

LEGEND		
	STREET NAME SIGN (D5-1)	5
	STOP SIGN (R1-1)	5
	"NO PARKING THIS SIDE OF STREET" (R7-1 MOD - SEE DETAIL, THIS SHEET)	11
	PEDESTRIAN TRAFFIC (W11-2)	2
	TYPE III BARRICADE	6
	STREET LIGHT	15
	LAKE DANGER WARNING SIGN	4

- NOTES**
- ALL TRAFFIC CONTROL SIGNS SHALL CONFORM TO CHAPTER 2 OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), CURRENT REVISION.
  - ALL STREET LIGHTING SHALL CONFORM TO JOHNSON COUNTY REMC GUIDELINES AND STANDARDS.  
FIXTURES FOR THIS SUBDIVISION SHALL BE "DECORATIVE STREET LIGHT - TRADITIONAL" USING 51 WATT LED BULBS.
  - ALL STREET SIGNS SHALL CONFORM TO CURRENT CITY STANDARDS (WHITE BACKGROUND, BLACK LETTERING, CITY SEAL INSTALLED WITH SPACER).
  - SEE SHEET C416 FOR SIGN DETAILS.

**BENCHMARK DATA**

ORIGINATING BENCHMARK

BENCHMARK ELEVATIONS FOR THIS PROJECT WERE DERIVED USING THE NATIONAL GEODETIC SURVEY ON LINE POSITIONING USER SERVICE (O.P.U.S.) AND ARE REFERENCED TO THE NAVD'83 DATUM.

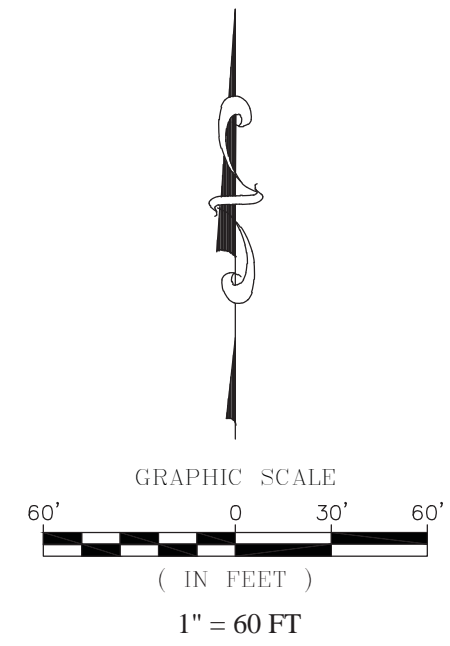
TBM #30  
CHISELED "X" ON NORTHWEST BOLT OF A FIRE HYDRANT, 35' ± EAST OF HURRICANE ROAD AND AT THE SOUTH ENTRANCE TO GOLF ACADEMY.  
ELEV. = 762.85'

**UTILITY CROSSINGS**

CONTRACTOR SHALL VERIFY DEPTHS OF ALL EXISTING ON-SITE UTILITIES PRIOR TO CONSTRUCTION TO CONFIRM THERE IS NOT ANY CONFLICTS WITH OTHER UTILITIES, STORM SEWERS OR STREETS. CONFLICTS AFTER CONSTRUCTION BEGINS ARE SOLELY THE CONTRACTOR'S RESPONSIBILITY.

**CITY OF FRANKLIN SUBDIVISION CONTROL ORDINANCE SECTION 6.13 STREET SIGN STANDARDS**

- A. GENERAL STREET SIGN REQUIREMENTS:**  
STREET SIGNS, INCLUDING STREET NAME SIGNS, STOP SIGNS, "NO PARKING" SIGNS, AND ALL OTHER APPROPRIATE REGULATORY SIGNS, SHALL BE INSTALLED BY THE SUBDIVIDER AT ALL LOCATIONS SPECIFIED ON THE APPROVED CONSTRUCTION PLANS AND OTHERWISE AS REQUIRED BY THE CITY ENGINEER.
- B. STREET SIGN INSTALLATION:**  
ALL STREET SIGNS SHALL BE INSTALLED PRIOR TO THE ACCEPTANCE OF THE SUBDIVISION'S STREETS BY THE BOARD OF PUBLIC WORKS & SAFETY.
- 1. TEMPORARY SIGNS:**  
THE SUBDIVIDER SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF TEMPORARY STREET AND TRAFFIC CONTROL SIGNS UNTIL THE PERMANENT SIGNS ARE INSTALLED AND ACCEPTED BY THE BOARD OF PUBLIC WORKS & SAFETY.
- 2. PERMITS:**  
AT HIS/HER DISCRETION, THE PLANNING DIRECTOR MAY WITHHOLD THE ISSUANCE OF IMPROVEMENT LOCATION PERMITS, INCLUDING THOSE FOR MODEL HOMES AND SPECULATIVE STRUCTURES, UNTIL APPROPRIATE PERMANENT OR TEMPORARY STREET SIGNS HAVE BEEN INSTALLED.
- C. STREET SIGN STANDARDS:**  
ALL STREET SIGN AND POST TYPES AND LOCATIONS SHALL CONFORM TO THE UNIFORM MANUAL OF TRAFFIC CONTROL DEVICES, APPLICABLE EDOT STANDARDS AND SPECIFICATIONS, THE REQUIREMENTS OF THE CITY ENGINEER, THE SPECIFICATIONS OF THE BOARD OF PUBLIC WORKS AND SAFETY, AND THE FOLLOWING:
- 1. SIGNPOSTS:**  
EACH SIGNPOST SHALL CONSIST OF A 2 INCH GALVANIZED TYPE A POST, 12 FEET LONG WITH A MINIMUM OF 5 FEET BELOW GRADE.
- a. STREET NAME SIGNPOST LOCATIONS:**  
STREET NAME SIGN POSTS SHALL BE LOCATED WITHIN THE STREET RIGHT-OF-WAY, NO CLOSER THAN 4 FEET FROM THE EDGE OF THE TRAVELED PORTION OF THE STREET.
- b. STOP SIGN SIGNPOST LOCATIONS:**  
STOP SIGN SIGNPOSTS SHALL BE LOCATED SO THAT THE EDGE OF THE SIGN IS A MINIMUM OF 2 FEET FROM THE EDGE OF THE TRAVELED PORTION OF THE STREET.
- c. SPEED LIMIT AND INFORMATIONAL SIGNPOST LOCATIONS:**  
SPEED LIMIT AND INFORMATIONAL SIGN SIGNPOSTS SHALL BE LOCATED SO THAT THE EDGE OF THE SIGN IS A MINIMUM OF 2 FEET FROM THE BACK EDGE OF THE CURB (OR SHOULDER IF NO CURB IS PRESENT).
- d. SIDEWALK OBSTRUCTION PROHIBITED:**  
IN NO INSTANCE SHALL ANY SIGNPOST BE LOCATED IN OR OBSTRUCTING A SIDEWALK.
- 2. STREET NAME SIGNS:**  
EACH STREET NAME SIGN SHALL BE MADE OF WHITE REFLECTORIZED, DOUBLE-BLADE METAL WITH CITY SEAL AND SPACER AND 4 INCH OR LARGER BLACK LETTERS MOUNTED AT THE TOP OF THE POST WITH THE STREET NAME LABELED ON BOTH SIDES.
- 3. STOP SIGNS:**  
EACH STOP SIGN SHALL BE A MINIMUM OF 30 INCHES IN WIDTH AND HAVE A HIGH-INTENSITY FINISH. THERE SHALL BE A MINIMUM OF 7 FEET FROM THE TOP OF THE ADJACENT CURB TO THE BOTTOM OF THE SIGN.
- 4. SPEED LIMIT AND INFORMATION SIGNS:**  
SPEED LIMIT AND OTHER INFORMATION SIGNS SHALL BE A 24 INCH BY 30 INCH VERTICAL RECTANGLE WITH A HIGH-INTENSITY FINISH.



APPROVAL PENDING/NOT FOR CONSTRUCTION

**STOEPPELWERTH**

ALWAYS ON

7965 East 106th Street, Fishers, IN 46038-2905  
phone: 317.846.5905 fax: 317.846.5942

STREET SIGN PLAN

WINTERFIELD SECTION 3

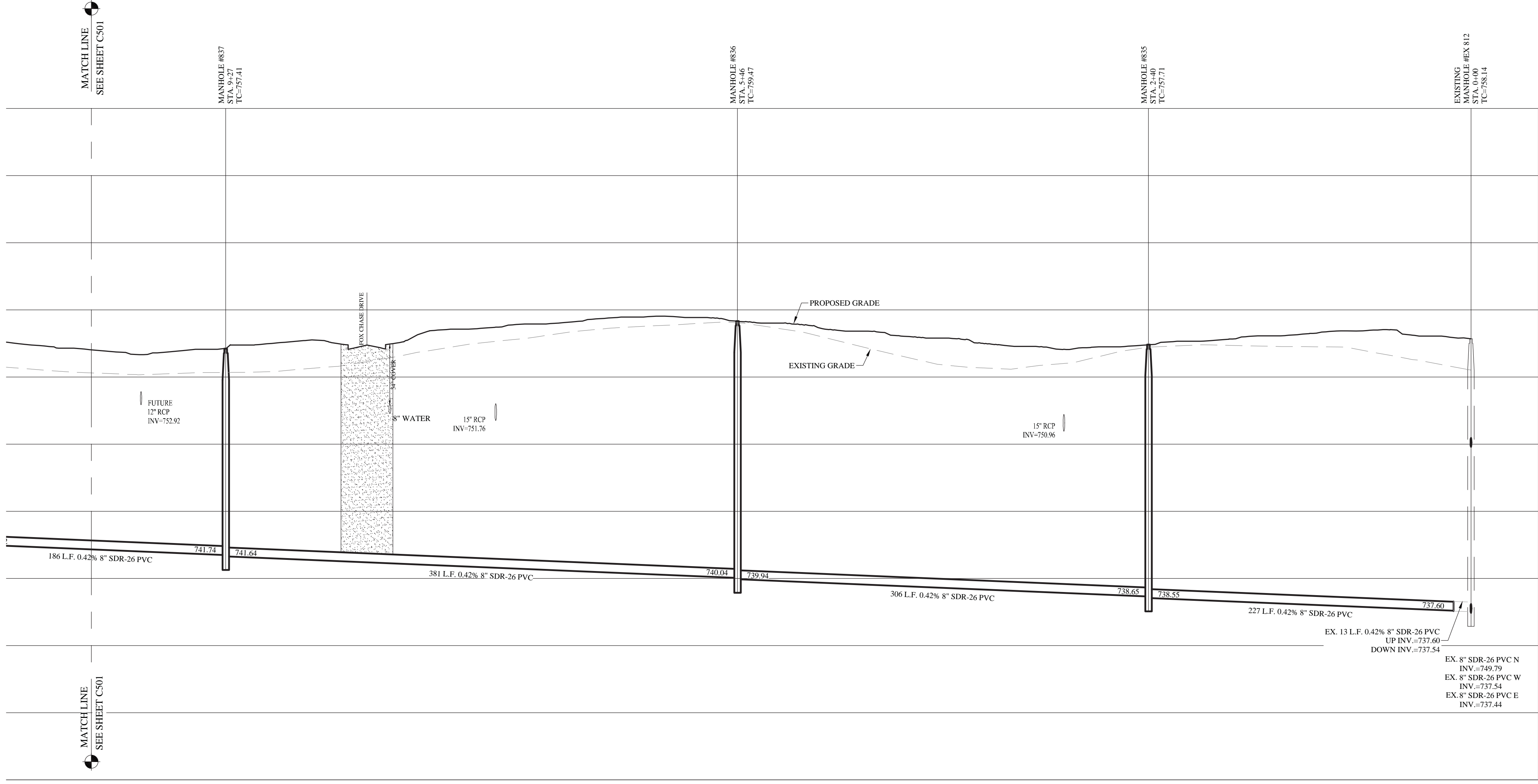
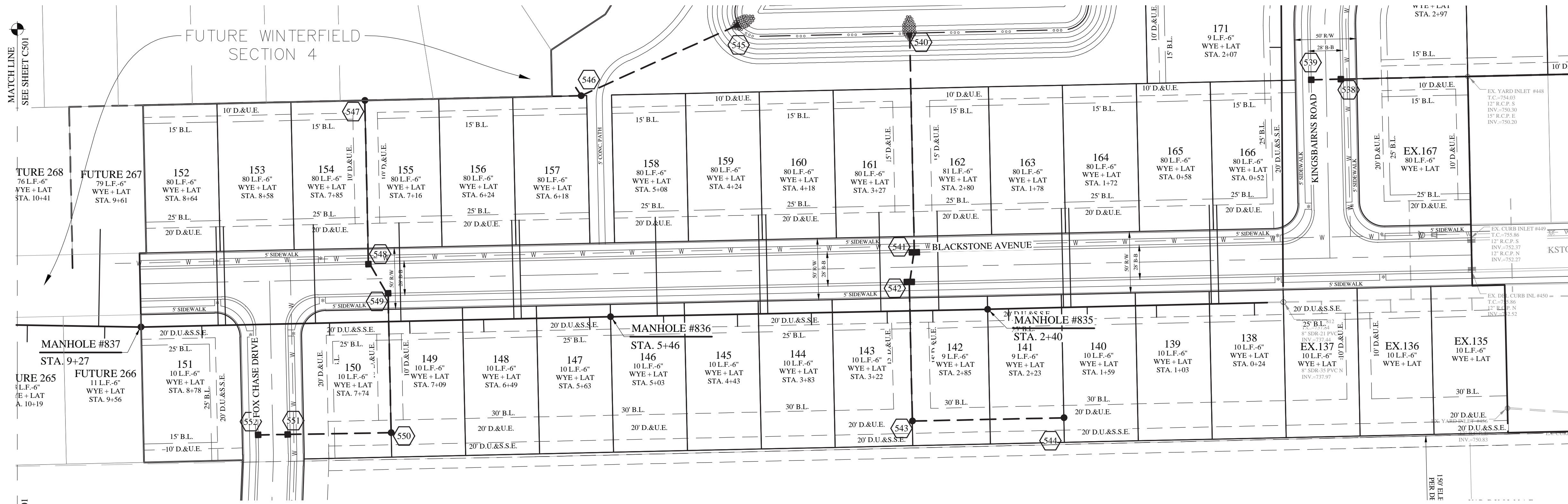
JOHNSON COUNTY, INDIANA

DRAWN BY: KJ/M/GEM  
CHECKED BY: KRG

SHEET NO. **C407**

6 & 8 A FOR NO. 100405FOR-S3





LEGEND	
	EXISTING SANITARY SEWER (w/ LATERALS)
	EXISTING STORM SEWER
	EXISTING WATER LINE
	PROPOSED SANITARY SEWER (w/ LATERALS)
	PROPOSED STORM SEWER
	PROPOSED WATER LINE
	DENOTES FULL DEPTH GRANULAR BACKFILL

NOTES	
1.	CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION TO CONFIRM THERE ARE NO CROSSING CONFLICTS. CONFLICTS THAT ARE DISCOVERED AFTER CONSTRUCTION BEGINS ARE SOLELY THE CONTRACTOR'S RESPONSIBILITY.
2.	THIS SURVEY REFLECTS ABOVE GROUND INDICATIONS OF UTILITIES AND INFORMATION AVAILABLE FROM UTILITY COMPANIES. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.
3.	MIN. SLOPES PER THE TEN STATE STANDARDS SHALL PREVAIL IN ALL CASES.
4.	ALL WATER MAINS SHALL MAINTAIN 18 INCHES VERTICAL CLEARANCE AND 10 FEET HORIZONTAL CLEARANCE.
5.	SEE SHEET C503 FOR SANITARY SEWER STRUCTURE DATA TABLE.
6.	SANITARY SEWER LATERAL STUBS TO FUTURE LOTS ARE TO BE MARKED PER CITY OF FRANKLIN REQUIREMENTS AND PROTECTED FROM FUTURE CONSTRUCTION BY INSTALLING A 2" x 2" LATH WITH RIBBON AROUND IT AT EACH LOCATION SO CONTRACTORS ARE AWARE OF THE MARKING.
7.	DUCTILE IRON FORCE MAIN SHALL HAVE A POLYETHYLENE COATING. CEMENT LINED DUCTILE IRON IS NOT ACCEPTABLE.
8.	ALL SANITARY LATERAL LENGTHS MUST BE A MINIMUM OF 4' DIAMETER, IN ACCORDANCE WITH 327 IAC 3-6-8-D.
9.	SANITARY CLEANOUTS SHALL BE PLACED WITHIN 30 FEET OF EACH BUILDING.
10.	SHORT SIDE SANITARY LATERALS ON MAIN DEEPER THAN 15' REQUIRE SLIP JOINT.

BENCHMARK DATA	
ORIGINATING BENCHMARK	
BENCHMARK ELEVATIONS FOR THIS PROJECT WERE DERIVED USING THE NATIONAL GEODETIC SURVEY ONLINE POSITIONING USER SERVICE (O.P.U.S.) AND ARE REFERENCED TO THE NAVD 83 DATUM.	
BM# 830 CHISELED "X" ON NORTHWEST BOLT OF A FIRE HYDRANT, 35% EAST OF HURRICANE ROAD AND AT THE SOUTH ENTRANCE TO GOLF ACADEMY. ELEV.=762.85'	



APPROVAL PENDING/NOT FOR CONSTRUCTION

STOEPPELWERTH

ALWAYS ON

7965 East 106th Street, Fishers, IN 46038-2905  
phone: 317.845.5905 fax: 317.845.5942

SANITARY SEWER PLAN & PROFILES

WINTERFIELD SECTION 3

JOHNSON COUNTY, INDIANA

FRANKLIN

DRAWN BY: KJ/M/GEM

CHECKED BY: KRG

SHEET NO. C500

6 & A FORM NO. 100405FOR-S3

THIS DRAWING IS NOT INTENDED TO BE REPRESENTED AS A RETRACTION OR CORRECTION OF ANY PREVIOUS SURVEY OR A SURVEYOR LOCATION REPORT.

CERTIFIED: 07/11/24

PROFESSIONAL ENGINEER

STATE OF INDIANA

PE#1200386

NO. 1200386

REVISIONS

DATE

MARK

BY





SEE SHEET C502  
MATCH LINE

MANHOLE #843  
STA 21+59

SEE SHEET C502  
MATCH LINE

MANHOLE #842  
STA. 19+44

MANHOLE #8+1  
STA. 17+19  
TC=762.01

MAINHOLE #840  
STA. 14+32  
TC=761.38

MANHOLE #839  
STA. 12+27

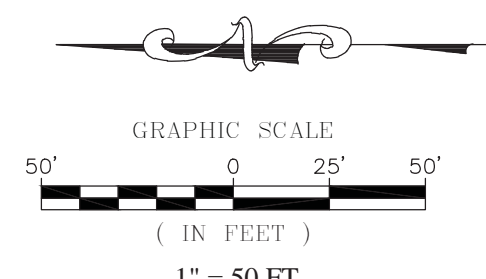
STA. 11+13  
TC=757.99

SEE SHEET C500

MATCH LINE



SEE SHEET C500  
MATCHLINE



- | NOTES |   |
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| 8.    | ALL SANITARY LATERAL LENGTHS MUST BE A MINIMUM OF 4" DIAMETER, IN ACCORDANCE WITH 32" IAC 3-6-83.   |
| 9.    | SANITARY CLEANOUTS SHALL BE PLACED WITHIN 30 FEET OF EACH BUILDING.   |
| 10.   | SHORT SIDE SANITARY LATERALS ON MAIN DEEPER THAN 15' REQUIRED SLIP JOINT.   |

APPROVAL PENDING/NOT FOR CONSTRUCTION

PROVAL PENDING/NOT FOR CONSTRUCTION

ALWAYS ON

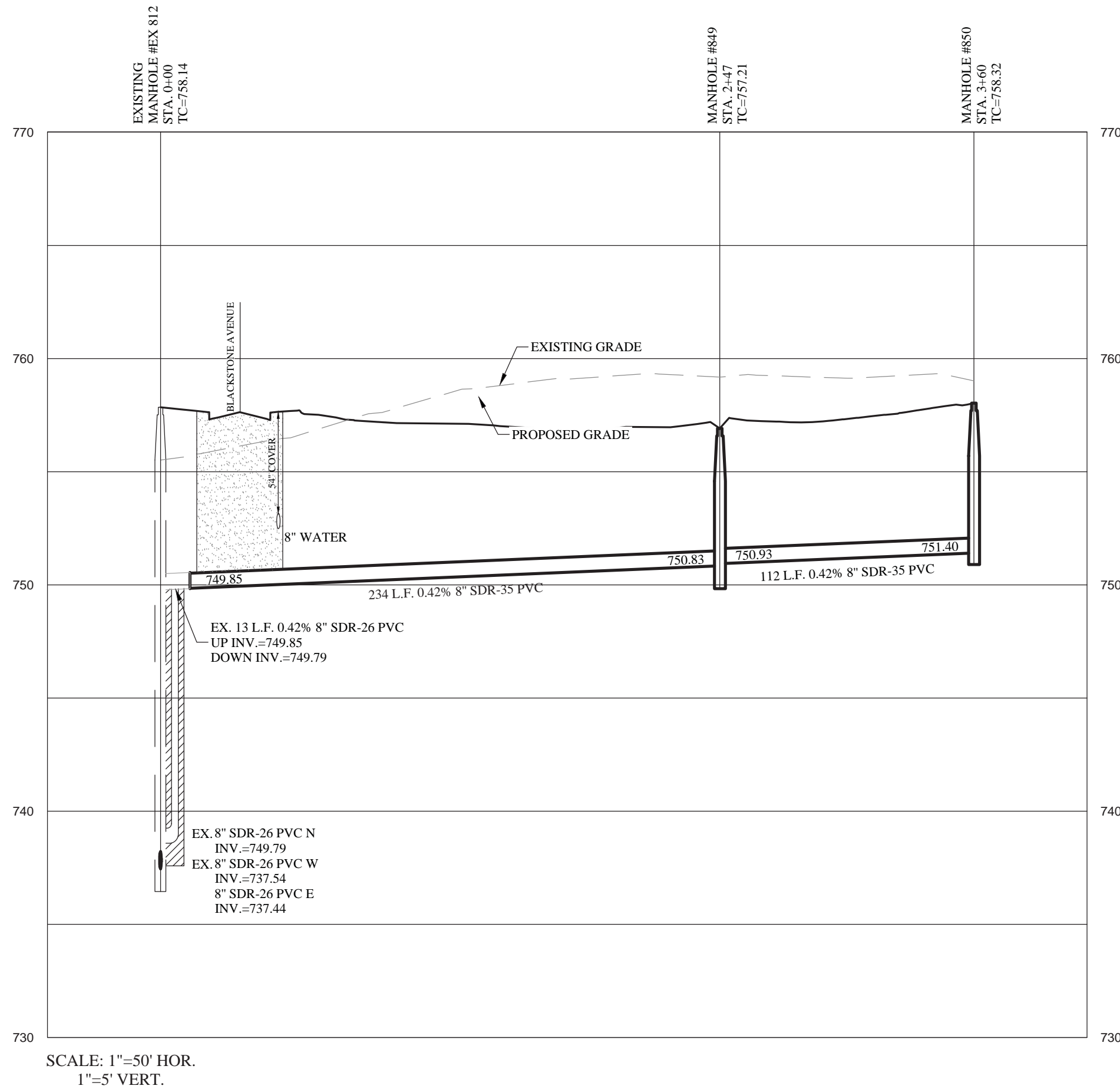
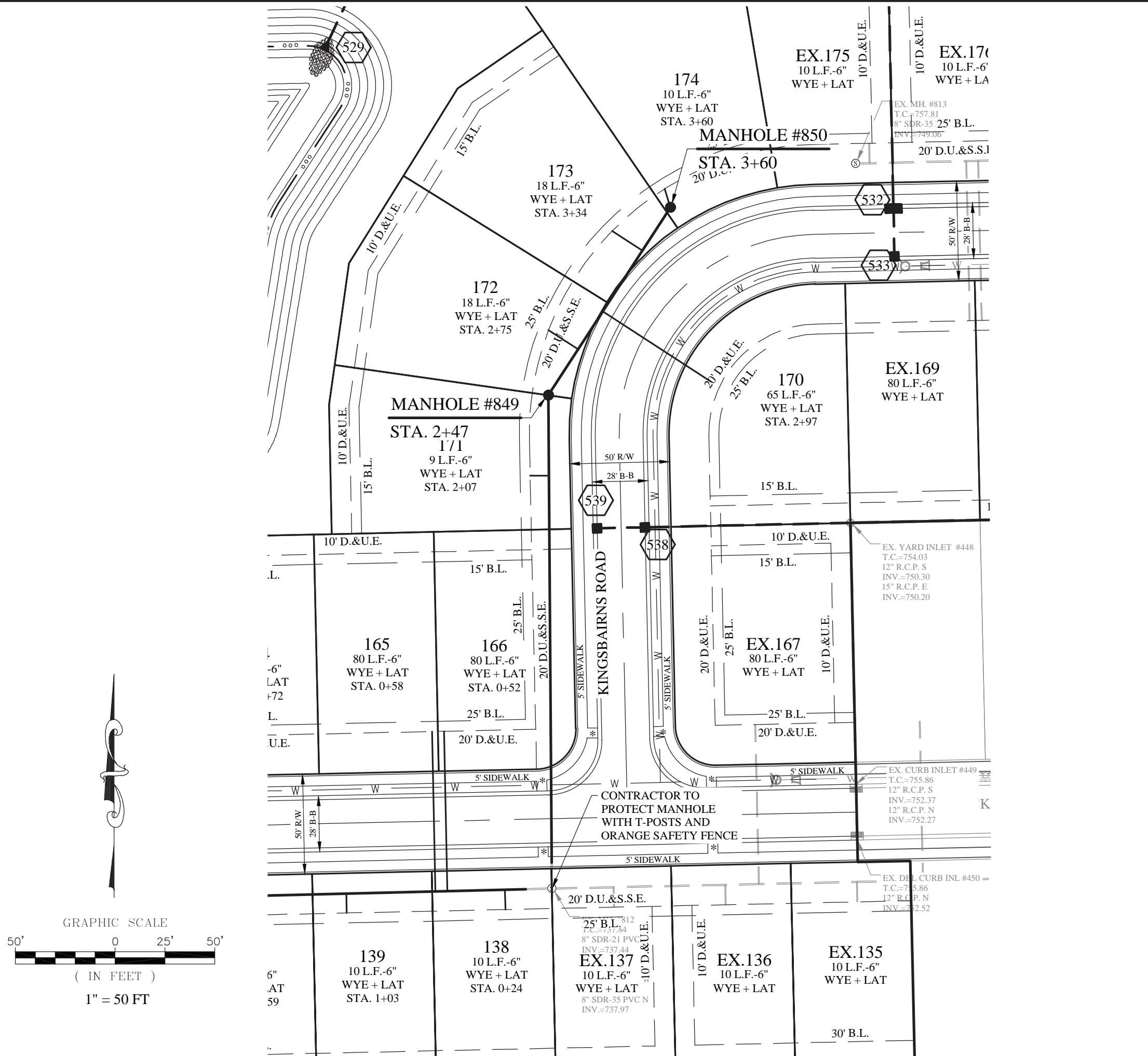
ALWAYS UN  
7965 East 106th Street Fishers, IN 46038-2505

JOHNSON COUNTY, INDIANA

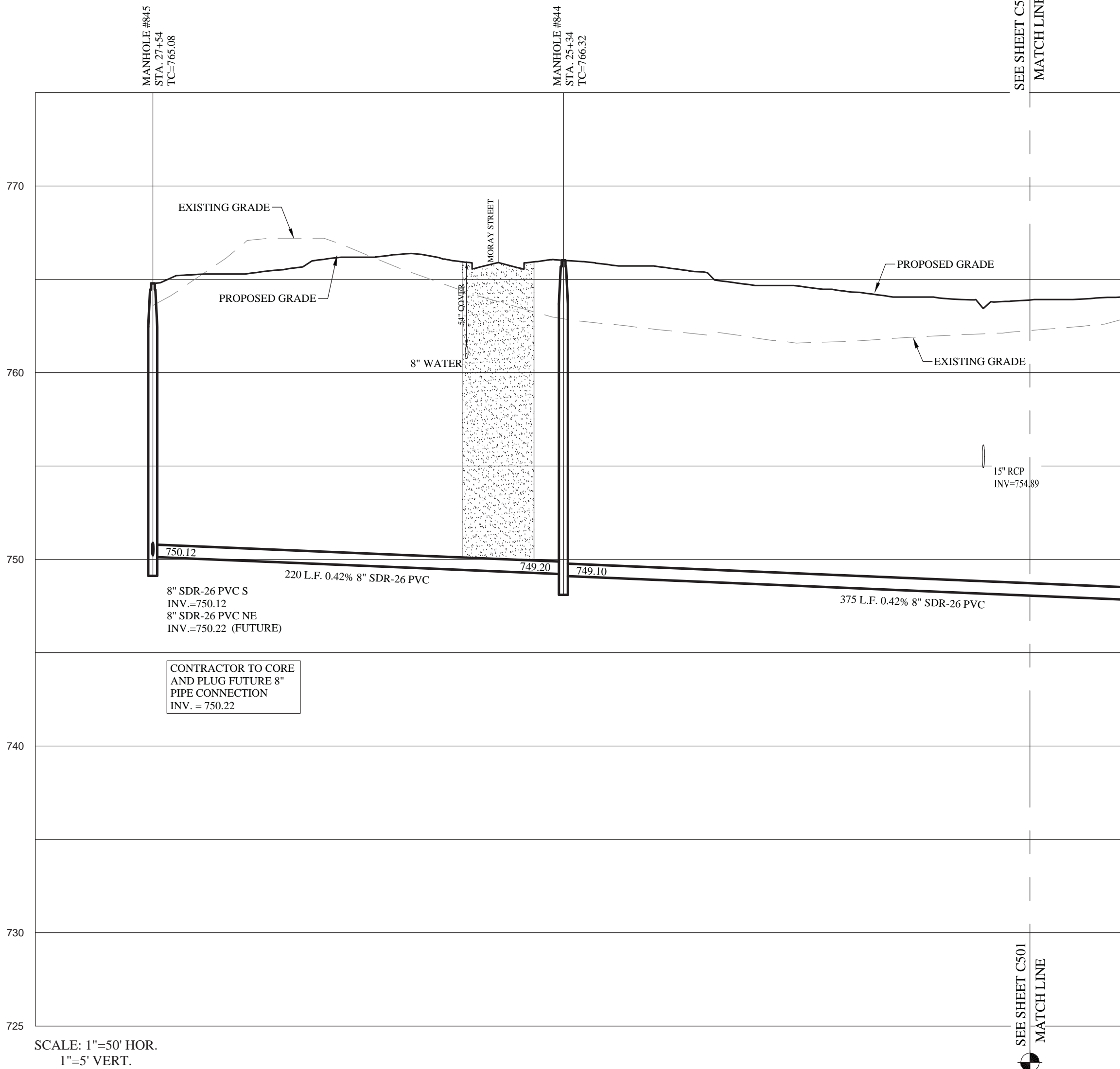
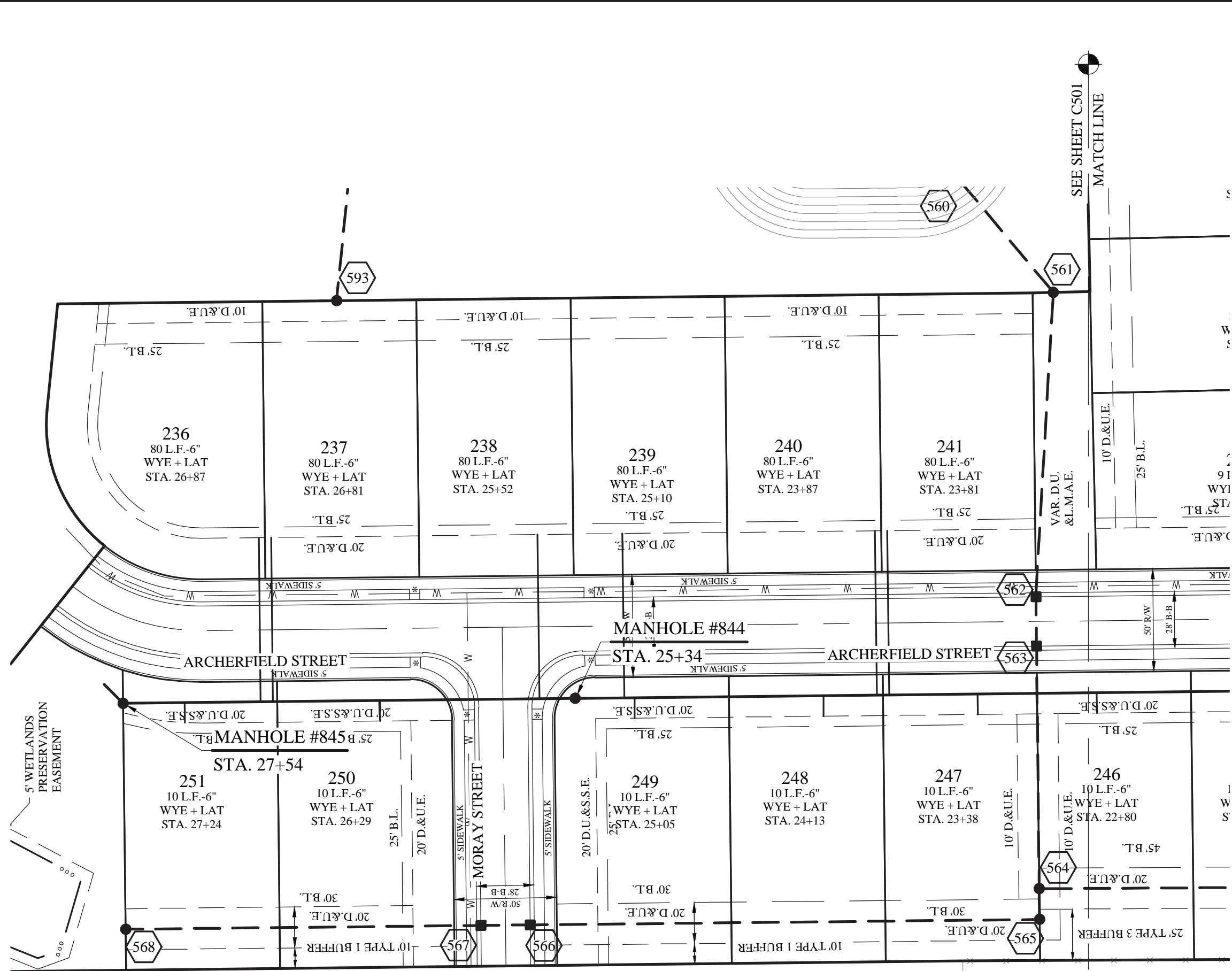
FRANKLIN

DRAWN BY: <b>KJJM/GEM</b>	CHECKED BY: <b>KRG</b>
SHEET NO. <b>C501</b>	
S & A JOB NO. <b>100405FOR-S3</b>	





SCALE: 1"=50' HOR.  
1"=5' VERT.



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**LEGEND**

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**BENCHMARK DATA**

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TBM #30  
CHISELED "X" ON NORTHWEST BOLT OF A FIRE HYDRANT, 35' EAST OF HURRICANE ROAD AND AT THE SOUTH ENTRANCE TO GOLF ACADEMY.  
ELEV.=762.85'



APPROVAL PENDING/NOT FOR CONSTRUCTION

**STOEPPELWERTH**

ALWAYS ON

7965 East 106th Street, Fishers, IN 46038-2905  
phone: 317.846.5905 fax: 317.846.5942

**SANITARY SEWER PLAN & PROFILES**

**WINTERFIELD**

**SECTION 3**

JOHNSON COUNTY, INDIANA

FRANKLIN

DRAWN BY: KJM/GEM  
CHECKED BY: KRG

SHEET NO.

**C502**

S.R.A. JOB NO.  
100405FOR-S3

REVISIONS

DATE

MARK

BY





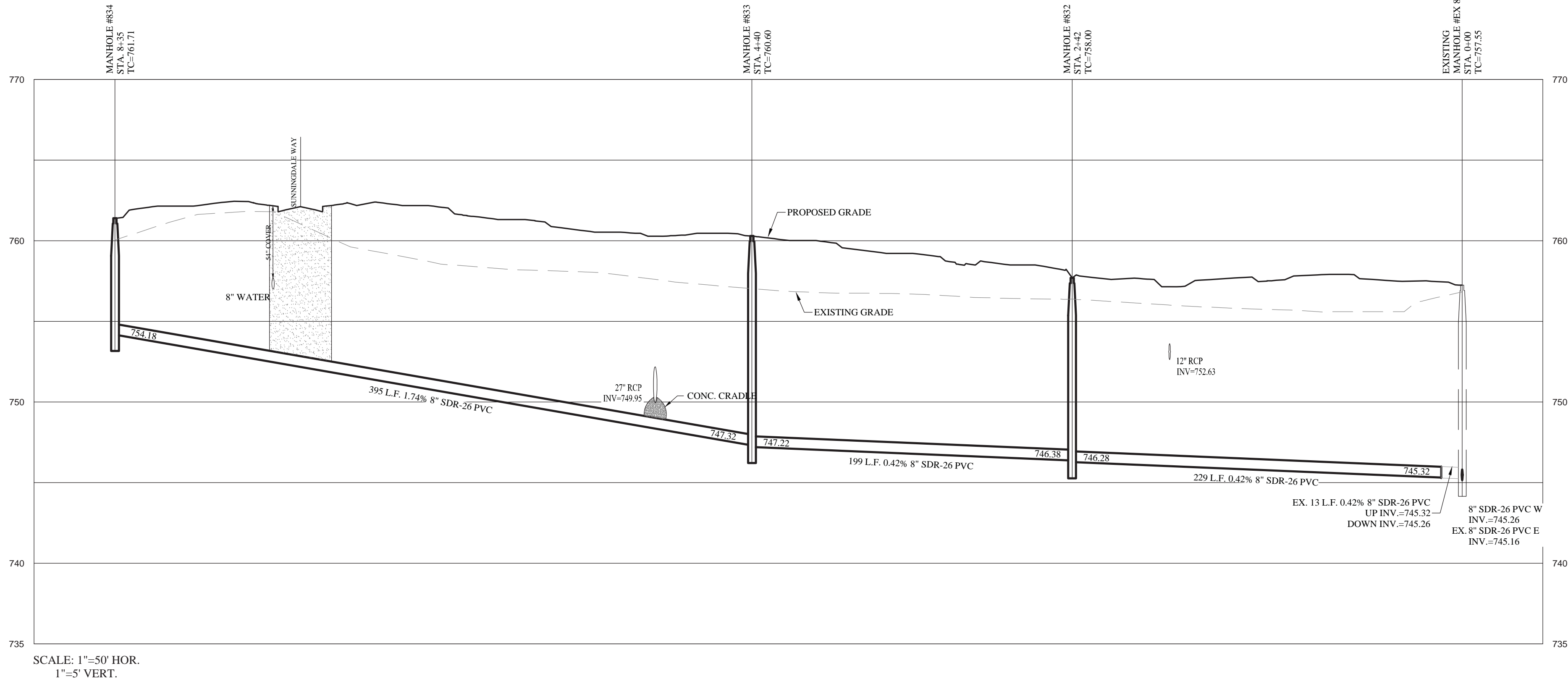
BENCHMARK DATA	
ORIGINATING BENCHMARK	
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- EXISTING STORM SEWER
- EXISTING WATER LINE
- PROPOSED SANITARY SEWER (w/ LATERALS)
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- SHORT SIDE SANITARY LATERALS ON MAIN DEEPER THAN 15' REQUIRE SLIP JOINT.



SANITARY SEWER STRUCTURE & PIPE TABLE												
STR.#	TYPE	T.C.	CASTING TYPE	DIA. IN	DIR. IN	INV. IN	DIA. OUT	DIR. OUT	INV. OUT	SLOPE	PIPE	LENGTH
EX 831	4' MH	757.55	EXISTING	8"	W	745.26	8"	E	745.16	0.42%	EX 831 STUB EX 831-EX 815	13' 248'
EX 812	4' MH	758.14	EXISTING	8"	N	749.79 737.54	8"	E	737.44	0.42%	EX 812 STUB N EX 812 STUB W EX 821 E	13' 13' 313'
EX 851	4' MH	762.29	EXISTING	8"	S	753.13	8"	N	753.04	0.42%	EX 851 STUB S 180	13' 355'
832	4' MH	758.00	R-1772	8"	W	746.38	8"	E	746.28	0.42%	832-833 831-832	199' 229'
833	4' MH	760.60	R-1772	8"	W	747.32	8"	E	747.22	0.42%	832-833 833-834	199' 395'
834	4' MH	761.71	R-1772				8"	E	754.18	1.74%	833-834	395'
835	4' MH	757.71	R-1772	8"	W	738.65	8"	E	738.55	0.42%	835-836 EX 812-835	306' 227'
836	4' MH	759.47	R-1772	8"	W	740.04	8"	E	739.94	0.42%	836-837 835-836	381' 306'
837	4' MH	757.41	R-1772	8"	W	741.74	8"	E	741.64	0.42%	836-837 836-837	381' 381'
838	4' MH	757.99	R-1772	8"	NW	742.62	8"	E	742.52	0.42%	838-839 837-838	115' 186'
839	4' MH	758.85	R-1772	8"	N	743.20	8"	SE	743.10	0.42%	839-840 838-839	205' 115'
840	4' MH	761.38	R-1772	8"	N	744.16 745.16	8"	S	744.06	0.42%	840-841 839-840 840-STUB	287' 205' 13'
841	4' MH	762.01	R-1772	8"	N	745.47 747.11	8"	S	745.37	0.42%	841-842 840-841 841-STUB	225' 287' 13'
842	4' MH	761.61	R-1772	8"	N	746.52	8"	S	746.42	0.42%	842-843 841-842	215' 225'
843	4' MH	763.79	R-1772	8"	N	747.52 747.62	8"	S	747.42	0.42%	843-844 842-843 843-846	375' 215' 222'
844	4' MH	766.32	R-1772	8"	N	749.20	8"	S	749.10	0.42%	844-845 843-844	220' 375'
845	4' MH	765.08	R-1772	8"	NE	750.22	8"	S	750.12	0.42%	844-845 845-STUB	220' 13'
846	4' MH	761.95	R-1772	8"	E	750.03	8"	W	749.93	1.04%	846-847 843-846	307' 222'
847	4' MH	762.70	R-1772	8"	E	751.42	8"	W	751.32	0.42%	847-848 846-847	222' 307'
848	4' MH	760.18	R-1772				8"	W	752.35	0.42%	847-848	222'
849	4' MH	757.21	R-1772	8"	NE	750.93	8"	S	750.83	0.42%	849-850 EX 812-849	112' 234'
850	4' MH	758.32	R-1772				8"	SW	751.40	0.42%	849-850	112'
852	4' MH	760.81	R-1772	8"	W	754.27	8"	N	754.17	0.42%	852-853 851-852	82' 234'
853	4' MH	760.34	R-1772				8"	E	754.61	0.42%	852-853	82'



APPROVAL PENDING/NOT FOR CONSTRUCTION

**STOEPPELWERTH**

ALWAYS ON

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**SANITARY SEWER PLAN & PROFILES**

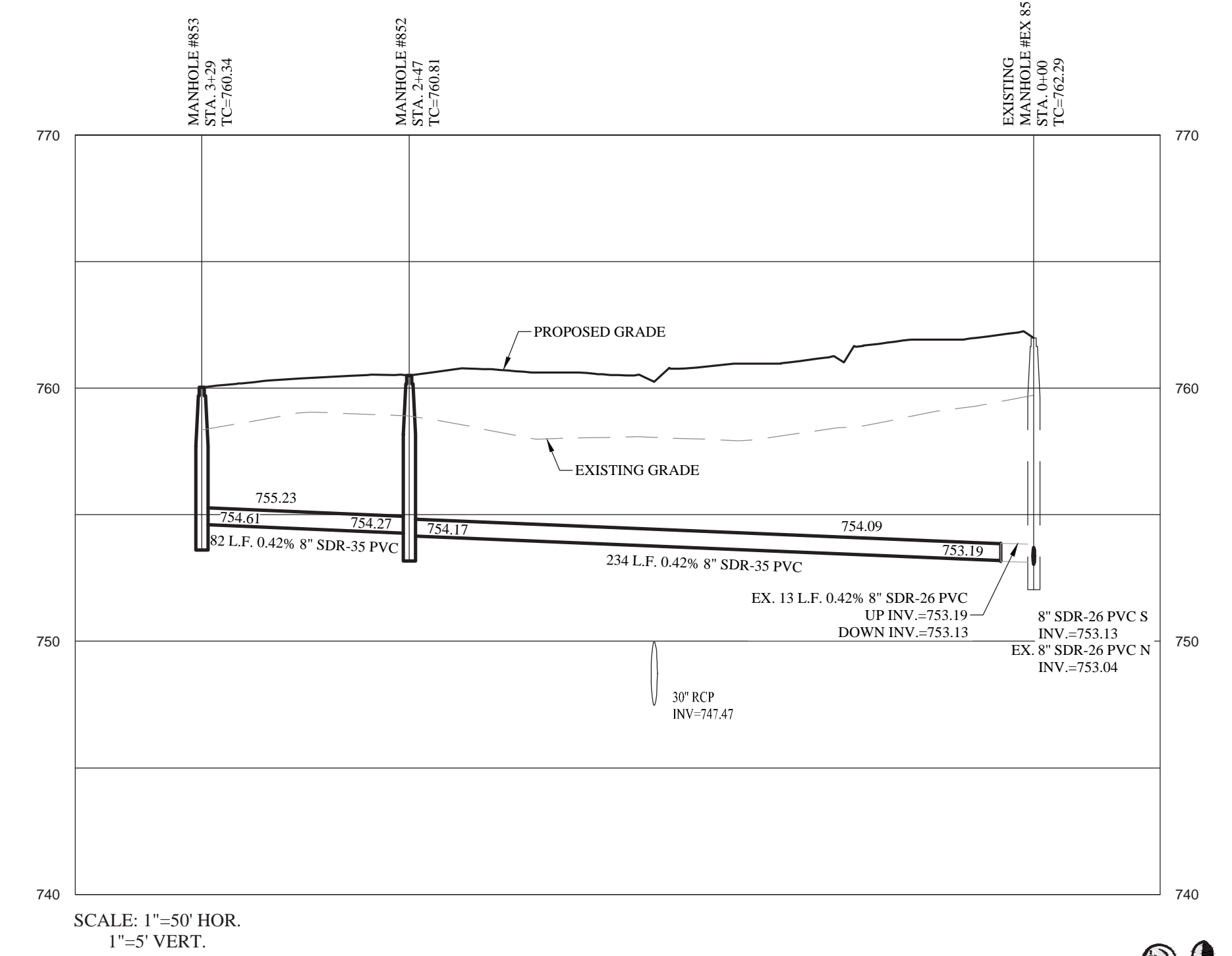
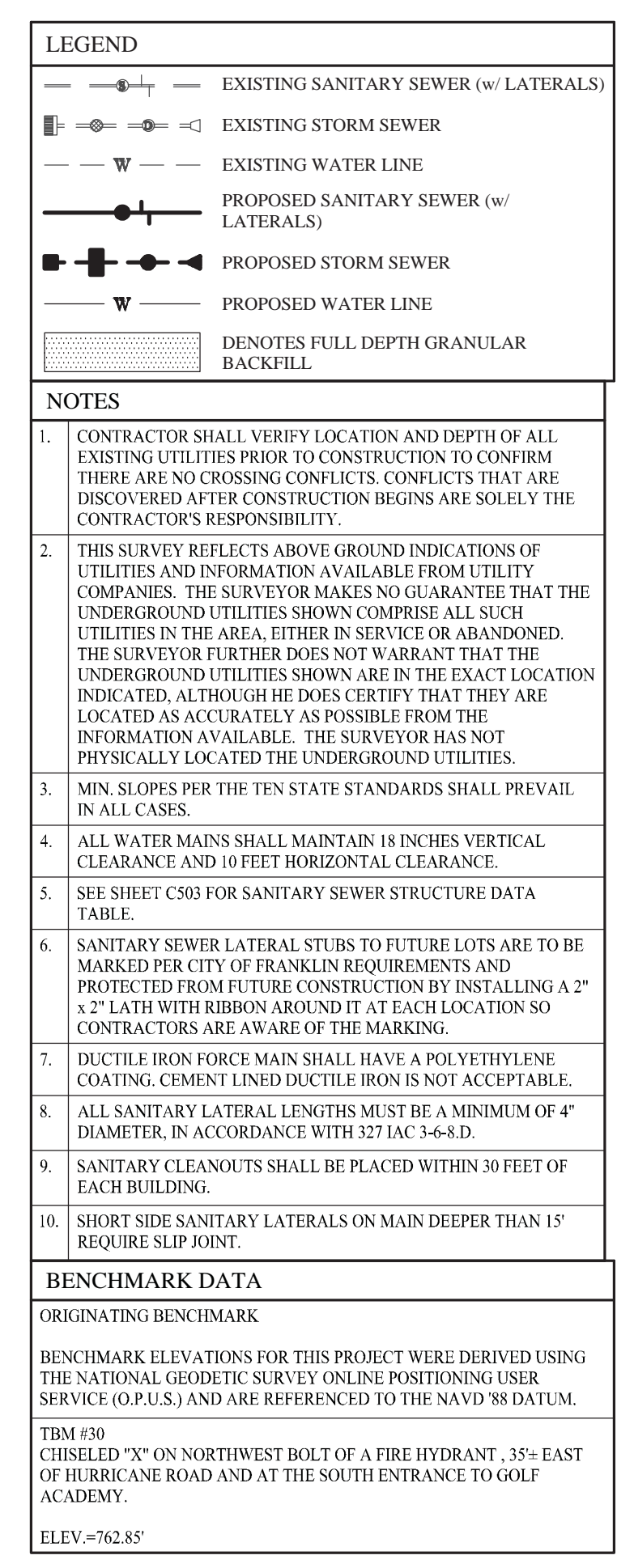
**WINTERFIELD SECTION 3**

JOHNSON COUNTY, INDIANA




FRANKLIN

DRAWN BY: KJM/GEM  
CHECKED BY: KRG  
SHEET NO: C503  
E & A FOR NO: 100405FOR-S3

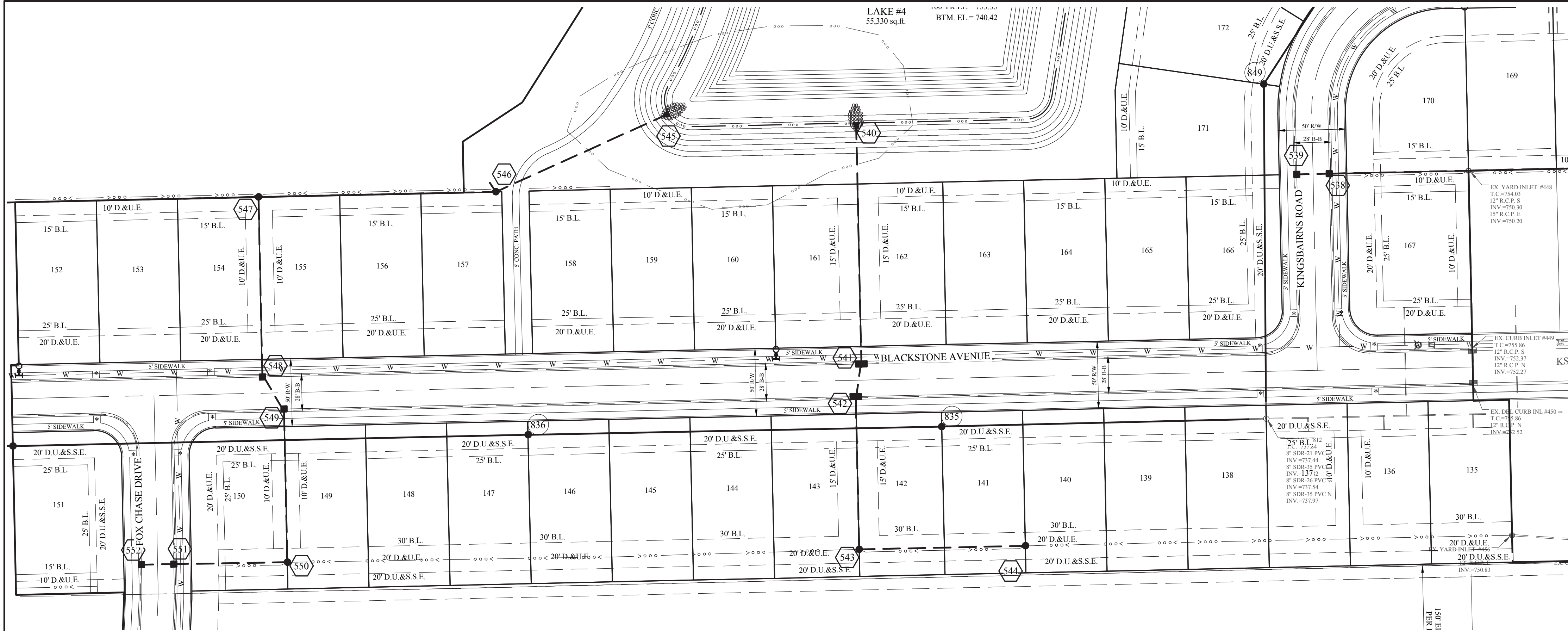




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Modified / By:  
Plotted / By:

DRAWN BY <b>KJM/GEM</b>	CHECKED BY <b>KRG</b>	SHEET NO. <b>C504</b>	14-A FOR NO. <b>100405FOR-53</b>	SANITARY SEWER PLAN & PROFILES  <b>WINTERFIELD SECTION 3</b>	JOHNSON COUNTY, INDIANA  <b>FRANKLIN</b>		APPROVAL: PENDING/NOT FOR CONSTRUCTION  <b>STOEPELWERTH</b>	ALWAYS ON 7945 East 106th Street, Fishers, IN 46038-2925 phone: 317.848.5925 fax: 317.848.5942	CERTIFIED: 07/11/24 		DATE	MARK	REVISIONS	BY

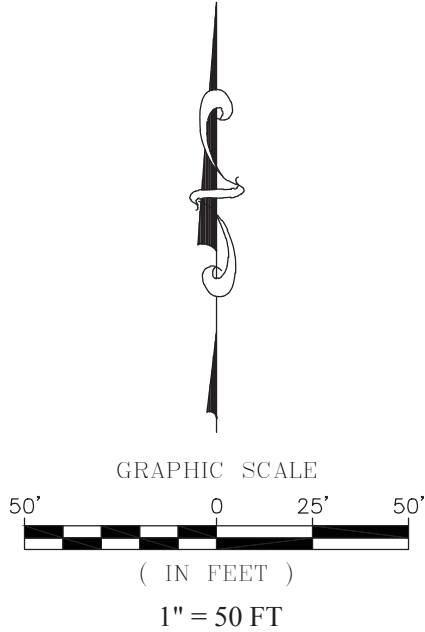




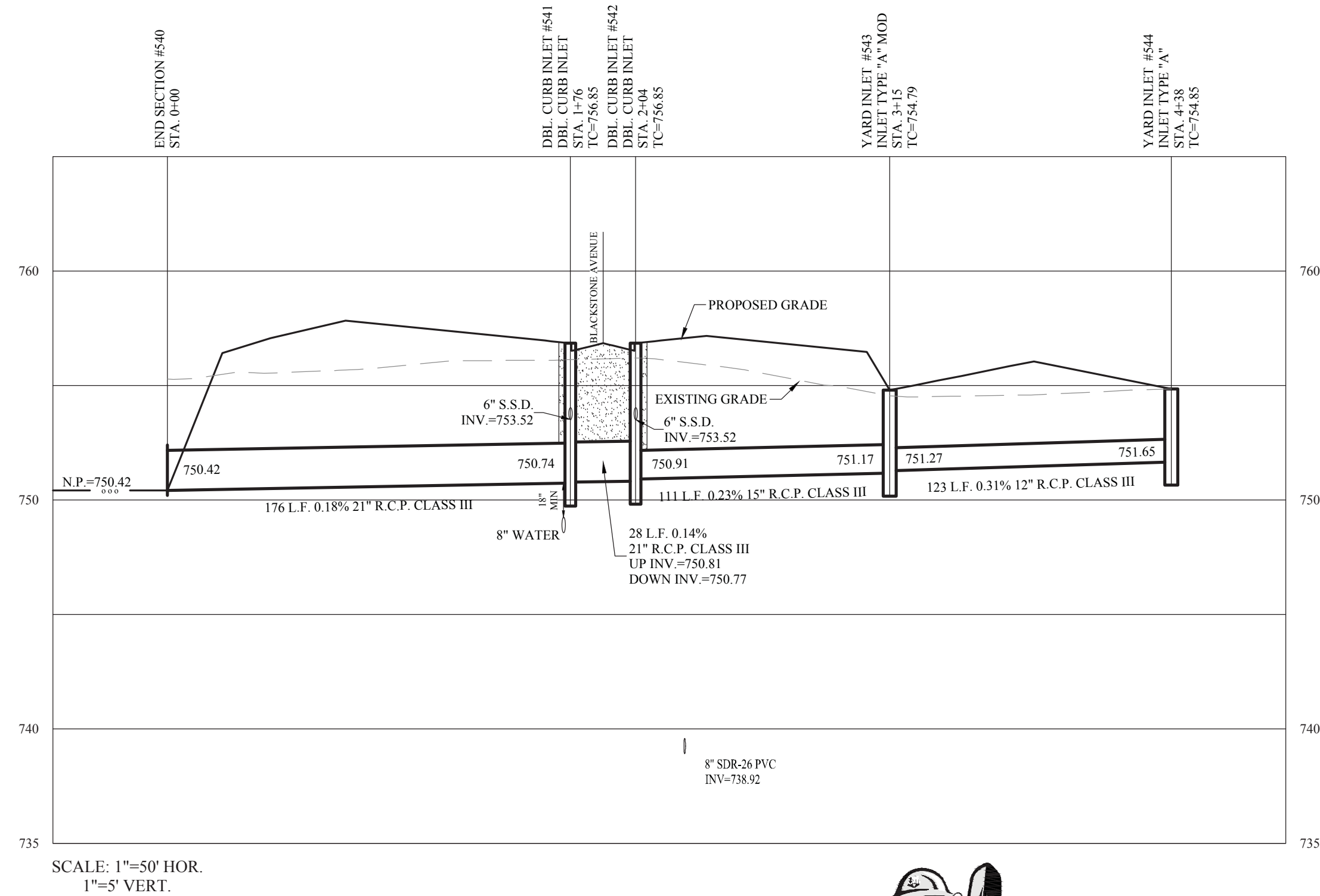
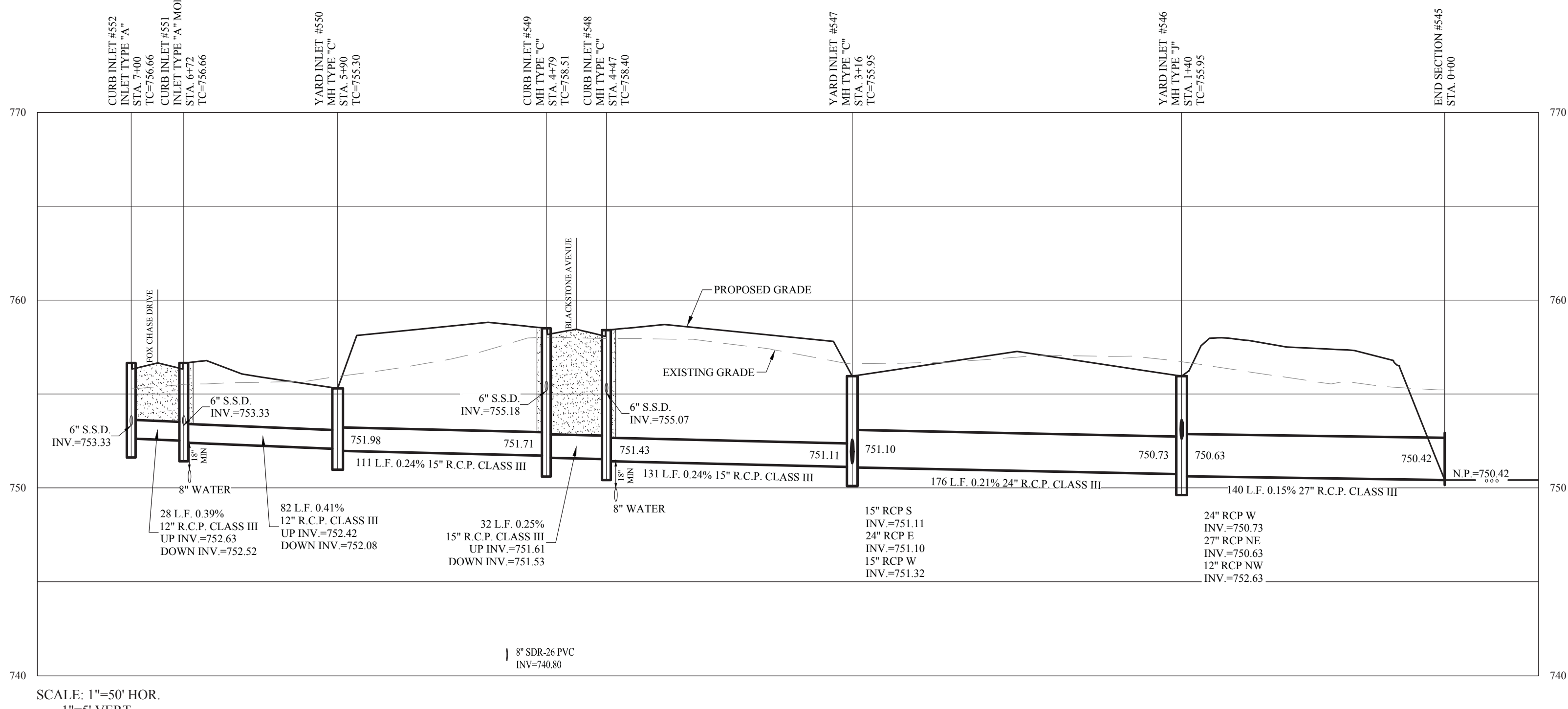
LEGEND	
EXISTING FEATURES	
— W —	WATER MAIN
— OHE —	ELECTRICAL LINE, OVERHEAD
— G —	GAS MAIN
— FM —	FORCEMAIN, SANITARY
— SS —	SANITARY SEWER
— S —	STORM SEWER
— 870 —	CONTOUR
— 0.00 —	NORMAL WATER ELEVATION
— 0.00 —	WATER FLOWLINE
PROPOSED FEATURES	
— W —	WATER MAIN
— SS —	SANITARY SEWER
— S —	STORM SEWER
— 870 —	CONTOUR
— 0.00 —	NORMAL WATER ELEVATION
— 0.00 —	SWALE FLOWLINE
— 6" SUB-SURFACE DRAIN (SWALE)	
— DENOTES FULL DEPTH GRANULAR BACKFILL	
— E —	ELECTRIC LINES

- NOTES
- CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION TO CONFIRM THERE ARE NO CROSSING CONFLICTS. CONFLICTS THAT ARE DISCOVERED AFTER CONSTRUCTION BEGINS ARE SOLELY THE CONTRACTOR'S RESPONSIBILITY.
  - THIS SURVEY REFLECTS ABOVE GROUND INDICATIONS OF UTILITIES AND INFORMATION AVAILABLE FROM UTILITY COMPANIES. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.
  - ALL WATER MAINS SHALL MAINTAIN 18 INCHES VERTICAL CLEARANCE AND 10 FEET HORIZONTAL CLEARANCE.
  - SEE SHEETS C801A - C801C FOR STRUCTURE DETAILS.
  - SEE SHEET C608 FOR STORM SEWER STRUCTURE DATA TABLE.

BENCHMARK DATA	
ORIGINATING BENCHMARK	
BENCHMARK ELEVATIONS FOR THIS PROJECT WERE DERIVED USING THE NATIONAL GEODETIC SURVEY ONLINE POSITIONING USER SERVICE (O.P.U.S.) AND ARE REFERENCED TO THE NAVD'83 DATUM.	
BM #30 CHISELED "X" ON NORTHWEST BOLT OF A FIRE HYDRANT, 25' EAST OF HURRICANE ROAD AND AT THE SOUTH ENTRANCE TO GOLF ACADEMY.	
ELEV. = 762.85'	



- NOTES:
- No structures, or improvements shall be permitted within The Legal Drain Easement. All utilities, buildings, structures, plantings, crops, trees, shrubs, and woody vegetation grown within the easement, or along the legal drain are at the risk of owner and subject to removal with minimal notice, without restitution, and subject to special assessment ... (IC 36-9-27-33).
  - This site plots by scale as being within a Regulated Watershed. Any and all site improvements within a regulated watershed are subject to review by The Johnson County Drainage Board. All tracts within a Regulated Drain Watershed are subject to assessments for Maintenance (IC 36-9-27-44), and when practicable, Reconstruction (IC 36-9-27-51).
  - No construction, or improvements shall impair or negatively impact any Private Drain Tile (IC 36-9-27-2) known or unknown. No construction, or improvements shall impair, impede, or negatively impact, a Natural Surface Watercourse (IC 36-9-27-4-3). When encountered said tile or watercourse will be designed, and re-routed so not to impede, impair, or negatively impact surface or subsurface water flow.
  - Private tiles, and mutual drain Connections to Regulated Drain (IC 36-27-9-17). All connections, or out-lets into a regulated drain are subject to approval by the county surveyor ( $\leq 10'$ ), or The Johnson County Drainage Board ( $\geq 11'$ ). Applications are available in the county surveyor's office and should include all maps, plans, specifications, bonding, easement verbiage, application fees and owners statement of water quality (IC 36-27-9-23), prior to approval.
  - Easement Provided, however, that Grantor and Grantee, their heirs, successors, and assigns, agree that the easement provided for herein and the drainage structures within said easement shall not be modified, extinguished, or altered in any way without the express written approval of the Johnson County Drainage Board.



APPROVAL PENDING / NOT FOR CONSTRUCTION

STOEPPELWERTH

ALWAYS ON

7965 East 106th Street, Fishers, IN 46038-2505  
phone: 317.849.5955 fax: 317.849.5942

STORM SEWER PLAN & PROFILES

WINTERFIELD SECTION 3

JOHNSON COUNTY, INDIANA

DRAWN BY: KJ/M/GEM

CHECKED BY: KR

SHEET NO.

C600

S.A.A JOB NO. 100405FOR-S3

THIS DRAWING IS NOT INTENDED TO BE REPRESENTED AS A RETAINMENT OR ORIGINAL BOUNDARY SURVEY, A ROUTE SURVEY OR A SURVEYOR LOCATION REPORT.

