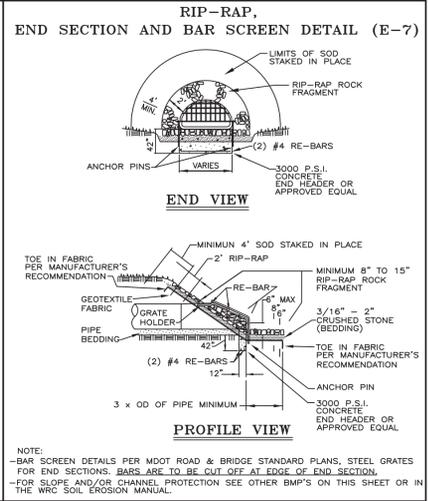
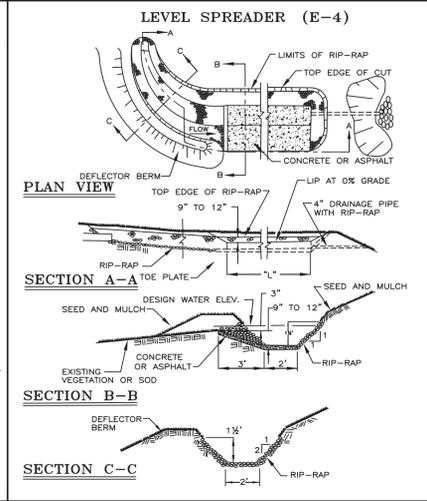
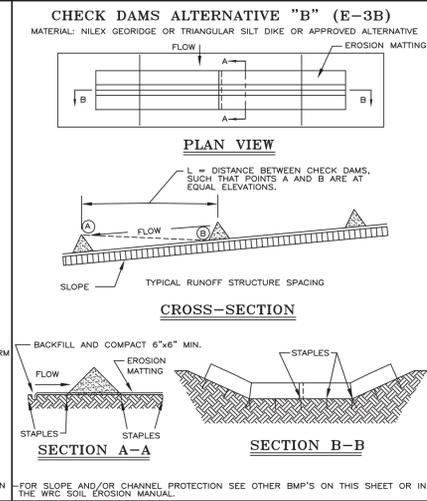
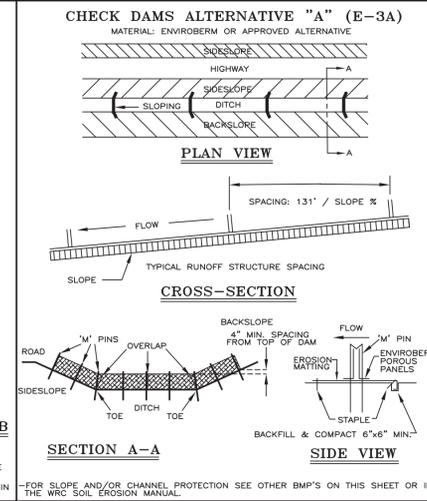
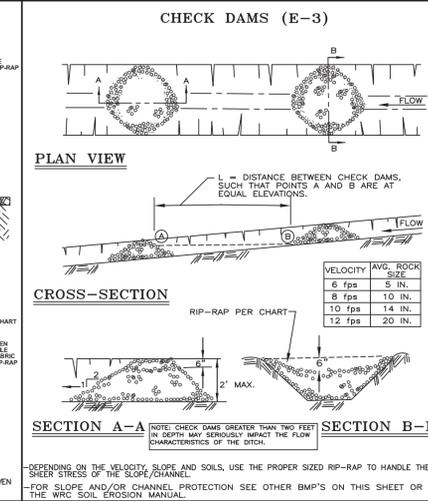
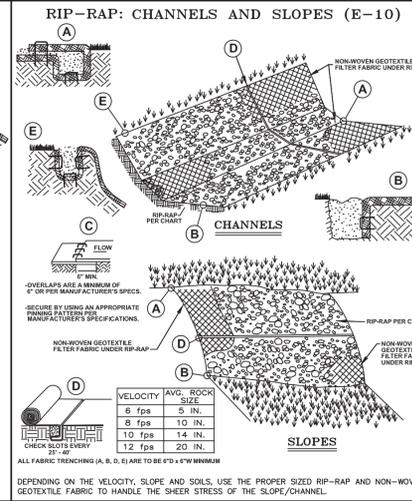
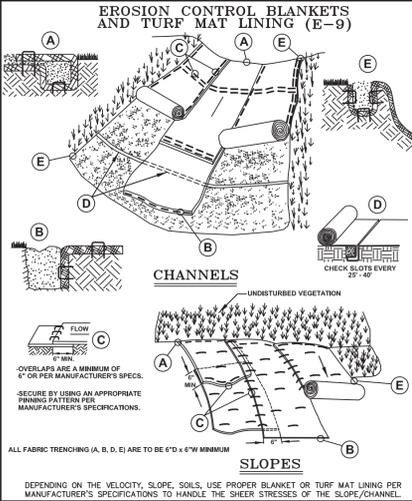
- MANHOLE FRAME AND COVER SHALL BE EJ 1040, TYPE A COVER OR EQUIVALENT.
  - CATCH BASINS AND INLET FRAME AND COVER SHALL BE AS FOLLOWS:
    - EJ 7045 WITH TYPE M1 GRATE AND 7050 T2 ADJUSTABLE BACK, OR EQUAL, FOR USE WITH CONCRETE CURB AND GUTTER, (STRAIGHT CURB/ M.D.O.T. F CURB) AND WITH CONCRETE PAVEMENT WITH INTEGRAL CURB.
    - EJ 7085 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.
    - EJ 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.
    - EJ FRAME 1040 WITH TYPE N OVAL GRATE OR TYPE O2 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.
    - EJ FRAME 7045Z WITH TYPE M4 VANE STYLE INLET GRATE (RIGHT HAND FLOW OR LEFT HAND FLOW) AND 7060 T1 BACK OR 7050 T2 BACK DEPENDING ON CURB STYLE, OR EQUAL, FOR USE WITH RELIEF BASINS WHICH ARE ON LONGITUDINAL ROAD SLOPES OF 4% OR GREATER.
    - EJ FRAME 5100 WITH TYPE M1 SINUSOIDAL GRATE, OR EQUAL, FOR USE IN NON-CURB PAVEMENT AREAS.
- NOTE: COVERS MUST HAVE THE "DUMP NO WASTE! DRAINS TO WATERWAY" LETTERING (WHEN APPLICABLE).



**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	



**NOTE:**

WHILE PERFORMING WORK INVOLVING GROUNDS MAINTENANCE AND/OR THE CONSTRUCTION/MAINTENANCE OF ANY INFRASTRUCTURE, INCLUDING ROADS, WATER MAINS, SANITARY SEWERS, STORM DRAINS AND STORM WATER BEST MANAGEMENT PRACTICES (BMPs), CONTRACTORS SHALL MINIMIZE POLLUTION FROM STORM WATER RUNOFF THAT CAN AFFECT WATER QUALITY RELATED TO WORK ACTIVITIES. POLLUTANTS THAT COULD IMPAIR WATER QUALITY MAY INCLUDE FUEL, GREASE AND OIL, NUTRIENTS, BACTERIA AND PATHOGENS, LITTER AND DEBRIS, AND SOIL EROSION AND SEDIMENTATION. APPLICABLE BMPs SHALL BE IMPLEMENTED BY THE CONTRACTOR TO THE MAXIMUM EXTENT PRACTICABLE TO PROTECT WATER QUALITY AND WILDLIFE HABITAT.

**SOIL EROSION AND SEDIMENTATION CONTROL DETAILS**

REVISION BLOCK

Rev.	By	Date	Description
1	WRC	01/01/01	ISSUED FOR APPROVAL
2	WRC	01/01/01	PROPOSED DETAIL REVISIONS
3	WRC	01/01/01	FOR CONSTRUCTION APPROVAL, NAME CHANGES
4	WRC	01/01/01	FOR CONSTRUCTION APPROVAL, NAME CHANGES
5	WRC	01/01/01	FOR CONSTRUCTION APPROVAL, NAME CHANGES

ORIG. DATE: 01/01/01

SCALE: NONE

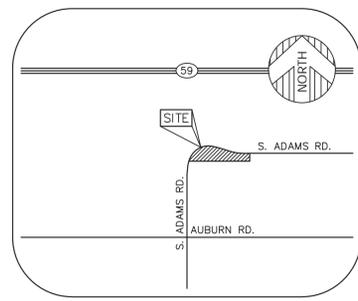
DESIGNED BY: WRC

DRAWN BY: Mapping

WRC WATER RESOURCES COMMISSIONER

ONE PUBLIC WORKS DRIVE, BLDG 95 WEST WATERFORD MICHIGAN 48320-1907

SHEET NO.: 1 of 1



VICINITY MAP  
(NOT TO SCALE)

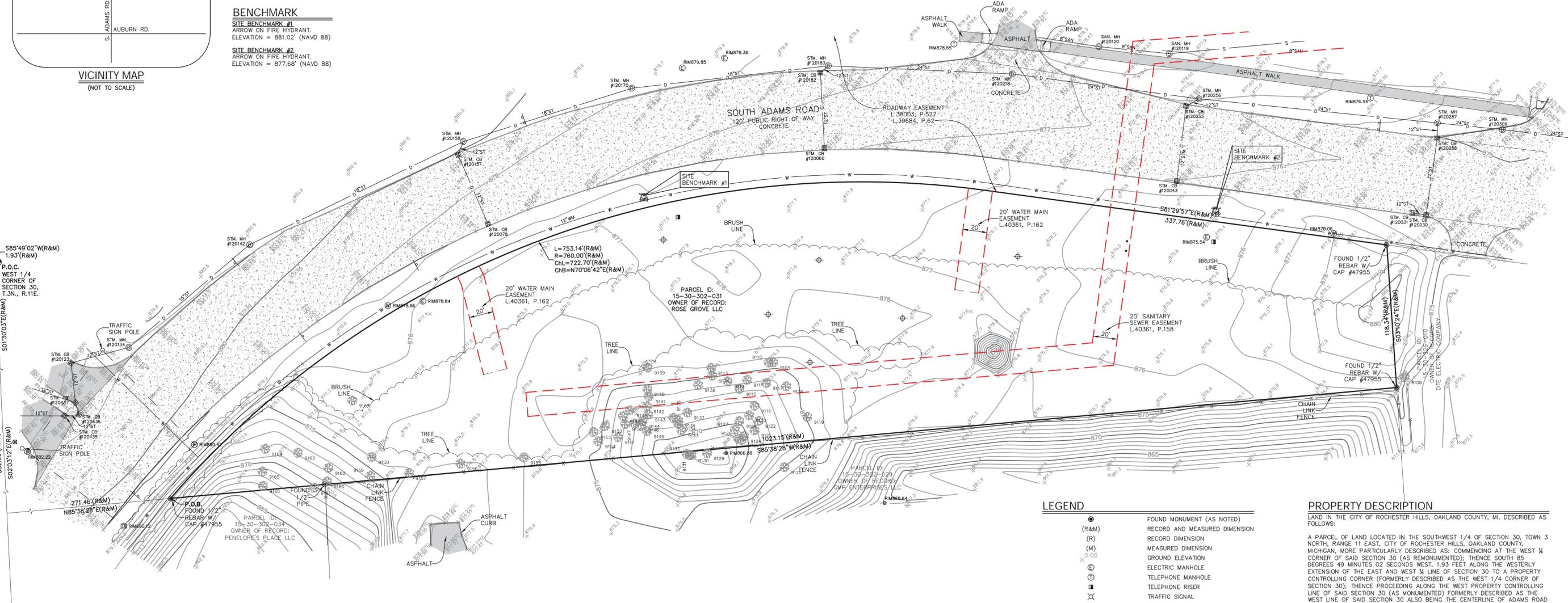
**PARCEL AREA**  
163,152± SQUARE FEET = 3.74± ACRES

**BASIS OF BEARING**  
SOUTH 02°03'12" EAST, BEING THE WEST LINE OF SECTION 30, AS DESCRIBED.

**BENCHMARK**  
SITE BENCHMARK #1  
ARROW ON FIRE HYDRANT.  
ELEVATION = 881.02' (NAVD 88)  
SITE BENCHMARK #2  
ARROW ON FIRE HYDRANT.  
ELEVATION = 877.68' (NAVD 88)



GRAPHIC SCALE  
( IN FEET )  
1 inch = 40 ft.



SOUTHWEST CORNER OF SECTION 30, T.3N., R.11E.

**TITLE REPORT NOTE**

ONLY THOSE EXCEPTIONS CONTAINED WITHIN THE FIRST AMERICAN TITLE INSURANCE COMPANY COMMITMENT No. 979775, DATED OCTOBER 20, 2022, AND RELISTED BELOW WERE CONSIDERED FOR THIS SURVEY. NO OTHER RECORDS RESEARCH WAS PERFORMED BY THE CERTIFYING SURVEYOR.

7. NOTICE OF CONSENT JUDGMENT AND FIRST AMENDMENT TO CONSENT JUDGMENT AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 38500, PAGE 563. (SEE DOCUMENT FOR TERMS AND CONDITIONS)

8. TERMS AND CONDITIONS CONTAINED IN RECIPROCAL EASEMENT AND OPERATION AGREEMENT AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 38003, PAGE 527. (ROADWAY EASEMENT AS SHOWN, UTILITY EASEMENT BLANKET IN NATURE, AND DETENTION BASIN EASEMENT DOES NOT CROSS SUBJECT PROPERTY, SEE DOCUMENT FOR ADDITIONAL TERMS AND CONDITIONS)

FIRST AMENDMENT TO RECIPROCAL EASEMENT AND OPERATION AGREEMENT RECORDED IN LIBER 39684, PAGE 62. (ROADWAY EASEMENT AS SHOWN, UTILITY EASEMENT BLANKET IN NATURE, AND DETENTION BASIN EASEMENT DOES NOT CROSS SUBJECT PROPERTY, SEE DOCUMENT FOR ADDITIONAL TERMS AND CONDITIONS)

9. SANITARY SEWER EASEMENT IN FAVOR OF THE CITY OF ROCHESTER HILLS AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 40361, PAGE 158. (AS SHOWN)

10. WATERMAIN EASEMENT IN FAVOR OF THE CITY OF ROCHESTER HILLS AND THE COVENANTS, CONDITIONS AND RESTRICTIONS CONTAINED IN INSTRUMENT RECORDED IN LIBER 40361, PAGE 162. (AS SHOWN)

11. TERMS AND CONDITIONS CONTAINED IN SANITARY EASEMENT AGREEMENT AS DISCLOSED BY INSTRUMENT RECORDED IN LIBER 43987, PAGE 767. SEE DOCUMENT FOR TERMS AND CONDITIONS)

**MANHOLE SCHEDULE**

NUM	TYPE	RIM (FT)	SIZE (IN)	DIR	INV ELEV (FT)	NUM	TYPE	RIM (FT)	SIZE (IN)	DIR	INV ELEV (FT)
120030	STORM CB	875.22	12	N	870.62	120170	STORM MH	879.41	18	E	872.01
		875.22		T/WATER	870.72			879.41	18	W	872.01
		875.22	B/STRUCTURE		868.82	120182	STORM CB	878.23	12	NE	873.23
120031	STORM CB	875.21	12	E	870.21			878.23		T/WATER	873.13
120151	SEWER MH	875.21			870.81			878.23		B/STRUCTURE	871.33
		875.21	B/STRUCTURE		869.01	120183	STORM MH	878.57	24	E	871.12
120043	STORM CB	875.96	NO VISIBLE PIPES		875.96			878.57	12	SW	872.97
		875.96	T/WATER		872.76			878.57	18	W	871.22
		875.96	B/STRUCTURE		871.56	120218	STORM MH	877.47	24	E	870.47
120060	STORM CB	877.14	NO VISIBLE PIPES		877.14			877.47	24	W	871.17
		877.14	T/WATER		873.84	120255	STORM CB	876.40	12	NE	872.4
		877.14	B/STRUCTURE		872.24			876.40		T/WATER	872.3
120078	STORM CB	878.37	NO VISIBLE PIPES		878.37			876.40		B/STRUCTURE	870.9
		878.37	T/WATER		874.72	120256	STORM MH	877.06	24	E	867.96
		878.37	B/STRUCTURE		873.67			877.06	12	SW	872.06
120119	SANITARY MH	878.10	8	E	864.95			877.06	24	W	869.46
		878.10	8	W	865.00	120287	STORM MH	875.98	24	E	867.23
		878.10	8	E	865.41			875.98	12	SW	868.48
120120	SANITARY MH	878.31	8	E	865.41			875.98	24	W	867.38
		878.31	8	W	865.41	120288	STORM CB	875.04	12	S	870.59
		881.85	12	E	875.85			875.04		T/WATER	870.44
		881.85	12	S	876.15			875.04		B/STRUCTURE	868.74
120134	STORM MH	881.21	15	E	874.91			875.04		B/STRUCTURE	868.74
		881.21	12	W	875.91	120309	STORM MH	874.68	24	E	860.18
		881.01	18	E	873.51			874.68	24	W	867.18
120142	STORM MH	881.01	15	W	874.61			874.68	24	E	876.76
		881.01	12	NE	874.27	120435	STORM CB	881.56	12	E	876.76
		879.57	T/WATER		874.17			881.56	12	W	876.56
		879.57	B/STRUCTURE		872.37	120436	STORM CB	881.22	12	N	876.42
		880.20	18	E	872.70			881.22	12	W	876.22
120158	STORM MH	880.20	18	E	872.70	120437	STORM CB	881.61	12	SE	876.21
		880.20	18	W	872.70			881.61	12	W	876.41

**LEGEND**

- (R&M) FOUND MONUMENT (AS NOTED)
- (R) RECORD AND MEASURED DIMENSION
- (M) RECORD DIMENSION
- (M) MEASURED DIMENSION
- 0.00 GROUND ELEVATION
- ⊕ ELECTRIC MANHOLE
- ⊕ TELEPHONE MANHOLE
- ⊕ TELEPHONE RISER
- ⊕ TRAFFIC SIGNAL
- ⊕ TRAFFIC SIGNAL MANHOLE
- ⊕ TRAFFIC SIGNAL CONTROL BOX
- ⊕ SQUARE CATCH BASIN
- ⊕ DRAIN
- ⊕ STORM DRAIN MANHOLE
- ⊕ FIRE HYDRANT
- ⊕ WATER GATE MANHOLE
- ⊕ WATER VALVE
- ⊕ FENCE POST
- ⊕ SINGLE POST SIGN
- ⊕ DOUBLE POST SIGN
- ⊕ SOIL BORING
- ⊕ TREE (AS NOTED)
- ⊕ PARCEL BOUNDARY LINE
- ⊕ ADJOINER PARCEL LINE
- ⊕ EASEMENT (AS NOTED)
- ⊕ ASPHALT CURB
- ⊕ CONCRETE CURB
- ⊕ EDGE OF CONCRETE (CONC.)
- ⊕ EDGE OF ASPHALT (ASPH.)
- ⊕ FENCE (AS NOTED)
- ⊕ TREE / BRUSH LINE (AS NOTED)
- ⊕ OVERHEAD UTILITY LINE
- ⊕ GAS LINE
- ⊕ SANITARY LINE
- ⊕ STORM LINE
- ⊕ WATER LINE
- ⊕ MINOR CONTOUR LINE
- ⊕ MAJOR CONTOUR LINE
- ⊕ ASPHALT
- ⊕ CONCRETE

**PROPERTY DESCRIPTION**

LAND IN THE CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MI, DESCRIBED AS FOLLOWS:

A PARCEL OF LAND LOCATED IN THE SOUTHWEST 1/4 OF SECTION 30, TOWN 3 NORTH, RANGE 11 EAST, CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN, MORE PARTICULARLY DESCRIBED AS: COMMENCING AT THE WEST 1/4 CORNER OF SAID SECTION 30 (AS REMONUMENTED); THENCE SOUTH 85 DEGREES 49 MINUTES 02 SECONDS WEST, 1.93 FEET ALONG THE WESTERLY EXTENSION OF THE EAST AND WEST 1/4 LINE OF SECTION 30 TO A PROPERTY CONTROLLING CORNER (FORMERLY DESCRIBED AS THE WEST 1/4 CORNER OF SECTION 30); THENCE PROCEEDING ALONG THE WEST PROPERTY CONTROLLING LINE OF SAID SECTION 30 (AS MONUMENTED) FORMERLY DESCRIBED AS THE WEST LINE OF SAID SECTION 30 ALSO BEING THE CENTERLINE OF ADAMS ROAD (VARIABLE WIDTH) THE FOLLOWING TWO (2) COURSES: 1) SOUTH 01 DEGREE 30 MINUTES 03 SECONDS EAST, 385.17 FEET AND 2) SOUTH 02 DEGREES 03 MINUTES 12 SECONDS EAST, 632.96 FEET; THENCE NORTH 85 DEGREES 38 MINUTES 28 SECONDS EAST, 271.46 FEET TO A POINT ON THE SOUTHERLY RIGHT OF WAY OF ADAMS ROAD (VARIABLE WIDTH), SAID POINT ALSO BEING THE POINT OF BEGINNING; THENCE FROM SAID POINT OF BEGINNING THE FOLLOWING TWO (2) COURSES ALONG SAID SOUTHERLY RIGHT OF WAY: 1) 753.14 FEET ALONG THE ARC OF A CURVE TO THE RIGHT, RADIUS 760.00 FEET, CENTRAL ANGLE 56 DEGREES 46 MINUTES 43 SECONDS, AND A CHORD THAT BEARS NORTH 70 DEGREES 06 MINUTES 42 SECONDS EAST, 722.70 FEET AND 2) SOUTH 81 DEGREES 29 MINUTES 57 SECONDS EAST, 337.76 FEET; THENCE SOUTH 03 DEGREES 10 MINUTES 24 SECONDS EAST, 118.34 FEET; THENCE SOUTH 85 DEGREES 39 MINUTES 28 SECONDS WEST, 1023.15 FEET TO THE POINT OF BEGINNING.

**SURVEYOR'S NOTE**

THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES OTHER THAN THE STRUCTURE INVENTORY SHOWN HEREON.

**SURVEYOR'S CERTIFICATION**

TO ROSE GROVE, LLC, AND FIRST AMERICAN TITLE INSURANCE COMPANY:

THIS IS TO CERTIFY THAT THIS MAP OR PLAN AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2021 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 2, 4, 5, 7A, 8, 9, 11A, AND 11B OF TABLE A, THEREOF. THE FIELD WORK WAS COMPLETED ON 11/22/22.

