FRANKLIN TRANSFER STATION
BUILDING ADDITION
CONSTRUCTION PLANS

730 INDUSTRIAL DRIVE, FRANKLIN, INDIANA 46131
JOHNSON COUNTY, IN

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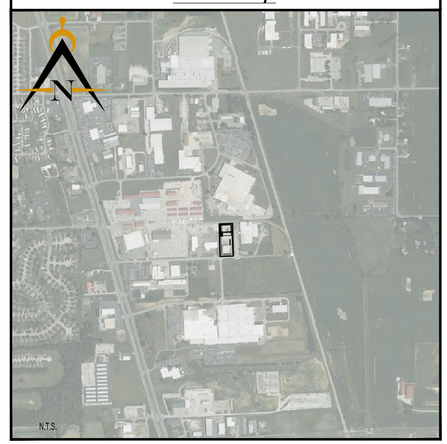
Project Map
SCALE: 1"=100'

Area Map



UTILITY PROVIDER

GAS
Vectren Energy
600 Industrial Dr.
Franklin, IN 46131
800-277-1376
(Shane Alexander)

WATER
Indiana American Water Co.
2501 Endress Place
Greenwood, IN 46143
317-881-0270
(Ron Ballard)

ELECTRIC
Johnson County REMC
750 International Dr.
Franklin, IN 46131
317-736-6174

SANITARY SEWER
Franklin Public Works Dept.
796 S. State St.
Franklin, IN 46131
888-736-3640

TELEPHONE
AT&T
1711 N. Morton St. Ste. B
Franklin, IN 46131
866-731-2653

DRAINAGE
Franklin Public Works Dept.
796 S. State St.
Franklin, IN 46131
888-736-3640
(Tyler Urban - MS4 Coordinator)

UTILITY HOTLINE: 1-800-382-5544 within Indiana 1-800-428-5200 outside Indiana
Note: The nature, size and location of utilities are per plans and locations provided by the respective utility companies together with field observation. The above list constitutes some, if not all, of the utility companies which provide service in the area of, and adjacent to, the subject property, based upon information available through such plans and locations, by incidental visual inspection. All utility companies should be notified prior to any excavation for field location of services and verification of size and nature of services.

Developer:

BEST WAY DISPOSAL
2577 KENTUCKY AVENUE
INDIANAPOLIS, INDIANA 46221
PH: (800) 354-1830
Contact:
Email:

Engineer:

Innovative
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FRANKLIN TRANSFER CENTER
BUILDING ADDITION
730 INDUSTRIAL DRIVE, FRANKLIN, IN 46131
TITLE SHEET

DATE:

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SHEET # *C100*

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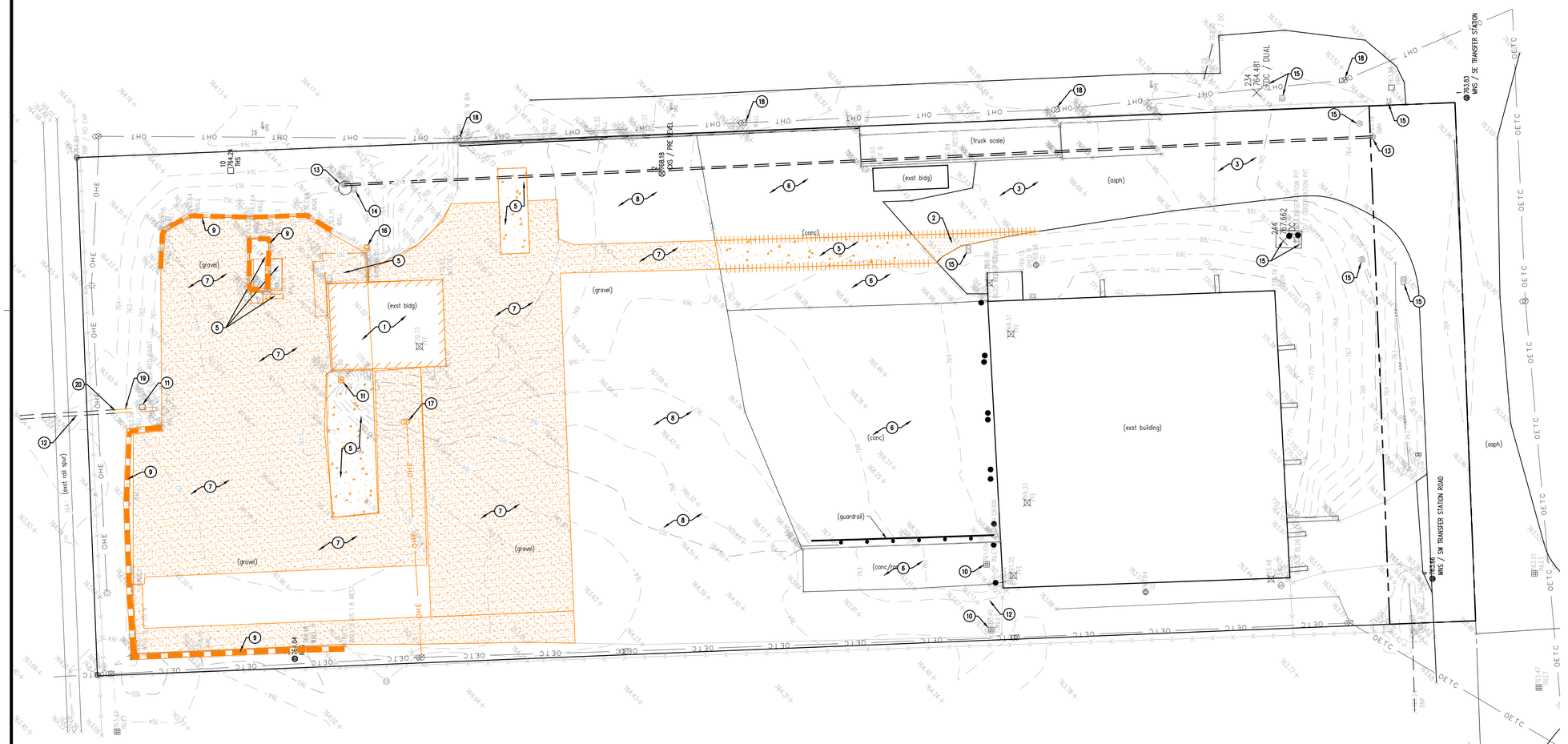

GRAPHIC SCALE

20 0 10 20

(IN FEET)
1 inch = 20 ft.

LEGEND:

	DESCRIPTION:
	SIGN
	WATER VALVE
	FIRE HYDRANT
	LIGHT POST
	GAS METER
	CLEAN–OUT
E	ELECTRIC METER BOX
	GUARD POST
	6"X6" WOOD POST
	WATER METER
AC	AIR CONDITIONER UNIT
	YARD LIGHT
R	REBAR SET/FOUND
	FLAT GRATE INLET
	COMBINATION POLE
	TELEPHONE PEDESTAL
	WOODEN LIGHT POLE
12"	CONIFEROUS TREE & SIZE
36"	DECIDUOUS TREE & SIZE
	BUSH
D	DRAINAGE MANHOLE
C	COMBINATION MANHOLE
	CURB INLET
	GROUND ACCENT LIGHT
	GUY WIRE
WTR	UNDG. WATER LINE
G	UNDG. GAS LINE
UT	UNDG. TELEPHONE LINE
UE	UNDG. ELECTRIC LINE
VCP	vitrified clay pipe
RCP	reinforced concrete pipe
PVC	polethylene coated pipe

DEMOLITION KEYNOTES

1. EXISTING BUILDING TO BE REMOVED
2. ASPHALT TO BE REMOVED
3. ASPHALT TO BE PROTECTED THROUGHOUT DURATION OF CONSTRUCTION AND REMAIN IN PLACE
4. SAWCUT PAVEMENT FULL DEPTH
5. CONCRETE AND BASE TO BE REMOVED FULL DEPTH
6. CONCRETE TO BE PROTECTED THROUGHOUT DURATION OF CONSTRUCTION AND REMAIN IN PLACE
7. STONE TO BE REMOVED
8. STONE TO REMAIN IN PLACE – REGRADE AS NEEDED
9. CONCRETE BLOCK TO BE REMOVED
10. STORM STRUCTURE TO BE PROTECTED THROUGHOUT DURATION OF CONSTRUCTION AND REMAIN IN PLACE
11. STORM STRUCTURE TO BE REMOVED
12. STORM PIPE TO BE PROTECTED THROUGHOUT DURATION OF CONSTRUCTION AND REMAIN IN PLACE
13. SANITARY STRUCTURE TO BE PROTECTED AND REMAIN IN PLACE
14. ELECTRICAL BOX TO BE PROTECTED THROUGHOUT DURATION OF CONSTRUCTION AND REMAIN IN PLACE
15. UTILITY TO BE PROTECTED THROUGHOUT CONSTRUCTION
16. UTILITY TO BE REMOVED
17. POWER POLE TO BE REMOVED
18. POWER POLE TO BE PROTECTED THROUGHOUT CONSTRUCTION
19. STORM PIPE TO BE REMOVED
20. PREPARE STORM PIPE FOR CONNECTION TO NEW STRUCTURE.

GENERAL NOTES

1. THE CONTRACTOR SHALL CONFORM TO ALL LOCAL, STATE, AND FEDERAL CODES, OBTAIN ALL PERMITS, AND GIVE NOTICES REQUIRED FOR EXECUTION OF THE WORK.
2. ALL MATERIALS BEING REMOVED AND NOT RELOCATED UNDER THE NEW CONSTRUCTION, INCLUDING TREES, SHRUBS, SIGNS, UTILITIES, UTILITY STRUCTURES, ETC., SHALL BE FIRST OFFERED TO THE OWNER'S REPRESENTATIVE AND, IF NOT ACCEPTED, SHALL BE PROPERLY DISPOSED OF BY THE CONTRACTOR.
3. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL CHARTED AND UNCHARTED UTILITIES. TAKE CARE TO PROTECT UTILITIES THAT ARE TO REMAIN. REPAIR ANY DAMAGE TO LOCAL STANDARDS AND AT THE CONTRACTOR'S EXPENSE. COORDINATE ALL CONSTRUCTION WITH THE APPROPRIATE UTILITY COMPANY.
4. THE CONTRACTOR SHALL VERIFY THE LIMITS OF DEMOLITION WITH THE OWNER'S REPRESENTATIVE PRIOR TO COMMENCEMENT OF WORK.
5. IN AREAS WHERE EXISTING PAVEMENT, WALKS, OR CURBS ARE TO BE REMOVED, SAW CUT TO PROVIDE A CLEAN EDGE. COORDINATE EXTENT OF PAVEMENT DEMOLITION WITH THE LIMIT OF NEW IMPROVEMENTS ON THE SITE LAYOUT PLAN.
6. THE CONTRACTOR SHALL COORDINATE PHASING OF THE DEMOLITION WITH THE OWNER'S REPRESENTATIVE, ADJACENT PROPERTY LANDOWNERS, UTILITY REGULATIONS AND LOCAL AUTHORITIES, WHERE APPROPRIATE, PRIOR TO BEGINNING WORK. DISRUPTION OF THE EXISTING UTILITIES SHALL BE MINIMIZED TO THE EXTENT POSSIBLE AND INITIATED ONLY AFTER APPROVAL BY UTILITY REGULATIONS AND LOCAL AUTHORITIES.
7. CAVITIES LEFT BY STRUCTURE REMOVAL SHALL BE SUITABLY BACKFILLED AND COMPACTED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS.
8. THE CONTRACTOR IS RESPONSIBLE FOR ALL DEMOLITION AND REMOVAL NECESSARY TO ACCOMPLISH THE PROPOSED IMPROVEMENTS SHOWN ON THESE PLANS.
9. THE CONTRACTOR SHALL CALL THE INDIANA ONE CALL SYSTEM, HOLEY MOLEY, OR OTHER REQUIRED UTILITY LOCATION COMPANIES 72 HOURS PRIOR TO PROCEEDING WITH ANY EXCAVATION.
10. THE CONTRACTOR SHALL PRESERVE AND PROTECT SURVEY CONTROL POINTS AND SHALL BE RESPONSIBLE FOR REPLACEMENT OF ANY DISTURBED CONTROL POINTS.
11. EXISTING TREES TO BE PRESERVED ARE TO BE APPROPRIATELY BARRICADED PRIOR TO CONSTRUCTION.
12. ALL STORM PIPE IS TO REMAIN IN PLACE. ADJUST STRUCTURE T.C.'s AS SHOWN.

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FRANKLIN TRANSFER CENTER
BUILDING ADDITION
730 INDUSTRIAL DRIVE, FRANKLIN, IN 46131

EXISTING TOPOGRAPHY AND DEMOLITION PLAN

DATE:

DATE: 02/04/2021
DRAWN BY: ALR
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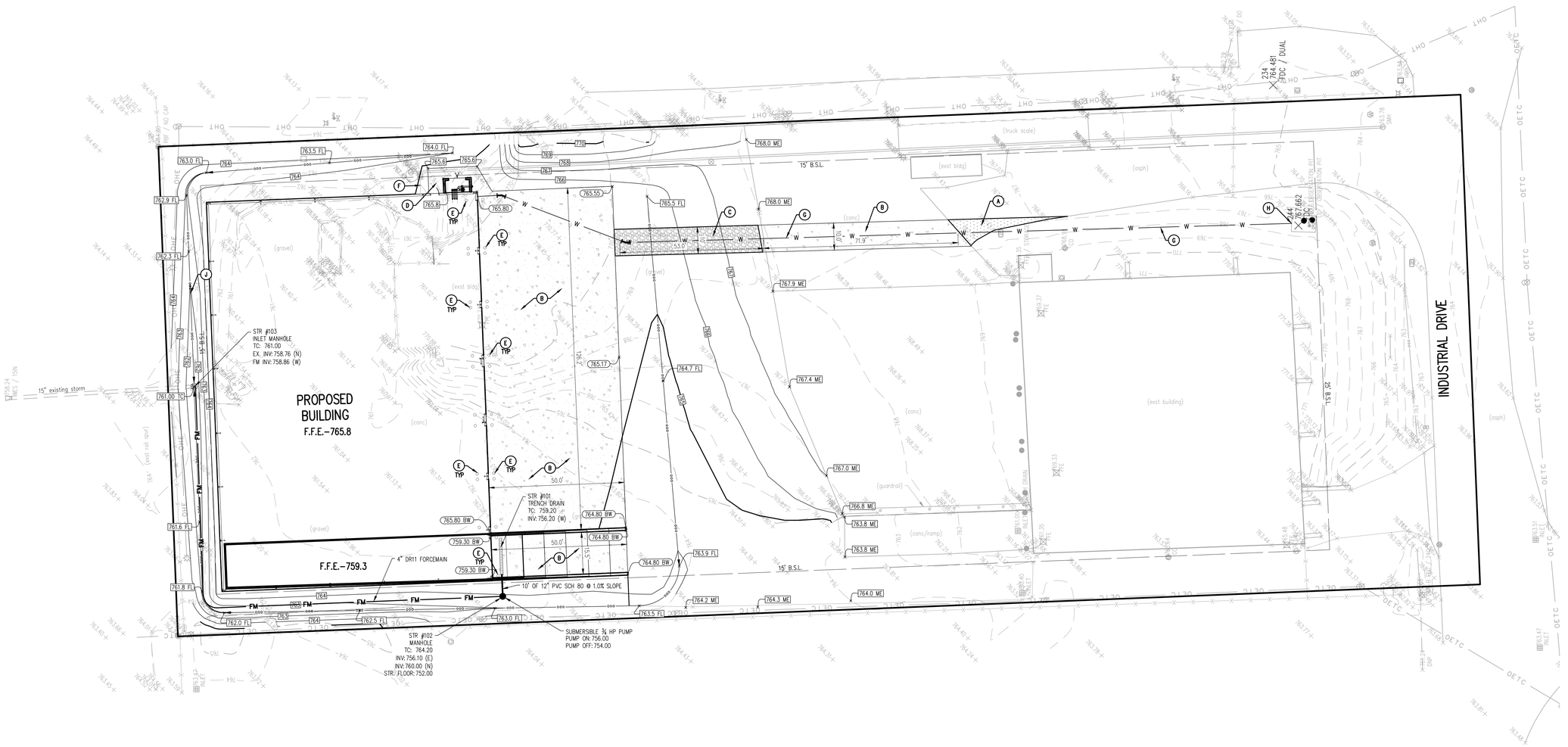

GRADING LEGEND

- Existing Storm Sewer
- New Storm Sewer
- Existing Sanitary Sewer
- Existing Contour
- Proposed Contour
- Existing Spot Elevation
- New Pavement Grade
- All Other Finish Grades
- Match Existing Grades
- Top of Curb Grade / Curb Gutter Grade
- Surface Flow Arrow
- Grade Break
- Swale Flowline w/Grade
- Existing Underground Gas Main
- Existing Underground Telephone
- Existing Overhead Electric
- Existing Water Main
- Existing Flowline
- Swale Flow Line

UTILITY LEGEND

- Existing Storm Sewer
- New Storm Sewer
- Existing Sanitary Sewer
- New Sanitary Sewer
- Storm Structure Number
- Sanitary Structure Number
- 6" Subsurface Drain
- Water Main
- Existing Gas Main
- Existing Telephone
- Existing Water Main
- Existing Flowline
- Existing Overhead Utilities

GENERAL NOTES

1. IT SHALL BE THE RESPONSIBILITY OF EACH SUBCONTRACTOR TO VERIFY ALL EXISTING UTILITIES AND CONDITIONS THAT PERTAIN TO THEIR PHASE OF WORK PRIOR TO START OF WORK.IT SHALL ALSO BE THE RESPONSIBILITY OF EACH SUBCONTRACTOR TO CONTACT THE OWNERS OF THE UTILITIES FOR PROPER STAKE LOCATIONS PRIOR TO START OF WORK.

2. IF ANY CHANGES, OMISSIONS OR ERRORS ARE FOUND ON THESE PLANS OR IN THE FIELD THE SUBCONTRACTOR SHALL NOTIFY, IN WRITING, THE OWNER AND ENGINEER BEFORE WORK IS STARTED OR RESUMED.

3. VERIFY SIGN LOCATION AND SIGN REQUIREMENTS WITH LOCAL GOVERNING AUTHORITIES.

4. ALL CONSTRUCTION ACTIVITY ON THIS SITE TO PERFORMED IN COMPLIANCE WITH ALL APPLICABLE O.S.H.A. STANDARDS FOR WORKER SAFETY.