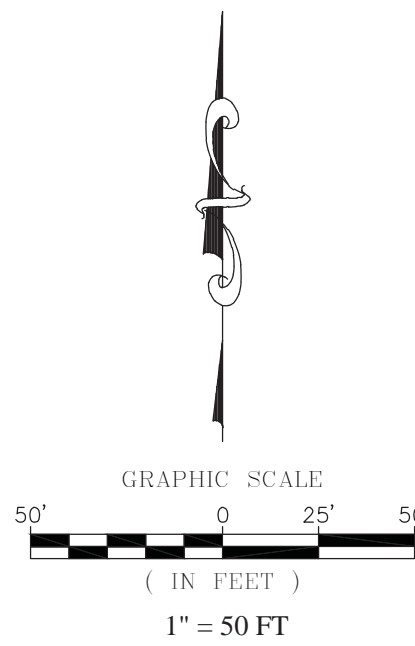
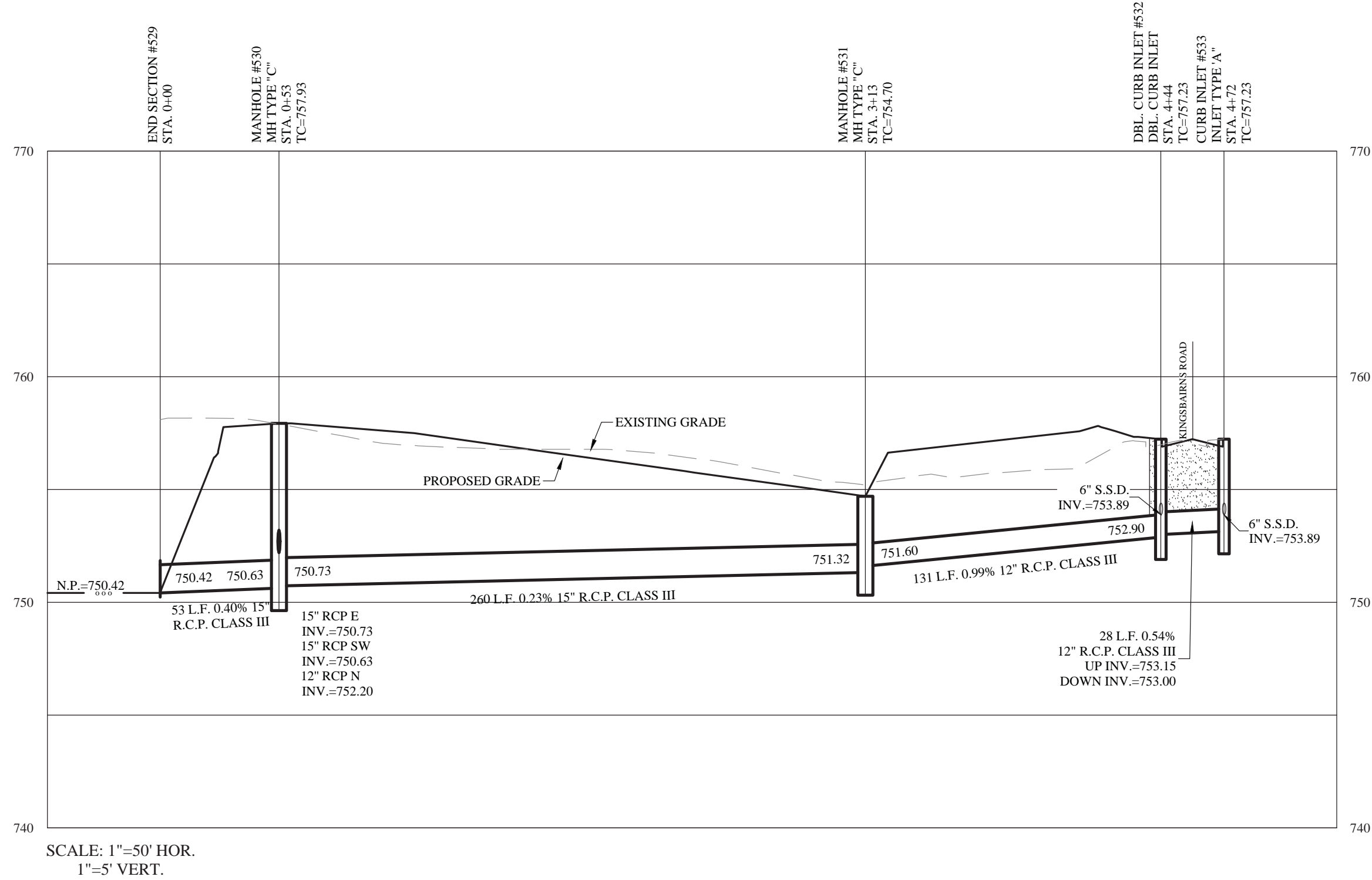
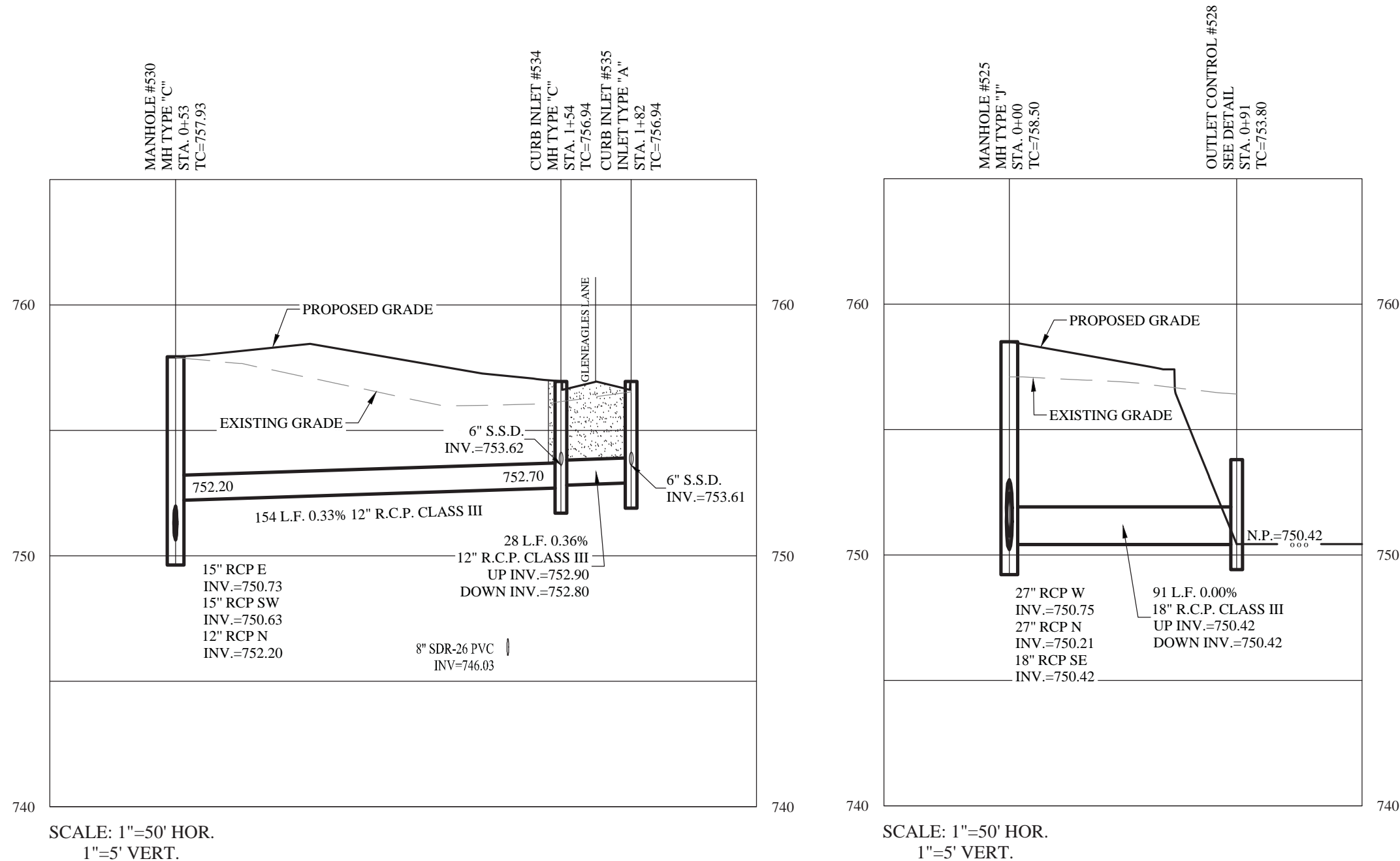
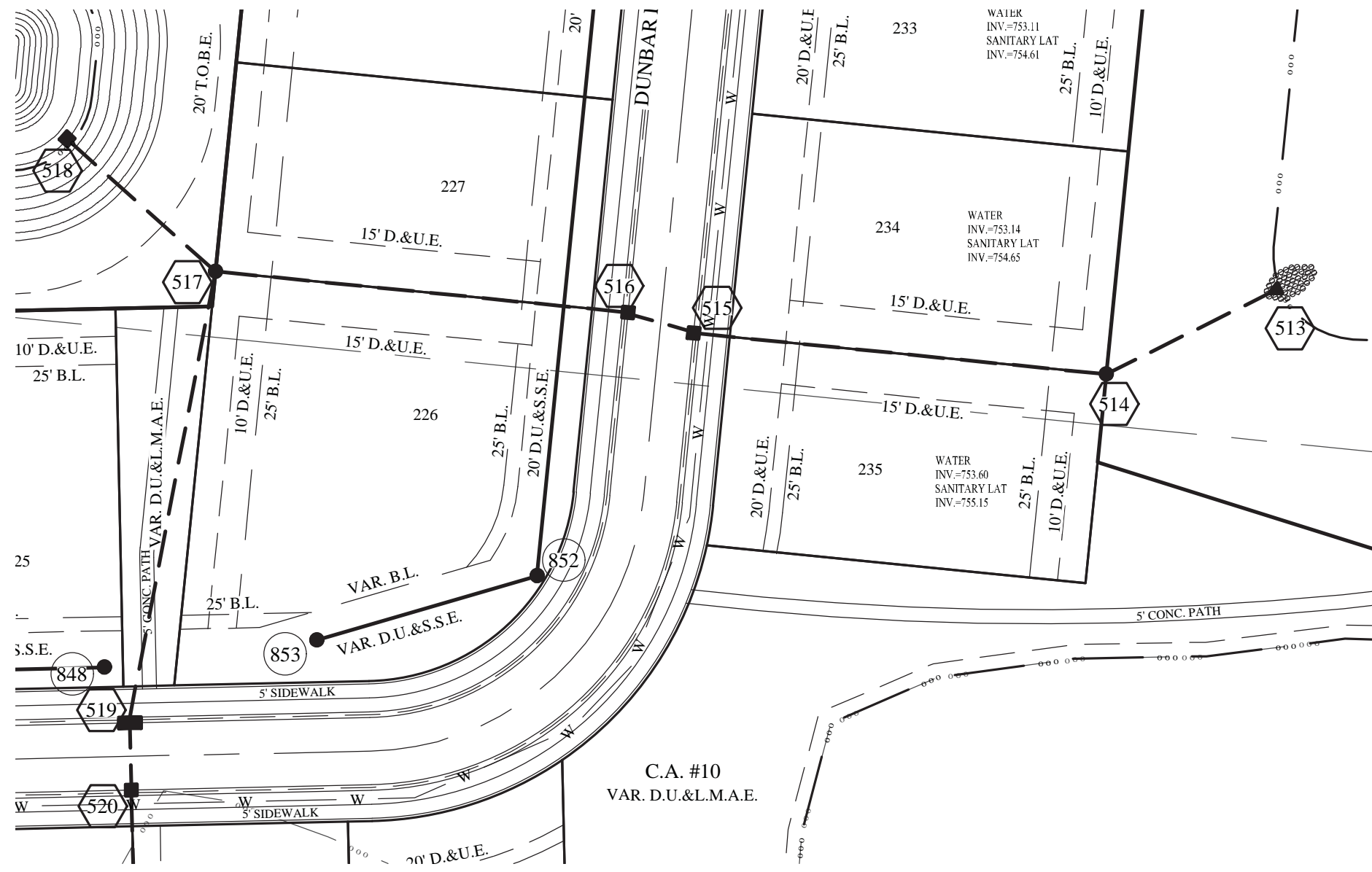
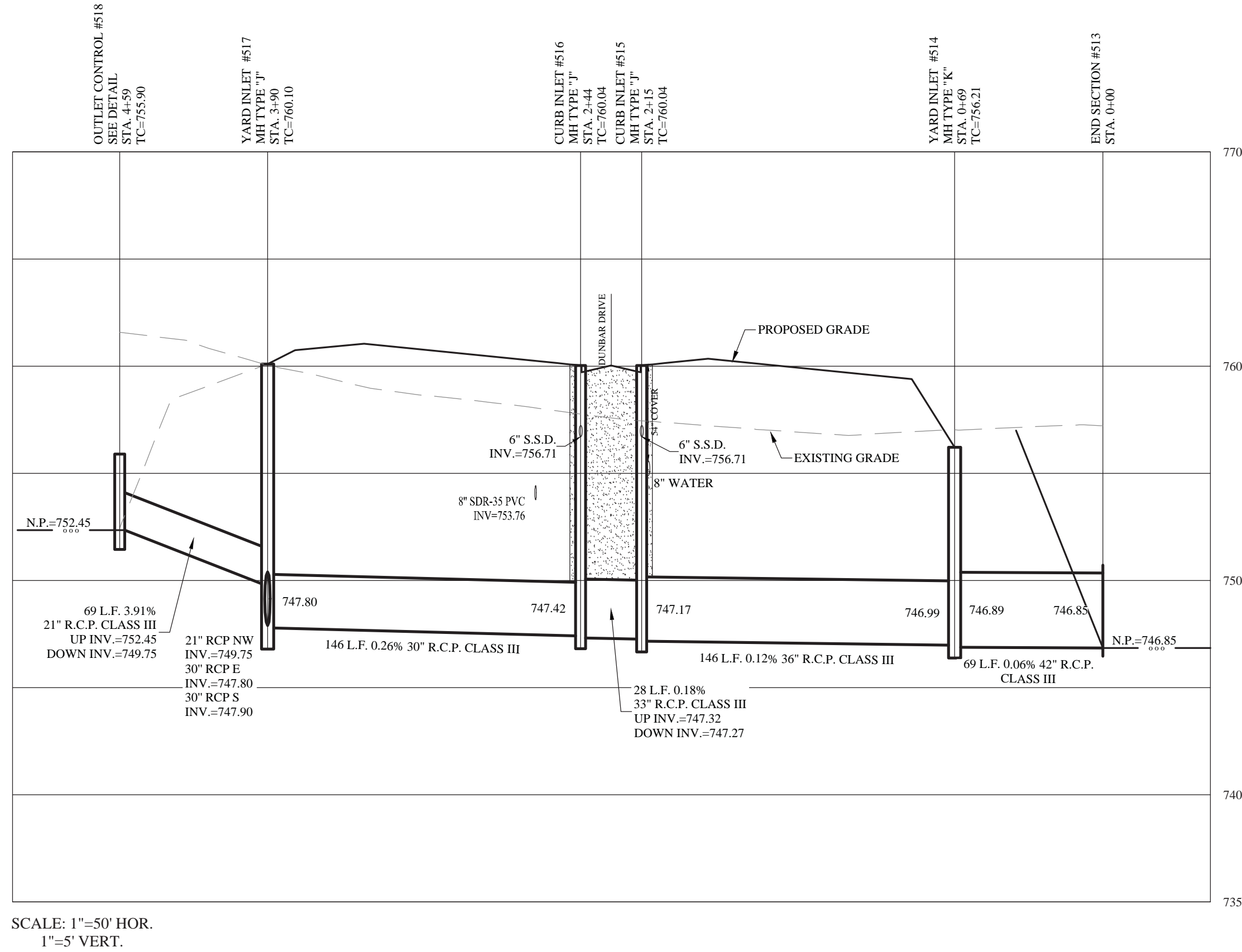
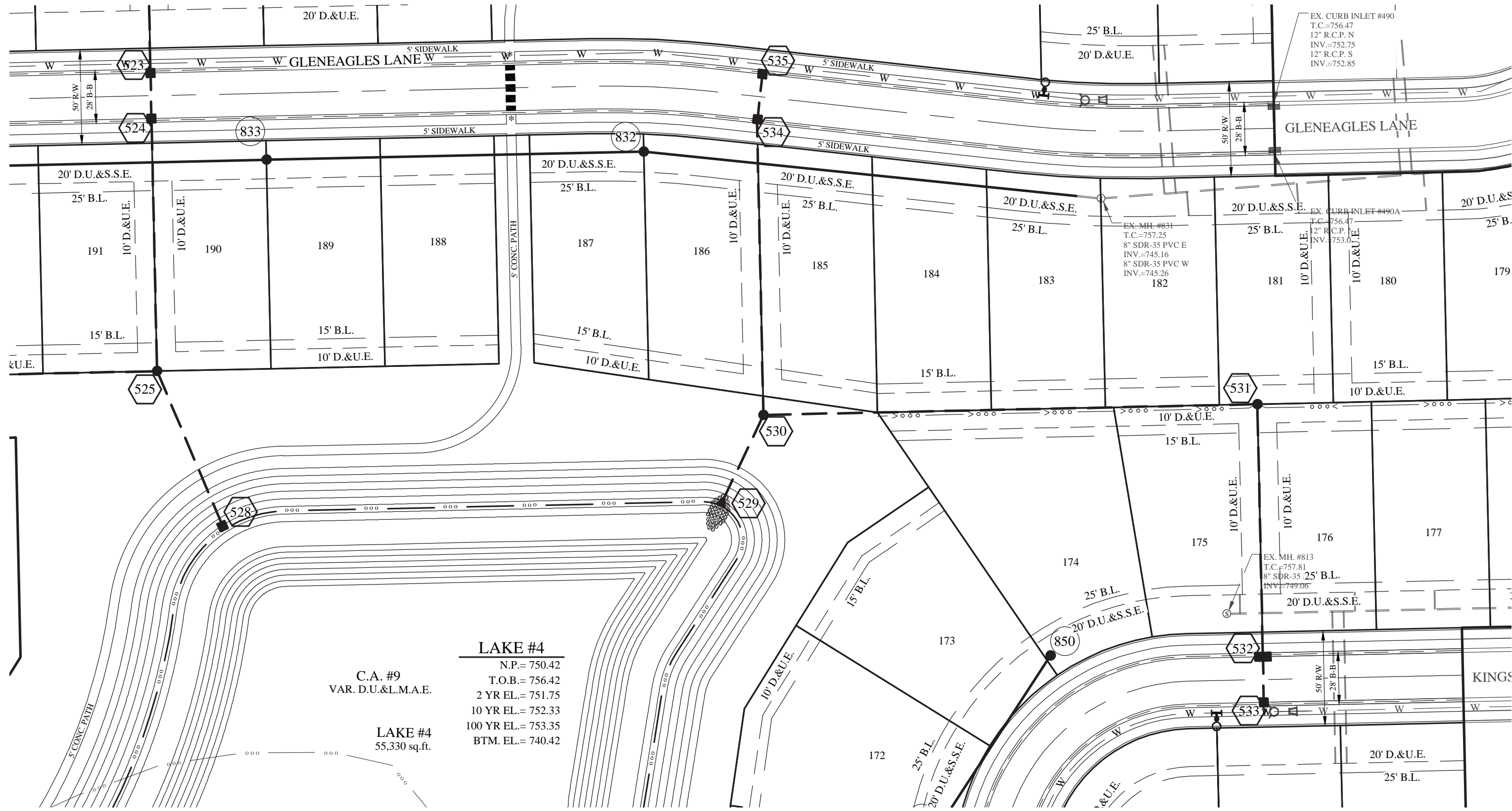
DATE

MARK

REVISIONS

BY





LEGEND	
EXISTING FEATURES	
— W —	WATER MAIN
— OHE —	ELECTRICAL LINE, OVERHEAD
— G —	GAS MAIN
— FM —	FORCEMAIN, SANITARY
— S —	SANITARY SEWER
— S — S —	STORM SEWER
— 870 —	CONTOUR
— 000 —	NORMAL WATER ELEVATION
— >000 —	WATER FLOWLINE
PROPOSED FEATURES	
— W —	WATER MAIN
— S —	SANITARY SEWER
— S — S —	STORM SEWER
— 870 —	CONTOUR
— 000 —	NORMAL WATER ELEVATION
— >000 —	SWALE FLOWLINE
— S —	CURB & GUTTER w/ 6" UNDERDRAIN
— S —	6" SUB-SURFACE DRAIN (SWALE)
— S —	DENOTES FULL DEPTH GRANULAR BACKFILL

- NOTES
1. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION TO CONFIRM THERE ARE NO CROSSING CONFLICTS. CONFLICTS THAT ARE DISCOVERED AFTER CONSTRUCTION BEGINS ARE SOLELY THE CONTRACTOR'S RESPONSIBILITY.
  2. THIS SURVEY REFLECTS ABOVE GROUND INDICATIONS OF UTILITIES AND INFORMATION AVAILABLE FROM UTILITY COMPANIES. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.
  3. ALL WATER MAINS SHALL MAINTAIN 18 INCHES VERTICAL CLEARANCE AND 10 FEET HORIZONTAL CLEARANCE.
  4. SEE SHEETS C601A - C601C FOR STRUCTURE DETAILS.
  5. SEE SHEET C608 FOR STORM SEWER STRUCTURE DATA TABLE.

BENCHMARK DATA	
ORIGINATING BENCHMARK	
BENCHMARK ELEVATIONS FOR THIS PROJECT WERE DERIVED USING THE NATIONAL GEODETIC SURVEY ONLINE POSITIONING USER SERVICE (OPUS) AND ARE REFERENCED TO THE NAVD 83 DATUM.	
TBM #30 CHISELED "X" ON NORTHWEST BOLT OF A FIRE HYDRANT, 35'-EAST OF HURRICANE ROAD AND AT THE SOUTH ENTRANCE TO GOLF ACADEMY.	
ELEV.=762.85'	

APPROVAL PENDING/NOT FOR CONSTRUCTION

STOEPELWERTH

ALWAYS ON

7965 East 106th Street, Fishers, IN 46038-2505  
phone: 317.849.5955 fax: 317.849.5942

STORM SEWER PLAN & PROFILES

WINTERFIELD

SECTION 3

DRAWN BY: KJ/M/GEM

CHECKED BY: KR/G

SHEET NO: C601

S & A JOB NO: 100405FOR-S3

JOHNSON COUNTY, INDIANA

FRANKLIN

REVISIONS

DATE

MARK

BY



LEGEND	
EXISTING FEATURES	
	WATER MAIN
	ELECTRICAL LINE, OVERHEAD
	GAS MAIN
	FORCE MAIN, SANITARY
	SANITARY SEWER
	STORM SEWER
	CONTOUR
	NORMAL WATER ELEVATION
	WATER FLOWLINE
PROPOSED FEATURES	
	WATER MAIN
	SANITARY SEWER
	STORM SEWER
	CONTOUR
	NORMAL WATER ELEVATION
	SWALE FLOWLINE
	CURB & GUTTER w/ 6' UNDERDRAIN
	6' SUB-SURFACE DRAIN (SWALE)
	DENOTES FULL DEPTH GRANULAR BACKFILL

- NOTES
- CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION TO CONFIRM THERE ARE NO CROSSING CONFLICTS. CONFLICTS THAT ARE DISCOVERED AFTER CONSTRUCTION BEGINS ARE SOLELY THE CONTRACTOR'S RESPONSIBILITY.
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  - SEE SHEET C608 FOR STORM SEWER STRUCTURE DATA TABLE.

BENCHMARK DATA

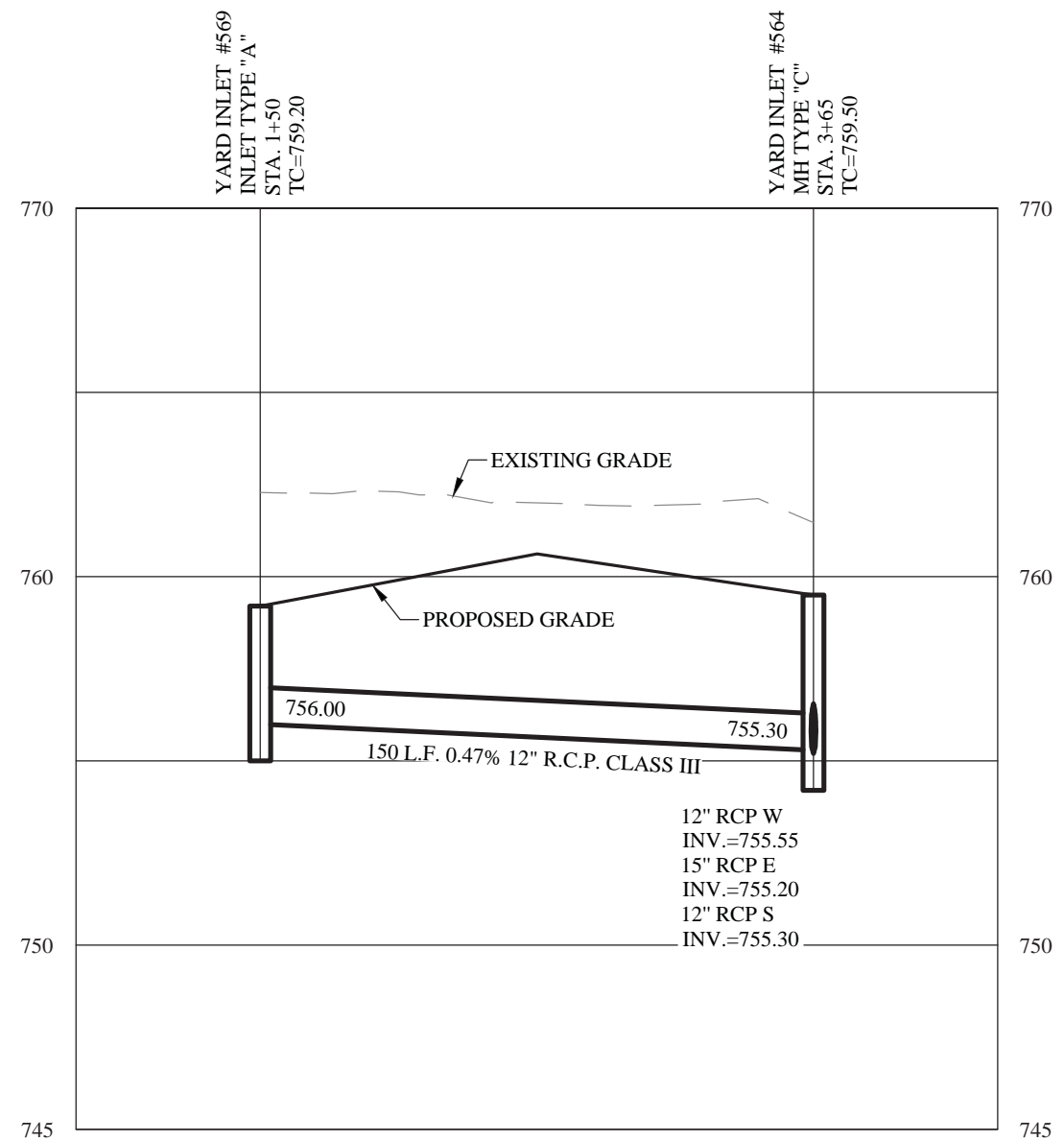
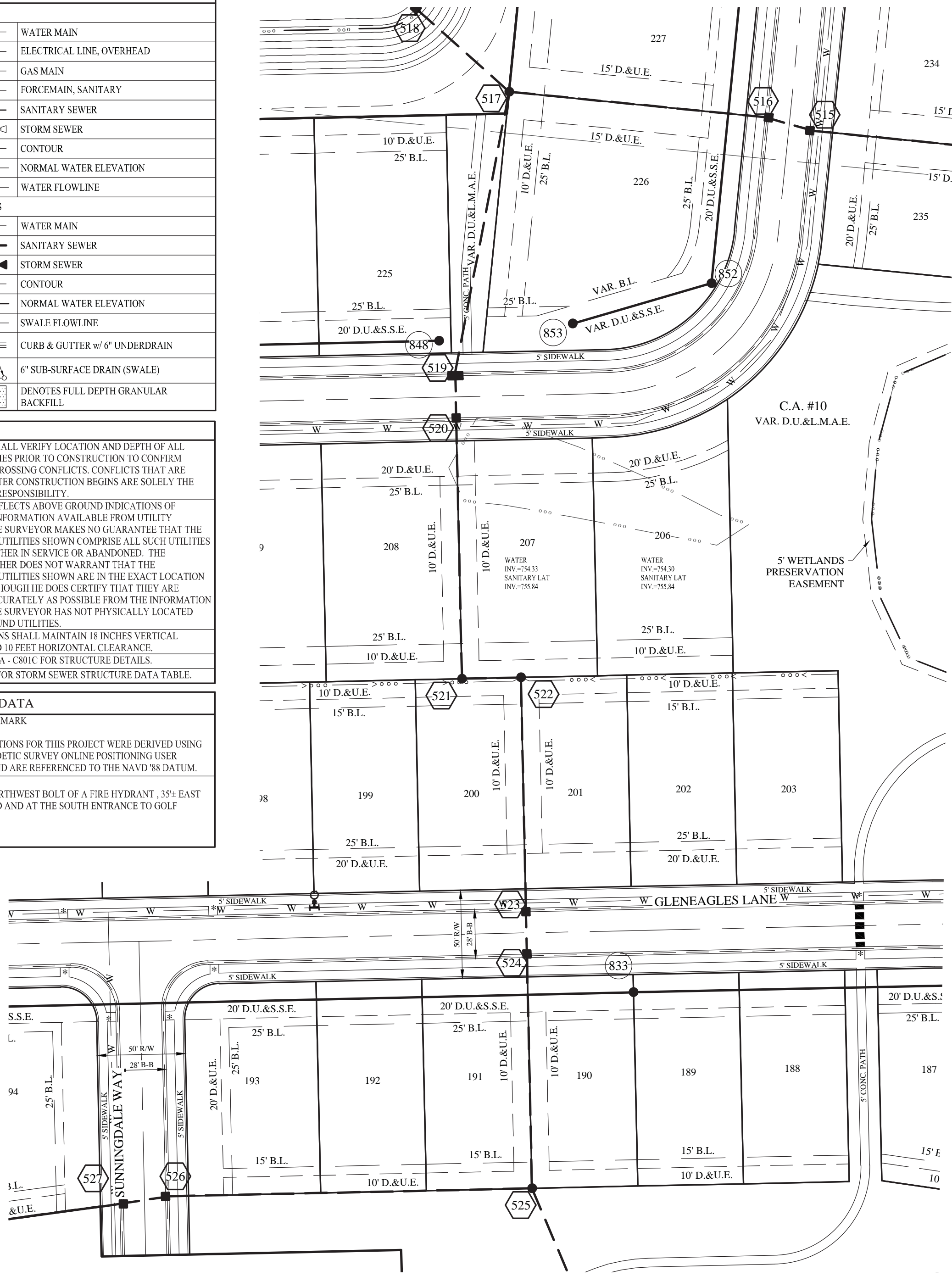
ORIGINATING BENCHMARK

BENCHMARK ELEVATIONS FOR THIS PROJECT WERE DERIVED USING THE NATIONAL GEODETIC SURVEY ONLINE POSITIONING USER SERVICE (O.P.U.S.) AND ARE REFERENCED TO THE NAVD 88 DATUM.

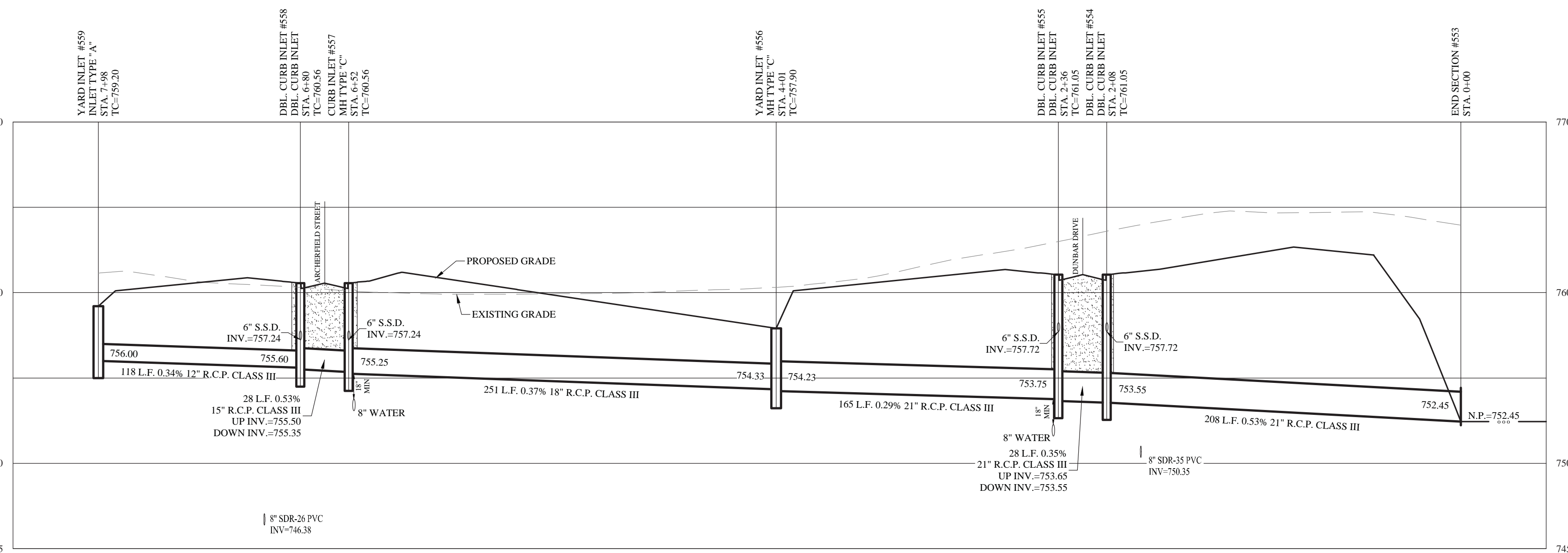
TBM #39

CHISELED "X" ON NORTHWEST BOLT OF A FIRE HYDRANT, 35'-EAST OF HURRICANE ROAD AND AT THE SOUTH ENTRANCE TO GOLF ACADEMY.

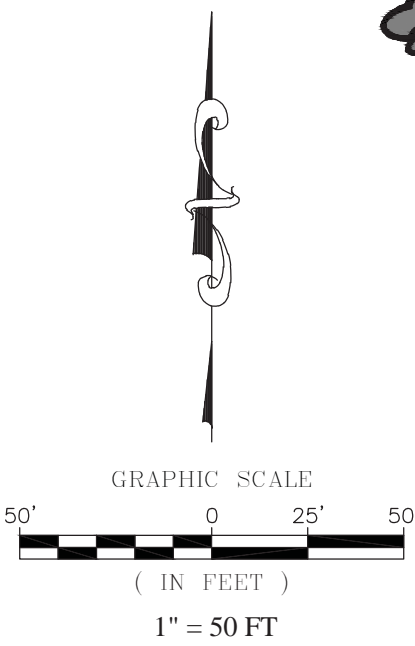
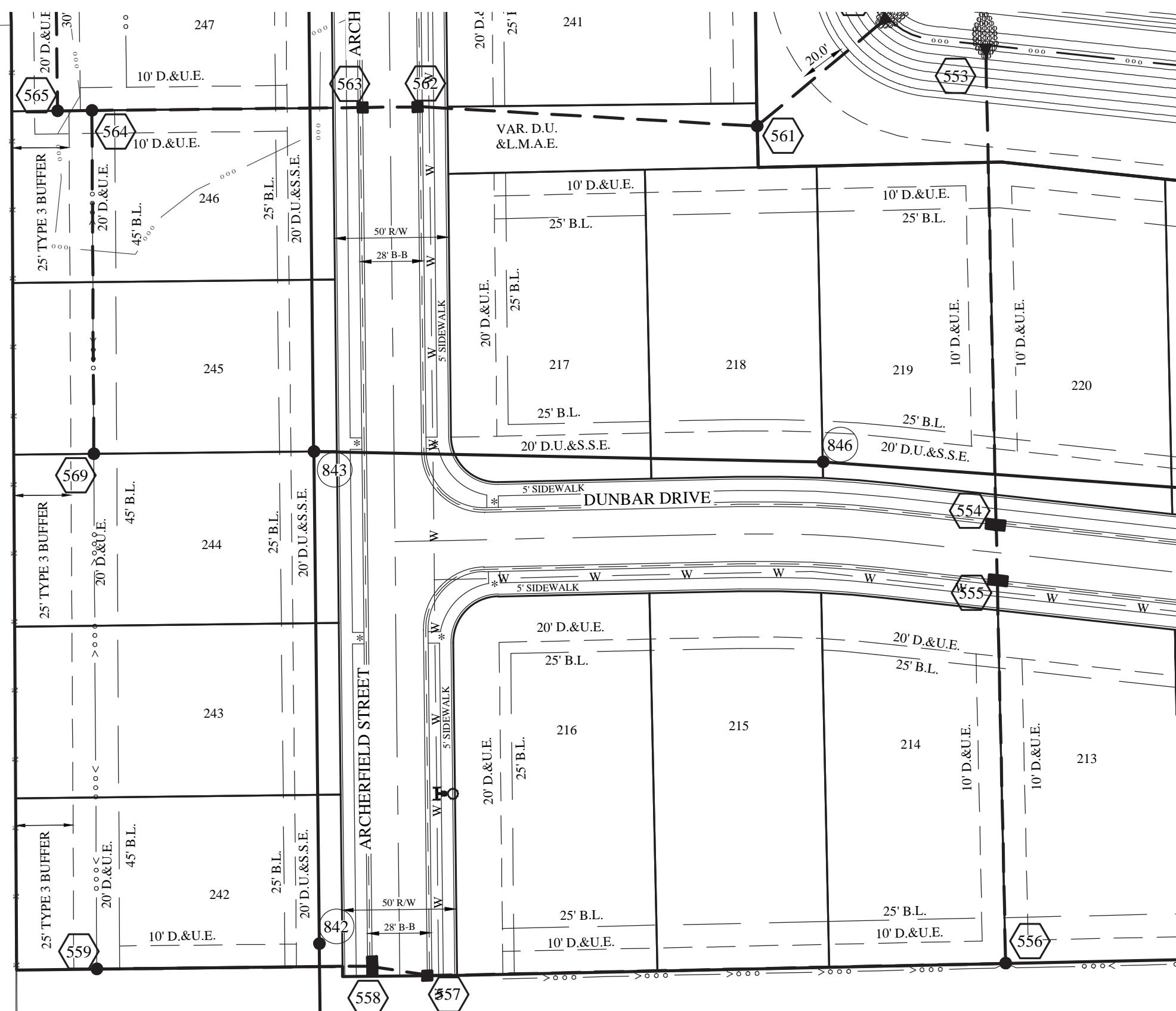
ELEV.=762.85'



SCALE: 1"=50' HOR.  
1"=5' VERT.



SCALE: 1"=50' HOR.  
1"=5' VERT.



APPROVAL: PENDING/NOT FOR CONSTRUCTION

**STOEPPELWERTH**

ALWAYS ON

7965 East 106th Street, Fishers, IN 46038-2505  
phone: 317.849.5955 fax: 317.849.5942

REGISTERED PROFESSIONAL ENGINEER

No. PE11200386

STATE OF INDIANA

CERTIFIED: 07/11/24

*[Signature]*

STORM SEWER PLAN & PROFILES

WINTERFIELD SECTION 3

JOHNSON COUNTY, INDIANA

FRANKLIN

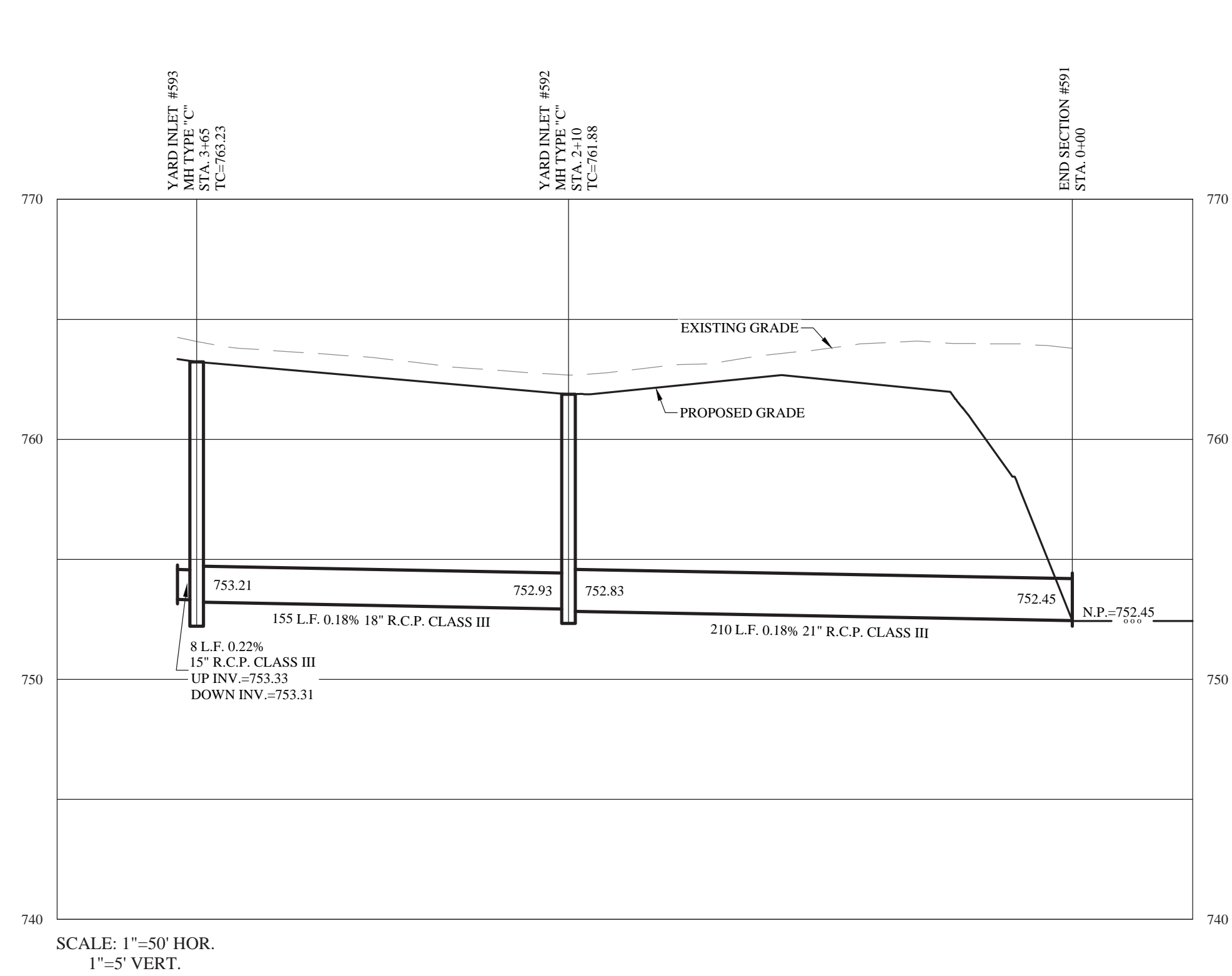
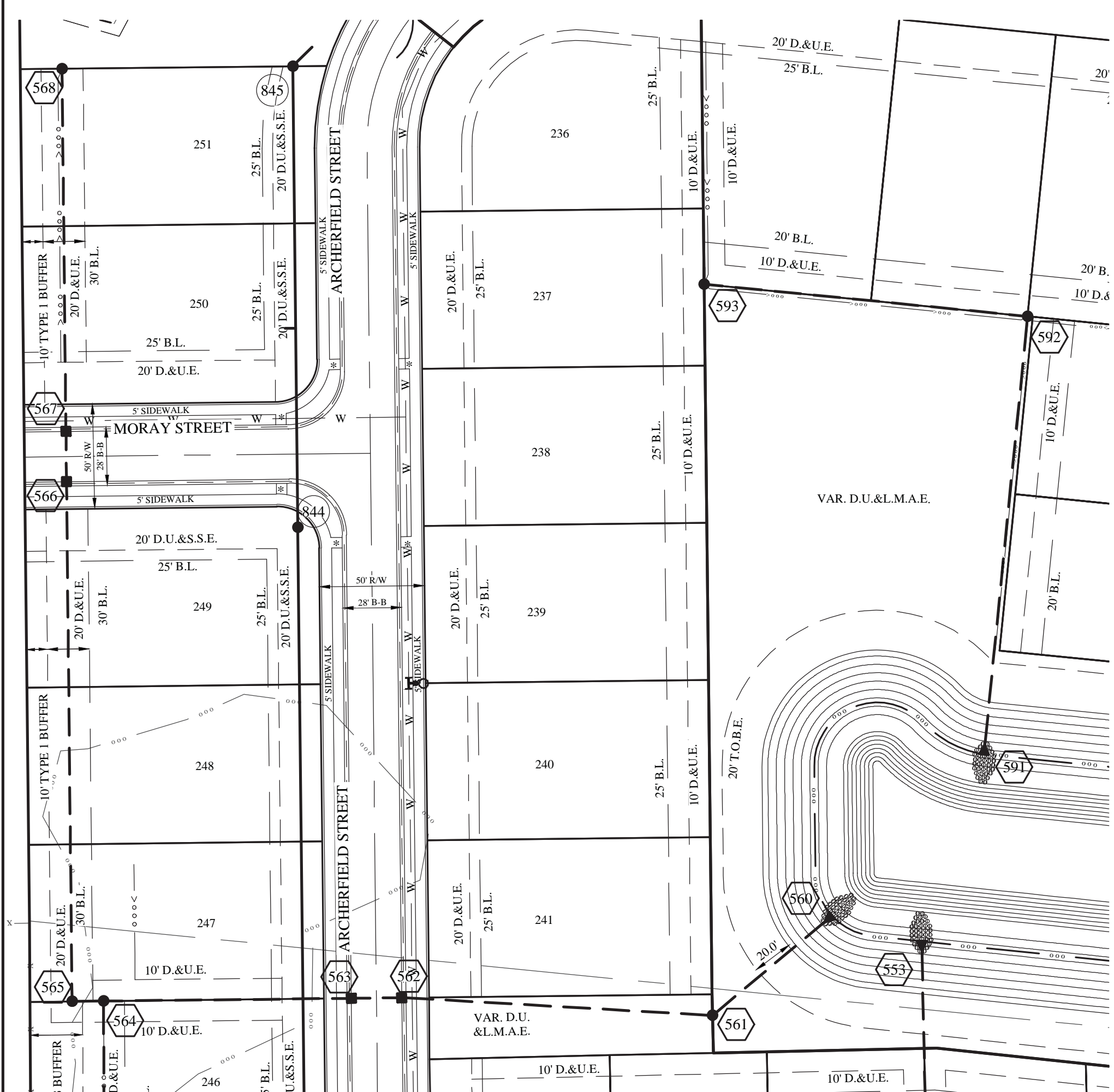
DRAWN BY: KJ/M/GEM

CHECKED BY: KR/G

SHEET NO. C602

S.A.A. JOB NO. 100405FOR-S3





SCALE: 1"=50' HOR.  
1"=5' VERT.

#### NOTES

- CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION TO CONFIRM THERE ARE NO CROSSING CONFLICTS. CONFLICTS THAT ARE DISCOVERED AFTER CONSTRUCTION BEGINS ARE SOLELY THE CONTRACTOR'S RESPONSIBILITY.
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- SEE SHEET C608 FOR STORM SEWER STRUCTURE DATA TABLE.

#### BENCHMARK DATA

ORIGINATING BENCHMARK  
BENCHMARK ELEVATIONS FOR THIS PROJECT WERE DERIVED USING THE NATIONAL GEODETTIC SURVEY ONLINE POSITIONING USER SERVICE (O.F.U.S.) AND ARE REFERENCED TO THE NAVD 88 DATUM.  
TRM 690  
CHISELED "X" ON NORTHWEST BOLT OF A FIRE HYDRANT, 35'± EAST OF HURRICANE ROAD AND AT THE SOUTH ENTRANCE TO GOLF ACADEMY.  
ELEV.=762.85'

#### LEGEND

##### EXISTING FEATURES

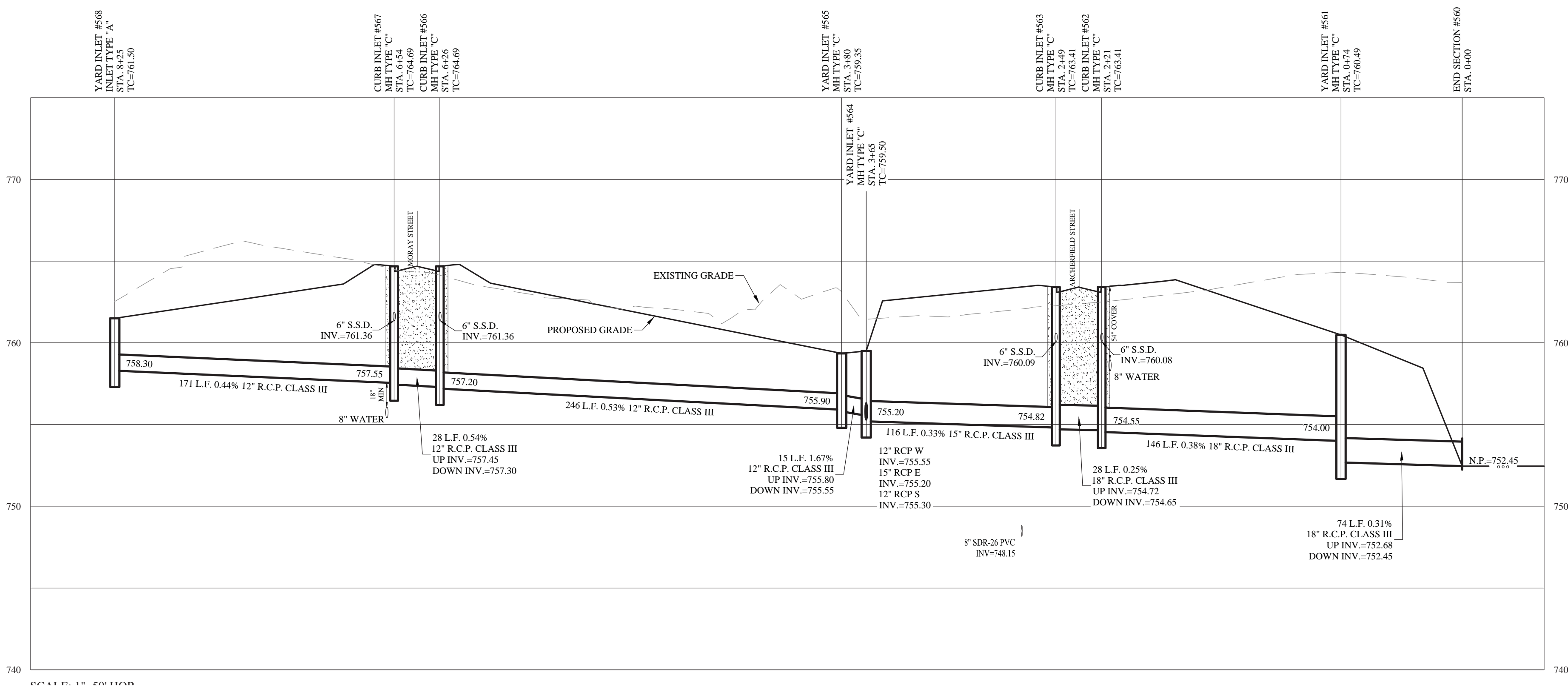
- W WATER MAIN
- OHE ELECTRICAL LINE OVERHEAD
- G GAS MAIN
- FM FORCEMAIN, SANITARY
- SS SANITARY SEWER
- SS STORM SEWER
- 870 CONTOUR
- Normal Water Elevation
- Water Flowline

##### PROPOSED FEATURES

- W WATER MAIN
- SS SANITARY SEWER
- SS STORM SEWER
- 870 CONTOUR
- Normal Water Elevation
- SWALE FLOWLINE
- CURB & GUTTER w/ 6" UNDERDRAIN
- 6" SUB-SURFACE DRAIN (SWALE)
- Denotes Full Depth Granular Backfill

STRUCTURE TABLE											
STR.#	CALLOUT	STR. TYPE	T.C.	CASTING TYPE	DIAMETER IN	DIR. IN	INV. IN	DIAMETER OUT	DIR. OUT	INV. OUT	SLOPE
448	EXISTING MANHOLE	EXISTING	754.03	EXISTING	12	W	750.30	12	E	750.20	0.39%
513	END SECTION		748.10		42	SW	746.85				
514	YARD INLET	MH TYPE "K"	756.21	R-4342	36	W	746.99	42	NE	746.89	0.06%
515	CURB INLET	MH TYPE "J"	760.04	R-3501-TL/TR	33	W	747.27	36	E	747.17	0.12%
516	CURB INLET	MH TYPE "J"	760.04	R-3501-TL/TR	30	W	747.42	33	E	747.32	0.18%
517	YARD INLET	MH TYPE "J"	760.10	R-4342	21 30	NW S	749.75 747.90	30	E	747.80	0.26%
518	OUTLET CONTROL	SEE DETAIL	755.90	SEE DETAIL				21	SE	752.45	3.91%
519	DBL. CURB INLET	DBL. CURB INLET	759.34	R-3501-TL/TR	30	S	748.38	30	N	748.28	0.23%
520	CURB INLET	MH TYPE "J"	759.34	R-3501-TL/TR	27	S	748.55	30	N	748.45	0.25%
521	YARD INLET	MH TYPE "J"	757.20	R-4342	27	E	749.10	27	N	749.00	0.31%
522	YARD INLET	MH TYPE "J"	756.59	R-4342	27	S	749.26	27	W	749.20	0.30%
523	CURB INLET	MH TYPE "J"	760.07	R-3501-TL/TR	27	S	749.73	27	N	749.63	0.28%
524	CURB INLET	MH TYPE "J"	760.07	R-3501-TL/TR	27	S	749.90	27	N	749.80	0.25%
525	MANHOLE	MH TYPE "J"	758.50	R-1772	27 18	W SE	750.75 750.42	27	N	750.21	0.24%
526	CURB INLET	MH TYPE "J"	761.35	R-3501-TR	27	W	751.34	27	E	751.24	0.24%
527	CURB INLET	MH TYPE "J"	761.32	R-3501-TL	27	W	751.50	27	E	751.40	0.21%
528	OUTLET CONTROL	SEE DETAIL	753.80	SEE DETAIL				18	NW	750.42	0.00%
529	END SECTION		752.21		15	NE	750.42				
530	MANHOLE	MH TYPE "C"	757.93	R-1772	15 12	E N	750.73 752.20	15	SW	750.63	0.40%
531	MANHOLE	MH TYPE "C"	754.70	R-1772	12	S	751.60	15	W	751.32	0.23%
532	DBL. CURB INLET	DBL. CURB INLET	757.23	R-3501-TR	12	S	753.00	12	N	752.90	0.99%
533	CURB INLET	INLET TYPE "A"	757.23	R-3501-TL				12	N	753.15	0.54%
534	CURB INLET	MH TYPE "C"	756.94	R-3501-TL/TR	12	N	752.80	12	S	752.70	0.33%
535	CURB INLET	INLET TYPE "A"	756.94	R-3501-TL/TR				12	S	752.90	0.36%
538	CURB INLET	INLET TYPE "A" MOD	756.13	R-3501-TL/TR	12	W	751.60	12	E	751.50	1.19%
539	CURB INLET	INLET TYPE "A"	756.13	R-3501-TL/TR				12	E	751.71	0.39%
540	END SECTION		752.21		21	S	750.42				
541	DBL. CURB INLET	DBL. CURB INLET	756.85	R-3501-TL/TR	21	S	750.77	21	N	750.74	0.18%
542	DBL. CURB INLET	DBL. CURB INLET	756.85	R-3501-TL/TR	15	S	750.91	21	N	750.81	0.14%
543	YARD INLET	INLET TYPE "A" MOD	754.79	R-4342	12	E	751.27	15	N	751.17	0.23%
544	YARD INLET	INLET TYPE "A"	754.85	R-4342				12	W	751.65	0.31%
545	END SECTION		752.75		27	SW	750.42				

STRUCTURE TABLE											
STR.#	CALLOUT	STR. TYPE	T.C.	CASTING TYPE	DIAMETER IN	DIR. IN	INV. IN	DIAMETER OUT	DIR. OUT	INV. OUT	SLOPE
546	YARD INLET	MH TYPE "J"	755.95	R-4342	24 12	W NW	750.73 752.63	27	NE	750.63	0.15%
547	YARD INLET	MH TYPE "C"	755.95	R-4342	15 15	S W	751.11 751.32	24	E	751.10	0.21%
548	CURB INLET	MH TYPE "C"	758.40	R-3501-TL	15	SE	751.53	15	N	751.43	0.24%
549	CURB INLET	MH TYPE "C"	758.51	R-3501-TR	15	S	751.71	15	NW	751.61	0.25%
550	YARD INLET	MH TYPE "C"	755.30	R-4342	12	W	752.08	15	N	751.98	0.24%
551	CURB INLET	INLET TYPE "A" MOD	756.66	R-3501-TL/TR	12	W	752.52	12	E	752.42	0.41%
552	CURB INLET	INLET TYPE "A"	756.66	R-3501-TL/TR				12	E	752.63	0.39%
553	END SECTION		754.24		21	S	752.45				
554	DBL. CURB INLET	DBL. CURB INLET	761.05	R-3501-TL/TR	21	S	753.55	21	N	753.55	0.53%
555	DBL. CURB INLET	DBL. CURB INLET	761.05	R-3501-TL/TR	21	S	753.75	21	N	753.65	0.35%
556	YARD INLET	MH TYPE "C"	757.90	R-4342	18	W	754.33	21	N	754.23	0.29%
557	CURB INLET	MH TYPE "C"	760.56	R-3501-TL/TR	15	W	755.35	18	E	755.25	0.37%
558	DBL. CURB INLET	DBL. CURB INLET	760.56	R-3501-TL/TR	12	W	755.60	15	E	755.50	0.53%
559	YARD INLET	INLET TYPE "A"	759.20	R-4342				12	E	756.00	0.34%
560	END SECTION		754.51		18	SW	752.45				
561	YARD INLET	MH TYPE "C"	760.49	R-4342	18	W	754.00	18	NE	752.68	0.31%
562	CURB INLET	MH TYPE "C"	763.41	R-3501-TL/TR	18	W	754.65	18	E	754.55	0.38%
563	CURB INLET	MH TYPE "C"	763.41	R-3501-TL/TR	15	W	754.82	18	E	754.72	0.25%
564	YARD INLET	MH TYPE "C"	759.50	R-4342	12 12	W S	755.55 755.30	15	E	755.20	0.33%
565	YARD INLET	MH TYPE "C"	759.35	R-4342	12	N	755.90	12	E	755.80	1.67%
566	CURB INLET	MH TYPE "C"	764.69	R-3501-TL/TR	12	N	757.30	12	S	757.20	0.53%
567	CURB INLET	MH TYPE "C"	764.69	R-3501-TL/TR	12	N	757.55	12	S	757.45	0.54%
568	YARD INLET	INLET TYPE "A"	761.50	R-4342				12	S	758.30	0.44%
569	YARD INLET	INLET TYPE "A"	759.20	R-4342				12	N	756.00	0.47%
591	END SECTION		754.78		21	N	752.45				
592	YARD INLET	MH TYPE "C"	761.88	R-4342	18	W	752.93	21	S	752.83	0.18%
593	YARD INLET	MH TYPE "C"	763.23	R-4342	15	N	753.31	18	E	753.21	0.18%

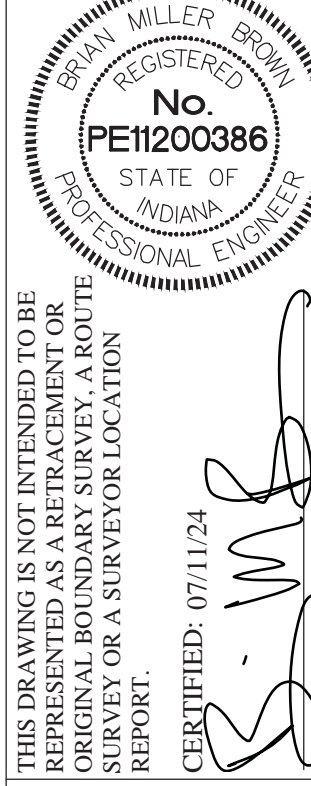


## STORM SEWER PLAN & PROFILES

## WINTERFIELD SECTION 3

## STOEPPELWERTH

ALWAYS ON  
7965 East 106th Street, Fishers, IN 46038-2505  
phone: 317.849.5955 fax: 317.849.5942



THIS DRAWING IS NOT INTENDED TO BE  
REPRESENTED AS A RETAINMENT OR  
ORIGINAL BOUNDARY SURVEY A ROUTE  
SURVEY OR A SURVEYOR LOCATION  
REPORT.

CERTIFIED: 07/11/24

FRANKLIN

JOHNSON COUNTY, INDIANA

DATE MARK REVISIONS BY



LEGEND

EXISTING FEATURES

W

WATER MAIN

OHE

ELECTRICAL LINE, OVERHEAD

G

GAS MAIN

FM

FORCEMAIN, SANITARY

SANITARY SEWER

STORM SEWER

870

CONTOUR

NORMAL WATER ELEVATION

WATER FLOWLINE

PROPOSED FEATURES

W

WATER MAIN

SANITARY SEWER

STORM SEWER

870

CONTOUR

NORMAL WATER ELEVATION

SWALE FLOWLINE

CURB & GUTTER w/ 6" UNDERDRAIN

DENOTES FULL DEPTH GRANULAR BACKFILL

NOTES

1. FOR CURB UNDERDRAIN DETAIL, SEE SHEET C802B.

2. CONTRACTOR SHALL VERIFY DEPTHS OF ALL EXISTING ONSITE UTILITIES PRIOR TO CONSTRUCTION TO CONFIRM THERE IS NOT ANY CONFLICTS WITH OTHER UTILITIES, STORM SEWERS OR STREETS. CONFLICTS AFTER CONSTRUCTION BEGINS ARE SOLELY THE CONTRACTOR'S RESPONSIBILITY.

3. THIS SURVEY REFLECTS ABOVE GROUND INDICATIONS OF UTILITIES AND INFORMATION AVAILABLE FROM UTILITY COMPANIES. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

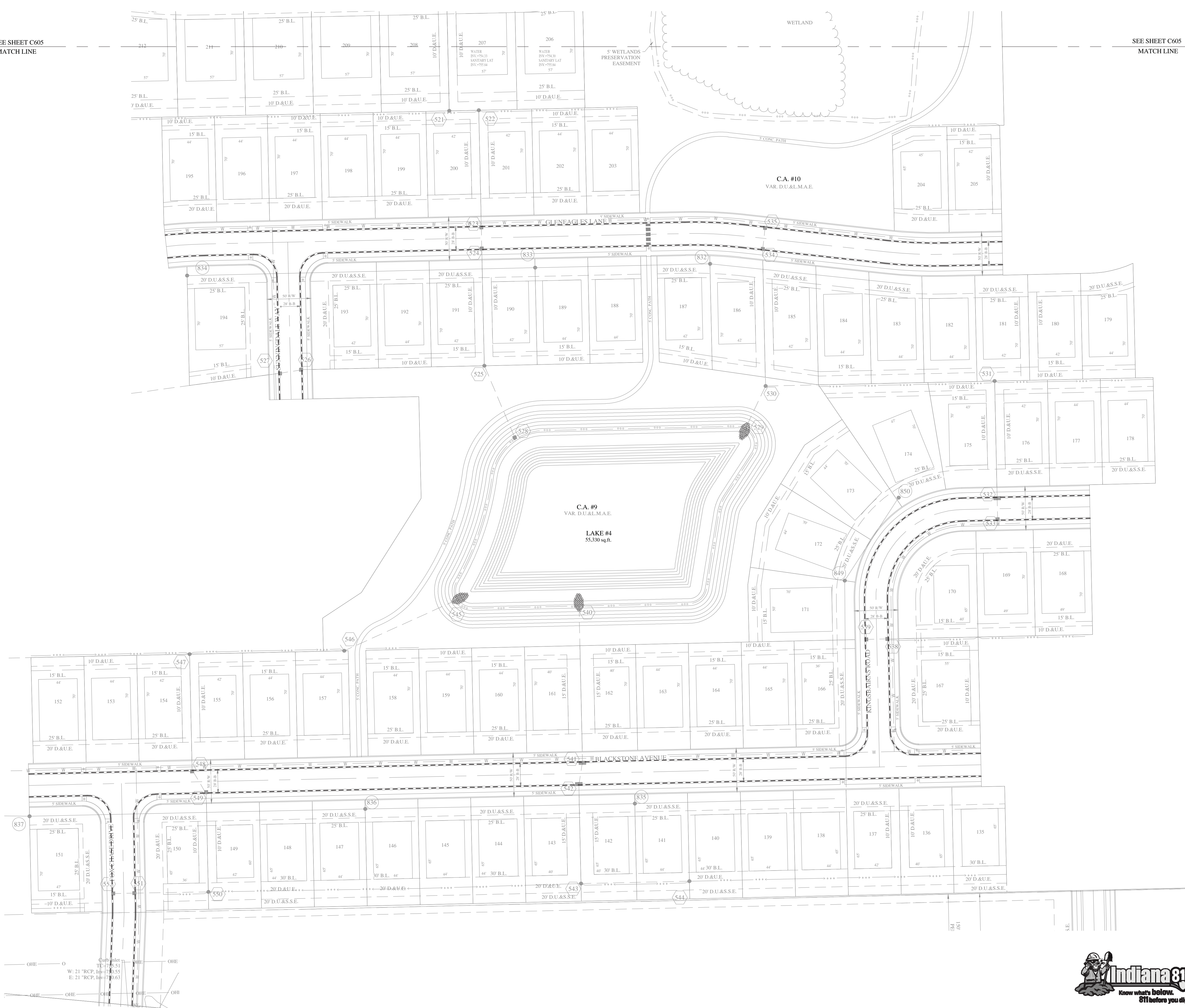
BENCHMARK DATA

ORIGINATING BENCHMARK

BENCHMARK ELEVATIONS FOR THIS PROJECT WERE DERIVED USING THE NATIONAL GEODETIC SURVEY ONLINE POSITIONING USER SERVICE (O.P.U.S.) AND ARE REFERENCED TO THE NAVD'83 DATUM.

TBM #30 CHISELED "X" ON NORTHWEST BOLT OF A FIRE HYDRANT, 35% EAST OF HURRICANE ROAD AND AT THE SOUTH ENTRANCE TO GOLF ACADEMY.

ELEV.=762.85'



APPROVAL PENDING/NOT FOR CONSTRUCTION

STOEPPELWERTH

ALWAYS ON

7965 East 106th Street, Fishers, IN 46038-2905

phone: 317.846.5905 fax: 317.846.5942

SUB-SURFACE DRAIN PLAN

WINTERFIELD

SECTION 3

JOHNSON COUNTY, INDIANA

FRANKLIN

DRAWN BY: KJ/M/GEM

CHECKED BY: KR/G

SHEET NO.

C604

6 & R FOR NO. 100405FOR-S3

THIS DRAWING IS NOT INTENDED TO BE REPRESENTED AS A RETRACEMENT OR SURVEY OR A SURVEYOR LOCATION REPORT.

CERTIFIED: 07/11/24

REGISTERED PROFESSIONAL ENGINEER

STATE OF INDIANA

No. PE1200386

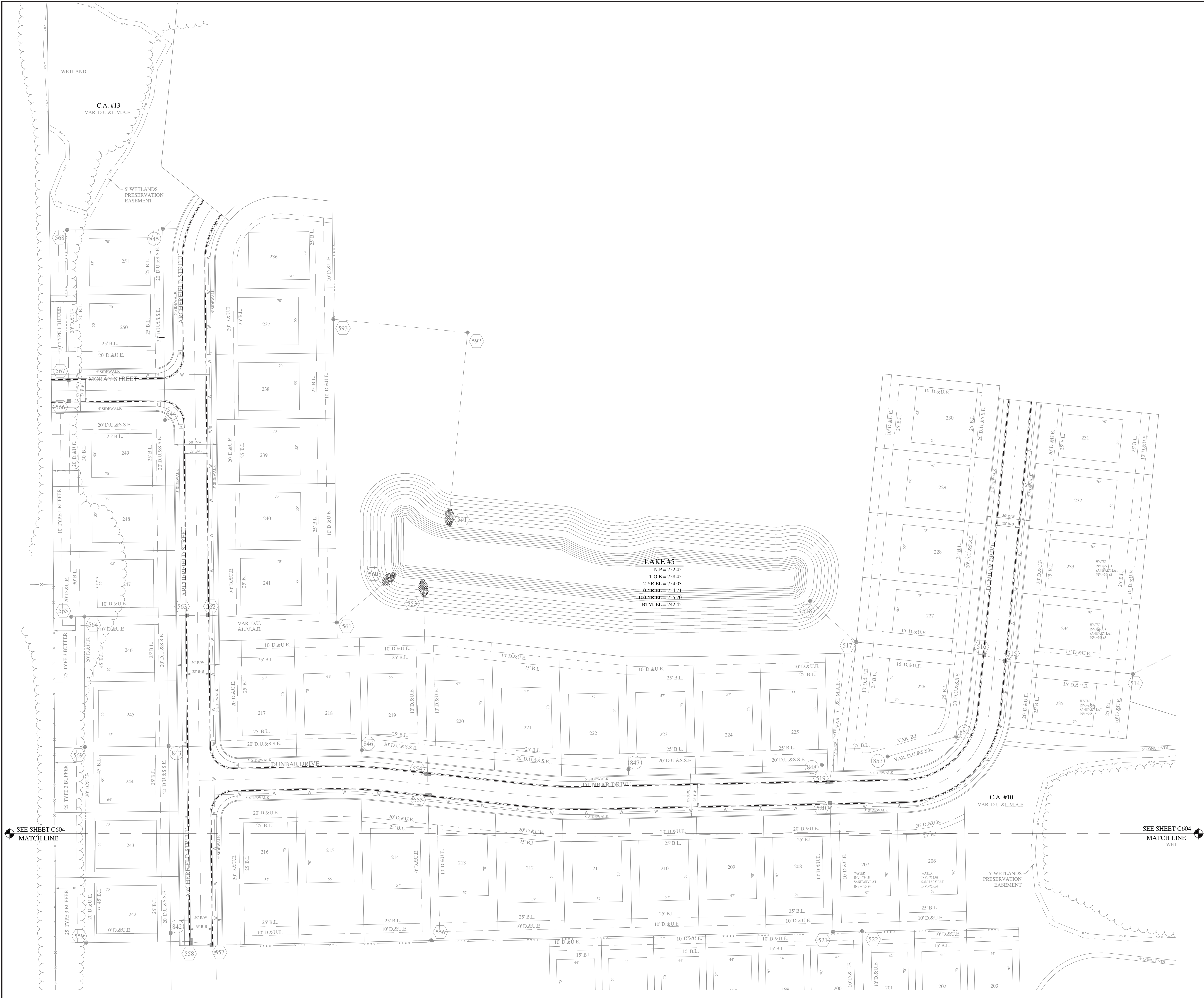
REVISIONS

DATE

MARK

BY





LEGEND

EXISTING FEATURES

W

WATER MAIN

OHE

ELECTRICAL LINE, OVERHEAD

G

GAS MAIN

FM

FORCEMAIN, SANITARY

SANITARY SEWER

STORM SEWER

870

CONTOUR

0.00

NORMAL WATER ELEVATION

>0.00

WATER FLOWLINE

PROPOSED FEATURES

W

WATER MAIN

SANITARY SEWER

STORM SEWER

870

CONTOUR

0.00

NORMAL WATER ELEVATION

>0.00

SWALE FLOWLINE

CURB & GUTTER w/ 6" UNDERDRAIN

DENOTES FULL DEPTH GRANULAR BACKFILL

NOTES

1. FOR CURB UNDERDRAIN DETAIL, SEE SHEET C802B.

2. CONTRACTOR SHALL VERIFY DEPTHS OF ALL EXISTING ONSITE UTILITIES PRIOR TO CONSTRUCTION TO CONFIRM THERE IS NOT ANY CONFLICTS WITH OTHER UTILITIES, STORM SEWERS OR STREETS. CONFLICTS AFTER CONSTRUCTION BEGINS ARE SOLELY THE CONTRACTOR'S RESPONSIBILITY.

3. THIS SURVEY REFLECTS ABOVE GROUND INDICATIONS OF UTILITIES AND INFORMATION AVAILABLE FROM UTILITY COMPANIES. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED, ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM THE INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

BENCHMARK DATA

ORIGINATING BENCHMARK

BENCHMARK ELEVATIONS FOR THIS PROJECT WERE DERIVED USING THE NATIONAL GEODETIC SURVEY ONLINE POSITIONING USER SERVICE (O.P.U.S.) AND ARE REFERENCED TO THE NAVD '88 DATUM.

TBM #30  
CHISELED "X" ON NORTHWEST BOLT OF A FIRE HYDRANT, 35+ EAST OF HURRICANE ROAD AND AT THE SOUTH ENTRANCE TO GOLF ACADEMY.

ELEV.=762.85'

GRAPHIC SCALE

50'

0

25'

50'

( IN FEET )

1" = 50 FT

THIS DRAWING IS NOT INTENDED TO BE REPRESENTED AS A RETRACTION OR CORRECTION OF A PREVIOUS SURVEY OR A SURVEYOR LOCATION REPORT.

THIS DRAWING IS NOT INTENDED TO BE REPRESENTED AS A RETRACTION OR CORRECTION OF A PREVIOUS SURVEY OR A SURVEYOR LOCATION REPORT.

APPROVAL PENDING/NOT FOR CONSTRUCTION

STOEPPELWERTH

ALWAYS ON

7965 East 106th Street, Fishers, IN 46038-2905

phone: 317.846.5905 fax: 317.846.5942

FRANKLIN

JOHNSON COUNTY, INDIANA

INDIANA 811

Know what's below.

811 before you dig.