DATE OF PLAT OR MAP: 12/02/22

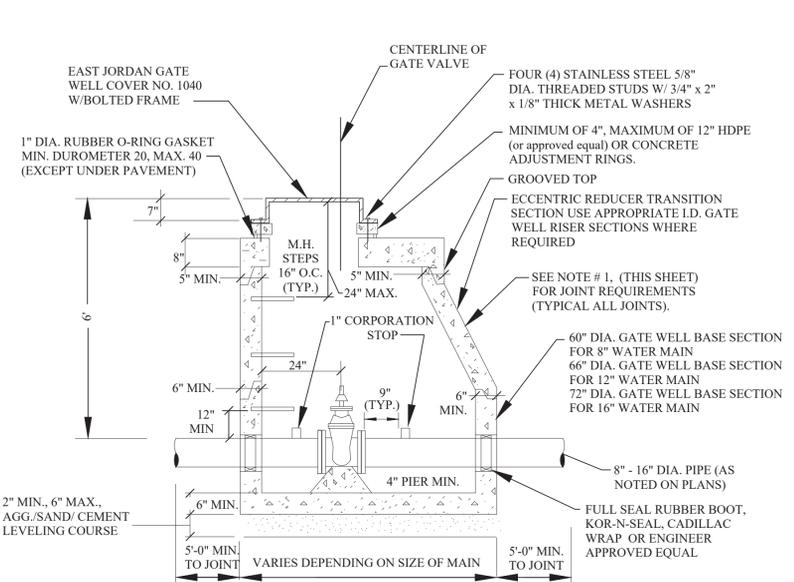
ANTHONY T. SYCKO, JR., P.S.  
PROFESSIONAL SURVEYOR  
MICHIGAN LICENSE NO. 47976  
22556 GRATIOT AVE., EASTPOINTE, MI 48021  
TSycko@kemtac-survey.com



PROFESSIONAL ENGINEERING, SURVEYING & ENVIRONMENTAL SERVICES  
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A GROUP OF COMPANIES  
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(800) 255-7222 (517) 758-9977 (734) 954-0888  
www.kemtacgroupofcompanies.com

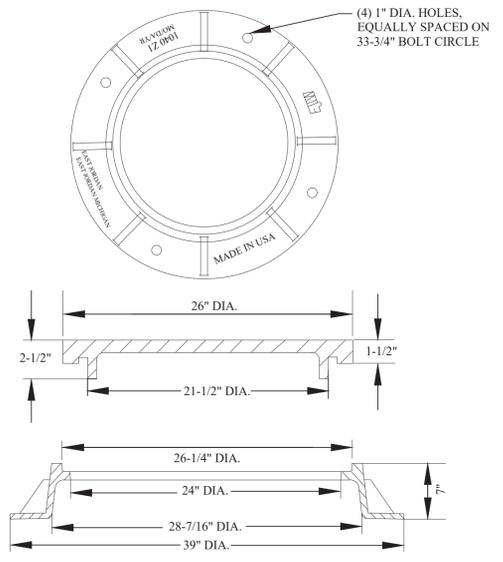
**ALTA / NSPS LAND TITLE SURVEY**  
PREPARED FOR: STONEFIELD ENGINEERING AND DESIGN  
2737 SOUTH ADAMS ROAD, ROCHESTER HILLS, MICHIGAN,  
PART OF SECTION 30,  
TOWN 3 NORTH, RANGE 11 EAST

DATE	BY	DESCRIPTION
12/02/22	JDM	NEW TITLE WORK
02/17/23	MRJ	ADDED TREE TAGS
12/09/22	JDM	REVISION
12/02/22	ATS	REVISION
DECEMBER 02, 2022		SCALE 1" = 40'
PROJECT NO. 22-03454		

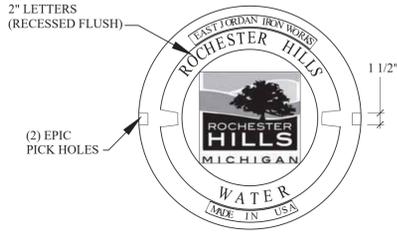


**ALL GATE WELLS**

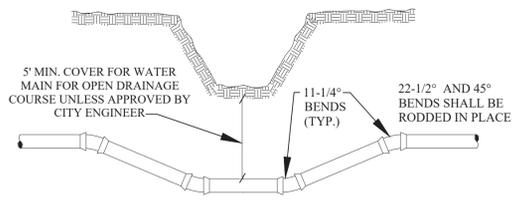
MANHOLE STEPS TO BE PLASTIC COATED STEEL MEETING THE REQUIREMENTS IN ASTM D 2146, TYPE II, GRADE 49108, MA. INDUSTRIES, P.S.I. POLYPROPYLENE OR APPROVED EQUAL. STEPS TO BE INSTALLED DURING MANHOLE MANUFACTURE, PLACED AT 16" C. TO C.



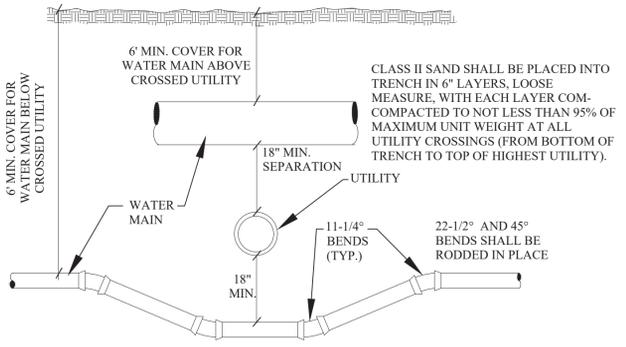
**FRAME**



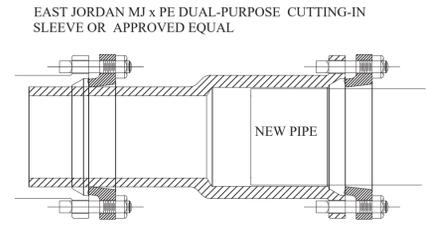
**LETTERING LAYOUT FOR GATE WELL COVERS**



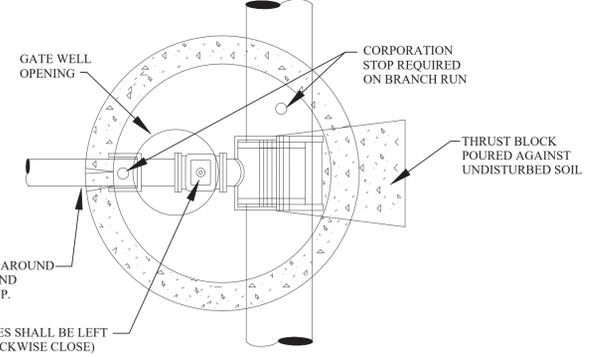
**DITCH CROSSING**



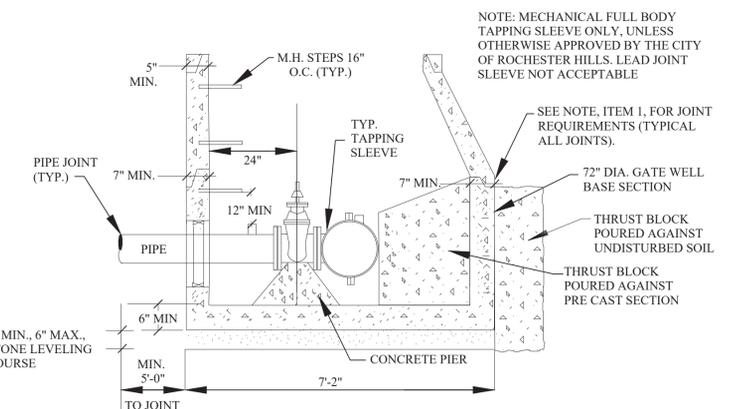
**UTILITY CROSSING**



**BOTTLE SLEEVE**



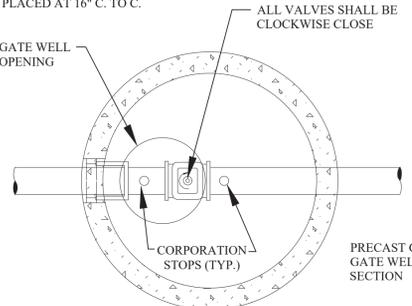
**PLAN TAPPING SLEEVE VALVE WELL (TYPICAL)**



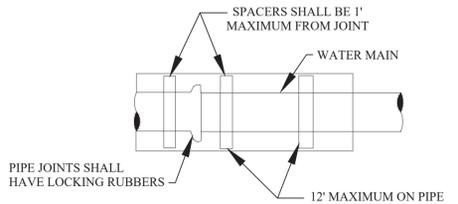
**TAPPING SLEEVE VALVE AND WELL (TYPICAL)**

**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 1 (i.e. 2'-0" 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; 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.
- 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.



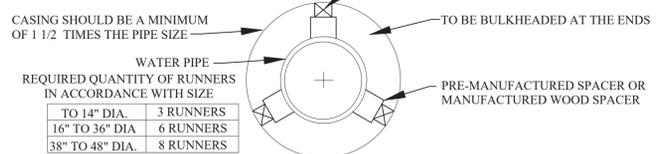
**GATE WELL (TYPICAL)**



**WATER MAIN IN CASING SECTION**

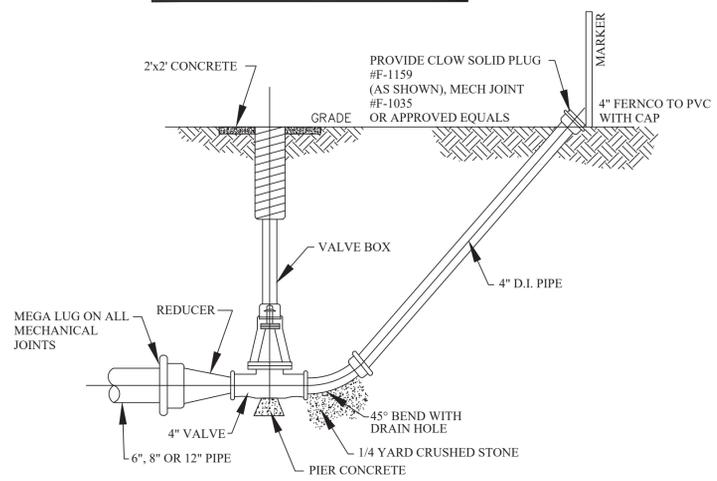
UNLESS OTHERWISE SPECIFIED, MINIMUM CASING PIPE SHALL BE ASTM A-139 GRADE B, WALL THICKNESS AS FOLLOWS:

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

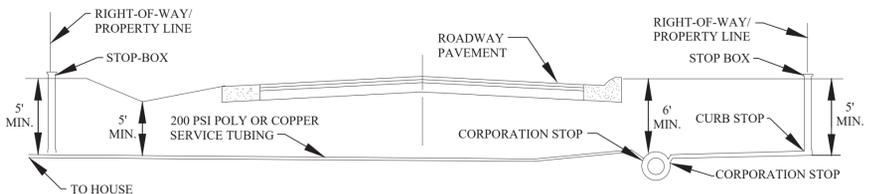


**SUPPORT FOR WATER MAIN CONSTRUCTED IN CASING PIPE**

TO	QUANTITY
TO 14" DIA.	3 RUNNERS
16" TO 36" DIA.	6 RUNNERS
38" TO 48" DIA.	8 RUNNERS

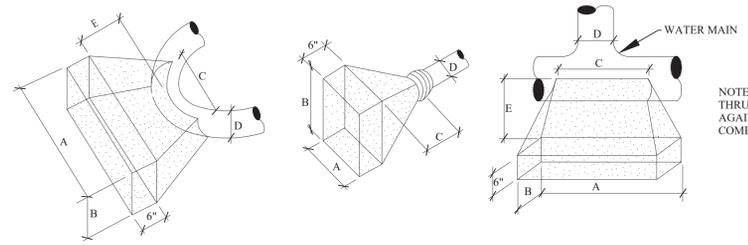


**DETAIL OF 4" BLOWOFF**



**TYPICAL PUBLIC ROAD WATER SERVICE CONNECTION**

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



**THRUST BLOCK DETAILS**



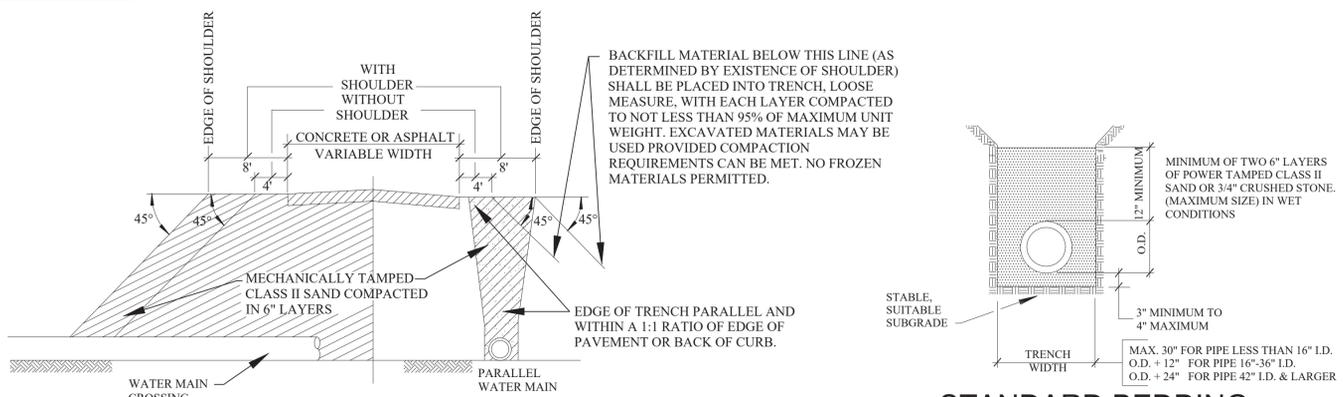
REVISIONS	DATE	APPROVED BY
		CITY COUNCIL, DATE: SEPTEMBER 23, 2019
		PREPARED BY ENGINEERING DIVISION DEPARTMENT OF PUBLIC SERVICES

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

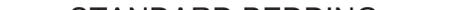
**City of Rochester Hills**  
1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

**WATER MAIN STANDARD DETAILS**

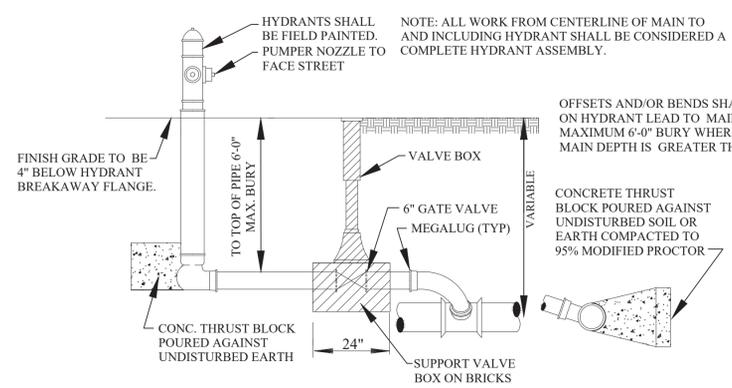
NOT TO SCALE DATE: 1/10/2018  
SHEET 1 OF 2



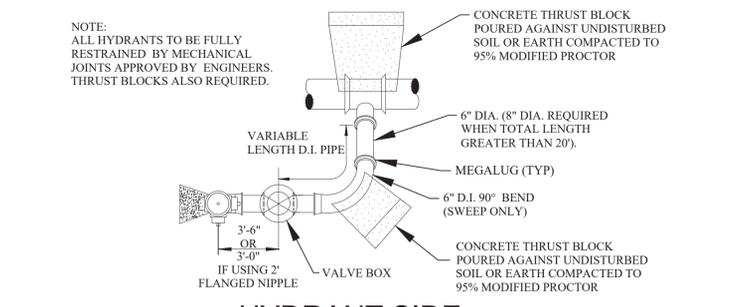
**MINIMUM BACKFILL UNDER OR WITHIN PAVEMENT INFLUENCE**



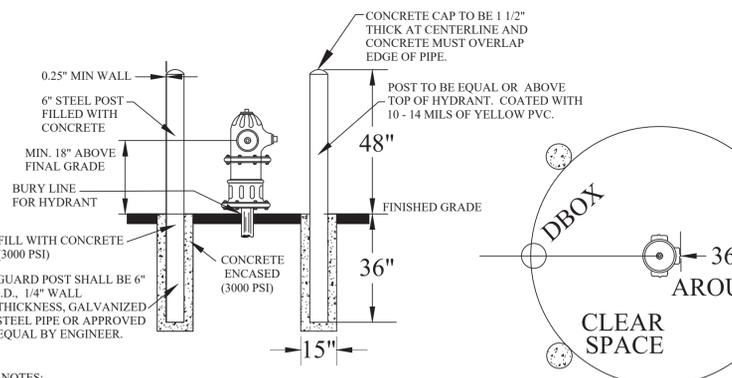
**STANDARD BEDDING FOR WATER MAIN**



**HYDRANT SIDE OUTLET OPTION**

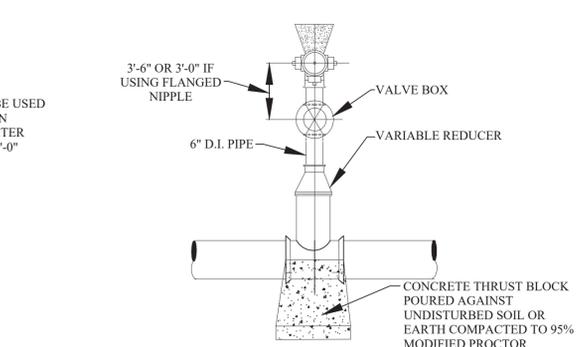


**HYDRANT SIDE OUTLET OPTION**

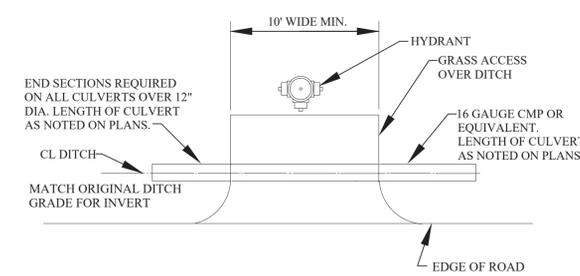


**GUARD POST**

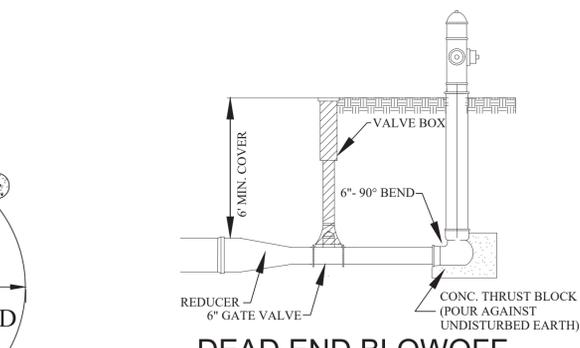
- NOTES:  
 1. GUARD POST SHALL NOT INTERFERE WITH HYDRANT OPERATION  
 2. TO BE INSTALLED IN ALL PAVED AREAS WHERE VEHICLE EQUIPMENT DAMAGE TO HYDRANT IS POSSIBLE.



**HYDRANT CONNECTION (TYPICAL)**



**DITCH ENCLOSURE AT HYDRANT/GATE WELL**



**DEAD END BLOWOFF CONNECTION**

**HYDRANT □ BLOWOFF DETAILS**

**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 COURSES.
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 DIP UNDER OTHER UTILITIES, THE SECTIONS WHICH ARE DEEPER THAN NORMAL SHALL BE CONSTRUCTED WITH 11-1/4° VERTICAL BENDS, 22 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. C478, 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 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.
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 NUT) 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 OPERATION 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 RESTRAINT SYSTEM, AS INDICATED 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 BACKFLOW PREVENTER WITH CURRENT CERTIFICATION.
2. CORPORATION STOPS USED FOR INSERTION INTO MAINS SHALL BE FORD TYPE B-44. ALL STOPS SHALL HAVE BRONZE CAST BODIES, KEYS, STEM WASHERS AND NUTS. INLET THREADS SHALL CONFORM TO THE LATEST VERSION OF AWWA C800.
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 DECISION 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 C151 (ANSI A21.5), EXCEPT AS OTHERWISE SPECIFIED HEREIN. PIPE SHALL BE DOUBLE CEMENT-LINED AND SEAL COATED WITH AN APPROVED BITUMINOUS SEAL COAT IN ACCORDANCE WITH AWWA C104 (ANSI A21.4).
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 C153 (ANSI A21.53). DUCTILE IRON FITTINGS SHALL BE RATED FOR 350 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.N.S.I./A.W.W.A. STANDARD SPECIFICATION D1248 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 10-MILS THICK, SUCH AS SCOTCHRAP, NO.50, POLYKEN NO. 900, OR TAPECOAT CT.

**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 IN LINE GATE VALVES EIGHT (8) INCH AND LARGER SHALL BE IN WELLS. SPECIFICATIONS SHALL INCLUDE THE DIRECTION OF OPERATION OF ALL VALVES (CLOCKWISE CLOSURE). VALVE BOX USE TO BE APPROVED BY ENGINEERING DIVISION.
3. ALL GATE WELL COVERS SHALL BE 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. 5-BR-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 MAIN 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 3 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 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. 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, LIE 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 ECT.).
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.

