

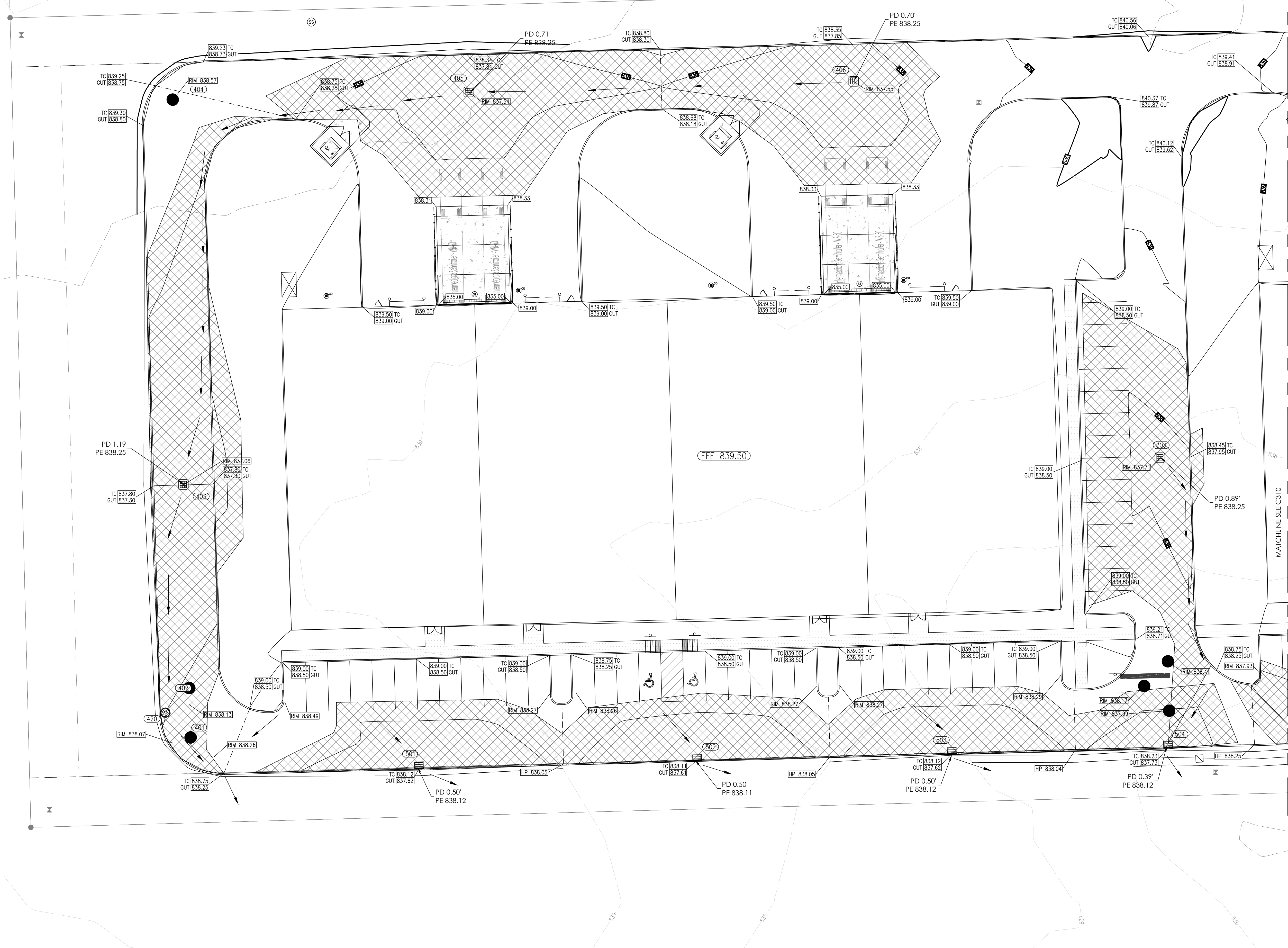
### PROPOSED LEGEND

	HYDRANT		FLOW LINE
	VALVE		FOUNDATION DRAIN
	TEE		CABLE TV LINE**
	ADAPTER		ELECTRIC LINE**
	BEND		FIBER OPTIC LINE
	TEMP. FLUSH HYDRANT		SUB-SURFACE DRAIN
	BLOW-OFF		STORM UNDERDRAIN
	THRUST BLOCK		STORM SEWER
	PLUG		SANITARY SEWER
	REDUCER		FORCE MAIN
	M.J. SLEEVE		GAS LINE
	CROSS		TELEPHONE LINE**
	WATER METER		WATER LINE
	POST INDICATOR VALVE		
	FIRE CONNECTION		
	TRANSFORMER PAD		
	RELOCATED ELECTRIC/TELEPHONE POLE		
	SIGN		
	HANDICAP PARKING		FLOW ARROW
	CLEAN OUT		EXISTING CONTOURS
	STORM CHAMBER		PROPOSED CONTOURS
	SANITARY MANHOLE		SWALE
	STORM MANHOLE		
	STORM COMBINATION INLET		SPOT ELEVATION
	STORM GRATE INLET		HIGH POINT ELEVATION
	STORM BEEHIVE/YARD DRAIN		TOP/BOTTOM CURB ELEVATION
	STORM FLARED END SECTION		ELEVATION
	BMP		ME - MATCH EXISTING GRADE

\*\*PREFIX FOR UTILITY LINES:  
 UC - UNDERGROUND  
 OH - OVERHEAD

### OVERFLOW ROUTING PLAN LEGEND & NOTES

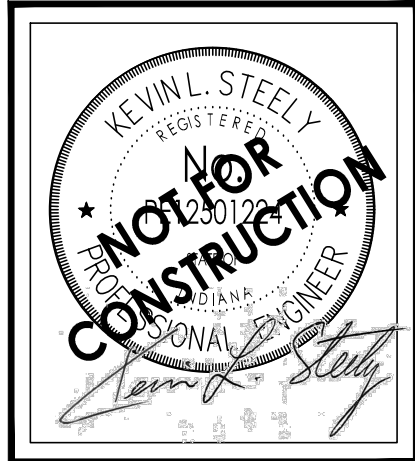
- PD PONDING DEPTH (FT)
- PE PONDING ELEVATION
- FFE FINISH FLOOR ELEVATION = 839.25
- OVERFLOW DIRECTION



CIVIL ENGINEERS  
 LAND SURVEYORS  
 DEVELOPMENT CONSULTANTS  
 GEOTECHNICAL  
 ENVIRONMENTAL  
 CONSTRUCTION STAKING  
 CONSTRUCTION MAT. TESTING



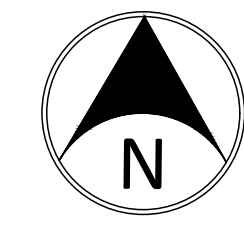
BY	
DATE	
PERIODS AND REVISIONS	



**COMPASS AND KEY INDUSTRIAL PARK**  
 2616 N RACEWAY RD, BROWNSBURG, IN 46224  
 SEC. 29 - 116N - P2E - JACOBI W/P - HENDRICKS COUNTY INDIANA  
**COMPASS AND KEY LLC**  
 9129 LOG RUN DR. S, INDIANAPOLIS, IN 46234  
**OVERFLOW ROUTING PLAN**

PLAN DATE:	02/19/26
DESIGN:	KLS
CHECK:	GRR
DRAWN:	KLS
PROJECT NO.:	2504018
SHEET NO.:	<b>C311</b>





40 0 40 80  
Graphic Scale: 1" = 40'

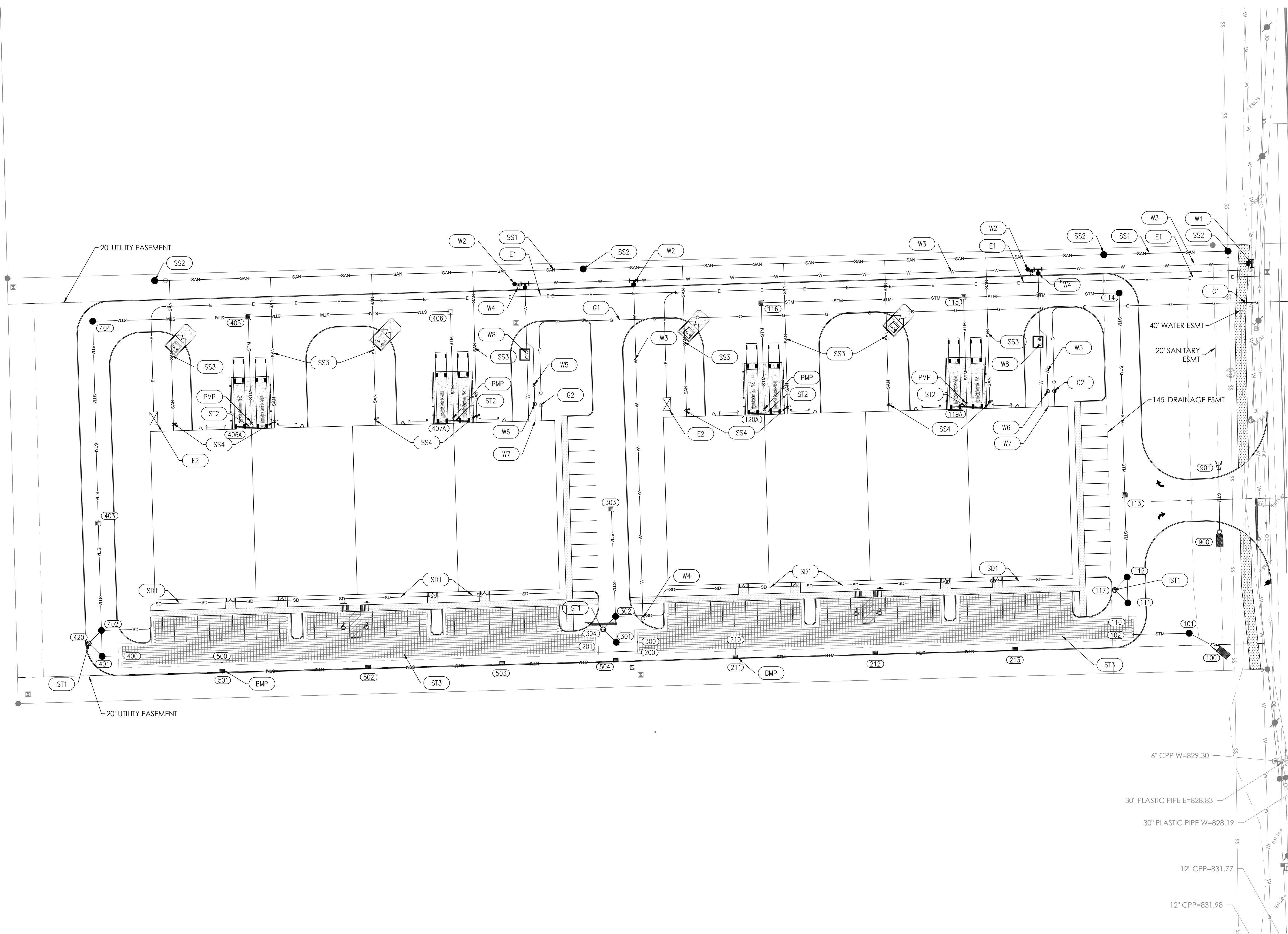
### PROPOSED LEGEND

	HYDRANT		FOUNDATION DRAIN
	VALVE		CABLE TV LINE**
	TEE		ELECTRIC LINE**
	ADAPTER		FIBER OPTIC LINE
	BEND		SUB-SURFACE DRAIN
	TEMP. FLUSH HYDRANT		STORM UNDERDRAIN
	BLOW-OFF		STORM SEWER
	THRUST BLOCK		SANITARY SEWER
	PLUG		FORCE MAIN
	REDUCER		GAS LINE
	M.J. SLEEVE		TELEPHONE LINE**
	CROSS		WATER LINE
	WATER METER		
	POST INDICATOR VALVE		
	FIRE CONNECTION		
	TRANSFORMER PAD		
	RELOCATED ELECTRIC/TELEPHONE POLE		
	SIGN		
	HANDICAP PARKING		
	CLEAN OUT		
	STORM CHAMBER		
	SANITARY MANHOLE		
	STORM MANHOLE		
	STORM COMBINATION INLET		
	STORM GRATE INLET		
	STORM BEEHIVE/YARD DRAIN		
	STORM FLARED END SECTION		
	BMP		

\*\*PREFIX FOR UTILITY LINES:  
UG - UNDERGROUND  
OH - OVERHEAD

### KEY PLAN

G1	GAS SERVICE: TBD BY CENTERPOINT ENERGY
G2	GAS METER(S) - CENTERPOINT ENERGY TO DETERMINE PIT OR WALL MOUNTED BANK
E1	ELECTRICAL LINE; USE 2" SCHEDULE 80 PVC CONDUIT IN PAVED AREAS WITH 24" COVER.
E2	PAD MOUNTED TRANSFORMER: TBD BY AES
SS1	8" PVC SDR 35 SANITARY SEWER MAIN
SS2	4' DIA PRE-CAST CONCRETE MANHOLE, SEE STRUCTURE DATA TABLE C401
SS3	6" PVC SDR 26 SANITARY LATERAL $\frac{8}{C800}$
SS4	SEWER CLEANOUT $\frac{8}{C800}$
###	STORM SEWER STRUCTURE, SEE STRUCTURE DATA TABLE C401 CASTING SHALL SAY, "DUMP NO WASTE <<< DRAINS TO WATERWAY"
ST1	STORMWATER QUALITY UNIT (SQU), C610
ST2	24 LF OF 6" DURASLOT DRAIN AT TRUCK DOCK, C802
ST3	STORMWATER SUBSURFACE MODULAR TANKS, C650-C651
W1	16" x 8" TAPPING SLEEVE & VALVE (16" PVC EXISTING MAIN)
W2	8" GATE VALVE
W3	8" D.J.P.
W4	6" HYDRANT
W5	1 1/4" WATER SERVICE LATERAL - HDPE SDR 9
W6	1" WATER METER
W7	COPPER OR DUCTILE IRON PIPE SHALL BE RUN 5' OUTSIDE THE BLDG FOOTER TO THE METER SETUP INSIDE THE BLDG.
W8	VAULT FOR BACKFLOW PREVENTION, FDC, PIV PER CEG DETAIL
SD1	6" SDR 35 PVC SUBSURFACE ROOF DRAIN HEADER (SOILD WALL)
PMP	DUPLEX SUBMERSIBLE PUMP IN PIT, DETAIL C803
BMP	BMP SNOT 18 R



### STORMWATER QUALITY UNITS

- SQU STR #420 - REQUIRED 1.33 CFS TREATMENT, USE AQUASWIRL XP-4
- SQU STR #310 - REQUIRED 0.56 CFS TREATMENT, USE AQUASWIRL XP-3
- SQU STR #116 - REQUIRED 1.19 CFS TREATMENT, USE AQUASWIRL XP-4

### GENERAL NOTES:

- CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITIES WITHIN THE PROJECT LIMITS PRIOR TO THE START OF CONSTRUCTION. IN THE EVENT A DISCREPANCY BETWEEN THE FIELD CONDITIONS AND THE PLANS, THE OWNER AND ENGINEER SHALL BE NOTIFIED IMMEDIATELY PRIOR TO THE START OF CONSTRUCTION.
- FOR VIEWING CLARITY OF THESE CONSTRUCTION PLANS, THE PIPES OR STRUCTURES MAY NOT BE DRAWN TO SCALE.
- A MINIMUM OF 18 INCHES OF VERTICAL SEPARATION AND 10 FEET OF HORIZONTAL SEPARATION SHALL BE PROVIDED BETWEEN WATER, STORM AND SANITARY LINES.
- A MINIMUM OF 18 INCHES OF VERTICAL SEPARATION SHALL BE PROVIDED BETWEEN STORM AND SANITARY SEWERS. IF THE VERTICAL SEPARATION BETWEEN THE STORM AND SANITARY LINES CANNOT BE ACHIEVED, THAN A CONCRETE SADDLE SHALL BE USED AT THESE CROSSINGS.
- WHEN CONNECTIONS ARE TO BE MADE TO EXISTING PIPING AND STRUCTURES OR WHERE CONSTRUCTION IS IN THE VICINITY OF EXISTING PIPING, THE LOCATION AND ELEVATION OF THE EXISTING PIPING AND STRUCTURES SHALL BE FIELD VERIFIED BY THE CONTRACTOR. IF ANY DISCREPANCIES ARE FOUND, THEN THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
- CONTRACTOR TO PROTECT EXISTING UTILITIES WHICH ARE MARKED TO REMAIN.

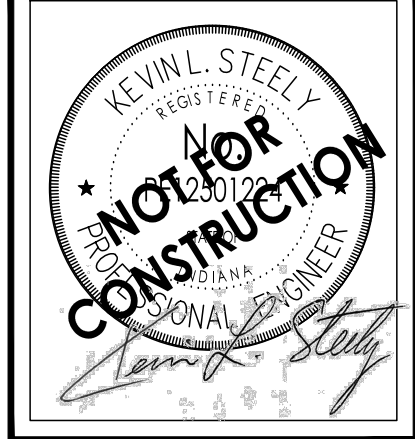
**WARNING: CONTRACTOR TO VERIFY PRESENCE AND EXACT LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.**

**NOTE: ALL SANITARY SEWER SHALL CONFORM TO CURRENT HENDRICKS COUNTY REGIONAL SEWER DISTRICT STANDARDS.**

**NOTE: ALL WORK TO CONFORM TO CURRENT CITY OF BROWNSBURG UTILITY AND INFRASTRUCTURE STANDARDS AND SPECIFICATIONS.**

**NOTE: ALL WATER MAIN CONSTRUCTION SHALL CONFORM TO CURRENT CITIZENS ENERGY GROUP STANDARDS**

DATE	BY



**COMPASS AND KEY INDUSTRIAL PARK**

2616 N RACEWAY RD, BROWNSBURG, IN 46234  
SEC 29 - 116N - R2E - JUNCOSIN TWP - HENDRICKS COUNTY INDIANA

**COMPASS AND KEY LLC**  
9129 LOG RUN DR S, INDIANAPOLIS, IN 46234

**UTILITY PLAN**

PLAN DATE:	02/19/26
DESIGN:	KLS
CHECK:	GRR
DRAWN:	KLS
PROJECT NO.:	2504018
SHEET NO.:	<b>C400</b>

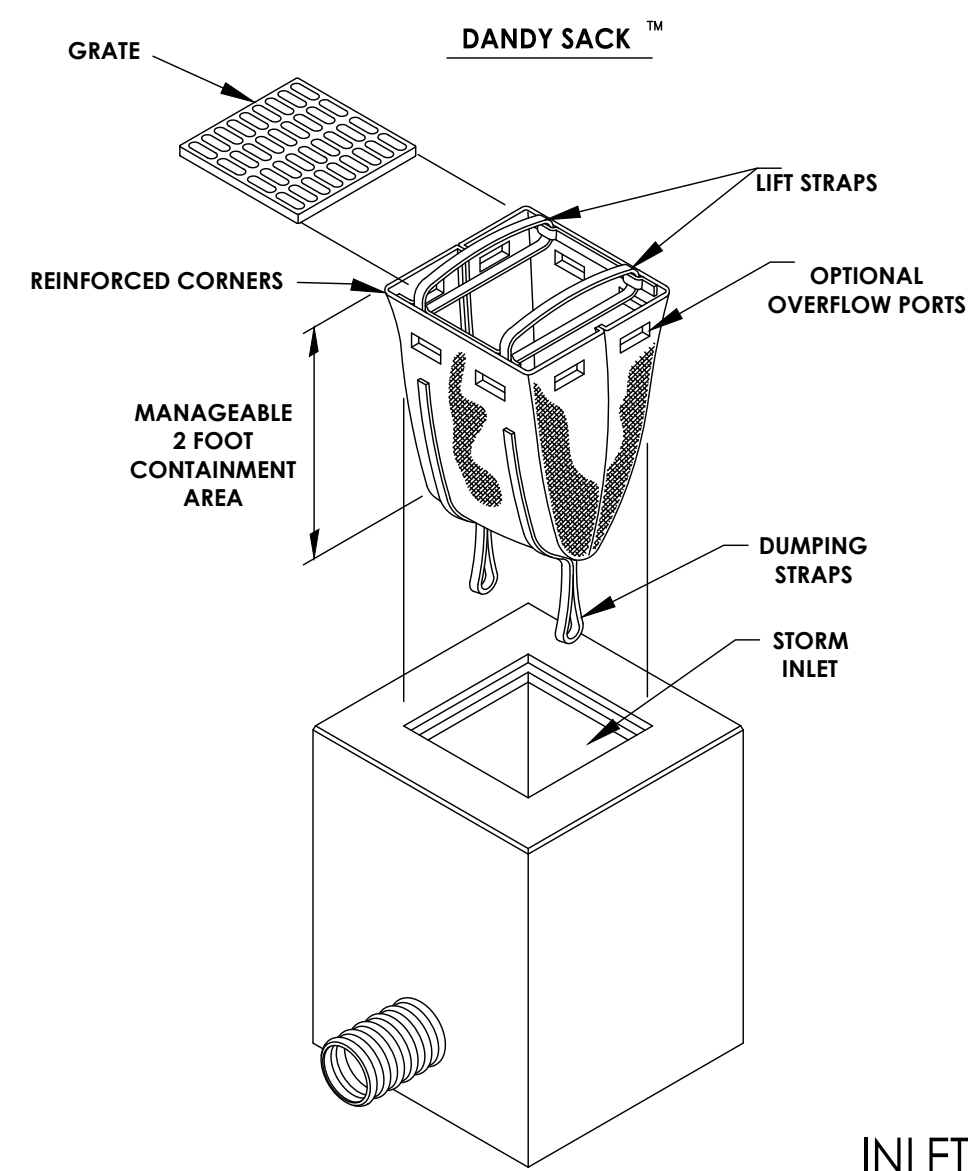
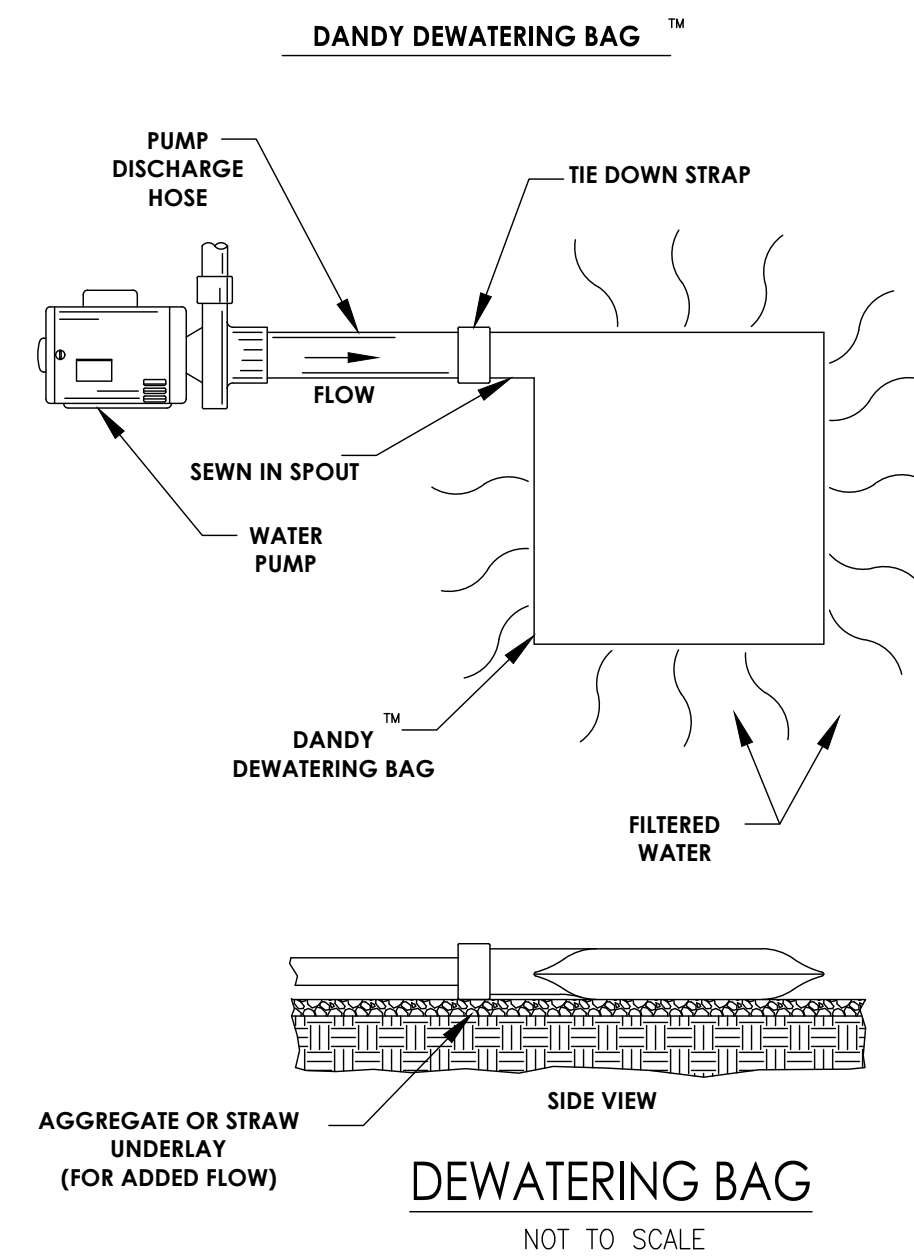


Y:\Project\2025\2504018\2504018\_Utilities\2504018\_C400\_Utility.dwg Plot: February 21, 2025 2:41:08 PM