DRAWN BY: KJM/GEM

CHECKED BY: KRG

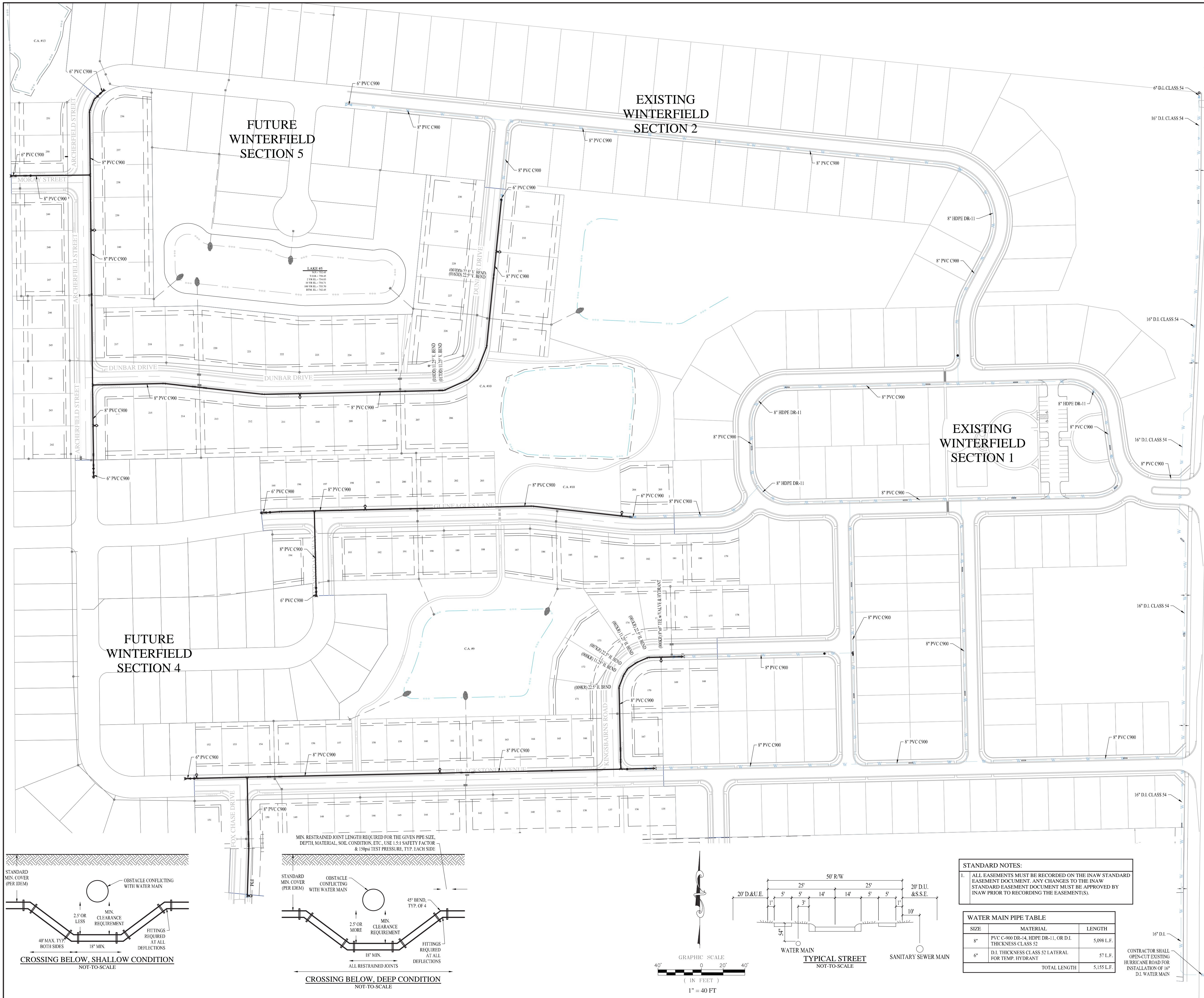
SHEET NO.

C605

6 & 8 FOR NO.

100405FOR-S3





LEGEND	
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATER LINE
	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED WATER LINE
	HYDRANT w/ 6" VALVE
	GATE VALVE
	REDUCER
	TEE
	BEND, HORIZONTAL
	BEND, VERTICAL

FOR SPECS ON ALL WATER-RELATED  
MATERIAL, STRUCTURE, ACCESSORY,  
INSTALLATION, HANDLING, ETC.,  
CONTRACTOR TO REFER TO INDIANA  
AMERICAN WATER PIPELINE SPECIFICATIONS,  
LATEST REVISION.

## WATER UTILITY INSTALLATION NOTES

1. INSTALLATION OF WATER MAIN, FITTINGS, VALVES, FIRE HYDRANT AND APPURTENANCES SHALL BE IN CONCORDANCE WITH INDIANA ADMINISTRATIVE CODES AND STANDARDS AND SPECIFICATIONS, LATEST REVISION.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION, SIZE AND MATERIAL OF THE EXISTING WATER MAIN PRIOR TO CONSTRUCTION.
3. AT THE POINT OF CONNECTION TO EXISTING WATER MAINS, A MINIMUM 6" DIAMETER AND 8' LONGVE MAYBE REQUIRED TO BE INSTALLED. THE EXISTING WATER MAIN CANNOT BE SPLIT DOWN WITHOUT IMPACTING CONDITIONS. TO BE DETERMINED AT THE PRE-CONSTRUCTION MEETING.
4. FOR PVC C90 PIPE INSTALLATION: DRIP IRREPIE IS REQUIRED; DEFLECTION OF JOINTS AND BENDING OF PIPES ARE NOT PERMITTED. ALL ANGLES SHALL BE MADE WITH NOSE CUTTING WHEELS. WHEN CUTTING DRIP IRREPIE JOINTS ARE REQUIRED, ALL JOINTS SHALL BE RESTRAINED WITH EXTERNAL SPLI SEPARATED STRIPPING HARNESSES. SELECT FLIT MATERIAL REQUIRED FOR BENDING AND EMBEDMENT REGARDLESS OF PIPE'S PROPORTION TO PAYMENT. PVC C90 PIPE IS NOT ALLOWED FOR PIPE LARGER THAN 12" NCHL.
5. FOR DUCTILE IRON PIPE INSTALLATION: THICKNESS CLASS 52 FOR TYPICAL DISTRIBUTION MAINS 12" NCHL.
6. FOR DUCTILE IRON PIPE, SMALLER VIBR RESTRAN OF PIPE-TO-PIPE WITH INTEGRAL STAINLESS STEEL LOCKING SEGMENTS ARE PERMITTED ON PIPE-TO-PIPE CONNECTION. IF SMALLER SIZE, PIPE-TO-PIPE CONNECTIONS GREATER THAN 12" NCHL NOMINAL SIZE SHALL BE RESTRAINED PER SPECIFICATION SECTION 15.05.
7. FOR HDPE PIPE INSTALLATION: DPS DBT1 FOR SIZES 4" NCHL AND ABOVE, DPS DBT2 FOR SIZES 6" NCHL AND ITS 8" NCHL SIZES SMALLER THAN 4" NCHL HDPE BENDS, TEES, AND CROSSES ARE NOT ACCEPTABLE. PRESSURE TESTING OF HDPE PIPE DIFFERS FROM DUCTILE IRON PIPE. FOR PIPE SIZES 12" NCHL AND ABOVE, 150 PSI FUSION MUST BE COMPLETED BY CERTIFIED TECHNICIAN; CERTIFICATION TO BE SUBMITTED PRIOR TO POST-CONSTRUCTION MEETING.
8. ALL IRON DUCTILE IRON PIPE, DUCTILE IRON FITTINGS, VALVE HYDRANTS, RESTRAINED HARNESSES, AND ALL OTHER METALLIC APPURTENANCES IN 12" NCHL BLUE POLYETHYLENE.
9. ALL FIRE HYDRANT LATERALS SHALL BE DUCTILE IRON PIPE.
10. ALL M-JOBSITS AND FLANGE BOLTS SHALL HAVE NYLAN OR FLOORCOTE III CORROSION RESISTANT COATING.
11. ALL FITTINGS SHALL BE REACHED USING MO RETAINER GLANDS.
12. THRUST RESTRAINT TO BE ATTAINED THROUGH THE RESTRAINT OF PIPE JOINTS AND FITTINGS. THRUST BLOCKS ARE NOT AN ACCEPTABLE MEANS OF THRUST RESTRAINT, EXCEPT WHEN REQUIRED IN ACCORDANCE WITH THE SPECIFICATION SECTIONS 15.05 AND 15.20 FOR PIPE JOINT RESTRAINT REQUIREMENTS FOR DUCTILE IRON AND PVC PIPE.
13. COPPER CLAD STEEL TRACER WIRE REQUIRED ON INSTALLATION OF ALL TRACER WIRE SHALL BE TAPE TO THE TRACER WIRE TO PIPE OR POLYETHYLENE ENCASING AT A MINIMUM SPACING OF 10 FEET. SPIECIES SHALL BE ENCASED IN WATERPROOF CONNECTOR HOUSINGS. TRACER WIRE SHALL BE IDENTIFIABLE TO THE SAME MANUFACTURER. DETECTABLE TAPE IS REQUIRED ONE FOOT ABOVE PIPE CONTINUITY SHALL BE TESTED AFTER COMPLETION OF BACKFILL.
14. SELECT FULL MATERIAL REQUIRED FOR FINAL BACKFILL WHEN WITHIN EFFECT OF PAYMENT PER SPECIFICATION SECTION 02.10.
15. MAINTAIN THE REQUIRED 10-FEET OF HORIZONTAL SEPARATION AT 18-INCHES OF VERTICAL SEPARATION FROM SANITARY AND STORM MAINS. MAINTAIN 18-INCHES OF VERTICAL SEPARATION FROM SANITARY AND STORM STRUCTURES. SEE 32714 & 3.2.4 OF THE INDIANA ADMINISTRATIVE CODE FOR MORE INFORMATION.
16. MAINTAIN MINIMUM COVER DEPTH OF 54" AND A MAXIMUM OF 72" FOR ALL MAINS.
17. ANCHOR COLLARS ARE REQUIRED WHEN TRANSITIONING FROM PVC/DI PIPE TO HDPE PIPE.

## PLAN NOTES

- |    |   |
|----|---|
| 1. | IF WATER MAIN PIPE SHALL BE DUCTILE IRON THICKNESS CLASS 5.   |
| 2. | SEE WATER MAIN JOINT RESTRAINT SPECIFICATION ON SHEET C708.   |
| 3. | WATER MAIN PIPE SHALL BE PVC 4000 DB-14, HDPE 400-11, OR DUCTILE IRON THICKNESS CLASS 5. THE WATER MAIN AND PRESSURE CLASS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION BASED ON COST OF EACH AT THAT TIME.   |
| 4. | CONTRACTOR TO USE ALTERNATE TECHNICAL STANDARD SEPARATION METHOD WHERE THE REQUIRED HORIZONTAL SEPARATION CANNOT BE MAINTAINED. THE WATER MAIN IS INSTALLED IN A WORKINGS GRADE 50 PSI PRESSURE RATED CASING THAT EXTENDS AT LEAST 8 FEET THE TOP OUTSIDE EDGE OF THE STRUCTURE AND THE ENDS OF THE CASING ARE SEALED.  |
| 5. | CONTRACTOR TO USE ALTERNATIVE TECHNICAL STANDARD THAT ALLOWS LESS THAN 8 FEET OF VERTICAL SEPARATION FROM STORMSANITARY INCHES. WATER MAIN IS INSTALLED IN A SEPARATE CASING THAT EXTENDS AT LEAST 8 FEET THE TOP OUTSIDE EDGE OF THE CASING. THE CASING SHALL EXTEND AT LEAST 10 FEET PAST THE OUTSIDE EDGE OF THE SEWER AT THE CROSSING IN BOTH DIRECTIONS. THE ENDS OF THE CASING ARE SEALED, AND THE WATER MAIN CASING AND SEWER ARE SEPARATED BY A MINIMUM OF 6 INCHES. SEE DETAILS ON SHEET C714. |

## BENCHMARK DATA

ORIGINATING BENCHMARK

BENCHMARK ELEVATIONS FOR THIS PROJECT WERE DERIVED USING THE NATIONAL GEODETIC SURVEY ONLINE POSITIONING USER SERVICE (O.P.U.S.) AND ARE REFERENCED TO THE NAVD '88 DATUM.

TBM #30  
CHISELED "X" ON NORTHWEST BOLT OF A FIRE HYDRANT, 35<sup>1</sup>/<sub>2</sub> EAST OF  
HURRICANE ROAD AND AT THE SOUTH ENTRANCE TO GOLF ACADEMY.



APPROVAL PENDING/NOT FOR CONSTRUCTION

# WATER PLAN & PROFILES

WINTERFIELD  
SECTION 3

DRAWN BY: <b>KJJM/GEM</b>		CHECKED BY: <b>KRG</b>	
SHEET NO. <b>C700</b>			
S & A JOB NO. <b>100405FOR-S3</b>			

[illegible]

THIS DRAWING IS NOT INTENDED TO BE  
REPRESENTED AS A RETRACEMENT OR  
ORIGINAL BOUNDARY SURVEY. A ROUTE  
SURVEY OR A SURVEYOR LOCATION

REPORT.

CERTIFIED: 07/11/24



PROVAL PENDING/NOT FOR CONSTRUCTION  
STOEPPELWERTH

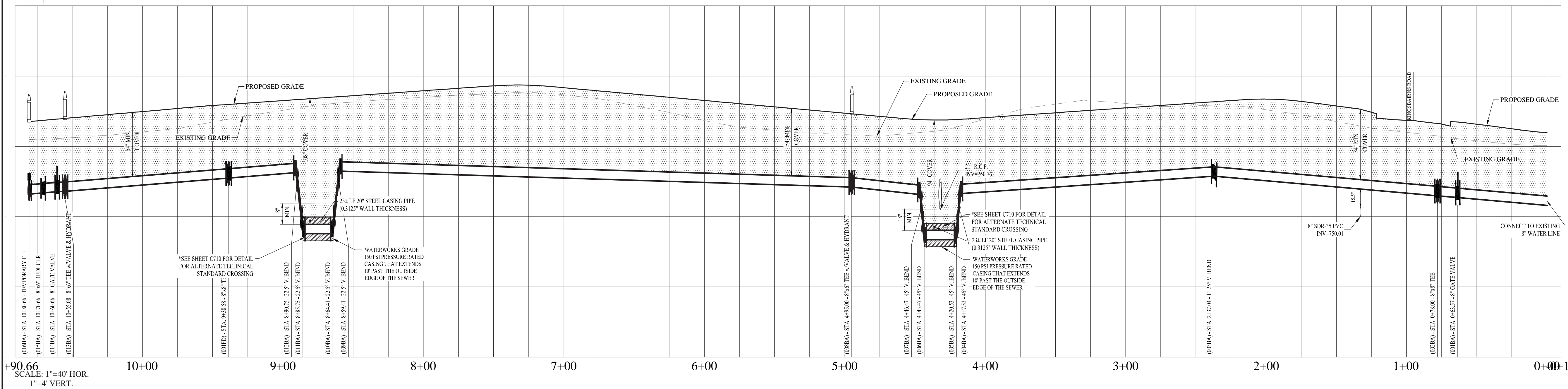
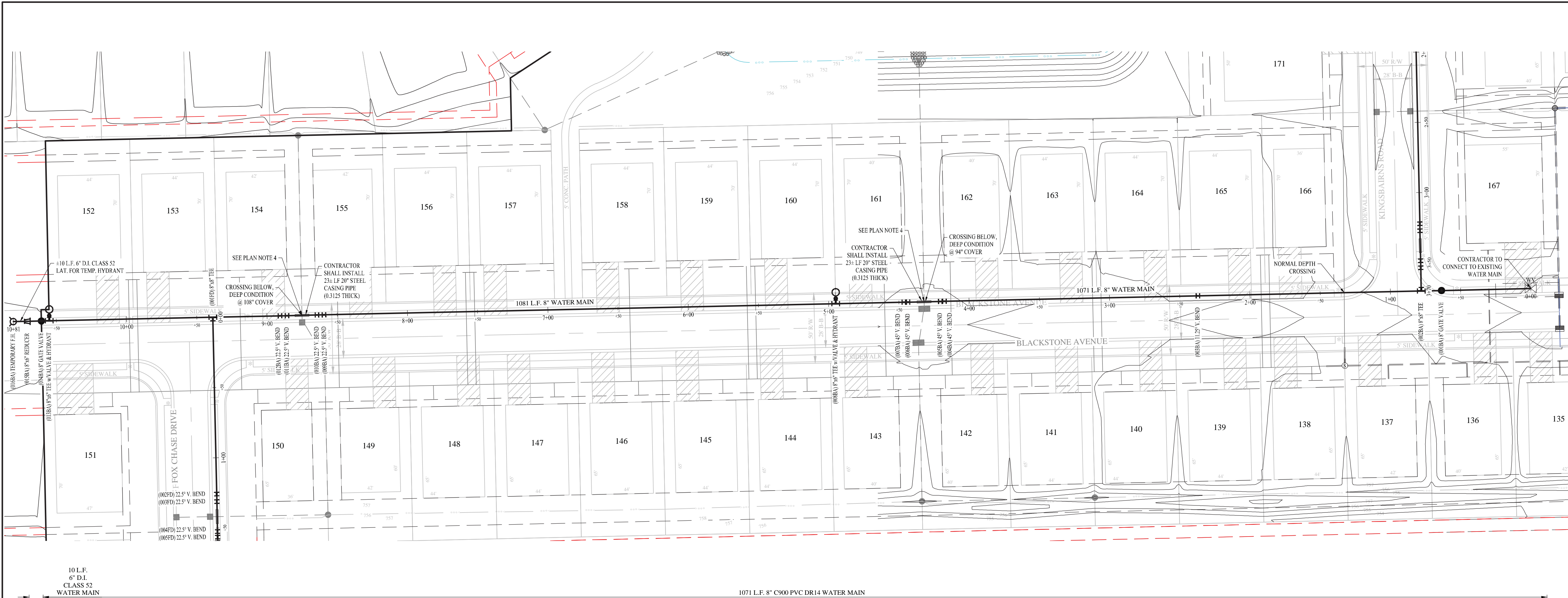
**ALWAYS ON**  
7965 East 106th Street, Fishers, IN 46038-2505  
phone: 317 849 5935 fax: 317 849 5942



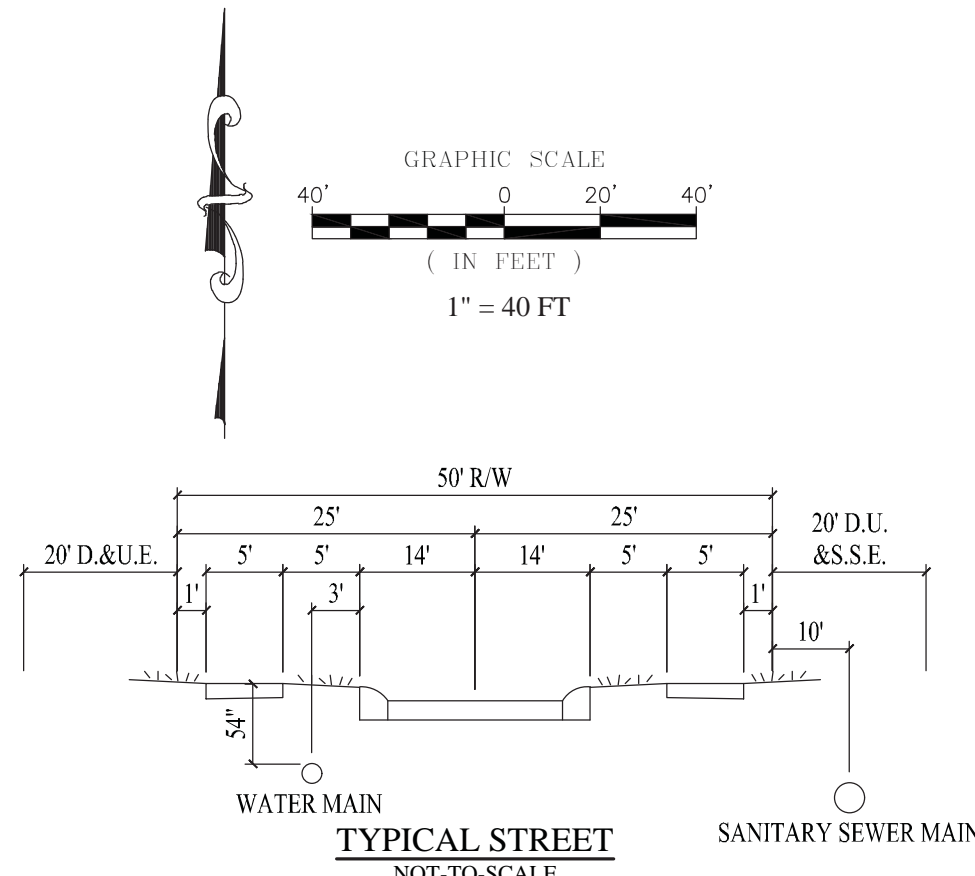
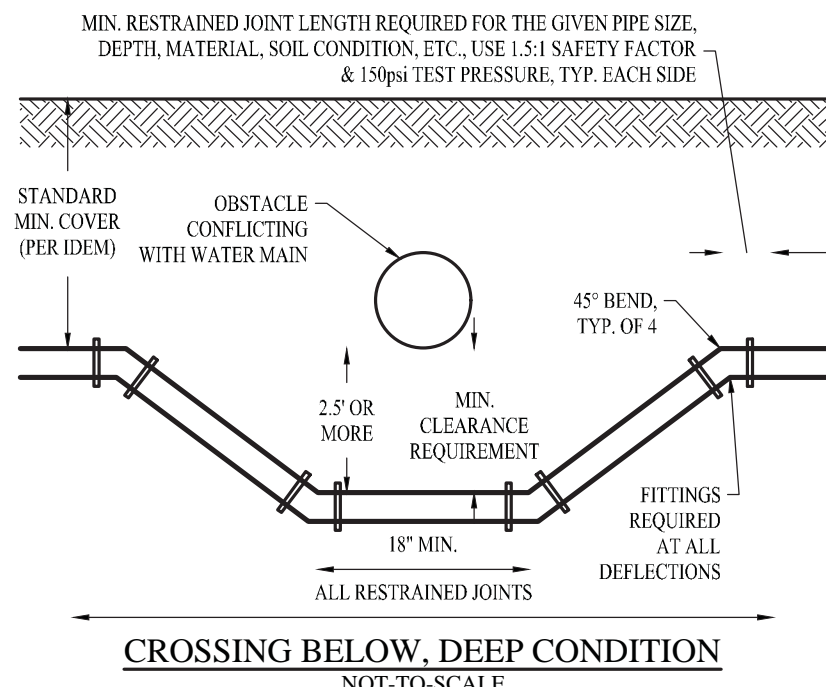
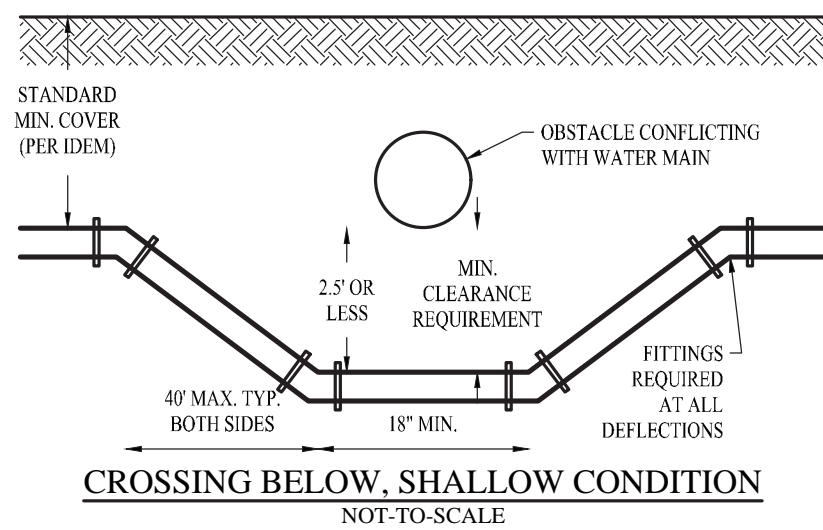
JOHNSON COUNTY, INDIANA

FRANKLIN





## BLACKSTONE AVENUE



STANDARD NOTES:  
1. ALL EASEMENTS MUST BE RECORDED ON THE INAW STANDARD EASEMENT DOCUMENT. ANY CHANGES TO THE INAW STANDARD EASEMENT DOCUMENT MUST BE APPROVED BY INAW PRIOR TO RECORDING THE EASEMENT(S).

WATER MAIN PIPE TABLE		
SIZE	MATERIAL	LENGTH
8"	PVC C-900 DR-14, HDPE DR-11, OR D.I. THICKNESS CLASS 52	5,098 L.F.
6"	D.I. THICKNESS CLASS 52 LATERAL FOR TEMP. HYDRANT	57 L.F.
TOTAL LENGTH		5,155 L.F.

LEGEND	
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATER LINE
	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED WATER LINE
	HYDRANT w/ 6" VALVE
	GATE VALVE
	REDUCER
	TEE
	BEND, HORIZONTAL
	BEND, VERTICAL

FOR SPECS ON ALL WATER-RELATED MATERIAL, STRUCTURE, ACCESSORY, INSTALLATION, HANDLING, ETC., CONTRACTOR TO REFER TO INDIANA AMERICAN WATER PIPELINE SPECIFICATIONS, LATEST REVISION.

#### WATER UTILITY INSTALLATION NOTES

- INSTALLATION OF WATER MAIN, FITTINGS, VALVES, FIRE HYDRANTS, AND APPURTENANCES SHALL BE IN ACCORDANCE WITH INDIANA AMERICAN WATER STANDARDS AND SPECIFICATIONS, LATEST REVISION.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION, SIZE AND MATERIAL OF THE EXISTING WATER MAIN PRIOR TO CONSTRUCTION.
- AT THE POINT OF CONNECTION TO EXISTING WATER MAINS, A TAPPING SLEEVE AND VALVE MAYBE REQUIRED TO BE INSTALLED IF THE EXISTING WATER MAIN CANNOT BE SHUT DOWN WITHOUT IMPACTING CUSTOMERS. TO BE DETERMINED AT THE PRE-CONSTRUCTION MEETING.
- FOR PVC C900 PIPE INSTALLATION: DR14 PIPE IS REQUIRED. DEFLECTION OF PIPE JOINTS AND BENDING OF PIPES ARE NOT PERMITTED. ALL ANGLES SHALL BE MADE WITH PROPER FITTINGS. WHEN RESTRAINT OF PIPE TO JOINTS ARE REQUIRED, ALL JOINTS SHALL BE RESTRAINED WITH EXTERNAL SPLIT SERRATED RESTRAINT HARNESSES. SELECT FILL MATERIAL REQUIRED FOR BEDDING AND EMBEDMENT REGARDLESS OF PIPE'S PROXIMITY TO PAVEMENT. PVC C900 PIPE IS NOT ALLOWED FOR PIPES LARGER THAN 12-INCH.
- FOR DUCTILE IRON PIPE INSTALLATION: THICKNESS CLASS 52 FOR TYPICAL DISTRIBUTION MAINS 12-INCH NOMINAL SIZE AND SMALLER. WHEN RESTRAINT OF PIPE-TO-PIPE JOINTS ARE REQUIRED, PUSH-ON RESTRAINING GASKETS WITH INTEGRAL STAINLESS STEEL LOCKING SEGMENTS ARE PERMITTED ON PIPE-TO-PIPE CONNECTIONS. 12-INCH NOMINAL SIZE AND SMALLER ONLY. PIPE-TO-PIPE CONNECTIONS GREATER THAN 12-INCH NOMINAL SIZE SHALL BE RESTRAINED PER SPECIFICATION SECTION 15.05.
- FOR HDPE PIPE INSTALLATION: DIPS DR11 FOR SIZES 4-INCH AND LARGER, DIPS DR9 FOR 3-INCH, AND CTS DR9 FOR SIZES SMALLER THAN 3-INCH. HDPE BENDS, TEES, AND CROSSES ARE NOT ACCEPTABLE. PRESSURE TESTING OF HDPE PIPE DIFFERS FROM DUCTILE IRON AND PVC PIPE. SEE SPECIFICATION SECTION 15.03-3.03. PIPE FUSION MUST BE COMPLETED BY CERTIFIED TECHNICIAN. CERTIFICATION TO BE SUBMITTED PRIOR TO PRE-CONSTRUCTION MEETING.
- ENCASE ALL DUCTILE IRON PIPING, DUCTILE IRON FITTINGS, VALVES, HYDRANTS, RESTRAINT HARNESSES, AND ALL OTHER METALLIC APPURTENANCES IN 12-MIL BLUE POLYETHYLENE.
- ALL FIRE HYDRANT LATERALS SHALL BE DUCTILE IRON PIPE.
- ALL MJ T-BOLTS AND FLANGE BOLTS SHALL HAVE NYLON OR FLUOROKOTE #1 CORROSION RESISTANT COATING.
- ALL FITTINGS SHALL BE RESTRAINED USING MJ RETAINER GLANDS.
- THRUST RESTRAINT TO BE ACHIEVED THROUGH THE RESTRAINT OF PIPE JOINTS AND FITTINGS. THRUST BLOCKS ARE NOT AN ACCEPTABLE MEANS OF THRUST RESTRAINT, EXCEPT WHEN REQUIRED IN CONNECTING TO EXISTING WATER MAIN AND FOR INSTALLATION OF FIRE HYDRANTS. SEE SPECIFICATION SECTIONS 15.05 AND 15.10 FOR PIPE JOINT RESTRAINT REQUIREMENTS FOR DUCTILE IRON AND PVC PIPE.
- COPPER-CLAD STEEL TRACER WIRE REQUIRED ON INSTALLATION OF ALL PIPE. TRACER WIRE SHALL BE TAPED TO PIPE OR POLYETHYLENE ENCASMENT AT A MINIMUM SPACING OF 10-FEET. SPLICES SHALL BE ENCASED IN WATERPROOF CONNECTORS. WIRE AND CONNECTORS ARE TO BE COMPATIBLE AND FROM THE SAME MANUFACTURER. DETECTABLE TAPE IS REQUIRED ONE FOOT ABOVE PIPE. CONTINUITY SHALL BE TESTED AFTER COMPLETION OF BACKFILL.
- SELECT FILL MATERIAL REQUIRED FOR FINAL BACKFILL WHEN WITHIN 5-FEET OF PAVEMENT PER SPECIFICATION SECTION 02.10.
- MAINTAIN THE REQUIRED 10-FEET OF HORIZONTAL SEPARATION AND 18-INCHES OF VERTICAL SEPARATION FROM SANITARY AND STORM SEWERS. MAINTAIN 6-FEET OF HORIZONTAL SEPARATION FROM SANITARY AND STORM STRUCTURES. SEE 1217 AC 8.3.2.4 OF THE INDIANA ADMINISTRATIVE CODE FOR MORE INFORMATION.
- MAINTAIN MINIMUM COVER DEPTH OF 54" AND A MAXIMUM OF 54"-24".
- ANCHOR COLLARS ARE REQUIRED WHEN TRANSITIONING FROM PVC(DI) PIPE TO HDPE PIPE.

#### PLAN NOTES

- 10" WATER MAIN PIPE SHALL BE DUCTILE IRON THICKNESS CLASS 54.
- SEE WATER MAIN JOINT RESTRAINT SCHEDULE ON SHEET C708.
- WATER MAIN PIPE SHALL BE PVC C-900 DR-14, HDPE DR-11, OR D.I. THICKNESS CLASS 52. THE PIPE MATERIAL AND PRESSURE CLASS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION BASED ON COST OF EACH AT THAT TIME.
- CONTRACTOR TO USE ALTERNATE TECHNICAL STANDARD SEPARATION METHOD WHERE THE REQUIRED HORIZONTAL SEPARATION CANNOT BE MET. THE WATER MAIN IS INSTALLED IN A WATERWORKS GRADE 150 PSI PRESSURE RATED CASING THAT EXTENDS AT LEAST 8 FEET PAST THE OUTSIDE EDGES OF THE STORMWATER STRUCTURE AND THE ENDS OF THE CASING ARE SEALED. SEE DETAILS ON SHEET C714.
- CONTRACTOR TO USE ALTERNATIVE TECHNICAL STANDARD THAT ALLOWS LESS THAN 18 INCHES OF VERTICAL SEPARATION FROM STORMSANITARY SEWERS. THE WATER MAIN IS INSTALLED IN A WATERWORKS GRADE 150 PSI PRESSURE RATED CASING THAT EXTENDS AT LEAST 10 FEET PAST THE OUTSIDE EDGE OF THE SEWER AT THE CROSSING IN BOTH DIRECTIONS. THE ENDS OF THE CASING ARE SEALED, AND THE WATER MAIN CASING AND SEWER ARE SEPARATED BY A MINIMUM OF 6 INCHES. SEE DETAILS ON SHEET C714.

#### BENCHMARK DATA

ORIGINATING BENCHMARK  
BENCHMARK ELEVATIONS FOR THIS PROJECT WERE DERIVED USING THE NATIONAL GEODETIC SURVEY ONLINE POSITIONING USER SERVICE (NAD 83) AND ARE REFERENCED TO THE NAVD 83 DATUM.  
TBM #30  
CHISELED "X" ON NORTHWEST BOLT OF A FIRE HYDRANT, 35' EAST OF HURRICANE ROAD AND AT THE SOUTH ENTRANCE TO GOLF ACADEMY.  
ELEV. = 762.85'



APPROVAL PENDING/NOT FOR CONSTRUCTION

**STOEPPELWERTH**  
ALWAYS ON  
7965 East 106th Street, Fishers, IN 46038-2905  
phone: 317.846.5905 fax: 317.846.5942

WATER PLAN & PROFILES  
WINTERFIELD  
SECTION 3

JOHNSON COUNTY, INDIANA  
FRANKLIN

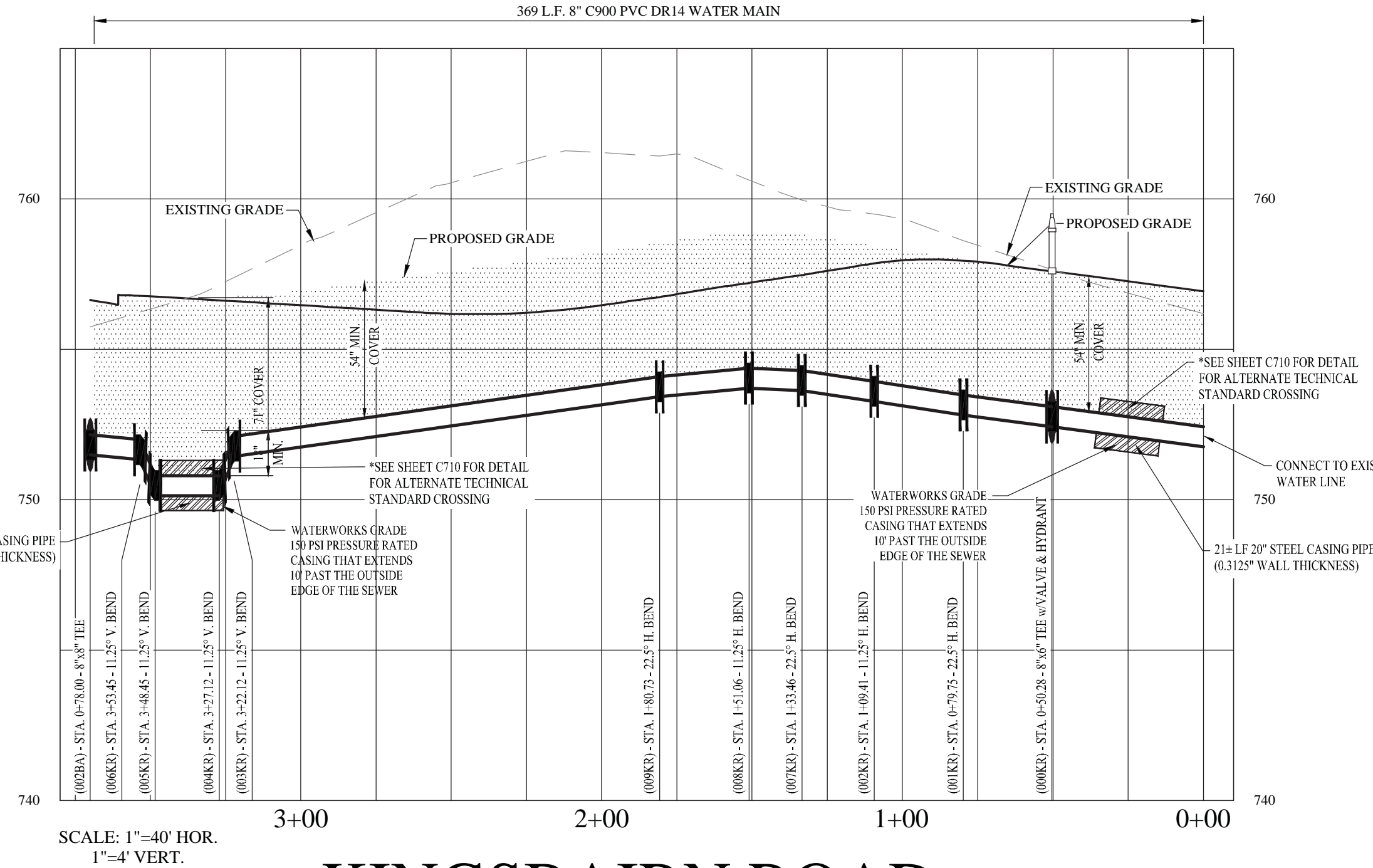
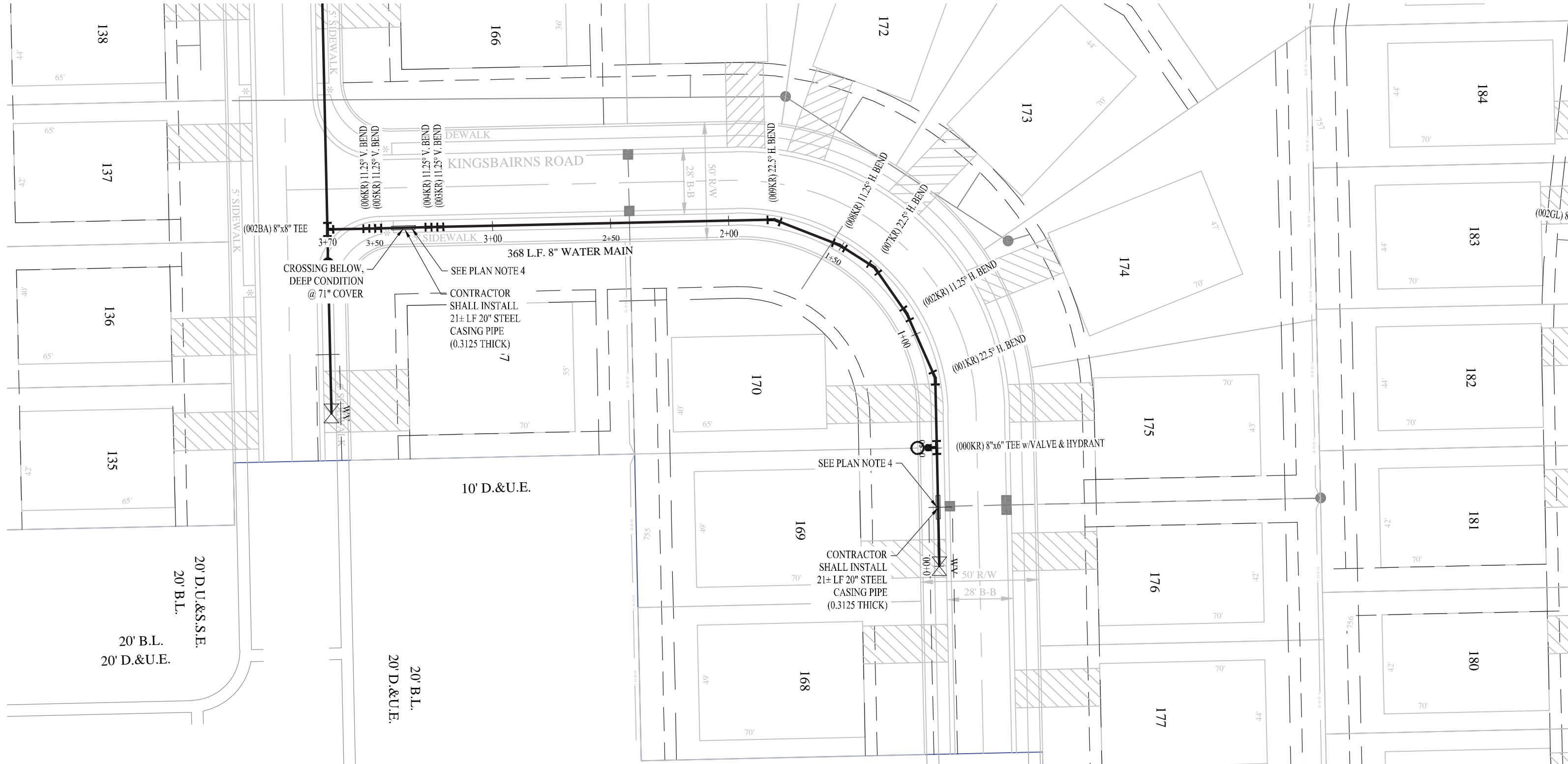
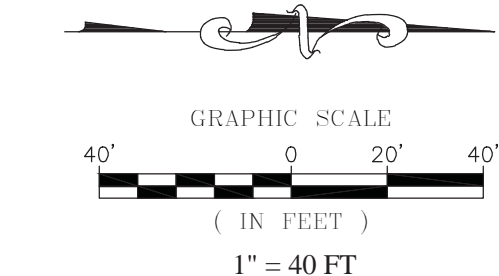
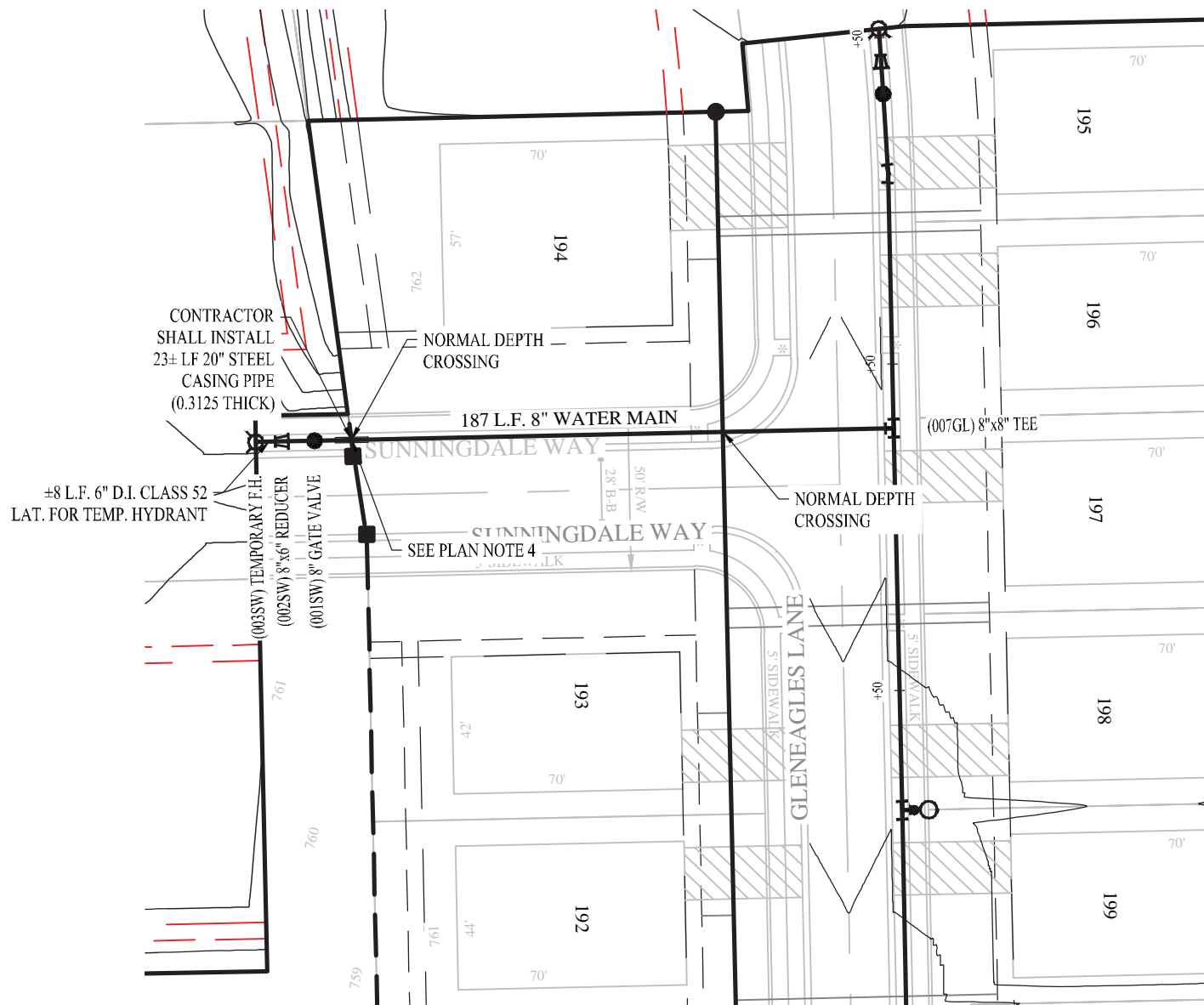
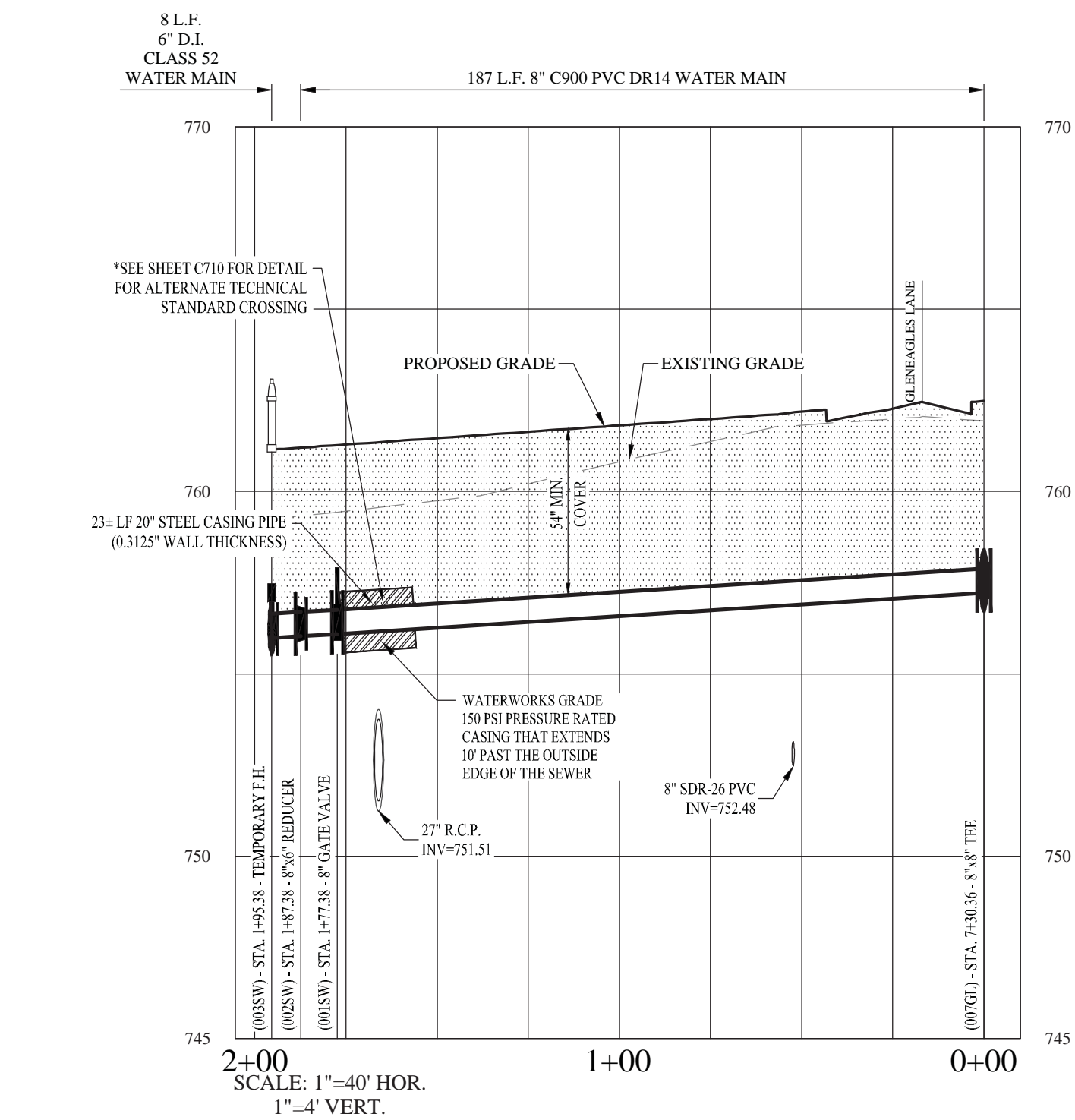
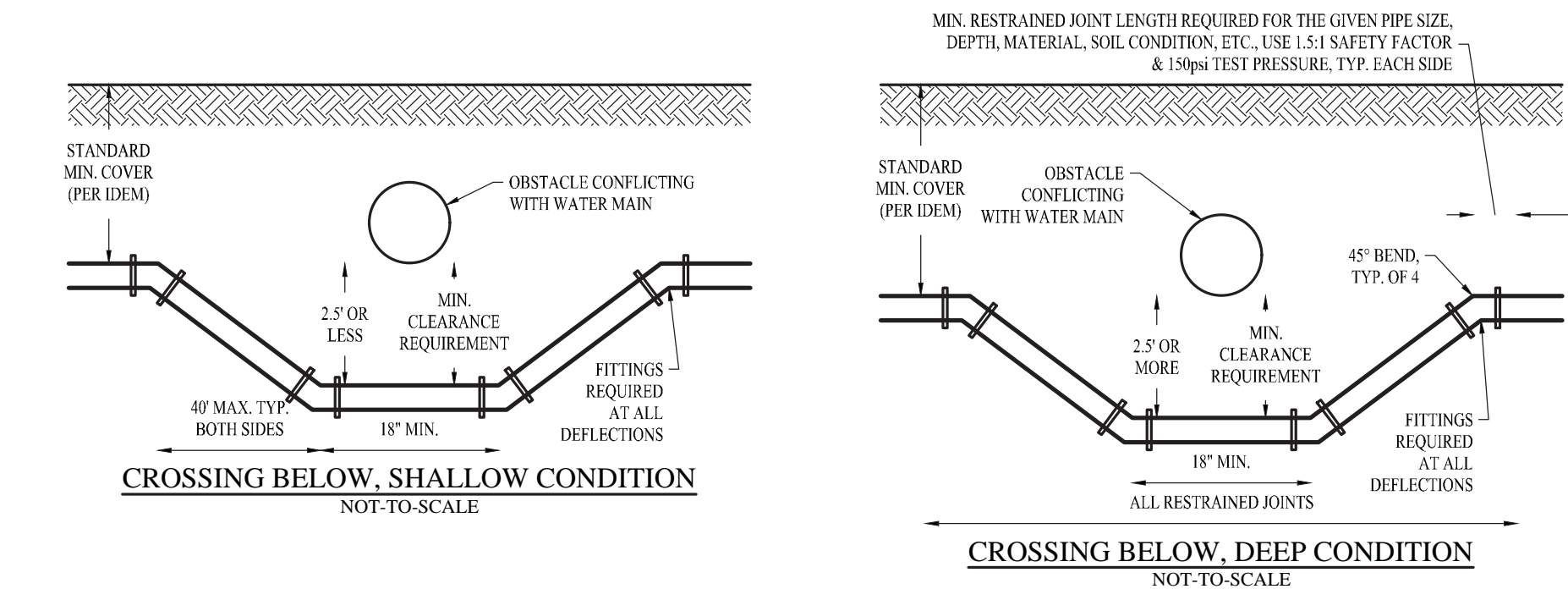
DRAWN BY: KJM/GEM  
CHECKED BY: KRK  
SHEET NO:  
C701  
6 & 8 FOR NO. 104045FOR-S3

REVISIONS  
DATE  
MARK  
BY



S:\10045FOR\S3\DWG\C700 - Water Profiles.dwg, C702, 6/28/2024, 12:27:47 PM, kmitchell, 11

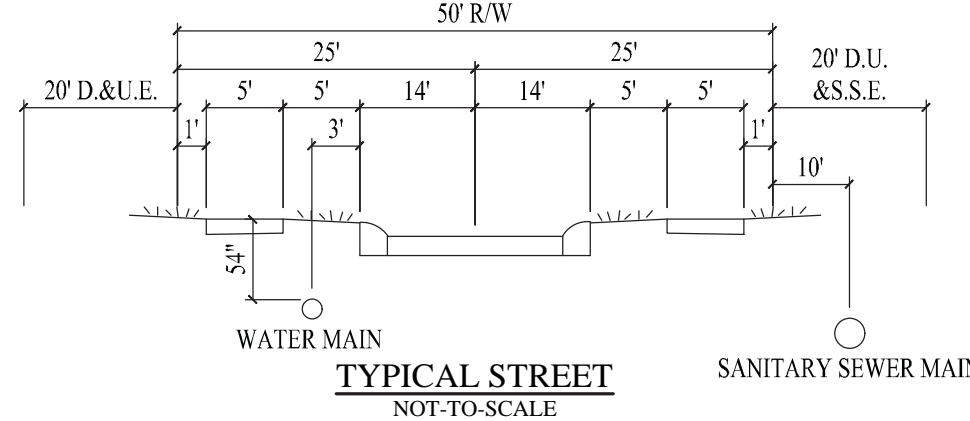
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Modified / By: June 20, 2024 12:58:15 PM / gnyers  
Printed / By: June 28, 2024 12:28:08 PM / Kenny Mitchell



**STANDARD NOTES:**

1. ALL EASEMENTS MUST BE RECORDED ON THE INAW STANDARD EASEMENT DOCUMENT. ANY CHANGES TO THE INAW STANDARD EASEMENT DOCUMENT MUST BE APPROVED BY INAW PRIOR TO RECORDING THE EASEMENT(S).

WATER MAIN PIPE TABLE		
SIZE	MATERIAL	LENGTH
8"	PVC C-900 DR-14, HDPE DR-11, OR D.I. THICKNESS CLASS 52	5,098 L.F.
6"	D.I. THICKNESS CLASS 52 LATERAL FOR TEMP. HYDRANT	57 L.F.
TOTAL LENGTH		5,155 L.F.



LEGEND	
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATER LINE
	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED WATER LINE
	HYDRANT w/ 6" VALVE
	GATE VALVE
	REDUCER
	TEE
	BEND, HORIZONTAL
	BEND, VERTICAL

FOR SPECS ON ALL WATER-RELATED MATERIAL, STRUCTURE, ACCESSORY, INSTALLATION, HANDLING, ETC., CONTRACTOR TO REFER TO INDIANA AMERICAN WATER PIPELINE SPECIFICATIONS, LATEST REVISION.

**WATER UTILITY INSTALLATION NOTES**

1. INSTALLATION OF WATER MAIN, FITTINGS, VALVES, FIRE HYDRANTS, AND APPURTENANCES SHALL BE IN ACCORDANCE WITH INDIANA AMERICAN WATER STANDARDS AND SPECIFICATIONS, LATEST REVISION.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION, SIZE AND MATERIAL OF THE EXISTING WATER MAIN PRIOR TO CONSTRUCTION.
3. AT THE POINT OF CONNECTION TO EXISTING WATER MAINS, A TAPPING SLEEVE AND VALVE MAY BE REQUIRED TO BE INSTALLED IF THE EXISTING WATER MAIN CANNOT BE SHUT DOWN WITHOUT IMPACTING CUSTOMERS. TO BE DETERMINED AT THE PRE-CONSTRUCTION MEETING.
4. FOR PVC C900 PIPE INSTALLATION: DR14 PIPE IS REQUIRED. DEFLECTION OF PIPE JOINTS AND BENDING OF PIPES ARE NOT PERMITTED. ALL ANGLES SHALL BE MADE WITH PROPER FITTINGS. WHEN RESTRAINT OF PIPE TO JOINTS ARE REQUIRED, ALL JOINTS SHALL BE RESTRAINED WITH EXTERNAL SPLIT SERRATED RESTRAINT HARNESSSES. SELECT FILL MATERIAL REQUIRED FOR BEDDING AND EMBEDMENT REGARDLESS OF PIPE'S PROXIMITY TO PAVEMENT. PVC C900 PIPE IS NOT ALLOWED FOR PIPES LARGER THAN 12-INCH.
5. FOR DUCTILE IRON PIPE INSTALLATION: THICKNESS CLASS 52 FOR TYPICAL DISTRIBUTION MAINS 12-INCH NOMINAL SIZE AND SMALLER. WHEN RESTRAINT OF PIPE TO PIPE JOINTS ARE REQUIRED, PUSH-ON RESTRAINING GASKETS WITH INTEGRAL STAINLESS STEEL LOCKING SEGMENTS ARE PERMITTED ON PIPE-TO-PIPE CONNECTIONS. 12-INCH NOMINAL SIZE AND SMALLER ONLY. PIPE-TO-PIPE CONNECTIONS GREATER THAN 12-INCH NOMINAL SIZE SHALL BE RESTRAINED PER SPECIFICATION SECTION 15105.
6. FOR HDPE PIPE INSTALLATION: HDPE DR11 FOR SIZES 4-INCH AND LARGER, IPS DR9 FOR 3-INCH, AND CTS DRY FOR SIZES SMALLER THAN 3-INCH. HDPE BENDS, TEES, AND CROSSES ARE NOT ACCEPTABLE. PRESSURE TESTING OF HDPE PIPE DIFFERS FROM DUCTILE IRON AND PVC PIPE. SEE SPECIFICATION SECTION 15093-3.03. PIPE FUSION MUST BE COMPLETED BY CERTIFIED TECHNICIAN. CERTIFICATION TO BE SUBMITTED PRIOR TO PRE-CONSTRUCTION MEETING.
7. ENCASE ALL DUCTILE IRON PIPING, DUCTILE IRON FITTINGS, VALVES, HYDRANTS, RESTRAINT HARNESSSES, AND ALL OTHER METALLIC APPURTENANCES IN 12-MIL BLUE POLYETHYLENE.
8. ALL FIRE HYDRANT LATERALS SHALL BE DUCTILE IRON PIPE.
9. ALL MJ T-BOLTS AND FLANGE BOLTS SHALL HAVE NYLON OR FLUOROKOTE #1 CORROSION RESISTANT COATING.
10. ALL FITTINGS SHALL BE RESTRAINED USING MJ RETAINER GLANDS.
11. THRUST RESTRAINT TO BE ACHIEVED THROUGH THE RESTRAINT OF PIPE JOINTS AND FITTINGS. THRUST BLOCKS ARE NOT AN ACCEPTABLE MEANS OF THRUST RESTRAINT, EXCEPT WHEN RESTRAINED IN CONNECTING TO EXISTING WATER MAIN AND FOR INSTALLATION OF FIRE HYDRANTS. SEE SPECIFICATION SECTIONS 15105 AND 15120 FOR PIPE JOINT RESTRAINT REQUIREMENTS FOR DUCTILE IRON AND PVC PIPE.
12. COPPER-CLAD STEEL TRACER WIRE REQUIRED ON INSTALLATION OF ALL PIPE. TRACER WIRE SHALL BE TAPED TO PIPE OR POLYETHYLENE ENCASEMENT AT A MINIMUM SPACING OF 10-FEET. SPLICES SHALL BE ENCASED IN WATERPROOF CONNECTORS. WIRE AND CONNECTORS ARE TO BE COMPATIBLE AND FROM THE SAME MANUFACTURER. DETECTABLE TAPES IS REQUIRED ONE FOOT ABOVE PIPE. CONTINUITY SHALL BE TESTED AFTER COMPLETION OF BACKFILL.
13. SELECT FILL MATERIAL REQUIRED FOR FINAL BACKFILL WHEN WITHIN 4-FEET OF PAVEMENT PER SPECIFICATION SECTION 0210.
14. MAINTAIN THE REQUIRED 10-FEET OF HORIZONTAL SEPARATION AND 18-INCHES OF VERTICAL SEPARATION FROM SANITARY AND STORM SEWERS. MAINTAIN 8-FEET OF HORIZONTAL SEPARATION FROM SANITARY AND STORM STRUCTURES. SEE 1271AC-6.3.2.9 OF THE INDIANA ADMINISTRATIVE CODE FOR MORE INFORMATION.
15. MAINTAIN MINIMUM COVER DEPTH OF 54" AND A MAXIMUM OF 54"-24".
16. ANCHOR COLLARS ARE REQUIRED WHEN TRANSITIONING FROM PVC/DI/CI PIPE TO HDPE PIPE.

**PLAN NOTES**

1. 16" WATER MAIN PIPE SHALL BE DUCTILE IRON THICKNESS CLASS 54.
2. SEE WATER MAIN JOINT RESTRAINT SCHEDULE ON SHEET C708.
3. WATER MAIN PIPE SHALL BE PVC C-900 DR-14, HDPE DR-11, OR D.I. THICKNESS CLASS 52. THE PIPE MATERIAL AND PRESSURE CLASS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION BASED ON COST OF EACH AT THAT TIME.
4. CONTRACTOR TO USE ALTERNATE TECHNICAL STANDARD SEPARATION METHOD WHERE THE REQUIRED HORIZONTAL SEPARATION CANNOT BE MET. THE WATER MAIN IS INSTALLED IN A WATERWORKS GRADE 150 PSI PRESSURE RATED CASING THAT EXTENDS AT LEAST 8 FEET PAST THE OUTSIDE EDGES OF THE STORMWATER STRUCTURE AND THE ENDS OF THE CASING ARE SEALED. SEE DETAILS ON SHEET C714.
5. CONTRACTOR TO USE ALTERNATIVE TECHNICAL STANDARD THAT ALLOWS LESS THAN 18 INCHES OF VERTICAL SEPARATION FROM STORM/SANITARY SEWERS. THE WATER MAIN IS INSTALLED IN A WATERWORKS GRADE 150 PSI PRESSURE RATED CASING THAT EXTENDS AT LEAST 10 FEET PAST THE OUTSIDE EDGE OF THE SEWER AT THE CROSSING IN BOTH DIRECTIONS. THE ENDS OF THE CASING ARE SEALED, AND THE WATER MAIN CASING AND SEWER ARE SEPARATED BY A MINIMUM OF 6 INCHES. SEE DETAILS ON SHEET C714.

**BENCHMARK DATA**

ORIGINATING BENCHMARK:  
BENCHMARK ELEVATIONS FOR THIS PROJECT WERE DERIVED USING THE NATIONAL GEODETIC SURVEY ONLINE POSITIONING USER SERVICE (O.P.U.S.) AND ARE REFERENCED TO THE NAVD 88 DATUM.  
TBM #30  
CROSSING 73' ON NORTHWEST BOLT OF A FIRE HYDRANT, 35' EAST OF HURRICANE ROAD AND AT THE SOUTH ENTRANCE TO GOLF ACADEMY.  
ELEV. -762.85'



APPROVAL: PENDING/NOT FOR CONSTRUCTION

STOEPPELWERTH

ALWAYS ON

7965 East 10th Street, Fishers, IN 46038-2905  
phone: 317.849.5905 fax: 317.849.5942

WATER PLAN & PROFILES

WINTERFIELD

SECTION 3

JOHNSON COUNTY, INDIANA

FRANKLIN

DRAWN BY: KJ/M/GEM

CHECKED BY: KR/G

SHEET NO.

C702

6 & 8 P.O. NO.

100405FOR-S3

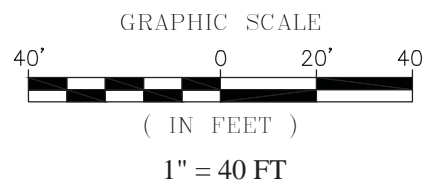
BY

REVISIONS

DATE

MARK





SIZE	MATERIAL	LENGTH
8"	PVC C-900 DR-14, HDPE DR-11, OR D.I. THICKNESS CLASS 52	5,098 L.F.
6"	D.I. THICKNESS CLASS 52 LATERAL FOR TEMP. HYDRANT	57 L.F.
TOTAL LENGTH		5,155 L.F.

FOR SPECS ON ALL WATER-RELATED  
MATERIAL, STRUCTURE, ACCESSORY,  
INSTALLATION, HANDLING, ETC.,  
CONTRACTOR TO REFER TO INDIANA  
AMERICAN WATER PIPELINE SPECIFICATIONS,  
LATEST REVISION.

WATER UTILITY INSTALLATION NOTES

- APPROVAL PENDING/NOT FOR CONSTRUCTION

DRAWN BY: <b>KJM/GEM</b>		CHECKED BY: <b>KRG</b>	
SHEET NO. <b>C703</b>			
S & A JOB NO. <b>100405FOR-S3</b>			

**EPPELW**

**ALWAYS ON**

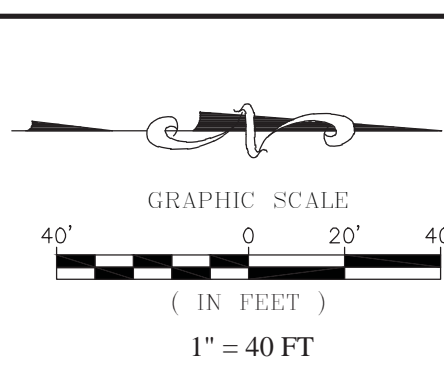
7965 East 106th Street, Fishers, IN 46038-2905  
phone: 317.849.5935 fax: 317.849.5942

THIS DRAWING IS NOT INTENDED TO BE REPRESENTED AS A PREFERRED METHOD OR

No.  
PE1200386  
STATE OF  
INDIANA  
PROFESSIONAL ENGINEER

[illegible]





LEGEND	
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATER LINE
	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED WATER LINE
	HYDRANT w/ 6" VALVE
	GATE VALVE
	REDUCER
	TEE
	BEND, HORIZONTAL
	BEND, VERTICAL

FOR SPECS ON ALL WATER-RELATED MATERIAL, STRUCTURE, ACCESSORY, INSTALLATION, HANDLING, ETC., CONTRACTOR TO REFER TO INDIANA AMERICAN WATER PIPELINE SPECIFICATIONS, LATEST REVISION.

## WATER UTILITY INSTALLATION NOTES

1. INSTALLATION OF WATER MAIN, FITTINGS, VALVES, FIRE HYDRANTS, AND APPURTENANCES SHALL BE IN ACCORDANCE WITH INDIANA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, LATEST REVISION.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION, SIZE AND MATERIAL OF THE EXISTING WATER MAIN PRIOR TO CONSTRUCTION.
3. AT THE POINT OF CONNECTION TO EXISTING WATER MAINS, A MINIMUM OF ONE (1) FEET AND VALVE MAYNEE REQUIRED TO BE INSTALLED IF THE EXISTING WATER MAIN CANNOT BE SHUT DOWN WITHOUT IMPACTING CUSTOMERS, TO BE DETERMINED AT THE PROJECT CONSTRUCTION MEETING.
4. FOR PVC C90 PIPE INSTALLATION: DR14 PIPE IS REQUIRED. DEFLECTION OF JOINTS AND BENDING OF PIPES ARE NOT PERMITTED. ALL ANGLES SHALL BE MADE WITH 45-Degree WELDED ELBOWS. JOINTS ON PIPES LESS THAN 4-INCH DIAMETERS SHALL BE RESTRAINED WITH EXTERNAL SPLIT SERATED RESTRAINT HARNESS. SELECT HPI MATERIAL REQUIRED FOR BEDDING AND EMBODIMENT REGARDLESS OF PIPES TYPE OR JOINT SYSTEM. PVC C90 PIPE IS NOT ALLOWED FOR PIPES LARGER THAN 12-INCH.
5. FOR DUCTILE IRON PIPE INSTALLATION: THICKNESS CLASS 52 FOR TYPICAL DISTRIBUTION MANS 12-INCH. DEFLECTION OF JOINTS AND BENDING OF PIPES ARE NOT PERMITTED. JOINTS ON PIPES ARE REQUIRED, PUSH-ON LOCKING RASGETS WITH INTEGRAL STAINLESS STEEL RESTRAIN SEGMENTS ARE PERMITTED ON PIPE-TO-PIPE CONNECTIONS. MINIMUM COVER SHALL ALLOW ONLY PIPE-TO-PIPE CONNECTIONS GREATER THAN 12-INCH NOMINAL SIZE SHALL BE RESTRAINED PER SPECIFICATION SECTION 15105.
6. FOR HDPE PIPE INSTALLATION: DIPR1 DR11 FOR SIZES 4-INCH AND SMALLER; DIPR1 DR9 FOR SIZES 6-INCH THROUGH 8-INCH; DIPR1 DR7 FOR SIZES 10-INCH THROUGH 12-INCH. BENDS, TEES, AND CROSSSES ARE NOT ACCEPTABLE. PRESSURE TESTING OF HDPE PIPE DIFFERS FROM THAT OF DUCTILE IRON PIPE. TESTING OF HDPE PIPE SHALL BE IDENTIFIED IN THE PROJECT MANUAL. REFER TO SPECIFICATION SECTION 15063-603. PIPE TESTING MUST BE COMPLETED BY CERTIFIED TECHNICIAN AND REPORT TO BE SUBMITTED PRIOR TO PRE-CONSTRUCTION MEETING.
7. ENCASE ALL DUCTILE IRON PIPE, DUCTILE IRON FITTINGS, VALVES, HYDRANTS, RESTRAINT HARNESSES, AND ALL OTHER METALLIC APPURTENANCES IN 12-MINIL LATERAL S.H.E.L.L.B.U.T.T.I.V.E.N.E.
8. ALL FIRE HYDRANT LATERAL S.H.E.L.L.B.U.T.T.I.V.E.N.E.
9. ALL MJ-BOLTS AND FLANGE BOLTS SHALL HAVE NYLON OR FLOORCOTE® III CORROSION RESISTANT COATING.
10. ALL FITTINGS SHALL BE RESTRAINED USING M3 RETAINER GLANDS.
11. THRUST RESTRAINT TO BE ACHIEVED THROUGH THE RESTRAINT OF PIPE JOINTS AND FITTINGS. THRUST BLOCKS ARE NOT AN ACCEPTABLE MEANS OF THRUST RESTRAINT. EXCEPTION WHEN REQUIRED IN CONNECTING TO EXISTING WATER MAIN AND FOR 15105 AND 15120 FOR PIPE JOINT RESTRAINT REQUIREMENTS FOR DUCTILE IRON AND PVC PIPE.
12. COPPER-LAB STEEL TRACKER WIRE REQUIRED ON INSTALLATION OF 12-INCH AND OVER WATER MAINS. TRACKER WIRE SHALL BE 12-GAUGE PIPE OR POLYETHYLENE ENCASEMENT AT A MINIMUM SPACING OF 10-FEET. SPLICES SHALL BE ENCASED IN WATERPROOF CONNECTORS. WIRE AND CONNECTORS ARE TO BE COMPATIBLE AND FROM THE SAME MANUFACTURER. DETECTABLE LAYER IS REQUIRED UNDER ANY ABOVE PIPE. CONTINUITY SHALL BE TESTED AFTER COMPLETION OF BACKFILL.
13. SELECT FILT MATERIAL REQUIRED FOR FINAL BACKFILL WHEN WRITTEN OR AGREED UPON PER SPECIFICATION SECTION 02110.
14. MAINTAIN THE REQUIRED 10-FOET OF HORIZONTAL SEPARATION AND 18-INCHES OF VERTICAL SEPARATION FROM SANITARY AND STORM SEWER LINES. SEE SECTION 05110-SEWER AND SANITARY AND STORM STRUCTURES SEE 3710-6 8-3.2.9 OF THE INDIANA ADMINISTRATIVE CODE FOR MORE INFORMATION.
15. MAINTAIN MINIMUM COVER DEPTH OF 5'4" AND A MAXIMUM OF 5'6".
16. ANCHOR COLLARS ARE REQUIRED FOR ALL PIPES. ANCHOR COLLARS FOR PVC/DI/CI PIPE TO HDPE PIPE.