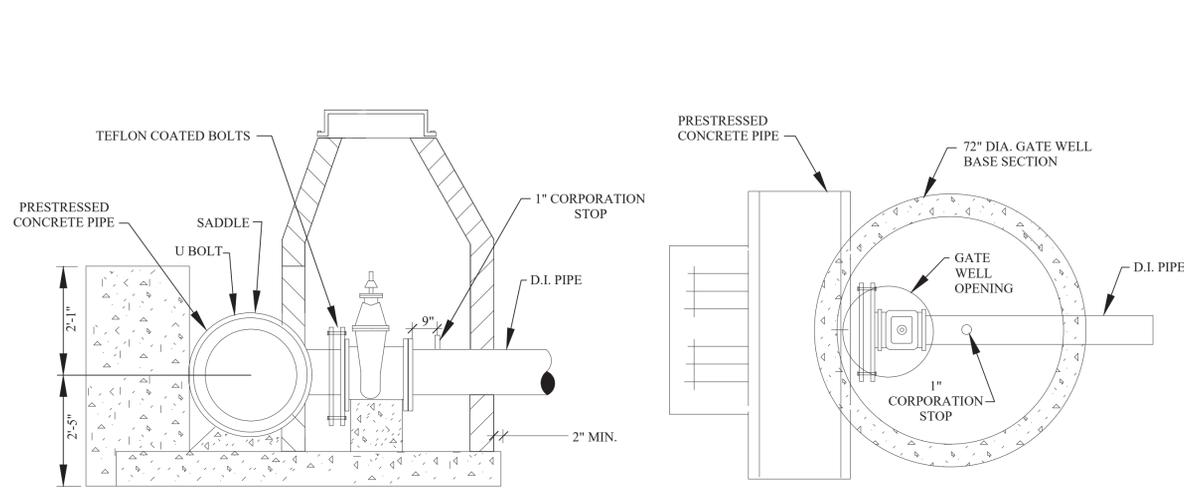


REVISIONS	DATE	APPROVED BY CITY COUNCIL, DATE: SEPTEMBER 23, 2019	NOTIFY ROCHESTER HILLS ENGINEERING DIVISION @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION
		PREPARED BY ENGINEERING DIVISION DEPARTMENT OF PUBLIC SERVICES	

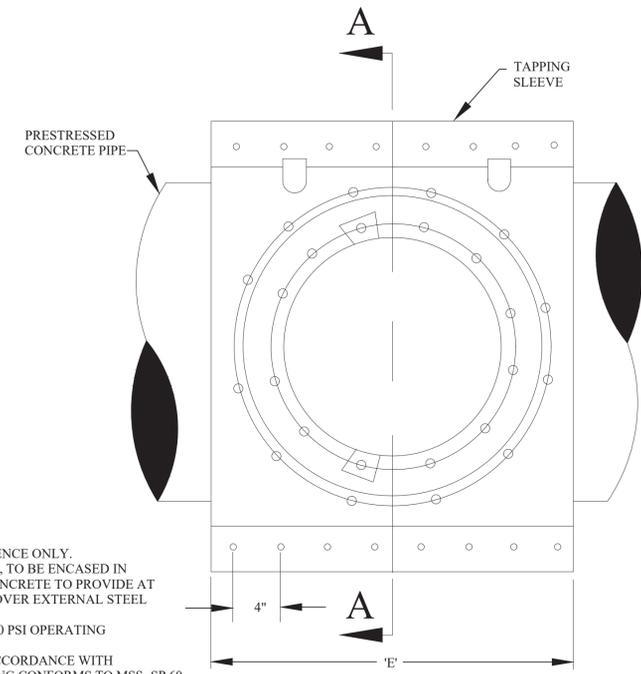
**City of Rochester Hills**  
 1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

**WATER MAIN STANDARD DETAILS**

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

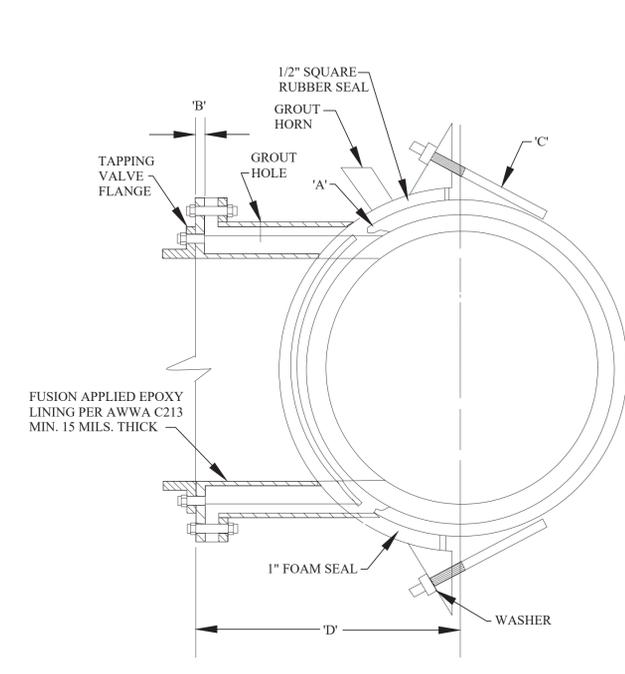


**CONCRETE PRESSURE TAP VALVE WELL ASSEMBLY WITH CONCRETE ENCASEMENT**



- 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.

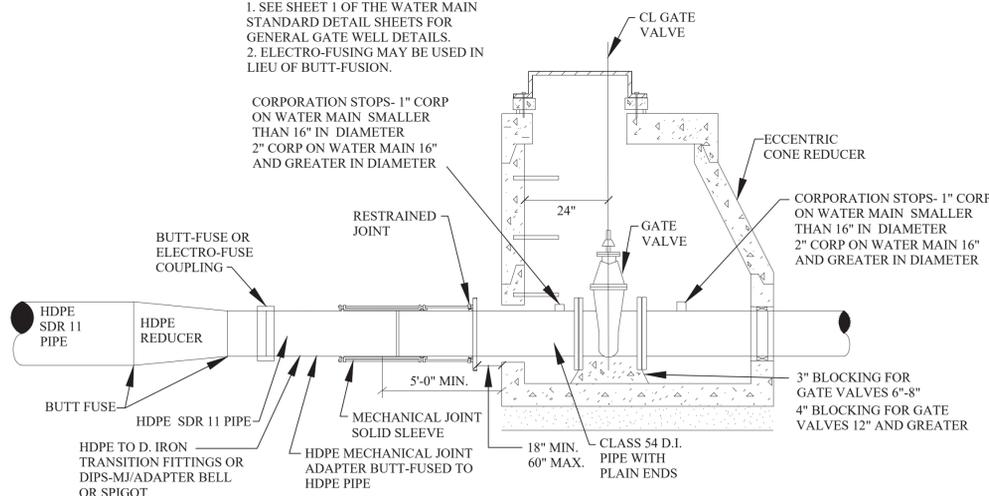
**CONCRETE TAPPING SLEEVE DETAILS**



**SECTION A-A**

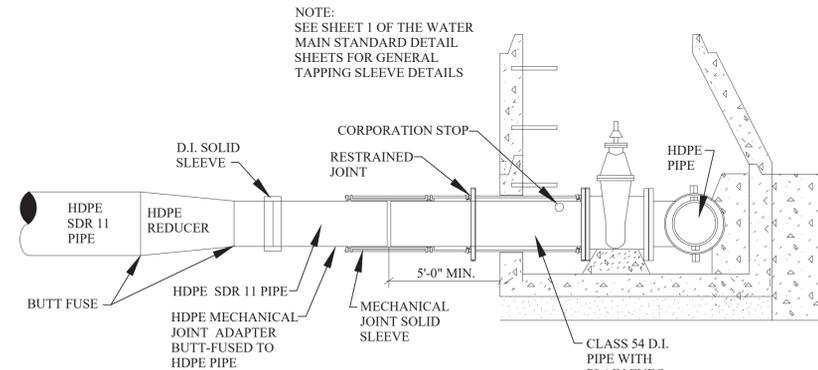
PIPE SIZE X TAP SIZE	A	B	C	D	E
16" X 4"	1/4"	7/8"	6"	14-1/16"	24"
16" X 6"	1/4"	1-1/8"	6"	14-5/16"	24"
16" X 8"	1/4"	1-1/8"	6"	14-5/16"	24"
16" X 10"	1/4"	1-3/8"	7"	14-9/16"	28"
16" X 12"	1/4"	1-3/8"	8"	14-9/16"	32"
20" X 4"	1/4"	7/8"	6"	16-1/2"	24"
20" X 6"	1/4"	1-1/8"	6"	16-1/2"	24"
20" X 8"	1/4"	1-1/8"	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. SEE SHEET 1 OF THE WATER MAIN STANDARD DETAIL SHEETS FOR GENERAL GATE WELL DETAILS.
  2. ELECTRO-FUSING MAY BE USED IN LIEU OF BUTT-FUSION.

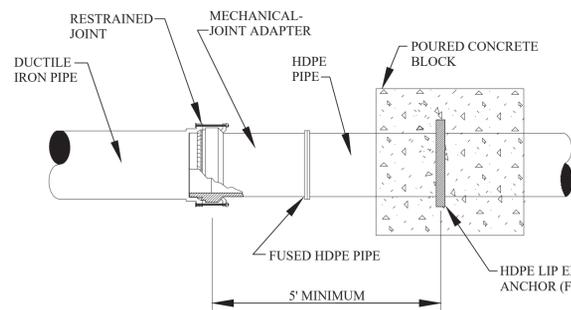


**TYPICAL GATE VALVE CONNECTION TO HDPE**

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

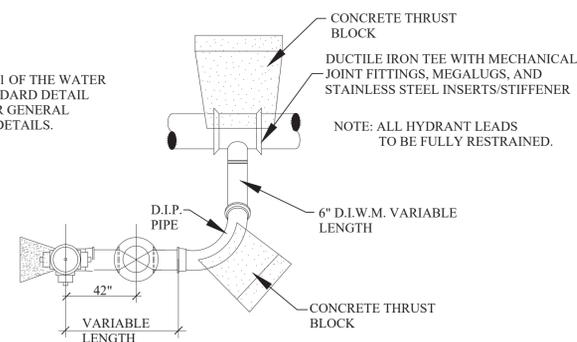


**TAPPING SLEEVE VALVE WELL**



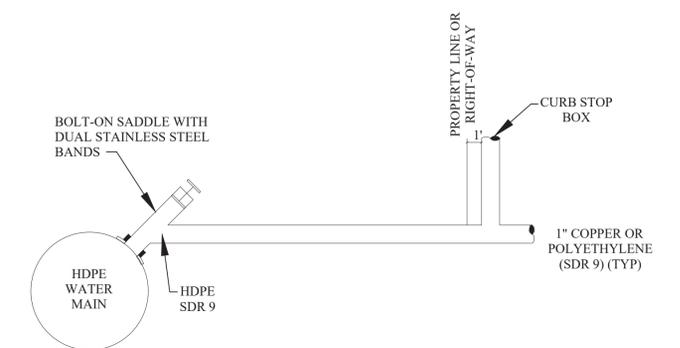
**MECHANICAL-JOINT ADAPTER**

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



**PLAN HYDRANT SIDE OUTLET**

- NOTE: ALL BURIED BOLTS SHALL BE CORTEN OR LOW ALLOY AND POLY-WRAPPED.



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

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

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

**WATER MAIN SPECIAL DETAILS**

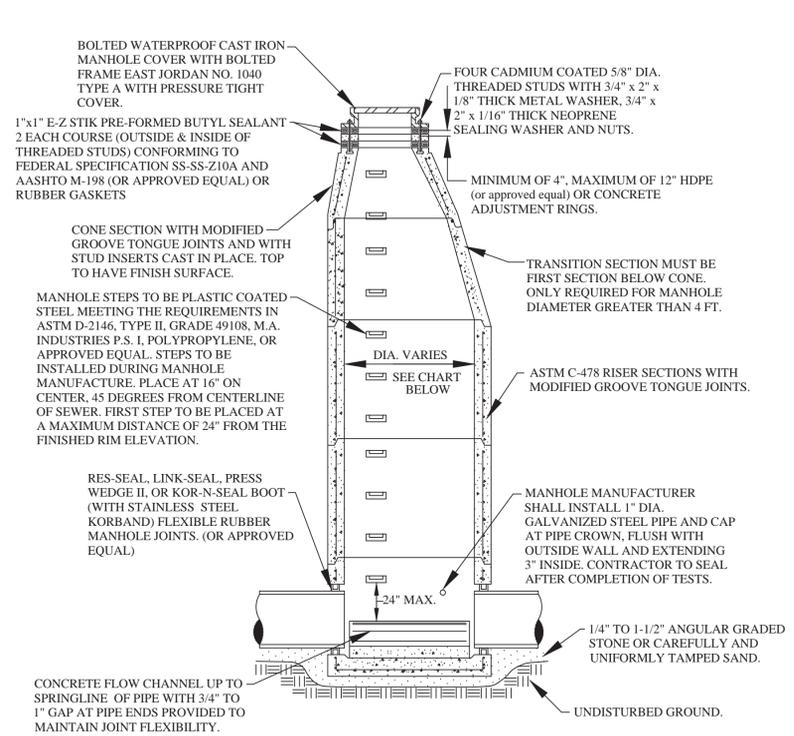
NOT TO SCALE DATE: 1/10/2019  
SHEET 1 OF 1



REVISIONS	DATE	APPROVED BY	NOTIFY ROCHESTER HILLS ENGINEERING DIVISION @ 248-841-2510 48 HRS. PRIOR TO START OF CONSTRUCTION
		CITY COUNCIL, DATE: SEPTEMBER 23, 2019	
		PREPARED BY ENGINEERING DIVISION DEPARTMENT OF PUBLIC SERVICES	

# SANITARY SEWER CONSTRUCTION NOTES

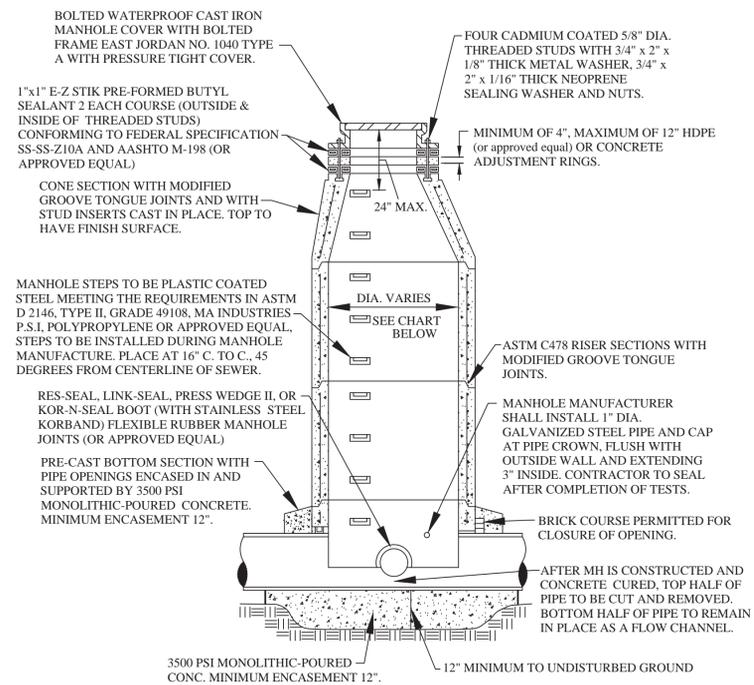
- ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF ROCHESTER HILLS AND THE OAKLAND COUNTY WATER RESOURCES COMMISSIONER (OCWRC). ALL SANITARY SEWER CONSTRUCTION SHALL HAVE FULL-TIME INSPECTION SUPERVISED BY THE CITY OF ROCHESTER HILLS INSPECTION SERVICES.
- NO 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 WATERTIGHT 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 WATERTIGHT 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 LAID.
- SELF-LEVELING ACCESS 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, WATERTIGHT 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, WATERTIGHT 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.
- AN 18 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.



## STANDARD MANHOLE

MANHOLE SIZING CHART

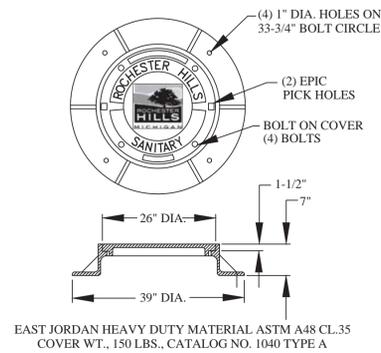
MANHOLE DIAMETER	MAX. PIPE SIZE FOR STRAIGHT THRU INST.	MAX. PIPE SIZE FOR RIGHT ANGLE INST.
4'	24"	18"
5'	36"	24"
6'	42"	36"
7'	60"	42"



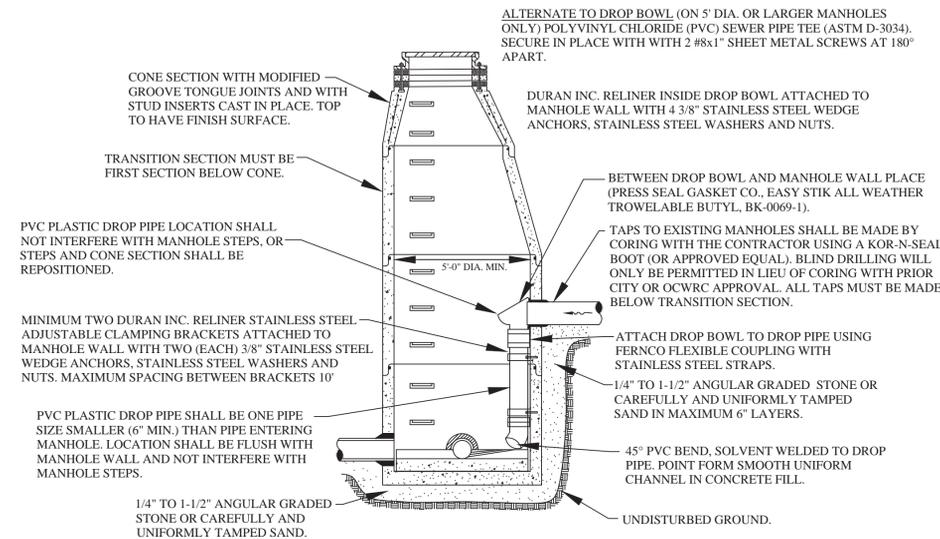
## MANHOLE CONSTRUCTED OVER EXISTING SEWER

MANHOLE SIZING CHART

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.

## 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 15% 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.



REVISIONS	DATE	APPROVED BY

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

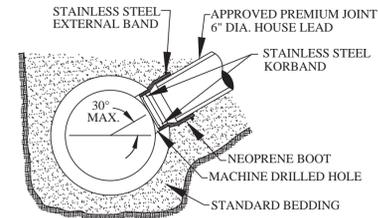
**City of Rochester Hills**  
1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

**SANITARY SEWER STANDARD DETAILS**

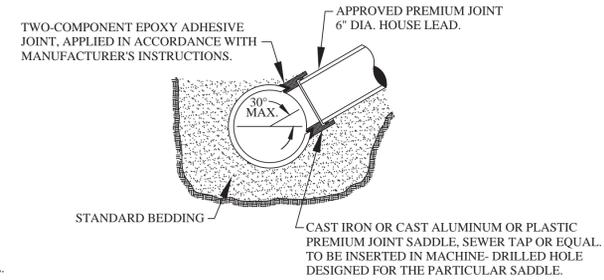
NOT TO SCALE	DATE: 1/10/2019
SHEET 1 OF 2	

# CITY OF ROCHESTER HILLS GRAVITY BUILDING LEAD REQUIREMENTS AND DETAILS

- ALL BUILDING LEAD WORK MUST BE PERFORMED UNDER THE CITY OF ROCHESTER HILLS INSPECTION.
- FOR ALL CITY OF ROCHESTER HILLS SYSTEMS CALL 248-841-2510 48-HOURS PRIOR TO SCHEDULING INSPECTION.  
FOR ALL OCWRC-OPERATED SYSTEMS, CALL 248-858-1110 48-HOURS IN ADVANCE PRIOR TO SCHEDULING INSPECTION.
- SANITARY SEWER MAY NOT BE USED AS A DE-WATERING OUTLET.
- 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.
- APPROVED BUILDING LEAD PIPE FOR GRAVITY SEWER LEADS:
  - PVC PLASTIC, ASTM D3034, SDR 23.5
  - SOLID WALL PVC SCHEDULE 40, ASTM D-2665
  - ANY DEVIATIONS FROM ABOVE SPECIFICATIONS REQUIRES APPROVAL BY CITY ENGINEER.
- ALLOWABLE TYPES OF SEWER PIPE ADAPTERS: FERNCO STRONGBACK COUPLING OR APPROVED EQUAL.
- 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.

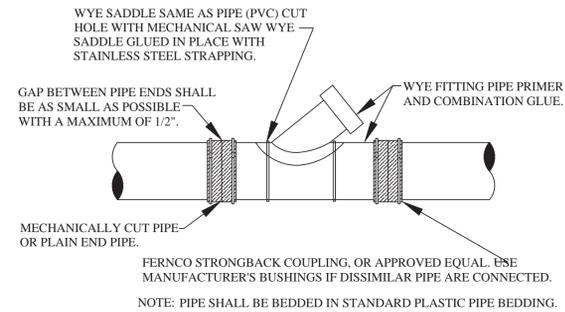


## KOR-N-TEE TAP FOR CONCRETE PIPE



NOTE: SURFACE OF MAIN SEWER SHALL BE CLEANED WITH AN ABRASIVE GRINDER PRIOR TO EPOXY APPLICATION. DUE TO VARIATION OF SET-UP TIME OF EPOXY ADHESIVE WITH TEMPERATURE, ANCHOR STRAPS SHALL BE USED TO SECURE SADDLE IN POSITION IN COLD WEATHER OR WHENEVER WORK IS TO PROCEED PRIOR TO COMPLETE CURE OF EPOXY.

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



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

- 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.
- 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).
- 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. \_\_\_\_\_

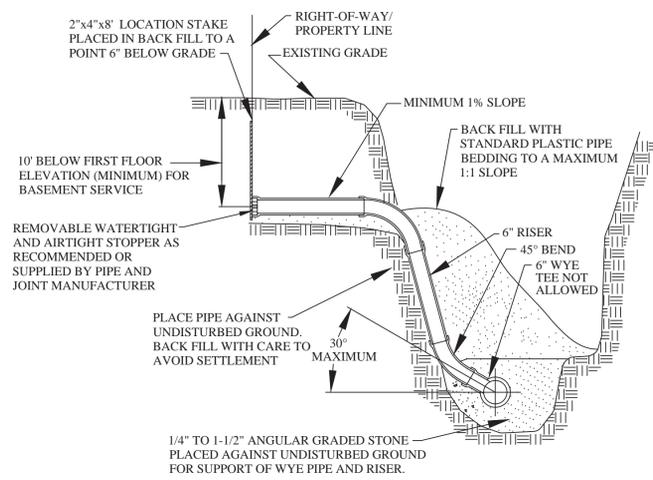
ENGINEER SEAL

- THE MAXIMUM SCALE SHALL BE ONE (1) INCH EQUALS FIFTY (50) FEET.
- THE SIZE, LENGTH, CLASS AND MANUFACTURER OF PIPE INSTALLED SHALL BE INDICATED.
- THE SIZE, MANUFACTURER AND MODEL NUMBERS OF ALL VALVES AND PUMPS INSTALLED SHALL BE INDICATED.
- A TOTAL AS-BUILT DRAWING QUANTITY LIST SHALL BE INCLUDED.
- THE LOCATIONS SHALL BE SHOWN ON THE PLANS WITH AN ACCURACY OF ONE (1) FOOT.
- THE OFFSET OF THE SANITARY MAIN FROM PROPERTY LINES SHALL BE INDICATED.
- ALL MANHOLES, VALVE WELLS, PUMPS AND ALL SANITARY SYSTEM APPURTENANCES SHALL BE LOCATED FROM TWO FIXED OBJECTS (MANHOLES, BUILDING CORNERS ETC.).
- ALL UNDERGROUND APPURTENANCES, SUCH AS TFC/ARV 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.
- THE ACCURATE LOCATION OF ALL UTILITY CROSSINGS WHERE THE VERTICAL SEPARATION IS LESS THAN 18" SHALL BE NOTED.
- AS-BUILTS SHALL BE PREPARED IN ACCORDANCE WITH CITY OF ROCHESTER HILLS AS-BUILT GUIDELINES AS PROVIDED AT THE PRE-CONSTRUCTION MEETING.