DANDY SACK™ SPECIFICATIONS

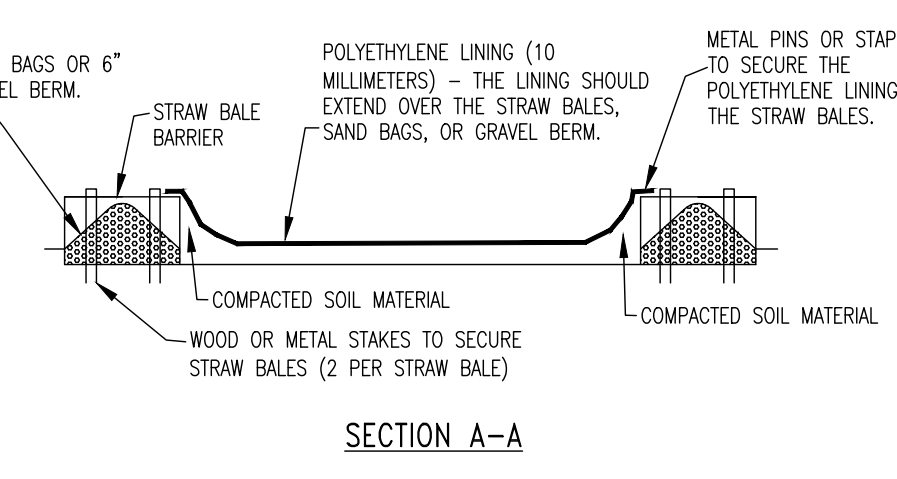
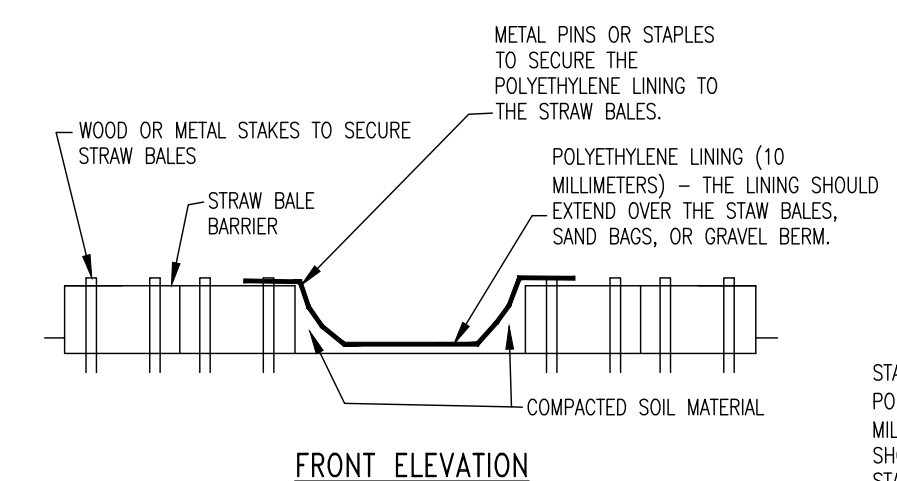
NOTE: THE DANDY SACK™ WILL BE MANUFACTURED IN THE U.S.A. FROM A WOVEN MONOFLAMENT FABRIC THAT MEETS OR EXCEEDS THE FOLLOWING SPECIFICATIONS:

Mechanical Properties	Test Method	Units	MARV
Grab Tensile Strength	ASTM D 4632	KN (BS)	1.78 (400 x 1.40) (315)
Grab Tensile Elongation	ASTM D 4632	%	13 x 15
Puncture Strength	ASTM D 4833	KN (BS)	0.47 (105)
Mullen Burst Strength	ASTM D 3786	KPA (PSI)	5500 (800)
Impedance Tear Strength	ASTM D 4533	KN (BS)	0.47 (105) x 0.73 (165)
UV Resistance	ASTM D 4355	%	50
Apparent Opening Size	ASTM D 4491	Mm (US Std Sieve)	0.425 (40)
Flow Rate	ASTM D 4491	l/(mm²/m (sqft/m²))	2832 (70)
Permeability	ASTM D 4491	Sec	0.90

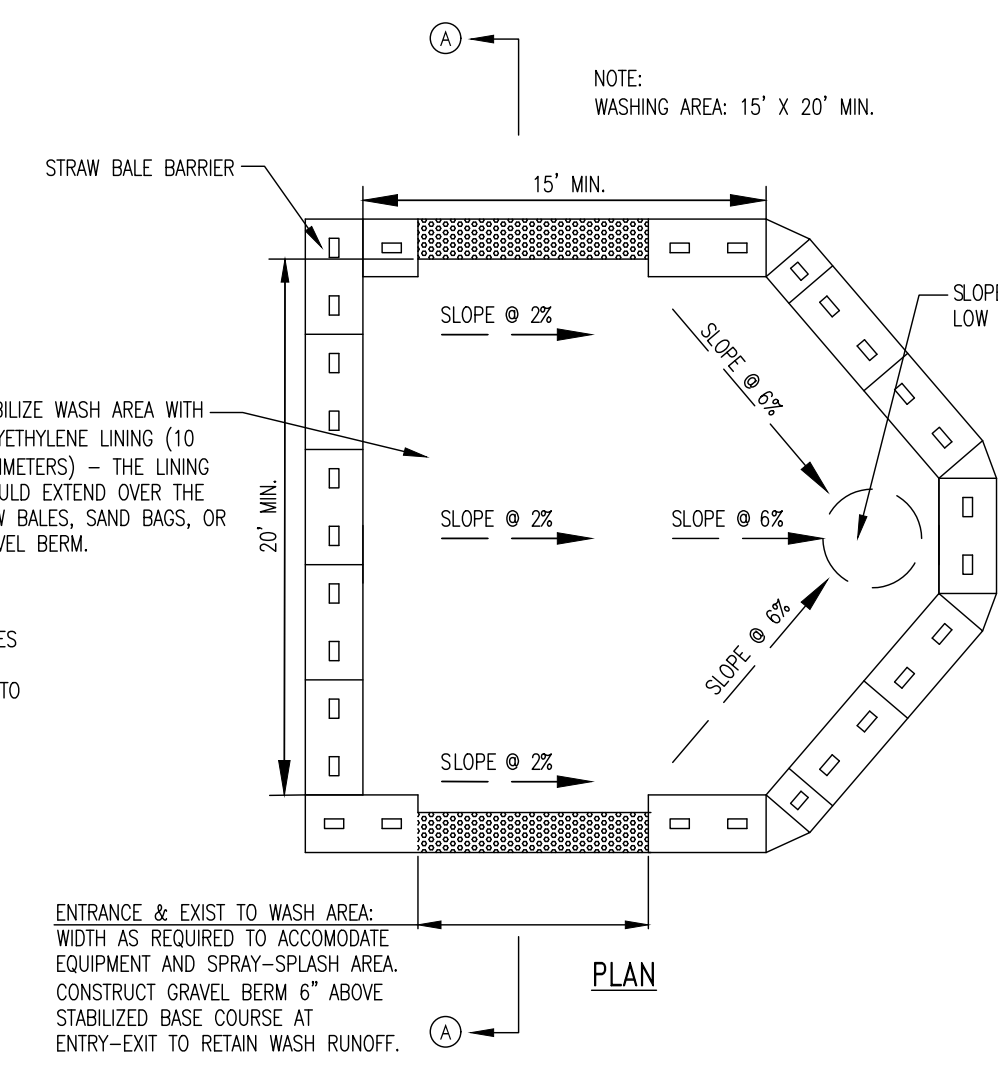
Mechanical Properties	Test Method	Units	MARV
Grab Tensile Strength	ASTM D 4632	KN (BS)	1.42 (325 x 0.89) (200)
Grab Tensile Elongation	ASTM D 4632	%	24 x 10
Puncture Strength	ASTM D 4833	KN (BS)	0.46 (103)
Mullen Burst Strength	ASTM D 3786	KPA (PSI)	3077 (450)
Impedance Tear Strength	ASTM D 4533	KN (BS)	0.51 (115) x 0.33 (75)
UV Resistance	ASTM D 4355	%	50
Apparent Opening Size	ASTM D 4751	Mm (US Std Sieve)	0.425 (40)
Flow Rate	ASTM D 4491	l/(mm²/m (sqft/m²))	3927 (145)
Permeability	ASTM D 4491	Sec	2.1

\*Note: All Dandy Sacks™ can be ordered with our optional oil absorbent liners

INLET PROTECTION  
NOT TO SCALE



CONCRETE WASHOUT AREA  
NOT TO SCALE



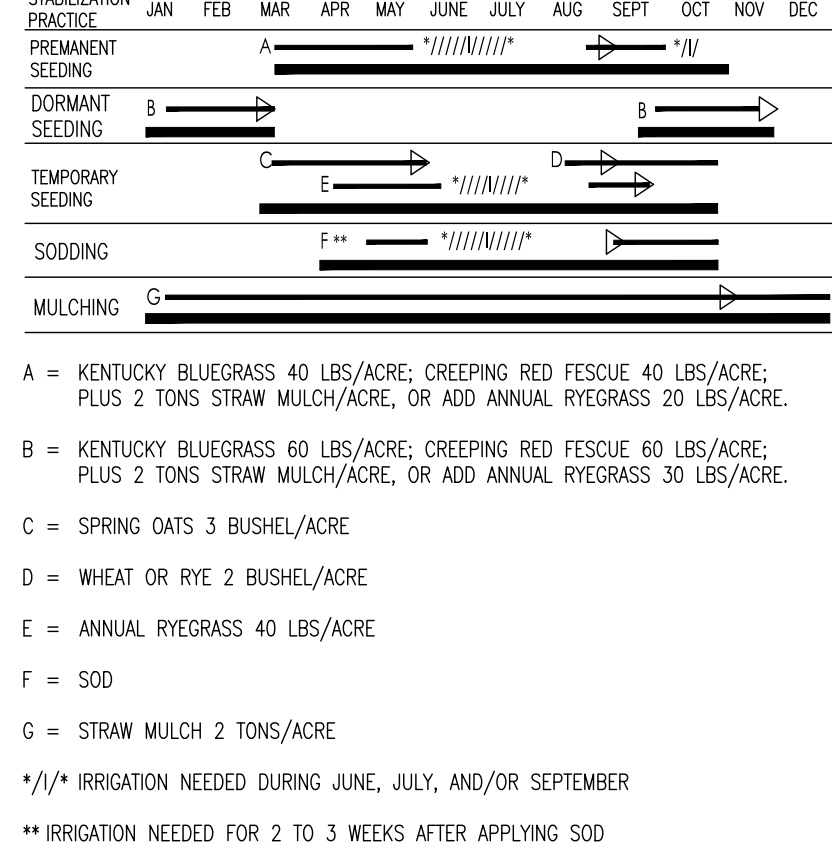
Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI	
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	C/D	4.8	59.8%	
CsB2	Crosby-Miami silt loams, 2 to 4 percent slopes, eroded	C/D	0.8	10.2%	
ThrA	Treaty silty clay loam, 0 to 1 percent slopes	B/D	2.3	28.6%	
<b>Subtotals for Soil Survey Area</b>				<b>8.0</b>	<b>98.6%</b>
<b>Totals for Area of Interest</b>				<b>8.1</b>	<b>100.0%</b>

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI	
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	C/D	0.1	1.2%	
ThrA	Treaty silty clay loam, 0 to 1 percent slopes	B/D	0.0	0.1%	
YbVA	Brookston silty clay loam-Urban land complex, 0 to 2 percent slopes	B/D	0.0	0.2%	
<b>Subtotals for Soil Survey Area</b>				<b>0.1</b>	<b>1.4%</b>
<b>Totals for Area of Interest</b>				<b>8.1</b>	<b>100.0%</b>



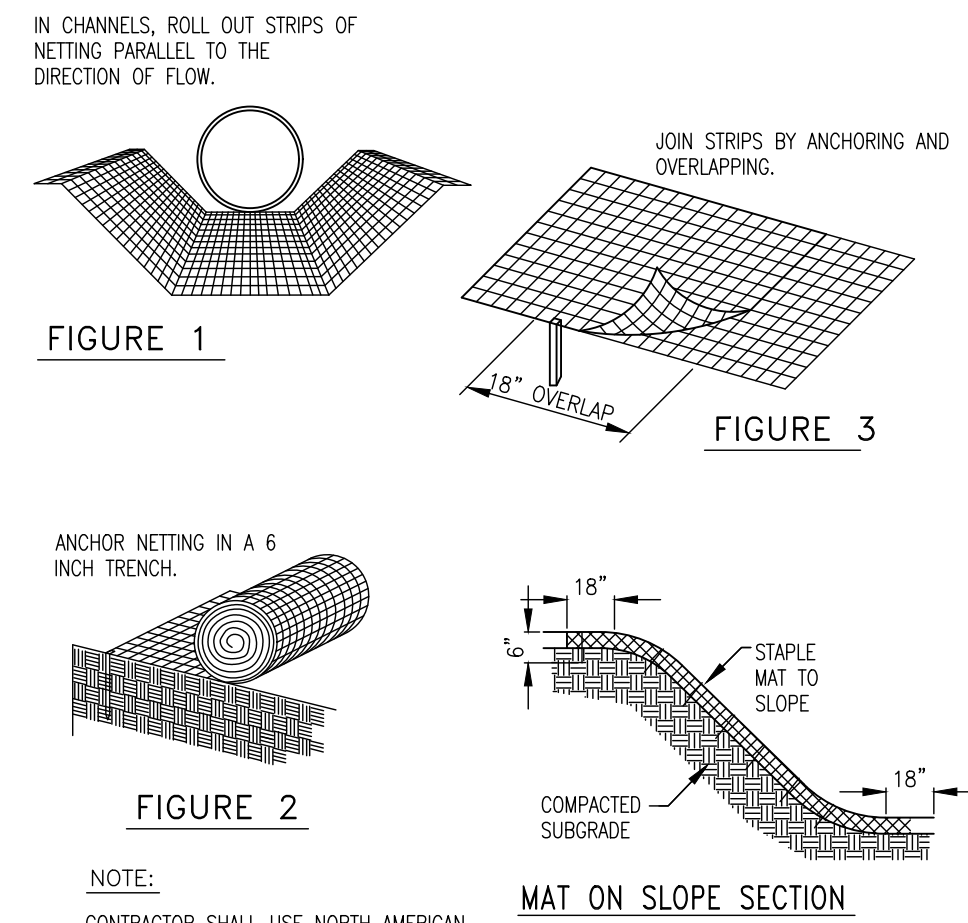
SEASONAL SOIL PROTECTION CHART



- INSTALLATION:
- THE BOTTOM 1" OF THE FENCE SHALL BE BURIED IN THE TRENCH ON THE UPSLOPE SIDE.
  - FENCE SHALL BE INSTALLED ALONG LEVEL GRADES, NOT ACROSS FLOW CHANNELS.
  - IF OPTIONAL SUPPORT WIRE FENCE IS USED, POST SPACING MAY BE EXTENDED TO 8' O.C.
- MAINTENANCE:
- INSPECT SILT FENCE PERIODICALLY (WEEKLY) AND AFTER EACH STORM EVENT.
  - IF FABRIC IS TORN OR DAMAGED OR IN ANY WAY BECOMES INEFFECTIVE, REPLACE THE AFFECTED PORTION IMMEDIATELY.
  - REMOVE DEPOSITED SEDIMENT WHEN IT REACHES HALF THE HEIGHT OF THE FENCE, OR IT IS CAUSING THE FABRIC TO BULGE.
  - TAKE CARE NOT TO UNDERMINE THE FENCE DURING SEDIMENT REMOVAL.
  - AFTER THE CONTRIBUTING AREA HAS BEEN STABILIZED, REMOVE THE FENCE AND REMAINING SEDIMENT, BRING THE DISTURBED AREA TO GRADE, AND STABILIZE.

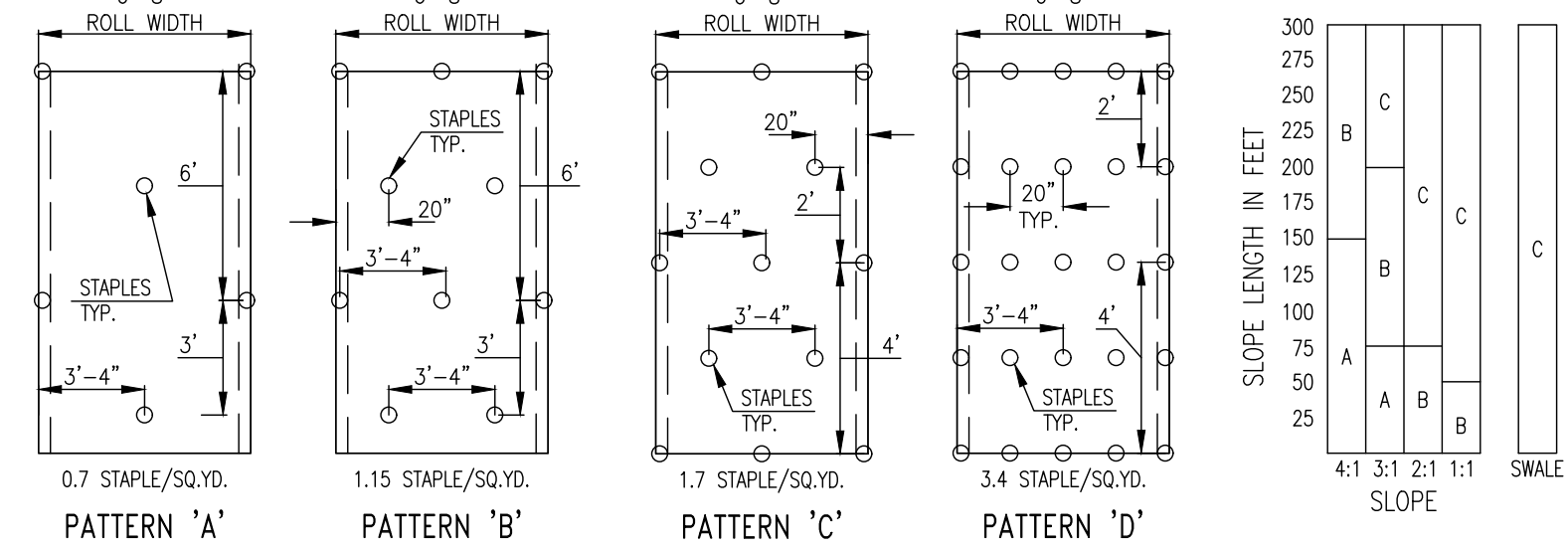
SEASONAL SOIL PROTECTION CHART

SILT FENCE SECTION  
NOT TO SCALE - PRACTICE 3.74



NOTE: CONTRACTOR SHALL USE NORTH AMERICAN GREEN SC150 BLANKET OR APPROVED ALTERNATE.

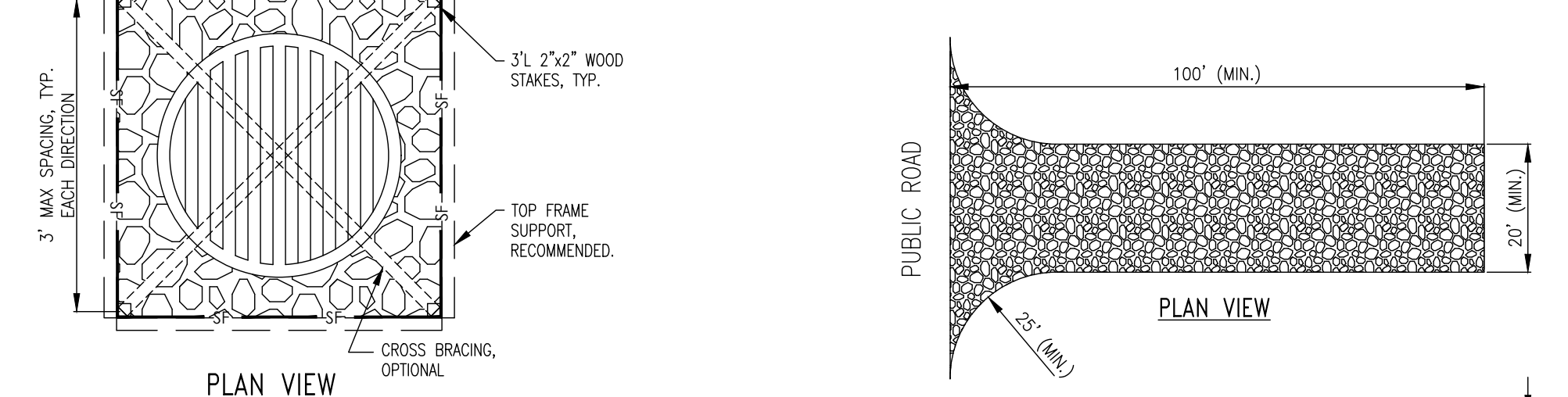
EROSION CONTROL BLANKET  
NOT TO SCALE



- INSTALLATION:
- BLANKET SHALL BE BIODEGRADABLE WOOD, STRAW OR COCONUT-FIBER MAT ENCLOSED IN A PHOTODEGRADABLE MESH.
  - SINGLE CHANNEL LININGS REQUIRE A 2' MIN. OVERLAP AT LONGITUDINAL JOINTS. SLOPESLOPES SHALL HAVE A 6" MIN. OVERLAP. THE UPSTREAM BLANKET SHALL ALWAYS OVERLAP THE DOWNSTREAM.
  - USE 6 INCH, 11 GA. WIRE "U" STAPLES. LONGER OR HEAVIER GAUGE STAPLES MAY BE NECESSARY FOR SOME SOIL TYPES.
  - USE STAPLE PATTERN INDICATED OR MANUFACTURER'S RECOMMENDATION, WHICHEVER REQUIRES THE GREATER STAPLE FREQUENCY.
  - STAPLE PATTERNS SHOWN APPLY TO NORTH AMERICAN GREEN BLANKETS. STAPLE PATTERNS MAY VARY BASED ON SOIL CONDITIONS AND RAINFALL AMOUNTS. INSTALL OTHER PATTERNS AS INSTALLED FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.

- MAINTENANCE:
- INSPECT WEEKLY, AND AFTER EACH STORM EVENT, ESPECIALLY AT THE EDGES OF BLANKETS WHERE EROSION MAY UNDERCUT THE MATERIAL.
  - REPAIR AND REPLACE DAMAGED MATERIAL AND ERODED BASE AREAS IMMEDIATELY.
  - RESTAPLE AND RESEAL AS NEEDED FOR EROSION CONTROL.

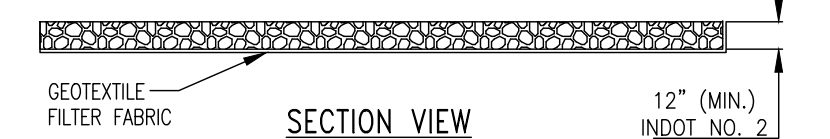
EROSION CONTROL BLANKETS  
NOT TO SCALE - PRACTICE 3.17



- INSTALLATION:
- CUT FENCE FABRIC FROM A SINGLE ROLL TO ELIMINATE JOINTS.
  - USE A MINIMUM OVERLAP 2' IF A JOINT IS NEEDED.
  - BURY 12" OF FENCE FABRIC PER THE SILT FENCE SECTION DETAIL.
  - SPACE SUPPORT EVENLY, WITH A MAXIMUM SPACING OF 3'.
  - SUPPORTS SHALL ABUT THE INLET PERIMETER WHEREVER POSSIBLE. PROVIDE A 4" BED OF NO. 2 STONE WHERE OVERFLOW FALLS ONTO UNPROTECTED SOIL.
  - PREFABRICATED WELDED WIRE UNITS ARE ACCEPTABLE.

- MAINTENANCE:
- INSPECT FENCE WEEKLY AND AFTER EACH STORM EVENT.
  - IF FENCE IS DAMAGED, REPAIR OR REPLACE IT IMMEDIATELY.
  - REMOVE DEPOSITED SEDIMENT WHEN IT REACHES ONE THIRD OF THE HEIGHT OF THE FENCE.
  - TAKE CARE NOT TO UNDERMINE THE FENCE DURING SEDIMENT REMOVAL.
  - AFTER THE CONTRIBUTING AREA HAS BEEN STABILIZED, REMOVE THE FENCE AND REMAINING SEDIMENT, BRING THE DISTURBED AREA TO GRADE, AND STABILIZE.
  - REPLACE THE FENCE WITH ANOTHER PRACTICE - STRAW BALES (PRACTICE 3.54), GRAVEL RING (PRACTICE 3.56), OR GRAVEL BAGS (PRACTICE 3.66) - IF IT CONTINUALLY SUSTAINS SIGNIFICANT DAMAGE.

SILT FENCE INLET PROTECTION  
NOT TO SCALE - PRACTICE 3.52



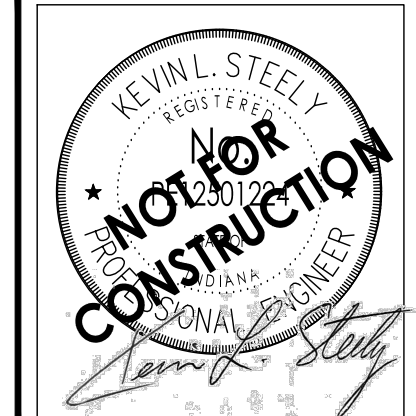
- MAINTENANCE:
- INSPECT WEEKLY, AND AFTER EACH STORM EVENT OR HEAVY USE.
  - RESHAPE AS NEEDED FOR DRAINAGE AND RUNOFF CONTROL.
  - TOPDRESS WITH CLEAN STONE AS REQUIRED. MAINTAIN MINIMUM DEPTH THROUGHOUT CONSTRUCTION.
  - IMMEDIATELY REMOVE MUD AND SEDIMENT TRACKED OR WASHED ONTO PUBLIC ROADS BY SWEEPING OR BRUSHING. (DO NOT FLUSH AREA WITH WATER).
  - REPAIR ANY BROKEN PAVEMENT IMMEDIATELY.