## PLAN NOTES

- |   |  |
|---|--|
| 1 | 16" WATER MAIN PIPE SHALL BE DUCTILE IRON THICKNESS CLASS 54.  |
| 2 | SEAL WATER MAIN JOINT RESTRAINT SCHEDULE ON SHEET C708.  |
| 3 | WATER MAIN PIPE SHALL BE PVC C-MOD 404, HDPE R101 OR D.I. THICKNESS CLASS 54. THE JOINT MATERIAL AND PRESSURE CLASS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION BASED ON COST OF EACH AT THAT TIME.   |
| 4 | CONTRACTOR TO USE ALTERNATE TECHNICAL STANDARD SEPARATION METHOD WHERE THE REQUIRED HORIZONTAL SEPARATION CANNOT BE MAINTAINED. THE METHOD TO BE USED IN A WATERWORKS GRADE 150 PSI PRESSURE RATED CASING THAT EXTENDS AT LEAST 4 FEET PAST THE OUTSIDE EDGES OF THE STORMWATER STRUCTURE AND THE ENDS OF THE CASING ARE SEATED. SEE DETAILS ON SHEET C708.  |
| 5 | CONTRACTOR TO USE ALTERNATE TECHNICAL STANDARD THAT ALLOWS LESS THAN 18 INCHES OF VERTICAL SEPARATION FROM STORM/SANITARY SEWERS. THE WATER MAIN IS INSTALLED IN A WATERWORKS GRADE 150 PSI PRESSURE RATED CASING THAT EXTENDS AT LEAST TO 4 FEET PAST THE OUTSIDE EDGE OF THE SEWER AT THE CROSSING IN BOTH DIRECTIONS. THE ENDS OF THE CASING ARE SEALED, AND THE WATER MAIN CASING AND SEWER ARE SEPARATED BY A MINIMUM OF 6 INCHES. SEE DETAILS ON SHEET C708. |

## BENCHMARK DATA

ORIGINATING BENCHMARK

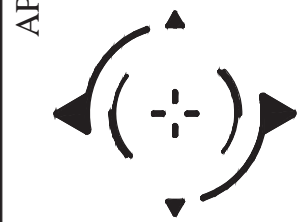
BENCHMARK ELEVATIONS FOR THIS PROJECT WERE DERIVED USING THE NATIONAL GEODETIC SURVEY ONLINE POSITIONING USER SERVICE (O.P.U.S.) AND ARE REFERENCED TO THE NAVD '88 DATUM.

TBM #30  
CHISELED "X" ON NORTHWEST BOLT OF A FIRE HYDRANT , 35'± EAST OF  
HURRICANE ROAD AND AT THE SOUTH ENTRANCE TO GOLF ACADEMY.  
ELEV.=762.85'

[illegible]

THIS DRAWING IS NOT INTENDED TO BE REPRESENTED AS A RETRACEMENT OR ORIGINAL BOUNDARY SURVEY, A ROUTE SURVEY OR A SURVEYOR LOCATION

APPROVAL PENDING/NOT FOR CONSTRUCTION  
STOEPPELWERTH

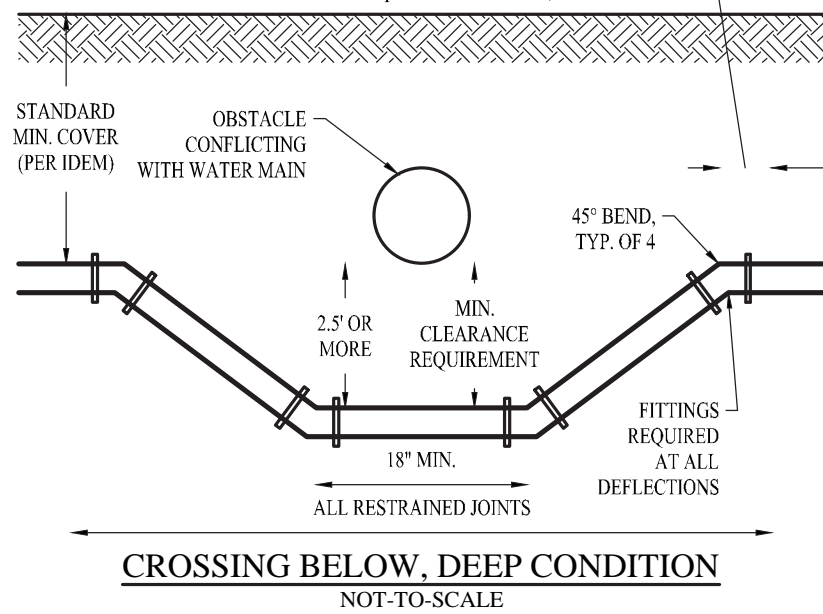
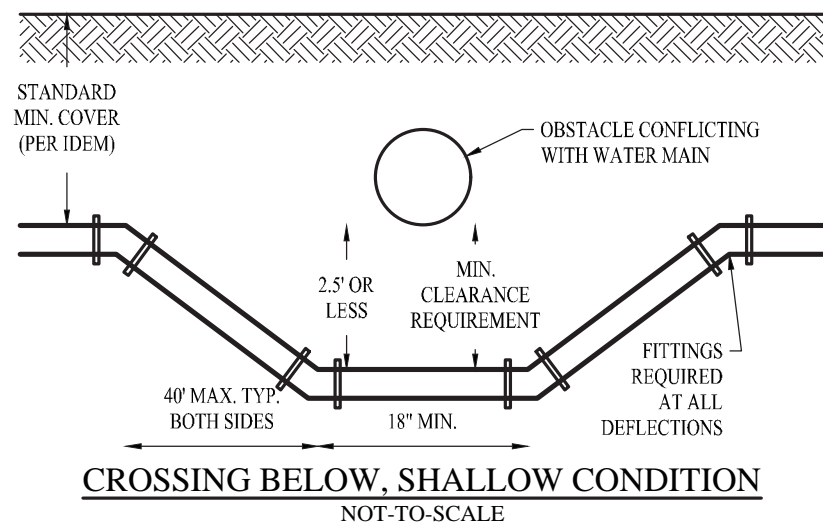


WATER PLAN & PROFILES  
WINTERFIELD  
SECTION 3  
JOHNSON COUNTY, INDIANA

JOHNSON COUNTY, INDIANA

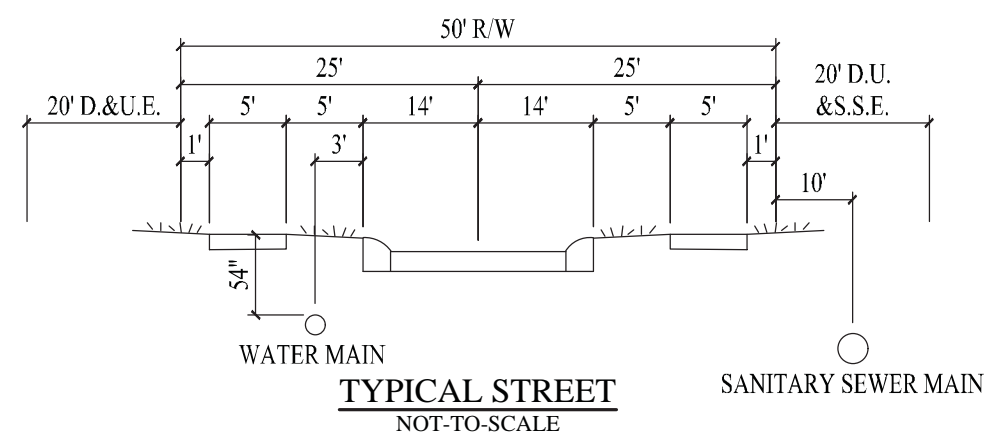
FRANKLIN

DRAWN BY: KJJM/GEM	CHECKED BY: KRG
SHEET NO. <b>C704</b>	
S & A JOB NO. 100405FOR-S3	



STANDARD NOTES:	
1.	ALL EASEMENTS MUST BE RECORDED ON THE INAW STANDARD EASEMENT DOCUMENT. ANY CHANGES TO THE INAW STANDARD EASEMENT DOCUMENT MUST BE APPROVED BY INAW PRIOR TO RECORDING THE EASEMENT(S).

WATER MAIN PIPE TABLE		
SIZE	MATERIAL	LENGTH
8"	PVC C-900 DR-14, HDPE DR-11, OR D.I. THICKNESS CLASS 52	5,098 L.F.
6"	D.I. THICKNESS CLASS 52 LATERAL FOR TEMP. HYDRANT	57 L.F.
TOTAL LENGTH		5,155 L.F.

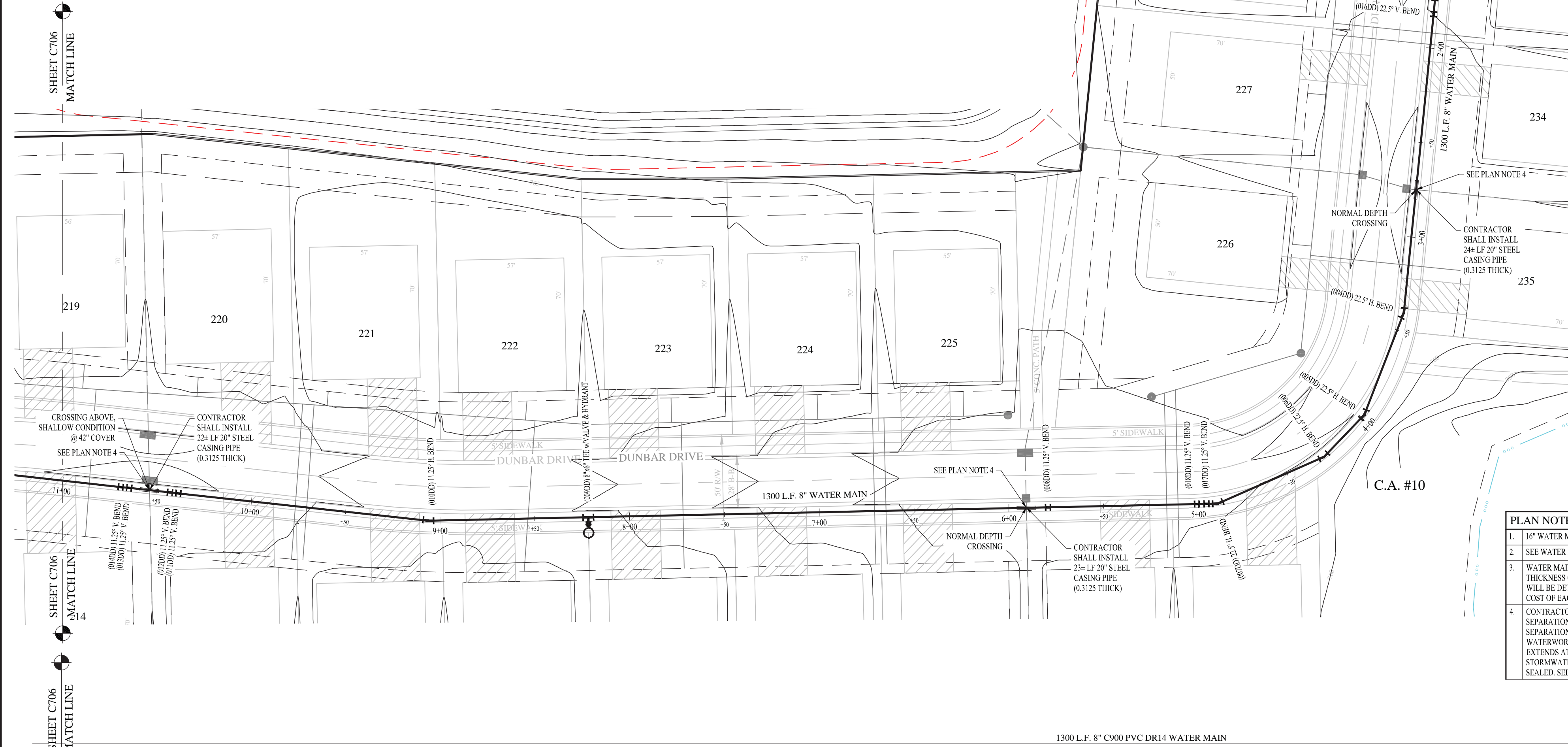




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June 20, 2024 12:58:15 PM / gnyiers  
Modified / By: June 26, 2024 12:28:56 PM / Kenny Mitchell  
Printed / By:

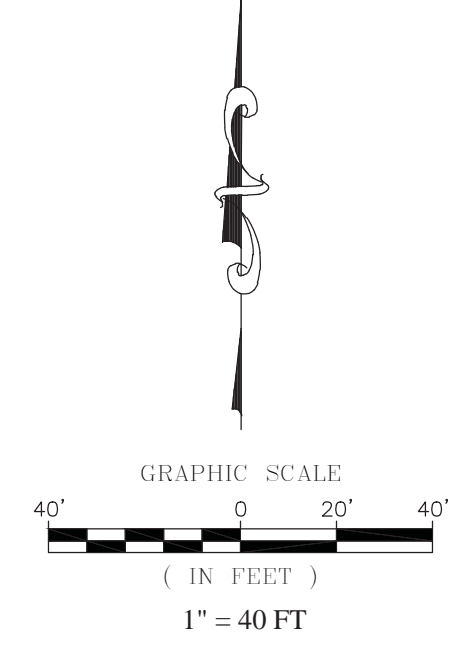
WATER UTILITY INSTALLATION NOTES	
1.	INSTALLATION OF WATER MAIN, FITTINGS, VALVES, FIRE HYDRANTS, AND APPURTENANCES SHALL BE IN ACCORDANCE WITH INDIANA AMERICAN WATER STANDARDS AND SPECIFICATIONS, LATEST REVISION.
2.	IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION, SIZE AND MATERIAL OF THE EXISTING WATER MAIN PRIOR TO CONSTRUCTION.
3.	AT THE POINT OF CONNECTION TO EXISTING WATER MAINS, A TAPPING SLEEVE AND VALVE MAYBE REQUIRED TO BE INSTALLED IF THE EXISTING WATER MAIN CANNOT BE SHUT DOWN WITHOUT IMPACTING CUSTOMERS. TO BE DETERMINED AT THE PRE-CONSTRUCTION MEETING.
4.	FOR PVC C900 PIPE INSTALLATION: DR14 PIPE IS REQUIRED. DEFLECTION OF PIPE JOINTS AND BENDING OF PIPES ARE NOT PERMITTED. ALL ANGLES SHALL BE MADE WITH PROPER FITTINGS. WHEN RESTRAINT OF PIPE-TO-PIPE JOINTS ARE REQUIRED, ALL JOINTS SHALL BE RESTRAINED WITH EXTERNAL SPLIT SERRATED RESTRAINT HARNESSSES. SELECT FILL MATERIAL REQUIRED FOR BEDDING AND EMBEDMENT REGARDLESS OF PIPE'S PROXIMITY TO PAVEMENT. PVC C900 PIPE IS NOT ALLOWED FOR PIPES LARGER THAN 12-INCH.
5.	FOR DUCTILE IRON PIPE INSTALLATION: THICKNESS CLASS 52 FOR TYPICAL DISTRIBUTION MAINS 12-INCH NOMINAL SIZE AND SMALLER. WHEN RESTRAINT OF PIPE-TO-PIPE JOINTS ARE REQUIRED, PUSH-ON RESTRAINING GASKETS WITH INTEGRAL STAINLESS STEEL LOCKING SEGMENTS ARE PERMITTED ON PIPE-TO-PIPE CONNECTIONS 12-INCH NOMINAL SIZE AND SMALLER ONLY. PIPE-TO-PIPE CONNECTIONS GREATER THAN 12-INCH NOMINAL SIZE SHALL BE RESTRAINED PER SPECIFICATION SECTION 15105.
6.	FOR HDPE PIPE INSTALLATION: DIPS DR11 FOR SIZES 4-INCH AND LARGER, IPS DR9 FOR 3-INCH, AND CTS DR9 FOR SIZES SMALLER THAN 3-INCH. HDPE BENDS, TEES, AND CROSSES ARE NOT ACCEPTABLE. PRESSURE TESTING OF HDPE PIPE DIFFERS FROM DUCTILE IRON AND PVC PIPE. SEE SPECIFICATION SECTION 1508-3.03. PIPE FUSION MUST BE COMPLETED BY CERTIFIED TECHNICIAN; CERTIFICATION TO BE SUBMITTED PRIOR TO PRE-CONSTRUCTION MEETING.

7.	ENCASE ALL DUCTILE IRON PIPING, DUCTILE IRON FITTINGS, VALVES, HYDRANTS, RESTRAINT HARNESSSES, AND ALL OTHER METALLIC APPURTENANCES IN 12-MIL BLUE POLYETHYLENE.
8.	ALL FIRE HYDRANT LATERALS SHALL BE DUCTILE IRON PIPE.
9.	ALL M/T-BOLTS AND FLANGE BOLTS SHALL HAVE XLYAN OR FLUOROKOTE #1 CORROSION RESISTANT COATING.
10.	ALL FITTINGS SHALL BE RESTRAINED USING M/T RETAINER GLANDS.
11.	THRUST RESTRAINT TO BE ACHIEVED THROUGH THE RESTRAINT OF PIPE JOINTS AND FITTINGS. THRUST BLOCKS ARE NOT AN ACCEPTABLE MEANS OF THRUST RESTRAINT. EXCEPT WHEN REQUIRED IN CONNECTING TO EXISTING WATER MAIN AND FOR INSTALLATION OF FIRE HYDRANTS. SEE SPECIFICATION SECTIONS 15105 AND 15120 FOR PIPE JOINT RESTRAINT REQUIREMENTS FOR DUCTILE IRON AND PVC PIPE.
12.	COPPER-CLAD STEEL TRACER WIRE REQUIRED ON INSTALLATION OF ALL PIPE. TRACER WIRE SHALL BE TAPED TO PIPE OR POLYETHYLENE ENCASMENT AT A MINIMUM SPACING OF 10-FEET. SPLICES SHALL BE ENCASED IN WATERPROOF CONNECTORS. WIRE AND CONNECTORS ARE TO BE COMPATIBLE AND FROM THE SAME MANUFACTURER. DETECTABLE TAPE IS REQUIRED ONE FOOT ABOVE PIPE. CONTINUITY SHALL BE TESTED AFTER COMPLETION OF BACKFILL.
13.	SELECT FILL MATERIAL REQUIRED FOR FINAL BACKFILL WHEN WITHIN 5-FEET OF PAVEMENT PER SPECIFICATION SECTION 0210.
14.	MAINTAIN THE REQUIRED 10-FEET OF HORIZONTAL SEPARATION AND 18-INCHES OF VERTICAL SEPARATION FROM SANITARY AND STORM SEWERS. MAINTAIN 8-FEET OF HORIZONTAL SEPARATION FROM SANITARY AND STORM STRUCTURES. SEE 327AC 6-3.2 OF THE INDIANA ADMINISTRATIVE CODE FOR MORE INFORMATION.
15.	MAINTAIN MINIMUM COVER DEPTH OF 5'-0" AND A MAXIMUM OF 5'-4"-0".
16.	ANCHOR COLLARS ARE REQUIRED WHEN TRANSITIONING FROM PVC/DI/CI PIPE TO HDPE PIPE.



LEGEND	
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATER LINE
	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED WATER LINE
	HYDRANT w/ 6\"/>
	GATE VALVE
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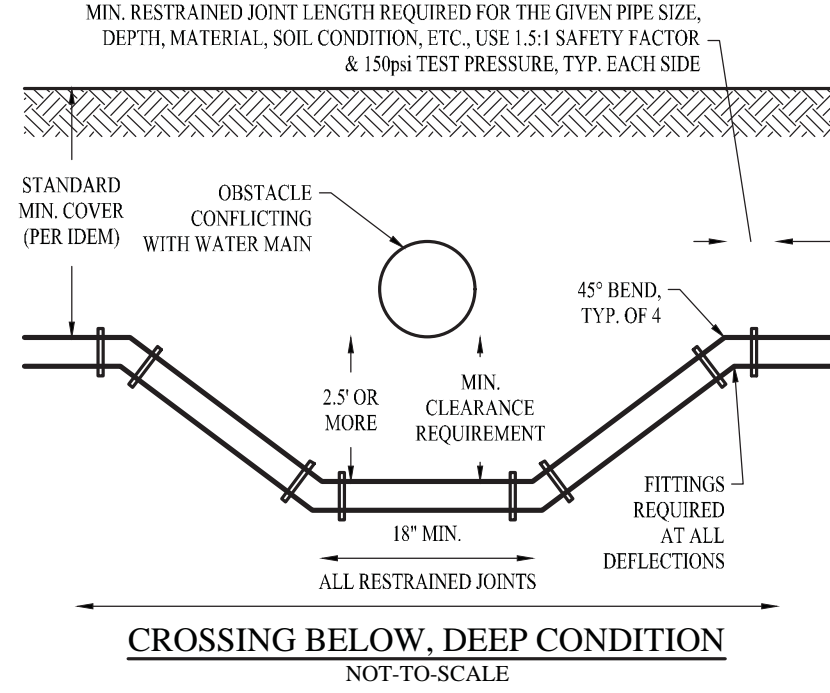
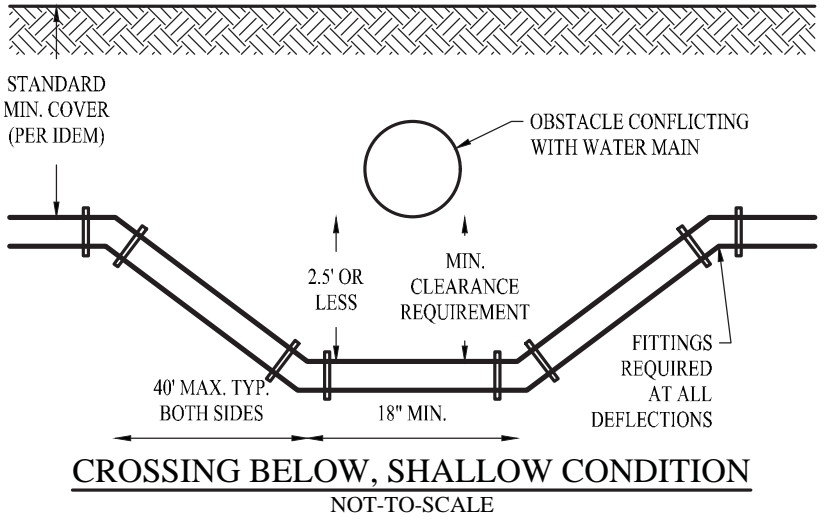
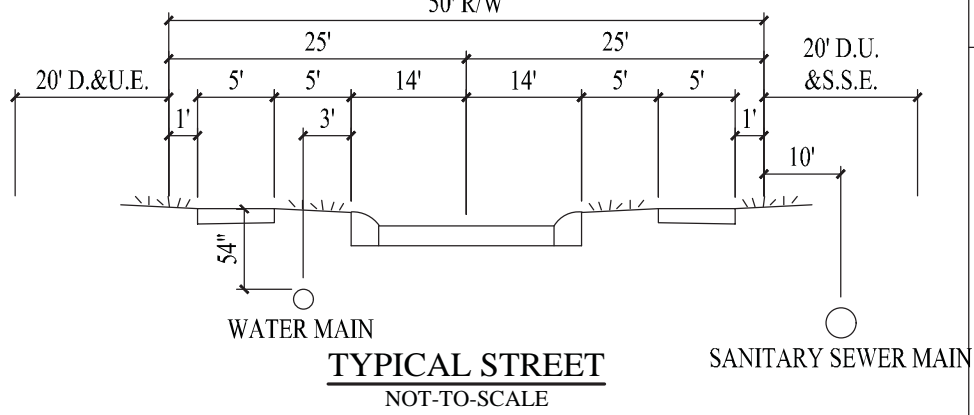
BENCHMARK DATA	
ORIGINATING BENCHMARK	
BENCHMARK ELEVATIONS FOR THIS PROJECT WERE DERIVED USING THE NATIONAL GEODETIC SURVEY ONLINE POSITIONING USER SERVICE (O.P.U.S.) AND ARE REFERENCED TO THE NAVD'83 DATUM.	
TBM #50	
CHISELED "X" ON NORTHWEST BOLT OF A FIRE HYDRANT, 35% EAST OF HURRICANE ROAD AND AT THE SOUTH ENTRANCE TO GOLF ACADEMY.	
ELEV. = 762.85'	



PLAN NOTES	
1.	16\"/>
2.	SEE WATER MAIN JOINT RESTRAINT SCHEDULE ON SHEET C708.
3.	WATER MAIN PIPE SHALL BE PVC C-900 DR-14, HDPE DR-11, OR D.I. THICKNESS CLASS 52. THE PIPE MATERIAL AND PRESSURE CLASS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION BASED ON COST OF EACH AT THAT TIME.
4.	CONTRACTOR TO USE ALTERNATE TECHNICAL STANDARD SEPARATION METHOD WHERE THE REQUIRED HORIZONTAL SEPARATION CANNOT BE MET. THE WATER MAIN IS INSTALLED IN A WATERWORKS GRADE 150 PSI PRESSURE RATED CASING THAT EXTENDS AT LEAST 8 FEET PAST THE OUTSIDE EDGES OF THE STORM/WATER STRUCTURE AND THE ENDS OF THE CASING ARE SEALED. SEE DETAILS ON SHEET C714.

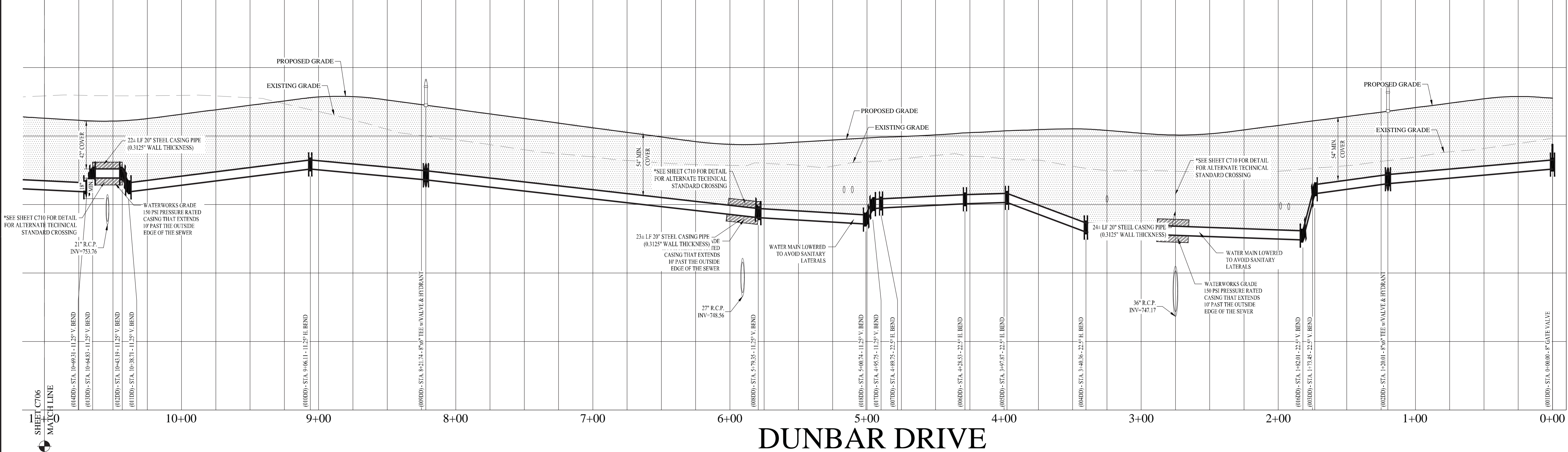
5.	CONTRACTOR TO USE ALTERNATE TECHNICAL STANDARD THAT ALLOWS LESS THAN 18 INCHES OF VERTICAL SEPARATION FROM STORM/SANITARY SEWERS. THE WATER MAIN IS INSTALLED IN A WATERWORKS GRADE 150 PSI PRESSURE RATED CASING THAT EXTENDS AT LEAST 10 FEET PAST THE OUTSIDE EDGE OF THE SEWER AT THE CROSSING IN BOTH DIRECTIONS. THE ENDS OF THE CASING ARE SEALED, AND THE WATER MAIN CASING AND SEWER ARE SEPARATED BY A MINIMUM OF 6 INCHES. SEE DETAILS ON SHEET C714.
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STANDARD NOTES:	
1.	ALL EASEMENTS MUST BE RECORDED ON THE INAW STANDARD EASEMENT DOCUMENT. ANY CHANGES TO THE INAW STANDARD EASEMENT DOCUMENT MUST BE APPROVED BY INAW PRIOR TO RECORDING THE EASEMENT(S).



FOR SPECS ON ALL WATER-RELATED MATERIAL, STRUCTURE, ACCESSORY, INSTALLATION, HANDLING, ETC., CONTRACTOR TO REFER TO INDIANA AMERICAN WATER PIPELINE SPECIFICATIONS, LATEST REVISION.

WATER MAIN PIPE TABLE		
SIZE	MATERIAL	LENGTH
8"	PVC C-900 DR-14, HDPE DR-11, OR D.I. THICKNESS CLASS 52	5,098 L.F.
6"	D.I. THICKNESS CLASS 52 LATERAL FOR TEMP. HYDRANT	57 L.F.
TOTAL LENGTH		5,155 L.F.



BY

REVISIONS

DATE

MARK

THIS DRAWING IS NOT INTENDED TO BE REPRESENTED AS A RETRACEMENT OR SURVEY OR A SURVEYOR LOCATION REPORT.

STOEPPELWERTH

APPROVAL PENDING/NOT FOR CONSTRUCTION

ALWAYS ON

7965 East 106th Street, Fishers, IN 46038-2905  
phone: 317.849.5905 fax: 317.849.5942

WATER PLAN & PROFILES

WINTERFIELD

SECTION 3

FRANKLIN

DRAWN BY: KJM/GEM

CHECKED BY: KRG

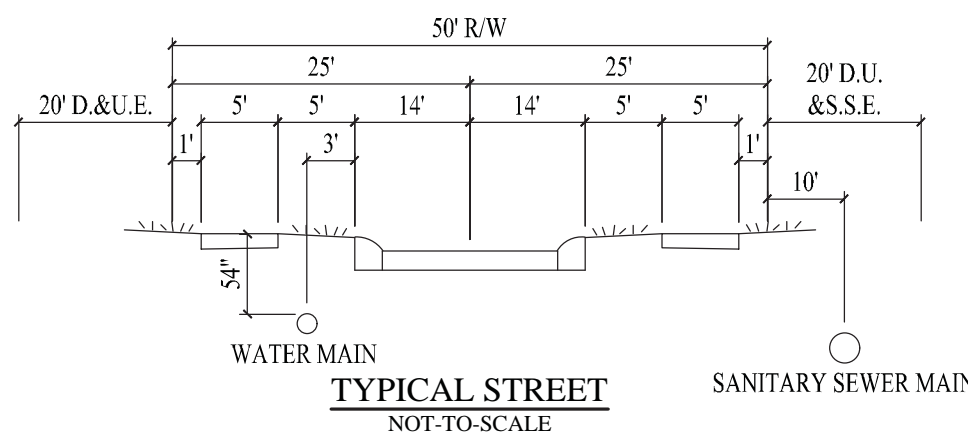
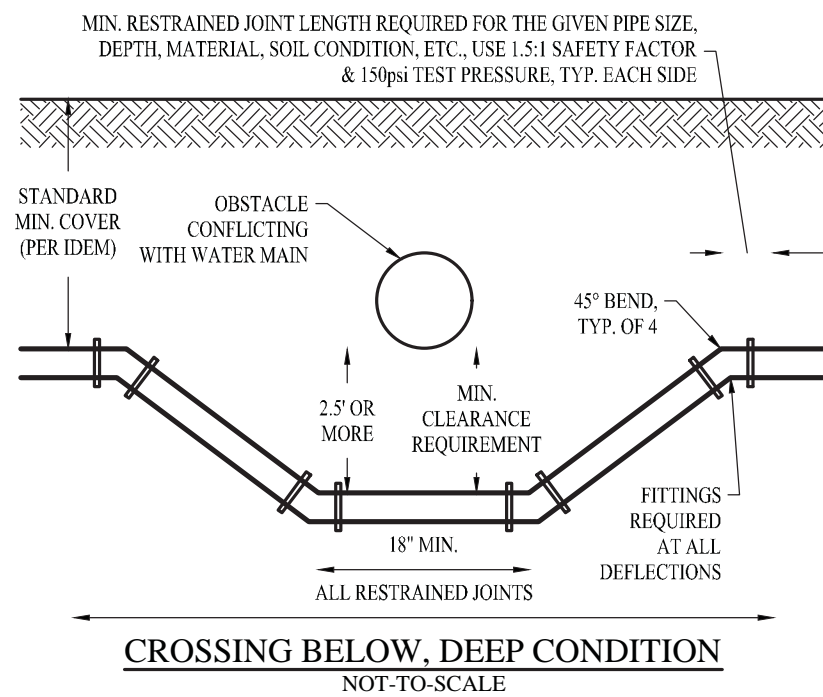
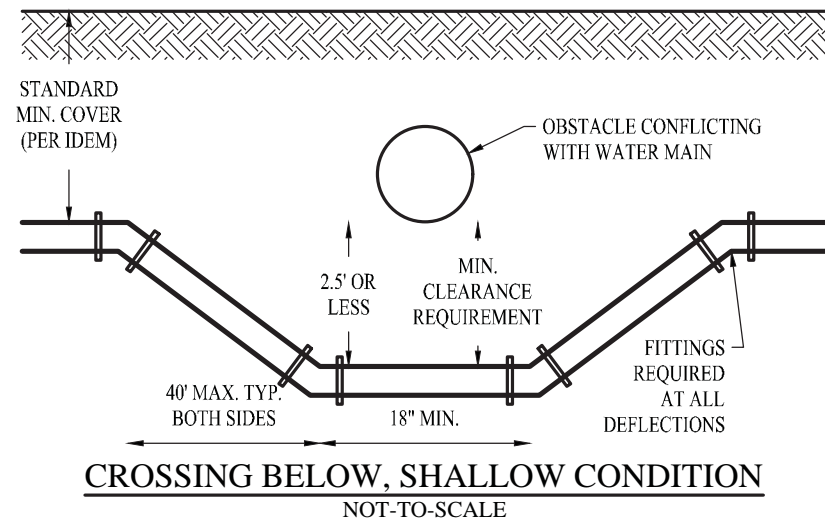
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C705

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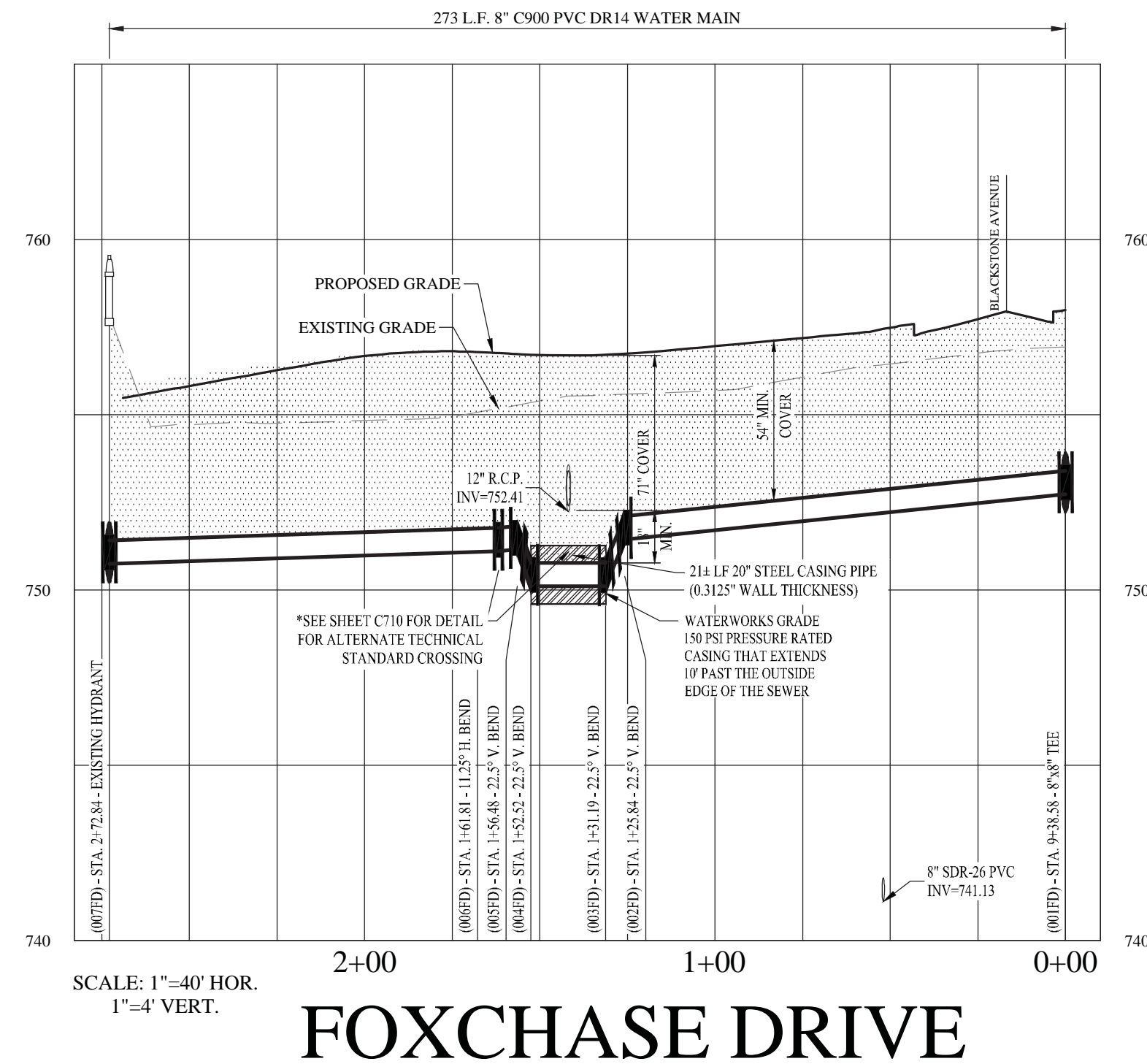
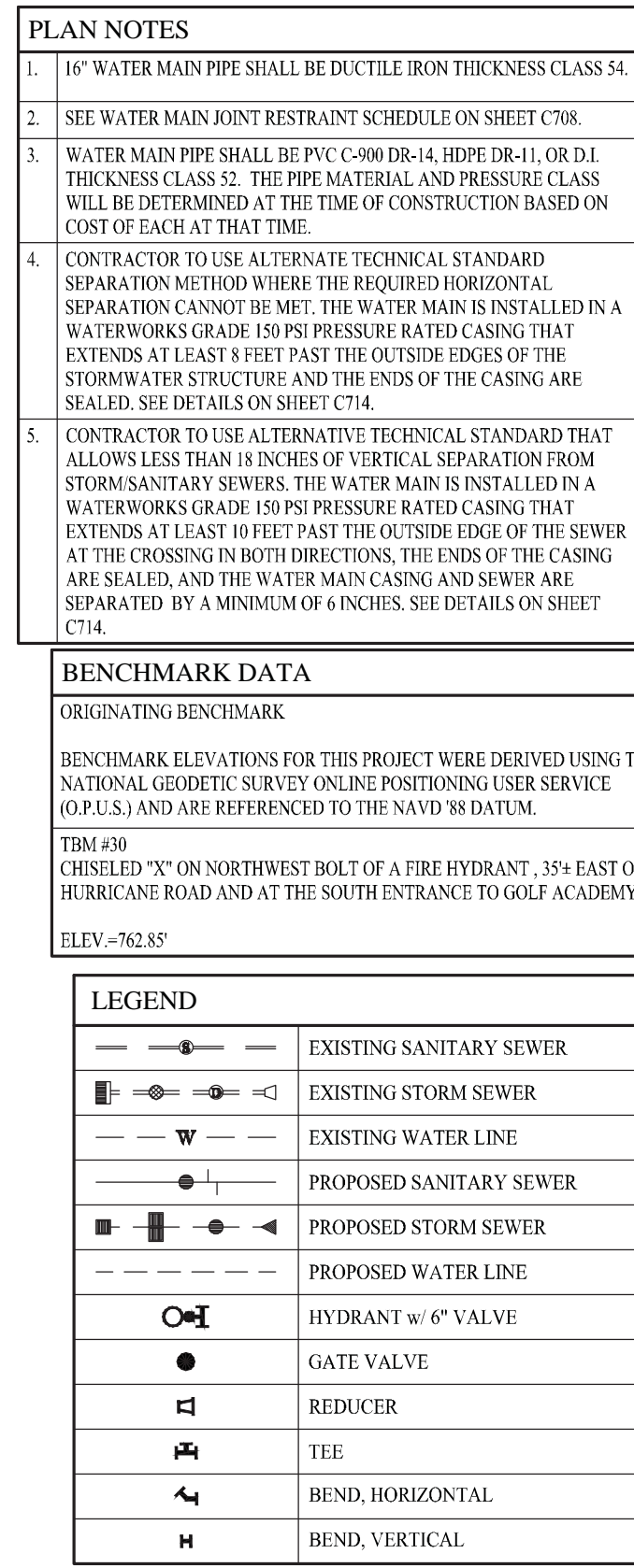
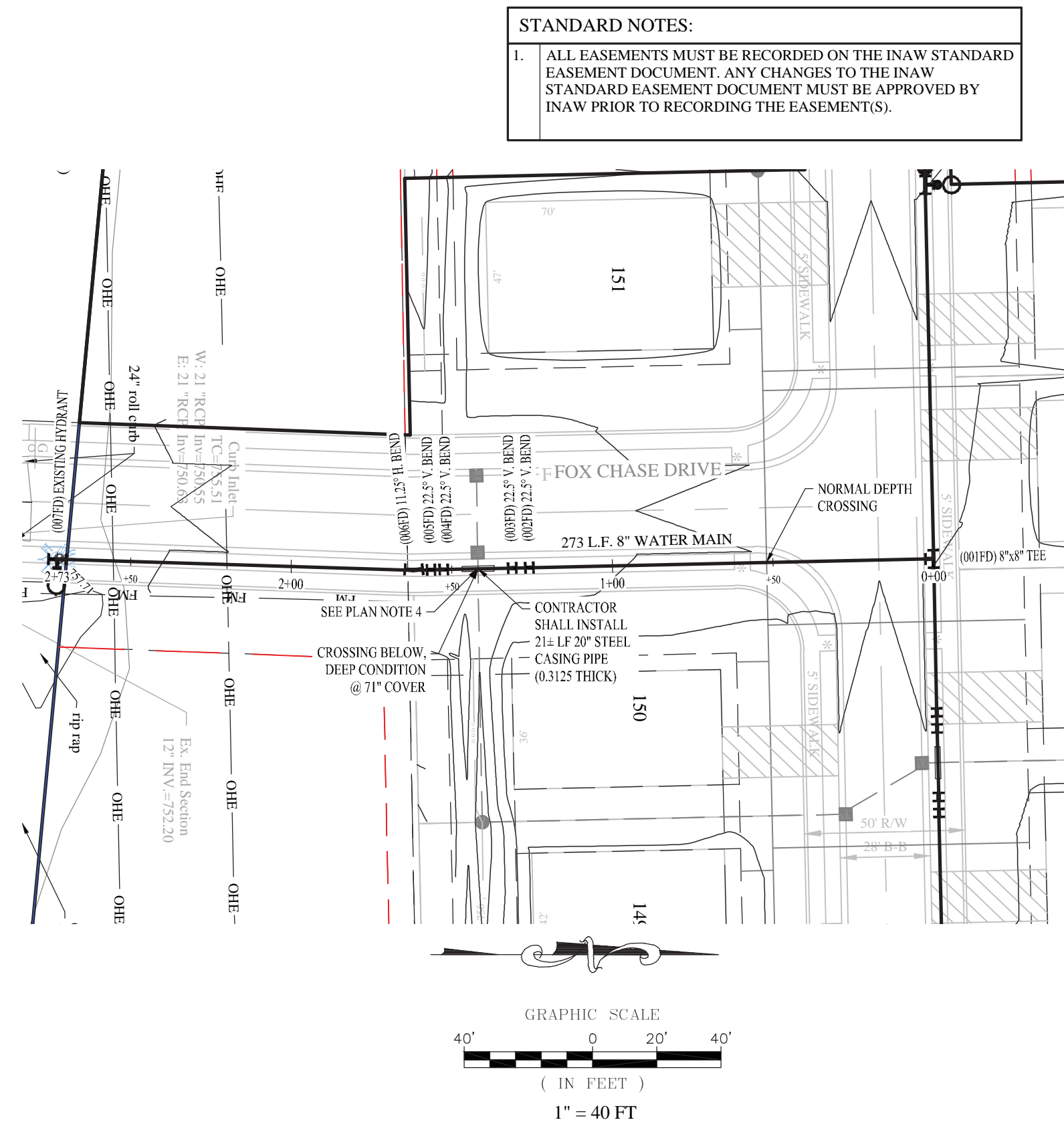
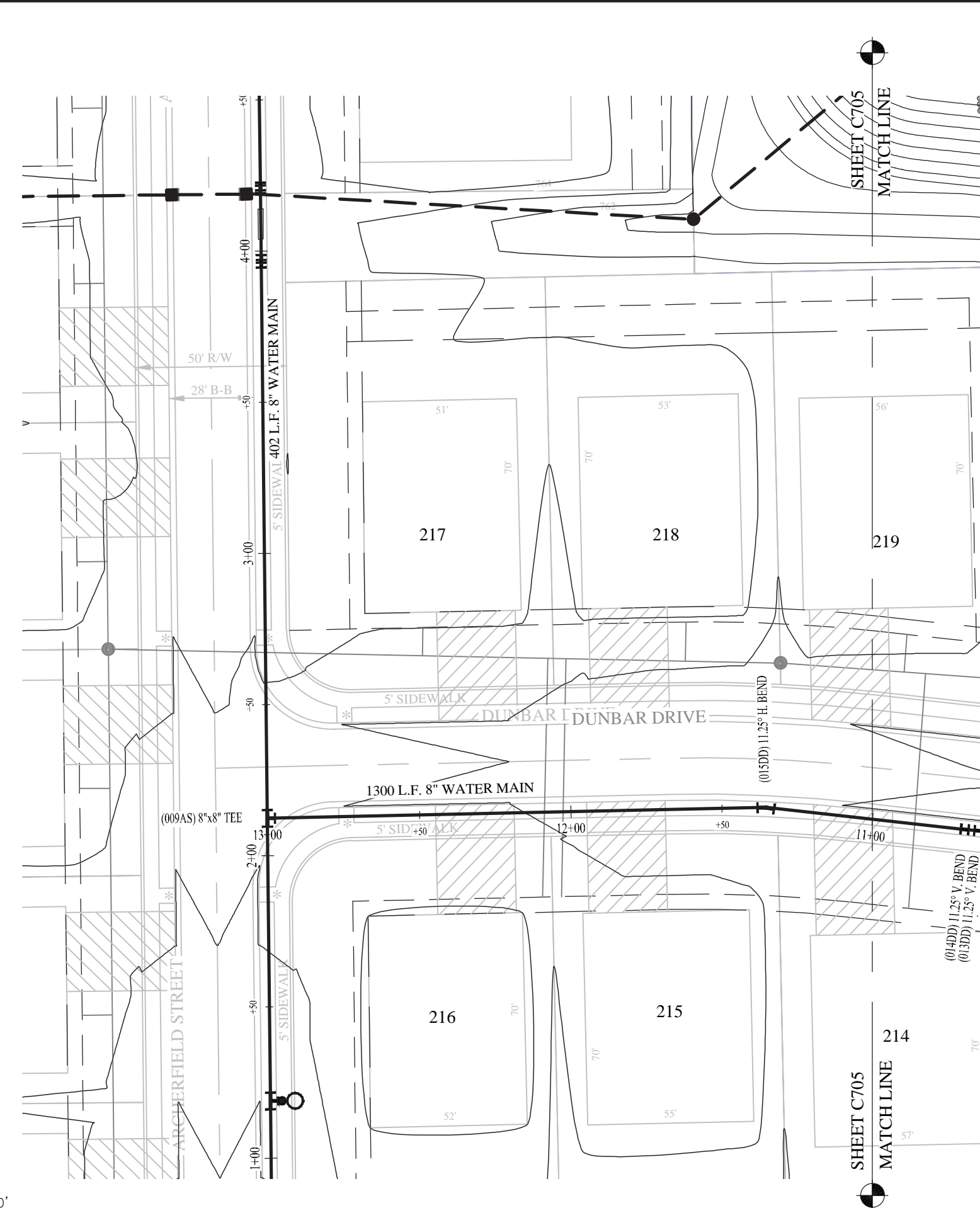
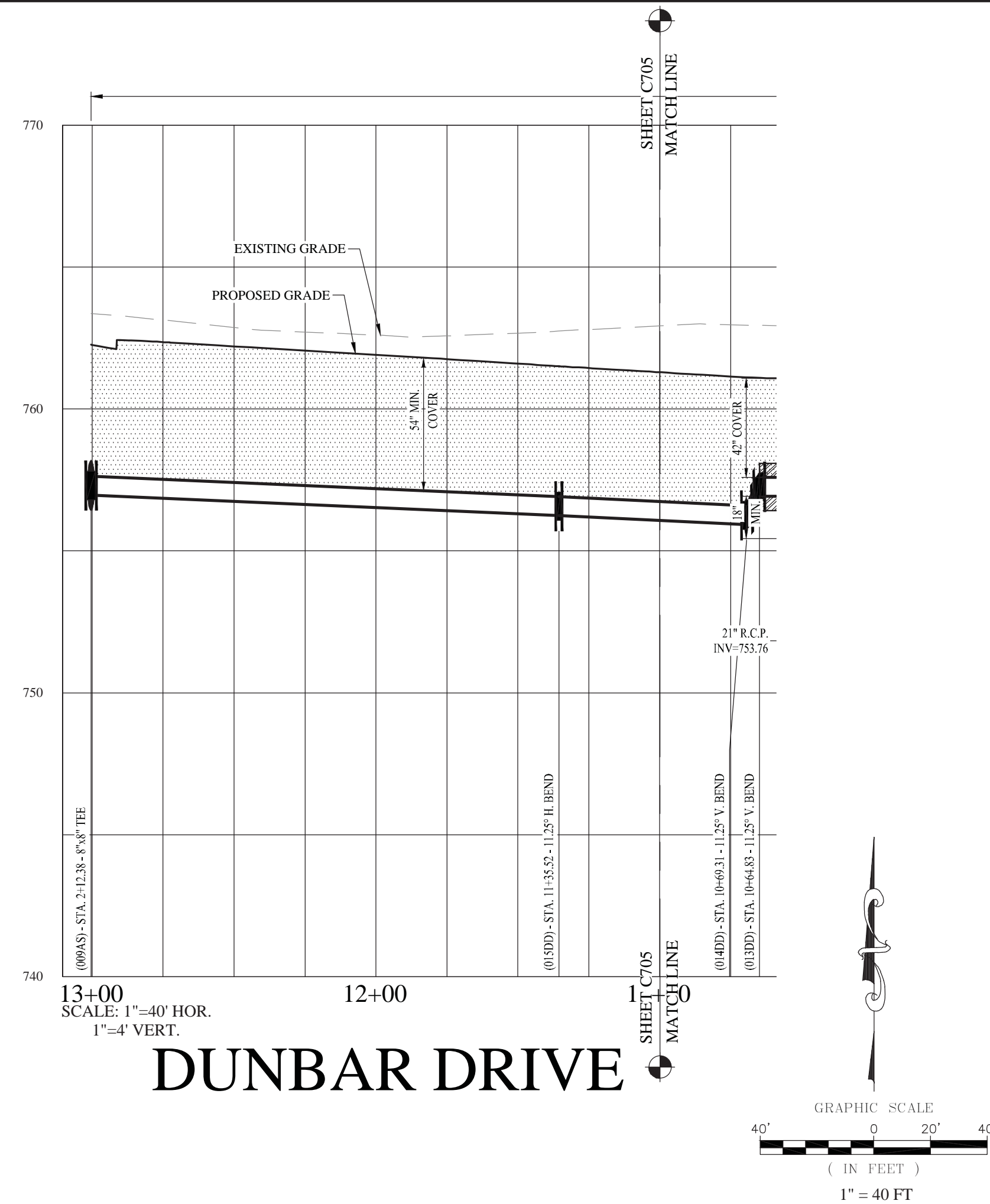
FOR SPECS ON ALL WATER-RELATED MATERIAL, STRUCTURE, ACCESSORY, INSTALLATION, HANDLING, ETC., CONTRACTOR TO REFER TO INDIANA AMERICAN WATER PIPELINE SPECIFICATIONS, LATEST REVISION.

WATER MAIN PIPE TABLE		
SIZE	MATERIAL	LENGTH
8"	PVC C-900 DR-14, HDPE DR-11, OR D.I. THICKNESS CLASS 52	5,098 L.F.
6"	D.I. THICKNESS CLASS 52 LATERAL FOR TEMP. HYDRANT	57 L.F.
TOTAL LENGTH		5,155 L.F.

#### WATER UTILITY INSTALLATION NOTES

- INSTALLATION OF WATER MAIN, FITTINGS, VALVES, FIRE HYDRANTS, AND APPURTENANCES SHALL BE IN ACCORDANCE WITH INDIANA AMERICAN WATER STANDARDS AND SPECIFICATIONS, LATEST REVISION.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE LOCATION, SIZE AND MATERIAL OF THE EXISTING WATER MAIN PRIOR TO CONSTRUCTION.
- AT THE POINT OF CONNECTION TO EXISTING WATER MAINS, A TAPPING SLEEVE AND VALVE MAY BE REQUIRED TO BE INSTALLED IF THE EXISTING WATER MAIN CANNOT BE SHUT DOWN WITHOUT IMPACTING CUSTOMERS, TO BE DETERMINED AT THE PRE-CONSTRUCTION MEETING.
- FOR PVC C900 PIPE INSTALLATION: DR14 PIPE IS REQUIRED. DEFLECTION OF PIPE JOINTS AND BENDING OF PIPES ARE NOT PERMITTED. ALL ANGLES SHALL BE MADE WITH PROPER FITTINGS. WHEN RESTRAINT OF PIPE-TO-PIPE JOINTS ARE REQUIRED, ALL JOINTS SHALL BE RESTRAINED WITH EXTERNAL SPLIT SEPARATED RESTRAINT HARNESS. SELECT FILL MATERIAL REQUIRED FOR BEDDING AND EMBEDMENT REGARDLESS OF PIPES PROXIMITY TO PAVEMENT. PVC C900 PIPE IS NOT ALLOWED FOR PIPES LARGER THAN 12-INCH.
- FOR DUCTILE IRON PIPE INSTALLATION: THICKNESS CLASS 52 FOR TYPICAL DISTRIBUTION MAINS 12-INCH NOMINAL SIZE AND SMALLER. WHEN RESTRAINT OF PIPE-TO-PIPE JOINTS ARE REQUIRED, PUSH-ON RESTRAINING GASKETS WITH INTEGRAL STAINLESS STEEL LOCKING SECTIONS ARE PERMITTED ON PIPE-TO-PIPE CONNECTIONS 12-INCH NOMINAL SIZE AND SMALLER ONLY. PIPE-TO-PIPE CONNECTIONS GREATER THAN 12-INCH NOMINAL SIZE SHALL BE RESTRAINED PER SPECIFICATION SECTION 15105.
- FOR HDPE PIPE INSTALLATION: DIPS DR11 FOR SIZES 4-INCH AND LARGER, DIPS DR9 FOR 3-INCH, AND CTS DR9 FOR SIZES SMALLER THAN 3-INCH. HDPE BENDS, TIES, AND CROSSES ARE NOT ACCEPTABLE. PRESSURE TESTING OF HDPE PIPE DIFFERS FROM DUCTILE IRON AND PVC PIPE. SEE SPECIFICATION SECTION 15030-3.05. PIPE FUSION MUST BE COMPLETED BY CERTIFIED TECHNICIAN; CERTIFICATION TO BE SUBMITTED PRIOR TO PRE-CONSTRUCTION MEETING.

- ENCASE ALL DUCTILE IRON PIPING, DUCTILE IRON FITTINGS, VALVES, HYDRANTS, RESTRAINT HARNESSES, AND ALL OTHER METALLIC APPURTENANCES IN 12-INCH BLUE POLYETHYLENE.
- ALL FIRE HYDRANT LATERALS SHALL BE DUCTILE IRON PIPE.
- ALL M/T-BOLTS AND FLANGE BOLTS SHALL HAVE NYLON OR FLUOROKOTE #1 CORROSION RESISTANT COATING.
- ALL FITTINGS SHALL BE RESTRAINED USING MU RETAINER GLANDS.
- THRUST RESTRAINT TO BE ACHIEVED THROUGH THE RESTRAINT OF PIPE JOINTS AND FITTINGS. THRUST BLOCKS ARE NOT AN ACCEPTABLE MEANS OF THRUST RESTRAINT, EXCEPT WHEN REQUIRED IN CONNECTING TO EXISTING WATER MAIN AND FOR INSTALLATION OF FIRE HYDRANTS. SEE SPECIFICATION SECTIONS 15105 AND 15120 FOR PIPE JOINT RESTRAINT REQUIREMENTS FOR DUCTILE IRON AND PVC PIPE.
- COPPER-CLAD STEEL TRACER WIRE REQUIRED ON INSTALLATION OF ALL PIPE. TRACER WIRE SHALL BE TAPED TO PIPE OR POLYETHYLENE ENCASMENT AT A MINIMUM SPACING OF 10-FEET. SPLICES SHALL BE ENCASED IN WATERPROOF CONNECTORS, WIRE AND CONNECTORS ARE TO BE COMPATIBLE AND FROM THE SAME MANUFACTURER. DETECTABLE TAPES ARE REQUIRED ONE FOOT ABOVE PIPE. CONTINUITY SHALL BE TESTED AFTER COMPLETION OF BACKFILL.
- SELECT FILL MATERIAL REQUIRED FOR FINAL BACKFILL WITHIN 5-FEET OF PAVEMENT PER SPECIFICATION SECTION 02110.
- MAINTAIN THE REQUIRED 10-FEET OF HORIZONTAL SEPARATION AND 18-INCHES OF VERTICAL SEPARATION FROM SANITARY AND STORM SEWERS. MAINTAIN 8-FEET OF HORIZONTAL SEPARATION FROM SANITARY AND STORM STRUCTURES. SEE 371 AC 6.3.3.4 OF THE INDIANA ADMINISTRATIVE CODE FOR MORE INFORMATION.
- MAINTAIN MINIMUM COVER DEPTH OF 54" AND A MAXIMUM OF 54"-24".
- ANCHOR COLLARS ARE REQUIRED WHEN TRANSITIONING FROM PVC/DI/CI PIPE TO HDPE PIPE.



## FOXCHASE DRIVE



File Name: S:\100405FOR-S3\DWG\C707 - Water Details.dwg - C707  
April 9, 2024 11:53:37 AM / rmyers  
June 21, 2024 7:13:54 AM / Karmy Mitchell  
Printed / By:

Table of Contents																			
SECTION 15105 DUCTILE IRON PIPE AND FITTINGS																			
PART 1: GENERAL																			
1.01 SCOPE OF WORK																			
The work under this section consists of providing all labor, materials, tools, equipment, and services required to install and test all ductile iron (DI) pipe and fittings (4 inch through 48 inch nominal diameter) for water distribution and transmission as indicated on the Drawings and as specified within this section and related sections of the Specification. Contractor shall furnish and install all required pipe restraint components and other related components that are not furnished by the Owner. Refer to Sections 01000, 01011, and 01075 for materials to be furnished by the Owner.																			
1.02 SUBMITTALS																			
A. Contractor shall submit Shop Drawings, manufacturer's literature and product data, installation instructions, and certifications for all products furnished under this section in accordance with Section 01300.																			
B. Required certifications include those specified under Quality Assurance below.																			
1.03 QUALITY ASSURANCE																			
A. Ductile iron pipe and fittings shall meet the minimum quality requirements by conforming to the below-referenced AWWA/ANSI standards as modified herein. Ductile iron pipe and fittings will be accepted on the basis of the Manufacturer's certification that the materials conform to this section.																			
B. The certification for ductile iron fittings shall list a fitting description, quantity, bare fitting weight, source, and applicable AWWA standard (C110 or C153). The certification shall accompany each delivery of the material to the project site.																			
C. Owner reserves the right to sample and test these materials subsequent to delivery at the project site.																			
D. Both manufacturer's certification of compliance must accompany each shipment.																			
E. If foreign-manufactured fittings are furnished, Contractor shall notify the Engineer in the Shop Drawing submittal and provide the necessary documentation to satisfy the Engineer and the Owner that the materials furnished meet the specified AWWA standards and, among other documentation that may be required, provide certificates of compliance on the components supplied.																			
12/2019 – Pipeline	15105 - 1	12/2019 – Pipeline	15105 - 2	12/2019 – Pipeline	15105 - 3	12/2019 – Pipeline	15105 - 4												
2.03 FITTINGS		2.04 JOINTS – ADDITIONAL REQUIREMENTS		allowed within this section, the existing pipe shall be cut to a plain spigot end unless otherwise approved by the Engineer.		SECTION 15120 POLYVINYL CHLORIDE (PVC) PIPE													
A. <u>Ductile Iron Fittings</u> . Standard fittings shall be ductile iron conforming to AWWA C110. Compact ductile iron fittings shall meet the requirements of AWWA C153. Fittings shall be suitable for the following working pressures unless otherwise noted in AWWA C110 or C153. <u>No gray cast iron fittings are permitted.</u>		A. All gaskets for buried pipe and fittings shall be of styrene butadiene rubber (SBR), unless otherwise required by the Drawings, Section 01011, or as directed by the Engineer.		D. <u>Restrained Mechanical Joints</u> :		PART 1: GENERAL													
<table><tr><th>Working Pressure Rating (psi)</th><th></th><th></th></tr><tr><th>Size (inch)</th><th>MJ Fittings</th><th>Flanged Fittings</th></tr><tr><td>3 – 24</td><td>350</td><td>250</td></tr><tr><td>30 – 48</td><td>250</td><td>250</td></tr></table>		Working Pressure Rating (psi)			Size (inch)	MJ Fittings	Flanged Fittings	3 – 24	350	250	30 – 48	250	250	B. Anti-rotation T-bolts shall be used on mechanical joints, except where special bolts are supplied with the approved restraint device, and shall be of domestic origin meeting the current provisions of AWWA C111. T-bolts and nuts shall be high-strength, corrosion-resistant low-alloy steel with the characteristics listed in Table 5 of AWWA C111. T-bolts shall be Xylan or Fluorokote #1 (corrosion resistant).		1. Use approved restrained joint device according to Section 15130. Slip the follower gland and gasket over the pipe joint and making sure that the small side of the gasket and lip of the gland face the bell socket. Insert the plain end into the bell socket. Push the gasket into position with fingers only, and seat gasket evenly. Slide gland into position, insert bolts, and tighten nuts by hand. Tighten MJ flange bolts alternately per manufacturer's recommendations to the manufacturer's recommended torque rating or, if not provided, to the following nominal torques as specified in AWWA C111 Table A.1:		1.01 SCOPE OF WORK	
Working Pressure Rating (psi)																			
Size (inch)	MJ Fittings	Flanged Fittings																	
3 – 24	350	250																	
30 – 48	250	250																	
B. <u>Coatings and Linings</u> . The fittings shall be coated on the outside with either asphaltic coating in accordance with AWWA C110 or fusion-bonded epoxy in accordance with AWWA C116, and the fittings shall be lined inside with either cement-mortar and asphaltic seal coating in accordance with AWWA C104 or fusion-bonded epoxy in accordance with AWWA C116.		C. Retainer glands of any style are not acceptable for pipe to pipe joints.		E. Ball and Socket Joints:		1.02 SUBMITTALS													
C. All fittings shall have mechanical joint bell ends conforming to AWWA C111 unless otherwise shown on the Drawings. However, for pipe 16-inch and larger, fittings with restrained ball joints compatible with the restrained joint pipe used will be permitted when authorized by the Engineer or Owner.		D. <u>Anchor Couplings</u> . Anchor couplings for anchoring the hydrant valve to pipeline tee's branch and for anchoring the hydrant to the valve shall consist of a plain end mechanical joint pipe with a rotating follower gland, retained by a welded ring, on one or both ends. Anchor couplings shall be installed for each hydrant branch and other locations where shown on the Drawings. Anchor couplings shall be manufactured from Thickness Class 53 ductile iron and shall meet the applicable requirements for both ductile iron pipe and fittings as specified in this section. Standard MJ gaskets as specified herein shall be used with anchor couplings.		Assemble and install the ball and socket joint according to the manufacturer's recommendations. Thoroughly clean and lubricate the joint. Check the retainer ring fastener.		A. Contractor shall submit Shop Drawings, manufacturer's literature and product data, installation instructions, and certifications for all products furnished under this section in accordance with Section 01300.													
D. <u>Restrained MJ Joints (all sizes)</u> . Restrained joints shall be used for all connections to valves and fittings, and all such connections shall be restrained mechanical joint type using retainer glands as specified in Section 15130. However, when restrained joint pipe (with factory-welded retainer bead or ring on the pipe spigot) is used, fittings manufactured with restrained joints compatible with the restrained joint pipe may be used in lieu of fittings with restrained mechanical joints. Restraining gaskets with integral stainless steel locking segments (including MJ Field-Lok gaskets) are not permitted on valves or fittings.		E. <u>Flanged</u> . Flanged joints shall conform to AWWA C110 (for fittings) or AWWA C115 (for pipe) and also to ANSI B16.42 Class 150. Unless otherwise noted on the Drawings (including bridge crossings), all exposed ductile iron pipe and fittings shall have flanged joints. Flanged joints are not permitted in underground installations except where exposed within structures or if allowed for tapping sleeves, saddles, and valves as specified in Sections 15150 and 15170.		F. <u>Pipe Protection</u>		B. Required certifications include those specified under Quality Assurance below.													
E. Non-restrained mechanical and push-on joints are not allowed for connections to valves, hydrants, or fittings.		1. Gaskets for all flanged joints shall be 1/8-inch thick, styrene butadiene rubber (SBR) or EPDM gaskets. Flange gaskets are not permitted.		1. Comply with requirements of Section 15000. Lift pipe in accordance with AWWA Standards C600 and manufacturer's recommendations, subject to the restrictions herein and in Section 15000.		1.03 QUALITY ASSURANCE													
F. <u>Acceptable ductile iron fittings manufacturers are:</u>		2. The bolts shall have American Standard heavy unfinished hexagonal head and nut dimensions all as specified in ANSI B18.2. Bolts and nuts shall be threaded in accordance with ASME/ANSI B1.1, Unified Inch Screw Threads (UN and UNR Thread Form) class 2A external and class 2B internal. Material for bolts and nuts shall conform to ASTM A307, 60,000 psi tensile strength, Grade B, unless otherwise specified in Section 01011. Xylan or Fluorokote #1 hex bolts (corrosion resistant) shall be used on 3 in. any buried flange bolts used with ductile or gray cast iron flanges.		2. Protect cement-mortar lining from damage during transportation (off- and on-site), preparation and installation. Transporting or lifting pipe by inserting lifting forks, chains, hooks, or any other device inside the pipe shall not be permitted. No exception shall be made during application of polyethylene encasement or any other time.		A. PVC pipe shall meet the minimum quality requirements by conforming to the below-referenced AWWA/ANSI standards as modified herein. PVC pipe will be accepted on the basis of the Manufacturer's certification that the materials conform to this section.													
1. Sigma through United States Pipe & Foundry Co. (domestic or foreign)		3. Each flange joint shall be fully compatible with its mating flange.		3. Protect asphaltic coating from damage during off- and on-site transportation, preparation and installation. Contractor shall utilize metal chains, steel cable, etc. to lift or transport pipe. Transporting or lifting pipe using forks on construction equipment shall not be permitted unless the pipe is supported on pallets or lumber and filled indirectly with the forks.		B. The Owner reserves the right to sample and test these materials subsequent to delivery at the project site.													
2. McNary Cast Iron Pipe Co. (Tyler Union domestic only)		F. <u>Connections to existing piping shall comply with Section 15000</u> . When connecting to existing ductile iron pipe, connection shall be made either as described in this section or using couplings in accordance with Section 15130. A restrained mechanical joint solid sleeve as specified above for ductile iron fittings may be used to connect an existing plain spigot end to a new pipe plain spigot end. When connection is to be made to an existing pipe with a joint type not		4. Protect pipe from damage from the jacking device (backhoe bucket, pipe jack, etc.) when assembling each pipe joint (i.e. "pushing home" every pipe). Wood or other suitable (non-metallic) material consistent with the pipe manufacturer's recommendations shall be used to push home the pipe.		1.04 RELATED WORK													
3. Star Pipe Products (domestic or foreign)		F. <u>Connections to existing piping shall comply with Section 15000</u> . When connecting to existing ductile iron pipe, connection shall be made either as described in this section or using couplings in accordance with Section 15130. A restrained mechanical joint solid sleeve as specified above for ductile iron fittings may be used to connect an existing plain spigot end to a new pipe plain spigot end. When connection is to be made to an existing pipe with a joint type not		5. Assemble and install the ball and socket joint according to the manufacturer's recommendations. Thoroughly clean and lubricate the joint. Check the retainer ring fastener.		A. Section 01000 Summary of Work													
4. Metafit, through United States Pipe & Foundry Co. or American Cast Iron Pipe Company.		F. <u>Connections to existing piping shall comply with Section 15000</u> . When connecting to existing ductile iron pipe, connection shall be made either as described in this section or using couplings in accordance with Section 15130. A restrained mechanical joint solid sleeve as specified above for ductile iron fittings may be used to connect an existing plain spigot end to a new pipe plain spigot end. When connection is to be made to an existing pipe with a joint type not		F. <u>Pipe Protection</u>		B. Section 01011 Special Provisions													
				1. Comply with requirements of Section 15000. Lift pipe in accordance with AWWA Standards C600 and manufacturer's recommendations, subject to the restrictions herein and in Section 15000.		C. Section 01075 Basis of Payment													
				2. Protect cement-mortar lining from damage during transportation (off- and on-site), preparation and installation. Transporting or lifting pipe by inserting lifting forks, chains, hooks, or any other device inside the pipe shall not be permitted. No exception shall be made during application of polyethylene encasement or any other time.		D. Section 01300 Submittals													
				3. Protect asphaltic coating from damage during off- and on-site transportation, preparation and installation. Contractor shall utilize metal chains, steel cable, etc. to lift or transport pipe. Transporting or lifting pipe using forks on construction equipment shall not be permitted unless the pipe is supported on pallets or lumber and filled indirectly with the forks.		E. Section 01600 Products													
				4. Protect pipe from damage from the jacking device (backhoe bucket, pipe jack, etc.) when assembling each pipe joint (i.e. "pushing home" every pipe). Wood or other suitable (non-metallic) material consistent with the pipe manufacturer's recommendations shall be used to push home the pipe.		F. Section 02210 Trenching, Backfilling and Compacting													
12/2019 – Pipeline	15105 - 6	12/2019 – Pipeline	15105 - 7	12/2019 – Pipeline	15105 - 8	12/2019 – Pipeline	15105 - 9												
G. Section 02558 Identification/Location Guide		F. ASTM D2555 – Standard Practice for Making Solvent Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings		B. PVC pipe 4 inch through 12 inch nominal size shall meet the requirements of AWWA C900. When AWWA C900 conflicts with the listed ASTM standards, the requirements of AWWA C900 shall prevail.		and interchangeable, and the complete restrained joint pipe system shall meet all requirements of AWWA C900. Restrained joint "sweeps" shall not be used.													
H. Section 15000 Piping - General Provisions		G. ASTM F417 - Standard Terminology Relating to Plastic Piping Systems		C. <u>Pipe Class</u> . All PVC pipe installed shall be DR 14 (305 psi Pressure Class per AWWA C900) unless otherwise indicated in this section, on the Drawings and/or in Section 01011. In no case shall PVC pipe with a wall thickness less than DR 14 be permitted. The pipe shall be capable of withstanding the overburden pressure determined by the depth of burial in field. When Cert-Lok™ restrained joint C900 PVC pipe is installed by horizontal directional drilling method, it shall be DR 14 (305 psi Pressure Class per AWWA C900) unless otherwise indicated on the Drawings or specified in Section 01011. PVC pipe pressure classes were increased in the latest revision of AWWA C900; however, <u>American Water does not allow pipe in its system to be fully subject to the revised Pressure Class pressures in AWWA C900 latest revision</u> . DR 14 shall not be subjected to working pressures exceeding 200 psi.		I. <u>Fittings</u>													
I. Section 15020 Disinfecting Pipelines		H. ASTM F417 - Standard Specification for Elastomeric Seats (Gaskets) for Joining Plastic Pipes		J. AWWA C905 - Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings, 4 In. Through 12 In. for Water Transmission and Distribution		No PVC fittings (including "sweeps") shall be permitted. All fittings for PVC pipe 4" diameter and larger shall be mechanical joint ductile iron fittings connected to PVC pipe with mechanical joint restraint devices as specified in Section 15130, unless otherwise indicated on the Drawings. Concrete thrust blocks shall be installed where shown on the Drawings.													
J. Section 15025 Flushing and Cleaning Pipelines		I. ASTM F1658 - Standard Guide for Construction Procedures for Buried Plastic Pipe		L. AWWA Manual M23 – PVC Pipe - Design and Installation		2.03 MANUFACTURERS													
K. Section 15030 Pressure and Leakage Tests		J. AWWA C905 - Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings, 4 In. Through 12 In. for Water Transmission and Distribution		M. NSF/ANSI 14 Plastic Piping System Components and Related Materials		A. J.M Eagle, Inc. 5200 West Century Boulevard Grand Island, NE 68803 (800) 621-4404 <a href="http://www.jmeagle.com">www.jmeagle.com</a>													
L. Section 15105 Ductile Iron Pipe and Fittings		K. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings, 4 In. Through 12 In. for Water Transmission and Distribution		N. NSF/ANSI 61 Drinking Water System Components – Health Effects		B. North American Pipe Corporation 5801 Post Oak Blvd., Suite 600 Houston, TX 77056 (713) 840-7473 <a href="http://www.northamericanpipe.com">www.northamericanpipe.com</a>													
M. Section 15130 Piping Specialties		L. AWWA Manual M23 – PVC Pipe - Design and Installation		O. Plastic Pipe Institute TR-2, PVC Rango Composition Listing of Qualified Ingredients		C. Diamond Plastics Corporation 1212 Johnston Road Grand Island, NE 68803 (800) PVC-PIPE <a href="http://www.dcpipco.com">www.dcpipco.com</a>													
N. 15150 Gate Valves		M. NSF/ANSI 14 Plastic Piping System Components and Related Materials				D. Northern Pipe Products 3322 39th Street NW Fargo, ND 58102 800-747-7655 <a href="http://www.northernpipe.com">www.northernpipe.com</a>													
O. Section 15170 Tapping Sleeves, Saddles, and Valves		N. NSF/ANSI 61 Drinking Water System Components – Health Effects				E. Sanders Pipe 7575 International Boulevard Clarksville, TN 37040 800-669-3553 <a href="http://www.sanderspipe.com">www.sanderspipe.com</a>													
P. Section 15180 Fire Hydrants		O. Plastic Pipe Institute TR-2, PVC Rango Composition Listing of Qualified Ingredients				F. Vulcan Plastics, a division of Consolidated Pipe & Supply Company Inc. 1226 Hilbo Parkway Birmingham, AL 35204 800-467-7261 <a href="http://www.consolidatedpipe.com">www.consolidatedpipe.com</a>													
Q. Section 15190 Air Valves, Blow-off Assemblies and Sampling Taps		P. ASTM D2241 - Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipes (SRP Series)																	
S. Section 15200 Service Lines		E. ASTM D2122 - Determining Dimensions of Thermoplastic Pipe and Fittings																	
1.05 REFERENCE		ASTM D2152 Ductile Iron Pipe and Fittings																	
Unless otherwise indicated, all references herein to other standards (e.g. AWWA, ASTM, ASME, ANSI etc.) shall mean the most current available revision. The following referenced documents are a part of this section. Comply with all applicable provisions and recommendations of the following documents, except as otherwise specified herein. Where a referenced document contains references to other standards, those other standards are included as references under this section as if referenced directly. In the event of a conflict between the requirements of this section and those of the referenced documents, the requirements of this section shall prevail.		PART 2: PRODUCTS				PART 3: EXECUTION													
A. ASTM D1784 - Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds		2.01 GENERAL				3.01 PACKAGING, HANDLING AND STORAGE													
B. ASTM D2122 - Determining Dimensions of Thermoplastic Pipe and Fittings		A. No foreign-manufactured pipe shall be allowed. All pipe and restraints shall be produced solely in the United States.				A. The manufacturer shall ensure that the interior of all pipe is clean and install plastic cleanlines plus or minus 1/8 inch to keep the pipe interiors clean or cover adequately to prevent dust or trash from entering pipes.													
C. ASTM D2152 Ductile Iron Pipe and Fittings		B. PVC pipe shall be used where shown on the Drawings, specified in Section 01075, listed in the Bid "Schedule of Prices" and Bid Tab, or where otherwise approved by the Engineer and Owner.				B. Sections of pipe having been discovered with cuts or gouges in excess of 10% of the pipe wall thickness shall not be used.													
D. ASTM D2241 - Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipes (SRP Series)		C. All materials that come in contact with potable water, including lubricants, shall be evaluated, tested, and certified for conformance with NSF/ANSI Standard 61.				C. Any section of pipe showing a crack or which has received a blow that may have caused an incident fracture, even though no such fracture is visible, shall be marked as rejected and removed at once from the work.													
E. ASTM D2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading		2.02 PIPE MATERIALS				3.02 INSTALLATION													
		A. All PVC pipe shall be PVC 1120 pressure pipe made from clean, virgin class 12454 PVC compound conforming to resin specification ASTM D1784 with outside diameter dimensions of cast iron pipe and shall conform to all applicable requirements of ASTM D1784 and D2241. The PVC compounds shall be treated or certified suitable for potable water product by the water pipe manufacturer (NSF) Testing Laboratory (NSF Standard No. 61). All PVC pipe shall be blue in color.				Except as modified herein, installation of PVC pipe shall be in full accordance with AWWA C905, AWWA Manual M23, and the United States Pipe and Foundry Company "Design and Construction". In the event of conflicting requirements or guidelines within these referenced publications, the requirements of AWWA C905 shall prevail. Contractor shall also follow the provisions of Sections 02210 and 15000, other sections as applicable, and all manufacturers' recommendations, in addition to the following requirements.													
						A. Assemble pipe using the following types of joints:													
						1. Gasketed bell joint – integral with the pipe.													
						2. Gasketed coupling – A double gasketed coupling as specified in Section 15130, or													
						3. Restrained mechanical joint (for pipe to fitting and pipe to valve joints only) – As specified in Section 15105.													
						4. Restrained Joint Coupling – Joints for restrained joint PVC pipe (Cert-Lok™) shall be as specified in Section 01011.													
						B. Assemble push-on joints in accordance with the pipe manufacturer's recommendations. Assemble mechanical joints in accordance with the fitting and restraint manufacturers' recommendations.													
						C. Do not remove factory installed gaskets. Keep the joint free of dirt, sand, grit, grease or any foreign material. Apply NSF certified lubricant when assembling gasketed joints in accordance with the pipe manufacturer's requirements. The use of improper lubricants can damage gaskets.													
						D. Good pipe alignment is essential for proper joint assembly. Align the spigot to the bell and insert the spigot into the bell until it contacts the gasket uniformly. Do not swing or "stab" the joint; that is, do not suspend the pipe and swing it into the bell. The spigot end of the pipe is marked by the manufacturer to indicate the													
11/2019 – Pipeline	15120 - 2	11/2019 – Pipeline	15120 - 3	11/2019 – Pipeline	15120 - 4	11/2019 – Pipeline	15120 - 5												