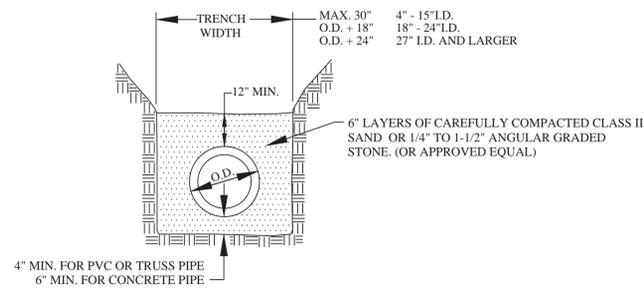


## SANITARY SEWER STANDARD DETAILS

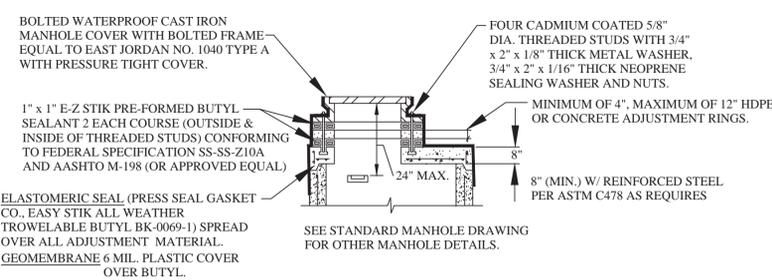
NOT TO SCALE DATE: 1/10/2019  
SHEET 2 OF 2



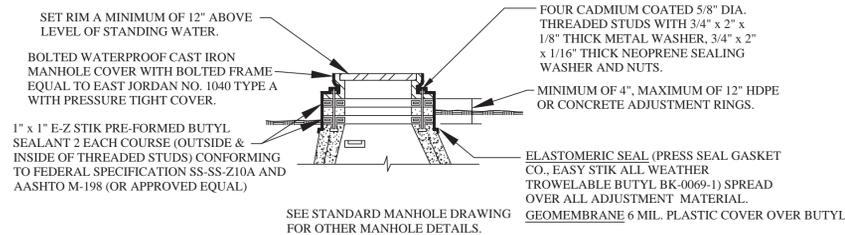
## HOUSE LEAD DETAIL



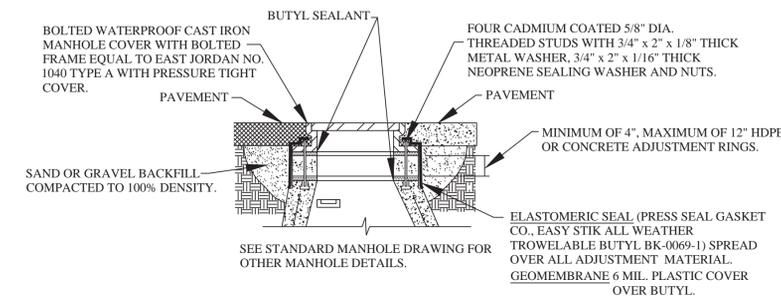
## STANDARD BEDDING (CLASS B)



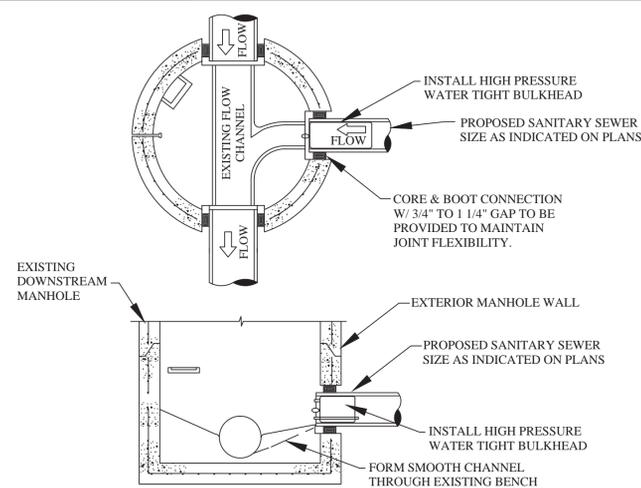
## FLAT TOP MANHOLE



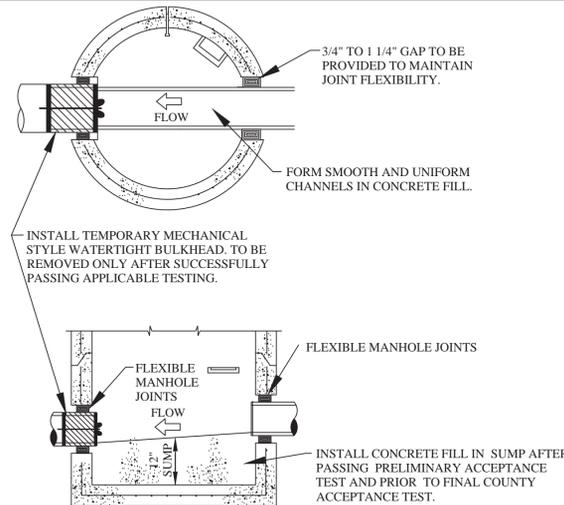
## ADJUSTMENT DETAIL FOR MANHOLE TOPS WITHIN FLOOD PRONE AREAS



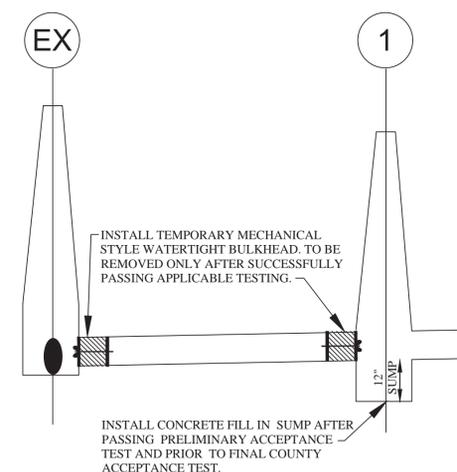
## ADJUSTMENT DETAIL MANHOLE TOPS WITHIN PAVEMENT AREAS



## TESTING BULKHEAD IN EXISTING MANHOLE



## FIRST MANHOLE UPSTREAM FROM SANITARY TAP



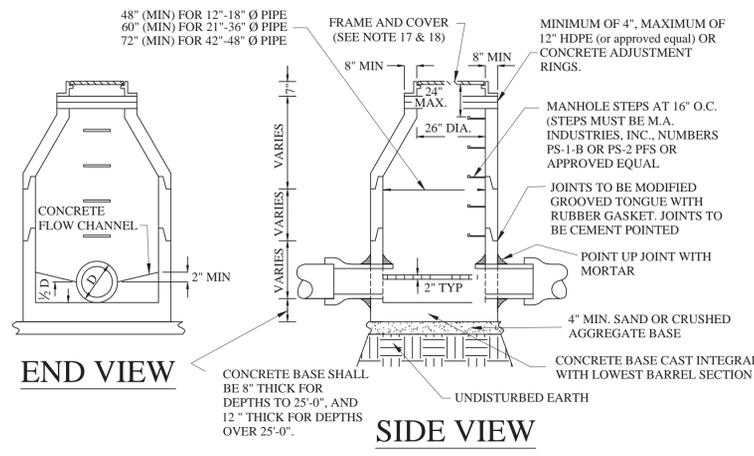
## PROFILE OF BULKHEADS AND ONE FOOT SUMP

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

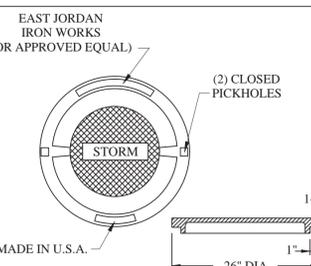
**City of Rochester Hills**  
1000 Rochester Hills Drive, Rochester Hills, Michigan 48309

REVISIONS	DATE	APPROVED BY CITY COUNCIL, DATE: _____

PREPARED BY ENGINEERING DIVISION  
DEPARTMENT OF PUBLIC SERVICES



**PRE-CAST STORM MANHOLE**



EAST JORDAN IRON WORKS (OR APPROVED EQUAL)

(2) CLOSED PICKHOLES

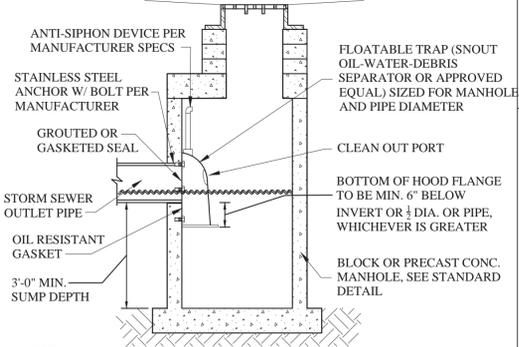
MADE IN U.S.A.

26" DIA.

1-1/2"

1"

EAST JORDAN HEAVY DUTY MATERIAL ASTM A48 CL.35 COVER WT. 150 LBS., CATALOG NO. 1040A PATTERN NO. 1040A, PRODUCT NO. 1040XX OAKCOSTD. 2" RAISED LETTERS, 1" RAISED LETTERS ALL RECESSED FLUSH



ANTI-SIPHON DEVICE PER MANUFACTURER SPECS

STAINLESS STEEL ANCHOR W/ BOLT PER MANUFACTURER

GROUTED OR GASKETED SEAL

STORM SEWER OUTLET PIPE

OIL RESISTANT GASKET

3'-0" MIN. SUMP DEPTH

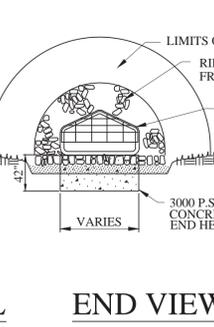
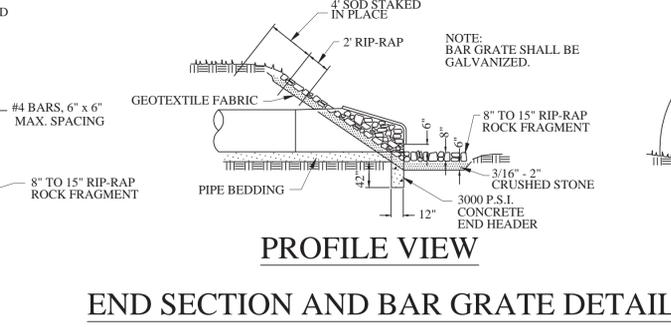
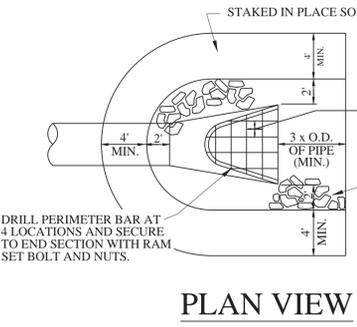
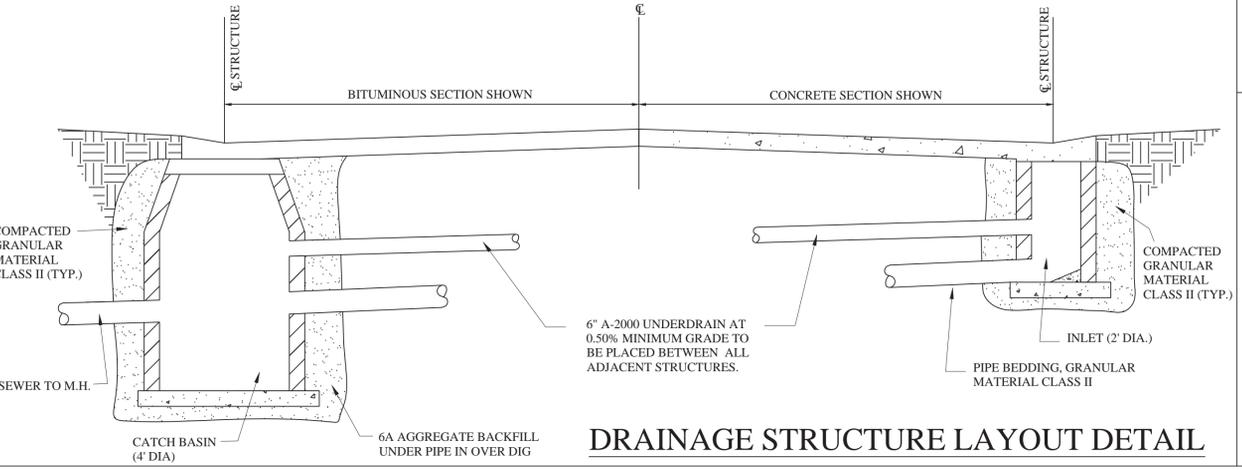
NOTE: QUANTITY OF FLOATABLE TRAPS REQUIRED FOR A SITE IS DEPENDENT ON TRAFFIC AND EXPECTED POLLUTANT LOAD. MINIMUM SUMP DEPTH TO BE 2 1/2 TIMES OUTLET PIPE DIAMETER OR 3 FEET, WHICHEVER IS GREATER. FLOATABLE TRAP AND ANTI-SIPHON DEVICE TO BE SIZED TO MANHOLE STRUCTURE.

FLOATABLE TRAP (SNOUT OIL-WATER-DEBRIS SEPARATOR OR APPROVED EQUAL) SIZED FOR MANHOLE AND PIPE DIAMETER

CLEAN OUT PORT

BOTTOM OF HOOD FLANGE TO BE MIN. 6" BELOW INVERT OR 1/4 DIA. OR PIPE, WHICHEVER IS GREATER

BLOCK OR PRECAST CONC. MANHOLE, SEE STANDARD DETAIL



REVISIONS	DATE	APPROVED BY

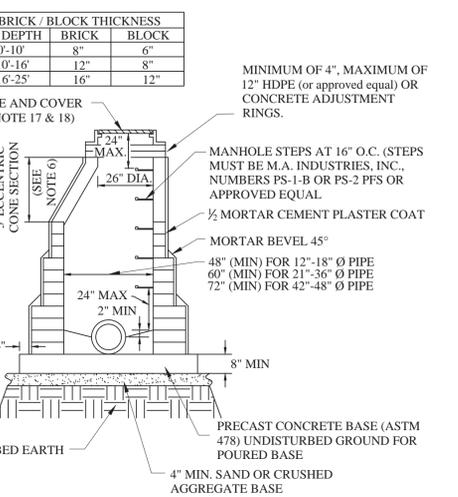
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APPROVED BY: \_\_\_\_\_

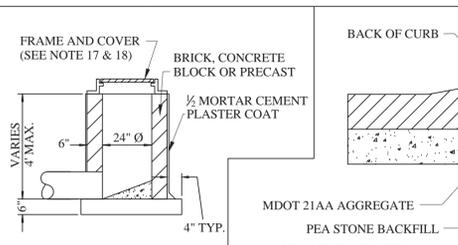
CITY COUNCIL, DATE: \_\_\_\_\_

PREPARED BY: ENGINEERING DIVISION  
DEPARTMENT OF PUBLIC SERVICES

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



**BRICK OR BLOCK MANHOLE**



(NOTE: PERMITTED BY CITY ONLY FOR SPECIAL CIRCUMSTANCES)

FRAME AND COVER (SEE NOTE 17 & 18)

BRICK, CONCRETE BLOCK OR PRECAST

1/2 MORTAR CEMENT PLASTER COAT

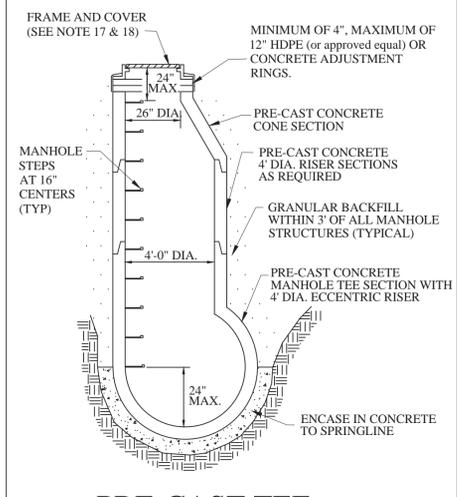
4" TYP.

MDOT 21AA AGGREGATE

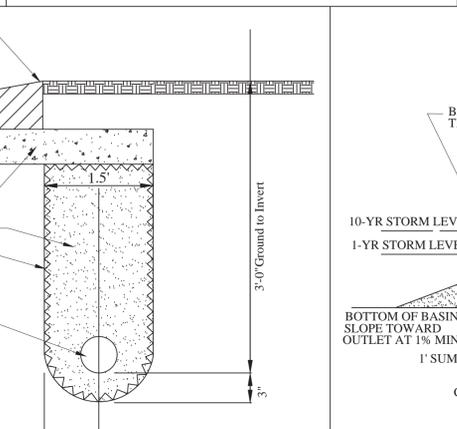
PEA STONE BACKFILL

WRAP TRENCH WITH GEOTEXTILE FABRIC, TYPE NW 8 OR APPROVED EQUAL

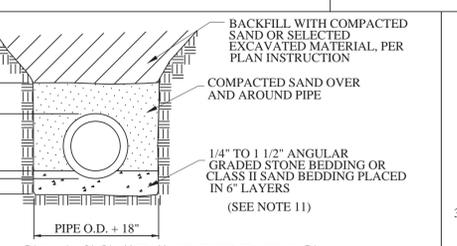
6 INCH CONTECH A-2000 PERFORATED PIPE OR APPROVED EQUAL



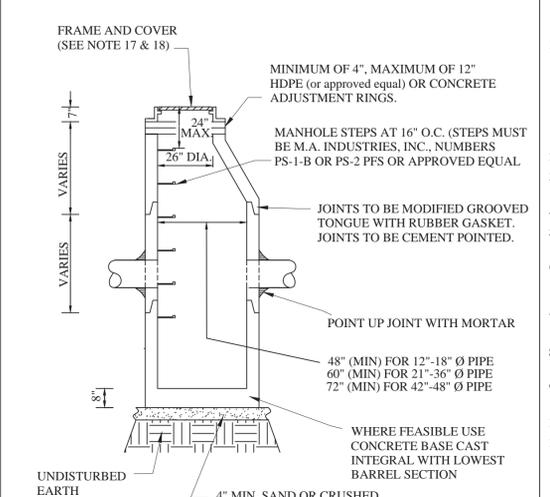
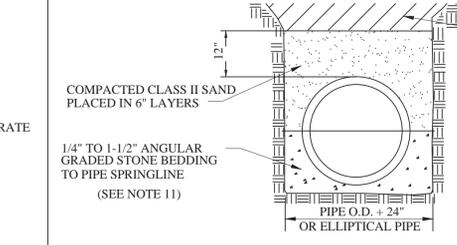
**PRE-CAST TEE MANHOLE DETAIL**



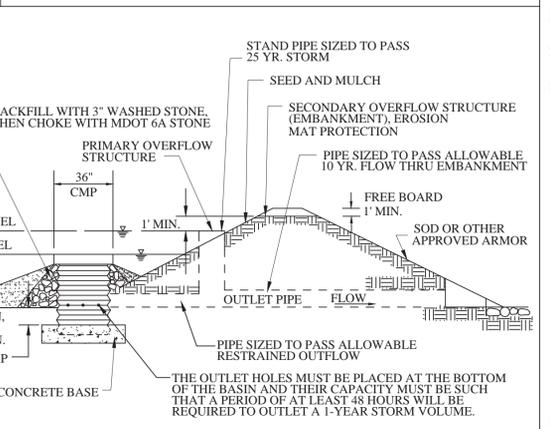
**EDGE DRAIN DETAIL**



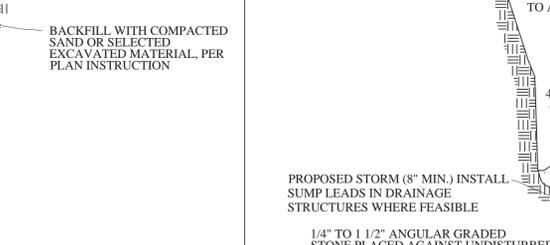
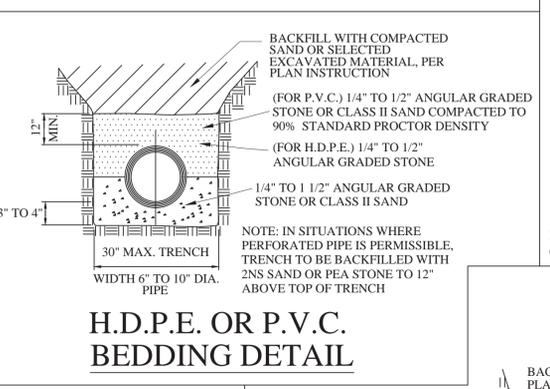
**CLASS "B" BEDDING TRENCH DETAIL FOR ELLIPTICAL OR 27" DIA. AND LARGER PIPE (CONCRETE OR METAL)**



