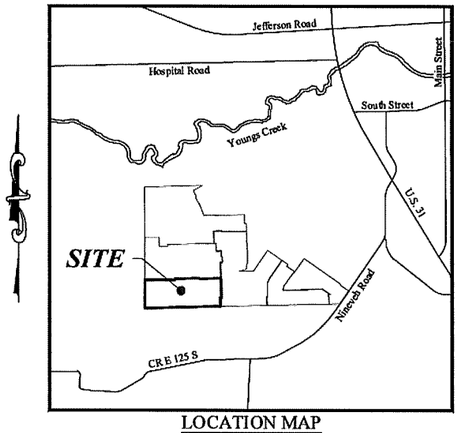
THIS INSTRUMENT PREPARED BY:
DENNIS D. OLMSTEAD, RLS
STOEPPELWERTH & ASSOCIATES, INC.
7965 E. 106TH STREET
FISHERS, INDIANA 46038
PHONE: (317) 849-5935

THIS INSTRUMENT PREPARED FOR:
WINDSTAR HOMES, LLC
5374 CAYMAN DRIVE
CARMEL, INDIANA 46033
PHONE: (317) 223-4257
CONTACT: MARK ALT

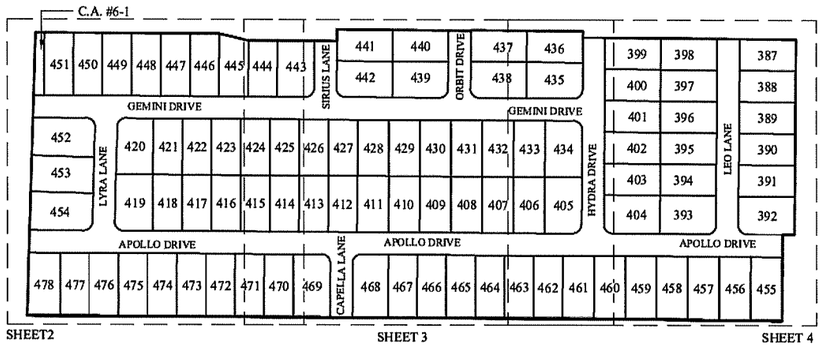
THE BLUFFS AT YOUNGS CREEK SECTION 6

MAJOR SUBDIVISION SECONDARY PLAT



LOCATION MAP
SCALE: 1" = 2,000'

CURVE TABLE: PARCEL						
CURVE	RADIUS	LENGTH	TANGENT	CHORD LENGTH	CHORD BEARING	DELTA
C1	20.00'	31.49'	20.07'	28.34'	N44°39'20"W	90°12'39"
C2	20.00'	31.34'	19.93'	28.23'	S45°20'40"W	89°47'21"
C3	20.00'	31.49'	20.07'	28.34'	N44°39'20"W	90°12'39"
C4	20.00'	31.34'	19.93'	28.23'	S45°20'40"W	89°47'21"
C5	20.00'	31.49'	20.07'	28.34'	N44°39'20"W	90°12'39"
C6	20.00'	31.34'	19.93'	28.23'	S45°20'40"W	89°47'21"
C7	20.00'	31.49'	20.07'	28.34'	N44°39'20"W	90°12'39"
C8	20.00'	31.34'	19.93'	28.23'	S45°20'40"W	89°47'21"
C9	20.00'	31.95'	20.55'	28.66'	S43°59'19"E	91°32'39"
C10	20.00'	30.88'	19.47'	27.90'	S46°00'41"W	88°27'21"
C11	20.00'	31.95'	20.55'	28.66'	N43°59'19"W	91°32'39"
C12	20.00'	30.88'	19.47'	27.90'	N46°00'41"E	88°27'21"
C13	20.00'	31.49'	20.07'	28.34'	S44°39'20"E	90°12'39"
C14	20.00'	31.34'	19.93'	28.23'	S45°20'40"W	89°47'21"
C15	20.00'	31.42'	20.00'	28.28'	S44°45'39"E	90°00'00"
C16	20.00'	31.42'	20.00'	28.28'	N45°14'21"E	90°00'00"



KEY MAP
SCALE 1" = 200'

SUBDIVISION MONUMENTATION	
	PER INDIANA ADMINISTRATIVE CODE (IAC), TITLE 865 IAC 1-12-18, AN AFFIDAVIT, CROSS-REFERENCED TO THIS PLAT, WILL BE RECORDED AFTER THE SUBDIVISION MONUMENTATION HAS BEEN COMPLETED AND MAY BE DELAYED FOR UP TO TWO YEARS FROM THE DATE OF RECORDATION OF THIS PLAT. MONUMENTS SET OR TO BE SET INCLUDE SUBDIVISION PERIMETER CORNERS, CENTERLINE INTERSECTIONS, CENTERLINE POINTS OF CURVATURE, CENTERLINE POINTS OF TANGENCY AND INTERIOR LOT/ PARCEL CORNERS (INCLUDING BEGINNING AND ENDS OF CURVES AND THE INTERSECTION OF LOT/PARCEL LINES).
○	A 5/8"X30" REBAR WITH CAP STAMPED "S&A FIRM #0008" SHALL BE SET AT ALL LOT OR PARCEL CORNERS, INCLUDING BEGINNING AND ENDING OF CURVES AND THE INTERSECTION OF LINES.
□	DENOTES A 4"X4"X36" LONG PRECAST CONCRETE MONUMENT WITH A CROSS CAST IN THE TOP, SET FLUSH WITH THE FINISH GRADE.
●	DENOTES A STREET CENTERLINE MONUMENT. EITHER A "COPPERWELD", A 5/8" DIA. STEEL ROD 12" LONG WITH 1-1/2" DIA. TAPERED BRASS CAP HAVING A CUT "X" IN TOP, SET FLUSH WITH THE FINISHED SURFACE COAT OR A 2" MAG NAIL, TEMPORARILY SET FLUSH WITH THE INTERMEDIATE COAT (BINDER).

LEGEND	
0000	ADDRESS
25	LOT NUMBER
R/W	RIGHT-OF-WAY
B.L.	BUILDING SETBACK LINE
C.A.	COMMON AREA
D.&U.E.	DRAINAGE & UTILITY EASEMENT
D.U.&S.S.E.	DRAINAGE UTILITY & SANITARY SEWER EASEMENT
△	SECTION CORNER

Dennis D. Olmstead
Professional Land Surveyor
No. 900012

DATED: 04/07/2022

DENNIS D. OLMSTEAD REGISTERED No. 900012 STATE OF INDIANA LAND SURVEYOR

JOB No. 83540MMA-S6
SHEET 1 OF 5

THIS INSTRUMENT PREPARED BY:
DENNIS D. OLMSTEAD, RLS
STOEPPELWERTH & ASSOCIATES, INC.
7965 E. 106TH STREET
FISHERS, INDIANA 46038
PHONE: (317) 849-5935

THIS INSTRUMENT PREPARED FOR:
WINDSTAR HOMES, LLC
5374 CAYMAN DRIVE
CARMEL, INDIANA 46033
PHONE: (317) 223-4257
CONTACT: MARK ALT

NOTE
REFER TO SHEET 1 FOR GENERAL NOTES, LEGEND, CURVE TABLES, AND ABBREVIATIONS.

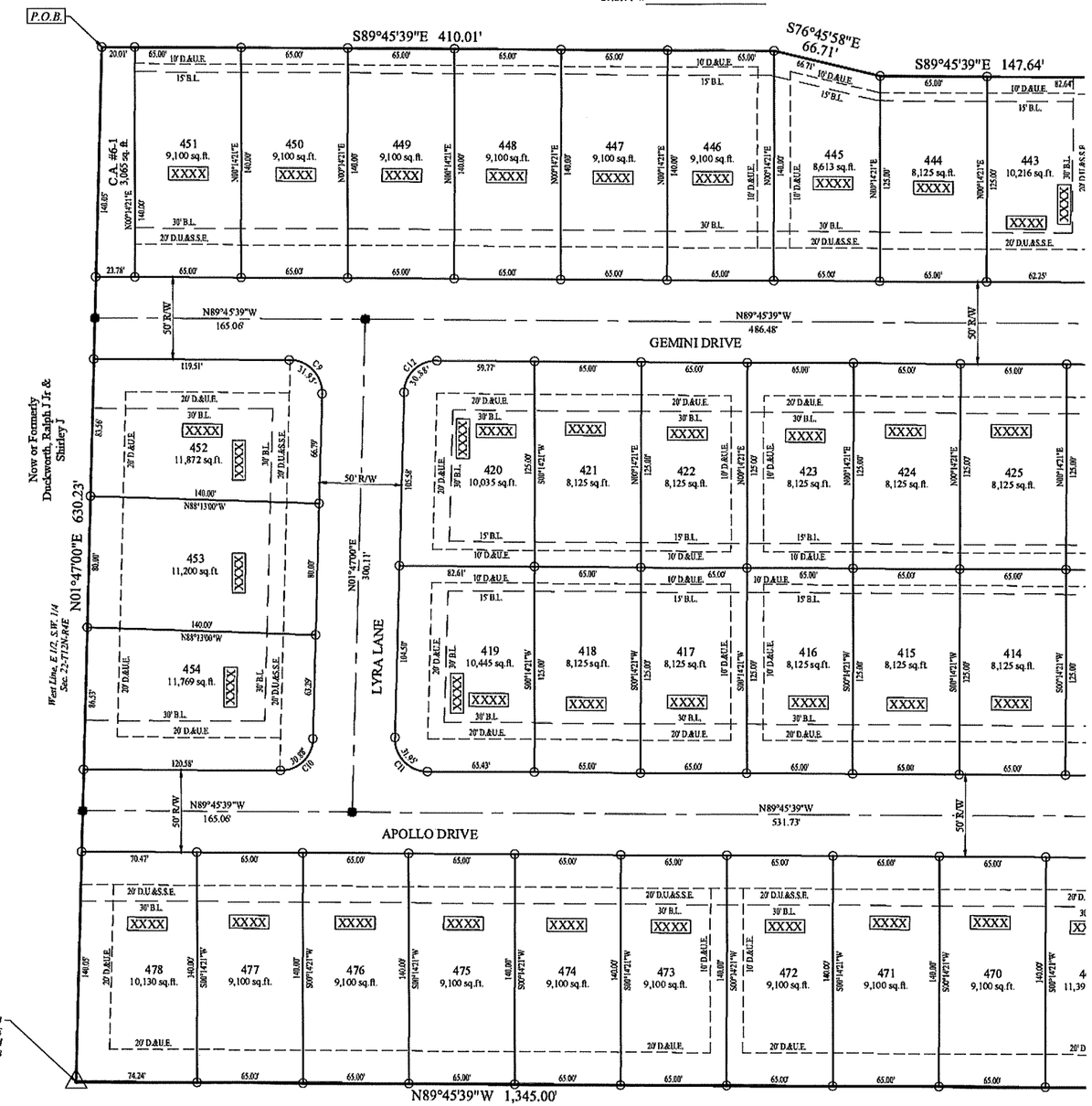
THE BLUFFS AT YOUNGS CREEK
SECTION 6
MAJOR SUBDIVISION
SECONDARY PLAT

Dennis D. Olmstead
Professional Land Surveyor
No. 900012

DATED: 04/07/2022

DENNIS D. OLMSTEAD REGISTERED No. 900012 STATE OF INDIANA LAND SURVEYOR

THE BLUFFS AT YOUNGS CREEK, SECTION 5
Instr. #_____



GRAPHIC SCALE
50' 0 25' 50'
(IN FEET)
1" = 50 FT

THIS INSTRUMENT PREPARED BY:
DENNIS D. OLMSTEAD, RLS
STOEPPEL WERTH & ASSOCIATES, INC.
7965 E. 106TH STREET
FISHERS, INDIANA 46038
PHONE: (317) 849-5935

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WINDSTAR HOMES, LLC
5374 CAYMAN DRIVE
CARMEL, INDIANA 46033
PHONE: (317) 223-4257
CONTACT: MARK ALT

NOTE
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THE BLUFFS AT YOUNGS CREEK SECTION 5

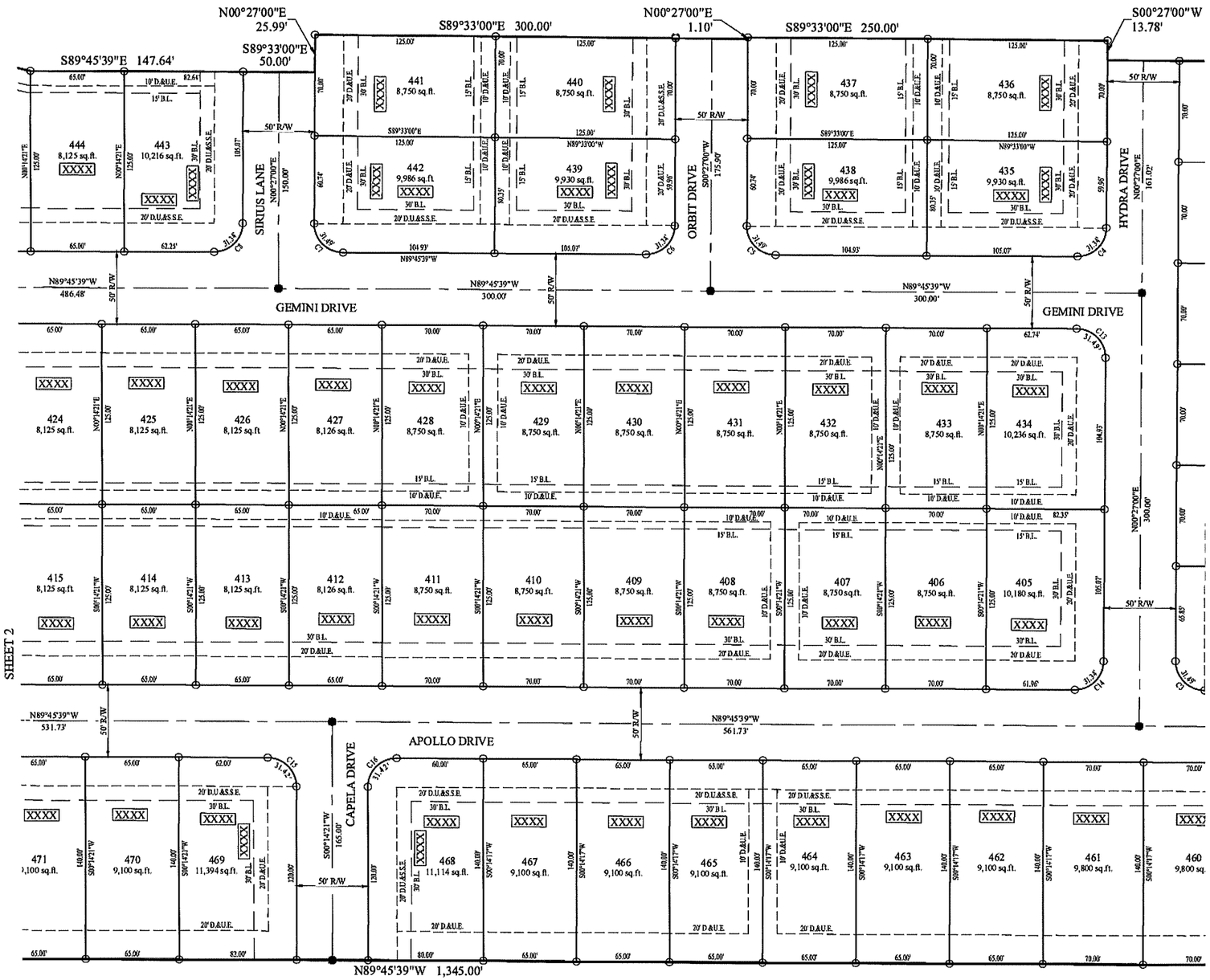
MAJOR SUBDIVISION SECONDARY PLAT

THE BLUFFS AT YOUNGS CREEK, SECTION 5
Instr. #_____

Dennis D. Olmstead
Professional Land Surveyor
No. 900012

DATED: 04/07/2022

DENNIS D. OLMSTEAD REGISTERED No. 900012 STATE OF INDIANA LAND SURVEYOR



THIS INSTRUMENT PREPARED BY:
DENNIS D. OLMSTEAD, RLS
STOEPPEL WERTH & ASSOCIATES, INC.
7965 E. 106TH STREET
FISHERS, INDIANA 46038
PHONE: (317) 849-5935

THIS INSTRUMENT PREPARED FOR:
WINDSTAR HOMES, LLC
5374 CAYMAN DRIVE
CARMEL, INDIANA 46033
PHONE: (317) 223-4257
CONTACT: MARK ALT

THE BLUFFS AT YOUNGS CREEK
SECTION 6
MAJOR SUBDIVISION
SECONDARY PLAT

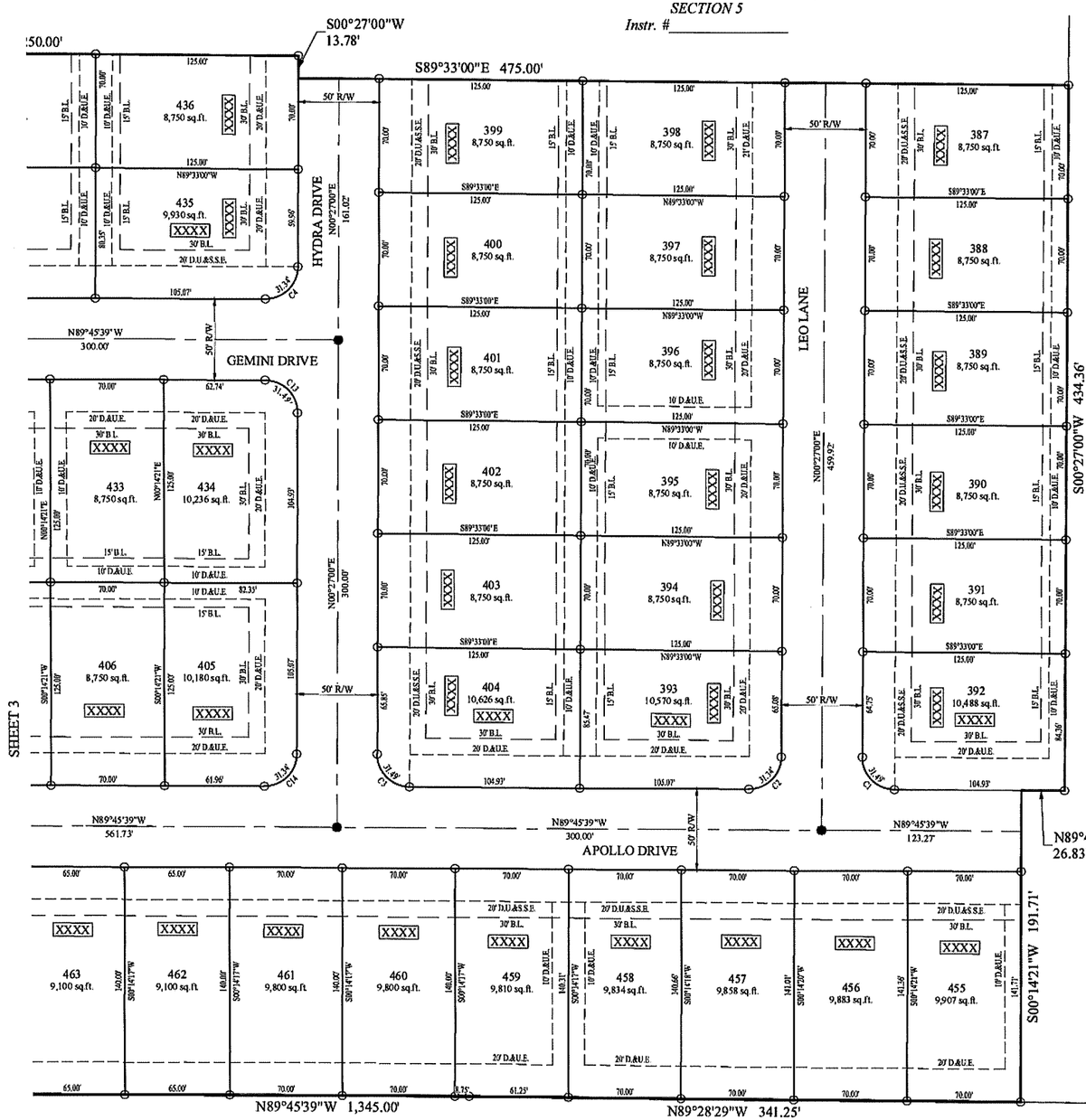
NOTE
REFER TO SHEET 1 FOR GENERAL NOTES, LEGEND, CURVE TABLES, AND ABBREVIATIONS.

Dennis D. Olmstead
Professional Land Surveyor
No. 900012

DATED: 04/07/2022

DENNIS D. OLMSTEAD REGISTERED No. 900012 STATE OF INDIANA LAND SURVEYOR

THE BLUFFS AT YOUNGS CREEK, SECTION 5
Instr. #_____



THE BLUFFS AT YOUNGS CREEK, SECTION 3 Instr. #2022-005497

GRAPHIC SCALE
50' 0 25' 50'
(IN FEET)
1" = 50 FT

THIS INSTRUMENT PREPARED BY:
DENNIS D. OLMSTEAD, RLS
STOEPPELWERTH & ASSOCIATES, INC.
7965 E. 106TH STREET
FISHERS, INDIANA 46038
PHONE: (317) 849-5935

THIS INSTRUMENT PREPARED FOR:
WINDSTAR HOMES, LLC
5374 CAYMAN DRIVE
CARMEL, INDIANA 46033
PHONE: (317) 223-4257
CONTACT: MARK ALT

THE BLUFFS AT YOUNGS CREEK
SECTION 6
MAJOR SUBDIVISION
SECONDARY PLAT

THE BLUFFS AT YOUNG'S CREEK, SECTION 6

I, the undersigned Professional Land Surveyor hereby certify that the included plat correctly represents a subdivision of part of the Southwest Quarter and part of the Southeast Quarter, all in Section 22, Township 12 North, Range 4 East of the Second Principal Meridian, Johnson County, Indiana, being more particularly describes as follows:

Beginning at the Southwest corner of the East Half of the Southwest Quarter of said Section; thence North 01 degree 47 minutes 00 seconds East, along the West line of said Half-Quarter Section, 630.23 feet; thence South 89 degrees 45 minutes 39 seconds East, parallel with the South line of said Half-Quarter Section, 410.01 feet; thence South 76 degrees 45 minutes 58 seconds East 66.71 feet; thence South 89 degrees 45 minutes 39 seconds East 147.64 feet; thence South 89 degrees 33 minutes 00 seconds East 50.00 feet; thence North 00 degrees 27 minutes 00 seconds East 25.99 feet; thence South 89 degrees 33 minutes 00 seconds East 300.00 feet; thence North 00 degrees 27 minutes 00 seconds East 1.10 feet; thence South 89 degrees 33 minutes 00 seconds East 250.00 feet; thence South 00 degrees 27 minutes 00 seconds West 13.78 feet; thence South 89 degrees 33 minutes 00 seconds East 475.00 feet to the West line of The Bluffs At Young's Creek, Section 3, per plat thereof recorded as Instrument Number 2022-005497 in the Office of the Recorder for Johnson County, Indiana; thence with the lines of said Subdivision the following 3 courses and distances: 1) South 00 degrees 27 minutes 00 seconds West 434.36 feet; 2) thence North 89 degrees 45 minutes 39 seconds West 26.83 feet; 3) thence South 00 degrees 14 minutes 21 seconds West 191.71 feet to the South line of the Southeast Quarter of said Section 22; thence North 89 degrees 28 minutes 29 seconds West, along said line, 341.25 feet to the Southwest corner of said Quarter Section; thence North 89 degrees 45 minutes 39 seconds West, along the South line of the East Half of the Southwest Quarter of said Section, 1,345.00 feet to the Point of Beginning, Containing 24.550 acres, more or less.

This subdivision consists of 92 lots numbered 387-478 (all inclusive) and 1 Common Area labeled C.A. #6-1. The size of lots and common area and width of streets are shown in feet and decimal parts thereof.

Cross-Reference is hereby made to a survey plat prepared by Stoeppelwerth & Associates, Inc. in accordance with Title 865, Article 1, Chapter 12 of the Indiana Administrative Code certified March 12, 2019 recorded as Instrument No. 2019-004894 in the Office of the Recorder for Johnson County, Indiana.

I further certify that I am a Professional Land Surveyor, licensed in compliance with the laws of the State of Indiana and that the within plat represents a subdivision of the lands surveyed within the cross referenced survey plat, and that to the best of my knowledge and belief there has been no change from the matters of the survey revealed by the cross-reference survey on any lines that are common with the new subdivision.

Witness my signature this _____ day of _____, 2022.

I affirm, under the penalties for perjury, that I have taken reasonable care to redact each social security number in this document, unless required by law.

Dennis D. Olmstead, PLS

_____
Dennis D. Olmstead
Professional Land Surveyor
No. 900012

PROFESSIONAL LAND SURVEYOR'S CERTIFICATE

I, Dennis D. Olmstead, hereby certify that I am a Professional Land Surveyor, licensed in compliance with the laws of the State of Indiana:

That all the monuments shown hereon actually exist or bond has been posted to cover the later installation of these monuments, and that all other requirements specified herein, done by me, have been met.

_____
Dennis D. Olmstead
Professional Land Surveyor
No. 900012

This subdivision is subject to all drainage system design and construction standards of the Franklin Subdivision Control Ordinance, all other applicable adopted standards of the City of Franklin, and the requirements of the City Engineer that provide for the repair and maintenance of the system.

EXECUTED AND DELIVERED in my presence:
WITNESS:

_____ _____
Witness's Signature Witness's Printed Name

State of Indiana)
)SS:
County of _____)

Before me, a Notary Public in and for said County and State, personally appeared _____[Witness's Name], being known to me to be the person whose name is subscribed as a witness to the foregoing instrument, who, being duly sworn by me, deposes and says that the foregoing instrument was executed and delivered by _____[Grantor's or other Signer's Name] in the above-named subscribing witness's presence.

Witness my hand and Notarial Seal this ____ day of _____, 2022.

_____ _____ County of Residence: _____
Notary Public

_____ _____ My Commission Expires: _____
Printed Name

CERTIFICATE OF APPROVAL

After having given public notice of the time, place and nature of hearing on the application for primary approval of this subdivision by publication in a newspaper of local circulation more than ten (10) days before the hearing thereon, under authority provided by the General Assembly of the State of Indiana, this plat was given approval by a majority of the members of the Franklin Plan Commission at a meeting held on the 19th day of February, 2019.

City of Franklin Plan Commission by:

_____ _____
Jim Martin, President Suzanne Findley, Secretary

This plat is hereby recommended for acceptance by the City of Franklin by:

_____ _____
Joanna M. Tennell, Senior Planner Mark A. Richards, City Engineer

BE IT RESOLVED by the Board of Public Works and Safety, City of Franklin, Johnson County, Indiana, that that the dedications shown on this plat are hereby approved and accepted this _____ day of _____, 2022.

_____ _____
Steve Barnett, Mayor Bob Swinehamer, Member

_____ _____
Melissa L. Jones, Member Jayne Rhoades, Clerk-Treasurer

I, Mark Alt, President, Windstar Homes, LLC, do hereby lay off and plat the described real estate into the subdivision to be known as The Bluffs at Youngs Creek, Section 5 in Johnson County, Indiana. All streets shown and not herefore dedicated, are hereby dedicated to the City of Franklin, Johnson County, Indiana.

The strips of or areas of land marked D.E., U.E. or Sanitary Sewer Easement (S.S.E.) or any combination thereof not heretofore dedicated and shown on this plat are here by dedicated and shall be reserved for the use, installation and maintenance of public utilities and drainage facilities subject at all times to the proper authorities. Within Drainage Easements or Sanitary Sewer Easements, no structures, planting or other material shall be placed or permitted to remain which may damage or change the direction of flow of drainage channels in the easements or which may obstruct or retard the flow of water through drainage channels in the easements. Except for those improvements for which a public utility is responsible, the Drainage Easement of each lot and all improvements in the Drainage Easement, including the slope and drainage pattern, shall be continuously maintained as a yard area by the owner of the land.

The street trees and sidewalks along the frontage of each individual lot shall be installed as part of the construction phase of the home on each individual lot.

This plat is hereby made subject to the Declaration of Covenants, Conditions and Restrictions recorded as Instrument No. 2020-0007565 and any amendments thereto.

This plat is hereby made subject to the written Primary Plat Commitments PC 2018-37 (PP) recorded as Instrument No. 2020-002650.

In Testimony whereof, witness the signatures of Owner and Declarant this _____ day of _____, 2022.

Owner:
Windstar Homes, LLC
5374 Cayman Drive
Carmel, Indiana 46033

_____
Mark Alt, President

State of Indiana)
) SS
County of _____)

Before me, the undersigned, a Notary Public in and for said County and State, personally appeared Mark Alt, President, of Windstar Homes LLC., and acknowledged the execution of this Instrument as his voluntary act and deed and affixed his signature thereto.

Witness my signature and seal this _____ day of _____, 2022.

_____ _____
County of Residence Notary Public

_____ _____
My commission expires Printed Name

Instrument No. _____ Received for record this _____ day of _____, 2022 at _____ AM/PM and recorded in Plat Cabinet _____, Page _____.

_____
Teresa K. Petro, Recorder
Johnson County, Indiana

Duly Entered for Taxation- _____ day of _____, 2022.
Subject to final acceptance for transfer

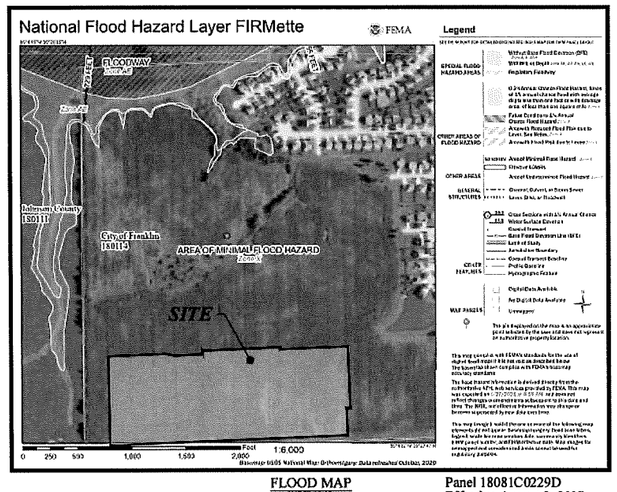
_____
Pamela J. Burton, Auditor
Johnson County, Indiana

Received by the Johnson County Assessor _____
Mark Alexander, Assessor
Johnson County, Indiana

THE BLUFFS AT YOUNGS CREEK

Section 6

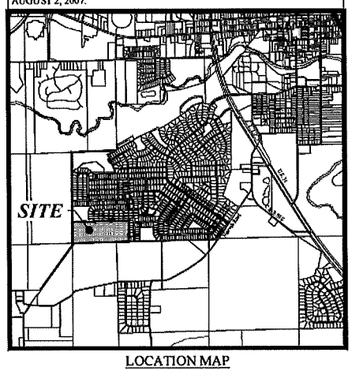
Developed by:
Windstar Homes, LLC
5374 Cayman Drive
Carmel, Indiana 46033
Contact: Mark Alt
Phone: (317) 223-4257



FLOOD MAP
NOT TO SCALE

Panel 18081C0229D
Effective August 2, 2007

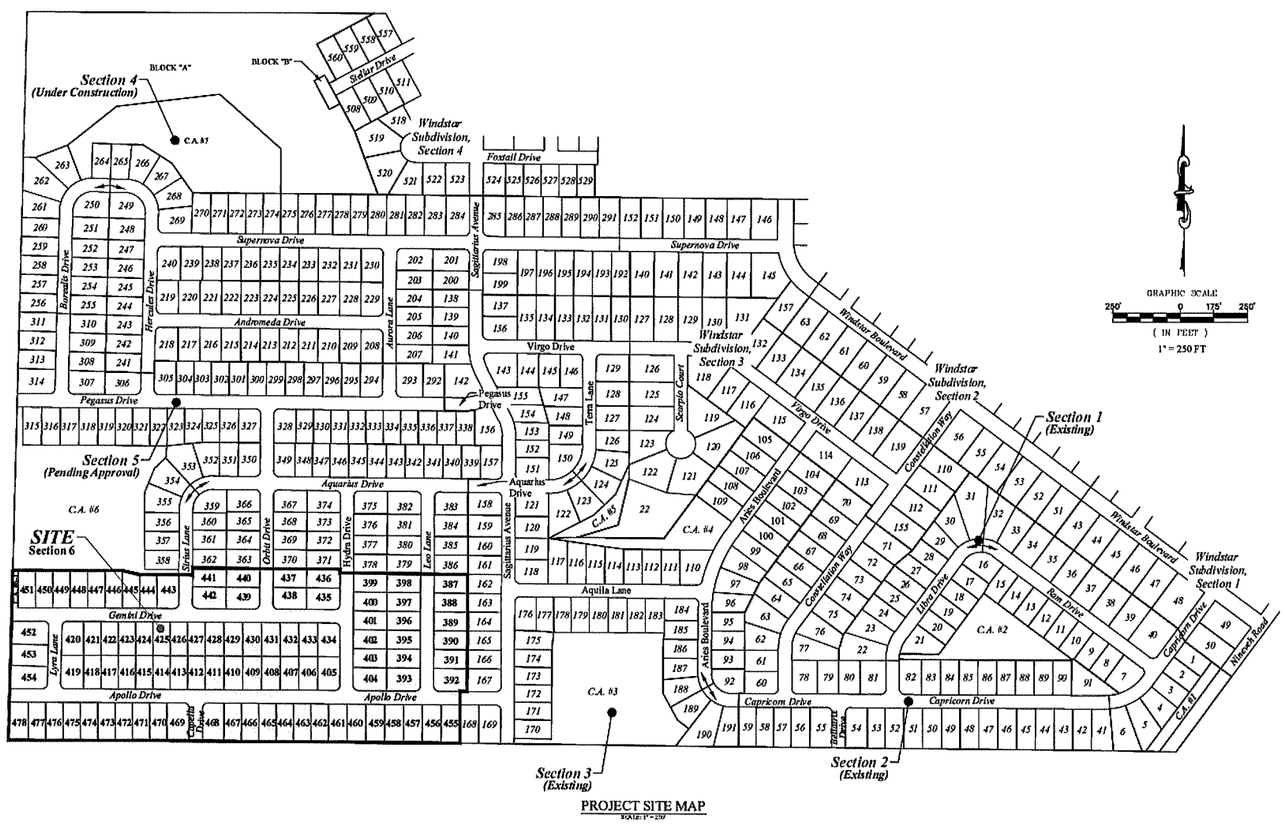
FLOOD STATEMENT
THIS IS TO CERTIFY THAT THE PROPOSED DEVELOPED PORTION OF THIS PROPERTY IS NOT LOCATED IN A SPECIAL FLOOD HAZARD ZONE "A" AS SAID TRACT PLOTS BY SCALE ON COMMUNITY PANEL 18081C0229D OF THE FLOOD INSURANCE RATE MAPS DATED AUGUST 2, 2007.



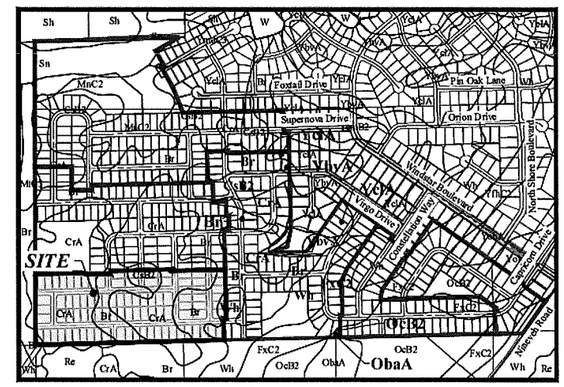
LOCATION MAP
SCALE: 1" = 2,000'

INDEX	
SHT. NO.	DESCRIPTION
C001	COVER SHEET
C100 - C101	TOPOGRAPHICAL SURVEY/DEMO PLAN
C200 - C203	SITE DEVELOPMENT PLAN / OFFSITE GRADING PLAN EMERGENCY FLOOD ROUTE PLAN
C300 - C308	INITIAL STORM WATER POLLUTION & PREVENTION PLAN TEMPORARY STORM WATER POLLUTION & PREVENTION PLAN PERMANENT SEDIMENT & EROSION CONTROL PLAN STORM WATER POLLUTION & PREVENTION SPECIFICATIONS STORM WATER POLLUTION & PREVENTION DETAILS
C400 - C407	STREET PLAN & PROFILES INTERSECTION DETAIL STREET SIGN PLAN
C500 - C502	SANITARY PLAN & PROFILES
C600 - C604	STORM PLAN & PROFILES SUB-SURFACE DRAIN / SUMP CONNECTION PLAN
C700 - C706	WATER PLAN & PROFILES
C800A - C803C	CONSTRUCTION SPECIFICATIONS & DETAILS
C900 - C901	STREET TREE PLAN

REVISIONS			
SHT. NO.	DESCRIPTION	DATE	BY



PROJECT SITE MAP
SCALE: 1" = 250'



SOILS MAP
SCALE: 1" = 660'

UTILITY CONTACTS
City of Franklin - Stormwater 796 South State Street Franklin, Indiana 46131 Contact: Tyler Urban Ph: (888) 736-3640 x1213
Johnson County REMC 750 International Drive Franklin, Indiana 46131 Contact: Gabriel Gaynor Ph: (317) 738-7618
Indiana American Water 153 East Emerson Avenue Greenwood, Indiana 46143 Contact: Tracy White Ph: (317) 885-2426
Century Link 50 North Jackson Street Franklin, Indiana 46131 Contact: Eddie Fields Ph: (317) 736-5338
City of Franklin - Wastewater 796 South State Street Franklin, Indiana 46131 Contact: Sally Brown Ph: (888) 736-3640
CenterPoint Energy 600 Industrial Drive Franklin, Indiana 46131 Contact: Kim Kelly Ph: (317) 736-2915
Comcast Cable 5330 East 65th Street Indianapolis, Indiana 46220 Contact: Matt Stringer Ph: (317) 275-6493

SOILS LEGEND	
MAP UNIT	BRIEF DESCRIPTION
Br	Brookston silty clay loam, 0 to 2 percent slopes
CrA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes
CrB2	Crosby-Miami silt loams, 2 to 4 percent slopes, eroded
MnC2	Miami silt loam, 6 to 12 percent slopes, eroded
MtC3	Miami clay loam, 6 to 12 percent slopes, severely eroded
Sh	Shoals silt loam
Sn	Sloan clay loam
YbvA	Brookston silty clay loam - Urban land complex, 0 to 2 percent slopes
YcIA	Crosby silt loam, fine-loamy subsoil - Urban land complex, 0 to 2 percent slopes
YmdC2	Miami clay loam-Urban land complex, 6 to 12 percent slopes, severely eroded

DESIGN DATA	
DESIGN SPEED LIMIT	25 M.P.H.
92 LOTS	
ACREAGE	24.550 AC. ±
DENSITY	3.75 LOTS/ACRE
GEMINI DRIVE	1,251.54 L.F.
APOLLO DRIVE	1,681.79 L.F.
CAPELLA DRIVE	165.00 L.F.
LYRA LANE	300.11 L.F.
HYDRA DRIVE	461.02 L.F.
LEO LANE	459.92 L.F.
ORBIT DRIVE	175.35 L.F.
SIRIUS LANE	150.00 L.F.
TOTAL	4,644.73 L.F.

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.

INDIANA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS LATEST EDITION TO BE USED WITH THESE PLANS UNLESS ALTERNATE SPECIFICATIONS ARE SHOWN WITHIN.

PLANS PREPARED BY:
STOEPPELWERTH & ASSOCIATES, INC.
CONSULTING ENGINEERS & LAND SURVEYORS
7965 E. 106th STREET, FISHERS, INDIANA 46038
PHONE: (317) 849-5935
FAX: (317) 849-5942
CONTACT: BRIAN K. ROBINSON
EMAIL: brobinson@stoeppelwerth.com

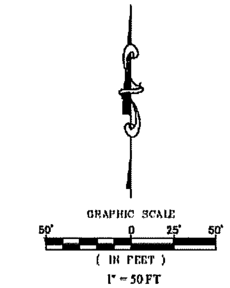
PLANS CERTIFIED BY:

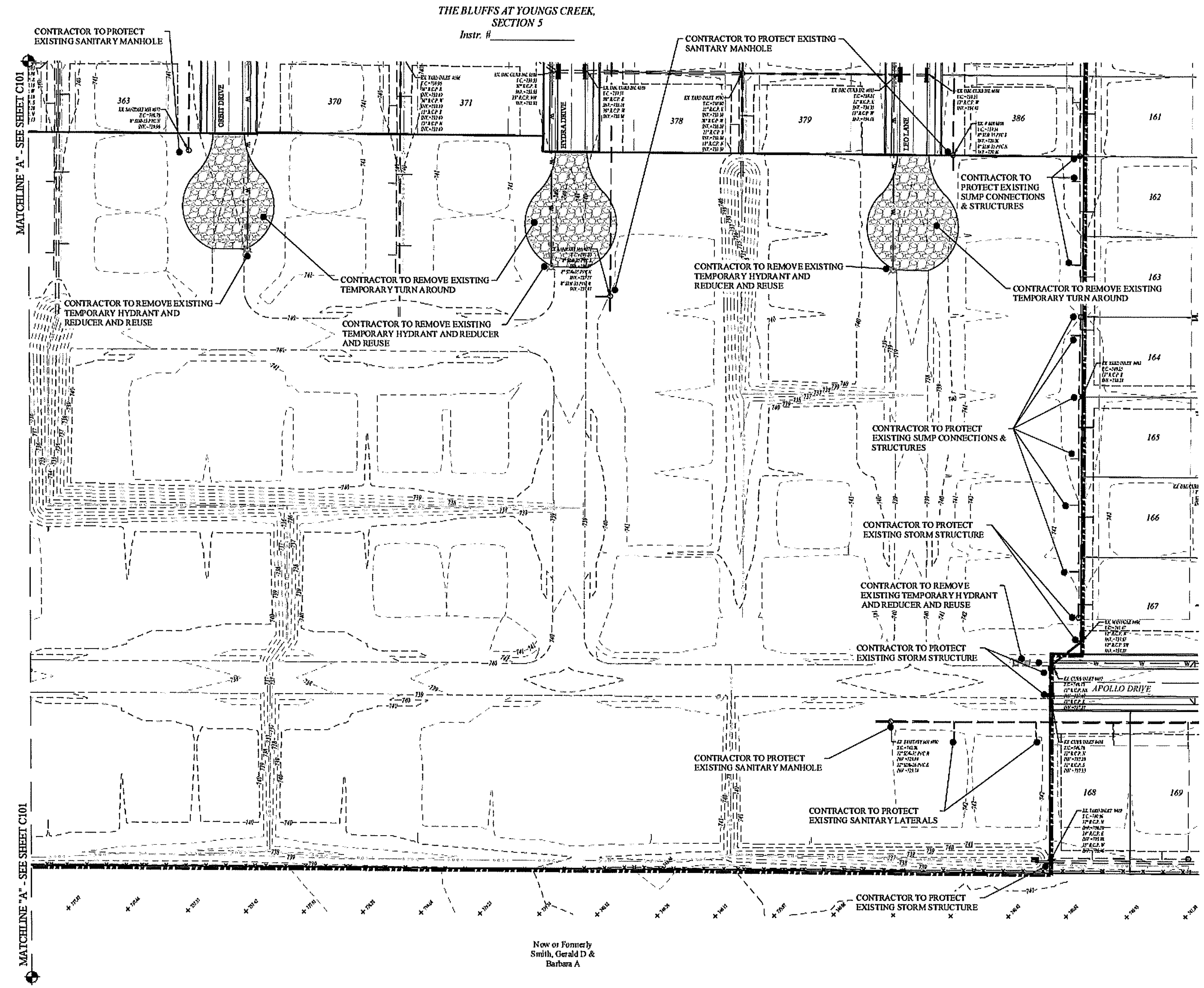
04/07/22

DAVID J. STOEPPELWERTH
PROFESSIONAL ENGINEER

DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

S & A JOB No. 83540MMA-S6





THE BLUFFS AT YOUNGS CREEK, SECTION 3
Instr. #2022-005497

LEGEND

	CONTOUR
	SWALE
	LAKE NORMAL POOL ELEVATION
	SANITARY SEWER (w/ LATERALS)
	STORM SEWER (w/ STRUCTURES)
	WATER MAIN
	GAS LINE
	FENCE LINE
	TREE LINE
	LIGHT POLE
	FIRE HYDRANT
	WATER VALVE
	WATER METER
	MAILBOX
	CLEANOUT
	TELEPHONE PEDESTAL
	CABLE TV PEDESTAL
	ELECTRICAL TRANSFORMER
	CONTROL POINT
	DENOTES CONSTRUCTION LIMITS
	DENOTES AREAS OF REMOVAL

BENCHMARK DATA

ORIGINATING BENCHMARK

JOHNSON COUNTY BENCHMARK TTAS: A 4" COPPER PLATE, CENTER PUNCHED, STAMPED "YFTTAS" SET ON A 36" IRON ROD SET IN 6"x36" CONCRETE, 6"± BELOW GROUND LEVEL APPROXIMATELY 20 FEET FROM THE CENTER OF THE NORTHBOUND LANES OF U.S. 31 AND APPROXIMATELY 654' NORTHWEST OF ITS INTERSECTION OF NINEVEH ROAD.

BENCHMARK ELEVATION = 743.13 (NAVD 88)

UTILITY CROSSINGS

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.

NOTES

1. 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.

DATE	MARK	REVISIONS	BY

DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

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

CERTIFIED: 04/07/22

STOEPPELWERTH
ALWAYS ON
7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

TOPOGRAPHICAL SURVEY / DEMO PLAN

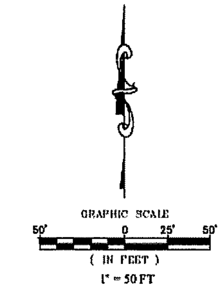
THE BLUFFS AT YOUNGS CREEK SECTION 6

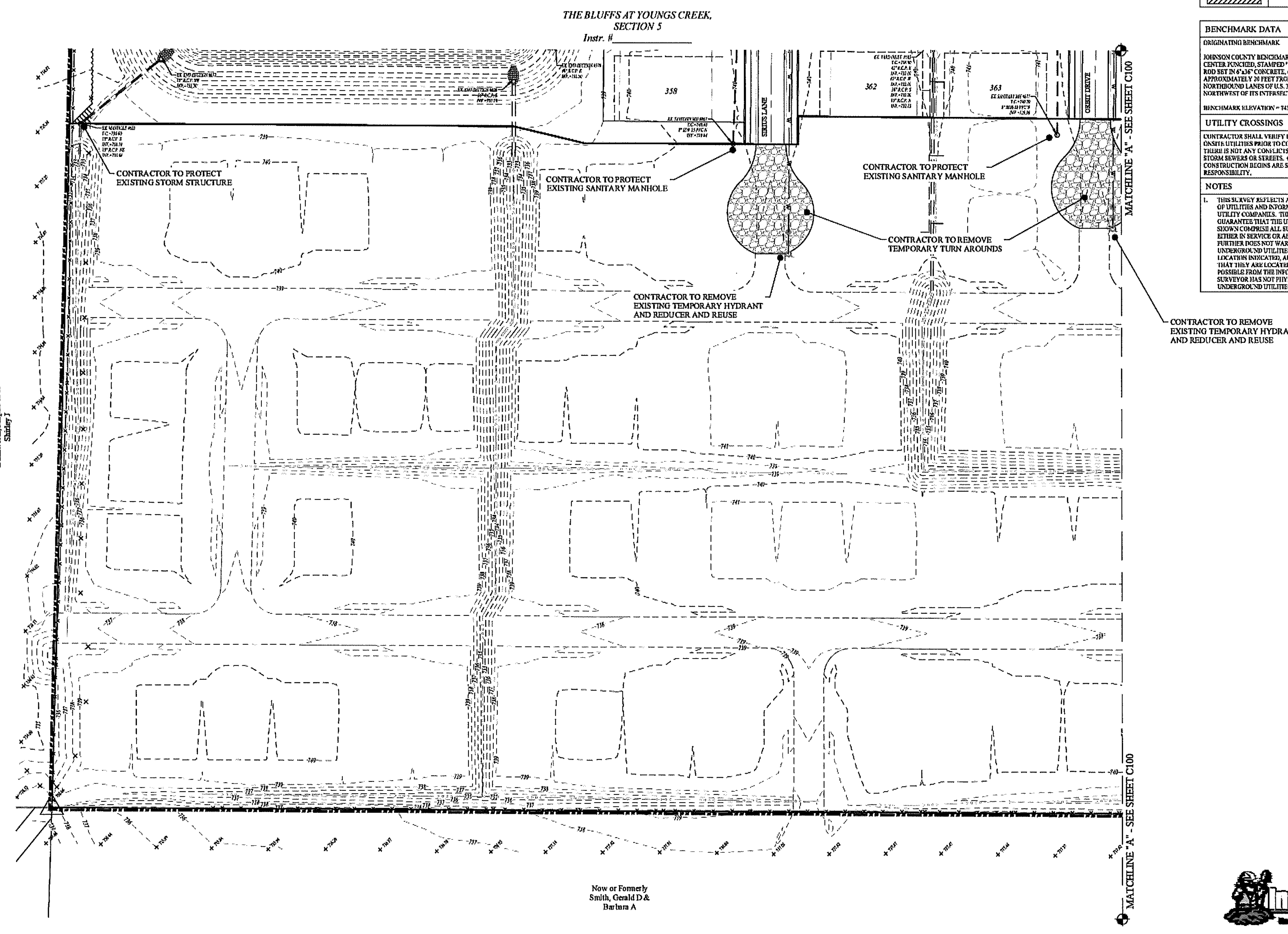
FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY:	CHECKED BY:
DCM	BKR

SHEET NO. C100

S & A JOB NO. 83540MMA-S6





LEGEND

Symbol	Description
	CONTOUR
	SWALE
	LAKE NORMAL POOL ELEVATION
	SANITARY SEWER (w/ LATERALS)
	STORM SEWER (w/ STRUCTURES)
	WATER MAIN
	GAS LINE
	FENCE LINE
	TREE LINE
	LIGHT POLE
	FIRE HYDRANT
	WATER VALVE
	WATER METER
	MAILBOX
	CLEANOUT
	TELEPHONE PEDESTAL
	CABLE TV PEDESTAL
	ELECTRICAL TRANSFORMER
	CONTROL POINT
	DENOTES CONSTRUCTION LIMITS
	DENOTES AREAS OF REMOVAL

BENCHMARK DATA

ORIGINATING BENCHMARK

JOHNSON COUNTY BENCHMARK TTA5: A 4" COPPER PLATE, CENTER PUNCHED, STAMPED "YFTTA5" SET ON A 36" IRON ROD SET IN 6"x36" CONCRETE, 6"± BELOW GROUND LEVEL APPROXIMATELY 20 FEET FROM THE CENTER OF THE NORTHBOUND LANES OF U.S. 31 AND APPROXIMATELY 654' NORTHWEST OF ITS INTERSECTION OF NINEVEH ROAD.

BENCHMARK ELEVATION = 743.13 (NAVD 88)

UTILITY CROSSINGS

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.

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DATE	MARK	REVISIONS	BY

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CERTIFIED: 04/07/22

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TOPOGRAPHICAL SURVEY / DEMO PLAN

THE BLUFFS AT YOUNGS CREEK SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY:	CHECKED BY:
DCM	BKR

SHEET NO.
C101

S & A JOB NO.
83540MMA-S6

File Name: S:\83540MMA-S6\DWG\C100 - Topographical Survey.dwg - C101
Modified / By: March 22, 2022 11:16:27 AM / RMorris
Plotted / By: March 22, 2022 11:26:45 AM / Raven Morris

MATCHLINE "A" - SEE SHEET C201

THE BLUFFS AT YOUNGS CREEK,
SECTION 5
Instr. #_____

THE BLUFFS AT YOUNGS CREEK,
SECTION 3
Instr. #2022-005497

GEMINI DRIVE

APOLLO DRIVE

Now or Formerly
Smith, Gerald D &
Barbara A

GRAPHIC SCALE
50' 0 25' 50'
(IN FEET)
1" = 50 FT

LEGEND

	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATER LINE
	EXISTING CONTOUR
	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED CONTOUR
	PROPOSED WATER LINE
	PROPOSED SWALE
740	PROPOSED GRADE ELEVATION
	PROPOSED 5' SIDEWALK (BY HOME BUILDER) (DEVELOPER SHALL INSTALL SIDEWALKS ALONG ALL COMMON AREAS)
	PROPOSED CURB w/ 6" UNDERDRAIN
1 RED	PROPOSED 6" SUB-SURFACE DRAIN
10 750.2 MFF=750.9 MPG=750.4	LOT NUMBER PAD GRADE MINIMUM FINISH FLOOR ELEVATION MINIMUM FLOOD PROTECTION GRADE
MFF=750.0	MINIMUM FINISH FLOOR ELEVATION IS BASED OFF OF THE FOLLOWING CRITERIA: 1. 12" (1.0) ABOVE THE NEAREST UPSTREAM OR DOWNSTREAM SANITARY MANHOLE, WHICHEVER IS LOWEST. 2. 8" (0.5) ABOVE THE MPG
MPG	MINIMUM FLOOD PROTECTION GRADE (LAKE / FLOOD PROTECTION)
B.L.	BUILDING SETBACK LINE
M.E.	MATCH EXISTING
H.P.	HIGH POINT
L.P.	LOW POINT
P.V.I.	POINT OF VERTICAL INTERSECTION
GRD. CHG	GRADE CHANGE

BENCHMARK DATA

ORIGINATING BENCHMARK

JOHNSON COUNTY BENCHMARK #TAS: A 4" COPPER PLATE, CENTER PUNCHED, STAMPED "#TAS" SET ON A 36" IRON ROD SET IN 6"x36" CONCRETE, 6" BELOW GROUND LEVEL APPROXIMATELY 20 FEET FROM THE CENTER OF THE NORTHBOUND LANES OF U.S. 31 AND APPROXIMATELY 65' NORTHWEST OF ITS INTERSECTION OF NINEVEH ROAD.

BENCHMARK ELEVATION = 743.13 (NAVD 88)

UTILITY CROSSINGS

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.

EARTH WORK NOTES

1. EXCAVATION
   - A. EXCAVATED MATERIAL THAT IS SUITABLE MAY BE USED FOR FILLS. ALL UNSUITABLE MATERIAL AND ALL SURPLUS EXCAVATED MATERIAL NOT REQUIRED SHALL BE REMOVED FROM THE SITE.
   - B. PROVIDE AND PLACE, ANY ADDITIONAL FILL MATERIAL FROM OFFSITE AS MAY BE NECESSARY TO PRODUCE THE GRADES REQUIRED ON PLANS. FILL OBTAINED FROM OFFSITE SHALL BE OF QUALITY AS SPECIFIED FOR FILLS HEREIN AND THE SOURCE APPROVED BY THE DEVELOPER. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR FOR ANY COSTS FOR FILL NEEDED
2. REMOVAL OF TREES
   - A. ALL TREES AND STUMPS SHALL BE REMOVED FROM AREAS TO BE OCCUPIED BY A ROAD SURFACE OR STRUCTURE AREA. TREES AND STUMPS SHALL NOT BE BURIED ON SITE.
3. PROTECTION OF TREES
   - A. THE CONTRACTOR SHALL, AT THE DIRECTION OF THE DEVELOPER, ENDEAVOR TO SAVE AND PROTECT TREES OF VALUE AND WORTH WHICH DO NOT IMPAIR CONSTRUCTION OF IMPROVEMENTS AS DESIGNED.
   - B. IN THE EVENT CUT OR FILL EXCEEDS 0.5 FEET OVER THE ROOT AREA, THE DEVELOPER SHALL BE CONSULTED WITH RESPECT TO PROTECTIVE MEASURES TO BE TAKEN, IF ANY, TO PRESERVE SUCH TREES.
4. REMOVAL OF TOPSOIL
   - A. ALL TOPSOIL SHALL BE REMOVED FROM ALL AREAS BENEATH FUTURE PAVEMENTS OR BUILDING. TOPSOIL REMOVAL SHALL BE TO A MINIMUM DEPTH OF 6 INCHES OR TO THE DEPTH INDICATED IN THE GEOTECHNICAL REPORT PROVIDED BY THE DEVELOPER TO BE ENCAVATED OR FILLED. TOPSOIL SHOULD BE STORED AT A LOCATION WHERE IT WILL NOT INTERFERE WITH CONSTRUCTION OPERATIONS. THE TOPSOIL SHALL BE FREE OF DEBRIS AND STONES
5. UTILITIES
   - A. RULES AND REGULATION GOVERNING THE RESPECTIVE UTILITY SHALL BE OBSERVED IN EXECUTING ALL WORK UNDER THIS SECTION
   - B. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE LOCATION OF EXISTING UNDERGROUND UTILITIES 2 WORKING DAYS PRIOR TO COMMENCING WORK. FOR UTILITY LOCATIONS TO BE MARKED CALL TOLL FREE 811.
6. SITE GRADING
   - A. THE CONTRACTOR SHALL DO ALL CUTTING, FILLING, COMPACTING OF FILLS AND ROUGH GRADING REQUIRED TO BRING ENTIRE PROJECT AREA TO SUBGRADE AS SHOWN ON THE DRAWING.
   - B. THE TOLERANCE FOR PAVED AREAS SHALL NOT EXCEED 0.05 FEET ABOVE ESTABLISHED SUBGRADE. ALL OTHER AREAS SHALL NOT EXCEED 0.05 FEET PLUS OR MINUS THE ESTABLISHED GRADE. PROVIDE ROUNDINGS AT TOP AND BOTTOM OF BANKS AND OTHER BREAKS IN GRADE.
   - C. THE ENGINEER SHALL BE NOTIFIED WHEN THE CONTRACTOR HAS EXCEEDED THE TOLERANCES STATED ABOVE, SO THAT FIELD ADJUSTMENTS AND SPOT ELEVATIONS CAN BE VERIFIED BY THE ENGINEER. THE CONTRACTOR SHALL NOT REMOVE EQUIPMENT FROM THE SITE UNTIL THE ENGINEER HAS VERIFIED THAT THE JOB MEETS THE ABOVE TOLERANCE
   - D. MINIMUM ACCEPTABLE GRADE OF SWALES WITHOUT SUBSURFACE DRAIN IS 1.00%. MINIMUM ACCEPTABLE GRADE OF SWALES WITH SUBSURFACE DRAIN IS 0.50%. ANY SWALE SECTION WITHOUT SUB-SURFACE DRAIN CONSTRUCTED TO LESS THAN 1.00% SHALL BE RE-GRADED TO MEET THE MINIMUM GRADE. ANY SWALE SECTION WITH SUBSURFACE DRAIN CONSTRUCTED TO LESS THAN 0.50% SHALL BE RE-GRADED TO MEET THE MINIMUM GRADE

REAR PAD LINE
15' MINIMUM PREFERRED
OR MINIMUM WITH APPROVAL
CENTERLINE SWALE
PAD ELEV. (PER DEV. PLAN)
PAD ELEV. -0.2
6:1 PREFERRED MAX

TYPICAL REAR YARD GRADE
CROSS SECTION
SCALE NOT-TO-SCALE

Indiana 811

NO.	DATE	MARK	REVISIONS

DAVID J. STOEPPELWERTH
REGISTERED
No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

THIS DRAWING IS NOT INTENDED TO BE USED AS A BOUNDARY SURVEY. AN ORIGINAL ROUNDABOUT SURVEY, A ROUTE SURVEY OR A SURVEYOR LOCATION REPORT.