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proper depth of insertion, and Contractor shall use extreme caution to avoid over-inserting pipe into the bell.		SECTION 15125 HIGH DENSITY POLYETHYLENE (HDPE) PIPE		applicable certifications and qualifications. Fusion Technicians' Certifications shall have been completed within the past two years.		those specific pipes will take place. Approval of the products or tests is not implied by the Engineer's decision not to inspect the manufacturing, testing, or finished pipes.	
E. Protect pipe from damage when assembling ("pushing home") pipe joints. Wood or other suitable (non-metallic) material consistent with the pipe manufacturer's recommendations shall be used as a cushion while pushing home the pipe. Avoid metal to plastic contact. Neither deflection of PVC pipe joints nor bending of PVC pipe are permitted. All angles shall be made with proper fittings.		PART 1 - GENERAL		E. Submit verification by the pipe manufacturer that the Contractor has been trained in the proper method of handling, joining, and installing the new pipe (including installation by directional drilling and/or pipe bursting where applicable). The Contractor shall have satisfactorily performed a minimum of five (5) equivalent projects throughout the past five years.		D. HDPE pipe shall be fused only by certified fusion technicians, as documented by the pipe supplier or manufacturer, by the fusion machine manufacturer, or by other documentation acceptable to the Engineer. The fusion equipment operator shall be fully trained in the use of the respective equipment.	
F. PVC pipe shall not be installed with less than 3 feet of cover. DR 14 PVC pipe shall not be installed with more than 30 feet of cover.		1.01 SCOPE OF WORK		F. POST-CONSTRUCTION SUBMITTALS		E. Owner and Engineer reserve the right to perform on-site crack checks for fusion technicians' qualifications and to stop any fusion work being performed by personnel unable to promptly provide documentation of the required qualifications.	
G. Pressure testing of DR 14 PVC pipe shall not exceed 305 psi.		A. The work under this section consists of providing all labor, materials, tools, equipment, and services required to produce and test all high-density polyethylene (HDPE) pressure pipe and fittings (4 inches through 48 inches nominal diameter) with ductile-iron-pipe-equivalent outside diameters for water distribution and transmission as indicated on the Drawings and as specified within this section and related sections of the Specifications. This section shall also apply to installation of HDPE water mains smaller than 4-inch diameter to the extent applicable (materials for HDPE pipe smaller than 4-inch diameter are specified in Section 15200). Contractor shall furnish and install all required pipe, pipe restraint components, and other related components, which shall not be furnished by the Owner. Refer to Sections 01000, 01011 and 01075 for materials to be furnished by the Owner.		1. Pipe Size and Thickness		F. For HDPE installations 16-inch diameter and larger, Contractor shall, upon request by the Owner or Engineer, and at no additional cost to the Owner, arrange for the pipe manufacturer's field representative to be on-site during installation of HDPE to oversee the fabrication of five (5) butt fusion joints for each work crew installing this type of joint.	
I. Research has documented that certain pipe materials (such as polyvinyl chloride, polyethylene, and polypropylene) and certain elastomers (such as those used in gasket material) may be subject to permeation by lower-molecular weight organic solvents or petroleum products. Products specified in this section shall only be installed in soils that are free of both petroleum products and organic solvents. If during the course of pipeline installation, the Contractor identifies or suspects the presence of petroleum products or any unknown chemical substance in the native soil, Contractor shall stop installing pipe in the area of suspected contamination and notify the Engineer immediately. Contractor shall not resume installing piping in the area of suspected contamination until direction is provided by the Engineer.		B. When water mains smaller than 4-inch diameter are required, high-density polyethylene pipe in accordance with Section 15200 shall be used.		2. Machine Size			
J. Unless otherwise shown on the Drawings or indicated in Section 01011, PVC pipe shall not be installed at sites where frequent excavation can be anticipated in the vicinity of the pipe (including treatment plant and booster station sites), where the pipeline is laid on a river channel bottom, or with less than 3 feet of cover over the top of pipe. PVC pipe shall not be installed in any circumstance with less than 3 feet or more than 30 feet of cover over the crown of the pipe. Unless otherwise shown on the Drawings or approved in writing by the Engineer.		1.02 SUBMITTALS		3. Fusion Technician Identification			
		A. Contractor shall submit Shop Drawings, manufacturer's literature and product data, installation instructions, certifications and other required submittals for all products furnished under this section in accordance with Section 01300.		4. Job Identification			
		B. The following product data is required from the pipe manufacturer:		5. Fusion Joint Number			
		1. Pipe Size		6. Fusion, Heating, and Drag Pressure Settings			
		2. Dimensionality		7. Heat Plate Temperature			
		3. Pressure Class		8. Time Stamp			
		4. Color		9. Heating and Cool Down Time of Fusion			
		5. Recommended Minimum Bending Radius		10. Ambient Temperature.			
		6. Recommended Maximum Safe Pull Force (if pipe will be used for directional drilling, pipe bursting, or other trenchless installation method)					
		7. Certificate of compliance from the pipe manufacturer that the product pipe is in compliance with Project requirements.					
		C. Submit fusion method(s), quality control procedures, and documentation for fusion process.					
		D. Fusion Technicians Certifications: Submit required certifications, including those specified under Quality Assurance below and all proposed fusion technicians'					
3.03 TAPPING				1.03 QUALITY ASSURANCE			
A. Use a tapping sleeve or saddle in accordance with Section 15170 and/or 15200 (as appropriate).				A. HDPE pipe and fittings shall meet the minimum quality requirements by conforming to the below-referenced AWWA/ANSI and ASTM standards as modified herein. HDPE pipe and fittings will be accepted on the basis of the Manufacturer's certification that the materials conform to this section.			
				B. The certification for HDPE fittings shall list a fitting description, quantity, bare fitting weight, source, and applicable AWWA standard (C906). The certification shall accompany each delivery of the material to the project site.			
				C. Owner and Engineer reserve the right to witness pipe manufacturing at the manufacturer's facility where the pipe to be provided for the Work will be produced. Owner and Engineer reserve the right to inspect, sample, and test these materials subsequent to delivery at the project site. Such inspections shall in no way relieve the manufacturer of the responsibilities to provide products that comply with the applicable standards and this section. Should the Engineer wish to witness the manufacture of specific pipes, the manufacturer shall provide the Engineer with adequate advance notice of when and where the production of			
END OF SECTION				D. Electrofusion fittings, couplings, and saddles shall only be used where permitted by the Engineer and shall not be permitted for use with HDD. Electrofusion fittings shall comply with ASTM F1055.			
11/2019 - Pipeline	15120 - 7	11/2019 - Pipeline	15125-1	11/2019 - Pipeline	15125-2	11/2019 - Pipeline	15125-3
J. ASTM F714 - Standard Specification for Polyethylene (PE) Pipe (SDR-PR) Based on Outside Diameter		applications installed in accordance with Section 02350 and for horizontal directional drilling applications installed in accordance with Section 02458 unless otherwise shown on the Drawings, specified in Section 01011 or 01075, listed in the Schedule of Prices, or otherwise approved by the Engineer and Owner.		by pipe bursting methods shall be minimum Pressure Class 200 psi and wall thickness not less than DR 9.0, unless otherwise shown on the Drawings or specified in Section 02350 or 01011. HDPE pipe shall not be subjected to working pressures exceeding the pipe's Pressure Class.		I. Improved Piping Products, Inc. (adapters and fittings only) 4311 Director Drive San Antonio, TX 78219	
K. ASTM F1055 - Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene (PEX) Pipe and Tubing		C. The nominal pipe diameter shall be as specified on the Contract Drawings. HDPE pipe sizes shall be nominal diameters of 4", 6", 8", 12", 16", 20", 24", 30", 36", 42", or 48" only with outside diameters conforming to ductile iron pipe sizes (DIPS). HDPE pipe size shall be selected to provide the required inside diameter, which may require pipe to be upsized, at the Engineer's direction, to the next size listed above when HDPE pipe is used in place of ductile iron or PVC pipe.		E. HDPE elbows/bends, tees, and crosses are not allowed.		2.04 PIPE ROLLERS	
L. ASTM F1473 - Standard Test Method for North Tensile Test to Measure the Resistance to Slow Crack Growth of Polyethylene Pipes and Resins		D. HDPE fittings shall not be used except for saddles, adapters and temporary caps as specified below. All other fittings shall be ductile iron.		F. HDPE branch saddles for 3-inch diameter branch/service connections shall be conventional fusion type or electrofusion type as directed and/or approved by the Owner or Engineer. 3-inch saddles shall be DR 11 or DR 9 PE 3408/3608 or PE 4710 with a pressure rating that equals or exceeds the water main Pressure Class. No HDPE saddles shall be permitted for branch/service connections larger than 3-inch.		A. Pipe rollers shall be designed for the purpose of supporting and guiding pipe with minimal friction.	
M. ASTM F1290 - Standard Practice for Electrofusion Joining Polyolefin Pipe and Fittings		E. All materials that come in contact with potable water, including lubricants, shall be evaluated, tested, and certified for conformance with ANS/NSF Standard 61.		G. Electrofusion fittings, couplings, and saddles shall only be used where permitted by the Engineer and shall not be permitted for use with HDD. Electrofusion fittings shall comply with ASTM F1055.		B. Pipe rollers shall be of sufficient size to fully support the weight of the pipe during handling and installation and shall not damage the pipe in any way. Spacing shall be as recommended by the manufacturer and shall prevent pipe abrasions and additional stress on the piping.	
N. ASTM F1688 - Standard Guide for Construction Procedures for Buried Plastic Pipe		2.02 HDPE PIPE AND FITTINGS		H. JOINT RECORDING		3.01 PACKAGING, HANDLING, AND STORAGE	
O. ASTM F2206 - Standard Specification for Fabricated Fittings of Butt-Fused Polyethylene (PE) Plastic Pipe, Fittings, Sheet Stock, Plate Stock or Block Stock		A. All HDPE pipe and fittings shall fully meet the requirements of AWWA C906 and shall be made from the same virgin resin meeting the requirements of the Plastic Pipe Institute (PPI) material designation PE 3408/3608 or PE 4710 (where PE 4710 is required on the Drawings, in Section 01011, and/or in Section 01075, PE 3408/3608 shall not be permitted) with an ASTM D3350 minimum cell classification of PE 34544AC. A higher number cell classification limit which gives a desirable higher primary property per ASTM D3350 may be submitted for approval by the Engineer and, if approved, may be used at no extra cost to the Owner.		1. Butt fusion equipment shall be equipped with a Datalogger. Records of each weld (including, as a minimum, heater temperature, fusion pressure, and a graph of the fusion cycle) shall be appropriately identified and provided to the Engineer daily.		A. The manufacturer shall ensure that the interior of all pipe is clean and install plastic cleanliness plugs in all pipes to keep the pipe interiors clean or cover adequately to prevent dirt or truck exhaust from entering pipes.	
P. ASTM F2620 - Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings		B. The pipe and fittings shall contain no recycled component except for rework material generated in the manufacturer's own plant that has the same cell classification as the material to which it is being added. The pipe shall be homogeneous throughout and free of visible cracks, holes, voids, foreign inclusions, or other defects that may affect the wall integrity.		2. Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine. The fusion data logging and joint report shall be generated by software developed specifically for the butt-fusion of thermoplastic pipe. The software shall register and/or record the parameters required by the pipe manufacturer and these Specifications. Data not logged by the data logger shall be recorded manually and be included in the Fusion Technician's joint report.		B. Contractor shall take care not to damage any HDPE pipe. All pipes shall be visually inspected for gouges. Gouges in excess of ten percent (10%) of the pipe wall thickness are considered excessive and are not acceptable. In areas where excessive gouges or other damage is present, the affected pipe section shall be cut out and removed. The remaining, undamaged portions of the pipe shall be repaired by butt fusion to make a continuous section.	
Q. Plastic Pipe Institute TN 34 - Installation Guidelines For Electrofusion Couplings 14" and Larger		C. The material shall have a minimum Hydrostatic Design Basis (HDB) of 1,600 psi (1.03 MPa) at 73 degrees F per ASTM D2527. The material shall be black with minimum 2% carbon black for ultraviolet protection. Permanent identification of water piping service shall be provided by co-extruding longitudinal blue stripes into the pipe outside surface and no less than two locations around the pipe's circumference, so at least one stripe is visible from any angle. The striping material shall be the same color as the pipe. T-bells and nuts shall be black. T-bells shall be blue. Stripes printed or painted on the outside surface shall not be acceptable.		3. QUALITY CONTROL OF HDPE FUSION PROCESS (BOTH BUTT FUSION AND ELECTROFUSION, AS APPLICABLE) SHALL BE ADHERED TO AND MONITORED BY CONTRACTOR WITH ALL RELATED DOCUMENTATION SUBMITTED TO THE ENGINEER.		C. Connections to new mains larger than 3-inch nominal diameter shall be made with ductile iron tees in accordance with Section 15105 and 15130.	
R. AWWA C906 - Polyethylene (PE) Pressure Pipe and Fittings, 4 in. Through 65 in. (100 mm through 1,650 mm), for Waterworks		D. All HDPE pipe and fittings shall be minimum Pressure Class 160 psi with wall thickness not less than dimension ratio (DR) 11, unless otherwise shown on the Drawings or specified in Section 01011, 02458 or this section. However, all HDPE pipe installed with more than 20 feet of cover and all HDPE pipe installed		4. DATA LOGGING DEVICE - The current version of the pipe manufacturer's recommended and compatible software shall be used. Data logging device operations and maintenance manual shall be with the unit at all times. If using for extended periods of time, an independent 110V power source shall be available to extend battery life.		D. For connections larger than 3-inch nominal diameter to existing HDPE mains, mechanical clamps or tapping sleeves or saddles designed for HDPE pipe (of the correct outside diameter) and meeting the requirements of Section 15170 shall be used unless otherwise indicated on the Drawings and/or specified in Section 01011 and/or 01075.	
S. AWWA Manual M55 - PE Pipe Design and Installation		E. Only appropriately sized and outfitted fusion machines that have been approved by the pipe manufacturer shall be used for the fusion process. Fusion machines must incorporate the following parameters, including the following elements:		5. FUSION TECHNICIAN CERTIFICATIONS		3.02 PIPE INSTALLATION	
T. Plastic Pipe Institute (PPI) "Handbook of Polyethylene Pipe"		1. HEAT PLATE - Heat plates shall be in good condition with no deep gouges or scratches. Plates shall be clean and free of any debris or contamination. Heater controls shall function properly; cord and plug shall be in good condition. The appropriately sized heat plate shall be capable of maintaining a uniform and consistent heat profile and temperature for the size of pipe being fused, per the pipe manufacturer's guidelines.		A. Performance Pipe A Division of Chevron Phillips Chemical Company 5085 West Park Blvd., Suite 500 P.O. Box 269006 Plano, Texas 75093		Installation of HDPE pipe and fittings shall be in full accordance with AWWA Manual M55, except as modified herein. Contractor shall follow the provisions of Sections 02210, 02350, 02458, and 15000, or other manufacturers as applicable, and all manufacturers' recommendations, in addition to the following requirements:	
U. PPI TR-33 - Generic Butt Fusion Joining Procedure for Field Joining of Polyethylene Pipe		2. CARRIAGE - Carriage shall travel smoothly with no binding at less than 50 psi. Jaws shall be in good condition with proper inserts for the pipe size being fused. Insert pins shall be installed with no interference to carriage travel.		B. JM Eagle 5200 West Century Boulevard Los Angeles, California 90045		A. Trenching, bedding, and backfilling shall be comply with Section 02210. Trenching shall be performed in accordance with ASTM D2774.	
V. NSF/ANSI 14 Plastics Piping System Components and Related Materials		3. GENERAL MACHINE - Overview of machine body shall yield no obvious defects, missing parts, or potential safety issues during fusion.		C. WL Plastics Corporation Corporation 3575 Lone Star Circle, Suite 300 Fort Worth, TX 76177		B. Unless authorized in writing by the Engineer on a case-by-case basis, changes in direction shall be accomplished by bending the pipe in the act of installing a fitting, subject to approval by the Engineer. Maximum pipe bending radius shall be in conformance with AWWA Manual M55 and the manufacturer's recommendation for the specific diameter and dimension ratio (DR) of the pipe. The following table shows minimum bending radius based upon the allowable strain of the pipe wall. Potential flow restrictions, surge and other non-trench-shield and pipe strain issues may reduce the values shown here per the Engineer's and/or manufacturer's recommendations. The minimum bend radius multiplier determines the minimum (RDR) radius of the pipe curvature, which is calculated by multiplying the outside diameter of the pipe by the multiplier for the appropriate DR used. Bending radius allowed by the manufacturer can vary, so Contractor shall verify the multiplier with the manufacturer prior to ordering the pipe. In no case shall the installed radius be less than 125% of the manufacturer's permitted bending radius.	
W. NSF/ANSI 32 Drinking Water System Components - Health Effects		4. DATA LOGGING DEVICE - The current version of the pipe manufacturer's recommended and compatible software shall be used. Data logging device operations and maintenance manual shall be with the unit at all times. If using for extended periods of time, an independent 110V power source shall be available to extend battery life.		D. Poly-Cam (Series 415 side fusion saddles only) 1101 McKinley St. Brook, MN 55303		C. Tapping sleeves or saddles shall be used to tap the polyethylene pipe and shall use Type 316 stainless steel stiffener rings. Flange bolts must span the entire width of the flange joint, and provide sufficient thread length to fully engage the nut. JM Adapter Kit shall include HDPE anchor fitting, standard rubber gasket, extra length corrosion resistant T-bolts, internal Type 316 stainless steel stiffener, and C-153 (2"-12") or C-110 (14"-24") heavy body ductile iron gland ring.	
X. NSF/ANSI 372 Drinking Water System Components - Lead Content		5. FUSION TECHNICIAN CERTIFICATIONS		E. ISCO Industries (adapters and fittings only) 926 Baxter Ave. Louisville, KY 40204 "Pipe manufactured by Performance Pipe or JM Eagle may be supplied through ISCO."		3.03 SERVICE CONNECTIONS AND TAPPING	
PART 2 - PRODUCTS				F. Georg Fischer Central Plastics LLC Pipe & Fabricated Products (formerly Independent Pipe Products Inc.) (adapters and fittings only) 39005 Independent Plastics Drive Shawnee, OK 74804		A. Unless specifically indicated on the Contract Drawings, no mechanical service saddles or taps are permitted on HDPE pipe without written approval by the Owner.	
2.01 GENERAL				G. Nupi Americans Inc. (adapters and fittings only) 1511 Superior Way Houston, TX 77039		B. Side-fusion (sidewall fused) polyethylene hot tapping saddles shall be provided for each 2-inch nominal diameter and smaller branch/service connection to HDPE mains as specified in Part 2 above, and branch saddles for 3-inch branch/service connections to HDPE mains shall be provided as specified in Part 2 above. HDPE main shall be tapped with a tapping tool or machine that meets the pipe and saddle manufacturers' requirements. Installation of sidewall fused polyethylene saddles and HDPE branch saddles shall be in accordance with AWWA Manual M55, PPI TR-33, ASTM F2620 and shall be by the conventional saddle fusion method unless otherwise approved in writing by the Owner.	
A. No foreign-manufactured items provided under this section shall be allowed. All pipe, fittings, saddles, and other HDPE appurtenances shall be produced solely in the United States.				H. Improved Piping Products, Inc. (adapters and fittings only) 4311 Director Drive San Antonio, TX 78219		C. Connections to new mains larger than 3-inch nominal diameter shall be made with ductile iron tees in accordance with Section 15105 and 15130.	
B. HDPE pipe shall be used where shown on the Drawings and may be used where approved by the Engineer. HDPE pipe shall be used both for pipe bursting						D. For connections larger than 3-inch nominal diameter to existing HDPE mains, mechanical clamps or tapping sleeves or saddles designed for HDPE pipe (of the correct outside diameter) and meeting the requirements of Section 15170 shall be used unless otherwise indicated on the Drawings and/or specified in Section 01011 and/or 01075.	
11/2019 - Pipeline	15125-5	11/2019 - Pipeline	15125-6	11/2019 - Pipeline	15125-7	11/2019 - Pipeline	15125-8
PE pipe Dimension Ratio (DR) 11.0 20 times pipe O.D. 0.0 *When installed by HDD, minimum bend radius shall be as specified in Section 02458.		C. Butt fusion and electrofusion procedures shall be in accordance with the manufacturer's recommendations and the requirements herein. Surfaces must be clean and dry before joining. The wall thicknesses of the adjoining pipe shall have the same DR at the point of fusion unless a specific fitting is specified.		H. JOINT RECORDING		3.04 SERVICE CONNECTIONS AND TAPPING	
C. The HDPE pipe shall be continuously or partially supported on rollers or other Engineer-approved friction-decreasing implements during joining and installation, such that the pipe is not over-stressed or critically abraded prior to or during installation. A sufficient quantity of rollers or other approved implements, spaced per the pipe manufacturer's guidelines, shall be used to assure adequate support and resist excessive sagging of the pipe during installation. Contractor shall ensure that pipe is not permitted to slide sideways on the rollers or other implements.		D. Each butt-fused joint shall be precisely aligned and shall have uniform roll back beads resulting from the use of proper temperature and pressure. The joint interior surfaces shall be smooth. Internal bead projections shall not be greater than 3/16-inch, or they shall be removed. The fused joint shall be watertight. The tensile strength at yield of the butt-fusion joints shall not be less than that of the pipe. A specimen of pipe cut across the butt-fusion joint shall be tested in accordance with ASTM D-638.		1. Butt fusion equipment shall be equipped with a Datalogger. Records of each weld (including, as a minimum, heater temperature, fusion pressure, and a graph of the fusion cycle) shall be appropriately identified and provided to the Engineer daily.		A. Unless specifically indicated on the Contract Drawings, no mechanical service saddles or taps are permitted on HDPE pipe without written approval by the Owner.	
D. Tracer wires shall be installed with the HDPE pipe as specified in Section 02458 and 02058.		E. Only appropriately sized and outfitted fusion machines that have been approved by the pipe manufacturer shall be used for the fusion process. Fusion machines must incorporate the following parameters, including the following elements:		2. Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine. The fusion data logging and joint report shall be generated by software developed specifically for the butt-fusion of thermoplastic pipe. The software shall register and/or record the parameters required by the pipe manufacturer and these Specifications. Data not logged by the data logger shall be recorded manually and be included in the Fusion Technician's joint report.		B. Side-fusion (sidewall fused) polyethylene hot tapping saddles shall be provided for each 2-inch nominal diameter and smaller branch/service connection to HDPE mains as specified in Part 2 above, and branch saddles for 3-inch branch/service connections to HDPE mains shall be provided as specified in Part 2 above. HDPE main shall be tapped with a tapping tool or machine that meets the pipe and saddle manufacturers' requirements. Installation of sidewall fused polyethylene saddles and HDPE branch saddles shall be in accordance with AWWA Manual M55, PPI TR-33, ASTM F2620 and shall be by the conventional saddle fusion method unless otherwise approved in writing by the Owner.	
E. HDPE pipe shall not be employed with directional drilling through rock or other adverse conditions unless it is encased and only with approval of the Engineer.		1. HEAT PLATE - Heat plates shall be in good condition with no deep gouges or scratches. Plates shall be clean and free of any debris or contamination. Heater controls shall function properly; cord and plug shall be in good condition. The appropriately sized heat plate shall be capable of maintaining a uniform and consistent heat profile and temperature for the size of pipe being fused, per the pipe manufacturer's guidelines.		3. QUALITY CONTROL OF HDPE FUSION PROCESS (BOTH BUTT FUSION AND ELECTROFUSION, AS APPLICABLE) SHALL BE ADHERED TO AND MONITORED BY CONTRACTOR WITH ALL RELATED DOCUMENTATION SUBMITTED TO THE ENGINEER.		C. Connections to new mains larger than 3-inch nominal diameter shall be made with ductile iron tees in accordance with Section 15105 and 15130.	
F. Research has documented that certain pipe materials (such as polyethylene, polybutylene, polyvinyl chloride, and asbestos cement) and certain elastomers, such as used in jointing gaskets and packing glands, may be subject to permeation by lower-molecular weight organic solvents or petroleum products. Products supplied in this section shall only be installed in soils that are free of both petroleum products and organic solvents. If during the course of pipeline installation the Contractor identifies or suspects the presence of petroleum products or any unknown chemical substance in the native soil, Contractor shall stop installing piping in the area of suspected contamination and notify the Engineer immediately. Contractor shall not resume installing piping in the area of suspected contamination until direction is provided by the Engineer.		2. CARRIAGE - Carriage shall travel smoothly with no binding at less than 50 psi. Jaws shall be in good condition with proper inserts for the pipe size being fused. Insert pins shall be installed with no interference to carriage travel.		4. DATA LOGGING DEVICE - The current version of the pipe manufacturer's recommended and compatible software shall be used. Data logging device operations and maintenance manual shall be with the unit at all times. If using for extended periods of time, an independent 110V power source shall be available to extend battery life.		D. For connections larger than 3-inch nominal diameter to existing HDPE mains, mechanical clamps or tapping sleeves or saddles designed for HDPE pipe (of the correct outside diameter) and meeting the requirements of Section 15170 shall be used unless otherwise indicated on the Drawings and/or specified in Section 01011 and/or 01075.	
G. Unless otherwise shown on the Drawings or indicated in Section 01011, HDPE pipe shall not be installed at sites where frequent excavation can be anticipated in the vicinity of the pipe (including treatment plant and booster station sites) or where the pipeline is laid on a river channel bottom (except when installed by HDD). HDPE pipe shall not be installed in any circumstance with less than 3 feet or more than 25 feet of cover over the crown of the pipe.		3. GENERAL MACHINE - Overview of machine body shall yield no obvious defects, missing parts, or potential safety issues during fusion.		5. FUSION TECHNICIAN CERTIFICATIONS		3.05 ANCHOR RESTRAINTS	
		4. DATA LOGGING DEVICE - The current version of the pipe manufacturer's recommended and compatible software shall be used. Data logging device operations and maintenance manual shall be with the unit at all times. If using for extended periods of time, an independent 110V power source shall be available to extend battery life.		A. Performance Pipe A Division of Chevron Phillips Chemical Company 5085 West Park Blvd., Suite 500 P.O. Box 269006 Plano, Texas 75093		A. Concrete anchor collars located at each end of the watermain shall be provided.	
		5. FUSION TECHNICIAN CERTIFICATIONS		B. JM Eagle 5200 West Century Boulevard Los Angeles, California 90045		3.06 TESTING	
		6. GEORG FISCHER CENTRAL PLASTICS LLC PIPE & FABRICATED PRODUCTS (FORMERLY INDEPENDENT PIPE PRODUCTS INC.) (ADAPTERS AND FITTINGS ONLY) 39005 INDEPENDENT PLASTICS DRIVE SHAWNEE, OK 74804		C. WL PLASTICS CORPORATION CORPORATION 3575 LONE STAR CIRCLE, SUITE 300 FORT WORTH, TX 76177		A. Pressure testing shall be conducted in accordance with the Manufacturer's recommended procedures and Section 15030, or as otherwise recommended in writing by the Engineer.	
		7. IMPROVED PIPING PRODUCTS, INC. (ADAPTERS AND FITTINGS ONLY) 4311 DIRECTOR DRIVE SAN ANTONIO, TX 78219		D. POLY-CAM (SERIES 415 SIDE FUSION SADDLES ONLY) 1101 MCKINLEY ST. BROOK, MN 55303		B. Stream Crossings shall be pressure testing prior to chlorination and disinfection.	
11/2019 - Pipeline	15125-10	11/2019 - Pipeline	15125-11	11/2019 - Pipeline	15125-12	11/2019 - Pipeline	15125-13
3.03 PIPE AND FITTING JOINING							
A. All HDPE pipe joining shall be by butt fusion procedures. Electrofusion shall be used only as permitted by the Engineer. Service connections shall be as specified in Article 3.04 below.							
B. HDPE pipe thermal butt fusion welding is to be performed in accordance with the Plastic Pipe Institute "Handbook of Polyethylene Pipe", Polyethylene Joining Procedures, and 49 CFR 192, Subpart F, latest edition.							
11/2019 - Pipeline	15125-10	11/2019 - Pipeline	15125-11	11/2019 - Pipeline	15125-12	11/2019 - Pipeline	15125-13

APPROVAL: PENDING/NOT FOR CONSTRUCTION

STOEPPELWERTH

ALWAYS ON

WATERPLAN DETAILS  
WINTERFIELD  
SECTION 3

DRAWN BY: KJM/GEM  
CHECKED BY: KRG  
SHEET NO.

JOHNSON COUNTY, INDIANA

FRANKLIN

REVISIONS

DATE

MARK

BY

THIS DRAWING IS NOT INTENDED TO BE A REPLACEMENT FOR THE ORIGINAL BOUNDARY SURVEY. A ROUTE REPORT.

REGISTERED PROFESSIONAL ENGINEER  
No. PE1200386  
STATE OF INDIANA  
EXPIRATION DATE: 07/11/24

APPROVAL PENDING/NOT FOR CONSTRUCTION

STOEPPELWERTH

WATER PLAN DETAILS  
WINTERFIELD  
SECTION 3

JOHNSON COUNTY, INDIANA

FRANKLIN

ALWAYS ON

phone: 317.849.5925 fax: 317.849.5942

STOEPPELWERTH  
REGISTERED PROFESSIONAL ENGINEER  
No. PE1200386  
STATE OF INDIANA  
EXPIRATION DATE: 07/11/24  
THIS DRAWING IS NOT INTENDED TO BE REPRESENTED AS A RETRACTION OR AMENDMENT TO ANY PREVIOUS DRAWING OR REPORT.

REVISIONS

DATE

MARK

BY

DRAWN BY: KJ/M/GEM  
CHECKED BY: KR/G  
SHEET NO. C708  
K & R P&M NO. 100405FOR-S3



END OF SECTION



**STANDARD DETAIL**

**FIRE HYDRANT DETAIL**

15125-15



## STANDARD DETAIL

### FIRE HYDRANT INSTALLATION DETAILS

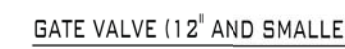
DRAWN BY: S. FORD  
APP'D BY: E.N.



**STANDARD DETAIL**

**TEMPORARY DEAD-END  
FIRE HYDRANT DETAIL**

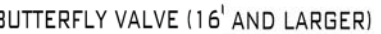
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APP'D BY: E.N.



**STANDARD DETAIL**

**GATE VALVE (12" AND SMALLER)**

	DRAWN BY: S. FORD
8	APP'D BY: E.N.



**STANDARD DETAIL**

**BUTTERFLY VALVE (16" AND LARGER)**

DRAWN BY: S. FORD  
 APP'D BY: E.N.



## STANDARD DETAIL

### THRUST BLOCKS

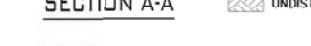
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 P'D BY: E.N.



## STANDARD DETAIL

### SEWER SEPARATION

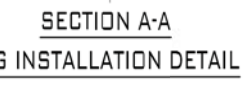
DRAWN BY:	S. FORD
APP'D BY:	E.N.



**STANDARD DETAIL**

**ANCHOR COLLAR DETAIL**

DRAWN BY: S. FORD  
APP'D BY: E.N.



## STANDARD DETAIL

### CASING INSTALLATION

	DRAWN BY: S. FORD
18	APP'D BY: E.N.



<b>INDIANA</b> <b>AMERICAN WATER</b> ENGINEERING DEPARTMENT 153 N. EMERSON AVENUE GREENWOOD, INDIANA 46143	<b>SINGLE WATER SERVICE</b>	
	DATE: JANUARY, 2018 LATEST REV: JANUARY, 2018	DRAWN BY: S. FOR APP'D BY: E.N.

PP'D BY: E.N.



<b>INDIANA</b> <b>AMERICAN WATER</b> ENGINEERING DEPARTMENT 153 N. EMERSON AVENUE GREENWOOD, INDIANA 46143	<b>DUAL WATER SERVICE</b>	
	DATE: JANUARY, 2018 LATEST REV: JANUARY, 2018	DRAWN BY: S. FORBES APP'D BY: E.N.

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File Name: S:\100405FOR-S3\DWG\C707 - Water Details.dwg - C710  
Modified / By: April 9, 2024 11:53:37 AM / gmyers  
Plotted / By: June 21, 2024 7:14:03 AM / Kenny Mitchell

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
DRINKING WATER BRANCH

Alternative to Technical Standard  
Separation Distances for Water Mains  
March 7, 2023

The standards for separation described in 327 IAC 8-3.2 and 10 States Standards are to be complied with. Every effort must be made to position new water mains, valves, hydrants, and new sewers to provide the required separation of the water system components from the sewers and sewer structures. At sewer crossings, one full length of water pipe shall be located so all joints on the water main will be as far as possible from the sewer. For instances where the required separation distances cannot be met the alternatives to the technical standard herein may be proposed. Encasing the water system components in a polyethylene wrap or simply installing the water system components with compression type joints are not acceptable alternatives to the technical standards. A summary of all proposed alternatives to the technical standard, including sheet/page number and station, must be provided with the permit application.

1. Horizontal Separation from Sewers<sup>1</sup> (See Figure 1)

- A. Water mains and sewers may be installed parallel and with the distances between the water main and the sewer of less than 10 feet, or with a crossing at an angle with a sewer of less than 45 degrees provided the water main and sewer are separated by a minimum of eighteen inches measured vertically from the outside edge of the water main to the outside edge of the sewer, and
1. The water main through the length of the water main where the required horizontal separation distance cannot be met is installed in a waterworks grade 150 psi pressure rated casing and the ends of the casing are sealed, or
  2. The sewer through the length of the sewer where the required horizontal separation distance cannot be met is constructed using waterworks grade 150 psi pressure rated pipe with compression type joints and the waterworks grade sewer pipe is labeled as a wastewater or stormwater sewer pipe, or
  3. The sewer segment containing the length of the sewer where the required horizontal separation distance cannot be met is lined with an acceptable commercial interior lining system, the installed lining system is tested for leakage, and the leak test results confirm the lining system is watertight.

<sup>1</sup> Sewers include sanitary, combined, storm and force mains.

Page 1 of 9

Alternative to Technical Standard  
Separation Distances for Water Mains  
(Continued)

2. Vertical Separation from Sewers (See Figure 2)

- A. A water main may be installed crossing a sewer or a sewer may be installed crossing a water main with less than 18 inches of vertical clearance between the outside of the water main and the outside of the sewer provided:
1. The water main is installed in a waterworks grade 150 psi pressure rated casing that extends at least 10 feet past the outside edge of the sewer at the crossing in both directions, the ends of the casing are sealed, and the water main casing and sewer are separated by a minimum of six inches measured vertically from the outside edge of the casing to the outside edge of the sewer, or
  2. The sewer is constructed in a waterworks grade 150 psi pressure rated pipe and fittings with compression type joints at least 10 feet past the outside edge of the water main in both directions, the waterworks grade sewer pipe is labeled as a wastewater or stormwater sewer pipe, and the water main and sewer are separated by a minimum of six inches measured vertically from the outside edge of the water main to the outside edge of the sewer.

3. Horizontal Separation from Existing Wastewater<sup>2</sup> Manholes (See Figure 3)

- A. A new water main may be installed with less than 8 feet of horizontal separation between the outside edge of the water main and the outside edge of an existing wastewater manhole provided:
1. The water main is installed in a waterworks grade 150 psi pressure rated casing that extends at least 8 feet past the outside edges of the wastewater manhole, the ends of the casing are sealed, and the water main casing and all crossing sewers are separated by a minimum of six inches measured vertically from the outside edge of the casing to the outside edge of the sewer.

4. Horizontal Separation from New Wastewater Manholes (See Figure 4)

- A. A new water main may be installed with less than 8 feet of horizontal separation between the outside edge of the water main and the outside edge of a new wastewater manhole provided:
1. The water main is installed in a waterworks grade 150 psi pressure rated casing that extends at least 8 feet past the outside edges of the wastewater manhole, the ends of the casing are sealed, and the water main casing and all crossing sewers are separated by a minimum of six inches measured vertically from the outside edge of the casing to the outside edge of the sewer, or

<sup>2</sup> Wastewater manholes include sanitary and combined manholes and lift station wet wells.

Page 2 of 9

Alternative to Technical Standard  
Separation Distances for Water Mains  
(Continued)

2. The wastewater manhole pipe connection seals conform to the ASTM C923 Standard, the manhole is sealed to prevent exfiltration from the structures by application of an acceptable commercial interior manhole lining system, and all sewers crossing the water main are separated by a minimum of eighteen inches measured vertically from the outside edge of the sewer to the outside edge of the water main.
  8. A new wastewater manhole may be installed with less than 8 feet of horizontal separation between the outside edge of the wastewater manhole and the outside edge of an existing water main provided:
1. All sewers crossing the water main are separated by a minimum of eighteen inches measured vertically from the outside edge of the sewer to the outside edge of the water main, and
  2. The wastewater manhole pipe connection seals conform to the ASTM C923 Standard and the manhole is sealed to prevent exfiltration from the structures by application of an acceptable commercial interior manhole lining system.

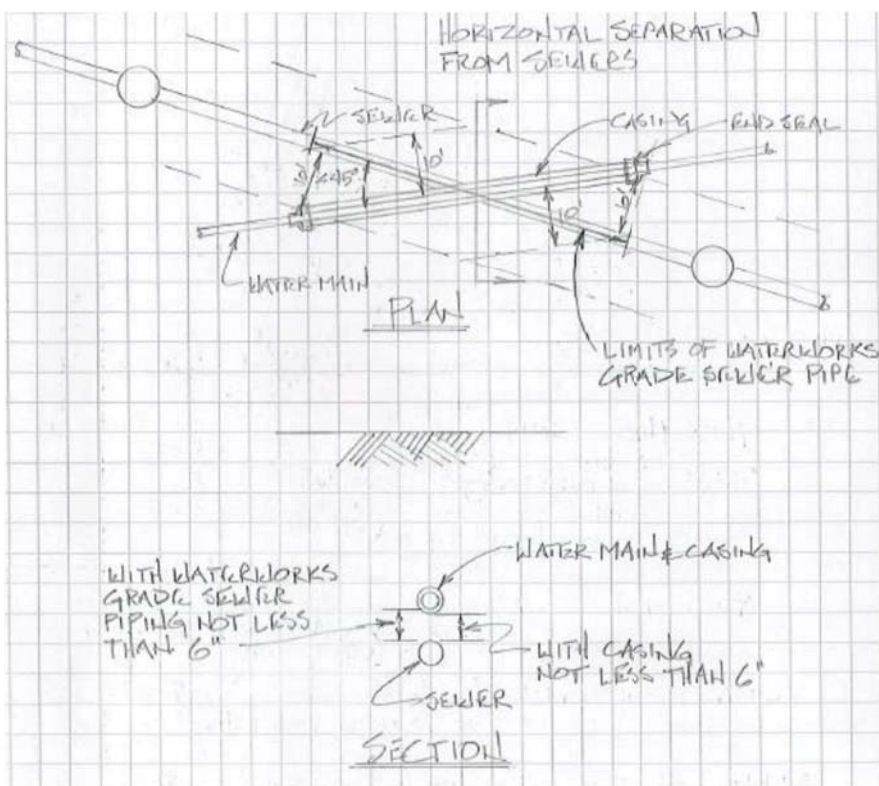
5. Horizontal Separation from Stormwater Structures (See Figures 5 & 6)

- A. A new water main may be installed with less than 8 feet of horizontal separation between the outside edge of the water main and the outside edge of a stormwater manhole or catch basin, or a new stormwater manhole or catch basin may be installed with less than 8 feet of horizontal separation between the outside edge of the stormwater manhole or catch basin and the outside edge of a water main provided:
1. The water main is installed in a waterworks grade 150 psi pressure rated casing that extends at least 8 feet past the outside edges of the stormwater manhole or catch basin, the ends of the casing are sealed, and the water main casing and all crossing storm sewers are separated by a minimum of six inches measured vertically from the outside edge of the casing to the outside edge of the storm sewer, or
  2. Existing and new stormwater manholes or catch basins are sealed to prevent exfiltration from the structures by the application of an acceptable commercial interior manhole lining system, or
  3. New stormwater manholes or catch basins are installed with mastic in all joints and with mastic between the casings and structures, with all pipe penetrations properly booted and or grouted, and all pick holes properly grouted.

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Alternative to Technical Standard  
Separation Distances for Water Mains  
(Continued)

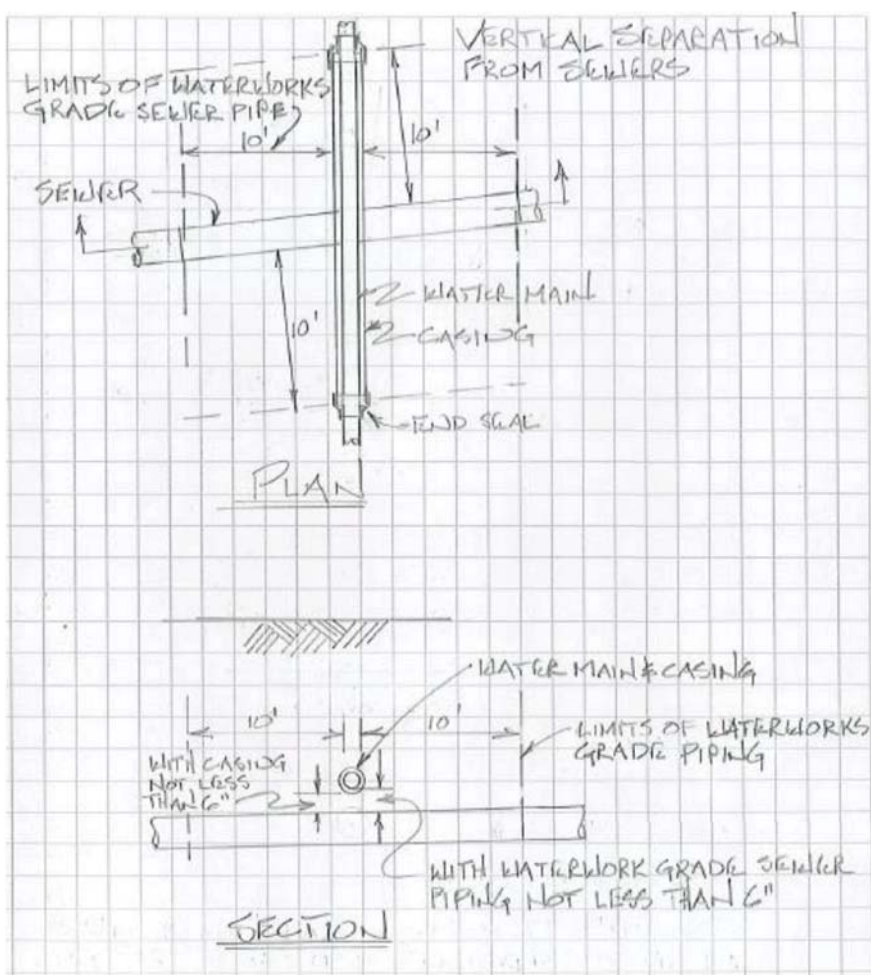
Figure 1  
Horizontal Separation From Sewers



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Alternative to Technical Standard  
Separation Distances for Water Mains  
(Continued)

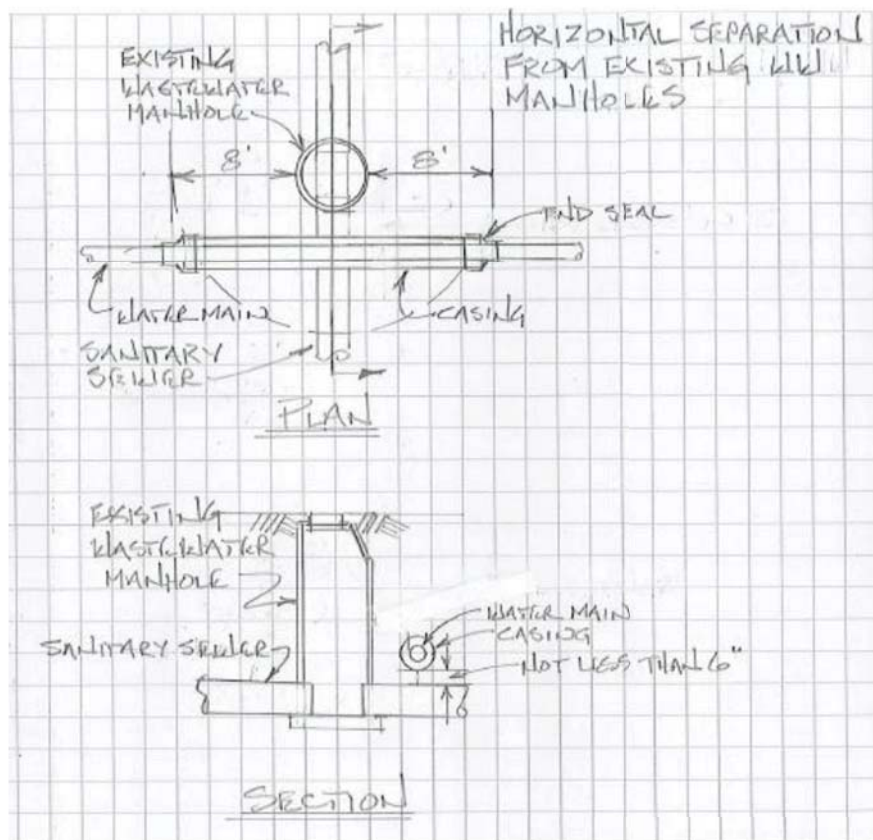
Figure 2  
Vertical Separation From Sewers



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Alternative to Technical Standard  
Separation Distances for Water Mains  
(Continued)

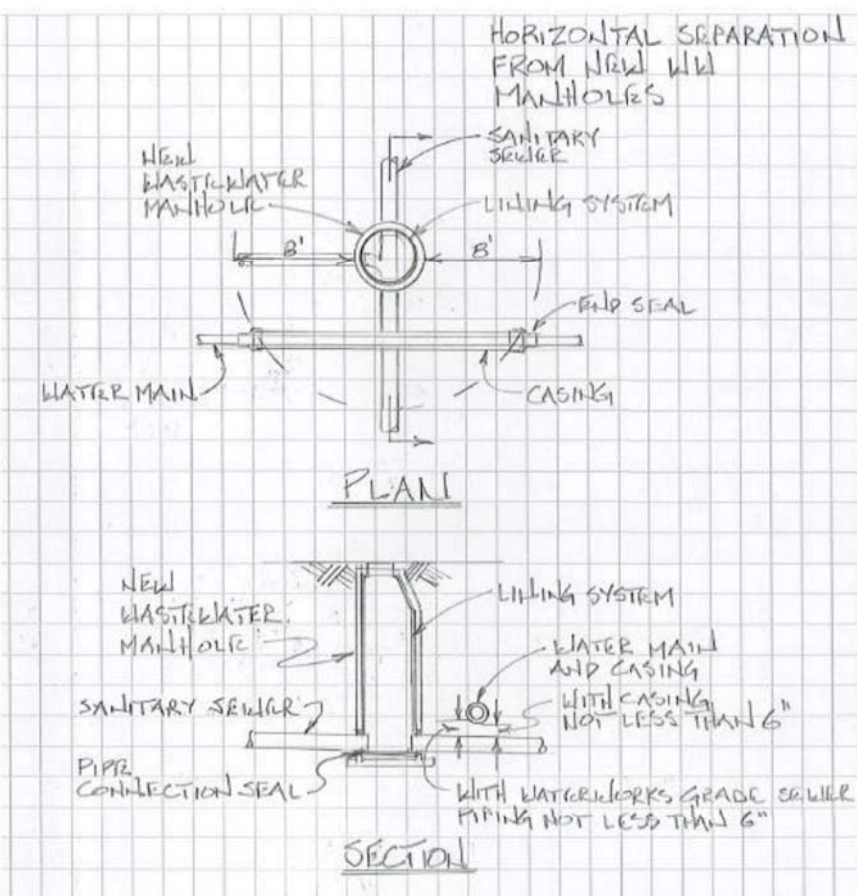
Figure 3  
Horizontal Separation From Existing Wastewater Manholes



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Alternative to Technical Standard  
Separation Distances for Water Mains  
(Continued)

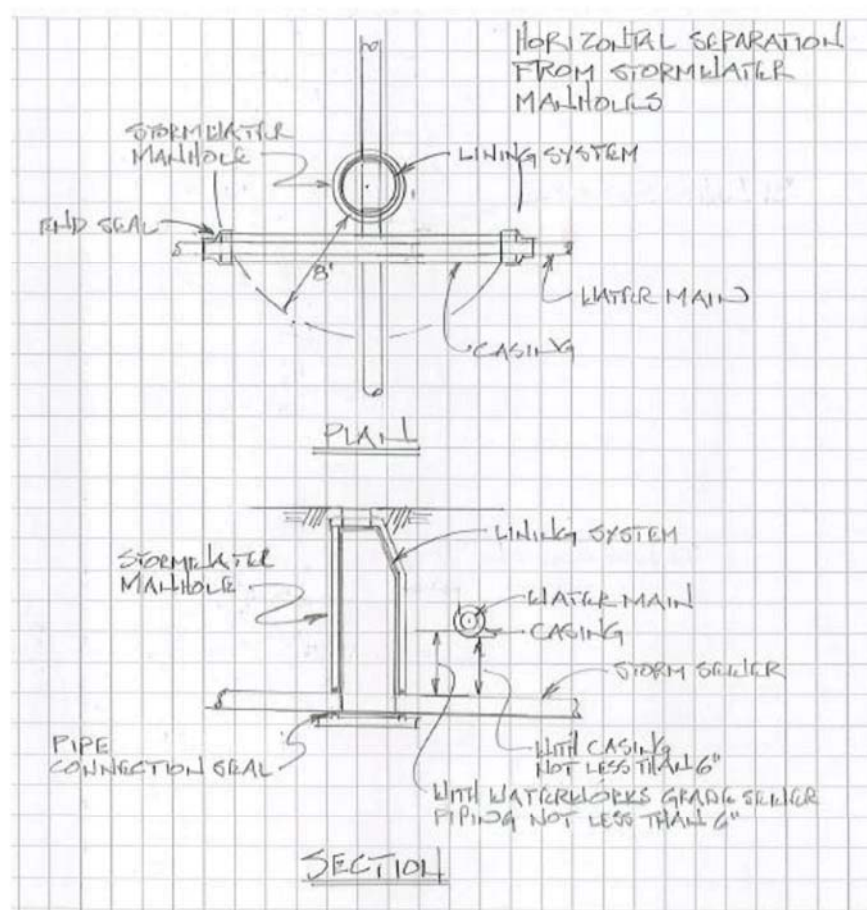
Figure 4  
Horizontal Separation From New Wastewater Manholes



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Alternative to Technical Standard  
Separation Distances for Water Mains  
(Continued)

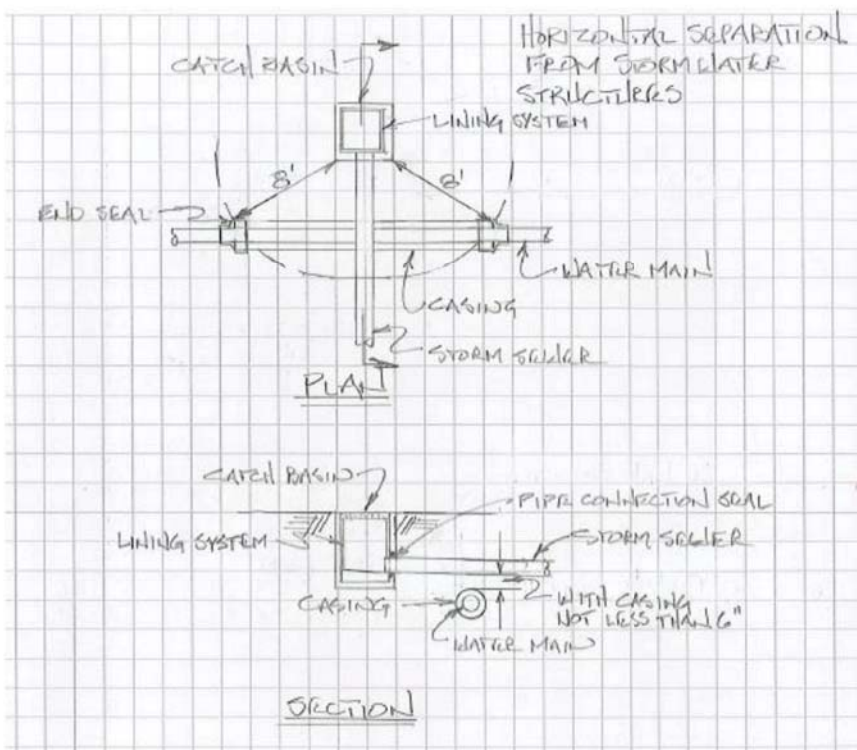
Figure 5  
Horizontal Separation From Stormwater Manholes



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Alternative to Technical Standard  
Separation Distances for Water Mains  
(Continued)

Figure 6  
Horizontal Separation From Stormwater Structures



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APPROVAL: PENDING/NOT FOR CONSTRUCTION		STOEPPELWERTH		ALWAYS ON		JOHNSON COUNTY, INDIANA		FRANKLIN	
WATER PLAN DETAILS		WINTERFIELD SECTION 3		SHEET NO.		C710		K & A FORM NO. 100405FOR-S3	
DRAWN BY: KJM/GEM		CHECKED BY: KRG		DATE: 07/11/24		REVISIONS		BY	
THIS DRAWING IS NOT INTENDED TO BE REPRESENTED AS A RETACEMENT OR ORIGINAL LEGENDARY SURVEY, A ROUTE REPORT		REGISTERED PROFESSIONAL ENGINEER No. PE1200386 STATE OF INDIANA		DATE: 07/11/24		REVISIONS		BY	



File Name: S:\100405FOR\S3\DWG\C800 - Construction Details.dwg - C800A  
Modified By: June 29, 2024 7:21:49 AM / kmitchell  
Plotted By: June 21, 2024 6:59:11 AM / Kenny Mitchell

CITY OF FRANKLIN - STANDARD SPECIFICATIONS

SECTION 1

INTRODUCTION

1.01 General

The Franklin Department of Public Works is responsible for the installation of all sanitary and storm sewer facilities constructed in the City of Franklin. All sanitary sewer collection facilities shall be designed and constructed in full accordance with these Standards, Indiana Department of Environmental Management (IDEM), and Ten States Standards for Sewage Works latest edition.

The purpose of these Standards is to establish a minimum criteria for design and workmanship. The jurisdiction of the Standards includes the entire sanitary system and its appurtenances from the point of connection with the building plumbing to the final point of discharge at the treatment facility.

It shall be the Owner's/Contractor's responsibility to comply with all requirements of the City or other authority having jurisdiction on work if such authority imposes greater requirements. Furthermore, the Owner shall be responsible for procuring all necessary permits and licenses, pay all charges and fees for acquiring and recording all easements, and giving all notices necessary and incidental to the work.

Addenda and/or revisions to these Standards may be issued periodically and will be distributed and made available to the public and contractor at the City Planning Department and the Wastewater Treatment Facility. Users shall be responsible to keep apprised of any changes and revisions to these Standards.

Any conflicts between these Standards and any other applicable Ordinance and State laws shall be superseded by such Ordinance or law. These Standards are approved and adopted by the City of Franklin, Board of Public Works and Safety.

SECTION 5

MATERIALS

5.01 General

This section provides a description of the materials acceptable for the construction of sanitary sewer facilities and storm sewers. Use of other materials which are not specified herein shall only be permitted with the written approval by the DPW and City Engineer.

5.02 Gravity Sanitary Sewer

A. General

The DPW currently allows the use of the following pipe material:

Reinforced Concrete Pipe (RCP)  
Ductile Iron Pipe (DIP)  
Polyvinyl Chloride Pipe (PVC)  
High Density Polyethylene Pipe (HDPE)  
Composite Wall Truss Pipe

All pipe shall be the bell and spigot type with elastomeric seal joints.

All pipe shall be required to withstand a hydrostatic pressure of twenty (20) feet of water (8.6 psi) for two (2) hours while being deflected to the maximum amount recommended by manufacturer. Continuing the hydrostatic pressure, a shear load of one hundred (100) pounds per inch of nominal pipe diameter shall be applied to an unsupported spigot immediately adjacent to joint. During testing period, there shall be no visible leakage at joint.

B. Sanitary Sewer Pipe Materials

1. Reinforced Concrete Pipe

Reinforced concrete pipe shall be Reinforced Concrete Culvert, Storm Drain and Sewer Pipe conforming to ASTM Designation C 76. Pipe shall be wall thickness "B" or "C" as required by site conditions. Class shall be as required by loading conditions, but shall not be less than Class II.

Reinforced concrete pipe shall be tested in accordance with ASTM Designation C 497.

Joints for sewer pipe manufactured of reinforced concrete shall be flexible watertight joints conforming to "Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible, Watertight, Rubber Gaskets" (ASTM Designation C443). Joints shall be made using rubber or rubber-like materials manufactured to fit tongue and groove or bell-and-spigot type concrete pipe. The joint shall be installed in accordance with the manufacturer's recommendations.

Lateral connections to the RCP sewer shall be subject to DPW approval. Where lateral connections must be made to the RCP sewer, a rubber connector with stainless steel clamp shall be used. The connector shall be the sole element relied on to assure a flexible watertight seal of the pipe.

The rubber for the connector shall comply with ASTM C 923 and shall be resistant to ozone, weather elements, chemicals including acids and alkalis and salt.

The stainless steel elements of the connector shall be totally nonmagnetic Series 305 stainless steel. The stainless steel pipe 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 the DPW for approval. Connections not approved by the DPW shall be subject to removal and replacement with an approved adaptor.

2. Ductile Iron Pipe (DIP)

All ductile iron pipe shall conform to the ANSI A21.51 and AWWA C 151, latest revisions. Ductile iron pipe shall be Class 350 for 8" through 12", for 14" through 18" Class shall be 250. Pipe shall have a 40 mil polyethylene coating in accordance with ANSI/ASTM D1248.

Fittings shall be standardized for the type of pipe and joint specified and shall comply with ANSI A21.10 and AWWA C110. Fittings shall be either mechanical joint or push-on type. Pipe joints shall use O-ring gaskets in accordance with ANSI 21.11 and AWWA C 111.

3. Polyvinyl Chloride Pipe (PVC)

a. Smooth Wall PVC

All PVC pipe 15 inches or less in diameter shall meet the requirements of ASTM Designation D 3034. All PVC pipe greater than 15 inches in diameter shall meet or exceed the requirements of ASTM F 679. For diameters 15 inches or less, the pipe shall have a minimum cell classification of 12454-B and for diameters greater than 15 inches, the pipe shall have a minimum cell classification of 12454-C with all pipe having a minimum tensile strength of 7000 psi as defined in ASTM D 1784.

All PVC pipe shall be tested in accordance with Standard Method of Test for External Loading Properties of Plastic Pipe by Parallel - Plate Loading, ASTM Designation 2412. Minimum pipe stiffness shall be 46 psi.

b. Ribbed Polyvinyl Chloride Pipe (PVC)

All Ribbed PVC Pipe shall conform to ASTM Designation F 794 for sewer pipes 8 inch through 48 inch in diameter. All 8 inch through 18 inch pipe supplied under this contract shall have a minimum uniform pipe stiffness of 60 psi. All pipe 21 inch and larger shall have a minimum uniform pipe stiffness of 46 psi. The minimum cell classification shall be 12454-B as defined by ASTM D 1784.

c. Polyvinyl Chloride Corrugated Pipe (PVC)

All corrugated PVC pipe shall conform to ASTM F 949 for sewer pipes 6 inches through 18 inches. Minimum cell classification shall be 12454-B or 12454-C as defined by ASTM D 1784. PVC pipe shall have a minimum pipe stiffness of 50 psi in accordance with testing under ASTM D 2412.

Joints for plastic pipe shall be elastomeric gasket joints in accordance with ASTM Designation D 3212. Gaskets used in the push-on joints shall conform to ASTM Designation F 477. The pipe manufacturer shall provide "Home Marks" on the uncoupled end of each piece of pipe.

Fittings shall be manufactured of PVC housing a Cell Classification of 12454-B or 12454-C as defined by ASTM D 1784.

Only smooth exterior pipe shall be used at manhole connections.

4. High Density Polyethylene Pipe (HDPE)

All High Density Polyethylene Pipe shall be manufactured from materials meeting the requirements of Type III, Class C, Category 5, Grade P34, as defined in ASTM D 1248, Standard Specifications for Polyethylene Plastics molding and extrusion materials. Pipe and fittings shall be made from high molecular weight high density polyethylene material meeting the requirements of ASTM D 3350, cell class PE 334433C. All HDPE shall have a minimum pipe stiffness of 46 psi when measured in complete accordance with ASTM D 2412. The Ring Stiffness Constant (RSC) classification value for pipe between bell and spigot shall comply with the minimum value of 36 lbs/ft.

This pipe shall be installed in accordance with the manufacturer's recommendations for this particular application.

The joints shall be manufactured with bell and spigot end construction with a rubber gasket to form a positive seal when assembled in the trench. The rubber gasket material and manufacture shall conform to ASTM F 477.

Only manufactured wyes, tees, adapters of the bell and spigot type shall be used. No saddle connections shall be permitted.

5.04 Building Services/Service Laterals

Building services shall be SDR 35 PVC pipe conforming to ASTM D 3034. Joints shall be gasket push-on, compression type conforming to ASTM D 3212. Gaskets shall conform to ASTM F 477.

5.05 Sanitary Sewer Manholes

A. General

Location of manholes shall be as required in Section 4.02(D)(1).

B. Types of Manholes

Manholes shall be either monolithic (cast-in-place) or precast. If monolithic manholes are to be used, the Contractor shall submit drawings showing all dimensions, dimensions, and connections for DPW approval. All drawings shall be certified by a registered Professional Engineer.

C. Precast Manholes

Manholes shall be constructed in accordance with the ASTM Specifications for "Precast Reinforced Concrete Manhole Risers and Tops", Designation C 478. The minimum wall thickness shall be five (5) inches for manholes four (4) feet in diameter. When the depth of the manhole exceeds twelve (12) feet, then the depth in excess of twelve (12) feet shall be reinforced with two layers of reinforcement the same as required for reinforced concrete sewer pipe of same diameter as the riser of the manhole per ASTM Specification Designation C 76 for Class III Pipe. The precast tops shall be of the eccentric cone type. Precast flat covers shall be not less than eight (8) inches thick and reinforced with two layers of steel with a minimum area of 0.39 square inches per linear foot in both directions in each layer. Precast flat bottoms of manholes shall also be reinforced the same as specified herein for precast flat top. Hoisting lugs or hooks shall be cast in place for handling and setting of the rings. Openings of proper sizes and suitable design shall be cast in place for receiving the sewer and/or drop pipes and connections. Adjusting riser rings shall be provided as approved by the DPW.