**PRECAST STORM CATCH BASIN**



**SO-2 FOREBAY OUTLET FILTER (CMP)**

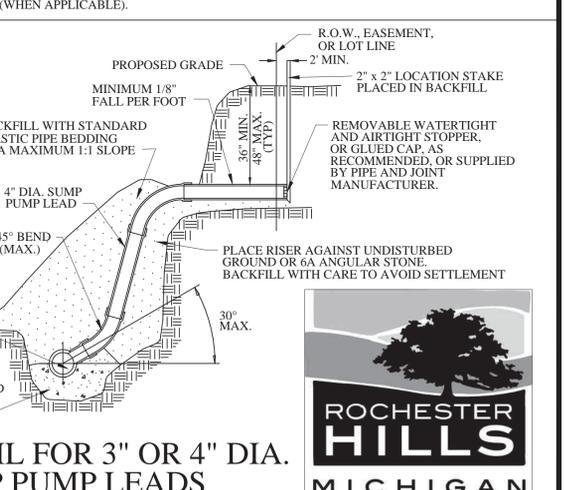


**HOUSE LEAD DETAIL FOR 3" OR 4" DIA. PLASTIC SUMP PUMP LEADS**

- GENERAL NOTES:**
- 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 TILES, SEWER LATERALS AND CULVERTS SHALL BE REPAIRED EXPEDITIOUSLY. DEBRIS COLLECTED SHALL BE DISPOSED IN A COMMERCIAL LANDFILL OR OTHER APPROVED LOCATION.
  - STORM SEWER PIPE SHALL BE OF SIZE AND TYPE NOTED ON THE APPROVED PLANS.
  - REINFORCED CONCRETE PIPE (RCP) SHALL BE MODIFIED GROOVED TONGUE JOINTS WITH O-RING TYPE RUBBER GASKET, PER ASTM C443.
  - ALL CATCH BASIN LEADS AND INLET LEADS SHALL BE ASTM C76-CLASS IV PIPE.
  - MINIMUM PIPE SIZE FOR SEWERS, CATCH BASINS LEADS, AND INLET LEADS SHALL BE 12" NOMINAL INTERNAL DIAMETER.
  - ECCENTRIC CONES SHALL BE PROVIDED ON ALL STRUCTURES, REGARDLESS OF THE MATERIAL USED. PRECAST REINFORCED CONCRETE MANHOLE, BLOCK, OR BRICK TO PROVIDE A TRUE VERTICAL FACE FOR PLACEMENT OF MANHOLE STEPS.
  - THE INSIDE JOINTS OF PIPES SIZES 42" AND LARGER DIAMETER SHALL BE POINTED UP WITH MORTAR UPON COMPLETION OF BACKFILLING OPERATIONS.
  - ALL PIPES SHALL HAVE CLASS, LOT NUMBER, AND DATE OF MANUFACTURE CONSPICUOUSLY MARKED ON EACH LENGTH BY MANUFACTURER.
  - ALL END SECTIONS 18" AND LARGER SHALL BE PROVIDED WITH A GALVANIZED BAR SCREEN.
  - PRECAST REINFORCED CONCRETE SECTIONS SHALL CONFORM TO ASTM 2478.
  - IN DRY, STABLE SOILS, PEASTONE (EQUIVALENT TO M.D.O.T. 34R SPECIFICATIONS) MAY BE SUBSTITUTED FOR THE STANDARD BEDDING. IF THE TRENCH IS WET OR UNSTABLE A GEOTEXTILE FABRIC MUST BE USED TO LINE THE TRENCH PRIOR TO THE PLACEMENT OF THE 2NS SAND, PEASTONE, OR 1/4" - 1-1/2" ANGULAR GRADED STONE.
  - SCHEDULE INSPECTIONS 48 HOURS PRIOR TO START OF CONSTRUCTION BY CALLING THE CITY'S INSPECTION LINE AT 248-841-2510. FULL TIME INSPECTION SHALL BE REQUIRED FOR ALL UNDERGROUND STORM SEWER CONSTRUCTION.
  - THE CONTRACTOR SHALL CONTACT MISS DIG 72 HOURS BEFORE CONSTRUCTION AT (811) TO LOCATE EXISTING UNDERGROUND UTILITIES.
  - PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL HAVE IN HIS POSSESSION A CURRENT SOIL EROSION CONTROL PERMIT AS ISSUED BY THE OCWRC.
  - MINIMUM SUMP DEPTH IS 2' FOR CATCH BASINS, MINIMUM SUMP DEPTH IS 3' FOR CATCH BASINS WITH FLOATABLE TRAP INSTALLATIONS.
  - AS A MEANS OF INSURING PROPER INSTALLATION OF THE STORM SEWER PIPE, AT THE DISCRETION OF THE CITY ENGINEER, THE CONTRACTOR SHALL VIDEO INSPECT, ACCORDING TO THE CITY OF ROCHESTER HILLS VIDEO INSPECTION STANDARDS, 100% OF THE STORM SEWER PIPE 12" AND LARGER IN DIAMETER. IF VIDEO INSPECTION IS REQUIRED BY THE CITY ENGINEER 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 VIDEO INSPECTION STANDARDS.
- PROJECTS THAT THE CITY ENGINEER MAY IMPOSE THESE REQUIREMENTS ARE:
- ALL PUBLIC PROJECTS OR PROJECTS BEING CONSTRUCTED ON PUBLIC PROPERTY.
  - ANY PROJECT INVOLVING A DEVELOPMENT, SUBDIVISION, SITE CONDOMINIUM, OR ASSOCIATION.
  - ANY PROJECT THAT WILL RESULT IN MORE THAN ONE OWNER RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF THE COMPLETE STORM DRAINAGE SYSTEM.

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

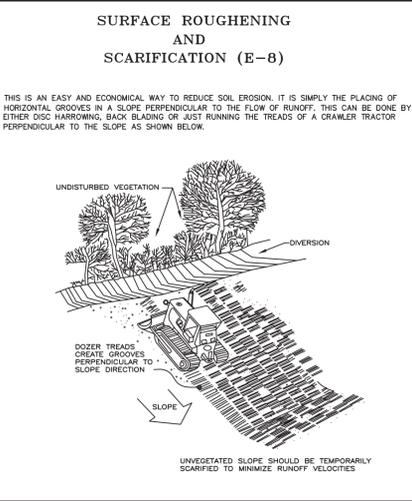
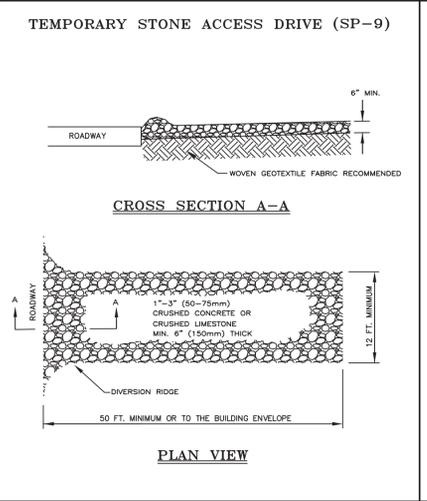
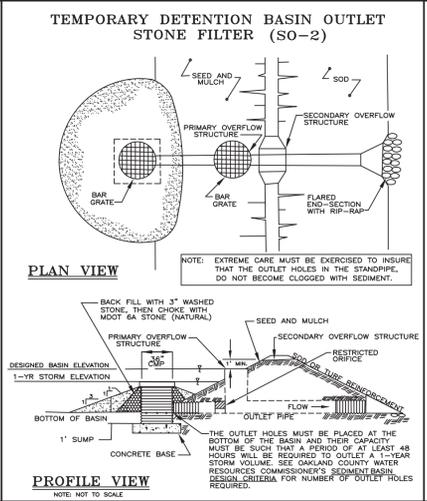
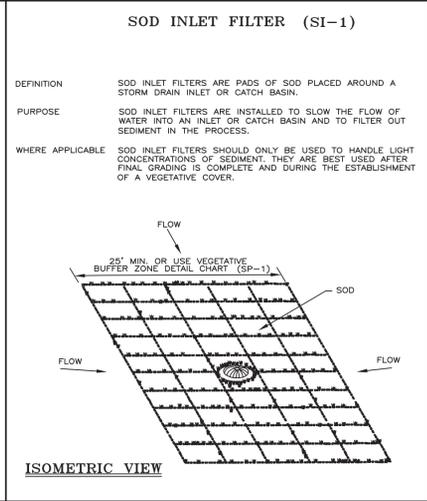
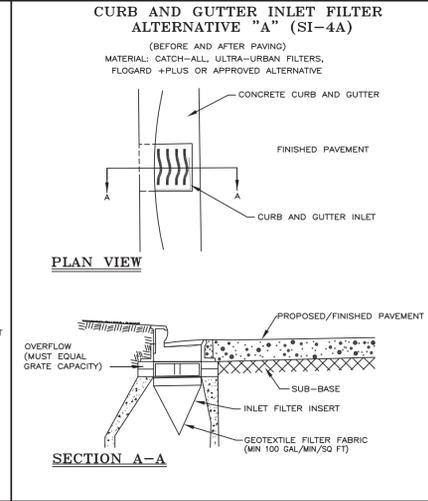
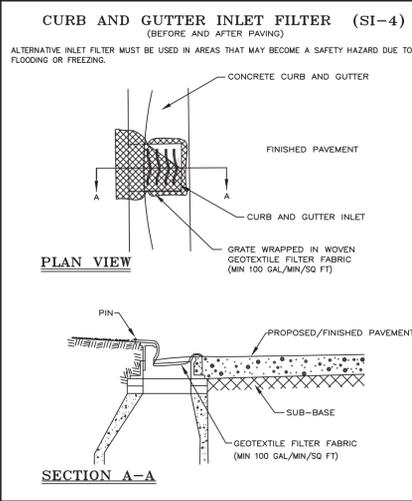
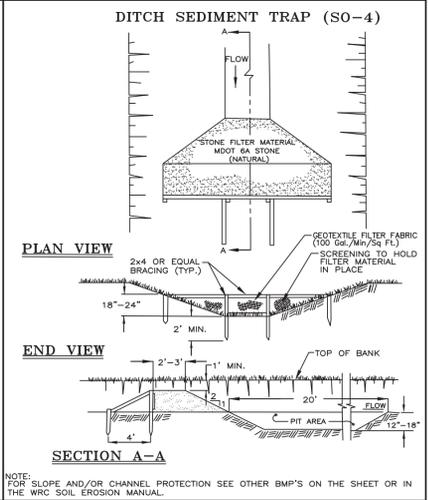
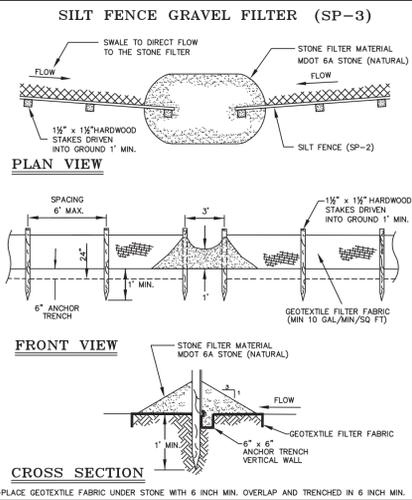
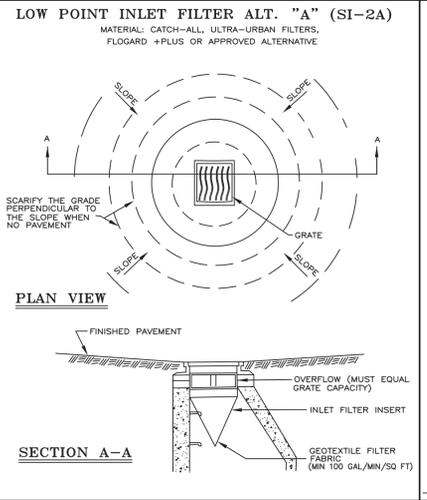
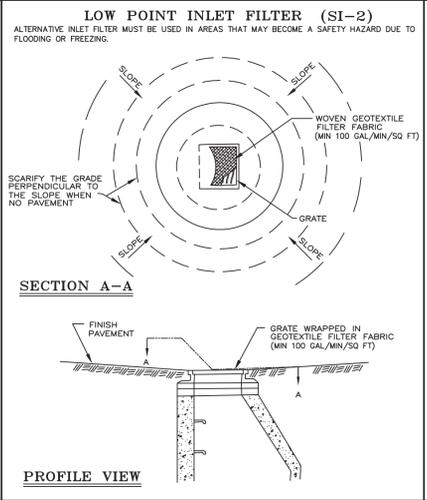
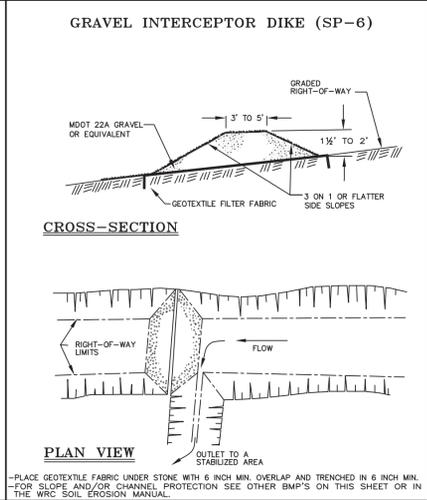
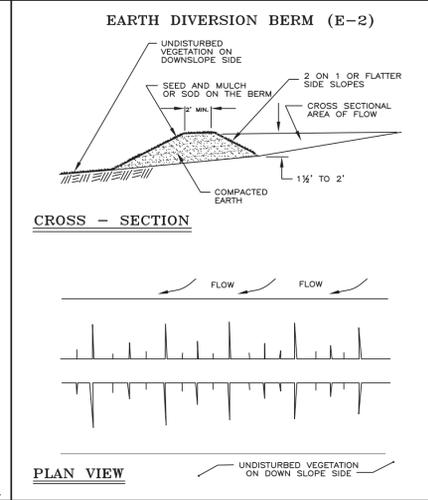
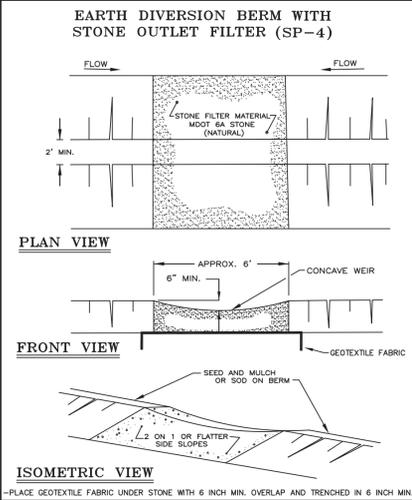
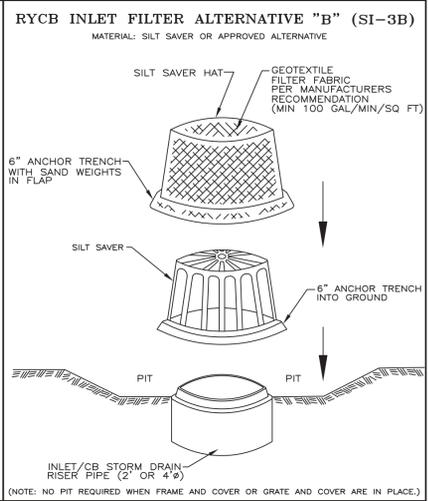
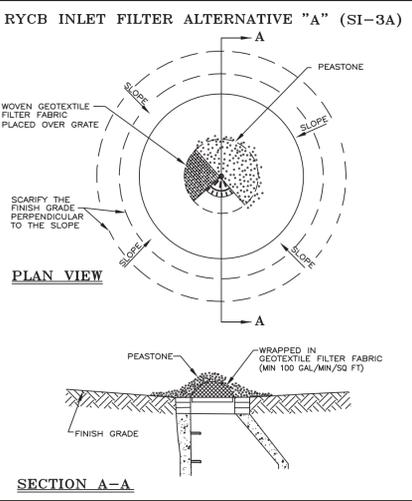
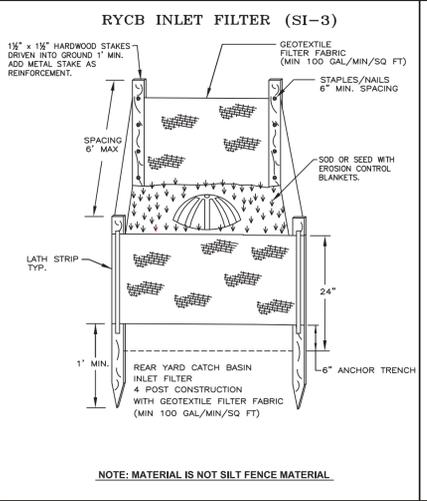
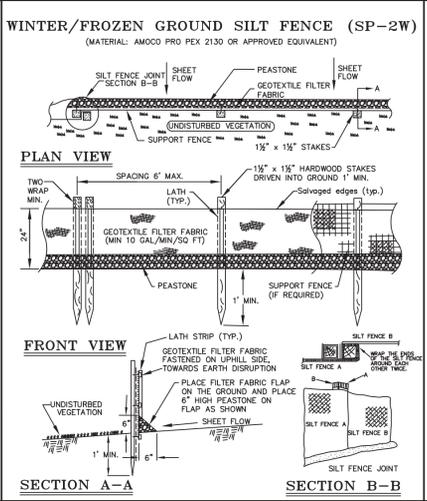
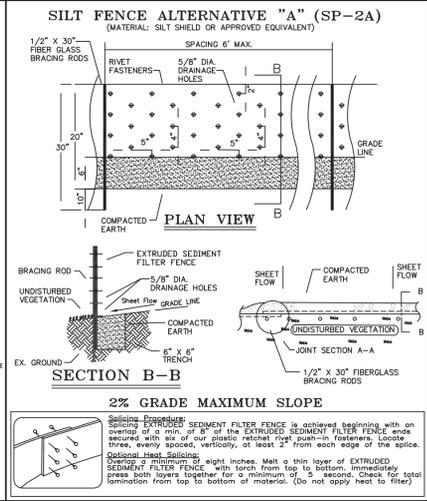
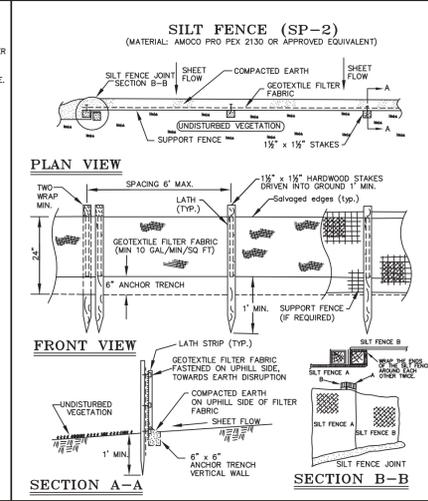
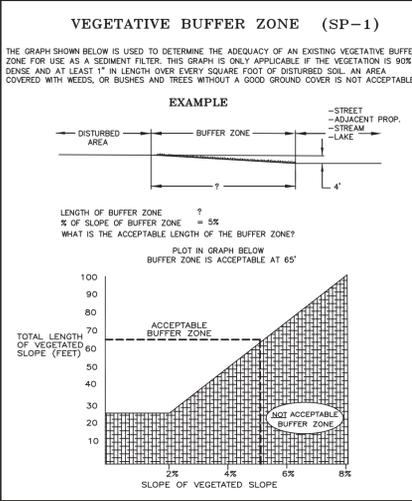
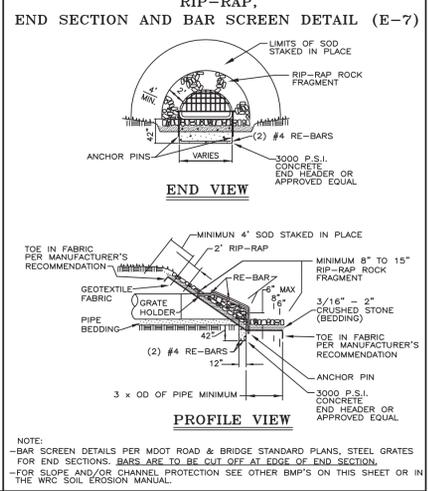
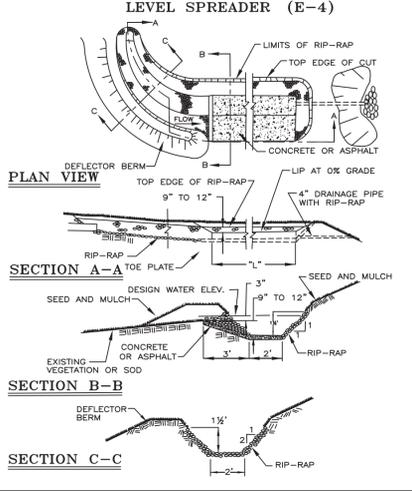
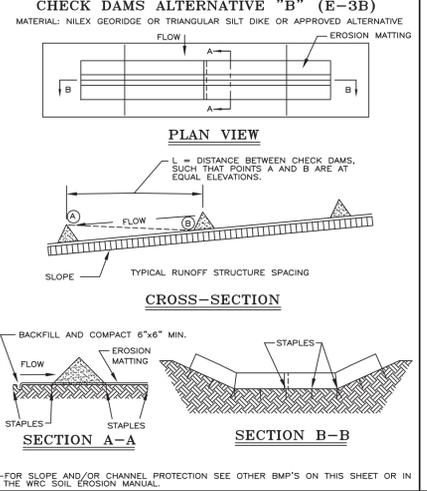
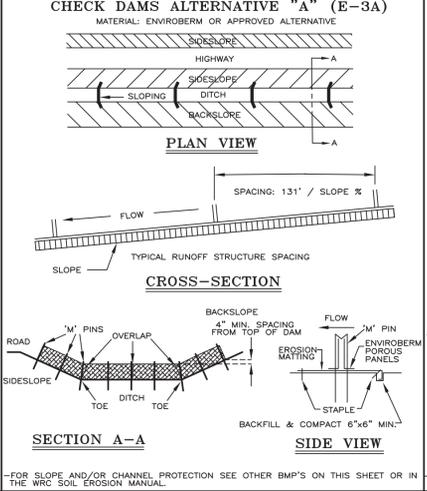
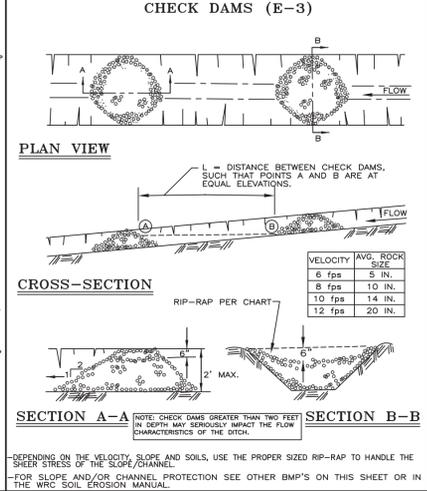
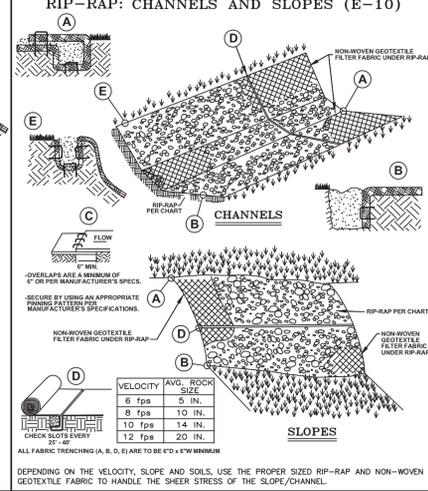
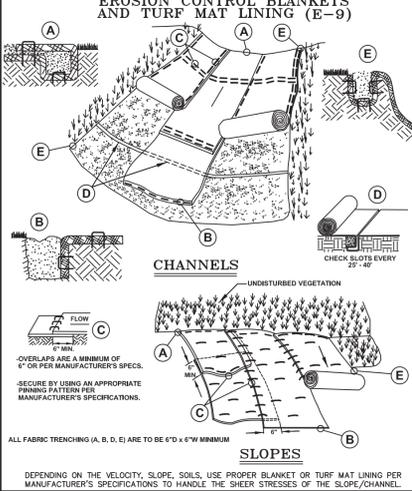
- MANHOLE FRAME AND COVER SHALL BE EJ 1040, TYPE A COVER OR EQUIVALENT.
  - CATCH BASINS AND INLET FRAME AND COVER SHALL BE AS FOLLOWS:
    - EJ 7045 WITH TYPE M1 GRATE AND 7050 T2 ADJUSTABLE BACK, OR EQUAL, FOR USE WITH CONCRETE CURB AND GUTTER, (STRAIGHT CURB/ M.D.O.T. F CURB) AND WITH CONCRETE PAVEMENT WITH INTEGRAL CURB.
    - EJ 7085 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.
    - EJ 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.
    - EJ FRAME 1040 WITH TYPE N OVAL GRATE OR TYPE O2 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.
    - EJ FRAME 7045Z WITH TYPE M4 VANE STYLE INLET GRATE (RIGHT HAND FLOW OR LEFT HAND FLOW) AND 7060 T1 BACK OR 7050 T2 BACK DEPENDING ON CURB STYLE, OR EQUAL, FOR USE WITH RELIEF BASINS WHICH ARE ON LONGITUDINAL ROAD SLOPES OF 4% OR GREATER.
    - EJ FRAME 5100 WITH TYPE M1 SINUSOIDAL GRATE, OR EQUAL, FOR USE IN NON-CURB PAVEMENT AREAS.
- NOTE: COVERS MUST HAVE THE "DUMP NO WASTE! DRAINS TO WATERWAY" LETTERING (WHEN APPLICABLE).