CERTIFIED: 04/07/22

STOEPPELWERTH
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SITE DEVELOPMENT PLAN

THE BLUFFS AT YOUNGS CREEK
SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

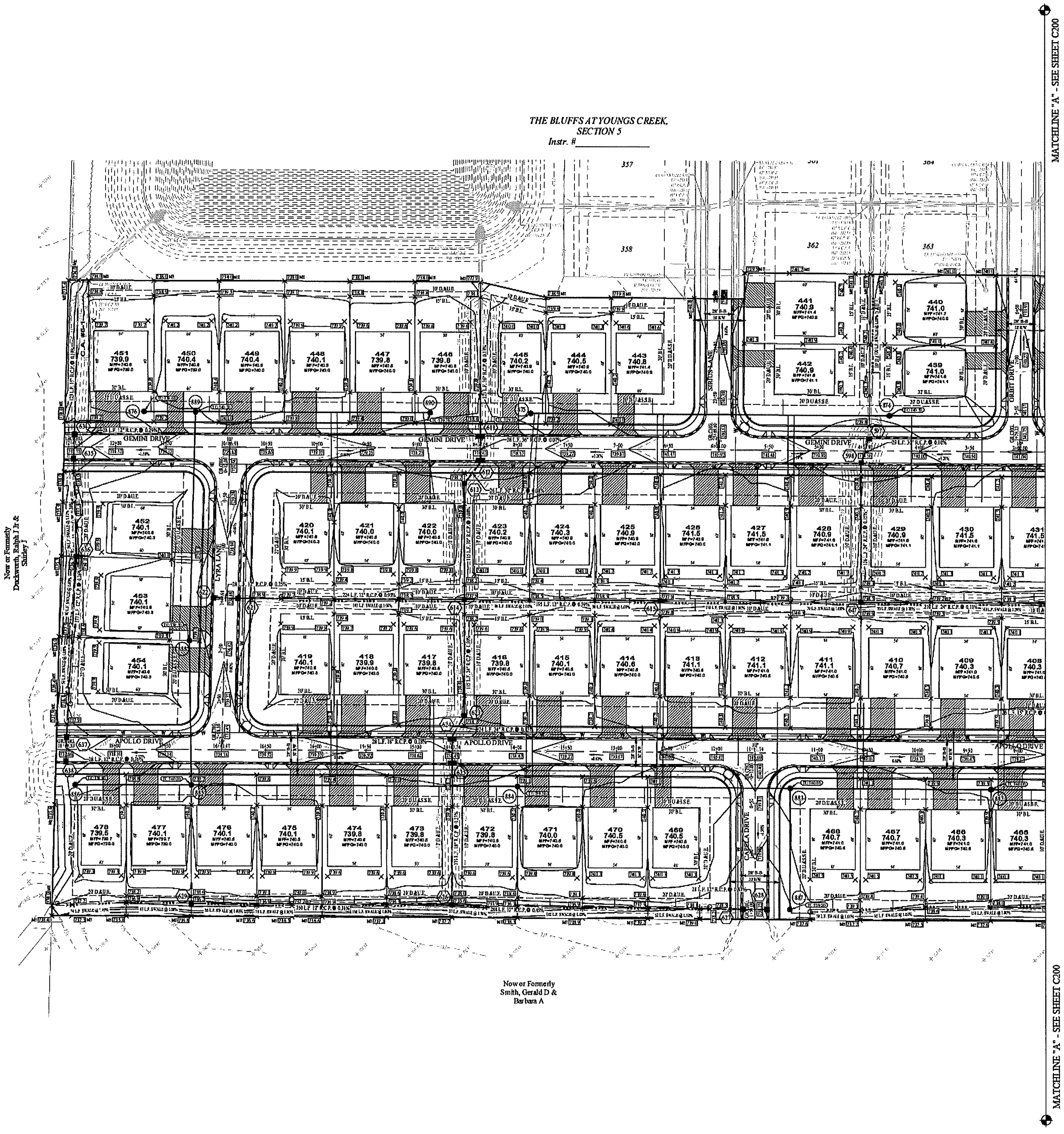
DRAWN BY: DCM | CHECKED BY: BKR

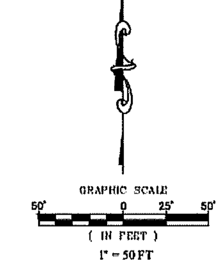
SHEET NO.
C200

S & A JOB NO.
83540MMA-S6

File Name: S:\83540MMA-S6\DWG\C200 - Site Development Plan.dwg - C200
Modified / By: March 21, 2022 10:52:48 AM / RMorris
Plotted / By: March 22, 2022 11:28:30 AM / Raven Morris

MATCHLINE "A" - SEE SHEET C201





LEGEND

— —●┤—	EXISTING SANITARY SEWER
▯=●==●==◁	EXISTING STORM SEWER
— —W— —	EXISTING WATER LINE
— —▬— —	EXISTING CONTOUR
——●┤——	PROPOSED SANITARY SEWER
■–▮–●–◀	PROPOSED STORM SEWER
——▬——	PROPOSED CONTOUR
——W——	PROPOSED WATER LINE
——>>>>——	PROPOSED SWALE
7466	PROPOSED GRADE ELEVATION
═══	PROPOSED 5' SIDEWALK (BY HOME BUILDER) (DEVELOPER SHALL INSTALL SIDEWALKS ALONG ALL COMMON AREAS)
═══	PROPOSED CURB w/ 6" UNDERDRAIN
RISER	PROPOSED 6" SUB-SURFACE DRAIN
10 750.2 MFF=750.8 MFPG=750.4	LOT NUMBER PAD GRADE MINIMUM FINISH FLOOR ELEVATION MINIMUM FLOOD PROTECTION GRADE
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MFPG	MINIMUM FLOOD PROTECTION GRADE (LAKE / FLOOD PROTECTION)
B.L.	BUILDING SETBACK LINE
M.E.	MATCH EXISTING
H.P.	HIGH POINT
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P.V.I.	POINT OF VERTICAL INTERSECTION
GRD. CHG.	GRADE CHANGE

BENCHMARK DATA

ORIGINATING BENCHMARK

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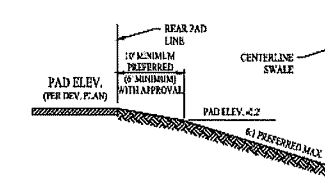

TYPICAL REAR YARD GRADE CROSS SECTION
SCALE NOT-TO-SCALE

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DAVID L. STOEPPELWERTH
REGISTERED No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

CERTIFIED: 04/07/22

MARK	DATE	REVISIONS	BY

STOEPPELWERTH
ALWAYS ON
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phone: 317.849.5935 fax: 317.849.5942

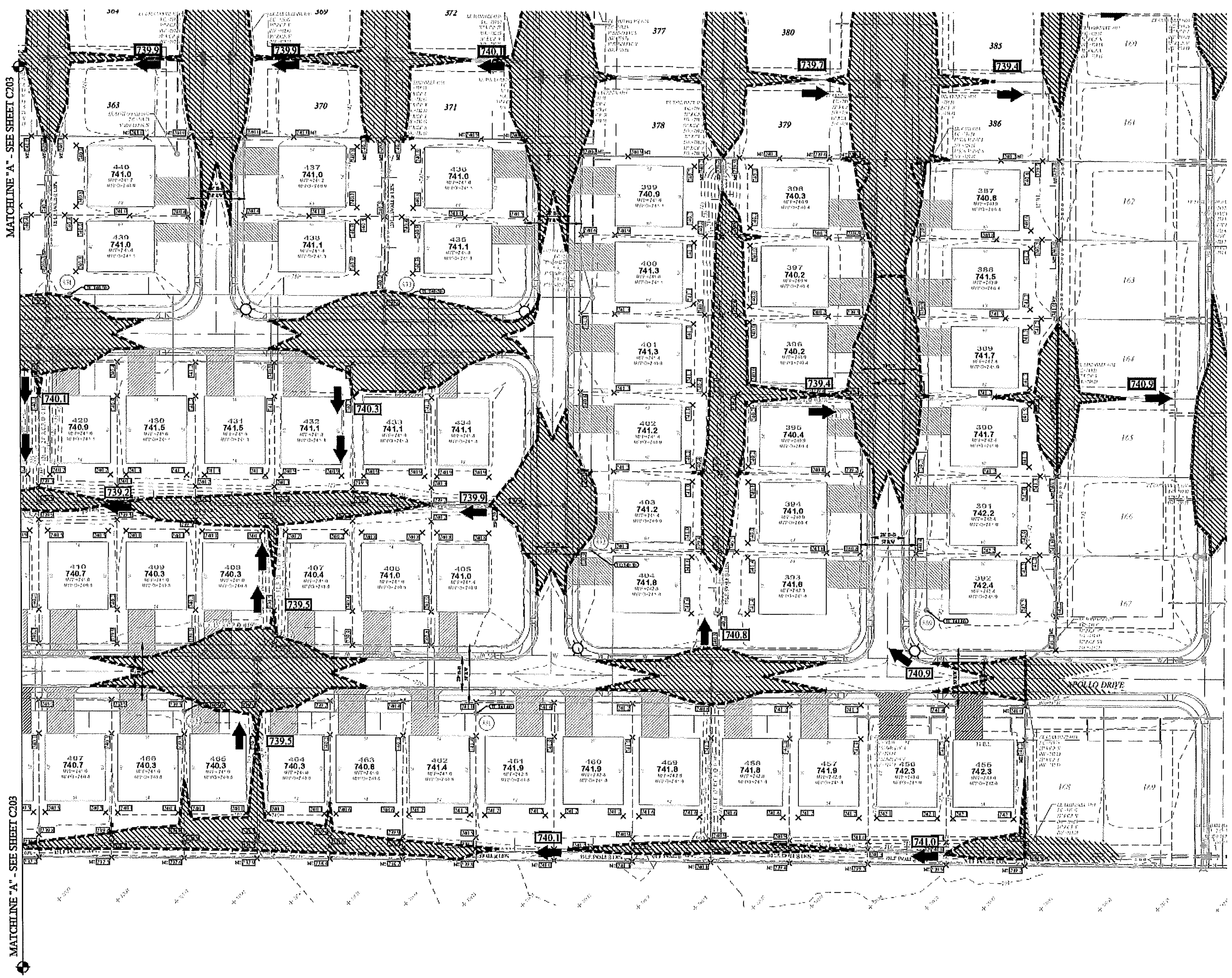
SITE DEVELOPMENT PLAN
THE BLUFFS AT YOUNGS CREEK SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY:	CHECKED BY:
DCM	BKR

SHEETNO.
C201
S & A JOB NO.
83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C200 - Site Development Plan.dwg - C201
Modified / By: March 21, 2022 10:52:48 AM / RMorris
Plotted / By: March 22, 2022 11:28:55 AM / Raven Morris



GRAPHIC SCALE

50' 0 25' 50'

(IN FEET)

1" = 50 FT

LEGEND	
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING CONTOUR
	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED CONTOUR
	PROPOSED SWALE
	PROPOSED GRADE ELEVATION
10 750.2 MFF=750.0 MFPG=750.4	LOT NUMBER PAD GRADE MINIMUM FINISH FLOOR ELEVATION MINIMUM FLOOD PROTECTION GRADE
MFF=750.0	MINIMUM FINISH FLOOR ELEVATION IS BASED OFF OF THE FOLLOWING CRITERIA: 1. 12" (1.0') ABOVE THE NEAREST UPSTREAM OR DOWNSTREAM SANITARY MANHOLE, WHICHEVER IS LOWEST. 2. 6" (0.5') ABOVE THE MFPG
	EMERGENCY OVERFLOW PONDING (FOR 100-YEAR STORM, ASSUMING ALL INLETS ARE COMPLETELY CLOGGED)
	EMERGENCY FLOOD ROUTING
	LOCATION OF STORMWATER DISCHARGE FROM SITE

THIS SHEET IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT TO BE USED FOR CONSTRUCTION.

FUTURE SECTIONS SHOWN AT FUTURE DEVELOPED CONDITIONS.

DATE	MARK	REVISIONS	BY

DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

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CERTIFIED: 04/07/22

STOEPPELWERTH

ALWAYS ON

7965 East 106th Street, Fishers, IN 46038-2505 phone: 317.849.5935 fax: 317.849.5942

EMERGENCY FLOOD ROUTE PLAN

THE BLUFFS AT YOUNGS CREEK SECTION 6

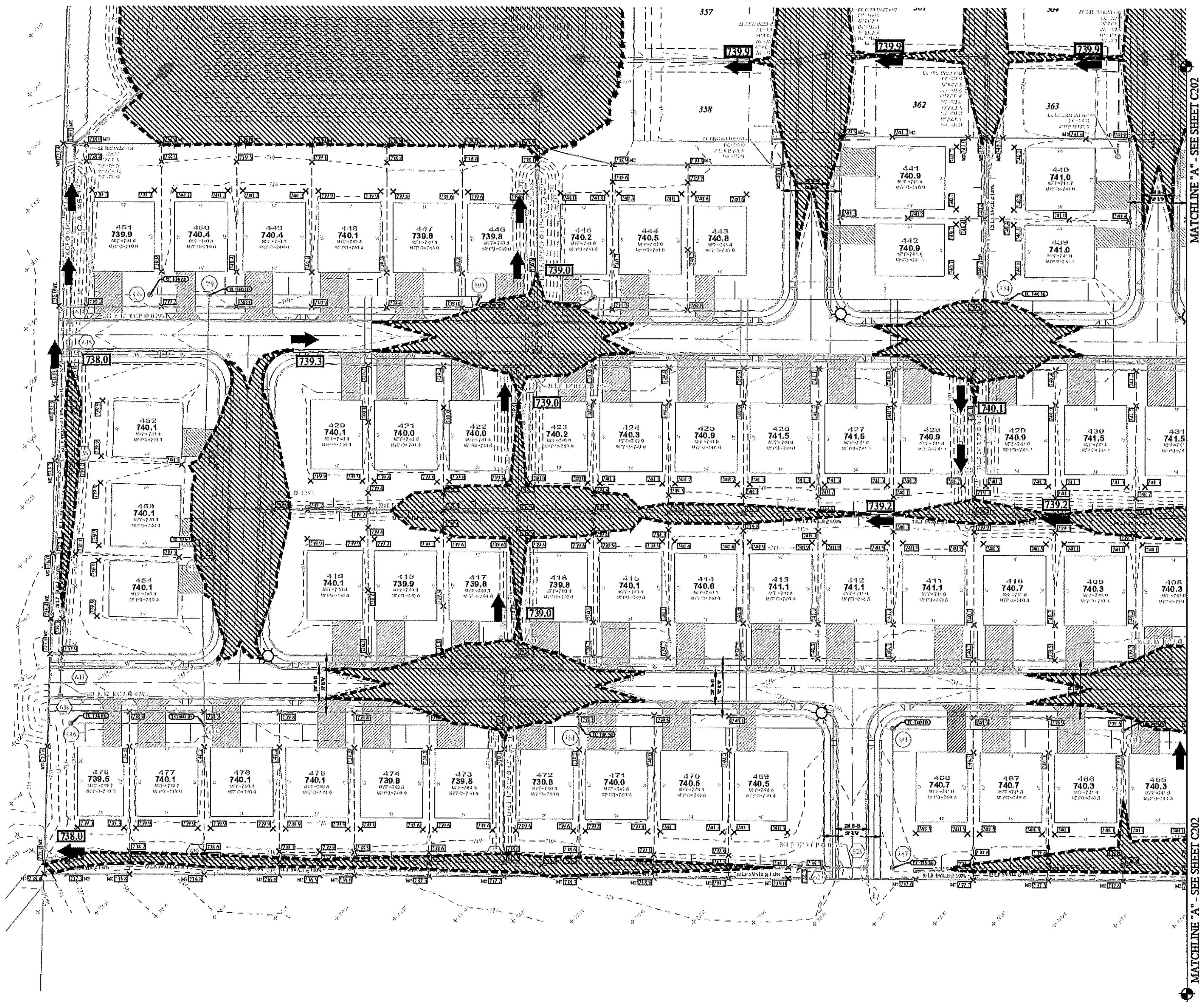
FRANKLIN, FRANKIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY: DCM CHECKED BY: BKR

SHEET NO. C202

S & A JOB NO. 83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C202 - Emergency Flood Route.dwg - C202
Modified / By: March 1, 2022 9:59:28 AM / dMargraf
Plotted / By: March 22, 2022 11:31:00 AM / Raven Morris



GRAPHIC SCALE
50' 0 25' 50'
(IN FEET)
1" = 50 FT

LEGEND

Symbol	Description
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING CONTOUR
	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED CONTOUR
	PROPOSED SWALE
	PROPOSED GRADE ELEVATION
10 / 750.2 / MFF=750.0 / MFPG=750.4	LOT NUMBER PAD GRADE MINIMUM FINISH FLOOR ELEVATION MINIMUM FLOOD PROTECTION GRADE
MFF=750.0	MINIMUM FINISH FLOOR ELEVATION IS BASED OFF OF THE FOLLOWING CRITERIA: 1. 12" (1.0') ABOVE THE NEAREST UPSTREAM OR DOWNSTREAM SANITARY MANHOLE, WHICHEVER IS LOWEST. 2. 6" (0.5') ABOVE THE MFPG
	EMERGENCY OVERFLOW PONDING (FOR 100-YEAR STORM, ASSUMING ALL INLETS ARE COMPLETELY CLOGGED)
	EMERGENCY FLOOD ROUTING
	LOCATION OF STORMWATER DISCHARGE FROM SITE

THIS SHEET IS FOR INFORMATIONAL PURPOSES ONLY AND IS NOT TO BE USED FOR CONSTRUCTION.

FUTURE SECTIONS SHOWN AT FUTURE DEVELOPED CONDITIONS.

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EMERGENCY FLOOD ROUTE PLAN

THE BLUFFS AT YOUNGS CREEK SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY: DCM
CHECKED BY: BKR
SHEET NO. C203
S & A JOB NO. 83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C202 - Emergency Flood Route.dwg - C203
Modified / By: March 1, 2022 8:58:28 AM / dMargraf
Plotted / By: March 22, 2022 11:31:18 AM / Raven Morris

THE BLUFFS AT YOUNGS CREEK,
SECTION 5
Instr. #_____

THE BLUFFS AT YOUNGS CREEK,
SECTION 3
Instr. #2022-005497

MATCHLINE "A" - SEE SHEET C300B

MATCHLINE "A" - SEE SHEET C300B

Now or Formerly
Smith, Gerald D &
Barbara A

APOLLO DRIVE

POSTING SIGN LOCATION

PROPOSED 20' x 150' MIN
STONE ACCESS DRIVE

FUEL OIL TANK (DOUBLE WALL)

PORT-O-LET

PROPOSED CONSTRUCTION
STAGING AREA

CONSTRUCTION DUMPSTER

CONCRETE WASH OUT AREA

GRAPHIC SCALE
50' 0 25' 50'
(IN FEET)
1" = 50 FT

LEGEND	
	DENOTES CONSTRUCTION LIMITS
	DENOTES SILT FENCE
	TEMPORARY BELOW GRADE "DROP INLET PROTECTION BASKET"
	TEMPORARY "DROP INLET PROTECTION BASKET", "SEDIMENT CONTROL DEVICES"
	ROCK HORSE SHOE DAM

THIS SHEET TO BE USED FOR EROSION CONTROL ONLY.

PERSON ONSITE RESPONSIBLE FOR EROSION CONTROL:
MARK ALT - WINDSTAR HOMES, LLC
MARK ALT
PHONE: (317) 223-4257

NOTES

1. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED IN THE FIELD BY THE INSPECTOR.
2. NO EARTH DISTURBING ACTIVITIES MAY TAKE PLACE WITHOUT AN APPROVED STORM WATER MANAGEMENT PERMIT.
3. ANY DISTURBED LAND WHICH WILL BE LEFT UNDISTURBED FOR 14 DAYS OR MORE SHALL RECEIVE TEMPORARY MULCH SEEDING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE ADEQUATE VEGETATIVE GROWTH OCCURS TO STABILIZE THOSE AREAS, IF THE VEGETATION DOES NOT EXHIBIT SUFFICIENT GROWTH TO PROVIDE STABILIZATION, THE WORK MUST EITHER BE REPEATED OR OTHER MEANS UNDERTAKEN TO ACHIEVE REQUIREMENT.

NO.	DATE	MARK	REVISIONS	BY

DAVID J. STOEPPELWERTH
REGISTERED
No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

THIS DRAWING IS NOT INTENDED TO BE USED FOR CONSTRUCTION OR AS AN ORIGINAL ROUND ANY SURVEY, A ROUTE SURVEY OR A SURVEYOR LOCATION REPORT.

CERTIFIED: 04/07/22

David J. Stoeppelwerth

STOEPPELWERTH
ALWAYS ON
7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

INITIAL STORM WATER POLLUTION PREV. PLAN
THE BLUFFS AT YOUNGS CREEK
SECTION 6
JOHNSON COUNTY, INDIANA
FRANKLIN, FRANKLIN TOWNSHIP

DRAWN BY: DCM | CHECKED BY: BKR
SHEET NO. C300A
JOB NO. 83540MMA-S6

Indiana 811

File Name: S:\83540MMA-S6\DWG\C300 - Erosion Control - Initial.dwg - C300A
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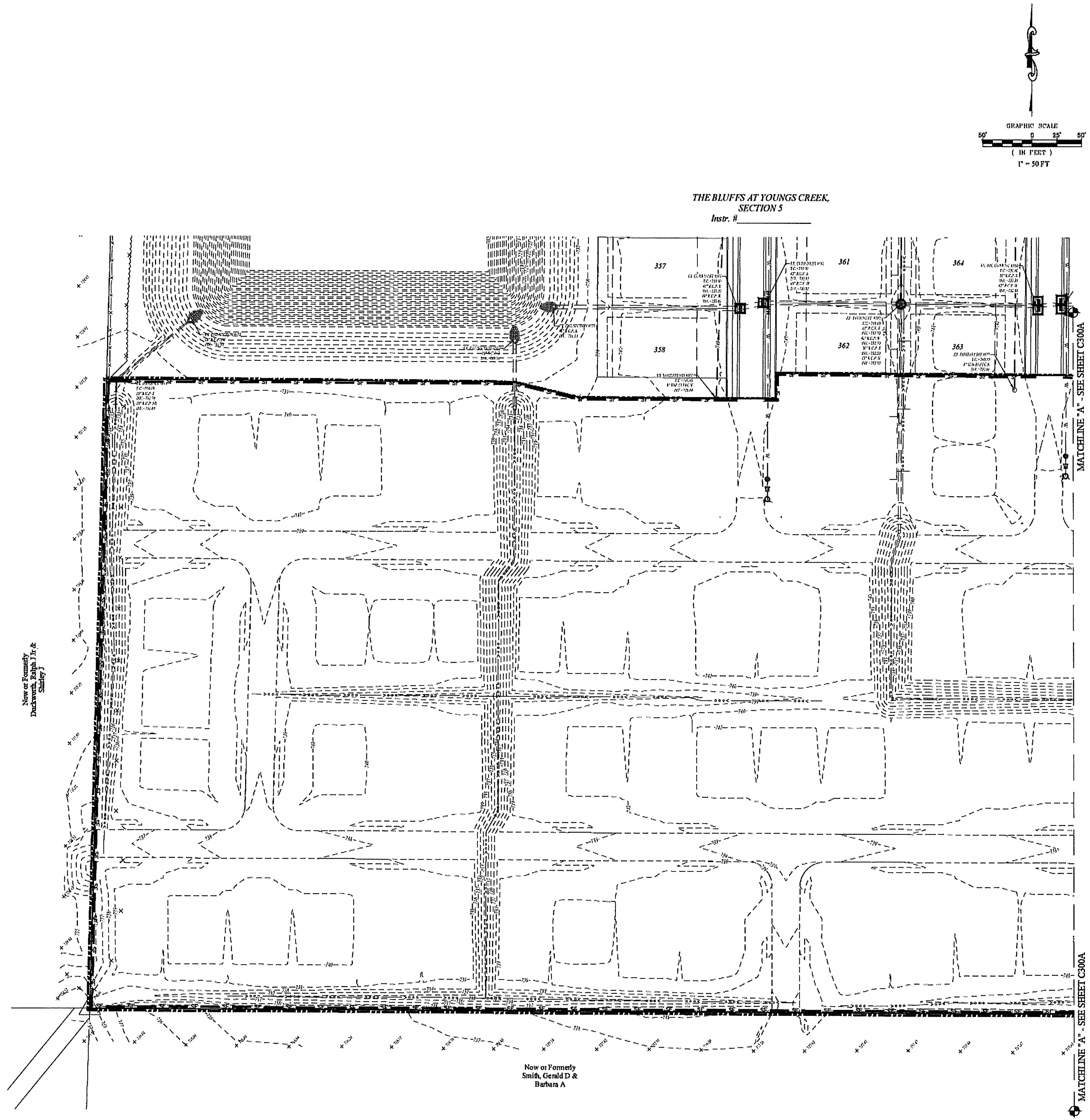
Plotted / By: March 22, 2022 11:32:20 AM / Raven Morris



LEGEND	
(dash line)	DENOTES CONSTRUCTION LIMITS
(silt fence line)	DENOTES SILT FENCE
(square)	TEMPORARY BELOW GRADE "DROP INLET PROTECTION BASKET"
(circle)	TEMPORARY "DROP INLET PROTECTION BASKET", "SEDIMENT CONTROL DEVICES"
(horseshoe)	ROCK HORSE SHOE DAM

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DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

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CERTIFIED: 04/07/22

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INITIAL STORM WATER POLLUTION PREV. PLAN

THE BLUFFS AT YOUNGS CREEK SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP — JOHNSON COUNTY, INDIANA

DRAWN BY: DCM — CHECKED BY: BKR

SHEET NO. C300B

S & A JOB NO. 83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C300 - Erosion Control - Initial.dwg - C300B
Modified / By: March 21, 2022 11:00:01 AM / RMorris
Plotted / By: March 22, 2022 11:32:29 AM / Raven Morris

LEGEND	
	DENOTES CONSTRUCTION LIMITS
	DENOTES SILT FENCE
	TEMPORARY BELOW GRADE "DROP INLET PROTECTION BASKET"
	TEMPORARY "DROP INLET PROTECTION BASKET", "SEDIMENT CONTROL DEVICES"
	ROCK HORSE SHOE DAM
	ROCK CHECK DAM
	LOCATION OF STORMWATER DISCHARGE FROM SITE (SEE SECTION A9 ON SHEET C303)

THIS SHEET TO BE USED FOR EROSION CONTROL ONLY.

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MARK ALT
PHONE: (317) 223-4257

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THE BLUFFS AT YOUNGS CREEK, SECTION 5
Instr. #_____

MATCHLINE "A" - SEE SHEET C301B

MATCHLINE "A" - SEE SHEET C301B

Now or Formerly
Smith, Gerald D &
Barbara A

THE BLUFFS AT YOUNGS CREEK, SECTION 3
Instr. #2022-005497

DAVID J. STOEPPELWERTH
REGISTERED
No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

THIS DRAWING IS NOT INTENDED TO BE USED AS A PROPERTY LINE SURVEY, BOUNDARY SURVEY OR A TOPO SURVEY OR A SURVEYOR LOCATION REPORT.

CERTIFIED: 04/07/22

DATE	MARK	REVISIONS	BY

STOEPPELWERTH
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TEMPORARY STORM WATER POLLUTION PREV. PLAN
THE BLUFFS AT YOUNGS CREEK
SECTION 6
FRANKLIN, FRANKLIN TOWNSHIP — JOHNSON COUNTY, INDIANA

DRAWN BY:	CHECKED BY:
DCM	BKR

SHEET NO
C301A

S & A JOB NO
83540MMA-S6

Indiana 811

File Name: S:\83540MMA-S6\01WG\C301 - Erosion Control - Temporary.dwg - C301A
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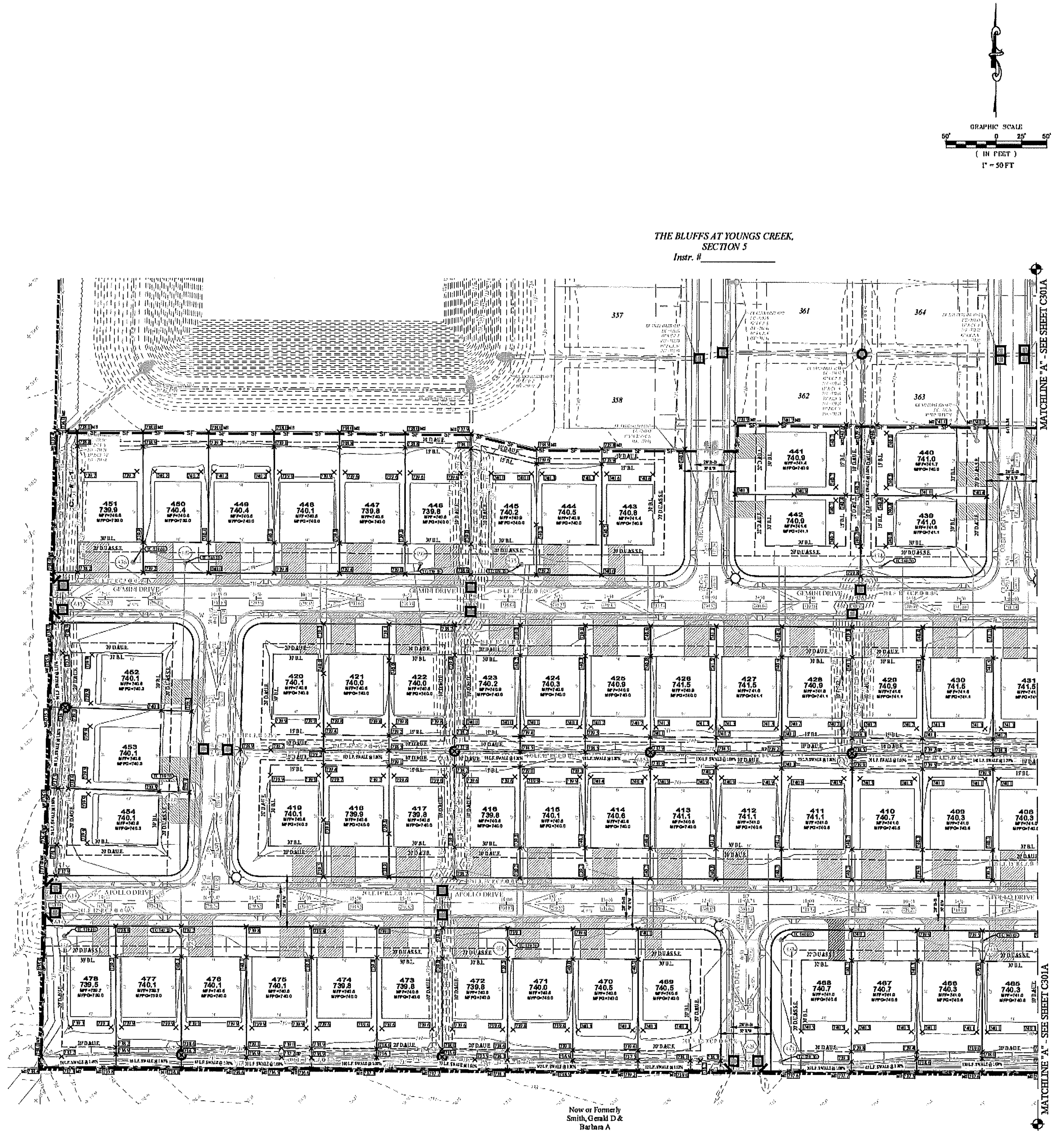

LEGEND

Symbol	Description
(dashed line)	DENOTES CONSTRUCTION LIMITS
(fence line)	DENOTES SILT FENCE
□	TEMPORARY BELOW GRADE "DROP INLET PROTECTION BASKET"
○	TEMPORARY "DROP INLET PROTECTION BASKET", "SEDIMENT CONTROL DEVICES"
(symbol)	ROCK HORSE SHOE DAM
(symbol)	ROCK CHECK DAM
*	LOCATION OF STORMWATER DISCHARGE FROM SITE (SEE SECTION AS ON SHEET C103)

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PERSON ONSITE RESPONSIBLE FOR EROSION CONTROL:
MARK ALT - WINDSTAR HOMES, LLC
MARK ALT
PHONE: (317) 223-4257

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DATE	MARK	REVISIONS	BY

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CERTIFIED: 04/07/22

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TEMPORARY STORM WATER POLLUTION PREV. PLAN

THE BLUFFS AT YOUNGS CREEK SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY: DCM CHECKED BY: BKR

SHEET NO. C301B

S & A JOB NO. 83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C301 - Erosion Control - Temporary.dwg - C301B
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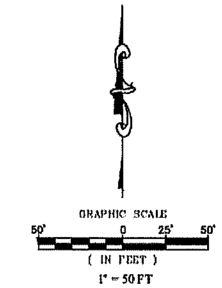
Plotted / By: March 22, 2022 11:34:39 AM / Raven Morris



LEGEND

— x x — x x —	DENOTES CONSTRUCTION LIMITS
— SF — SF —	DENOTES SILT FENCE
(hatched)	DENOTES PERMANENT SEEDING & MULCH AREAS
(crosshatched)	DENOTES SEEDING W/ FIBER BLANKET #S75 BY NORTH AMERICAN GREEN
(dotted)	DENOTES TEMPORARY SEEDING & MULCH AREAS
	REFER TO SHEETS C312 - C313 FOR SEEDING/MULCHING SPECIFICATIONS

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MARK ALT
PHONE: (317) 223-4257

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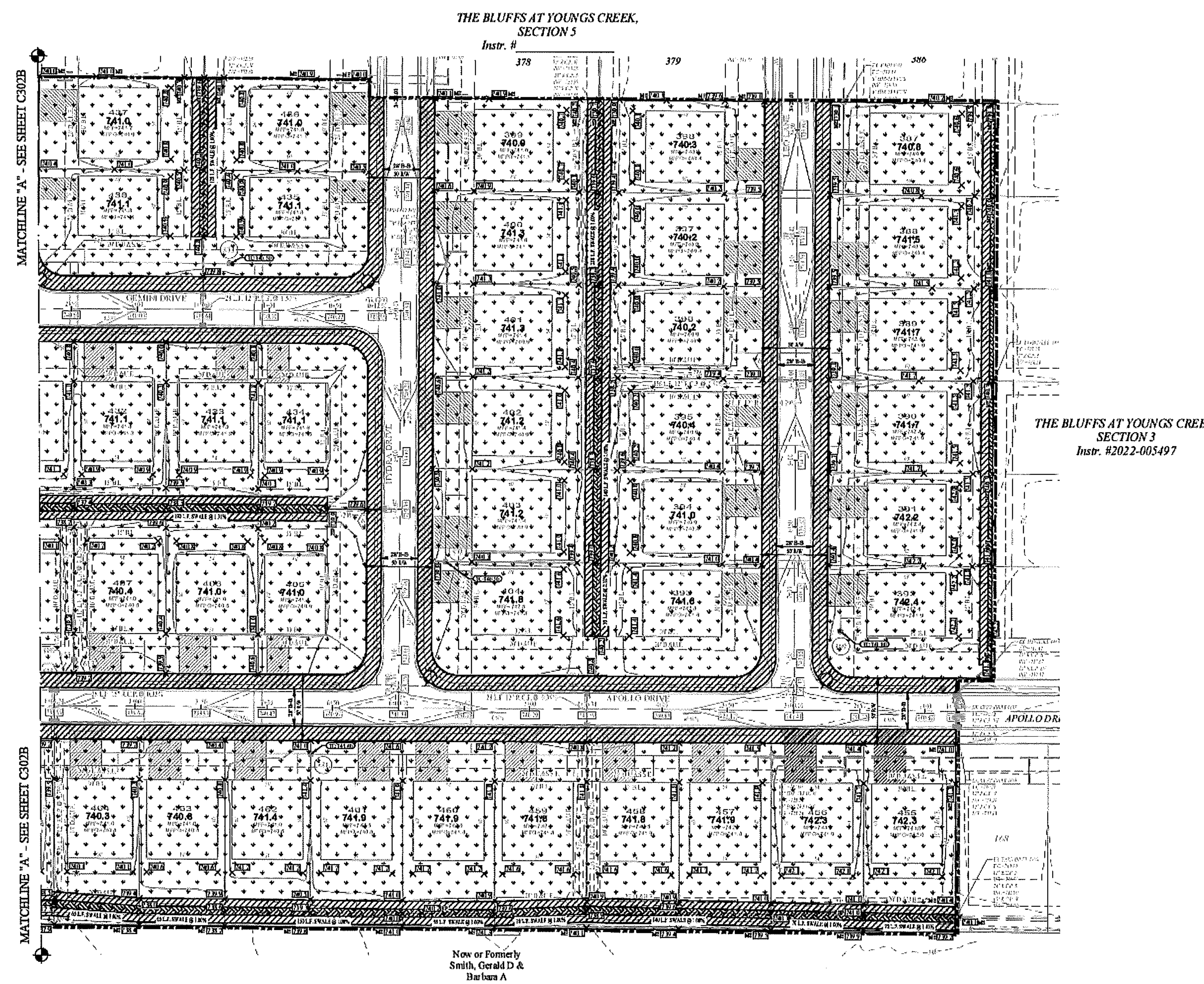

REVISIONS		
DATE	MARK	BY

DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

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CERTIFIED: 04/07/22

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PERMANENT STORM WATER POLLUTION PREV. PLAN

THE BLUFFS AT YOUNGS CREEK
SECTION 6

FRANKLIN, FRANKIN TOWNSHIP — JOHNSON COUNTY, INDIANA

DRAWN BY: DCM
CHECKED BY: BKR
SHEET NO. C302A
S & A JOB NO. 83540MMA-S6

Indiana 811

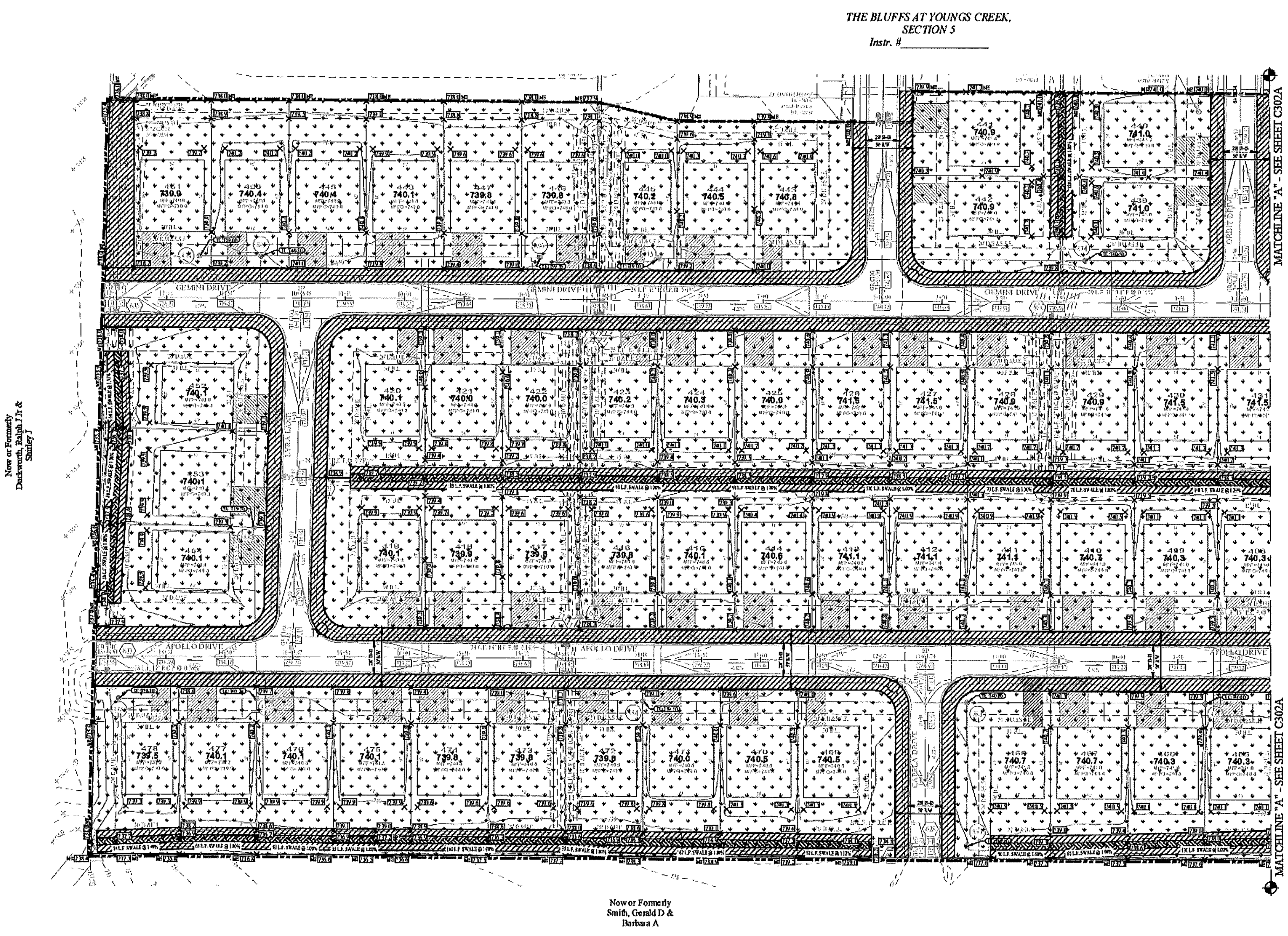
File Name: S:\83540MMA-S06\DWG\C302 - Erosion Control - Permanent.dwg - C302A
Modified / By: March 21, 2022 11:10:50 AM / RMorris
Plotted / By: March 22, 2022 11:38:41 AM / Raven Morris

GRAPHIC SCALE

50' 0 25' 50'

(IN FEET)

1" = 50 FT



LEGEND	
(dash-dot line)	DENOTES CONSTRUCTION LIMITS
(line with markers)	DENOTES SILT FENCE
(hatched)	DENOTES PERMANENT SEEDING & MULCH AREAS
(cross-hatched)	DENOTES SEEDING W/ FIBER BLANKET #S75 BY NORTH AMERICAN GREEN
(dotted)	DENOTES TEMPORARY SEEDING & MULCH AREAS
	REFER TO SHEETS C312 - C313 FOR SEEDING/MULCHING SPECIFICATIONS

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REVISIONS | MARK | DATE | BY

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PERMANENT STORM WATER POLLUTION PREV. PLAN

THE BLUFFS AT YOUNGS CREEK SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY: DCM | CHECKED BY: BKR

SHEET NO. C302B

S&A JOB NO. 83540MMA-S6

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PERSON ONSITE RESPONSIBLE FOR EROSION CONTROL:
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MARK ALT
PHONE: (317) 223-4257

THE BLUFFS AT YOUNGS CREEK, SECTION 6

SITE NAME
The area scheduled for construction is known as "The Bluffs at Youngs Ceek, Section 6" (hereinafter referred to as the "Project").

PROJECT LOCATION
The property is located south of the Windstar Subdivision, approximately 0.5 miles west of S Nineveh Road (Airport Road) and Windstar Blvd.
Latitude is 39° 28' 00" N
Longitude is 86° 04' 17" W

OWNER'S INFORMATION
Windstar Homes, LLC
5374 Cayman Drive
Carmel, Indiana 46033
Phone: (317) 223-4257
Contact Person: Mark Alt, Member

OPERATOR'S INFORMATION
Windstar Homes, LLC
5374 Cayman Drive
Carmel, Indiana 46033
Phone: (317) 223-4257
Contact Person: Mark Alt, Member

NOTICE OF INTENT
All parties defined as owners or operators must submit a Notice of Intent (NOI) at least 48 hours prior to commencement of on-site construction activities. Submittal of late NOI's is not prohibited; however, authorization under the construction general permit is only for discharges that occur after permit coverage is granted. Unpermitted discharges may be subject to enforcement actions by the EPA. For the purposes of this permit, an operator is defined as any party meeting either of the following requirements;

a. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications.

b. The party has day-to-day operational control of those activities at a project that are necessary to ensure compliance with a stormwater pollution prevention plan for the site or other permit conditions.

A1 - Plan Index
Cover Sheet

A2 - 11" x 17" PLAT
This drawing is attached in the O & M Manual.

A3 - PROJECT NARRATIVE
This project includes the construction of 92 lots and 1 common area which consists of approximately 24.550 acres. Construction will include pad grades for homes, associated roadways, landscaping, drainage infrastructure,

A4 - VICINITY MAP
A copy of the vicinity map is shown on the Cover Sheet.

A5 - LEGAL DESCRIPTION OF PROJECT SITE
The site is part of a tract of land as described on the Final Plat.

A6 - LOCATION OF ALL LOTS AND PROPOSED SITE IMPROVEMENTS
The site will be subdivided as shown on the Site Plans. Please refer to Sheets C200 - C201 for detail.

A7 - HYDROLOGIC UNIT CODE (HUC14)
05120204090040, Youngs Creek - Ray Creek

A8 - STATE AND FEDERAL WATER QUALITY PERMITS
IDEM Rule 5

A9 - SPECIFIC POINT WHERE STORMWATER DISCHARGE WILL LEAVE THIS SITE
Stormwater will leave the site through proposed and existing storm sewers and lakes

A10 - LOCATION AND NAME OF ALL WETLANDS, LAKES, AND WATERCOURSES ON AND ADJACENT TO THIS SITE
Youngs Creek approximately 900' northwest of this site.

A11 - IDENTIFICATION OF ALL RECEIVING WATERS
The overall site outlets to existing storm sewer system and existing lake to the north within Windstar, Subdivision, and northwest to Lake #4, and ultimately Youngs Creek - Buckhart Creek.

A12 - IDENTIFICATION OF ALL POTENTIAL DISCHARGES TO GROUND WATER
None

A13 - 100-YEAR FLOODPLAINS, FLOODWAYS, AND FLOODWAY FRINGES
No portion of the developed site is located within a Special Flood Hazard Area (Zone AE). This information was obtained from Flood Insurance Rate Map (FIRM) Panel 18081C0229D for Johnson County, Indiana dated August 02, 2007.

A14 - PRE-CONSTRUCTION AND POST-CONSTRUCTION ESTIMATE OF PEAK DISCHARGE
Outlet 4 (North) - Interim Section 6

Allowable 10-year discharge:	141.48 cfs	Post-construction 2-year discharge:	16.35 cfs
Allowable 100-year discharge:	273.19 cfs	Post-construction 10-year discharge:	35.61 cfs
		Post-construction 100-year discharge:	49.55 cfs

A15 - ADJACENT LAND USE
North: Residential
East: Residential
South: Agricultural
West: Agricultural

A16 - LOCATIONS AND APPROXIMATE BOUNDARIES OF ALL DISTURBED AREAS
See Sheets C200 - C201 and C301A - C302B.

A17 - IDENTIFICATION OF EXISTING VEGETATIVE COVER
Existing site consists of vegetation and crops.

A18 - SOILS MAP INCLUDING SOIL DESCRIPTIONS AND LIMITATIONS
Soil information from the Johnson County Soil Survey is shown on the Cover Sheet and Sheet C304.

A19 - LOCATIONS, SIZE, AND DIMENSIONS OF PROPOSED STORMWATER SYSTEMS
Locations of stormwater systems: See Sheets C200 - C201 and C600 - C602.
Size of storm sewers: See Sheets C200 - C201 and C600 - C602.
Details of storm inlets and manholes: See Sheets C600 - C602 and details on Sheets C801A - C801B.

A20 - PLANS FOR ANY OFF-SITE CONSTRUCTION ACTIVITIES ASSOCIATED WITH THIS PROJECT
None

A21 - LOCATIONS OF PROPOSED SOIL STOCKPILES AND/OR BORROW/DISPOSAL AREAS
None.

A22 - EXISTING SITE TOPOGRAPHY
Refer to Sheets C100 - C101 for the existing site topography plan.

A23 - PROPOSED FINAL SITE TOPOGRAPHY
Refer to Sheets C200 - C201 for the proposed final site topography plan.

B1 - DESCRIPTION OF POTENTIAL POLLUTANT SOURCES ASSOCIATED WITH CONSTRUCTION ACTIVITIES

The following potential pollutant sources may be associated with construction activities on site:
1. Material storage areas (more specifically described below)
2. Construction waste material
3. Fuel storage areas and fueling stations
4. Exposed soils
5. Leaking vehicles and equipment
6. Sanitary waste from temporary toilet facilities
7. Litter
8. Windblown dust
9. Soil tracking off site from construction equipment
10 Water from concrete washout

The following construction materials will be staged or stored on site at various points during development of the site.
1. Structural fill
2. Road base
3. Concrete drainage pipe
4. Concrete culverts
5. Precast concrete manholes

B2 - SEQUENCE DESCRIBING STORMWATER QUALITY MEASURE IMPLEMENTATION RELATIVE TO LAND-DISTURBING ACTIVITIES
1. The Contractor shall schedule a Pre-construction meeting with the City of Franklin prior to any constructing on the site being started. The Contractor and/or Developer shall notify IDEM and the City of Franklin 48 hours prior to start of construction.
2. Following the required pre-construction meeting the Contractor shall install the "posting information center". The location of the posting information center is shown on Sheets C300B and C301B. The posting information center is the location where a copy of the approved IDEM Rule 5 Permit, Approved SWPP Plan, signed O&M Manual and Maintenance Logs are to be located. The Contractor shall proceed to construct the construction entrance after all posting requirements have been met.
3. Immediately following the installation of the construction entrance, the Contractor shall construct the maintenance and refueling area. Please refer to the maintenance and refueling area details and specifications on Sheets C305 - C307.
4. Prior to any earth moving, the Contractor shall install all silt fence as shown on Sheets C300A - C300B. The details and specifications for silt fence installation are located on Sheet C307.
10. The Contractor shall protect existing curb inlets with drop inlet protection baskets and end section inlets with rock horse shoe dams as shown on Sheets C301A - C301B.
Refer to rock horseshoe dam detail on Sheet C304.
Refer to drop inlet protection basket details and specifications on Sheets C306-C307.
11. When the "existing" site/construction limits are completely protected, the Contractor shall begin stripping the existing top soil within the construction limits and utilize in non-structural fill areas.
12. The Contractor shall install Lake inlet pipes from structures 572-573, 579-580, 609-610, 632-633 and install associated erosion control methods as show on C302A - C302B. Immediately following construction, the Contractor shall stabilize the banks with erosion control blanket as shown on Sheets C302A - C302B.
Refer to erosion control blanket details and specifications on Sheet C306.
13. The Contractor shall install the proposed storm sewers and cut the proposed swales as shown on Sheets C200 - C201. Swales shall be stabilized with an erosion control blanket immediately following their construction.
14. All inlets shall be protected with drop inlet baskets immediately following their installation.
Refer to drop inlet protection basket details and specifications on Sheets C306-C307.
15. The Contractor shall continue to grade the remainder of the site as shown on Sheets C200 - C201.
16. The Contractor shall excavate around the existing sanitary manholes and storm structures and expose the proposed connection points for the gravity sanitary sewer and storm sewer for this project
17. The proposed onsite storm sewer and sanitary sewer shall be installed concurrently with each other when crossings are encountered.
18. The Contractor shall install water main.
19. The Contractor shall prepare the sub-grade for the proposed road system. If lime stabilization is the method chosen, dust shall be kept to a minimum. Dust shall be removed from the construction vehicles prior to leaving the site.
20. The Contractor shall install all concrete curb.
21. The Contractor shall have all other appropriate utilities installed. It is ultimately the responsibility of the Contractor to ensure that the trench area is seeded and mulched immediately following the installation of each utility.
22. The Contractor shall install all asphalt pavement.
23. The Contractor shall install the proposed erosion control blanket in the remaining swales as shown on Sheets C302A - C302B.
22. The Contractor shall permanent seed all areas between the back of curb and the constructed pads and all other areas that are illustrated on Sheets C302A - C302B.
Refer to the seed mixture details and specifications on Sheets C305 - C306.
23. The Contractor shall schedule a site inspection with the City of Franklin to ensure that the site is stabilized. After the Inspector approves the site conditions, the Contractor shall remove all temporary erosion control practices.
24. The post-construction erosion control practices then become the responsibility of the Developer of this project.
25. The Developer of this project shall continue to monitor this site for good house keeping on the post-construction BMP's until a NOT is filed with IDEM.

B3 - STABLE CONSTRUCTION ENTRANCE LOCATIONS AND SPECIFICATIONS
Construction entrance will be in place prior to this phase of construction. Entrance is shown for reference on Sheet C300A.
Refer to Sheets C305 for details and specifications.

B4 - SEDIMENT CONTROL MEASURES FOR SHEET FLOW AREAS
Sheet flow areas will be protected by seed and mulch or hydroseeding. Erosion control blankets will be installed on sloped areas where the slope exceeds 3:1 (horizontal to vertical). Silt fencing will be utilized to minimize runoff from construction areas, as identified on Sheet C300A - C301B.
Refer to Sheet C307 for details and specifications.

B5 - SEDIMENT CONTROL MEASURES FOR CONCENTRATED FLOW AREAS
Erosion control blankets will be used in swales and the banks of Lake #3 as shown on Sheets C302A - C302D. Sheet flow areas will be protected by seed and mulch or hydroseeding. Erosion control blankets will be installed on sloped areas where the slope exceeds 3:1 (horizontal to vertical). Silt fencing will be utilized to minimize runoff from construction areas, as identified on Sheets C302A - C302D.
Refer to erosion control blanket details and specifications on Sheet C306.

B6 - STORM SEWER INLET PROTECTION MEASURE LOCATIONS AND SPECIFICATIONS
The Contractor has the option to use one of several storm sewer inlet protection methods, depending on the inlet location and the stage of construction. Manufactured products such as the Catch-All products may also be used at the Contractor's discretion. Manufactured products shall be installed in accordance with the manufacturer's specifications. Straw bales will not be allowed as inlet protection measures. Coconut fiber mats are recommended.
Refer to Sheets C300A - C300B & C301A - C301B for locations and refer to Sheets C306 - C307 for details and specifications

B7 - RUNOFF CONTROL MEASURES
The silt fencing will be utilized to slow runoff and minimize sediment discharge.
Refer to Sheet C307 for additional information.

B8 - STORMWATER OUTLET PROTECTION SPECIFICATIONS
Rip-rap revetment will be used at each of the stormwater outlets where not connecting into existing manholes.
Refer to Sheets C301A & C301B for additional information.
Refer to Sheet C306 for details.

B9 - GRADE STABILIZATION STRUCTURE LOCATIONS AND SPECIFICATIONS
Erosion control blankets will be utilized as grade-stabilization structures.
Refer to Sheet C306 for additional information.

B10 - LOCATION, DIMENSIONS, SPECIFICATIONS, AND CONSTRUCTION DETAILS OF EACH STORMWATER QUALITY MEASURE
Temporary "Coconut Fiber Mat", Below Grade "Drop Inlet Protection Basket", Temporary "Drop Inlet Protection Basket", Sediment Control Devices". Each measure is shown on Sheets C301A - C301B.
Refer to details and specifications on Sheets C306 - C307.

B11 - TEMPORARY SURFACE STABILIZATION METHODS APPROPRIATE FOR EACH SEASON
Refer to Sheets C305 - C306 for specifications.

B12 - PERMANENT SURFACE STABILIZATION SPECIFICATIONS
Refer to Sheets C305 - C306 for specifications.

B13 - MATERIAL HANDLING AND SPILL PREVENTION PLAN
Solid Waste Disposal

No solid material, including building materials, is permitted to be discharged to surface waters or buried on site. All solid waste materials, including disposable materials incidental to the construction activity, must be collected in containers or closed dumpsters. The collection containers must be emptied periodically and the collected material hauled to a landfill permitted by the State and/or appropriate local municipality to accept the waste for disposal.

A foreman or supervisor should be designated in writing to oversee, enforce, and instruct construction workers on proper solid waste procedures.

Hazardous Waste

Whenever possible, minimize the use of hazardous materials and generation of hazardous wastes. All hazardous waste materials will be disposed in the manner specified by federal, state, or local regulations or by the manufacturer.

Use containment berms in fueling and maintenance areas and where potential for spills is high.

A foreman or supervisor should be designated in writing to oversee, enforce and instruct construction workers on proper hazardous waste procedures. The location of any hazardous waste storage areas should be indicated on the stormwater pollution prevention plan by the operator following on-site location of the facility.

Dust Control/Off-site Vehicle Tracking

During construction, water trucks should be used, as needed, by each contractor or subcontractor to reduce dust. After construction, the site should be stabilized to reduce dust.

Construction traffic should enter and exit the site at a Construction Entrance with a rock pad or equivalent device. The purpose of the rock pad is to minimize the amount of soil and mud that is tracked into existing streets. If sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize offsite impacts.

Sanitary/Septic

Contractors and subcontractors must comply with all state and local sanitary sewer, portable toilet, or septic system regulations. Sanitary facilities shall be provided at the site by each contractor or subcontractor throughout construction activities. The sanitary facilities should be utilized by all construction personnel and be serviced regularly. All expenses associated with providing sanitary facilities are the responsibility of the contractors and subcontractors.

The location of any sanitary facilities should be indicated on the stormwater pollution prevention plan by the operator following on-site location of said facilities.

Water Source

Water used to establish and maintain grass, to control dust, and for other construction purposes must originate from a public water supply or private well approved by the State or local health department.

Equipment Fueling and Storage Areas

Equipment fueling, maintenance, and cleaning should only be completed in protected areas (i.e., bermed area). Leaking equipment and maintenance fluids will be collected and not allowed to discharge into soil where they may be washed away during a rain event.

Equipment wash down (except for wheel washes) should take place within an area surrounded by a berm. The use of detergents is prohibited.

Hazardous Material Storage

Chemicals, paints, solvents, fertilizers, and other toxic or hazardous materials should be stored in their original containers (if original container is not resealable, store the products in clearly labeled, waterproof containers). Except during application, the containers should be kept in trucks or in bermed areas within covered storage facilities. Runoff containing such materials shall be collected, removed from the site, and disposed of in accordance with the federal, state, and local regulations.

As may be required by federal, state, or local regulations, the Contractor should have a Hazardous Materials Management Plan and/or Hazardous Materials Spill Prevention Program in place. A foreman or supervisor should be designated in writing to oversee, enforce, and instruct construction workers on proper hazardous materials storage and handling procedures. The location of any hazardous material storage areas should be indicated on the stormwater pollution prevention plan by the operator following on-site location of the storage areas.

Spill Response Directions

In the event of small spills, please contact the construction supervisor. In the event of spills that require removal of soils or other materials, please contact the construction supervisor, developer, County Surveyor's Office and the Local Fire Department.

In the event of spills that have potential groundwater or surface water contamination, please contact the construction supervisor, developer, County Surveyor's Office, Local Fire Department and IDEM.

Contact Numbers

Emergency Response	911
Franklin Fire Department	(888) 736-3650
Franklin Police Department	(317) 736-3670
Indiana Department of Natural Resources	(317) 477-8773
Indiana Department of Environmental Management	(317) 233-7745
Johnson County Soil and Water	(317) 736-9540
Windstar Homes, LLC	(317) 223-4257
Johnson County Surveyor's Office	(317) 346-4341

B14 - MONITORING AND MAINTENANCE GUIDELINES FOR EACH PROPOSED STORMWATER QUALITY MEASURE
Inspection Schedule/Reporting

All impacted areas, as well as all erosion and sediment control devices, will be inspected every seven (7) calendar days and within 24 hours after a rainfall of 0.5 inch or greater. Where sites have been final or temporarily stabilized or on sites where runoff is unlikely due to winter conditions (e.g., site is covered with snow, ice, or frozen ground exists), such inspections shall be conducted at lease once every month.

Inspections shall be conducted and a written report prepared, by a designated and qualified person familiar with the USEPA NPDES Storm Water General Permit, and the Project.

Inspection reports shall be completed including scope of the inspection, name(s) and qualifications of personnel making the inspection, the date of the inspection, observations relating to the implementation of the SWPPP, and any actions taken as a result of incidents of noncompliance noted during the inspection. The inspection report should state whether the site was in compliance or identify any incidents of noncompliance. The contractor shall keep a copy of the inspection reports on site and permanently for a period of two years following construction. The on-site reports may be requested by inspections conducted by the local MS-4.

Construction Entrance

Locations where vehicles exit the site shall be inspected for evidence of off-site sediment tracking. Each contractor and subcontractor shall be responsible for maintaining the Construction Entrance and other controls.

Material Storage Inspections

Inspectors must evaluate areas used for storage of materials that are exposed to precipitation. The purpose is to ensure that materials are protected and/or impounded so that pollutants cannot discharge from storage areas. Off-site material storage areas used solely by the subject project are considered to be part of the project and must be included in the erosion control plans and the site inspection reports.

Soil Stabilization Inspections

Seeded areas will be inspected to confirm that a healthy stand of vegetation is maintained. The site has achieved final stabilization once all areas are covered with pavement of have a stand of vegetation with at least 70% of the background vegetation density. The density of 70% or greater must be maintained to be considered as stabilized. The operator or their representative will water, fertilize, and reseed disturbed areas as needed to achieve this goal.

Erosion and Sediment Control Inspections

All controls should be inspected at least once every seven (7) calendar days and following any storm event of 0.5 inch or greater. The following is a list of inspection/maintenance practices that will be used for specific controls;

1. Geotextiles/Erosion Control Mats: Missing or loose matting must be replaced or re-anchored.
2. Inlet Protection: Sediment should be removed when it reaches approximately one-half the height of the fence. If a sump is used, sediment should be removed when the volume of the basin is reduced by 50%.
3. Mulching: Inspected for thin or bare spots caused by natural decomposition or weather-related events. Mulch in high traffic area should be replaced on a regular basis to maintain uniform protection.
4. Silt Fence: Removal of built-up sediment will occur when the sediment reaches one-half the height of the fence.
5. Stabilized Construction Entrance: Periodic regarding and top dressing with additional stones.
6. Vegetation: Protect newly seeded areas from excessive runoff and traffic until vegetation is established. Establish a watering and fertilizing schedule.
7. Good Housekeeping: Litter, construction debris, and construction chemicals exposed to stormwater shall be prevented from becoming a pollutant source for stormwater discharges through screening of outfalls and daily pickup of litter.

In the event that sediment escapes the construction site, off-site accumulations of sediment must be removed at a frequency sufficient to minimize adverse impacts. An example of this may be the situation where sediment has washed into the street and could be carried into the storm sewers by the next rainfall and/or pose a safety hazard to users of public streets.

Material Handling and Spill Prevention

Discharge of hazardous substances or oil into stormwater is subject to reporting requirements. In the event of a spill of a hazardous substance, the operator is required to notify the

National Response Center (1-800-424-8802)

to properly report the spill. In addition, the operator shall submit a written description of the release (including the type and amount of material released, the date of the release, the circumstances of the release, and the steps to be taken to prevent future spills) to the local MS-4.

Compliance of the site with the General Construction Permit remains the responsibility of all operators that have submitted an NOI until such time as they have submitted a Notice of Termination (NOT). The permittee's authorization to discharge under the General Construction Permit terminates at midnight of the day the NOT is signed.

All permittees must submit an NOT within thirty (30) days after one or more of the following conditions have been met:
1. Final stabilization has been achieved on all portions of the site for which the permittee was responsible.
2. Another operator/permittee has assumed control over all areas of the site that have not been finally stabilized.
3. In residential construction operations, temporary stabilization has been completed and the residence has been transferred to the homeowner.

B15 - EROSION AND SEDIMENT CONTROL SPECIFICATIONS FOR INDIVIDUAL BUILDING LOTS
Construction sequence for the site are shown on this sheet.

C1 - DESCRIPTION OF POLLUTANTS AND THEIR SOURCES ASSOCIATED WITH THE PROPOSED LAND USE
The proposed land use will consist of single family residential houses. The pollutants and sources of each pollutant normally expected from these types of land uses are listed below;

Pollutant Source: Passenger vehicles, delivery vehicles, and trucks
Type of Pollutant: Oil, gasoline, diesel fuel, any hydrocarbon associated with vehicular fuels and lubricants, grease, antifreeze, windshield cleaner solution, brake fluid, brake dust, rubber, glass, metal and plastic fragments, grit, road de-icing materials.

Pollutant Source: Residence
Type of Pollutant: Cleaning solutions or solvents, leaks from HVAC equipment, grit from roof drainage, aggregate or rubber fragments from roofing system.

Pollutant Source: Trash dumpster
Type of Pollutant: Cleaning solutions or solvents, litter (paper, plastic, general refuse associated with distributions operations), uneaten food products, bacteria.

Pollutant Source: Roadway
Type of Pollutant: Any pollutant associated with vehicular sources, grit from asphalt wearing surface, bituminous compounds from periodic maintenance (sealing, resurfacing and patching), pavement de-icing materials, paint fragments from parking stall stripes, concrete fragments, wind-blown litter from off-site sources, and elevated water temperatures from contact with impervious surfaces.

Pollutant Source: Lawn and landscape areas
Type of Pollutant: Fertilizers, soil, organic material (leaves, mulch, grass clippings).

The anticipated pollution sources are the vehicles that will use these future facilities, including both truck and passenger vehicle traffic. Possible pollutants include oil, gasoline, anti-freeze and other pollutants associated with vehicular traffic.

C2 & C3 - SEQUENCE DESCRIBING STORMWATER QUALITY MEASURE IMPLEMENTATION: DESCRIPTION OF PROPOSED POST CONSTRUCTION STORMWATER QUALITY MEASURES
1. Swales: The proposed grassed swales will collect storm water from sheet flow areas and convey them to the storm sewer. The design of the swales will allow sediment to be partially infiltrated before storm water enters the designed storm sewer system.
2. Inlets: The proposed inlets will prevent large debris such as paper, trash and construction material from entering the storm sewer. The inlet castings are also stamped with an environmental protection stamp informing the public not to pollute the environment.
3. Inlets: The proposed inlets will prevent large debris such as paper, trash and construction material from entering the storm sewer. The inlet castings are also stamped with an environmental protection stamp informing the public not to pollute the environment.
4. Lake: The design of the lake will detain the "first flush" storm water and allow the suspended solids to settle prior to releasing the storm water.

C4 - LOCATION, DIMENSIONS, SPECIFICATIONS AND CONSTRUCTION DETAILS OF EACH STORMWATER QUALITY MEASURES
1. Inlets and inlet castings: The details and specifications for the storm inlet castings can be found on Sheets C600 - C602 and Sheets C801A - C801B.

C5 - DESCRIPTION OF MAINTENANCE GUIDELINES FOR POST-CONSTRUCTION STORMWATER QUALITY MEASURES
Maintenance requirements for the post-construction stormwater quality measures are described in the attached O&M Manual.

THIS DRAWING IS NOT INTENDED TO BE REPRESENTED AS A RETRACEMENT OR ORIGINAL BOUNDARY SURVEY, A ROUTE SURVEY OR A SURVEYOR LOCATION REPORT.
CERTIFIED: 04/07/22

DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

STOEPPELWERTH
ALWAYS ON
7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

STORM WATER POLLUTION PREV. PLAN SPECS.
THE BLUFFS AT YOUNGS CREEK SECTION 6
FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY:	CHECKED BY:
DCM	BKR

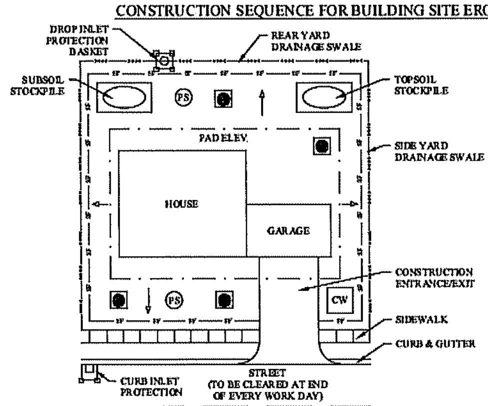
SHEET NO. C303
JOB NO. 83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C303 - Erosion Control Specifications.dwg - C303
Modified By: February 22, 2022 11:08:30 AM / RMorris
Plotted By: March 22, 2022 11:37:10 AM / Raven Morris

THIS SHEET TO BE USED FOR EROSION CONTROL ONLY.