STABILIZED CONSTRUCTION ENTRANCE  
NOT TO SCALE - PRACTICE 3.0

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ENVIRONMENTAL  
CONSTRUCTION STAKING  
CONSTRUCTION MGMT. TESTING



BY	
DATE	
REVISED AND REVISIONS	



COMPASS AND KEY INDUSTRIAL PARK  
2616 N RACEWAY RD., BROWNSBURG, IN 46234  
SEC. 29 - 116N - R2E - UNINCORP W/P - HENDRICKS COUNTY, INDIANA  
COMPASS AND KEY LLC  
9129 LOG RUN DR S., INDIANAPOLIS, IN 46234  
SWPPP DETAILS AND SOILS

PLAN DATE:	02/19/26
DESIGN:	KLS
CHECK:	GRR
DRAWN:	KLS
PROJECT NO.:	2504018
SHEET NO.:	C504





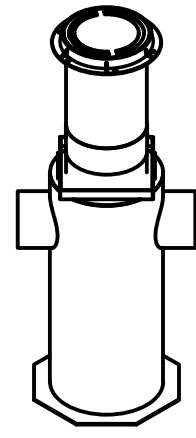




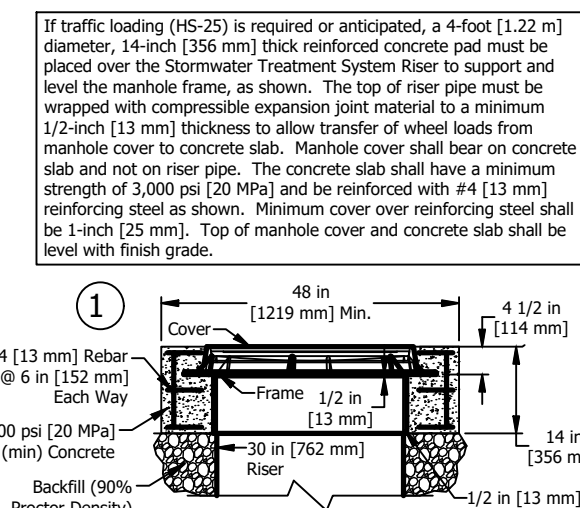
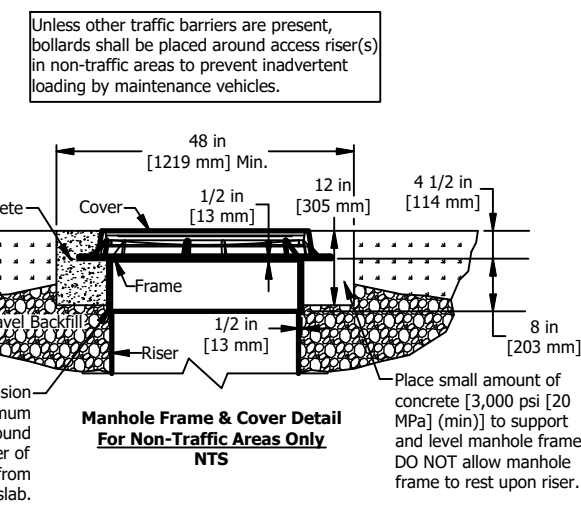




Aqua-Swirl® Polymer Coated Steel (PCS)  
Stormwater Treatment System



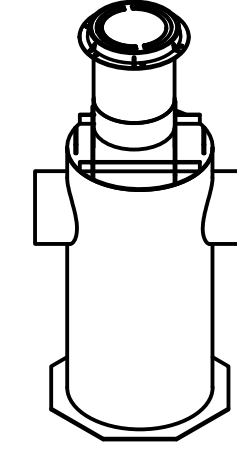
Projected View  
SCALE 1:70



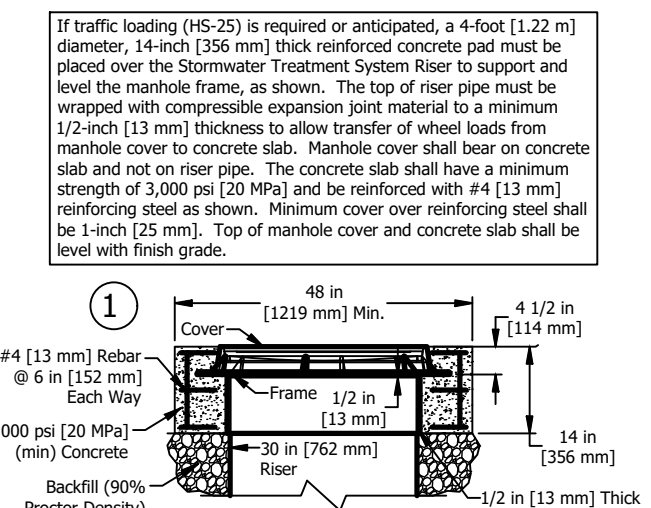
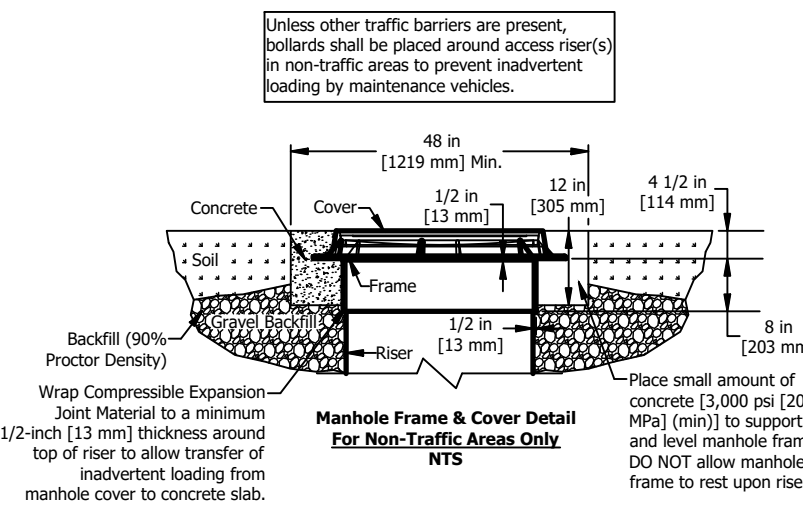
Please see accompanied Aqua-Swirl® specification notes. See Site Plan for actual system orientation.

- ① As an alternative, 42 in [1067 mm] diameter, HS-20/25 rated precast concrete rings may be substituted. 14 in [356 mm] thickness must be maintained.
- ② XP-3 inlet/outlet pipe size ranges up to 21 in [533 mm].
- ③ XP-3 chamber height may vary depending on inlet/outlet pipe size.
- ④ Orientation may vary from 180°, 90°, or custom angles to meet site conditions.

Aqua-Swirl® Polymer Coated Steel (PCS)  
Stormwater Treatment System

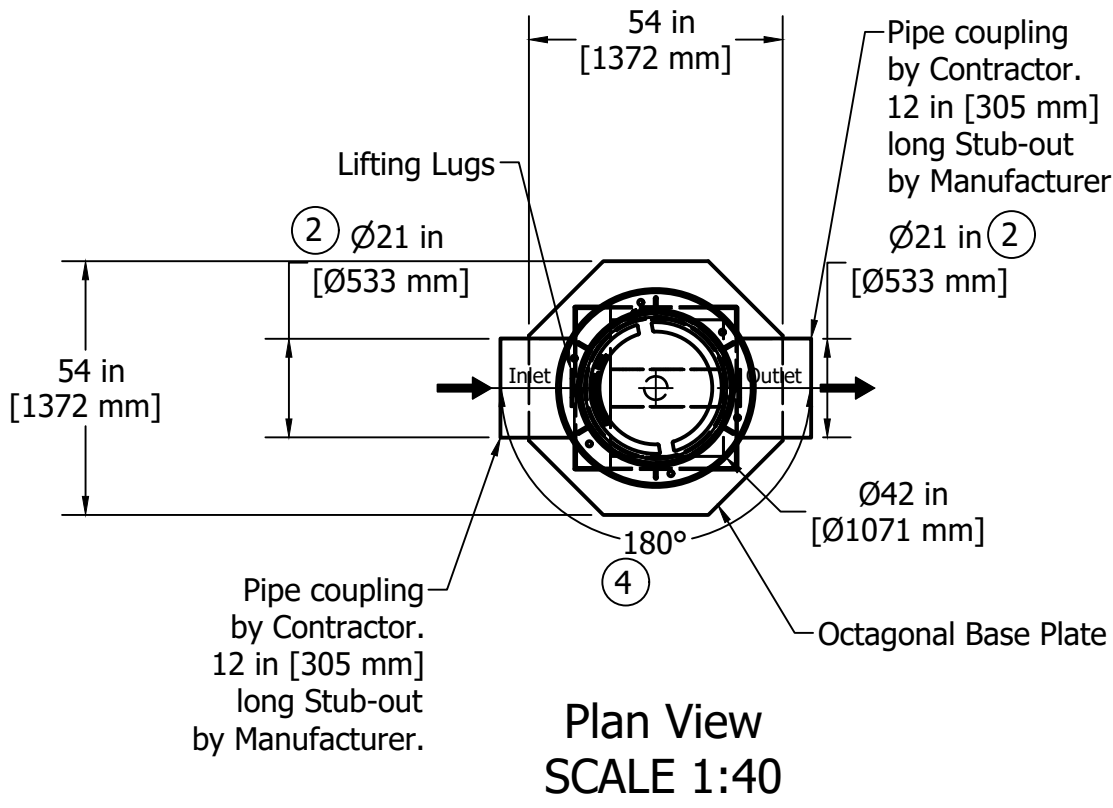


Projected View  
SCALE 1:70

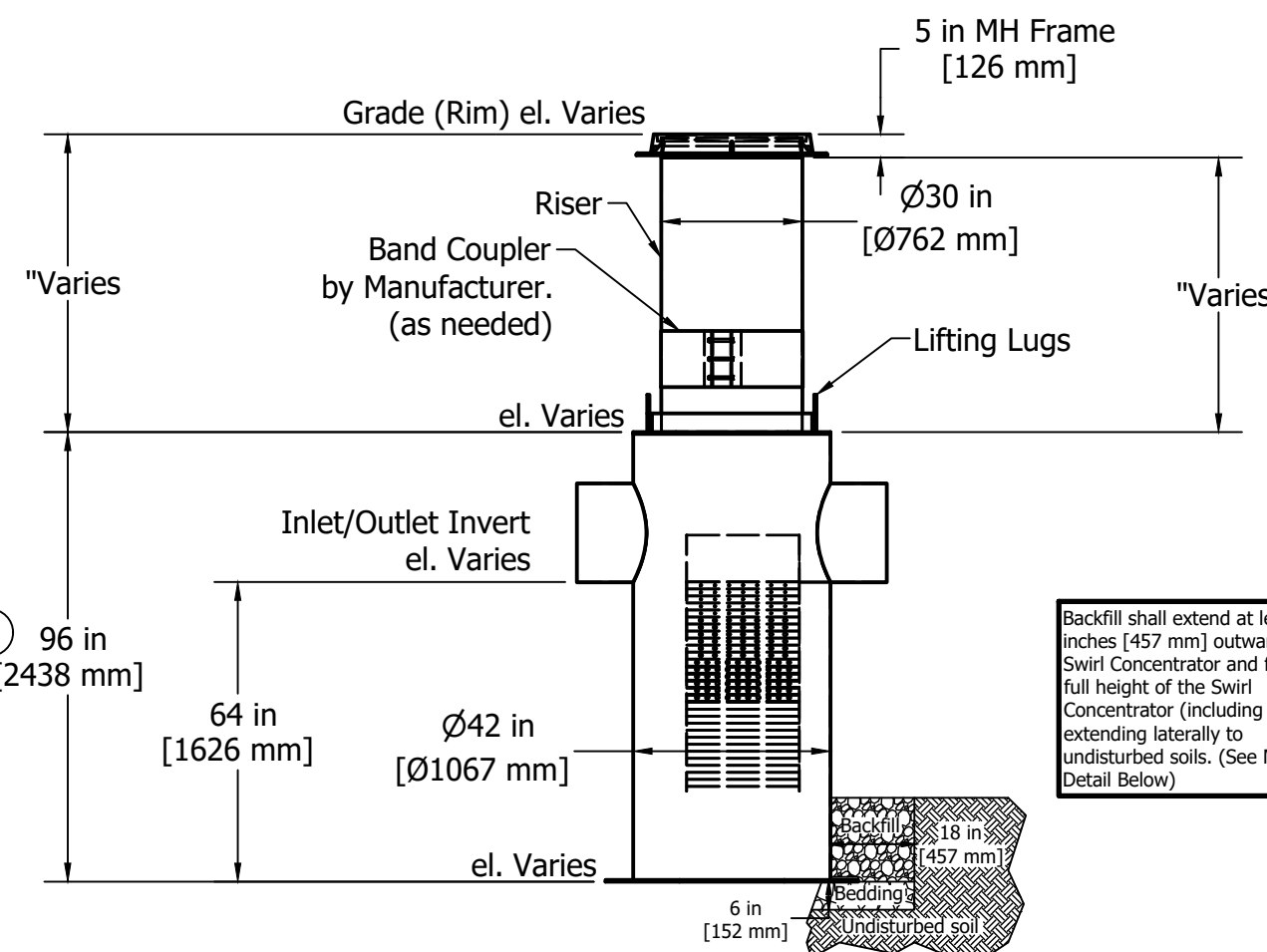


Please see accompanied Aqua-Swirl® specification notes. See Site Plan for actual system orientation.

- ① As an alternative, 42 in [1067 mm] diameter, HS-20/25 rated precast concrete rings may be substituted. 14 in [356 mm] thickness must be maintained.
- ② XP-4 inlet/outlet pipe size ranges up to 27 in [686 mm].
- ③ XP-4 chamber height may vary depending on inlet/outlet pipe size.
- ④ Orientation may vary from 180°, 90°, or custom angles to meet site conditions.



Plan View  
SCALE 1:40



Elevation View  
SCALE 1:40

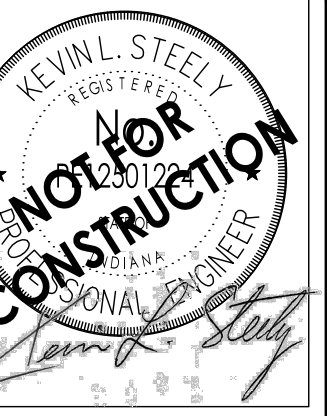
AquaShield® Phone (888) 344-9044 Fax (423) 826-2112 www.aquashieldinc.com	Aqua-Swirl XCELERATOR® High Performance XP-3	Structure #:	XP-3 STD	Revised:		Rvw. Date:	
	Standard Detail	Drawn By:	CWatson				
		Scale:	As Shown				
		Date:	5/5/2025				

AquaShield® Phone (888) 344-9044 Fax (423) 826-2112 www.aquashieldinc.com	Aqua-Swirl XCELERATOR® High Performance XP-4	Structure #:	XP-4 STD	Revised:		Rvw. Date:	
	Standard Detail	Drawn By:	CWatson				
		Scale:	As Shown				
		Date:	5/5/2025				

CIVIL ENGINEERS  
LAND SURVEYORS  
DEVELOPMENT CONSULTANTS  
GEO-TECHNICAL  
ENVIRONMENTAL  
CONSTRUCTION STAKING  
CONSTRUCTION MAT. TESTING



BY:	
DATE:	
REVISIONS AND ISSUES:	



COMPASS AND KEY INDUSTRIAL PARK  
2616 N RACEWAY RD, BROWNSBURG, IN 46234  
SEC 29 - 116N - R2E - J10C01NWP - HERRICKS COUNTY INDIANA  
COMPASS AND KEY LLC  
9129 LOG RUN DR S, INDIANAPOLIS, IN 46234  
SQU DETAILS

PLAN DATE:	02/19/26
DESIGN:	KLS
CHECK:	GRR
DRAWN:	KLS
PROJECT NO.:	2504018
SHEET NO.:	C610



Y:\Project\2025\2504018\Accessories\Drawings\Accessories\811\2504018-C610-SQU.dwg Plot: February 21, 2025 2:23:47 PM

**GENERAL NOTES & DISCLAIMERS**

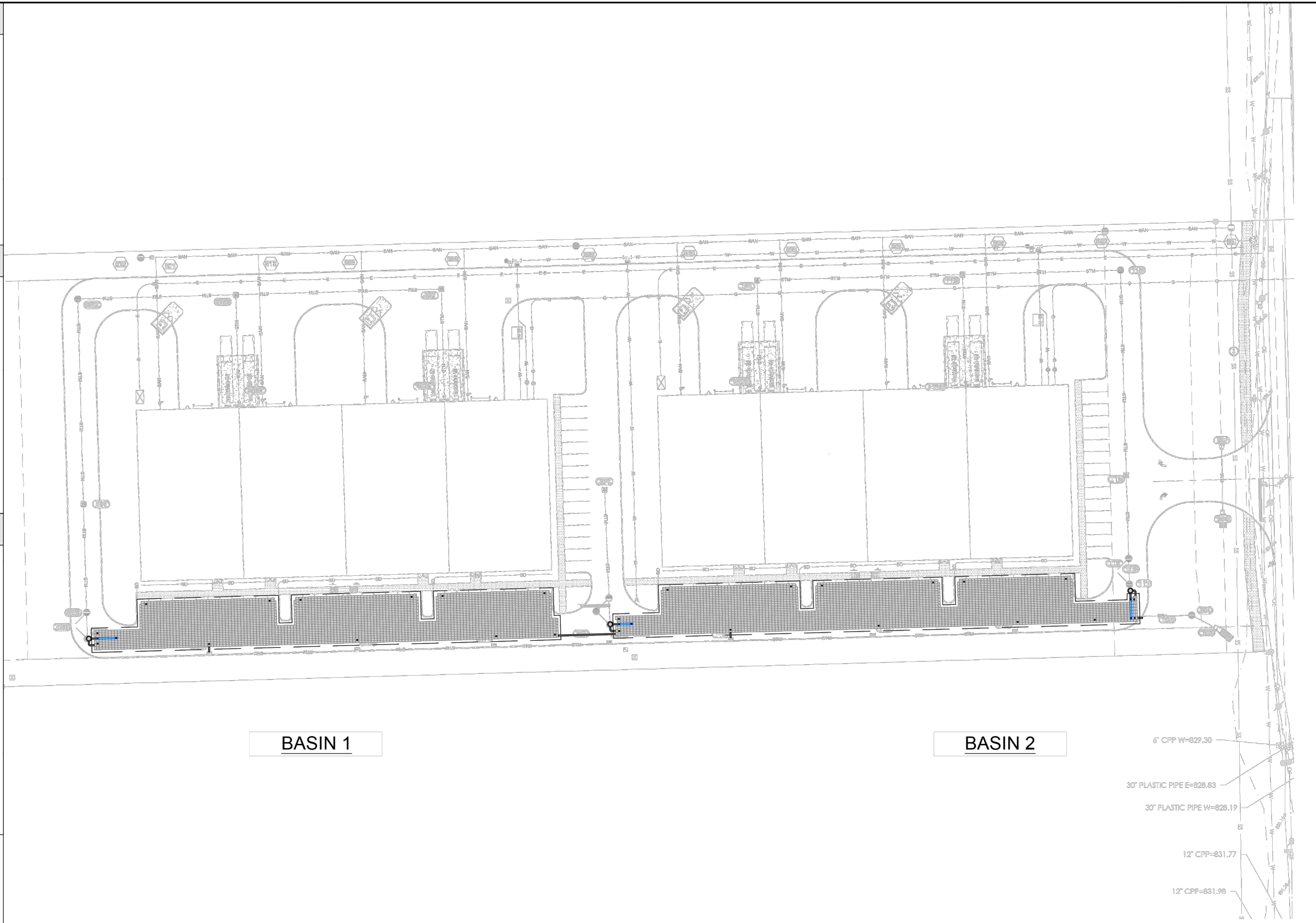
- MATERIAL SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.
- CONSULTANT DRAWINGS ARE BEING RELIED UPON AS BEING ACCURATE IN DEPICTING SITE CONDITIONS, THAT THEY SATISFY ANY LOCAL BUILDING CODE REQUIREMENTS, AND THAT THEY ACCURATELY DEPICT SUBSURFACE CONDITIONS.
- FERGUSON SUPPLIES THE PRODUCTS ONLY AND TAKES NO RESPONSIBILITY FOR INSTALLATION AND HAS NO ROLE IN THE INSTALLATION OF THE PRODUCTS.
- R-TANK SYSTEMS ARE NOT DESIGNED TO SUPPORT LOADS FROM BUILDINGS, RETAINING WALLS, ETC. THEREFORE, THE ENGINEER OF RECORD MUST COORDINATE WITH THE PROPER DISCIPLINES TO ENSURE NO STRUCTURAL LOADS ARE IMPOSED UPON THE SYSTEM AND ANY INFILTRATION FROM THE SYSTEM HAS BEEN ACCOUNTED FOR IN FOUNDATION DESIGN.

**MATERIAL HANDLING**

- PROTECT R-TANK AND OTHER MATERIALS FROM DAMAGE DURING DELIVERY AND OFFLOADING. HANDLING IS TO BE PERFORMED WITH EQUIPMENT APPROPRIATE TO THE MATERIALS AND SITE CONDITIONS.
- STORAGE OF MATERIALS SHOULD BE ON SMOOTH SURFACES, FREE FROM DIRT, MUD AND DEBRIS, AND AWAY FROM ANY OPEN FLAME, WELDING OPERATIONS, OR OTHER POTENTIAL HEAT SOURCES.
- UV SENSITIVE MATERIALS AND R-TANK UNITS SHOULD BE STORED UNDER A TARP TO PROTECT FROM SUNLIGHT WHEN TIME FROM DELIVERY TO INSTALLATION EXCEEDS TWO WEEKS.
- WHEN HANDLING AND INSTALLING PRODUCT IN COLD WEATHER:
  - WHEN THE AIR TEMPERATURE IS 40° F OR BELOW, CARE MUST BE TAKEN WHEN HANDLING PLASTICS TO ENSURE NO CRACKING. DO NOT USE FROZEN MATERIALS OR MATERIALS WET OR COATED WITH ICE OR FROST.
  - DO NOT BUILD ON FROZEN GROUND OR WET, SATURATED OR MUDDY SUBGRADE.

**INSTALLATION NOTES**

- R-TANK INSTALLATION SHALL NOT BEGIN UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-INSTALLATION CONFERENCE PER THE R-TANK SPECIFICATION.
- INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
- BACKFILL, GEOTEXTILE, AND/OR LINER SHALL BE IN ACCORDANCE WITH THE R-TANK SPECIFICATIONS. QUANTITIES ARE APPROXIMATIONS BASED ON DIMENSIONS SHOWN.
- THE USE OF CONSTRUCTION EQUIPMENT IS LIMITED. REFER TO THE CONSTRUCTION EQUIPMENT COVER DETAIL INCLUDE WITHIN THIS PLAN SET.
- FERGUSON RECOMMENDS, PRIOR TO SITE STABILIZATION, ALL UPSTREAM INLETS BE PROTECTED FROM ACTIVE CONSTRUCTION SITE RUNOFF INCLUDING DEBRIS AND SEDIMENT FROM ENTERING THE SYSTEM.
- PRE-TREATMENT DEVICES ARE RECOMMENDED UP-STREAM OF ALL INFLOW CONNECTIONS. LEAF GUARDS SHOULD BE INSTALLED ON ANY DOWNPOUT CONNECTIONS. CONTRACTOR AND ENGINEER ARE RESPONSIBLE ON ENSURING THE LAST UP-STREAM STRUCTURE IS ADEQUATE TO CONTAIN THE NECESSARY TREATMENT DEVICE.
- CONTACT YOUR LOCAL FERGUSON REPRESENTATIVE WITH ANY QUESTIONS.