5. TEMPORARY TRAFFIC CONTROL DURING CONSTRUCTION SHALL CONFORM TO APPLICABLE STATE AND LOCAL STANDARDS.

6. SEE ARCHITECTURAL PLANS FOR BUILDING DIMENSIONS.

7. SEE PHOTOMETRIC PLAN FOR LIGHT LOCATIONS AND TYPE.

8. SEE TITLE SHEET C001 FOR LEGAL DESCRIPTION AND BENCHARK INFORMATION.

SITE NOTES

1. ALL RADIUS AND OTHER DIMENSIONS FOR 6" STANDING CURB ARE TO FACE OF CURB.
2. ALL RADIUS AND OTHER DIMENSIONS FOR 2' ROLL CURB ARE TO BACK OF CURB.
3. IT SHALL BE THE RESPONSIBILITY OF EACH SUBCONTRACTOR TO VERIFY ALL EXISTING UTILITIES AND CONDITIONS PERTAINING TO THE PHASE OF WORK. IT SHALL ALSO BE THE SUBCONTRACTOR'S RESPONSIBILITY TO CONTACT THE OWNERS OF THE VARIOUS UTILITIES FOR PROPER STAKE LOCATION OF EACH UTILITY BEFORE WORK IS STARTED. THE SUBCONTRACTOR SHALL NOTIFY IN WRITING THE OWNER AND THE ENGINEER OF ANY CHANGES, OMISSIONS OR ERRORS FOUND ON THESE PLANS OR IN FIELD BEFORE WORK IS STARTED OR RESUMED.
4. VERIFY SIGN LOCATIONS AND SIGN REQUIREMENTS WITH LOCAL GOVERNING AUTHORITIES.
5. TEMPORARY TRAFFIC CONTROL DURING CONSTRUCTION TO CONFORM TO APPLICABLE LOCAL AND STATE STANDARDS.
6. ALL CONSTRUCTION ACTIVITY ON THIS SITE TO BE PERFORMED IN COMPLIANCE WITH APPLICABLE O.S.H.A. STANDARDS FOR WORKER SAFETY.
7. ALL DIMENSIONS TO THE BUILDINGS ARE TO THE OUTSIDE OF BUILDING FOUNDATION WALL.
8. SEE ARCHITECTURAL PLANS FOR BUILDING DIMENSIONS.
9. SERVICE WALKS SHALL BE NON-REINFORCED CONCRETE 4" THICK AND WIDTH AS INDICATED ON PLANS.
10. EXPANSION JOINTS ARE TO BE PLACED AT ALL WALK INTERSECTIONS AND BETWEEN WALKS AND PLATFORMS. SIDEWALK SCORES ARE TO BE EQUALLY SPACED BETWEEN EXPANSION JOINTS. CONTRACTION JOINTS AND PERPENDICULAR SIDEWALKS AT 5' INTERVALS OR LESS WITH A CONTRACTION JOINT EVERY 20' OR LESS.

SITE KEYNOTES

- (A) Asphalt Pavement Section — 1 / C801
- (B) Concrete Pavement Section — 2 / C801
- (C) Gravel Pavement Section — 3 / C801
- (D) 5' Concrete Sidewalk — 4 / C801
- (E) Pipe Bollard — 5 / C801
- (F) Electrical Service
- (G) 6" Fire Protection Line
- (H) Connect Water to Existing Water Vault

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FRANKLIN TRANSFER CENTER
BUILDING ADDITION
730 INDUSTRIAL DRIVE, FRANKLIN, IN 46131

DEVELOPMENT PLAN

DATE:

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ISSUED:	CHECKED BY:
	JWK

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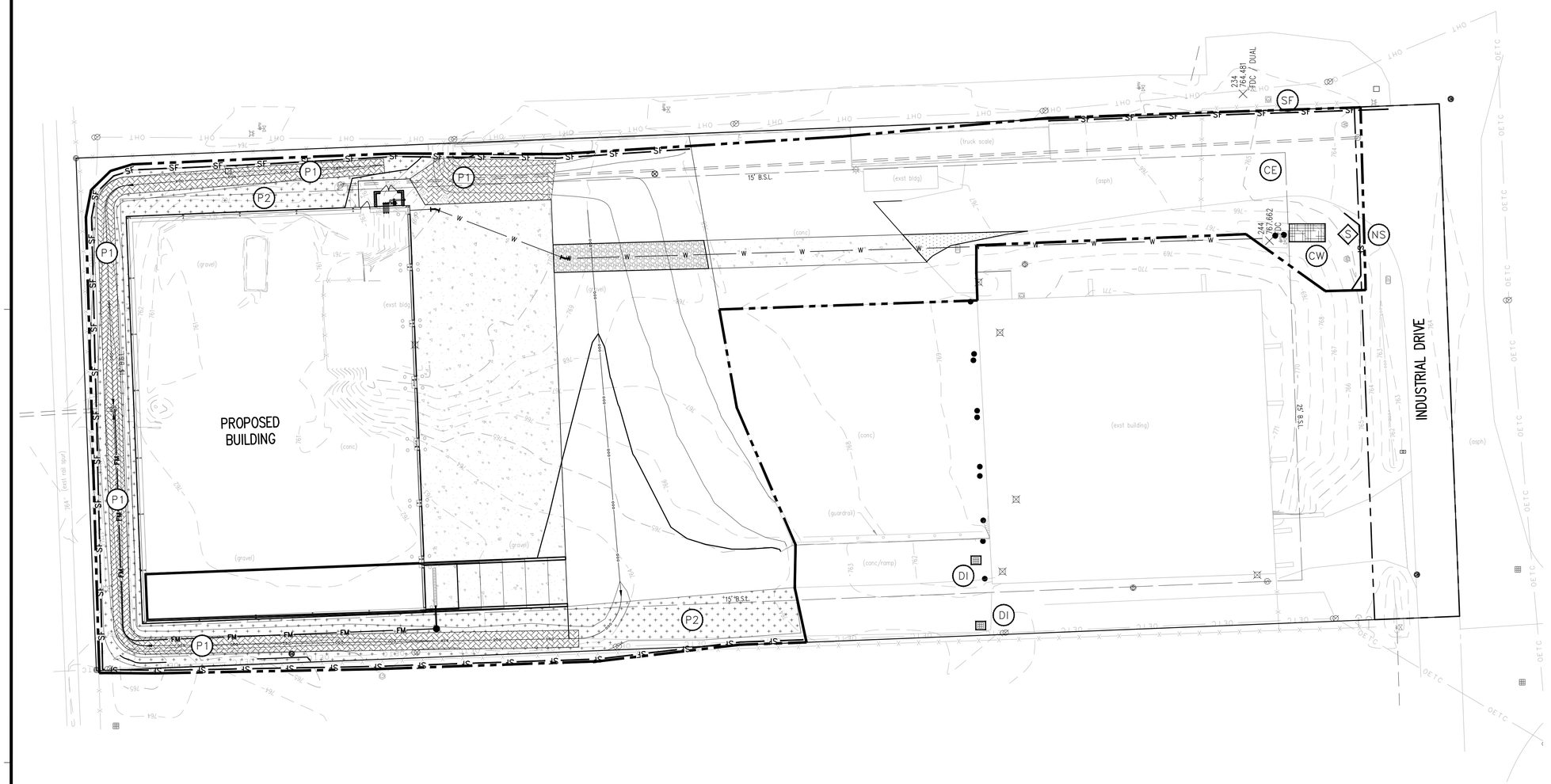

GRAPHIC SCALE

20 0 10 20

(IN FEET)
1 inch = 20 ft.

EROSION CONTROL LEGEND

CONCRETE WASHOUT	CW
PERMANENT SEEDING WITH EROSION CONTROL BLANKETS	P1
PERMANENT SEEDING WITH STRAW MULCH AT 1.5–2 TONS/ACRE	P2
TEMPORARY SEED WITH ANNUAL RYE GRASS	P3
RIP RAP IN RENO MATTRESS WITH COATED GALVANIZED BASKET	RR
DROP INLET PROTECTION	DI
TEMPORARY CONSTRUCTION ENTRANCE LOCATION	CE
NOTIFICATION SIGN	NS
INLET PROTECTION BASKET	IF
ULTIMATE DISCHARGE LOCATION	UD
SHEET FLOW PROTECTION BARRIER	SF
CONSTRUCTION LIMITS	
EXISTING STORM SEWER	
NEW STORM SEWER	
EXISTING SANITARY SEWER	
STORM STRUCTURE NUMBER	
SWALE / FLOWLINE	
SURFACE FLOW ARROW	

GENERAL NOTES

1. IT SHALL BE THE RESPONSIBILITY OF EACH SUBCONTRACTOR TO VERIFY ALL EXISTING UTILITIES AND CONDITIONS THAT PERTAIN TO THEIR PHASE OF WORK PRIOR TO START OF WORK.IT SHALL ALSO BE THE RESPONSIBILITY OF EACH SUBCONTRACTOR TO CONTACT THE OWNERS OF THE UTILITIES FOR PROPER STAKE LOCATIONS PRIOR TO START OF WORK.

2. IF ANY CHANGES, OMISSIONS OR ERRORS ARE FOUND ON THESE PLANS OR IN THE FIELD THE SUBCONTRACTOR SHALL NOTIFY, IN WRITING, THE OWNER AND ENGINEER BEFORE WORK IS STARTED OR RESUMED.

3. VERIFY SIGN LOCATION AND SIGN REQUIREMENTS WITH LOCAL GOVERNING AUTHORITIES.

4. ALL CONSTRUCTION ACTIVITY ON THIS SITE TO PERFORMED IN COMPLIANCE WITH ALL APPLICABLE O.S.H.A. STANDARDS FOR WORKER SAFETY.

5. TEMPORARY TRAFFIC CONTROL DURING CONSTRUCTION SHALL CONFORM TO APPLICABLE STATE AND LOCAL STANDARDS.

6. SEE ARCHITECTURAL PLANS FOR BUILDING DIMENSIONS.

7. SEE PHOTOMETRIC PLAN FOR LIGHT LOCATIONS AND TYPE.

8. SEE TITLE SHEET C001 FOR LEGAL DESCRIPTION AND BENCHARK INFORMATION.

9. USE EXISTING PACEMENT AS CONSTRUCTION ENTRANCE.

10. TRACKING OF SEDIMENT ONTO ABUTGING ROAD SYSTEM SHALL BE PREVENTED TO THE GREATEST EXTENT POSSIBLE. VEHICLES SHALL BE CLEANED OF MUD AND DEBRIS AS REQUIRED TO PREVENT TRACKING. MUD AND DEBRIS WHICH IS TRACKED ONTO THE ROAD SYSTEM SHALL BE REMOVED BY SCRAPING AND/OR SWEEPING AND PLACED IN A PROTECTED AREA.

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EROSION CONTROL PLAN

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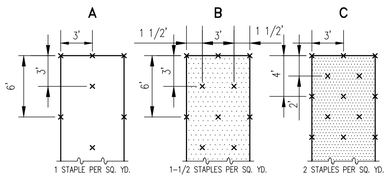
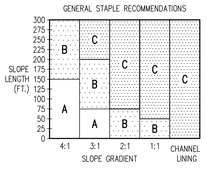
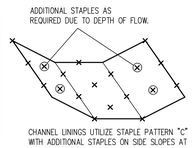
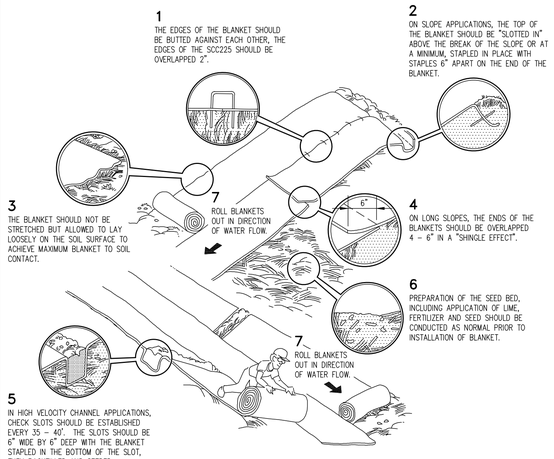




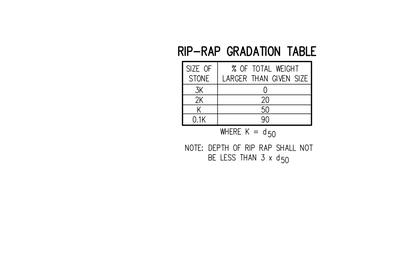


STAPLE PATTERNS APPLY TO ALL NORTH AMERICAN EROSION CONTROL BLANKETS. STAPLE PATTERNS MAY VARY DEPENDING UPON SOIL TYPE AND AVERAGE ANNUAL RAINFALL.

AT SLOPE LENGTHS GREATER THAN 300 FEET OR WHERE DRAINAGE OVER LARGE AREAS IS DIRECTED ONTO THE BLANKETS, STAPLE PATTERN "C" SHOULD BE UTILIZED.



EROSION BLANKET INSTALLATION
NTS



Irrigation needed during this period. To control erosion at times other than in the shaded areas, use mulch.

* Late summer seeding dates may be extended 5 days if mulch is applied.

** Increase seeding application by 50%

FIGURE 5-3

Temporary Seedings

Kind of Seed	1000 Sq. Ft.	Acre	Remarks
Wheat or Rye	3.5 lbs.	2 bu.	Cover seed 1" to 1 1/2" deep
Spring Oats	2.3 lbs.	3 bu.	Cover seed 1" deep
Annual Ryegrass	1 lb.	40 lbs.	Cover seed 1/4" deep*

* Not necessary where mulch is applied.

	SOIL CONDITION			Shade Tolerance	Close Mowing to 2-3 1/2inches	Trampling Tolerance	Fertility Needs	Winter Hardiness	Flooding Tolerance (Days)	Mature Height (Inches)	Emergence Time (days)	Salt Tolerance		
	Wet	Norm	Dry									Gen.	Soil	Spray
Creeping Red Fescue Festuca rubra	2	1	2	1	1	1	Med.	1	20–25	12–18	7–21			S
Kentucky Bluegrass Poa pratinsis	2	1	2	1	1	1	Med.	1	25–35	12–18	10–20			MT
Tall Fescue Festuca L. arundinacea	2	1	1	1	1	1	Low	1	24–35	24–36	5–14		T	
Perennial Ryegrass Lolium perenne	2	1	2	–	1	2	Med–High	2	15–20	12–18	5–10		MT	
Crownvetch Coronilla varia	–	1	1	2	–	–	Low	1	5–10	24	14–21	T		
Red Clover Trifolium pratense	–	1	–	2	–	–	Med.	1	7–10	18	5–10	S	S	

Ranking:
1 Good
2 Medium
– Not tolerant

Salt Tolerance (to both soil salts & spray):
T = Tolerance
MT = Medium Tolerance
S = Slight Tolerance

FIGURE 5-4

EROSION CONTROL SCHEDULE

EROSION CONTROL MEASURE	✱ MAINTENANCE	INSTALLATION SEQUENCE
STONE ENTRANCE	PRIOR TO CLEARING AND GRADING	AS NEEDED
SILT FENCE	PRIOR TO CLEARING AND GRADING	WEEKLY, AFTER STORM EVENTS AND AS NEEDED
EXISTING INLET PROTECTION	PRIOR TO CLEARING AND GRADING	WEEKLY, AFTER STORM EVENTS AND AS NEEDED
TREE PROTECTION	PRIOR TO CLEARING AND GRADING	WEEKLY, AFTER STORM EVENTS AND AS NEEDED
TEMPORARY DIVERSIONS	ALONG WITH ROUGH GRADING	WEEKLY, AFTER STORM EVENTS AND AS NEEDED
TEMPORARY SEEDING	AFTER ROUGH GRADING	WATER AS NEEDED
PERMANENT SEEDING	AFTER FINISH GRADING	WATER AS NEEDED
EROSION CONTROL MATTING	AFTER FINISH GRADING	WEEKLY, AFTER STORM EVENTS AND AS NEEDED
STRAW BALES	AFTER FINISH GRADING	WEEKLY, AFTER STORM EVENTS AND AS NEEDED
INLET PROTECTION	AFTER EACH INLET IS PLACED	WEEKLY, AFTER STORM EVENTS AND AS NEEDED
SEED, SOD & LANDSCAPE AROUND UNITS FINISHED	AFTER FINISHED GRADING AROUND FINISHED UNITS	WATER AS NEEDED
REMOVAL OF STRAW BALES	AFTER ALL AREAS DRAINING TO THESE AREAS ARE STABILIZED	N/A
REMOVAL OF INLET PROTECTION	AFTER ALL AREAS DRAINING TO THESE AREAS ARE STABILIZED	N/A
REMOVAL OF SILT FENCE	AFTER ALL AREAS DRAINING TO THESE AREAS ARE STABILIZED	N/A

✱ – SEE CHART FOR MAINTENANCE REQUIREMENTS

Seedbed Preparation

Apply lime to raise the pH to the level needed for species being seeded. Apply 23 pounds of 12–12–12 analysis fertilizer (or equivalent) per 1000 sq. ft. (approximately 1000 pounds per acre) or fertilize according to test. Application of 150 lbs. of ammonium nitrate on areas low in organic matter and fertility will greatly enhance vegetative growth.

Work the fertilizer and lime into the soil to a depth of 2–3 inches with a harrow, disk or rake operated across the slope as much as possible.

Seeding

Select a seed mixture based on projected use of the area (Figure 5–2), while considering best seeding dates. See Figure 5–3 this sheet. If tolerances are a problem, such as salt tolerance of seedings adjacent to streets and highways, see Figure 5–4 this sheet before final selection.

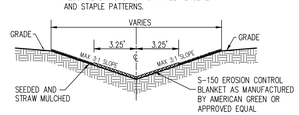
Mulch

Baled straw mulch is to be applied at a rate of 3000 lbs. per acre. (For Erosion Control Blanket, use North American S150 or Equivalent.)

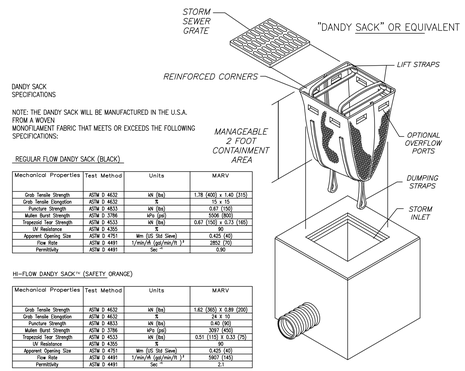
Figure 5–2: Permanent Seed Mixtures

Species	Seeding Rate lbs/acre	Seeding Rate lbs/1000 sq. ft.	Suitable pH	Site Suitability* Well	Site Suitability* Droughty	Site Suitability* Drained	Site Suitability* Wet
Level and Sloping, Open Areas							
1. Tall Fescue	35	.8	5.5–8.3	2	1	2	
2. Tall Fescue Red Clover**	25 5	.6 .12	5.5–8.3		1		
3. Kentucky Bluegrass Creeping Red Fescue	15 15	.4 .4	5.5–7.5	2	1		
Steep Banks and Cuts							
4. Tall Fescue Kentucky Bluegrass	15 25	.4 .6	5.8–7.5	2	1	2	
5. Tall Fescue Emerald Crownvetch**	35 10	.8 .25	5.5–8.3	2	1		
Lawns and High Maintenance Areas							
6. Kentucky Bluegrass Creeping Red Fescue	40 40	.9 .9	5.8–7.5	2	1		
7. Perennial Ryegrass (Turf Type)	170	4.0	5.0–7.5		1		
8. Tall Fescue	170	4.0	5.5–8.3	2	1	2	

* 1 – Preferred 2 – Will Tolerate ** Inoculate with specific inoculants.