All manhole joints shall be tongue and groove and they shall be sealed with an O-ring and joint sealer conforming to Federal Specifications SS-S-00210 and similar to "Kent-Seal No. 2" as manufactured by the Hamilton Kent Manufacturing Co., of Kent, Ohio; "RAM-NEK" as manufactured by the K.T. Snyder Co. of Houston, Texas, or equal. Cracked or damaged barrel joints shall be rejected.

D. Manhole Steps

The steps provided shall be manufactured of reinforced plastic and shall be twelve (12) inches wide and one (1) inch square.

E. Manhole Bases

Manhole bases shall be of cast-in-place monolithic concrete or precast concrete. Where sewer lines pass through or enter manholes, the invert channels shall be smooth and semi-circular in cross section and may be formed directly in the concrete of the manhole base, may be half the full laid in the concrete, or may be constructed by laying the sewer lines continuously through the manhole and break-hardened and neatly trimming the edges. Changes of direction of flow within the manholes shall be made with a smooth curve with as long as a radius as possible. The floor of the manhole outside the channels shall be smooth and slope

toward the channel not less than one (1) inch per foot.

No mortar or concrete shall be placed in water, and no water shall be allowed to flow over or against the concrete before it has set for a period of time deemed sufficient by the DPW to prevent damage to the structure. The invert channel through manholes should be made to conform in shape and slope to that of the sewer. All invert channels are to have a properly mortared joint on either side, sloped to prevent solids deposition.

F. Adjusting Rings

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 and not more than twelve (12) inches total of adjusting rings shall be allowed for adjustment of the manhole frame and cover to required elevation.

G. Sewer Pipe 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.

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 pipe 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 the DPW for approval. Connections not approved by the DPW shall be subject to removal and replacement with an approved adaptor.

H. Castings

Standard manholes shall have a R-1772 CVH frame and lid by Neenah Foundry, 1875-3 by East Jordan Iron Works, or approved equal. Material shall be in compliance with ASTM A 48, CL 35B. Each lid shall have 2 inch high letters indicating "City of Franklin Sanitary Sewer".

Where watertight castings are required, the manholes shall have a R-1916F frame and lid by Neenah Foundry, 1045 HD by East Jordan Iron Works, or approved equal. The frame shall be anchored to through the riser rings (if provided) to the cone section with four (4) galvanized rods.

I. Frame Chimney Seal

An internal or external rubber seal shall be installed on all sanitary manholes. A rubber seal extension, to cover any additional heights of chimney not covered by the seal itself, shall be used when required. The internal and external rubber seal and pipe extensions shall be as manufactured by Cretex Specialty Products, or equal.

The sleeves shall be extended from a high grade rubber compound conforming to the applicable requirements of ASTM C 923. The bands used for compressing the sleeve and extension against the manhole shall be fabricated from 16 gauge stainless steel conforming to ASTM A 240 type 304, any screws, bolts or nuts used on this band shall be stainless steel conforming to ASTM F 593 and 594, type 304.

The joint between the manhole frame and chimney or cone shall be 3/4" thick and made using cement mortar. Any sealant used between the adjustment or grade rings of the chimney shall not be used in this joint. Installation of these rubber seals shall be in accordance with the manufacturer's recommendation.

5.06 Storm Sewers

A. General

The DPW currently allows the use of the following pipe materials:

Reinforced Concrete Pipe  
Reinforced Concrete Horizontal Elliptical Pipe  
Precast Reinforced Concrete Box Sections  
Fully Bituminous Coated Fully Paved Corrugated Steel Pipe:  
14 gauge aluminum coated Type II or precast galvanized, 12"-36"  
12 gauge aluminum coated Type II or precast galvanized, 42" and larger  
Fully Bituminous Coated, Half Paved Steel Helical Ribbed Pipe (Type I):  
14 gauge aluminum coated Type II, 12"-36"  
12 gauge aluminum coated Type II, 42" and larger  
16 Gauge Aluminum Alloy Helical Ribbed Pipe (Type I):  
High Density Polyethylene Pipe (HDPE), 12"-18"  
Polyvinyl Chloride Pipe (PVC), 12"-18"

B. Materials

All pipe shall be in conformance to these specifications and all applicable sections of the latest edition of the Indiana Department of Transportation Standard Specifications, American Association of State Highway and Transportation Officials (AASHTO), and American Society for Testing and Materials (ASTM). RCP shall be used at all road crossings. HDPE and PVC pipe shall only be used in non-loading areas only with prior approval of the DPW.

C. Material Standard References

The following standard shall be used for materials used in the City:

Corrugated Steel Culvert Pipe and Pipe Anchors DOT 908.07  
Bituminous Coated Corrugated Steel or Aluminum Pipe, Pipe-Arch, or Underdrain 908.08  
Fiber Bonded Fully Bituminous Coated Corrugated Steel Culvert 908.04  
Corrugated Aluminum Alloy Culvert Pipe and Pipe-Arches 907.02  
Reinforced Concrete Pipe ASTM C 76 ASTM C 50  
Acrylonitrile-Butadiene-Styrene (ABS) Composite Sewer Piping 907.15  
Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings 907.16  
Type FSM SDR-35 PVC Sewer Pipe 907.19  
Rubber Gaskets 906.04  
Precast Reinforced Concrete Box Sections 907.05  
AASHTO M294 ASTM F 714 & ASTM F 894  
High Density Polyethylene Pipe (HDPE) AASHTO M304 ASTM F679  
Polyvinyl Chloride Pipe (PVC)

5.07 Storm Manholes

Storm manholes shall be in accordance with Section 5.05 (C), (D), (E) and (F). Castings shall be R-1972CVIT by Neenah Foundry, 1875-3 by East Jordan Iron Works, or approved equal. Where more than five castings are required, each shall have 2 inch high letters indicating "City of Franklin Storm Sewer".

5.08 Storm Inlets and Catch Basins

A. General

All standard inlets shall be constructed of reinforced precast concrete sections. Joints between sewer pipe and inlet walls shall be sealed with non-shrink grout.

B. Materials

1. Inlets/Basins

Precast concrete inlets shall be constructed in accordance with ASTM Standard C 478. Adjustment to final grade of inlet casting shall be accomplished by utilizing precast concrete adjusting rings. Adjusting rings when required should be sized to adjust to final grade by using a maximum of three (3) adjusting rings. Adjusting rings shall be limited to less than one (1) foot of inlet depth.

All inlet joints, along with the adjusting rings and top casting are to be sealed with 1/2 inch extrudable gasket (Kent Seal, or equal) to produce soil-tight joint.

Precast box inlets shall be constructed in accordance with Indiana Department of Transportation (DOT) Standard Specifications.

2. Castings

Inlet castings shall be Neenah Type R-3501-TR, or equal for rolled curbs.

Inlet castings for vertical curb shall be Neenah Type R-3085-DL, or equal.

Inlet castings for round catch basins shall be Neenah Type R-2502-B-D, or equal.

5.09 Pipe End Sections

A. General

Pipe end treatment shall be either precast concrete with end footings, or prefabricated galvanized steel.

SECTION 7

INSTALLATION/CONSTRUCTION

7.01 General

This section shall provide general, minimum requirements for the installation and construction for DPW service area.

7.02 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 trenches, pumps, pumps, hoist, 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 Agency Classification) in the over-excavated area.

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 accumulation of surface water from excavations. The diversion and removal of surface and/or groundwater shall be performed in a manner which will prevent the accumulation of water within the construction area.

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

A. Clearing

Preparatory to excavation, the site of all open cut excavations, embankments, and fills shall be first cleared of obstructions and existing facilities (except those which must remain temporarily or permanently in service). On all public or private property where grants or easements have been obtained, and on the property of the City, the Contractor shall remove and keep separate the top soil, and shall carefully replace it after the backfilling is completed.

B. Pavement Cutting

Prior to excavating paved areas all excavation edges falling within the pavement shall be saw cut in a neat, straight manner. Cutting shall be performed with a saw designed specifically for this purpose. The cut shall penetrate the entire pavement thickness where possible. If the existing pavement is more than 6 inches thick, then a cut of not less than 6 inch depth shall be made. If pavement cuts are made in streets which are opened to traffic, prior to excavation, then the cuts shall be thoroughly filled with sand and maintained full until the excavation is performed.

C. Protection of Existing Improvements

Before any excavation is started, adequate protection shall be provided for all existing utilities and City structures.

D. Protection of Trees and Shrubs

No existing trees or shrubs in street right-of-ways and easements shall be damaged or destroyed. Where branches of trees or shrubs interfere with the Contractor's operations, they shall be protected by tying back wherever possible. No limbs or branches shall be cut. If his operations will not permit saving certain trees, the Contractor shall be wholly responsible for satisfying all claims for restoration or restitution resulting from their damage or removal.

If small trees and shrubs are moved or pruned to permit more working space, pruning shall be done in accordance with Home and Garden Bulletin No. 83, U.S. Department of Agriculture, "Pruning Shade Trees and Repairing Their Injuries". However, the Contractor shall obtain, in writing, the City's permission to move or prune trees or shrubs. All such work shall be authorized by the Tree Board.

E. Maintenance of Public Travel

The Contractor shall carry on the WORK in a manner which will cause a minimum of interruption to traffic, and may close to through travel not more than two (2) consecutive blocks, including the cross street intersected. Where traffic must cross through trenches, the Contractor shall provide suitable bridges to street intersections and driveways. The Contractor shall post suitable signs indicating that a street is closed and necessary detour signs for the proper maintenance of traffic. Prior to closing of any streets the Contractor shall notify responsible municipal authorities.

F. Utility Interruption

The Contractor shall proceed with caution in the excavation and preparation of the trench or pit so that the exact location of underground structures may be determined. Prior to proceeding with trench excavation the Contractor shall contact all utility companies in the area to aid in locating their underground services.

The Contractor shall take all reasonable precautions against damage to existing utilities. However, in the event of a break in an existing water main, gas main, sewer or underground cable, he shall immediately notify the responsible official of the organization operating the utility interrupted. The Contractor shall lend all possible assistance in restoring services and shall assume all costs, charges, or claims connected with the interruption and repair of such services.

G. Open Cut Excavation

Open cut excavation shall be safely supported and of sufficient width and depth (and only to such width and depth) to provide adequate room for the construction or installation of the work to the lines, grades and dimensions.

1. Trench Dimensions

The bottom width of the trench at and below the top of the pipe and inside the sheeting and bracing, if used, shall not exceed the recommendations as contained in the applicable ASTM Standard for the pipe being used.

Trench sheeting and bracing or a trench shield or box shall be used as required by the rules and regulations of OSHA. The bottom of the trench shall still meet the above standards.

If the trench widths are exceeded without the written permission of the City Engineer and DPW, the pipe shall be installed with a concrete cradle or with concrete encasement or other ASTM approved methods as approved by the City Engineer and DPW.

2. Excavations With Sloping Sides, Limited

The Contractor may, at his option, where working conditions and right of way permit (as determined by the City Engineer and DPW), excavate pipe line trenches and pits for structures with sloping sides, but with the following limitations:

- a. In general, only braces and vertical trenches will be permitted in traveled streets, alleys, narrow easements and for pit excavations more than 10 feet deep.
- b. Where pipe line trenches with sloping sides are permitted, the slopes shall not extend below the top of the pipe, and trench excavations below this point shall be made with near-vertical sides with widths not exceeding those specified herein before.
- c. Slopes shall conform to all OSHA regulations.

H. Earth Excavation

Earth materials shall be excavated so that the open cuts conform with the required lines, grades and dimensions.

1. **Unsuitable Foundation:** When the bottom of the excavation is unsuitable as a foundation, it shall be excavated below grade and then refilled with concrete or crushed stone to the grade as the DPW or its representative may direct. The crushed stone refill shall be mechanically compacted in six (6) inch layers or as directed by the DPW.

2. **Unauthorized Excavation:** Unauthorized excavation below grade shall be filled with crushed stone or concrete and compacted as ordered and directed by the DPW or its representative.

3. **Excavated Earth For Backfill:** Excavated earth materials may be used for backfilling to the approval of the City Engineer and Such material may be used only where its class is allowed. For example: Excavated material conforming to "Class II" description may be used where "Class III" material is required.

I. Boring and Jacking

Construction of the pipeline by boring and jacking methods will be permitted unless otherwise specified on the plans.

1. **Backstop:** The backstop shall be of sufficient strength and positioned to support the thrust of the boring equipment without incurring any vertical or horizontal displacement during such boring operations.

2. **Guide Rails:** The guide rails for the boring equipment may be of either timber or steel. They shall be laid accurately to line and grade and maintained in this position until completion of the boring operations.

3. **Casing Pipe:** Steel casing pipe shall be new, conform to ASTM A 139 and shall be of the size (diameter) shown on the plans. The lengths of pipe shall be welded as they are installed. Where lengths of casing pipe are joined during the boring operations, care shall be taken to insure that the proper line and grade is maintained.

The minimum wall thickness for casing pipes under highways, railroads and streams shall be 0.375 inches. Steel shall be Grade B under railroads and Grade A at all other locations.

7.04 Bedding and Backfill

A. General

All trenches or excavations shall be backfilled to the original surface of the ground or such other grades as required or directed. In general the backfilling shall be carried along as speedily as possible.

B. Backfill Materials

The following materials shall be used for backfill in accordance with and in the manner indicated by the requirements specified herein.

- Class I - Angular, 6 to 40 mm (1/4 to 1 1/2 inches), graded stone such as crushed stone.
- Class II - Coarse sands and gravel with maximum particle size of 40 mm (1 1/2 inches), including various grades of sands and gravel containing small percentages of fines, generally granular and non-cohesive, either wet or dry. Soil types GW, GP, SW and SP are included in this class.
- Class III - Fine sand and clayey gravel including fine sands, sand-clay mixtures and gravel-clay mixtures. Soil types GM, GC, SM and SC are included in this class.
- Class IV - Silty, clayey sands and clays, including inorganic clays and silts of medium to high plasticity and liquid limits. Soil types MH, ML, CH and CL are included in this class. These materials are not recommended for bedding. This class shall also include any excavated material free from rock (3 inches and concrete, roots, stumps, rubbish, frozen material and other similar articles whose presence in the backfill would cause excessive settlement.

C. Backfill of Trench Excavations for Pipes and Conduits

Bedding and Backfill materials samples shall be submitted to the City Engineer and DPW prior to start of construction.

D. Bedding

1. Rigid Pipe and Conduit Bedding

For purposes of this specification, rigid pipe and conduits shall include those made of steel, ductile iron, concrete, RCP, PVC/ABS Truss and other materials as determined by the City Engineer and DPW.

All rigid conduit and pipe shall be laid to the lines and grades unless otherwise directed by the DPW. All rigid conduit and pipe shall be bedded in compacted Class I or II material, placed on a flat trench. The bedding shall have a minimum thickness of 4" or one-fourth (1/4) the outside pipe diameter below the pipe and shall extend halfway on the pipe barrel at the sides. All material shall be placed in the trench in approximately six (6) inch layers. Each layer, shall be leveled and evenly distributed on both sides of the pipe so as not to disturb, displace or damage the pipe and shall be thoroughly compacted. When Class I materials are used in compacted bedding, the bedding shall be placed in the trench in a maximum of six (6) inch layers (before compaction). Each layer, shall be leveled and evenly distributed on both sides of the pipe so as not to disturb, displace or damage the pipe and shall be adequately compacted. When Class I materials are used in compacted bedding, the bedding shall be placed in the trench in a maximum of six (6) inch layers and thoroughly compacted to prevent settlement. Class II and IV material shall not be used when the trench is located in an area subject to vehicular traffic.

2. Flexible and Semi-rigid Conduit Bedding

For purposes of this specification, flexible and semi-rigid conduits and pipes shall include those made of PVC, HDPE, and other materials as determined by the City Engineer and DPW.

All flexible and semi-rigid pipe shall be laid to the lines and grades unless otherwise directed by the DPW. All flexible and semi-rigid conduit shall be bedded in compacted Class I or Class II material, placed on a flat trench. The bedding shall have a minimum 4" thickness or one-fourth (1/4) the outside pipe diameter below the pipe and shall extend to twelve inches above the top of the pipe level of the full width of the trench. All material shall be placed in the trench in a maximum of six (6) inch layers (before compaction). Each layer, shall



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CITY OF FRANKLIN - STANDARD SPECIFICATIONS (CONT.)

SECTION 8

RESTORATION OF SURFACES

8.01 General

Restoration of surfaces within the public right-of-way and easements shall include the removal of the existing surface, the disposal of the surplus material and the construction of new surfaces and adjusting all new and existing structures for proper grade prior to paving as indicated on the plans and/or as specified in these Specifications.

8.02 Restoration of Paved Surfaces

A. Restoration

After all excavations within the limits of paved surfaces have been properly backfilled and compacted, the paved surfaces shall be restored to a condition as good as or better than existed prior to the beginning of the work, in accordance with the following specifications.

Paved Surfaces: Streets, alleys, sidewalks, driveways, curbs and gutters, not constructed or maintained by the State Highway Department, but paved with asphalt, concrete, cinders, crushed stone, waterbound macadam, oil-bound macadam, or heterogeneous paving materials, which are wholly or partially removed, damaged, or disturbed by the Contractor's operations, shall be restored with like or better materials, acceptable to the City Engineer and DPW, to a condition as good as or better than existed prior to the beginning of the work, so that movement of traffic, both vehicular and pedestrian, through the restored work shall be as free, safe and unimpeded as before.

B. Temporary Surface

Temporary trench surfaces shall be installed and maintained in accordance with these specifications. This temporary surface shall be maintained by the Contractor until the permanent pavement is placed. Before placing permanent pavement, all or parts of the temporary surface shall be removed, as necessary, and hauled from the site of the work.

C. Temporary Pavement Replacement

Trench surfaces of highly traveled streets and roads may be, at the direction of DPW, required to receive a temporary pavement replacement of cold mixed bituminous pavement. This temporary pavement shall be surface mixture Class A or B prepared and placed in accordance with Section 406 - Cold Mixed Bituminous Pavement of the latest edition of the Indiana State Highway Department Specifications. Prime and tack coats shall not be required. All temporary pavement shall be maintained by the Contractor to proper grade so as not to impede the safe flow of traffic until the permanent pavement replacement is made.

D. Permanent Paving

Permanent paved surfaces shall be restored in accordance with the following requirements, unless otherwise set forth by the City Engineer, in all cases, the methods and materials of restoration shall meet the requirements of the Indiana State Highway Department, as applicable.

1. Class "B" Concrete Pavement

Existing local streets, roads, alleys, driveways and parking areas consisting of concrete pavement shall be restored according to the following requirements.

Areas subjected to excavation or damage by the Contractor are to be replaced as a whole. Sidewalks to be replaced in complete sections, streets and driveways as complete sections or replaced with sections that coincide with the original pattern, and to the DPW's and/or City Engineer's satisfaction.

Prior to placing concrete, the existing edges are to be saw-cut in a neat straight manner, sub-base compacted, wetted down and edges swept. The use of flexible joint material is required as needed. All chunks of existing material larger than three by three (3 x 3) inches are to be removed.

Class "B" concrete pavement shall consist of a cast in place, layer of Class A concrete with one (1) layer of woven wire fabric (6 x 6 - W1.4 x W1.4) meeting ASTM Designation 497. The concrete layer shall be six inches thick. All rigid concrete pavement work and materials shall meet the latest specifications of the Indiana State Highway Department.

2. Class "C" Asphalt Pavement

Existing local streets and roads consisting of asphalt paving shall be restored with binder and surface of the thickness specified and as follows:

Areas subject to Class C asphalt pavement replacement shall have the existing edges (those created by cutting prior to excavation) re-cut in a neat straight manner as to remove irregularities and damaged areas. Manholes, service line trenches and existing valve areas are to be boxed out in a neat manner. All cuts shall be parallel or perpendicular to the Curved or diagonal cuts shall not be allowed. All chunks of existing material larger than three by three (3 x 3) inches are to be removed.

The aggregate base course, including the previously placed temporary surface or pavement, shall have the upper portions removed to allow placement of the binder and surface. After the base is cutback, it shall be re-compacted with a ten (10) ton roller or other suitable equipment if approved by the City Engineer. Care shall be taken to assure that not less than six (6) inches of compacted aggregate base remains below the permanent pavement.

The binder course(s) shall consist of compacted Hot Asphaltic Concrete, Type A, Size No. 9 as defined by the latest edition of the Indiana State Highway Specifications. Compaction shall be accomplished with suitable smooth wheel rollers. Generally, conventional self-propelled rollers of not less than 10 tons gross weight shall be used. The City Engineer may allow other specialized rollers for narrow trenches or lighter rollers with vibratory action. The City Engineer shall consider alternate equipment only if Contractor requests same in writing and includes technical data on the specific equipment to be considered.

The quantity and thickness of binder courses required shall match the existing pavement, but not less than one (1) course, two (2) inches in thickness.

The surface course shall consist of compacted Hot Asphaltic Concrete Surface Type A, (Size No. 11 or 12) as defined by the latest edition of the Indiana State Highway Specifications and placed in the same manner as described above for binder. The surface thickness shall match the existing pavement, but not less than one (1) inch.

3. Adjustments of Shoulders Necessitated by Resurfacing

The shoulders of the road shall be adjusted to the elevation of the resurfacing with all materials (i.e., earth, sod, gravel, crushed stone, asphalt, etc.) necessary. The transition may be made within a distance of one (1) foot to one and one-half (1 1/2) feet from the edge of paving except in unusual cases where a greater distance is required. Existing driveways shall be primed and wedged from a featheredge to the final height of the resurfaced street paving.

8.03 Restoration of Ground Surfaces

All ground surfaces in public Rights of Way and easements that have been damaged or destroyed by the Contractor's operations shall be restored in accordance with the following specifications. All surplus material, rock, trees, shrubs, concrete pipe, asphalt, crushed stone, etc., not to be used in the Contractor's restoration operations shall be removed from the site and disposed of in an acceptable manner.

1. Restoration of Grassed Areas with Sod

Where shown on the plans or required by the DPW or City Engineer, established grassed areas shall be restored with sod containing grasses of comparable quality. Sod shall be placed and rolled so that the final elevations of the area being restored are the same as existed prior to the beginning of construction. Sod shall be pegged where necessary, and shall be watered and cared for to assure its survival.

2. Restoration of Grassed Areas with Seed and Mulch

The Contractor shall seed and mulch in one of the following manners:

- a. The ground shall be loosened approximately three (3) inches deep with a disc or a harrow and fertilized with twenty-five (25) pounds of 10-10-10, or equivalent, and one hundred (100) pounds of agricultural lime per one thousand (1,000) square feet.

The mixture of seed applied shall be as follows:

35% Kentucky Bluegrass  
30% Perennial Ryegrass (Lolium Perenne)  
30% Kentucky 31 Fescue  
5% Inert Matter

The seed shall be applied at a rate of four (4) pounds per one thousand (1,000) square feet and shall be well raked or boarded into the soil and mulched with straw of sufficient thickness to hold the seed until it is germinated.

- b. Mulching Material: Materials for mulching shall be wheat, oats, barley or rye straw only. All materials shall be reasonably free from weed seeds, foreign material, and other grasses and chaff, and shall contain no Johnson Grass. The straw shall be reasonably bright in color and shall not be musty, moldy, caked, or of otherwise low quality. The straw shall be dry on delivery, and spread evenly.

Mulch net may be required on special areas designated by the DPW to hold mulch in place until turf is established. The net shall be made of a tightly twisted craft paper yarn, leno woven with a wrap count of one (1) pair of yarns per two (2) inches and a filling count of two (2) per inch. Salvage edges and center shall be reinforced with polyethylene filament. The material shall have a minimum width of forty-five (45) inches.

SECTION 9

INSPECTION, TESTING AND ACCEPTANCE

9.01 General

This section describes the minimum requirement and general procedures for the inspection, testing and acceptance of systems dedicated to the DPW.

Connection Permits for sanitary service will not be issued until all the requirements of this section are fulfilled.

9.02 Inspection

Inspection of the construction shall occur for the duration of the project, including the installation of service laterals. The Owner shall execute the Agreement with DPW for such services if the DPW does not have staff available to perform such inspections.

A. Estimated Cost

The DPW shall send a letter to the Owner stating the estimated manhours and amount of the inspection fee to be paid to the City for services performed by representatives of the DPW. The amount provided in the letter shall be 75% of the total estimated cost of the inspection services based upon the estimated payment manhours multiplied by the base hourly rate.

The estimated manhours shall be based upon the following assumptions:

Average daily production = 250 ft./day  
Final inspection + Verification of As-Built = 8 hours  
Inspection Time = 20 - 30 hrs/week

Where a lift station is required, additional time for the inspection during construction and final start-up shall be added.

The fee provided is a pre-construction estimate only. The actual inspection time may vary for project to project and may exceed or be less than the estimate based upon the actual project duration. Inspection time at the site shall be verified by the Owner or a representative of the Owner.

The remaining cost, 25% shall be paid prior to final acceptance by the DPW.

B. General Requirements

1. Contractor and/or Owner shall provide notice to the DPW and his representative of the planned commencement of construction forty-eight (48) hours prior to such commencement.

2. Once the construction starts, the Contractor shall be responsible for informing and/or notifying the inspection representative assigned of the following:

- a. Daily work schedule, including any changes in schedule;  
b. Prior notification if work is to be performed on weekends and/or holidays;  
c. Date tests are to be performed; and  
d. Date as-built verification is to be performed.

3. The DPW, upon request of the Contractor and/or Owner, will schedule the Final Inspection.

All testing required shall be performed under the observation of the DPW or DPW's representative. It shall be the Contractor's responsibility to schedule the testing with the DPW representative and/or DPW. Test results obtained in the absence of the presence of the DPW will not be accepted.

9.03 Testing

A. Leakage Testing

1. General

All sanitary sewers shall be tested for infiltration and exfiltration.

Contractor shall furnish all labor, materials and equipment required for making tests. Tests shall be made at times arranged with the DPW and his representative. Sections of sewers shall be isolated and measurements of infiltration and exfiltration shall be made by approved means. The DPW or his representative must be present during all final tests.

Sewers whose crowns are below ground water level at time of testing shall be tested for infiltration. Where crown of pipe is above ground water level, sewer shall be tested for exfiltration. If ground water level varies during period of construction, sewers may be tested for both. Spans are not to be tested for Final Acceptance until complete.

Immediately preceding all leakage tests (exfiltration, infiltration and air) the sewer to be tested shall be cleaned by flushing a ball through the The Contractor shall furnish an inflatable rubber ball of a size that will inflate to fit snugly into the pipe to be tested. The ball may, at the option of the Contractor, be used without a tag line; or a rope or cord may be fastened to the ball to enable the Contractor to know and control its position at all times. The ball shall be placed in the last cleanout or manhole on the pipe to be cleaned, and water shall be introduced behind the ball shall pass through the pipe with only the pressure of the water impelling it. All debris flushed out ahead of the ball shall be removed at the first manhole where its presence is noted. In the event cemented or wedged debris, or a damaged pipe shall stop the ball, the Contractor shall remove the obstruction.

2. Infiltration Tests

Sanitary sewers which are constructed with ground water level above Crown of pipe shall be tested for infiltration after sewers have been installed and backfilling has been substantially completed. A convenient section of sewer shall be selected between manholes. The upper section of sewer shall be plugged watertight with temporary bulkhead. A suitable measuring device shall be installed at the lower end.

The amount of water flowing through the outlet shall be measured periodically through the next twenty-four (24) hours. The flow thus measured shall then be converted by gallons per day per inch diameter per mile and compared with the maximum allowable limit of two hundred gpd/in./mile.

3. Exfiltration Tests

A section or sections of sanitary sewer between manholes shall be isolated by water tight bulkheading. Isolated sections shall then be filled with water to a level three (3) feet above the crown of the pipe at the upstream end of the section; water level at the downstream end of the section shall not be more than six (6) feet above the crown of the pipe. After allowing the water to stabilize overnight, the section shall be refilled with water to the original level. After one (1) hour more, the volume of water lost in the section shall be determined by measuring the drop in the water level.

4. Allowable Leakage

Infiltration or exfiltration of any given segment of sewer pipe shall not be permitted to exceed a rate of two hundred (200) gallons per twenty-four hours per mile of sewer per inch of pipe diameter (0.158 gpd/in./100 ft.).

5. Low Pressure Air Testing

For gravity sanitary sewers installed with the pipe crown above the ground water level, air pressure testing may be used in lieu of the exfiltration test. Low pressure air testing is used to determine the existence of pipe leaks; however, it does not indicate water leakage limits.

Prior to the low pressure air testing, all wyes, tees, or end of side sewer stubs shall be plugged with flexible-joint caps, or acceptable alternate, securely fastened to withstand the internal test pressures. Such plugs or caps shall be readily removable, and their removal shall provide a socket suitable for making a flexible-joint lateral connection or extension.

All plugs shall be securely banded to prevent possible blowout due to internal air pressure. One plug shall have an inlet tap, or other provision for connecting a hose to a portable air supply source. Air hose shall be connected to the inlet tap and a portable air supply source.

Air equipment shall consist of all necessary valves and pressure gauges to control rate of air flow into the test section and to enable monitoring of air pressure within the test section. Testing apparatus shall also be equipped with pressure relief device to prevent the possibility of loading test section with full capacity of compressor.

Air shall be slowly added to test section until pressure inside pipe is raised to 4.0 psig. After a pressure of 4.0 psig is obtained, air supply shall be regulated such that pressure is maintained between 3.5 and 4.0 psig for a period of two (2) minutes, to allow air temperature to stabilize in equilibrium with temperature of pipe walls. Pressure will normally drop slightly until equilibrium is obtained. During this period, all plugs shall be checked with soap solution to detect any plug leak.

After this two (2) minute air stabilization period, air supply shall be disconnected and test pressure allowed to decrease. Time required for test pressure to drop from 3.5 psig to 2.5 psig is determined by means of stop watch, and this time interval is then compared with required time to determine if rate of air loss is within the allowable limit. Required time to arrive at the allowable air loss is calculated by means of following formula:

$$T = \frac{0.0850 \text{ DK}}{Q}$$

Where: T = time in seconds

K = .000419 DL, but not less than 1.0

Q = Rate of loss (=0.003 cfm/sq. ft. of internal surface)

D = Diameter of pipe in inches

L = length of pipe tested in feet

Upon completion of test, the bleeder valve shall be opened and all air allowed to escape. Plugs shall not be removed until all air pressure in test section has been released. Also, no one shall be allowed in trench or manhole while test is being conducted.

All pipe lines thirty (30) inch diameter and over shall be tested one joint at a time with joint testing apparatus. Joint shall be isolated with an expanding shield equipped with gaskets which fit tightly against pipe walls on each side of joint to be tested. Allowable leakage for such a test is equal to that which would occur on the basis of allowable leakage for one length of pipe.

If measured time interval for the pressure to drop from 3.5 psig to 2.5 psig is less than the required time as calculated, sewer section shall be deemed to have failed test. Contractor shall then proceed to repair pipe at his cost as necessary until the sewer section passes the test. All testing shall be conducted in presence of DPW or his representative (inspector).

6. Excessive Leakage

If infiltration or exfiltration rate of sewer exceeds maximum rate specified, contractor shall make all necessary repairs to reduce leakage below the allowable. Such repairs shall be made at Contractor's expense. Under no circumstances will grouting be considered an acceptable means of repair. When repairs have been completed, but not more than thirty (30) days after first test, sewer section shall be subjected to a second leakage test as specified above.

If the second test should again indicate leakage in excess of the allowable amount, the Contractor shall, at his own expense, provide complete internal inspection of entire section in question, by means of videotape recording of television inspection or by color photography with exposures every two (2) to four (4) feet along the sewer. Contractor shall employ an independent sewer testing service to inspect pipe. Inspection service shall prepare a written report and shall review videotape or films with DPW, Contractor, and DPW's representative. Contractor shall then submit a written plan for correction of leakage. Contractor, DPW, and DPW's representative shall meet as necessary to develop actual program for inspection and repair. Contractor shall not proceed to repair line until he receives written authorization to proceed from City Engineer, DPW or DPW's representative. All inspections, reports, repair, replacement, and compensation for additional professional expense shall be paid by the Owner/Contractor.

B. Deflection Testing of Installed Flexible Plastic Pipe

1. Final Acceptance Test

Prior to the final deflection test, the DPW or his representative may, at his option, order the lamping of certain or all sections. Lamping must show a "full moon" and no excessive puddling effects in the span.

The main line shall be flushed prior to the vertical ring deflection tests. The vertical ring deflection tests shall not be performed prior to successful completion of leakage testing requirements.

All main line plastic pipe and PVC/ABS Truss sewers eight (8) inch in diameter and greater shall be measured for vertical ring deflection at least thirty (30) days after installation, but no later than thirty (30) days prior to final acceptance of the project. Maximum ring deflection of the pipeline under load shall be limited to five percent (5%) of the vertical internal pipe diameter. All pipe exceeding this deflection shall be considered to have reached the limit of this serviceability and shall be relaid or replaced by the Owner/Contractor.

The cost of all deflection testing shall be borne by the Contractor and shall be accomplished by using a deflectionometer, which will produce a continuous record of pipe deflection, or by pulling a mandrel, sphere, or pin-type go-no-go device through the pipeline. The diameter of the go-no-go device shall be ninety-five percent (95%) of the undeflected inside diameter of the flexible pipe. The mandrel shall be pulled through the sewers by one man, by hand and specifically without the aid of mechanical devices.

C. Sanitary Manhole Testing

All manhole vacuum tests shall be conducted in the presence of a representative of the DPW.

The vacuum test equipment shall consist of: inflatable plugs for all incoming and outgoing sewer lines; an inflatable test collar to seal the manhole at the manhole frame; and a vacuum pump. A vacuum gauge shall be located in line between the test collar and the pump to accurately indicate the vacuum in inches of mercury within the manhole. The vacuum gauge shall have a range to no more than thirty (30) inches of mercury, with scale markings of no greater than one-half (1/2) inch of mercury vacuum and an accuracy to within ± two percent (2%) of true vacuum.

The vacuum test shall be conducted by plugging all incoming and outgoing sewer lines in the manhole at a location beyond the connection of the sewer pipe with the manhole. All plugs shall be blocked in place so as not to move during the The vacuum testing collar shall be inflated in the frame in accordance with the equipment manufacturer's recommendations. A vacuum of ten (10) inches of mercury shall be drawn and the vacuum pump turned off and the valve between the vacuum pump and the vacuum gauge shall be turned off.

The time period which is taken for the vacuum to fall from ten inches (10") of mercury to nine inches (9") of mercury shall be determined. If the time taken for the vacuum to reduce the ten inches (10") of mercury to nine inches (9") of mercury is less than the time indicated in the following Table, then the manhole work shall be considered not acceptable and shall be rejected. If the time is equal to or exceeds the time indicated below, the manhole work shall be accepted.

Manhole Depth (ft.)	Time (sec)
8	48" 60" 72"
10	20 26 33
12	25 33 41
14	30 39 49
16	35 46 57
18	40 52 65
20	45 59 73
22	50 65 81
24	55 72 89
26	59 78 97
28	64 85 105
30	69 91 113
For each add 1" add:	74 98 121
	5 7 8

Contractor shall submit to the DPW the results of each manhole vacuum test. Such reports shall include a description of the location of the manhole, the time, date and weather of the test, a list of all persons present, the diameter and depth of the manhole and the allowable test results, and the actual test results.

All manholes shall be repaired by Contractor and retested as described above until a successful test is made. After each test, the temporary plugs shall be removed.

Once all manholes have been tested, the manholes will be given a field visual inspection. The inspection shall be performed at the discretion of the DPW during the warranty period following a rainfall sufficient enough to raise the groundwater table above the problem areas. All leakage problems determined by this inspection shall be corrected by the Contractor within an agreed upon time to the satisfaction of the DPW. Where necessary to complete the work, the Contractor shall be responsible for the bypassing and/or blocking of the flow in the manholes and must have prior approval by the City Engineer or DPW. It will be the Contractor's responsibility to supply his own traffic control as required by the particular location and/or jurisdiction.

D. Storm Sewer Testing

All rigid pipe shall be lampout; any misalignment shall be repaired.

All flexible pipe shall receive a deflection test as required by paragraph B. Deflection test shall be limited to 7% of the vertical, internal pipe diameter.

9.04 Lateral Location Forms

The Owner/Contractor shall submit a lateral location form for each lot. The form shall be completed and signed by the Contractor, the DPW or his representative during lateral inspection. This form shall include one (1) Polaroid type photo taken from the point of connection to the public sewer, looking back along the lateral to the building.

SECTION 10

EROSION CONTROL

10.01 General

This section provides the general guidelines for the control of erosion and sediment for construction sites. Control of sedimentation for construction site may be accomplished through utilization of a variety of control practices. The complexity of the erosion and sediment control plan will vary depending upon individual site conditions. The goal of such a plan is to limit the quantity of sediment leaving the construction site. The Contractor's plan must be approved by the DPW and City Engineer.

In addition, the Contractor must also comply with Rule 5 327 IAC 15-5 for land alteration which disturbs 5 acres or more.

10.2 Permitting Requirements

If the Owner/Contractor is required to submit a soil erosion control plan to the State under Rule 5 (327 IAC 15-5), such plan shall be deemed in compliance with DPW requirements. In this case all applicable State and Federal permits or notices for land disturbing activities shall be obtained or filed prior to beginning land disturbing activities. Copies of all applications, letter of intent, submittals, plans and other erosion and sediment control related information shall be submitted to the DPW and City Engineer.

10.3 Design Guidelines

In order to fully achieve an acceptable level of erosion and sediment control on the construction site, the following design principles shall be fully adhered to during site analysis and development of the erosion and sediment control plan:

- A. Existing site contours should be followed as close as reasonably possible in order to minimize cut and fill.  
B. Existing natural vegetation should remain undisturbed for as long as possible during the construction activities. Naturally vegetated areas along property lines, jurisdictional wetlands, lakes, and watercourses, both natural and man-made, should be left undisturbed during all phases of the site construction. These vegetative filter strips will be required at the discretion of the DPW.  
C. A logical sequencing of site construction activities must be provided in order to minimize the size of exposed land areas, and the length of time land areas are left without some form of temporary or permanent soil protection.  
D. Soil stockpiles shall be stabilized utilizing either vegetative establishment, sediment trapping barriers, or erosion control measures such as tarring or mulching, singly or in combination.  
E. Storm sewer inlets which are made operable either before or during the construction phase of development shall be provided with protection from siltation.  
F. Stable, properly maintained construction traffic access routes and stream crossings shall be identified on the site erosion and sediment control plan as needed. These construction access routes shall be established as part of the site perimeter sediment control barriers, prior to the initiation of on-site land alteration activities. Where sediment is transported onto public street or road surfaces, these streets or roads shall be cleaned thoroughly at the end of each day. Sediment shall be removed by either scraping, shoveling or sweeping and be transported to a controlled fill area. Street washing will be allowed only if wash water flows to a controlled sediment trapping area.  
G. Runoff velocities shall be kept as low as possible.  
H. A thorough maintenance and follow-up program, and identification of the person(s) responsible for its implementation will be required.

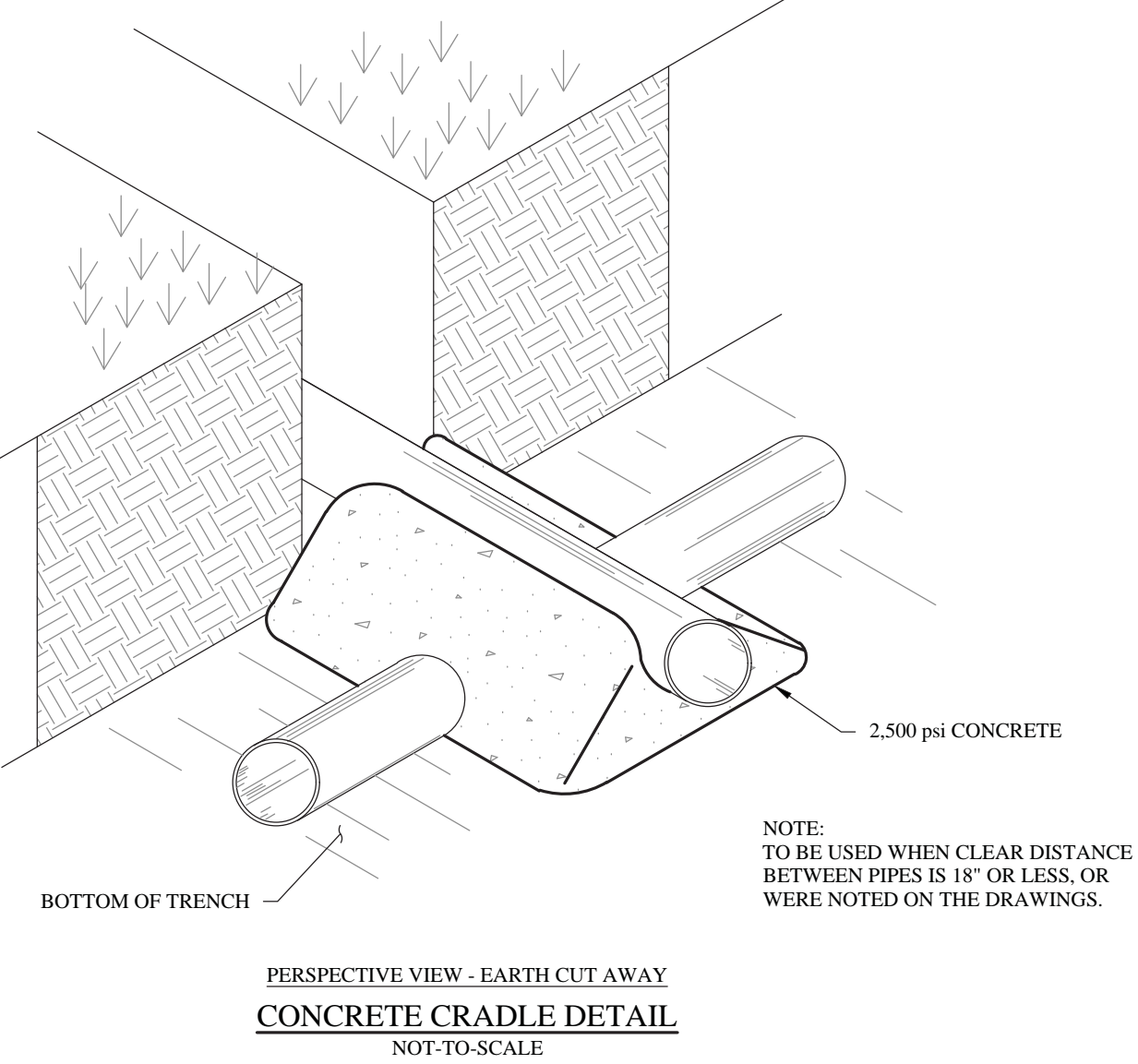
The latest edition of the Indiana Handbook for Erosion Control in Developing Areas shall be used for detailed technical guidance for all erosion and sediment control practices. The following general practice guidance applies to the development of all control plans:

- A. Perimeter Control - Perimeter control measures shall be installed as specified on the approved plan, including: construction access drives, straw bale dams and fabric fencing, temporary sediment traps, sediment basins, and diversions.  
B. Vegetative Control - Disturbed areas which are a final grade shall be permanent seeded within seven (7) days. At the discretion of the DPW, barren areas to be rough graded and left undisturbed for more than thirty (30) days shall be established with temporary vegetation; and dormant seeding will be required during seasonal periods (October through February) for those barren areas to be left undisturbed for one hundred and twenty (120) days or longer.  
C. Slope Protection - Slope protection shall be provided by use of temporary and permanent diversion levees, vegetative cover, and slope drains. Concentrated stormwater flows shall not be allowed to flow down cut or fill slopes without proper slope stabilization.  
D. Sediment Trapping - To achieve the goal of preventing sediment from leaving the construction site, the DPW will require the use of sediment barriers such as fabric fencing, straw bale dams, and sediment basins.  
E. Protection of Outlet Channel - Concentrated stormwater runoff leaving a development site shall be outletted to an open channel, storm sewer pipe or culvert which is capable of receiving this discharge. Runoff velocities shall be controlled during all storm events so that the peak runoff velocity during and after the completion of the land alteration approximates existing conditions.

The principles and practices provided by the State in Rule 5 are to be followed in the development of all control plans. Rule 5 does not give specific requirements for use of various practices leaving that to the localities. Individual practices can be modified or waived upon request to the DPW based on special site characteristics and conditions.

The designer should rely on the Indiana Handbook for Erosion Control in Developing Areas (HECDA) for detailed design, construction and maintenance criteria for all erosion control practices. Such criteria shall be required by the DPW unless waived in writing. The manual can be obtained from:

Urban Conservation Program  
Division of Soil Conservation  
Indiana Department of Natural Resources  
402 West Washington Street, Rm. W-265  
Indianapolis, Indiana 46204-2748



APPROVAL PENDING / NOT FOR CONSTRUCTION

STOEPPELWERTH

ALWAYS ON

7965 East 106th Street, Fishers, IN 46038-2505  
phone: 317.849.5955 fax: 317.849.5942

JOHNSON COUNTY, INDIANA

FRANKLIN

CONSTRUCTION SPECIFICATION & DETAILS

WINTERFIELD

SECTION 3

DRAWN BY: KJ/M/GEM

CHECKED BY: KRK

SHEET NO.

C800B

S & A FOR NO.

100405FOR-S3

THIS DRAWING IS NOT INTENDED TO BE REPRESENTED AS A REPLACEMENT FOR ORIGINAL BOUNDARY SURVEY, A ROUTE SURVEY OR A SURVEYOR LOCATION REPORT.

REGISTERED PROFESSIONAL ENGINEER

STATE OF INDIANA

PE1200386

07/11/24

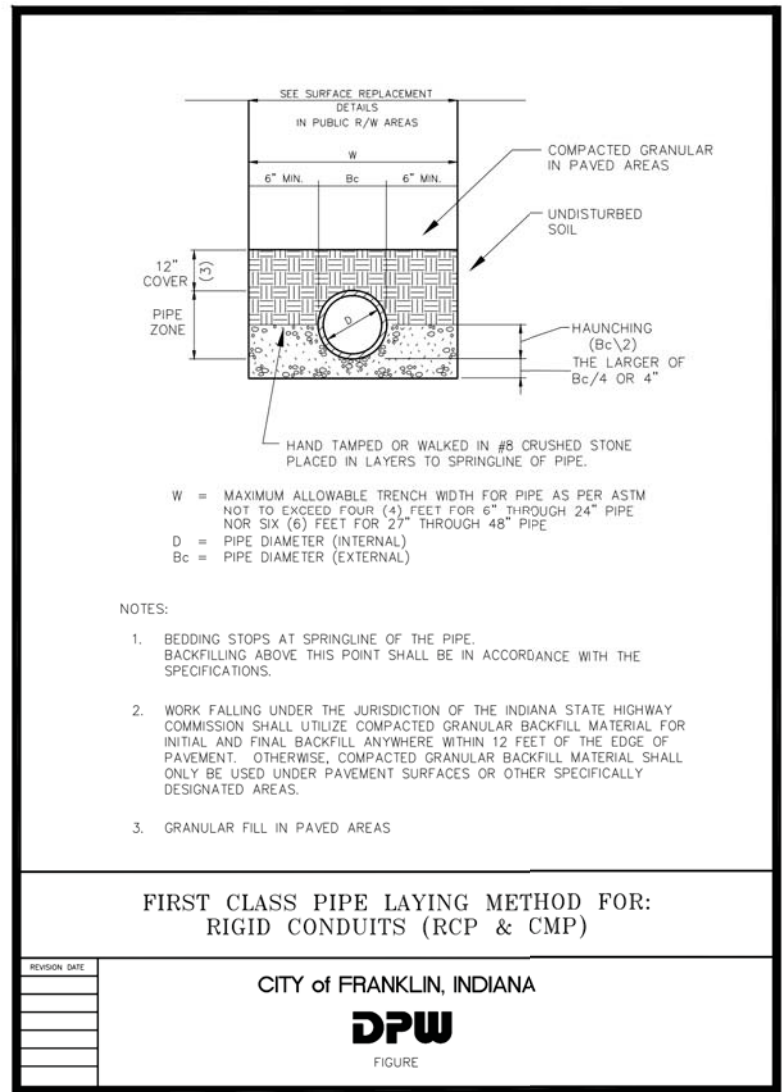
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REVISIONS

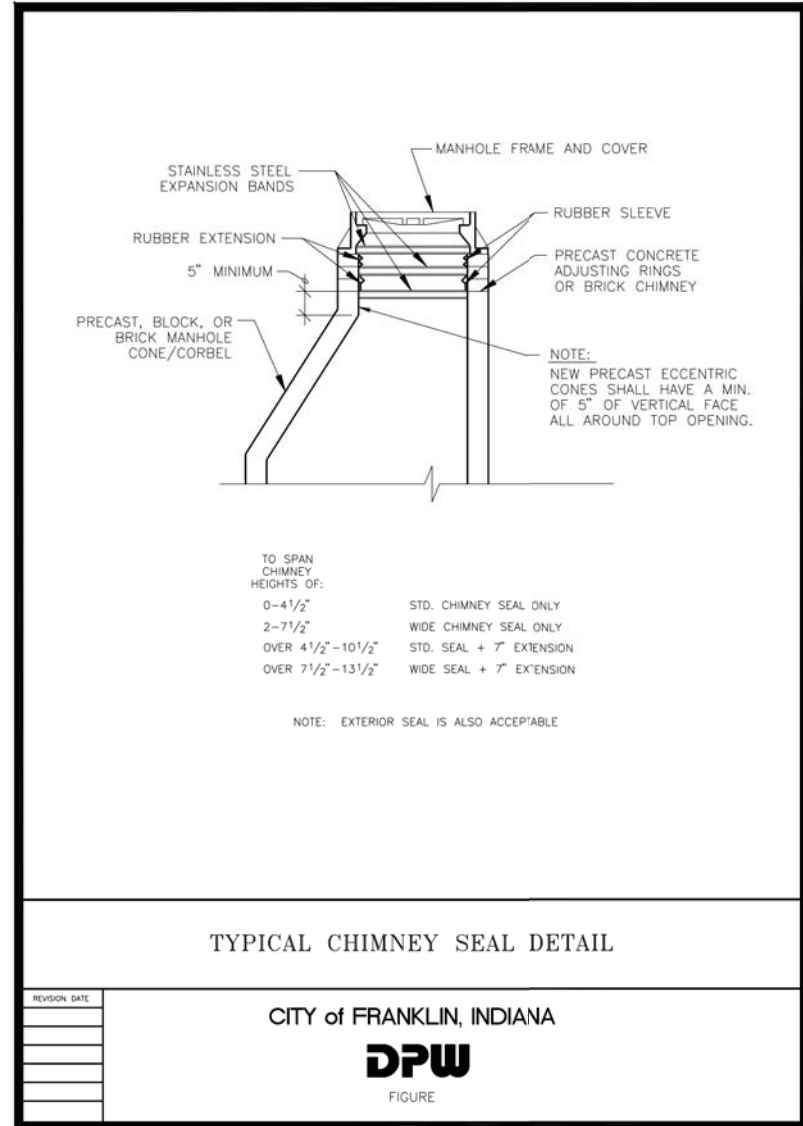
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CITY OF FRANKLIN - STANDARD SPECIFICATIONS

1-71



CITY OF FRANKLIN - STANDARD SPECIFICATIONS

1-42

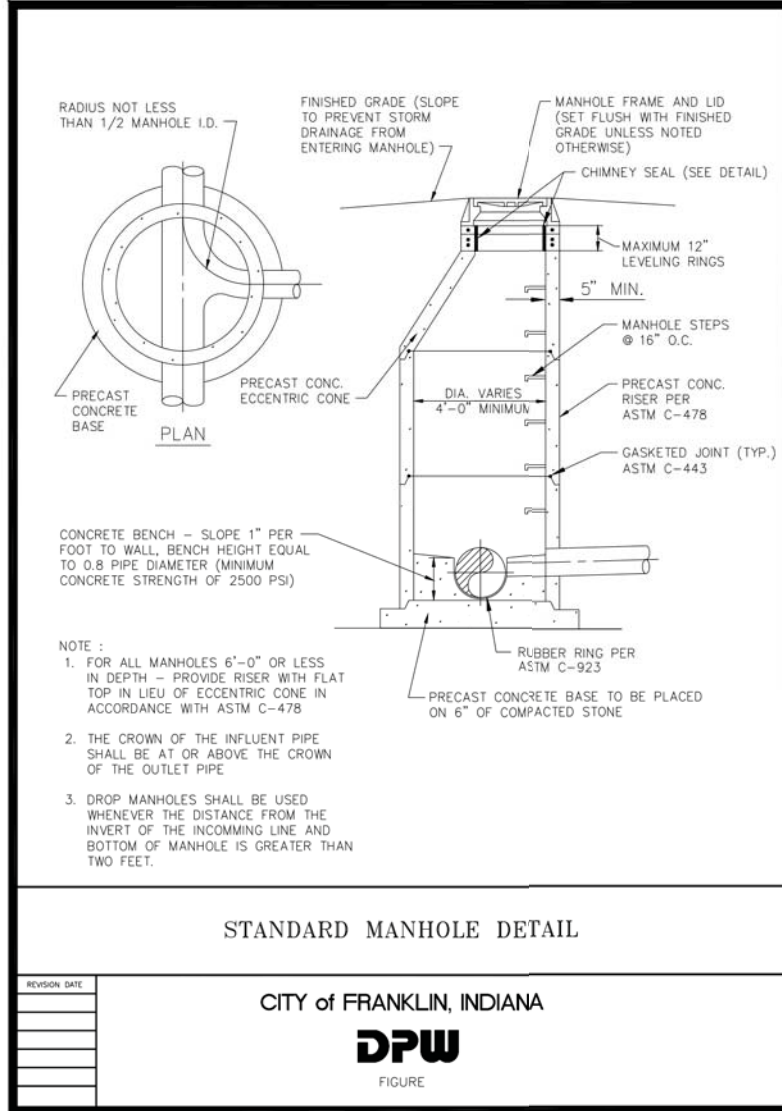


Illustration 5-1

CITY OF FRANKLIN - STANDARD SPECIFICATIONS

1-33

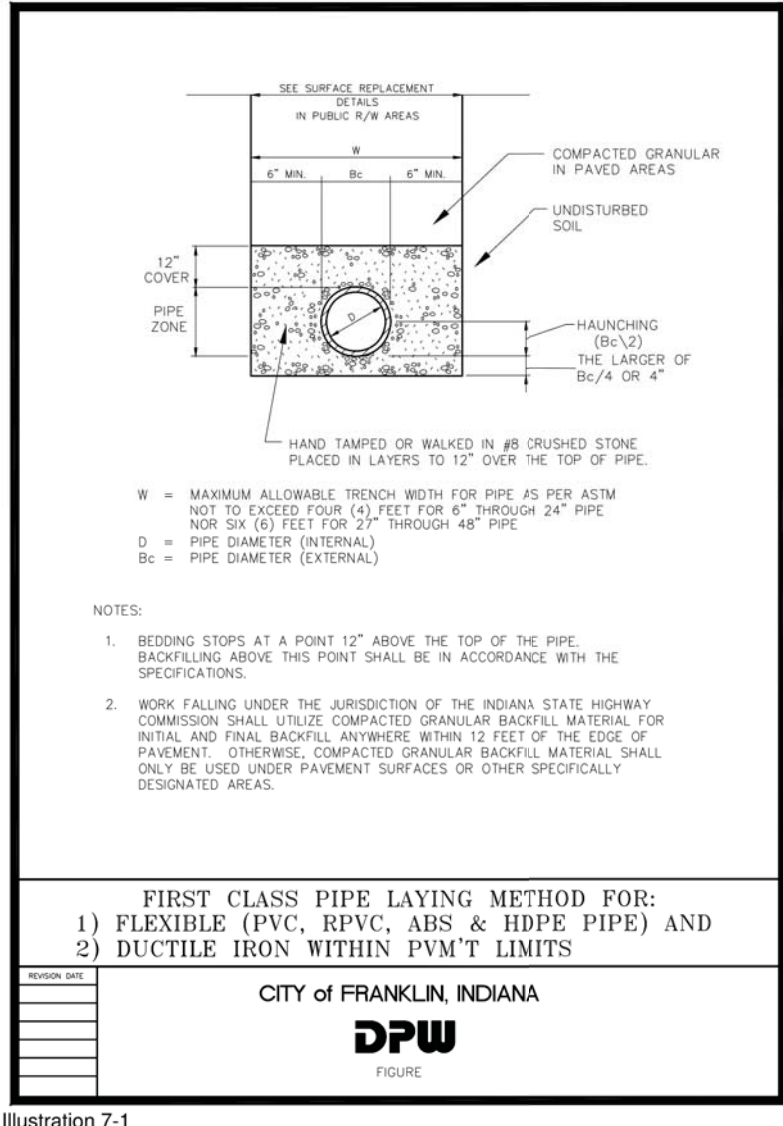


Illustration 7-1

CITY OF FRANKLIN - STANDARD SPECIFICATIONS

1-70

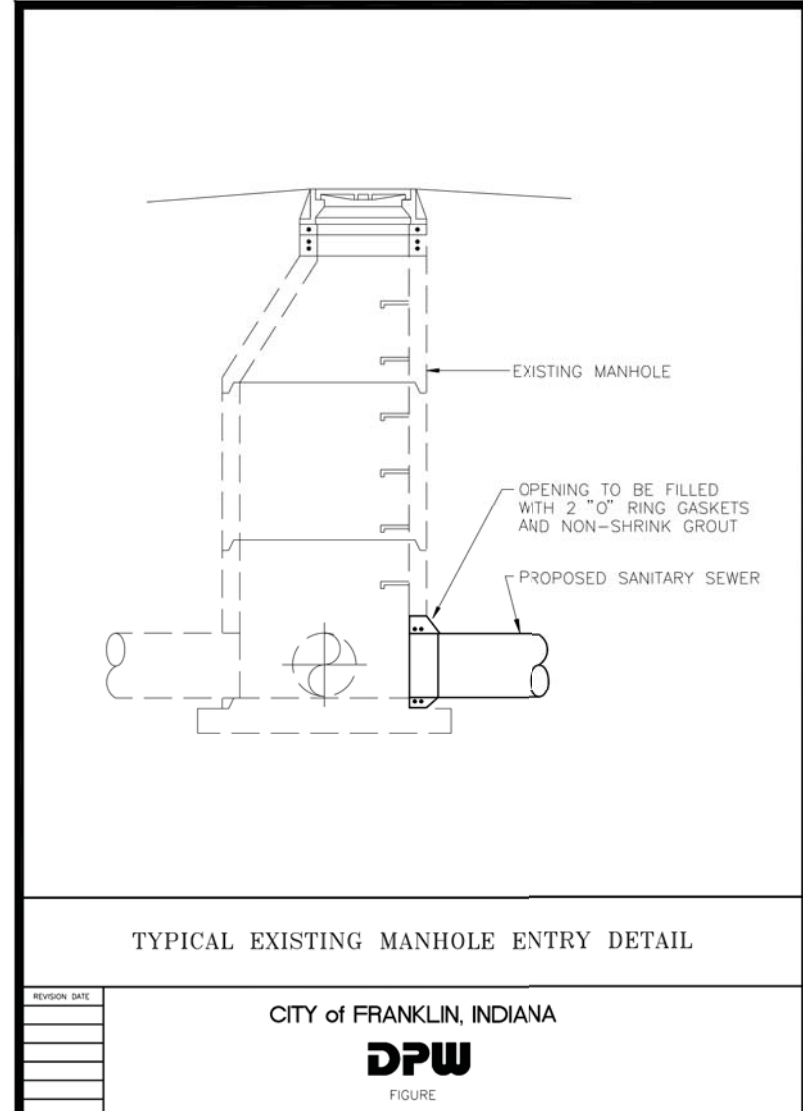


Illustration 5-5

CITY OF FRANKLIN - STANDARD SPECIFICATIONS

1-37

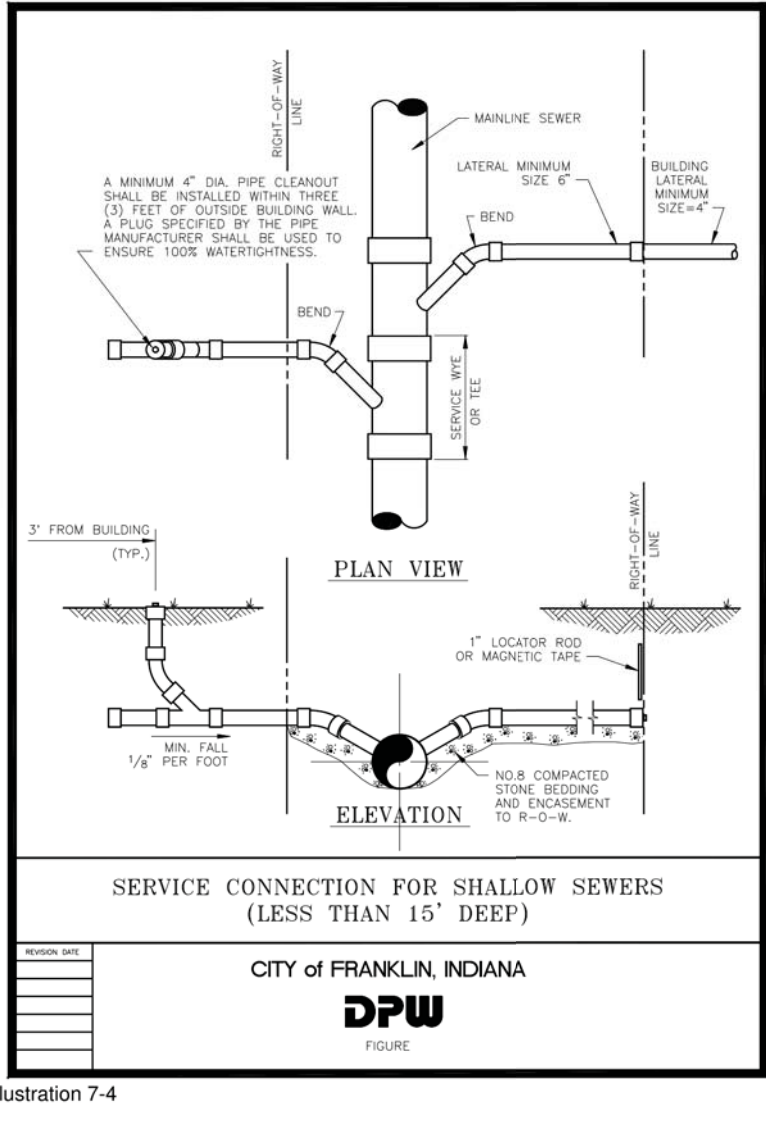


Illustration 7-4

CITY OF FRANKLIN - STANDARD SPECIFICATIONS

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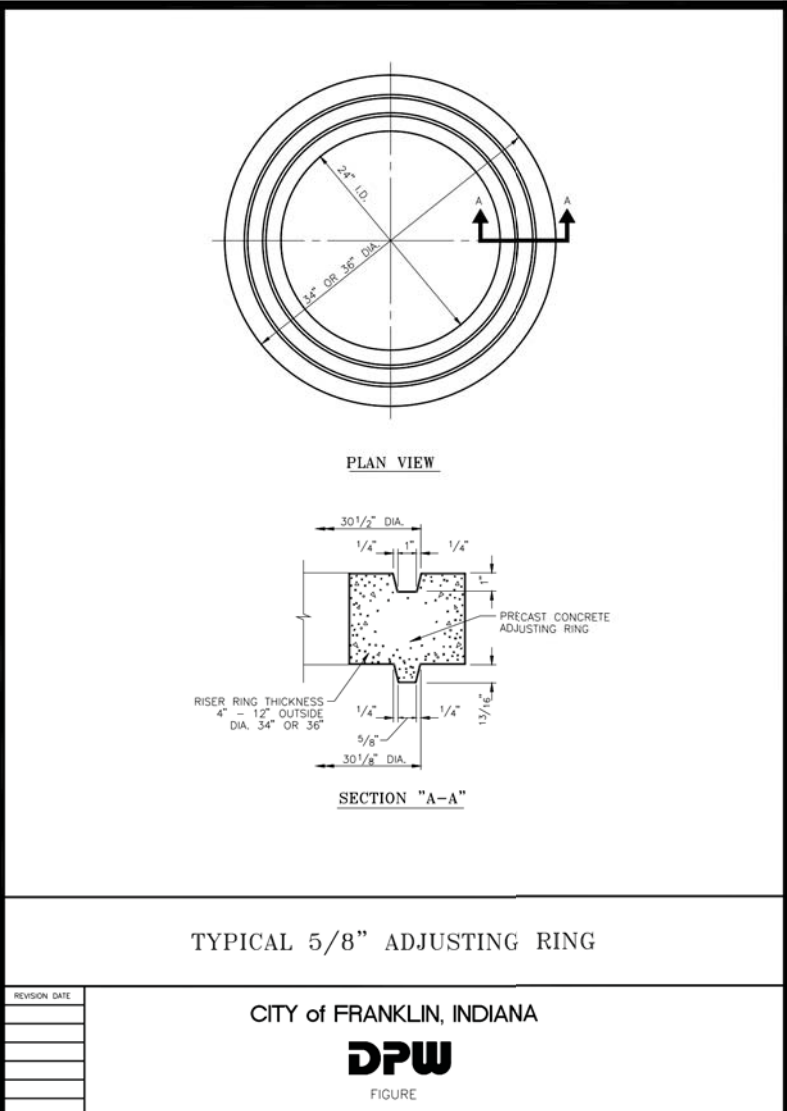