PERSON ONSITE RESPONSIBLE FOR EROSION CONTROL:
MARK ALT - WINDSTAR HOMES, LLC
MARK ALT
PHONE: (317) 223-4257

CONSTRUCTION SEQUENCE FOR BUILDING SITE EROSION CONTROL PRACTICES



EROSION CONTROL PLAN LEGEND

- PROPERTY LINE/DRAINAGE SWALE
- DRAINAGE FLOW
- TREE CONSERVATION
- SILT FENCE
- CW — CONCRETE WASHOUT
- PS — PERMANENT SEEDING
- AREA TO BE TOP-SOILED, SEEDED, AND MULCHED BY OWNER AT COMPLETION OF CONSTRUCTION. PALIMAR IS TO BE USED OF GRASS GROWTH IS NOT POSSIBLE.

NOTES

1. EROSION/ SEDIMENT CONTROL MEASURES MUST BE FUNCTIONAL AND BE MAINTAINED THROUGHOUT CONSTRUCTION.
2. MAINTAIN POSITIVE DRAINAGE AWAY FROM THE STRUCTURE.
3. CONTRACTOR TO CLEAN STREETS WHEN DIRT AND CONSTRUCTION DEBRIS IS EVIDENT.
4. PERIMETER PROTECTION SHOULD BE INSTALLED BEFORE EXCAVATION OF BASEMENT/FOUNDATION HAS BEGUN. PERIMETER PROTECTION ON LOTS SHALL REMAIN IN PLACE UNTIL THE LOT IS STABILIZED WITH AT LEAST 70% COVER. ALL TRASH AND CONSTRUCTION DEBRIS SHALL BE DISPOSED PROPERLY INTO AN ENCLOSED WASTE RECEPTACLE.

STORM WATER POLLUTION & PREVENTION NOTES

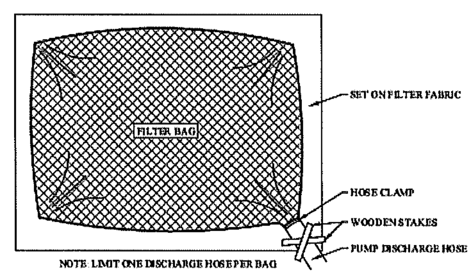
A. ALL STORM WATER QUALITY MEASURES, INCLUDING EROSION AND SEDIMENT CONTROL, NECESSARY TO COMPLY WITH THIS RULE MUST BE IMPLEMENTED IN ACCORDANCE WITH THE PLAN AND SUFFICIENT TO SATISFY SUBSECTION (B)
B. PROVISIONS FOR EROSION AND SEDIMENT CONTROL ON INDIVIDUAL BUILDING LOTS REGULATED UNDER THE ORIGINAL PERMIT OF A PROJECT SITE OWNER MUST INCLUDE THE FOLLOWING REQUIREMENTS
  - B.1. THE INDIVIDUAL LOT OPERATOR, WHETHER OWNING THE PROPERTY OR ACTING AS THE AGENT OF THE PROPERTY OWNER, SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL REQUIREMENTS ASSOCIATED WITH ACTIVITIES ON INDIVIDUAL LOTS.
  - B.2. INSTALLATION AND MAINTENANCE OF A STABLE CONSTRUCTION SITE ACCESS.
  - B.3. INSTALLATION AND MAINTENANCE OF APPROPRIATE PERIMETER EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO LAND DISTURBANCE.
  - B.4. SEDIMENT DISCHARGE AND TRACKING FROM EACH LOT MUST BE MINIMIZED THROUGHOUT THE LAND DISTURBING ACTIVITIES ON THE LOT UNTIL PERMANENT STABILIZATION HAS BEEN ACHIEVED.
  - B.5. CLEAN-UP OF SEDIMENT MUST BE REDISTRIBUTED OR DISPOSED OF IN A MANNER THAT IS IN COMPLIANCE WITH ALL APPLICABLE STATUTES AND RULES.
  - B.6. ADJACENT LOTS DISTURBED BY AND INDIVIDUAL LOT OPERATOR MUST BE REPAIRED AND STABILIZED WITH TEMPORARY OR PERMANENT SURFACE STABILIZATION.
  - B.7. FOR INDIVIDUAL RESIDENTIAL LOTS, FINAL STABILIZATION MEETING THE CRITERIA IN SECTION 7(B)(20) OR THIS RULE WILL BE ACHIEVED WHEN THE INDIVIDUAL LOT OPERATOR:
    - B.7.A COMPLETES FINAL STABILIZATION, OR
    - B.7.B HAS INSTALLED APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES FOR AN INDIVIDUAL LOT PRIOR TO OCCUPATION OF THE HOME BY THE HOMEOWNER AND HAS INFORMED THE HOMEOWNER OF THE REQUIREMENT FOR, AND BENEFITS OF, FINAL STABILIZATION. 7(B)(20) FINAL STABILIZATION OF A PROJECT SITE IS ACHIEVED WHEN:
      - B.7.1.A ALL LAND DISTURBING ACTIVITIES HAVE BEEN COMPLETED AND A UNIFORM (FOR EXAMPLE, EVENLY DISTRIBUTED, WITHOUT LARGE BARE AREAS) PERENNIAL VEGETATIVE COVER WITH A DENSITY OF SEVENTY PERCENT (70%) HAS BEEN ESTABLISHED ON ALL UNPAVED AREAS AND AREAS NOT COVERED BY PERMANENT STRUCTURES, OR EQUIVALENT PERMANENT STABILIZATION MEASURES HAVE BEEN EMPLOYED, AND
      - B.7.1.B CONSTRUCTION PROJECTS ON LAND USED FOR AGRICULTURAL PURPOSES ARE RETURNED TO ITS PRECONSTRUCTION AGRICULTURAL USE OR DISTURBED AREAS, NOT PREVIOUSLY USED FOR AGRICULTURAL PRODUCTION, SUCH AS FILTER STRIPS AND AREAS THAT ARE NOT BEING RETURNED TO THEIR PRECONSTRUCTION AGRICULTURAL USE, MEET THE FINAL STABILIZATION REQUIREMENTS IN CLAUSE (A).
  - B.8. THE PERMIT HOLDER/OWNER NEEDS TO CONDUCT AN ONSITE E.C. EVALUATION AFTER EVERY MEASURABLE RAIN FALL EVENT OF .5" OR GREATER. THESE MUST BE FILED FOR A MINIMUM OF THREE YEARS

INDIVIDUAL LOT STORM WATER POLLUTION & PREVENTION DETAIL

NOT-TO-SCALE

EROSION CONTROL NOTES

EROSION CONTROL MEASURE	INSTALLATION SEQUENCE	MAINTENANCE
STONE ENTRANCE	PRIOR TO CLEANING AND GRADING	• INSPECT ENTRANCE PAD AND SEDIMENT DISPOSAL AREA WEEKLY AND AFTER STORM EVENTS OR HEAVY USE. • RESHAPE PAD AS NEEDED FOR DRAINAGE AND RUNOFF CONTROL. • TOPDRESS WITH CLEAN STONE AS NEEDED. • IMMEDIATELY REMOVE MUD AND SEDIMENT TRACKED OR WASHED ONTO PUBLIC ROADS BY BRUSHING OR SWEEPING. FLUSHING SHOULD ONLY BE USED IF THE WATER IS CONVEYED INTO A SEDIMENT TRAP OR BASIN. • REPAIR ANY BROKEN ROAD PAVEMENT IMMEDIATELY.
SILT FENCE	PRIOR TO CLEANING AND GRADING	• INSPECT THE SILT FENCE PERIODICALLY AND AFTER EACH STORM EVENT. • IF FENCE FABRIC TEARS, STARTS TO DECOMPOSE, OR IN ANY WAY BECOMES INEFFECTIVE, REPLACE THE AFFECTED PORTION IMMEDIATELY. • REMOVE DEPOSITED SEDIMENT WHEN IT REACHES HALF THE HEIGHT OF THE FENCE AT ITS LOWEST POINT OR IS CAUSING THE FABRIC TO BULGE. • TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT. • AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED, REMOVE THE FENCE AND SEDIMENT DEPOSITS, BRING THE DISTURBED AREA TO GRADE, AND STABILIZE.
TOPSOIL STOCKPILE	PRIOR TO CLEANING AND GRADING	• DETERMINE DEPTH AND SUITABILITY OF TOPSOIL AT THE SITE. (FOR HELP, CONTACT YOUR LOCAL SWCD OFFICE TO OBTAIN A COUNTY SOIL SURVEY REPORT OR CONSULT WITH A SOIL SCIENTIST.) • PRIOR TO STRIPPING TOPSOIL, INSTALL ANY SITE-SPECIFIC DOWNSLOPE PRACTICES NEEDED TO CONTROL RUNOFF AND SEDIMENTATION. • REMOVE THE SOIL MATERIAL NO DEEPER THAN WHAT THE COUNTY SOIL SURVEY DESCRIBES AS "SURFACE SOIL" (I.E., A OR AP HORIZON). • STOCKPILE THE MATERIAL IN ACCESSIBLE LOCATIONS THAT NEITHER INTERFERE WITH OTHER CONSTRUCTION ACTIVITIES NOR BLOCK NATURAL DRAINAGE; AND INSTALL SILT FENCES OR OTHER BARRIERS TO TRAP SEDIMENT (SEE EXHIBIT 3.02-B). (SEVERAL SMALL PILES AROUND THE CONSTRUCTION SITE ARE USUALLY MORE EFFICIENT AND EASIER TO CONTAIN THAN ONE LARGE PILE.) • IF SOIL IS STOCKPILED FOR MORE THAN 6 MO., IT SHOULD BE TEMPORARILY SEEDED OR COVERED WITH A TARP OR SURROUNDED BY A SEDIMENT BARRIER.
TEMPORARY DIVERSIONS	AFTER ROUGH GRADING	• INSPECT WEEKLY AND FOLLOWING EACH STORM EVENT. • REMOVE SEDIMENT FROM THE CHANNEL AND REINFORCE THE RIDGE AS NEEDED. • CHECK THE OUTLETS AND MAKE NECESSARY REPAIRS IMMEDIATELY. • REMOVE SEDIMENT FROM TRAPS WHEN THEY ARE 50% FULL. • WHEN THE WORK AREA HAS BEEN STABILIZED, REMOVE THE RIDGE, FILL THE CHANNEL TO BLEND WITH THE NATURAL GROUND, REMOVE TEMPORARY SLOPE DRAINS, AND STABILIZE ALL DISTURBED AREAS.
ROCK DAM	AFTER ROUGH GRADING	• INSPECT THE ROCK DAM AND BASIN FOLLOWING EACH STORM EVENT. • REMOVE SEDIMENT WHEN IT ACCUMULATES TO HALF THE DESIGN VOLUME (MARKED BY STAKE) • CHECK THE DAM AND ABUTMENTS FOR EROSION, PIPING, AND ROCK DISPLACEMENT, AND REPAIR IMMEDIATELY IF THE BASIN DOES NOT DRAIN BETWEEN STORMS, REPLACE THE STONE ON THE UPSTREAM FACE OF DAM IF THE BASIN DRAINS TO RAPIDLY FOLLOWING A STORM (LESS THAN 6 HRS.), ADD INDOT CA NO. 5 GRAVEL ON THE UPSTREAM FACE OF THE DAM. • ONCE THE CONTRIBUTING DRAINAGE AREA HAS BEEN PERMANENTLY STABILIZED, a. REMOVE WATER AND SEDIMENT FROM THE BASIN, b. REMOVE THE DAM, DISPOSING OF THE ROCK IN DESIGNATED DISPOSAL AREAS, c. SMOOTH THE SITE TO BLEND THE SURROUNDING AREA, d. STABILIZE
TEMPORARY SEEDING	AFTER ROUGH GRADING	• INSPECT PERIODICALLY AFTER PLANTING TO SEE THAT VEGETATIVE STANDS ARE ADEQUATELY ESTABLISHED, RE-SEED IF NECESSARY. • CHECK FOR EROSION DAMAGE AFTER STORM EVENTS AND REPAIR; RESEED AND MULCH IF NECESSARY. • TOPDRESS FALL SEEDED WHEAT OR RYE SEEDINGS WITH 50 LBS/ACRE OF NITROGEN IN FEBRUARY OR MARCH IF NITROGEN DEFICIENCY IS APPARENT. (EXHIBIT 3.11-B SHOWS ONLY WHEAT/RYE FALL SEEDED.)
PERMANENT SEEDING	AFTER FINISH GRADING	• INSPECT PERIODICALLY, ESPECIALLY STORM EVENTS, UNTIL THE STAND IS SUCCESSFULLY ESTABLISHED. (CHARACTERISTICS OF A SUCCESSFUL STAND INCLUDE: VIGOROUS DARK GREEN OR BLUISH-GREEN SEEDLINGS, UNIFORM DENSITY WITH NURSE PLANTS, LEGUMES, AND GRASSES WELL INTERMIXED; GREEN LEAVES; AND THE PERENNIALS REMAINING GREEN THROUGHOUT THE SUMMER, AT LEAST AT THE PLANT BASE.) • PLAN TO ADD FERTILIZER THE FOLLOWING SEASON ACCORDING TO SOIL TEST RECOMMENDATIONS. • REPAIR DAMAGED, BARE, OR SPARSE OR PATCHY, BY FILLING ANY GULLIES, RE-FERTILIZING, OVER- OR RE-SEEDING AND MULCHING AFTER RE-PREPARING THE SEEDBED. • IF VEGETATION FAILS TO GROW, CONSIDER SOIL TESTING TO DETERMINE ACIDITY OR NUTRIENT DEFICIENCY PROBLEMS. (CONTACT YOUR SWCD OR COOPERATIVE EXTENSION OFFICE FOR ASSISTANCE.) • IF ADDITIONAL FERTILIZATION IS NEEDED TO GET A SATISFACTORY STAND, DO SO ACCORDING TO SOIL TEST RECOMMENDATIONS.
EROSION CONTROL MATTING	AFTER FINISH GRADING	• DURING VEGETATIVE ESTABLISHMENT, INSPECT AFTER STORM EVENTS FOR ANY EROSION BELOW THE BLANKET. • IF ANY AREA SHOWS EROSION, PULL BACK THAT PORTION OF THE BLANKET COVERING IT, ADD SOIL, RE-SEED THE AREA, AND RE-LAY AND STAPLE THE BLANKET. • AFTER VEGETATIVE ESTABLISHMENT, CHECK THE TREATED AREA PERIODICALLY.
INLET PROTECTION	AFTER EACH INLET IS PLACED	• INSPECT FREQUENTLY FOR DAMAGE BY VEHICULAR TRAFFIC, AND REPAIR IF NEEDED. • INSPECT AFTER EACH STORM EVENT. • REMOVE SEDIMENT (BUT NOT BY FLUSHING) WHEN IT REACHES HALF THE HEIGHT OF THE BARRIER. • DEPOSIT REMOVED SEDIMENT WHERE IT WILL NOT ENTER STORM DRAINS.
REMOVAL OF INLET PROTECTION	AFTER ALL AREAS DRAINING TO THESE AREAS ARE STABILIZED	N/A
REMOVAL OF SILT FENCE	AFTER ALL AREAS DRAINING TO THESE AREAS ARE STABILIZED	N/A



PLAN VIEW

NOT-TO-SCALE

CROSS SECTION

NOT-TO-SCALE

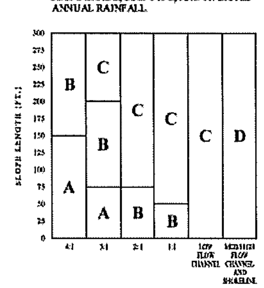
DEWATERING FILTER BAG DETAIL

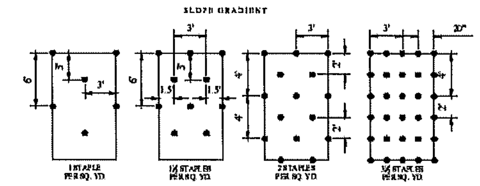
NOT-TO-SCALE

NOTES

1. TO BE USED WHEN PUMPING DIRTY WATER.
2. ANY DISCHARGE OF CONTAMINATED WATER DUE TO DEWATERING SHALL OUTLET THROUGH EXISTING VEGETATION OR FILTER BAGS THAT WILL NOT ADVERSELY IMPACT STORM WATER QUALITY.

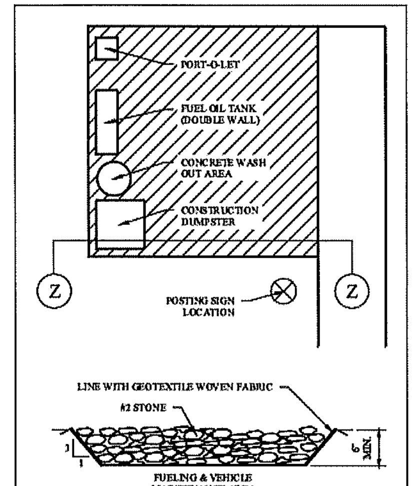
STAPLE PATTERNS APPLY TO ALL NORTH AMERICAN GREEN EROSION CONTROL BLANKETS. STAPLE PATTERNS WILL VARY DEPENDING UPON SLOPE LENGTH, SLOPE GRADE, SOIL TYPE, AND AVERAGE ANNUAL RAINFALL.





EROSION CONTROL BLANKET STAPLE PATTERN GUIDE

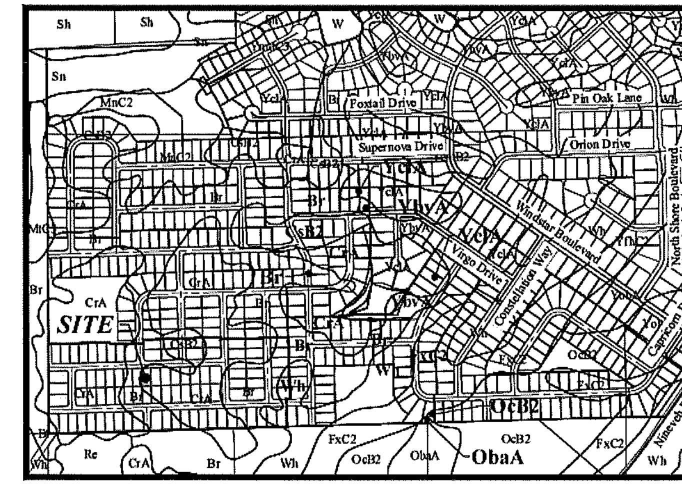
NOT-TO-SCALE



SECTION "Z - Z"

CONSTRUCTION ENTRANCE DETAIL

NOT-TO-SCALE



SOILS MAP

SCALE 1" = 600'

SOILS LEGEND

Map Unit: Br - Brookston silty clay loam, 0 to 2 percent slopes

Component: Brookston (95%)
The Brookston component makes up 95 percent of the map unit. Slopes are 0 to 2 percent. This component is on till plains on till plains. The parent material consists of loess over loamy till. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 6 inches during January, February, March, April, May, December. Organic matter content in the surface horizon is about 4 percent. This component is in the F111AY007IN Till Depression Flatwood ecological site. Nonirrigated land capability classification is 2w. This soil meets hydric criteria.
Component: Crosby (5%)

Map Unit: CrA - Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes

Component: Crosby (93%)
The Crosby component makes up 93 percent of the map unit. Slopes are 0 to 2 percent. This component is on wisconsin water-lain moraines on till plains. The parent material consists of silty material or loess over loamy till. Depth to a root restrictive layer, densic material, is 24 to 40 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during January, February, March, December. Organic matter content in the surface horizon is about 3 percent. This component is in the F111AY206IN Wet Till Ridge ecological site. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 35 percent.
Component: Williamstown, eroded (5%)
Component: Treaty, drained (2%)

Map Unit: CsB2 - Crosby-Miami silt loams, 2 to 4 percent slopes, eroded

Component: Crosby, eroded (64%)
The Crosby, eroded component makes up 64 percent of the map unit. Slopes are 2 to 4 percent. This component is on Wisconsin recessional moraines on till plains. The parent material consists of silty material or loess over loamy till. Depth to a root restrictive layer, densic material, is 24 to 40 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during January, February, March, December. Organic matter content in the surface horizon is about 3 percent. This component is in the F111AY006IN Wet Till Ridge ecological site. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 30 percent.
Component: Miami, eroded (33%)
The Miami, eroded component makes up 33 percent of the map unit. Slopes are 2 to 4 percent. This component is on Wisconsin recessional moraines, till plains. The parent material consists of silty material or loess over loamy till. Depth to a root restrictive layer, densic material, is 24 to 40 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 32 inches during January, February, March, April, December. Organic matter content in the surface horizon is about 2 percent. This component is in the F111AY008IN Till Ridge ecological site. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 33 percent.
Component: Treaty, drained (3%)

Map Unit: FxC2 - Fox complex, 6 to 12 percent slopes, eroded

Component: Fox (50%)
The Fox component makes up 50 percent of the map unit. Slopes are 6 to 12 percent. This component is on outwash plains. The parent material consists of loamy outwash over sandy and gravelly outwash. Depth to a root restrictive layer, strongly contrasting textural stratification, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the F111AY015IN Dry Outwash Upland ecological site. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 40 percent.
Component: Fox, severely eroded (45%)
The Fox, severely eroded component makes up 45 percent of the map unit. Slopes are 8 to 12 percent. This component is on outwash plains. The parent material consists of loamy outwash over sandy and gravelly outwash. Depth to a root restrictive layer, strongly contrasting textural stratification, is 20 to 40 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. This component is in the F111AY015IN Dry Outwash Upland ecological site. Nonirrigated land capability classification is 4e. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 40 percent.

Map Unit: ObaA - Ockley loam, 0 to 2 percent slopes

Component: Ockley (80%)
The Ockley component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on stream terraces, outwash plains. The parent material consists of loamy outwash over sandy and gravelly outwash. Depth to a root restrictive layer, strongly contrasting textural stratification, is 40 to 72 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the F111AY015IN Dry Outwash Upland ecological site. Nonirrigated land capability classification is 2s. This soil does not meet hydric criteria.
Component: Fox (10%)
Component: Sleeth (10%)

Map Unit: OcB2 - Ockley loam, 2 to 6 percent slopes, eroded

Component: Ockley (100%)
The Ockley component makes up 100 percent of the map unit. Slopes are 2 to 6 percent. This component is on stream terraces, outwash plains. The parent material consists of loamy outwash over sandy and gravelly outwash. Depth to a root restrictive layer, strongly contrasting textural stratification, is 20 to 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 2 percent. This component is in the F111AY015IN Dry Outwash Upland ecological site. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Map Unit: Wh—Whitaker silt loam, 0 to 2 percent slopes

Component: Whitaker (90%)
The Whitaker component makes up 90 percent of the map unit. Slopes are 0 to 2 percent. This component is on outwash plains on outwash plains. The parent material consists of silty outwash over loamy outwash. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 5 inches during January, February, March. Organic matter content in the surface horizon is about 2 percent. This component is in the F111AY014IN Outwash Upland ecological site. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 32 percent.
Component: Rensselaer (5%)
Component: Sleeth (3%)
Component: Mahalasville, till substratum (2%)

Map Unit: YbvA—Brookston silty clay loam-Urban land complex, 0 to 2 percent slopes

Component: Brookston (65%)
The Brookston component makes up 65 percent of the map unit. Slopes are 0 to 2 percent. This component is on till plains on till plains. The parent material consists of loess over loamy till. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is moderate. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 6 inches during January, February, March, April, May, December. Organic matter content in the surface horizon is about 4 percent. This component is in the F111AY007IN Till Depression Flatwood ecological site. Nonirrigated land capability classification is 2w. This soil meets hydric criteria.
Component: Urban land (30%)
Component: Crosby (5%)

Map Unit: YclA—Crosby silt loam, fine-loamy subsoil-Urban land complex, 0 to 2 percent slopes

Component: Crosby (60%)
The Crosby component makes up 60 percent of the map unit. Slopes are 0 to 2 percent. This component is on wisconsin water-lain moraines on till plains. The parent material consists of silty material or loess over loamy till. Depth to a root restrictive layer, densic material, is 24 to 40 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is low. Available water to a depth of 40 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during January, February, March, December. Organic matter content in the surface horizon is about 3 percent. This component is in the F111AY206IN Wet Till Ridge ecological site. Nonirrigated land capability classification is 2w. This soil does not meet hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 35 percent.
Component: Urban land (30%)
Component: Treaty, drained (5%)
Component: Williamstown, eroded (5%)

DATE	MARK	REVISIONS	BY

DAVID J. STOEPPELWERTH — REGISTERED No. 19358 — STATE OF INDIANA — PROFESSIONAL ENGINEER

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

CERTIFIED: 04/07/22

STOEPPELWERTH
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STORM WATER POLLUTION PREV. PLAN SPECS.

THE BLUFFS AT YOUNGS CREEK SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP — JOHNSON COUNTY, INDIANA

DRAWN BY: DCM
CHECKED BY: BKR
SHEET NO. C304
S & A JOB NO. 83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C304 - Erosion Control Details.dwg - C304
Modified / By: March 21, 2022 11:15:28 AM / RMorris
Plotted / By: March 22, 2022 11:24:29 AM / Raven Morris

SITE ACCESS & PREPARATION

Temporary Construction Ingress/Egress Pad (Large Sites—Two Acres or Larger)

A temporary construction ingress/egress pad is a sediment control measure consisting of a stabilized aggregate pad with geotextile underlayment that is used at any point where construction traffic will be traveling between a large construction site and adjoining public right-of-way, street, alley, sidewalk, or parking areas.

Purpose

To provide ingress/egress to a construction site and minimize tracking of mud and sediment onto public roadways.

Specifications

Location

- Avoid locating on steep slopes or at curves in public roads.

Dimensions

- Width – 20 feet minimum or full width of entrance/exit roadway, whichever is greater.
- Length – 150 feet minimum (length can be shorter for small sites).
- Thickness – eight inches minimum.

Washing Facility (optional)

- Level area with three inch, or larger, washed aggregate or install a commercial wash rack.
- Divert waste water to a sediment trap or basin.

TEMPORARY CONSTRUCTION INGRESS/EGRESS PAD (LARGE SITES—TWO ACRES OR LARGER)

Materials

- One to two and one-half inch diameter washed aggregate [Indiana Department of Transportation Coarse Aggregate No. 2 (see Appendix D)].
- One-half to one and one-half inch diameter washed aggregate [INDOT CA No. 53 (see Appendix D)].
- Geotextile fabric underlayment (see Appendix C) (used as a separation layer to prevent intermixing of aggregate and the underlying soil material and to provide greater bearing strength when encountering wet conditions or soils with a seasonal high water table limitation).

Installation

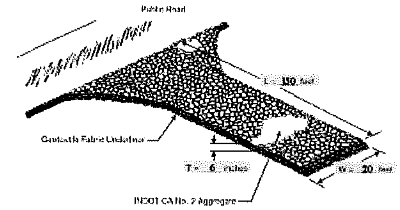
1. Remove all vegetation and other objectionable material from the foundation area.
2. Grade foundation and crown for positive drainage. If the slope of the construction entrance is toward a public road and exceeds two percent, construct an eight inch high diversion ridge with a ratio of 3-to-1 side slopes across the foundation area about 15 feet from the entrance to divert runoff away from the road (see Temporary Construction Ingress/Egress Pad Cross-Section View Worksheet).
3. Install a culvert pipe under the pad if needed to maintain proper public road drainage.
4. If wet conditions are anticipated, place geotextile fabric on the graded foundation to improve stability.
5. Place aggregate (INDOT CA No. 2) to the dimensions and grade shown in the construction plans, leaving the surface smooth and sloped for drainage.
6. Top-dress the first 50 feet adjacent to the public roadway with two to three inches of washed aggregate (INDOT CA No. 53) [optional, used primarily where the purpose of the pad is to keep soil from adhering to vehicle tires].
7. Where possible, divert all storm water runoff and drainage from the ingress/egress pad to a sediment trap or basin.

Maintenance

- Inspect daily.
- Reshape pad as needed for drainage and runoff control.
- Top dress with clean aggregate as needed.
- Immediately remove mud and sediment tracked or washed onto public roads.
- Flushing should only be used if the water can be conveyed into a sediment trap or basin.

TEMPORARY CONSTRUCTION INGRESS/EGRESS PAD (LARGE SITES—TWO ACRES OR LARGER)

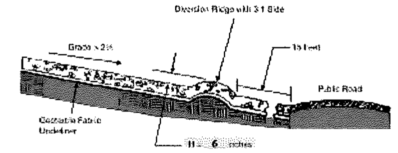
Temporary Construction Ingress/Egress Pad
Plan View Worksheet
(large sites—two acres or larger)



L = Ingress/Egress Pad Length
W = Ingress/Egress Pad Width
T = Aggregate Thickness

TEMPORARY CONSTRUCTION INGRESS/EGRESS PAD (LARGE SITES—TWO ACRES OR LARGER)

Temporary Construction Ingress/Egress Pad
Cross-Section View Worksheet
(large sites two acres or larger)



H = Height of Diversion Ridge

SURFACE STABILIZATION

Temporary Seeding

Temporary seeding involves the establishment of rapid growing annual grasses or small grains to stabilize disturbed areas until such time as a permanent, nonerosive cover can be established.

Purpose

- To provide vegetative cover where permanent seeding is not desirable or practical.
- To reduce erosion and sedimentation damage by stabilizing disturbed areas.
- To reduce problems associated with mud or dust from unvegetated soil surfaces during construction.
- To reduce sediment-laden storm water runoff from being transported to downstream areas.
- To improve visual aesthetics of construction areas.

Specifications

Seedbed Preparation

Grade and apply soil amendments.

Seeding Frequency

Seed rough graded areas daily while soil is still loose and moist.

Density of Vegetative Cover

Eighty percent or greater over the soil surface.

TEMPORARY SEEDING

Materials

- Soil Amendments – Select materials and rates as determined by a soil test (contact your county soil and water conservation district or cooperative extension office for assistance and soil information, including available soil testing services) or 400 to 600 pounds of 12-12-12 analysis fertilizer, or equivalent. Consider the use of reduced phosphorus application where soil tests indicate adequate phosphorus levels in the soil profile.
- Seed – Select appropriate plant species seed or seed mixtures on the basis of quick germination, growth, and time of year to be seeded (see Table 1).
- Mulch
  - Straw, hay, wood fiber, etc. (to protect seedbed, retain moisture, and encourage plant growth).
  - Anchored to prevent removal by wind or water or covered with manufactured erosion control blankets.

Table 1. Temporary Seeding Specifications

Seed Species[1]	Rate per Acre	Planting Depth	Optimum Dates[2]
Wheat or Rye	150 lbs.	1 to 1½ inches	Sept. 15 – Oct. 30
Spring Oats	100 lbs.	1 inch	March 1 – April 15
Annual Ryegrass	40 lbs.	¼ inch	March 1 – May 1 Aug. 1 – Sept. 1
German Millet	40 lbs.	1 to 2 inches	May 1 – June 1
Sudangrass	35 lbs.	1 to 2 inches	May 1 – July 30
Buckwheat	60 lbs.	1 to 2 inches	April 15 – June 1
Corn (broadcast)	300 lbs.	1 to 2 inches	May 11 – Aug. 10
Sorghum	35 lbs.	1 to 2 inches	May 1 – July 15

[1] Perennial species may be used as a temporary cover, especially if the area to be seeded will remain idle for more than one year (see **Permanent Seeding** on page 35).

[2] Seeding done outside the optimum seeding dates increases the chances of seeding failure. Dates may be extended or shortened based on the location of the project site within the state.

Notes
Mulch alone is an acceptable temporary cover and may be used in lieu of temporary seeding, provided that it is appropriately anchored.

A high potential for fertilizer, seed, and mulch to wash exists on steep banks, cuts, and in channels and areas of concentrated flow.

TEMPORARY SEEDING

Application

Seedbed Preparation

1. Test soil to determine pH and nutrient levels.
2. Apply soil amendments as recommended by the soil test. If testing is not done, apply 400 to 600 pounds per acre of 12-12-12 analysis fertilizer, or equivalent.
3. Work the soil amendments into the upper two to four inches of the soil with a disk or rake operated across the slope.

Seeding

1. Select a seed species or an appropriate seed mixture and application rate from Table 1.
2. Apply seed uniformly with a drill or cultipacker seeder or by broadcasting. Plant or cover seed to the depth shown in Table 1.

   Notes:
   1. If drilling or broadcasting the seed, ensure good seed-to-soil contact by firming the seedbed with a roller or cultipacker after completing seeding operations.
   2. Daily seeding when the soil is moist is usually most effective.
   3. If seeding is done with a hydroseeder, fertilizer and mulch can be applied with the seed in a slurry mixture.

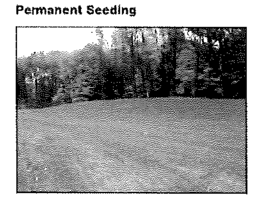
3. Apply mulch (see **Mulching** on page 55 or **Compost Mulching** on page 59) and anchor it in place.

Maintenance

- Inspect within 24 hours of each rain event and at least once every seven calendar days.
- Check for erosion or movement of mulch and repair immediately.
- Monitor for erosion damage and adequate cover (80 percent density); reseed, fertilize, and apply mulch where necessary.
- If nitrogen deficiency is apparent, top-dress fall seeded wheat or rye seeding with 50 pounds per acre of nitrogen in February or March.

SURFACE STABILIZATION

Permanent Seeding



Permanent seeding involves the establishment of a perennial vegetative cover to protect soils from erosive forces.

Purpose

- To provide permanent vegetative cover and improve visual aesthetics of a project site.
- To reduce erosion and sedimentation damage by stabilizing disturbed areas.
- To reduce problems associated with mud or dust from unvegetated soil surfaces.
- To reduce sediment-laden storm water runoff from being transported to downstream areas.

Specifications

Seedbed Preparation

Grade and apply soil amendments.

Seeding Frequency

Seed final graded areas daily while soil is still loose and moist.

Density of Vegetative Cover

Ninety percent or greater over the soil surface.

PERMANENT SEEDING

Materials

- Soil Amendments – Select materials and rates as determined by a soil test (contact your county soil and water conservation district or cooperative extension office for assistance and soil information, including available soil testing services) or 400 to 600 pounds of 12-12-12 analysis fertilizer, or equivalent. Consider the use of reduced phosphorus application where soil tests indicate adequate phosphorus levels in the soil profile.
- Seed – Select an appropriate plant species seed or seed mixture on the basis of soil type, soil pH, region of the state, time of year, and intended land use of the area to be seeded (see Table 1).
- Mulch
  - Straw, hay, wood fiber, etc. (to protect seedbed, retain moisture, and encourage plant growth).
  - Anchored to prevent removal by wind or water or covered with premanufactured erosion control blankets.

Application

Site Preparation

1. Grade the site to achieve positive drainage.
2. Add topsoil (see **Topsoil Salvage and Utilization** on page 25) or compost mulch (see **Compost Mulching** on page 59) to achieve needed depth for establishment of vegetation. (Compost material may be added to improve soil moisture holding capacity, soil friability, and nutrient availability.)

Seedbed Preparation

1. Test soil to determine pH and nutrient levels.
2. Apply soil amendments as recommended by the soil test and work into the upper two to four inches of soil. If testing is not done, apply 400 to 600 pounds per acre of 12-12-12 analysis fertilizer, or equivalent.
3. Till the soil to obtain a uniform seedbed. Use a disk or rake operated across the slope, to work the soil amendments into the upper two to four inches of the soil.

Seeding

Optimum seeding dates are March 1 to May 10 and August 10 to September 30. Permanent seeding done between May 10 and August 10 may need to be irrigated. Seeding outside or beyond optimum seeding dates is still possible with the understanding that reseeding or overseeding may be required if adequate surface

PERMANENT SEEDING

cover is not achieved. Reseeding or overseeding can be easily accomplished if the soil surface remains well protected with mulch.

1. Select a seeding mixture and rate from Table 1. Select seed mixture based on site conditions, soil pH, intended land use, and expected level of maintenance.
2. Apply seed uniformly with a drill or cultipacker seeder (see Figure 1) or by broadcasting (see Figure 2). Plant or cover the seed to a depth of one-fourth to one-half inch. If drilling or broadcasting the seed, ensure good seed-to-soil contact by firming the seedbed with a roller or cultipacker after completing seeding operations. (If seeding is done with a hydroseeder (see Figure 3), fertilizer and mulch can be applied with the seed in a slurry mixture.)
3. Mulch all seeded areas (see **Mulching** on page 55 and **Compost Mulching** on page 59) and use appropriate methods to anchor the mulch in place. Consider using erosion control blankets on sloping areas and conveyance channels (see **Erosion Control Blanket** on page 63).

Maintenance

- Inspect within 24 hours of each rain event and at least once every seven calendar days until the vegetation is successfully established.
- Characteristics of a successful stand include vigorous dark green or bluish green seedlings with a uniform vegetative cover density of 90 percent or more.
- Check for erosion or movement of mulch.
- Repair damaged, bare, gullied, or sparsely vegetated areas and then fertilize, reseed, and apply and anchor mulch.
- If plant cover is sparse or patchy, evaluate the plant materials chosen, soil fertility, moisture condition, and mulch application; repair affected areas either by overseeding or preparing a new seedbed and reseeding. Apply and anchor mulch on the newly seeded areas.
- If vegetation fails to grow, consider soil testing to determine soil pH or nutrient deficiency problems. (Contact your soil and water conservation district or cooperative extension office for assistance.)
- If additional fertilization is needed to get a satisfactory stand, do so according to soil test recommendations.
- Add fertilizer the following growing season. Fertilize according to soil test recommendations.
- Fertilize turf areas annually. Apply fertilizer in a split application. For cool-season grasses, apply one-half of the fertilizer in late spring and one-half in early fall. For warm-season grasses, apply one-third in early spring, one-third in late spring, and the remaining one-third in middle summer.

PERMANENT SEEDING

Table 1. Permanent Seeding Recommendations

This table provides several seed mixture options. Additional seed mixtures are available commercially. When selecting a mixture, consider intended land use and site conditions, including soil properties (e.g., soil pH and drainage), slope aspect, and the tolerance of each species to shade and drought.

Open Low-Maintenance Areas
(remaining idle more than six months)

Seed Mixtures	Rate per Acre Pure Live Seed	Optimum Soil pH
1. Perennial ryegrass - white clover[1]	70 lbs. 2 lbs.	5.5 to 7.0
2. Perennial ryegrass - tall fescue[2]	70 lbs. 50 lbs.	5.5 to 7.0
3. Tall fescue[2] - white clover[1]	70 lbs. 2 lbs.	5.5 to 7.5

Steep Banks and Cuts, Low-Maintenance Areas (not mowed)

Seed Mixtures	Rate per Acre Pure Live Seed	Optimum Soil pH
1. Smooth brome grass - red clover[1]	35 lbs. 20 lbs.	5.5 to 7.0
2. Tall fescue[2] - white clover[1]	50 lbs. 2 lbs.	5.5 to 7.5
3. Tall fescue[2] - red clover[1]	50 lbs. 20 lbs.	5.5 to 7.5
4. Orchard grass - red clover[1] - white clover[1]	30 lbs. 20 lbs. 2 lbs.	5.5 to 7.0
5. Crownvetch[1] - tall fescue[2]	12 lbs. 30 lbs.	5.5 to 7.0

Lawns and High-Maintenance Areas

Seed Mixtures	Rate per Acre Pure Live Seed	Optimum Soil pH
1. Bluegrass	140 lbs.	5.5 to 7.0
2. Perennial ryegrass (turf type)	60 lbs. 90 lbs.	5.5 to 7.0
3. Tall fescue (turf type)[2] - bluegrass	170 lbs. 30 lbs.	5.5 to 7.5

PERMANENT SEEDING

Channels and Areas of Concentrated Flow

Seed Mixtures	Rate per Acre Pure Live Seed	Optimum Soil pH
1. Perennial ryegrass - white[1]	150 lbs. 2 lbs.	5.5 to 7.0
2. Kentucky bluegrass - smooth bromegrass - switchgrass - timothy - perennial ryegrass - white clover[1]	20 lbs. 10 lbs. 3 lbs. 4 lbs. 10 lbs. 2 lbs.	5.5 to 7.5
3. Tall fescue[2] - white clover[1]	150 lbs. 2 lbs.	5.5 to 7.5
4. Tall fescue[2] - perennial ryegrass - Kentucky bluegrass	150 lbs. 20 lbs. 20 lbs.	5.5 to 7.5

[1] For best results: (a) legume seed should be inoculated; (b) seeding mixtures containing legumes should preferably be spring-seeded, although the grass may be fall-seeded and the legume frost-seeded (see **Dormant Seeding and Frost Seeding** on page 41); and (c) if legumes are fall-seeded, do so in early fall.

[2] Tall fescue provides little cover for, and may be toxic to some species of wildlife. The Indiana Department of Natural Resources recognizes the need for additional research on alternatives such as buffalograss, orchardgrass, smooth bromegrass, and switchgrass. This research, in conjunction with demonstration areas, should focus on erosion control characteristics, wildlife toxicity, turf durability, and drought resistance.

Notes
1. An oat or wheat companion or nurse crop may be used with any of the above permanent seeding mixtures, at the following rates:

   (a) spring oats – one-fourth to three-fourths bushel per acre
   (b) wheat – no more than one-half bushel per acre

2. A high potential for fertilizer, seed, and mulch to wash exists on steep banks, cuts, and in channels and areas of concentrated flow.

PERMANENT SEEDING

Figure 1. Cultipacker Seeder

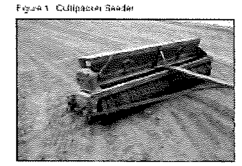


Figure 2. Broadcast Seeding

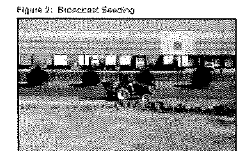
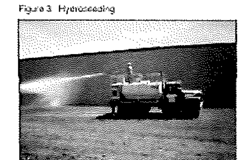


Figure 3. Hydroseeding



SURFACE STABILIZATION

Dormant Seeding & Frost Seeding

Dormant seeding is a temporary or permanent seeding application at a time when soil temperatures are too low for germination to occur (less than 50°F).

Frost seeding is a temporary or permanent seeding application in late winter when soils are in the freeze-thaw stage. This measure can be used to repair or enhance areas having thin or declining vegetative cover or to revegetate an area.

Purpose

- To provide early germination and soil stabilization in the spring.
- To reduce sediment-laden storm water runoff from being transported to downstream areas.
- To improve the visual aesthetics of the construction area.
- To repair or enhance previous seeding.

Specifications

Seedbed Preparation

Grade and apply soil amendments as recommended by a soil test (incorporate soil amendments into soil prior to soil freezing).

Density of Vegetative Cover

Eighty percent or greater over the soil surface.

Materials

- Soil Amendments – Select materials and rates as determined by a soil test (contact your county soil and water conservation district or cooperative extension office for assistance and soil information, including available soil testing services) or 200 to 300 pounds of 12-12-12 analysis fertilizer, or equivalent. Consider the use of reduced phosphorus application where soil tests indicate adequate phosphorus levels in the soil profile.

DORMANT SEEDING & FROST SEEDING

- Seed – Select an appropriate plant species seed or seed mixture on the basis of soil type, soil pH, region of the state, time of year, and intended land use of the area to be seeded (see Table 1 or Table 2).
- Mulch –
  - Straw, hay, wood fiber, compost, etc. (to protect seedbed, retain moisture, and encourage plant growth).
  - Anchored to prevent removal by wind or water or covered with premanufactured erosion control blankets.

Application

(see Tables 1 and 2)

Site Preparation

1. Grade the site to achieve positive drainage.
2. Add topsoil (see **Topsoil Salvage and Utilization** on page 25) to achieve needed depth for establishment of vegetation.

Dormant Seeding

Site preparation, seedbed preparation and mulching can be done months ahead of actual seeding or if the existing ground cover is adequate, seeding can be done directly into it.

1. Test soil to determine pH and nutrient levels.
2. Broadcast soil amendments as recommended by a soil test and work into the upper two to four inches of soil. If testing was not done, apply 200 to 300 pounds per acre of 12-12-12 analysis fertilizer, or equivalent.
3. Apply and anchor mulch (see **Mulching** on page 55 and **Compost Mulching** on page 59) immediately after completion of grading and addition of soil amendments.
4. Select an appropriate seed species or mixture from Table 1 for temporary seeding or Table 2 for permanent seeding. Broadcast the seed on top of the mulch and/or existing ground cover at the rate shown. (Seed areas when soil temperatures are below 50°F but the soil is not frozen.)

Frost Seeding

Seed is broadcast over the prepared seedbed and incorporated into the soil by natural freeze-thaw action.

1. Test soil to determine pH and nutrient levels.

STORM WATER POLLUTION PREV. PLAN SPECS.

THE BLUFFS AT YOUNGS CREEK
SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

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

CERTIFIED: 04/07/22

DAVID J. STOEPPELWERTH
REGISTERED
No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

DATE	MARK	REVISIONS	BY

DRAWN BY: DCM
CHECKED BY: BKR
SHEET NO. C305
S & A JOB NO. 83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C304 - Erosion Control Details.dwg - C305
Modified / By: March 21, 2022 11:15:28 AM / RMorris
Plotted / By: March 22, 2022 11:24:33 AM / Raven Morris

DORMANT SEEDING & FROST SEEDING

2. Broadcast soil amendments as recommended by a soil test and work into the upper two to four inches of soil before it freezes. If testing was not done, apply 200 to 300 pounds per acre of 12-12-12 analysis fertilizer, or equivalent.
3. Select an appropriate seed species or mixture from Table 1 for temporary seeding or Table 2 for permanent seeding. Broadcast the seed on the seedbed or into the existing ground cover at the rate shown. (Seed areas when the soil is frozen. Do not work the seed into the soil.)

Maintenance

- Inspect at least once every seven calendar days.
- Check for erosion or movement of mulch.
- Check for inadequate cover (less than 60 percent density over the soil surface), reseed and mulch in mid to late April if necessary. For best results, reseed within the recommended dates shown in Temporary Seeding on page 31 and Permanent Seeding on page 35.
- Apply 200 to 300 pounds per acre of 12-12-12 analysis fertilizer, or equivalent, between April 15 and May 10 or during periods of vigorous growth.
- Fertilize turf areas annually. Apply fertilizer in a split application. For cool-season grasses, apply one-half of the fertilizer in late spring and one-half in early fall. For warm-season grasses, apply one-third in early spring, one-third in late spring, and the remaining one-third in middle summer.

Table 1. Temporary Dormant or Frost Seeding Recommendations

Seed Species	Rate per Acre
Wheat or rye	150 lbs.
Spring oats	100 lbs.
Annual ryegrass	50 lbs.

Table 2 provides several seeding options. Additional seed mixtures are available commercially. When selecting a mixture, consider site conditions, including soil properties (e.g., soil pH and drainage), slope aspect, and the tolerance of each species to shade and drought.

DORMANT SEEDING & FROST SEEDING

Table 2. Permanent Dormant or Frost Seeding Recommendations

Open Low-Maintenance Areas (remaining idle more than six months)

Seed Mixtures	Rate per Acre Pure Live Seed	Optimum Soil pH
1. Perennial ryegrass - white clover[1]	75 lbs 3 lbs	5.6 to 7.0
2. Kentucky bluegrass - smooth bromegrass - switchgrass - timothy - perennial ryegrass - white clover[1]	30 lbs 15 lbs 5 lbs 6 lbs 15 lbs 3 lbs	5.6 to 7.5
3. Perennial ryegrass - tall fescue[2]	45 lbs 45 lbs	5.6 to 7.0
4. Tall fescue[2] - white clover[1]	75 lbs 3 lbs	5.5 to 7.5

Steep Banks and Cuts, Low-Maintenance Areas (not mowed)

Seed Mixtures	Rate per Acre Pure Live Seed	Optimum Soil pH
1. Smooth bromegrass - red clover[1]	50 lbs 30 lbs	5.5 to 7.5
2. Tall fescue[2] - white clover[1]	75 lbs 3 lbs	5.5 to 7.5
3. Tall fescue[2] - red clover	75 lbs 30 lbs	5.5 to 7.5
4. Orchardgrass - red clover[1] - white clover[1]	45 lbs 30 lbs 3 lbs	5.6 to 7.0
5. Crownvetch[1] - tall fescue	15 lbs 45 lbs	5.6 to 7.0

Lawns and High-Maintenance Areas

Seed Mixtures	Rate per Acre Pure Live Seed	Optimum Soil pH
1. Bluegrass	210 lbs.	5.5 to 7.0
2. Perennial ryegrass (turf type) - bluegrass	90 lbs. 135 lbs.	5.6 to 7.0
3. Tall fescue (turf type)[2] - bluegrass	250 lbs. 45 lbs.	5.6 to 7.5

DORMANT SEEDING & FROST SEEDING

Channels and Areas of Concentrated Flow

Seed Mixtures	Rate per Acre Pure Live Seed	Optimum Soil pH
1. Perennial ryegrass - white clover[1]	225 lbs. 3 lbs.	5.6 to 7.0
2. Kentucky bluegrass - smooth bromegrass - switchgrass - timothy - perennial ryegrass - white clover[1]	30 lbs. 15 lbs. 5 lbs. 6 lbs. 15 lbs. 3 lbs.	5.5 to 7.5
3. Tall fescue[2] - white clover[1]	225 lbs. 5 lbs.	5.5 to 7.5
4. Tall fescue[2] - perennial ryegrass - Kentucky bluegrass	225 lbs. 30 lbs. 30 lbs.	5.5 to 7.5

[1] For best results: (a) legume seed should be inoculated; (b) seeding mixtures containing legumes should preferably be spring-seeded, although the grass may be fall-seeded and the legume frost-seeded; and (c) if legumes are fall-seeded, do so in early fall.

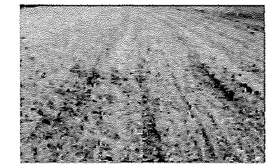
[2] Tall fescue provides little cover for, and may be toxic to some species of wildlife. The Indiana Department of Natural Resources recognizes the need for additional research on alternatives such as bullgrass, orchardgrass, smooth bromegrass, and switchgrass. This research, in conjunction with demonstration areas, should focus on erosion control characteristics, wildlife toxicity, turf durability, and drought resistance.

Notes:

1. If using mixtures other than those listed in this table, increase seeding rates by 50 percent over the conventional seeding rates.
2. A high potential for fertilizer, seed, and mulch to wash exists on steep banks, cuts, and in channels and areas of concentrated flow.

SURFACE STABILIZATION

Mulching



Mulching is the application of plant residues/materials to enhance and protect vegetative establishment and minimize erosion potential.

Purpose

- To prevent erosion by protecting the soil from wind and water impact.
- To provide temporary surface stabilization.
- To prevent soil from crusting.
- To conserve soil moisture, moderate soil temperature, and promote seed germination and seedling growth.

Note: **This measure should not be used in storm water runoff channels or areas where concentrated flow is attempted.**

Specifications

Materials

Table 1. Mulch Specifications

Material[1]	Rate per Acre	Comments
Straw or hay	2 tons	Should be dry, free of undesirable seeds. Spread by hand or machine. Must be crimped or anchored (see Table 2).
Wood fiber or cellulose	1 ton	Apply with a hydraulic mulch machine and use with tacking agent.

[1] Mulching is not recommended in concentrated flows. Consider erosion control blankets or other stabilization methods.

MULCHING

Coverage

The mulch should have a uniform density of at least 75 percent over the soil surface.

Anchoring

Table 2. Mulch Anchoring Methods

Anchoring Method[1]	How to Apply
Mulch anchoring tool or farm disk (dull, serrated, and blades set straight)	Crimp or punch the straw or hay two to four inches into the soil. Operate machinery on the contour of the slope.
Cleating with dozer tracks	Operate dozer up and down slope to prevent formation of rills by dozer cleats.
Wood hydromulch fibers	Apply according to manufacturer's recommendations.
Synthetic tackifiers, binders, or soil stabilizers	Apply according to manufacturer's recommendations.
Netting (synthetic or biodegradable material)	Install netting immediately after applying mulch. Anchor netting with staples. Edges of netting strips should overlap with each up-slope strip overlapping four to six inches over the adjacent down-slope strip. Best suited to slope applications. In most instances, installation details are site specific, so manufacturer's recommendations should be followed.

[1] All forms of mulch must be anchored to prevent displacement by wind and/or water.

Application

1. Apply mulch at the recommended rate shown in Table 1.
2. Spread the mulch material uniformly by hand, hayfork, mulch blower, or hydraulic mulch machine. After spreading, no more than 25 percent of the ground should be visible.
3. Anchor straw or hay mulch immediately after application. The mulch can be anchored using one of the methods listed below:
   a. Crimp with a mulch anchoring tool, a weighted farm disk with dull serrated blades set straight, or track cleats of a bulldozer,
   b. Apply hydraulic mulch with short cellulose fibers,
   c. Apply a liquid tackifier, or
   d. Cover with netting secured by staples.

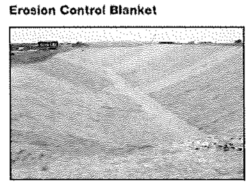
MULCHING

Maintenance

- Inspect within 24 hours of each rain event and at least once every seven calendar days.
- Check for erosion or movement of mulch; repair damaged areas, reseed, apply new mulch and anchor the mulch in place.
- Continue inspections until vegetation is firmly established.
- If erosion is severe or recurring, use erosion control blankets or other more substantial stabilization methods to protect the area.

SURFACE STABILIZATION

Erosion Control Blanket



An erosion control blanket is a biodegradable, organic or synthetic mulch incorporated with a biodegradable, photodegradable, or permanent polypropylene, natural fiber, or similar netting material. It is an alternative to mulch and normally used on slopes and in concentrated flow channels.

Purpose

- To prevent erosion by protecting the soil from rainfall impact, overland water flow, concentrated runoff, or wind.
- To provide temporary surface stabilization.
- To anchor mulch in critical areas, including slopes and concentrated flow conveying systems.
- To reduce soil crusting.
- To conserve soil moisture and increase seed germination and seedling growth.

Specifications

Effective Life

The functional life of an erosion control blanket is dependent on the materials used.

Anchoring

Staples, pins or stakes used to prevent movement or displacement of blanket. (Follow manufacturer's recommendations for specific applications.)

Materials

- Organic (straw, excelsior, woven paper, coconut fiber, etc.) or synthetic mulch incorporated with a polypropylene, natural fiber or similar netting material. (The netting may be biodegradable, photodegradable or permanent.)

EROSION CONTROL BLANKET

Note: **Some erosion control blanket nettings may pose a threat to certain species of wildlife if they become entangled in the netting matrix.**

- Six to 12-inch staples, pins, or stakes

Installation

1. Select the type and weight of erosion control blanket to fit the site conditions (e.g., slope, channel, flow velocity) per the manufacturer's specifications.
2. Prepare the seedbed, add soil amendments, and permanently seed (see **Permanent Seeding** on page 35) the area immediately following seedbed preparation.
3. Lay erosion control blankets on the seeded area so that they are in continuous contact with the soil with each up-slope or up-stream blanket overlapping the down-slope or down-stream blanket by at least eight inches or follow manufacturer's recommendations.
4. Tuck the uppermost edge of the upper blankets into a check slot (slit trench), backfill with soil and tamp down. In certain applications, the manufacturer may require additional check slots at specific locations down slope from the uppermost edge of the upper blankets.
5. Anchor the blankets in place by driving staples, pins, or stakes through the blanket and into the underlying soil. Follow an anchoring pattern appropriate for the site conditions and as recommended by the manufacturer.

Maintenance

- Inspect within 24 hours of each rain event and at least once every seven calendar days.
- Check for erosion or displacement of the blanket.
- If any area shows erosion, pull back that portion of the blanket covering the eroded area, add soil and tamp, reseed the area, replace and staple the blanket.

SURFACE STABILIZATION

Riprap Slope Protection

Riprap slope protection is an erosion control measure consisting of geotextile fabric and stone riprap that is placed on an unvegetated slope to protect the soil from erosive forces.

Purpose

To protect slopes or similar areas subject to erosion by water.

Specifications

Slope

A ratio of 2:1 or flatter (designed by a qualified individual/professional engineer; slopes exceeding 2:1 may require additional design considerations).

Minimum Thickness

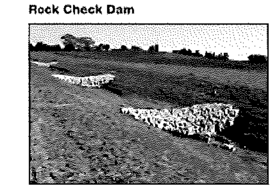
Two times the designed d_{50} (see Appendix A – Glossary) stone diameter plus the depth of the bedding material.

Materials

- Riprap
  - Hard, angular, and weather resistant.
  - Specific gravity of at least 2.5.
  - Size and gradation that will withstand velocities of storm water discharge flow design.
  - Well-graded mixture of stone with 50 percent of the stone pieces, by weight, larger than the designed d_{50} size.
  - Largest pieces should not exceed two times the designed d_{50} and no more than 15 percent of the pieces (by weight) should be less than three inches

RUNOFF CONTROL

Rock Check Dam



A rock check dam is a series of runoff control structures, consisting of geotextile fabric and aggregate, placed across drainage channels to slow storm water runoff. This measure may also provide limited effectiveness as a sediment control measure.

Purpose

- To reduce erosion in a drainage channel by slowing velocity of flow. (Check dams are commonly used (a) in channels that are eroding, but where permanent stabilization is impractical due to their short period of usefulness, and (b) in eroding channels where construction delays or weather conditions prevent timely installation of erosion-resistant linings.)
- To reduce flow velocities in a drainage channel.

Note: **Do not use check dams in perennial streams.**

Specifications

Contributing Drainage Area

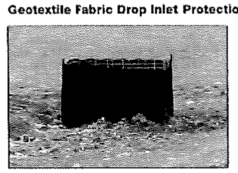
Two acres maximum.

Riprap Check Dam

- Dam height
  - Two feet maximum.
  - center of the dam at least nine inches lower than the points of contact between the uppermost points of the riprap dam and channel banks.
- Side slope – ratio of 2:1 or flatter.
- Spacing – toe of the upstream dam at same elevation as overflow weir of the downstream dam.

TEMPORARY DROP INLET PROTECTION

Geotextile Fabric Drop Inlet Protection



Geotextile fabric drop inlet protection is a temporary sediment control measure consisting of a temporary geotextile fabric barrier placed around a storm drain drop inlet.

Purpose

To capture sediment at the entrance to a storm drain inlet, allowing full use of the storm drain system during the construction period.

Note: **This measure is not recommended for paved surfaces due to inability to entrench the fabric and lack of an anchoring system.**

Specifications

Note: **Alternative support systems may be substituted for hardwood posts and cross braces.**

Contributing Drainage Area

One acre maximum.

Effective Life

Six months (maximum)

Capacity

Runoff from a two-year frequency, 24-hour storm event entering a storm drain without bypass flow.

Geotextile Structure

- Height – 12 to 18 inches, measured from top of storm drain inlet.
- Post spacing – 36-inch maximum spacing between posts.
- Frame support – bracing to strengthen integrity of the structure. (Structure must withstand 1½-foot head of water and sediment without collapsing or undercutting.)

GEOTEXTILE FABRIC DROP INLET PROTECTION

Materials

- Support posts
  - 2 x 2 inch or 2 x 4 inch hardwood posts.
  - Three feet length, minimum.
- 1 x 2 inch or 1 x 3 inch hardwood cross bracing lumber.
- Lathe
- Staples or nails.
- Geotextile fabric

Table 1. Geotextile Fabric Specifications

Physical Property	Woven	Non-Woven
Filtering Efficiency	85%	85%
UV Resistance (Inhibitors and stabilizers to ensure six month minimum life at temperatures of 0° to 120° F)	70%	85%
Tensile Strength at 20% Elongation: Standard Strength Extra Strength	 30 lbs./linear inch 50 lbs./linear inch	 50 lbs./linear inch 70 lbs./linear inch
Slurry Flow Rate	0.3 gal./min./sq. ft.	4.5 gal./min./sq. ft.
Water Flow Rate	15 gal./min./sq. ft.	220 gal./min./sq. ft.

Installation

(see Exhibits 1 and 2)

1. Dig an eight-inch deep, four-inch wide trench around the perimeter of the inlet.
2. If using pre-assembled geotextile fabric and posts, drive the posts into the soil, tightly stretching the geotextile fabric between posts as each is driven. (Posts must be placed on the inlet side of the anchor trench with the geotextile fabric on the side of the trench farthest from the inlet.)

Note: If assembling the geotextile fabric and posts on-site, drive the posts into the soil and then secure the geotextile fabric to the posts by placing a piece of lathe over the fabric and fastening it to the post (stretching the fabric between posts as it is fastened).

GEOTEXTILE FABRIC DROP INLET PROTECTION

3. Use the wrap joint method when joining posts (see **Silt Fence** on page 215).
4. Place the bottom 12 inches of geotextile fabric into the eight-inch deep trench, laying the remaining four inches in the bottom of the trench and extending away from the inlet.
5. Backfill the trench with soil material and compact it in place.
6. Brace the posts by nailing braces into each corner post or utilize rigid panels to support fabric.

Note: **In situations where storm water may bypass the structure, either:**

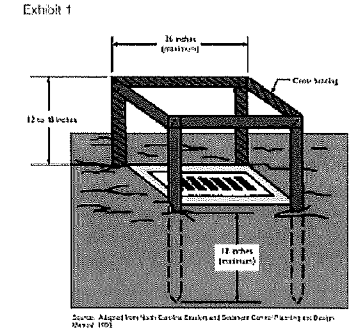
- Set the top of the geotextile fabric filter at least six inches lower than the ground elevation on the down-slope side of the storm drain inlet,
- Build a temporary dike, compacted to six inches higher than the fabric, on the down-slope side of the storm drain inlet, AND/OR
- Use in conjunction with excavated drop inlet protection (see **Excavated Drop Inlet Protection** on page 145).

Maintenance

- Inspect daily.
- Inspect geotextile fabric and make needed repairs immediately.
- Remove sediment from pool area to provide storage for the next storm event. Avoid damaging or undercutting fabric during sediment removal.
- When contributing drainage area has been stabilized, remove sediment, properly dispose of all construction material, grade area to the elevation of the storm drain inlet top, then stabilize immediately.

GEOTEXTILE FABRIC DROP INLET PROTECTION

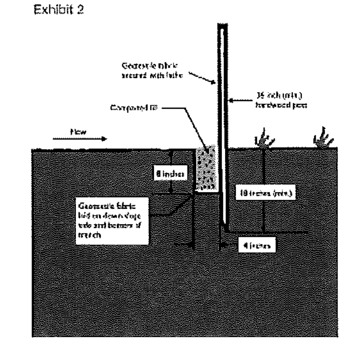
Exhibit 1



Source: Adapted from North Carolina Erosion and Sediment Control Planning and Design Manual, 1993

GEOTEXTILE FABRIC DROP INLET PROTECTION

Exhibit 2



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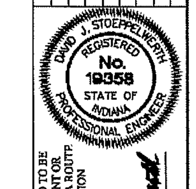

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STORM WATER POLLUTION PREV. PLAN SPECS.