TYPICAL SWALE DETAIL w/EROSION MATTING
NTS



DANDY SACK SPECIFICATIONS

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

REGULAR FLOW DANDY SACK (BLACK)

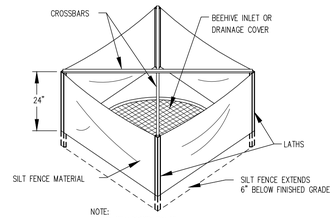
Mechanical Properties	Test Method	Units	MARV
Grab Tensile Strength	ASTM D 4632	kN (lbs)	1.78 (400) x 1.40 (315)
Grab Tensile Elongation	ASTM D 4632	%	10 x 15
Puncture Strength	ASTM D 4833	kN (lbs)	0.67 (150)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	3206 (800)
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.67 (150) x 0.73 (165)
UV Resistance	ASTM D 4355	%	90
Apparent Opening Size	ASTM D 4751	Mm (US Std Sieve)	0.425 (40)
Flow Rate	ASTM D 4491	l/min/M (gal/min/ft)*	2852 (70)
Permittivity	ASTM D 4491	Sec-1	0.90

HI-FLOW DANDY SACK™ (SAFETY ORANGE)

Mechanical Properties	Test Method	Units	MARV
Grab Tensile Strength	ASTM D 4632	kN (lbs)	1.62 (365) X 0.89 (200)
Grab Tensile Elongation	ASTM D 4632	%	24 X 10
Puncture Strength	ASTM D 4833	kN (lbs)	0.40 (90)
Mullen Burst Strength	ASTM D 3786	kPa (psi)	3097 (450)
Trapezoid Tear Strength	ASTM D 4533	kN (lbs)	0.51 (115) X 0.53 (75)
UV Resistance	ASTM D 4355	%	90
Apparent Opening Size	ASTM D 4751	Mm (US Std Sieve)	0.425 (40)
Flow Rate	ASTM D 4491	l/min/M (gal/min/ft)*	5907 (145)
Permittivity	ASTM D 4491	Sec-1	2.1

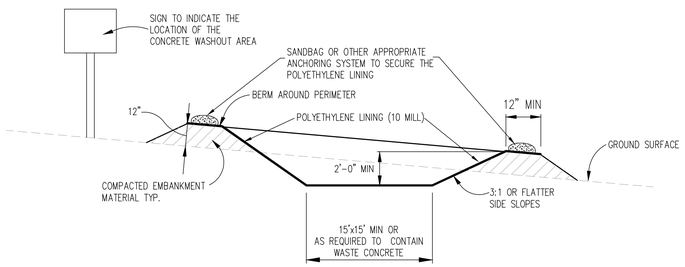
*Note: All Dandy Socks™ can be ordered with our optional oil absorbent pillows

DROP INLET PROTECTION



NOTE:
1. SEE SILT FENCE DETAIL FOR MATERIAL SPECIFICATIONS.
2. SILT FENCE SHALL BE PREASSEMBLED BY SUPPLIER.

INLET PROTECTION – SILT FENCE
NTS



NOTES:
1. CONCRETE WASHOUT AREA SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON SITE AND LINED WITH POLYETHYLENE LINER.

2. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE WASHOUT AREA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT AREA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.

3. THE CONCRETE WASHOUT AREA SHALL BE REPAIRED AND ENLARGED OR CLEANED OUT AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.

4. AT THE END OF CONSTRUCTION, ALL CONCRETE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT AN APPROVED WASTE SITE.

5. WHEN THE CONCRETE WASHOUT ARE IS REMOVED, THE DISTURBED AREA SHALL BE SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE INSPECTOR.

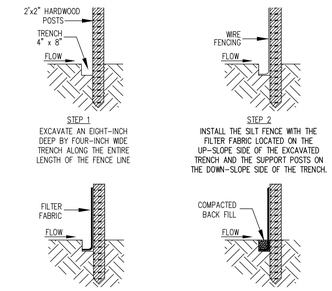
CONCRETE WASHOUT DETAIL
NTS

RIP-RAP GRADATION TABLE

SIZE OF STONE	% OF TOTAL WEIGHT LARGER THAN GIVEN SIZE
3K	0
2K	20
K	50
0.1K	90

WHERE K = d_{50}

NOTE: DEPTH OF RIP RAP SHALL NOT BE LESS THAN 3 x d_{50}



NOTE:
1. 2"x2" HARDWOOD SUPPORT POSTS SPACED 8 FT APART IF FENCE IS SUPPORTED BY WIRE; 6 FT APART IF EXTRA-STRENGTH FABRIC IS USED WITHOUT SUPPORT WIRE.
2. SUPPORT WIRE TO BE USED IF RECOMMENDED BY MANUFACTURER.
3. STEEL FENCE POST MAY BE SUBSTITUTED FOR HARDWOOD POSTS (STEEL POST SHOULD HAVE PROJECTIONS FOR FASTENING FABRIC).
4. PER INDOT STANDARD 918.04.

SILT FENCE INSTALLATION DETAIL
N.T.S.

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ENGINEERING & CONSULTING
Whitestown, IN 46075
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3961 Perry Boulevard
Ph. 317-769-2916

REVISIONS:

PREPARED FOR:
BEST WAY DISPOSAL
2577 KENTUCKY AVENUE
INDIANAPOLIS, INDIANA 46221
(800) 354-1830

FRANKLIN TRANSFER CENTER
BUILDING ADDITION
730 INDUSTRIAL DRIVE, FRANKLIN, IN 46131

EROSION CONTROL DETAILS

DATE:

DATE: 02/04/2021
DRAWN BY: ALR
ISSUED:
CHECKED BY: JWK
JOB NUMBER: 20136
SHEET # C104

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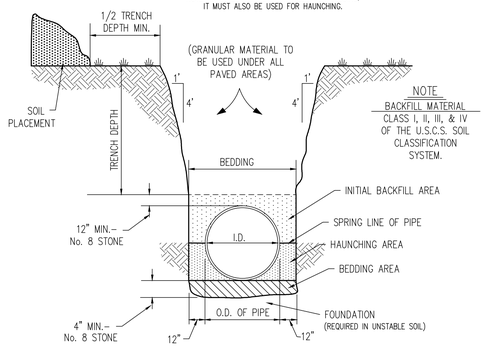
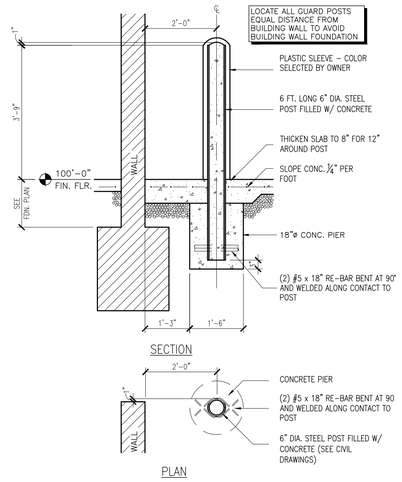
REQUIRED COMPACTION TABLE
% STANDARD PROCTOR DENSITY (ASTM D 2321)

	BACKFILL MATERIAL – (SEE NOTE)			
TRENCH AREA	CLASS I	CLASS II	CLASS III	CLASS IV
BEDDING	FLAT SHOVEL	85%	90%	UNDISTURBED BOTTOM
HAUNCH		85%	90%	NO
INITIAL BACKFILL	NO COMPACTION	85%	90%	NO

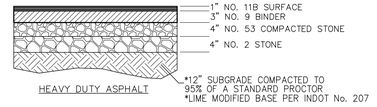
NOTE: IF CLASS I MATERIAL IS USED FOR BEDDING, IT MUST ALSO BE USED FOR HAUNCHING.

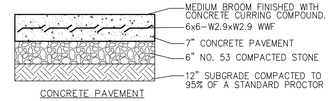


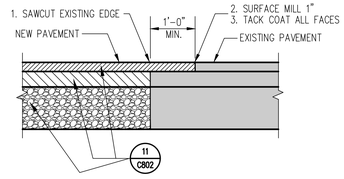
STORM SEWER
TRENCH & PIPE EMBEDMENT DETAIL
NTS



BOLLARD DETAIL
NTS

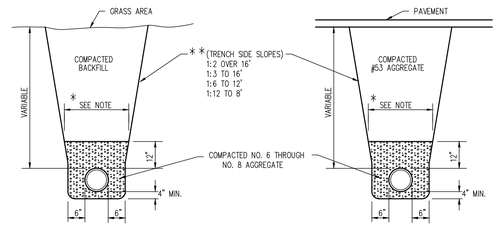






● PREPARED SUBGRADE PER INDOT SPECIFICATION No. 207

16 C802 TYPICAL PAVEMENT TIE–IN DETAIL
NTS



BEDDING FOR PIPE AS FOLLOWS:
FLEXIBLE PIPE D–2321 CLASS 1, 2, 3
RIGID PIPE ASTM C–12 CLASS A, B, OR C

SANITARY SEWER TRENCH DETAILS
NTS

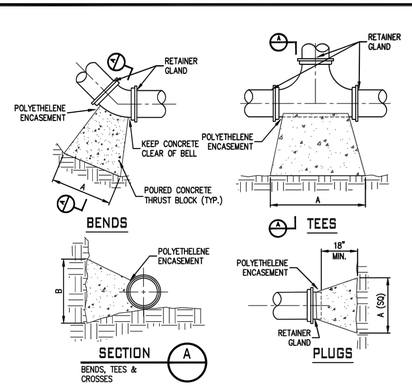
THE CONTRACTOR SHALL BE AWARE THAT IF THE TOP OF THE TRENCH IS WITHIN 5' OF THE PROPOSED FUTURE BACK OF CURB, THAT GRANULAR BACKFILL (NO. 53 AGGREGATE) SHALL BE PLACED IN THE EXCAVATION AND COMPACTED TO 95% MODIFIED PROCTOR AT 6" MAX. LIFTS.

WIDTH VARIES BASED ON THE TYPE OF PIPE MATERIAL & DEPTH OF COVER. CONSULT THE PROJECT ENGINEER IF THE 6" CLEARANCE ON EACH SIDE OF THE PIPE IS NOT SUFFICIENT.

THE EXCAVATION OF THE TRENCH SIDE SLOPES SHALL BE IN ACCORDANCE WITH I.O.S.H.A. REGULATIONS.

IN THE EVENT THAT A SOFT AREA IS ENCOUNTERED OR THE BOTTOM OF THE TRENCH IS OVER DUG, THE TRENCH BOTTOM WILL BE REFILLED WITH NO. 8 COMPACTED AGGREGATE BEFORE THE PIPE IS LAID IN PLACE.

THIS TRENCH DETAIL IS TO BE USED FOR ALL TYPES OF SANITARY SEWER PIPE MATERIAL INCLUDING P.V.C., (SDR–35) AND P.V.C. TRUSS PIPE.



THRUST BLOCK DETAIL
N.T.S.

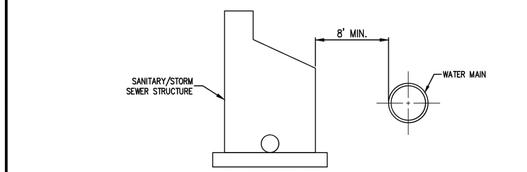
NOTES:
1. THRUST BLOCK DIMENSIONS SHALL BE PROVIDED BY THE DESIGN ENGINEER.
2. THRUST BLOCKS SHALL BE INSTALLED AGAINST UNDISTURBED SOIL WITH ADEQUATE BEARING TO PREVENT MOVEMENT OF FITTING.
3. NO THRUST BLOCKS TO BE PLACED IN SEWER LATERAL DITCHES.
4. THRUST BLOCKING MUST FIT IN EASEMENT, IN SOME CASES ADDITIONAL RESTRAINT MAY BE REQUIRED.
5. DESIGN TO BE BASED ON 200 PSI HYDROSTATIC WATER PRESSURE (150 PSI STATIC PRESSURE PLUS 50 PSI WATER HAMMER).
6. INSTALL POLYETHYLENE ENCASEMENT ON ALL D.I. PIPE AND FITTINGS PRIOR TO POURING CONCRETE.
7. PIPE JOINTS AND BOLTS MUST BE ACCESSIBLE.
8. ALLOW SUFFICIENT CLEARANCE BETWEEN CONCRETE AND BOLTS FOR FUTURE MAINTENANCE.
9. ALL ANCHOR BOLTS SHALL BE CORROSION RESISTANT, AND SIZED PER SPECIFICATION.
10. THRUST BLOCKING DETAILS ARE SHOWN HERE FOR TYPICAL INSTALLATIONS. IN SOME CASES, ADDITIONAL RESTRAINT MAY BE REQUIRED.
11. CONCRETE USED FOR THRUST BLOCKS SHALL BE MIN 3000 PSI CONCRETE.
12. FOR UNSTABLE SOIL CONDITIONS, THE ENGINEER SHALL VERIFY THRUST BLOCK DIMENSIONS.

INDIANA AMERICAN WATER
ENGINEERING DEPARTMENT
153 N. EMERSON AVENUE
GREENWOOD, INDIANA 46143

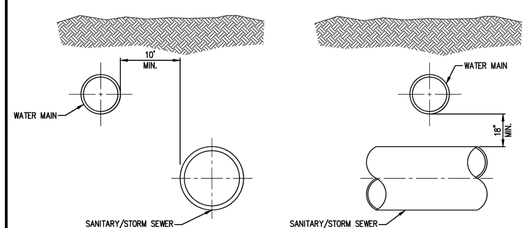
STANDARD DETAIL

THRUST BLOCKS

DATE: JANUARY, 2018	DRAWN BY: S. FORD
LATEST REV: JANUARY, 2018	APP'D BY: E.N.



HORIZONTAL OFFSET REQUIREMENTS FOR SANITARY/STORM SEWER STRUCTURES



BASIC SEPARATION REQUIREMENTS:
1. WATER MAINS AND SEWERS SHOULD BE SEPARATED AS FAR AS IS REASONABLE IN BOTH THE HORIZONTAL AND VERTICAL DIRECTIONS. THE STANDARD DEPTH OF COVER REQUIREMENTS PER COUNTY, AS SPECIFIED IN 327 IAC 8, SHALL BE MAINTAINED FOR ALL WATER MAIN CROSSINGS.
2. PARALLEL CONSTRUCTION: THE HORIZONTAL DISTANCE BETWEEN PRESSURE WATER MAINS AND SEWERS SHALL BE AT LEAST 10 FEET.
3. PERPENDICULAR CONSTRUCTION (CROSSING): PRESSURE WATER MAINS SHALL BE AT LEAST 18" ABOVE SANITARY/STORM SEWERS WHERE THESE LINES MUST CROSS. THE CROSSING MUST BE AT A MINIMUM ANGLE OF 45 DEGREES.

REQUIRED SEPARATION BETWEEN WATER MAINS AND SANITARY/STORM SEWERS & STRUCTURES

INDIANA AMERICAN WATER
ENGINEERING DEPARTMENT
153 N. EMERSON AVENUE
GREENWOOD, INDIANA 46143

STANDARD DETAIL

SEWER SEPARATION

DATE: JANUARY, 2018	DRAWN BY: S. FORD
LATEST REV: JULY, 2018	APP'D BY: E.N.

Innovative ENGINEERING & CONSULTING
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REVISIONS:

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FRANKLIN TRANSFER CENTER
BUILDING ADDITION
730 INDUSTRIAL DRIVE, FRANKLIN, IN 46131

STANDARD DETAILS

DATE:

DATE:	DRAWN BY:
02/04/2021	ALR
ISSUED:	CHECKED BY: JWK

JOB NUMBER: 20136

SHEET # C801

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

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SECTION 01000

GENERAL SCOPE OF WORK

1.01 WORK INCLUDED

A. The Contractor shall furnish all labor, services, materials, tools, transportation, and utility services necessary for and incidental to the complete construction of the proposed project, as shown by the plans or as herein specified, or both, including any issued addenda.

B. The work to be done shall not be limited to the exact extent described in the specifications and/or drawings, but shall include all incidental work necessary or customarily done for the completion of the project.

C. PERMITS: The Contractor shall procure and pay for all utility permits not previously obtained by the Owner that are necessary relative to the proposed construction activities.

1.02 SANITARY REGULATIONS

A. The Contractor shall provide adequate sanitary conveniences for the use of those employed on the work, and their use shall be strictly enforced. Such conveniences shall be made available when the first employees arrive on the site, shall be properly secluded from public observation, and shall be constructed and maintained at such points and in such manner as may be approved.

B. The Owner shall have the right to inspect any building erected, maintained or used by the Contractor to determine whether or not the sanitary regulations are in compliance with all applicable codes.

C. The Contractor shall rigorously prohibit the committing of nuisances upon the lands of the Owner or others about the works, or upon adjacent property.

1.03 WATER FOR CONSTRUCTION PURPOSES

A. The Contractor, at his own expense, shall provide all water required for construction or sanitary purposes.

1.04 ELECTRICAL ENERGY

A. The Contractor shall make all necessary applications, arrangements, and pay all fees and charges for electrical energy for power and light required for the proper completion of this contract. The Contractor shall provide and pay for all temporary wiring, switches, connections and meters.

B. There shall be sufficient artificial light by means of electricity so that all work may be done in a workmanlike manner when there is insufficient daylight.

1.05 TEMPORARY HEAT

A. If temporary heat is required for the protection of the work, the Contractor shall provide and install approved heating apparatus, and shall provide adequate and proper fuel and maintain heat as required.

B. Temporary heating apparatus shall be installed and operated in such manner that the finished work will not be damaged thereby.

1.06 MATERIALS, SAMPLES, APPROVAL

A. Unless otherwise indicated on the drawings or specified, only new materials and equipment shall be incorporated in the work. All materials and equipment furnished by the Contractor, to be incorporated in the work, shall be subject to the inspection and approval by the Engineer prior to installation. No material shall be processed or fabricated for, or delivered to, the work site without being subject to prior approval of the Engineer, except at the risk of the Contractor.