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

**STORM SYSTEM STANDARD DETAILS**





**NOTE:**

WHILE PERFORMING WORK INVOLVING GROUNDS MAINTENANCE AND/OR THE CONSTRUCTION/MAINTENANCE OF ANY INFRASTRUCTURE, INCLUDING ROADS, WATER MAINS, SANITARY SEWERS, STORM DRAINS AND STORM WATER BEST MANAGEMENT PRACTICES (BMPs), CONTRACTORS SHALL MINIMIZE POLLUTION FROM STORM WATER RUNOFF THAT CAN AFFECT WATER QUALITY RELATED TO WORK ACTIVITIES. POLLUTANTS THAT COULD IMPAIR WATER QUALITY MAY INCLUDE FUEL, GREASE AND OIL, NUTRIENTS, BACTERIA AND PATHOGENS, LITTER AND DEBRIS, AND SOIL EROSION AND SEDIMENTATION. APPLICABLE BMPs SHALL BE IMPLEMENTED BY THE CONTRACTOR TO THE MAXIMUM EXTENT PRACTICABLE TO PROTECT WATER QUALITY AND WILDLIFE HABITAT.

### SOIL EROSION AND SEDIMENTATION CONTROL DETAILS

REV.	DATE	DESCRIPTION
1	01/01/01	ISSUED FOR PERMITS
2	01/01/01	PROPOSED DETAIL REVISIONS
3	01/01/01	FOR CONSTRUCTION APPROVAL, NAME CHANGES
4	01/01/01	FOR CONSTRUCTION APPROVAL, NAME CHANGES
5	01/01/01	FOR CONSTRUCTION APPROVAL, NAME CHANGES

ORIG. DATE: 01/01/01

SCALE: NONE

DESIGNED BY: WRC

DRAWN BY: Mapping

WRC WATER RESOURCES COMMISSIONERS

ONE PUBLIC WORKS DRIVE, BLDG 95 WEST WATERFORD MICHIGAN 48326-1907

SHEET NO.: 1 of 1

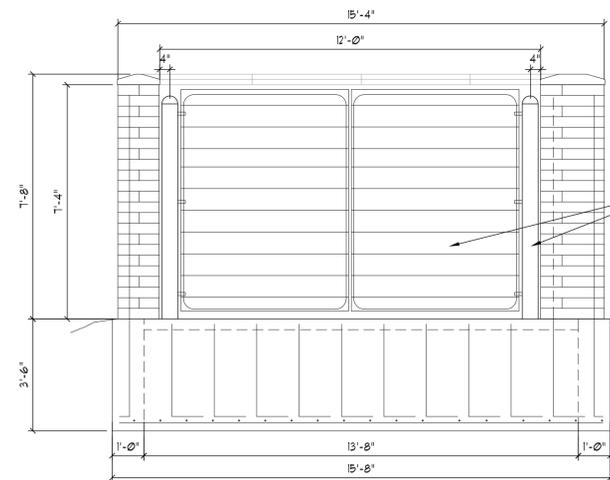








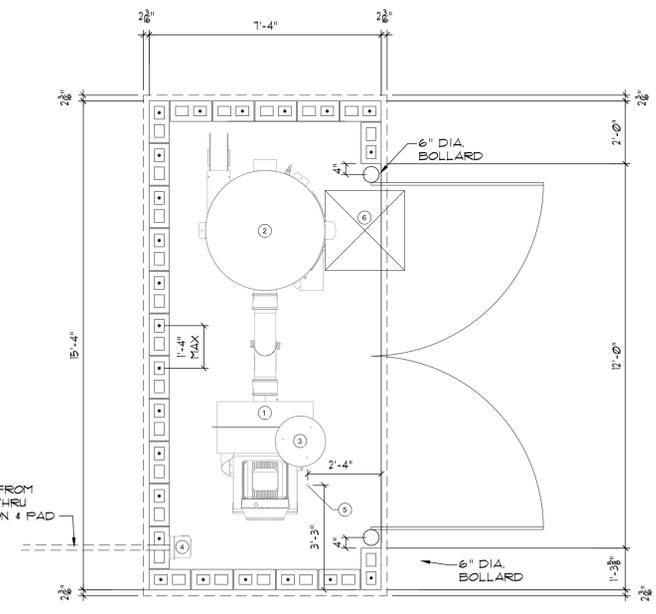
103 WIND HAVEN DR, STE 101  
NICHOLASVILLE KY 40356  
859.523.1500



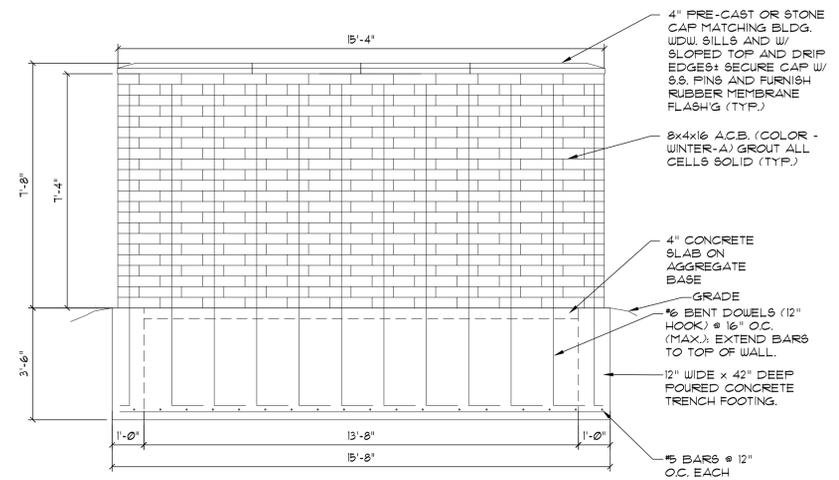
FRONT ELEVATION

STEEL GATES, MATCH COLOR OF BUILDING. HINGES TO BE WELDED TO 6" GALVANIZED STEEL BOLLARDS TO PREVENT SLIPPING. SEE GATE DETAIL ON CIVIL SHEETS FOR ADDITIONAL INFO.

GRADE  
RUN THREE CONDUITS FROM BUILDING THRU FOUNDATION & PAD

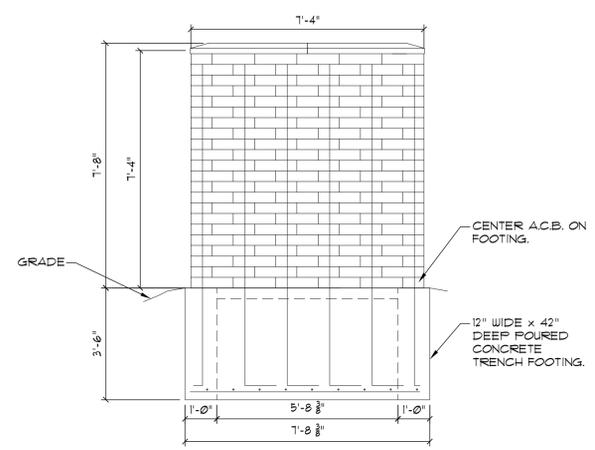


PLAN VIEW



REAR ELEVATION

4" PRE-CAST OR STONE CAP MATCHING BLDG. WDW. SILLS AND W/ SLOPED TOP AND DRIP EDGES. SECURE CAP W/ S.S. FINS AND FURNISH RUBBER MEMBRANE FLASHING (TYP.)  
8x4x16 A.C.B. (COLOR - WINTER-A) GROUT ALL CELLS SOLID (TYP.)  
4" CONCRETE SLAB ON AGGREGATE BASE  
GRADE  
#6 BENT DOWELS (12" HOOK) @ 16" O.C. (MAX.) EXTEND BARS TO TOP OF WALL.  
12" WIDE x 42" DEEP FOURSIDE CONCRETE TRENCH FOOTING.  
#5 BARS @ 12" O.C. EACH WAY (TYP.)



SIDE ELEVATION

CENTER A.C.B. ON FOOTING.  
12" WIDE x 42" DEEP FOURSIDE CONCRETE TRENCH FOOTING.

VACUUM ENCLOSURE DETAIL  
SCALE: 3/8" = 1'-0"

REFER TO SITE PLAN FOR LOCATION

REVISION	DATE

06/14/2023  
Permit Set  
PROJECT NUMBER  
2737 S. Adams Rd.  
DRAWN BY: REB

WhiteWater Carwash  
2737 S. Adams Rd.  
Rochester Hills, MI 48309  
Monument Sig & Vac. Enclosure Details

SHEET NUMBER  
S0.1





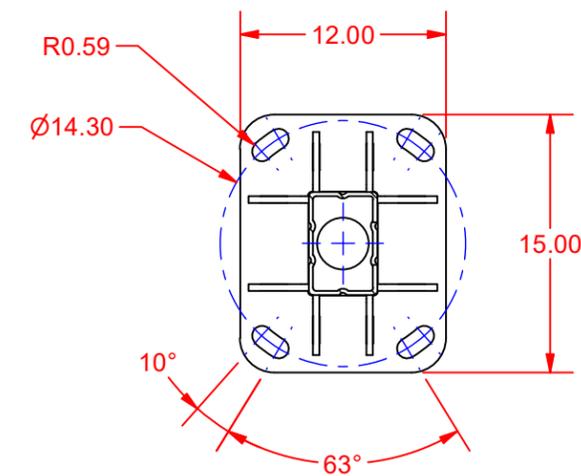
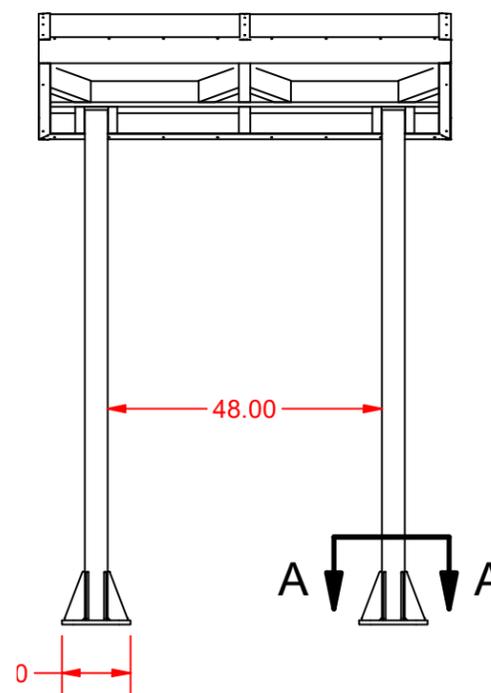
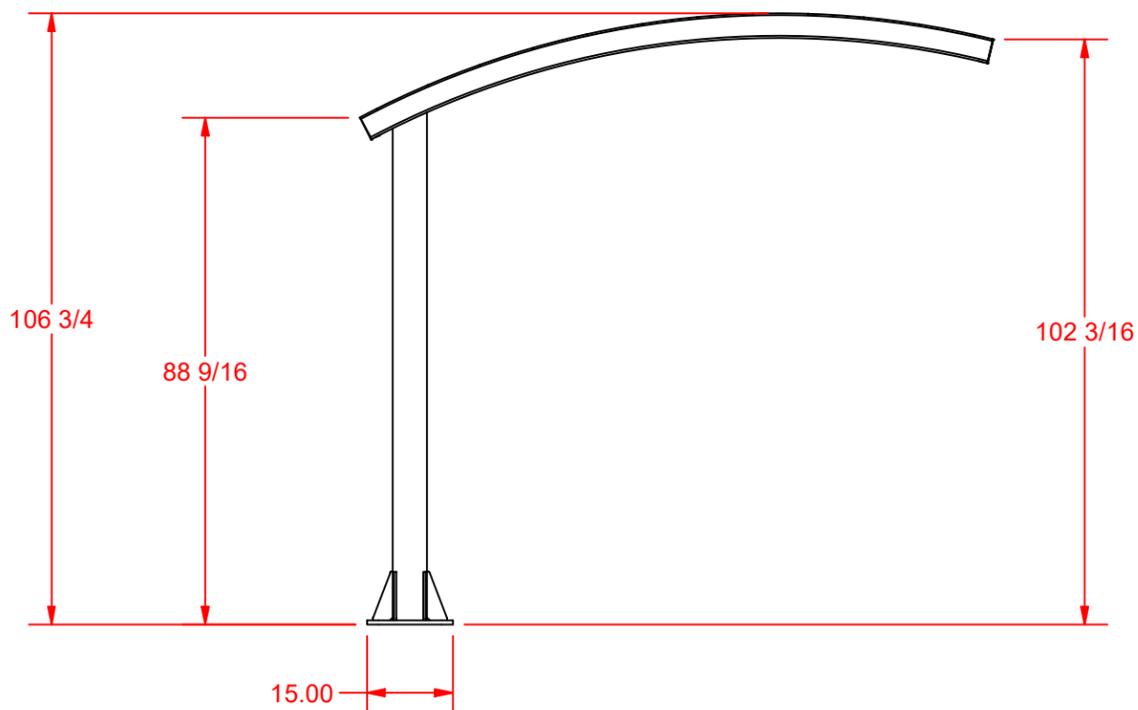
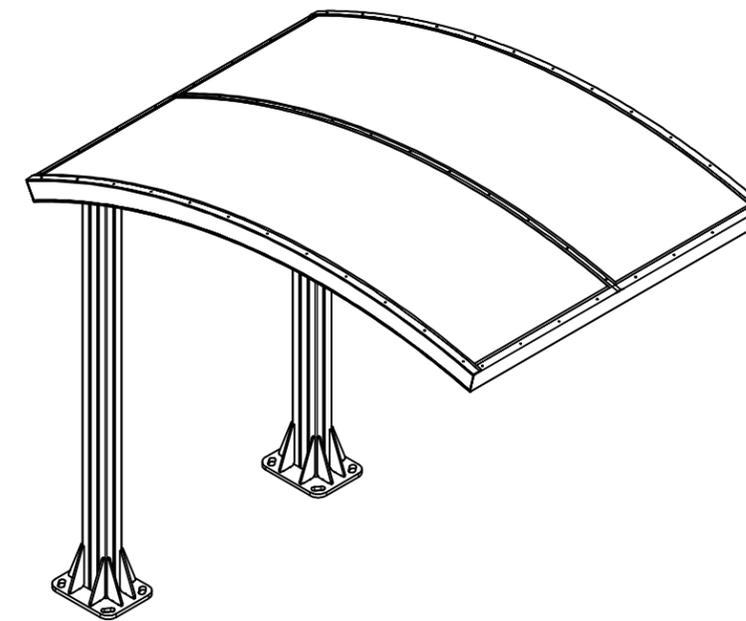
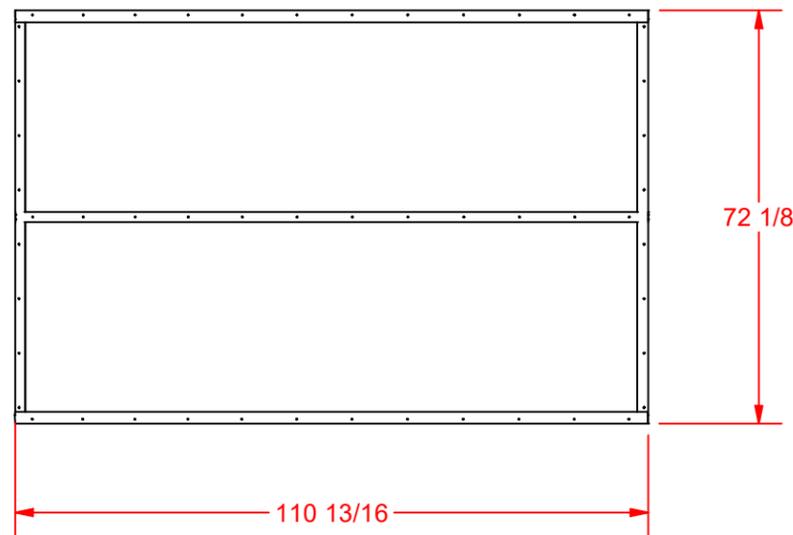


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SECTION A-A

White Water Car Wash  
 Colonel Glenn Hwy (45459)  
 GEI 22-341  
 08/05/2022

**SONNY'S**  
 The CarWash Factory

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 PARTS MUST BE FREE OF RUST, BURRS, AND SHARP CORNERS.

**TOLERANCES**  
 UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES AND TOLERANCES AS FOLLOWS:  
 FRACTIONAL  $\pm 1/8"$   
 .XX DECIMAL PLACES  $\pm 0.060$   
 .XXX DECIMAL PLACES  $\pm 0.030$   
 ANGULARITY  $\pm 2'$   
 FINISH 125

DRAWN BY	D. Guzman
DESIGNED BY	S. Magley
ENG APPROVED BY	1/13/2021
REVISED BY	
CATEGORY	REV

PART NUMBER	<b>Canopy Sonny's</b>
DESCRIPTION	
THIRD ANGLE	SCALE N.T.S.
SIZE	B
SHEET	1 OF 1

MATERIAL:

4

3

2

1

4

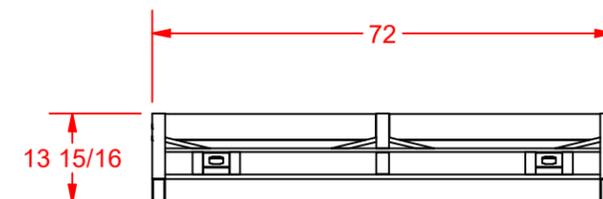
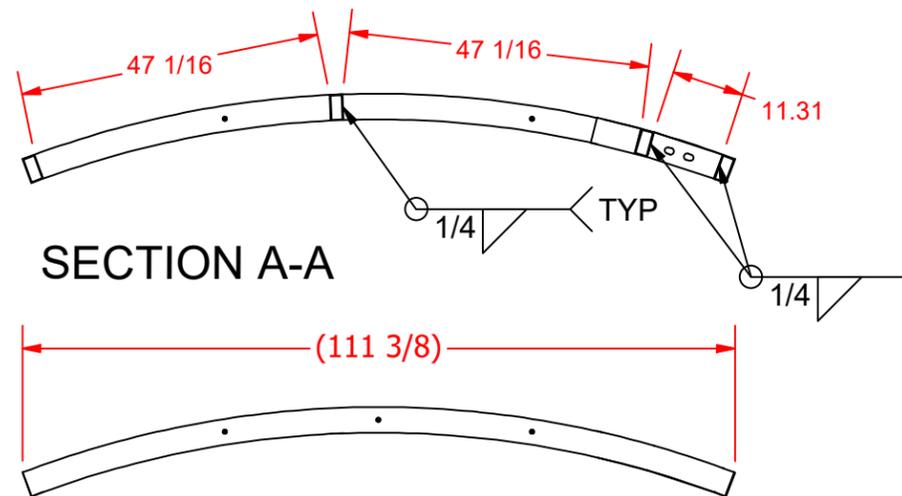
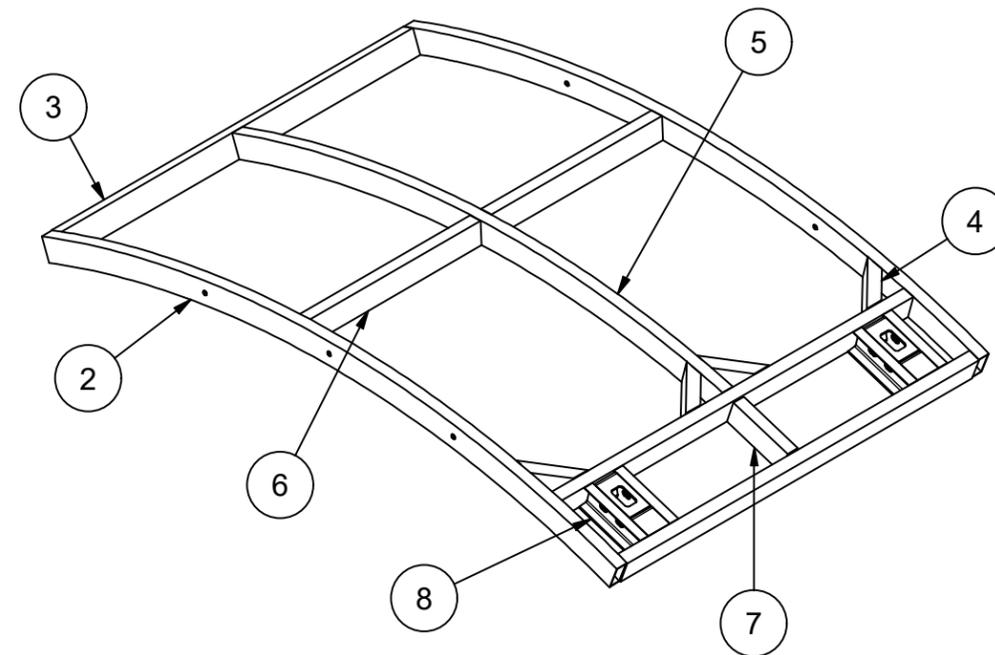
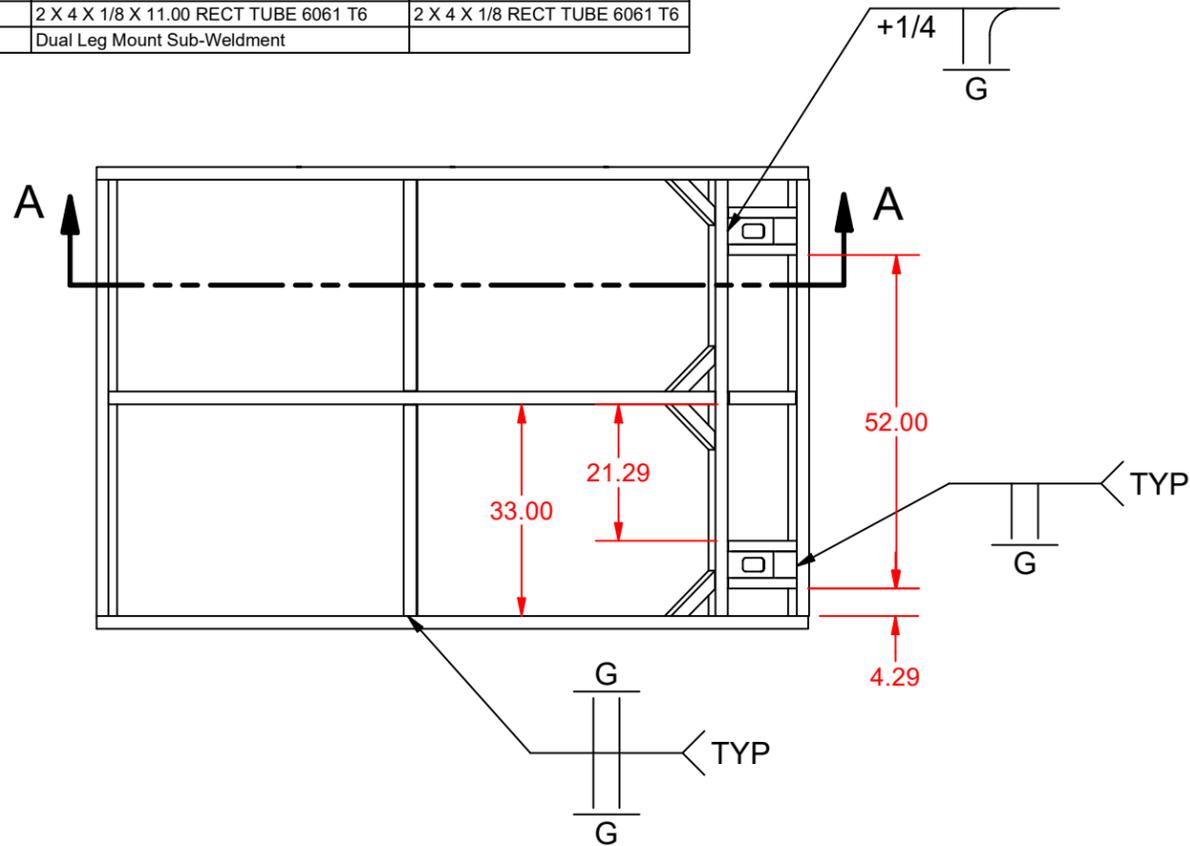
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1