**R-TANK QUANTITIES**

BASIN	1	2
TRAFFIC RATING	HS-20	HS-20
# OF HD DOUBLE-MINI R-TANKS	3579	3785
# OF HD DOUBLE-MINI ACCESS MODULES	7	12

**R-TANK VOLUMES**

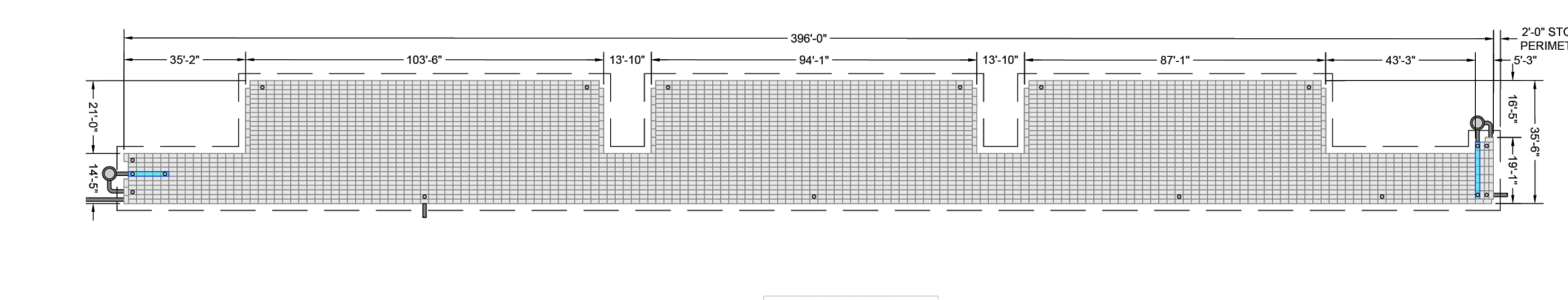
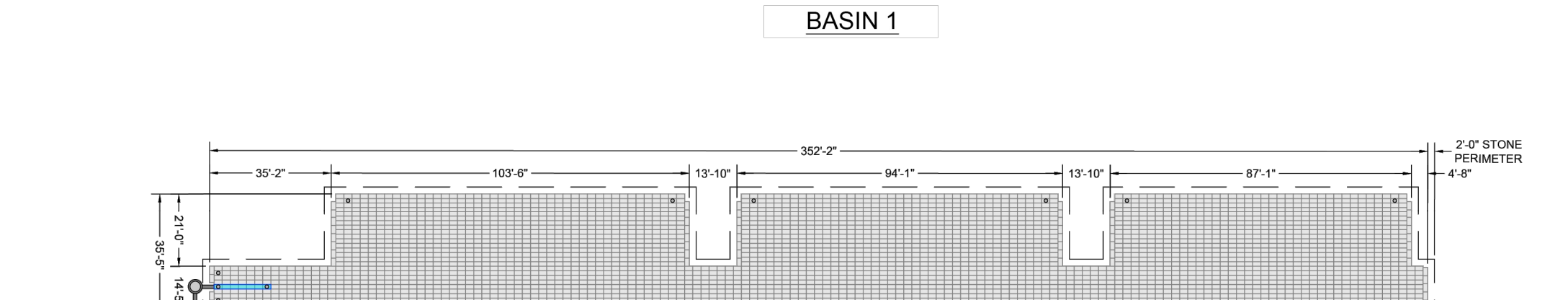
TOTAL SYSTEM STORAGE	44,773 CF	47,585 CF
R-TANK STORAGE VOLUME	37,188 CF	39,353 CF
STONE STORAGE VOLUME (40% VOID RATIO)	7,668 CF	8,232 CF
STONE BED FOOTPRINT	12,797 SF	13,648 SF
STONE QUANTITY	823 CY	869 CY

**R-TANK ELEVATIONS**

DESCRIPTION	ELEVATION
BASE INV.	832.25
TANK INV.	832.50
TOP OF TANK	836.04
GEOSOID	837.04
MIN. ALLOW. FINAL GRADE	837.71
MAX. ALLOW. FINAL GRADE	843.03

**LEGEND**

- R-TANK HD DOUBLE-MINI UNITS
- R-TANK HD DOUBLE-MINI ACCESS UNITS
- INSPECTION PORT
- 12" PIPE CONNECTION
- EXCAVATION PERIMETER
- PERIMETER BACKFILL



**DATE INITIALS DESCRIPTIONS**

2/16/2025	CRH	INCREASE VOLUME AND CHANGE TANK TYPE
2/19/2025	CRH	REVISE PIPE CONNECTIONS AND TREATMENT ROWS

DISTRIBUTED BY: **R-TANK** **FERGUSON WATERWORKS**

**R-Tank**  
MODULAR STORMWATER STORAGE SYSTEM

**SYSTEM OVERLAY**  
COMPASS & KEY INDUSTRIAL  
BROWNSBURG, IN

DATE: 2/16/2025  
DATE: 11/17/2025  
SHEET NO: 1 of 7

THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO FERGUSON WATERWORKS BY THE DESIGN ENGINEER, CONTRACTOR, OR OTHER PROJECT REPRESENTATIVE. THE ENGINEER OF RECORD SHALL REVIEW AND APPROVE THAT THE DEPICTED LAYOUT AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE REGULATIONS AND PROJECT SPECIFIC REQUIREMENTS.

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2/19/2025	CRH	REVISE PIPE CONNECTIONS AND TREATMENT ROWS

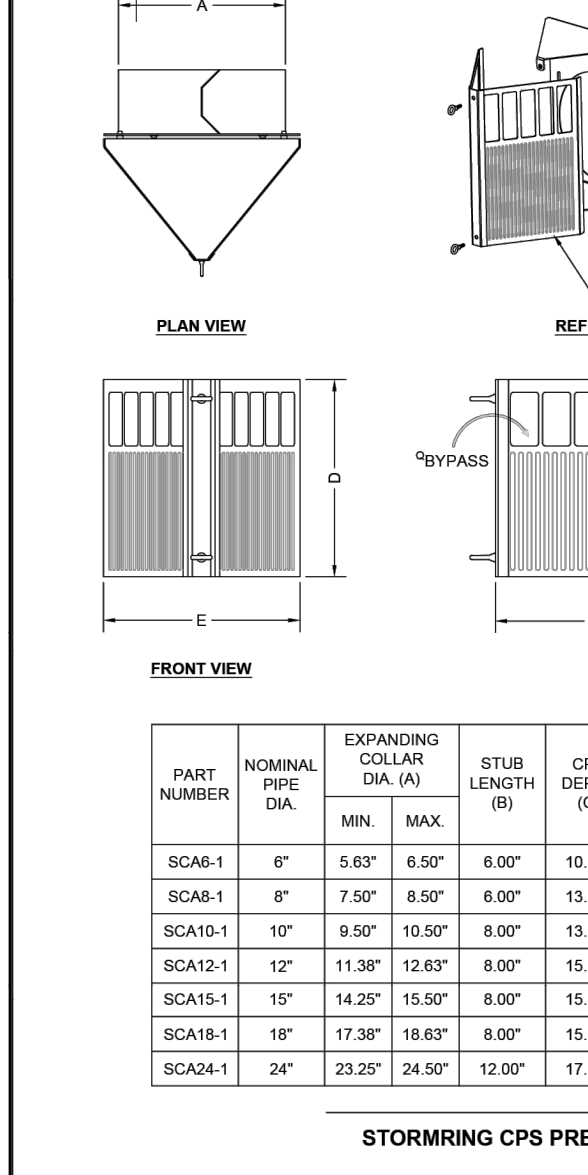
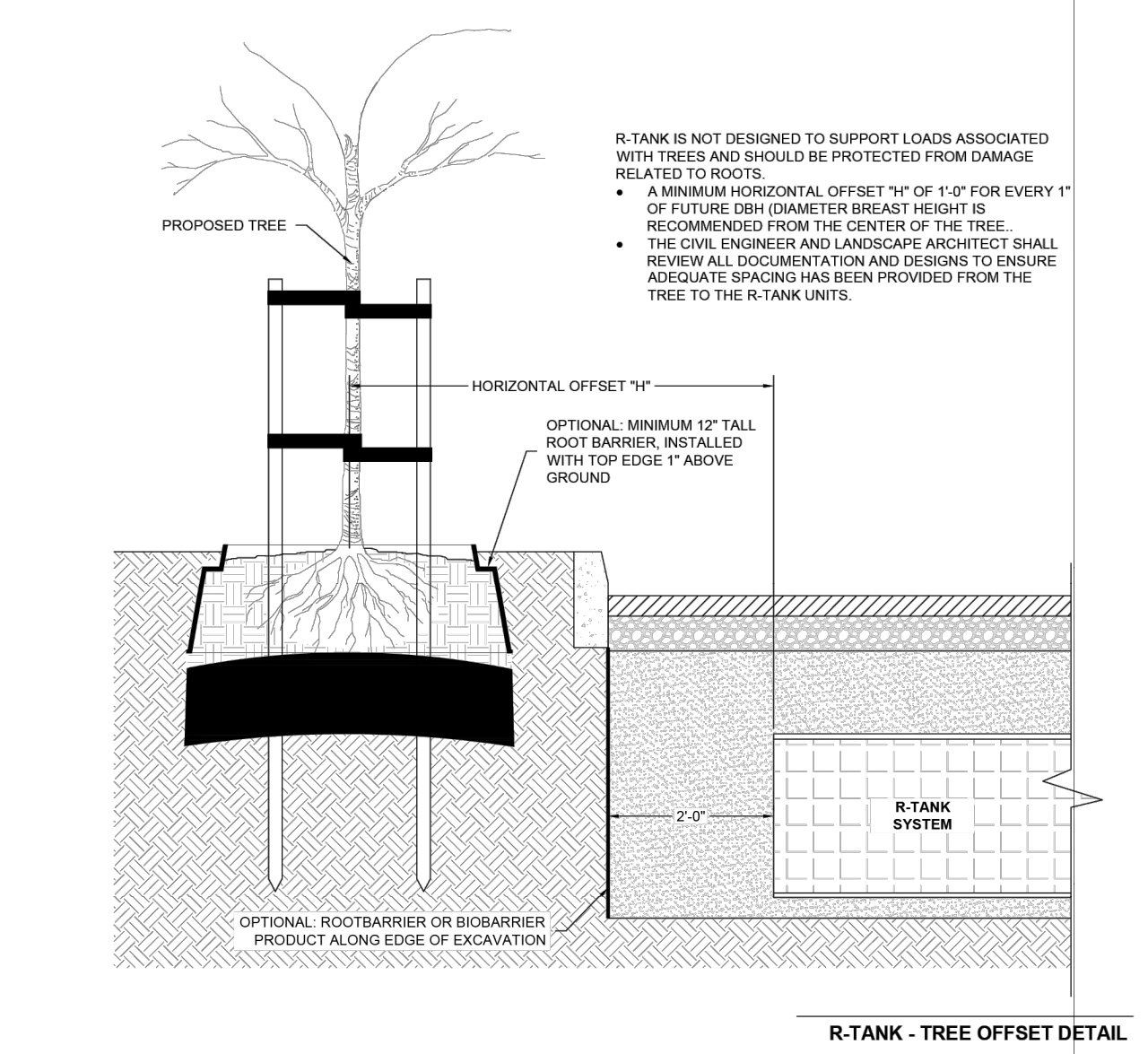
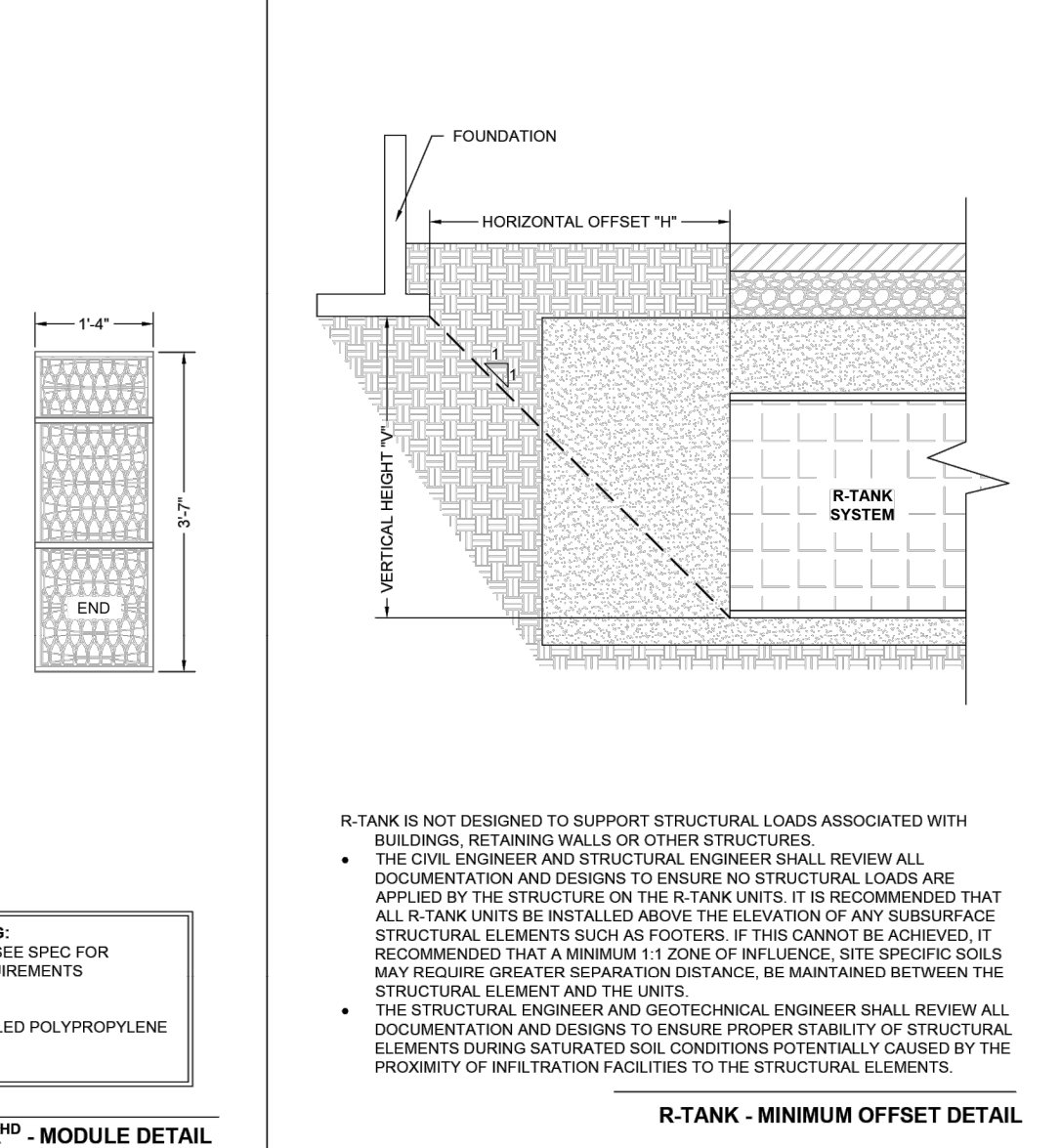
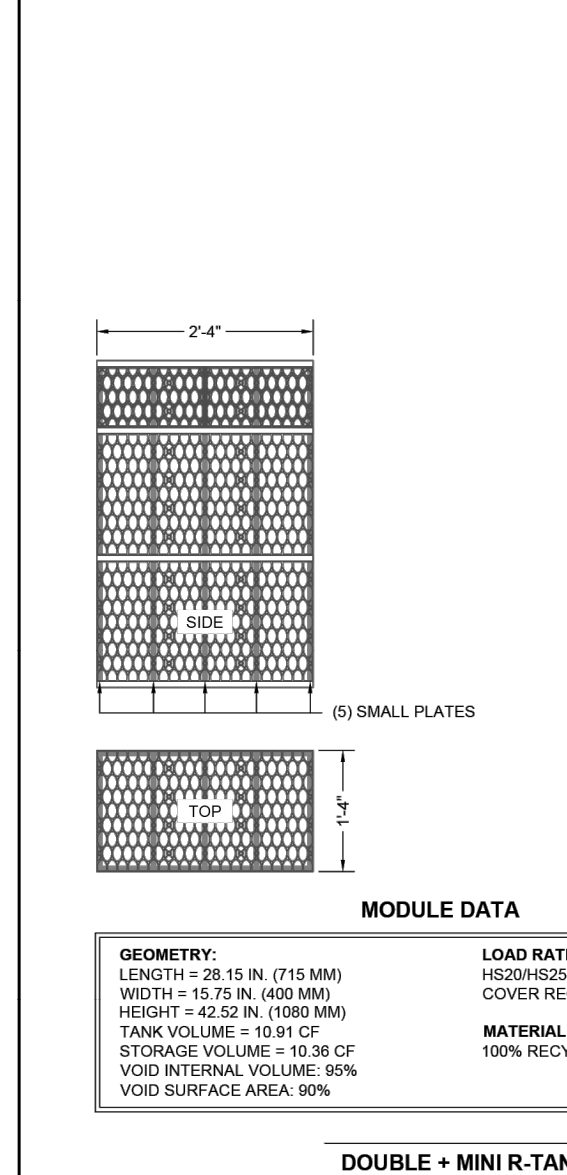
DISTRIBUTED BY: **R-TANK** **FERGUSON WATERWORKS**

**R-Tank**  
MODULAR STORMWATER STORAGE SYSTEM

**SYSTEM LAYOUT**  
COMPASS & KEY INDUSTRIAL  
BROWNSBURG, IN

DATE: 2/16/2025  
DATE: 11/17/2025  
SHEET NO: 2 of 7

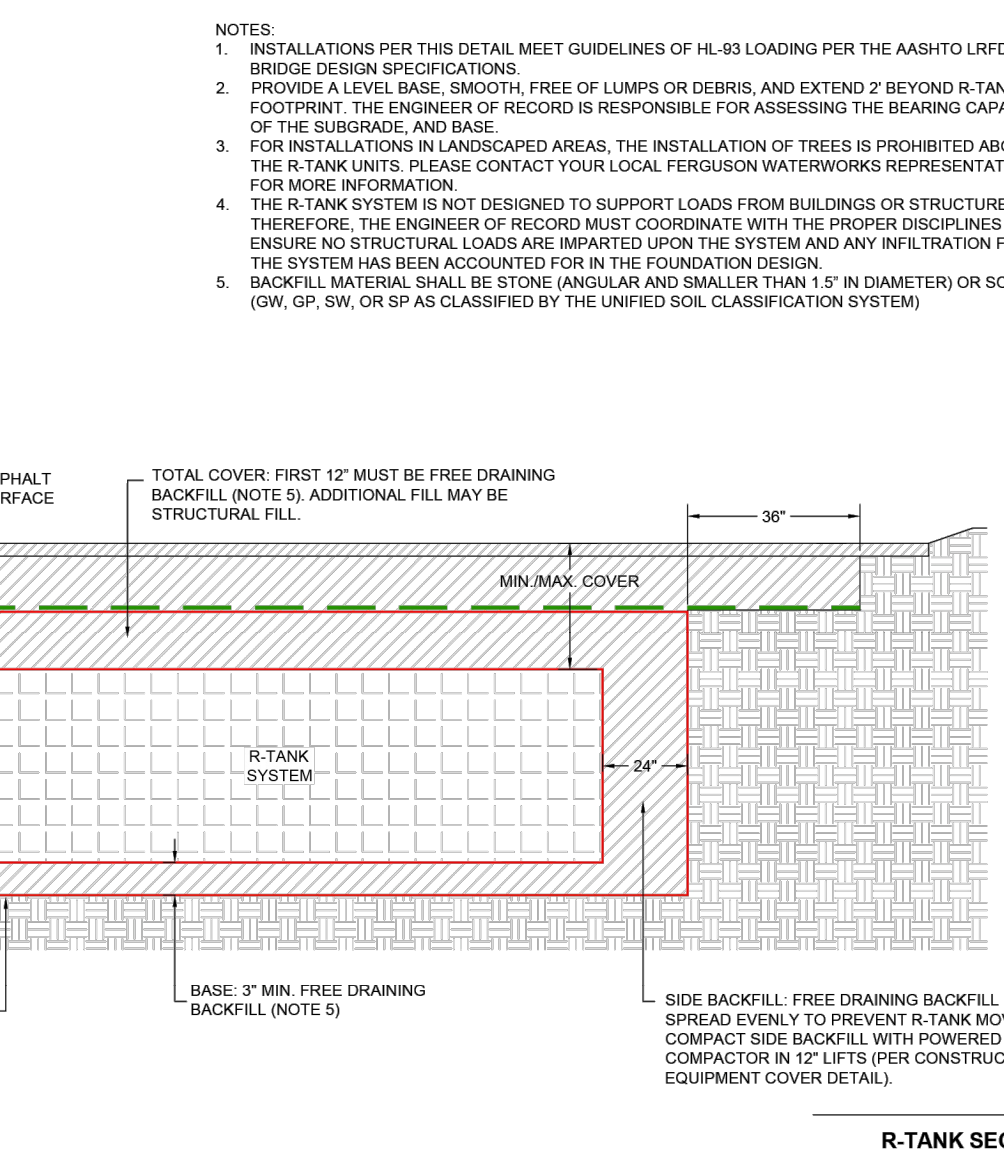
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**R-TANK UNIT LOAD RATING**

UNIT TYPE	COMPRESSION STRENGTH	NON-VEHICULAR MIN. COVER*	HS-20 MIN. COVER*	HS-25 MIN. COVER*	MAX. COVER*
HD	33.0 PSI	12"	20"	24"	6.98'

\*MINIMUM AND MAXIMUM COVER ARE MEASURED FROM THE TOP OF THE R-TANK UNIT TO THE TOP OF THE FINISHED SURFACE.



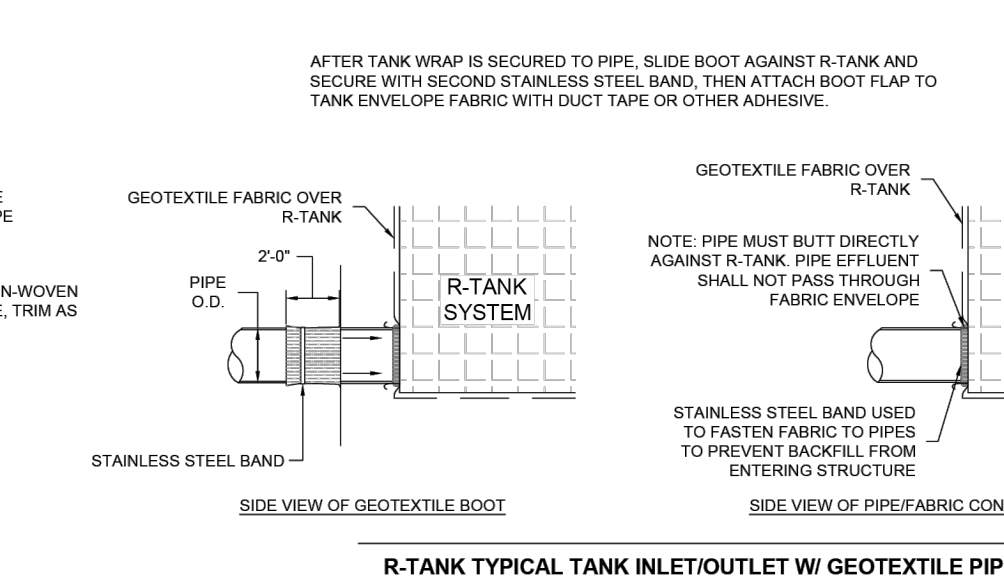
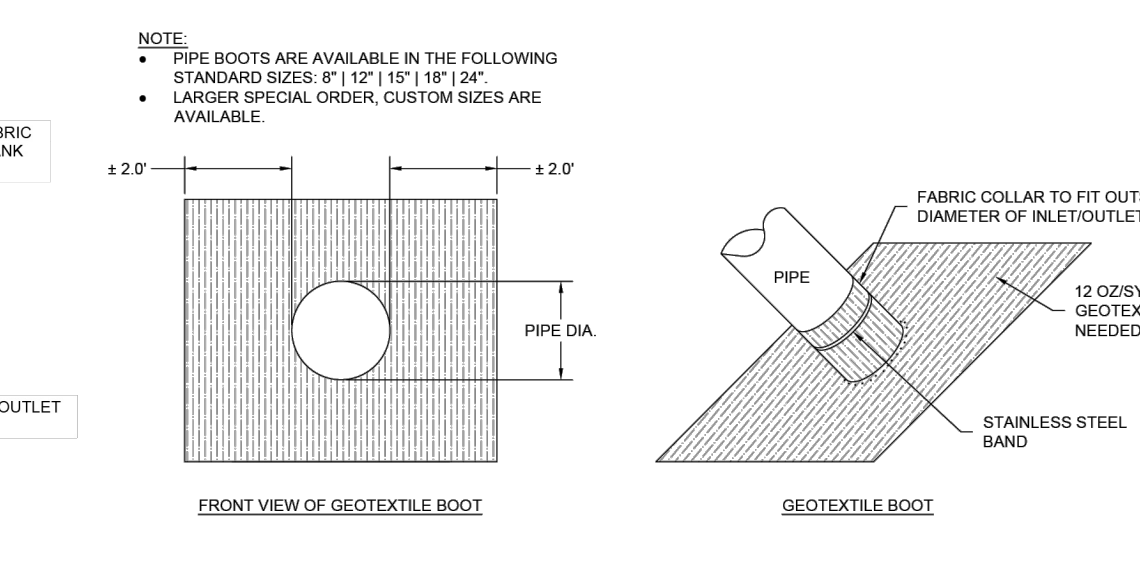
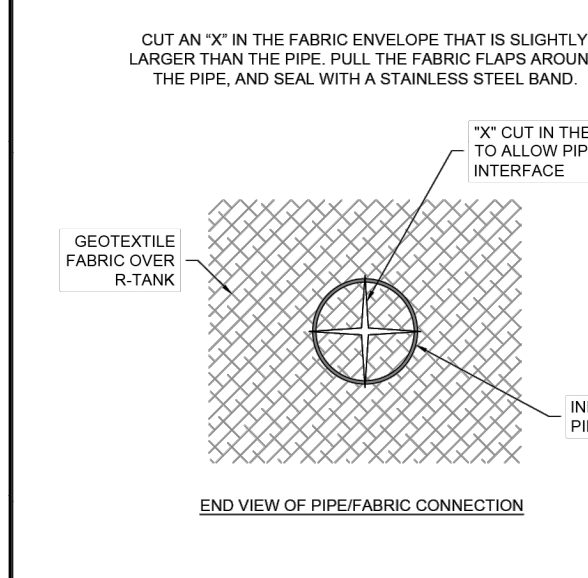
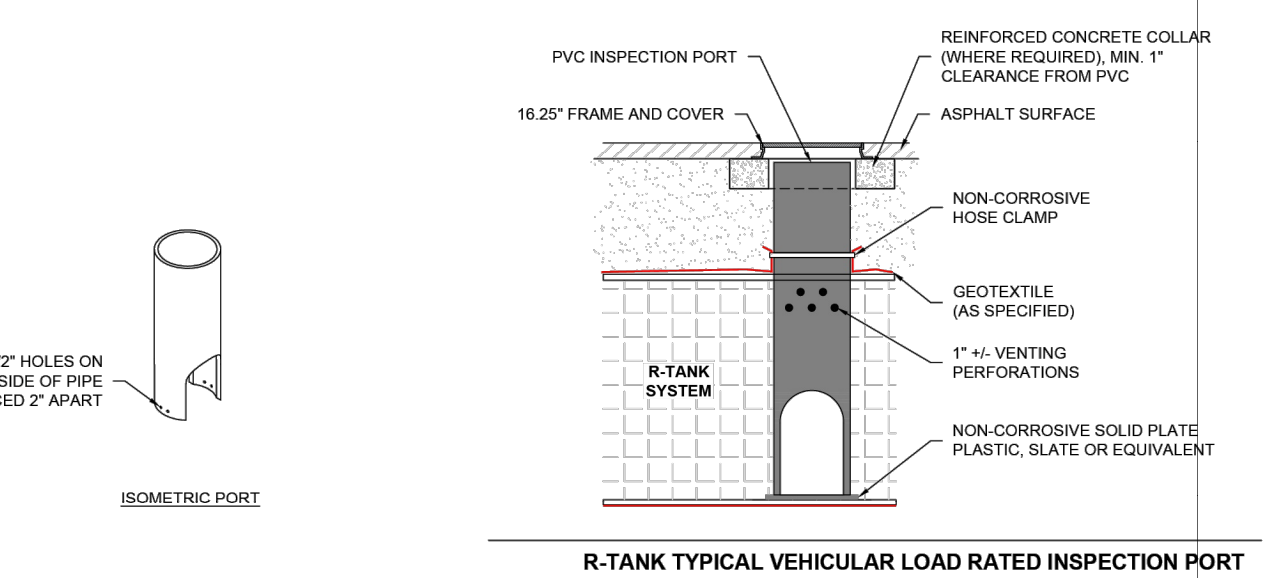
**NOTES**

- INSPECTION PORT IS USED IN THE ACCESS MODULE TO INSPECT THE LEVEL OF SEDIMENT ACCUMULATION AND PERFORM ROUTINE MAINTENANCE.
- MINIMUM REQUIRED MAINTENANCE INCLUDES A QUARTERLY INSPECTION DURING THE FIRST YEAR OF OPERATION AND A YEARLY INSPECTION THEREAFTER. FLUSH AS NEEDED.
- R-TANK MAY BE USED IN TRAFFIC APPLICATIONS. SEE TRAFFIC LOADING DETAIL FOR MINIMUM & MAXIMUM COVER REQUIREMENTS.
- IF INSPECTION PORT IS LOCATED IN A NON-TRAFFIC AREA, A PLASTIC CAP CAN BE USED IN LIEU OF A FRAME AND COVER WITH CONCRETE COLLAR.