THE BLUFFS AT YOUNGS CREEK
SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY: DCM
CHECKED BY: BKR
SHEET NO. C306
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File Name: S:\83540MMA-S06\DWG\C304 - Erosion Control Details.dwg - C306
Modified / By: March 21, 2022 11:15:28 AM / RMorris
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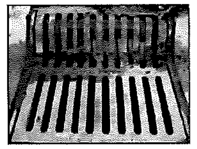
TEMPORARY CURB & PAVED AREA INLET PROTECTION

Insert (Basket) Curb Inlet Protection

***Insert (basket) curb inlet protection** is a temporary sediment control measure consisting of a metal frame or basket that is used to support a geotextile fabric. The system is installed under the storm sewer grate.*




Purpose

To minimize sediment from entering the storm sewer system while allowing runoff to enter the storm sewer system in the event of excessive storm events. This measure traps sediment associated with small storm events below the grade of the paved area. This measure does not place an obstruction in the street to trap sediment and is especially conducive to stages of construction when the public has access to the project site.

Note: **This measure should be used in conjunction with other sediment control measures.**

Specifications

Contributing Drainage Area:

One-quarter acre maximum.

Capacity

Runoff from a two-year frequency, 24-hour storm event entering a storm drain without bypass flow.

INSERT (BASKET) CURB INLET PROTECTION

Location

- At curb inlets on paved roads and parking lots.
- Down grade from construction activities (e.g., individual home sites)

Materials

- Metal frame or basket with a top width and length such that the frame fits into the inlet. (The frame is supported by the structural integrity of the storm sewer.)
- The metal frame or geotextile should be designed with a bypass to allow storm water to flow into the storm sewer system during excessive storm events.
- The system should be designed for ease of maintenance.
- Geotextile fabric.

Table 1. Geotextile Fabric Specifications

Physical Property	Woven	Non-Woven
Filtering Efficiency	85%	85%
UV Resistance (inhibitors and stabilizers to ensure six month minimum life at temperatures of 0° F to 120° F)	70%	85%
Tensile Strength at 20% Elongation		
Standard Strength	30 lbs./linear inch	50 lbs./linear inch
Extra Strength	50 lbs./linear inch	70 lbs./linear inch
Slurry Flow Rate	0.3 gal./min./sq. ft.	4.5 gal./min./sq. ft.
Water Flow Rate	15 gal./min./sq. ft.	220 gal./min./sq. ft.

Installation

1. Remove the storm sewer grate and place the frame into the grate opening.
2. Place geotextile fabric into the frame and secure according to the manufacturer's recommendations.
3. Replace the storm sewer grate.

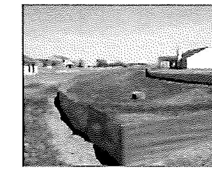
INSERT (BASKET) CURB INLET PROTECTION

Maintenance

- Inspect daily.
- Remove accumulated sediment and debris after each storm event. Deposit sediment in an area where it will not re-enter the paved area or storm drains.
- Replace or clean geotextile fabric as needed.
- When the contributing drainage area has been stabilized, remove inlet protection.

SEDIMENT BARRIERS & FILTERS

Silt Fence



*A **silt fence** is a temporary barrier of entrenched geotextile fabric stretched across and attached to supporting posts and installed on the contour to intercept and treat sediment-laden storm water runoff from small, unvegetated drainage areas.*

Purpose

To trap sediment from small, disturbed areas by reducing the velocity of sheet flow. Silt fences capture sediments by ponding water to allow deposition, not by filtration.

Note: **Silt fence is not recommended for use as a diversion and should not be used across a stream, channel, ditch, swale, or anywhere that concentrated flow is anticipated.**

Specifications

Drainage Area

- Limited to one-quarter acre per 100 linear feet of fence.
- Further restricted by slope steepness (see Table 1).

Effective Life

Six months (maximum).

Location

- Installed parallel to the slope contour.
- Minimum of 10 feet beyond the toe of the slope to provide a broad, shallow sediment pool.
- Accessible for maintenance (removal of sediment and silt fence repair).

SILT FENCE

Spacing

Table 1. Slope Steepness Restrictions

Percent Slope		Maximum Distance
< 2%	< 50:1	100 feet
2% – 5%	50:1 to 20:1	75 feet
5% – 10%[1]	20:1 to 10:1	50 feet
10% – 20%[1]	10:1 to 5:1	25 feet
> 20%[1]	> 5:1	15 feet

[1] Consider other alternatives.

Note: Multiple rows of silt fence are not recommended on the same slope.

Trench

- Depth – eight inches minimum.
- Width – four inches minimum.
- After installing fence, backfill with soil material and compact (to bury and anchor the lower portion of the fence fabric).

Note: **An alternative to trenching is to use mechanical equipment to plow in the silt fence.**

Materials and Silt Fence Specifications

- Fabric – woven or non-woven geotextile fabric meeting specified minimums outlined in Table 2.

SILT FENCE

Table 2. Geotextile Fabric Specifications for Silt Fence (minimum)

Physical Property	Woven Geotextile Fabric	Non-Woven Geotextile Fabric
Filtering efficiency	85%	85%
Tensile strength at 20% elongation: Standard strength / Extra strength	30 lbs. per linear inch / 50 lbs. per linear inch	50 lbs. per linear inch / 70 lbs. per linear inch
Slurry flow rate	0.3 gal/min/square feet	4.5 gal/min/square feet
Water flow rate	15 gal/min/square feet	220 gal/min/square feet
UV resistance	70%	85%
Post spacing	7 feet	5 feet

Note: Silt fences can be purchased commercially.

- Height – a minimum of 18 inches above ground level (30 inches maximum).
- Reinforcement – fabric securely fastened to posts with wood lathe.
- Support Posts
  - 2 x 2-inch hardwood posts. Steel fence posts may be substituted for hardwood posts (steel posts should have projections for fastening fabric).
  - Spacing
    - Eight feet maximum if fence is supported by wire mesh fencing.
    - Six feet maximum for extra-strength fabric without wire backing.

Installation

Prefabricated silt fence (see Exhibits 1, 2, and 3)

1. Lay out the location of the fence so that it is parallel to the contour of the slope and at least 10 feet beyond the toe of the slope to provide a sediment storage area. Turn the ends of the fence up slope such that the point of contact between the ground and the bottom of the fence end terminates at a higher elevation than the top of the fence at its lowest point (see Exhibit 1).
2. Excavate an eight-inch deep by four-inch wide trench along the entire length of the fence line (see Exhibit 2). Installation by plowing is also acceptable.
3. Install the silt fence with the filter fabric located on the up-slope side of the excavated trench and the support posts on the down-slope side of the trench.

SILT FENCE

4. Drive the support posts at least 18 inches into the ground, tightly stretching the fabric between the posts as each is driven into the soil. A minimum of 12 inches of the filter fabric should extend into the trench. (If it is necessary to join the ends of two fences, use the wrap joint method shown in Exhibit 3.)
5. Lay the lower four inches of filter fabric on the bottom of the trench and extend it toward the up-slope side of the trench.
6. Backfill the trench with soil material and compact it in place.

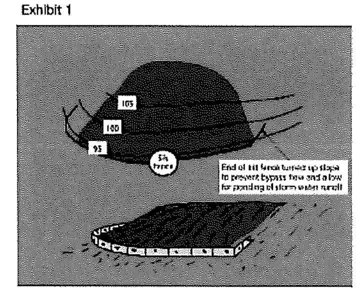
Note: **If the silt fence is being constructed on-site, attach the filter fabric to the support posts (refer to Tables 1 and 2 for spacing and geotextile specifications) and attach wooden laths to secure the fabric to the posts. Allow for at least 12 inches of fabric below ground level. Complete the silt fence installation, following steps 1 through 6 above.**

Maintenance

- Inspect within 24 hours of a rain event and at least once every seven calendar days.
- If fence fabric tears, starts to decompose, or in any way becomes ineffective, replace the affected portion immediately. Note: **All repairs should meet specifications as outlined within this measure.**
- Remove deposited sediment when it is causing the filter fabric to bulge or when it reaches one-half the height of the fence at its lowest point. When contributing drainage area has been stabilized, remove the fence and sediment deposits, grade the site to blend with the surrounding area, and stabilize.

SILT FENCE

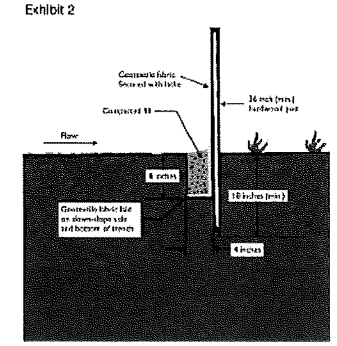
Exhibit 1



Source: Adapted from Commonwealth of Pennsylvania Erosion and Sediment Pollution Control Manual, 1990

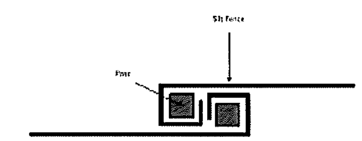
SILT FENCE

Exhibit 2



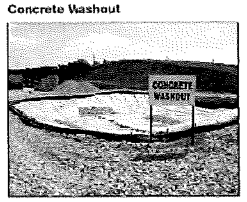
SILT FENCE

Exhibit 3



SITE MANAGEMENT MEASURES

Concrete Washout



***Concrete washout areas** are designated locations within a construction site that are either a prefabricated unit or a designed measure that is constructed to contain concrete washout. Concrete washout systems are typically used to contain washout water when chutes and hoppers are rinsed following delivery.*

Purpose

Concrete washout systems are implemented to reduce the discharge of pollutants that are associated with concrete washout waste through consolidation of solids and retention of liquids. Uncured concrete and associated liquids are highly alkaline which may leach into the soil and contaminate ground water or discharge to a waterbody or wetland which can elevate the pH and be harmful to aquatic life. Performing concrete washout in designated areas and into specifically designed systems reduces the impact concrete washout will have on the environment.

Specifications

Site Management

- Complete construction/installation of the system and have washout locations operational prior to concrete delivery.
- Do not wash out concrete trucks or equipment into storm drains, wetlands, streams, rivers, creeks, ditches, or streets.
- Never wash out into a storm sewer drainage system. These systems are typically connected to a natural conveyance system.
- Where necessary, provide stable ingress and egress (see **Temporary Construction Ingress/Egress Pad** on page 171).
- It is recommended that washout systems be restricted to washing concrete from mixer and pump trucks and not used to dispose of excess concrete or

CONCRETE WASHOUT

residual loads due to potential to exceed the design capacity of the washout system. Small amounts of excess or residual concrete (not washout water) may be disposed of in areas that will not result in flow to an area that is to be protected.

- Install systems at strategic locations that are convenient and in close proximity to work areas and in sufficient number to accommodate the demand for disposal.
- Install signage identifying the location of concrete washout systems.

Location

- Locate concrete washout systems at least 50 feet from any creeks, wetlands, ditches, karst features, or storm drains/manmade conveyance systems.
- To the extent practical, locate concrete washout systems in relatively flat areas that have established vegetative cover and do not receive runoff from adjacent land areas.
- Locate in areas that provide easy access for concrete trucks and other construction equipment.
- Locate away from other construction traffic to reduce the potential for damage to the system.

General Design Considerations

- The structure or system shall be designed to contain the anticipated washout water associated with construction activities.
- The system shall be designed, to the extent practical, to eliminate runoff from entering the washout system.
- Runoff from a rainstorm or snowmelt should not carry wastes away from the washout location.
- Washout will not impact future land uses (i.e., open spaces, landscaped areas, home sites, parks).
- Washout systems/containment measures may also be utilized on smaller individual building sites. The design and size of the system can be adjusted to accommodate the expected capacity.

Prefabricated Washout Systems/Containers

- Self-contained sturdy containment systems that are delivered to a site and located at strategic locations for concrete disposal.

CONCRETE WASHOUT

- These systems are manufactured to resist damage from construction equipment and protect against leaks or spills.
- Manufacturer or supplier provides the containers. The project site manager maintains the system or the supplier provides complete service that includes maintenance and disposal.
- Units are often available with or without ramps. Units with ramps lend themselves to accommodate pump trucks.
- Maintain according to the manufacturer's recommendations.

Designed and Installed Units

These units are designed and installed on site. They tend to be less reliable than prefabricated systems and are often prone to failure. Concrete washout systems can be constructed above or below grade. It is not uncommon to have a system that is partly below grade with an additional containment structure above grade.

- Washout systems shall utilize a pit or bermed area designed and maintained at a capacity to contain all liquid and concrete waste generated by washout operations.
- The volume of the system must also be designed to contain runoff that drains to the system and rainfall that enters the system for a two-year frequency, 24-hour storm event.
  - Below Grade System
    - A washout system installed below grade should be a minimum of ten feet wide by ten feet long, but sized to contain all liquid and waste that is expected to be generated between scheduled cleanout periods. The size of the pit may be limited by the size of polyethylene available. The polyethylene lining should be of adequate size to extend over the entire excavation.
    - Include a minimum 12-inch freeboard to reasonably ensure that the structure will not overtop during a rain event.
    - Line the pit with ten millimeter polyethylene lining to control seepage.
    - The bottom of excavated pit should be above the seasonal high water table.
  - Above Grade System
    - A system designed and built above grade should be a minimum of ten feet wide by ten feet long, but sized to contain all liquid and waste that is expected to be generated between scheduled cleanout periods. The size of the containment system may be limited by the size of

CONCRETE WASHOUT

polyethylene available. The polyethylene lining should be of adequate size to extend over the berm or containment system.

- The system design may utilize an earthen berm, straw bales, sandbags, or other acceptable barriers that will maintain its shape and integrity and support the polyethylene lining.
- Include a minimum four-inch freeboard as part of the design.

Washout Procedures

- Do not leave excess mud in the chutes or hopper after the pour. Every effort should be made to empty the chutes and hopper at the pour. The less material left in the chutes and hopper, the quicker and easier the cleanout. Small amounts of excess concrete (not washout water) may be disposed of in areas that will not result in flow to an area that is to be protected.
- At the washout location, scrape as much material from the chutes as possible before washing them. Use non-water cleaning methods to minimize the chance for waste to flow off site.
- Remove as much mud as possible when washing out.
- Stop washing out in an area if you observe water running off the designated area or if the containment system is leaking or overflowing and ineffective.
- Do not back flush equipment at the project site. Back flushing should be restricted to the plant as it generates large volumes of waste that more than likely will exceed the capacity of most washout systems. If an emergency arises, back flush should only be performed with the permission of an on-site manager for the project.
- Do not use additives with wash water. Do not use solvents or acids that may be used at the target plant.

Materials

- Minimum of ten millimeter polyethylene sheeting that is free of holes, tears, and other defects. The sheeting selected should be of an appropriate size to fit the washout system without seams or overlap of the lining (**designed and installed systems**).
- Signage.
- Orange safety fencing or equivalent.
- Straw bales, sandbags (bags should be ultraviolet-stabilized geotextile fabric), soil material, or other appropriate materials that can be used to construct a containment system (**above grade systems**).

CONCRETE WASHOUT

- Metal pins or staples at a minimum of six inches in length, sandbags, or alternative fastener to secure polyethylene lining to the containment system.
- Non-collapsing and non-water holding cover for use during rain events (optional).

Installation

Prefabricated Washout Systems/Containers

- Install and locate according to the manufacturer's recommendations.

Designed and Installed Systems

- Utilize and follow the design in the storm water pollution prevention plan to install the system.
- Dependent upon the type of system, either excavate the pit or install the containment system.
- A base shall be constructed and prepared that is free of rocks and other debris that may cause tears or punctures in the polyethylene lining.
- Install the polyethylene lining. For excavated systems, the lining should extend over the entire excavation. The lining for bermed systems should be installed over the pooling area with enough material to extend the lining over the berm or containment system. The lining should be secured with pins, staples, or other fasteners.
- Place flags, safety fencing, or equivalent to provide a barrier to construction equipment and other traffic.
- Place a non-collapsing, non-water holding cover over the washout facility prior to a predicted rainfall event to prevent accumulation of water and possible overflow of the system (optional).
- Install signage that identifies concrete washout areas.
- Post signs directing contractors and suppliers to designated locations.
- Where necessary, provide stable ingress and egress (see **Temporary Construction Ingress/Egress Pad** on page 171) or alternative approach pad for concrete washout systems.

File Name: S:\83540MMA-S06\DWG\C304 - Erosion Control Details.dwg - C307
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STORM WATER POLLUTION PREV. PLAN SPECS.

THE BLUFFS AT YOUNGS CREEK SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY: DCM | CHECKED BY: BKR

SHEET NO. C307

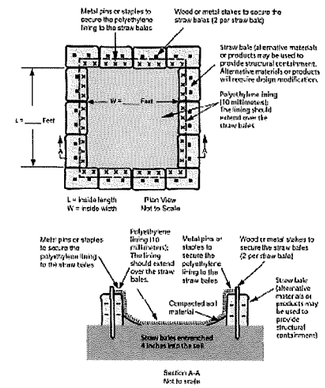
JOB NO. 83540MMA-S6

Maintenance

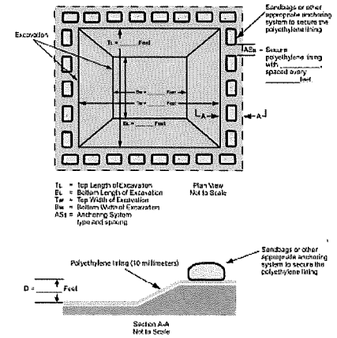
- Inspect daily and after each storm event.
- Inspect the integrity of the overall structure including, where applicable, the containment system.
- Inspect the system for leaks, spills, and tracking off-site by equipment.
- Inspect the polyethylene lining for failure, including tears and punctures.
- Once concrete wastes harden, remove and dispose of the material.
- Excess concrete should be removed when the washout system reaches 50 percent of the design capacity. Use of the system should be discontinued until appropriate measures can be initiated to clean the structure. Prefabricated systems should also utilize this criterion, unless the manufacturer has alternate specifications.
- Upon removal of the solids, inspect the structure. Repair the structure as needed or construct a new system.
- Dispose of all concrete in a legal manner. Reuse the material on site, recycle, or haul the material to an approved construction/demolition landfill site. Recycling of material is encouraged. The waste material can be used for multiple applications including but not limited to mulberds and backfilling. The suitability for recycling should be checked locally.
- The plastic liner should be replaced after every cleaning; the removal of material will usually damage the lining.
- The concrete washout system should be repaired or enlarged as necessary to maintain capacity for concrete waste.
- Concrete washout systems are designed to promote evaporation. However, if the liquids do not evaporate and the system's storage capacity may be necessary to vacuum or remove the liquids and dispose of them in an acceptable method. Disposal may be allowed at the local sanitary sewer authority provided their National Pollutant Discharge Elimination System permits allow for acceptance of this material. Another option could be to utilize a secondary containment system or haul for further dewatering.
- Prefabricated units are often pumped out the company supplying the unit provides this service.
- Inspect construction activities on a regular basis to ensure suppliers, contractors, and others are utilizing designated washout areas. If concrete waste is being disposed of improperly, identify the violators and take appropriate action.

- When concrete washout systems are no longer required, the concrete washout systems shall be closed. Dispose of all hardened concrete and other materials used to construct the system.
- Holes, depressions, and other land disturbances associated with the system should be backfilled, graded, and stabilized.

Concrete Washout (Above Grade System) Worksheet



Concrete Washout (Below Grade System) Worksheet



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DAVID J. STOEPPELWERTH
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PROFESSIONAL ENGINEER

STORM WATER POLLUTION PREV. PLAN SPECS.

THE BLUFFS AT YOUNGS CREEK
SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY: DCM | CHECKED BY: BKR

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S & A JOB NO. 83540MMA-S6

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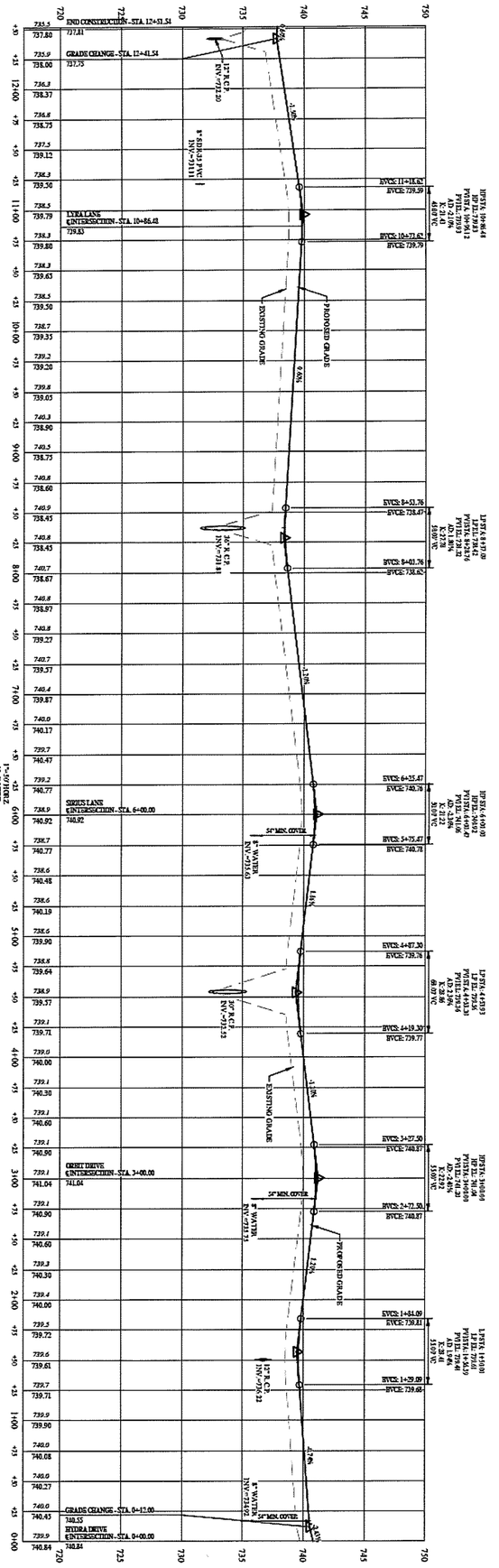

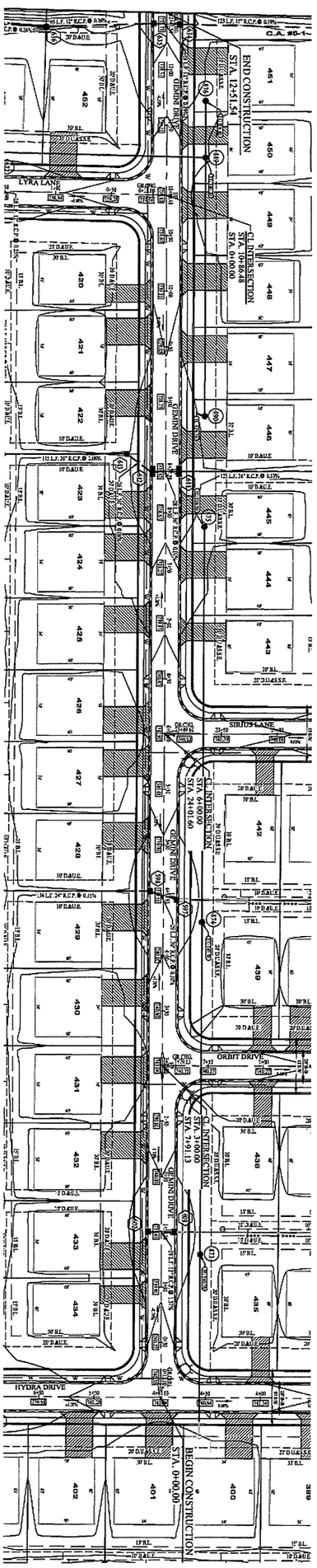

GRAPHIC SCALE
0 25' 50'
(IN FEET)
1" = 50' FT

LEGEND

BVCS	BEGIN VERTICAL CURVE STATION	
BVCE	BEGIN VERTICAL CURVE ELEVATION	
EVCS	END VERTICAL CURVE STATION	
EVCE	END VERTICAL CURVE ELEVATION	
GR. CHG.	GRADE CHANGE	
PVI	POINT OF VERTICAL INTERSECTION	
VC	VERTICAL CURVE	
K	VERTICAL CURVE K-VALUE	

UTILITY CROSSINGS

CONTRACTOR SHALL VERIFY DEPTHS OF ALL EXISTING UTILITY CROSSINGS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY IF CONFLICT EXISTS WITH OTHER UTILITIES. ENGINEER DOES NOT HAVE CONTROL OF CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES OF CONSTRUCTION OR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE CONSTRUCTION. NOR DOES ENGINEER HAVE CONTROL OVER OR CHARGE OF ACTS OR OMISSIONS OF THE CONTRACTOR, SUBCONTRACTORS, AGENTS OR EMPLOYEES OF THE CONTRACTOR OR SUBCONTRACTORS. NOR DOES ENGINEER HAVE AUTHORITY OVER OR RESPONSIBILITY FOR THE FAILURE OF THE CONTRACTOR OR SUBCONTRACTORS TO PERFORM THEIR WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. AFTER CONSTRUCTION BEGINS, ARE SOLELY THE CONTRACTOR'S RESPONSIBILITY.

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STREET PLAN & PROFILES

THE BLUFFS AT YOUNGS CREEK
SECTION 6

FRANKLIN, FRANKIN TOWNSHIP JOHNSON COUNTY, INDIANA

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David J. Stoeppelwerth

DAVID J. STOEPPELWERTH — No. 18358 — STATE OF INDIANA — REGISTERED LAND SURVEYOR

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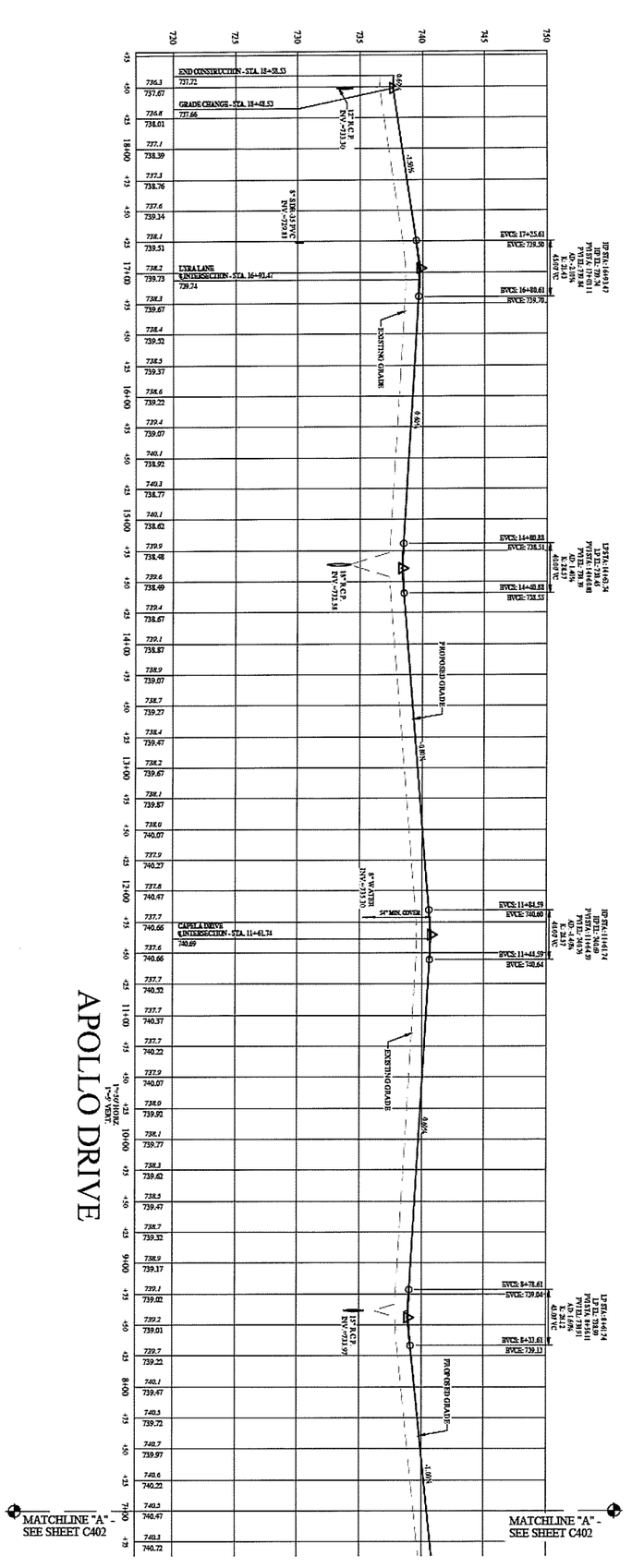

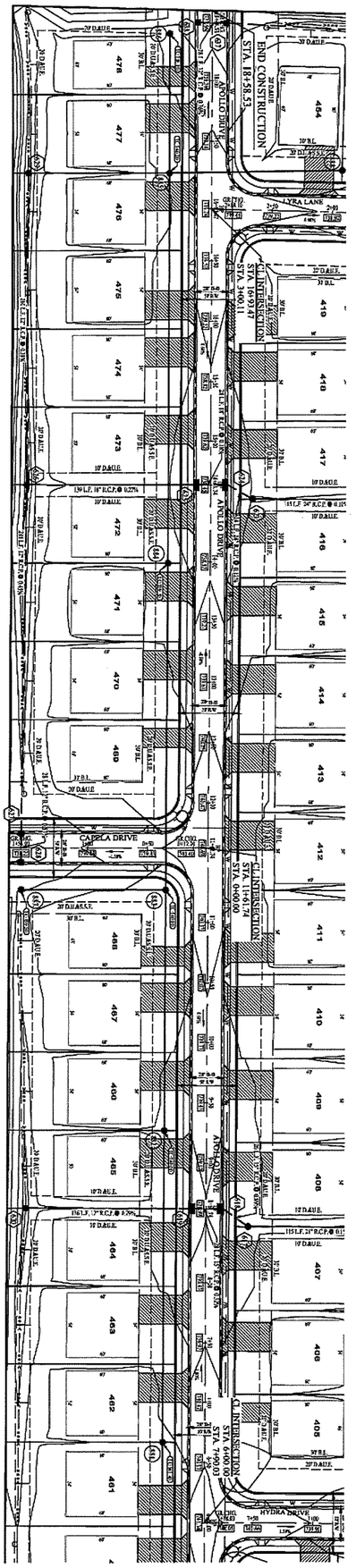

GRAPHIC SCALE
(IN FEET)
1" = 50' FT

LEGEND

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BVCE	BEGIN VERTICAL CURVE ELEVATION	
EVCS	END VERTICAL CURVE STATION	
EVCE	END VERTICAL CURVE ELEVATION	
GR. CHG.	GRADE CHANGE	
PVI	POINT OF VERTICAL INTERSECTION	
VC	VERTICAL CURVE	
K	VERTICAL CURVE K-VALUE	

UTILITY CROSSINGS

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THE BLUFFS AT YOUNGS CREEK
SECTION 6

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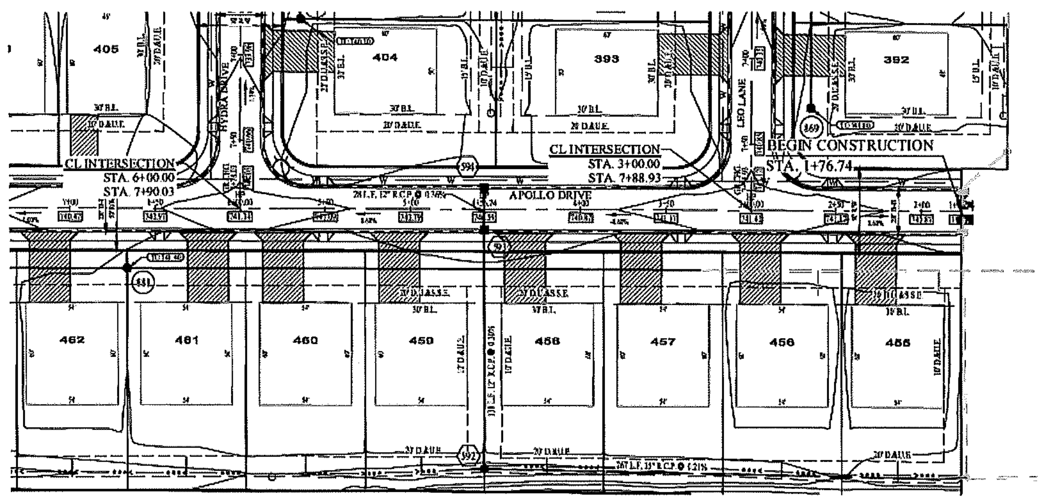
David J. Stoeppelwerth

REGISTERED LAND SURVEYOR — DAVID J. STOEPPELWERTH — No. 10358 — STATE OF INDIANA — PROFESSIONAL ENGINEER

DATE	MARK	REVISIONS	BY



GRAPHIC SCALE
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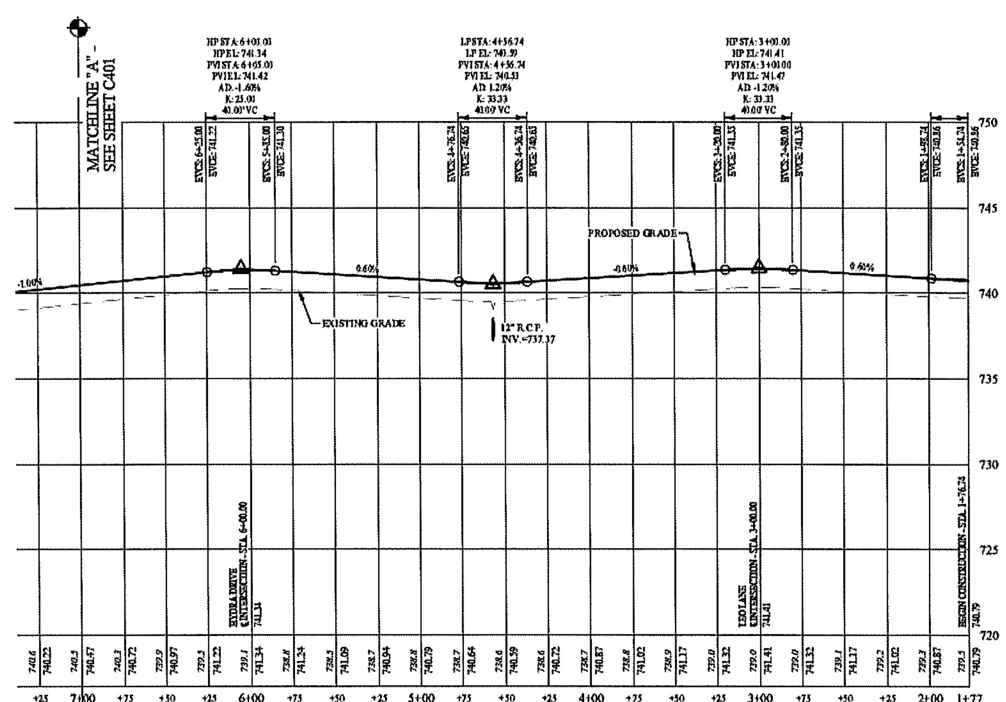
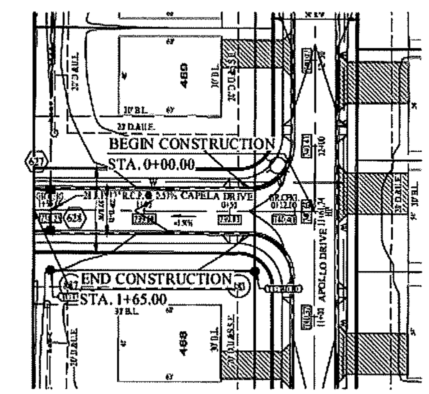
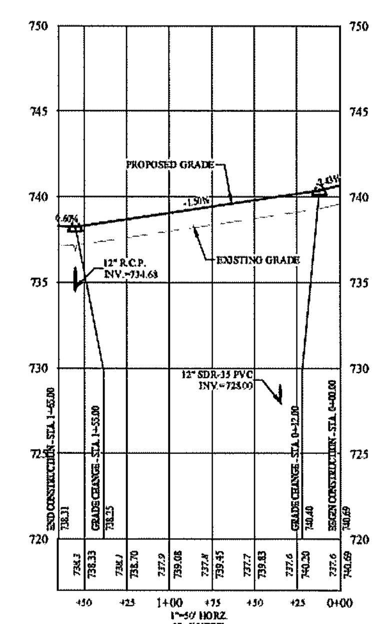
1" = 50 FT



APOLLO DRIVE





CAPELA DRIVE

LEGEND	
BVCS	BEGIN VERTICAL CURVE STATION
BVCE	BEGIN VERTICAL CURVE ELEVATION
EVCS	END VERTICAL CURVE STATION
EVCE	END VERTICAL CURVE ELEVATION
GR. CHG.	GRADE CHANGE
PVI	POINT OF VERTICAL INTERSECTION
VC	VERTICAL CURVE
K	VERTICAL CURVE K-VALUE

UTILITY CROSSINGS

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STREET PLAN & PROFILES

THE BLUFFS AT YOUNGS CREEK SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY: DCM
CHECKED BY: BKR
SHEET NO. C402
S & A JOB NO. 83540MMA-S6

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BVCE	BEGIN VERTICAL CURVE ELEVATION
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EVCE	END VERTICAL CURVE ELEVATION
GR. CHG.	GRADE CHANGE
PVI	POINT OF VERTICAL INTERSECTION
VC	VERTICAL CURVE
K	VERTICAL CURVE K-VALUE

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GRAPHIC SCALE
50' 0 25' 50'
(IN FEET)
1" = 50 FT

LYRA LANE

SIRIUS LANE

ORBIT DRIVE

HYDRA DRIVE

1"=50' HORZ.
1"=5' VERT.

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CHECKED BY:	BKR
SHEET NO	C403
S & A JOB NO	83540MMA-S6

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No. 19358
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PROFESSIONAL ENGINEER

NO.	DATE	MARK	REVISIONS

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STREET PLAN & PROFILES
THE BLUFFS AT YOUNGS CREEK
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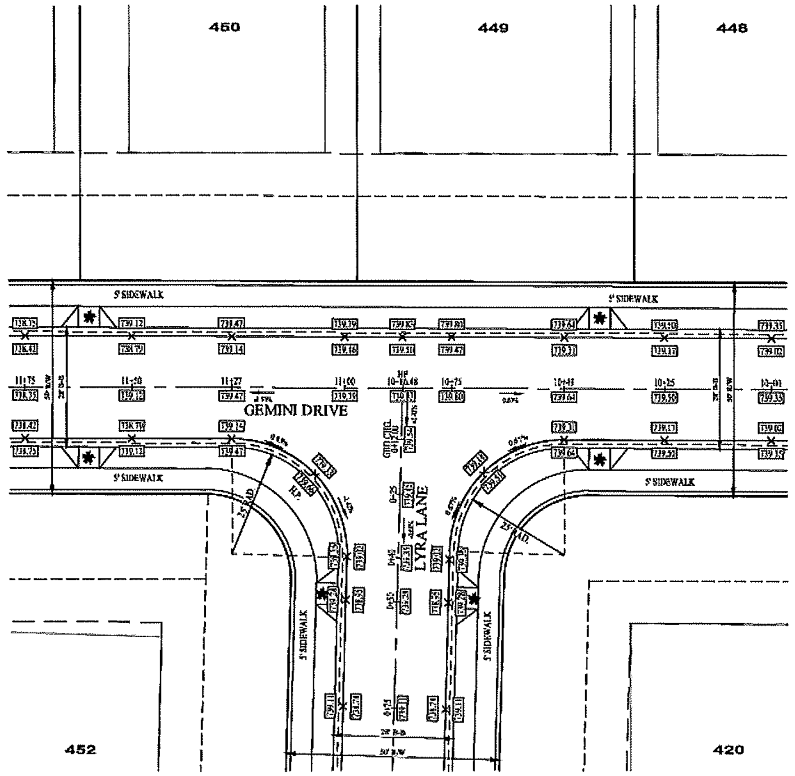
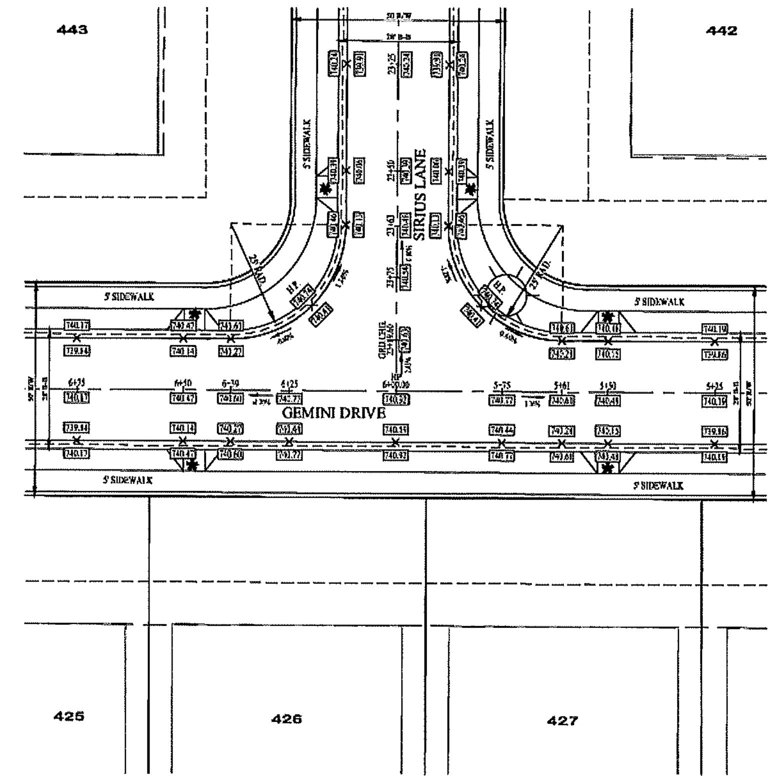
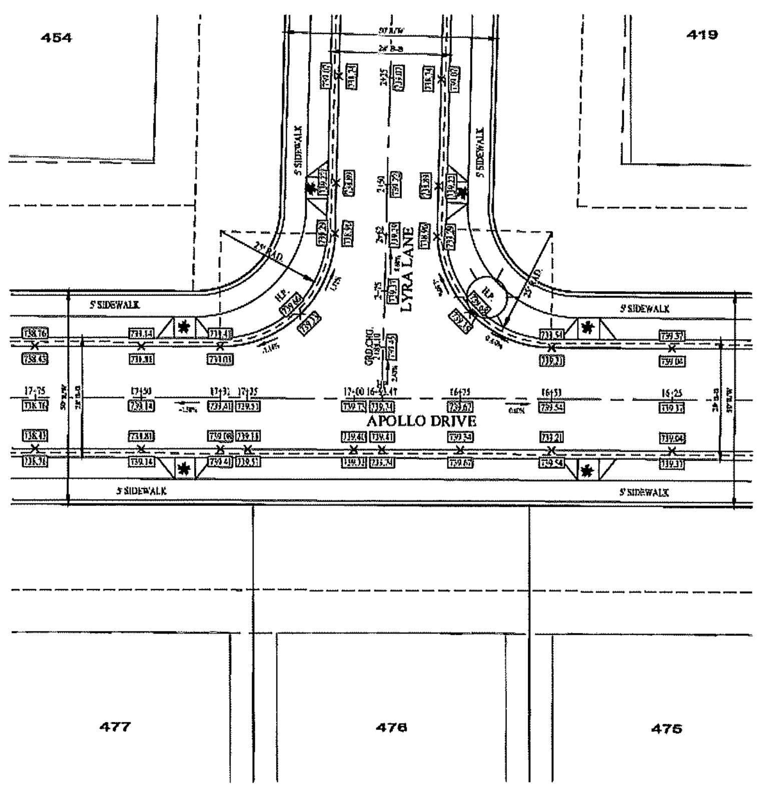


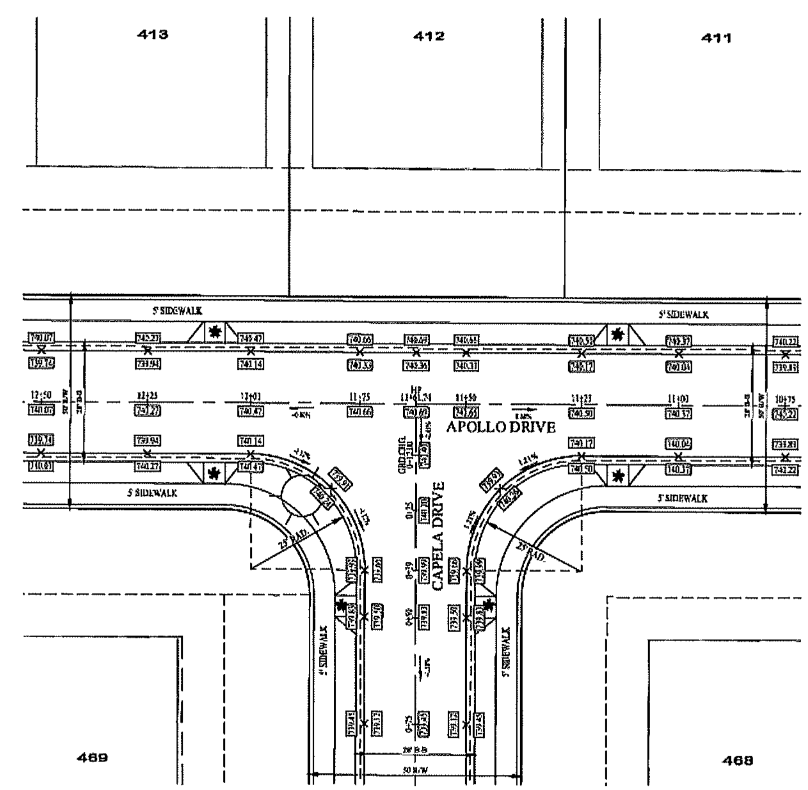
INTERSECTION DETAIL
GEMINI DRIVE & LYRA LANE
SCALE 1" = 20'



INTERSECTION DETAIL
GEMINI DRIVE & SIRIUS LANE
SCALE 1" = 20'



INTERSECTION DETAIL
APOLLO DRIVE & LYRA LANE
SCALE 1" = 20'



INTERSECTION DETAIL
APOLLO DRIVE & CAPELA DRIVE
SCALE 1" = 20'

GRAPHIC SCALE
20' 0 10' 20'
(IN FEET)
1" = 20 FT

LEGEND	
*	ADA RAMP TO BE INSTALLED SEE DETAILS ON SHEET C802A

REVISIONS | DATE | MARK | BY

DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

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

CERTIFIED: 04/07/22

STOEPPELWERTH
ALWAYS ON
7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

INTERSECTION DETAILS

THE BLUFFS AT YOUNGS CREEK
SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP
JOHNSON COUNTY, INDIANA

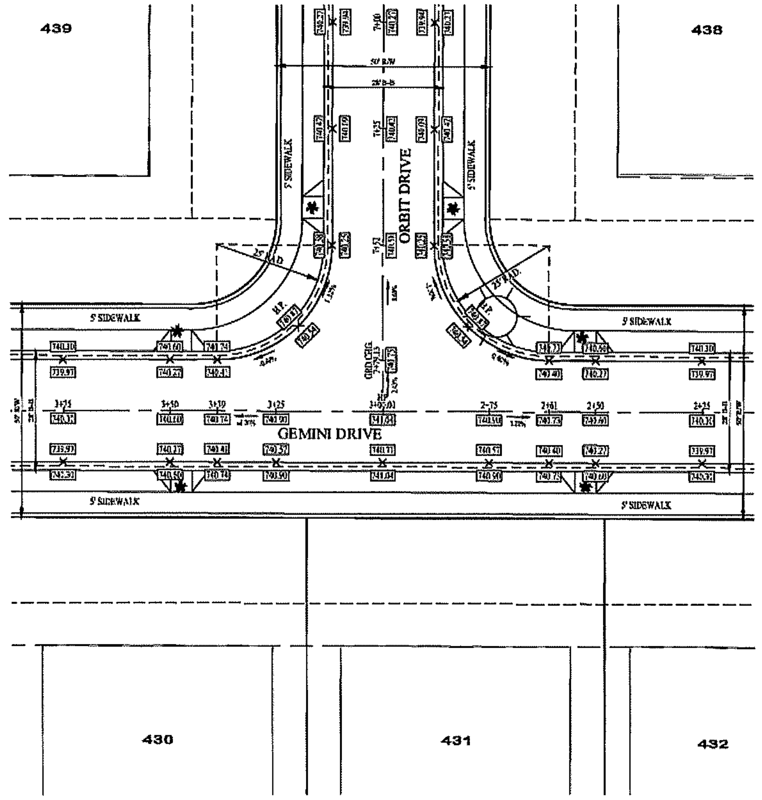
DRAWN BY:	CHECKED BY:
DCM	BKR

SHEET NO.
C404

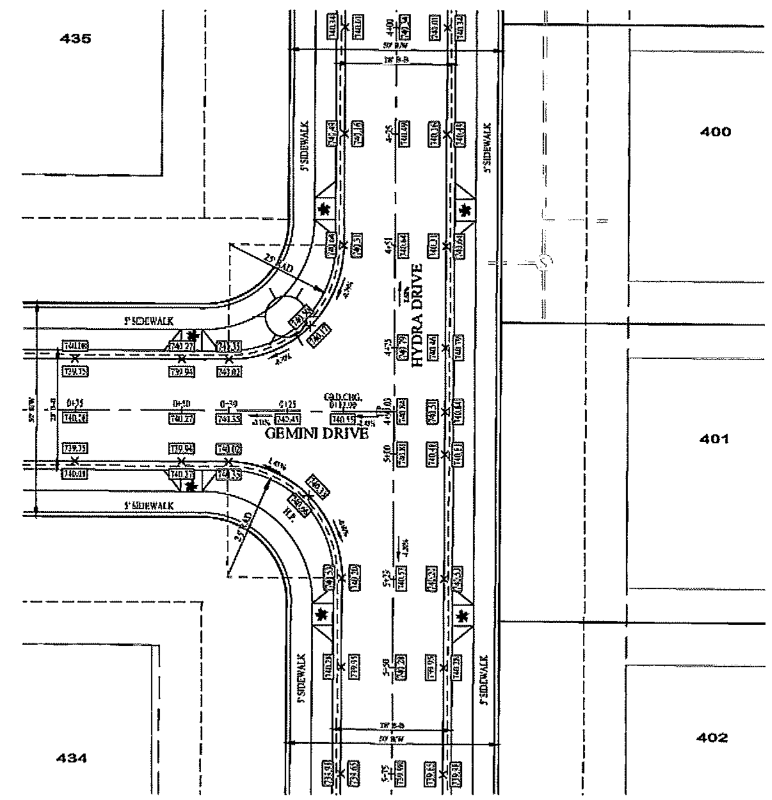
S&A JOB NO.
83540MMA-S6

Indiana 811

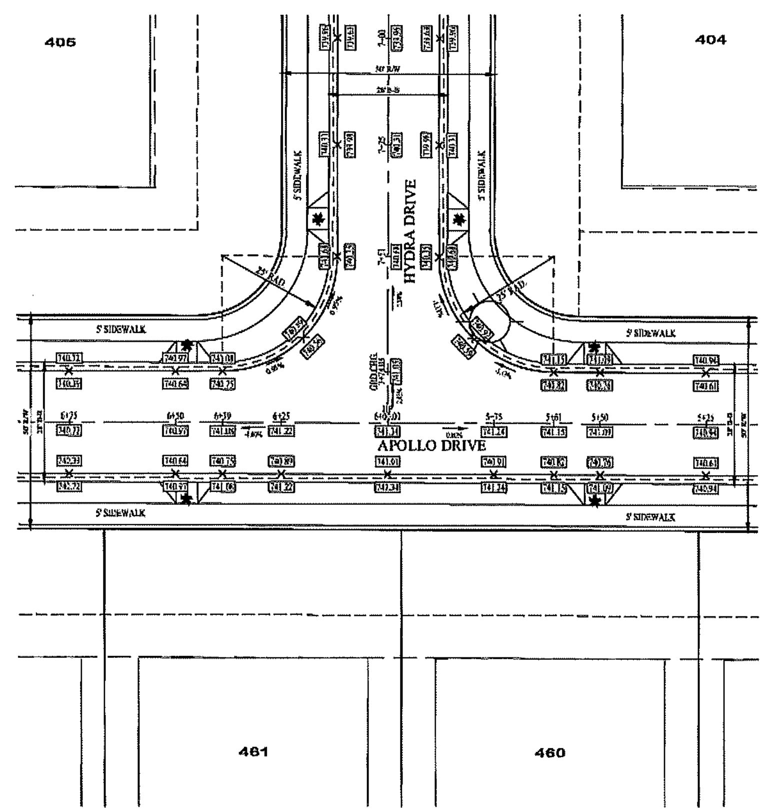
File Name: S:\83540MMA-S06\DWG\C404 - Intersection Details.dwg - C404
Modified / By: March 21, 2022 1:41:53 PM / RMorris
Plotted / By: March 22, 2022 11:51:07 AM / Raven Morris



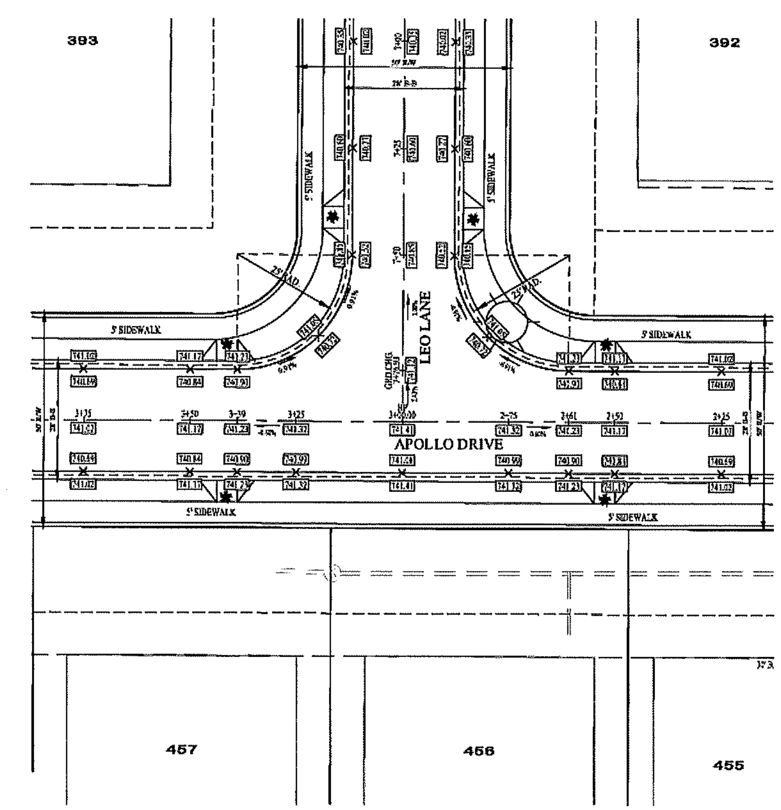
INTERSECTION DETAIL
GEMINI DRIVE & ORBIT DRIVE
SCALE 1" = 20'



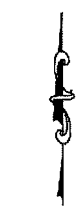
INTERSECTION DETAIL
GEMINI DRIVE & HYDRA DRIVE
SCALE 1" = 20'



INTERSECTION DETAIL
APOLLO DRIVE & HYDRA DRIVE
SCALE 1" = 20'



INTERSECTION DETAIL
APOLLO DRIVE & LEO LANE
SCALE 1" = 20'



GRAPHIC SCALE
20' 0 10' 20'
(IN FEET)
1" = 20 FT

LEGEND
* ADA RAMP TO BE INSTALLED SEE DETAILS ON SHEET C802A

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

CERTIFIED: 04/07/22

DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

STOEPPELWERTH
ALWAYS ON
7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

INTERSECTION DETAILS
THE BLUFFS AT YOUNGS CREEK
SECTION 6
FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DATE	MARK	REVISIONS	BY

DRAWN BY: DCM
CHECKED BY: BKR
SHEET NO. C405
S.&A. JOB NO. 83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C404 - Intersection Details.dwg - C405
Modified / By: March 21, 2022 1:41:53 PM / RMorris
Plotted / By: March 22, 2022 11:51:40 AM / Raven Morris

LEGEND		
(street name sign symbol)	STREET NAME SIGN (D3-1)	8
(stop sign symbol)	STOP SIGN (R1-1)	8
(no parking sign symbol)	"NO PARKING THIS SIDE OF STREET" (R7-1 MOD - SEE DETAIL, THIS SHEET)	9
(street light symbol)	STREET LIGHT	7

NOTES	
1.	ALL TRAFFIC CONTROL SIGNS SHALL CONFORM TO CHAPTER 2 OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), CURRENT REVISION.
2.	ALL STREET LIGHTING SHALL CONFORM TO JOHNSON COUNTY REMC GUIDELINES AND STANDARDS. FIXTURES FOR THIS SUBDIVISION SHALL BE "DECORATIVE STREET LIGHT - TRADITIONAL" USING 31 WATT LED BULBS.
3.	SEE SHEET C407 FOR STANDARD SIGN DETAILS.

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 AND 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 INDOT 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 3 INCH GALVANIZED TYPE A POST, 12 FEET LONG WITH A MINIMUM OF 3 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 3 FEET FROM THE EDGE OF THE TRAVELED PORTION OF THE STREET.

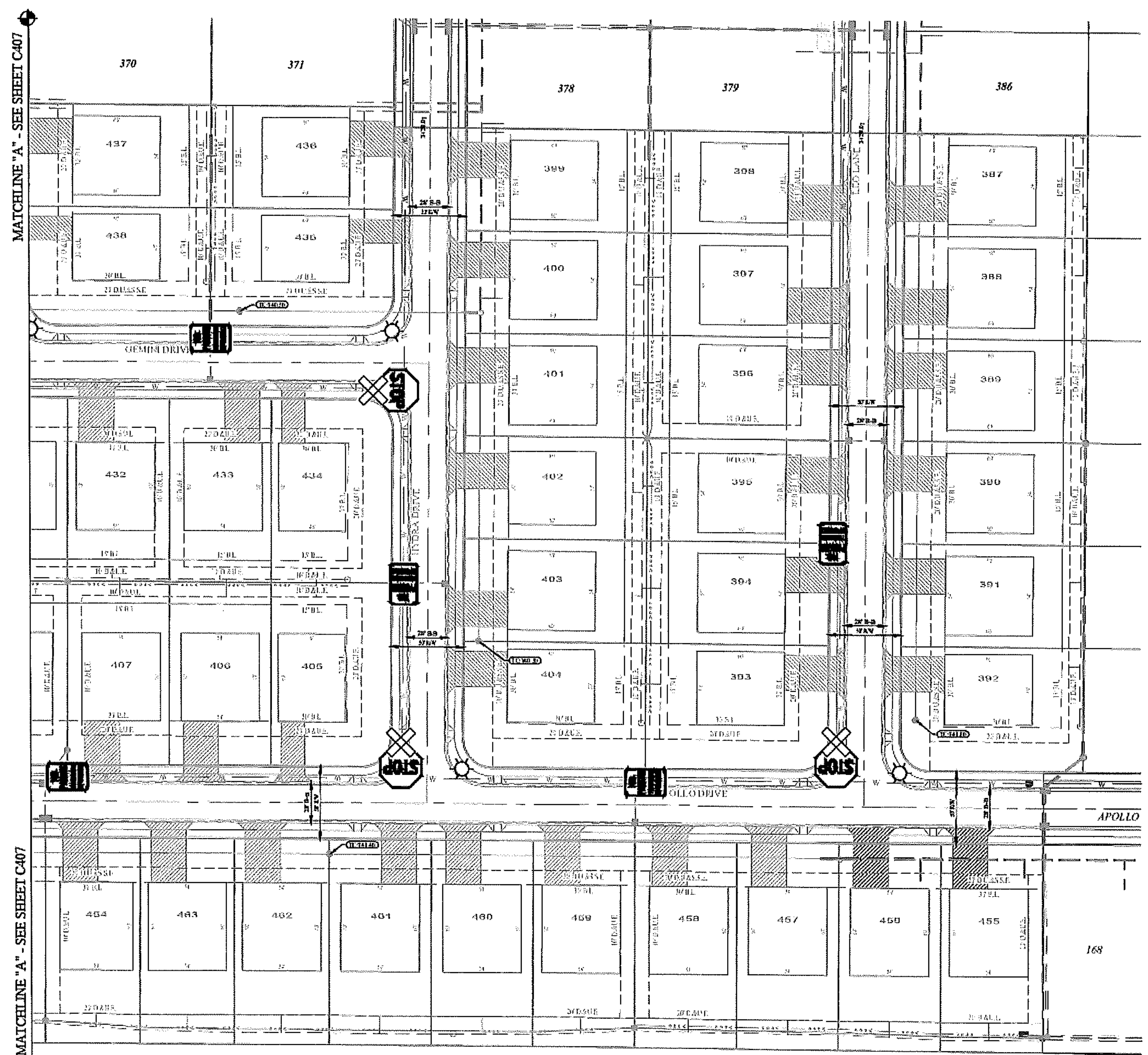
c. SPEED LIMIT AND INFORMATIONAL SIGNPOST LOCATIONS:
SPEED LIMIT AND INFORMATION SIGN SIGNPOSTS SHALL BE LOCATED SO THAT THE EDGE OF THE SIGN IS A MINIMUM OF 2 FEET FROM THE BACK EDGE OF THE CURB (OR SHOULDER IF NO CURB IS PRESENT).

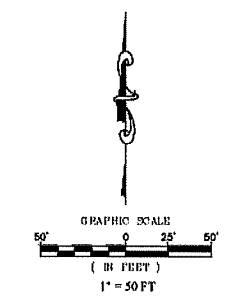
d. SIDEWALK OBSTRUCTION PROHIBITED:
IN NO INSTANCE SHALL ANY SIGNPOST BE LOCATED IN OR OBSTRUCTING A SIDEWALK.

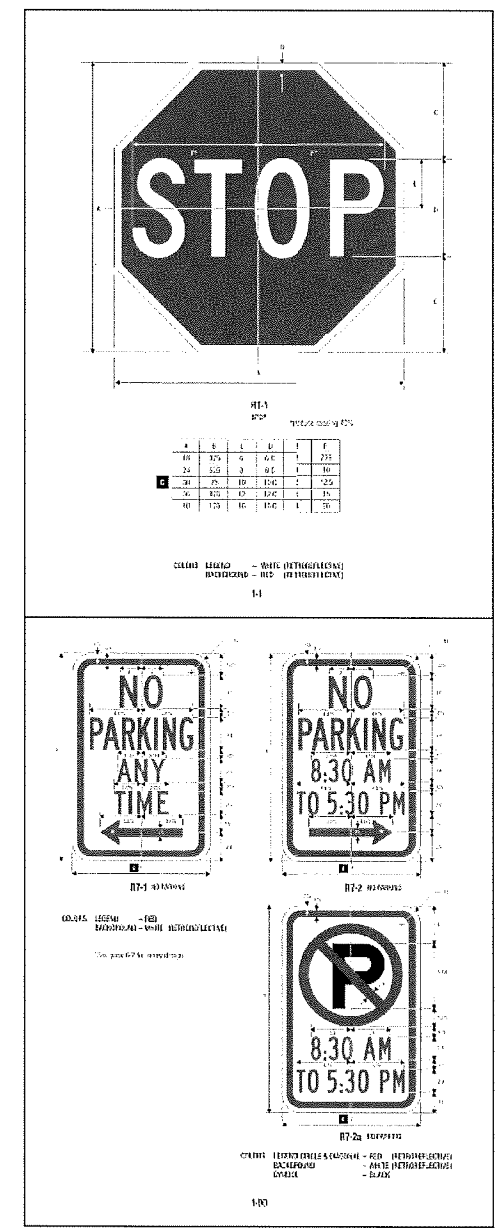
2. STREET NAME SIGNS:
EACH STREET NAME SIGN SHALL BE MADE OF WHITE REFLECTORIZED, DOUBLE-BLADE METAL WITH CITY SEAL AND SPACER AND 4 INCH OR LARGE BLACK LETTERS MOUNTED AT THE TOP OF THE POST WITH THE STREET NAME LABELED ON BOTH SIDES.