B. The Contractor may be required to submit to the Engineer data relating to materials and equipment the Contractor proposes to furnish for the work. Such data shall be in sufficient detail to enable the Engineer to identify the particular product in question, and to form an opinion as to its conformity to the contract requirements.

C. Facilities and labor for the handling and inspection of all materials and equipment shall be furnished by the Contractor. Defective materials and equipment shall be immediately removed from the site of the work.

D. If the Engineer so requires, either prior to or during the progress of the work, the Contractor shall submit samples of materials for such special tests as may be necessary to demonstrate that such materials conform to the specifications. Such samples shall be furnished, taken, packed, and shipped as directed at the expense of the Contractor. Except as otherwise noted, the Owner shall make arrangements for and pay for the tests.

E. All samples shall be packed so as to reach their destination in good condition and shall be so labeled as to indicate the materials represented, the name of the work and location for which the material is intended, and the name of the Contractor submitting the sample. To insure consideration of samples, the Contractor shall notify the Engineer by letter that the samples have been shipped and shall properly describe the samples in the letter. In no case shall said letter of notification be enclosed with the samples.

F. When required, the Contractor shall submit data and samples, or place his orders sufficiently early to permit consideration, inspection, testing, and approval before the materials are necessary for incorporation in the work. Any delay resulting from the Contractors failure to do so shall not be used as a basis of a claim against the Owner or the Engineer.

2.01 APPROVAL OF CONSTRUCTION MATERIALS

A. When required, the Contractor shall submit to the Engineer information regarding the material, manufacturer, any pertinent catalog or model numbers and design criteria of all materials furnished by the Contractor. No such materials shall be installed without the written approval of the Engineer.

B. When required, the Contractor shall furnish to the Engineer, triplicate sworn copies of manufacturer's shop or mill test (or reports from independent testing laboratories) relative to materials and concrete data, equipment performance ratings.

C. After approval of the samples, data, etc., the materials and equipment used on the work shall correspond therewith.

2.02 HANDLING AND DISTRIBUTION

A. The Contractor shall, at his own expense, handle, haul, and distribute all materials, equipment, and all surplus materials on the different portions of the work as required. The Contractor shall provide suitable and adequate storage for materials and equipment during the progress of the work, and be responsible for any loss of, or damage to, materials and equipment furnished or accepted by the Contractor until the final acceptance of the work.

B. Delays in handling involving storage and/or demurrage charges by the railroad company shall be at the exense of the Contractor.

3.01 CONTRACTOR'S SHOP AND WORKING DRAWINGS

A. When required, Contractor shall submit for approval, shop or working drawings for all equipment and materials fabricated for this project and for which drawings are especially requested.

B. When required, material shall be purchased or fabricated for equipment or other features until the Engineer has certified that the shop or working drawings conform to the contract requirements. All materials and work involved in the construction shall then be as represented by said drawings.

C. "DELETED"

D. When required, all shop or working drawings shall be submitted in three copies (unless otherwise specified) to the Engineer through the Contractor. Only drawings which have been checked and corrected by the material fabricator shall be submitted. The Contractor shall be responsible for the prompt submission of all shop or working drawings so that there shall be no delay to the work due to the absence of such drawings. Additional prints of approved drawings shall be furnished, as required.

E. The approval of shop and working drawings, etc., will be general and shall not relieve the Contractor from the responsibility for details of design.

4.01 OCCUPYING PRIVATE LAND

A. The Contractor shall not (except after consent from the proper parties is granted) enter or occupy with men, tools, materials, or equipment any land outside the easements or property of the Owner.

4.02 INTERFERENCE WITH AND PROTECTION OF STREETS

A. The Contractor shall not close or obstruct any portion of a street, road, or private way without obtaining permits from the proper authorities. If any streets or private way shall be rendered unsafe by the Contractor's operations, the Contractor shall make such repairs or provide such temporary ways and/or guards as shall be acceptable to the Engineer.

B. Streets, roads, private ways, and walks shall be maintained passable by the Contractor at the Contractor's expense. The Contractor shall assume full responsibility for the adequacy and safety of provisions made.

4.03 PROTECTION TO PROPERTY

A. Materials delivered shall be neatly, safely, and compactly piled along the sides of the roadway in which, the improvement is located, adjacent thereto, or as the Engineer may direct, in such manner as to cause the least inconvenience and damage to property and to the general public, and not within five (5) feet of any fire hydrant. Private drives and street crossings shall be kept unobstructed.

B. The Contractor shall be responsible for protecting all existing facilities during the entire period of construction. Any damage to existing facilities caused by the Contractor shall be repaired by the Contractor at his expense and in a manner approved by the Engineer.

5.01 BARRICADES AND PROTECTION

A. The Contractor shall provide proper barricades and rails as directed, not only for the protection of the public generally, but as may be required to prevent intrusion by and possible accident to children and other persons. Danger signals, such as warning signs, red flags and lanterns shall be provided and maintained day and night, as required.

B. The Contractor shall:

C. Protect the excavation and trenches from damage due to rain water, ground water, backing of drains and sewers, and all other water. Provide all pumps and equipment and enclosures to provide such protection.

D. Remove all snow and ice as may be required for the proper protection and/or execution of the work.
Provide and maintain guard lights at all barricades, railings, obstructions in the streets, roads, or sidewalks, and at all trenches or pits adjacent to public walks or roads.

E. Provide protection against weather (i.e. rain, wind, storms, frost, or heat) so as to maintain all work, materials, apparatus, and fixtures from injury or damage.

F. Any work damaged by failure to provide protection, as required above, shall be removed and replaced at the Contractor's expense.

6.01 RESPONSIBILITY TO PROTECT UTILITY INSTALLATIONS

A. The Contractor shall at all times exercise such precautions as may be necessary to protect the Owner from any liability resulting from the damage, injury, or interruption of any utility installations, including gas mains, water mains, power cables, telephone cables, telegraph cables, T.V. cables, storm sewers, or any other such utilities as may be encountered underground or on the surface. In the event any of the Contractor's activities conflict with any of the aforesaid installations in the course of construction, the Contractor shall forthwith notify the Engineer of such conditions, and shall not move any of the aforesaid utility installations without the express written consent of the Owner.

6.02 INSUFFICIENCY OF SAFETY PRECAUTIONS

A. If, at any time, in the opinion of the Engineer, the work is not properly lighted, barricaded, and in all respects safe with respect to public travel, persons on or about the work, or public or private property, the Engineer shall have the right to order such safeguards to be erected and such precautions to be taken as the Engineer deems advisable and, the Contractor shall promptly comply with such orders.

7.01 WORK TO CONFORM

A. All work shall conform during its progress and on its completion truly to the lines, levels, and grades indicated on the drawings, or as provided by the Engineer, and shall be built in a thoroughly substantial and workmanlike manner, in accordance with the plans, specifications, and directions as provided by the Engineer.

B. All work done without instructions having been given therefore by the Engineer, or completed without proper lines or levels shall not be estimated or paid for except when such work is authorized by the Engineer in writing. Work so done may be ordered uncovered, removed, and replaced at the Contractor's sole cost and expense.

8.01 PRECAUTIONS DURING ADVERSE WEATHER

A. During adverse weather the Contractor shall take all necenssary precautions so that the work may be properly performed.

B. During cold weather, materials shall be preheated, as required, and the materials and adjacent structures into which said materials are to be incorporated shall be kept sufficiently warm so that a proper bond shall occur and a proper curing, aging, or drying will result. Protected spaces shall be artificially heated by approved means which will result in a moist or a dry atmosphere according to the particular requirements of the work being protected. Ingredients for concrete and mortar shall be sufficiently heated so that the mixture shall be warm throughout when used.

C. The Engineer may suspend construction operations at any time when in his judgment the conditions are unsuitable or the proper precautions are not being taken.

8.02 CUTTING AND PATCHING

A. The Contractor shall leave all chases or openings for the installation of his, or any other contractor's work, or shall cut the same in existing work and shall assure that all sleeves or forms are at the work and properly set in ample time to prevent delays. The Contractor shall be responsible that all chases, openings, and sleeves are accurately located, and of proper size and shape.

B. In case of the Contractor's failure to have, or to cut, all such openings and/or have all such sleeves provided and set in proper time, the Contractor shall cut them or set them afterwards at the Contractor's expense, but in so doing shall confine the cutting to the smallest amount possible consistent with the work to be completed. In no case shall piers or structural members be cut without the consent and approval of the Engineer.

C. "DELETED"

D. "DELETED"

8.03 CONTINUITY OF WORK

A. The Contractor must complete the work as it progresses and restore the site of the work as nearly as possible to its original, or proposed, condition as soon as the work is completed.

8.04 LINES, GRADES, MEASUREMENTS

A. The Owner shall employ, at his own expense, a competent surveyor certified as a Professional Registered Land Surveyor in the State of Indiana. Based on reference points and benchmarks to be provided by the Owner, said surveyor shall establish all lines, elevations, reference marks, etc., for the Contractor.

B. A "one-time" staking and cost incurred thereof for all improvements to be performed, per the plans as prepared by Innovative Engineering & Consulting, Inc., shall be provided at the Owner's expense. Any and all costs incurred relative to the restaking of any item, regardless of reason, shall be performed at the Contractor's expense. Be advised that a pre-construction meeting between the Owner and Contractor shall be conducted to determine the method of construction staking and to establish the identity of responsible parties representing each entity relative to construction staking activities.

C. The Contractor shall provide all measurements and confirm all dimensions necessary for the proper construction of the work called for by the drawings and specifications. During the prosecution of the work, the Contractor shall make all necessary measurements to prevent any misfitting. The Contractor shall be responsible for the accurate construction of all proposed improvements.

D. Adjustment of grades shown on drawings may be necessary to conform to actual field conditions or to maintain cover with respect to proposed grades. Such adjustments shall be considered part of the job conditions and no extra compensation shall be allowed for such changes, except where specifically otherwise noted in the plans and specifications. Such adjustments must be approved by the Engineer prior to being performed.

8.05 RECORD DOCUMENTS

A. Description

1. Definitions: Record copies are defined to include those documents relating directly to performance of the work which the Contractor is required to prepare for the Owner's records. Record copies shall indicate all revisions in the work from that shown and specified by original contract documents; and provide additional information of value to Owner's records, but not indicated by original contract documents. Record copies include newly prepared drawings, "marked-up" copies of contract drawings, shop drawings, specifications, addenda and change orders, "marked-up" product data submittals, field records for variable and concealed conditions such as excavations and foundations, and miscellaneous record information or work which is otherwise recorded only schematically, or not at all. Certain individual sections of these specifications may indicate specific record copy requirements which extend the requirements of this section.

2. As required, provide accurate survey information indicating locations and elevations of all underground utility lines, including elevations, location, and change of direction of piping, conduit, valves, fittings, tanks and manholes.

A. Record Product Data

B. As required and during progress of the work, the Contractor shall maintain one copy of each product data submittal, and mark up significant variations in the actual work in comparison with submitted information. Include both variations in product as delivered to the site, and variations from manufacturer's instructions and recommendations for installation. Identify concealed products and portions of the work which cannot be identified after concealment. Note related change orders and mark up or record drawings and specifications. Upon completion of mark-up, submit complete sets to the Engineer for Owner's records. Label each data submittal "AS-BUILT" in 1-1/2-inch high letters.

8.07 SITE CLEAN-UP AND RESTORATION

A. In addition to the cleaning requirements set forth in the "General Conditions", the Contractor shall keep the working area free at all times of tools, materials and equipment not essential to the progress of the work. Debris, waste materials, and rubbish shall be properly disposed of and not allowed to accumulate. If the Contractor should fail to do this, the Owner shall make the necessary arrangements to effect the clean-up by others and shall back charge the cost to the Contractor. If such action becomes necessary on the part and in the opinion of the Owner, the Owner will not be responsible for the inadvertent removal of material which the Contractor would not have disposed of had the Contractor affected the required clean up.

B. Where material or debris has washed, flowed into, or been placed in watercourses, ditches, gutters, drains, catch-basins, or elsewhere as result of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of during progress of the work, and the ditches, channels, drains, etc., kept in a clean and neat condition.

C. On or before the completion of the work, the Contractor shall, unless otherwise directed or permitted in writing by the Owner, tear down and remove all temporary buildings and structures built by the Contractor; shall remove all temporary works, tools, and machinery or other construction equipment furnished by the Contractor; shall remove, acceptably disinfect, and cover all organic matter and material containing organic matter in, under, and around privies, houses, and other buildings used by the Contractor; shall remove all rubbish from any grounds which the Contractor has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by the Contractor's operations in a neat and satisfactory condition.

D. The Contractor shall restore or replace, when and as directed, any public or private property damaged by the Contractor's work, equipment, and/or employees to a condition at least equal to that existing immediately prior to the beginning of operations. To this end the Contractor shall do as required all necessary highway or driveway, walk, and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration.

E. The Contractor shall thoroughly clean all materials and equipment installed and upon completion of the work shall deliver the site in its proposed condition and new appearing condition.

SECTION 01090

REFERENCE STANDARDS

1.01 SCOPE

A. The Contractor, all subcontractors, equipment and material suppliers shall ensure that construction, installation, equipment, products and materials, shall conform to the requirements and specifications of the latest printed edition of the following standards and codes, as applicable, including, but not limited to:

AASHTO American Association of State Highway & Transportation Officials
ACI American Concrete Institute
AIA American Institute of Architects
AISC American Institute of Steel Construction, Inc.
AISI American Iron and Steel Institute
ANSI American National Standards Institute, Inc.
APWA American Public Works Association
ASCE American Society of Civil Engineers
ASSE American Society of Sanitary Engineers
ASTM American Society for Testing & Materials
AWS American Welding Society
AWWA American Water Works Association
BOCA BOCA National Plumbing Code
CS Commercial Standards
FCI Fluids Control Institute
FM Factory Mutual
FS Federal Specifications
IOSHA Indiana Occupational Safety & Health Act
ISBH On Site Water Supply & Wastewater Disposal for Public & Commercial Establishments, Bulletin S.E. 13
InDOT Indiana Department of Transportation
MSWSCI Model Specifications for Water and Sewer Construction in Indiana
NAAMM National Association of Architectural Metal Manufacturing
NEC National Electric Code
NFPA National Fire Protection Association
NEMA National Electric Manufacturers
NSB National Bureau of Standards Engineers
NSF National Sanitation Foundation
NSPE National Society of Professional
OSHA Occupational Safety & Health Act
PPI Plastic Pipe Institute
Recommended Standards for Sewage Works
Recommended Standards for Water Works
UBC Uniform Building Code
UL Underwriters Laboratory, Inc.
UMC Uniform Mechanical Code
UNI-Bell Uni-Bell PVC Pipe Association
UPC Uniform Plumbing Code
USPS US Product Standards
WPCF Water Pollution Control Federation

2.01 SUBMITTALS

A. If more than one specification applies to any one particular material, product, product model, or installation, the Contractor shall consult with the Engineer to determine the applicable specification or standard.

SECTION 01100

PROJECT DESCRIPTION

PART 1 - GENERAL

1.01 SCOPE

A. The Contractor shall perform all work required to complete the project in accordance with the drawings and specifications as prepared by Innovative Engineering & Consulting, Inc., and shall provide and furnish all labor, materials, tools, equipment, transportation, services and supervision to install all items of construction.

B. The Contractor shall thoroughly familiarize himself with the Contract Documents, Local, State and Federal Laws and Ordinances and all other matters which can in any way affect the work as proposed by the plans as prepared by Innovative Engineering & Consulting, Inc.

C. The Contractor shall be responsible for verifying that all required permits and approvals have been obtained from the respective Town, County, Conservancy, and State agencies prior to the commencement of any construction activities.

D. It shall be the Contractor's responsibility to determine the exact location of all existing utilities in the vicinity of the construction area prior to the commencement of any construction activity.

E. It shall be the Contractor's responsibility for notification and coordination of all construction activities with the respective utility companies.

F. It shall be the responsibility of the Developer and Contractor to maintain quality control throughout the project. Failure to do so may result in removal and replacement of the defective work. It is required that the Contractor have a qualified Superintendent on the job site at all times during construction.

G. It is essential that the work to be done in conjunction with this project be installed according to these plans and specifications. Innovative Engineering & Consulting, Inc. shall be required to certify to certain portions of this project upon completion; therefore, to obtain approval and acceptance by all appropriate agencies, documentation shall be required to confirm that improvements performed are in substantial compliance with these plans and specifications.

1.02 PROJECT DESCRIPTION

A. The project shall consist of earthwork and grading operations, the construction of roads, curbs, sanitary sewers, storm sewers, water mains and all associated work as shown on the drawings, and as indicated in the specifications as prepared by Innovative Engineering & Consulting Inc.

SECTION 01065

REGULATORY REQUIREMENTS

1.01 SCOPE

A. The Contractor shall comply with all applicable Federal, State and Local Codes, including but not limited to:

1. Occupational Safety & Health Act of 1970, as amended
2. The National Electric Code
3. National Electric Safety Code
4. Uniform Building Code, latest edition
5. Life Safety Code
6. National Fire Protection Association Code, latest edition
7. The BOAC National Plumbing Code, latest edition
8. Indiana Plumbing Code, latest edition

B. All work performed, materials furnished, or equipment supplied and installed under this project shall conform to all requirements of the Indiana Department of Environmental Management, to the Recommended Standards for Water Works ("10 State Standards"), current edition, and all Federal requirements relating to water facilities.

C. All work shall comply with all utility regulations.

SECTION 01500

TEMPORARY FACILITIES

PART 1 - GENERAL

1.01 DESCRIPTION

A. The Contractor shall provide the following temporary facilities:

1. Sanitary facilities.
2. Barricades and enclosures.
3. Field office (Contractor's option).
4. Telephone services.
5. Utility connections, maintenance & removal.

B. Temporary structures required by Subcontractors, for storage or other purposes in the performance of their contracts, shall be located and erected only with the approval of Engineer and shall be removed and premises cleaned of all debris when directed.

C. The Contractor shall furnish and pay cost of power.

1.02 REQUIREMENTS OF REGULATORY AGENCIES

A. Obtain and pay for permits as required by authorities.

B. Comply with all applicable Federal, State, and Local Codes, including but not limited to:

1. Occupational Safety and Health Act of 1970, as amended.
2. National Electric Code.
3. National Electric Safety Code.
4. Uniform Building Code, latest edition.
5. Life Safety Code.

C. Comply with utility regulations.

PART 2 - PRODUCTS

2.01 TEMPORARY STRUCTURES (When Provided)

A. Storage Sheds:
1. Provided by each Subcontractor, as required.
2. Coordinate location and removal with General Contractor.
B. Enclosures:
C. Provide temporary weather tight enclosures for all exterior openings.
D. Equip exterior doors with locks and closures.
E. Provide lights, signs and barricades as required to protect construction personnel and the general public.
F. Sanitary Facilities:
1. Provide and maintain, in sanitary condition, approved type temporary toilet facilities. Toilets shall be portable type equal to Saniprep units.
2. Remove temporary toilets upon completion of work.