PARTS LIST				
ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
1	10	97467A727	Rivet Nut 5/16-18 SS	Stainless Steel
2	2	20018094-A	Canopy 2 x 4 Long Rolled Rec Tube W/ Holes	2 X 4 X 1/8 RECT TUBE 6061 T6
3	3	20018095	2 X 4 X 1/8 X 68 RECT TUBE 6061 T6	2 X 4 X 1/8 RECT TUBE 6061 T6
4	4	20018097	Gusset, 2 x 4 Mr FMR Canopy Top	2 X 4 X 1/8 RECT TUBE 6061 T6
5	1	20018098	Mr FMR Canopy 2 x 4 Short Rolled Rec Tube	2 X 4 X 1/8 RECT TUBE 6061 T6
6	2	20018099	2 X 4 X 1/8 X 32.94 RECT TUBE 6061 T6	2 X 4 X 1/8 RECT TUBE 6061 T6
7	1	20018107	2 X 4 X 1/8 X 11.00 RECT TUBE 6061 T6	2 X 4 X 1/8 RECT TUBE 6061 T6
8	2	20018112	Dual Leg Mount Sub-Weldment	2 X 4 X 1/8 RECT TUBE 6061 T6

REVISION HISTORY		
REV	DESCRIPTION	DATE
A	RELEASED TO PRODUCTION	12/20/2018
B	ADDED RIVET NUT ON EXIT END BEAM	12/9/2020
C	MADE EXIT AND ENTRANCE BEAM THE SAME; ADDED AND CHANGED RIVET NUTS TO 5/16; REMOVED WELDING ON ENDCAPS	1/15/2021



White Water Car Wash  
 Colonel Glenn Hwy (45459)  
 GEI 22-341  
 08/05/2022

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**MATERIAL:**

<b>TOLERANCES</b> UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES AND TOLERANCES AS FOLLOWS: FRACTIONAL ± 1/8" .XX DECIMAL PLACES ± 0.060 .XXX DECIMAL PLACES ± 0.030 ANGULARITY ± 2' FINISH 125	<b>DRAWN BY</b> M.Doty 11/13/2018	<b>DESIGNED BY</b> D.Guzman 11/10/2018
<b>REVISOR</b> M.Doty 12/20/2018	<b>REV</b> C	

<b>PART NUMBER</b> <b>20018125</b>
<b>DESCRIPTION</b> Mr FMR Dual Leg Canopy Top Weldment

<b>THIRD ANGLE</b>	<b>SCALE</b> N.T.S.	<b>SIZE</b> B	<b>SHEET</b> 1 OF 1
--------------------	------------------------	------------------	------------------------

4

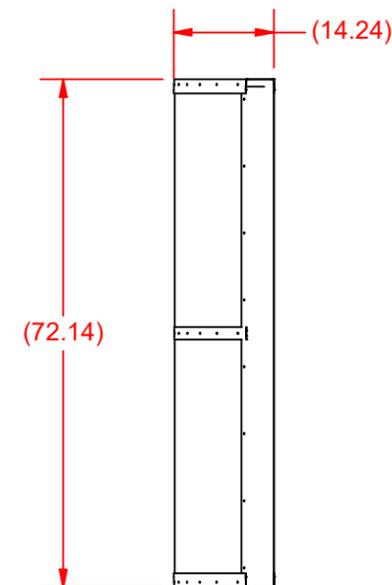
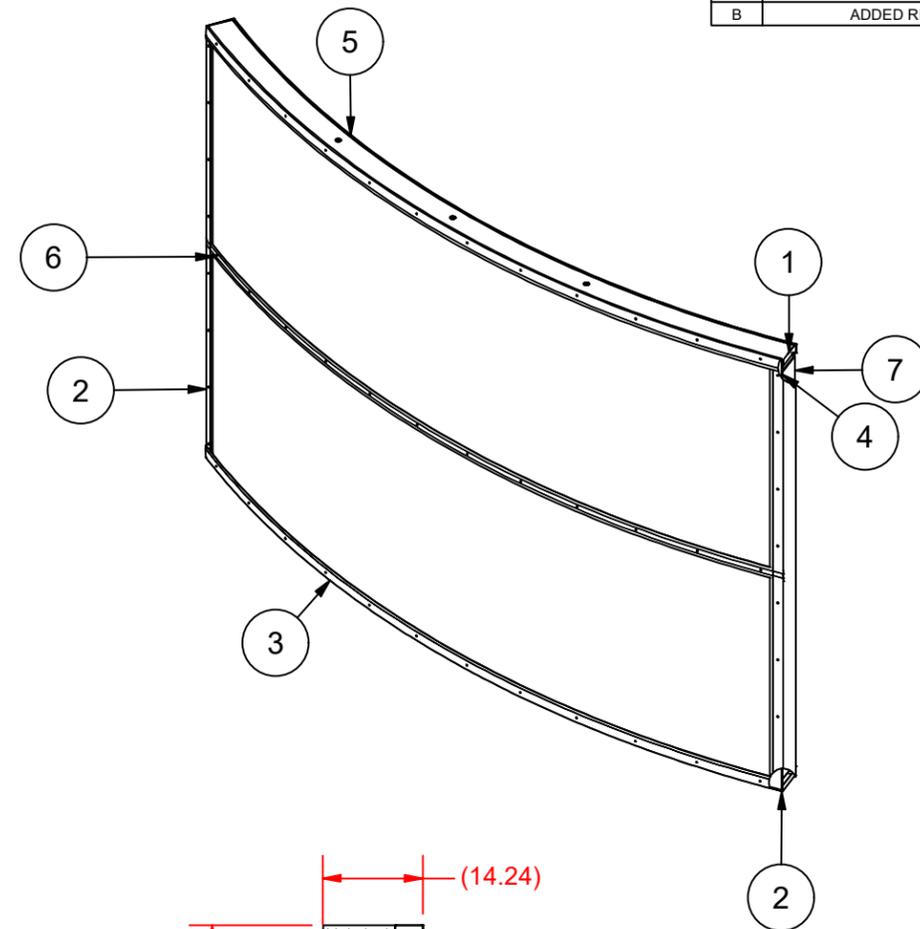
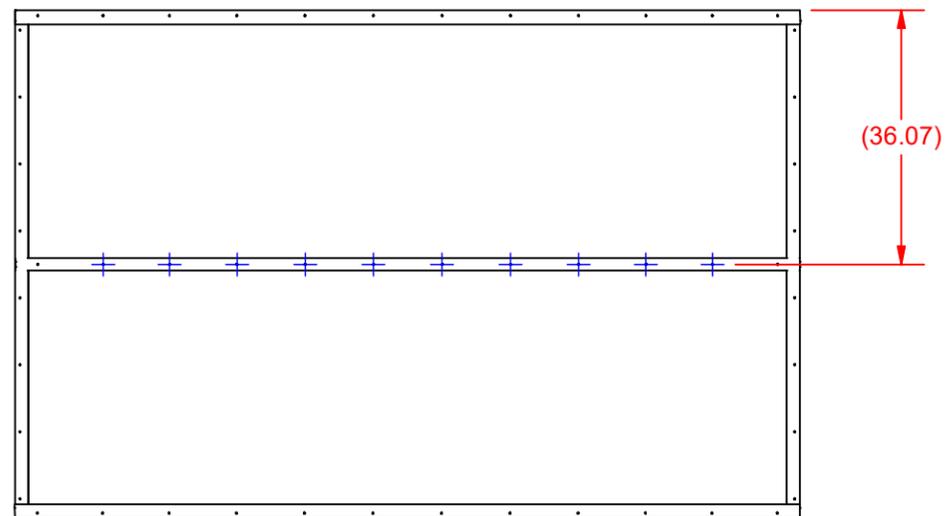
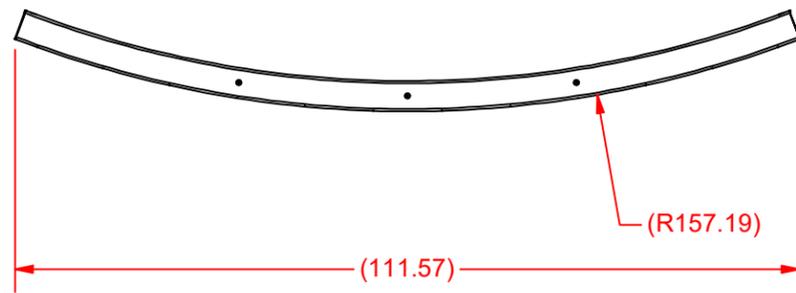
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2

1

PARTS LIST				
ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
1	1	10013028-A	Canopy Cover Side Edge Front W/ Holes	20 Gauge Aluminum 5052
2	2	10013029	Mr FMR Canopy Cover Front/Back Edge	20 Gauge Aluminum 5052
3	2	10013030	Mr FMR Canopy Cover Side Edge Top	20 Gauge Aluminum 5052
4	2	10013031	Mr FMR Canopy Cover Top Sheet	20 Gauge Aluminum 5052
5	2	10013032	Mr FMR Canopy Cover Side Edge Bottom	20 Gauge Aluminum 5052
6	1	10013033	Mr FMR Canopy Cover Middle Flap	20 Gauge Aluminum 5052
7	1	20018125	Mr FMR Dual Leg Canopy Top Weldment	
2	1	10013028	Mr FMR Canopy Cover Side Edge Front	20 Gauge Aluminum 5052

REVISION HISTORY		
REV	DESCRIPTION	DATE
A	RELEASED TO PRODUCTION	12/18/2020
B	ADDED RIVETNUTS	1/15/2021



White Water Car Wash  
 Colonel Glenn Hwy (45459)  
 GEI 22-341  
 08/05/2022

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 FRACTIONAL ± 1/8"  
 .XX DECIMAL PLACES ± 0.060  
 .XXX DECIMAL PLACES ± 0.030  
 ANGULARITY ± 2'  
 FINISH 125

DRAWN BY	S. Magley	12/18/2020
DESIGNED BY	D. Guzman	12/18/2020
ENG APPROVED BY		
REVISED BY	S. Magley	12/18/2020
CATEGORY	POS	REV B

PART NUMBER	<b>10013861</b>
DESCRIPTION	Top, Dual Leg Round Canopy

4

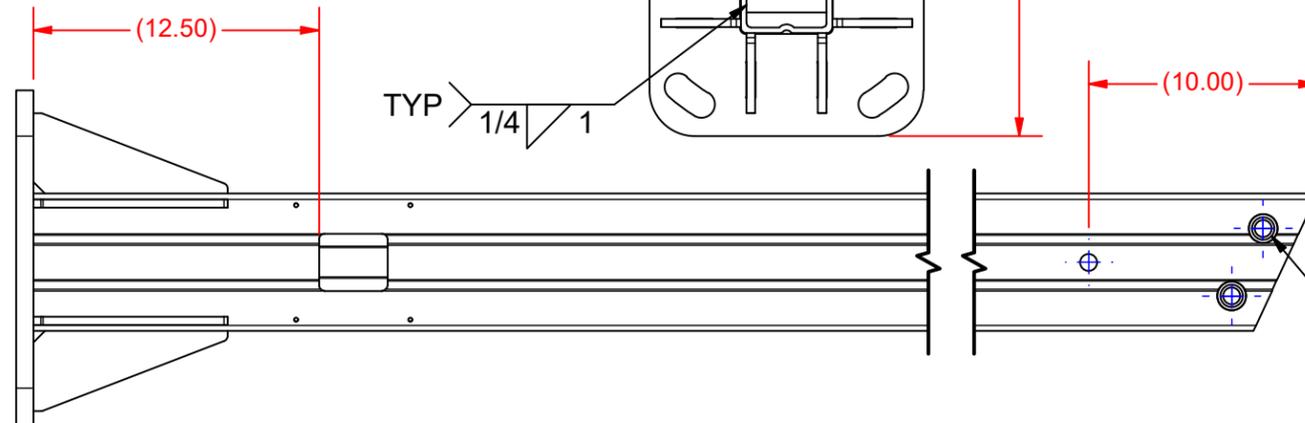
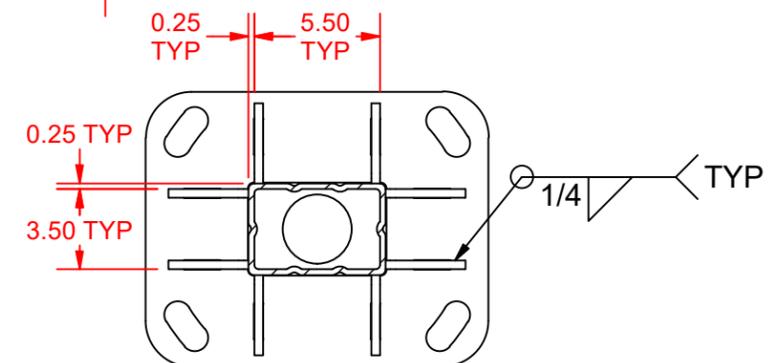
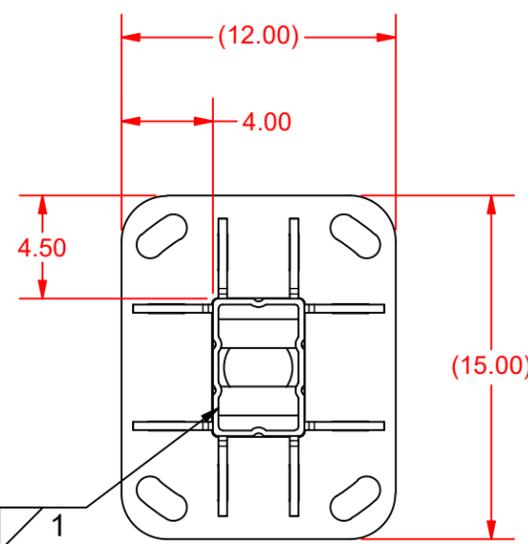
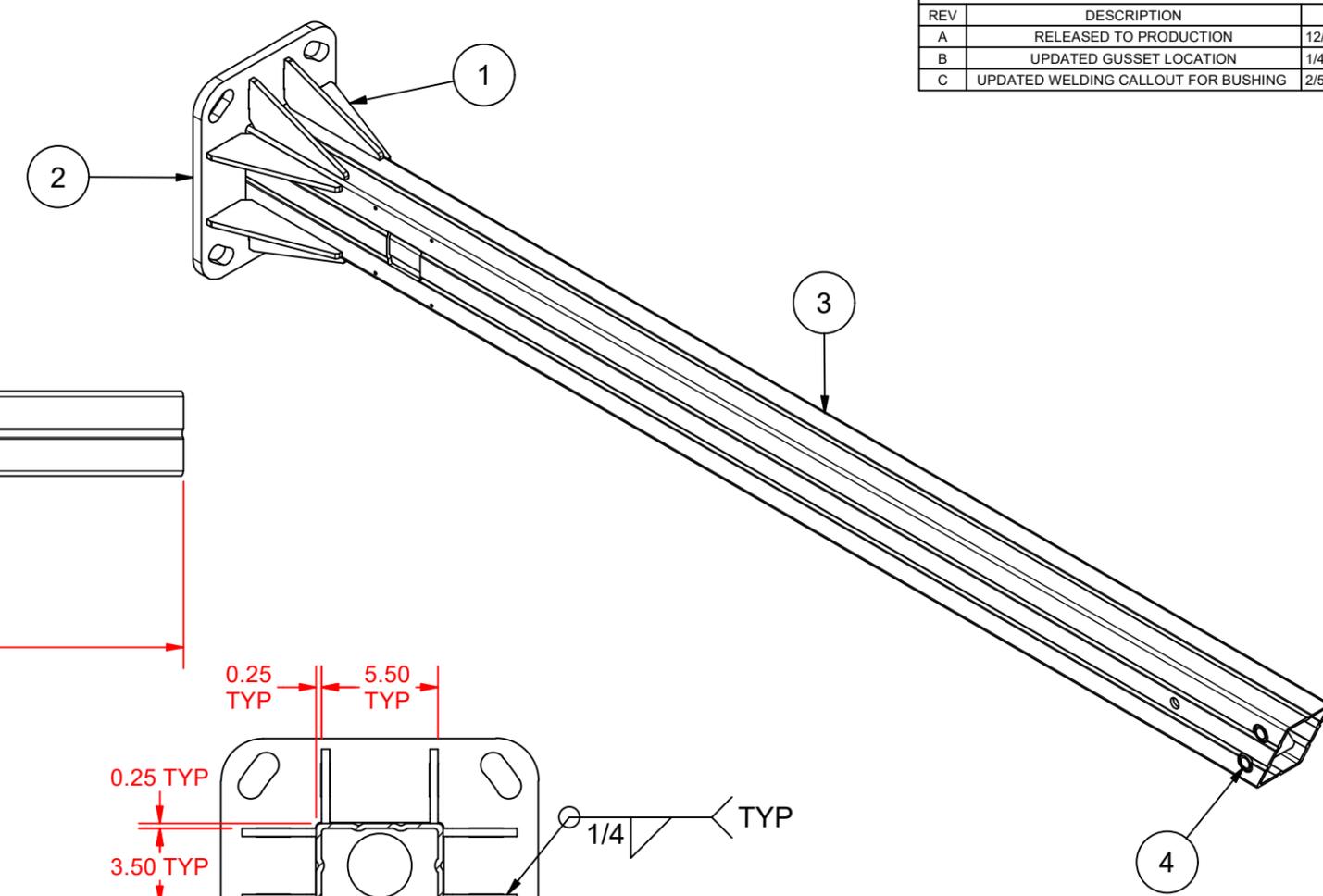
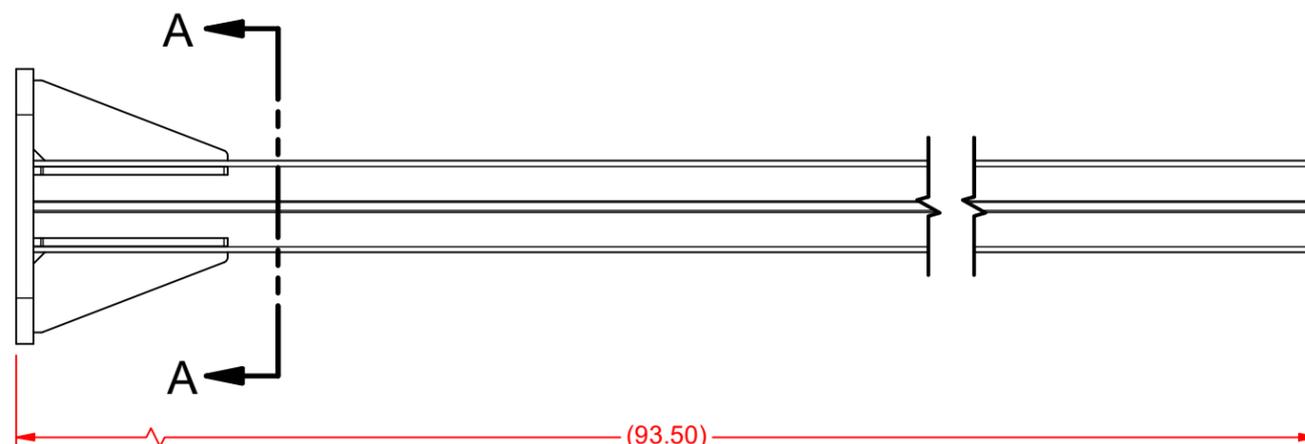
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2

1

PARTS LIST				
ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL
1	8	10013316	Pay Station Canopy Leg Gusset	21418-* - 3/8 X 4 Flat Bar 6061 T6
2	1	20018579	Pay Station Canopy Footplate	21469-* - 3/4 X 12 Flat Bar 6061 T6
3	1	20019221	Leg Post, Dual Leg Round Canopy	24313-* - 4 X 6 X 1/4 QUADEX TUBE 6061 T6
4	2	20019222	Bushing Insert 1-1/4 OD 3/4 ID X 4IN AL	22122-* 1-1/4 OD X 1/4 WALL X144 RD TUBE 6061 T6

REVISION HISTORY		
REV	DESCRIPTION	DATE
A	RELEASED TO PRODUCTION	12/18/2020
B	UPDATED GUSSET LOCATION	1/4/2021
C	UPDATED WELDING CALLOUT FOR BUSHING	2/5/2021



FLUSH +0.00/-0.030 TYP

White Water Car Wash  
Colonel Glenn Hwy (45459)  
GEI 22-341  
08/05/2022

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FRACTIONAL ± 1/8"
.XX DECIMAL PLACES ± 0.060
.XXX DECIMAL PLACES ± 0.030
ANGULARITY ± 2°
FINISH 125