Illustration 5-6

CITY OF FRANKLIN - STANDARD SPECIFICATIONS

1-38

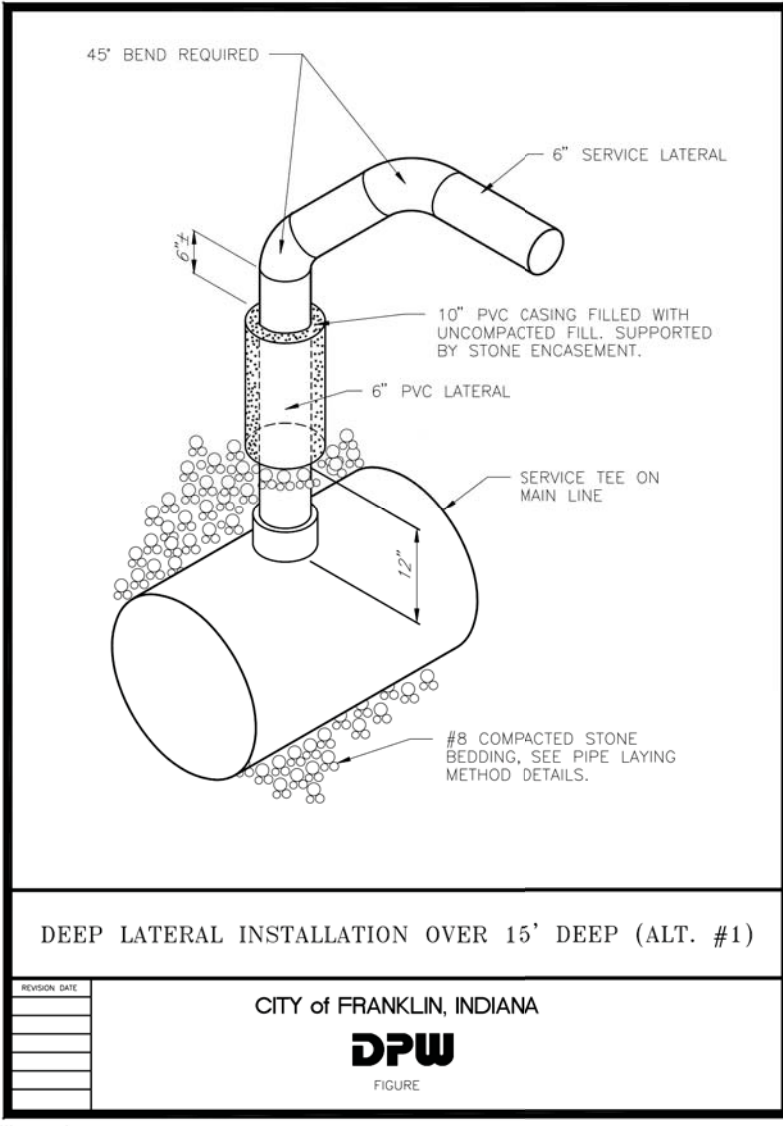


Illustration 7-5

CITY OF FRANKLIN - STANDARD SPECIFICATIONS

1-74

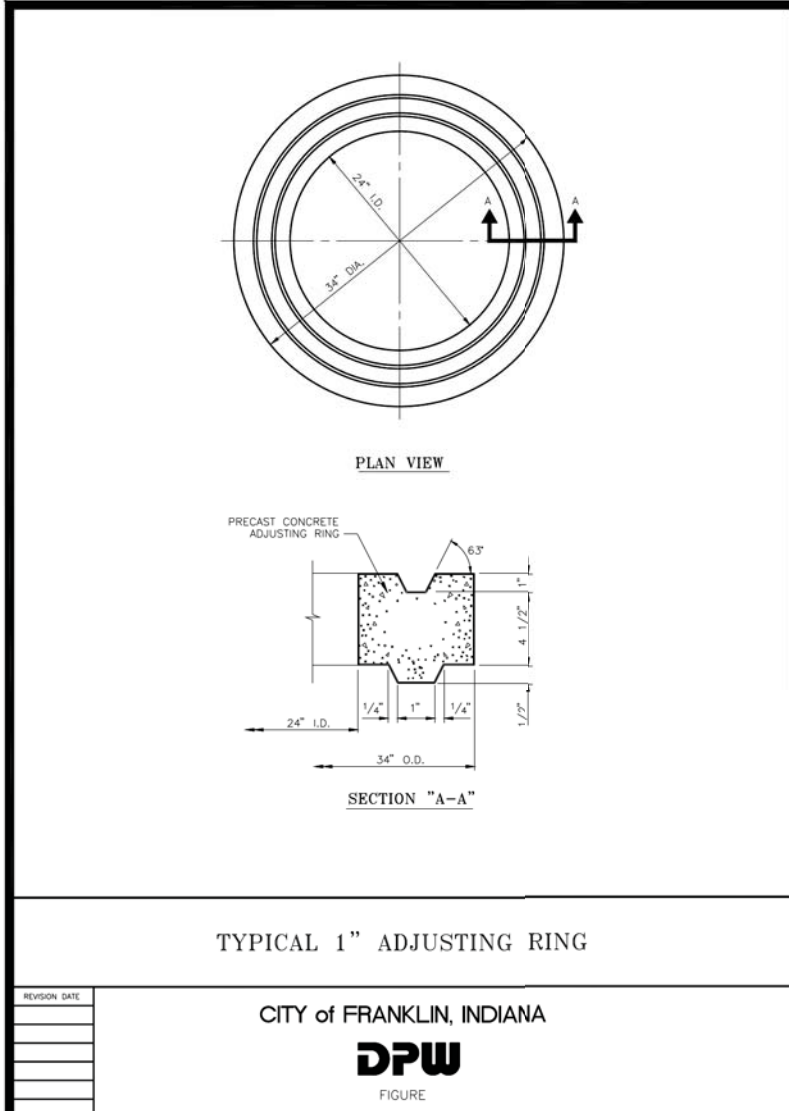


Illustration 5-7

CITY OF FRANKLIN - STANDARD SPECIFICATIONS

1-39

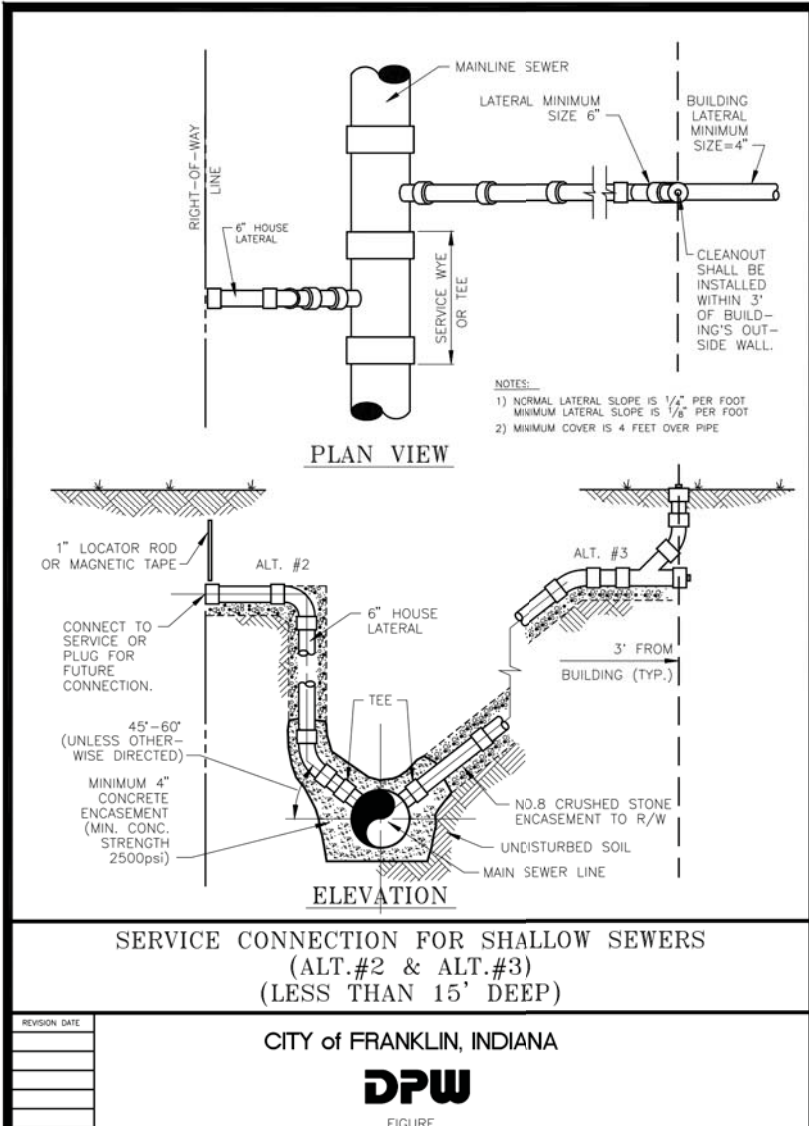


Illustration 7-6

CITY OF FRANKLIN - STANDARD SPECIFICATIONS

1-75

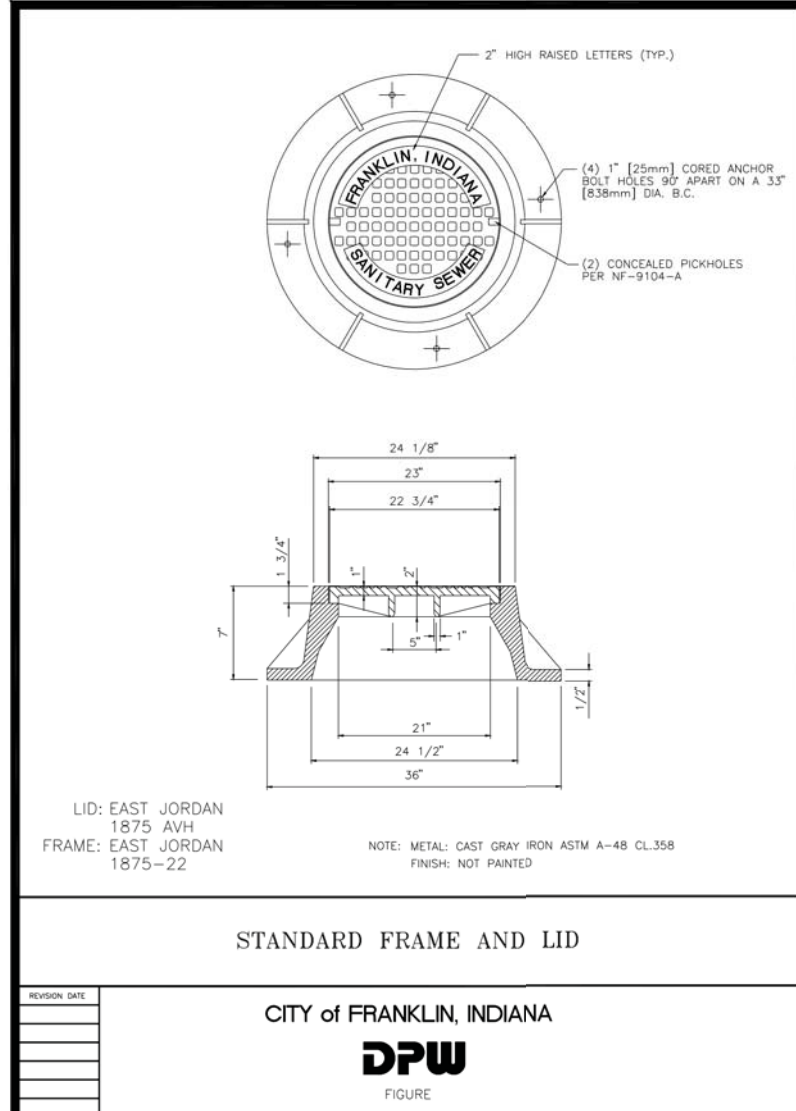
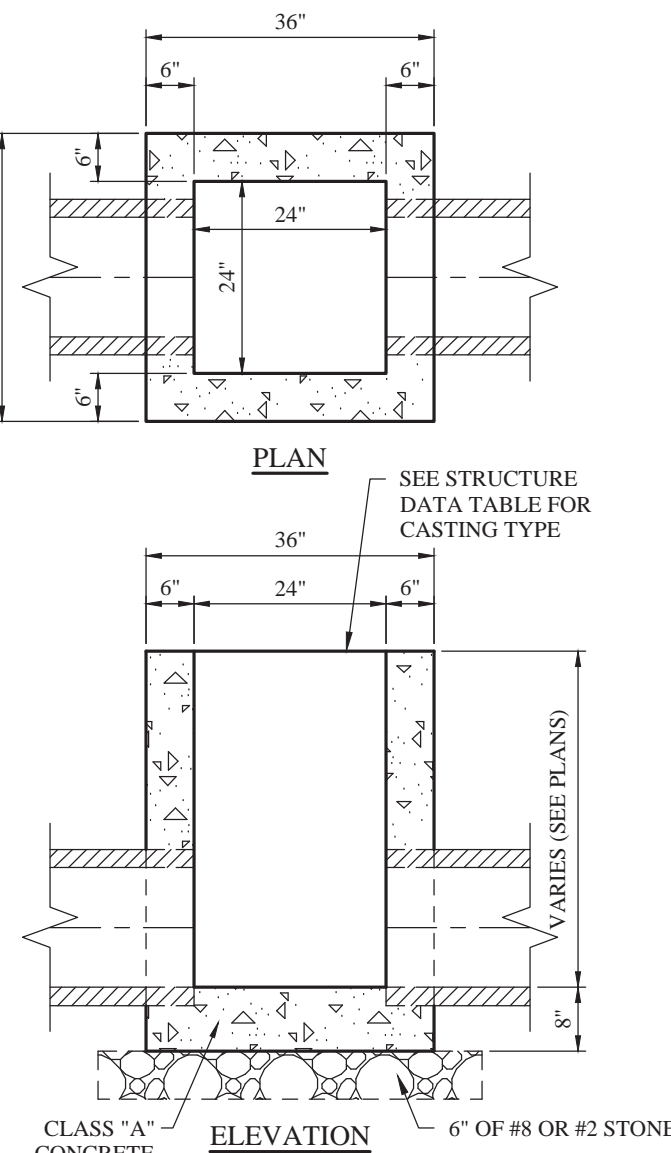
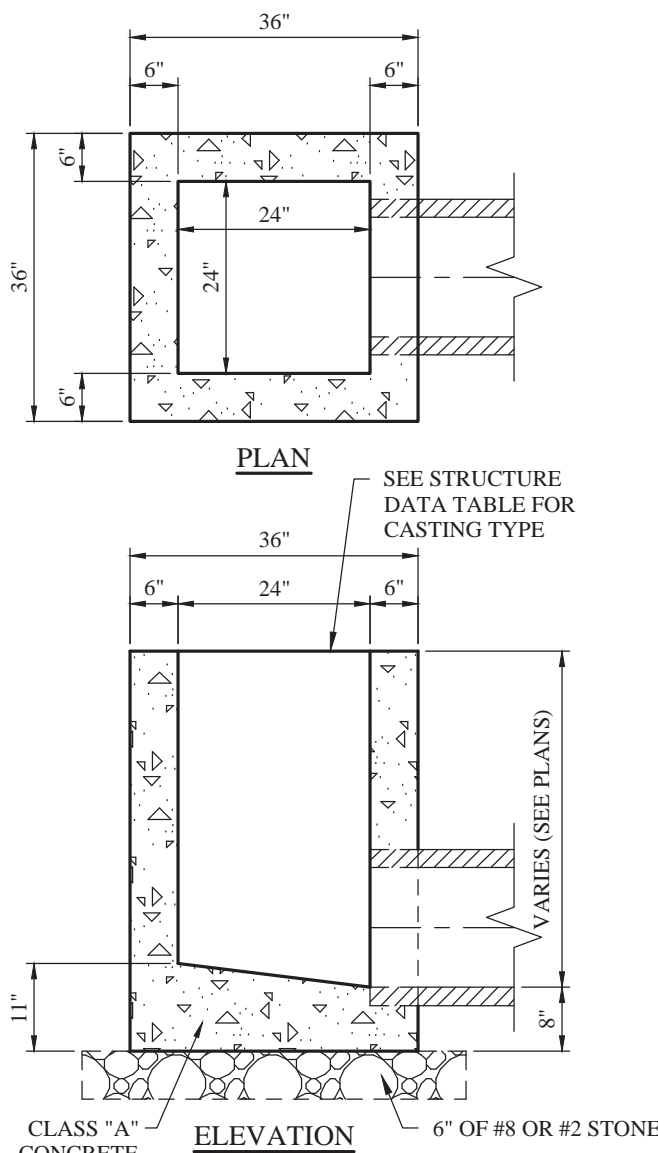
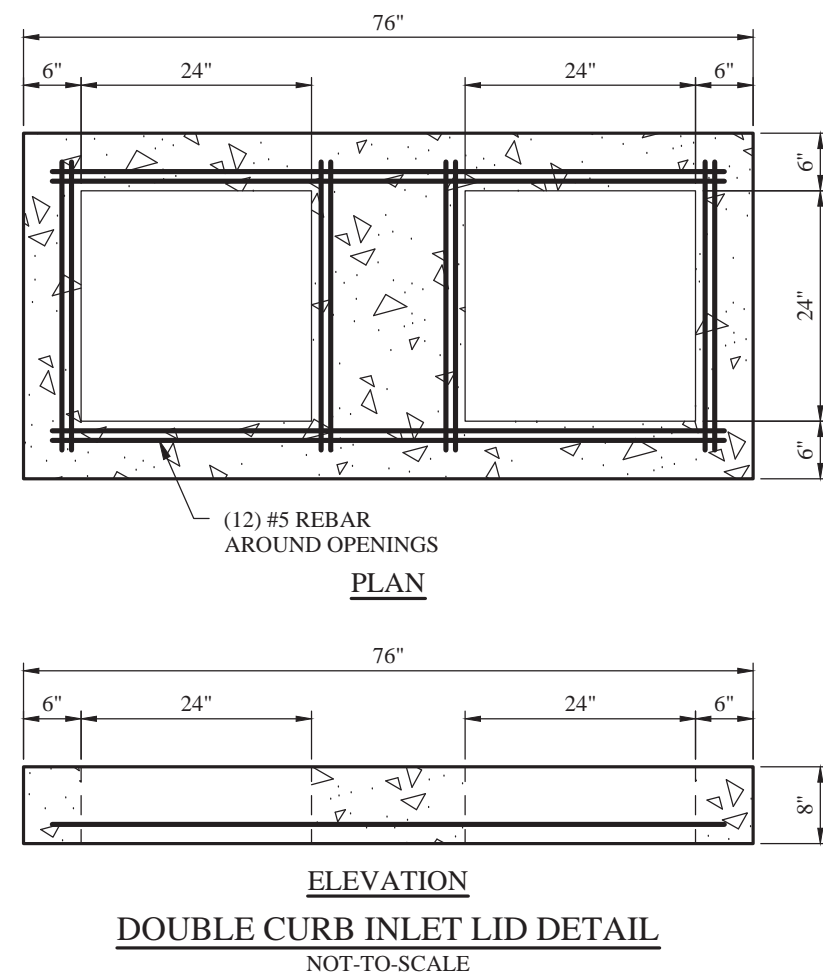
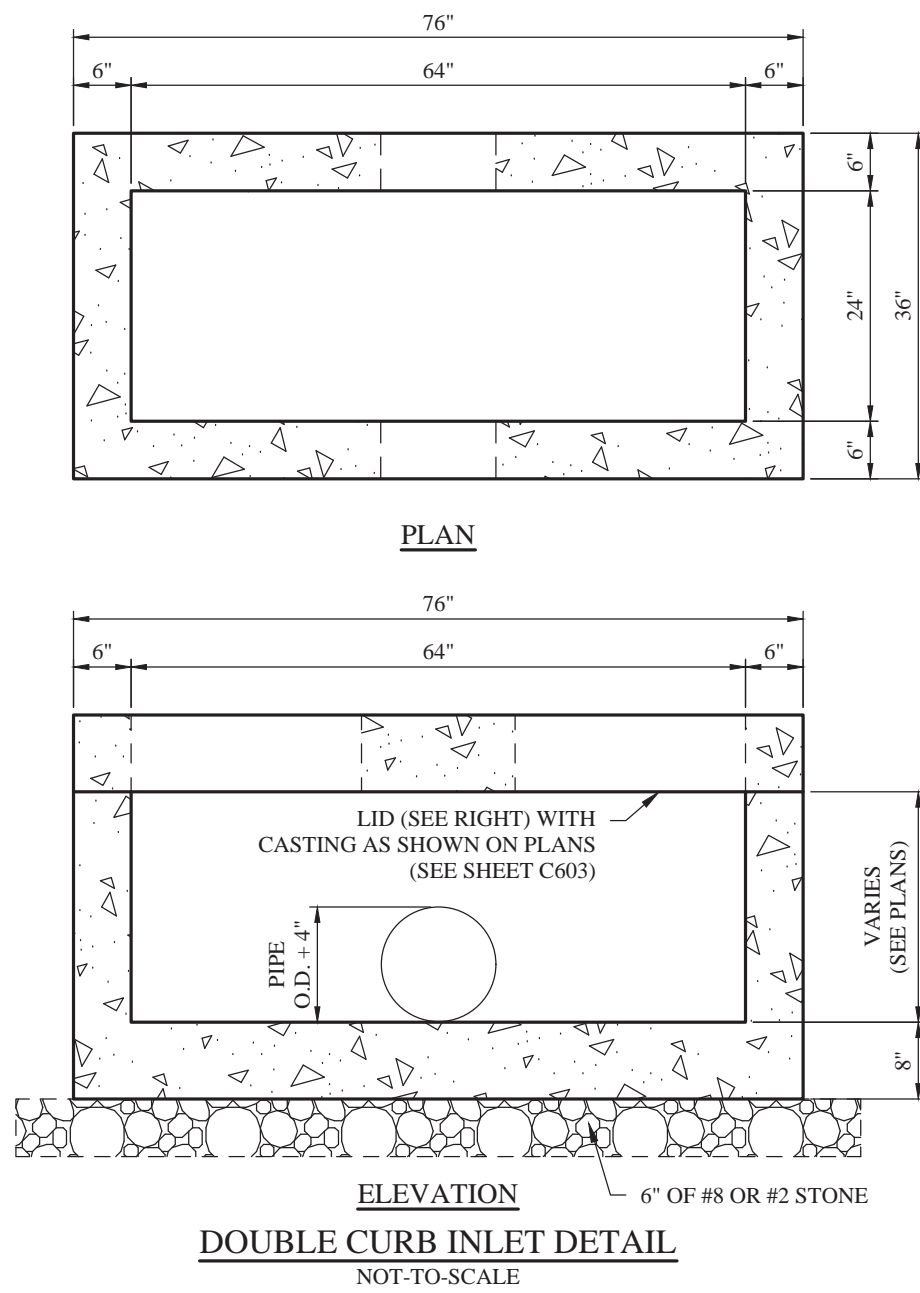
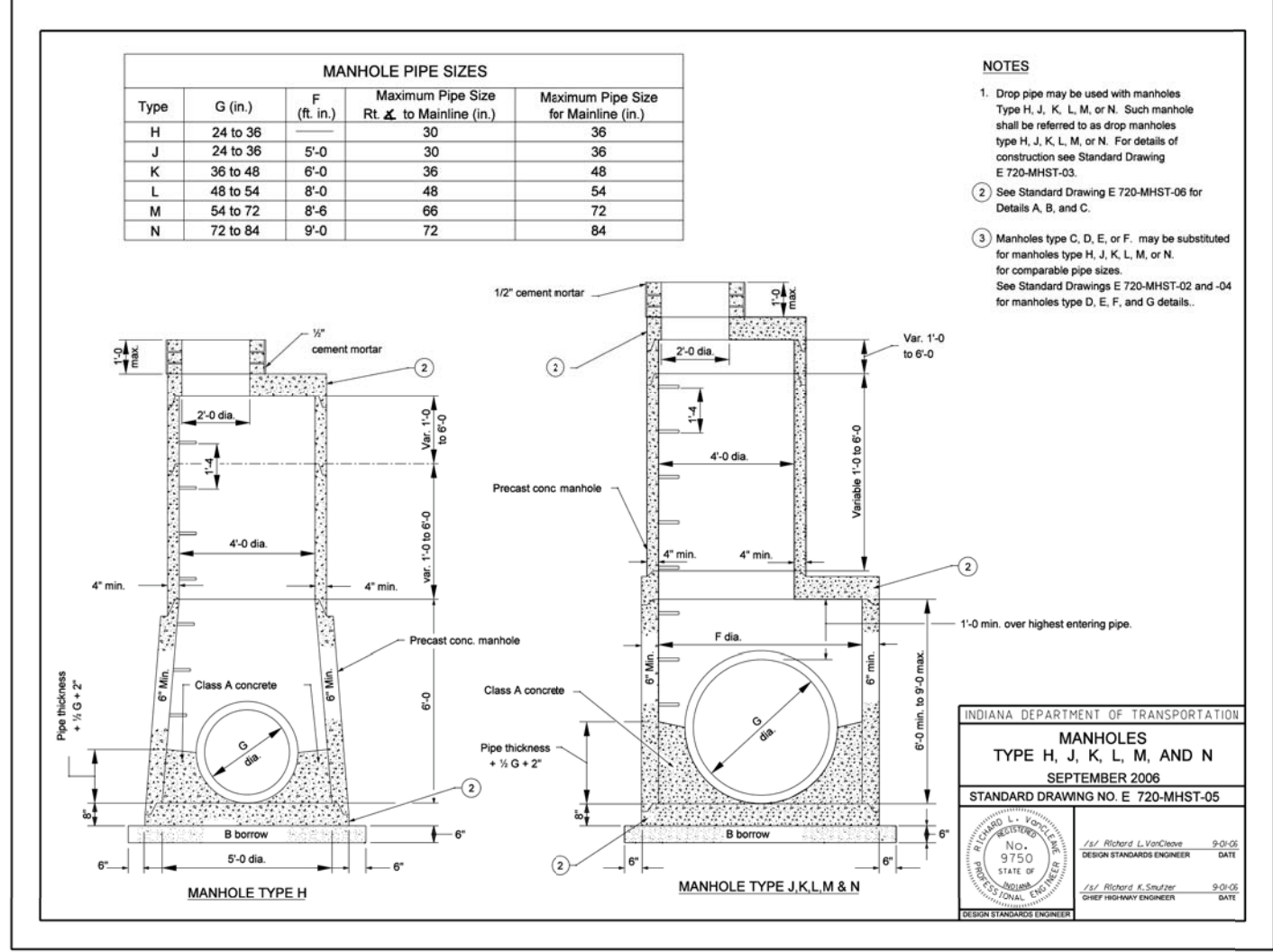


Illustration 5-8

CITY OF FRANKLIN - STANDARD SPECIFICATIONS

1-40





# CONSTRUCTION SPECIFICATION & DETAILS

## WINTERFIELD SECTION 3

FRANKLIN  
JOHNSON COUNTY, INDIANA

APPROVAL: PENDING/NOT FOR CONSTRUCTION

# STOPPELWERTH

ALWAYS ON

7065 Ego 104th Street, Fishers, IN 46038-2505  
phone: 317 849 5935 fax: 317 849 5942

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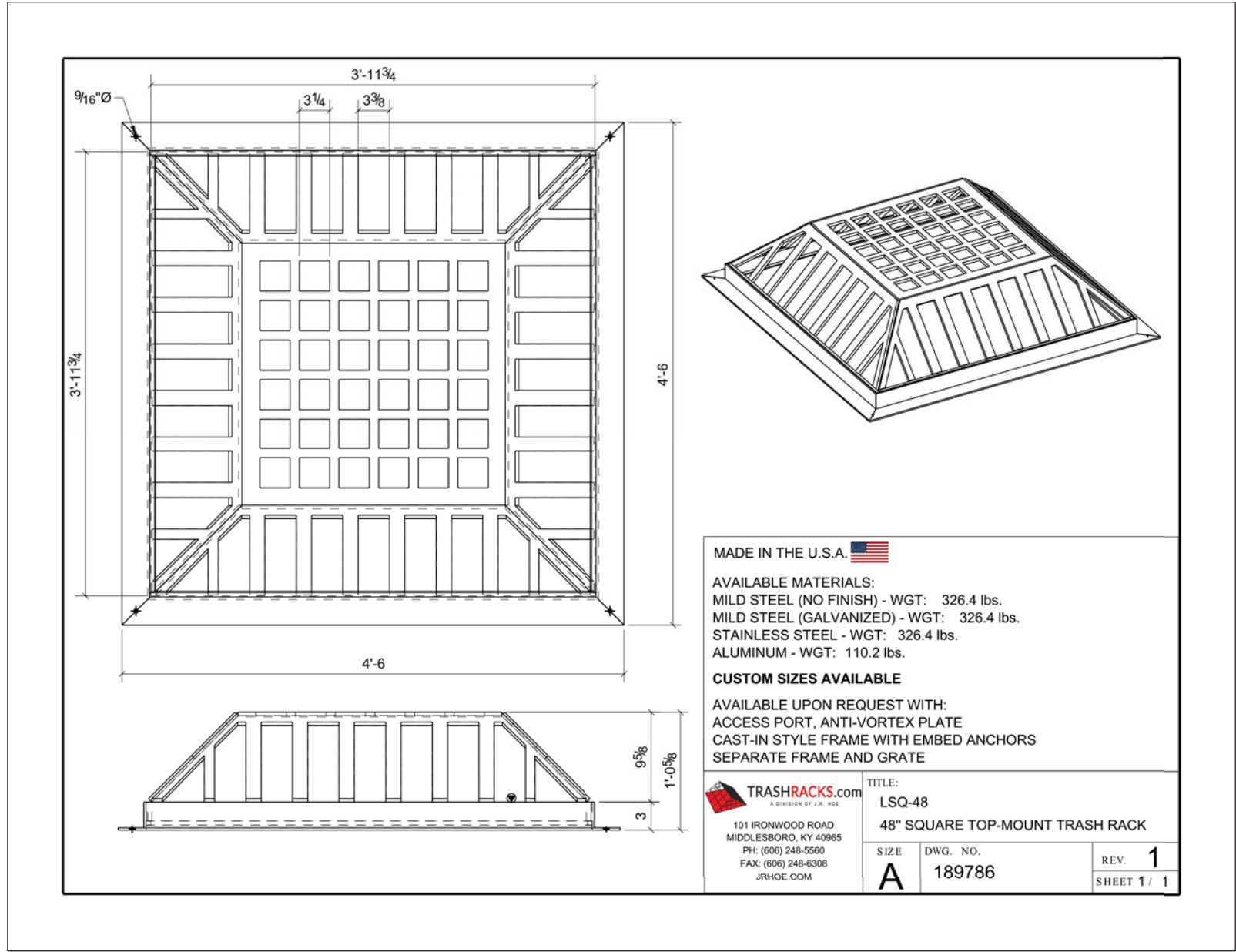
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CHECKED BY: **KRG**

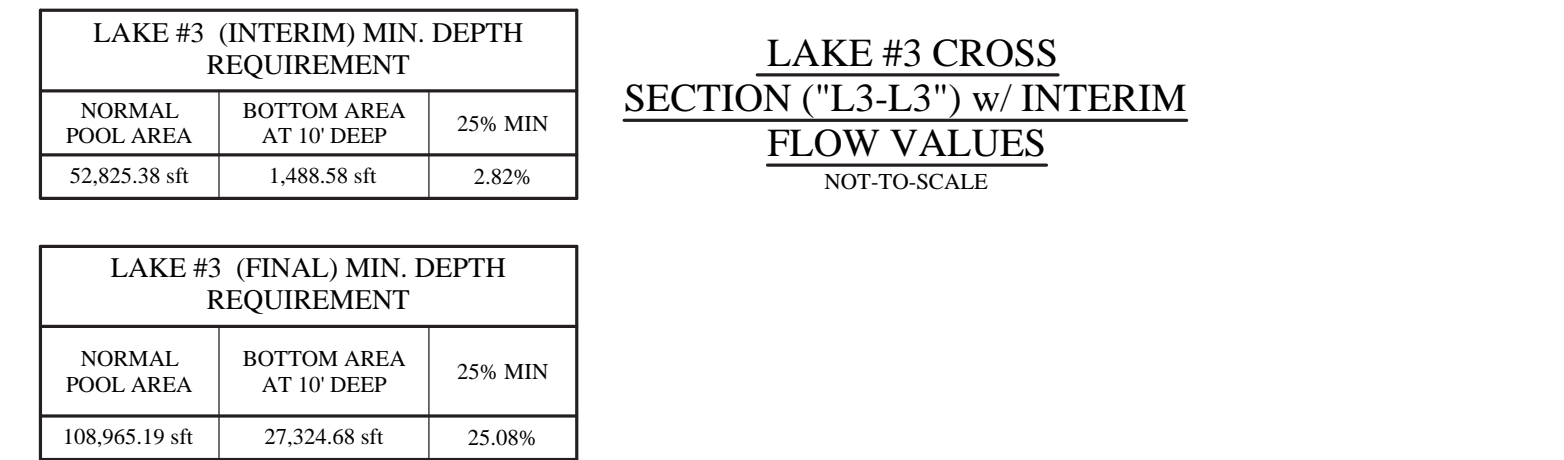
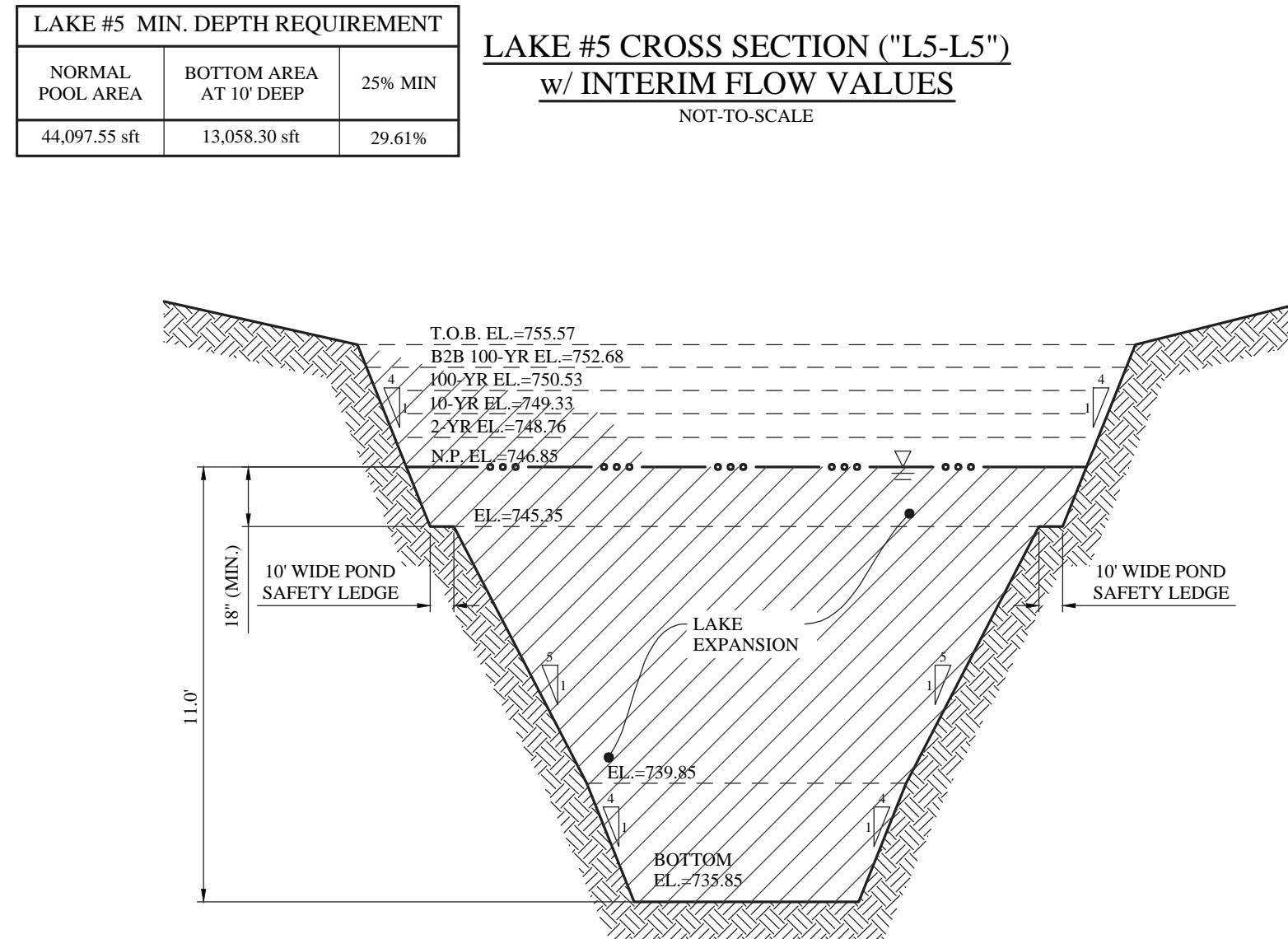
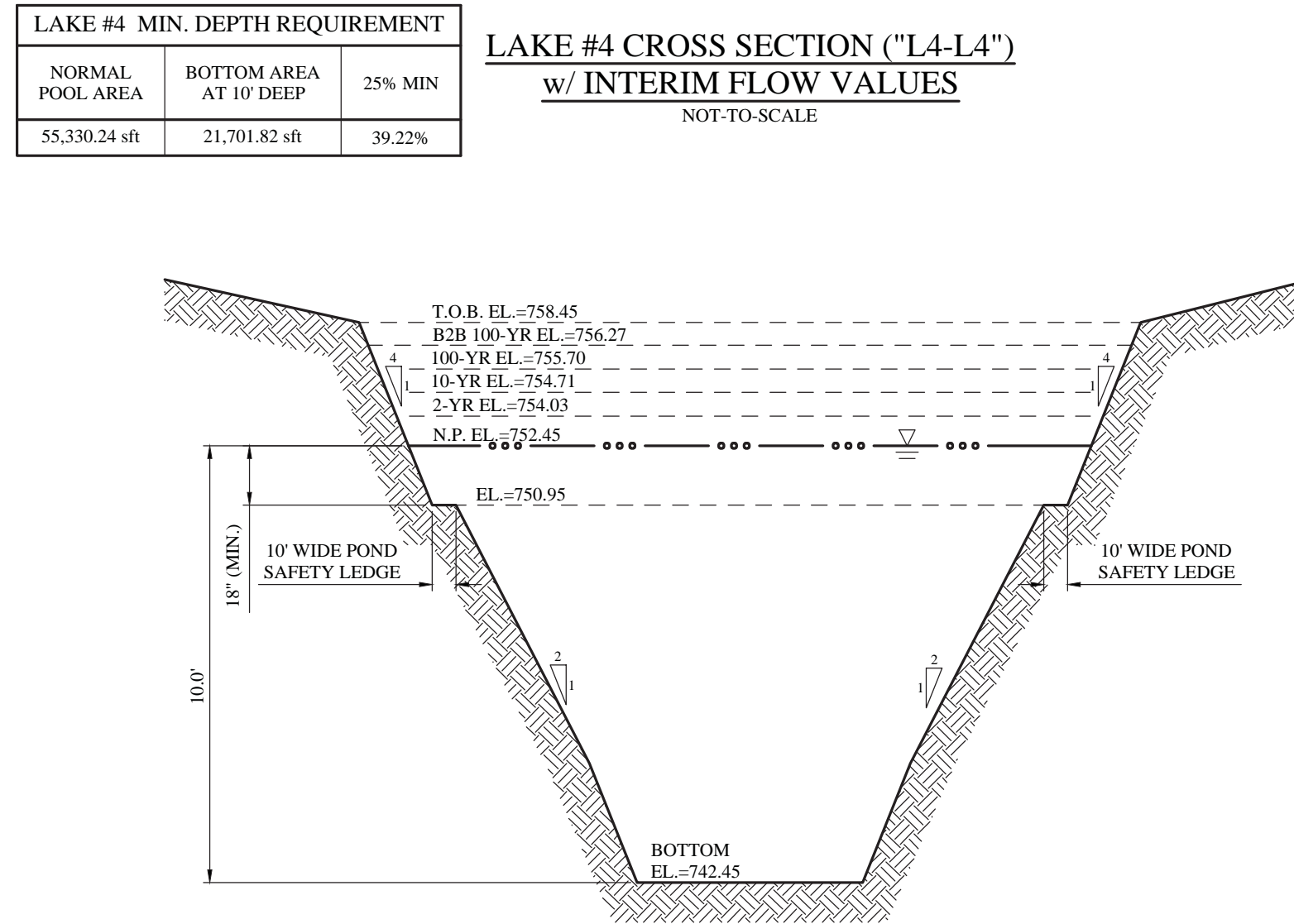
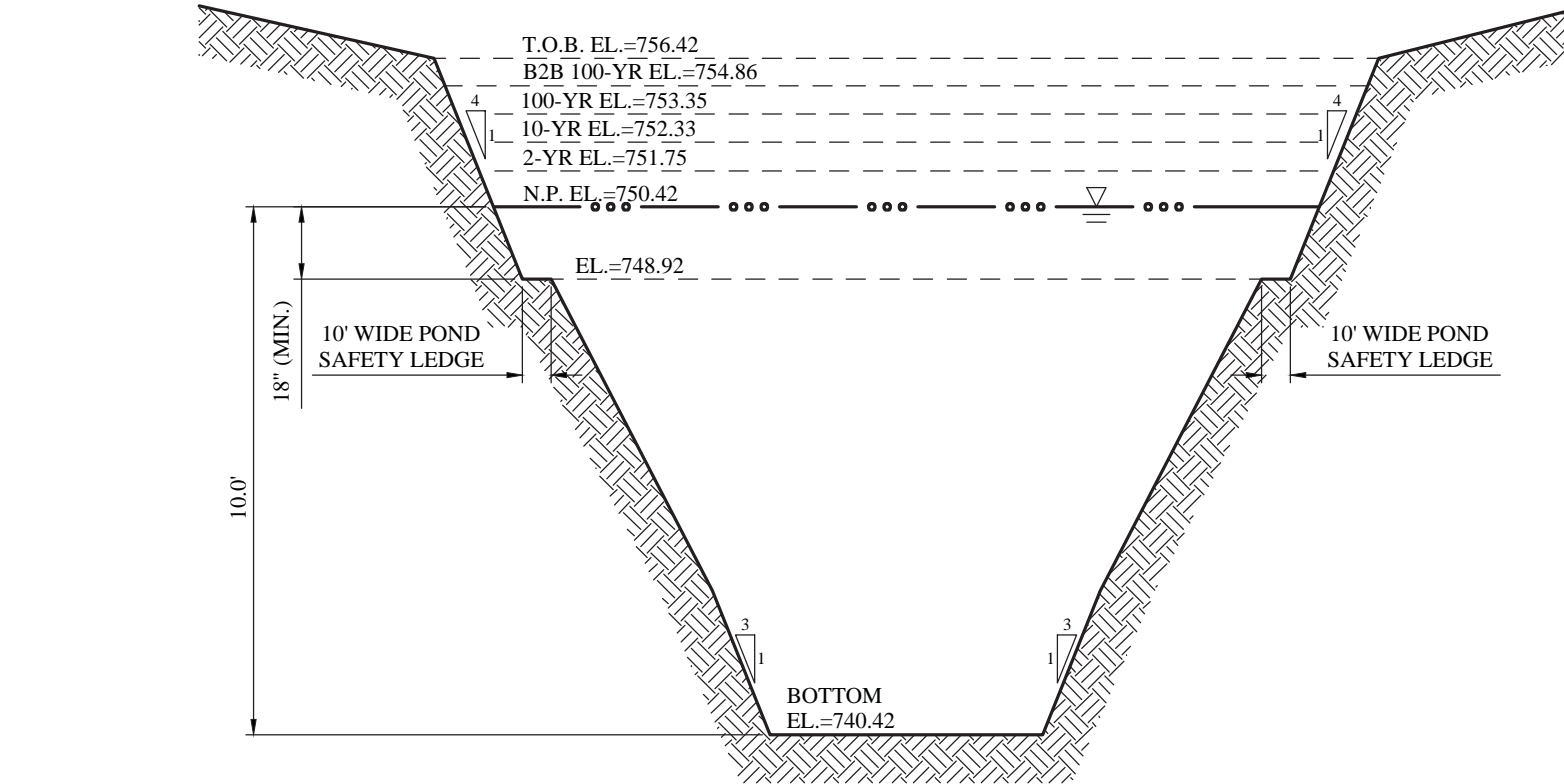
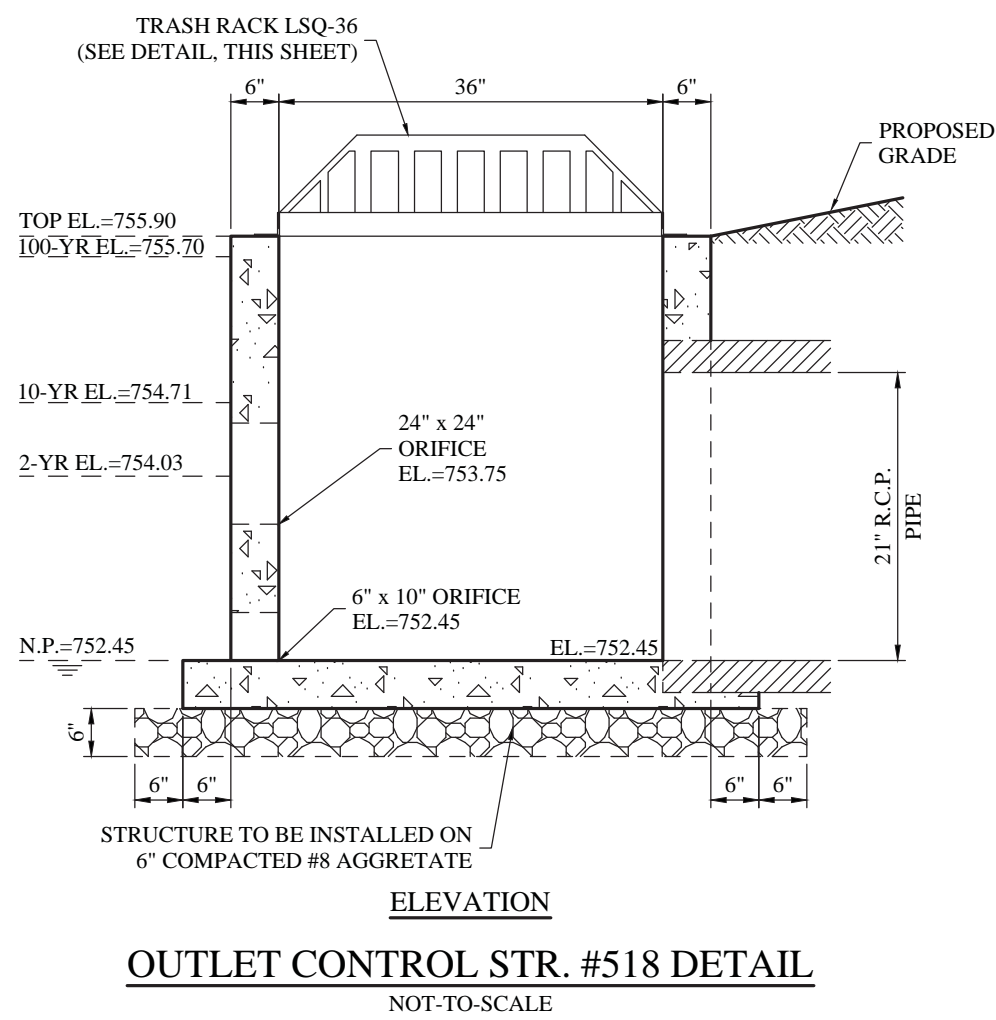
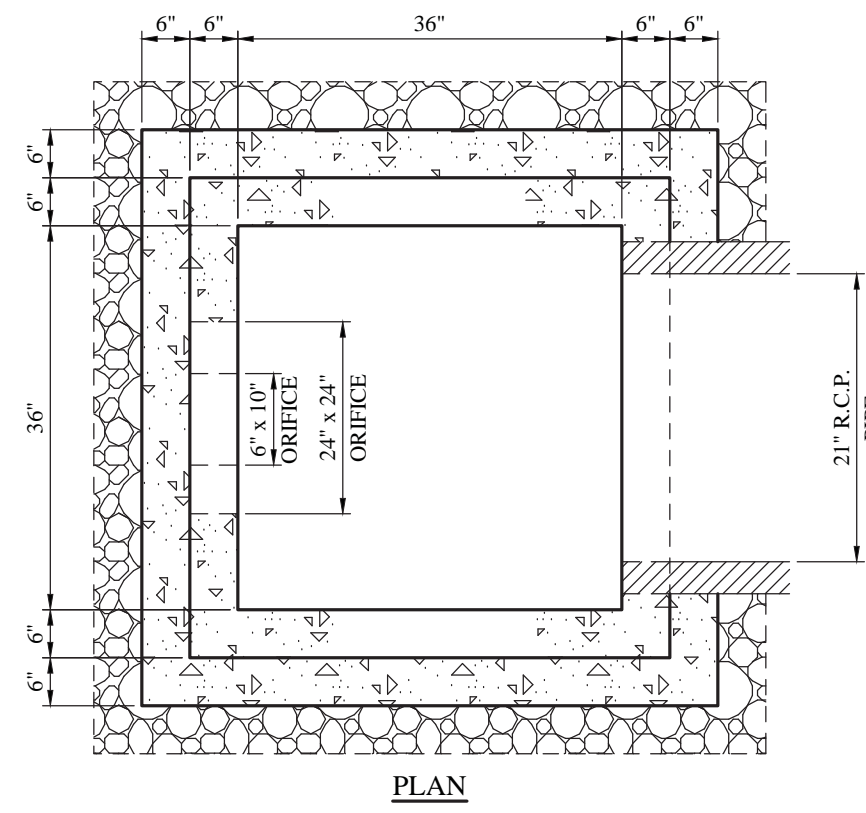
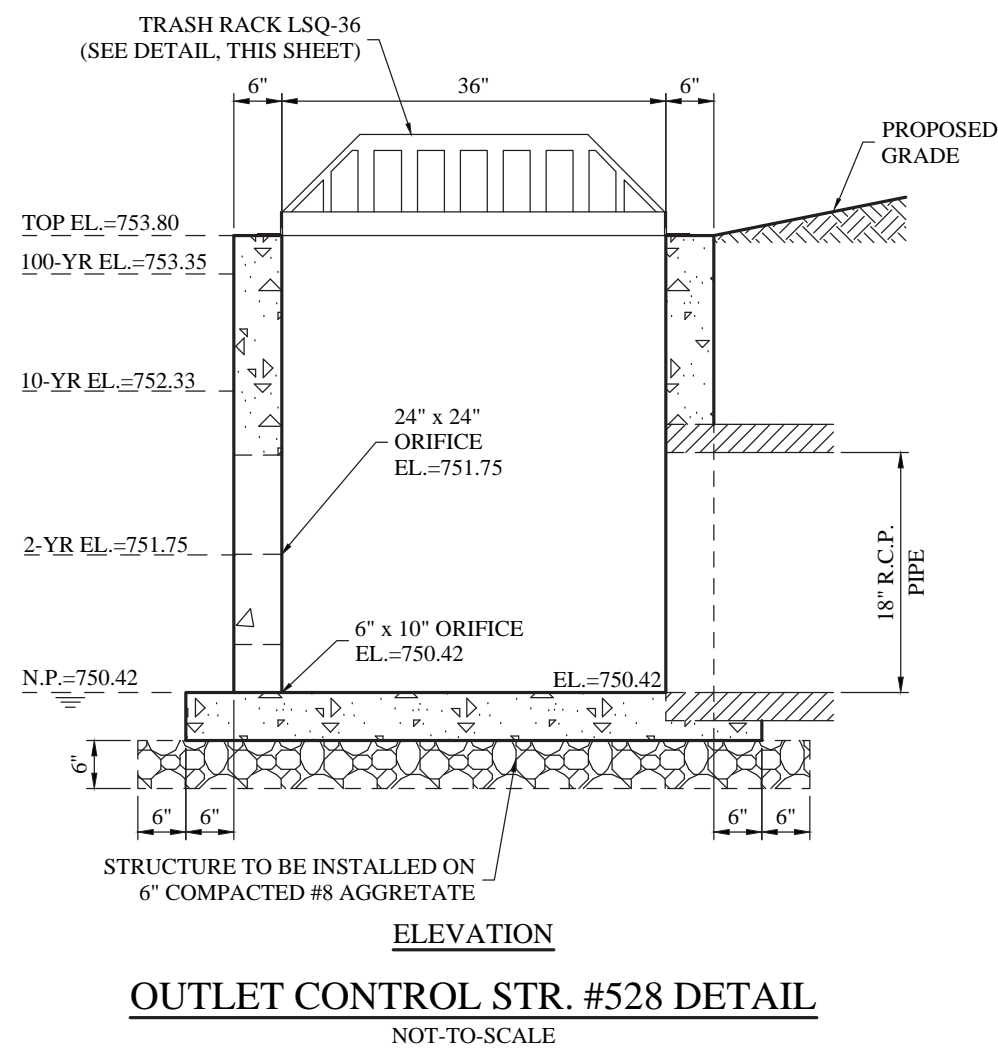
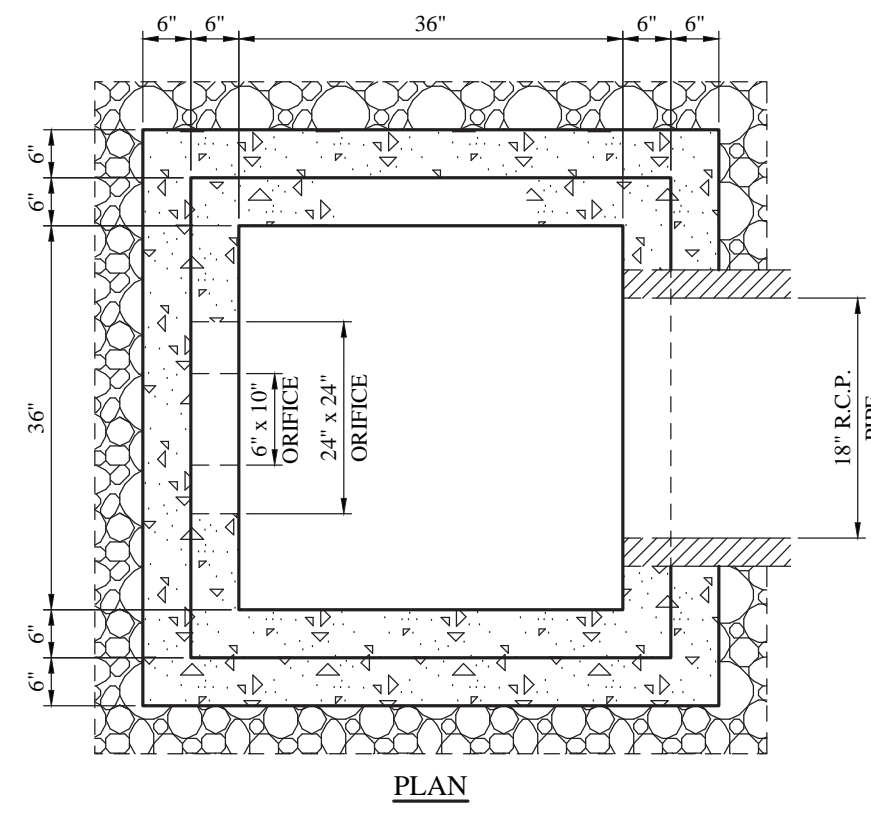
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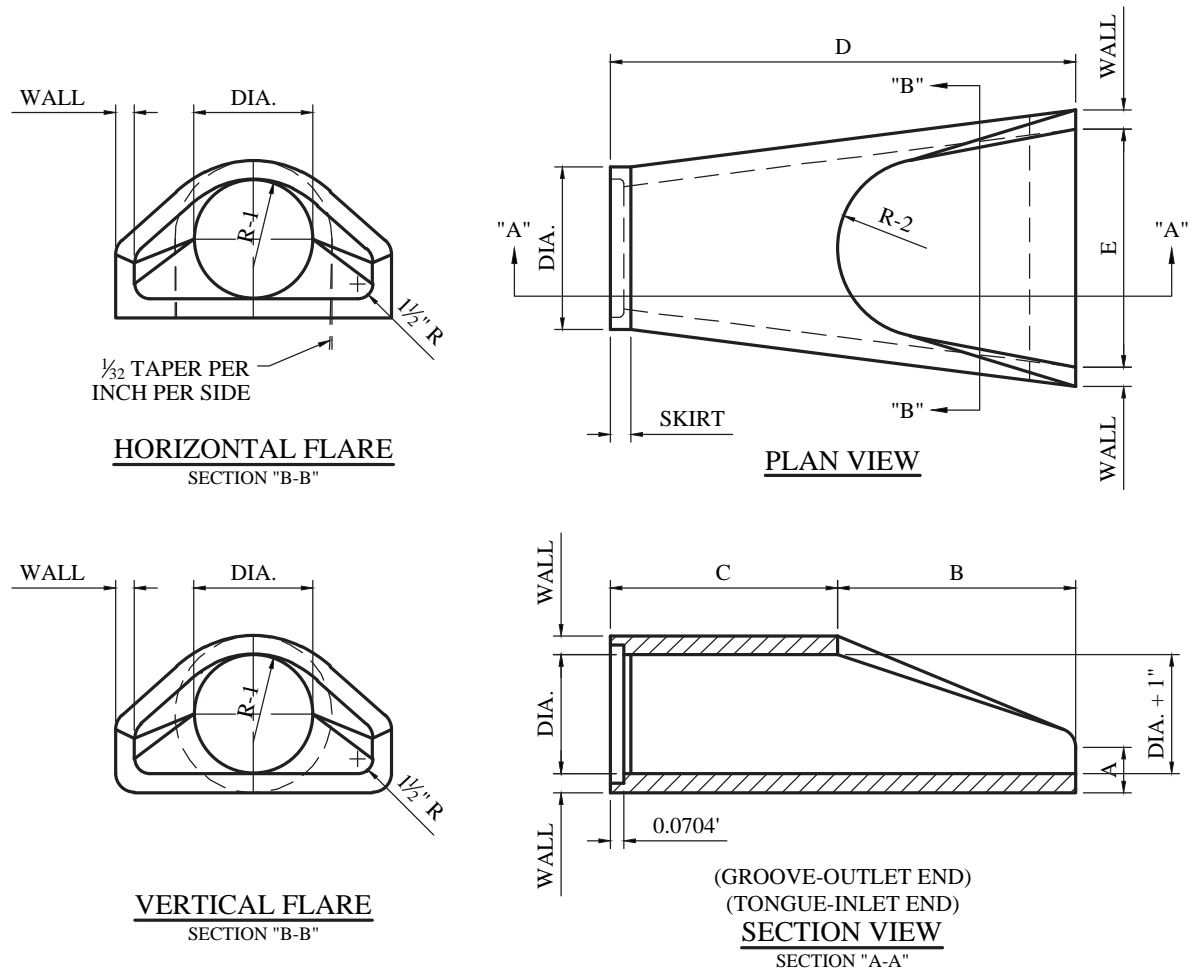
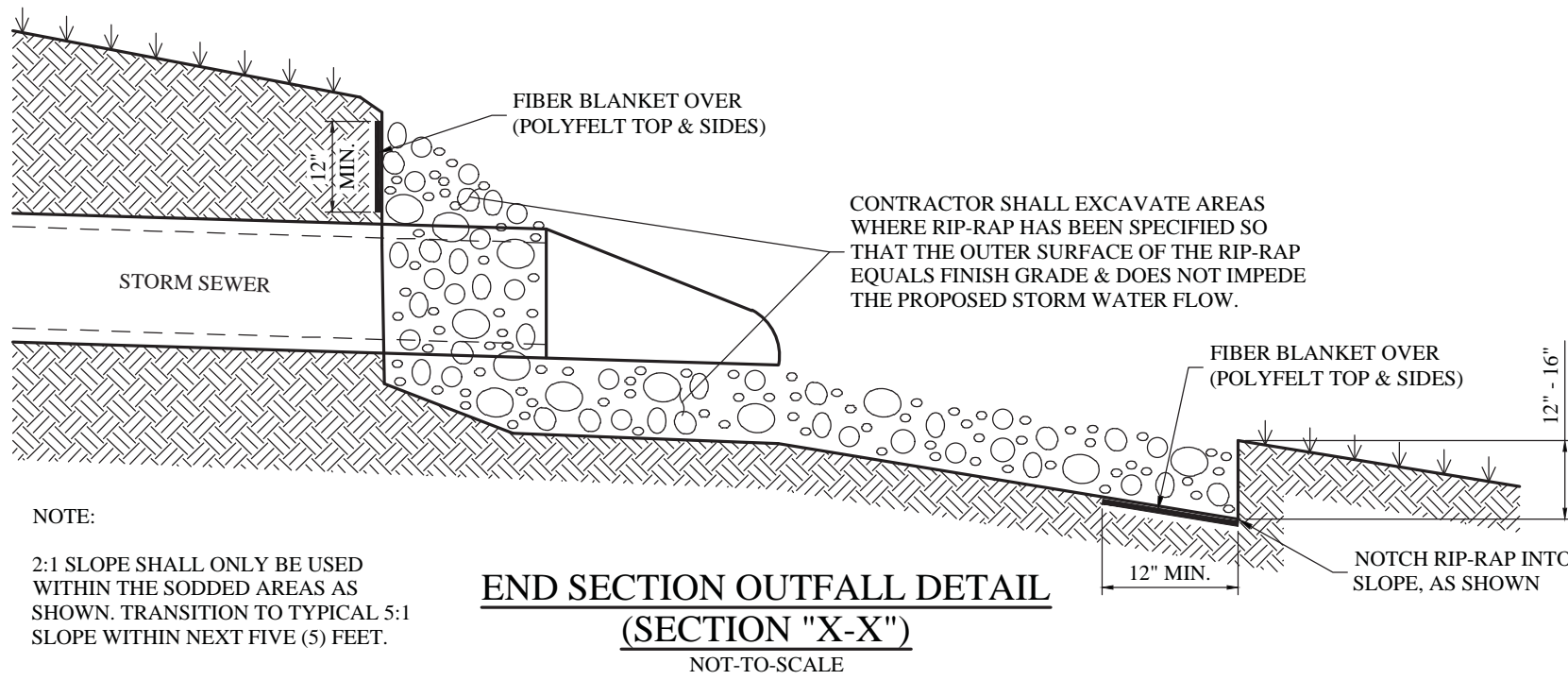




ALL CASTINGS SHALL HAVE THE WORDS "NO DUMPING - DRAINS TO STREAM"  
CAST IN RAISED OR RECESSED LETTERS AT A MINIMUM OF ONE INCH (1") IN  
HEIGHT, AND AN EMBOSSED ENVIRONMENTAL LOGO (FISH).



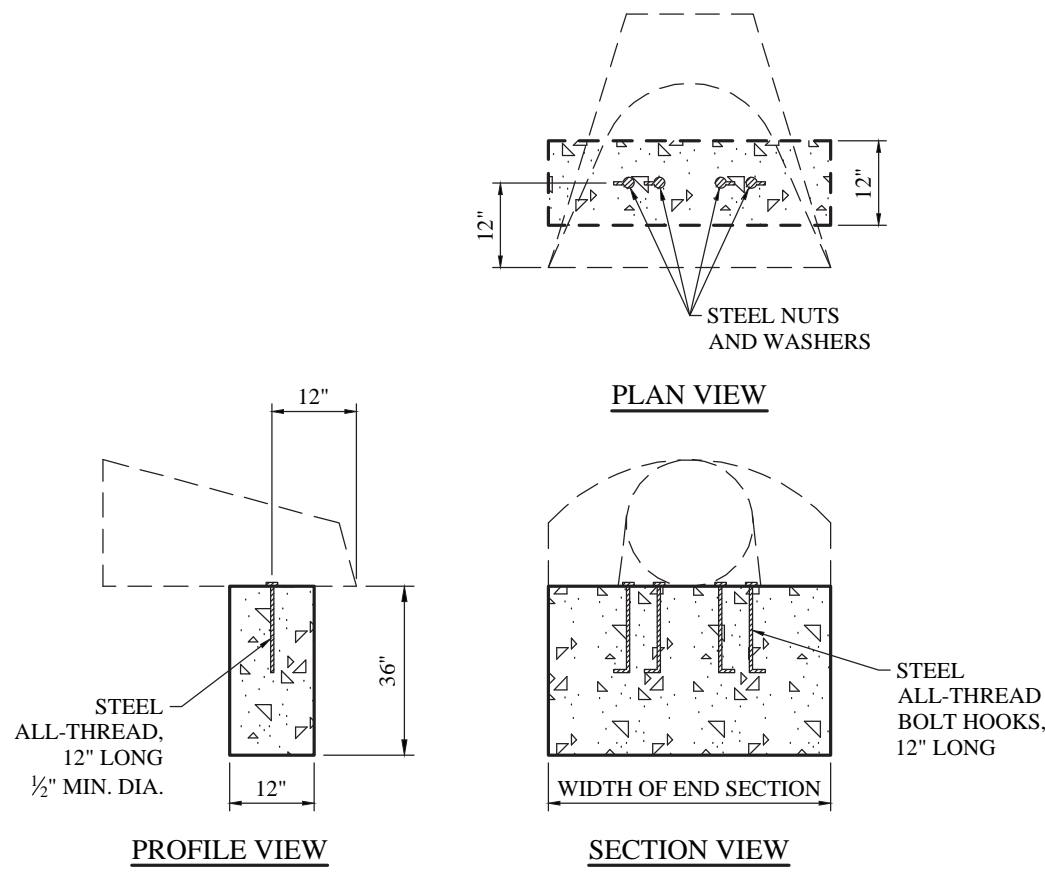




DIA.	WALL	G / T	WT. SEC.	A	B	C	D	E	DIA. + 1"	R-1	R-2	SKIRT
12"	2"	1 1/2"	530#	4"	24"	48 1/2"	72 7/8"	24"	13"	10 1/8"	9"	3 1/2"
15"	2 1/2"	2"	740#	6"	27"	46"	73"	30"	16"	12 1/2"	11"	3 1/2"
18"	2 1/2"	2 1/2"	990#	9"	27"	46"	73"	36"	19"	15 1/2"	12"	4"
21"	2 3/4"	2 3/4"	1,280#	9"	35"	38"	73"	42"	22"	16 1/2"	13"	4"
24"	3"	2 1/2"	1,520#	9 1/2"	43 1/2"	30"	73 1/2"	48"	25"	16 1/8"	14"	4 1/2"
27"	3 1/2"	2 1/2"	1,930#	10 1/2"	48"	25 1/2"	73 1/2"	54"	28"	17 3/4"	14 1/2"	4 1/2"
30"	3 1/2"	3"	2,190#	12"	54"	19 3/4"	73 1/2"	60"	31"	18 3/8"	15"	5"
36"	4"	3 1/2"	4,100#	15"	63"	34 1/2"	97 3/4"	72"	37"	24 3/8"	20"	5 1/2"
42"	4 1/2"	3 3/4"	5,380#	21"	63"	35"	98"	78"	43"	27 1/4"	22"	5 1/2"
48"	5"	4 1/4"	6,550#	24"	72"	26"	98"	84"	49"	28 1/2"	22"	5 3/4"
54"	5 1/2"	4 3/4"	8,040#	27"	65"	35"	100"	90"	55"	32 3/4"	24"	6 1/4"
60"	6"	5"	8,750#	30"	60"	39"	99"	96"	61"	36 1/4"	24"	6 3/4"
66"	6 1/2"	5 1/2"	10,630	24"	78"	21"	99"	102"	67"	35 1/8"	24"	7 1/4"
72"	7"	6"	12,520#	34"	78"	21"	99"	108"	73"	38 3/8"	24"	7 3/4"
78"	7 1/2"	6 1/2"	14,430#	24"	78"	21"	99"	114"	79"	41 1/8"	24"	8 1/2"
84"	8"	7"	16,350#	24"	78"	21"	99"	120"	85"	44 1/8"	24"	9"

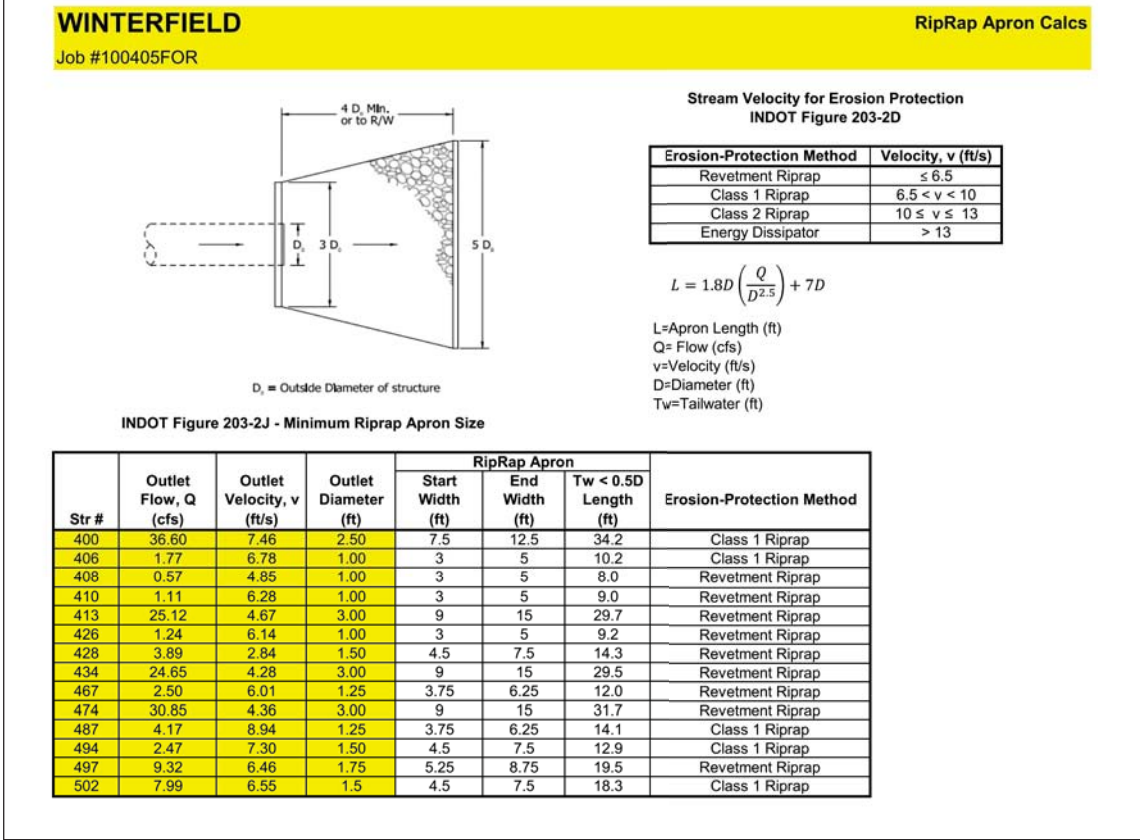
NOTES:  
MANUFACTURE OF END SECTION IS IN ACCORDANCE WITH APPLICABLE PORTIONS OF A.S.T.M. SPECIFICATION C76.

PRE-CAST CONCRETE END SECTION DETAIL  
NOT-TO-SCALE



NOTES:  
ALL-THREAD SPACING TO BE TWO PER FOOT  
EX. 12" END SECTION = 2 ALL-THREAD  
24" END SECTION = 4 ALL-THREAD

ANCHOR FOR CONCRETE END SECTIONS  
NOT-TO-SCALE

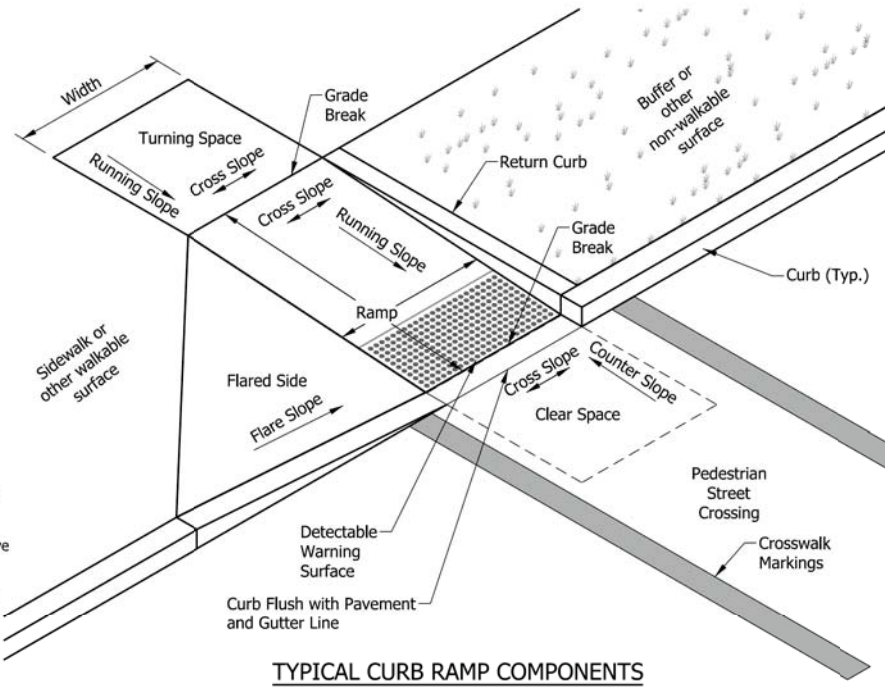




INDEX	
SHEET NO.	SUBJECT
1	Curb Ramp Drawing Index and General Notes
2-3	Perpendicular Curb Ramp Typical Placement
4	Perpendicular Curb Ramp Component Details
5	One-Way Directional Perpendicular Curb Ramp Typical Placement
6	One-Way Directional Perpendicular Curb Ramp Component Details
7	Parallel Curb Ramp Typical Placement
8	Parallel Curb Ramp Component Details
9	Blended Transition Curb Ramp, Depressed Curb Ramp and Diagonal Curb Ramp Typical Placement
10	Blended Transition Curb Ramp Component Details
11	Median Cut-Through and Median Perpendicular Curb Ramp Typical Placement
12-13	Detectable Warning Surface Placement and Configuration
14	Detectable Warning Surface Details

#### GENERAL NOTES:

- All slopes are absolute rather than relative to the sidewalk or roadway grade. Slopes at least 0.50% less than the maximum are preferred.
- Ramp or Blended Transition. A ramp or blended transition shall be used to lower or raise the sidewalk to connect with the street or highway.
- Turning Space. A turning space shall be provided at the top of a perpendicular ramp, bottom of a parallel ramp, or where the pedestrian travel requires a change in direction. A common turning space may be shared by adjacent ramps. The turning space shall have a minimum clear dimension of 4 ft x 4 ft. Where the turning space is constrained at the back of the sidewalk by a curb, retaining wall, building, or feature over 2 inches in height, the minimum clear dimension shall be 4 ft x 5 ft, with the 5-ft dimension in the direction of the ramp running slope.
- Flared Side. A flared side shall be used adjacent to a walkable surface. A flared side may be used adjacent to a non-walkable surface. A flared side shall have a maximum slope of 10.00% measured parallel to the back of the curb.
- Return Curb. A return curb is placed perpendicular to the roadway curb. A return curb may be used adjacent to a non-walkable surface. A return curb shall not be used adjacent to a walkable surface. The return curb may be located where the non-walkable surface is flared and the curb adjacent the roadway is tapered to meet the flush curb at the bottom of the ramp.
- Clear Space. A clear space shall be provided beyond the bottom grade break of a curb ramp wholly contained within the crosswalk and wholly outside the parallel vehicular travel path. The clear space shall have a minimum clear dimension of 4 ft x 4 ft.
- Detectable Warning Surface. A detectable warning surface shall consist of truncated domes and be placed at each street, highway, or railroad crossing. The detectable warning surface shall extend a minimum of 2 ft in the direction of pedestrian travel and be placed the entire width of a ramp, blended transition, or turning space.
- Running Slope. The running slope of a ramp, blended transition, or turning space shall be measured parallel to the direction of pedestrian travel.
  - A running slope of 2.00% or less is considered level.
  - A ramp shall have a maximum running slope of 8.33% but shall not require a ramp length to exceed 15 ft.
  - A blended transition shall have a maximum running slope of 5.00%.
  - A turning space shall have a maximum running slope of 2.00%.
- Width. Unless otherwise noted, minimum width of a ramp, blended transition, or turning space, excluding flared sides or return curbs, shall be 4 ft.
- Grade Break. A grade break at the top and bottom of a ramp, blended transition, or turning space shall be perpendicular to the running slope. Grade breaks shall not be within the ramp, blended transition, turning space, or detectable warning surface. Grade breaks shall be flush. Vertical discontinuities shall not be greater than 1/2 in. Where a discontinuity is greater than 1/4 in, the surface shall be beveled with a slope not steeper than 10:1.
- Cross Slope Exceptions. The cross slope of a ramp, blended transition, or turning space shall be measured perpendicular to the direction of pedestrian travel.
  - The maximum cross slope at a pedestrian street crossing without posted yield or stop control shall be 5.00%.
  - The maximum cross slope at a pedestrian street crossing with posted yield or stop control shall be 2.00%.
  - The maximum cross slope at a midblock crossing shall be the established grade of the adjacent roadway.
- Counter Slope. A counter slope is the cross slope of the gutter or street adjacent the running slope of the ramp, blended transition, or turning space. See Standard Drawing E 604-SWCR-14 for counter slope details.
- Objects such as a utility cover, vault frame, and grating shall be placed outside the curb ramp.
- Curb ramps shall be placed within the marked crosswalk area.
- Drainage inlets should be located uphill from a curb ramp to prevent ponding in the path of pedestrian travel.