E. Field Offices:
1. Furnish, install, and maintain field office.
2. General Contractor's offices required for general use and project meetings.
3. Option: portable trailer units.
4. Adequate office equipment for construction coordination and shop drawing storage.
5. Automatic heating and ventilating equipment.
6. Emergency first-aid equipment, ABC fire extinguisher and extra hard hats.
7. Drinking water supply.
8. Telephone with loud outside gong.
9. Provide locks on doors.

2.02 TEMPORARY UTILITIES

A. Temporary Electricity and Water

1. The Contractor shall at his expense arrange for the provision, distribution, and continuance throughout the Work of temporary electrical power. All elements of such electrical service shall conform to the regulations of the National Electric Code and the Safety Code for the Construction Industry. All temporary wiring shall include a green equipment grounding conductor, and the entire temporary electrical service shall have equipment grounding continuity; all outlets for the connection of portable equipment shall be of the grounding type. Contractor and subcontractors shall be responsible for all necessary wiring and extension cords to reach from the nearest outlet of adequate capacity to the point of operation; all such devices shall conform to the requirements specified herein.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Temporary Structures

1. Locate to avoid interference with work.
2. Relocate as required and/or directed by Designer.
3. Construct on stable foundation with code approved service connections.

B. Temporary Electrical Services:

1. Service and distribution may be overhead or underground.
2. Locate lighting controls at entrance to each area.
3. Do not run branch circuits on floor.

3.02 PROTECTION

A. Safety: Maintain lights and barricades on all obstructions and hazards during construction of the project in conformance with Federal and local laws and codes.

B. Fire Protection:

1. Provide multi-purpose dry chemical fire extinguisher at each building.
2. Mount units in protective red enclosures plainly marked and readily accessible.

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BUILDING ADDITION
730 INDUSTRIAL DRIVE, FRANKLIN, IN 46131

STANDARD SPECIFICATIONS

DATE:

DATE: 02/04/2021
DRAWN BY: ALR
ISSUED:
CHECKED BY: JWK
JOB NUMBER: 20136
SHEET #: C901

File Path:\Name: J:\2020\20136- Franklin Transfer\Dwgs\20136 C901 SPEC.dwg Date: Feb 04,2021 - 1:12pm

SECTION 02100

SITE WORK

PART 1 – GENERAL

1.01 SCOPE

A. The work performed under this section includes, but is not limited to, the work necessary to prepare the site for execution of the project.

B. The Contractor shall supply all labor, materials and equipment necessary for proper execution.

PART 2 – PRODUCTS

2.01 NOT APPLICABLE

PART 3 – EXECUTION

3.01 PREPARATION

A. Prior to any clearing operations, the Contractor shall stake the clearing limits arrived at after consultation with the Developer/ Owner. Trees to remain within the clearing limits shall be clearly marked.

B. Prior to any excavation, Contractor shall field locate all electrical, water lines, natural gas pipe lines, sewer lines, cable TV, underground telephone cables, etc. Any damage to existing buried utilities shall be properly corrected at the Contractor's expense.

C. When construction is to be executed in developed areas and reconstruction of existing facilities (streets, curbs, driveways, sidewalks, parkways, etc.), the Contractor shall photograph log the site prior to any disturbance of existing facilities.

3.02 PROTECTION

A. Protect existing trees and shrubbery to remain.
1. Protect tops, trunks and roots of existing trees on the project site that are to remain.
2. Existing trees subject to construction damage shall be boxed, fenced or otherwise protected before work is started.
3. Do not permit heavy equipment or stockpiles within branch spread.
4. Remove interfering branches without injury to trunks and cover scars with asphaltum base tree paint.

B. The Contractor shall use extreme care to protect existing pavement, curb and gutters, driveways and parkways. The Contractor shall be held responsible for all damages and repair or replace any damages, at the Contractor's expense, to the satisfaction of the Engineer or as specified in these documents.

3.03 TRIMMING

A. Remove interfering branches without injury to trunks and apply tree wound dressing to all cuts over two (2) inches in diameter.

B. Trimming shall be in accordance with good tree surgical practice.

3.04 CLEARING

A. Remove trees, saplings, shrubs, bushes, undergrowth, etc., within limits of clearing.

B. Removal of trees:

1. All trees three inches (3") in diameter and larger shall be trimmed of branches, cut into 8' to 10' lengths and stored on the site where directed by the Engineer and shall remain on the property of the Owner.

2. All trees, branches and shrubs less than three inches (3") in diameter may be processed with a mechanical chipper and stock–piled where directed by the Engineer, or may be disposed of by the Contractor away from the Owner's property, at the Contractor's option.

C. Remove existing bituminous pavement to its entire depth from areas to be covered with new construction and dispose of debris off the site. Debris shall not be used for filling, backfilling, or any other purpose in the construction.

D. Comply with the applicable laws and ordinances governing the disposal of materials, rubbish and trash.

E. No burning allowed on the site. No onsite trash or rubbish burial allowed unless otherwise approved by the Owner.

F. Take care to keep nuisance of trash, noise and dust at a minimum.

G. Repair all damage inflicted to areas which are not to receive excavation work, or replace as required.

H. To avoid maintenance problems, root systems shall remain intact in areas where erosion is likely.

I. Remove all debris immediately from the Owner's property.

3.05 GRUBBING

A. Remove stumps, roots larger than 1–1/2" diameter, vegetation and boulders within the construction limit.

B. All tree stumps to be removed to the following depth:

If within paved areas:	24" below subgrade.
If within lawn areas:	24" below finish grade.
If within building areas:	36" below subgrade.

C. Strip all topsoil to its entire depth of the construction area, minimum of 6" depth.

1. Do not use top soil for subgrade fill.
2. Stockpile topsoil for use in finish grading operations in approved areas where indicated on the drawings, or as determined by the Owner.
3. Areas to be stripped shall first be scraped clean of all brush, weeds, grass, roots, and other materials that will interfere with lawn maintenance.
4. Topsoil shall be reasonably free from subsoil, debris, and stones larger than 2" in diameter.

SECTION 02200

EARTHWORK

PART 1 – GENERAL

1.01 SCOPE

A. The work performed under this Section includes, but is not necessarily limited to: foundations, backfilling, fill compaction, rough and finish grading, as indicated on the drawings, and as herein specified.

1.03 SUBMITTALS

Reports of all tests to Engineers.

1.04 BENCHMARKS AND MONUMENTS

A. Maintain all benchmarks, monuments, and other reference points, if destroyed or disturbed, replace as directed, at Contractor's expense.

1.05 SITE GRADING

A. The Contractor shall perform all grading operations to bring subgrades, after final compaction, to the required grades and sections as proposed per the construction plans as prepared by Innovative Engineering & Consulting Inc.

B. Subgrade shall be proof rolled with the suitable equipment and all spongy and otherwise unsuitable material shall be removed and replaced with suitable material.

C. Subgrade for streets and pavement areas shall be prepared in compliance with INDOT and Jurisdictional Standard Specifications for all areas of street construction. Subgrade shall be compacted to 100% of Standard Proctor in the upper 6" of depth. Depths of embankment below the upper 6" shall be compacted to 95% of Standard Proctor.

D. See Section 03000, "Pavement Construction".

E. All fill material shall be formed from soil free of deleterious material. Prior to placement of fill, a sample of the proposed fill material shall be submitted a designated Soils Engineer for approval. The fill material should be placed in layers not to exceed eight (8") inches in loose thickness, and shall be compacted to 95% of the maximum density obtainable with the Standard Proctor Test method.

F. All fill material in areas outside of building and pavement areas shall be compacted lightly and protected from erosion. Areas of building construction shall not have unsuitable material placed in said location, and fill shall be compacted in accordance with the Soils Engineer's specifications (minimum of 95% Standard Proctor). Such areas shall be determined by the Owner's representative.

1.06 PROTECTION

A. Protect newly graded areas from the action of the elements. Any settlement or washing that occurs prior to acceptance of the work shall be repaired and grades re–established to the required elevations and slopes. Fill to required subgrade levels any areas where settlement occurs.

1.07 DISPOSITION OF UTILITIES

A. Active utilities shall be protected from damage and removed or relocated only as indicated or specified. Where active utilities are encountered but are not shown on the drawings, the Engineer shall be advised. The work shall be adequately protected, supported or relocated as directed by the Utility and Engineer.
B. Inactive and abandoned utilities encountered in excavating and grading operations shall be reported to the Engineer. In absence of specific requirements, plug or cap such utility lines at least three feet outside of new work or as required by local regulations.

PART 2 – EXECUTION

2.01 GRADING

A. Furnish, operate and maintain such equipment and materials as necessary to control uniform layers, section and smoothness of grade for maximum compaction, drainage, erosion and sediment control.

B. Rough Grading

1. Evenly grade to elevation 6 inches below finish grade elevations indicated.
2. Protect all constructed items during grading operations, and repair if damaged.
3. All areas in the project, including excavated and filled sections and adjacent transition areas, shall be reasonably smooth, compacted and free from irregular surface changes.
4. The degree of finish shall be that ordinarily obtainable from either blade–grader or scraper operations, except as otherwise specified.
5. The finished subgrade surface generally shall be not more than 0.10 feet above or below the established grade or approved cross–section, with due allowance for topsoil and sod where required.
6. The tolerance for areas within 10 feet of buildings shall not exceed 0.15 feet above or below the established subgrade.
7. All ditches, swales and gutters shall be finished to drain readily.
8. Unless otherwise indicated on the drawings, the subgrade shall be evenly sloped to provide drainage away from sanitary manhole structures.
9. Provide roundings at top and bottom of banks and at other breaks in grade.
10. The provisions regarding rock excavation set forth forth under Section 02223, shall apply equally to rock excavation in areas outside of sewer trenches. If rock is encountered, it shall be removed to depths as follows:

a. Under surfaced areas: to underside of surfacing or base course.

b. Under lawns and planted areas: to 24" below finished grade, unless otherwise approved by the Engineer.

C. Finish Grading

1. Proceed to finish elevations indicated.
2. Rake subsoil clean of stones and debris. Scarify to depth of 3".
3. Spread top soil over prepared subgrade to a minimum depth of 6", and rolled until suitable for seeding.
4. Finish grade shall comply with the site grades provided per the "Grading Plan".
5. Leave topsoil ready to be seeded.

D. Protection

1. Protect newly graded areas from the action of the elements.
2. Any settlement or washing that occurs prior to acceptance of the work shall be repaired, and grades re–established to the required elevations and slopes.
3. Fill to required subgrade levels any areas where settlement occurs.

SECTION 02630

STORM SEWER PIPE MATERIALS, MANHOLES AND INLETS

PART 1 – GENERAL

1.01 SCOPE

A. The work performed under this section shall consist of the installation of storm sewer pipes, manholes and inlets.

B. Manholes and inlets shall be sized in accordance with the "Utility Plan", "Plans and Profiles", and "Specifications".

C. All storm sewer to be installed per current Marion County Standards.

PART 2 –MATERIALS

2.01 STORM SEWER MANHOLES AND INLETS

A. All storm manholes, including bases, risers, barrels, cones and flat slabs, shall be precast concrete manufactured, tested and marked in conformance with ASTM 478, utilizing 4,000 PSI concrete, Type II Cement.

B. All storm manhole bottom sections shall be monolithic, incorporating the manhole bottom.

C. All steps shall be either cast iron, fiberglass or rubber coated cast iron and shall conform to ASTM 478. Steps shall be a minimum width of 12 inches. All steps shall be a maximum of 16 inches center to center.

D. All cone sections shall be eccentric with a minimum opening of 24 inches. Precast reinforced concrete slabs may be used in place of eccentric cones, provided a minimum of 6 inches of soil is provided over the slab where permanent vegetation is to be established.

E. Grade rings shall be of precast concrete, manufactured in accordance with ASTM 478.

F. Castings shall be as shown on the "Utility Plan", "Plans and Profiles", and "Specifications" for manufacturer, type and model number.

G. All lift holes shall be repaired with 100 percent non–shrink epoxy grout, then smoothed and covered, both inside and out, with a trowelable grade butyl rubber backplaster.

H. Precast box inlets shall be constructed in accordance with Indiana Department of Transportation (INDOT) Standard Specifications (latest edition).

I. Pipe connections to manholes and box inlets shall be grouted both inside and out with a grout mixture composed of 2 parts of No.23 fine aggregate and 1 part Portland Cement.

2.02 STORM SEWER PIPE MATERIALS

A. Storm sewer pipe material shall be reinforced concrete in conformance with ASTM C–76, "Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe".

B. Lift holes are not allowed for pipe less than 24 inches in diameter. A maximum of two holes are allowed for pipe 24 inches in diameter or greater. Lift holes shall be repaired using the most recent INDOT Standard Specifications.

C. Castings shall be shown on the "Utility Plan", "Plans and Profiles", and "Specifications", for manufacturer, type and mold number.

PART 3 – EXECUTION

A. The precast manhole and inlet bottom section, with incorporated base, shall be placed on undisturbed soil with a minimum bearing pressure of 1500 lbs./sq. ft covered with a 2 inch leveling course of sand, stone or grout, on grade in place to the dimensions shown on the plans.

B. All manholes and inlets must be installed in "as manufactured" condition. Manhole and inlet sections with cracks or damaged joints shall not be accepted.

C. Joints between precast storm manhole segments shall be sealed utilizing an approved rubber gasket in conformance with ASTM C–443, trowelable grade butyl rubber or non–asphaltic mastic (AASHTO M–198). A permanent soil–tight seal shall be formed between all manhole segments.

D. Backfilling shall be in accordance with Section 02225, "Trench Backfilling".

E. The maximum allowable vertical distance from grade rings shall be 18 inches. Grade rings and manhole frames shall be set in mastic or material approved by the Engineer.

F. The manhole and box inlet bench walls shall be smooth and formed with Class "C" concrete. Sand, stone, brick or block fillers shall not be allowed. Castings grade adjustments for the box inlets using brick and mortar shall be in full conformance with the Indiana Department of Transportation (INDOT) Standard Specifications for workmanship and materials.

G. All manholes and box inlets, including adjusting rings and spacers, must be soil–tight, not permitting migration of surrounding materials into the storm system. Any manhole which is not soil–tight shall be repaired or replaced at the Contractor's expense.

H. All manhole and box inlets shall be set at finished grade.

SECTION 02782

TRENCH CONSTRUCTION

PART 1 – GENERAL

1.01 SCOPE

A. The work performed under this Section includes, but is not limited to, the work necessary for trenching excavation required for the proper installation of pipes, manholes, catch basins, valves, appurtenances and other structures required.

B. "DELETED"

PART 2 – EQUIPMENT & MATERIALS

2.01 EQUIPMENT

A. The Contractor shall have equipment of adequate size and reliability for proper and timely execution of the trenching required. The equipment must include, but may not be limited to, backholes, dump trucks, sump pumps, ditch pumps, hoses, trench shields, shoring, well point equipment, line location equipment, by–pass pumping equipment, air compressors, compaction equipment, etc.

B. Upon request, the Contractor, shall provide an equipment list at the Engineer's request.

PART 3 – EXECUTION

3.01 PREPARATION

A. All utilities must be field located and marked by the respective utility. This shall be the responsibility of the Contractor. All utilities shown on the plans are for reference purposes only and must be verified by the Contractor. Any utilities damaged shall be repaired at the sole expense of the Contractor. Prior to excavation in any right–of–way or easement, the Contractor shall secure a dated photo log the length of the entire project and provide the Owner with one copy of the dated photo log.

B. All directly affected property owners shall be notified at least 24 hours in advance of any construction. This shall be the responsibility of the Contractor.

C. The Owner and Engineer shall be notified at least 48 hours in advance of any construction.

D. All obstructions for the project must be removed. Trees, shrubs, poles and other structures which are to be preserved shall be properly braced and protected. Unless otherwise directed, all large trees and large shrubs shall be preserved with damage to the root structure held to a minimum.

E. Before closing any alley, street, highway or thoroughfare, the Contractor shall notify all appropriate public authorities and obtain all necessary permits. All permits shall be obtained by the Contractor and at the Contractor's expense, as required. All permits must be available for inspection at the job site.

3.02 SAFETY

A. All local, state, federal, and OSHA requirements must be strictly followed and enforced for the protection of employees, residents, and inspectors.

B. The Contractor shall provide adequate barricades, lights, and personnel to provide all required posting and flagging for safe movement of traffic and people around and through the job site.

3.03 TRENCH EXCAVATION

A. Excavation shall be of sufficient width and depth to permit proper installation of the pipes as specified on the drawings. The minimum allowable trench width shall be two (2) feet. The maximum allowable trench width shall be as required by local state, and federal regulations. All trenching and backfilling greater than the amount shown on the contract drawings must be included in the lineal foot cost of the pipe.

B. The Contractor shall excavate trenches to the depth specified to achieve adequate cover for the installation of force mains and sanitary sewers.

C. Excavations near existing manholes shall be made in a manner that shall prevent differential earth loads on the manhole. Manholes damaged during excavation shall be repaired or replaced by the Contractor at the Contractor's expense.

D. If soft or unsatisfactory foundation material is encountered, it shall be removed and replaced with backfill to provide adequate support for the pipe being installed. The Engineer shall be consulted upon delivery of the unsuitable material. When unsuitable material must be excavated and replaced with suitable material, the Contractor shall be reimbursed on a per yard basis. This cost must be included in the Contractor's bid unit price for pipe.

E. If the trench is over excavated, the trench bottom shall be backfilled with suitable material in 6" lifts and compacted to provide adequate bearing support for the pipe being installed. This shall be completed at the contractor's expense.

F. Spoil from the excavation shall be placed away from the edge of the trench a distance equal to the depth of the trench.

G. All existing utilities and existing structures must be protected from damage and prevented from settlement.

3.04 MANHOLE, INLET AND CATCH BASIN EXCAVATION

A. Excavations shall be sufficient size, and only of sufficient size to permit the work to be economically and properly constructed in the manner and of the size specified on the plans. The bottom of the excavation shall have the shape and dimensions of the underside of the manhole.

B. Extreme care shall be taken such that over excavation does not occur beyond the outside of the manhole. Backfill to the invert of the influent and effluent mains shall be compacted to support the pipe bedding to prevent settlement away from the manhole and shearing of the pipe at the exterior manhole walls.

3.05 SHORING, SHEETING AND BRACING

A. Open cut trenches shall be sheeted and braced as required by all governing local, state or federal laws as may be necessary to protect life, property or the work.

B. Shoring, sheeting and bracing shall be placed to prevent adjacent soil from entering the trench from above, through, or below.