**R-TANK INSPECTION PORT DIMENSIONS**

UNIT TYPE	DOGHOUSE BOTTOM WIDTH (A")	DOGHOUSE VERTICAL LENGTH (B")	DOGHOUSE OPENING HEIGHT (C")	PORT DIAMETER (D")
HD	10"	9"	14"	12"
SD	10"	3"	8"	12"
UD	8"	7"	12"	10"
XD	10"	VARIES**	VARIES**	12"

\*\*PORTS ARE SUPPLIED WITH A STANDARD DOGHOUSE LENGTH OF 9". THE OPENING LENGTH SHALL BE REDUCED IN THE FIELD TO CORRESPOND WITH THE SPECIFIED PRODUCT TYPE.



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DISTRIBUTED BY: **R-TANK** **FERGUSON WATERWORKS**

**R-Tank**  
MODULAR STORMWATER STORAGE SYSTEM

**SYSTEM DETAILS**  
COMPASS & KEY INDUSTRIAL  
BROWNSBURG, IN

DATE: 2/16/2025  
DATE: 11/17/2025  
SHEET NO: 3 of 7

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**R-Tank**  
MODULAR STORMWATER STORAGE SYSTEM

**SYSTEM DETAILS**  
COMPASS & KEY INDUSTRIAL  
BROWNSBURG, IN

DATE: 2/16/2025  
DATE: 11/17/2025  
SHEET NO: 4 of 7

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CIVIL ENGINEERS  
LAND SURVEYORS  
DEVELOPMENT CONSULTANTS  
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ENVIRONMENTAL  
CONSTRUCTION STAKING  
CONSTRUCTION MAT. TESTING

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SITE DEVELOPMENT

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P: 317.999.1216  
www.TERRAinc.com

REVISIONS AND REVISIONS

NO.	DATE	BY	DESCRIPTION

KEVIN STEELY  
REGISTERED PROFESSIONAL ENGINEER  
NOT FOR CONSTRUCTION

**COMPASS AND KEY INDUSTRIAL PARK**  
2516 N RACEWAY RD, BROWNSBURG, IN 46234  
SEC 29 - 116N-R2E - 10C001 WFP - HERRICKS COUNTY INDIANA

**COMPASS AND KEY LLC**  
9129 LOG RUN DR S, INDIANAPOLIS, IN 46234

**DETENTION SYSTEM DETAILS**

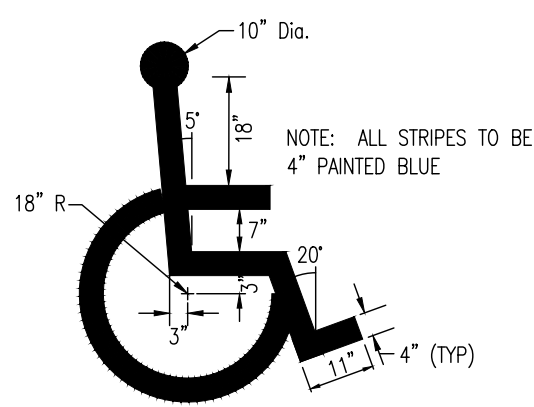
PLAN DATE: 02/19/26  
DESIGN: KLS  
CHECK: GRR  
DRAWN: KLS

PROJECT NO: 2504018  
SHEET NO: C650

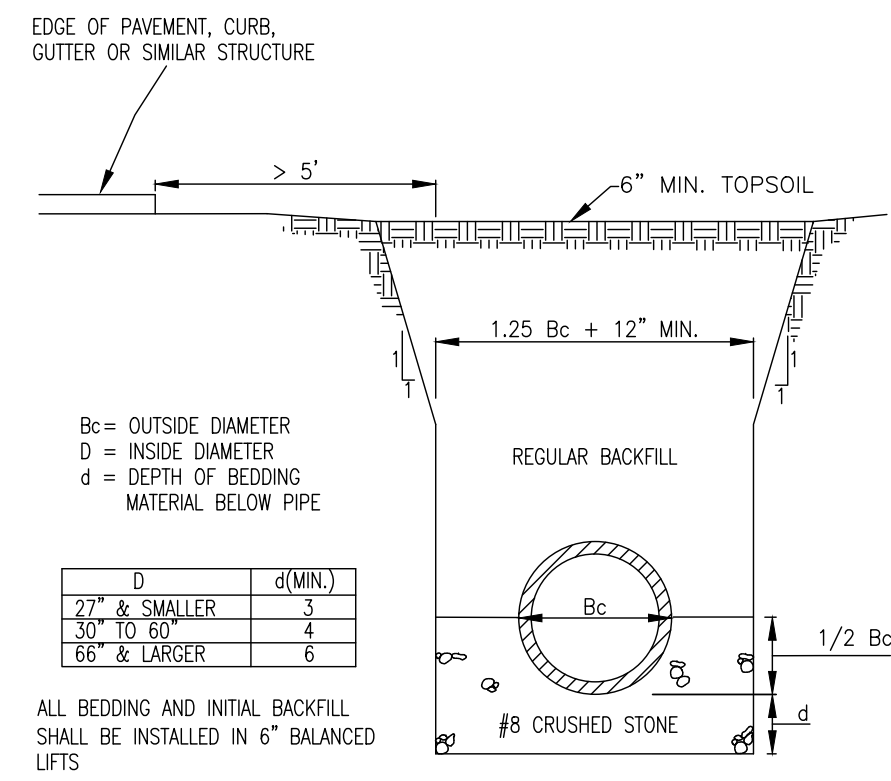
Indiana 811  
Know what's below. Call before you dig.



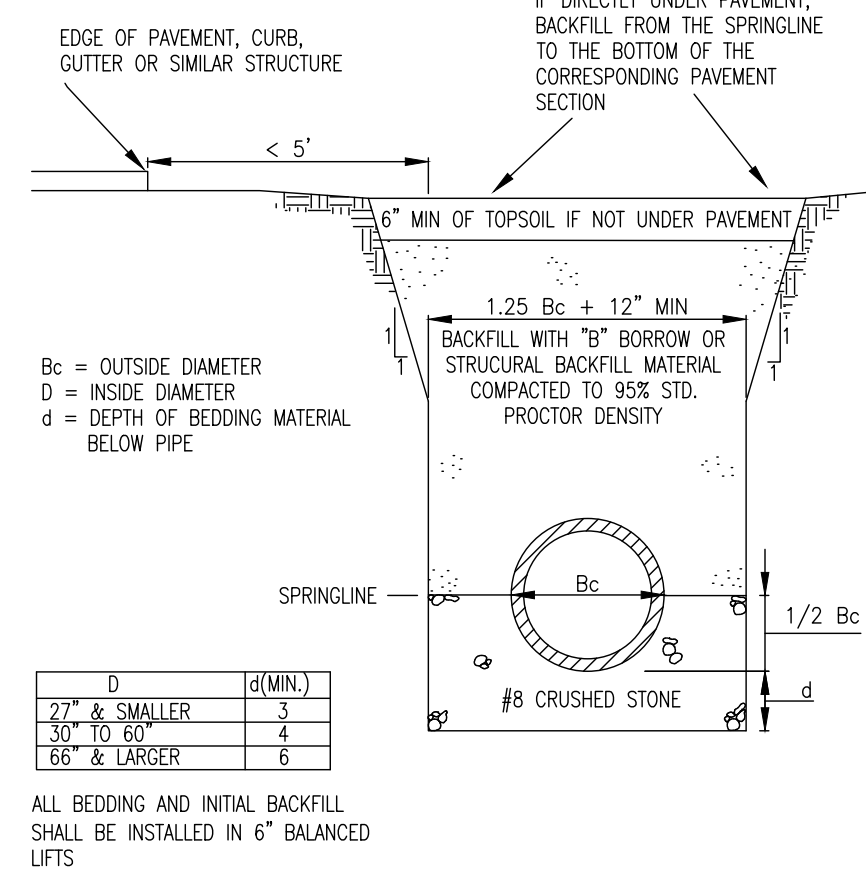




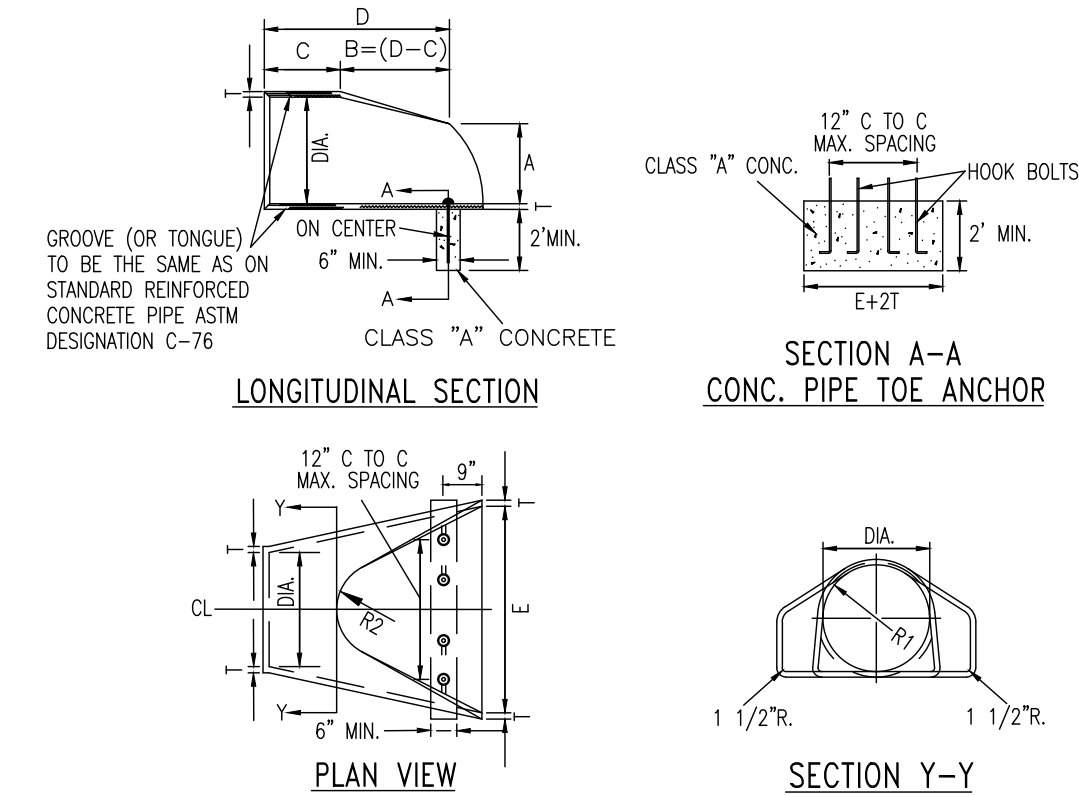
1 "ADA" PARKING SYMBOL DETAIL  
NOT TO SCALE  
C800



2 RCP BEDDING SECTION > 5' FROM  
EDGE OF PAVEMENT  
NOT TO SCALE  
C800



3 RCP BEDDING SECTION < 5' FROM  
EDGE OF PAVEMENT  
NOT TO SCALE  
C800

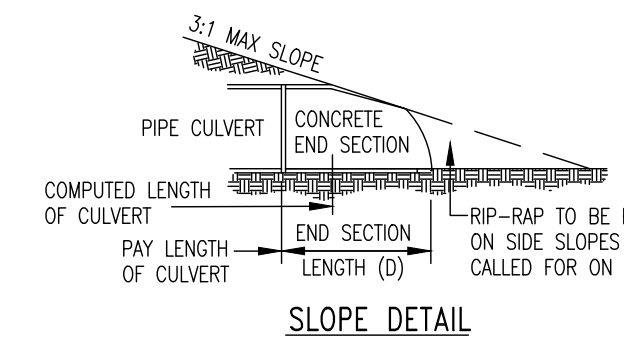


DIA (MM)	A	C	D	E	K	R 1	R 2	APPROX WEIGHT
12" 2'	5"	4'-3"	6'-2"	2'-0"	1.3	10 1/8"	9"	800
15" 2 1/4'	7"	4'-0"	6'-3"	2'-6"	1.5	12 1/2"	11"	1100
18" 2 1/2'	11"	4'-1"	6'-2"	3'-0"	1.8	15 1/2"	12"	1300
21" 2 3/4'	11"	3'-6"	6'-3"	3'-6"	2.1	16 1/8"	13"	1500
24" 3'	11"	3'-0"	6'-3"	4'-0"	2.3	18 3/16"	14"	1800
27" 3 1/4'	11"	2'-6"	6'-3"	4'-6"	2.6	18 3/16"	14"	2100
30" 3 1/2'	11"	2'-0"	6'-3"	5'-0"	2.9	18 1/2"	15"	2400
33" 3 3/4'	11"	1'-6"	6'-3"	5'-6"	3.1	23 3/4"	17 1/2"	4100
36" 4'	11"	1'-1"	6'-3"	6'-0"	3.4	24 3/16"	17 1/2"	4200

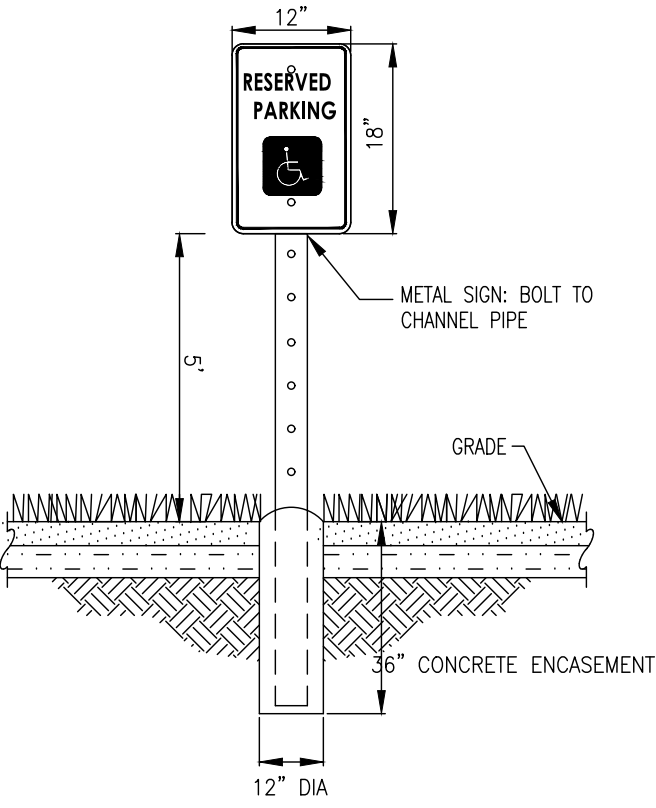
TOLERANCE ± 1"

4 PRECAST CONCRETE END SECTION DETAIL  
NOT TO SCALE  
C800

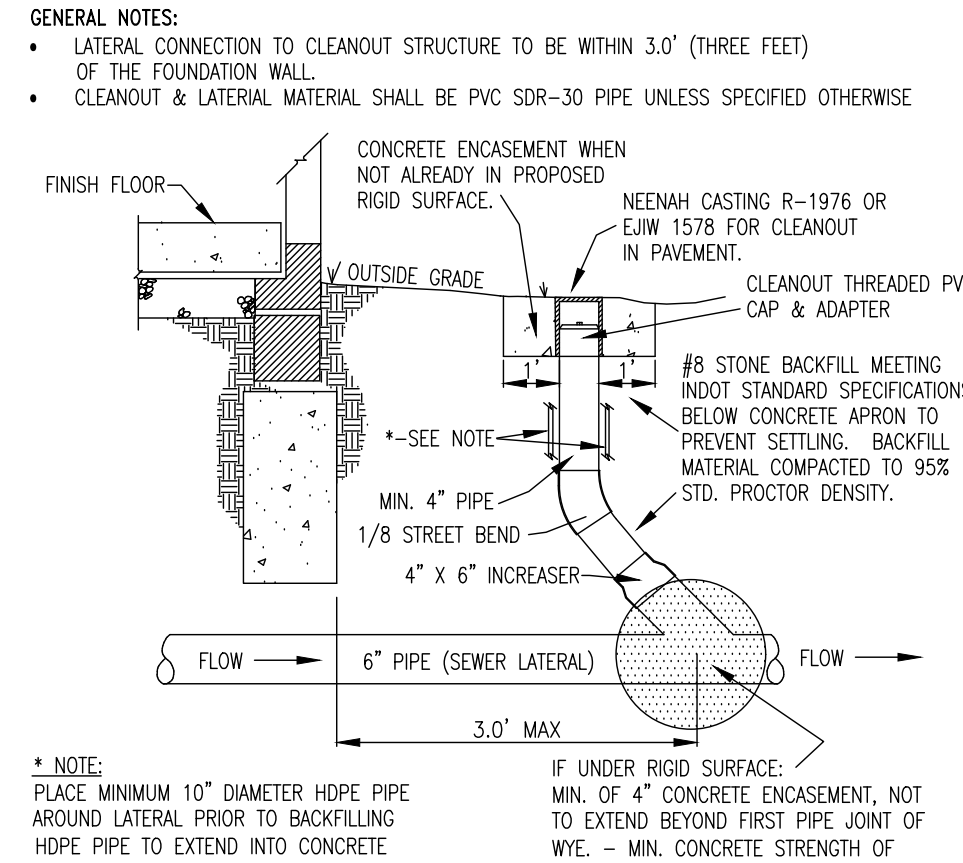
**GENERAL NOTES:**  
CONCRETE IN THESE END SECTIONS SHALL BE THE SAME GRADE AND STRENGTH AS SPECIFIED FOR REINFORCED CONCRETE PIPE, A.S.T.M. DESIGNATION C-76 (AS SET OUT IN STANDARD SPECIFICATIONS). REINFORCEMENT IN THE "C" PORTION SHALL BE THE SAME AS SPECIFIED FOR REINFORCED CONCRETE. REINFORCEMENT IN THE "B" PORTION SHALL HAVE A CROSS SECTIONAL AREA EQUAL TO THAT OF ONE LAYER OF STEEL IN THE "C" PORTION. THE END OF THE PIPE CULVERT SHALL BE PLACED IN THE CONCRETE END SECTION SO THAT THE FLOW LINES ARE FLUSHED. THE JOINT SHALL BE COMPLETELY FILLED WITH MORTAR. VARIATIONS IN DIMENSIONS - THE THICKNESS OF THE CONCRETE, THE POSITION OF STEEL, AND THE INTERNAL DIAMETER OF THE PIPE SHALL CONFORM WITH THE VARIATIONS IN DIMENSIONS AS PROVIDED IN THE SPECIFICATIONS FOR REINFORCED CONCRETE CULVERT, STORM DRAIN, AND SEWER PIPE, A.S.T.M. DESIGNATION C-76. WHERE VITRIFIED CLAY CULVERT OR CAST IRON CULVERT PIPE IS USED, A "PIPE END SECTION" COMPARABLE TO THAT AS SHOWN FOR METAL OR CONCRETE SHALL BE FURNISHED AND SHALL BE AS APPROVED BY THE ENGINEER, EXCEPT IN AREAS OF ACID OR MINE WATER THEN THE USE OF METAL END SECTION IS PROHIBITED. END SECTIONS WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR EACH "PIPE END SECTION" COMPLETED IN PLACE AND ACCEPTED. CONCRETE PIPE TOE ANCHORS SHALL BE REQUIRED ON ALL CONCRETE PIPE END SECTIONS. THE COST THEREOF SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE PER EACH "PIPE END SECTION."



**NOTE:** METAL PIPE END SECTIONS MAY BE USED WITH CONCRETE PIPE, WHERE PERMITTED BY LOCAL CODES, PROVIDING THE METHOD OF CONNECTION IS APPROVED BY THE ENGINEER PRIOR TO INSTALLATION OF PIPE.