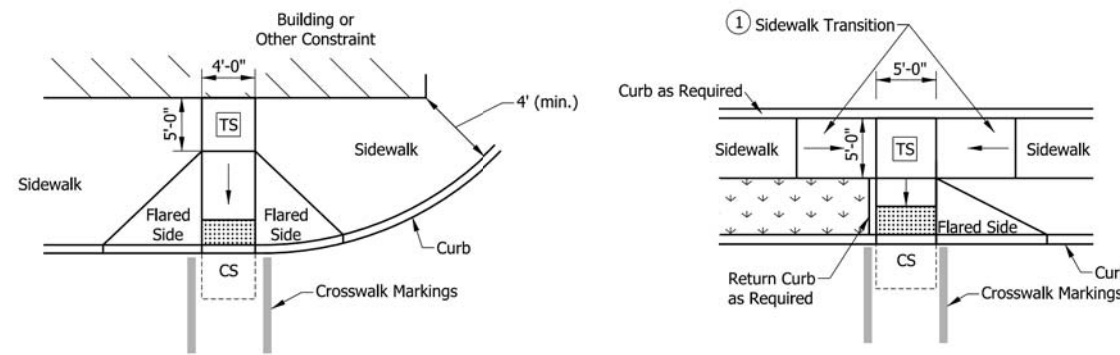


TYPICAL CURB RAMP COMPONENTS

#### INDIANA DEPARTMENT OF TRANSPORTATION CURB RAMP DRAWING INDEX AND GENERAL NOTES SEPTEMBER 2018

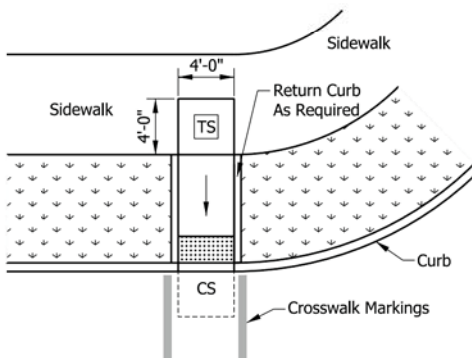
STANDARD DRAWING NO. E 604-SWCR-01

	<i>/s/ Elizabeth W. Phillips</i> DESIGN STANDARDS ENGINEER DATE 03/29/18
	<i>/s/ John Leckie</i> CHIEF ENGINEER DATE 04/25/18



PERPENDICULAR CURB RAMP  
ADJACENT WALKABLE SURFACE

TIERED PERPENDICULAR CURB RAMP



PERPENDICULAR CURB RAMP  
ADJACENT NON-WALKABLE SURFACE

#### NOTES:

- Where insufficient width between the curb and back of sidewalk prevents a standard perpendicular curb ramp running slope, a sidewalk transition may be used to lower the sidewalk grade. The sidewalk transition running slope shall not exceed 8.33%. See Standard Drawing Series E 604-SDWK for sidewalk details.
- The turning space shall have a minimum clear dimension of 4 ft x 4 ft and a running slope of 2.00% maximum. Where the turning space is constrained at the back of the sidewalk, the minimum clear dimension shall be 4 ft x 5 ft, with the 5-ft dimension in the direction of the ramp running slope.

#### LEGEND:

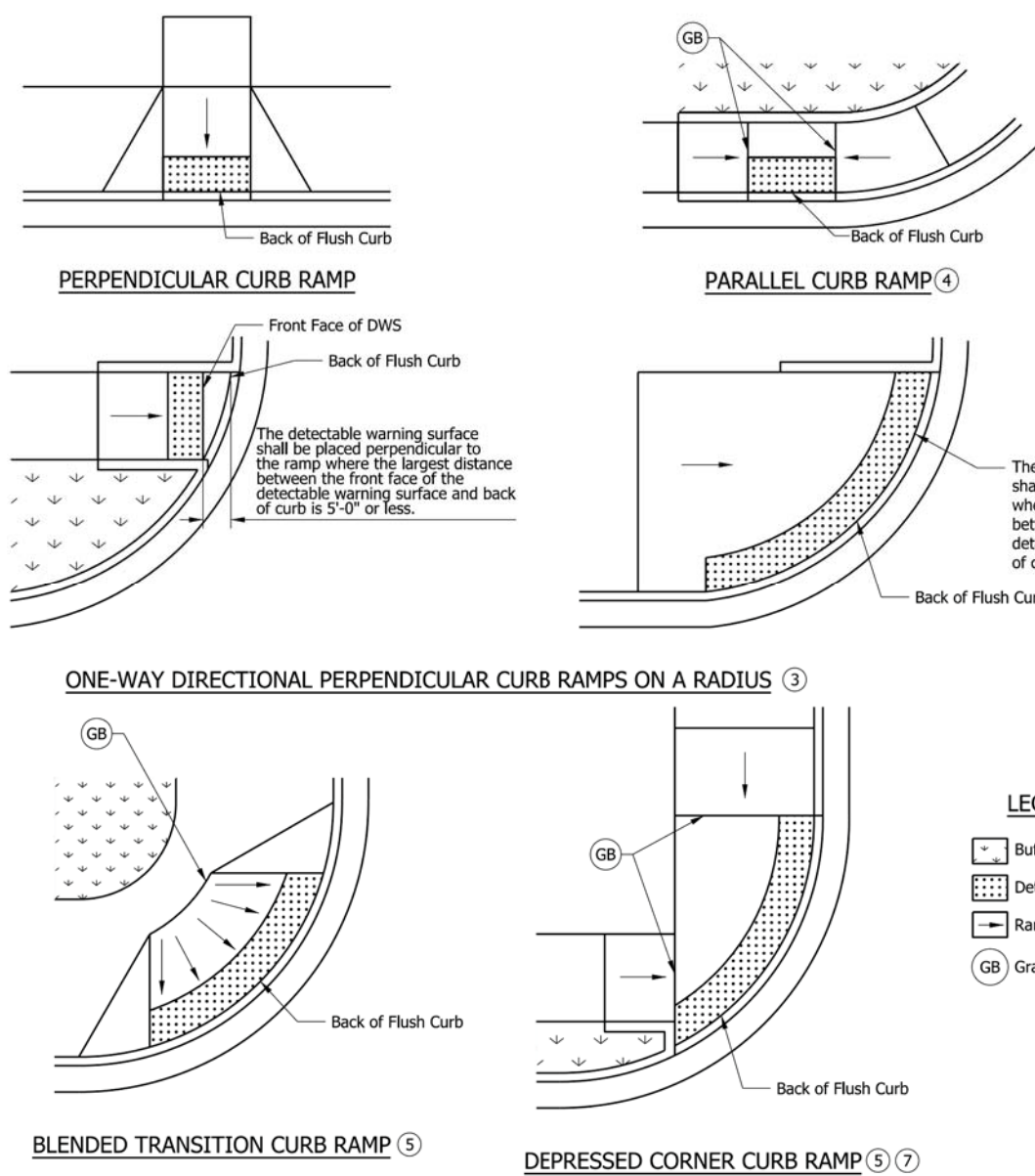
- Buffer or Other Non-Walkable Surface
- Ramp
- Detectable Warning Surface
- Turning Space
- Clear Space

#### INDIANA DEPARTMENT OF TRANSPORTATION

##### PERPENDICULAR CURB RAMP TYPICAL PLACEMENT SEPTEMBER 2018

STANDARD DRAWING NO. E 604-SWCR-02

	<i>/s/ Elizabeth W. Phillips</i> DESIGN STANDARDS ENGINEER DATE 03/29/18
	<i>/s/ John Leckie</i> CHIEF ENGINEER DATE 04/25/18



#### NOTES:

- A detectable warning surface shall be placed at each street, highway, or railroad crossing. See Standard Drawing E 604-SDWK-03 for a detectable warning surface placement at a sidewalk driveway crossing.
- The detectable warning surface shall extend a minimum of 2 ft in the direction of pedestrian travel and extend the full width as shown. The detectable warning surface shall not be placed across a grade break.
- Where the distance from the face of the detectable warning surface is 5 ft or less from the back of curb, the detectable warning surface shall be placed perpendicular to the ramp. Where the distance from the face of the detectable warning surface is more than 5 ft from the back of curb, the detectable warning surface shall be placed at the back of curb as shown or in an alternate placement configuration. See Standard Drawing E 604-SWCR-13 for alternate detectable warning surface placement.
- The detectable warning surface on a parallel curb ramp shall be placed on the turning space at the flush transition between the street and turning space at the back of curb.
- The detectable warning surface on a blended transition or depressed corner shall be placed at the back of curb as shown or in an alternate placement configuration. See Standard Drawing E 604-SWCR-13 for alternate detectable warning surface placement.
- See Standard Drawing E 604-SWCR-14 for detectable warning surface details.

#### LEGEND:

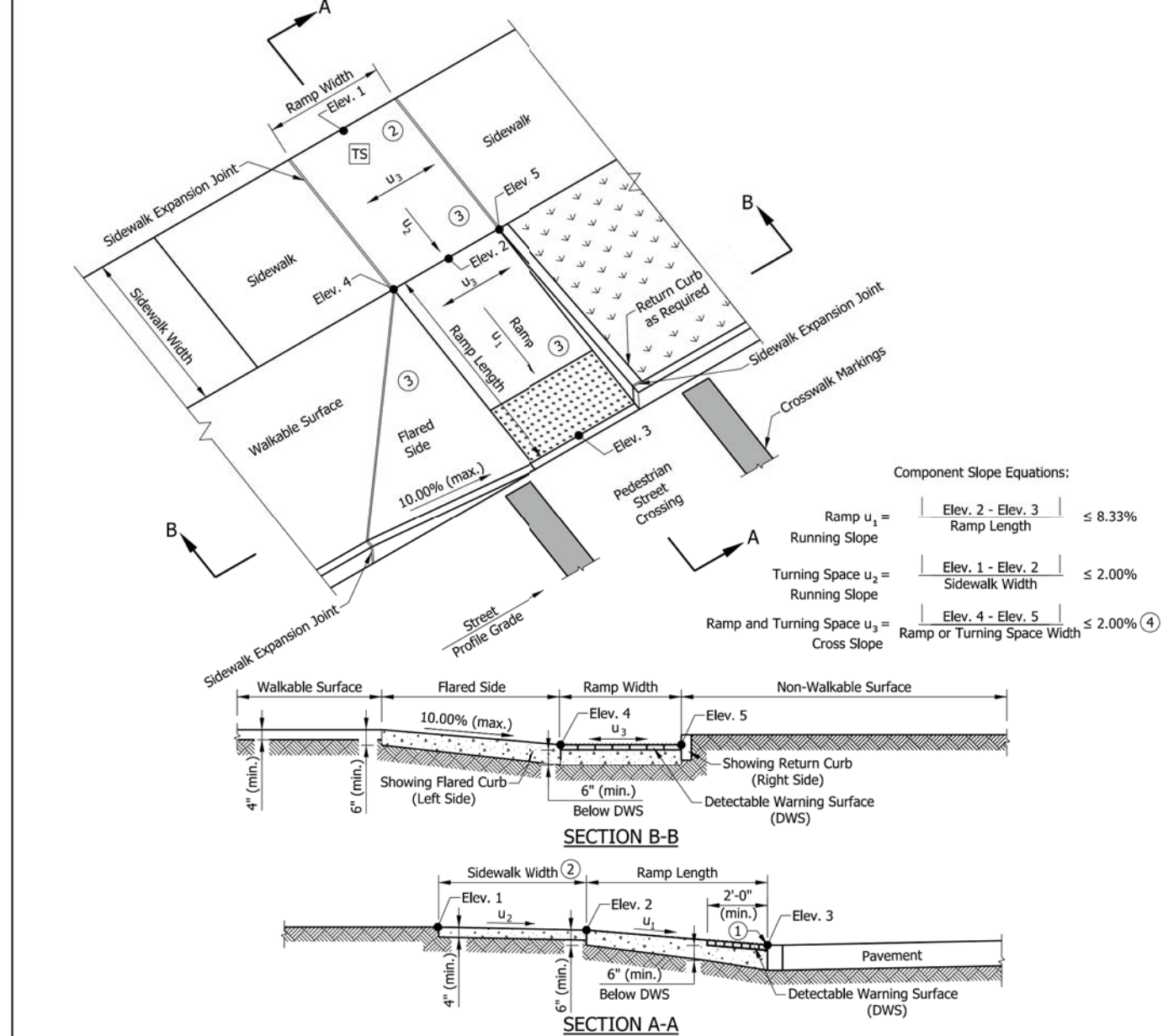
- Buffer or Other Non-Walkable Surface
- Detectable Warning Surface (DWS)
- Ramp
- Grade Break

#### INDIANA DEPARTMENT OF TRANSPORTATION

##### DETECTABLE WARNING SURFACE PLACEMENT AND CONFIGURATION SEPTEMBER 2018

STANDARD DRAWING NO. E 604-SWCR-12

	<i>/s/ Elizabeth W. Phillips</i> DESIGN STANDARDS ENGINEER DATE 03/29/18
	<i>/s/ John Leckie</i> CHIEF ENGINEER DATE 04/25/18



#### NOTES:

- The bottom edge of the ramp and top of curb shall be flush with the edge of adjacent pavement and gutter line.
- The turning space shall have a minimum clear dimension of 4 ft x 4 ft. Where the turning space is constrained at the back of the sidewalk, the minimum clear dimension shall be 4 ft x 5 ft, with the 5-ft dimension in the direction of the ramp running slope. Where a tiered perpendicular curb ramp is used, a constrained turning space shall have a minimum clear dimension of 5 ft x 5 ft.
- Curb ramp surface shall be coarse broomed transverse to the running slope.
- See Standard Drawing E 604-SWCR-01 for cross slope exceptions.
- See Standard Drawing E 604-SWCR-12, -13, and -14 for Detectable Warning Surface placement, configuration, and details.
- See Standard Drawing E 604-CSS0-01 for sidewalk expansion joint details.

#### LEGEND:

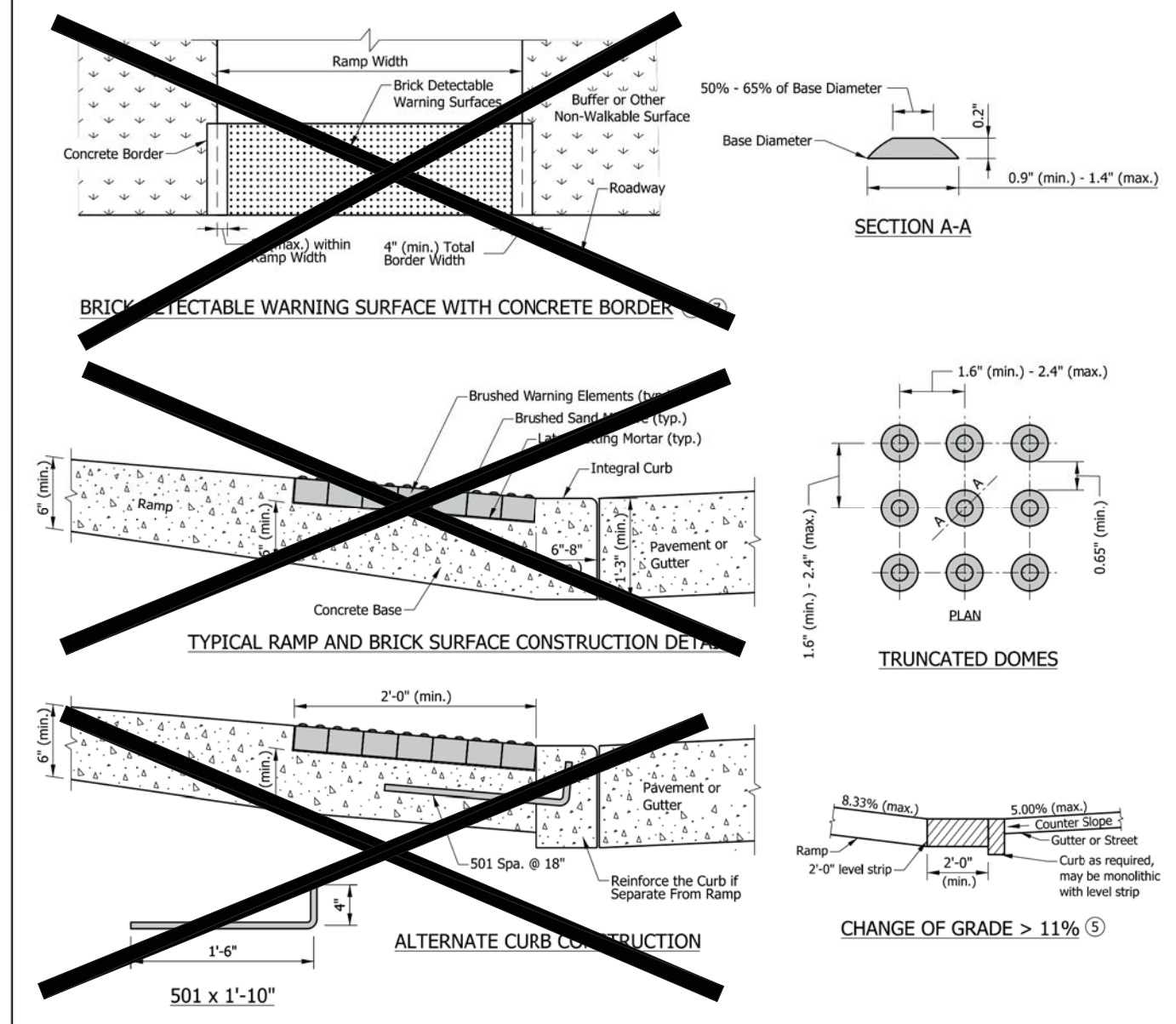
- Buffer or Other Non-Walkable Surface
- Ramp
- Detectable Warning Surface
- Turning Space

#### INDIANA DEPARTMENT OF TRANSPORTATION

##### PERPENDICULAR CURB RAMP COMPONENT DETAILS SEPTEMBER 2018

STANDARD DRAWING NO. E 604-SWCR-04

	<i>/s/ Elizabeth W. Phillips</i> DESIGN STANDARDS ENGINEER DATE 03/29/18
	<i>/s/ John Leckie</i> CHIEF ENGINEER DATE 04/25/18



#### NOTES:

- Detectable warning surface shall consist of truncated domes. Domes shall be aligned in a square or radial grid pattern with diameter and center-to-center spacing within the ranges specified.
- The detectable warning surface may be field cut. Truncated dome spacing between adjacent panels shall be within the ranges specified.
- The detectable warning surface shall contrast visually with adjacent surfaces, either light-on-dark or dark-on-light.
- The detectable warning surface shall extend a minimum of 2 ft in the direction of pedestrian travel and extend the full width as shown. The detectable warning surface shall not be placed across a grade break.
- The maximum counter slope of the gutter or street at the bottom of the ramp shall be 5.00%. Where the algebraic difference between the running slope and the counter slope exceeds 11%, a 2-ft minimum level strip should be provided at the bottom of the ramp.
- Where a concrete border is used for forming, the concrete border shall be cast monolithically with the curb ramp concrete. The border shall not reduce the ramp width by more than 2 in. on each side.
- Where forming other than a concrete border is used, the edge restraint shall not encroach upon the ramp width.

#### INDIANA DEPARTMENT OF TRANSPORTATION

##### DETECTABLE WARNING SURFACE DETAILS SEPTEMBER 2018

STANDARD DRAWING NO. E 604-SWCR-14

	<i>/s/ Elizabeth W. Phillips</i> DESIGN STANDARDS ENGINEER DATE 03/29/18
	<i>/s/ John Leckie</i> CHIEF ENGINEER DATE 04/25/18

#### NOTE

CONTRACTOR SHALL INSTALL 2' x 2' IRON DETECTABLE WARNING PLATES (UNPAINTED) AT ALL CURB RAMPS.

APPROVAL PENDING / NOT FOR CONSTRUCTION

THIS DRAWING IS NOT INTENDED TO BE REPRESENTED AS A REPLACEMENT OF ORIGINAL BOUNDARY SURVEY OR A SURVEYOR LOCATION REPORT.

CERTIFIED: 07/11/24

ALWAYS ON

7965 East 106th Street, Fishers, IN 46038-2505  
phone: 317.849.5955 fax: 317.849.5942

CONSTRUCTION SPECIFICATION & DETAILS

WINTERFIELD SECTION 3

S&A JOB NO. 100405FOR-S3

DRAWN BY: KJM/GEM

CHECKED BY: KR

SHEET NO. C802A

S&A JOB NO. 100405FOR-S3

FRANKLIN

JOHNSON COUNTY, INDIANA

REVISIONS

MARK

DATE

BY



SPECIAL PROVISION FOR LIME MODIFICATION

STREET CONSTRUCTION

- DESCRIPTION: This work shall consist of upgrading of mostly fine grained soils by uniformly mixing small amounts of lime (3 to 6%) by weight to aid compaction by drying out wet areas, and to provide a working platform for subsequent construction.
- MATERIALS: Material shall meet the requirements of the Section 913 of the INDOT Standard Specifications.
- LIME:
- High calcium or dolomite Hydrated Lime ( $\text{Ca(OH)}_2$  -  $\text{Mg(OH)}_2$ ) shall have a minimum of 90% total available calcium hydroxide content and the hydrates must contain no more than 5% carbon dioxide content if sampled at the lime plant, or no more than 7% if sampled at the job site.
  - High calcium hydrated lime shall have a minimum available calcium hydroxide  $\text{Ca(OH)}_2$  content of 90%. The method used for determination of available lime shall conform to AASHTO T219-T2 or ASTM C25.
  - Maximum Mechanical Moisture content shall be 4%.
  - Gradation: All hydrated lime shall conform to the following gradation requirement. At least 85% passing a #200 sieve (0.075 mm). Determination of particle size shall conform to the provision for wet sieving as ASTM C110.
  - Other lime products such as quicklime - high calcium (CaO) or Dolomite (CaO-MgO) may be substituted with written approval by the Inspecting Engineer. By-product lime (kiln dust) shall not be used.

WATER: Water used for lime modification shall be in accordance with all applicable requirements of 913 and 913.01 of the INDOT Specifications, except that the minimum acceptable pH is 6.5.

EQUIPMENT: The machinery, tools and equipment necessary for proper execution of the work shall be available on the project site and approved by the Inspecting Engineer prior to the commencing of construction operations.

- STORAGE AND HANDLING:
- Hydrated lime shall be stored and handled in closed weatherproof containers until immediately before distribution on the subgrade. Hydrated lime in bags shall be stored in weather protected conditions with adequate protection from ground dampness, and the facility shall be approved by the Inspecting Engineer prior to commencement of any lime work.
  - Each shipment shall be accompanied by a bill of lading and by a certificate of compliance stating conformance to the applicable specification requirements.
  - The Contractor shall take appropriate preventive and protective (safety) measure that shall be exercised by those working with this material. All safety measures shall comply with applicable OSHA requirements.

- MIXTURE COMPOSITION:
- Sample: At his own expense, the Contractor shall provide a minimum of 10 pounds (5 Kg) of lime and 100 pounds (50 Kg) of soil to be used at least 30 days prior to the construction of the lime modified soils if requested by the Inspecting Engineer.
  - Mix Design: Lime will be proportioned within a range of 3 to 6 percent of soil (oven - dry basis). The required proportion of lime will be recommended by the Contractor and approved by the Inspecting Engineer prior to construction using samples of soil and lime. The Inspecting Engineer reserves the right to make such adjustments of lime proportioning as are considered necessary during the progress of the work within the range specified. Source or type of lime shall not be changed during the progress of the work without permission of the Inspecting Engineer. However, the Inspecting Engineer may choose to use different types of lime on different portions of the project, but shall not be mixed.

- CONSTRUCTION REQUIREMENTS:
- Temperature and Weather Limitations: No lime modification shall be performed at a soil temperature less than 45° F (7° C) and the air temperature rising of subgrade soil when it is measured 4" (100 mm) below the surface. Lime shall not be mixed with frozen soils or with soil containing frost.
  - Preparation of Existing Roadway: All deleterious material, such as stumps, roots, turf, etc. and aggregate larger than 3" (75 mm) shall be removed. Any soft organic soils shall be removed as directed by the Inspecting Engineer.
  - Spreading of Lime: The roadbed shall be scarified or disked prior to distribution of the lime. The machine shall be of such design that a visible indication is given at all times that the machine is cutting to the required depth. The lime shall than be distributed uniformly over the surface by means of cyclone, screw-type, or pressure manifold type distributor. The Inspecting Engineer may reject any procedure which does not provide even distribution of lime.
- Lime shall not be applied when wind conditions are such that blowing lime becomes objectionable to adjacent property owners or creates a hazard to traffic on adjacent roadways.

The spreading of lime shall be limited to the amount which can be incorporated into the soil within the same working day. In the event that rain intervenes causing cessation of work and exposure of the lime to washing or blowing, the Inspecting Engineer may require additional lime to be spread.

- Mixing: The lime, soil and water (if necessary) shall be thoroughly blended by rotary speed mixers or a disc harrow. The mixing shall continue until a homogeneous layer of the required thickness has been obtained and clods are broken down so that 100%, exclusive of rock particle, will pass a one-inch (25mm) sieve and at least 60% will pass a No. 4 sieve (4.75 mm). The loose thickness of a single lime modified layer shall not exceed eight (8) inches (200 mm) if a disc harrow is used and fourteen (14) inches (355 mm) if a rotary speed mixer is used.
- Compaction: Compaction of the mixture shall begin as soon as is practicable after mixing. In no case shall compaction be started later than three (3) days after mixing unless approved by the Inspecting Engineer. If compaction is to be delayed, the surface of the lime modified soil shall be cross-graded and sealed by either blade dragging or light rolling immediately after mixing. Compaction shall be continued until the Contractor has shown that the lime modified layer has a density not less than 100 percent within the special subgrade treatment zone and/or 95 percent, below special subgrade treatment zone, of the maximum dry density. The standard dry density of the lime treated soil shall be obtained by AASHTO T 99. The field in-place dry density will be obtained by the Contractor in accordance with AASHTO T 191.

Aeration by means of further mixing, or the addition of water and further mixing, may be required by the Inspecting Engineer to achieve the required compaction.

- Finishing: When compaction of the lime modified soil is nearing completion, the surface shall be shaped to the required line, grades and cross section, and compaction continued until uniform and adequate compaction is obtained.

The Inspecting Engineer reserves the right to determine the actual thickness of the completed and cured layer by coring or other means, and any deficient areas shall be acceptably corrected.

METHOD OF MEASUREMENT: Processing lime modified soils will be measured in square yards of the thickness specified.

- Contract Quantities: When the project is constructed essentially to the lines, grades or dimensions shown on the plans and the Contractor and the Inspecting Engineer have agreed in writing that the plan quantities are accurate, no further measurement will be required.

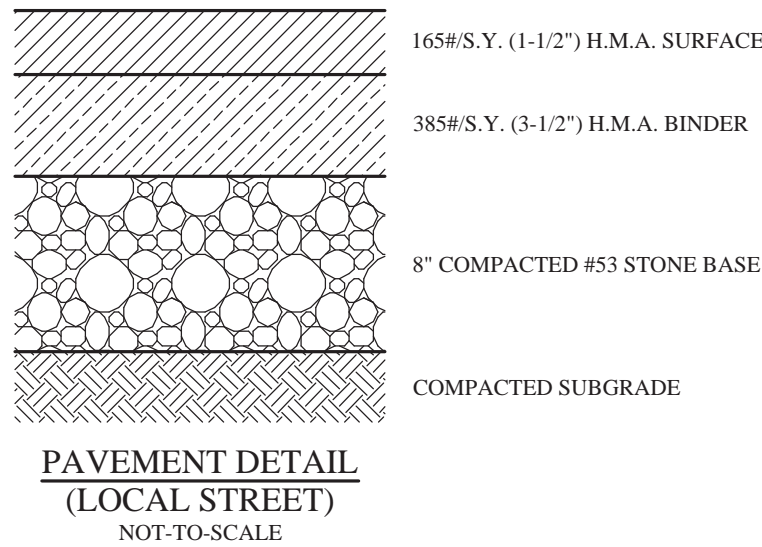
- Measured Quantities: Processing lime modified soils will be measured in place and the area computed in square yards (square meters). The widths for measurement will be as shown on the plans.

All water used will be considered incidental to the work.

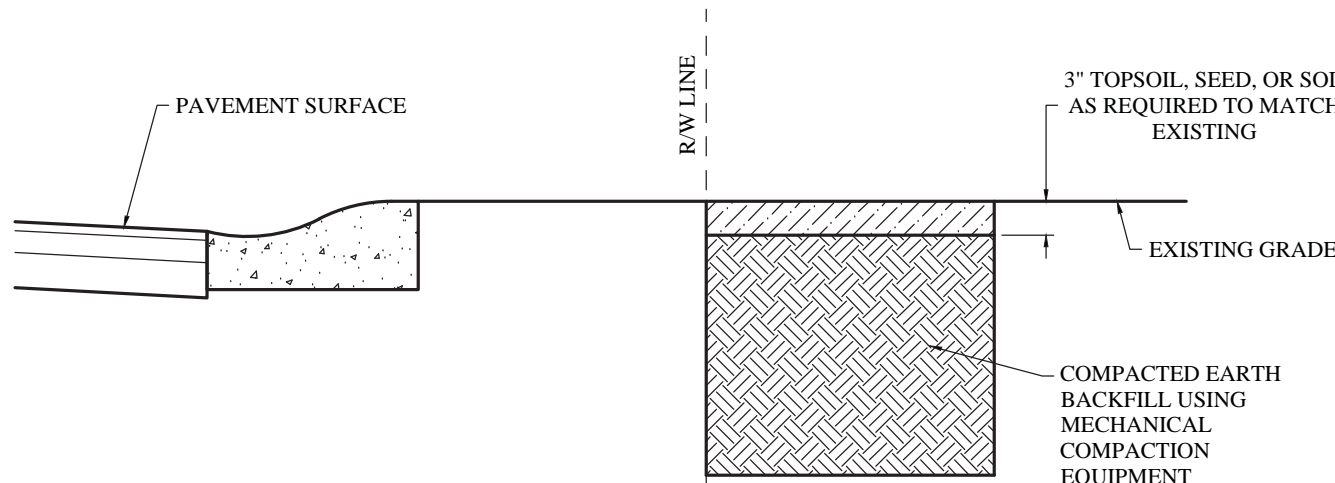
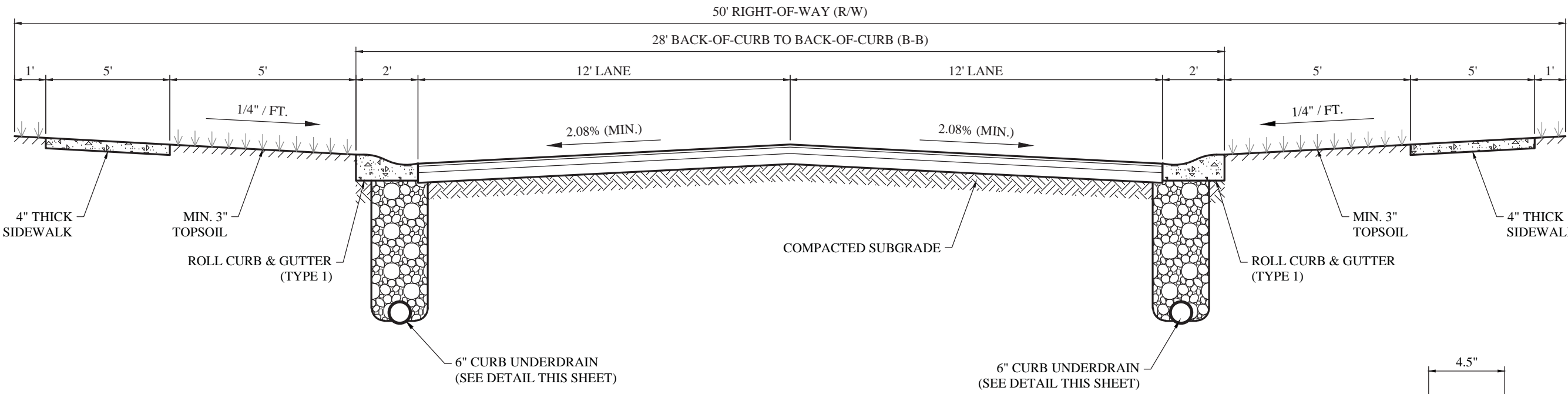
The modified roadbed will be measured in square yards.

Lime will be measured in tons (metric ton).

The Inspecting Engineer may accept original signed bills in lieu of weighing.



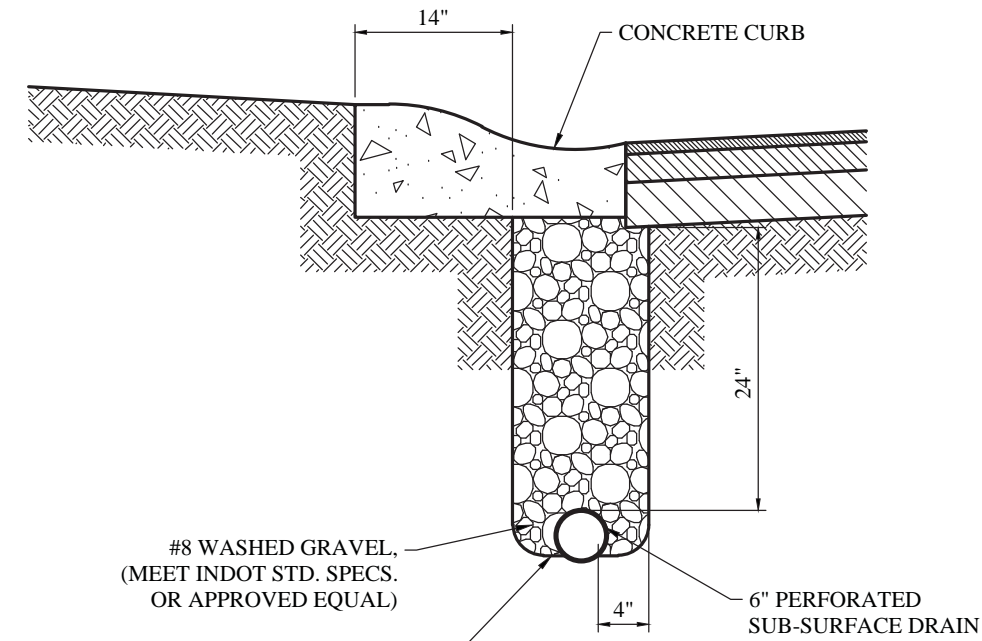
CROSS SLOPE DESIGN DATA (w/ ROLL CURB & GUTTER)		
STREET WIDTH (B-B)	LANE WIDTH	DESIGN SLOPE
20'	8'	4.13%
22'	9'	3.67%
24'	10'	3.30%
26'	11'	3.00%
28'	12'	2.75%
30'	13'	2.54%
32'	14'	2.36%
34'	15'	2.20%
36' +	16'	2.08%



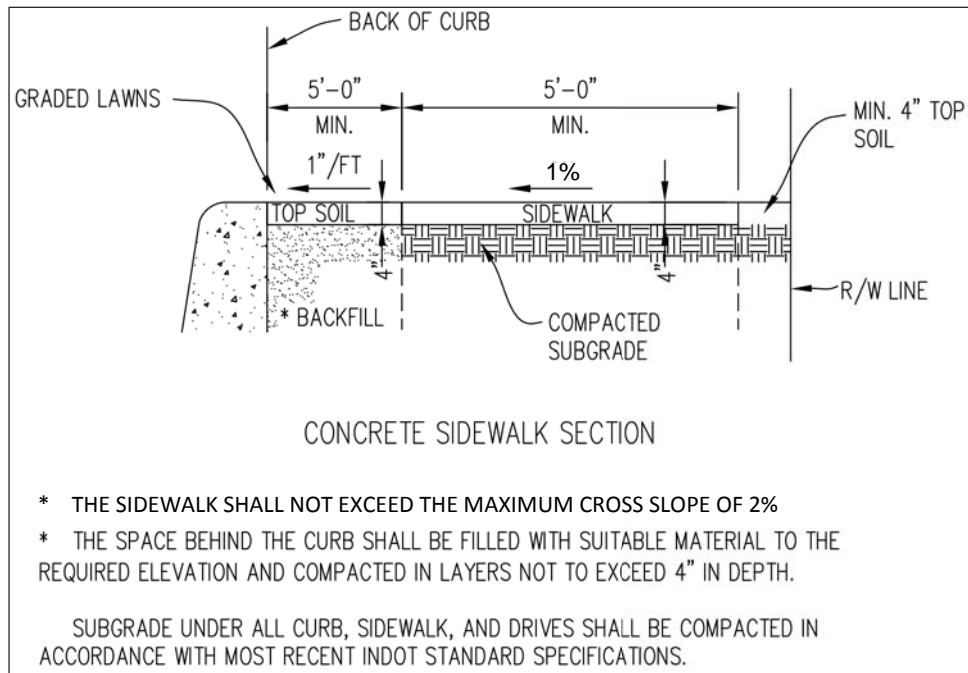
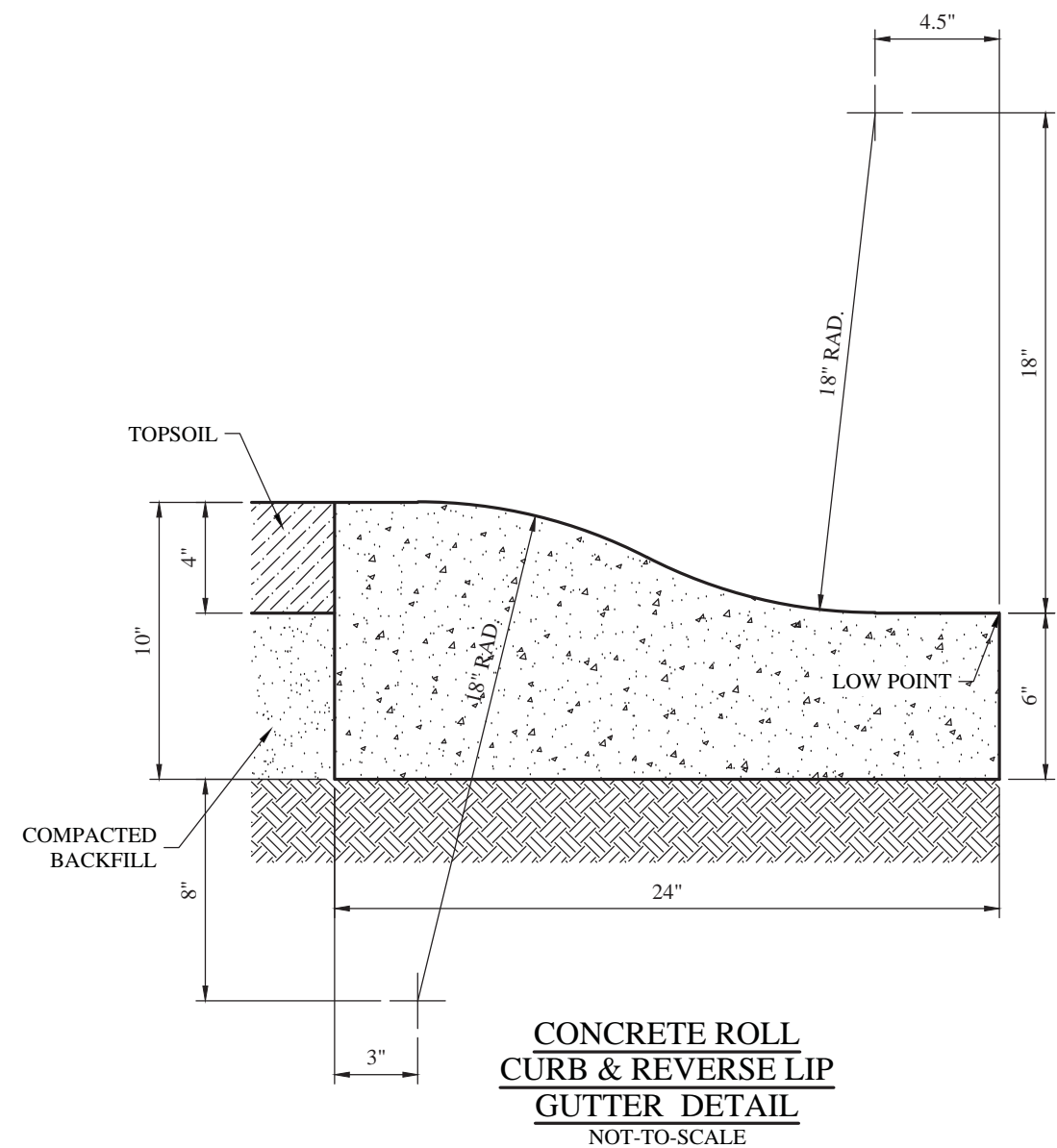
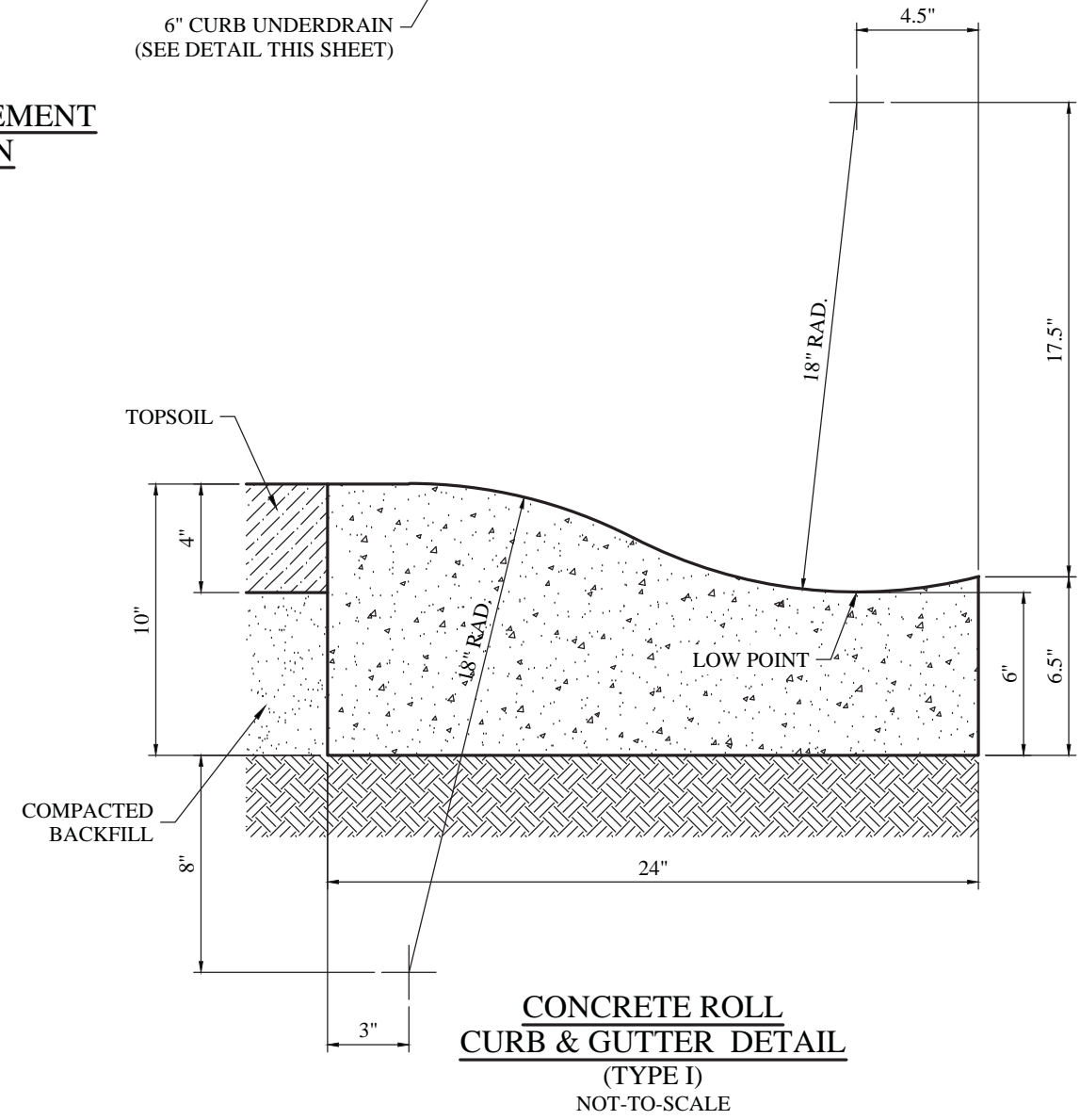
STANDARD FULL DEPTH  
GRANULAR BACKFILL DETAIL  
(PER STANDARD PLAN 92-02)  
NOT-TO-SCALE

NOTES:

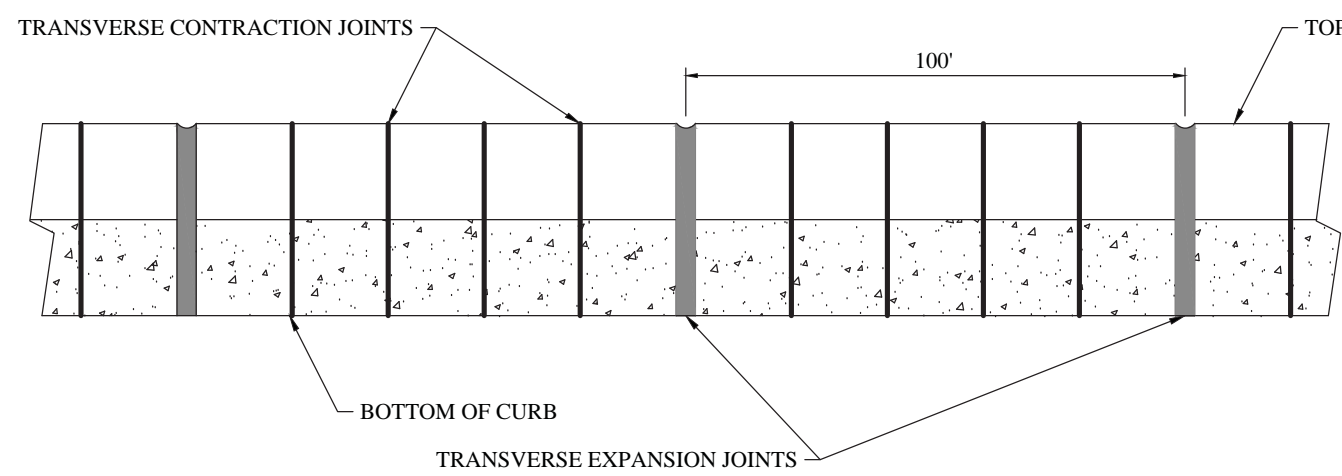
- GRANULAR BACKFILL WILL NOT BE REQUIRED WHEN ENTIRE TRENCH AREA IS 5'-0" OR MORE BEYOND THE BACK EDGE OF THE EXISTING CURB.
- ALL EXCAVATED AREAS UNDER PAVED ROADWAYS, OR WITHIN 5'-0" OF THE PAVEMENT EDGE, OR BACK EDGE OF CURB SHALL BE BACKFILLED WITH GRANULAR MATERIAL TO WITHIN 3" OF THE TOP OF THE TRENCH (OR TO FINAL GRADE UNDER PAVEMENT). THIS GRANULAR BACKFILL SHALL BE PLACED IN 12" LIFTS AND EACH LAYER SHALL BE COMPACTED BY MECHANICAL MEANS TO AT LEAST 95% OF ITS MAXIMUM DRY DENSITY.
- IF ANY PORTION OF TRENCH AREA IS NEARER THAN 5'-0" FROM THE EDGE OF THE ROADWAY SURFACE, THE ENTIRE TRENCH MUST BE BACKFILLED WITH GRANULAR MATERIAL.



CURB UNDERDRAIN DETAIL  
NOT-TO-SCALE

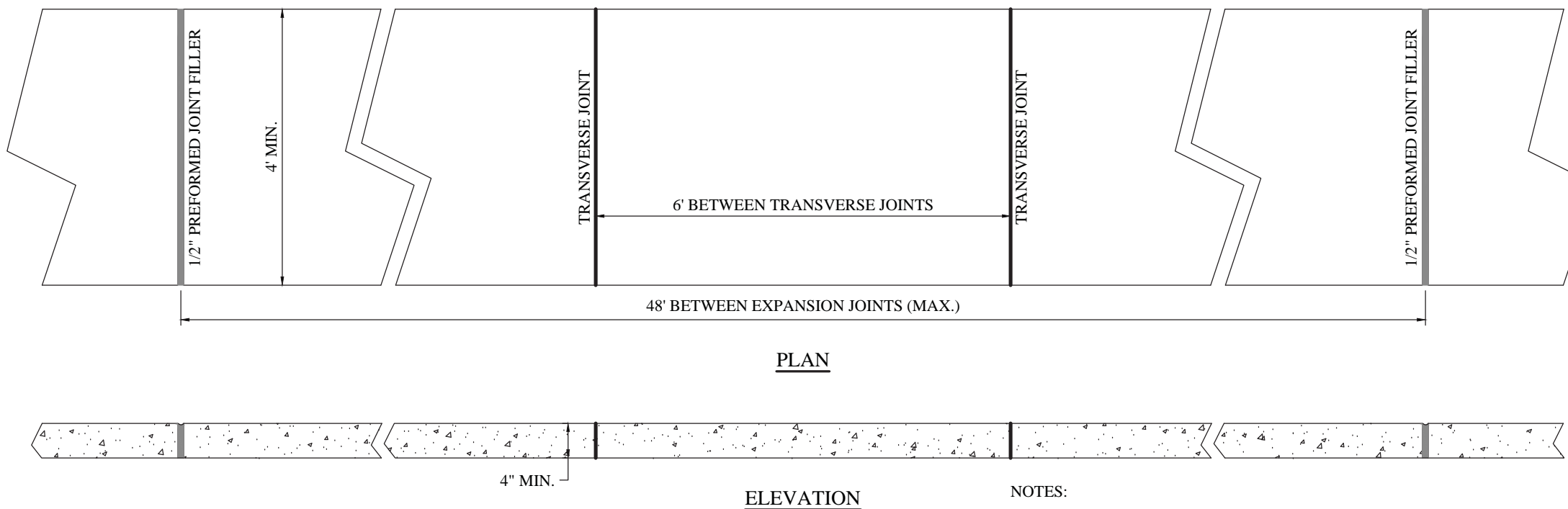


- THE SIDEWALK SHALL NOT EXCEED THE MAXIMUM CROSS SLOPE OF 2%
  - THE SPACE BEHIND THE CURB SHALL BE FILLED WITH SUITABLE MATERIAL TO THE REQUIRED ELEVATION AND COMPACTED IN LAYERS NOT TO EXCEED 4" IN DEPTH.
- SUBGRADE UNDER ALL CURB, SIDEWALK, AND DRIVES SHALL BE COMPACTED IN ACCORDANCE WITH MOST RECENT INDOT STANDARD SPECIFICATIONS.



NOTE:

WHEN BUILT IN CONJUNCTION WITH CONCRETE PAVEMENT, EXPANSION AND CONTRACTION JOINTS SHOULD BE PLACED AT THE SAME LOCATIONS AS IN THE PAVEMENT SLABS. THE CURB AND GUTTER SHOULD BE TIED TO THE PAVEMENT BY 1/2" ROUND DEFORMED BARS AT ABOUT 3 FOOT INTERVALS. IF NO CONCRETE PAVEMENT IS BEING BUILT AT THE TIME THE CURB IS CONSTRUCTED, EXPANSION JOINTS SHOULD BE PLACED AT THE ENDS OF ALL RETURNS AND AT INTERVALS NOT TO EXCEED 100 FEET. CONTRACTION JOINTS SHOULD BE INSTALLED AT 20 FOOT SPACING.



NOTES:

- THE SPACE BEHIND THE CURB SHALL BE FILLED WITH SUITABLE MATERIAL TO THE REQUIRED ELEVATION AND COMPACTED IN LAYERS NOT TO EXCEED 6" IN DEPTH.
- SUBGRADE UNDER ALL CURB, SIDEWALK, AND DRIVES SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 207.02 OF THE STANDARD SPECIFICATIONS.

CONCRETE SIDEWALK JOINT DETAIL  
NOT-TO-SCALE

DRAWN BY: KJ/M/GEM		CHECKED BY: KRG	SHEET NO. C802B	S & A JOB NO. 100405FOR-S3
DATE: 07/11/24		DATE: 07/11/24		
APPROVAL: PENDING / NOT FOR CONSTRUCTION		JOHNSON COUNTY, INDIANA		
CONSTRUCTION SPECIFICATION & DETAILS		FRANKLIN		
WINTERFIELD SECTION 3		JOHNSON COUNTY, INDIANA		
C802B		JOHNSON COUNTY, INDIANA		
S & A JOB NO. 100405FOR-S3		JOHNSON COUNTY, INDIANA		

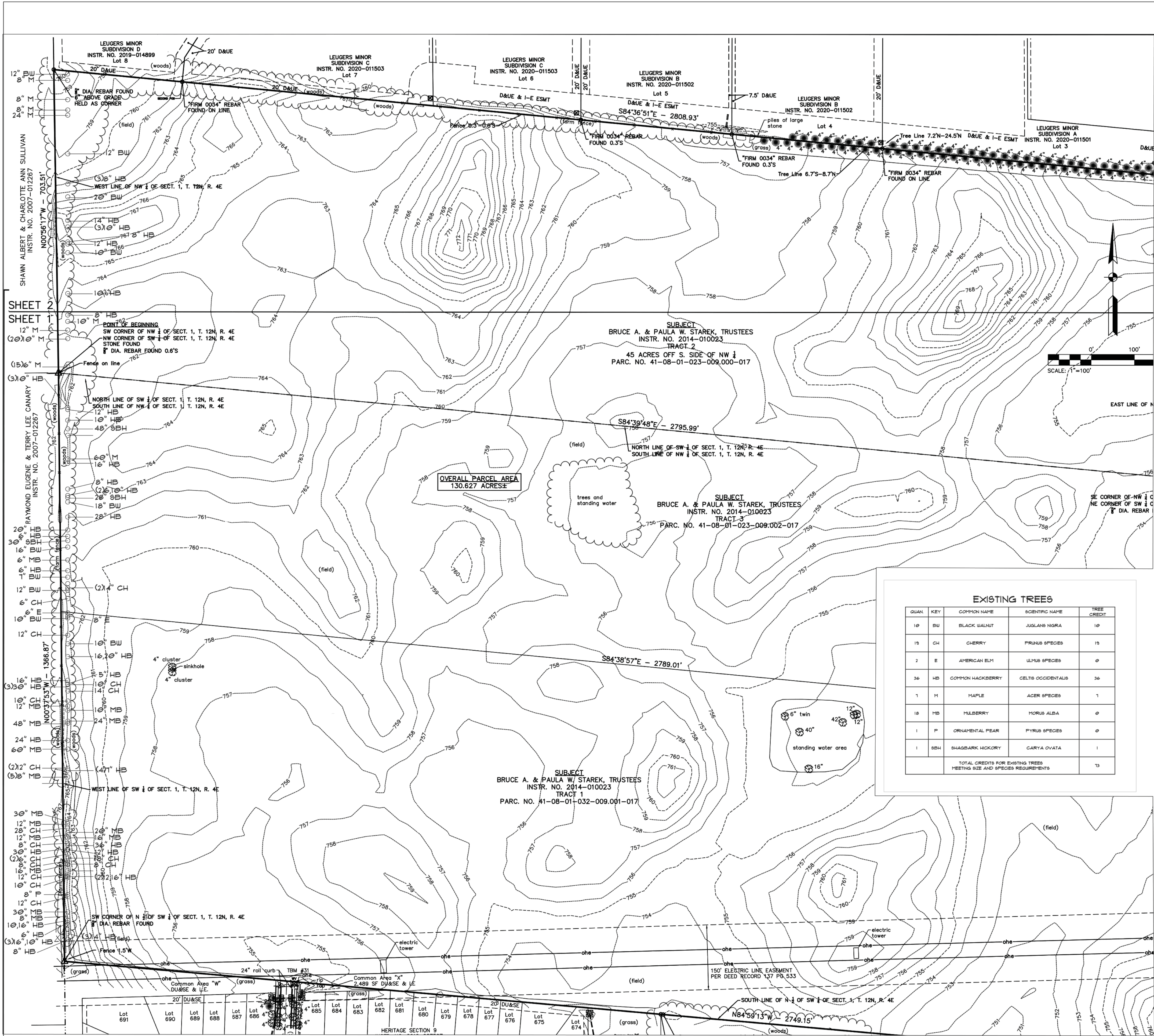
THIS DRAWING IS NOT INTENDED TO BE REPRESENTED AS A RETACEMENT OR ORIGINAL BOUNDARY SURVEY A ROUTE SURVEY OR A SURVEYOR LOCATION REPORT.

CERTIFIED: 07/11/24

Professional Engineer

7965 East 106th Street, Fishers, IN 46038-2505  
phone: 317.849.5955 fax: 317.849.5942





TREE SURVEY  
NTS

STREET TREE PLAN  
SCALE 1" = 60'



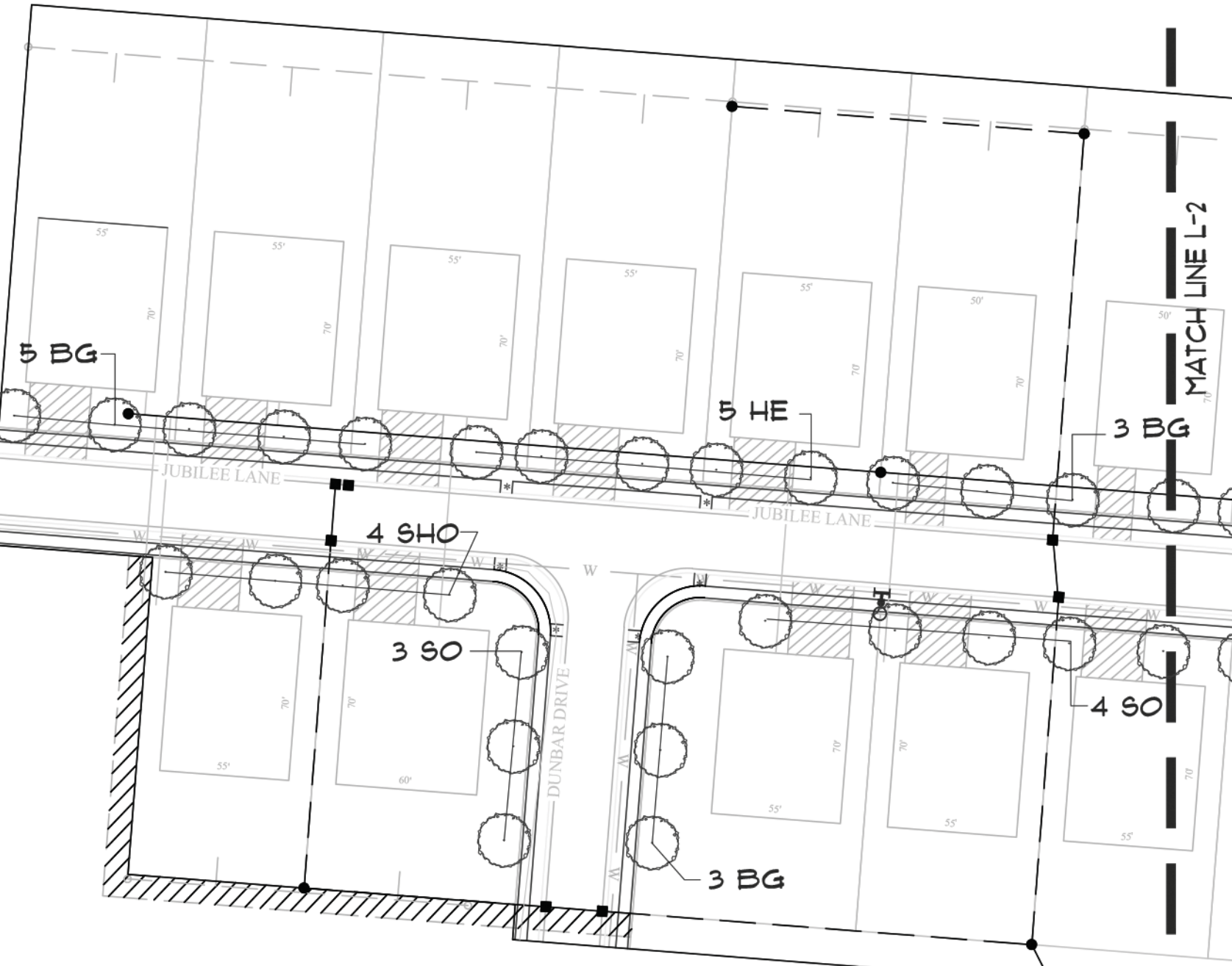
DESIGNED FOR  
FORESTAR GROUP INC.  
9322 NORTH MERIDIAN STREET  
SUITE 211  
INDIANAPOLIS, IN 46260

PROJECT NAME  
**WINTERFIELD**  
FRANKLIN, INDIANA















SHEET NAME  
**TREE SURVEY**  
**STREET TREE**  
**LANDSCAPE PLAN**





DESIGNER  
**CLA**  
DATE: APRIL 1, 2022  
REVISION DATE:  
MAY 2, 2022

SHEET



PLANT SCHEDULE

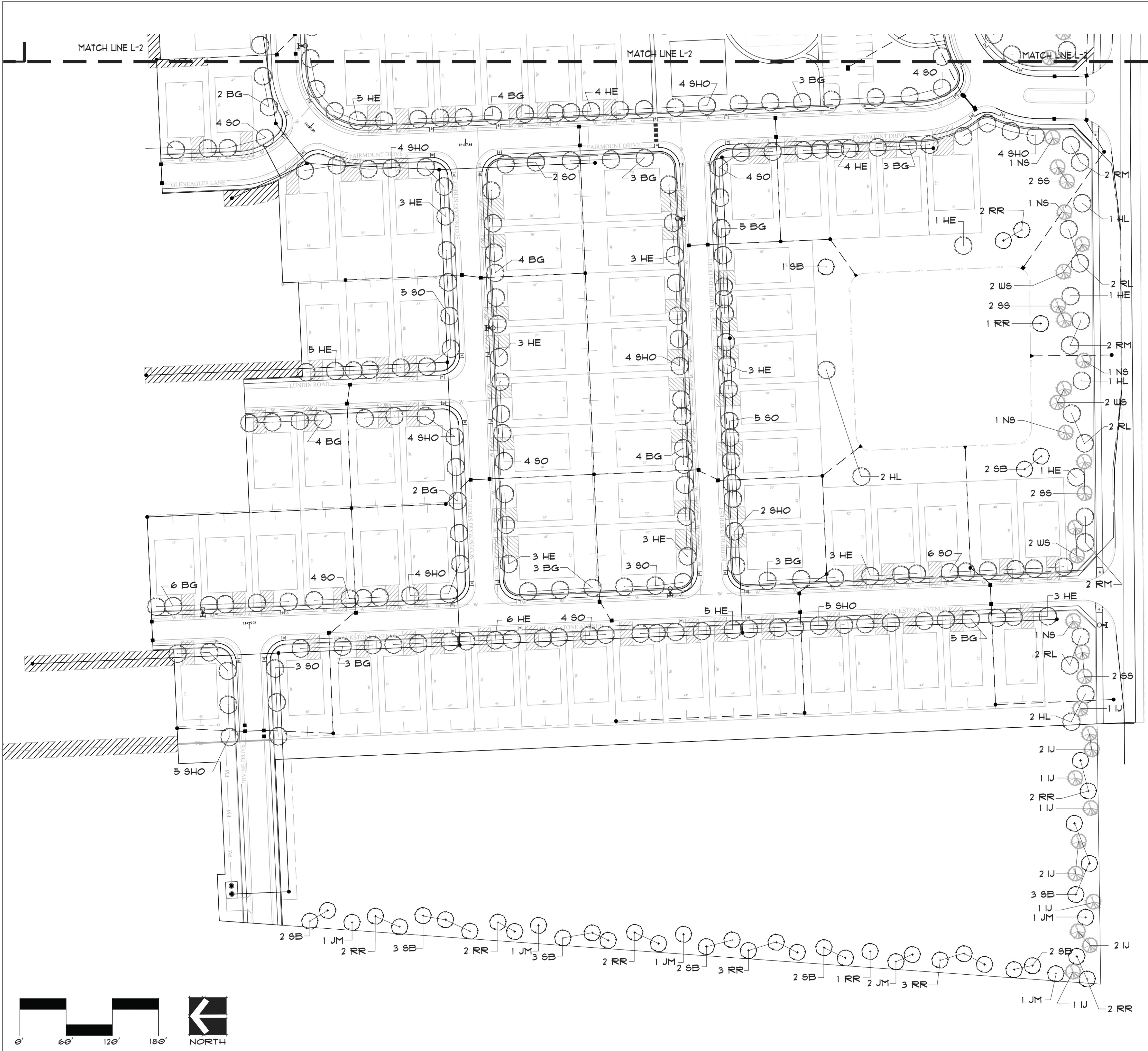
SYMBOL	KEY	COMMON NAME	SCIENTIFIC NAME	SIZE	QUANT
TOTAL SHADE/STREET TREES					
	BG	BLACK GUM, BLACK TUPELO	NYSSA SYLVATICA	2"	56
	HE	HONEYLOCUST	ULMUS X 'HONEYLOCUST'	2"	56
	HL	HONEYLOCUST SHADBLASTER	GLIEDTBIA TR. 'NERISS'	2"	14
	RL	REDHORN LINDEN	TILIA AMERICANA X EUGLORA	2"	14
	RH	MAPLE 'RED SUNSET'	ACER 'RED SUNSET'	2"	16
	SO	SCARLET OAK	QUERCUS COCINEA	2"	81
	SHO	SHUMARD OAK	QUERCUS SHUMARDS	2"	61
ORNAMENTAL TREES					
	JH	MAGNOLIA 'DR. HERRILL'	MAGNOLIA X LOEBNERI 'DR. HERRILL'	1-1/2"	1
	RR	ROYAL RANDOLPHS CRABAPPLE	MALUS CV. 'ROYAL RANDOLPHS'	1-1/2"	21
	SB	SERVICEBERRY 'AUTUMN BRILLIANCE'	AMELANCHIER BRILLIANCE SERVICEBERRY	1' CLUMP	31
EVERGREEN TREES					
	U	LOUISA JUNIFER	LOUISA JUNIFER	6"	11
	NS	NORWAY SPRUCE	PICEA ABIES	6"	15
	SS	SERBIAN SPRUCE	PICEA CHOROKA	6"	14
	WS	WHITE SPRUCE	PICEA GLAUCA	6"	13

SYMBOL	KEY	COMMON NAME	SCIENTIFIC NAME	SIZE	QUANT
STREET TREES					
	BG	BLACK GUM, BLACK TUPELO	NYSSA SYLVATICA	2"	56
	HE	ACCOLADE ELM	ULMUS X 'ACCOLADE'	2"	56
	SO	SCARLET OAK	QUERCUS COCINEA	2"	81
	SHO	SHUMARD OAK	QUERCUS SHUMARDI	2"	61
TOTAL STREET TREES PROVIDED TREES REQUIRED AT 40' SPACING (3,650' LENGTH = 343 TREES REQUIRED)					346









PLANT SCHEDULE					
SYMBOL	KEY	COMMON NAME	SCIENTIFIC NAME	SIZE	QUANT
TOTAL SHADE/STREET TREES					
	BG	BLACK GUM, BLACK TUPELO	NYSSA SYLVATICA	2"	96
	HE	HOMESTEAD ELM	ULMUS X 'HOMESTEAD'	2"	96
	HL	HONEYLOCUST SHADEMASTER	GLEITSIA TRI. 'INERMIS'	2"	14
	RL	REDMOND LINDEN	TILIA AMERICANA X EUCHLORA	2"	14
	RM	MAPLE 'RED SUNSET'	ACER 'RED SUNSET'	2"	16
	SO	SCARLET OAK	QUERCUS COCCINEA	2"	81
	SHO	SHUMARD OAK	QUERCUS SHUMARDII	2"	61
ORNAMENTAL TREES					
	JM	MAGNOLIA 'DR MERRILL'	MAGNOLIA X LOEBNERI 'DR MERRILL'	1-1/2"	1
	RR	ROYAL RANDROPS CRABAPPLE	MALUS CV. 'ROYAL RANDROPS'	1-1/2"	21
	SB	SERVICEBERRY 'AUTUMN BRILLIANCE'	AMELANCHIER BRILLIANCE SERVICEBERRY	1' CLUMP	31
EVERGREEN TREES					
	IU	IOWA JUNIPER	IOWA JUNIPER	6'	11
	NS	NORWAY SPRUCE	PICEA ABIES	6'	15
	SO	SERBIAN SPRUCE	PICEA OMORICA	6'	14
	WS	WHITE SPRUCE	PICEA GLAUCA	6'	13

SYMBOL	KEY	COMMON NAME	SCIENTIFIC NAME	SIZE	QUANT
STREET TREES					
	BG	BLACK GUM, BLACK TUPELO	NYSSA SYLVATICA	2"	96
	HE	ACCOLADE ELM	ULMUS X 'ACCOLADE'	2"	96
	SO	SCARLET OAK	QUERCUS COCCINEA	2"	81
	SHO	SHUMARD OAK	QUERCUS SHUMARDII	2"	61
TOTAL STREET TREES PROVIDED TREES REQUIRED AT 40' SPACING (13,650' LENGTH = 343 TREES REQUIRED)					346

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DESIGNED FOR  
FORESTAR GROUP INC.  
5252 NORTH MERIDIAN STREET  
SUITE 211  
INDIANAPOLIS, IN 46260

PROJECT NAME  
**WINTERFIELD**  
FRANKLIN, INDIANA

SHEET NAME  
**BUFFER & STREET TREE  
LANDSCAPE PLAN**

DESIGNER  
TF

DATE: APRIL 1, 2022  
REVISION DATE: MAY 2, 2022

SHEET  
**L3**