C. Sheeting and shoring shall be placed to the invert of the pipe being installed.

D. Extreme care shall be taken so that voids are not developed behind sheeting or shoring. Should voids be evident, the Contractor shall be responsible for adequately filling all voids with appropriate backfill material by jetting or ramming.

E. Wood sheeting cut off or left in the trench shall be considered incidental to the construction and no additional payment shall be made to the Contractor.

F. "DELETED"

G. The Contractor shall be held accountable and responsible for the sufficiency of all sheeting and bracing used, and for all damage to persons or property resulting from improper quality, strength, placement, maintaining or removal. This includes damage to trees, sidewalks, and other property in the street area as well as on private grounds.

3.06 DEWATERING

A. All trenches shall be completely dewatered prior to pipe laying. Discharge from the dewatering pumps shall be natural drainage channels, drains, or storm sewers. Discharged water must not damage any property or cause undue inconvenience to any property owner.

B. No water shall be allowed to rise in the trench excavation until sufficient backfill has been placed to prevent flotation.

3.07 ROCK EXCAVATION

A. The Contractor shall include the cost of rock excavation where rock is encountered in the lineal feet cost of the pipe. No additional compensation will be made to the Contractor for
B. Rock excavation shall be made 6 inches below the outside surface of the pipe and bedded as provided for in Section 02225, "Backfilling".

C. Extreme care shall be exercised in blasting, if required, on the work under this project. Signals of danger shall be given and displayed before firing of any blasts.

D. The Contractor agrees to indemnify and hold the Owner and the Engineer harmless against all claims for damages to real or personal property or for injuries to persons, or deaths caused in any manner whatsoever, by explosions, blasting, handling or storing explosives for the work performed.

SECTION 03000

PAVEMENT CONSTRUCTION

PART 1 – GENERAL

1.01 SCOPE

A. The work performed under this Section includes, but is not limited to, the work necessary for public roadway construction.

B. The Contractor shall supply all labor, materials, and equipment necessary for proper execution.

PART 2 – EXECUTION

A. Reference should be made to the plan sheet titled "General Details" for applicable pavement construction requirements.

B. All street and pavement construction shall be in accordance with the plans and specifications, and conform to the minimum standards of the applicable jurisdictional office and INDOT.

C. Subgrade shall be prepared in compliance with Section 207.02 of the INDOT Standard Specifications (latest edition). No traffic shall be permitted on the prepared subgrade prior to paving.

D. Backfilling of utility trenches with granular material under pavement areas is required.

E. Contractor shall notify the applicable jurisdictional office a minimum of seventy–two (72) hours prior to commencement of street construction within any existing or proposed right–of–way.

WATER MAIN CONSTRUCTION

All Water Main to be installed in compliance with the current Citizens Water Standards & Specifications.

NOTE: THE CONTRACTOR SHALL RECEIVE APPROVAL, IN WRITING, FROM INNOVATIVE ENGINEERING & CONSULTING, INC. FOR ANY CHANGES TO THE PLANS OR SPECIFICATIONS.

BOTH WATER AND SANITARY MAINS SHALL HAVE A MINIMUM HORIZONTAL SEPARATION OF TEN (10) FEET, AND/OR A MINIMUM VERTICAL SEPARATION OF EIGHTEEN (18) INCHES.

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REVISIONS:

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FRANKLIN TRANSFER CENTER
BUILDING ADDITION
730 INDUSTRIAL DRIVE, FRANKLIN, IN 46131

STANDARD SPECIFICATIONS

DATE:

DATE: 02/04/2021
DRAWN BY: ALR
ISSUED:
CHECKED BY: JWK

JOB NUMBER: 20136

SHEET # C902

File Path\Name: J:\2020\20136 - Franklin Transfer\Dwgs\20136.0901.SPEC.dwg - Date: Feb 04,2021 - 1:12pm

GRAVITY SANITARY SEWER MAIN

CITIZEN'S ENERGY GROUP CURRENTLY ALLOWS THE USE OF THE FOLLOWING PIPE MATERIALS MEETING OR EXCEEDING THE MINIMUM REQUIREMENTS/SPECIFICATIONS SET FORTH HEREIN FOR THE CONSTRUCTION OF GRAVITY SANITARY SEWERS:

> POLYVINYL CHLORIDE PIPE (PVC)
> DUCTILE IRON PIPE (DIP)

VITRIFIED CLAY PIPE (VCP) IS NOT AN APPROVED MATERIAL FOR THE CONSTRUCTION OF SANITARY SEWERS DISCHARGING TO THE CITIZEN'S ENERGY GROUP SEWER SYSTEM. IN GENERAL, ALL GRAVITY SANITARY SEWER PIPE SHALL BE THE BELL AND SPIGOT TYPE WITH ELASTOMERIC SEAL JOINTS AND SMOOTH INTERIOR WALLS MEETING OR EXCEEDING ALL REQUIREMENTS SET FORTH IN THE LATEST ASTM STANDARD REFERENCED HEREIN.

CITIZEN'S ENERGY GROUP DOES NOT ALLOW THE USE OF SOLVENT CEMENT JOINT FOR GRAVITY SANITARY SEWERS EIGHT (8) INCHES IN DIAMETER OR LARGER.

SADDLE CONNECTIONS SHALL NOT BE ALLOWED FOR NEW CONSTRUCTION.

THE CONTRACTOR SHALL UPON REQUEST FURNISH CITIZENS WATER WITH MANUFACTURER'S CERTIFICATION STATING THAT THE PIPE SUPPLIED MEETS OR EXCEEDS ALL REQUIREMENTS OF THE APPLICABLE ASTM/ANSI STANDARDS AND THESE STANDARDS.

A. POLYVINYL CHLORIDE PIPE

1. POLYVINYL CHLORIDE (PVC) GRAVITY SANITARY SEWER PIPE SHALL BE THE INTEGRAL WALL BELL AND SPIGOT TYPE WITH ELASTOMERIC SEAL JOINTS AND SMOOTH INNER WALLS MEETING OR EXCEEDING ALL OF THE REQUIREMENTS SET FORTH IN ASTM D-3034 FOR PIPE DIAMETERS 15-INCHES OR LESS AND MEETING OR EXCEEDING ALL OF THE REQUIREMENTS SET FORTH IN ASTM F-679 FOR PIPE DIAMETERS GREATER THAN 15-INCHES.

   PIPE DIAMETERS 15-INCHES OR LESS SHALL HAVE A MINIMUM CELL CLASSIFICATION OF 12454-B OR 12454-C. PIPE DIAMETERS GREATER THAN 15-INCHES, SHALL HAVE A MINIMUM CELL CLASSIFICATION OF 12454-C. ALL PIPE SHALL HAVE A MINIMUM TENSILE STRENGTH OF 34.50 LX/[PA AS DEFINED IN ASTM D-1784. PVC SANITARY SEWER PIPE SHALL HAVE A MINIMUM PIPE STIFFNESS OF 46 PSI FOR EACH DIAMETER WHEN MEASURED AT 5% VERTICAL RING DEFLECTION AND TESTED IN ACCORDANCE WITH ASTM D-241 2.

   THE MINIMUM WALL THICKNESS FOR PVC SEWER PIPE 15-INCHES OR LESS IN DIAMETER SHALL CONFORM TO SDR-35 TYPE PSM AS SPECIFIED IN ASTM D-3034, SCHEDULE 80, OR SCHEDULE 40 PVC AS SPECIFIED IN ASTM D-2241, THE MINIMUM WALL THICKNESS FOR PVC SEWER PIPE GREATER THAN 15-INCHES IN DIAMETER SHALL CONFORM TO T-1 AS SPECIFIED IN ASTM F-679. WALL THICKNESS SHALL BE APPROPRIATE FOR THE DEPTH OF INSTALLATION. SDR35 SHALL BE USED FOR SEWERS UP TO 15 FEET DEEP. SDR26 SHALL BE USED FOR SEWERS GREATER THAN 15 FEET DEEP.

2. JOINTS: FLEXIBLE GASKETED JOINTS SHALL BE COMPRESSION TYPE SO THAT WHEN ASSEMBLED, THE GASKET INSIDE THE BELL WILL BE COMPRESSED RADICALLY ON THE PIPE SPIGOT TO FORM A WATERTIGHT SEAL. THE ASSEMBLY OF JOINTS SHALL BE IN ACCORDANCE WITH THE PIPE MANUFACTURER'S RECOMMENDATIONS AND ASTM D-32L2. THE GASKETS SEALING THE JOINT SHALL BE MADE OF RUBBER OF SPECIAL COMPOSITION HAVING A TEXTURE TO ASSURE A WATERTIGHT AND PERMANENT SEAL AND SHALL BE THE PRODUCT OF A MANUFACTURER HAVING AT LEAST FIVE (5) YEARS EXPERIENCE IN THE MANUFACTURE OF RUBBER GASKETS FOR PIPE JOINTS.

   THE GASKET SHALL BE A CONTINUOUS RING OF FLEXIBLE JOINT RUBBER OF A COMPOSITION AND TEXTURE WHICH IS RESISTANT TO COMMON INGREDIENTS OF SEWAGE, INDUSTRIAL WASTES AND GROUNDWATER, WHICH WILL ENDURE PERMANENTLY UNDER THE CONDITIONS LIKELY TO BE IMPOSED BY THIS SERVICE. THE GASKET SHALL CONFORM TO THE REQUIREMENTS OF ASTM F-477,

   ALL FIELD-CUTTING OF PIPE SHALL BE DONE IN A NEAT, TRIM MANNER USING A HAND OR POWER SAW. THE CUT END SHALL BE BEVELED USING A TILE OR WHEEL TO PRODUCE A SMOOTH BEVEL OF APPROXIMATELY 15 DEGREES WITH A MINIMUM DEPTH OF ONE THIRD THE PIPE WALL THICKNESS. FIELD CUT PIPE WILL ONLY BE ALLOWED TO BE INSTALLED AT MANHOLES, AT PREFABRICATED TEES AND WYES, AND AT THE CONNECTION OF NEW SANITARY SEWER TO EXISTING SANITARY SEWER.

3. FITTINGS: ONLY MANUFACTURED FITTINGS MADE OF PVC PLASTIC HAVING A CELL CLASSIFICATION OF 12454-B OR 12454-C AS DEFINED IN ASTM D-1784 SHALL BE USED.

4. MARKING: THE DATE OF MANUFACTURE, CLASS OF PIPE, SPECIFICATION DESIGNATION, SIZE OF PIPE, NAME OR TRADEMARK OF MANUFACTURER, AND IDENTIFICATION OF LAND/LOCATION SHALL , BE LEGIBLY MARKED ON THE OUTSIDE OF EACH PIPE SECTION IN ACCORDANCE WITH ASTM D-3034.

5. AFTER INSTALLATION, ALL MAINS SHALL BE LAMPED TO INSURE ALIGNMENT. INSPECTION SHALL BE PERFORMED BY THE JURISDICTIONAL UTILITY. ALL MAINS NOT LAID TRUE TO ALIGNMENT AND GRADE WILL BE REALIGNED AT THE CONTRACTOR'S EXPENSE.

6. AFTER LAMPING OF THE SEWER MAINS, ALL MAINS SHALL BE DEFLECTION TESTED. DEFLECTION TESTING SHALL BE PERFORMED USING A 5% OR LESS DEFLECTION ALLOWANCE POINT MANDREL. THE MANDREL SHALL BE PULLED WITHOUT MECHANICAL ASSISTANCE. IF PVC PIPE FAILS THE MANDREL TEST, THE PVC PIPE SHALL EXCAVATED AND BROUGHT WITHIN PERMITTED TOLERANCES. THE PREFERRED METHOD SHALL BE REROUNDING IN PLACE. IF TRUSS PIPE FAILS THE MANDREL TEST, THE SECTIONS FAILING THE MANDREL TEST SHALL BE REPLACED. ALL TESTING SHALL PERFORMED IN THE PRESENCE OF THE JURISDICTIONAL UTILITY AND COMPLETED NO SOONER THAN 30 DAYS AFTER BACKFILLING. ALL EXCAVATION, REPLACEMENT, AND REPAIRS SHALL BE THE CONTRACTOR'S EXPENSE.

7. UPON COMPLETION OF THE MANDREL TESTS THE MAINS SHALL BE AIR TESTED. AIR TESTING SHALL CONFORM TO ASTM F-1417-92, "STANDARD TEST METHOD FOR INSTALLATION ACCEPTANCE OF PLASTIC GRAVITY SEWER LINES USING LOW-PRESSURE AIR". THE MINIMUM ALLOWABLE TIME REQUIREMENT SHALL BE FOR A 1.0 PSIG PRESSURE DROP. ALL TESTING SHALL BE PERFORMED IN THE PRESENCE OF THE JURISDICTIONAL UTILITY AND AT THE EXPENSE OF THE CONTRACTOR. ALL SECTIONS FAILING THE AIR TEST SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE.

8. CLEANING AND TELEVISION INSPECTION

   ALL NEWLY INSTALLED SANITARY SEWER SHALL BE CLEANED AND TELEVISED BY THE DEVELOPER/CONTRACTOR PRIOR TO ACCEPTANCE BY CITIZENS WATER. CITIZENS WATER'S CAMERA AND SYSTEM MAY BE USED AT THE CITIZENS WATER RATES AND CHARGES SHOULD THE DEVELOPER/CONTRACTOR REQUEST SUCH AND EQUIPMENT IS AVAILABLE. THE DEVELOPER SHALL BE RESPONSIBLE FOR COORDINATING THE USE OF THE CCTV CAMERA SYSTEM TO INSPECT THE LINES AFTER CLEANING. THIS PROCEDURE SHALL BE DONE AFTER ALL LINES HAVE BEEN INSTALLED AND PRIOR TO FINAL WALK THROUGH. UPON WRITTEN REQUEST AND PAYMENT OF REIMBURSEMENT FOR THE COST OF TAPE, A COPY OF THE TELEVISED LINES WILL BE PROVIDED TO THE DEVELOPER. THE DEVELOPER SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH CLEANING AND TELEVISING THE LINES.

SANITARY SEWER MANHOLES

SANITARY SEWER MANHOLES SHALL BE INSTALLED AT THE END OF EACH LINE SEGMENT; AT ALL CHANGES IN GRADE, SIZE, MATERIALS AND/OR ALIGNMENT; AT ALL INTERSECTIONS; AND AT DISTANCES NOT GREATER THAN 400 FEET FOR SEWERS 18 INCHES OR LESS AND 500 FEET FOR SEWERS GREATER THAN 18 INCHES. CLEANOUTS SHALL NOT BE SUBSTITUTED FOR MANHOLES. ALL MANHOLE EXTENSIONS SHALL BE COATED WITH AN APPROVED FACTORY APPLIED BITUMASTIC COATING.

A. TYPES OF MANHOLES

   CITIZENS WATER WILL ACCEPT/ALLOW PRECAST MANHOLES CONFORMING TO THE SPECIFICATIONS HEREIN.

1.

2. PRECAST MANHOLES

   PRECAST REINFORCED CONCRETE MANHOLES INCLUDING BASES, RISERS/BARRELS, CONES AND FLAT SLABS SHALL BE CONSTRUCTED OF EITHER WET OR DRY CAST CLASS A CONCRETE MEETING OR EXCEEDING THE REQUIREMENTS OF ASTM C-478, LATEST REVISION. SEE DETAILS CITIZEN'S ENERGY GROUP STANDARD DETAILS INCLUDED IN THESE CONSTRUCTION DOCUMENTS.

   PRECAST REINFORCED CONCRETE MANHOLES SHALL BE MANUFACTURED, TESTED AND MARKED IN ACCORDANCE WITH ASTM C-478 AND SHALL BE CONSTRUCTED WITH THE BASE AND THE FIRST RISER SECTION AS ONE COMPLETE PRECAST UNIT. WHERE USED, PRECAST MANHOLE CONES SHALL BE THE ECCENTRIC CONE TYPE.

   NO "SEE THROUGH" LIFT HOLES SHALL BE ALLOWED ON PRECAST CONCRETE MANHOLES 48 INCHES IN DIAMETER OR LESS. ALL LIFT HOLES SHALL BE THOROUGHLY WETTED AND COMPLETELY FILLED WITH NON-SHRINK MORTAR OR EPOXY GOUT; THEN SMOOTHED AND COVERED, BOTH INSIDE AND OUT, WITH A TROWELABLE GRADE BUTYL RUBBER BASE BACKPLASTER MATERIAL TO ENSURE WATER TIGHTNESS.

   ALL JOINTS BETWEEN PRECAST MANHOLE ELEMENTS SHALL BE MADE WITH AN APPROVED RUBBER GASKET IN ACCORDANCE WITH ASTM C-443, LATEST EDITION, AND A L/2-INCH DIAMETER NON-ASPHALTIC MASTIC (KENT SEAL OR APPROVED EQUAL) CONFORMING TO AASHTO M-198 AND FEDERAL SPECIFICATIONS SS-521-A.

B. MANHOLES BASES, INVERTS AND FLOW CHANNELS/BENCH WALLS

   MONOLITHIC OR PRECAST MANHOLE BASES SHALL BE OF 6" MINIMUM THICKNESS FOR 4' DIAMETER AND 8" MINIMUM THICKNESS FOR LARGER DIAMETERS, AND SHALL BE CONSTRUCTED OF CLASS A CONCRETE HAVING A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.

   THE BOTTOM INVERT OF ALL PIPE ENTERING A MANHOLE SHALL BE AT LEAST THREE (3) INCHES ABOVE THE TOP OF THE BASE SLAB SO THAT THE FINISHED SEWER CHANNEL MAY BE INSTALLED AND SHAPED. THE INSTALLATION OF THE FINAL SEWER CHANNEL MAY BE DONE AT THE POINT OF FABRICATION OF THE PRECAST BASE OR CAST-IN-PLACE.

   THE FLOW CHANNELS WITHIN MANHOLES SHALL BE AN INTEGRAL PART OF THE PRECAST BASE. THE CHANNELS SHALL BE SHAPED AND FORMED FOR A CLEAN TRANSITION WITH PROPER HYDRAULICS TO ALLOW THE SMOOTH CONVEYANCE OF FLOW THROUGH THE MANHOLE. THE BENCH WALL SHALL BE FORMED TO THE CROWN OF THE INLET AND OUTLET PIPES TO FORM A 'U" SHAPED CHANNEL AS SHOWN IN DETAILS IN THESE CONSTRUCTION DOCUMENTS. THE BENCH WALL SHALL SLOPE BACK FROM THE CROWN AT MINIMUM L/2-INCH PER FOOT TO THE MANHOLE WALL.

   FOR CONNECTIONS TO EXISTING MANHOLES, FLOW CHANNELS AND BENCH WALLS SHALL BE REQUIRED AND SHAPED AS IF IT WERE A NEW MANHOLE.