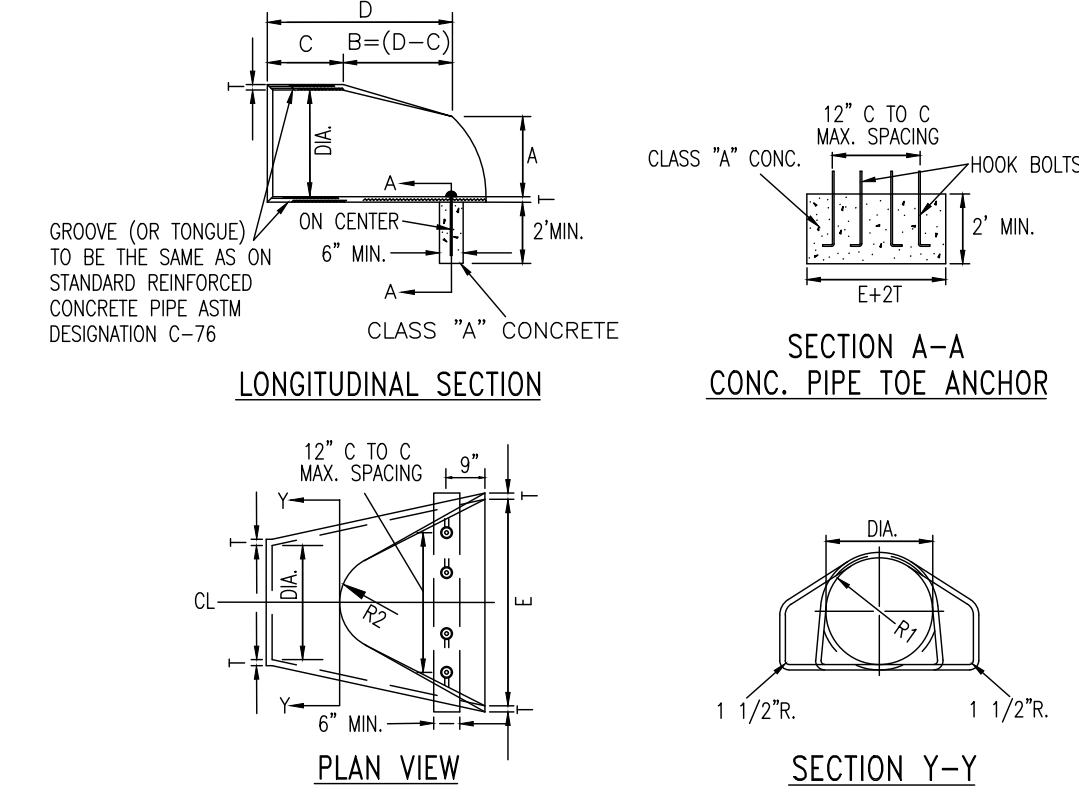


6 ADA PARKING SIGN  
NOT TO SCALE  
C800



**GENERAL NOTES:**  
• LATERAL CONNECTION TO CLEANOUT STRUCTURE TO BE WITHIN 3.0' (THREE FEET) OF THE FOUNDATION WALL.  
• CLEANOUT & LATERAL MATERIAL SHALL BE PVC SDR-30 PIPE UNLESS SPECIFIED OTHERWISE.  
• CONCRETE ENCASEMENT WHEN NOT ALREADY IN PROPOSED RIGID SURFACE.  
• NEENAH CASTING R-1976 OR E.J.W. 1578 FOR CLEANOUT IN PAVEMENT.  
• CLEANOUT THREADED PVC CAP & ADAPTER.  
• #8 STONE BACKFILL MEETING INDOT STANDARD SPECIFICATIONS BELOW CONCRETE APRON TO PREVENT SETTLING. BACKFILL MATERIAL COMPACTED TO 95% STD. PROCTOR DENSITY.  
• MIN. 4" PIPE.  
• 1/8" STREET BEND.  
• 4" X 6" INCREASER.  
• 6" PIPE (SEWER LATERAL).  
• 3.0' MAX.  
• IF UNDER RIGID SURFACE: MIN. 6" 4" CONCRETE ENCASEMENT, NOT TO EXTEND BEYOND FIRST PIPE JOINT OF WYE. - MIN. CONCRETE STRENGTH OF 3500 PSI, 28 DAY COMPRESSIVE STRENGTH.  
• PLACE MINIMUM 10" DIAMETER HDPE PIPE AROUND LATERAL PRIOR TO BACKFILLING HDPE PIPE TO EXTEND INTO CONCRETE.  
• GENERAL NOTE: BEDDING TO BE PLACED ON UNDISTURBED EARTH. COMPACTION OF GRANULAR BACKFILL IS CRITICAL UNDER WYE AND BENDS. IF PROPER COMPACTION CANNOT BE ACHIEVED, THEN PLACE A MINIMUM OF 6" OF 3500 PSI, 28 DAY COMPRESSIVE STRENGTH CONCRETE AROUND THE PIPE TO BARE ON STABLE GROUND (PER INSPECTOR). SEE SERVICE LATERAL DETAIL AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

8 TYPICAL BUILDING SANITARY CLEANOUT SECTION  
NOT TO SCALE  
C800

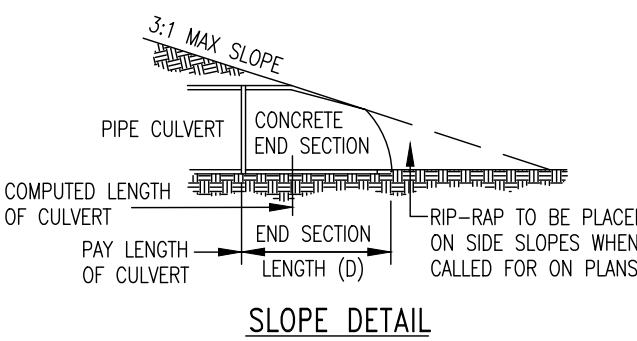


DIA (MM)	A	C	D	E	K	R 1	R 2	APPROX WEIGHT
12" 2'	5"	4'-3"	6'-2"	2'-0"	1.3	10 1/8"	9"	800
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27" 3 1/4'	11"	2'-6"	6'-3"	4'-6"	2.6	18 3/16"	14"	2100
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33" 3 3/4'	11"	1'-6"	6'-3"	5'-6"	3.1	23 3/4"	17 1/2"	4100
36" 4'	11"	1'-1"	6'-3"	6'-0"	3.4	24 3/16"	17 1/2"	4200

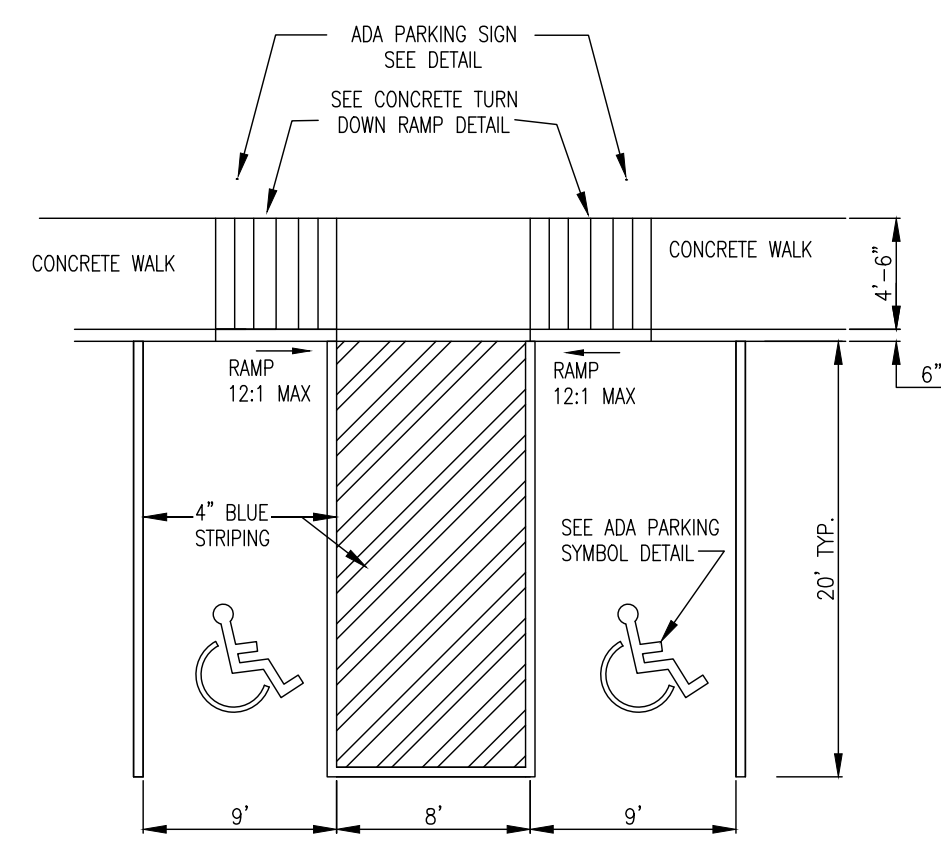
TOLERANCE ± 1"

9 PRECAST CONCRETE END SECTION DETAIL  
NOT TO SCALE  
C800

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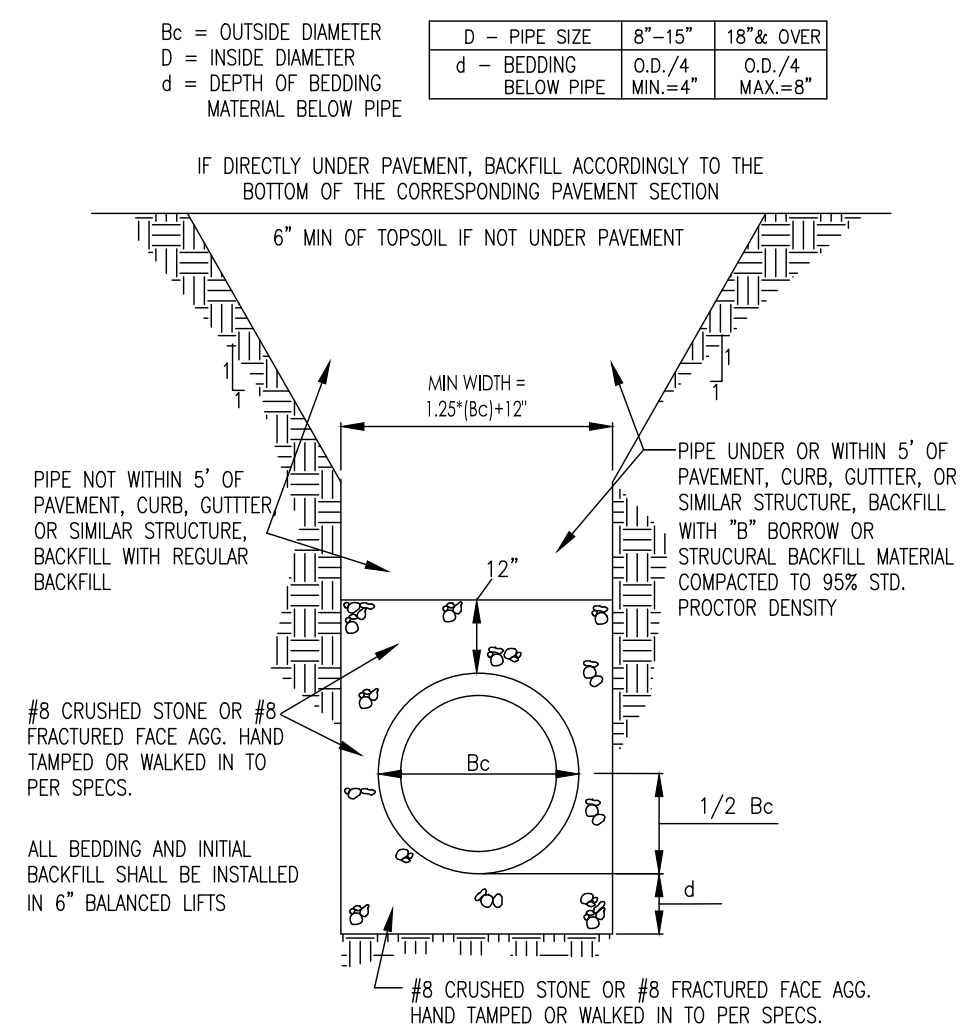


**NOTE:** METAL PIPE END SECTIONS MAY BE USED WITH CONCRETE PIPE, WHERE PERMITTED BY LOCAL CODES, PROVIDING THE METHOD OF CONNECTION IS APPROVED BY THE ENGINEER PRIOR TO INSTALLATION OF PIPE.

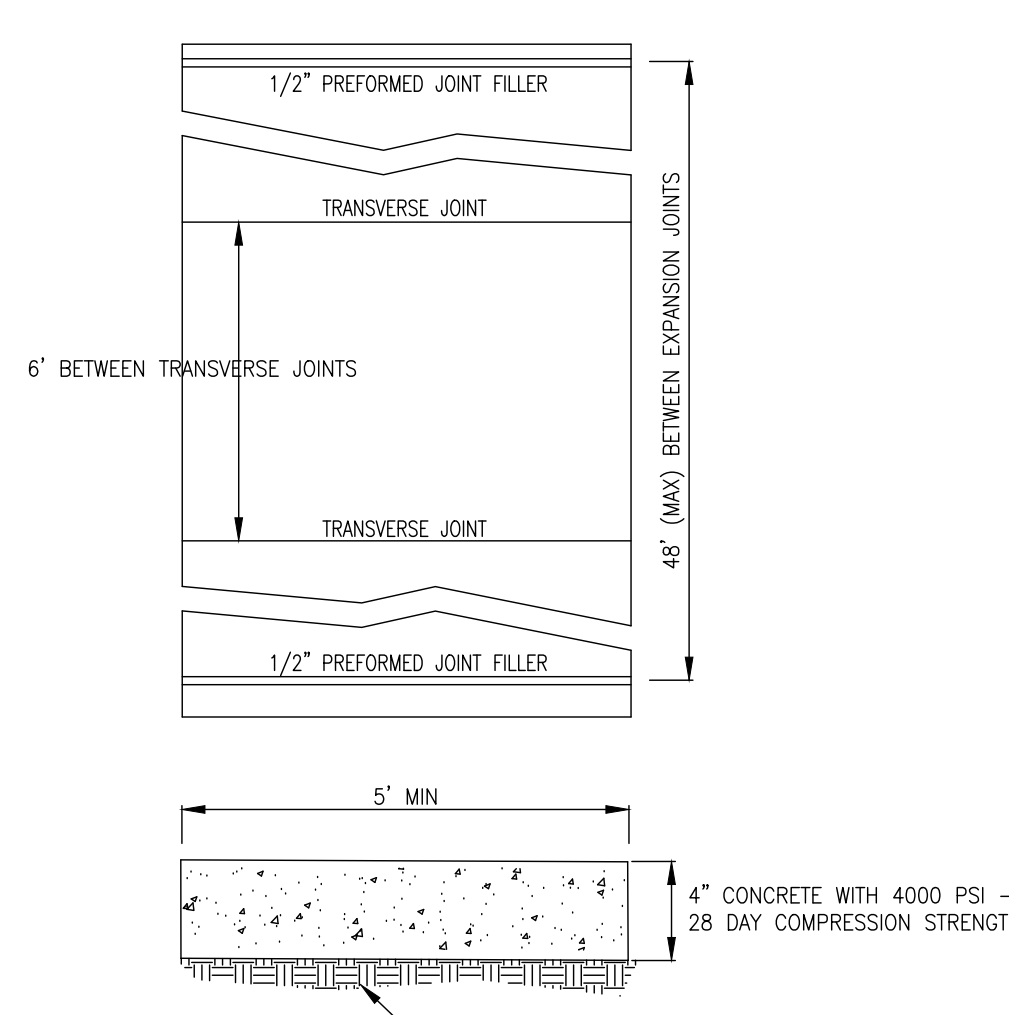


**NOTE:**  
MAX. 2% SLOPE ANY DIRECTION

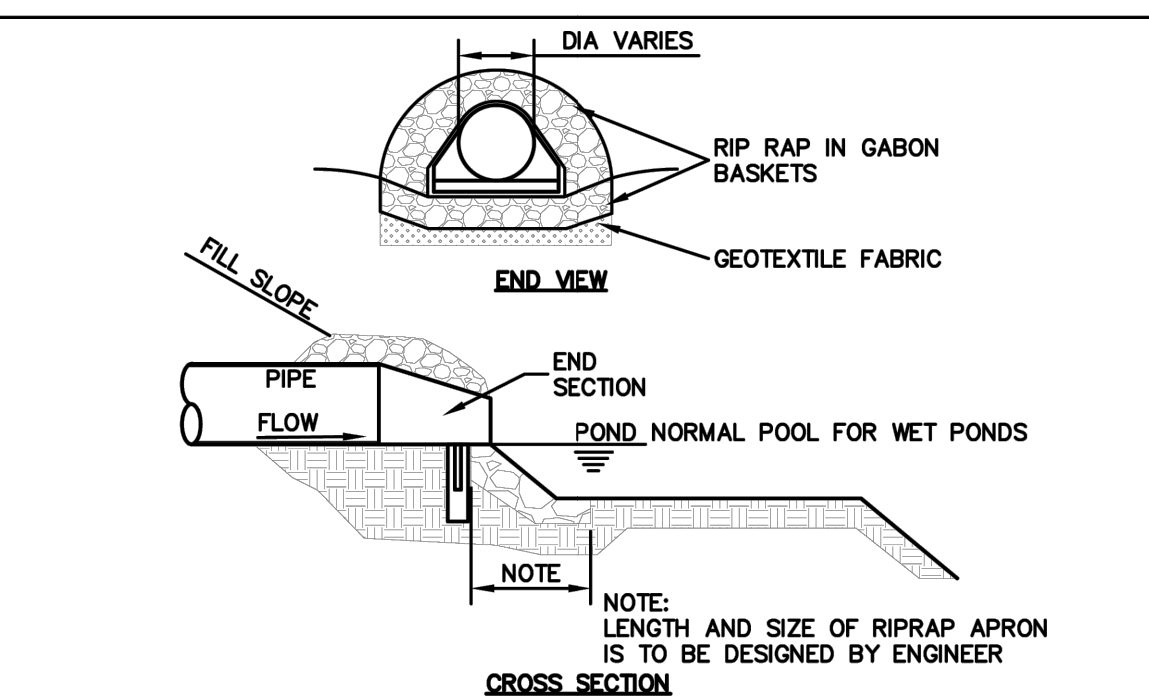
10 ADA PARKING STALLS  
NOT TO SCALE  
C800



11 HDPE BEDDING SECTION DETAIL  
NOT TO SCALE  
C800



13 TYPICAL SIDEWALK SECTION  
NOT TO SCALE  
C800



**NOTES:**  
1. THE USE OF TURF REINFORCEMENT MAT IS PREFERRED (AS OPPOSED TO RIPRAP OR OTHER HARD ARMORING) TO REINFORCE VEGETATION AND PREVENT EROSION AND SCOURING IN AREAS OF CONCENTRATED FLOW, ON INTERIOR POND SLOPES, AT STORM SEWER OUTFALLS AND STEEP SLOPES.  
2. IF RIPRAP IS TO BE USED, ALL RIPRAP PLACED FOR PIPE AND OUTFALL PROTECTION SHALL BE CONTAINED IN GABION BASKETS IN ACCORDANCE WITH THIS DETAIL, SPECIFICATION 02101 EROSION AND SEDIMENT CONTROL AND STORMWATER POLLUTION PREVENTION, AND IN CONFORMANCE WITH THE LINES, GRADES, AND LOCATIONS INDICATED ON THE DRAWINGS.

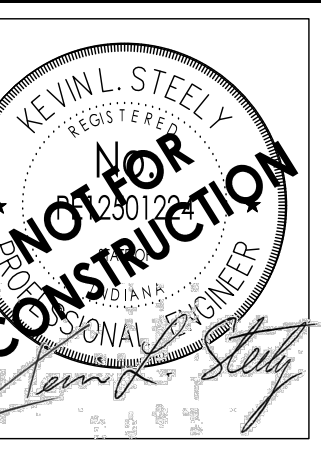
**INSTALLATION:**  
1. PLACE RIPRAP GABION BASKETS OVER GEOTEXTILE.  
2. PROVIDE NON-WOVEN NEEDLE PUNCHED OR HEAT BONDED GEOTEXTILE CONSISTING OF STRONG, ROT-RESISTANT, CHEMICALLY STABLE LONG-CHAIN SYNTHETIC POLYMER MATERIALS WHICH ARE DIMENSIONALLY STABLE RELATIVE TO EACH OTHER. GEOTEXTILE SHALL MEET OR EXCEED INDOT STANDARD SPECIFICATIONS.  
3. PROVIDE GABION BASKETS CONSTRUCTED OF WELDED WIRE FABRIC OR TRIPLE TWISTED WIRE FABRIC.  
4. ASSEMBLE AND INSTALL GABION BASKETS IN ACCORDANCE WITH THIS DETAIL AND THE MANUFACTURER'S INSTRUCTIONS.  
5. INSTALL CONTINUOUS LACING WIRE FOR FULL LENGTH OF BASKET.  
6. ANY RIPRAP GABION BASKET DAMAGED DURING INSTALLATION SHALL BE REPLACED.

**MAINTENANCE:**  
1. DURING CONSTRUCTION, INSPECT WITHIN 24 HOURS OF A RAIN EVENT AND AT LEAST ONCE EVERY SEVEN CALENDAR DAYS.  
2. ROUTINELY CHECK FOR EROSION OR SCOURING AROUND SIDES OF THE APRON; REPAIR IMMEDIATELY.  
3. ROUTINELY CHECK FOR PIPING OR UNDERCUTTING; REPAIR IMMEDIATELY.  
4. ROUTINELY CHECK WELDED WIRE OR TRIPLE TWISTED FABRIC FOR DAMAGE AND REPAIR IMMEDIATELY.

TOWN OF BROWNSBURG  
DETAIL NO. EC-03  
REVISION DATE:  
FEBRUARY 2024



BY	
DATE	
REVISIONS AND ISSUES	









**GENERAL NOTES**

1. THE MUNICIPALITY REQUIREMENTS AND THE LATEST INDIANA DEPARTMENT OF TRANSPORTATION (INDOT) STANDARD SPECIFICATIONS INCLUDING CHANGES SHALL GOVERN ALL CONSTRUCTION ITEMS THAT ARE A PART OF THIS PLAN UNLESS OTHERWISE NOTED. WHEN CONFLICTS ARISE BETWEEN ABOVE-LISTED SPECIFICATIONS, THE MORE STRINGENT SHALL TAKE PRECEDENCE.
2. STANDARD SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS, AND RECURRING SPECIAL PROVISIONS, CONSTRUCTION PLANS, AND SUBSEQUENT DETAILS ARE ALL TO BE CONSIDERED AS PART OF THE CONTRACT. INCIDENTAL ITEMS OR ACCESSORIES NECESSARY TO COMPLETE THIS WORK MAY NOT BE SPECIFICALLY NOTED BUT ARE CONSIDERED A PART OF THIS CONTRACT.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HAVING THE UTILITY COMPANIES LOCATE THEIR FACILITIES IN THE FIELD PRIOR TO CONSTRUCTION AND SHALL ALSO BE RESPONSIBLE FOR THE MAINTENANCE AND PRESERVATION OF THESE FACILITIES. THE ENGINEER DOES NOT WARRANT THE LOCATION OF ANY EXISTING UTILITIES SHOWN ON THE PLAN. THE CONTRACTOR SHALL CALL INDIANA UNDERGROUND PLANT PROTECTION SERVICE (811 OR 1.800.362.2764) AND THE MUNICIPALITY FOR UTILITY LOCATIONS AND ALL UTILITIES THAT DO NOT SUBSCRIBE TO 811.
4. NO CONSTRUCTION PLANS SHALL BE USED FOR CONSTRUCTION UNLESS SPECIFICALLY MARKED "FOR CONSTRUCTION" PRIOR TO COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AFFECTING THE WORK WITH THE ACTUAL CONDITIONS AT THE JOB SITE. IN ADDITION, THE CONTRACTOR MUST VERIFY THE SURVEYOR'S LINE AND GRADE STAKES. IF THERE ARE ANY DISCREPANCIES WITH WHAT IS SHOWN ON THE CONSTRUCTION PLANS, HE/SHE MUST IMMEDIATELY REPORT THEM TO THE SURVEYOR OR ENGINEER BEFORE DOING ANY WORK. OTHERWISE, THE CONTRACTOR ASSUMES FULL RESPONSIBILITY. IN THE EVENT OF DISAGREEMENT BETWEEN THE CONSTRUCTION PLANS, SPECIFICATIONS, AND/OR SPECIAL DETAILS, THE CONTRACTOR SHALL SECURE WRITTEN INSTRUCTION FROM THE ENGINEER PRIOR TO PROCEEDING WITH ANY PART OF THE WORK AFFECTED BY OMISSIONS OR DISCREPANCIES. FAILING TO SECURE SUCH INSTRUCTION SHALL BE CONSIDERED BY THE CONTRACTOR TO HAVE PROCEEDED AT THE CONTRACTOR'S OWN RISK AND EXPENSE. IN THE EVENT OF ANY DOUBTS OR QUESTIONS ARISING WITH RESPECT TO THE TRUE MEANING OF THE CONSTRUCTION PLANS OR SPECIFICATIONS, THE DECISION OF THE ENGINEER SHALL BE FINAL AND CONCLUSIVE.
5. NOTIFICATION OF COMMENCING CONSTRUCTION:
  - a. THE CONTRACTOR SHALL NOTIFY WORKING GOVERNMENTAL AGENCIES AND AFFECTED UTILITIES IN WRITING AT LEAST THREE FULL WORKING DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION. IN ADDITION, THE CONTRACTOR SHALL NOTIFY, AS APPROPRIATE, ALL TESTING AGENCIES, THE MUNICIPALITY, AND THE OWNER SUFFICIENTLY IN ADVANCE OF CONSTRUCTION.
  - b. FAILURE OF THE CONTRACTOR TO ALLOW PROPER NOTIFICATION TIME WHICH RESULTS IN THE TESTING COMPANIES BE UNABLE TO VISIT THE SITE AND PERFORM TESTING WILL CAUSE THE CONTRACTOR TO SUSPEND THE OPERATION TO BE TESTED UNTIL THE TESTING AGENCY CAN SCHEDULE TESTING OPERATIONS. COST OF SUSPENSION OF WORK SHALL BE BORNE BY THE CONTRACTOR.