DRAWN BY	D. Guzman	12/18/2020
DESIGNED BY	D. Guzman	12/18/2020
ENG APPROVED BY		
REVISED BY	S. Magley	2/5/2021
CATEGORY	POS	REV C

PART NUMBER	<b>20019220</b>
DESCRIPTION	Leg, Dual Leg Round Canopy
THIRD ANGLE	SCALE N.T.S.
SIZE B	SHEET 1 OF 1

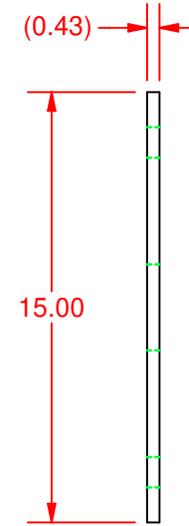
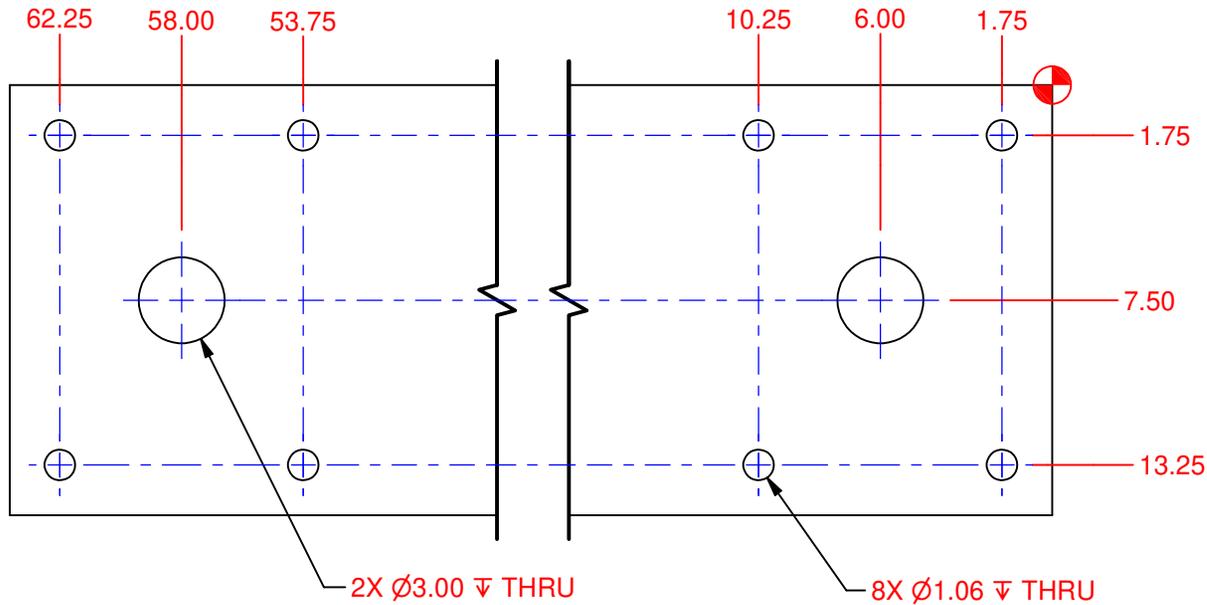
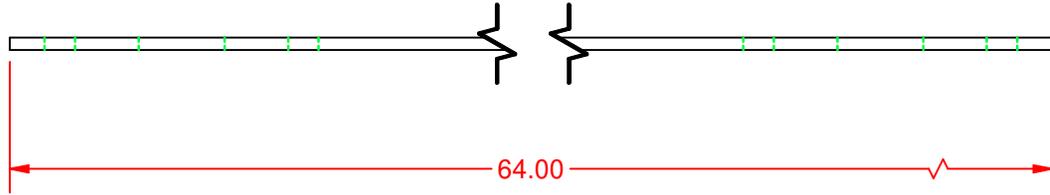
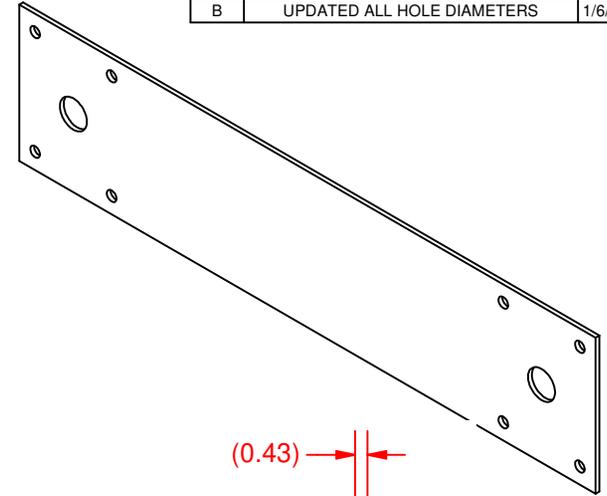
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3

2

1

REVISION HISTORY		
REV	DESCRIPTION	DATE
A	RELEASED TO PRODUCTION	1/5/2021
B	UPDATED ALL HOLE DIAMETERS	1/6/2021



White Water Car Wash  
 Colonel Glenn Hwy (45459)  
 GEI 22-341  
 08/05/2022

**SONNY'S**  
 The CarWash Factory

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PARTS MUST BE FREE OF RUST, BURRS, AND SHARP CORNERS.

**MATERIAL:** Wood

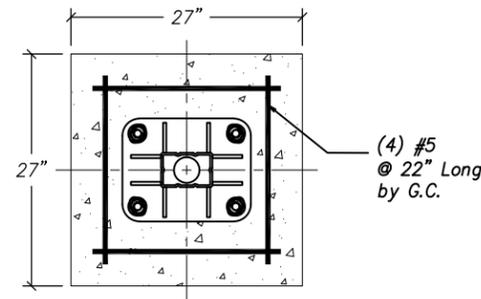
**TOLERANCES**  
 UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES AND TOLERANCES AS FOLLOWS:

FRACTIONAL ± 1/16"  
 .XX DECIMAL PLACES ± 0.030  
 .XXX DECIMAL PLACES ± 0.005  
 ANGULARITY ± 2'  
 FINISH 125

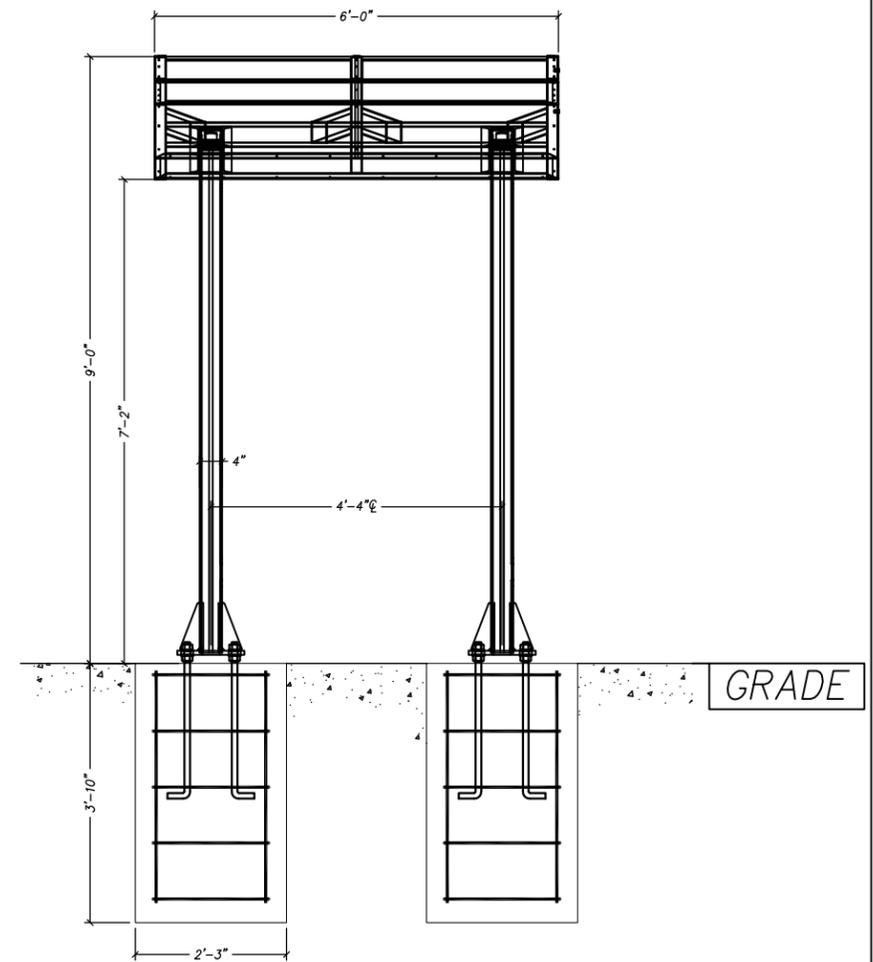
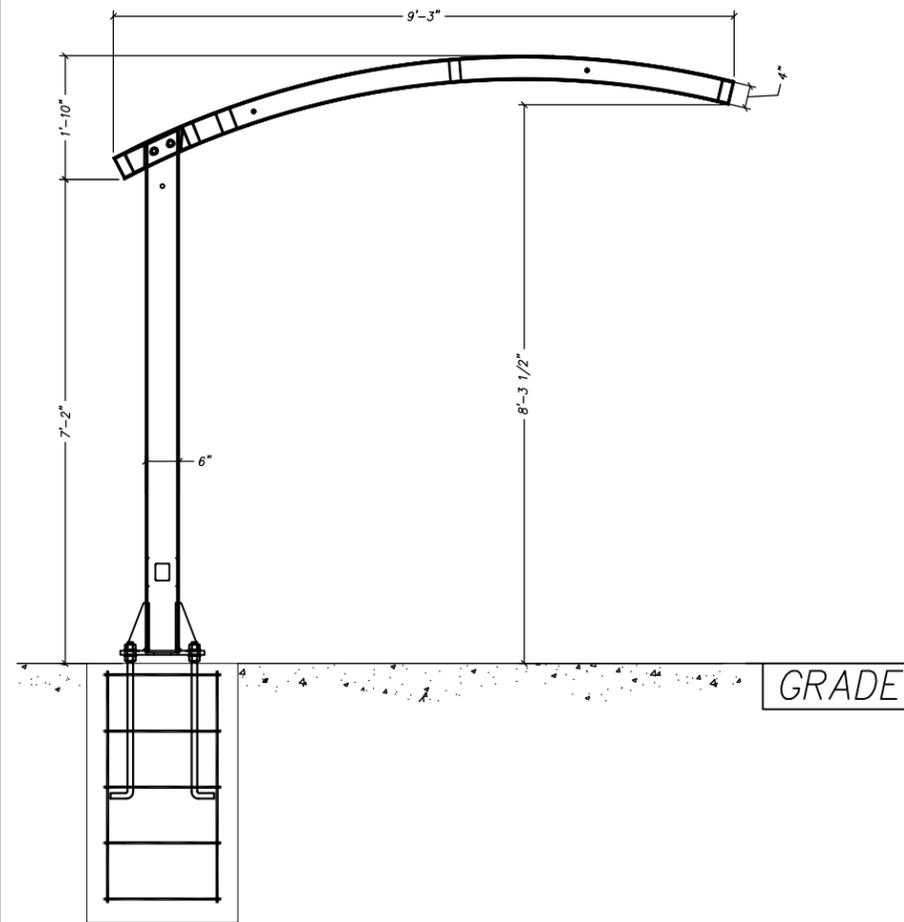
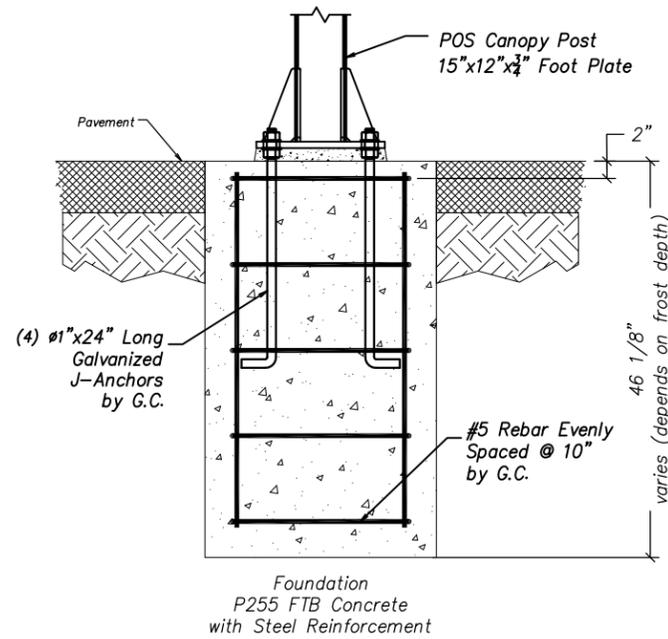
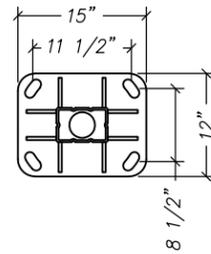
DRAWN BY	J.Kurtz	12/29/2020
DESIGNED BY	J.Kurtz	12/29/2020
ENG APPROVED BY		
REVISED BY	S.Magley	1/5/2021
CATEGORY		REV -

PART NUMBER	<b>20019243</b>		
DESCRIPTION	Pay Station Canopy J Bolt Template		
THIRD ANGLE	SCALE	SIZE	SHEET
	N.T.S.	A	1 OF 1

POS Canopy Foundation



Vacuum Boom Foot Plate Dim



White Water Car Wash  
 Colonel Glenn Hwy (45459)  
 GEI 22-341  
 08/05/2022

**DISCLAIMER:** Although building codes have been considered in developing this drawing, verification of site specific conditions and compliance with Federal, State & local building codes is the exclusive responsibility of the Customer and/or Architect & Engineer. These drawings reflect requirements for SONNY'S FURNISHED EQUIPMENT ONLY unless otherwise noted. Please refer to other manufacturers, if any, for their requirements.

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Sonny's PayStation Canopy

Scale: N.T.S.

Location:

Sheet	Rev.
01	+-

SCHEMATIC GATE CONFIGURATION



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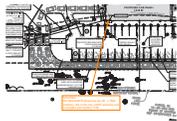
Date:	03.01.17
Revision Date:	01.25.21
Created By:	LV
Revised By:	LAV
Checked By:	

# SITE PLAN.pdf Markup Summary

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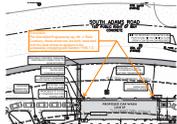
## Building Department (6)

---



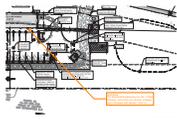
**Subject:** Building Department  
**Author:** Bluebeam  
**Date:** 8/29/2023 2:27:52 PM  
**Status:**

5/31/2023:  
Per Stonefield Engineering rep, Mr. J. Reid Cooksey, this is the only 'public' entrance and it complies with Section 1105.



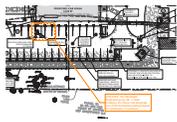
**Subject:** Building Department  
**Author:** Bluebeam  
**Date:** 8/29/2023 2:31:26 PM  
**Status:**

5/31/2023:  
Per Stonefield Engineering rep, Mr. J. Reid Cooksey, these entrances are both 'restricted', and the west entrance appears to be accessible complying with Section 1105.1.3.



**Subject:** Building Department  
**Author:** Bluebeam  
**Date:** 8/29/2023 2:31:11 PM  
**Status:**

5/31/2023:  
Per Stonefield Engineering rep, Mr. J. Reid Cooksey, this is the only 'service' entrance and it complies with Section 1105.1.5.



**Subject:** Building Department  
**Author:** Bluebeam  
**Date:** 8/29/2023 2:31:01 PM  
**Status:**

5/31/2023: Per Stonefield Engineering rep, Mr. J. Reid Cooksey, the Owner will designate one of the accessible parking spaces for employees, if necessary.

Mark Artinian 248-841-2446  
ArtinianM@RochesterHills.org

**Subject:** Building Department  
**Author:** Bluebeam  
**Date:** 8/29/2023 2:36:46 PM  
**Status:**

Mark Artinian 248-841-2446  
ArtinianM@RochesterHills.org

Yes

**Subject:** Building Department  
**Author:** Bluebeam  
**Date:** 8/29/2023 2:37:29 PM  
**Status:**

Yes

---

## Engineering Department (2)

---



**Subject:** Engineering Department  
**Author:** Jason Boughton  
**Date:** 8/24/2023 9:50:43 AM  
**Status:**

The applicant needs to submit a Land Improvement Permit (LIP) application with engineer's estimate, fee and construction plans to proceed with the construction plan review process.

Jason Boughton 248-841-2446  
BoughtonJ@RochesterHills.org Yes

**Subject:** Engineering Department  
**Author:** Jason Boughton  
**Date:** 8/24/2023 9:50:50 AM  
**Status:**

---

## Fire Department (1)

---

Lt. Walter Murphy 248-841-2712  
MurphyW@RochesterHills.org Yes

**Subject:** Fire Department  
**Author:** Lieutenant W. Murphy  
**Date:** 8/29/2023 2:04:20 PM  
**Status:**

---

Group (5)

---



**Subject:** Group  
**Author:** macdonaldj  
**Date:** 8/24/2023 8:55:59 AM  
**Status:**

City of Rochester Hills Planning & Economic Development



**Subject:** Group  
**Author:** C.McLeod  
**Date:** 8/29/2023 10:42:10 AM  
**Status:**

SP



**Subject:** Group  
**Author:** C.McLeod  
**Date:** 8/29/2023 10:42:16 AM  
**Status:**



**Subject:** Group  
**Author:** C.McLeod  
**Date:** 8/29/2023 10:42:24 AM  
**Status:**

LIP



**Subject:** Group  
**Author:** C.McLeod  
**Date:** 8/29/2023 10:43:06 AM  
**Status:**

---

Image (1)

---



**Subject:** Image  
**Author:** Keith  
**Date:** 8/24/2023 1:16:29 PM  
**Status:**

---

Jenny McGuckin - YES (1)

---



**Subject:** Jenny McGuckin - YES  
**Author:** Jenny McGuckin  
**Date:** 8/25/2023 9:01:24 AM  
**Status:**

---

Natural Resouces (1)

---

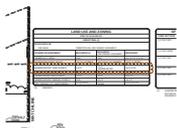


**Subject:** Natural Resouces  
**Author:** Matt Einheuser  
**Date:** 8/24/2023 10:29:21 AM  
**Status:**

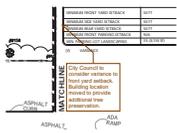
---

Planning Department (6)

---



**Subject:** Planning Department  
**Author:** C.McLeod  
**Date:** 8/29/2023 10:44:07 AM  
**Status:**



**Subject:** Planning Department  
**Author:** C.McLeod  
**Date:** 8/29/2023 10:44:47 AM  
**Status:**

City Council to consider variance to front yard setback. Building location moved to provide additional tree preservation.

Assessing Yes

**Subject:** Planning Department  
**Author:** C.McLeod  
**Date:** 8/30/2023 9:22:39 AM  
**Status:**

Assessing

Yes

As noted in response letter windows are a part of new concepts for Whitewater. It is unclear as to why these facades cannot be updated to provide additional windows

**Subject:** Planning Department  
**Author:** C.McLeod  
**Date:** 8/30/2023 9:42:25 AM  
**Status:**

As noted in response letter windows are a part of new concepts for Whitewater. It is unclear as to why these facades cannot be updated to provide additional windows

Chris McLeod 248-941-0272 mcLeod@richlandhills.org Yes

**Subject:** Planning Department  
**Author:** C.McLeod  
**Date:** 8/30/2023 9:44:38 AM  
**Status:**

**NASH**

With the condition of a variance being granted by the City Council for the reduced front yard setback, JNTY, MICHIGAN

**Subject:** Planning Department  
**Author:** C.McLeod  
**Date:** 8/31/2023 8:09:42 AM  
**Status:**

With the condition of a variance being granted by the City Council for the reduced front yard setback.

**Traffic (6)**



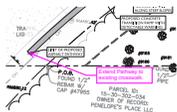
**Subject:** Traffic  
**Author:** Keith  
**Date:** 8/24/2023 1:11:06 PM  
**Status:**

With condition that the cross walk location and Pathway extension is addressed prior to construction plan approval and final Pathway/cross walk location is reflected on the final Site Plan.



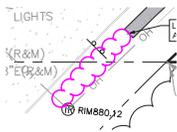
**Subject:** Traffic  
**Author:** Keith  
**Date:** 8/24/2023 1:15:25 PM  
**Status:**

Show existing cross walk , reference photo attached.

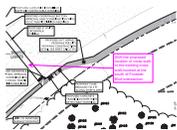


**Subject:** Traffic  
**Author:** Keith  
**Date:** 8/24/2023 1:18:25 PM  
**Status:**

Extend Pathway to existing crosswalk.



**Subject:** Traffic  
**Author:** Keith  
**Date:** 8/24/2023 1:18:12 PM  
**Status:**



**Subject:** Traffic  
**Author:** Keith  
**Date:** 8/24/2023 1:22:49 PM  
**Status:**

Shift the proposed location of cross walk to the existing cross walk located at the south of Forester Blvd intersection.

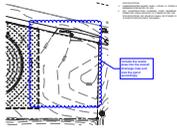
**Subject:** Traffic  
**Author:** Keith  
**Date:** 8/24/2023 1:24:36 PM  
**Status:**



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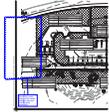
### Underground Utilities (5)

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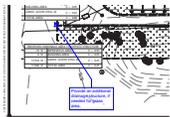
**Subject:** Underground Utilities  
**Author:** Jason Boughton  
**Date:** 8/24/2023 9:53:32 AM  
**Status:**

Include the onsite area into the overall drainage map and size the pond accordingly



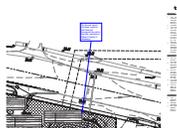
**Subject:** Underground Utilities  
**Author:** Jason Boughton  
**Date:** 8/24/2023 9:53:32 AM  
**Status:**

Include the onsite area into the overall drainage map and size the pond accordingly



**Subject:** Underground Utilities  
**Author:** Jason Boughton  
**Date:** 8/24/2023 9:53:32 AM  
**Status:**

Provide an additional drainage structure, if needed for grass area.



**Subject:** Underground Utilities  
**Author:** Jason Boughton  
**Date:** 8/24/2023 9:53:32 AM  
**Status:**

Per the soil report provided, revise to Soil Group B throughout the entire site plan submission. Adjust C factors if necessary



**Subject:** Underground Utilities  
**Author:** Jason Boughton  
**Date:** 8/24/2023 9:55:19 AM  
**Status:**

Revise the control structure to incorporate this into the overall storm sewer management plan or provide a reason why this standard is not being met.