C. ADJUSTING RINGS

   NO BRICK OR BLOCK SHALL BE USED IN THE CONSTRUCTION OF A MANHOLE OR TO ADJUST THE ELEVATION OF THE FRAME AND COVER. WHERE ONE (1) SOLID RISER OR BARREL SECTION CANNOT BE USED, FINAL ADJUSTMENTS IN ELEVATION OF THE FRAME AND COVER SHALL ONLY BE ACCOMPLISHED BY THE USE OF PRECAST CONCRETE ADJUSTING RINGS CONFORMING TO ASTM C-478. RINGS SHALL BE OF A NOMINAL THICKNESS OF NOT LESS THAN FOUR (4) INCHES. NOT MORE THAN TWELVE (12) INCHES TOTAL OF ADJUSTING RINGS SHALL BE ALLOWED FOR ADJUSTMENT OF THE MANHOLE FRAME AND COVER TO THE REQUIRED ELEVATION.

   A WATERTIGHT SEAL SHALL BE PROVIDED BETWEEN THE CONE AND RISER RING, EACH ADJOINING RISER RING, AND RISER RING AND CASTING BY THE USE OF TWO (2) ROWS OF 1/2-INCH EXTRUDABLE PREFORMED GASKET MATERIAL. MATERIAL SHALL BE PLACED IN KEYWAYS AND SHALL COMPLETELY FILL ALL CAVITIES.

D. CASTING, FRAME AND COVER

THE TYPE OF FRAME AND COVER TO BE USED SHALL BE NEENAH R-1712-B-SP, MODEL 1022-1AGSMD AS MANUFACTURED BY EAST JORDAN IRON WORKS, OR EQUAL WITH MACHINED BEARING SURFACE AND TYPE F CONCEALED PICKHOLE. SANITARY SEWER MANHOLE COVERS SHALL HAVE THE WORDS "SANITARY SEWER" CAST IN THE COVER IN LETTERS TWO (2) INCHES IN HEIGHT.

E. EXTRUDABLE PREFORMED GASKET MATERIAL

TWO (2) 1/2-INCH WIDE NOMINAL SIZE BUTYL RUBBER BASE GASKET MATERIAL, CONFORMING TO AASHTO M-198 AND FEDERAL SPECIFICATION SS-S-210A, SHALL BE USED FOR ADJUSTING RING GROOVES; BETWEEN ADJUSTING RING AND CONE; BETWEEN ADJUSTING RING AND CASTING; AND IN JOINTS OF PRECAST MANHOLE SECTIONS. THE GASKET MATERIAL SHALL BE AS MANUFACTURED BY HAMILTON KENT-SEAL, RUB'R-NEK L-T-M BY K.L. SNYDER COMPANY, OR AN APPROVED EQUAL. A COMPATIBLE PRIMER OR SOLVENT AS RECOMMENDED BY THE MANUFACTURER OF THE BUTYL BASE MATERIAL SHALL BE USED TO PREPARE SURFACES PRIOR TO APPLICATION OF BUTYL BASE MATERIAL.

F. TROWELABLE BUTYL RUBBER BACKPLASTER

THE EXTERIOR OF THE MANHOLE FROM TWO (2) INCHES BELOW THE BOTTOM RISER RING ON THE CONE SECTION TO AND COVERING THE BASE OF THE CASTING, INCLUDING THE VOIDS ON THE OUTSIDE JOINTS OF THE RISER RINGS SHALL BE SEALED WITH A TROWELABLE GRADE BUTYL RUBBER BASE EXTERIOR BACK PLASTER MATERIAL, 1/4 INCH MINIMUM THICKNESS WHEN DRY. ALL INTERIOR RISERS SHALL BE FITTED WITH AN APPROVED CHIMNEY SEAL.

G. OUTSIDE DROP MANHOLES

NO INSIDE DROP MANHOLE CONNECTIONS SHALL BE ALLOWED FOR NEW SEWER CONSTRUCTION. INSIDE DROP CONNECTIONS TO EXISTING MANHOLES SHALL ONLY BE ALLOWED UPON WRITTEN APPROVAL OF THE CITIZEN'S ENERGY GROUP. WHERE A SANITARY SEWER OR SANITARY SEWER LATERAL ENTERS A MANHOLE 24 INCHES OR MORE ABOVE THE INVERT OF THE OUTGOING SEWER, THE INCOMING SEWER SHALL BE CONNECTED TO THE MANHOLE BY MEANS OF AN OUTSIDE DROP CONNECTION. ALL NEW SANITARY SEWERS REQUIRING A DROP CONNECTION SHALL BE CONSTRUCTED WITH AN OUTSIDE DROP CONNECTION PER DETAIL 5-C. OUTSIDE DROP CONNECTIONS MAY BE EITHER PRECAST OR MONOLITHICALLY POURED. DETAILED DRAWINGS SHALL BE SUBMITTED FOR APPROVAL FOR ALL FIELD FABRICATED DROP CONNECTIONS.

THE FOOTING FOR THE PORTION OF THE MANHOLE UNDER THE DROP SHALL BE CONNECTED TO THE MANHOLE BASE. A MINIMUM OF THREE (3) 1/2 INCH DIAMETER REINFORCING RODS SHALL BE PLACED AS DOWELS INTO THE MANHOLE BASE. THESE RODS SHALL BE TIED TO THE REINFORCEMENTS. THE RODS SHALL BE TIED TO THE REINFORCEMENT AS SPECIFIED IN ACI BUILDING CODE REQUIREMENTS. THE RODS SHALL BE EXTENDED AS THE VERTICAL PART OF THE DROP IS CONSTRUCTED. IN ADDITION, THE DROP SHALL BE TIED INTO EACH JOINT OF PRECAST CONCRETE MANHOLE WITH A MINIMUM 3/8 INCH ROD TO PREVENT ANY SEPARATION OF THE DROP FROM THE PRECAST MANHOLE.

H. MANHOLE DIAMETERS

THE FOLLOWING ARE MINIMUM MANHOLE DIAMETERS FOR SANITARY SEWERS ENTERING/EXITING A MANHOLE AT THE FOLLOWING RAN ANGLES:

PIPE SIZING	MANHOLE DIAMETERS PIPES ENTERING/ LEAVING AT 0°-45° BEND	PIPES ENTERING/ LEAVING AT 45°-90° BEND
8"-21"	48"	48"
24"	48"	60"
27"-30"	60"	60"
33"-36"	60"	72"

I. STEPS

MANHOLE STEPS SHALL BE POLYPROPYLENE COATED STEEL REINFORCING OR AN APPROVED NON-CORROSIVE FIBERGLASS MATERIAL. THE COPOLYMER POLYPROPYLENE SHALL MEET THE REQUIREMENTS OF ASTM D4101 REINFORCED WITH DEFORMED 3/8 INCH MINIMUM DIAMETER REINFORCING STEEL CONFORMING TO ASTM A615, GRADE 60. STEPS SHALL BE 12" ON CENTER AND NOT MORE THAN 24" FROM THE TOP OR INVERT.

J. SEWER PIPES TO MANHOLE CONNECTIONS

TO CONNECT A SANITARY SEWER TO A MANHOLE, EITHER A FLEXIBLE BOOT KOR-N-SEAL 1 OR 2, FLEXIBLE CONNECTOR, CAST-IN-PLACE DURA-SEAL GASKET, "A"-LOCK GASKET OR AN APPROVED EQUAL SHALL BE USED. CONNECTIONS TO AN EXISTING MANHOLE SHALL BE A FLEXIBLE BOOT KOR-N-SEAL OR APPROVED EQUAL. IF THE FLEXIBLE BOOT CONNECTION IS USED, IT SHALL BE PLACED IN THE REINFORCED CONCRETE MANHOLE BASE AND SECURED TO THE PIPE BY A STAINLESS STEEL CLAMP. FLEXIBLE CONNECTORS SHALL CONFORM TO ASTM C-923. THE CAST-IN-PLACE INFLATABLE GASKET SHALL CONFORM TO ASTM C-923.

WHERE CONNECTION IS MADE TO AN EXISTING MANHOLE, THAT MANHOLE SHALL BE REHABILITATED TO THE CURRENT STANDARDS OF CITIZEN'S ENERGY GROUP. THIS SHALL INCLUDE REHABILITATING FLOW CHANNEL AND TAKING PRESCRIBED REPAIR MEASURES TO REDUCE INFILTRATION.

ALL CONNECTIONS SHALL PROVIDE FOR A WATERTIGHT SEAL BETWEEN THE PIPE AND MANHOLE. THE CONNECTOR SHALL BE THE SOLE ELEMENT RELIED UPON TO ASSURE A FLEXIBLE WATERTIGHT SEAL OF THE PIPE TO THE MANHOLE, THE RUBBER FOR THE CONNECTOR SHALL COMPLY WITH ASTM C-923 AND SHALL BE RESISTANT TO OZONE, WEATHER ELEMENTS, CHEMICALS, INCLUDING ACIDS AND ALKALIS, ANIMAL AND VEGETABLE FATS, OILS AND PETROLEUM PRODUCTS.

THE STAINLESS STEEL ELEMENTS OF THE CONNECTOR SHALL BE TOTALLY NON-MAGNETIC SERIES 305 STAINLESS STEEL. THE STAINLESS STEEL CLAMP SHALL BE CAPABLE OF SUSTAINING APPLIED TORQUE IN EXCESS OF EIGHTY (80) INCH-POUNDS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SUBMIT DETAILS OF THE PROPOSED CONNECTION TO CITIZENS FOR APPROVAL. CONNECTIONS NOT APPROVED BY CITIZENS SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT WITH AN APPROVED ADAPTER.

K. REJECTION OF PRECAST MANHOLE SECTIONS

PRECAST REINFORCED CONCRETE MANHOLES, RISERS AND TOPS SHALL BE SUBJECT TO REJECTION FOR FAILURE TO CONFORM TO ANY OF THE FOLLOWING REQUIREMENTS:

1. FRACTURES OR CRACKS PASSING THROUGH THE SHELL, EXCEPT FOR A SINGLE END CRACK THAT DOES NOT EXCEED THE DEPTH OF THE JOINT
2. DEFECTS THAT INDICATE IMPERFECT PROPORTIONING, MIXING AND MOLDING.
3. SURFACE DEFECTS INDICATING HONEYCOMBED OR OPEN TEXTURE.
4. DAMAGED ENDS, WHERE SUCH DAMAGE WOULD PREVENT MAKING A SATISFACTORY JOINT.
5. INFILTRATION INTO MANHOLE EXCEEDING ALLOWED LIMITS
6. THE INTERNAL DIAMETER OF THE MANHOLE SECTION VARYING BY MORE THAN ONE (1) PERCENT FROM THE NOMINAL DIAMETER.
7. NOT INSTALLED IN CONFORMANCE WITH THESE STANDARDS.
8. NOT CLEARLY MARKED AS OF DATE OF MANUFACTURER, TRADE NAME, SIZE DESIGNATION PART NUMBER, AND ASTM NUMBER.
9. HAVING A DEVIATION MORE THAN 1/4" FROM THE STRAIGHT EDGE AT ANY POINT ACROSS THE TOP OF MANHOLE CONE SECTION OR RISER RING; AND/OR
10. HAVING ANY VISIBLE STEEL BARS ALONG THE INSIDE OR OUTSIDE SURFACE OF THE MANHOLE EXCEPT FOR REINFORCEMENT STIRRUPS OR SPACERS USED TO POSITION THE CAGE DURING
MANUFACTURE.

5.12 BUILDING SEWERS
BUILDING SEWERS SHALL BE EITHER SDR 35, SCHEDULE 80 OR SCHEDULE 40 PVC BELL AND SPIGOT TYPE PIPE CONFORMING TO ASTM D2241. JOINTS SHALL BE FLEXIBLE GASKET PUSH-ON COMPRESSION TYPE ASSEMBLED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

ANY PART OF A BUILDING SEWER THAT IS LOCATED WITHIN TEN (10) FEET OF A WATER SERVICE PIPE SHALL BE CONSTRUCTED OF WATER WORKS GRADE PRESSURE PIPE.

VITRIFIED CLAY PIPE (VCP) SHALL NOT BE PERMITTED FOR BUILDING SEWER CONSTRUCTION.

ALL MANHOLES, INCLUDING GRADING RINGS, MUST BE WATERTIGHT, NOT PERMITTING ANY INFILTRATION OR EXFILTRATION. ANY MANHOLE WHICH IS NOT WATER TIGHT SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE. SANITARY MANHOLE GRADE RINGS AND FRAMES IN PAVED AREAS AND AREAS SUBJECT TO FLOODING SHALL BE SET AND SEALED IN MASTIC OR EQUIVALENT, APPROVED BY THE ENGINEER. SANITARY MANHOLE RINGS AND FRAMES NOT SUBJECT TO FLOODING MAY BE SEALED WITH MORTAR.

ALL SANITARY SEWER MANHOLES SHALL BE VACUUM TESTED IN ACCORDANCE WITH CURRENT STANDARDS AND SPECIFICATIONS OF THE INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT AND THE MODEL SPECIFICATIONS FOR WATER AND SEWER CONSTRUCTION IN INDIANA, 1st EDITION, 1998. AIR (VACUUM) TESTING OF MANHOLES SHALL BE IN ACCORDANCE WITH ASTM C-1244-93 STANDARD TESTING METHOD, AND ALL APPLICABLE CITIZENS SANITARY SEWER SPECIFICATIONS.

SEWER INSTALLATION

SUITABLE TOOLS AND EQUIPMENT SHALL BE USED FOR THE SAFE AND CONVENIENT HANDLING AND LAYING OF PIPE. GREAT CARE SHALL BE TAKEN TO PREVENT PIPE COATINGS OR WRAPPINGS FROM BEING DAMAGED. CAREFULLY EXAMINE ALL PIPE FOR CRACKS AND OTHER DEFECTS. NO PIPE OR FITTINGS SHALL BE LAID WHICH ARE KNOWN TO BE DEFECTIVE. IF PIPE OR FITTINGS ARE DISCOVERED TO BE CRACKED, BROKEN OR DEFECTIVE ALTER BEING LAID, THEY SHALL BE REMOVED AND REPLACED WITH SOUND MATERIAL. THOROUGHLY CLEAN ALL PIPE AND FITTINGS BEFORE INSTALLATION. ALL PIPE AND APPURTENANCES SHOULD BE KEPT CLEAN UNTIL ACCEPTED AS COMPLETED WORK.

A. LINE AND GRADE

THE CONTRACTOR SHALL FINISH AND SET ALL LINE AND GRADE STAKES (HUB) AND STAKES FOR BENCHMARKS. THE BENCHMARKS SHALL BE SET IN STRATEGIC LOCATIONS OF THE PROJECT IN ORDER TO FACILITATE THE CONTRACTORS INSTALLATION OF THE LINE AND GRADE STAKES FOR EACH PIPELINE. ONLY THE LASER METHOD SHALL BE USED TO SET THE GRADE OF THE PIPELINE. THE CONTRACTOR SHALL CONSTANTLY CHECK LINE AND GRADE OF THE LASER BEAM AND THE PIPE.

B. POINT OF COMMENCEMENT AND LAYING OF PIPE

PIPE LAYING SHALL COMMENCE AT THE LOWEST POINT IN THE PROPOSED SEWER LINE. LAY THE PIPE WITH THE BELL END OF BELL AND SPIGOT PIPE OR WITH THE RECEIVING GROOVE END OF TONGUE AND GROOVE PIPE POINTING UPGRADE. ANY OTHER PROCEDURE SHALL BE FOLLOWED ONLY WITH PERMISSION OF CITIZENS.

LAY EACH PIPE ON AN EVEN FIRM BED AS SPECIFIED SO THAT NO UNEVEN STRAIN WILL COME IN CONTACT WITH ANY PART OF THE PIPE. PARTICULAR CARE SHALL BE EXERCISED TO PREVENT THE PIPES FROM BEARING ON THE SOCKETS. HAND DIG ALL BELL HOLES FOR BELL AND SPIGOT PIPE.

COMPLETELY SHOVE HOME ALL PIPE (TO THE ASSEMBLY MARK) IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. ON PIPE OF THE TONGUE AND GROOVE TYPE THIRTY (30) INCHES AND LARGER IN DIAMETER, PRESSURE MUST BE APPLIED TO THE CENTER OF EACH PIPE AS IT IS LAID BY A WINCH AND CABLE OR OTHER MECHANICAL MEANS.

ALL CONNECTION FITTINGS SHALL BE SEALED WITH A WATERTIGHT STOPPER.

THE CONTRACTOR SHALL EXTEND THE BUILDING WYE LATERAL TO THE RIGHT-OF-WAY LINE AND SHALL
PLACE A #10 MAGNETIC LOCATOR WIRE ABOVE THE END OF THE PIPE TO WITHIN THREE (3) FEET OF THE GROUND SURFACE. FROM MAIN TO TOP OF CLEANOUT.

C. CONSTRUCTION BULKHEADS

BEFORE EXTENDING A SANITARY SEWER, THE CONTRACTOR SHALL PROVIDE A WATERTIGHT BULKHEAD IN THE EXISTING SEWER IMMEDIATELY DOWNSTREAM OF THE POINT OF CONNECTION. THIS BULKHEAD SHALL BE LEFT IN PLACE UNTIL THE NEW SANITARY SEWER HAS BEEN CLEANED OF ALL ACCUMULATED WATER AND DEBRIS AND ACCEPTED BY CITIZENS. DURING ALL INTERMISSIONS IN CONSTRUCTION OF THE SANITARY SEWER PIPE, THE OPEN FACE OF THE LAST PIPE LAID SHALL BE PLUGGED, COVERED OR BULKHEADED SO AS TO PREVENT SAND, WATER, EARTH OR OTHER MATERIALS FROM ENTERING THE PIPE.

WHENEVER PIPE AND SPECIAL CASTINGS ARE REQUIRED TO BE CUT, THE CUTTING SHALL BE DONE BY SKILLED WORKMEN IN SUCH MANNER AS TO LEAVE A SMOOTH END AT RIGHT ANGLES TO THE AXIS OF THE PIPE WITHOUT DAMAGE TO THE PIPE CASTING OR CEMENT LINING. CUTTING TORCHES SHALL NOT BE USED.

D. LAYING OF PIPE IN COLD WEATHER

CITIZENS RESERVES THE RIGHT TO ORDER PIPE INSTALLATION DISCONTINUED WHENEVER, IN ITS OPINION, THERE IS DANGER OF THE QUALITY OF WORK BEING IMPAIRED BECAUSE OF COLD WEATHER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HEATING THE PIPE AND JOINTING MATERIAL SO AS TO PREVENT FREEZING OF JOINTS. DO NOT LAY ANY PIPE ON FROZEN GROUND. NO FLEXIBLE OR SEMI--RIGID PIPE SHALL BE LAID WHEN THE AIR TEMPERATURE IS LESS THAN 32 DEGREES F UNLESS PROPER PRECAUTIONS PER THE MANUFACTURERS RECOMMENDATIONS ARE TAKEN BY THE CONTRACTOR AND THE METHOD IS APPROVED BY CITIZENS.