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.

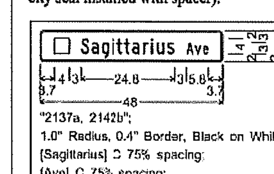
4. SPEED LIMIT AND INFORMATION SIGNS:
SPEED LIMIT AND OTHER INFORMATION SIGNS SHALL BE A 24 INCH BY 30 INCH VERTICAL RECTANGLE WITH A HIGH-INTENSITY FINISH.







NOTE:
Street Sign Standards to reflect current standards (white background, black lettering, city seal installed with spacer).



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

CERTIFIED: 04/07/22

DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

STOEPPELWERTH ALWAYS ON
7965 East 106th Street, Fishers, IN 46038-2505 phone: 317.849.5935 fax: 317.849.5942

STREET SIGN PLAN
THE BLUFFS AT YOUNGS CREEK SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

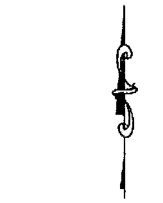
DRAWN BY:	CHECKED BY:
DCM	BKR

SHEET NO.
C406

B & A JOB NO.
83540MMA-S6

DATE	MARK	REVISIONS	BY

File Name: S:\83540MMA-S6\DWG\C406 - Street Sign Plan.dwg - C406
Modified / By: March 21, 2022 2:13:20 PM / RMorris
Plotted / By: March 22, 2022 11:53:45 AM / Raven Morris

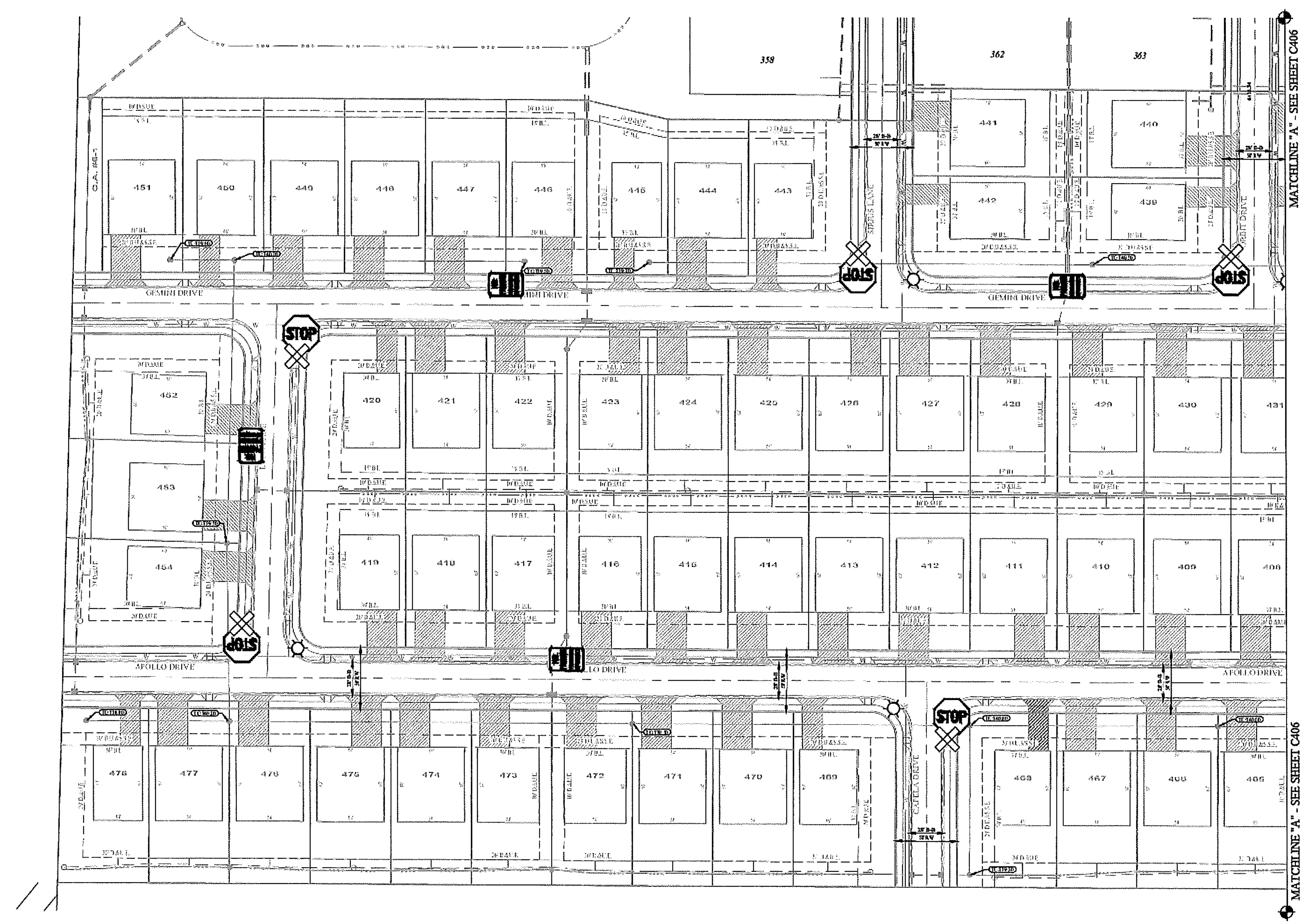


GRAPHIC SCALE

50' 0 25' 50'

(IN FEET)

1" = 50 FT



LEGEND

Symbol	Description	Qty
(street name sign symbol)	STREET NAME SIGN (D3-1)	8
(stop sign symbol)	STOP SIGN (R1-1)	8
(no parking sign symbol)	"NO PARKING THIS SIDE OF STREET" (R7-1 MOD - SEE DETAIL, SHEET C407)	9
(street light symbol)	STREET LIGHT	7

REVISIONS			
DATE	MARK		BY

DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

NOTES

1. ALL TRAFFIC CONTROL SIGNS SHALL CONFORM TO CHAPTER 2 OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), CURRENT REVISION.
2. 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.
3. SEE SHEET C407 FOR STANDARD SIGN DETAILS.

CITY OF FRANKLIN SUBDIVISION CONTROL ORDINANCE
SECTION 6.13 STREET SIGN STANDARDS

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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.

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CERTIFIED: 04/07/22

STOEPPELWERTH
ALWAYS ON
7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

STREET SIGN PLAN

THE BLUFFS AT YOUNGS CREEK SECTION 6

FRANKLIN, FRANKIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY: DCM
CHECKED BY: BKR

SHEET NO. C407

S & A JOB NO. 83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C406 - Street Sign Plan.dwg - C407
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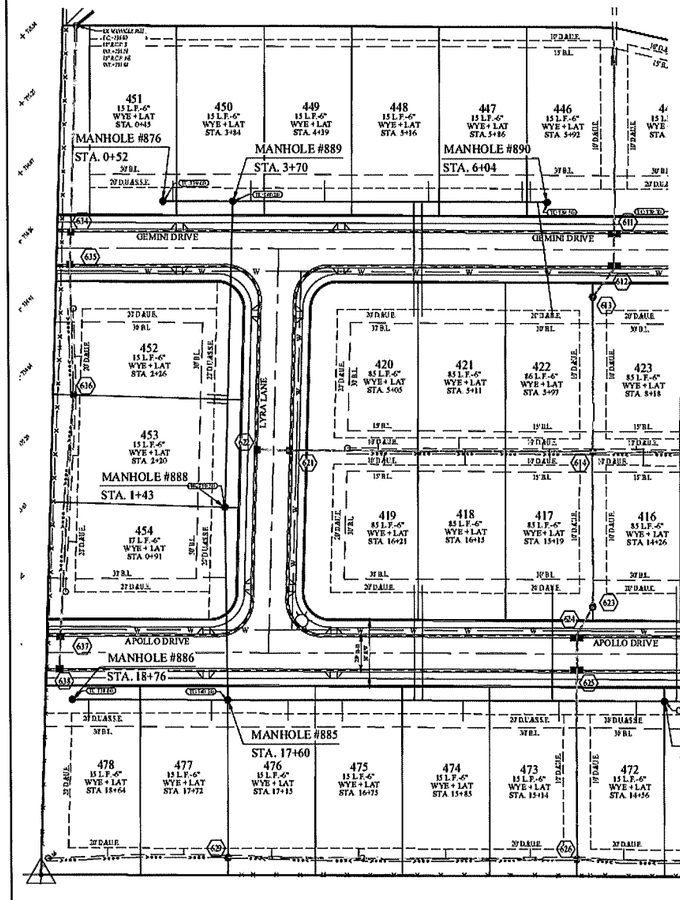
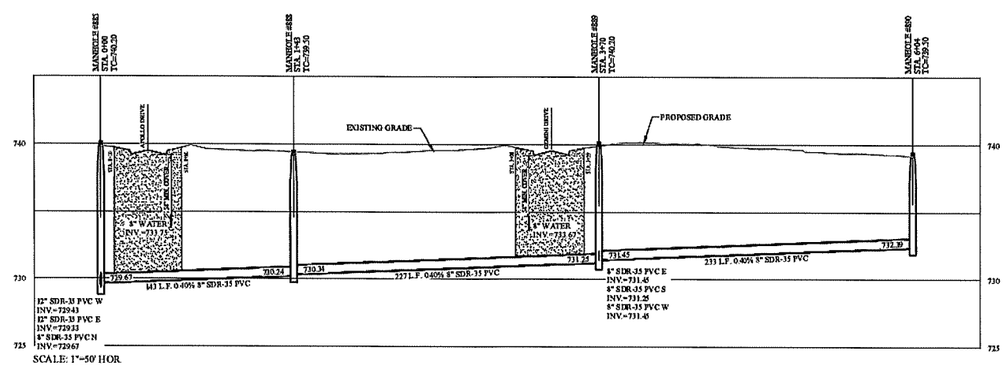
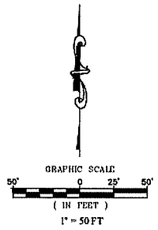
Plotted / By: March 22, 2022 11:53:59 AM / Raven Morris







LEGEND

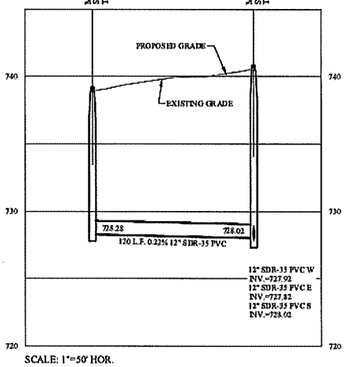
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATER LINE
	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED WATER LINE
	DENOTES FULL DEPTH FLOWABLE BACKFILL

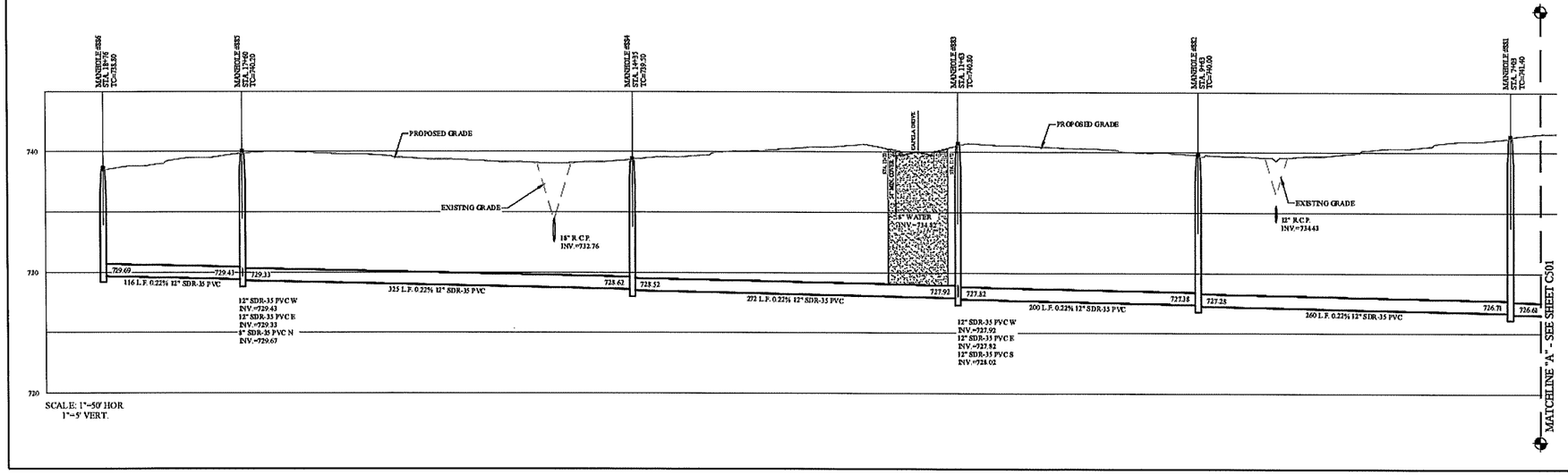
UTILITY CROSSINGS

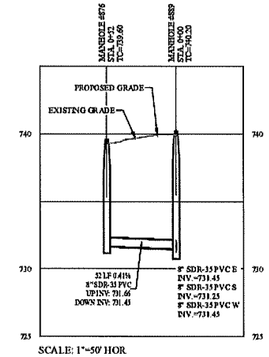
CONTRACTOR SHALL VERIFY DEPTHS OF ALL EXISTING ONSITE UTILITIES PRIOR TO CONSTRUCTION TO CONFIRM THERE IS NOT ANY CONFLICTS WITH OTHER UTILITIES, STORM SEWERS OR STREETS. CONFLICTS AFTER CONSTRUCTION BEGINS ARE SOLELY THE CONTRACTOR'S RESPONSIBILITY.

NOTES

1. 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 TIE VISUALLY LOCATED THE UNDERGROUND UTILITIES.
2. MIN. SLOPES PER THE ISDH STATE STANDARDS SHALL PREVAIL IN ALL CASES.
3. ALL WATER MAINS SHALL MAINTAIN 18 INCHES VERTICAL CLEARANCE AND 10 FEET HORIZONTAL CLEARANCE.
4. CONTRACTOR SHALL INSTALL SERVICE LATERALS TO FUTURE LOTS (LOCATIONS NOTED ON PLANS)
5. ALL SANITARY LATERALS SHALL OVER THAN 12' SHALL BE SDR-35 PVC. ALL SANITARY LATERALS DEEPER THAN 12' SHALL BE SDR-26 PVC.
6. SEE SHEET C502 FOR SANITARY STRUCTURE DATA TABLE.
7. 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.







REVISIONS

DATE	MARK

DAVID J. STOEPPELWERTH
REGISTERED
No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

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

CERTIFIED: 04/07/22

STOEPPELWERTH & ASSOCIATES
ALWAYS ON THE LEVEL
7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

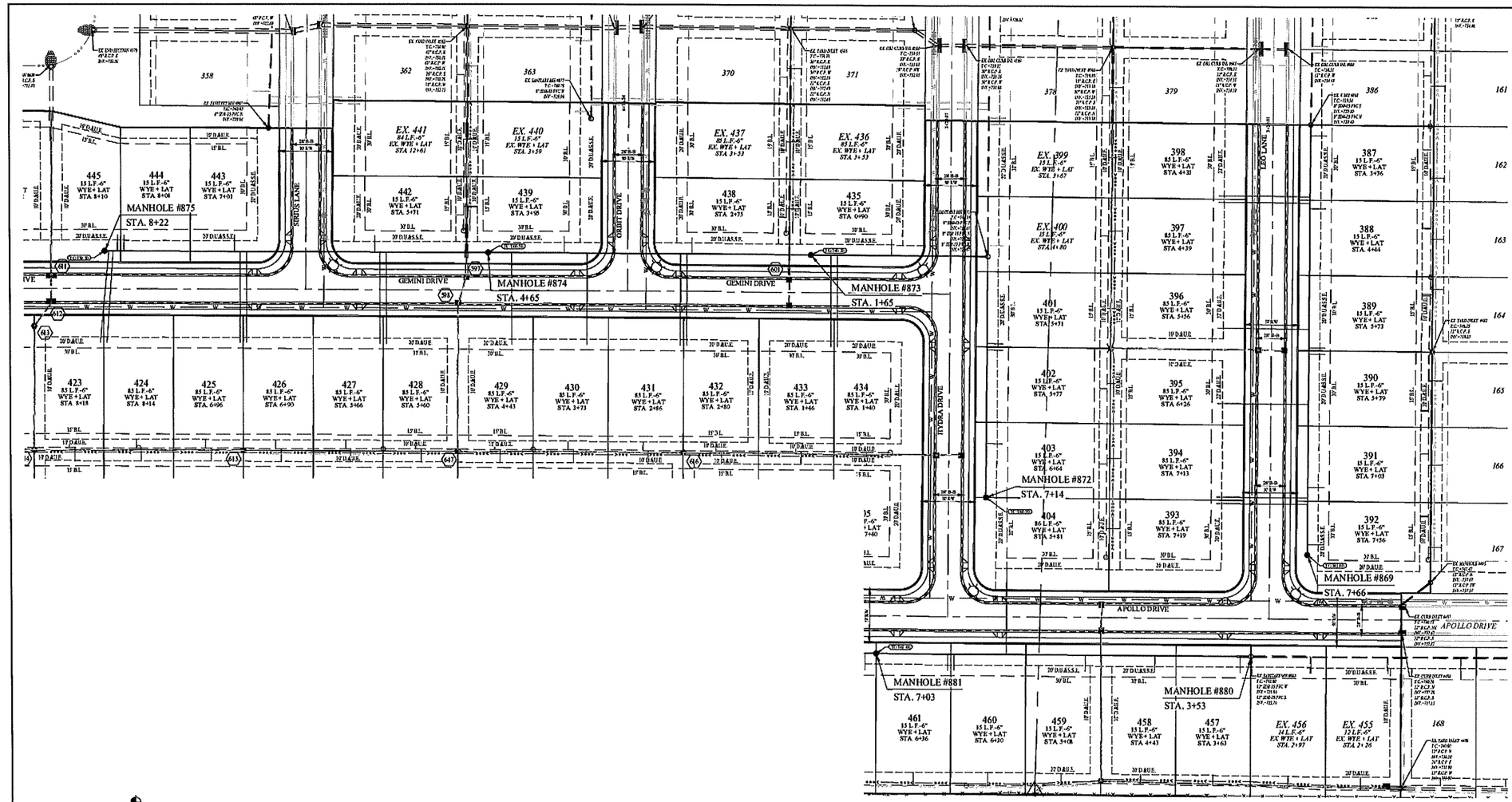
SANITARY SEWER PLAN & PROFILES
THE BLUFFS AT YOUNGS CREEK
SECTION 6
FRANKLIN, FRANKLIN TOWNSHIP
JOHNSON COUNTY, INDIANA

DRAWN BY:	CHECKED BY:
DCM	BKR

SHEET NO.
C500

J.O. JOB NO.
83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C500 - Sanitary Plan & Profile.dwg - C500
Modified / By: March 21, 2022 2:23:45 PM / RMorris
Plotted / By: March 22, 2022 2:39:40 PM / Raven Morris



LEGEND

- EXISTING SANITARY SEWER
- EXISTING STORM SEWER
- EXISTING WATER LINE
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED WATER LINE
- DENOTES FULL DEPTH FLOWABLE BACKFILL

UTILITY CROSSINGS

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.

NOTES

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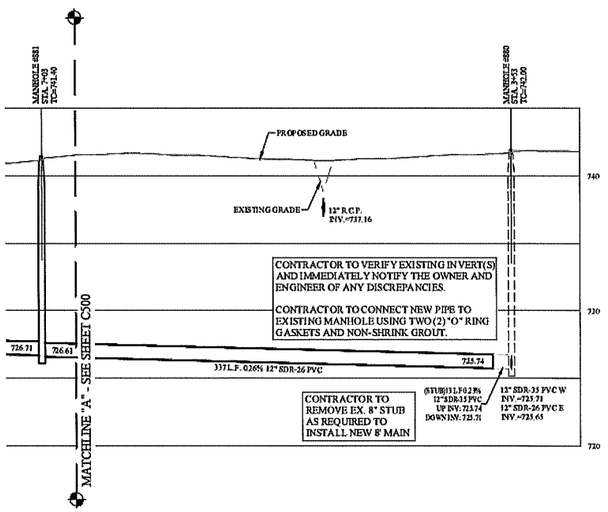
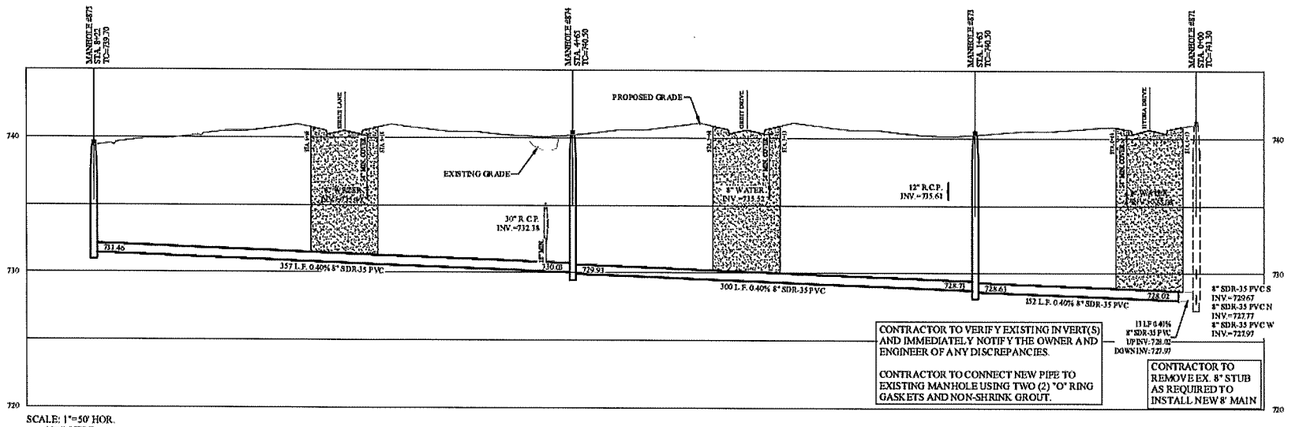
2. MIN. SLOPES PER THE I.E.N.STATE'S STANDARDS SHALL PREVAIL IN ALL CASES.
3. ALL WATER MAINS SHALL MAINTAIN 18 INCHES VERTICAL CLEARANCE AND 10 FEET HORIZONTAL CLEARANCE.
4. CONTRACTOR SHALL INSTALL SERVICE LATERALS TO PSTUCEE LOTS (LOCATIONS NOTED ON PLANS)
5. ALL SANITARY LATERALS SHALL LOWER THAN 12" SHALL BE SDR-35 PVC. ALL SANITARY LATERAL'S DIFFPER THAN 12" SHALL BE SDR-26 PVC.
6. SEE SHEET C502 FOR SANITARY STRUCTURE DATA TABLE.
7. 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.

GRAPHIC SCALE
50' 0 25' 50'
(IN FEET)
1" = 50 FT

Indiana 811





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

DATE	MARK	REVISIONS	BY

DAVID J. STOEPPELWERTH
REGISTERED
No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

THIS DRAWING IS NOT INTENDED TO BE USED FOR ANY PURPOSE OTHER THAN ORIGINAL BOUNDARY SURVEY, A ROUTE SURVEY OR A SURVEYOR LOCATION REPORT.

CERTIFIED: 04/07/22

David J. Stoeppelwerth

STOEPPELWERTH
ALWAYS ON
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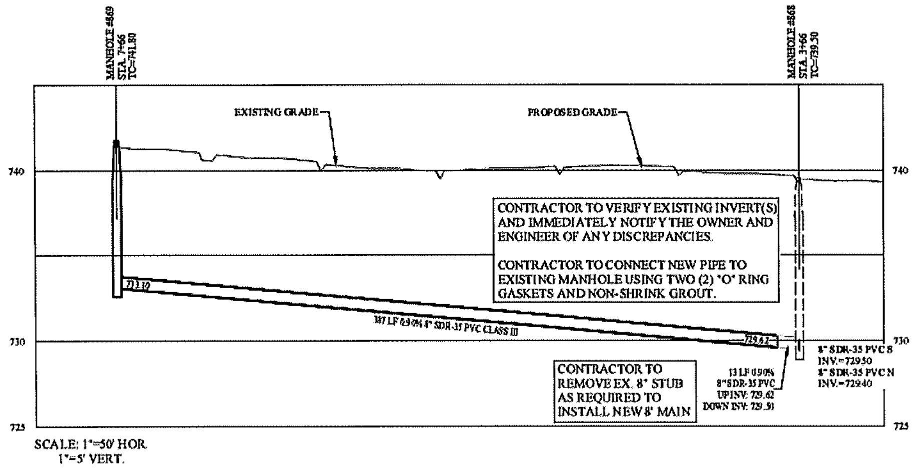
SANITARY SEWER PLAN & PROFILES
THE BLUFFS AT YOUNGS CREEK
SECTION 6
FRANKLIN, FRANKLIN TOWNSHIP — JOHNSON COUNTY, INDIANA

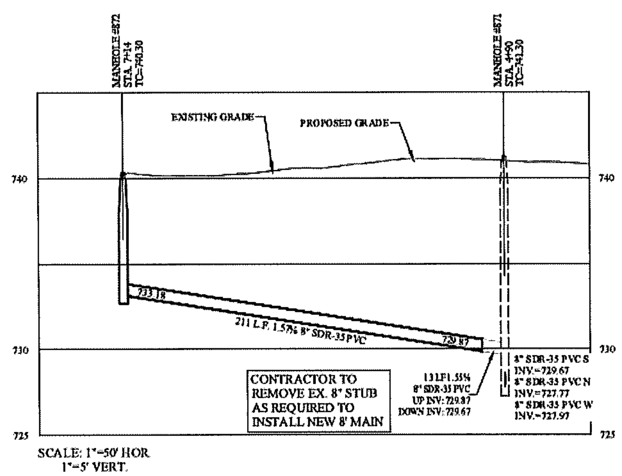
DRAWN BY:	CHECKED BY:
DCM	BKR

SHEET NO
C501

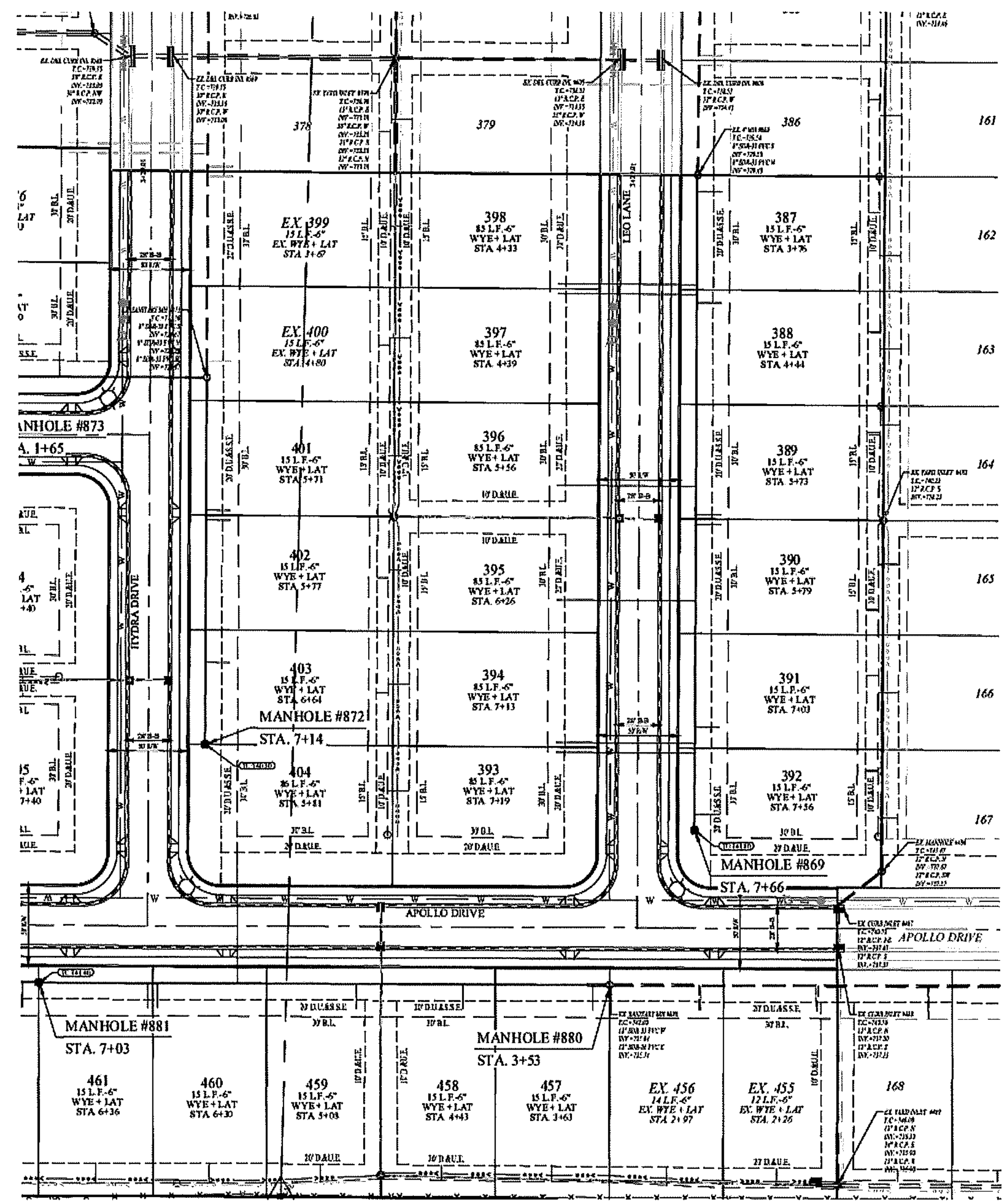
JOB & JOB NO.
83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C500 - Sanitary Plan & Profile.dwg - C501
Modified / By: March 21, 2022 2:25:43 PM / RMorris
Plotted / By: March 22, 2022 2:58:32 PM / Parker Morris





SANITARY STRUCTURE DATA TABLE													
STR.#	TYPE	T.C.	CASTING TYPE	DIA. IN	DIR. IN	INV. IN	DIA. OUT	DIR. OUT	INV. OUT	SLOPE	PIPE	LEN.	MATERIAL
868	4' MH	739.54	R-1772	8	S	729.50	8	N	729.40	0.42%	868-869 (1) 862-868	13' 366'	SDR-35 PVC SDR-35 PVC
869	4' MH	741.76	R-1772				8	N	733.10	0.90%	868-869	387'	SDR-35 PVC
871	4' MH	741.32	R-1772	8 8	S W	729.67 727.97	8	N	727.77	0.40%	871-872 STUB 870-871 871-873 STUB	13' 266' 13'	SDR-35 PVC SDR-35 PVC SDR-35 PVC
872	4' MH	740.33	R-1772				8	N	733.18	1.57%	871-872	211'	SDR-35 PVC
873	4' MH	740.52	R-1772	8	W	728.73	8	E	728.63	0.40%	873-874 871-873	300' 152'	SDR-35 PVC SDR-35 PVC
874	4' MH	740.51	R-1772	8	W	730.03	8	E	729.93	0.40%	874-875 873-874	357' 300'	SDR-35 PVC SDR-35 PVC
875	4' MH	739.69	R-1772				8	E	731.46	0.40%	874-875	357'	SDR-35 PVC
876	4' MH	739.59	R-1772				8	E	731.66	0.41%	889-876	52'	SDR-35 PVC
881	4' MH	741.45	R-1772	12	W	726.71	12	E	726.61	0.26%	881-882 880-881	260' 337'	SDR-35 PVC SDR-26 PVC
882	4' MH	739.97	R-1772	12	W	727.38	12	E	727.28	0.22%	882-883 881-882	200' 260'	SDR-35 PVC SDR-35 PVC
883	4' MH	740.85	R-1772	12 12	W S	727.92 728.02	12	E	727.82	0.22%	883-884 882-883 883-887	272' 200' 120'	SDR-35 PVC SDR-35 PVC SDR-35 PVC
884	4' MH	739.54	R-1772	12	W	728.62	12	E	728.52	0.22%	884-885 883-884	325' 272'	SDR-35 PVC SDR-35 PVC
885	4' MH	740.17	R-1772	12 8	W N	729.43 729.67	12	E	729.33	0.22%	885-886 884-885 885-888	116' 325' 143'	SDR-35 PVC SDR-35 PVC SDR-35 PVC
886	4' MH	738.78	R-1772				12	E	729.69	0.22%	885-886	116'	SDR-35 PVC
887	4' MH	739.21	R-1772				12	N	728.28	0.22%	883-887	120'	SDR-35 PVC
888	4' MH	739.53	R-1772	8	N	730.34	8	S	730.24	0.40%	885-888 888-889	143' 227'	SDR-35 PVC SDR-35 PVC
889	4' MH	740.23	R-1772	8 8	E W	731.45 731.45	8	S	731.25	0.40%	889-890 888-889 889-876	233' 227' 52'	SDR-35 PVC SDR-35 PVC SDR-35 PVC
890	4' MH	739.48	R-1772				8	W	732.39	0.40%	889-890	233'	SDR-35 PVC



LEGEND

	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATER LINE
	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED WATER LINE
	DENOTES FULL DEPTH FLOWABLE BACKFILL

UTILITY CROSSINGS

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.

NOTES

1. 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.
2. MIN. SLOPES PER THE TEN STATE STANDARDS SHALL PREVAIL IN ALL CASES.
3. ALL WATER MAINS SHALL MAINTAIN 18 INCHES VERTICAL CLEARANCE AND 10 FEET HORIZONTAL CLEARANCE.
4. CONTRACTOR SHALL INSTALL SERVICE LATERALS TO FUTURE LOTS (LOCATIONS NOTED ON PLANS)
5. ALL SANITARY LATERALS SHALLOWER THAN 12' SHALL BE SDR-35 PVC. ALL SANITARY LATERALS DEEPER THAN 12' SHALL BE SDR-26 PVC.
6. SEE SHEET C502 FOR SANITARY STRUCTURE DATA TABLE.
7. 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.

GRAPHIC SCALE
(IN FEET)
1" = 50 FT

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

CERTIFIED: 04/07/22

DAVID J. STOEPPELWERTH REGISTERED No. 19356 STATE OF INDIANA PROFESSIONAL ENGINEER

STOEPPELWERTH
ALWAYS ON

SANITARY SEWER PLAN & PROFILES
THE BLUFFS AT YOUNGS CREEK SECTION 6
FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY: DCM
CHECKED BY: BKR
SHEET NO. C502
JOB NO. 83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C500 - Sanitary Plan & Profile.dwg - C502
Modified / By: March 21, 2022 2:22:43 PM / RMorris
Plotted / By: March 22, 2022 2:31:28 PM / Raven Morris

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

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

GRAPHIC SCALE
50' 0 25' 50'
(IN FEET)
1" = 50 FT

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

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

LEGEND

	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATER LINE
	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED WATER LINE
	DENOTES FULL DEPTH FLOWABLE BACKFILL

UTILITY CROSSINGS

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2. ALL WATER MAINS SHALL MAINTAIN 18 INCHES VERTICAL CLEARANCE AND 10 FEET HORIZONTAL CLEARANCE.
3. SEE SHEETS C801A – C801B FOR STRUCTURE DETAILS.
4. SEE SHEET C601 FOR STORM STRUCTURE DATA TABLE.

NO.	DATE	REVISIONS	BY

DAVID J. STOEPPELWERTH
REGISTERED
No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

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

CERTIFIED: 04/07/22

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STORM SEWER PLAN & PROFILES
THE BLUFFS AT YOUNGS CREEK
SECTION 6
FRANKLIN, FRANKLIN TOWNSHIP — JOHNSON COUNTY, INDIANA

DRAWN BY:	CHECKED BY:
DCM	BKR

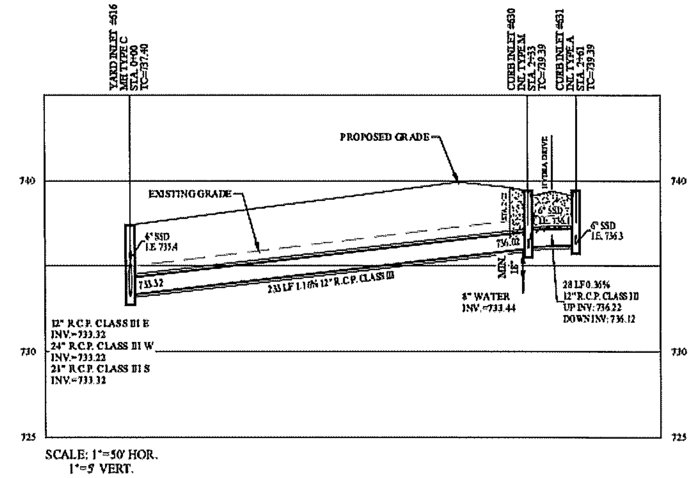
SHEET NO.
C600

S & A JOB NO.
83540MMA-S6

Indiana 811 — Utility Protection Service

File Name: S:\83540MMA-S6\DWG\C600 - Storm Plan & Profile.dwg - C600
Modified / By: March 1, 2022 3:35:38 PM / dMargraf
Plotted / By: March 22, 2022 12:57:02 PM / Raven Morris

STRUCTURE TABLE											
STR #	CALLOUT	STR. TYPE	T.C.	CASTING TYPE	DIAMETER IN	DIR. IN	INV. IN	DIAMETER OUT	DIR. OUT	INV. OUT	SLOPE
591	YARD INLET	MH TYPE C	737.60	R-4342	12	E	734.35	21	N	733.63	0.09%
592	YARD INLET	INL TYPE F	738.90	R-4215-C	12	N	736.81	15	E	736.48	0.21%
593	CURB INLET	INL TYPE M	740.59	R-3501-TR	12	N	737.32	12	S	737.22	0.30%
594	CURB INLET	INL TYPE A	740.59	R-3501-TR				12	S	737.42	0.36%
597	CURB INLET	MH TYPE J	739.57	R-3501-TR	30	S	732.50	30	N	732.40	0.09%
598	CURB INLET	MH TYPE J	739.57	R-3501-TR	24	S	732.63	30	N	732.53	0.10%
601	CURB INLET	INL TYPE M	739.61	R-3501-TR	12	S	736.00	12	N	735.90	1.39%
602	CURB INLET	INL TYPE A	739.61	R-3501-TR				12	N	736.44	1.57%
607	CURB INLET	INL TYPE M	738.88	R-3501-TR	12	E	735.23	12	W	735.13	0.57%
608	DBL CURB INL	DBL CURB INL	738.88	R-3501-TL & TR				12	W	735.31	0.29%
611	DBL CURB INL	DBL CURB INL	738.43	R-3501-TL & TR	36	S	731.80	36	N	731.76	0.13%
612	DBL CURB INL	DBL CURB INL	738.43	R-3501-TL & TR	30	SW	731.92	36	N	731.82	0.07%
613	MANHOLE	MH TYPE J	738.79	R-1772	30	S	732.04	30	NE	731.94	0.08%
614	YARD INLET	INL TYPE J	737.90	R-4342	24 12 12	S W E	732.21 732.45 732.32	30	N	732.13	0.08%
615	YARD INLET	INL TYPE E	737.90	R-4215-C				12	W	733.09	0.39%
616	YARD INLET	MH TYPE C	737.40	R-4342	12 21	E S	733.32 733.32	24	W	733.22	0.13%
617	MANHOLE	MH TYPE C	739.33	R-1772	15	SW	733.59	21	N	733.49	0.15%
618	DBL CURB INL	DBL CURB INL	738.99	R-3501-TL & TR	15	S	733.92	15	NE	733.82	0.89%
619	DBL CURB INL	DBL CURB INL	738.99	R-3501-TL & TR	12	S	734.26	15	N	734.01	0.32%
620	YARD INLET	INL TYPE E	737.35	R-4215-C				12	N	735.33	0.79%
621	CURB INLET	INL TYPE M	738.68	R-3501-TR	12	W	734.68	12	E	734.58	0.95%
622	CURB INLET	INL TYPE A	738.68	R-3501-TR				12	E	734.75	0.25%
623	MANHOLE	MH TYPE C	738.80	R-1772	24	SW	732.42	24	N	732.32	0.10%
624	DBL CURB INL	DBL CURB INL	738.45	R-3501-TL & TR	18	S	732.55	24	NE	732.45	0.12%
625	DBL CURB INL	DBL CURB INL	738.45	R-3501-TL & TR	18	S	732.70	18	N	732.60	0.18%
626	YARD INLET	INL TYPE F	735.60	R-4215-C	12 12	E W	733.20 733.17	18	N	733.07	0.27%
627	CURB INLET	INL TYPE M	738.25	R-3501-TR	12	E	734.60	12	W	734.50	0.45%
628	CURB INLET	INL TYPE A	738.25	R-3501-TR				12	W	734.76	0.57%
629	YARD INLET	INL TYPE E	736.20	R-4215-C				12	E	734.16	0.38%
630	CURB INLET	INL TYPE M	739.39	R-3501-TR	12	E	736.12	12	W	736.02	1.16%
631	CURB INLET	INL TYPE A	739.39	R-3501-TR				12	W	736.22	0.36%
634	CURB INLET	MH TYPE C	737.75	R-3501-TR	12	S	732.16	15	N	732.06	0.19%
635	CURB INLET	MH TYPE C	737.75	R-3501-TR	12	S	732.34	12	N	732.24	0.29%
636	YARD INLET	INL TYPE P	736.70	R-4215-C	12	S	732.69	12	N	732.59	0.26%
637	CURB INLET	INL TYPE M	737.66	R-3501-TR	12	S	733.25	12	N	733.15	0.26%
638	CURB INLET	INL TYPE A	737.66	R-3501-TR				12	N	733.35	0.36%
647	YARD INLET	MH TYPE J	738.50	R-4342	24	E	732.94	24	N	732.84	0.15%



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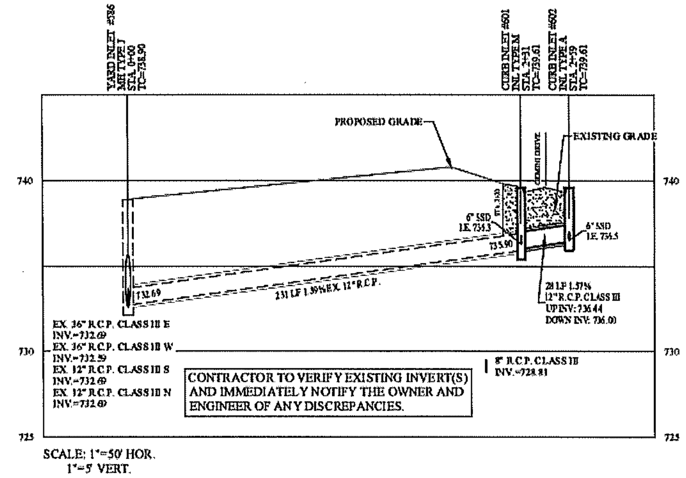

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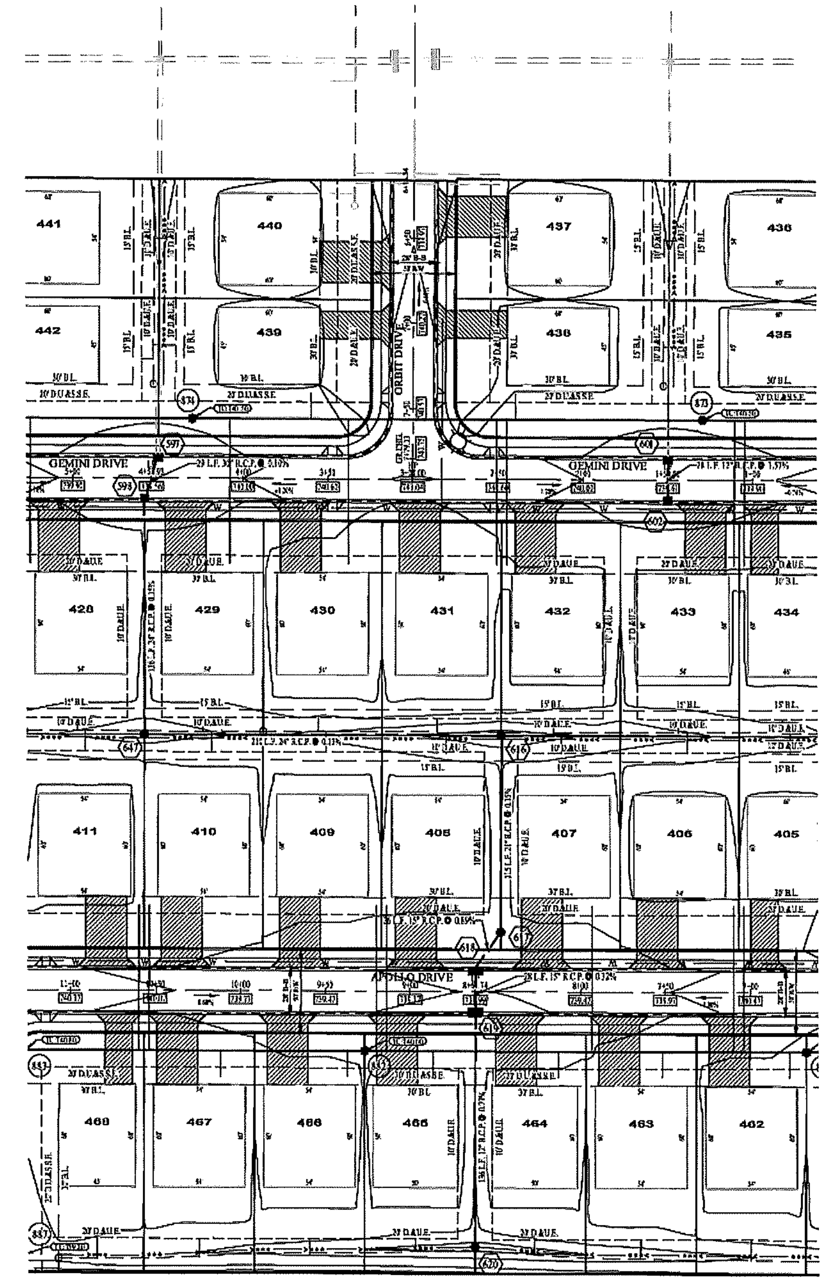

LEGEND	
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATER LINE
	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED WATER LINE
	DENOTES FULL DEPTH FLOWABLE BACKFILL

UTILITY CROSSINGS

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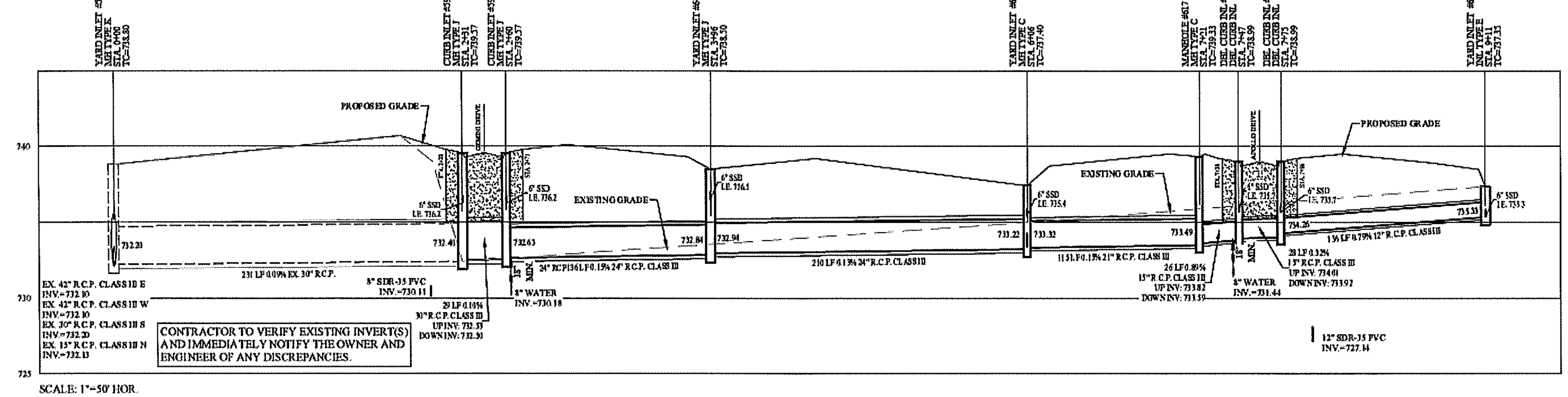
3. SEE SHEETS C801A - C801B FOR STRUCTURE DETAILS.
4. SEE SHEET C601 FOR STORM STRUCTURE DATA TABLE.

GRAPHIC SCALE
50' 0 25' 50'
(IN FEET)
1" = 50 FT



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DATE	MARK	REVISIONS	BY

DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

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CERTIFIED: 04/07/22

STOEPPELWERTH
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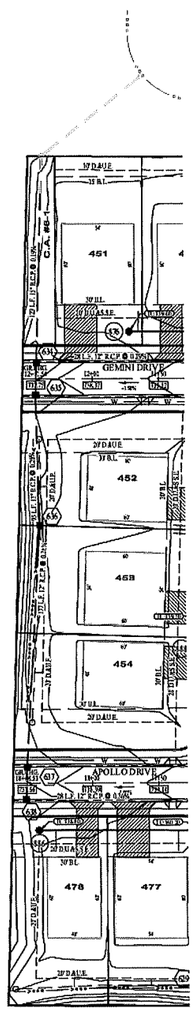
STORM SEWER PLAN & PROFILES

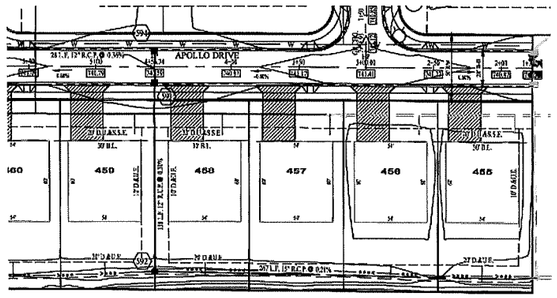
THE BLUFFS AT YOUNGS CREEK SECTION 6

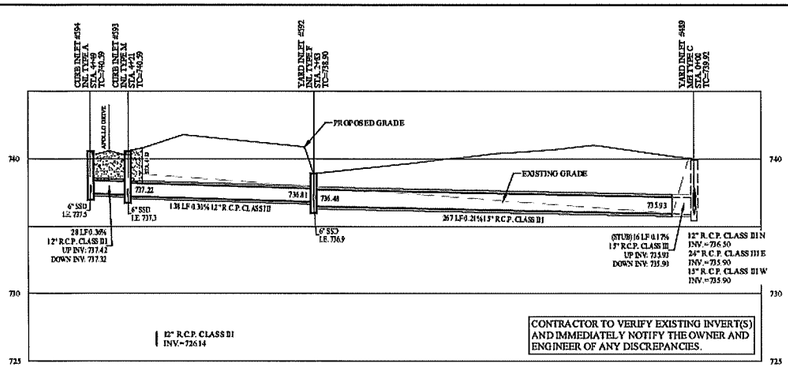
FRANKLIN, FRANKIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY: DCM
CHECKED BY: BKR
SHEET NO. C601
S & A JOB NO. 83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C600 - Storm Plan & Profile.dwg - C601
Modified / By: March 1, 2022 3:35:38 PM / dMargraf
Plotted / By: March 22, 2022 12:03:01 PM / Raven Morris







SCALE: 1"=50' HOR.
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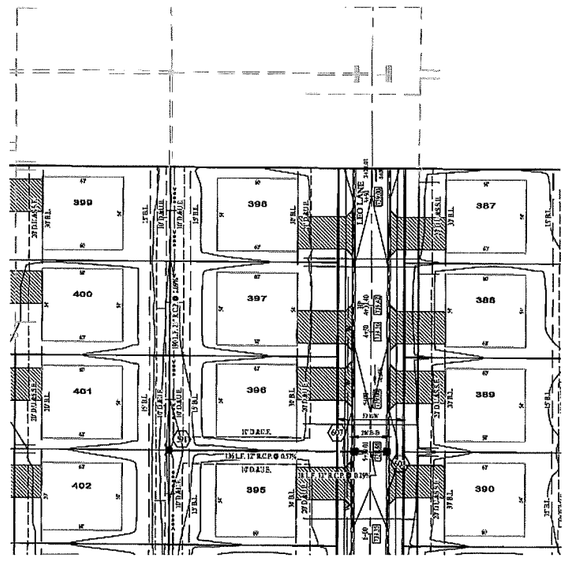

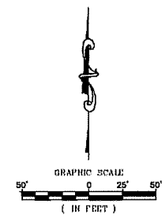

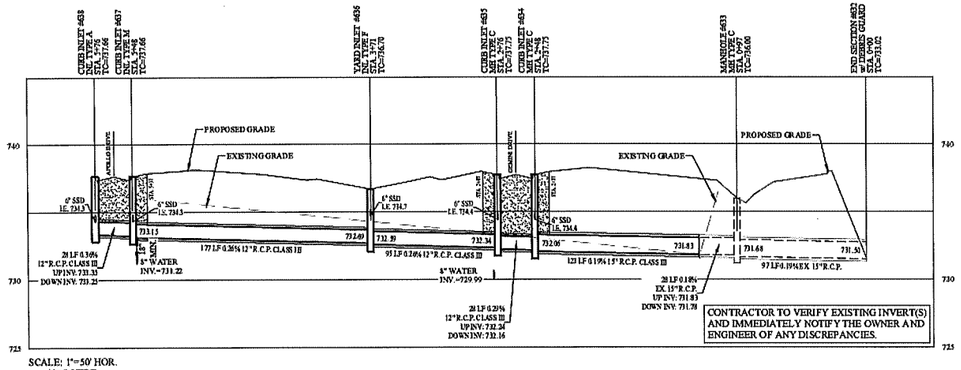

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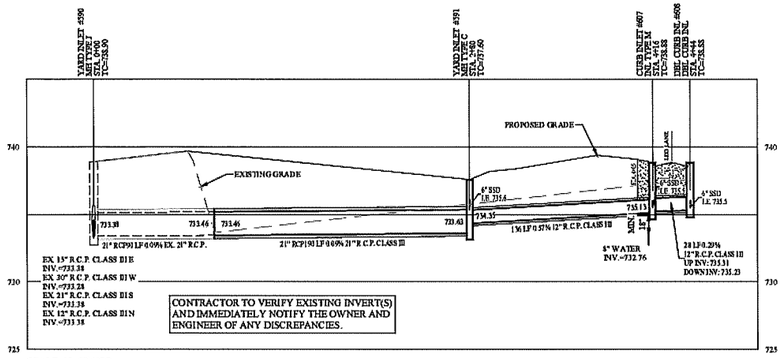

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LEGEND

	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATER LINE
	PROPOSED SANITARY SEWER
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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.

NOTES

1. 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.
2. ALL WATER MAINS SHALL MAINTAIN 18 INCHES VERTICAL CLEARANCE AND 10 FEET HORIZONTAL CLEARANCE.
3. SEE SHEETS C601A - C601B FOR STRUCTURE DETAILS.
4. SEE SHEET C601 FOR STORM STRUCTURE DATA TABLE.

NO.	DATE	MARK	REVISIONS	BY

DAVID J. STOEPPELWERTH
REGISTERED
No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

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

CERTIFIED: 04/07/23

David J. Stoeppelwerth

STOEPPELWERTH
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STORM SEWER PLAN & PROFILES
THE BLUFFS AT YOUNGS CREEK
SECTION 6
FRANKLIN, FRANKLIN TOWNSHIP — JOHNSON COUNTY, INDIANA

DRAWN BY:	CHECKED BY:
DCM	BKR

SHEET NO.
C602

S & A JOB NO.
83540MMA-S6

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

File Name: S:\83540MMA-S06\DWG\C600 - Storm Plan & Profile.dwg - C602
Modified / By: March 1, 2023 3:35:38 PM / dMargraf
Plotted / By: March 22, 2022 12:04:12 PM / Raven Morris

LEGEND

EXISTING FEATURES	
—— W ——	WATER MAIN
—— —○— ——	SANITARY SEWER
▯- -○- -○- -◁	STORM SEWER
PROPOSED FEATURES	
—— W ——	WATER MAIN
——●—┼——	SANITARY SEWER
■- -▮- -●- -◀	STORM SEWER
—— >○○○ ——	SWALE FLOWLINE
═══════	CURB & GUTTER w/ 4" UNDERDRAIN
- - - ⌐ RISER ↘	6" SUB-SURFACE DRAIN (SWALE)

GRAPHIC SCALE

50' 0 25' 50'

(IN FEET)

1" = 50 FT

NOTES

1. FOR SWALE UNDERDRAIN DETAIL, SEE SHEET C901B
FOR CURB UNDERDRAIN DETAIL, SEE SHEET C901B

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.

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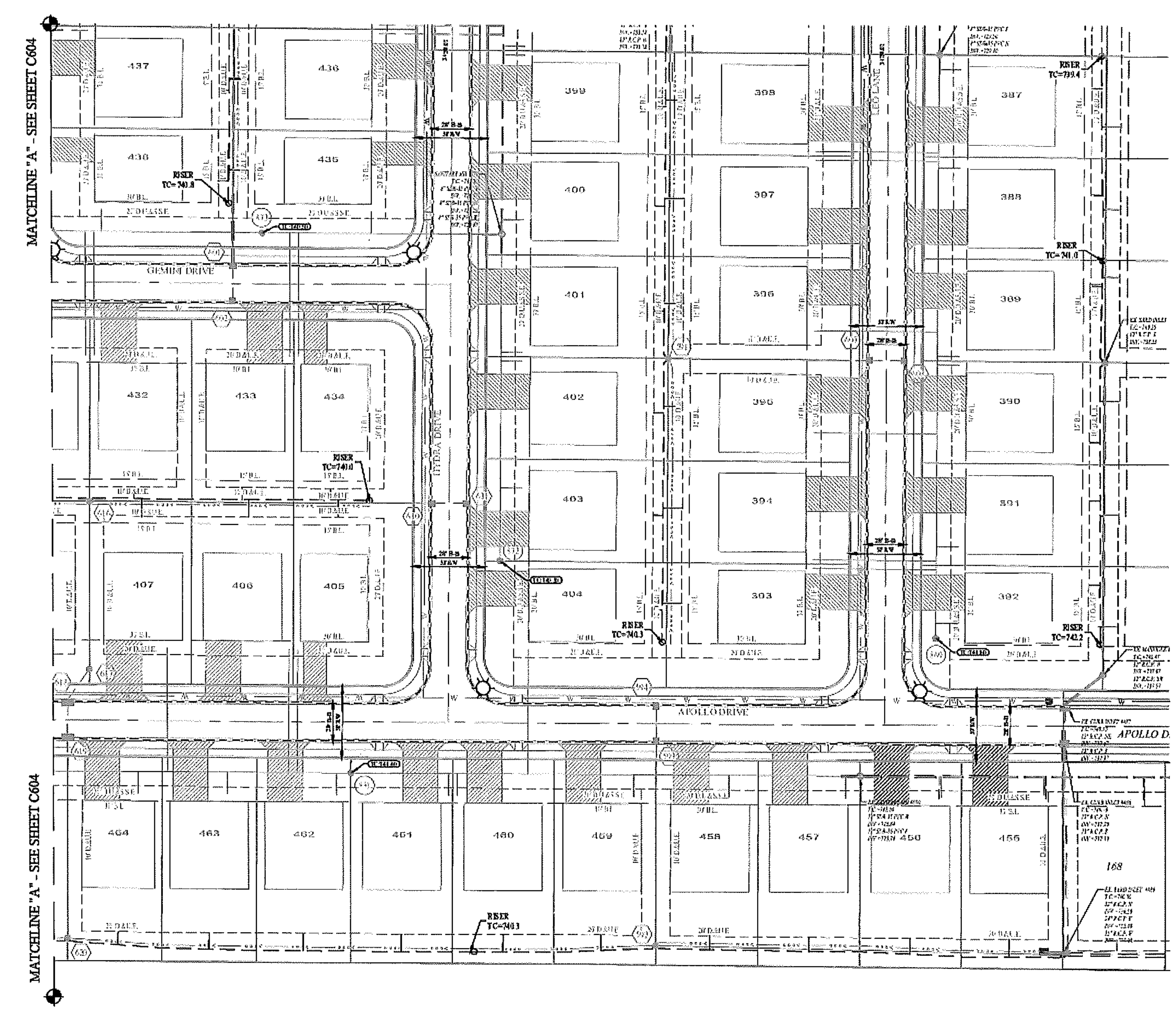

DATE	MARK
REVISIONS	BY

DAVID J. STOEPPELWERTH
REGISTERED
No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

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

CERTIFIED: 04/07/22

STOEPPELWERTH

ALWAYS ON

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SUB-SURFACE DRAIN / SUMP CONNECTION PLAN

THE BLUFFS AT YOUNGS CREEK
SECTION 6

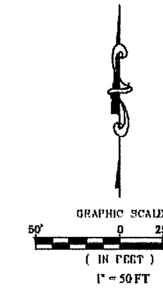
FRANKLIN, FRANKIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY:	CHECKED BY:
DCM	BKR

SHEET NO.
C603

S & A JOB NO.
83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C603 - Subsurface Drain Plan.dwg - C603
Modified / By: March 21, 2022 2:30:52 PM / RMorris
Plotted / By: March 22, 2022 12:07:15 PM / Raven Morris



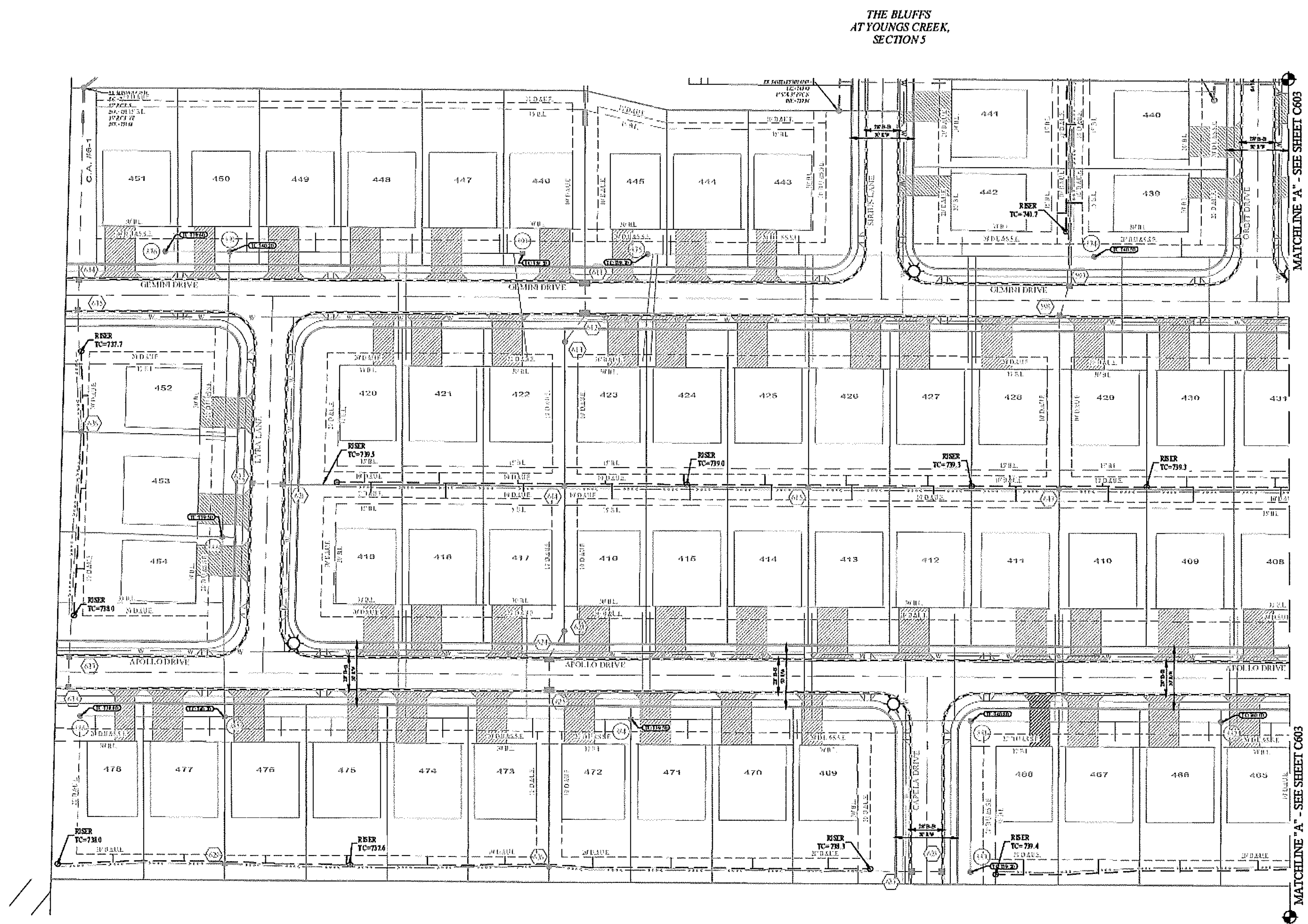
LEGEND

EXISTING FEATURES	
——— W ———	WATER MAIN
(symbol)	SANITARY SEWER
(symbol)	STORM SEWER
PROPOSED FEATURES	
——— W ———	WATER MAIN
(symbol)	SANITARY SEWER
(symbol)	STORM SEWER
——— >••• ———	SWALE FLOWLINE
(symbol)	CURB & GUTTER w/ 4" UNDERDRAIN
(symbol)	6" SUB-SURFACE DRAIN (SWALE)

NOTES

1. FOR SWALE UNDERDRAIN DETAIL, SEE SHEET C901B
   FOR CURB UNDERDRAIN DETAIL, SEE SHEET C902B
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.