6. ALL CONTRACTORS SHALL KEEP ACCESS AVAILABLE AT ALL TIMES FOR ALL EMERGENCY TRAFFIC. AS DIRECTED BY THE MUNICIPALITY.
7. ALL PROPOSED GRADES SHOWN ON PLANS ARE FINISHED SURFACE ELEVATIONS, UNLESS NOTED OTHERWISE.
8. THE CONTRACTOR SHALL PRESERVE ALL CONSTRUCTION STAKES UNTIL THEY ARE NO LONGER NEEDED. ANY STAKES DESTROYED OR DAMAGED BY THE CONTRACTOR PRIOR TO THEIR USE SHALL BE RESET BY THE SURVEYOR AT THE CONTRACTOR'S EXPENSE.
9. ALL FRAMES AND LIDS FOR STORM AND SANITARY SEWERS, VALVE WALK COVERS, FIRE HYDRANTS, AND B-BOXES ARE TO BE ADJUSTED TO MEET FINISHED GRADE. THIS ADJUSTMENT IS TO BE MADE BY THE SEWER AND WATER CONTRACTOR, AND THE COST IS TO BE CONSIDERED INCIDENTAL. THESE ADJUSTMENTS TO FINISHED GRADE WILL NOT ALIENATE THE CONTRACTOR FROM ANY ADDITIONAL ADJUSTMENTS AS REQUIRED BY THE MUNICIPALITY AND/OR UTILITY PROVIDER UPON FINAL INSPECTION OF THE FINISHED GRADES WHICH MAY BE DETERMINED BY THE MUNICIPALITY AND/OR UTILITY PROVIDER AND MAY VARY FROM PLAN GRADE.
10. ANY EXISTING SIGNS, LIGHT STANDARDS, AND UTILITY POLES THAT INTERFERE WITH CONSTRUCTION OPERATIONS AND ARE NOT NOTED ON THE PLANS FOR DISPOSAL SHALL BE REMOVED AND RESET BY THE CONTRACTOR AT HIS/HER OWN EXPENSE. AS DIRECTED BY THE ENGINEER, ANY DAMAGE TO THESE ITEMS SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT HIS/HER OWN EXPENSE TO THE SATISFACTION OF THE OWNER. ANY SIGNS NOT REQUIRED TO BE RESET SHALL BE DELIVERED TO THE RESPECTIVE OWNERS.
11. REMOVAL OF SPECIFIED ITEMS, INCLUDING BUT NOT LIMITED TO, PAVEMENT SIDEWALK, CURB, CURB AND GUTTER, CURBS, ETC., SHALL BE DISPOSED OF OFF-SITE BY THE CONTRACTOR AT THE CONTRACTOR'S OWN EXPENSE. THE CONTRACTOR IS RESPONSIBLE FOR ANY PERMITS REQUIRED FOR SUCH DISPOSAL.
12. ANY FIELD TIES ENCOUNTERED SHALL BE INSPECTED BY THE MUNICIPALITY. THE DRAIN TILE SHALL BE CONNECTED TO THE STORM SEWER SYSTEM AND A RECORD KEPT BY THE CONTRACTOR OF THE LOCATIONS AND TURNED OVER TO THE MUNICIPALITY UPON COMPLETION OF THE PROJECT. THE COST OF THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT, AND NO ADDITIONAL COMPENSATION SHALL BE ALLOWED.
13. BEFORE ACCEPTANCE, ALL WORK SHALL BE INSPECTED BY THE MUNICIPALITY, AS NECESSARY.
14. EASEMENTS FOR THE EXISTING UTILITIES, BOTH PUBLIC AND PRIVATE, AND UTILITIES WITHIN PUBLIC RIGHTS-OF-WAY ARE SHOWN ON THE PLANS ACCORDING TO AVAILABLE RECORDS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF THESE UTILITY LINES AND THEIR PROTECTION FROM DAMAGE DUE TO CONSTRUCTION OPERATIONS. IF EXISTING UTILITY LINES OF ANY NATURE ARE ENCOUNTERED WHICH CONFLICT WITH THE LOCATION OF NEW CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT MAY BE RESOLVED.
15. OWNER SHALL OBTAIN EASEMENTS AND APPROVAL OF PERMITS NECESSARY TO FACILITATE CONSTRUCTION OF THE PROPOSED UTILITIES. THE CONTRACTOR, HOWEVER, SHALL FURNISH ALL REQUIRED BONDS AND EVIDENCE OF INSURANCE NECESSARY TO SECURE THESE PERMITS AND EASEMENTS.
16. THE CONTRACTORS SHALL PLAN THEIR WORK BASED ON THEIR OWN BORINGS, EXPLORATIONS, AND OBSERVATIONS TO DETERMINE SOIL CONDITIONS AT THE LOCATION OF THE PROPOSED WORK IF NOT PROVIDED BY ENGINEER.
17. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR SAFETY ON THE JOB PER OSHA REGULATIONS.
18. IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO PROVIDE PROPER BARRICADING, WARNING DEVICES, AND THE SAFE MANAGEMENT AND PROTECTION OF ALL UTILITIES WITHIN THE AREA OF CONSTRUCTION. ALL SUCH DEVICES AND THEIR INSTALLATION SHALL CONFORM TO THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREET AND HIGHWAYS, LATEST EDITION, AND IN ACCORDANCE WITH THE MUNICIPAL ORDINANCES.
19. THE CONTRACTOR SHALL COLLECT AND REMOVE ALL CONSTRUCTION DEBRIS, EXCESS MATERIALS, TRASH, OIL AND GREASE RESIDUE, MACHINERY, TOOLS, AND OTHER MISCELLANEOUS ITEMS WHICH WERE NOT PRESENT PRIOR TO PROJECT COMMENCEMENT AT NO ADDITIONAL EXPENSE TO THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ACQUIRING ANY AND ALL PERMITS NECESSARY FOR THE HAULING AND DISPOSAL REQUIRED FOR CLEANUP. AS DIRECTED BY THE ENGINEER OR OWNER, BURNING ON THE SITE IS NOT PERMITTED.
20. NO UNDERGROUND WORK SHALL BE COVERED UNTIL IT HAS BEEN APPROVED BY THE MUNICIPALITY. APPROVAL TO PROCEED MUST BE OBTAINED FROM THE MUNICIPALITY AND/OR UTILITY PROVIDER PRIOR TO INSTALLING PAVEMENT BASE, BINDER, AND SURFACE. AND PRIOR TO POURING ANY CONCRETE AFTER FORMS HAVE BEEN SET, AS NECESSARY.
21. ALL EXISTING UTILITIES OR IMPROVEMENTS, INCLUDING WALKS, CURBS, PAVEMENT AND PARKWAYS DAMAGED OR REMOVED DURING CONSTRUCTION SHALL BE PROPERLY RESTORED TO THEIR RESPECTIVE ORIGINAL CONDITION. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT UNLESS A PAY ITEM IS LISTED ON THE BID LIST. CONTRACTOR TO PROVIDE VIDEO EVIDENCE ALL EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
22. AT THE CLOSE OF EACH WORKING DAY AND AT THE CONCLUSION OF CONSTRUCTION OPERATIONS, ALL DRAINAGE STRUCTURES AND FLOW LINES SHALL BE FREE FROM DIRT AND DEBRIS.
23. TREES NOT MARKED FOR REMOVAL SHALL BE CONSIDERED AS DESIGNATED TO BE SAVED AND SHALL BE PROTECTED, AS PER MUNICIPAL STANDARDS. DO NOT CUT DURING BUD MATING SEASON.
24. LIMB PRUNING SHALL BE PERFORMED UNDER THE SUPERVISION OF AN APPROVED LANDSCAPE ARCHITECT, FORESTER, OR ARBORIST AND SHALL BE UNDERTAKEN IN A TIMELY FASHION SO AS NOT TO INTERFERE WITH CONSTRUCTION. ALL LIMBS, BRANCHES, AND OTHER DEBRIS RESULTING FROM THE WORK SHALL BE DISPOSED OF OFF-SITE BY THE CONTRACTOR AT HIS/HER OWN EXPENSE. ALL CUTS OVER ONE (1) INCH IN DIAMETER SHALL BE PAINTED WITH AN APPROVED TREE PAINT.
25. WHERE SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER, EXISTING DRAINAGE STRUCTURES AND PIPES SHALL BE CLEARED OF DEBRIS AND PATCHED AS NECESSARY TO ASSURE INTEGRITY OF THE STRUCTURE. THIS WORK SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE MERGED INTO THE CONTRACT UNIT PRICE EACH FOR STRUCTURE AND PRICE PER LINEAL FOOT FOR STORM SEWERS, WHICH SHALL BE PAYMENT IN FULL FOR CLEANING, PATCHING, REMOVAL AND DISPOSAL OF DEBRIS AND DIRT.
26. HYDRANTS SHALL NOT BE FLUSHED DIRECTLY ONTO THE ROAD SUBGRADES. WHENEVER POSSIBLE, HOSES SHALL BE USED TO DIRECT THE WATER INTO LOT AREAS OR THE STORM SEWER SYSTEM, IF AVAILABLE. DAMAGE TO THE ROAD SUBGRADE OR LOT GRADING DUE TO EXCESSIVE WATER SATURATION AND/OR EROSION FROM HYDRANT FLUSHING, OR FROM LEAKS IN THE WATER DISTRIBUTION SYSTEM WILL BE REPAIRED BY THE CONTRACTOR FLUSHING OR USING THE HYDRANT AT THE CONTRACTOR'S OWN EXPENSE. LEAKS IN THE WATER DISTRIBUTION SYSTEM SHALL BE THE RESPONSIBILITY OF THE WATER MAIN CONTRACTOR AND SHALL BE REPAIRED AT HIS/HER EXPENSE.
27. AFTER THE STORM SEWER SYSTEM HAS BEEN CONSTRUCTED, THE CONTRACTOR SHALL PLACE EROSION CONTROL AT LOCATIONS INDICATED BY THE ENGINEER. THE PURPOSE OF THE EROSION CONTROL WILL BE TO MINIMIZE THE AMOUNT OF SILTATION THAT NORMALLY WOULD ENTER THE STORM SEWER SYSTEM FROM ADJACENT AND/OR UPSTREAM DRAINAGE AREAS.
28. THE TRENCHES FOR PIPE INSTALLATION SHALL BE KEPT DRY AT ALL TIMES DURING PIPE PLACEMENT. APPROPRIATE FACILITIES TO MAINTAIN THE DRY TRENCH SHALL BE PROVIDED BY THE CONTRACTOR, AND THE COST OF SUCH SHALL BE INCIDENTAL TO THE UNIT PRICE FOR THE ITEM. PLANS FOR THE SITE DEWATERING, IF EMPLOYED, SHALL BE SUBMITTED TO AND APPROVED BY THE ENGINEER PRIOR TO IMPLEMENTATION. NO ADDITIONAL COMPENSATION SHALL BE MADE FOR DEWATERING DURING CONSTRUCTION UNLESS APPROVED IN WRITING BY THE OWNER.

**EROSION CONTROL NOTES**

29. EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH IDEM REGULATIONS AND STANDARDS FOR SOIL EROSION AND SEDIMENTATION CONTROL AND SHALL BE MAINTAINED BY THE CONTRACTOR IN PLACE UNTIL GRASS IS 75% ESTABLISHED AND ACCEPTABLE TO THE ENGINEER. CONTRACTOR TO INSPECT EROSION CONTROL MEASURES WEEKLY AND AFTER EACH 1/2" RAIN EVENT AND HAVE COPIES ON-SITE FOR REVIEW BY IDEM.
30. CONSTRUCTION ENTRANCE SHALL BE LOCATED SO AS TO PROVIDE THE LEAST AMOUNT OF DISTURBANCE TO THE FLOW OF TRAFFIC IN AND OUT OF THE SITE. ADDITIONALLY, CONSTRUCTION ENTRANCES SHALL BE LOCATED TO COINCIDE WITH THE PHASING OF THE PAVEMENT REPLACEMENT.
31. POST CONSTRUCTION STORM WATER POLLUTION CONTROL MEASURES INCLUDE STABILIZATION BY PERMANENT PAVING, DRAINAGE SYSTEM STRUCTURE(S), OR LANDSCAPING.

**DEMOLITION NOTES**

1. THE INTENT OF THE DEMOLITION PLAN IS TO DEPICT EXISTING FEATURES THAT ENCUMBER THE PROPOSED CONSTRUCTION AREA AND ARE SCHEDULED FOR REMOVAL. SOME INCIDENTAL ITEMS MAY HAVE BEEN INADVERTENTLY OMITTED FROM THE PLAN. THE CONTRACTOR IS ENCOURAGED TO THOROUGHLY INSPECT THE SITE AS WELL AS REVIEW THE PLANS AND SPECIFICATIONS PRIOR TO SUBMITTING PROPOSAL. CONTRACTOR WILL NOT RECEIVE ADDITIONAL COMPENSATION FOR INCIDENTAL ITEMS NOT SHOWN ON THE DEMOLITION PLAN.
2. THE LOCATIONS OF EXISTING UTILITIES SHOWN ON THIS PLAN HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR ACCURACY. PRIOR TO COMMENCING ANY DEMOLITION ACTIVITY, THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES FOR ON-SITE LOCATIONS OF EXISTING UTILITIES AND FIELD VERIFY HORIZONTAL AND VERTICAL ALIGNMENT OF ALL UNDERGROUND UTILITIES. ANY DISCREPANCIES SHOULD BE REPORTED PRIOR TO CONSTRUCTION.
3. THE CONTRACTOR SHALL MAINTAIN ALL UTILITY SERVICES TO THE EXISTING BUILDINGS AT ALL TIMES. UTILITY SERVICES SHALL NOT BE INTERRUPTED WITHOUT APPROVAL FROM THE CONSTRUCTION MANAGER.
4. CONTRACTOR IS REQUIRED TO OBTAIN ALL NECESSARY DEMOLITION PERMITS.
5. THE CONTINUOUS ACCESS SHALL BE MAINTAINED FOR THE TRUCKS AT ALL TIMES DURING DEMOLITION OF THE EXISTING FACILITIES.
6. CONTRACTOR MAY LIMIT SAW-CUT AND PAVEMENT REMOVAL TO ONLY THOSE AREAS WHERE IT IS REQUIRED AS SHOWN ON THESE CONSTRUCTION PLANS BUT IF ANY DAMAGE IS INCURRED ON ANY OF THE SURROUNDING PAVEMENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ITS REMOVAL AND REPAIR.
7. THE CONTRACTOR SHALL COORDINATE WITH RESPECTIVE UTILITY COMPANIES PRIOR TO THE REMOVAL AND/OR RELOCATION OF UTILITIES OR PRIOR TO ANY FURTHER DEMOLITION. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY CONCERNING PORTIONS OF WORK WHICH MAY BE PERFORMED BY THE UTILITY COMPANY'S FORCES AND ANY FEES WHICH ARE TO BE PAID TO THE UTILITY COMPANY FOR THEIR SERVICES. THE CONTRACTOR IS RESPONSIBLE FOR PAYING ALL FEES AND CHARGES.
8. THE CONTRACTOR SHALL USE DUE CARE IN HAULING DEBRIS FROM SITE TO ENSURE THE SAFETY OF THE PUBLIC.
9. DAMAGE TO ALL EXISTING CONDITIONS TO REMAIN WILL BE REPLACED AT CONTRACTOR'S EXPENSE.
10. CONTRACTOR SHALL LIMIT ALL DEMOLITION ACTIVITIES TO THOSE AREAS DELINEATED ON THE CONSTRUCTION DRAWINGS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
11. CONTRACTOR IS RESPONSIBLE FOR CONTROLLING AIRBORNE DUST AND POLLUTANTS BY USING WATER SPRINKLING OR OTHER SUITABLE MEANS OF CONTROL.
12. CONTRACTOR TO USE CARE IN HANDLING DEBRIS FROM SITE TO ENSURE THE SAFETY OF THE PUBLIC. HAUL ROUTE TO BE CLOSELY MONITORED FOR DEBRIS OR MATERIALS TRACKING ONTO ADJOINING ROADWAYS, ETC. ROADWAYS AND WALKWAYS TO BE CLEARED DAILY OR AS REQUIRED TO MAINTAIN PUBLIC SAFETY.
13. DEWATERING SHOULD BE ANTICIPATED AND INCLUDED. DEWATERING SHALL BE DONE IN ACCORDANCE WITH LOCAL, REGIONAL AND IDEM REQUIREMENTS.

**EARTHWORK NOTES**

1. GENERAL
  - a. ALL EARTHWORK OPERATIONS TO CONFORM TO GEOTECHNICAL RECOMMENDATIONS IN THE GEOTECHNICAL REPORT PROVIDED BY AIL & WITZG ENGINEERING, DATED AUGUST 22, 2022 PROJECT NUMBER 22N0501.
  - b. IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERSTAND THE SOIL AND GROUNDWATER CONDITIONS AT THE SITE.
  - c. ANY QUANTITIES IN THE BID PROPOSAL ARE INTENDED AS A GUIDE FOR THE CONTRACTOR'S USE IN DETERMINING THE SCOPE OF THE COMPLETED PROJECT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ALL MATERIAL QUANTITIES AND APPRISE HIMSELF/HERSELF OF ALL SITE CONDITIONS. THE CONTRACT PRICE SUBMITTED BY THE CONTRACTOR SHALL BE CONSIDERED AS LUMP SUM FOR THE COMPLETE PROJECT. NO CLAIMS FOR EXTRA WORK WILL BE RECOGNIZED.
  - d. THE CONTRACTOR WILL NOTE THAT THE QUANTITIES SHOWN ON THE CONSTRUCTION PLANS ARE FINISHED GRADE AND SUBGRADE ELEVATIONS (AS NOTED) AND THAT PAVEMENT THICKNESS, TOPSOIL, ETC., MUST BE ACCOUNTED FOR.
  - e. THE CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE DURING CONSTRUCTION AND PREVENT STORMWATER FROM RUNNING INTO OR STANDING IN EXCAVATED AREAS. THE FAILURE TO PROVIDE PROPER DRAINAGE WILL NEGATE ANY POSSIBLE ADDED COMPENSATION REQUESTED DUE TO DELAYS OR UNSTABLE MATERIALS CREATED AS A RESULT THEREOF. FINAL GRADES SHALL BE PROTECTED AGAINST DAMAGE FROM EROSION, SEDIMENTATION, AND TRAFFIC.
2. PLANS FOR THE SITE DEWATERING. IF EMPLOYED, SHALL BE SUBMITTED AND APPROVED PRIOR TO IMPLEMENTATION. NO ADDITIONAL COMPENSATION SHALL BE MADE FOR DEWATERING DURING CONSTRUCTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTATION OF THE SOIL EROSION AND SEDIMENTATION CONTROL MEASURES. THE INITIAL ESTABLISHMENT OF EROSION CONTROL PROCEDURES AND THE PLACEMENT OF SILL AND FILTER FENCINGS TO PROTECT ADJACENT PROPERTY SHALL OCCUR BEFORE GRADING BEGINS.
4. PRIOR TO COMMENCEMENT OF GRADING ACTIVITIES, THE CONTRACTOR SHALL ERCT A CONSTRUCTION FENCE AROUND ANY TREE DESIGNATED TO BE PRESERVED. SAID FENCE SHALL BE PLACED IN A CIRCLE CENTERED AROUND THE TREE. THE DIAMETER OF WHICH SHALL BE SURE THAT THE ENTIRE DRIP ZONE (EXTEND OF FURTHEST EXTENDING BRANCHES) SHALL BE WITHIN THE FENCE LIMITS. THE EXISTING GRADE WITHIN THE FENCED AREA SHALL NOT BE DISTURBED.
5. TOPSOIL EXCAVATION INCLUDES:
  - a. EXCAVATION OF TOPSOIL AND OTHER STRUCTURALLY UNSUITABLE MATERIALS WITHIN THOSE AREAS THAT WILL REQUIRE EARTH EXCAVATION OR CONTACTED EARTH FILL MATERIAL. EXISTING VEGETATION SHALL BE REMOVED PRIOR TO STRIPPING TOPSOIL OR FILLING AREAS.
  - b. PLACEMENT OF EXCAVATED MATERIAL IN OWNER DESIGNATED AREAS FOR FUTURE USE WITHIN AREAS TO BE LANDSCAPED AND THOSE AREAS NOT REQUIRING STRUCTURAL FILL MATERIAL. PROVIDE NECESSARY EROSION CONTROL MEASURES FOR ANY AND ALL STOCKPILES.
  - c. TOPSOIL STOCKPILED FOR SPREAD SHALL BE FREE OF CLAY AND SHALL NOT CONTAIN ANY OF THE TRANSITIONAL MATERIAL BETWEEN THE TOPSOIL AND CLAY. THE TRANSITIONAL MATERIAL SHALL BE USED IN NON-STRUCTURAL FILL AREAS OR DISPOSED OF OFF-SITE.
  - d. TOPSOIL SPREAD SHALL INCLUDE HAULING AND SPREADING OF TOPSOIL DIRECTLY OVER AREAS TO BE LANDSCAPED WITH SHOWN ON THE PLANS OR AS DIRECTED BY THE OWNER AND MAY NOT INCLUDE STUMPS, WOOD, OR STONES GREATER THAN 1 INCH DIAMETER.
6. EARTH EXCAVATION INCLUDES:
  - a. EXCAVATION OF SUBSURFACE MATERIALS WHICH ARE SUITABLE FOR USE AS STRUCTURAL FILL. THE EXCAVATION SHALL BE TO WITHIN A TOLERANCE OF 0.1 FEET OF THE PLAN SUBGRADE ELEVATIONS WHILE MAINTAINING PROPER DRAINAGE. THE TOLERANCE WITHIN PAVEMENT AREAS SHALL BE SUCH THAT THE EARTH MATERIALS SHALL "BALANCE" DURING THE FINE GRADINGS OPERATION. ENGINEER CANNOT GUARANTEE BALANCED SITE.
  - b. PLACEMENT OF SUITABLE MATERIALS SHALL BE WITHIN THOSE AREAS REQUIRING STRUCTURAL FILL IN ORDER TO ACHIEVE THE PLAN SUBGRADE ELEVATIONS TO WITHIN A TOLERANCE OF 0.1 FEET. THE FILL MATERIALS SHALL BE PLACED IN LOOSE LIFTS THAT SHALL NOT EXCEED EIGHT (8) INCHES IN THICKNESS, AND THE WATER CONTENT SHALL BE ADJUSTED IN ORDER TO ACHIEVE REQUIRED COMPACTION, PER SOILS OR GEOTECHNICAL REPORT.
  - c. STRUCTURAL FILL MATERIAL MAY BE PLACED WITHIN THOSE PORTIONS OF THE SITE NOT REQUIRING STRUCTURAL FILL WITHIN SIX (6) INCHES OF THE PLAN FINISHED GRADE ELEVATION. IN AREAS REQUIRING STRUCTURAL FILL, HOWEVER, THIS MATERIAL SHALL NOT BE PLACED OVER TOPSOIL OR OTHER UNSUITABLE MATERIALS UNLESS SPECIFICALLY DETERMINED BY A SOILS ENGINEER WITH THE CONCURRENTURE OF THE OWNER.
  - d. COMPACTION OF SUITABLE MATERIALS SHALL BE TO AT LEAST 93% OF THE MODIFIED PROCTOR DRY DENSITY WITHIN PROPOSED PAVEMENT AREAS. SIDEWALK COMPACTION SHALL BE AT LEAST 95% OF THE MODIFIED PROCTOR WITHIN PROPOSED BUILDING PAD AREAS OR AS RECOMMENDED BY THE GEOTECHNICAL REPORT.
7. UNSUITABLE MATERIAL: UNSUITABLE MATERIALS SHALL BE CONSIDERED MATERIAL THAT IS NOT SUITABLE FOR THE SUPPORT OF PAVEMENT AND BUILDING CONSTRUCTION AND IS ENCOUNTERED BELOW NORMAL TOPSOIL DEPTHS AND THE PROPOSED SUBGRADE ELEVATION. THE DECISION TO REMOVE SAID MATERIAL AND TO WHAT EXTENT SHALL BE MADE BY THE GEOTECHNICAL ENGINEER OR SOILS TESTING AGENCY WITH THE CONCURRENTURE OF THE OWNER.
8. MISCELLANEOUS. THE CONTRACTOR SHALL:
  - a. SPREAD AND COMPACT UNIFORMITY TO THE DEGREE SPECIFIED ALL EXCESS TRENCH SPOIL AFTER COMPLETION OF THE UNDERGROUND IMPROVEMENTS.
  - b. SCARIFY, DISC, AERATE, AND COMPACT TO THE DEGREE SPECIFIED THE UPPER TWELVE (12) INCHES OF THE SUITABLE SUBGRADE MATERIAL IN ALL AREAS THAT MAY BE SOFT DUE TO EXCESS MOISTURE CONTENT. THIS APPLIES TO CUT AREAS AS WELL AS FILL AREAS.
  - c. PROVIDE WATER TO ADD TO DRY MATERIAL IN ORDER TO ADJUST THE MOISTURE CONTENT FOR THE PURPOSE OF ACHIEVING THE SPECIFIED COMPACTION.
  - d. BACKFILL THE CURB AND GUTTER AFTER ITS CONSTRUCTION AND PRIOR TO THE PLACEMENT OF THE BASE COURSE MATERIAL.
  - e. TESTING AND FINAL ACCEPTANCE.
9. THE CONTRACTOR SHALL PROVIDE AS A MINIMUM A FULLY LOADED SIX-WHEEL TANDEM AXLE TRUCK FOR PROOF ROLLING THE PAVEMENT SUBGRADE PRIOR TO THE PLACEMENT OF THE CURB AND GUTTER AND THE BASE MATERIAL. THIS SHALL BE WITNESSED BY THE GEOTECHNICAL ENGINEER, ENGINEER OR SOILS TESTING AGENCY AND THE OWNER. (SEE PAVING SPECIFICATION).