WHEN PIPES WITH RUBBER GASKETS OR RESILIENT-TYPE JOINTS ARE TO BE LAID IN COLD WEATHER, SUFFICIENTLY WARM THE GASKET OR JOINT MATERIAL SO AS TO FACILITATE MAKING A PROPER JOINT.

E. ABANDONED SEWERS AND STRUCTURES

SEWERS AND STORM WATER DRAINS WHICH ARE TO BE ABANDONED SHALL BE BULLHEADED WITH MORTAR AND AN EIGHT (8) INCH THICK BRICK WALL. SEWERS, STORM WATER DRAINS, AND STRUCTURES WHICH ARE TO BE ABANDONED IN PLACE SHALL BE FILLED WITH SAND OR CELLULAR CONCRETE AND PLUGGED, UNLESS OTHERWISE INDICATED ON THE PLANS. SERVICE SHALL BE MAINTAINED IN SUCH SEWERS AND DRAINS UNTIL CITIZENS ORDERS BULKHEADS PLACED. NO TIMBER BULKHEADS SHALL BE ALLOWED. ALL CASTINGS ON SUCH ABANDONED STRUCTURES ARE THE PROPERTY OF CITIZENS AND SHALL BE SALVAGED BY THE CONTRACTOR AND DELIVERED AS DIRECTED, UNLESS OTHERWISE SPECIFIED, ALL ABANDONED MANHOLES, CATCH BASINS AND INLETS SHALL BE REMOVED TO A DEPTH OF THREE (3) FEET BELOW THE PROPOSED OR ESTABLISHED GRADE OR EXISTING STREET GRADE, WHICHEVER IS LOWER.

DEWATERING AND CONTROL OF SURFACE WATER

WHERE GROUNDWATER IS ENCOUNTERED, THE CONTRACTOR SHALL MAKE EVERY EFFORT NECESSARY TO SECURE A DRY TRENCH BOTTOM BEFORE LAYING PIPE. THE CONTRACTOR SHALL PROVIDE, INSTALL AND OPERATE SUFFICIENT SUMPS, PUMPS, HOSE, PIPING, WELL POINTS, ETC., NECESSARY TO DEPRESS AND MAINTAIN THE GROUNDWATER LEVEL BELOW THE BASE OF THE EXCAVATION. IF THE CONTRACTOR IS UNABLE TO REMOVE THE STANDING WATER IN THE TRENCH, THE CONTRACTOR SHALL OVER--EXCAVATE THE PROPOSED BOTTOM GRADE OF THE SEWER BEDDING, AND PLACE NOT LESS THAN THREE (3) INCHES OF CLASS NO. 2 CRUSHED STONE (INDIANA DEPARTMENT OF HIGHWAY AGGREGATE CLASSIFICATION) IN THE OVER--EXCAVATED AREA.

THE CONTRACTOR AND/OR OWNER SHALL BE LIABLE FOR ALL LAWSUITS WHICH MAY ARISE AS A RESULT OF THE CONTRACTOR'S DEWATERING EFFORTS.

THE CONTRACTOR SHALL KEEP THE SITE FREE OF SURFACE WATER AT ALL TIMES AND SHALL INSTALL DRAINAGE DITCHES, DIKES, PUMPS, AND PERFORM OTHER WORK NECESSARY TO DIVERT OR REMOVE RAINFALL AND OTHER ACCUMULATED SURFACE WATER FROM EXCAVATIONS. THE DIVERSION AND REMOVAL OF SURFACE AND/OR GROUNDWATER SHALL BE PERFORMED IN A MANNER WHICH WILL PREVENT WATER FROM ACCUMULATING WITHIN THE CONSTRUCTION AREA.

UNDER NO CIRCUMSTANCES SHALL SURFACE WATER AND/OR GROUNDWATER BE DISCHARGED TO, DISPOSED OF OR ALLOWED TO FLOW INTO CITIZENS SANITARY SEWER SYSTEM.

TRENCHING

THE WIDTH OF THE TRENCH AT AND BELOW THE TOP OF THE SANITARY SEWER SHALL BE ONLY AS WIDE AS IS NECESSARY FOR PROPER INSTALLATION AND BACKFILLING. THE TRENCH WIDTH SHALL BE CONSISTENT WITH SAFETY REQUIREMENTS AND MANUFACTURES RECOMMENDATIONS FOR THE TYPE OF PIPE. THE MINIMUM WIDTH OF TRENCH FOR SANITARY SEWERS, AND FORCE MAINS, 42-INCHES IN DIAMETER AND LESS SHALL BE 1.25 TIMES THE OUTSIDE DIAMETER (O.D) PLUS 12-INCHES (SEE DETAIL 5A):

THE DESIGN PLANS AND SPECIFICATIONS SUBMITTED TO CITIZEN'S ENERGY GROUP FOR REVIEW, APPROVAL AND ISSUANCE OF A CONSTRUCTION PERMIT SHALL INCLUDE A DETAILED TRENCH DRAWING. PLASTIC PIPE SHALL INCLUDE MANUFACTURER'S PRODUCT DATA INDICATING THE TYPE OF TRENCH FOR THE SIZE OF PIPE AND DEPTH OF CONSTRUCTION.

THE DESIGN OF THE SEWER PIPE AND STRUCTURES IS PREDICATED UPON THE WIDTH OF TRENCH INDICATED ABOVE. SHOULD THESE LIMITS BE EXCEEDED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION AND INSTALLATION OF SUCH REMEDIAL MEASURES AS MAY BE REQUIRED BY THE ENGINEER AND/OR CITIZENS.

BELL HOLES SHALL BE EXCAVATED FOR BELL AND SPIGOT PIPE AND MECHANICAL JOINT PIPE, SO THAT THE ENTIRE BARREL OF THE PIPE IS RESTING ON THE BEDDING.

THE PIPE TRENCH SHALL NOT BE EXCAVATED MORE THAN ONE HUNDRED (100) FEET IN ADVANCE OF PIPE LAYING.

WHENEVER PIPE TRENCHES ARE EXCAVATED BELOW THE DESIGNED BEDDING BOTTOM, THE CONTRACTOR SHALL FILL THE OVER-EXCAVATION WITH MECHANICALLY COMPACTED NO. 8 (1/4-INCH TO 3/4-INCH) CRUSHED STONE OR NO. 8 FRACTURED FACE AGGREGATE.

ALL ROCK, BOULDERS AND STONES 6-INCHES IN DIAMETER AND LARGER ENCOUNTERED IN TRENCHES SHALL BE REMOVED. BOULDERS OR ROCKS ARE NOT TO BE USED FOR TRENCH BACKFILL. REMOVE ANY ROCK ENCOUNTERED TO SIX (6) INCHES BELOW THE PIPE, AND REPLACE WITH NO. 8 CRUSHED STONE OR NO. 8 FRACTURED FACE AGGREGATE, COMPACTED.

IN CASES WHERE MATERIAL IS DEPOSITED ALONG OPEN TRENCHES, THE MATERIAL SHALL BE PLACED SO THAT NO DAMAGE WILL RESULT TO THE WORK OR ADJACENT PROPERTY AS A RESULT OF RAIN OR OTHER SURFACE WASH.

IF THE BOTTOM OF THE TRENCH IS OF UNDESIRABLE MATERIAL, AN ADDITIONAL SIX (6) INCHES OF TRENCH BOTTOM SHALL BE EXCAVATED AND FILLED WITH CLASS 2 CRUSHED STONE AND COMPACTED USING A HAND HELD MECHANICAL TAMPER. WHERE THE DISTANCE TO STABLE GROUND IS EXCESSIVE, THE ENGINEER SHALL ORDER IN WRITING, OTHER TYPES OF FOUNDATION AS DEEMED NECESSARY, SUBJECT TO THE APPROVAL OF CITIZENS.

BEDDING

BEDDING MATERIAL SHALL BE COMPACTED NO. 8 CRUSHED STONE OR NO. 8 FRACTURED FACE AGGREGATE AND SHALL BE PLACED IN THE TRENCH BOTTOM SUCH THAT AFTER THE PIPE HAS BEEN PLACED, IMBEDDED TO GRADE AND ALIGNED, THERE REMAINS A 4-INCH MINIMUM DEPTH OF MATERIAL BELOW THE PIPE BARREL AND A MINIMUM OF 3-INCHES BELOW THE BELL (SEE DETAIL 5A).

A. PLASTIC OR FLEXIBLE PIPE

BEDDING SHALL BE PLACED AROUND THE SIDES OF THE PIPE UP TO THE SPRINGLINE (1/2 THE OUTSIDE DIAMETER). THIS MATERIAL SHALL BE SHOVEL SLICED OR OTHERWISE CAREFULLY PLACED AND "WALKED" OR HAND TAMPED TO ENSURE COMPACTION OF THE HAUNCH AREA AND COMPLETE FILLING OF ALL VOIDS. FROM THE SPRINGLINE TO TWELVE (12) INCHES ABOVE THE CROWN OF THE PIPE, BEDDING SHALL BE ADDED IN SIX (6) LIFTS AND 'WALKED" IN FOR COMPACTION. BACKFILLING OF THE REMAINDER OF THE TRENCH SHALL BE AS SPECIFIED.

B. DUCTILE IRON

BEDDING SHALL BE PLACED AROUND THE SIDES OF THE PIPE UP TO THE SPRINGLINE (1/2 THE OUTSIDE DIAMETER). THIS MATERIAL SHALL BE SHOVEL SLICED OR OTHERWISE CAREFULLY PLACED AND "WALKED" OR HAND TAMPED TO ENSURE COMPACTION OF THE HAUNCH AREA AND COMPLETE FILLING OF ALL VOIDS. FROM THE SPRINGLINE TO THE TOP OF THE PIPE, BEDDING SHALL BE ADDED IN SIX (6) LIFTS AND "WALKED" IN FOR COMPACTION. BACKFILLING OF THE REMAINDER OF THE TRENCH SHALL BE AS SPECIFIED.

BACKFILL

A. MATERIALS

THE FOLLOWING MATERIALS SHALL BE USED AS BACKFILL.

CLASS I – ANGULAR, SIX (6) TO FORTY (40) MILLIMETERS (1/4 TO 1-1/2 INCH) GRADED STONE SUCH AS CRUSHED STONE. INDOT CLASSIFICATION NO.5, NO.8, NO,9, AND NO. S3. A NO. 8 GRAVEL CONTAINING A MINIMUM 50% MECHANICAL CRUSH COUNT, AND MEETING THE FOLLOWING NOMINAL SIZE AND PERCENTS PASSING WILL HE CONSIDERED AN EQUIVALENT CLASS I MATERIAL: 100% PASSING 1" SIEVE, 75-95% PASSING 3/4" SIEVE, 40-70% PASSING 1/2" SIEVE AND 0-15% PASSING NO.4 SIEVE.

CLASS II – COARSE SANDS AND GRAVELS WITH MAXIMUM PARTICLE SIZE FORTY (40) MILLIMETERS (1-1/2 INCH), INCLUDING VARIOUSLY GRADED SANDS AND GRAVELS CONTAINING SMALL PERCENTAGES OF FINES, GENERALLY GRANULAR AND NON-COHESIVE, EITHER WET OR DRY. SOIL TYPES GM, GP, SW AND SP AND INDOT CLASSIFICATION FOR "B" BORROW MATERIAL ARE INCLUDED IN THIS CLASS.

CLASS III – FINE SAND AND CLAY GRAVELS, INCLUDING FINE SANDS, SAND-CLAY MIXTURES AND GRAVEL-CLAY MIXTURES. SOIL TYPES GM, GC, SM AND SC ARE INCLUDED IN THIS CLASS. THESE MATERIALS ARE NOT ACCEPTABLE FOR PIPE BEDDING,

CLASS IV – SILT, SILLY CLAYS AND CLAYS, INCLUDING ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY AND LIQUID LIMITS. SOIL TYPES MHO, ML., CHI AND CL ARE INCLUDED IN THIS CLASS. THESE MATERIALS ARE NOT ACCEPTABLE FOR PIPE BEDDING.

MATERIALS SHALL BE AGREED UPON PRIOR TO CONSTRUCTION. NO SIGNIFICANT DEVIATION FROM THIS STANDARD WILL BE PERMITTED WITHOUT AUTHORIZATION BY CITIZENS.

THE TERM "SELECT FILL" SHALL MEAN THE USE OF CLASS II OR III BACKFILL MATERIALS AS DESCRIBED ABOVE.

B. PLACEMENT

1. AREAS SUBJECT TO VEHICULAR TRAFFIC

IN AREAS UNDER PROPOSED OR EXISTING PAVED ROADS OR UNDER OR WITHIN FIVE FEET OF PAVEMENT, SIDEWALKS, CURBS, GUTTERS OR SIMILAR STRUCTURES, GRANULAR BACKFILL MATERIAL COMPLYING WITH THE REQUIREMENTS OF THE INDIANA DEPARTMENT OF HIGHWAYS STANDARD SPECIFICATIONS, MOST RECENT EDITION, SHALL BE USED.

THE MATERIAL SHALL BE PLACED IN UNIFORM LAYERS NOT EXCEEDING SIX (6) INCHES, LOOSE MEASUREMENT. WITHIN THREE (3) FEET OF THE SANITARY SEWER PIPE THE BACKFILL MATERIAL SHALL BE THOROUGHLY AND UNIFORMLY COMPACTED WITH HAND HELD MECHANICAL TAMPERS. THE REMAINING BACKFILL MATERIAL SHALL BE COMPACTED WITH MECHANICAL TAMPERS. A MINIMUM COMPACTION OF 95 PERCENT STANDARD PROCTOR DENSITY SHALL BE ACHIEVED WITHIN THE BACKFILL MATERIAL.

2. AREAS NOT SUBJECT TO VEHICULAR TRAFFIC

AREAS FIVE (5) FEET OR MORE FROM THE PAVED SURFACES BE CAREFULLY BACKFILLED WITH CLEAN FILL MATERIAL FREE OF ROCKS LARGER THAN 6-INCHES IN DIAMETER, FROZEN LUMPS OF SOIL, WOOD OR OTHER EXTRANEOUS MATERIAL AND INSTALLED AND COMPACTED AS NOTED ABOVE.

C. FLOWABLE FILL

1. UPON APPROVAL, FLOWABLE MORTAR MAY BE USED TO FILL TRENCHES FOR PIPE STRUCTURES, CULVERTS, UTILITY CUTS AND OTHER WORK EXTENDING UNDER PAVEMENT, TO FILL CAVITIES BENEATH SLOPE WALLS AND OTHER LOCATIONS. INSTALLATION, MATERIALS, AND CONSTRUCTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH INDOT STANDARDS. A MINIMUM 6" CONCRETE CAP SHALL BE INSTALLED ABOVE FLOWABLE FILL IN ALL LOCATIONS.

TRENCH BOX PULLING AND SHEETING

WHEN REQUIRED BY THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) TO PROTECT LIFE, PROPERTY, OR THE WORK, SHEET AND BRACE ALL OPEN CUT TRENCHES IN ACCORDANCE WITH CFR 1926. UPON COMPLETION OF THE WORK, ALL TEMPORARY FORMS, SHORES, AND BRACING SHALL BE REMOVED. ALL VACANCIES OR VOIDS LEFT BY THE SHEETING, SHALL BE CAREFULLY FILLED WITH PROPER BEDDING MATERIAL.

ANY DAMAGE TO PAVEMENT OR OTHER STRUCTURES DUE TO SHEETING, SHORING, OR BRACING SHALL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE.

SHEETING AND BRACING WHICH IS TO REMAIN IN PLACE SHALL BE CUT OFF AT THE ELEVATION OF 1.5 FEET ABOVE THE TOP OF THE SEWER PIPE UNLESS OTHERWISE DIRECTED BY THE ENGINEER

MANHOLE INSTALLATION

A. PREPARATION OF BASE

THE BOTTOM OF THE EXCAVATION TRENCH FOR THE MANHOLE SHALL BE FILLED WITH A MINIMUM OF SIX (6) INCHES OF NO. 8 CRUSHED STONE MECHANICALLY COMPACTED TO FORM A STABLE BASE. WHERE POOR OR UNSTABLE SOIL CONDITIONS EXIST OR OVER EXCAVATION HAS OCCURRED, ADDITIONAL NO. 2 CRUSHED STONE OR CLASS B CONCRETE SHALL BE USED TO FORM A STABLE BASE.

B. PLACEMENT

PRECAST MANHOLE SECTIONS SHALL BE PLACED TO PROVIDE PROPERLY ALIGNED VERTICAL SIDES. THE COMPLETED MANHOLE SHALL BE RIGID, TRUE TO DIMENSIONS AND WATERTIGHT. TOLERANCE SHALL NOT EXCEED 2 INCHES FOR MANHOLES UP TO 16 FEET IN DEPTH PLUS 1/8" PER FOOT FOR MANHOLES OVER 16 FEET. TOLERANCES SHALL BE CHECKED WITH A PLUMB LINE.

THE JOINTS BETWEEN MANHOLE SECTIONS SHALL BE MADE WITH AN APPROVED RUBBER O-RING IN ACCORDANCE WITH ASTM C-443 AND A 1/2-INCH DIAMETER NON-ASPHALTIC MASTIC (KENT SEAL OR EQUAL) CONFORMING TO AASHTO M-198 AND FEDERAL SPECIFICATIONS SS--521-A.

C. BACKFILL

BACKFILLING AND COMPACTION AROUND MANHOLES SHALL COMPLY WITH THE REQUIREMENTS SPECIFIED FOR THE CONNECTING SEWER.

NOTE: THE CONTRACTOR SHALL RECEIVE APPROVAL, IN WRITING, FROM INNOVATIVE ENGINEERING & CONSULTING, INC. FOR ANY CHANGES TO THE PLANS OR SPECIFICATIONS.

BOTH WATER AND SANITARY MAINS SHALL HAVE A MINIMUM HORIZONTAL SEPARATION OF TEN (10) FEET, AND/OR A MINIMUM VERTICAL SEPARATION OF EIGHTEEN (18) INCHES.

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FRANKLIN TRANSFER CENTER
BUILDING ADDITION
730 INDUSTRIAL DRIVE, FRANKLIN, IN 46131
STANDARD SPECIFICATIONS

DATE:

DATE: 02/04/2021
DRAWN BY: ALR
ISSUED:
CHECKED BY: JWK
JOB NUMBER: 20136
SHEET # C903