DATE	MARK	REVISIONS	BY



DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

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

CERTIFIED: 04/07/22

STOEPPELWERTH
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SUB-SURFACE DRAIN / SUMP CONNECTION PLAN

THE BLUFFS AT YOUNGS CREEK SECTION 6

FRANKLIN, FRANKIN TOWNSHIP — JOHNSON COUNTY, INDIANA

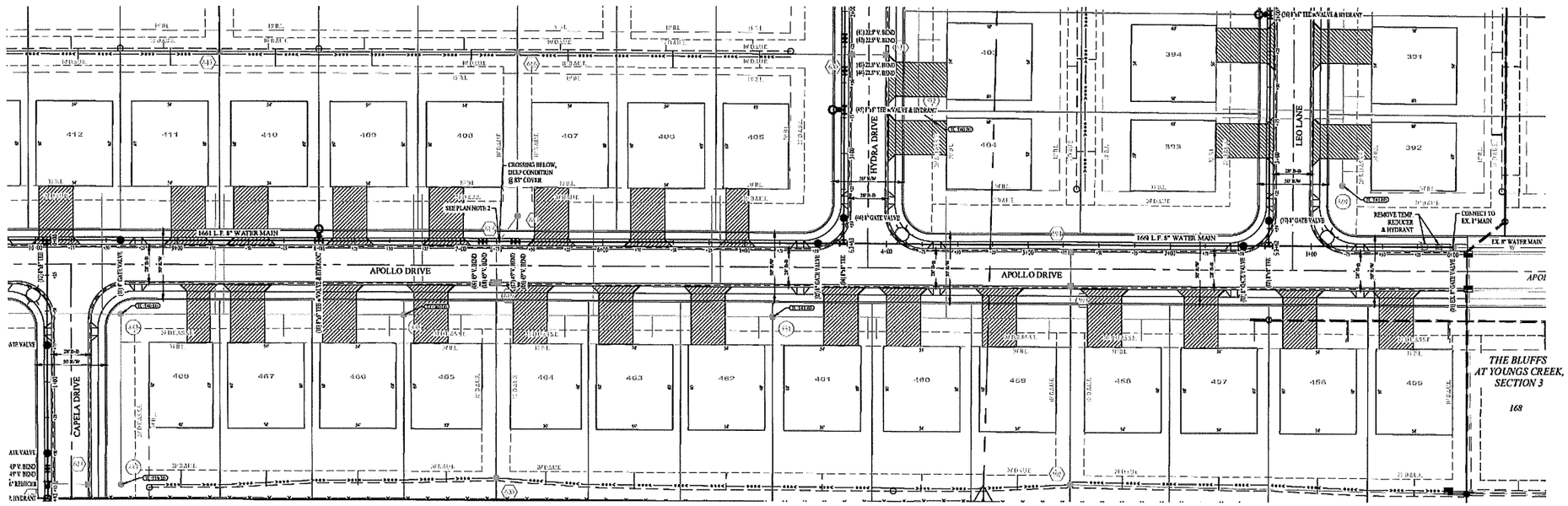
DRAWN BY:	CHECKED BY:
DCM	BKR

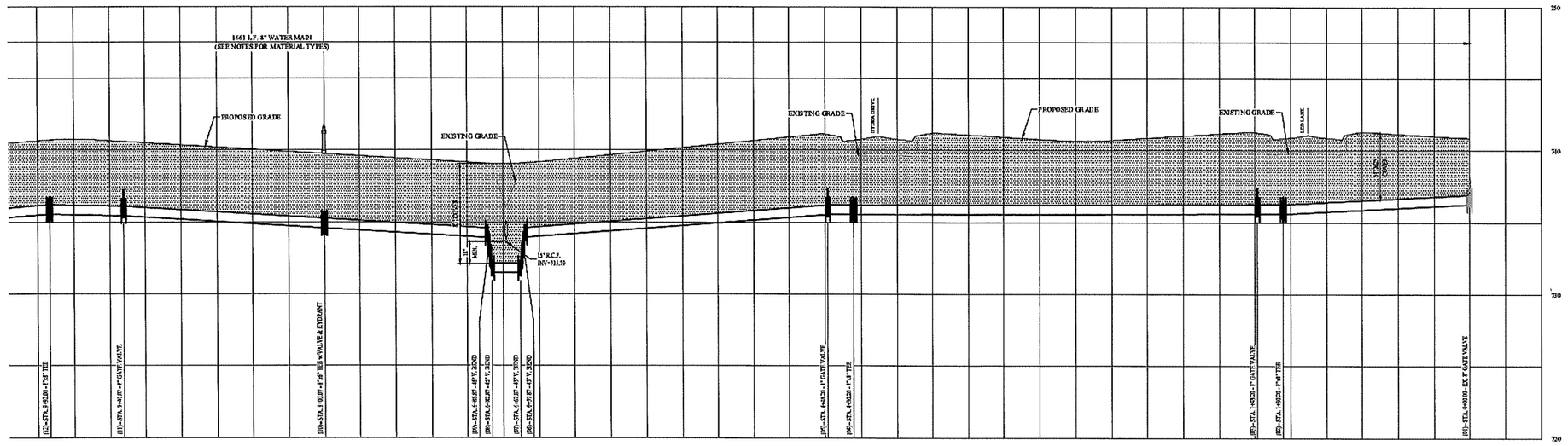
SHEET NO.
C604

S & A JOB NO.
83540MMA-S6

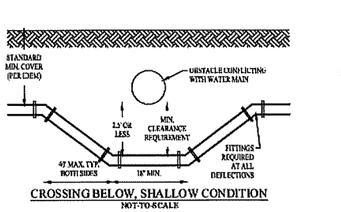
Indiana 811 — Know what's below. Call before you dig.

File Name: S:\83540MMA-S06\DWG\C603 - Subsurface Drain Plan.dwg - C604
Modified / By: March 21, 2022 2:30:52 PM / RMorris
Plotted / By: March 22, 2022 12:07:34 PM / Raven Morris

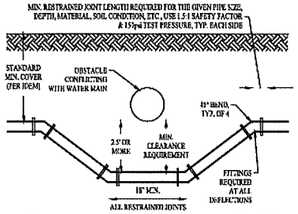




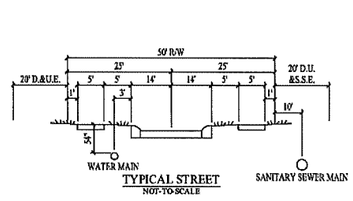
APOLLO DRIVE



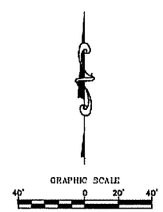
CROSSING BELOW, SHALLOW CONDITION
NOT-TO-SCALE



CROSSING BELOW, DEEP CONDITION
NOT-TO-SCALE



TYPICAL STREET
NOT-TO-SCALE



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-PIPE JOINTS ARE REQUIRED, ALL JOINTS SHALL BE RESTRAINED WITH EXTERNAL SPLIT SEGRATED RESTRAINT HARNESS. 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 15305.
6. FOR HDPE PIPE INSTALLATION: DIPS DR11 FOR SIZES 4-INCH AND LARGER, IPS DR9 FOR 4-INCH, AND CTS DR9 FOR SIZES SMALLER THAN 3-INCH. HDPE BENDS, TEES, AND CROSSES ARE NOT ACCEPTABLE. PRESSURE RATING OF HDPE PIPE DIFFERS FROM DUCTILE IRON AND PVC PIPE. SEE SPECIFICATION SECTION 15310-5.01. 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 HARNESSES, 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 XYLAN 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 REQUIRED IN CONNECTING TO EXISTING WATER MAIN AND FOR INSTALLATION OF FIRE HYDRANTS. SEE SPECIFICATION SECTIONS 15305 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. IF LICKS SHALL BE ENCASED IN WATER PROOF 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 02210.
14. MAINTAIN THE REQUIRED 10-FEET OF HORIZONTAL SEPARATION AND 18-INCHES OF VERTICAL SEPARATION FROM SANITARY AND STORM SEWERS. MAINTAIN 5-FEET OF HORIZONTAL SEPARATION FROM SANITARY AND STORM STRUCTURES. SEE I.C. 327 IAC 8-3.2-9 OF THE INDIANA ADMINISTRATIVE CODE FOR MORE INFORMATION.
15. MAINTAIN MINIMUM COVER DEPTH OF 54" AND A MAXIMUM OF 54"+24".

PLAN NOTES

1. WATER MAIN PIPE SHALL BE PVCC-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.
2. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 2' (24") OF HORIZONTAL SEPARATION FROM THE OUTSIDE OF THE STORM STRUCTURE AND CENTER A FULL LENGTH OF 20' OF PVC (OR DUCTILE IRON) PIPE ON SAID STORM STRUCTURE.
3. SEE WATER MAIN JOINT RESTRAINT SCHEDULE ON SHEET C703.

WATER MAIN PIPE TABLE

SIZE	MATERIAL	LENGTH
8"	PVC C-900 DR-14, HDPE DR-11, OR D.I. THICKNESS CLASS 52	4,859 L.F.
6"	D.I. THICKNESS CLASS 52 LATERAL FOR TEMP. HYDRANT	50 L.F.
	TOTAL LENGTH	4,909 L.F.

BENCHMARK DATA

ORIGINATING BENCHMARK

JOHNSON COUNTY BENCHMARK TITAS: A 4" COPPER PLATE, CENTER PUNCHOLD, STAMPED "TYTTAS" SET ON A 20" IRON ROD SET IN 6"x30" CONCRETE, 6"± BELOW GROUND LEVEL. APPROXIMATELY 20 FEET FROM THE CENTER OF THE NORTHBOUND LANES OF U.S. 31 AND APPROXIMATELY 65± NORTHWEST OF ITS INTERSECTION OF NINEVEH ROAD.

BENCHMARK ELEVATION = 743.13 (NAVD 88)

Indiana 811

DATE	MARK	REVISIONS	BY

DAVID J. STOEPPELWERTH
REGISTERED
No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

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

CERTIFIED: 04/07/22

David J. Stoeppelwerth

STOEPPELWERTH
& ASSOCIATES, INC.
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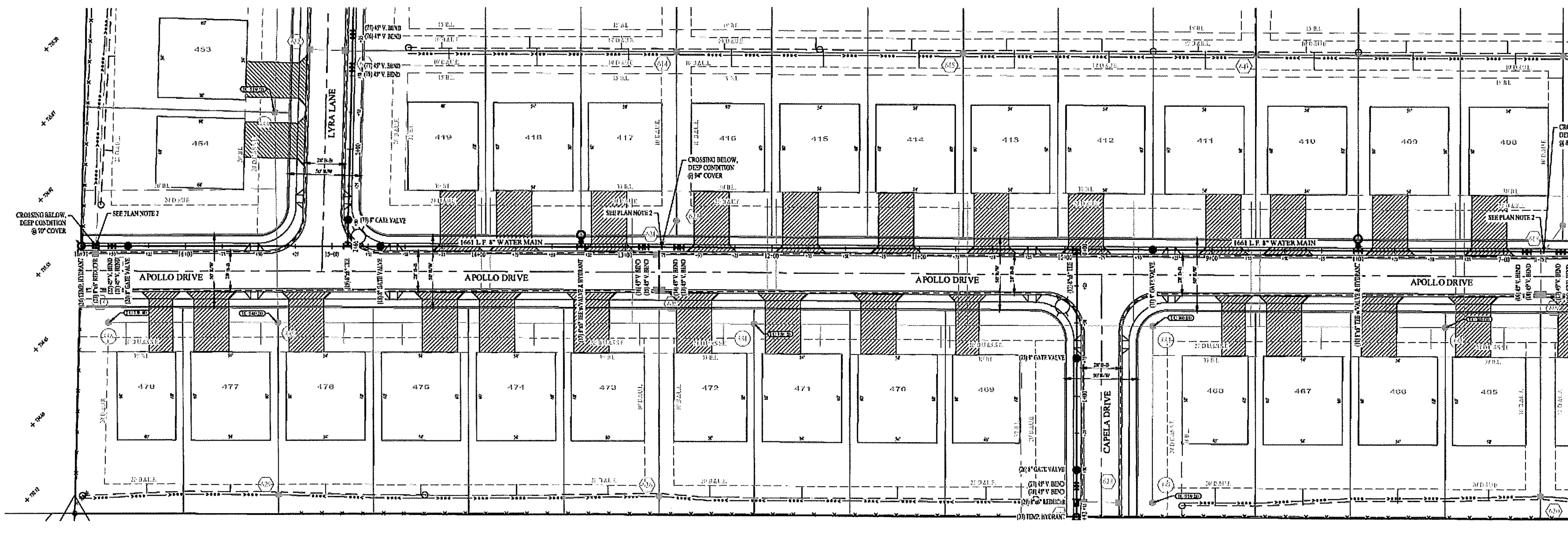
WATER PLAN & PROFILES
THE BLUFFS AT YOUNGS CREEK
SECTION 6
FRANKLIN, FRANKLIN TOWNSHIP — JOHNSON COUNTY, INDIANA

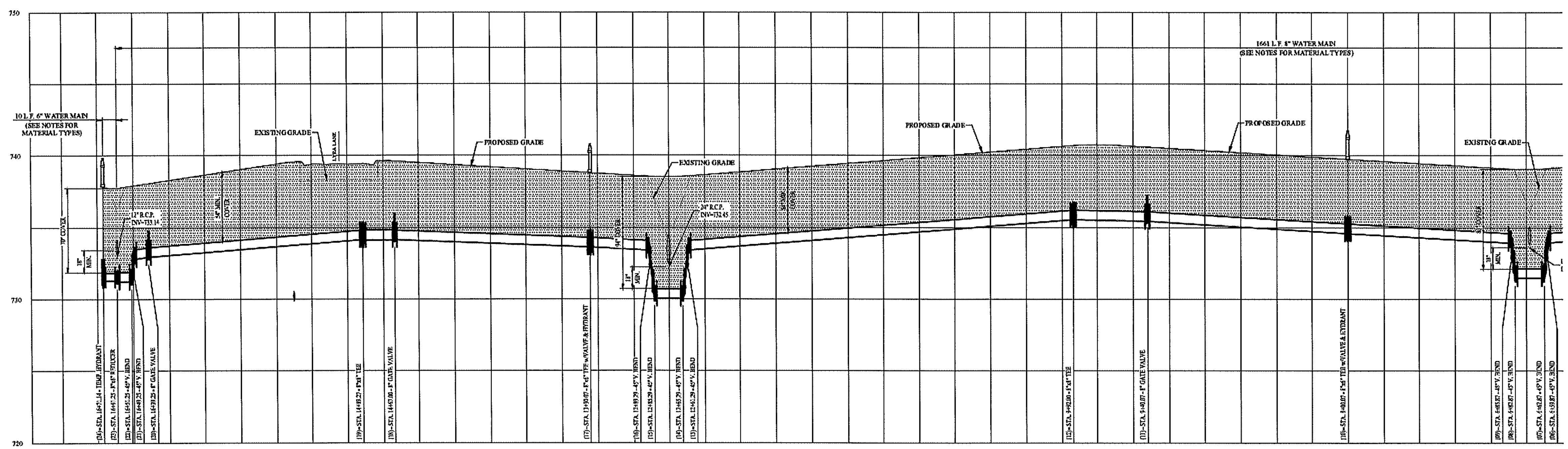
DRAWN BY:	CHECKED BY:
DCM	BKR

SHEET NO.
C700

S & A JOB NO.
83540MMA-S6

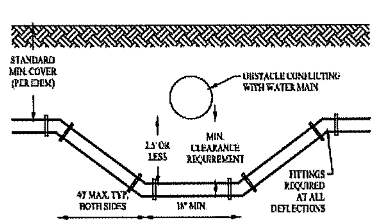
File Name: S:\83540MMA-S6\DWG\C700 - Water Profiles.dwg - C700
Modified / By: March 21, 2022 2:43:38 PM / RMorris
Plotted / By: March 22, 2022 11:46:02 AM / Raven Morris



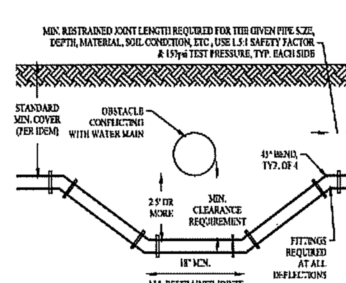


SCALE: 1"=40' HOR.
1"=4' VERT

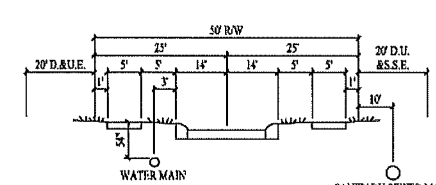
APOLLO DRIVE



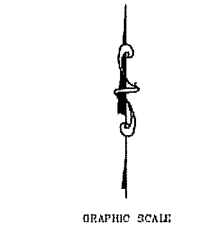
CROSSING BELOW, SHALLOW CONDITION
NOT-TO-SCALE



CROSSING BELOW, DEEP CONDITION
NOT-TO-SCALE



TYPICAL STREET
NOT-TO-SCALE



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

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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-PIPE 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.
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 15103.
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 15010-3.03. 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 HARNESSES, 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 XYLAN 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 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 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 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 02210.
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 327 IAC 8-3.2-9 OF THE INDIANA ADMINISTRATIVE CODE FOR MORE INFORMATION.
15. MAINTAIN MINIMUM COVER DEPTH OF 54" AND A MAXIMUM OF 54"+24".

PLAN NOTES

1. 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.
2. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 2' (24") OF HORIZONTAL SEPARATION FROM THE OUTSIDE OF THE STORM STRUCTURE AND CENTER A FULL LENGTH OF 20' OF PVC (OR DUCTILE IRON) PIPE ON SAID STORM STRUCTURE.
3. SEE WATER MAIN JOINT RESTRAINT SCHEDULE ON SHEET C703.

WATER MAIN PIPE TABLE

SIZE	MATERIAL	LENGTH
8"	PVC C-900 DR-14, HDPE DR-11, OR D.I. THICKNESS CLASS 52	4,859 L.F.
6"	D.I. THICKNESS CLASS 52 LATERAL FOR TEMP. HYDRANT	50 L.F.
	TOTAL LENGTH	4,909 L.F.

BENCHMARK DATA

ORIGINATING BENCHMARK

JOHNSON COUNTY BENCHMARK TTA5: A 4" COPPER PLATE, CENTER PUNCHED, STAMPED "YFTTA5" SET ON A 36" IRON ROD SET IN 6"x36" CONCRETE, 6"± BELOW GROUND LEVEL. APPROXIMATELY 20 FEET FROM THE CENTER OF THE NORTHBOUND LANES OF U.S. 31 AND APPROXIMATELY 650' NORTHWEST OF ITS INTERSECTION OF NINEVEH ROAD.

BENCHMARK ELEVATION = 743.13 (NAVD 88)

DATE	MARK	REVISIONS	BY

DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

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

CERTIFIED: 04/07/22

STOEPPELWERTH
ALWAYS ON
7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

WATER PLAN & PROFILES

THE BLUFFS AT YOUNGS CREEK
SECTION 6

JOHNSON COUNTY, INDIANA
FRANKLIN, FRANKIN TOWNSHIP

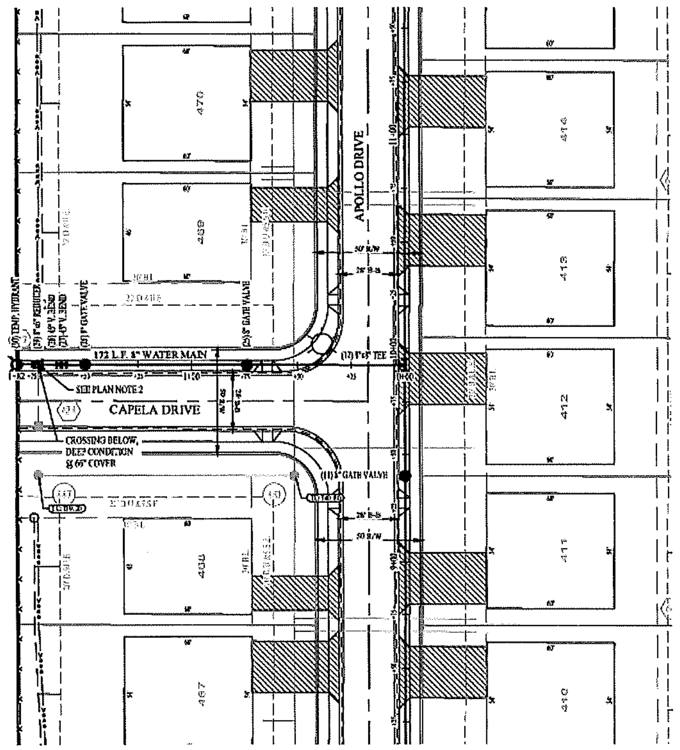
Know what's below. Call before you dig. Indiana 811

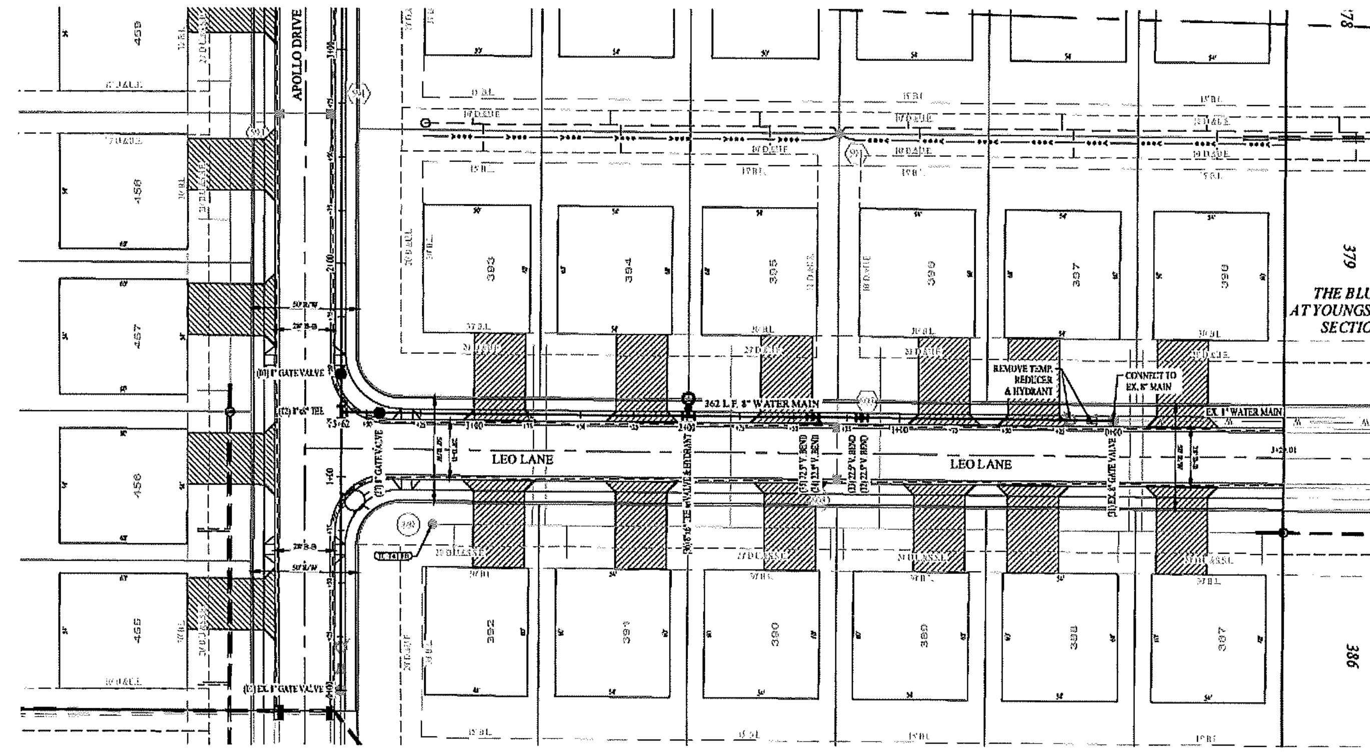
DRAWN BY:	CHECKED BY:
DCM	BKR

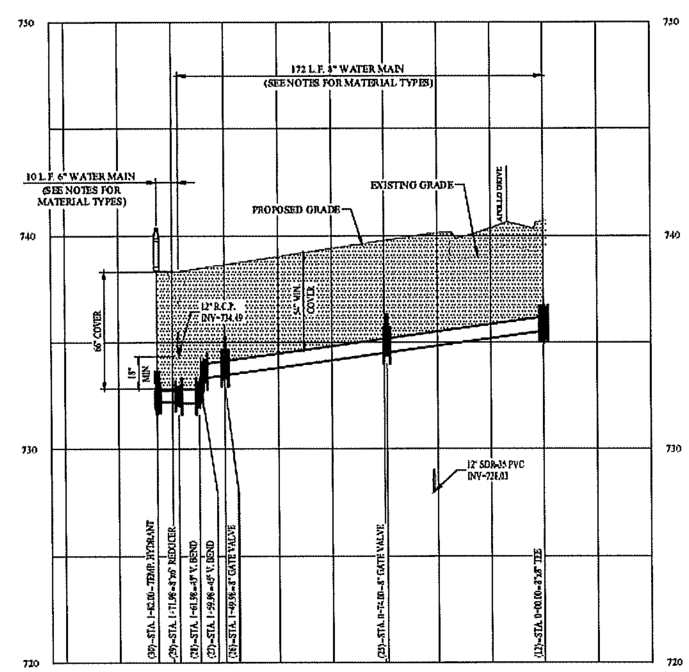
SHEET NO.
C701

S & A JOB NO.
83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C700 - Water Profiles.dwg - C701
Modified / By: March 21, 2022 2:43:38 PM / RMorris
Plotted / By: March 22, 2022 11:46:35 AM / Raven Morris

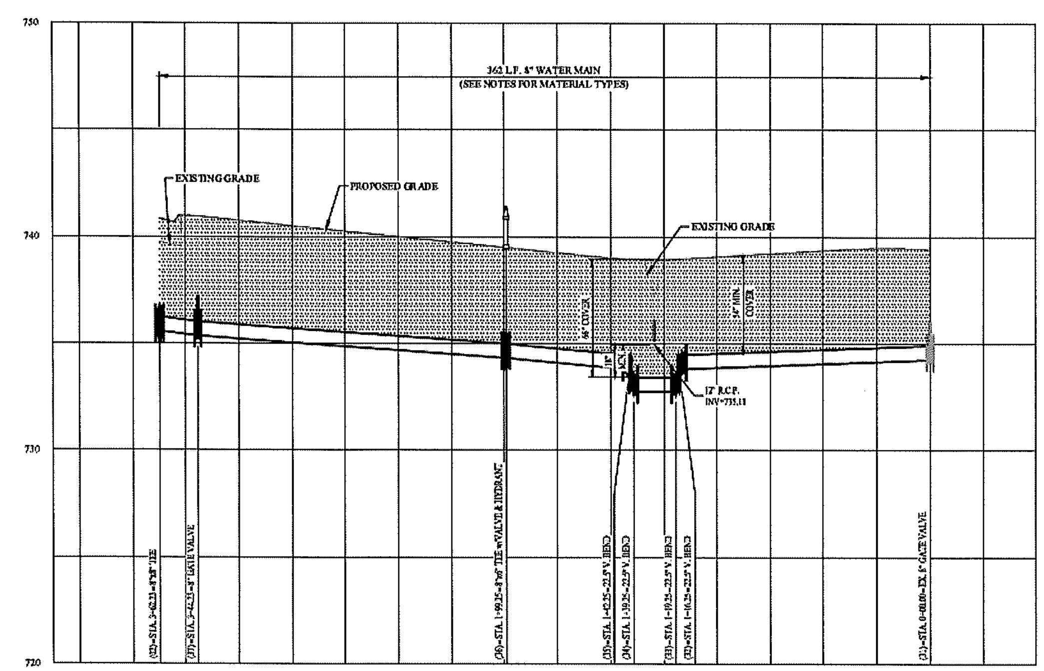






SCALE: 1"=40' HOR.
1"=4' VERT.

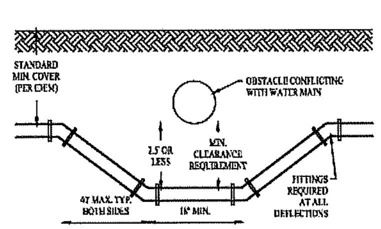
CAPELA DRIVE



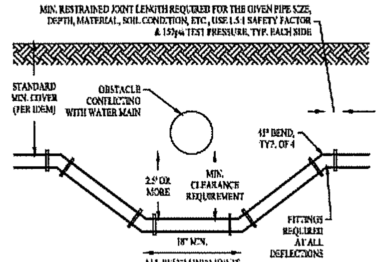
SCALE: 1"=40' HOR.
1"=4' VERT.

LEO LANE

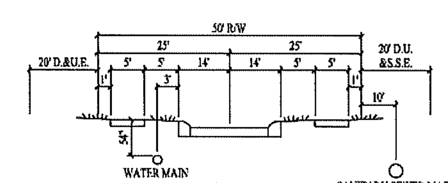
MIN. RESTRAINED JOINT LENGTH REQUIRED FOR THE GIVEN PIPE SIZE, DEPTH, MATERIAL, SOIL CONDITION, ETC., USE 1.5:1 SAFETY FACTOR & 150psi TEST PRESSURE, TYP. EACH SIDE



CROSSING BELOW, SHALLOW CONDITION
NOT-TO-SCALE



CROSSING BELOW, DEEP CONDITION
NOT-TO-SCALE



TYPICAL STREET
NOT-TO-SCALE

GRAPHIC SCALE
40' 0 20' 40'
(IN FEET)
1" = 40 FT

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 MAINS, 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 C910 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 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.
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 15930-3.03. 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 HARNESSES, 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 XYLAN 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 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 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 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 02210.
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 327 IAC 8-3.2-9 OF THE INDIANA ADMINISTRATIVE CODE FOR MORE INFORMATION.
15. MAINTAIN MINIMUM COVER DEPTH OF 54" AND A MAXIMUM OF 54"+24".

PLAN NOTES

1. WATER MAIN PIPE SHALL BE PVC C-910 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.
2. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 2' (24") OF HORIZONTAL SEPARATION FROM THE OUTSIDE OF THE STORM STRUCTURE AND CENTER A FULL LENGTH OF 20' OF PVC (OR DUCTILE IRON) PIPE ON SAID STORM STRUCTURE.
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WATER MAIN PIPE TABLE

SIZE	MATERIAL	LENGTH
8"	PVC C-900 DR-14, HDPE DR-11, OR D.I. THICKNESS CLASS 52	4,859 L.F.
6"	D.I. THICKNESS CLASS 52 LATERAL FOR TEMP. HYDRANT	50 L.F.
	TOTAL LENGTH	4,909 L.F.

BENCHMARK DATA

ORIGINATING BENCHMARK

JOHNSON COUNTY BENCHMARK TTAS: A 4" COPPER PLATE, CENTER PUNCHED, STAMPED "YFTTAS" SET ON A 30" IRON ROD SET IN 6"x36" CONCRETE, 6"± BELOW GROUND LEVEL. APPROXIMATELY 20 FEET FROM THE CENTER OF THE NORTHBOUND LANES OF U.S. 31 AND APPROXIMATELY 654' NORTHWEST OF ITS INTERSECTION OF NINEVEH ROAD.

BENCHMARK ELEVATION = 743.13 (NAVD 88)

DATE	MARK	REVISIONS	BY

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CERTIFIED: 04/07/22

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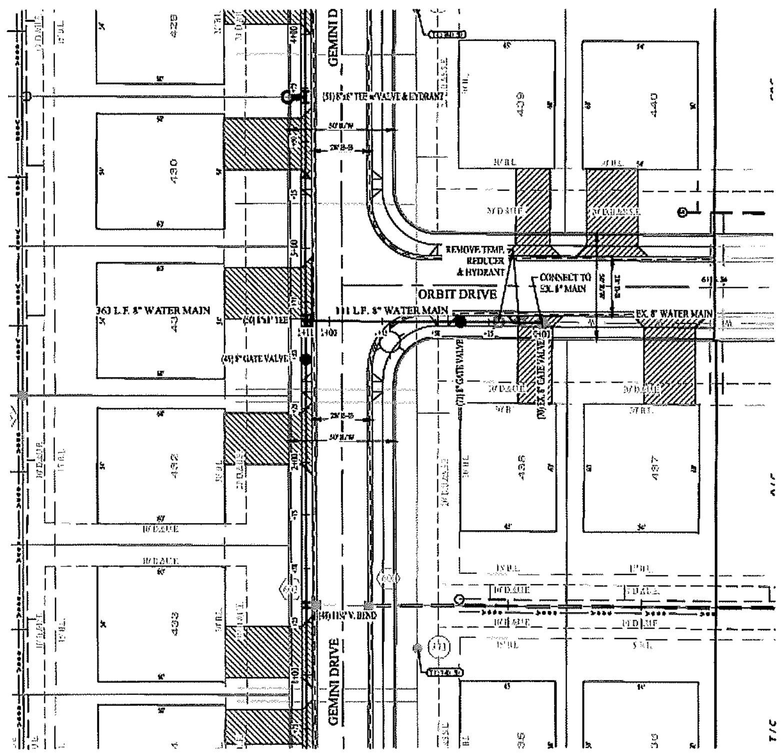
WATER PLAN & PROFILES

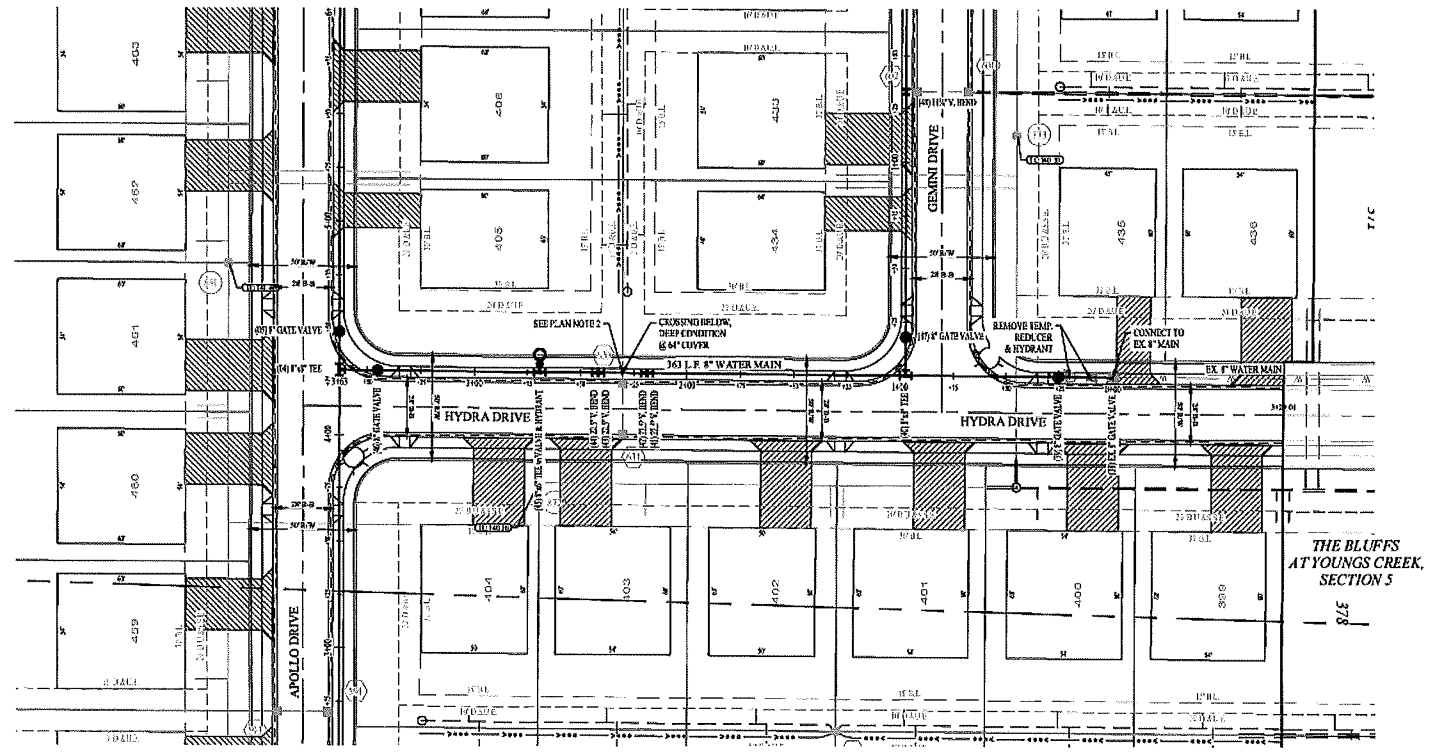
THE BLUFFS AT YOUNGS CREEK SECTION 6

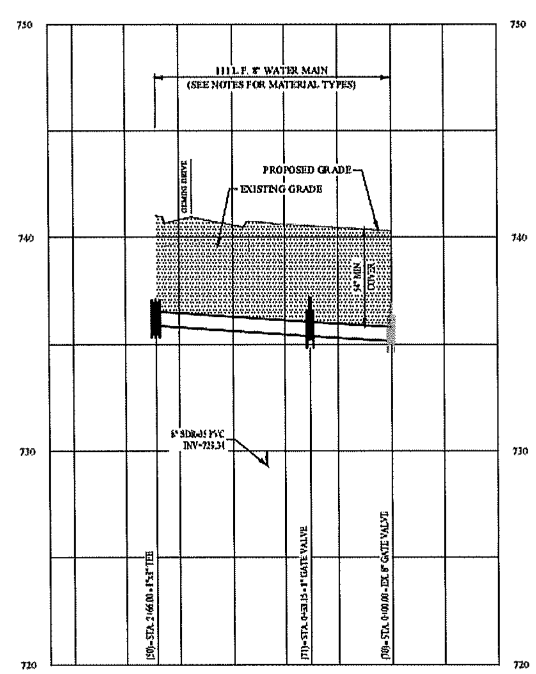
FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY: DCM CHECKED BY: BKR
SHEET NO. C702
S & A JOB NO. 83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C700 - Water Profiles.dwg - C702
Modified / By: March 21, 2022 2:43:38 PM / RMorris
Plotted / By: March 22, 2022 11:47:37 AM / Raven Morris

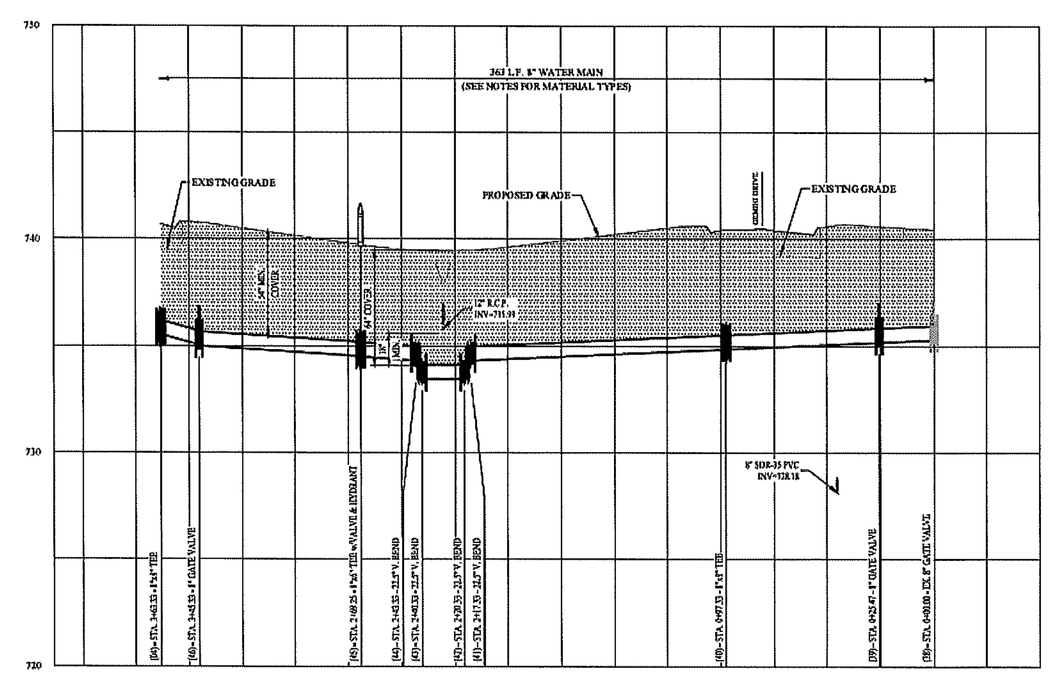






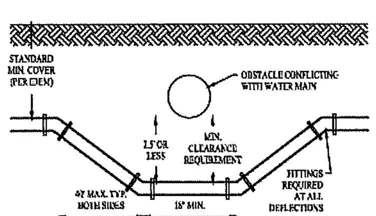
SCALE: 1"=40' HOR.
1"=4' VERT.

ORBIT DRIVE

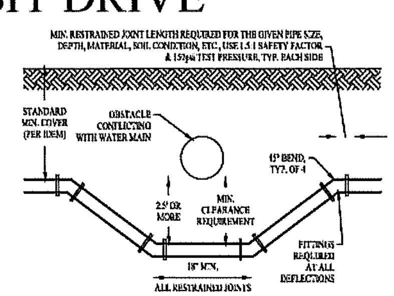


SCALE: 1"=40' HOR.
1"=4' VERT.

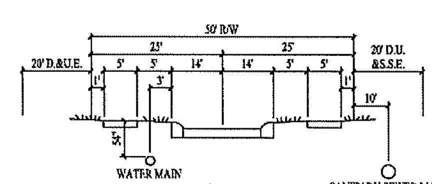
HYDRA DRIVE



CROSSING BELOW, SHALLOW CONDITION
NOT-TO-SCALE



CROSSING BELOW, DEEP CONDITION
NOT-TO-SCALE



TYPICAL STREET
NOT-TO-SCALE

GRAPHIC SCALE
40' 0 20' 40'
(IN FEET)
1" = 40 FT

LEGEND

	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATER LINE
	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED WATER LINE
	HYDRANT w/ 6" VALVE
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WATER MAIN PIPE TABLE

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BENCHMARK ELEVATION = 743.13 (NAVD 88)

DATE	MARK	REVISIONS	BY

DAVID J. STOEPPELWERTH
REGISTERED
No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

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CERTIFIED: 04/07/22

STOEPPELWERTH
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WATER PLAN & PROFILES

THE BLUFFS AT YOUNGS CREEK
SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

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

DRAWN BY: DCM
CHECKED BY: BKR
SHEET NO. C703
S & A JOB NO. 83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C700 - Water Profiles.dwg - C703
Modified / By: March 21, 2022 2:43:38 PM / RMorris
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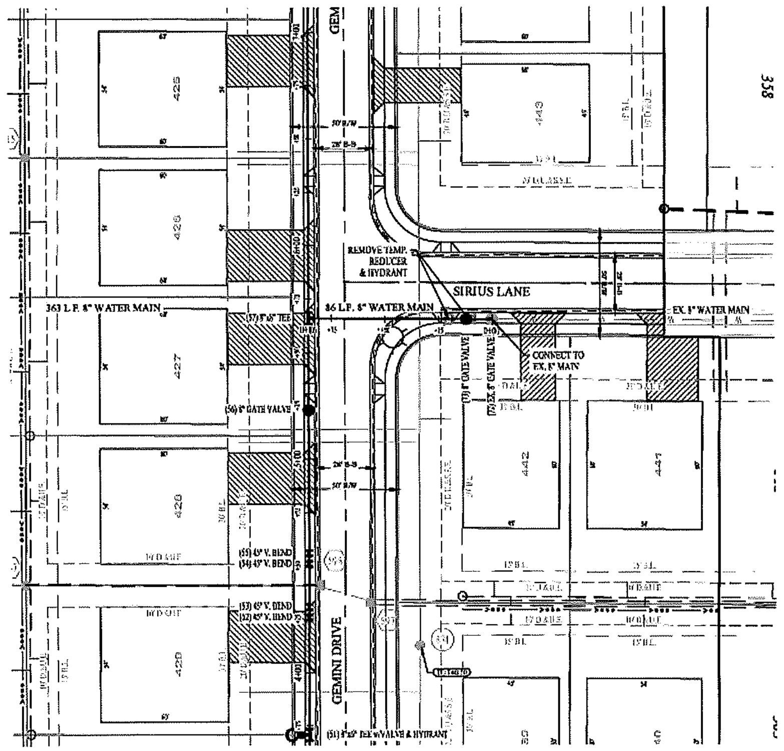
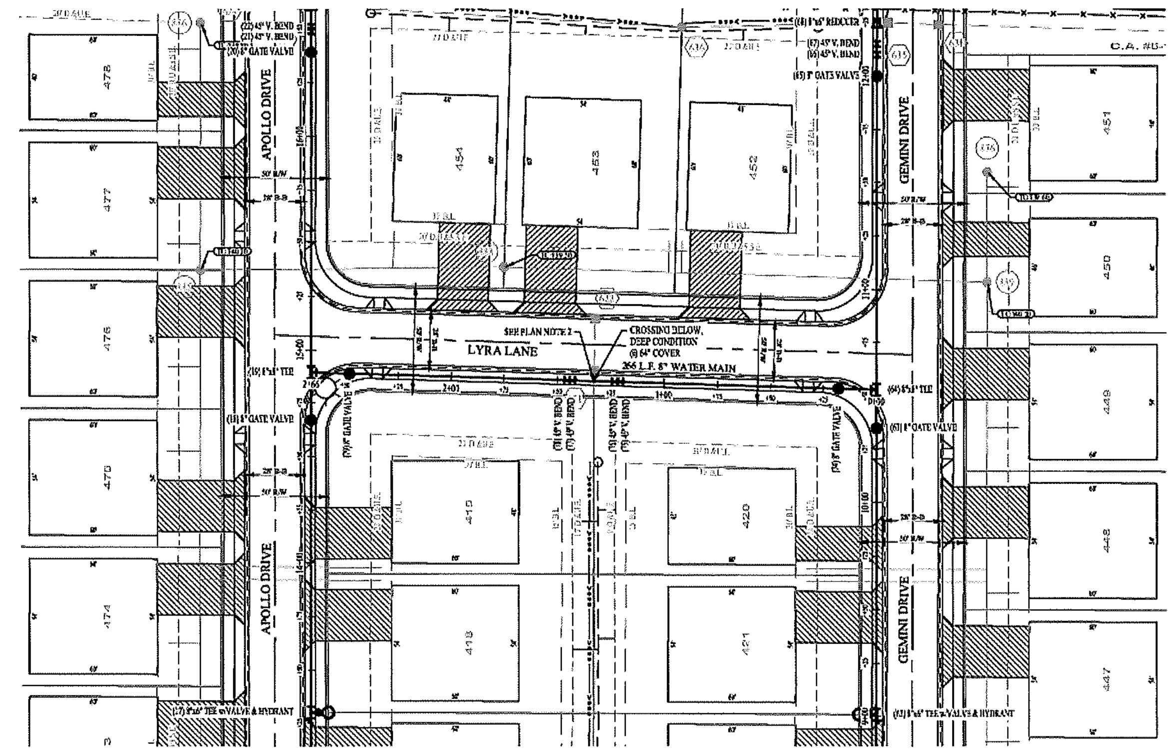
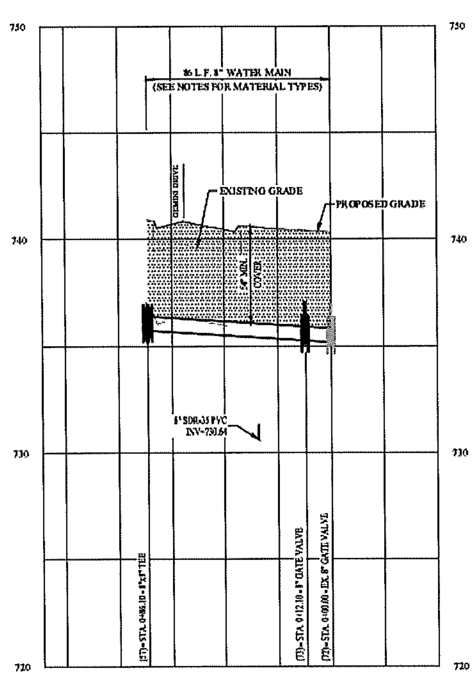
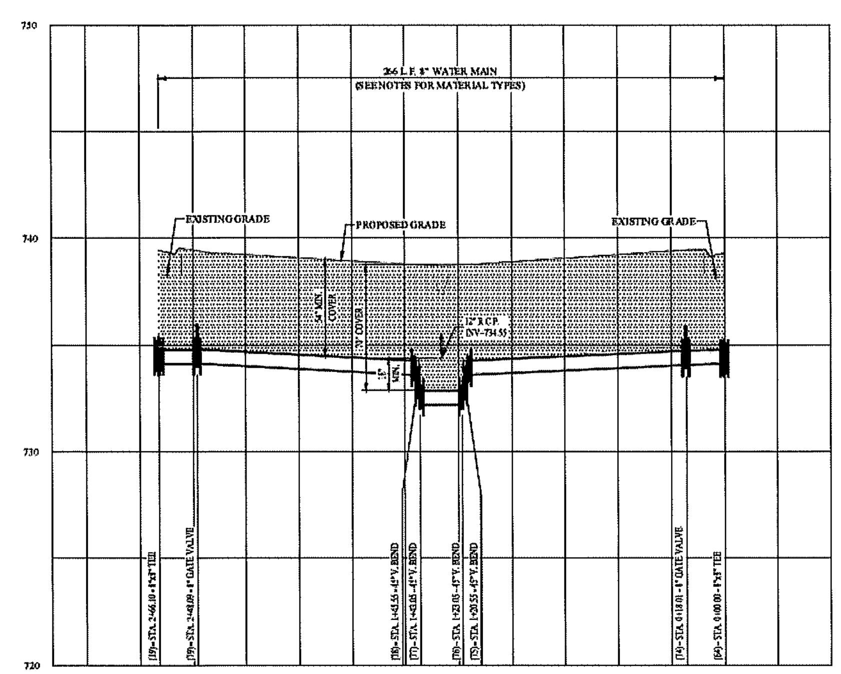






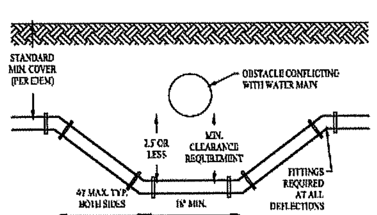
SCALE: 1"=40' HOR.
1"=4' VERT.

SIRIUS LANE



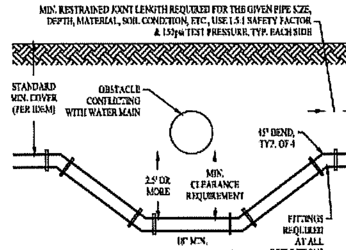
SCALE: 1"=40' HOR.
1"=4' VERT.

LYRA LANE

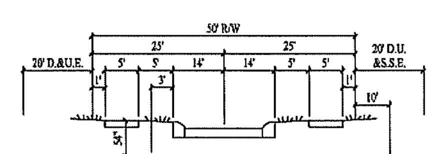


CROSSING BELOW, SHALLOW CONDITION
NOT-TO-SCALE

MIN. RESTRAINED JOINT LENGTH REQUIRED FOR THE GIVEN PIPE SIZE, DEPTH, MATERIAL, SOIL CONDITION, ETC. USE 1.5:1 SAFETY FACTOR & 150psi TEST PRESSURE, TYP. EACH SIDE



CROSSING BELOW, DEEP CONDITION
NOT-TO-SCALE



TYPICAL STREET
NOT-TO-SCALE

GRAPHIC SCALE
(IN FEET)
1" = 40 FT

LEGEND

Symbol	Description
	EXISTING SANITARY SEWER
	EXISTING STORM SEWER
	EXISTING WATER LINE
	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED WATER LINE
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	REDUCER
	TEE
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	BEND, VERTICAL

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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-PIPE 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.
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 15103.
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 15030-3.03. 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 HARNESSES, 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 XYLAN 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 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 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 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 02210.
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 327 IAC 8-3.2-9 OF THE INDIANA ADMINISTRATIVE CODE FOR MORE INFORMATION.
15. MAINTAIN MINIMUM COVER DEPTH OF 54" AND A MAXIMUM OF 54"+24".

PLAN NOTES

1. 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.
2. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 2' (24") OF HORIZONTAL SEPARATION FROM THE OUTSIDE OF THE STORM STRUCTURE AND CENTER A FULL LENGTH OF 20' OF PVC (OR DUCTILE IRON) PIPE ON SAID STORM STRUCTURE.
3. SEE WATER MAIN JOINT RESTRAINT SCHEDULE ON SHEET C703.

WATER MAIN PIPE TABLE

SIZE	MATERIAL	LENGTH
8"	PVC C-900 DR-14, HDPE DR-11, OR D.I. THICKNESS CLASS 52	4,859 L.F.
6"	D.I. THICKNESS CLASS 52 LATERAL FOR TEMP. HYDRANT	50 L.F.
	TOTAL LENGTH	4,909 L.F.

BENCHMARK DATA

ORIGINATING BENCHMARK

JOHNSON COUNTY BENCHMARK TTAS: A 4" COPPER PLATE, CENTER PUNCHED, STAMPED "YFTTAS" SET ON A 36" IRON ROD SET IN 6"x36" CONCRETE, 6"± BELOW GROUND LEVEL. APPROXIMATELY 20 FEET FROM THE CENTER OF THE NORTHBOUND LANES OF U.S. 31 AND APPROXIMATELY 650' NORTHWEST OF ITS INTERSECTION OF NINEVEH ROAD.

BENCHMARK ELEVATION = 743.13 (NAVD 88)

REVISIONS | DATE | MARK | BY

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

CERTIFIED: 04/07/22

DAVID J. STOEPPELWERTH, REGISTERED No. 19356, STATE OF INDIANA, PROFESSIONAL ENGINEER

STOEPPELWERTH
ALWAYS ON
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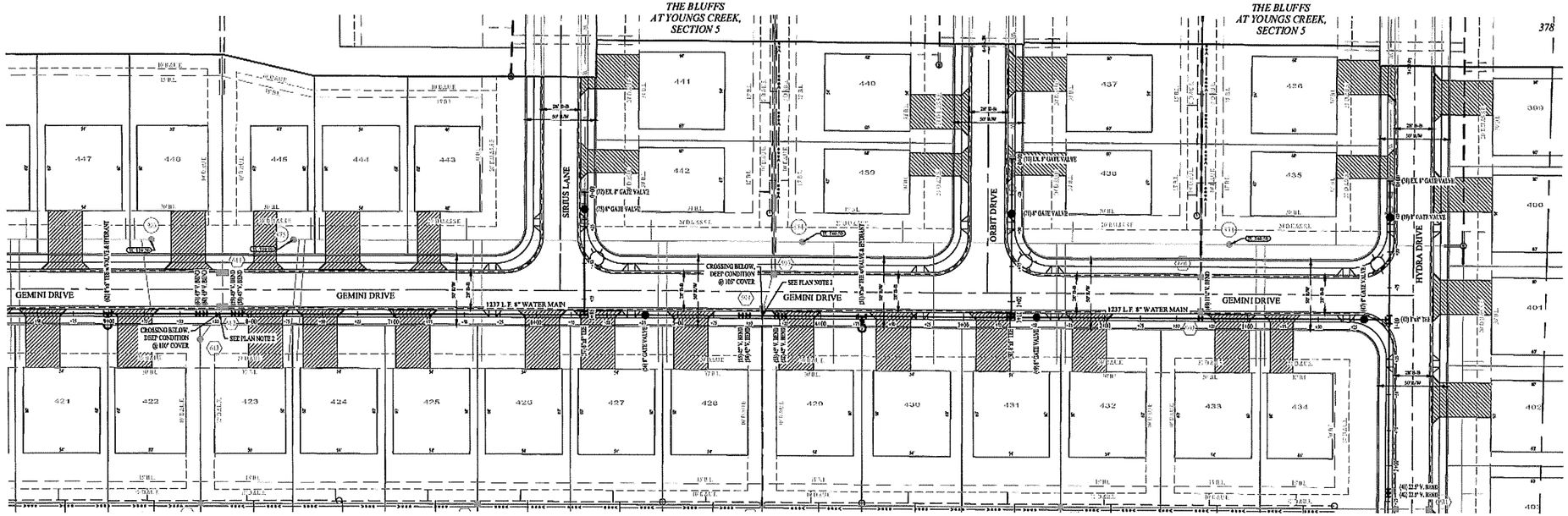
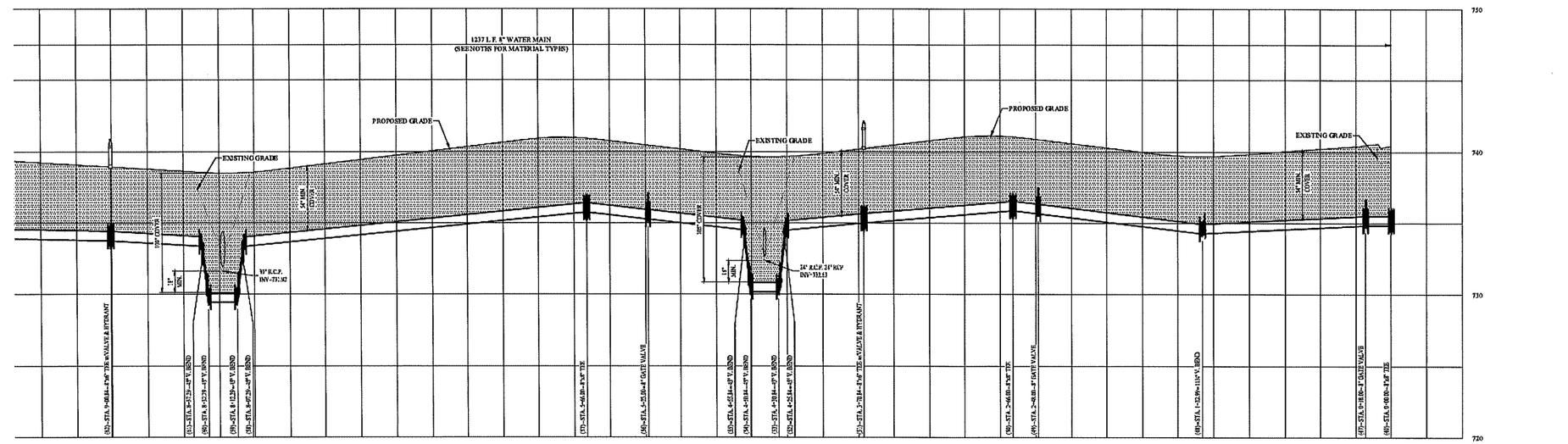
WATER PLAN & PROFILES
THE BLUFFS AT YOUNGS CREEK SECTION 6
FRANKLIN, FRANKLIN TOWNSHIP, JOHNSON COUNTY, INDIANA

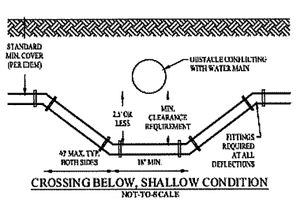
DRAWN BY: DCM
CHECKED BY: BKR
SHEET NO. C704
S.A.& JOB NO. 83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C700 - Water Profiles.dwg - C704
Modified / By: March 21, 2022 2:43:38 PM / RMorris
Plotted / By: March 22, 2022 11:49:47 AM / Raven Morris

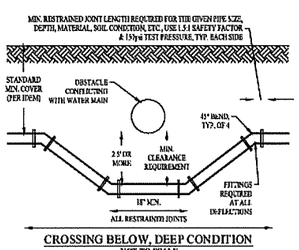




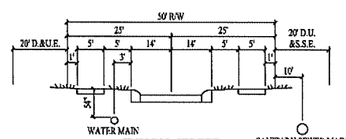
GEMINI DRIVE



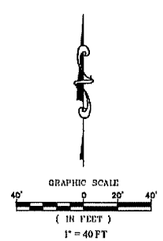
CROSSING BELOW, SHALLOW CONDITION
NOT-TO-SCALE



CROSSING BELOW, DEEP CONDITION
NOT-TO-SCALE



TYPICAL STREET
NOT-TO-SCALE



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. DEFLECTIONS 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 HARNESSES. 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.
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 INTERNAL 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 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 15105.03. PIPE FUSIONS 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 HARNESSES, AND ALL OTHER METALLIC APPURTENANCES IN 10-MIL BLUE POLYETHYLENE.
8. ALL FIRE HYDRANT LATERALS SHALL BE DUCTILE IRON PIPE.
9. ALL MJ T-BOLTS AND FLANGE BOLTS SHALL HAVE XYLAN OR FLUOROKOTE #1 COROSION RESISTANT COATING.
10. ALL FITTINGS SHALL BE RESTRAINED USING MJ RETAINER GLANDS.
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13. SELECT FILL MATERIAL IS REQUIRED FOR FINAL BACKFILL WHEN WITHIN 5-FEET OF PAVEMENT PER SPECIFICATION SECTION 02210.
14. 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 327 IAC 8-3.2-9 OF THE INDIANA ADMINISTRATIVE CODE FOR MORE INFORMATION.
15. MAINTAIN MINIMUM COVER DEPTH OF 54" AND A MAXIMUM OF 54"+24".