**PAVING NOTES**

1. GENERAL
  - a. FINISH WORK INCLUDES FINAL SUBGRADE SHAPING, PREPARATION AND COMPACTION; PLACEMENT OF SUBBASE COURSE MATERIALS; BITUMINOUS INTERMEDIATE AND/OR SURFACE COURSES; FORMING, FINISHING AND CURING CONCRETE PAVEMENT, CURBS, AND WALKS; AND FINAL CLEAN-UP AND ALL RELATED WORK.
2. SUBGRADE PREPARATION
  - a. EARTHWORK FOR PROPOSED PAVEMENT SUBGRADE SHALL BE FINISHED TO WITHIN 0.1 FOOT, PLUS OR MINUS, OF PLAN ELEVATION. THE PAVING CONTRACTOR SHALL SATISFY HIMSELF/HERSELF THAT THE SUBGRADE HAS BEEN PROPERLY PREPARED AND THAT THE FINISH TOP SUBGRADE ELEVATION HAS BEEN GRADED WITHIN TOLERANCES ALLOWED IN THESE SPECIFICATIONS. UNLESS THE CONTRACTOR ADVISES THE ENGINEER IN WRITING PRIOR TO FINE GRADINGS FOR CONCRETE CONSTRUCTION, IT IS UNDERSTOOD THAT HE/SHE HAS APPROVED AND ACCEPTS THE RESPONSIBILITY FOR THE SUBGRADE.
  - b. AFTER STRIPPING TO THE PROPOSED SUBGRADE LEVEL, THE BUILDING AND PARKING AREAS SHOULD BE PROOF-ROLLED WITH A TANDEM AXLE DUMP TRUCK OR SIMILAR HEAVY RUBBER TIRED VEHICLE TYPICALLY WITH AN AXIAL LOAD GREATER THAN NINE (9) TONS OR MEETING SPECIFICATIONS OUTLINED IN INDOT SECTION 203.26 FOR ROADWAY SUBGRADE COMPACTION AND PROOF-ROLLING.
  - c. MAXIMUM DEFLECTION ALLOWED IN ISOLATED AREAS MAY BE ONE (1) INCH IF NO DEFLECTION OCCURS OVER THE MAJORITY OF THE AREA.
  - d. PRIOR TO THE CONSTRUCTION OF THE CURB AND GUTTER AND THE PLACEMENT OF THE BASE MATERIAL, THE PAVEMENT AREA SHALL BE FINE-GRADED TO WITHIN 0.04 FEET (1/2 INCH) OF FINAL SUBGRADE ELEVATION. TO A POINT TWO (2) FEET BEYOND THE BACK OF THE CURB, SO AS TO ENSURE THE PROPER THICKNESS OF PAVEMENT COURSES. NO CLAIMS FOR EXCESS QUANTITY OF BASE MATERIALS DUE TO IMPROPER SUBGRADE PREPARATION WILL BE HONORED.
  - e. PRIOR TO PLACEMENT OF THE BASE COURSE, THE SUBGRADE SHALL BE APPROVED BY THE TESTING ENGINEER.
3. CONCRETE WORK
  - a. ALL EXTERIOR CONCRETE SHALL BE PORTLAND CEMENT CONCRETE CLASS S1 OR P.V. CONCRETE SHALL BE A MINIMUM OF SIX (6) BAG MIX AND SHALL DEVELOP A MINIMUM OF 4000 PSI COMPRESSIVE STRENGTH AT TWENTY-EIGHT (28) DAYS. ALL CONCRETE SHALL BE BROOM-FINISHED PERPENDICULAR TO THE DIRECTION OF TRAVEL.
  - b. CONCRETE CURB AND/OR COMBINATION CURB AND GUTTER SHALL BE OF THE TYPE SHOWN ON THE PLANS. THE CONTRACTOR IS CAUTIONED TO REFER TO THE CONSTRUCTION STANDARDS AND THE PAVEMENT CROSS SECTION TO DETERMINE THE GUTTER FLAG THICKNESS AND THE AGGREGATE BASE COURSE THICKNESS BENEATH THE CURB AND GUTTER. PRE-MOLDED FIBER EXPANSION JOINTS, WITH TWO 3/4 INCH BY 18 INCH EPOXY-COATED STEEL DOWEL BARS, SHALL BE GREASED AND FITTED WITH METAL EXPANSION TUBES. SAWED OR FORMED CONSTRUCTION JOINTS SHALL BE PROVIDED AT NO GREATER THAN TEN (10) TO TWENTY-FIVE (25) FEET INTERVALS BETWEEN EXPANSION JOINTS. NO HONEY-COMBING OF THE CURB AND GUTTER WILL BE ACCEPTED.
  - c. CURBS SHALL BE DEPRESSED AT LOCATIONS WHERE PUBLIC WALKS INTERSECT CURB LINES AND OTHER LOCATIONS, AS DIRECTED, FOR THE PURPOSE OF PROVIDING ACCESSIBILITY.
  - d. THE CURBS SHALL BE BACKFILLED AFTER THEIR CONSTRUCTION AND PRIOR TO THE PLACEMENT OF THE BASE COURSE.
  - e. CONCRETE SIDEWALK SHALL BE IN ACCORDANCE WITH THE ABOVE AND THE PLANS. PROVIDE SCORED JOINTS AT MAXIMUM 6-FOOT INTERVALS AND 1/4-INCH PRE-MOLDED FIBER EXPANSION JOINTS AT 20-FOOT MAXIMUM INTERVALS AND ADJACENT TO CONCRETE CURBS, DRIVEWAYS, FOUNDATIONS, AND OTHER STRUCTURES.
  - f. CONCRETE DRIVEWAY APRONS SHALL BE IN ACCORDANCE WITH THE ABOVE AND THE PLANS PROVIDE 6 INCH AND 4 INCH NO. 6 WELDED WIRE MESH IN ALL DRIVEWAYS. PROVIDE 1/4 INCH PRE-MOLDED FIBER EXPANSION JOINT ADJACENT TO CURBS AND CONCRETE SIDEWALKS. PROVIDE SAWED OR FORMED CONSTRUCTION JOINTS AT MID-POINT AND 15 FOOT MAXIMUM SPACING.
  - g. STANDARD REINFORCED CONCRETE PAVEMENT SHALL BE IN ACCORDANCE WITH THE ABOVE AND THE PLANS. SAWED OR FORMED CONSTRUCTION JOINTS SHALL BE AS SHOWN ON THE PLANS.
  - h. CONCRETE CURING AND PROTECTION SHALL BE PER INDOT STANDARDS. TWO (2) COATS OF INDOT APPROVED CURING AGENT SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES.
  - i. THE COST OF AGGREGATE BASE OR SUBBASE UNDER CONCRETE WORK SHALL BE INCLUDED IN THE COST OF THE RESPECTIVE CONCRETE ITEM.
4. FLEXIBLE PAVEMENT
  - a. THE PAVEMENT MATERIALS FOR BITUMINOUS STREETS, PARKING LOTS, AND DRIVE ASLES SHALL BE AS MORE STRINGENT SHALL APPLY.
  - b. ALL SANITARY MANHOLES TO BE CONCRETE AND MEET MANHOLE DESIGN SPECIFICATION OF ASTM C-478 AND JOINT SPECIFICATIONS OF ASTM C-443.
  - c. SANITARY SEWER LINES THAT ARE PROPOSED AT A DEPTH 15 FEET OR GREATER SHALL BE DUCTILE IRON CLASS S1 PIPE.

**SANITARY NOTES**

1. ALL UNSUITABLE MATERIALS SHALL BE REMOVED BELOW THE PROPOSED SANITARY SEWER AND REPLACED WITH COMPACTED CRUSHED GRAVEL OR STONE, AS PER THE LATEST INDOT OR UTILITY STANDARDS.
2. ALL TRENCHES BENEATH PROPOSED OR EXISTING UTILITIES, PAVEMENTS, ROADWAYS, SIDEWALKS, AND FOR A DISTANCE OF THREE (3) FEET ON EITHER SIDE OF SAME AND/OR WHERE SHOWN ON THE PLANS, SHALL BE BACKFILLED WITH A MATERIAL THAT HAS BEEN TREATED AND COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY.
3. ALL SANITARY SEWERS ARE TO BE CONSTRUCTED USING A LASER INSTRUMENT TO MAINTAIN LINE AND GRADE.
4. CONNECTIONS TO EXISTING SANITARY SEWER SYSTEM SHALL NOT BE DONE UNTIL AUTHORIZED BY HENDRICKS CO REG SEWER DIST.
5. WATERMANS SHALL BE SEPARATED FROM SANITARY SEWERS AND STORM SEWERS IN ACCORDANCE WITH IDEM REQUIREMENTS, AS SPECIFIED IN THE STANDARDS FOR WATER AND SEWER CONSTRUCTION IN INDIANA.
6. NO WATER LINE SHALL BE PLACED IN THE SAME TRENCH AS A SEWER LINE, EXCEPT UNDER SPECIAL CIRCUMSTANCES AND THEN ONLY UNDER THE FOLLOWING RULES:
  - a. IF NECESSARY, PERMISSION SHALL BE OBTAINED FROM HENDRICKS CO REG SEWER DIST IN WRITING PRIOR TO BEGINNING CONSTRUCTION.
  - b. THE BOTTOM OF A WATER LINE SHALL BE INSTALLED ON A SHELF A MINIMUM OF 18 INCHES ABOVE THE TOP OF THE SEWER AND 10 FEET HORIZONTALLY AWAY FROM THE EDGE OF THE SEWER.
7. ALL PIPE CONNECTION OPENINGS SHALL BE PRECAST WITH RESILIENT RUBBER WATER-TIGHT SLEEVES. THE BOTTOM OF THE MANHOLE SHALL HAVE A CONCRETE BENCH POUR TO FACILITATE SMOOTH FLOWS.
8. ALL SANITARY SEWER MANHOLE FRAMES AND LIDS SHALL BE PER DETAIL SHEET, UNLESS OTHERWISE NOTED ON THE PLANS AND DETAILS. THE LIDS SHALL HAVE RECESSED (CONCEALED) PICK HOLE AND BE SELF-SEALING WITH AN "O" RING GASKET. THE JOINTS BETWEEN THE FRAME AND CONCRETE SECTION SHALL BE SEALED WITH A BUTYL ROPE.
9. A MAXIMUM OF TWELVE (12) INCHES OF CONCRETE ADJUSTING RINGS SHALL BE USED TO ADJUST FRAME ELEVATIONS. RINGS SHALL BE SEALED TOGETHER WITH BUTYL ROPE.
10. ALL MANHOLES AND PIPES SHALL BE THOROUGHLY CLEANED OF DIRT AND DEBRIS, AND ALL VISIBLE LEAKAGE ELIMINATED, BEFORE FINAL INSPECTION AND ACCEPTANCE.
11. DEFLECTION, AIR, AND LEAKAGE TESTING WILL BE REQUIRED. THE PROCEDURE AND ALLOWABLE TESTING LIMITS SHALL BE IN ACCORDANCE WITH THE TEN STATE STANDARDS.
12. TESTING THE ALIGNMENT/STRAIGHTNESS SHALL BE IN ACCORDANCE WITH MUNICIPAL/UTILITY STANDARDS.
13. IF REQUIRED BY HENDRICKS CO REG SEWER DIST AND/OR UTILITY PROVIDER, ALL SANITARY SEWERS SHALL BE TELEVIEWD, AND A COPY OF THE TAPE AND WRITTEN REPORT SHALL BE SUBMITTED AND REVIEWED BY HENDRICKS CO REG SEWER DIST AND/OR UTILITY PROVIDER BEFORE FINAL ACCEPTANCE. THE REPORT SHALL INCLUDE STUB LOCATIONS AS WELL AS A DESCRIPTION OF ALL DEFECTS: WATER LEVEL LEAKS, AND LEAKS. IDENTIFY MANHOLE TO MANHOLE BOTH VERBALLY AND ON SCREEN USING MANHOLE NUMBERS FROM APPROVED PLANS. ORDER OF WRITTEN REPORT SHALL BE THE SAME AS THE VIDEOTAPE.
14. IF THE SANITARY SEWER INSTALLATION FAILS TO MEET THE TEST REQUIREMENTS SPECIFIED, THE CONTRACTOR SHALL DETERMINE THE CAUSE OR CAUSES OF THE DEFECT AND REPAIR, OR REPLACE ALL MATERIALS AND WORKMANSHIP, AS MAY BE NECESSARY TO COMPLY WITH THE TEST REQUIREMENTS.
15. CONTRACTOR SHALL SUBMIT CERTIFIED COPIES OF ALL REPORTS OF TESTS CONDUCTED BY AN INDEPENDENT LABORATORY BEFORE INSTALLATION OF PVC PLASTIC PIPE. TESTS SHALL BE CONDUCTED IN ACCORDANCE WITH STANDARD METHOD OF TEST FOR "EXTERNAL LOADING PROPERTIES OF PLASTIC PIPE BY PARALLEL PLATE LOADINGS," ASTM STANDARD D-2241, AS APPROPRIATE FOR THE PIPE TO BE USED. TESTS SHALL ALSO BE CONDUCTED TO DEMONSTRATE JOINT PERFORMANCE AT FIVE (5) PERCENT MAXIMUM DIAMETRIC DEFLECTION OF THE SPIGOT.
16. IF CONFLICT ARISES BETWEEN HENDRICKS CO REG SEWER DIST STANDARDS AND SANITARY SEWER NOTES, THE MORE STRINGENT SHALL APPLY.
17. UNLESS OTHERWISE SPECIFIED IN HENDRICKS CO REG SEWER DIST SPECIFICATIONS:
  - a. ALL SANITARY SEWER LINES SHALL BE PVC MEETING ASTM D-3034 STANDARDS AND JOINTS MEETING ASTM D-3212.
  - b. ALL SANITARY MANHOLES TO BE CONCRETE AND MEET MANHOLE DESIGN SPECIFICATION OF ASTM C-478 AND JOINT SPECIFICATIONS OF ASTM C-443.
  - c. SANITARY SEWER LINES THAT ARE PROPOSED AT A DEPTH 15 FEET OR GREATER SHALL BE DUCTILE IRON CLASS S1 PIPE.

**STORM SEWER NOTES**

1. ALL STORM SEWER PIPE SHALL BE RCP (ASTM C-76), UNLESS OTHERWISE NOTED ON THE PLANS, IN ACCORDANCE WITH THE FOLLOWING:
 

PLAN	TYPE	MATERIAL
12" - 66"	RCP	REINFORCED CONCRETE PIPE (ASTM C-76)
12" - 30"	HDPE	DUAL WALL HDPE, SMOOTH INTERIOR (ASTM F2648), VERIFY WITH ENGINEER.
<12"	PVC	SDR-35, ASTM D-3034

 REFER TO PLANS FOR PIPE SIZES.
  - FOR PIPE SIZES 12" TO 54" WITH COVER BETWEEN 2' - 10' USE SEWER CLASS II CONCRETE PIPE. FOR COVER GREATER THAN 10' BUT LESS THAN 16' USE CLASS V CONCRETE PIPE. FOR COVER GREATER THAN 16' USE CLASS V CONCRETE PIPE.
  - FOR PIPE SIZES GREATER THAN 54" WITH COVER BETWEEN 1' - 9' USE CLASS III CONCRETE PIPE. FOR COVER BETWEEN 9' - 13' USE CLASS IV CONCRETE PIPE.
  - FOR REINFORCED ELLIPTICAL CONCRETE PIPE (ASTM C-507) WITH COVER 3' OR LESS USE CLASS HE-IV. FOR COVER BETWEEN 3' AND 9' USE HE-III.
2. MASTIC COUPLING SHALL BE USED WHEN JOINING STORM SEWER PIPES OF DISSIMILAR MATERIALS. ENGINEER TO VERIFY MATERIAL WITH CITY OF BROWNSBURG SPECIFICATIONS.
3. ALL FOOTING DRAIN DISCHARGE PIPES AND DOWN SPOUTS SHALL DISCHARGE TO THE GROUND/STORM SEWER SYSTEM.
4. ALL STORM SEWERS ARE TO BE CONSTRUCTED USING A LASER INSTRUMENT TO MAINTAIN LINE AND GRADE.
5. THE CONTRACTOR SHALL MAINTAIN AT LEAST TWO (2) FEET OF COVER OVER THE TOP OF SHALLOW PIPES AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR SHALL MAINTAIN COVER OVER ANY PIPES THAT HAVE LESS THAN TWO (2) FEET OF COVER DURING CONSTRUCTION UNTIL THE AREA IS FULLY GRADED OR PAVED.
6. MANHOLE, CATCH BASIN, AND INLET BOTTOMS SHALL BE PRECAST CONCRETE SECTIONAL UNITS OR MONOLITHIC CONCRETE. MANHOLES AND CATCH BASINS SHALL BE A MINIMUM OF FOUR (4) FEET IN DIAMETER UNLESS OTHERWISE SPECIFIED ON THE PLANS. STRUCTURE JOINTS SHALL BE SEALED WITH "O" RING OR BUTYL ROPE. A MAXIMUM OF TWELVE (12) INCHES OF ADJUSTING RINGS SHALL BE USED.
7. A CONCRETE BENCH TO DIRECT FLOWS SHALL BE CONSTRUCTED IN THE BOTTOM OF ALL INLETS AND MANHOLES.
8. THE FRAME, GRATE, AND/OR CLOSED LID SHALL BE CAST IRON OF THE STYLE SHOWN ON THE PLANS.
9. THE STORM SEWER SYSTEM SHALL BE THOROUGHLY CLEANED PRIOR TO FINAL INSPECTION AND TESTING.
10. MANHOLES, CATCH BASINS, INLETS, FRAMES, GRATES, AND OTHER STRUCTURES SHALL BE CONSTRUCTED OF THE TYPE, STYLE, AND SIZE AS SET FORTH WITH THE ORDINANCES AND STANDARDS OF THE CITY OF BROWNSBURG.
11. ALL MATERIAL AND CONSTRUCTION SHALL CONFORM TO THE CITY OF BROWNSBURG CODE. WHEN CONFLICTS ARISE BETWEEN MUNICIPAL CODE AND GENERAL NOTES, THE MORE STRINGENT SHALL TAKE PRECEDENCE.

**WATERMAIN NOTES**

1. ALL WATER LINE MATERIALS AND INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE CURRENT RULES AND REGULATIONS OF UTILITY PROVIDER.
  - a. WATERMANS SHALL BE CONSTRUCTED OF AWWA C900 OR AWWA C905 PLASTIC PIPE AND SHALL BE CLASS 150 UNLESS OTHERWISE INDICATED ON THE PLAN. ONE COUPLING WITH TWO RUBBER GASKETS SHALL BE FURNISHED WITH EACH LENGTH OF PIPE. IT SHALL BE THE SAME MATERIAL AND BY THE SAME MANUFACTURER AS THE PIPE AND CONFORM TO ASTM D-3139. RUBBER GASKETS SHALL CONFORM TO ASTM F477.
  - b. TESTING OF THE PIPE AND COUPLINGS SHALL BE MADE IN ACCORDANCE WITH AWWA C900, REGARDLESS OF THE PLACE OF MANUFACTURE. ALL PIPE SHALL BE TESTED WITHIN THE CONTINENTAL UNITED STATES.
2. THE PIPE SHALL BE SDR 14 FOR FIRE PROTECTION MAINS AND DR 18 FOR WATER MAINS.
3. JOINTS SHALL BE BELL END OR COUPLING PUSH ON TYPE. THE PUSH ON JOINT AND JOINT COMPONENTS SHALL MEET THE REQUIREMENTS FOR ASTM D-3139. JOINT FOR PLASTIC PRESSURE PIPE USING FLEXIBLE ELASTOMERIC SEALS. THE JOINT SHALL BE DESIGNED SO AS TO PROVIDE FOR THE THERMAL EXPANSION AND CONTRACTION EXPERIENCED WITH A TOTAL TEMPERATURE CHANGE OF 75 DEGREES F IN EACH JOINT OF PIPE. THE LUBRICANT SHALL HAVE NO DETERIORATING EFFECTS ON THE GASKET OR THE PIPE. GASKETS SHALL MEET ALL APPLICABLE REQUIREMENTS OF ANSI STANDARD A21.11.
4. ALL FITTINGS SHALL BE OF DUCTILE IRON WITH GASKETS, GLANDS AND T-HEAD BOLTS WITH NUTS. DUCTILE IRON FITTINGS SHALL CONFORM TO ANSI/AWWA C110/A21.10, 30.5 POUNDS PER SQUARE INCH (PSI) PRESSURE RATING REQUIREMENTS. ALL FITTINGS SHALL BE CEMENT MORTAR LINED CONFORMING TO ANSI/AWWA C104/A21.4 AND SHALL BE COATED OUTSIDE WITH A BITUMINOUS COATING OR FUSION-BONDED EPOXY. FITTINGS SHALL HAVE DISTINCTLY CAST INTO THE PIPE EXTERIOR THE PRESSURE RATING AND LETTERS "DI" OR "DUCTILE" - ALL DUCTILE IRON FITTINGS ACCEPTABLE TO THE UTILITY SHALL BE RATED AT A MINIMUM OF 70-50/50 (KSI TENSILE STRENGTH - KSI YIELD STRENGTH - PERCENT ELONGATION), IN ACCORDANCE WITH ANSI/AWWA C110 STANDARDS REGARDING STRENGTH OF MATERIALS.
5. FITTING JOINTS SHALL BE OF THE STANDARD MECHANICAL JOINT TYPE CONFORMING TO ANSI/AWWA C111/A21.11 OR PUSH ON JOINT TYPE CONFORMING TO ANSI/AWWA C111/A21.11. ALL GASKETS, GLANDS AND T-HEAD BOLDS SHALL BE IN ACCORDANCE WITH AWWA C111/A21.11.
6. HIGH DENSITY CROSS-LAMINATED POLYETHYLENE ENCASEMENT MATERIALS SHALL BE USED FOR DUCTILE IRON PIPE AND FITTINGS. THE HIGH DENSITY CROSS-LAMINATED POLYETHYLENE TUBE MATERIAL SHALL CONFORM TO ANSI/AWWA C105 WITH A MINIMUM THICKNESS OF 4 MILS.
7. GATE VALVES SHALL BE USED ON ALL WATERMANS. ALL VALVES SHALL TURN COUNTER-CLOCKWISE TO OPEN. VALVES SHALL BE IRON BODY RESILIENT WEDGE GATE VALVES WITH BROME-MOUNTED SEATS AND NON-RISING STEMS CONFORMING TO AWWAC-509. THE VALVES SHALL HAVE MECHANICAL JOINTS.
8. WHERE WATERMANS AND SERVICES CROSS PROPOSED OR EXISTING STREETS, BACKFILL SHALL BE COMPACTED GRANULAR MATERIAL EXTENDING AT LEAST 5 FEET BEYOND THE BACK OF CURB OR EDGE OF PAVEMENT.
9. PROVIDE AND INSTALL FOUR MEGALUG JOINT RESTRAINTS AT EACH JOINT FROM THE MAINLINE TEE TO THE AUXILIARY VALVE AND BETWEEN THE AUXILIARY VALVE AND THE HYDRANT BARREL.
10. THE BREAK FLANGE AND ALL BELOW-GRADE FITTING SHALL HAVE STAINLESS STEEL NUTS AND BOLTS.
  - i. CORROSION STOPS SHALL BE BRONZE BODY KEY STOPS CONFORMING TO AWWA C-800 AND SHALL INCLUDE "J" BEND, TAILPIECE, AND COMPRESSION FITTINGS. SIZE AND LOCATION AS SHOWN ON THE PLANS.
  - ii. MAXIMUM DEFLECTION AT PIPE JOINTS SHALL BE IN ACCORDANCE WITH PIPE MANUFACTURER'S CURRENT RECOMMENDATIONS AND AWWA SPECIFICATIONS.
13. ALL WATERMANS SHALL BE BEDDED ON FIRM GROUND, WITH BELL HOLES EXCAVATED SO THAT THE PIPE HAS AN EVEN BEDDING FOR ITS ENTIRE LENGTH.
14. GRANULAR BEDDING MATERIAL OR GRANULAR BACKFILL MATERIAL SHALL BE CAREFULLY PLACED TO TWELVE (12) INCHES OVER THE TOP OF THE PIPE BEFORE FINAL BACKFILLING AND COMPACTION.
15. A MINIMUM DEPTH OF COVER OF FIFTY-FOUR (54) INCHES SHALL BE MAINTAINED OVER THE WATER LINES. THE MAXIMUM COVER SHALL BE SEVENTY-TWO (72) INCHES, EXCEPT AT CROSSINGS.
16. "MEGALUG" RETAINER GLANDS AND THRUST BLOCKING SHALL BE INSTALLED ON WATERMANS AT ALL BENDS, FITTINGS, TEES, ELBOWS. "MEGALUG" RESTRAINED JOINTS ARE REQUIRED ON ALL VALVES AND FITTINGS.
17. HORIZONTAL SEPARATION
  - a. WATERMANS SHALL BE LAID AT LEAST TEN (10) FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED DRAIN, STORM SEWER, SANITARY SEWER, OR SEWER SERVICES CONNECTION.
  - b. WATERMANS MAY BE LAID CLOSER THAN TEN (10) FEET TO A SEWER LINE WHEN:
    - i. LOCAL CONDITIONS PREVENT A LATERAL SEPARATION OF 10 FEET
    - ii. THE WATERMAIN INVERT IS AT LEAST EIGHTEEN (18) INCHES ABOVE THE CROWN OF THE SEWER.
  - c. BOTH THE WATERMAIN AND DRAIN OR SEWER SHALL BE CONSTRUCTED WITH CONCRETE ENCASED DUCTILE IRON WHEN IT IS IMPOSSIBLE TO MEET (1) OR (2) ABOVE. THE DRAIN OR SEWER SHALL BE PRESSURE-TESTED TO THE MAXIMUM EXPECTED SURCHARGE HEAD BEFORE BACKFILLING.
18. VERTICAL SEPARATION
  - a. ALL SERVICE PIPES SHALL BE BURIED AT LEAST FIFTY-FOUR (54) INCHES DEEP IN THE GROUND TO THE TOP OF PIPE.
  - b. A WATERMAIN PIPE SHALL BE LAID SO THAT ITS INVERT IS EIGHTEEN (18) INCHES ABOVE THE CROWN OF THE DRAIN OR SEWER WHENEVER WATERMANS CROSS STORM SEWERS, SANITARY SEWERS, OR SEWER SERVICE CONNECTIONS. THE VERTICAL SEPARATION SHALL BE MAINTAINED FOR THAT PORTION OF THE WATERMAIN LOCATED WITHIN TEN (10) FEET HORIZONTALLY OF ANY SEWER OR DRAIN CROSSING. A LENGTH OF WATERMAIN PIPE SHALL BE CENTERED OVER THE SEWER TO BE CROSSED WITH JOINTS EQUIDISTANT FROM THE SEWER OR DRAIN.
  - c. BOTH THE WATERMANS AND SEWER SHALL BE CONSTRUCTED WITH PIPE EQUIVALENT TO WATERMAIN STANDARDS OF CONSTRUCTION WHEN:
    - i. IT IS IMPOSSIBLE TO OBTAIN THE PROPER VERTICAL SEPARATION, AS DESCRIBED IN (A) ABOVE.
    - ii. OR THE WATERMAIN PASSES UNDER A SE