PLAN NOTES

1. WATER MAIN PIPE SHALL BE PVC C-900 DR-14, HDPE DR-11, OR DI. THICKNESS CLASS 52. THE PIPE MAY EQUAL AND PRESSURE CLASS WILL BE DETERMINED AT THE TIME OF CONSTRUCTION BASED ON COST OF EACH AT THAT TIME.
2. CONTRACTOR SHALL MAINTAIN A MINIMUM OF 2' (24") OF HORIZONTAL SEPARATION FROM THE OUTSIDE OF THE STORM STRUCTURE AND CENTER A FULL LENGTH OF 20' OF PVC (OR DUCTILE IRON) PIPE ON SAID STORM STRUCTURE.
3. SEE WATER MAIN JOINT RESTRAINT SCHEDULE ON SHEET C763.

WATER MAIN PIPE TABLE

SIZE	MATERIAL	LENGTH
8"	PVC C-900 DR-14, HDPE DR-11, OR D.I. THICKNESS CLASS 52	4,850 L.F.
6"	D.I. THICKNESS CLASS 52 LATERAL FOR TEMP. HYDRANT	50 L.F.
	TOTAL LENGTH	4,900 L.F.

BENCHMARK DATA

ORIGINATING BENCHMARK

JOHNSON COUNTY BENCHMARK TTAS: A 4" COPPER PLATE, CENTER PUNCHED, STAMPED "TTTAS" SET ON A 36" IRON ROD SET IN 6"x36" CONCRETE, 6"± BELOW GROUND LEVEL. APPROXIMATELY 20 FEET FROM THE CENTER OF THE NORTHBOUND LANES OF U.S. 31 AND APPROXIMATELY 650' NORTHWEST OF HIS INTERSECTION OF NINEVEH ROAD.

BENCHMARK ELEVATION = 743.13 (NAVD 88)

	REVISIONS	DATE	MARK	BY

DAVID J. STOEPPELWERTH
REGISTERED
No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

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CERTIFIED: 04/07/22

STOEPPELWERTH
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7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5962

WATER PLAN & PROFILES
THE BLUFFS AT YOUNGS CREEK
SECTION 6
FRANKLIN, FRANKLIN TOWNSHIP
JOHNSON COUNTY, INDIANA

DRAWN BY:	CHECKED BY:
DCM	BKR

SHEET NO
C705

S.E.A. JOB NO
83540MMA-S6

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

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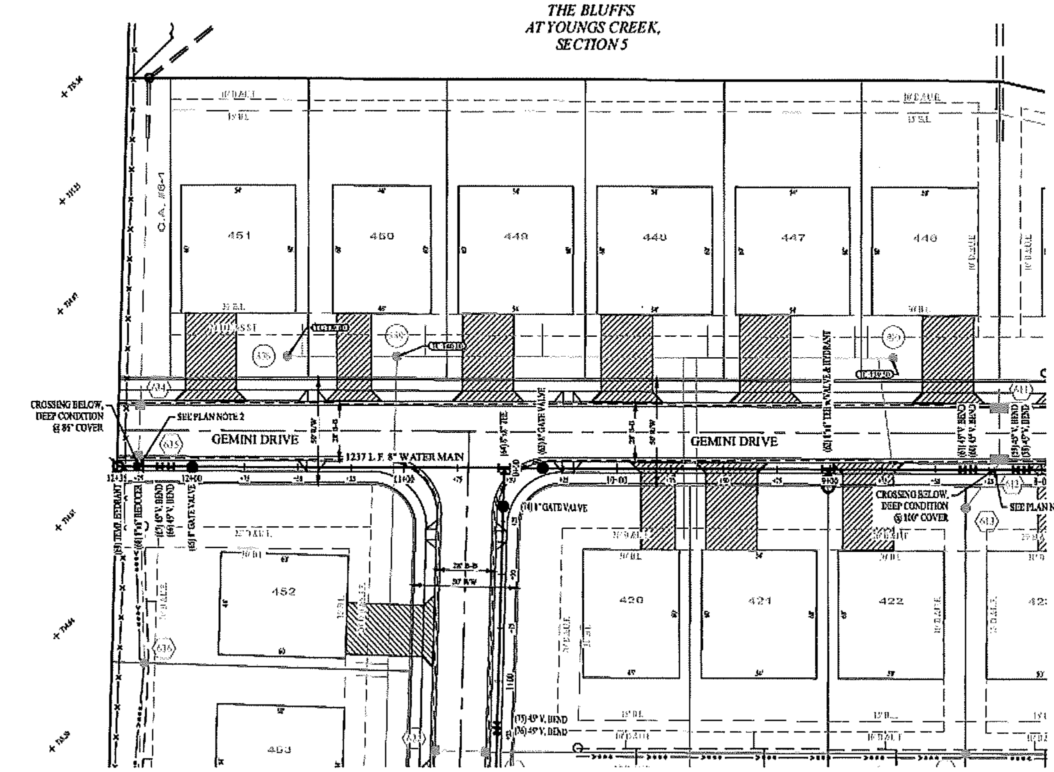
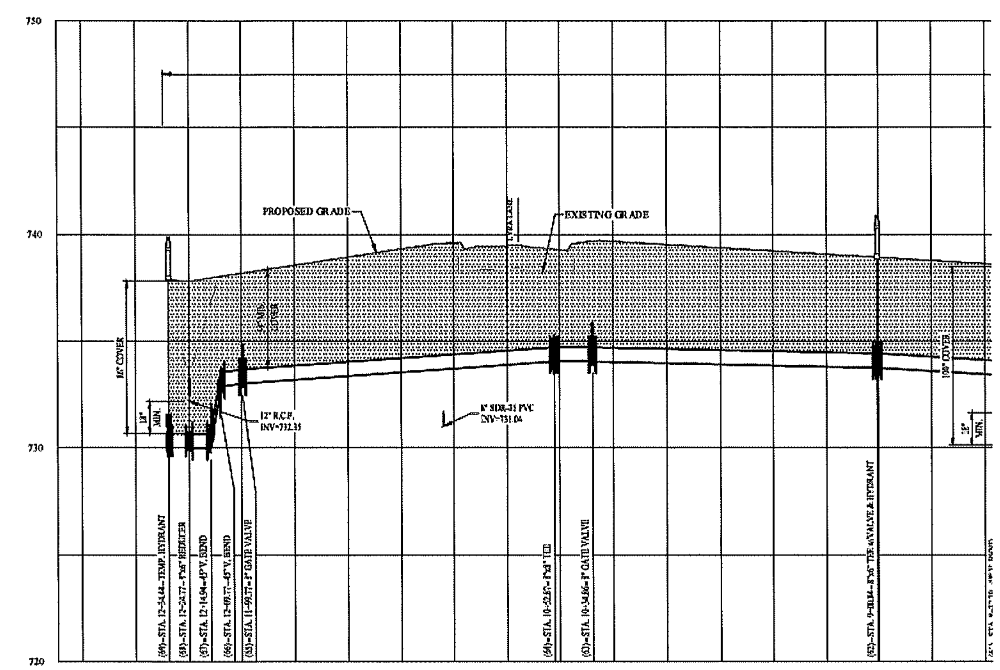
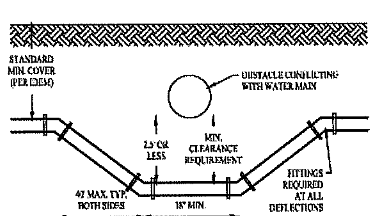
Modified / By: March 21, 2022 2:43:38 PM / RMorris
Plotted / By: March 22, 2022 11:50:21 AM / Raven Morris



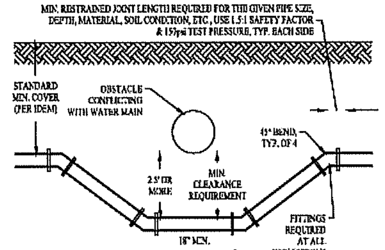


SCALE: 1"=40' HOR.
1"=4' VERT.

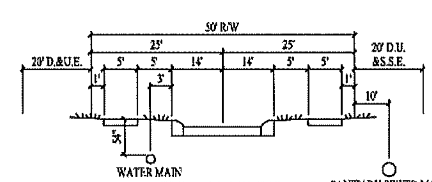
GEMINI DRIVE



CROSSING BELOW, SHALLOW CONDITION
NOT-TO-SCALE



CROSSING BELOW, DEEP CONDITION
NOT-TO-SCALE



TYPICAL STREET
NOT-TO-SCALE

GRAPHIC SCALE
(IN FEET)
1" = 40 FT

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

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3. SEE WATER MAIN JOINT RESTRAINT SCHEDULE ON SHEET C703.

WATER MAIN PIPE TABLE

SIZE	MATERIAL	LENGTH
8"	PVC C-900 DR-14, HDPE DR-11, OR D.I. THICKNESS CLASS 52	4,859 L.F.
6"	D.I. THICKNESS CLASS 52 LATERAL FOR TEMP. HYDRANT	50 L.F.
	TOTAL LENGTH	4,909 L.F.

BENCHMARK DATA

ORIGINATING BENCHMARK

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BENCHMARK ELEVATION = 743.13 (NAVD 88)

DATE	MARK	REVISIONS	BY

DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

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CERTIFIED: 04/07/22

STOEPPELWERTH
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WATER PLAN & PROFILES
THE BLUFFS AT YOUNGS CREEK SECTION 6

FRANKLIN, FRANKIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY: DCM
CHECKED BY: BKR
SHEET NO. C706
S & A JOB NO. 83540MMA-S6

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Modified / By: March 21, 2022 2:43:38 PM / RMorris
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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 III.

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 oils.

The stainless steel elements of the connector shall be totally nonmagnetic Series 305 stainless steel. The stainless steel clamp shall be capable of sustaining applied torque in excess of eighty (80) inch-pounds. It shall be the responsibility of the Contractor to submit details of the proposed connection to the DPW for approval. Connections not approved by the DPW shall be subject to removal and replacement with an approved adapter.

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 C111.

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 requirement 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 (PVCC)

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 having 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 402(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 reinforcement, 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 cages 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 tile 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 apron 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"-lok 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 clamp shall be capable of sustaining applied torque in excess of eighty (80) inch-pounds. It shall be the responsibility of the Contractor to submit details of the proposed connection to the DPW for approval. Connections not approved by the DPW shall be subject to removal and replacement with an approved adapter.

H. Castings

Standard manholes shall have a R-1772 CVH frame and lid by Neenah Foundry, 1873-3 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 seal extensions shall be as manufactured by Cretex Specialty Products, or equal.

The sleeves shall be extruded 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 precoated galvanized, 12"-36"
12 gauge aluminum coated Type II or precoated galvanized, 42" and larger
Fully Bituminous Coated, Half Paved Steel Helical Ribbed Pipe (Type IR):
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 IR)
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	IDOT	
Bituminous Coated Corrugated Steel or Aluminum Pipe, Pipe-Arch, or Underdrain	908.07	
Fiber Bonded Fully Bituminous Coated Corrugated Steel Culvert	908.08	
Corrugated Aluminum Alloy Culvert Pipe and Pipe-Arches	908.04	
Reinforced Concrete Pipe	907.02	ASTM C 76 ASTM C 55
Acrylonitrile-Butadiene-Styrene (ABS) Composite Sewer Piping	907.15	
Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings	907.16	
Type PSM SDR-35 PVC Sewer Pipe	907.19	
Rubber Gaskets	906.04	
Precast Reinforced Concrete Box Sections	907.05	
High Density Polyethylene Pipe (HDPE)	AASHTO M294	ASTM F 714 & ASTM F894
Polyvinyl Chloride Pipe (PVC)	AASHTO M304	ASTM F679

5.07 Storm Manholes

Storm manholes shall be in accordance with Section 5.05 (C), (D), (E) and (F). Castings shall be R-1972CV1T by Neenah Foundry, 1873-3 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 (IDOT) 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, sumps, pumps, hose, piping, well points, etc. necessary to depress and maintain the groundwater level below the base of the excavation. If the Contractor is unable to remove the standing water in the trench, the Contractor shall over-excavate the proposed bottom grade of the sewer bedding, and place not less than three (3) inches of Class No. 2 crushed stone (Indiana Department of Highway aggregate Classification) in the over-excavated area.

The Contractor 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 this operation 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 open trenches, the Contractor shall provide suitable bridges at 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 boxes 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 that 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 backfill subject to the approval of the City Engineer and Such material may be used only when its class is allowed. For example, Excavated material conforming to "Class II" description may be used where "Class II" 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 that 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 rapidly 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 inch), graded stone such as crushed stone.
Class II - Coarse sands and gravel with maximum particle size of 40 mm (1 1/2 inch), 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 - Silt, silty clays 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 up 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 or II material is used compaction may be accomplished by hand or mechanical tamping or by "walking" the material in. Bedding from the halfway point on the pipe to a point twelve (12) inches above the top of the pipe shall be a Class I, II, III, or IV material placed in six (6) inch layers and thoroughly compacted to prevent settlement. Class III and IV material shall not be used when the trench is located in an area subject to vehicular traffic.

2. Flexible and Semirigid Conduit Bedding

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

All flexible and semirigid pipe shall be laid to the lines and grades unless otherwise directed by the DPW. All flexible and semirigid 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 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 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 compaction may be accomplished by hand or mechanical tamping or by "walking" the material in. When Class II materials are used compaction shall be accomplished only by hand or mechanical tamping to a minimum eighty-five percent (85%) Standard Proctor Density.

E. Backfill Above Pipe

1. Method A - Backfill in Areas Not Subject to Vehicular Traffic

For purposes of this specification, trenches shall be considered subject to vehicular traffic if all or any portion of the excavation is located within four feet of a roadway or alley which is routinely traveled by powered vehicles. In the event of any question regarding the susceptibility of an area to traffic, the City Engineer's and DPW decision shall govern.

The trench between a level twelve (12) inches above the top of the pipe and the ground surface shall be backfilled with Class I, II, III or IV materials, as described above, deposited with mechanical equipment in such a manner that it will "flow" onto the bedding and not free fall. The Contractor shall consolidate the backfill by the back and forth travel of a suitable roller, wheeled device or other similar heavy equipment until no further settlement is obtained. Heavy equipment shall not be used until there is a cover of not less than three (3) feet over the To assist in promoting maximum settlement, the surface of the trench shall be left in a slightly rounded condition. Periodical dressing of the backfill at the trench to promote the drainage and safety conditions shall be made during the course of the work.

2. Method B - Backfill in Areas Subject to Vehicular Traffic (Mechanical Compaction)

The trench between a level of twelve (12) inches above the top of the pipe and the surface, which are located in areas subject to or possibly subject to vehicular traffic, shall be backfilled with Class I or II materials, deposited in uniform horizontal layers of two (2) feet +/- six (6) inches. Each layer shall be thoroughly compacted by mechanical tamping utilizing a crane mounted hydraulic vibratory compactor. Each layer shall be thoroughly compacted before the next succeeding layer is placed. This procedure shall be followed where trench walls remain stable during compaction. If in the opinion of the City Engineer and DPW, and/or their representative (inspector), the trench walls become unstable during compaction, then the City Engineer, DPW, and/or their representative (inspector) may authorize the Contractor to push from the back of the trench the Class I or II material into the trench the full depth, not to exceed twenty (20) lineal feet horizontally along the trench bottom and compact using the vibratory compactor in two (2) foot diagonal lifts.

The crane mounted vibratory compactors shall be capable of producing 1900 cycles per minute and have a compaction plate with the minimum dimensions of twenty-three by thirty-one (23 x 31) inches. The compactor shall be similar to those as manufactured by Allied, Ho-Pac, or equal.

When Class I or II materials do not contain sufficient moisture to obtain proper compaction, in the opinion of the City Engineer, DPW and/or their representative, it shall be moistened or wetted as directed by the City Engineer, DPW and/or their representative.

3. Method C - Backfill in Areas Subject to Vehicular Traffic (Jetting and Watersoaking)

In lieu of the Mechanical Compaction described in Method B above, the Contractor may compact the Class I or II materials by jetting and watersoaking in the manner described below. Except for compaction procedures of the Class I or II materials, all provisions of Method B described above shall apply to this Method C. The trench compaction shall be started at the point of lowest elevation of the trench and work up along the trench. Jetting and watersoaking shall not begin until the trench has been backfilled to within eight (8) inches of the finished surface. Jetting and water soaking is not allowed when the groundwater table is above the spring line of the pipe.

The holes through which water is injected into the backfill shall be centered over the trench backfill and at longitudinal intervals of not more than six (6) feet. Additional holes shall be provided if deemed necessary by the City Engineer to ensure adequate settlement. All holes shall be jetted and shall be carried to a point one (1) foot above the top of the Drilling the holes by means of augers or other mechanical means will not be permitted. Care shall be taken in jetting so as to prevent contact with, or any disturbance of the pipe.

The water shall be injected at a pressure and rate just sufficient to sink the holes at a moderate rate. After a hole has been jetted to the required depth, the water shall continue to be injected until it begins to overflow the surface. An approved soil auger shall be used for boring test holes. As soon as the jetting and watersoaking has been completed, all holes shall be filled with soil and compacted. Surface depressions resulting from backfill subsidence caused by jetting and watersoaking shall be filled and recompacted by tamping or rolling to the satisfaction of the City Engineer.

The Contractor shall provide all piping, fittings, etc., necessary to deliver the water along the site of the work and shall arrange with the Water Company for making the necessary taps and metering.

E. Temporary Surfaces Subject to Traffic

The Contractor shall open streets to traffic immediately after completing the backfill operation. He shall accomplish this by installing the compacted aggregate base immediately after granular backfill. The use of class II backfill as a temporary surface is specifically prohibited. When using Method C backfilling, the Contractor may elect to delay the jetting operation until just prior to installing the permanent pavement. This shall not relieve the Contractor from the responsibility of maintaining the temporary surface in accordance with these specifications.

F. Maintaining Trench Surfaces

All surface settlement of the backfill along trenches located beneath streets, roads, alleys, driveways and parking lots which are subject to traffic shall be kept filled level with or slightly above the original paved surface at all times with compacted aggregate base material until the permanent pavement is satisfactorily restored. When temporary asphalt pavement is used, depressions and "pot holes" shall be promptly filled with the temporary asphalt material. Special attention shall be given by the Contractor to the timely and proper maintenance, leveling and grading of the surface of all backfilled trenches, especially those subject to traffic and especially following rains. The surface of streets, roads and alleys shall be maintained smooth and free of ruts and water trapping depressions by periodic power blading, scarifying; and/or filling rutted areas, ruts, pockets, or holes with compacted aggregate base material or temporary asphalt where used.

As a dust preventive, the Contractor shall apply, calcium chloride over the surface of the compacted aggregate base in such amounts and at such times as are necessary to avoid or eliminate dust complaints from nearby residents. In event of any question regarding the existence or nonexistence of a dust nuisance, the City Engineer's and DPW's decision on the matter will govern. The material used shall be Regular Flake Calcium Chloride having a minimum chemical content of Calcium Chloride of seventy-seven percent (77%). Unless otherwise specified or ordered by the City Engineer and DPW, the rate of application shall be one and one half (1 1/2) pounds per square yard of surface covered.

Wherever surface settlement is not important, unless otherwise specified or directed, the backfill shall be neatly rounded over the trench to a sufficient height to allow for settlement to grade after consolidation. Just prior to the completion of all work under the contract, any surface settlement below original ground surface shall be refilled in a satisfactory manner, and reseeded as specified if required.

7.05 Laying of Sewers

A. General

This section on the Laying of Sewers shall be divided into two (2) classifications - rigid and nonrigid conduit. Pipe materials such as concrete, steel, PVC/ABS truss, and ductile iron pipe are considered rigid conduits. Thermoplastic (PVC) shall be considered nonrigid or flexible conduits.

B. Rigid Conduit Installation

All rigid conduit for sewer pipe shall be laid to the lines and grades, unless otherwise directed by the City Engineer and DPW. All rigid pipe shall be laid in accordance with the details for the First Class Pipe Laying Method. This First Class Pipe Laying Method may be achieved by Class B bedding methods as shown in the ASCE Manual of Practice No. 37, latest edition. Under this Class B bedding Method, the pipe shall be bedded in compacted granular material (Class I or Class II) placed on a flat trench bottom. The bedding shall have a minimum thickness of one-fourth (1/4) the outside pipe diameter below the pipe and shall extend halfway up the pipe barrel at the sides. All granular bedding material shall be placed in the trench in approximately six (6) inch layers. Compaction shall be accomplished by hand or mechanical tamping or by "walking" the granular material in. From the halfway point on the pipe (Springline) to a point twelve (12) inches above the top of the pipe, backfilling methods A or B or C shall be used depending on the trench location. In addition, all rigid conduit shall be installed in accordance with "Standard Recommended Practice for Installing Vitrified Clay Sewer Pipe" (ASTM Designation C 12 and ASTM D2321).

The laying of pipe in finished trenches shall be commenced at the lowest point, proceeding upstream, with the spigot ends pointing the direction of flow.

No blocking under pipes will be permitted, except as approved by the City Engineer or DPW for pipe to be encased in concrete or laid in concrete cradles.

The practice of blocking pipe up to grade with bedding material, then backfilling under is prohibited. The entire length of the bed section is to be at proper grade before installing pipe.

The supporting strength of the pipe is dependent upon its foundation and trench. To develop normal strength, the pipe shall have a firm uniform foundation under the entire lower quadrant of the barrel. No weight should be supported by the bell. The maximum trench width as recommended by ASTM at the level of the top of the pipe shall be maintained as narrow as possible, taking into consideration the limitation of the excavation equipment except as may be permitted by the City Engineer upon investigation of the soil conditions, laying methods and earth loadings.

All pipes and specials shall be carefully inspected before being laid, and no cracked, broken or defective pipe or special shall be used in the work. All pipe shall be carefully inserted in the bell in such a manner that there will be no unevenness of any kind along the bottom half of the pipes and so that there is a uniform joint space all around.

All pipe that is field cut shall have the homing-marks reestablished, insuring for proper seating depths. Pipes that are field cut shall have the cut ends retapered, by grinding or filing, as close to the original taper provided by the manufacturer as possible. When homing pipe with a spud-bar or other mechanical equipment, other than by hand, place a piece of wood between pipe and tool to prevent damage to bell end-section.

Pipe laid in open cut shall have all trench spaces and voids solidly and completely filled with suitable earth materials from the excavations which shall be thoroughly and solidly rammed into place, unless otherwise specified.

The ends of the pipes shall be protected to prevent the entrance of dirt or other foreign substances. Such protection shall be placed at night or whenever pipe laying is stopped for any reason. Suitable plugs designed for use with the pipe material shall be provided and properly secured and used to cap all stubs and branches.

C. Flexible Conduit Installation

Plastic sewer pipe (PVC) and other flexible pipe shall be carefully installed in accordance with the above specification for Rigid Conduit Installation, except where the following paragraphs modify those specifications.

Flexible conduit for sewer pipe shall be installed in accordance with "Underground installation of Flexible Thermoplastic Sewer Pipe" ASTM Designation C 2321.

The Contractor shall take special precautions when homing PVC pipe not to over-seat past the home-marks. The pipe installation must include adequate bedding to hold its proper placement, prior to installing the next section.

The Contractor shall use caution when storing thermoplastic pipe. Excessive spans, in sunlight, will cause bowing damage, and said damaged spans will be rejected.

In addition to the construction and testing procedures outlined in other sections of these specifications, the Contractor shall be required to install the flexible pipe in such a manner so that the diameter deflection of the pipe shall not exceed five percent (5%) when tested in accordance with the Final Acceptance Test. Bedding materials surrounding the pipe shall be compacted to the densities required to meet the five percent (5%) maximum deflection requirement. The area requiring compaction shall be included in the bed and side fill material and also the material placed above the pipe for a distance of twelve (12) inches over the top of the pipe.

The First Class Pipe Laying Method for Flexible conduit may be achieved by Class B Bedding Methods as shown in the ASCE Manual of Practice No. 37, latest edition. Under this class B Bedding Method, the pipe shall be bedded in compacted granular material (Class I or II) placed on a flat trench bottom. The bedding shall have a minimum thickness of one-fourth (1/4) the outside pipe diameter below the pipe and shall extend twelve (12) inches above the top of the pipe level and full width of the trench. All granular bedding material shall be placed in the trench in approximately six (6) inch layers.

Compaction shall be accomplished by hand or Mechanical Tamping or by "Walking" the granular material in for Class I materials only. When Class II materials are used compaction shall be accomplished by hand or mechanical tamping only to a minimum eighty-five percent (85%) Standard Proctor Density. Backfill from a point twelve (12) inches above the top of the pipe to the trench surface shall be in accordance with "backfilling Methods A or B or C" depending on the trench location.

Plastic pipe shall not be blocked, except where the plans or specifications call for concrete encasement or concrete cradles for the pipe. Blocks shall be encased in concrete also, or removed. Where plastic pipe is to be installed below maximum ground water table, adequate weights shall be provided to prevent flotation of the pipe.

Pipe and fittings shall be carefully inspected before being installed. Cracked, broken or otherwise defective pipe, shall not be used.

7.07 Structure Installation

All manholes, inlets and catch basins shall be installed on a minimum of a 6" No. 8 stone. This material shall be compacted.

DATE	MARK	REVISIONS	BY
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DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

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

CERTIFIED: 04/07/22

STOEPPELWERTH
ALWAYS ON
7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

CONSTRUCTION DETAILS

THE BLUFFS AT YOUNGS CREEK
SECTION 6

FRANKLIN, FRANKIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY: DCM CHECKED BY: BKR

SHEET NO. C800A

S&A JOB NO. 83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C800 - Construction Details.dwg - C800A
Modified / By: January 17, 2022 2:34:02 PM / dMargraf
Plotted / By: March 22, 2022 11:51:09 AM / Raven Morris

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 way 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 in 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 cut back, 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 Ground Areas with Sod

Where shown on the plans or required by the DPW or City Engineer, established ground 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 Ground 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 Rye Grass (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 harrowed into the soil and mulched with straw of sufficient thickness to hold the seed until it has 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 warp count of one (1) pair of yarns per two (2) inches and a filling count of two (2) per inch. Selvage 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-Builts = 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. Sewers 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 system 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 gph/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-jointed lateral connection or extension.

All plugs shall be securely braced 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 gages 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 the 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.

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

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 expertise 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 pudding 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 its 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 deflectometer, 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) Diameter = 48"	60"	72"
8		20	26	33
10		25	33	41
12		30	39	49
14		35	46	57
16		40	52	65
18		45	59	73
20		50	65	81
22		55	72	89
24		59	78	97
26		64	85	105
28		69	91	113
30		74	98	121
For each add'l 2' add.		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 ground water 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 to 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 lamped, 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 sites 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 1 acre 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, letters 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 tarping 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 installed 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 - Any disturbed land which will be left undisturbed for fourteen (14) days or more shall receive temporary mulch seeding. It is the Contractor's responsibility to ensure adequate vegetative growth occurs to stabilize these areas; if the vegetation does not exhibit sufficient growth to provide stabilization, the work must either be repeated or other means undertaken to achieve requirement.
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

File Name: S:\83540MMA-S06\DWG\C800 - Construction Details.dwg - C800B
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DATE	MARK	REVISIONS	BY

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CERTIFIED: 04/07/22

DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

STOEPPELWERTH
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7965 East 106th Street, Fishers, IN 46038-2505
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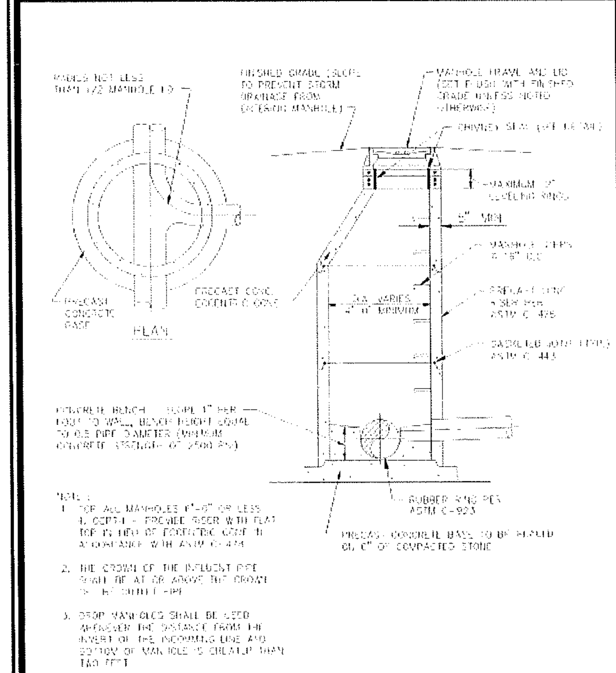
CONSTRUCTION DETAILS

THE BLUFFS AT YOUNGS CREEK
SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

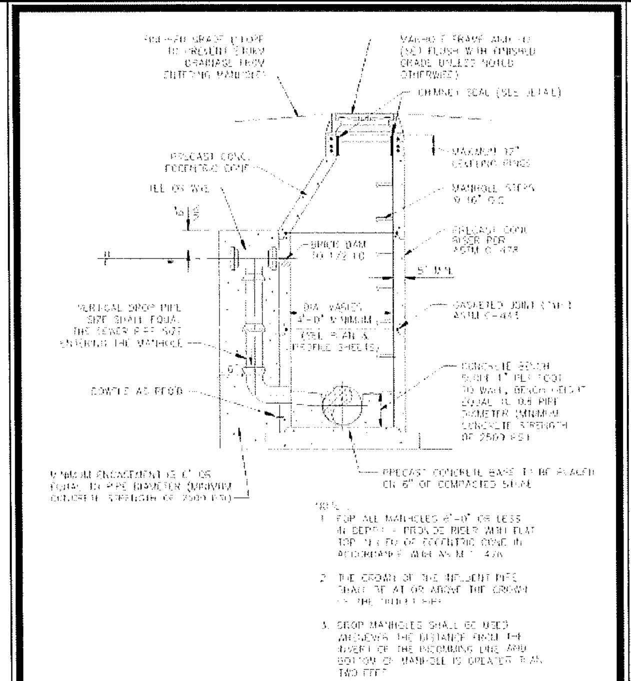
DRAWN BY: DCM
CHECKED BY: BKR
SHEET NO. C800B
S & A JOB NO. 83540MMA-S6



STANDARD MANHOLE DETAIL

CITY of FRANKLIN, INDIANA

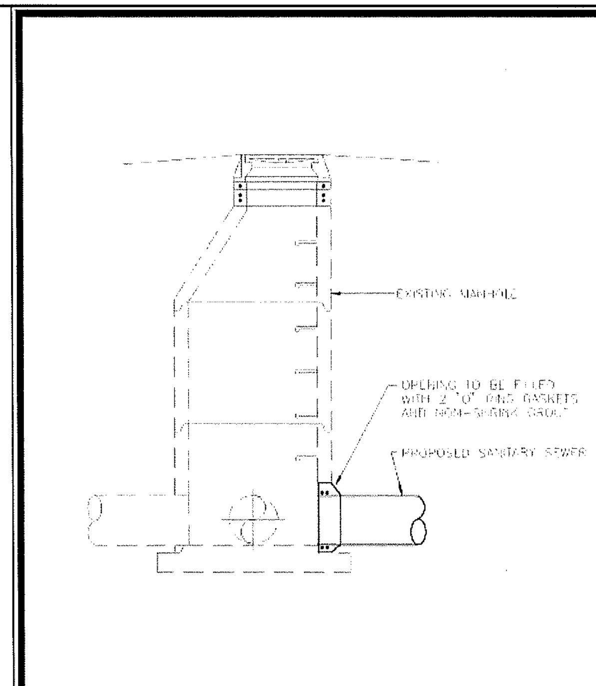
DPW



PRECAST DROP MANHOLE DETAIL

CITY of FRANKLIN, INDIANA

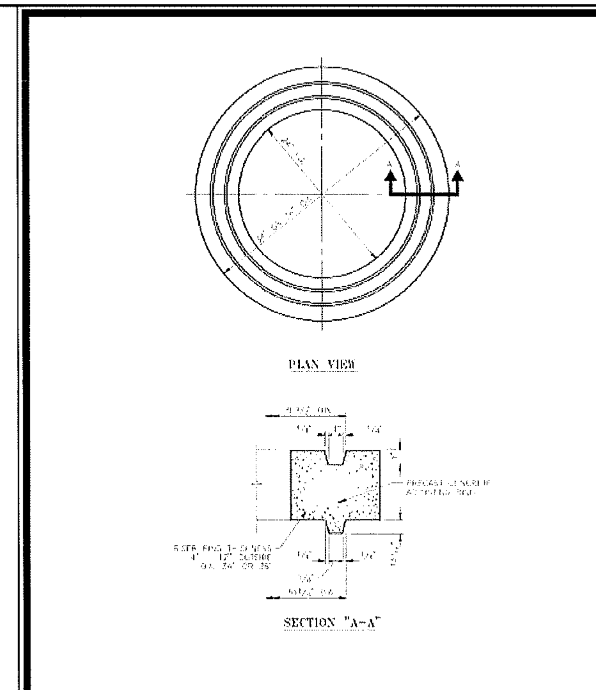
DPW



TYPICAL EXISTING MANHOLE ENTRY DETAIL

CITY of FRANKLIN, INDIANA

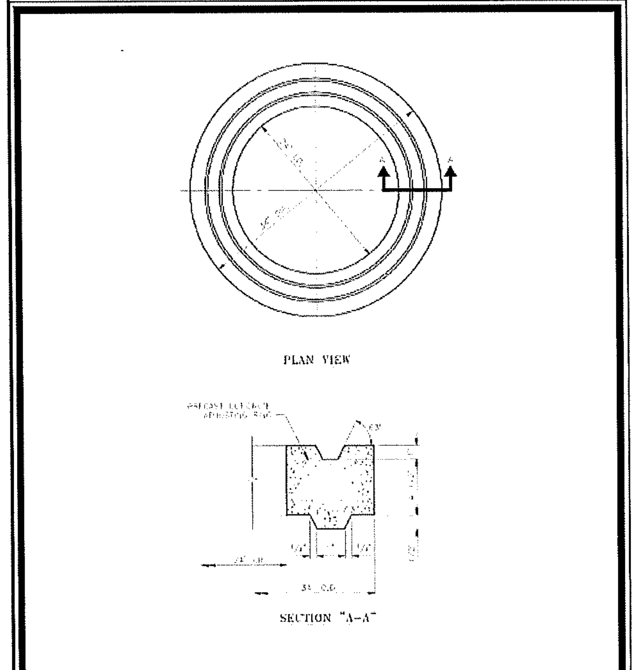
DPW



TYPICAL 5/8" ADJUSTING RING

CITY of FRANKLIN, INDIANA

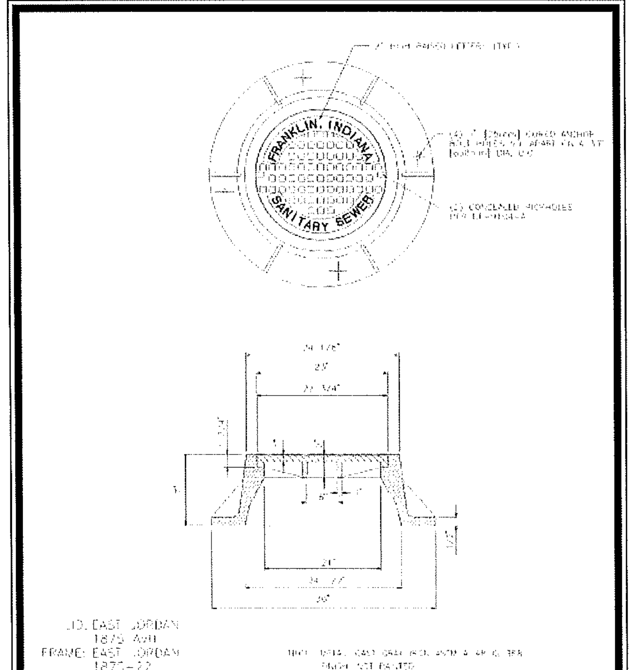
DPW



TYPICAL 1" ADJUSTING RING

CITY of FRANKLIN, INDIANA

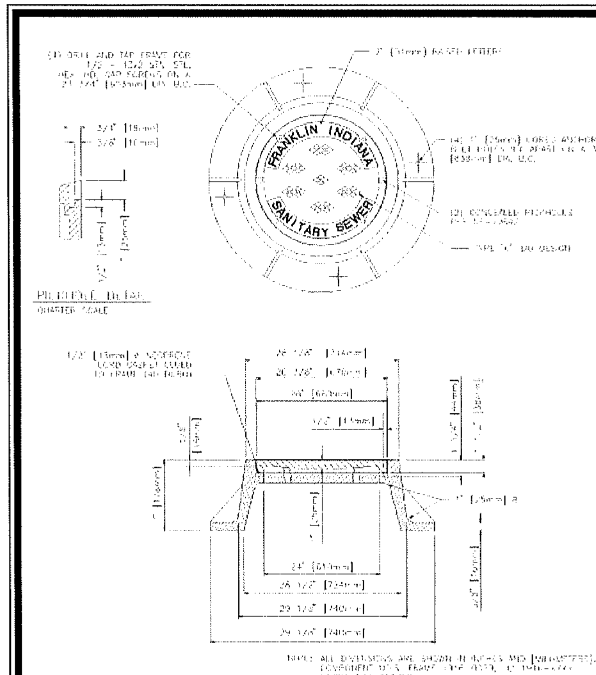
DPW



STANDARD FRAME AND LID

CITY of FRANKLIN, INDIANA

DPW



TYPICAL WATERTIGHT FRAME AND LID

CITY of FRANKLIN, INDIANA

DPW

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DAVID J. STOEPPELWERTH
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CERTIFIED: 04/07/22

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phone: 317.849.5935 fax: 317.849.5942

CONSTRUCTION DETAILS

THE BLUFFS AT YOUNGS CREEK
SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY: DCM
CHECKED BY: BKR

SHEET NO.
C800C

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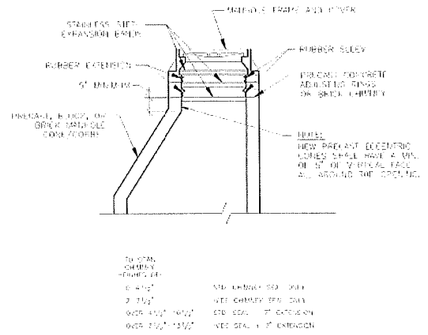
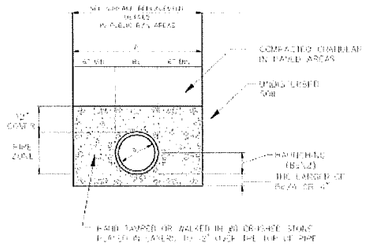


TYPICAL CHIMNEY SEAL DETAIL

CITY of FRANKLIN, INDIANA

DPW



W = MAXIMUM ALLOWABLE TRENCH WIDTH FOR PIPE, AS PER ASTM BUT TO EXCEED FOUR (4) FEET FOR 8" THROUGH 24" PIPE NOR SIX (6) FEET FOR 27" THROUGH 48" PIPE
B = PIPE DIAMETER (NOMINAL)
Bc = PIPE DIAMETER (OUTSIDE)

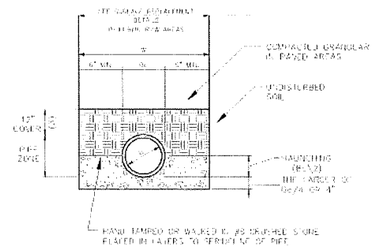
NOTES:

1. BEDDING STOPS AT A POINT 12" ABOVE THE TOP OF THE PIPE. BACKFILLING ABOVE THIS POINT SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
2. WITHIN PAVED AREAS UNDER THE JURISDICTION OF THE INDIANA STATE HIGHWAY COMMISSION SHALL UTILIZE COMPACTED GRANULAR BACKFILL MATERIAL FOR INITIAL AND FINAL BACKFILL ALWAYS WITHIN 10 FEET OF THE EDGE OF PAVEMENT. OTHERWISE, COMPACTED #2 AGGREGATE BACKFILL MATERIAL SHALL ONLY BE USED UNDER PAVEMENT SURFACES OR OTHER SPECIFICALLY DESIGNATED AREAS.

FIRST CLASS PIPE LAYING METHOD FOR:
1) FLEXIBLE (PVC, RPVC, ABS & HDPE PIPE) AND
2) DUCTILE IRON WITHIN PVM'T LIMITS

CITY of FRANKLIN, INDIANA

DPW



W = MAXIMUM ALLOWABLE TRENCH WIDTH FOR PIPE, AS PER ASTM BUT TO EXCEED FOUR (4) FEET FOR 8" THROUGH 24" PIPE NOR SIX (6) FEET FOR 27" THROUGH 48" PIPE
B = PIPE DIAMETER (NOMINAL)
Bc = PIPE DIAMETER (OUTSIDE)

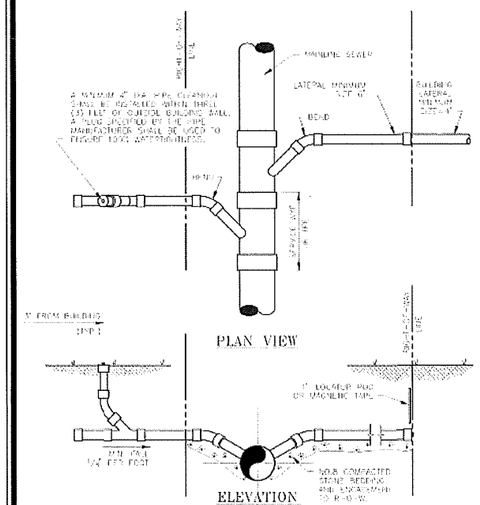
NOTES:

1. BEDDING STOPS AT A POINT 12" ABOVE THE TOP OF THE PIPE. BACKFILLING ABOVE THIS POINT SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.
2. WITHIN PAVED AREAS UNDER THE JURISDICTION OF THE INDIANA STATE HIGHWAY COMMISSION SHALL UTILIZE COMPACTED GRANULAR BACKFILL MATERIAL FOR INITIAL AND FINAL BACKFILL ALWAYS WITHIN 10 FEET OF THE EDGE OF PAVEMENT. OTHERWISE, COMPACTED GRANULAR BACKFILL MATERIAL SHALL ONLY BE USED UNDER PAVEMENT SURFACES OR OTHER SPECIFICALLY DESIGNATED AREAS.
3. GRANULAR FILL IN PAVED AREAS

FIRST CLASS PIPE LAYING METHOD FOR:
RIGID CONDUITS (RCP & CMP)

CITY of FRANKLIN, INDIANA

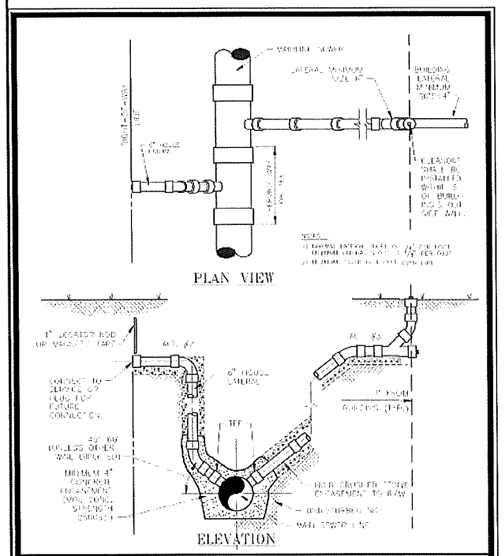
DPW



SERVICE CONNECTION FOR SHALLOW SEWERS
(LESS THAN 15' DEEP)

CITY of FRANKLIN, INDIANA

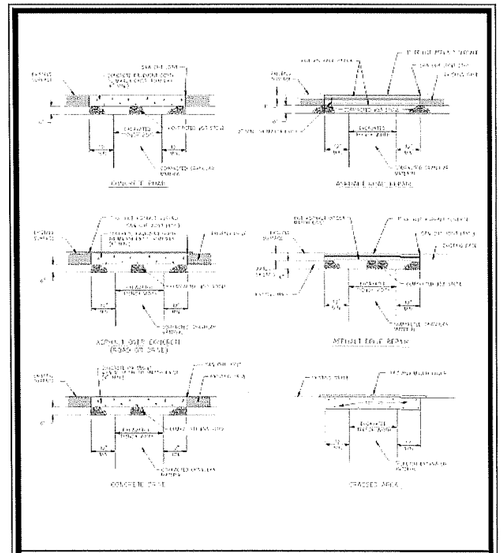
DPW



SERVICE CONNECTION FOR SHALLOW SEWERS
(ALT.#2 & ALT.#3)
(LESS THAN 15' DEEP)

CITY of FRANKLIN, INDIANA

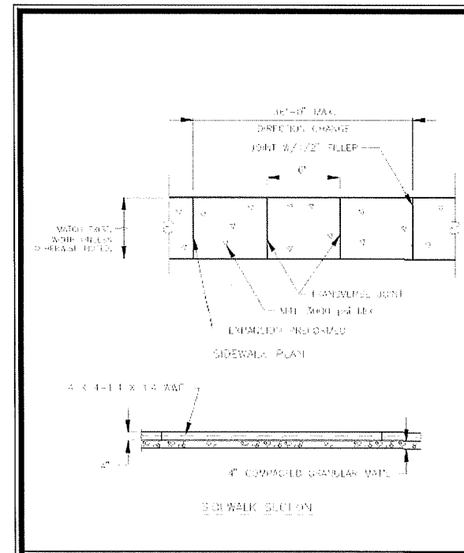
DPW



TYPICAL SURFACE REPLACEMENT DETAILS

CITY of FRANKLIN, INDIANA

DPW



TYPICAL SIDEWALK REPLACEMENT DETAIL

CITY of FRANKLIN, INDIANA

DPW

STOEPPELWERTH & ASSOCIATES
ALWAYS ON
7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

REVISIONS

BY	DATE	MARK

DAVID M. STOEPPELWERTH
REGISTERED
No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

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CERTIFIED: 04/07/22

CONSTRUCTION DETAILS

THE BLUFFS AT YOUNGS CREEK
SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP — JOHNSON COUNTY, INDIANA

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SHEET NO.
C800D

S & A JOB NO.
83540MMA-S6

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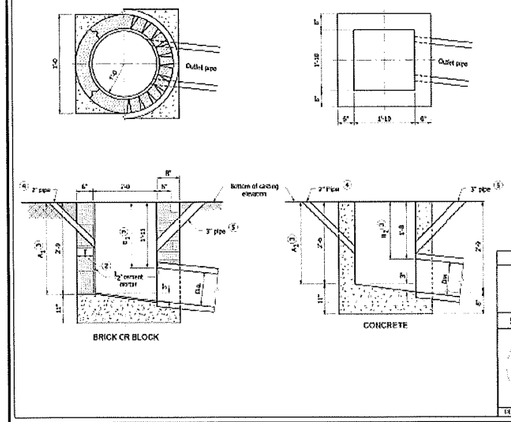


GENERAL NOTES

1. Brick, block, or concrete may be used.
2. T = 8" for brick structure
   T = 6" for segmental block structure
3. If special castal or where inlet pipe is required, A1, B1, A2, and B2 shall be increased or decreased 1"@ as directed.
4. 2" dia. pipe drain from bottom of curb to inlet. Aggregate to be placed around inlet end of pipe.
5. 3" dia. pipe to be kept open for drainage of subgrade or base until surface is placed.

INDIANA DEPARTMENT OF TRANSPORTATION

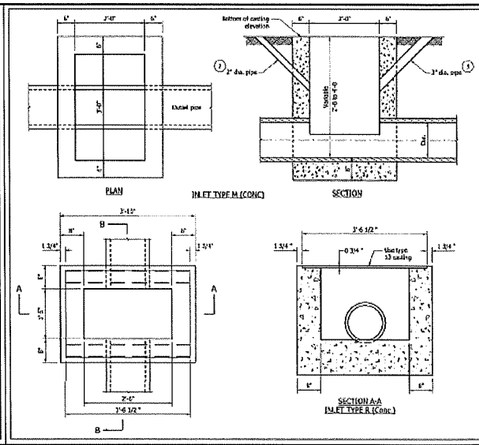
INLET TYPE A

SEPTEMBER 2008

STANDARD DRAWING NO. E 720- INST-01

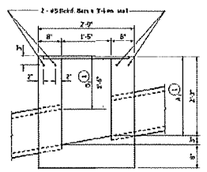
DESIGN STANDARDS ENGINEER — 09/30/08

CHIEF HIGHWAY ENGINEER — 09/30/08



GENERAL NOTES

1. If inlet pipe is required, A, and B shall be increased or decreased 1" @ as directed.
2. 2" dia. drain from bottom of curb to inlet. Aggregate to be placed around inlet end of pipe.
3. 3" min. dia. pipe to be kept open for drainage of subgrade or base until surface is placed.



INDIANA DEPARTMENT OF TRANSPORTATION

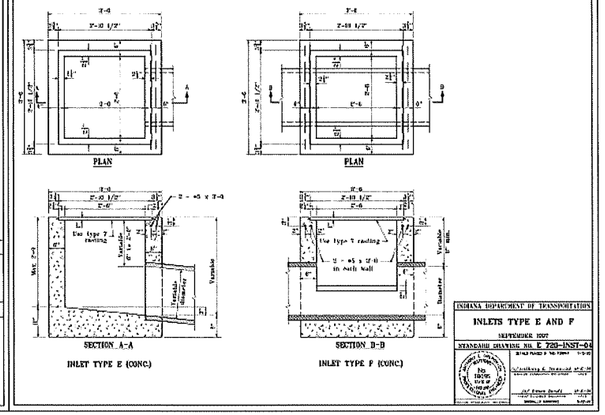
INLET TYPE M & R

SEPTEMBER 2009

STANDARD DRAWING NO. E 720 INST-07

DESIGN STANDARDS ENGINEER — 09/01/09

CHIEF HIGHWAY ENGINEER — 09/01/09

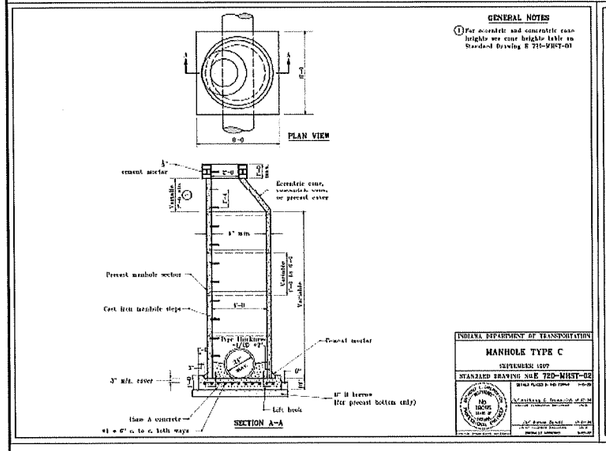


INDIANA DEPARTMENT OF TRANSPORTATION

INLETS TYPE E AND F

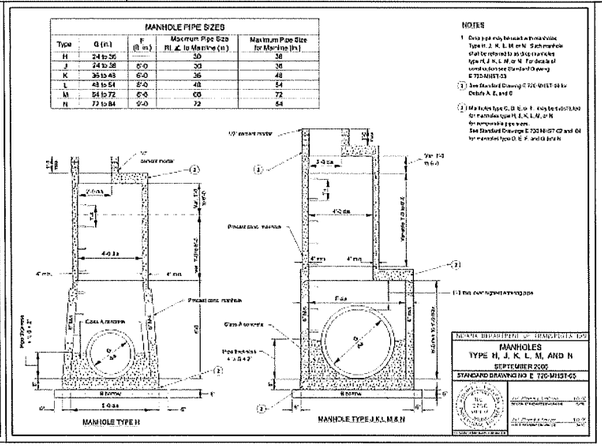
SEPTEMBER 2007

STANDARD DRAWING NO. E 720-INST-04



MANHOLE TYPE C

STANDARD DRAWING NO. E 720-MHST-02



MANHOLE PIPE SIZES

Type	G (in.)	F (ft. in.)	Maximum Pipe Size RC & Masonry (in.)	Maximum Pipe Size for Masonry (in.)
H	24 to 36	5'-0	30	36
J	24 to 36	5'-0	30	36
K	36 to 48	6'-0	36	48
L	48 to 54	8'-0	48	54
M	54 to 72	8'-6	66	72
N	72 to 84	9'-0	72	84

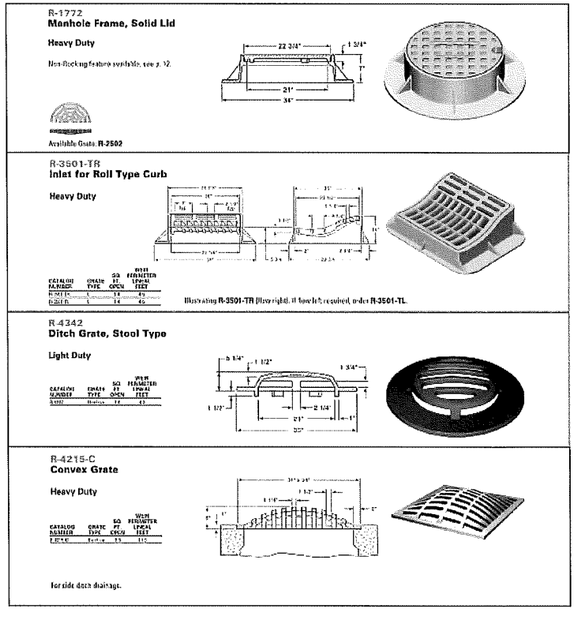
NOTES

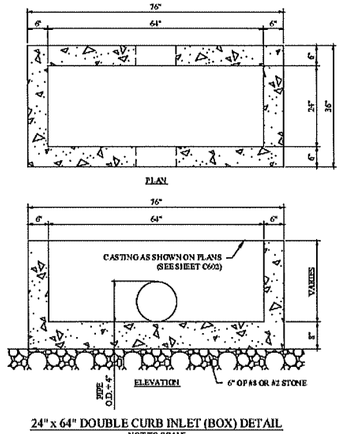
1. Drop pipe may be used as shown on Types H, J, K, L, M or N. Each manhole shall be referred to as Drop manhole Type H, J, K, L, M or N. For details of construction see Standard Drawing E 720-MHST-03.
2. See Standard Drawing E 720-MHST-04 for Details A, B, and C.
3. Manholes type C, D, E, or F may be substituted for manholes type H, J, K, L, M, or N for composite pipe sizes. See Standard Drawings E 720-MHST-02 and 04 for manholes type D, E, F, and G details.

MANHOLES TYPE H, J, K, L, M, AND N

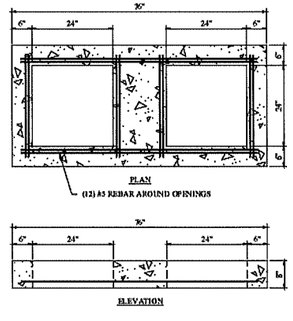
SEPTEMBER 2006

STANDARD DRAWING NO. E 720-MHST-05





24" x 64" DOUBLE CURB INLET (BOX) DETAIL
NOT-TO-SCALE



NOTE:
CONTRACTOR TO INSTALL WITH R-3501-TR & TL CASTINGS, UNLESS OTHERWISE NOTED IN PLANS.

24" x 64" DOUBLE CURB INLET (LID) DETAIL
NOT-TO-SCALE

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).

DATE	MARK	REVISIONS	BY

DAVID M. STOEPPELWERTH
REGISTERED
No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

THIS DRAWING IS NOT INTENDED TO BE REPRESENTATIVE AS A SURVEY, PLAT OR LEGAL DESCRIPTION. CONSULT A PLAT SURVEY OR A SURVEYOR LOCATION REPORT.

CERTIFIED: 04/07/23

STOEPPELWERTH
& ASSOCIATES INC.
ALWAYS ON
7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

CONSTRUCTION DETAILS

THE BLUFFS AT YOUNGS CREEK
SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP — JOHNSON COUNTY, INDIANA

DRAWN BY: DCM
CHECKED BY: BKR

SHEET NO.
C801A

S & A JOB NO.
83540MMA-S6

File Name: S:\83540MMA-S06\DWG\C801 - Construction Details.dwg - C801A
Modified / By: February 23, 2022 8:36:18 AM / RMorris
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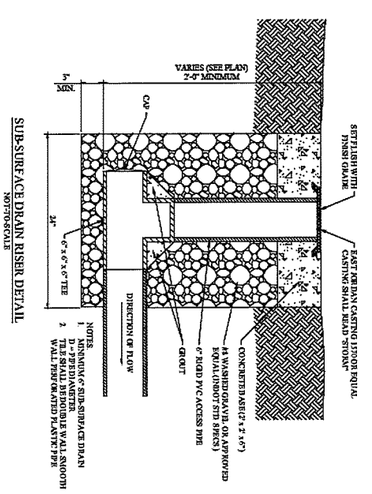
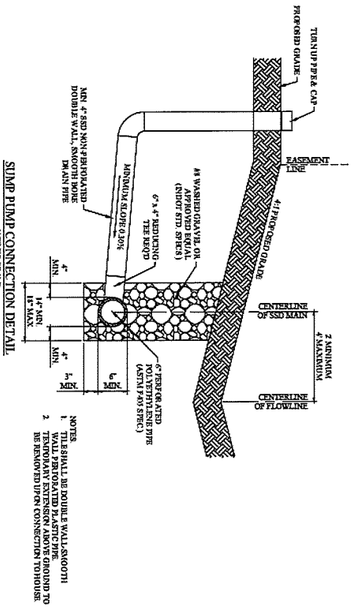
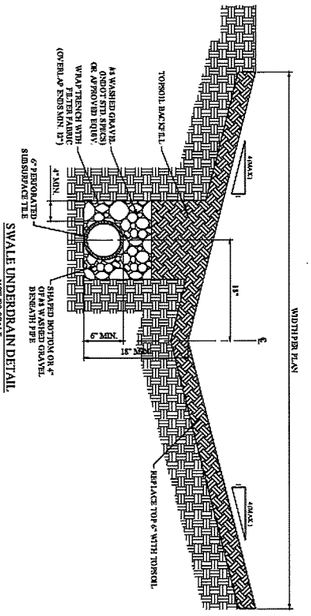
Plotted / By: March 22, 2022 11:51:30 AM / Raven Morris



SUB-SURFACE DRAIN RISER DETAIL
NOT TO SCALE



SUMP PUMP CONNECTION DETAIL
NOT TO SCALE



SWALE UNDERDRAIN DETAIL
NOT TO SCALE

83540MMA-S6	C801B	CONSTRUCTION DETAILS	STOEPPELWERTH ALWAYS ON	THIS DRAWING IS NOT INTENDED TO BE REPRESENTED AS A RETRACEMENT OR ORIGINAL BOUNDARY SURVEY, A ROUTE SURVEY OR A SURVEYOR LOCATION REPORT.
	DRAWN BY: DCM	THE BLUFFS AT YOUNGS CREEK SECTION 6	7965 East 106th Street, Fishers, IN 46038-2505 phone: 317.849.5935 fax: 317.849.5942	CERTIFIED: 04/07/22
	CHECKED BY: BKR	FRANKLIN, FRANKIN TOWNSHIP JOHNSON COUNTY, INDIANA		David J. Stoeppelwerth

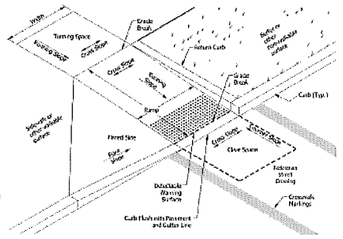
REGISTERED LANDSCAPE ARCHITECT No. 19358 STATE OF INDIANA DAVID J. STOEPPELWERTH

DATE	MARK	REVISIONS	BY

INDEX

GENERAL NOTES:

1. All slopes are stated as either their ratio to the sidewalk or roadway grade. Slopes at least 0.50% less than the maximum are preferred.
2. 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.
3. Turning Space. A turning space shall be provided at the top of a perpendicular ramp, bottom of a parallel ramp, or where the pedestrian must negotiate 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 fixture 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.
4. 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.
5. 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 omitted 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.
6. 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.
7. Detectable Warning Surface. A detectable warning surface shall consist of truncated domes and be placed at curb 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.
8. Running Slope. The running slope of a ramp, blended transition or turning space shall be measured parallel to the direction of pedestrian travel.
   a. A running slope of 2.00% or less is considered level.
   b. A ramp shall have a maximum running slope of 8.33% but shall not require a ramp longer than 15 ft.
   c. A blended transition shall have a maximum running slope of 5.00%.
   d. A turning space shall have a maximum running slope of 2.00%.
9. Width. Unless otherwise noted, minimum width of a ramp, blended transition, or turning space, excluding flared sides or return curb, shall be 4 ft.
10. 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 edge shall be beveled with a slope not steeper than 1V:2H.
11. Cross Slope Exception. The cross slope of a ramp, blended transition, or turning space shall be measured perpendicular to the direction of pedestrian travel.
    a. The maximum cross slope at a pedestrian street crossing without yield or stop control shall be 5.00%.
    b. The maximum cross slope at a pedestrian street crossing with yield or stop control shall be 2.00%.
    c. The maximum cross slope at a midblock crossing shall be the established grade of the adjacent roadway.
12. Gutter Slope. A maximum slope in 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.
13. Objects such as a utility cover, vault frame, and grating shall be placed outside the ramp runs.
14. Rail Stops shall be placed within the marked crosswalk at all.
15. Drainage inlets should be located uphill from accessible ramps to prevent ponding in the path of pedestrian travel.

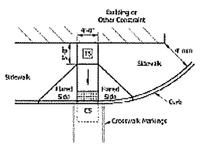


TYPICAL CURB RAMP COMPONENTS

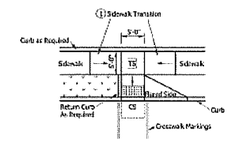
INDIANA DEPARTMENT OF TRANSPORTATION	
CURB RAMP DRAWING INDEX AND GENERAL NOTES SEPTEMBER 2018	
STANDARD DRAWING NO. E 604-SWCR-01	
No. 10200124 STATE OF INDIANA REGISTERED PROFESSIONAL ENGINEER	/s/ Elizabeth W. Phillips — DESIGN STANDARDS ENGINEER — 03/29/18 DATE /s/ John Eckle — CHIEF ENGINEER — 04/25/18 DATE

NOTES:

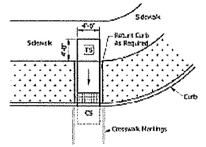
1. Where insufficient width between the curb and back of sidewalk prevents a standard perpendicular curb ramp running slope, a sidewalk transition may be used to lower the sidewalk grade. The sidewalk transition running slope shall not exceed 8.33%. See Standard Drawing Series E 604-SDWK for sidewalk details.
2. 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.



PERPENDICULAR CURB RAMP
ADJACENT WALKABLE SURFACE



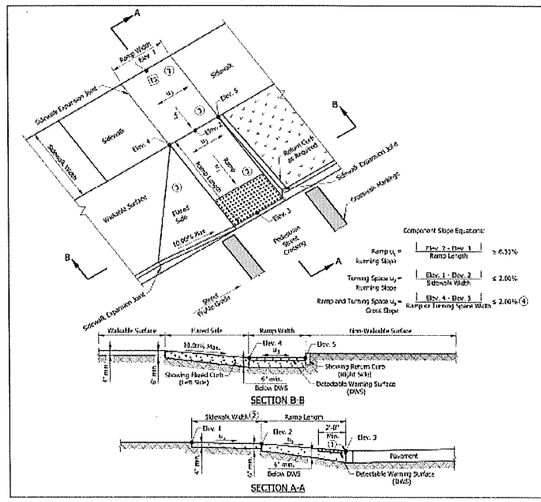
TIERED PERPENDICULAR CURB RAMP



PERPENDICULAR CURB RAMP
ADJACENT NON-WALKABLE SURFACE

LEGEND:
- Buffer or Other Non-Walkable Surface
- Ramp
- Detectable Warning Surface
- TS Turning Space
- CS Clear Space

INDIANA DEPARTMENT OF TRANSPORTATION	
PERPENDICULAR CURB RAMP TYPICAL PLACEMENT SEPTEMBER 2018	
STANDARD DRAWING NO. E 604-SWCR-02	
No. 10200124 STATE OF INDIANA REGISTERED PROFESSIONAL ENGINEER	/s/ Elizabeth W. Phillips — DESIGN STANDARDS ENGINEER — 03/29/18 DATE /s/ John Eckle — CHIEF ENGINEER — 04/25/18 DATE

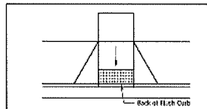


NOTES:

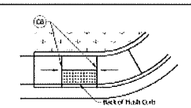
1. The bottom edge of the ramp and top of curb shall be flush with the edge of adjacent pavement and gutter line.
2. The turning space shall have a minimum clear dimension of 4 ft x 4 ft. Where the turning space is constrained at the back of the sidewalk, the minimum clear dimension shall be 4 ft x 5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

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

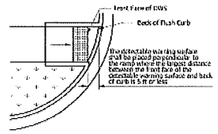
INDIANA DEPARTMENT OF TRANSPORTATION	
PERPENDICULAR CURB RAMP COMPONENT DETAILS SEPTEMBER 2018	
STANDARD DRAWING NO. E 604-SWCR-04	
No. 10200124 STATE OF INDIANA REGISTERED PROFESSIONAL ENGINEER	/s/ Elizabeth W. Phillips — DESIGN STANDARDS ENGINEER — 03/29/18 DATE /s/ John Eckle — CHIEF ENGINEER — 04/25/18 DATE

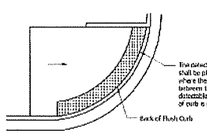


PERPENDICULAR CURB RAMP

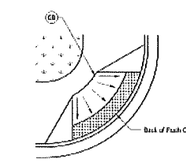


PARALLEL CURB RAMP (4)

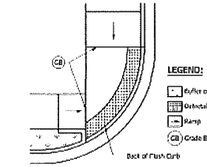




ONE-WAY DIRECTIONAL PERPENDICULAR CURB RAMPS ON A RADIUS (3)



BLENDED TRANSITION CURB RAMP (5)



DEPRESSED CORNER CURB RAMP (5)

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

NOTES:

1. A detectable warning surface shall be placed at curb street, highway, or railroad crossing. See Standard Drawing E 604-SDWK-03 for a detectable warning surface placement at a sidewalk driveway crossing.
2. 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.
3. 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.
4. 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.
5. 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.
6. See Standard Drawing E 604-SWCR-14 for detectable warning surface details.

INDIANA DEPARTMENT OF TRANSPORTATION	
DETECTABLE WARNING SURFACE PLACEMENT AND CONFIGURATION SEPTEMBER 2018	
STANDARD DRAWING NO. E 604-SWCR-12	
No. 10200124 STATE OF INDIANA REGISTERED PROFESSIONAL ENGINEER	/s/ Elizabeth W. Phillips — DESIGN STANDARDS ENGINEER — 03/29/18 DATE /s/ John Eckle — CHIEF ENGINEER — 04/25/18 DATE

NOTE

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

DATE	MARK	REVISIONS	BY

DAVID J. STOEPPELWERTH
REGISTERED
No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

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

CERTIFIED: 04/07/22

/s/ David J. Stoeppelwerth

STOEPPELWERTH & ASSOCIATES, INC.
ALWAYS ON
7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

CONSTRUCTION DETAILS

THE BLUFFS AT YOUNGS CREEK
SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

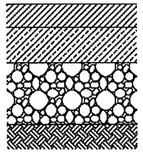
DRAWN BY: DCM | CHECKED BY: BKR

SHEET NO.
C802A

S & A JOB NO.
83540MMA-S6

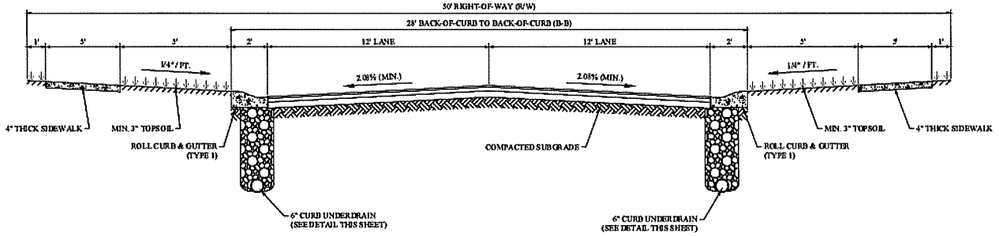
File Name: S:\83540MMA-S06\DWG\C802 - Construction Details.dwg - C802A
Modified / By: January 18, 2022 12:25:45 PM / dMargraf
Plotted / By: March 22, 2022 11:51:38 AM / Raven Morris

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:
A. HIGH CALCIUM OR DOLOMITE HYDRATED LIME ($CA(OH)_2$ $4MG(OH)_2$) 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.
B. HIGH CALCIUM HYDRATED LIME SHALL HAVE A MINIMUM AVAILABLE CALCIUM HYDROXIDE $CA(OH)_2$ CONTENT OF 90%. THE METHOD USED FOR DETERMINATION OF AVAILABLE LIME SHALL CONFORM TO AASHTO T219-72 OR ASTM C25.
C. MAXIMUM MECHANICAL MOISTURE CONTENT SHALL BE 4%.
D. 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 ON ASTM C110.
E. OTHER LIME PRODUCTS SUCH AS QUICKLIME- HIGH CALCIUM (CAO) OR DOLOMITH (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 6.3.
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:
A. 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.
B. EACH SHIPMENT SHALL BE ACCOMPANIED BY A BILL OF LOADING AND BY A CERTIFICATE OF COMPLIANCE STATING CONFORMANCE TO THE APPLICABLE SPECIFICATION REQUIREMENTS.
C. 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:
A. 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 SOIL S IF REQUESTED BY THE INSPECTING ENGINEER.
B. 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:
A. TEMPERATURE AND WEATHER LIMITATIONS: NO LIME MODIFICATION SHALL BE PERFORMED AT A SOIL TEMPERATURE LESS THAN 450 F (70 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.
B. 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.
C. 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 SAM 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.
D. 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.
E. 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 CROWN-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 AASITO 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.
F. 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 IF 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.
A. 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.
B. 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.

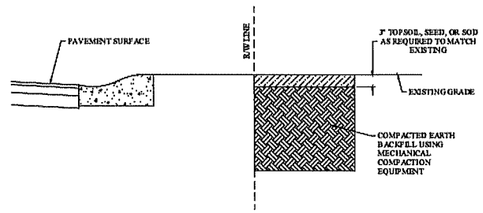


PAVEMENT DETAIL
NOT-TO-SCALE

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%



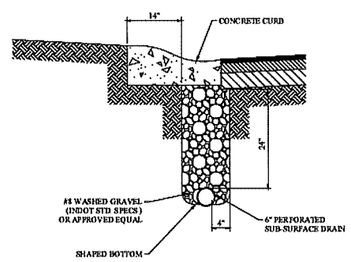
TYPICAL ROADWAY & PAVEMENT COMPOSITION SECTION
NOT-TO-SCALE



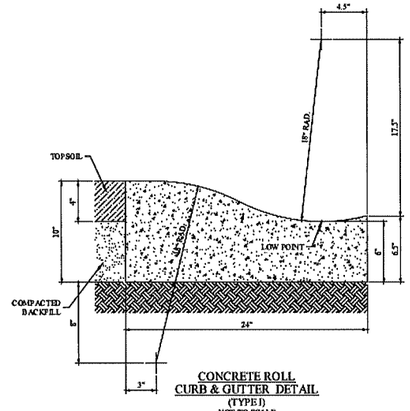
STANDARD FULL DEPTH GRANULAR BACKFILL DETAIL
(PER STANDARD PLAN 92-02)
NOT-TO-SCALE

NOTES:

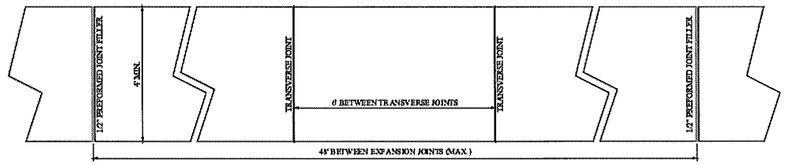
1. GRANULAR BACKFILL WILL NOT BE REQUIRED WHEN ENTIRE TRENCH AREA IS 5'-0" OR MORE BEYOND THE BACK EDGE OF THE EXISTING CURB
2. ALL EXCAVATED AREAS UNDER PAVEMED ROADWAYS, OR WITHIN 5'-0" OF THE PAVEMENT EDGE, OR BACK EDGE OF CURB SHALL BE BACKFILLED WITH GRANULAR MATERIAL TO WITHIN 3" OF THE TOP OF 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.
3. 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



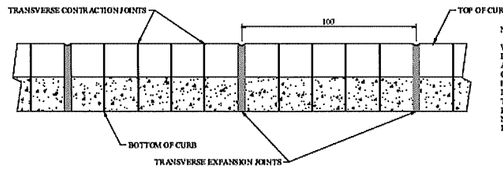
CONCRETE ROLL CURB & GUTTER DETAIL
(TYPE I)
NOT-TO-SCALE



NOTES:

1. 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.
2. 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

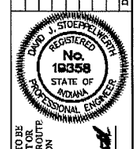


NOTE:

WHEN BUILT IN CONJUCTION 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.

CURB JOINT DETAIL
NOT-TO-SCALE

REVISIONS		
BY	MARK	DATE



THIS DRAWING IS NOT INTENDED TO BE USED FOR CONSTRUCTION FOR ORIGINAL BOUNDARY SURVEY, A BOUNDARY SURVEY OR A SURVEYOR LOCATION REPORT.

CERTIFIED: 04/07/23

STOEPPELWERTH & ASSOCIATES, INC.
ALWAYS ON
7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

CONSTRUCTION DETAILS

THE BLUFFS AT YOUNGS CREEK
SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP
JOHNSON COUNTY, INDIANA

DRAWN BY:	CHECKED BY:
DCM	BKR

SHEET NO.
C802B

S & A JOB NO.
83540MMA-S6

File Name: S:\83540MMA-S6\DWG\C802 - Construction Details.dwg - C802B
Modified / By: January 18, 2022 12:25:45 PM / dMangraf
Plotted / By: March 22, 2022 11:51:40 AM / Raven Morris

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 of 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 the 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. Bolt 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.

1.04 RELATED WORK

A. Section 01000 Summary of Work

B. Section 01011 Special Provisions

C. Section 01075 Basis of Payment

D. Section 01300 Submittals

E. Section 01600 Products

F. Section 02210 Trenching, Backfilling and Compacting

G. Section 02558 Identification/Location Guide

H. Section 15000 Piping - General Provisions

I. Section 15020 Disinfecting Pipelines

J. Section 15025 Flushing and Cleaning Pipelines

K. Section 15030 Pressure and Leakage Tests

L. Section 15130 Piping Specialties

M. Section 15150 Gate Valves

N. Section 15155 Butterfly Valves

O. Section 15170 Tapping Sleeves, Saddles, and Valves

P. Section 15180 Fire Hydrants

Q. Section 15185 Abandonment of Mains and Hydrants

R. Section 15190 Air Valves, Blow-off Assemblies and Sampling Taps

S. Section 15200 Service Lines

1.05 REFERENCE

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.

A. ASME / ANSI B1.1 - Unified Inch Screw Threads

B. ASME / ANSI B16.42 - Ductile Iron Pipe Flanges and Flanged Fittings, Classes 150 and 300

C. ASME / ANSI B18.2 - Square and Hex Bolts and Screws (Inch Series)

D. ASTM A307 – Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60000 PSI Tensile Strength

E. ASTM A536 – Standard Specification for Ductile Iron Castings

F. AWWA C104 / ANSI A21.4 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings

G. AWWA C105 / ANSI A21.5 - Polyethylene Encasement for Ductile-Iron Pipe Systems

H. AWWA C110 / ANSI A21.10 - Ductile-Iron and Gray-Iron Fittings

I. AWWA C111 / ANSI A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

J. AWWA C115 / ANSI A21.15 - Flanged Ductile-Iron Pipe with Threaded Flanges

K. AWWA C116 / ANSI A21.16 - Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings for Water Supply Service

L. AWWA C150 / ANSI A21.50 - Thickness Design of Ductile-Iron Pipe

M. AWWA C151 / ANSI A21.51 - Ductile-Iron Pipe, Centrifugally Cast

N. AWWA C153 / ANSI A21.53 - Ductile-Iron Compact Fittings

O. AWWA C600 - Installation of Ductile-Iron Mains and Their Appurtenances

P. NSF/ANSI 61 Drinking Water System Components – Health Effects

PART 2: PRODUCTS

2.01 GENERAL

A. No foreign-manufactured pipe or appurtenances, except for ductile iron fittings, shall be allowed. All pipe and restraints shall be produced solely in the United States.

B. All materials that come in contact with potable water, including lubricants, shall be evaluated, tested, and certified for conformance with ANSI/NSF Standard 61.

2.02 DUCTILE IRON PIPE

A. Ductile iron pipe shall conform to the latest specifications as adopted by the American National Standards Institute, Inc., (ANSI) and the American Water Works Association (AWWA). Specifically, ductile iron pipe shall conform to AWWA C151 in standard supplied sizes, except as modified herein. Pipe shall be supplied in 18 or 20 foot nominal lengths or as required to meet the requirements of the Drawings.

B. The pipe exterior shall be coated with an asphaltic coating in accordance with AWWA C151. The pipe interior shall be cement mortar lined and asphaltic seal coated in compliance with the latest revision of AWWA C104.

C. Pipe Class: Pipe wall thickness shall be the required thickness class based on the design conditions in accordance with AWWA C150. The thickness class of pipe to be furnished shall be as required on the Drawings and/or as specified in Section 01011 but shall not be less than recommended by the pipe manufacturer or less than the minimum requirements indicated in Table 1

Table 1

MINIMUM RATED WORKING PRESSURE FOR DUCTILE IRON PIPE MANUFACTURED IN ACCORDANCE WITH AWWA STANDARD C151

Pipe Nominal Size (Inches)	Thickness Class
12 and smaller	52 (See Note 2)
16 – 20	54
24 and larger	54

Note:

1. The noted thickness class is adequate to support 3/4 and 1-inch corporation stops by direct tapping. Provide a full tapping sleeve or saddle in accordance with Section 15170 and/or 15200 (as appropriate) for taps larger than 1-inch due to limited wall thickness.
2. 12-inch and smaller pipe: Engineer to determine Thickness Class increase to Thickness Class 54 to meet critical parameters due to operating pressures greater than 100 psi, high system criticality, high consequence of failure and accessibility for repair of the pipe.

D. Plain ends shall be suitably beveled to permit easy entry into the bell and shall have home marks to indicate when the spigot is fully seated in the bell.

E. All non restrained joints for pipe to pipe connections shall be standard push on joints recommended by the pipe manufacturer and conforming to AWWA C151 and C111. Mechanical joints are not allowed for pipe to pipe connections. Push-on joints shall be of a type which employs a single elongated groove gasket to effect the joint seal.

F. Restrained Joint Pipe (12-inch and smaller): Unless otherwise indicated on the Drawings or in Section 01011 or furnished by the Owner, restrained joints for

pipe to pipe connections 12-inch nominal size and smaller shall use push-on restraining gaskets with integral stainless steel locking segments recommended by the pipe manufacturer and conforming to AWWA C111. Restraint system shall be UL-listed and rated for a working pressure of 350 psi. Restraining gaskets shall not be used on connections to valves or fittings or for connections to pipe materials other than ductile iron (e.g. gray cast iron). If required by the Drawings or Section 01011 and/or if furnished by the Owner, restrained-joint pipe such as specified below for 16-inch and larger pipe shall be used for 12-inch and smaller piping.

G. Restrained Joint Pipe (16-inch and larger): Restrained joints for pipe to pipe connections (16-inch and larger) shall consist of factory-welded retainer bead or ring on the pipe spigot, and either factory manufactured bolted retainer rings, ductile iron locking segments held in place by rubber retainers, or ductile iron retaining rings that lock over the bell of the joint and are secured to prevent rotation. All components of the bolted or snap rings assemblies shall be constructed of corrosion-resistant, high-strength, low-alloy steel and shall conform to AWWA C111 as applicable. Restrained joint pipe shall be U.S. Pipe TR Flex, Bolt-Lok, or HP LOK; Clow TR Flex or Super Lock; American Flex-Ring or Lok-Ring. Restrained system shall be suitable for the following minimum working pressures:

Size (inch)	Pressure (psi)
12 and smaller	52(See Note 2, Table 1)
20	54
24	54
30 - 48	54

Gaskets utilizing integral locking segments such as Field Lok gaskets are not permitted for restraint of pipe 16-inch or larger. Restrained joint pipe per this article shall not be acceptable where ball and socket pipe is required by the Drawings, Section 0100(, and/or Section 01011. Restrained joint ductile iron pipe installed by horizontal directional drill method shall also comply with Section 02458.

H. Ball and Socket Pipe:

Ball and socket pipe shall comply with AWWA C150 and C151 and shall be U.S. Pipe USIFLEX Boltless Flexible Joint Pipe, American Flex-Lok Ball Joint Pipe, McWane Ball and Socket Joint Pipe.

I. Flanged piping shall be Thickness Class 53 ductile iron unless otherwise required by the Drawings or Section 01011.

J. Acceptable ductile iron pipe manufacturers are:

1. United States Pipe & Foundry Co. (including Griffin Pipe)
2. McWane Family of Companies (Clow, Atlantic States, etc.)
3. American Cast Iron Pipe Company.

2.03 FITTINGS

A. Ductile Iron Fittings: 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. No gray cast iron fittings are permitted.

Working Pressure Rating (psi)

Size (inch)	MJ Fittings	Flanged Fittings
3 – 24	350	250
30 – 4(	250	250

B. Coating and Lining: 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. 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 bell joints compatible with the restrained joint pipe used will be permitted when authorized by the Engineer or Owner.

D. Restrained MJ Joints (all sizes): Restrained joints shall be used for all connections to valves and fittings, and at 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. Non-restrained mechanical and push-on joints are not allowed for connections to valves, hydrants, or fittings

F. Acceptable ductile iron fittings manufacturers are:

1. Sigma through United States Pipe & Foundry Co. (domestic or foreign)
2. McWane Cast Iron Pipe Co. (Tyler Union domestic only)
3. Star Pipe Products (domestic or foreign)
4. Metalfit, through United States Pipe & Foundry Co. or American Cast Iron Pipe Company.

2.04 JOINTS – ADDITIONAL REQUIREMENTS

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.

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 6 of AWWA C111. T-bolts shall be Xylan or FluoroKote #1 (corrosion resistant).

C. Retainer glands of any style are not acceptable for pipe to pipe joints.

D. Anchor Couplings: 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, restrained 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

E. Flanged: 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/or 15170.

1. Gaskets for all flanged joints shall be 1/8-inch thick, styrene butadiene rubber (SBR) or EPDM gaskets. Paper flange gaskets are not permitted.
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 any buried flange bolts used with ductile or gray cast iron flanges
3. Each flange shall be fully compatible with its mating flange

F. Connections to existing piping shall comply with Section 15000. 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

allowed within this section, the existing pipe shall be cut to a plain spigot end unless otherwise approved by the Engineer.

PART 3: EXECUTION

3.01 INSTALLATION

Installation of ductile iron pipe and appurtenances shall be in full accordance with AWWA C600 except as modified herein. Contractor shall follow the provisions of Sections 02210 and 15000, other sections as applicable (including related sections listed in Part 1 above), and all manufacturers' recommendations, in addition to the following requirements:

A. All Joint Types:

Immediately prior to assembly, thoroughly clean the surfaces that the gasket will contact using a bacteria-free solution (bleach, potable water or NSF-61 compliant material)

B. Non-restrained Push-On Joints:

Insert the gasket into the groove in the bell. Apply a sufficient coating of manufacturer approved NSF-61 certified lubricant to the gasket and the spigot end of the pipe before assembling the joint in accordance with the manufacturer's requirements, AWWA C600, and other requirements of this section. The use of improper lubricants can damage gaskets, so ensure that only lubricants approved by the gasket manufacturer are used. Center the spigot end in the bell, and push home the spigot end. The maximum allowable deflection at the joints for push-on joint pipe shall be the lesser of manufacturer's recommendations or as described in the DIPRA Guideline, Installation Guide for Ductile Iron Pipe, as follows:

Size of Pipe	Deflection Angle	Maximum Deflection (18-ft Length)	Maximum Deflection (20-ft Length)
4" - 12"	5 degrees	18"	21"
14" - 42"	3 degrees	11"	12"
48" - 64"	3 degrees	N/A	12"

C. Restrained Push-On:

Assemble and install the restrained push-on joint with the pipes aligned in the same axis according to the manufacturer's recommendations. Use feeler gauge to check all joints installed with push-on restraining gaskets with integral stainless steel locking segments. Contractor shall not reuse restraining gaskets once a joint is disassembled. Check the retainer ring fastener where present. Unless otherwise directed by the manufacturer, joints shall not be deflected until the joint has been fully assembled and checked for proper assembly; deflection shall not exceed manufacturer's recommended allowances.

D. Restrained Mechanical Joints:

1. Use approved restrained joint device according to Section 15130. Slip the follower gland and gasket over the pipe plain end 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 normal torques as specified in AWWA C111 Table A.1:

Bolt Size (inch)	Pipe Nominal Size (inches)	Range of Torque in Foot-Pounds
5/8	3	45-60
3/4	4 - 24	75 - 90
1	30 – 36	100 – 120
1-1/4	42 - 48	120 - 150

2. Secure restrained joint device to pipe barrel in accordance with Section 15130 and the restraint device manufacturer's recommendations.

E. Ball and Socket Joints

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

F. Pipe Protection

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
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.
3. Protect asphaltic coating from damage during off- and on-site transportation, preparation and installation. Contractor shall not 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 lifted indirectly with the forks.
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.

SECTION 15120

POLYVINYL CHLORIDE (PVC) PIPE

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 polyvinyl chloride (PVC) pressure pipe (4 inches through 12 inches nominal diameter only) 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. 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. 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.

B. The Owner reserves the right to sample and test these materials subsequent to delivery at the project site.

1.04 RELATED WORK

A. Section 01000 Summary of Work

B. Section 01011 Special Provisions

C. Section 01075 Basis of Payment

D. Section 01300 Submittals

E. Section 01600 Products

F. Section 02210 Trenching, Backfilling and Compacting

G. Section 02558 Identification/Location Guide

H. Section 15000 Piping - General Provisions

I. Section 15020 Disinfecting Pipelines

J. Section 15025 Flushing and Cleaning Pipelines

K. Section 15030 Pressure and Leakage Tests

L. Section 15105 Ductile Iron Pipe and Fittings

M. Section 15130 Piping Specialties

N. 15150 Gate Valves

O. Section 15170 Tapping Sleeves, Saddles, and Valves

P. Section 15180 Fire Hydrants

Q. Section 15185 Abandonment of Mains and Hydrants

R. Section 15190 Air Valves, Blow-off Assemblies and Sampling Taps

S. Section 15200 Service Lines

1.05 REFERENCE

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.

A. ASTM D1784 - Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds

B. ASTM D2122 - Determining Dimensions of Thermoplastic Pipe and Fittings

C. ASTM D2152 Poly(Vinyl Chloride) (PVC) Pipe and Molded Fittings by Acetone Immersion

D. ASTM D2241 – Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)

E. ASTM D2412 - Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading

F. ASTM D2855 – Standard Practice for Making Solvent Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings

G. ASTM F412 - Standard Terminology Relating to Plastic Piping Systems

H. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

I. ASTM F1668 - Standard Guide for Construction Procedures for Buried Plastic Pipe

J. AWWA C605 - Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings

K. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, and Fabricated Fittings, 4 In. Through 12 In., for Water Transmission and Distribution

L. AWWA Manual M23 – PVC Pipe - Design and Installation

M. NSF/ANSI 14 Plastic Piping System Components and Related Materials

N. NSF/ANSI 61 Drinking Water System Components – Health Effects

O. Plastic Pipe Institute TR-2. PVC Range Composition Listing of Qualified Ingredients

PART 2: PRODUCTS

2.01 GENERAL

A. No foreign-manufactured pipe shall be allowed. All pipe and restraints shall be produced solely in the United States.

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.

C. All materials that come in contact with potable water, including lubricants, shall be evaluated, tested, and certified for conformance with ANSI/NSF Standard 61.

2.02 PIPE MATERIALS

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 tested or certified suitable for potable water products by the National Sanitation Foundation (NSF) Testing Laboratory (NSF Standard No. 61). All PVC pipe shall be blue in color.

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.

C. Pipe Class: All PVC pipe installed shall be DR 14 (305 psi Pressure Class per AWWA C900) unless otherwise indicated in this section, or 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 Certa-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, American Water does not allow pipe in its system to be fully subject to the revised Pressure Class pressures in AWWA C900 latest revision. DR 14 shall not be subjected to working pressures exceeding 200 psi.

D. Minimum pipe stiffness (F/dY) at 5% deflection shall be as follows when tested in accordance with D2241:

1. DR 14 pipe: 914 psi for all sizes

E. The pipe shall be designed to pass a quick burst test pressure of 985 psi (DR 14 pipe) applied in 60 to 70 seconds when tested in accordance with ASTM D1599, as referenced in ASTM D2241.

F. Standard laying lengths shall be 20-feet (±1 inch). Random lengths of not more than 15% of the total footage of each size may be shipped in lieu of the standard lengths. Return of reclaimed material shall not be accepted.

G. The pipe shall have bell and spigot ends with push-on, O-ring rubber gasket, compression type joints conforming to the requirements of ASTM 2672. Elastomeric gaskets shall conform to the requirements of ASTM F477 for high-head (>50 ft.) applications in all respects.

H. Restrained Joint Pipe: Appropriate restraint shall be provided at all fittings and valves and at other locations as shown on the Drawings or required in Section 01011. PVC pipe-to-pipe joints shall be restrained using an external restraint harness as specified in Section 15130. Gaskets utilizing integral locking segments such as Field-Lok gaskets are not permitted for use with PVC pipe. Certa-Lok™ restrained joint C900 pipe may be used where restrained joint pipe is required, including horizontal directional drilling applications where allowed by Section 02458 and approved by the Engineer. Restrained joint PVC pipe shall utilize couplings with high-strength, flexible thermoplastic splines, which shall be inserted into mating, precision-machined full-circumferential grooves in the pipe and coupling to provide full 360-degree restraint with evenly distributed loading. Couplings shall be designed for use at or above the pressure class of the pipe and shall incorporate twin elastomeric sealing gaskets meeting the requirements of ASTM F477. Joints shall meet the zero leakage test requirements of ASTM D3139. The pipe, couplings, and locking splines shall be completely non metallic

and interchangeable; and the complete restrained joint pipe system shall meet all requirements of AWWA C900. Restrained joint "sweeps" shall not be used.

I. Fittings

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.

2.03 MANUFACTURERS

Acceptable PVC pipe manufacturers are:

A. JM Eagle, Inc.
5200 West Century Boulevard
Los Angeles, CA 90045
(800) 621-4404
www.jmeagle.com

B. North American Pipe Corporation
2801 Post Oak Blvd., Suite 600
Houston, TX 77056
(713) 840-7473
www.northamericanpipe.com

C. Diamond Plastics Corporation
1212 Johnstown Road
Grand Island, NE 68803
(800) PVC-PIPE
www.dpcpipe.com

D. Northern Pipe Products
1302 39th Street NW
Fargo, ND 58102
800-747-7655
www.northernpipe.com

E. Sanderson Pipe
676 International Boulevard
Clarksville, TN 37040
800-000-3553
www.sandersonpipe.com

F. Vulcan Plastics, a division of Consolidated Pipe & Supply Company Inc.
1205 Hilltop Parkway
Birmingham, AL 35204
800-467-7261
www.consolidatedpipe.com

PART 3: EXECUTION

3.01 PACKAGING, HANDLING AND STORAGE

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 dust or truck exhaust from entering pipes.

B. Sections of pipe having been discovered with cuts or gouges in excess of 10% of the pipe wall thickness shall not be used.

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.

3.02 INSTALLATION

Except as modified herein, installation of PVC pipe shall be in full accordance with AWWA C605, AWWA Manual M23, and the Uni-Bell "Handbook of PVC Pipe Design and Construction." In the event of conflicting requirements or guidelines within these referenced publications, the requirements of AWWA C605 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 (Certa-Lok™) shall be as specified in Article 2.02 above.

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

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DATE	MARK	REVISIONS	BY

DAVID J. STOEPPELWERTH REGISTERED No. 19358 STATE OF INDIANA PROFESSIONAL ENGINEER

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

CERTIFIED: 04/07/22

STOEPPELWERTH
ALWAYS ON
7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

CONSTRUCTION DETAILS
THE BLUFFS AT YOUNGS CREEK
SECTION 6
FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY: DCM
CHECKED BY: BKR
SHEET NO. C803A
S&A JOB NO. 83540MMA-S6

proper depth of insertion, and Contractor shall use extreme caution to avoid over-inserting pipe into the bell.

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.

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.

G. Pressure testing of DR 14 PVC pipe shall not exceed 305 psi

H. Only ductile iron fittings per specification 15105 may be used with PVC pipe. PVC fittings are not permitted. See detail drawings and Section 15130 for transitions between different pipe materials.

I. Research has documented that certain pipe materials (such as polyvinyl chloride, polyethylene, and polybutylene) 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.

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.

3.03 TAPPING

A. Use a tapping sleeve or saddle in accordance with Section 15170 and/or 15200 (as appropriate).

END OF SECTION

SECTION 15125

HIGH DENSITY POLYETHYLENE (HDPE) PIPE

PART 1: GENERAL

1.01 SCOPE OF WORK

A. The work under this section consists of providing all labor, materials, tools, equipment, and services required to provide 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. HDPE pipe will not be furnished by the Owner. Refer to Sections 01000, 01011 and 01075 for materials to be furnished by the Owner.

B. Where water mains smaller than 4-inch diameter are required, high density polyethylene pipe in accordance with Section 15200 shall be used

1.02 SUBMITTALS

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.

B. The following product data is required from the pipe manufacturer:

1. Pipe Size
2. Dimensionality
3. Pressure Class
4. Color
5. Recommended Minimum Bending Radius
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'

applicable certifications and qualifications. Fusion Technicians' Certifications shall have been completed within the past two years.

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). Contractor shall have satisfactorily performed a minimum of five (5) equivalent projects throughout the past five years.

F. POST-CONSTRUCTION SUBMITTALS

A fusion technician's joint report of as-recorded data for every fusion joint performed on the project, including joints that were rejected, shall be provided by the Contractor and/or fusion provider and shall also be supplied to the pipe supplier or manufacturer promptly upon request. Specific requirements of the fusion technician's joint report shall include:

1. Pipe Size and Thickness
2. Machine Size
3. Fusion Technician Identification
4. Job Identification
5. Fusion Joint Number
6. Fusion, Heating, and Drag Pressure Settings
7. Heat Plate Temperature
8. Time Stamp
9. Heating and Cool Down Time of Fusion
10. Ambient Temperature.

1.03 QUALITY ASSURANCE

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 (C900). 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

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.

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.

E. Owner and Engineer reserve the right to perform onsite card checks for fusion technicians' qualifications and to stop any fusion work being performed by personnel unable to promptly provide documentation of the required qualifications

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.

1.04 RELATED WORK

A. Section 01000 Summary of Work
B. Section 01011 Special Provisions
C. Section 01075 Basis of Payment
D. Section 01300 Submittals
E. Section 01600 Products
F. Section 02210 Trenching Backfilling and Compacting
G. Section 02350 Pipe Bursting of Water Mains
H. Section 02450 Horizontal Directional Drilling (HDD)
I. Section 02660 Identification/Location Guide
J. Section 15000 Piping - General Provisions
K. Section 15020 Disinfecting Pipelines
L. Section 15025 Flushing and Cleaning Pipelines
M. Section 15030 Pressure and Leakage Tests
N. Section 15105 Ductile Iron Pipe and Fittings
O. Section 15130 Piping Specialties

P. Section 15150 Gate Valves
Q. Section 15155 Butterfly Valves
R. Section 15170 Tapping Sleeves, Saddles, and Valves
S. Section 15180 Fire Hydrants
T. Section 15185 Abandonment of Mains and Hydrants
U. Section 15190 Air Valves Blow-off Assemblies and Sampling Taps
V. Section 15200 Service Lines

1.05 REFERENCE

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.

A. ASTM D638 - Standard Test Method for Tensile Properties of Plastics

B. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

C. ASTM D1238 - Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer

D. ASTM D1505 - Standard Test Method for Density of Plastics by the Density-Gradient Technique

E. ASTM D2774 - Standard Practice for Underground Installation of Thermoplastic Pressure Piping

F. ASTM D2837 - Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products

G. ASTM D3261 - Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing

H. ASTM D3350 - Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

I. ASTM F412 - Standard Terminology Relating to Plastic Piping Systems

J. ASTM F714 - Standard Specification for Polyethylene (PE) Pipe (SDR-PR) Based on Outside Diameter

K. ASTM F1055 - Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene (PEX) Pipe and Tubing

L. ASTM F1473 - Standard Test Method for Notch Tensile Test to Measure the Resistance to Slow Crack Growth of Polyethylene Pipes and Resins

M. ASTM F1290 - Standard Practice for Electrofusion Joining Polyolefin Pipe and Fittings

N. ASTM F1668 - Standard Guide for Construction Procedures for Buried Plastic Pipe

O. ASTM F2206 - Standard Specification for Fabricated Fittings of Butt-Fused Polyethylene (PE) Plastic Pipe, Fittings, Sheet Stock, Plate Stock or Block Stock

P. ASTM F2620 - Standard Practice for Heat Fusion Joining of Polyethylene Pipe and Fittings

Q. Plastic Pipe Institute TN 34 - Installation Guidelines For Electrofusion Couplings 14" and Larger

R. AWWA C906 - Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 65 In. (100 mm Through 1,650 mm), for Waterworks

S. AWWA Manual M55 - PE Pipe Design and Installation

T. Plastic Pipe Institute (PPI) "Handbook of Polyethylene Pipe"

U. PPI TR-33 - Generic Butt Fusion Joining Procedure for Field Joining of Polyethylene Pipe

V. NSF/ANSI 14 Plastics Piping System Components and Related Materials

W. NSF/ANSI 61 Drinking Water System Components - Health Effects

X. NSF/ANSI 372 Drinking Water System Components - Lead Content

PART 2: PRODUCTS

2.01 GENERAL

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.

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

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.

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.

D. HDPE fittings shall not be used except for saddles, adapters and temporary caps as specified below. All other fittings shall be ductile iron.

E. All materials that come in contact with potable water, including lubricants, shall be evaluated, tested, and certified for conformance with ANSI/NSF Standard 61.

2.02 HDPE PIPE AND FITTINGS

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 ATSM D3350 minimum cell classification of PE 345464C. 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.

B. The pipe and fittings shall contain no recycled compound 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

C. The material shall have a minimum Hydrostatic Design Basis (HDB) of 1,600 psi (11.03 MPA) at 73 degrees F per ASTM D 2837. 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 at 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 material as the pipe material except for color, which shall be blue. Stripes printed or painted on the outside surface shall not be acceptable

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

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

E. HDPE elbows/bends, tees, and crosses are not allowed.

2.03 FITTINGS, SADDLES, ADAPTERS AND TEMPORARY CAPS

A. Plain end butt fused mechanical joint adapter fittings shall be used when joining polyethylene pipe to valves, ductile iron fittings, or other pipe materials. Butt fusion fittings shall comply with ASTM D3261. When using a butt-fused adapter, a Type 316 stainless steel stiffener shall be used.

B. Butt fused IPS to DIPS adapters shall be used to connect DIPS-size HDPE pipe to IPS-size HDPE pipe.

C. Saddles for branch/service connections 2-inch diameter and smaller shall be conventional fusion type, side fusion (sidewall fused) tapping saddles in conformance with ASTM D1598, D1599, and AWWA C906, rated for at least 200 psi working pressure with NSF-61- and NSF-372-compliant female threaded brass alloy insert per AWWA C800 (CC threads unless otherwise specified in Section 01011) to receive a corporation stop. Saddle branch shall be PE 3408/3608 or PE 4710 HDPE per ASTM D3350 with cell classification 345464C or higher. A Type 304 or 316 stainless steel compression ring shall be provided around the outer diameter of the branch outlet opposing the threaded insert.

D. HDPE branch saddles for 3-inch diameter branch/service connections shall be conventional fusion 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.

E. 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.

F. Mechanical (compression) fittings and couplings shall be as specified in Sections 15105 and 15130 and shall use gaskets and restraining devices specifically designed for, or tested and found to be acceptable for, use with polyethylene pipe. Type 316 stainless steel stiffeners shall be utilized in the HDPE pipe with all mechanical joint (compression) ductile iron fittings, couplings, and valves. Compression-type HDPE or PVC fittings shall not be used. T-bolts and nuts shall be high-strength, corrosion-resistant low-alloy steel with the characteristics listed in Table 8 of AWWA C111. T-bolts shall be Xylan or Fluorocote A1 (corrosion resistant). Other bolts and nuts shall be as specified in Section 15130.

2.04 PIPE ROLLERS

A. Pipe rollers shall be designed for the purpose of supporting and guiding pipe with minimal friction.

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 HDPE pipe manufacturer and shall prevent pipe abrasions and additional stress on the piping.

2.05 ACCEPTABLE MANUFACTURERS—HDPE PIPE AND FITTINGS

A. Performance Pipe
A Division of Chevron Phillips Chemical Company
5085 West Park Blvd., Suite 500
P.O. Box 269006
Plano, Texas 75093

B. JM Eagle
5200 West Century Boulevard
Los Angeles, California 90045

C. WL Plastics Corporation Corporation
3575 Lone Star Circle, Suite 300
Fort Worth, TX 76177

D. Poly-Cam (Series 416 side fusion saddles only)
1101 McKinley St.
Anoka, MN 55303

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.

F. Georg Fischer Central Plastics LLC Pipe & Fabricated Products (formerly Independent Pipe Products Inc.) (adapters and fittings only)
39605 Independence
Shawnee, OK 74804

G. Nupi Americas Inc. (adapters and fittings only)
1511 Superior Way
Houston, TX 77039

H. Improved Piping Products, Inc. (adapters and fittings only)
4311 Director Drive
San Antonio, TX 78219

I. Improved Piping Products, Inc. (adapters and fittings only)
4311 Director Drive
San Antonio, TX 78219

PART 3: EXECUTION

3.01 PACKAGING, HANDLING, AND STORAGE

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 dust or truck exhaust from entering pipes.

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 rejoined by butt fusion to make a continuous section.

3.02 PIPE INSTALLATION

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, other sections as applicable; and of manufacturers' recommendations, in addition to the following requirements:

A. Trenching, bedding, and backfilling shall be comply with Section 02210. Trenching shall be performed in accordance with ASTM D2774

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 lieu 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 stability 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 (cold) 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.

PE pipe Dimension Ratio (DR)	Minimum Bending Radius Multiplier*
11.0	25 times pipe O.D.
9.0	20 times pipe O.D.

*When installed by HDD, minimum bending radius shall be as specified in Section 02458.

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. Tracer wires shall be installed with the HDPE pipe as specified in Section 02450 and 02658.

E. HDPE pipe shall not be employed with directional drilling through rock or other abrasive conditions unless it is encased and only with approval of the Engineer.

F. Research has documented that certain pipe materials (such as polyethylene, polybutylene, polyvinyl chloride, and asbestos cement) and certain elastomers, such as used in joining 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.

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.

3.03 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.

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 pipes shall have the same DR at the point of fusion unless a specific fitting is specified

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.

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 properties, including the following elements:

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.
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
3. GENERAL MACHINE - Overview of machine body shall yield no obvious defects, missing parts, or potential safety issues during fusion.
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 fusing for extended periods of time, an independent 110V power source shall be available to extend battery life

F. Integrity of heating plate in the fusion equipment shall be checked a minimum of twice per each 8 hour work shift for temperature uniformity.

G. Other equipment specifically required for the fusion process shall include the following:

1. Pipe rollers shall be used for support of pipe to either side of the machine
2. A weather protection canopy that allows full machine motion of the heat plate, fusion assembly and carriage shall be provided for fusion in inclement and/or windy weather.
3. Fusion machine operations and maintenance manual shall be kept with the fusion machine at all times.
4. Facing blades shall be appropriate for cutting HDPE pipe.

H. JOINT RECORDING

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.
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.

I. Electrofusion reports of each weld shall be appropriately identified and provided to the Engineer. The reports shall include, as a minimum, the fusion date, time, ambient temperature, fitting type and size, user ID, and the manufacturer of the part.

J. 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.

K. All fused joints will be subject to acceptance by the Engineer prior to pipe installation. All defective joints shall be cut out and replaced at no cost to the Owner. Any section of the pipe with a gash, blister, abrasion, nick, scar, or other deleterious fault greater in depth than ten percent (10%) of the wall thickness shall not be used and must be removed from the site. However, a defective area of the pipe may be cut out and the joint fused in accordance with the procedures stated above. In addition, if in the opinion of the Engineer any section of pipe has other defects, including those hereinafter listed, that may indicate damaged, improperly manufactured, faulty, or substandard pipe, said pipe shall be discarded or returned to the manufacturer and not used. Defects warranting pipe rejection include the following: concentrated ridges, discoloration, excessive spot roughness, and pitting; insufficient or variable wall thickness; pipe damage from bending, crushing, stretching or other stress; pipe damage that impacts the pipe strength, the intended use, the internal diameter of the pipe, internal roughness characteristics; or any other defect of manufacturing or handling.

L. Unless otherwise approved in writing by the Owner and Engineer, mechanical (compression) fittings shall be used only when joining polyethylene materials to other piping materials or valves and shall be installed as specified in Sections 15105 and 15130. Blocking must be provided at changes in direction for any mechanical fittings

M. ELECTROFUSION

1. Electrofusion joining shall be done in accordance with the fitting and pipe manufacturers' recommended procedures and ASTM F 1290 and PPI TN 34. The process of electrofusion requires an electricity source, a transformer (commonly called an electrofusion box) that has wire leads, a method to read

electronically (by laser or otherwise) input from the barcode of the fitting, and a fitting that is compatible with the type of electrofusion box used. The electrofusion box shall be capable of reading and storing the input parameters and the fusion results for later download to a record file

2. Qualification of the fusion technician shall be demonstrated by evidence of electrofusion training within the past year on the equipment to be utilized for this application. For a pipe surface to be properly prepared for electrofusion, the outer layer or "skin" of the pipe shall be removed to expose a clean, virgin pipe material. This can be achieved by using one of several types of approved scraping tools. Wood rasps or metal files are not acceptable methods. It is very important to note that abrasive materials, such as sandpaper or emery cloth, should never be used in place of a scraping tool. A minimum of 0.007 to 0.010 inch of the pipe's surface material shall be removed during the scraping process in order to expose a clean virgin material. The pipe surface shall be clean and free from any type of contaminants that may be spread before scraping begins. Should the pipe surface be contaminated with dirt, mud or drilling fluids before scraping, clean water shall be used to remove the surface level of these contaminates. However, water shall not be used to clean the pipe surfaces once the virgin material has been exposed. In those instances, a minimum 70% isopropyl alcohol concentration, with no additional additives, shall be used as a cleaning agent. For applications where a fitting will be moved around on the pipe, such as a repair application where a coupling will be pushed completely over one end of the pipe, the pipe shall be scraped for the entire length of the coupling to prevent a clean fitting from being contaminated by unscraped pipe
3. Marks may be made on the outer surface of the pipe as a visual aid to help indicate the required scraper coverage. Marks made on the pipe shall not be made with a "grease pencil" or other type of petroleum based marker that will leave a contaminant behind.
4. Care shall be taken to ensure that the polyethylene pipe is not out-of-round before attempting the electrofusion process. Out of round pipe shall be removed or corrected in accordance with the pipe manufacturer's instructions
5. All pipe that shall be fixed with electrofusion couplings shall be restrained or sufficiently supported on each side of the pipe to restrict movement during the fusion and cooling process and alleviate or eliminate sources of stress and/or strain until both the fusion cycle and the cooling cycle are complete. Electrofused fittings shall be cooled for the time required by the manufacturer
6. Electrofusion fittings shall only be re-fused in the event of an input power interruption, i.e. fusion leads were detached during fusion, generator runs out of fuel, processor malfunction, or other circumstance that results in processor input power interruption.

N. Polyethylene pipe shall be joined to ductile iron pipe by the use of butt-fused mechanical joint adapters as specified in Part 2. When using a butt-fused adapter to connect to a valve or to another pipe material, a Type 316 stainless steel stiffener shall be used.

O. Flange adapters, when required, shall be butt fused to 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. MJ 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

3.04 SERVICE CONNECTIONS AND TAPPING

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.

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.

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.

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.

3.05 ANCHOR RESTRAINTS

A. Concrete anchor collars located at each end of the watermain shall be provided.

3.06 TESTING

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.

B. Stream Crossings shall be pressure testing prior to chlorination and disinfection.

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Modified / By: January 18, 2022 12:28:02 PM / dMargraf
Plotted / By: March 22, 2022 11:51:55 AM / Raven Morris

DATE	MARK	REVISIONS	BY

DAVID J. STOEPPELWERTH
REGISTERED
No. 19358
STATE OF INDIANA
PROFESSIONAL ENGINEER

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CERTIFIED: 04/07/22

STOEPPELWERTH
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7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

CONSTRUCTION DETAILS

THE BLUFFS AT YOUNGS CREEK
SECTION 6

FRANKLIN, FRANKIN TOWNSHIP
JOHNSON COUNTY, INDIANA

DRAWN BY: DCM
CHECKED BY: BKR

SHEET NO.
C803B

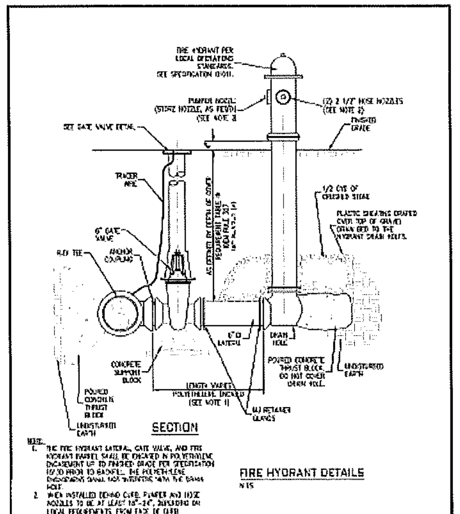
S & A JOB NO.
83540MMA-S6

C. A ¾-inch NPT test nipple and plug shall be provided on each tapping saddle to allow pre-testing of the saddle assembly before making the tap.

D. Any third party inspections will be paid for by the Owner.

END OF SECTION

11/2019 – Pipeline 15126-15

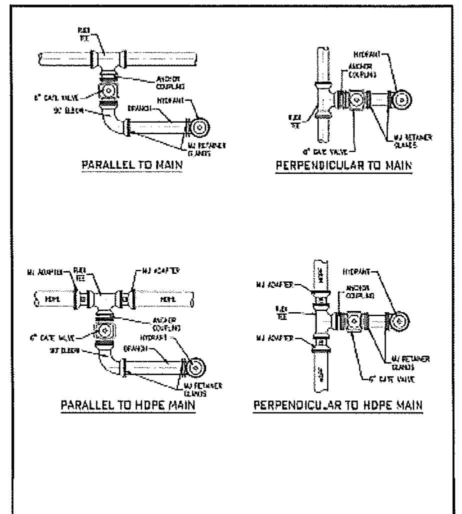


STANDARD DETAIL

FIRE HYDRANT DETAIL

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

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

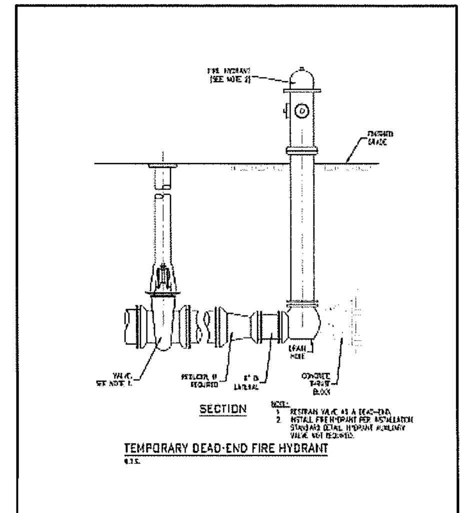


STANDARD DETAIL

FIRE HYDRANT INSTALLATION DETAILS

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

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

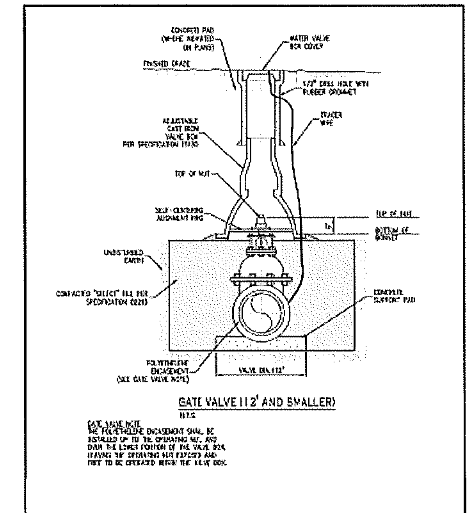


STANDARD DETAIL

TEMPORARY DEAD-END FIRE HYDRANT DETAIL

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

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

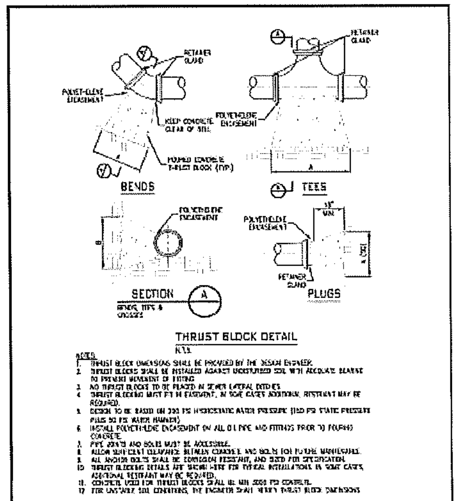


STANDARD DETAIL

GATE VALVE (12" AND SMALLER)

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

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

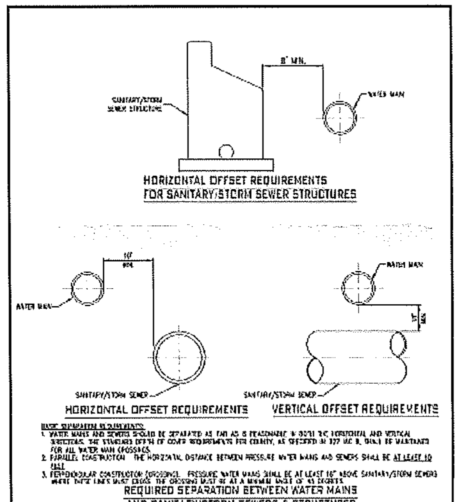


STANDARD DETAIL

THRUST BLOCKS

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

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



STANDARD DETAIL

SEWER SEPARATION

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

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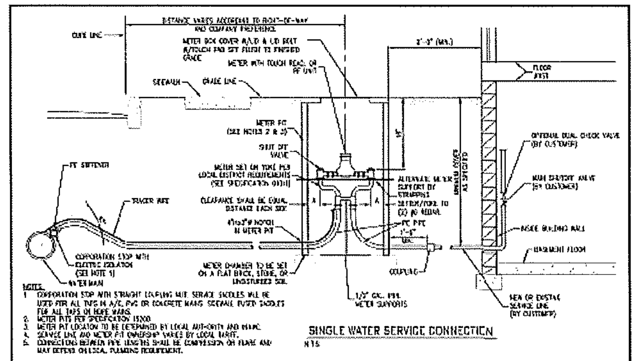
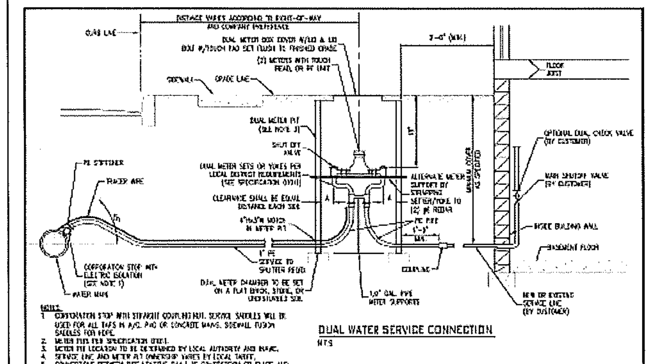


STANDARD DETAIL

SINGLE WATER SERVICE

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

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



STANDARD DETAIL

DUAL WATER SERVICE

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

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

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Plotted / By: March 22, 2022 11:52:08 AM / Raven Morris

REVISIONS — DATE — MARK — BY

DAVID J. STOEPPELWERTH, REGISTERED No. 19358, STATE OF INDIANA, PROFESSIONAL ENGINEER

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CERTIFIED: 04/07/22

STOEPPELWERTH
ALWAYS ON
7965 East 106th Street, Fishers, IN 46038-2505
phone: 317.849.5935 fax: 317.849.5942

CONSTRUCTION DETAILS

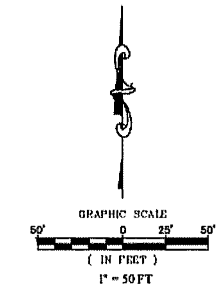
THE BLUFFS AT YOUNGS CREEK SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP — JOHNSON COUNTY, INDIANA

DRAWN BY: DCM — CHECKED BY: BKR

SHEET NO. **C803C**

S & A JOB NO. 83540MMA-S6

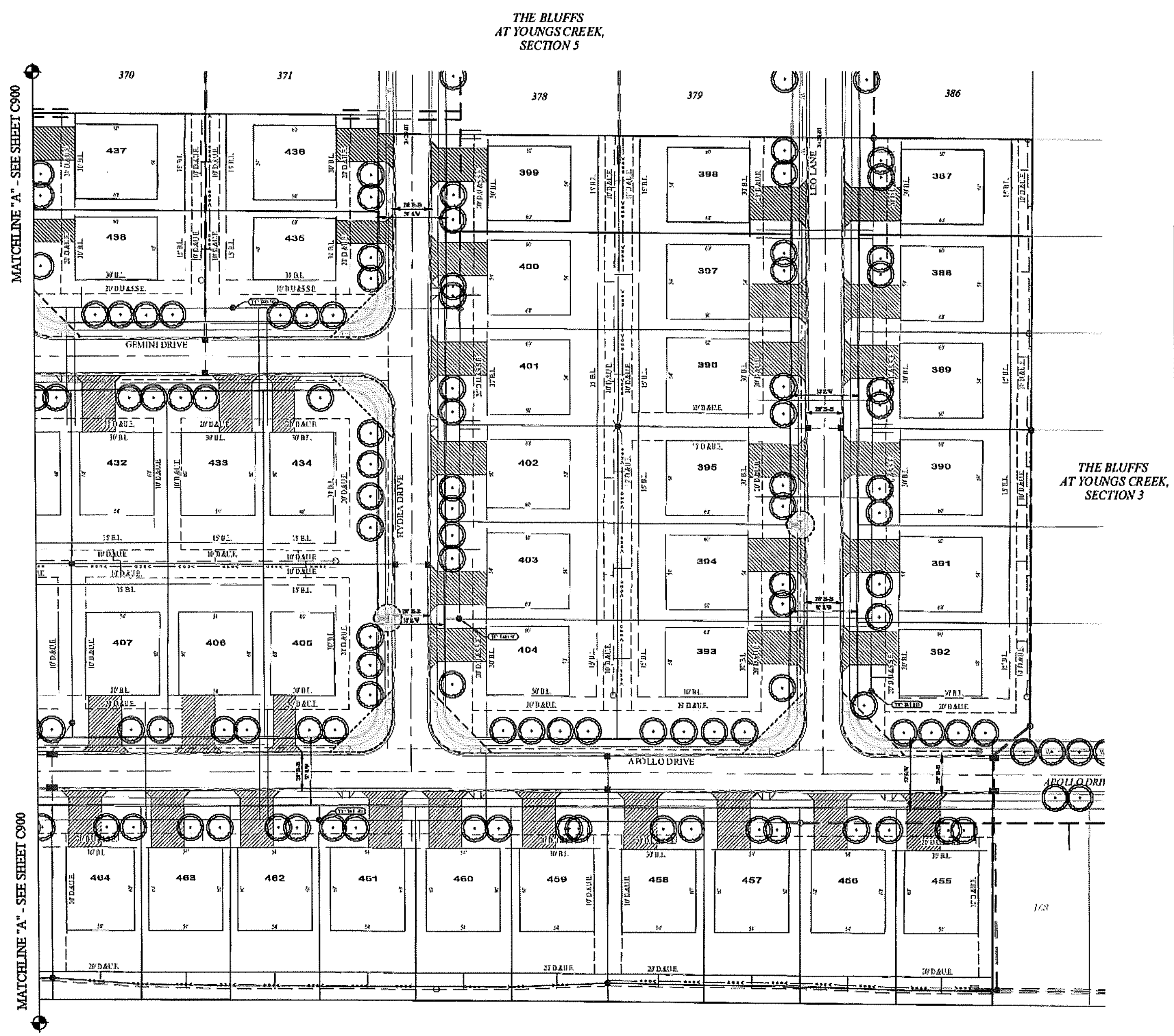


LEGEND

Symbol	Description
Sanitary sewer line symbol	PROPOSED SANITARY SEWER
Storm sewer line symbol	PROPOSED STORM SEWER
Water line symbol	PROPOSED WATER LINE
Hydrant symbol	PROPOSED HYDRANT w/6" VALVE
Gate valve symbol	PROPOSED GATE VALVE
Street tree symbol	PROPOSED STREET TREE
Shaded zone symbol	PLANT RESTRICTION ZONE. NO TREES INSIDE VISION CLEARANCE TRIANGLES OR PERIMETER STREET RIGHTS-OF-WAY. NO TREES WITHIN TEN (10) FEET OF FIRE HYDRANTS. NO TREES WITHIN FIVE (5) FEET OF ANY UNDERGROUND UTILITY SERVICE.

NOTES

1. ONE STREET TREE SHALL BE PLANTED FOR EVERY 40 FEET OF STREET FRONTAGE OR FRACTION THEREOF, MINUS THE WIDTH OF THE DRIVEWAY(S) AS MEASURED ALONG THE FRONT PROPERTY LINE. TREES MAY BE EVENLY SPACED OR GROUPED TOGETHER. ALL STREET TREES SHALL BE A MINIMUM OF 2 INCH CALIPER AS MEASURED 6 INCHES FROM THE TOP OF THE ROOT BALL, AT THE TIME OF PLANTING. STREET TREES SHALL BE PLANTED WITHIN 10 FEET OF THE RIGHT-OF-WAY. TREE PLANTINGS WITHIN THE RIGHT-OF-WAY SHOULD BE AVOIDED IF AT ALL POSSIBLE. HOWEVER, STREET TREES MAY BE PROVIDED IN THE RIGHT-OF-WAY, ONLY AS NECESSARY, TO MEET SPACING REQUIREMENTS OR REDUCE CONFLICTS WITH UTILITIES. NO TREE SHALL BE PLANTED WITHIN 10 FEET OF ANY FIRE HYDRANT OR 5 LATERAL FEET OF ANY UNDERGROUND UTILITY SERVICE.
2. ALL STREET TREES WILL COMPLY WITH THE APPROVED CITY OF FRANKLIN PERMITTED STREET TREE LIST.



6.15 Street Tree Standards (cont.)

Subdivisions Standards 6

Permitted Street Trees

Common Name	Scientific Name
Hornbeam	
American Hornbeam	*Carpinus Caroliniana*
Upright European Hornbeam	*Carpinus Betulus "Fastigiata"*
Elm	
Accolade Elm	*Ulmus Japonica x Wilsoniana "Morton"*
Frontier Elm	*Ulmus Carpinifolia x Parvifolia "Frontier"*
Homestead Elm	*Ulmus "Homestead" (complex hybrid)*
Ash	
Green Ash	*Fraxinus Pennsylvanica*
White Ash	*Fraxinus Americana*
Ginko (Male)	
Fairmount Ginko	*Ginko Biloba "Fairmount"*
Sentry Ginko	*Ginko Biloba "Sentry"*
Upright Ginko	*Ginko Biloba "Upright"*
Honeylocust	
Majestic Honeylocust	*Gleditzia Triacanthos Inermis "Majestic"*
Moraine Honeylocust	*Gleditzia Triacanthos Inermis "Moraine"*
Shademaster Honeylocust	*Gleditzia Triacanthos Inermis "Shademaster"*
Skyline Honeylocust	*Gleditzia Triacanthos Inermis "Skyline"*
Sunburst Honeylocust	*Gleditzia Triacanthos Inermis "Sunburst"*
Linden	
Basswood	*Tilia Americana*
Chancellor Linden	*Tilia Cordata "Chancellor"*
Greenspire Linden	*Tilia COrdata "Greenspire"*
Silver Linden	*Tillia Cordata "Silver"*
Swedish Upright Linden	*Tilia Cordata "Swedish Upright"*
Maple	
Armstrong Red Maple	*Acer Rubrum "Autumn Flame"*
Paperback Maple	*Acer Griseum*
Red Sunset Red Maple	*Acer Rubrum "Red Sunset"*
Striped Maple	*Acer Pensylvanicum*
Sugar Maple	*Acer Saccharum*
Tilford Red Maple	*Acer Rubrum "Tilford"*
Trident Maple	*Acer Buergerianum*
Oak	
Bur Oak	*Quercus Macrocarpa*
Chestnut Oak	*Quercus Prinus*
Chinkapin Oak	*Quercus Muehlenbergii*
English Oak	*Quercus Robur*
Laurel Oak	*Quercus Hemisphaerica*
Pin Oak	*Quercus Palustris*
Post Oak	*Quercus Stellata*
Red Oak	*Quercus Borealis*
Scarlet Oak	*Quercus Coccinea*
Shingle Oak	*Quercus Imbricaria*
Shumard Oak	*Quercus Shumardii*
White Oak	*Quercus Alba*
Common Alder	*Alnus Glutinosa*
Golden Raintree	*Koelreuteria Paniculata*
London PlaneTree	*Platanus x Acerifolia*

City of Franklin Subdivision Control Ordinance: Effective Date - April 11, 2005
Revised per Ordinance #2013-07

Page: 6-35

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CERTIFIED: 04/07/22

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STREET TREE PLAN

THE BLUFFS AT YOUNGS CREEK SECTION 6

FRANKLIN, FRANKLIN TOWNSHIP JOHNSON COUNTY, INDIANA

DRAWN BY:	CHECKED BY:
DCM	BKR

SHEET NO. C900

S&A JOB NO. 83540MMA-S6

Indiana 811

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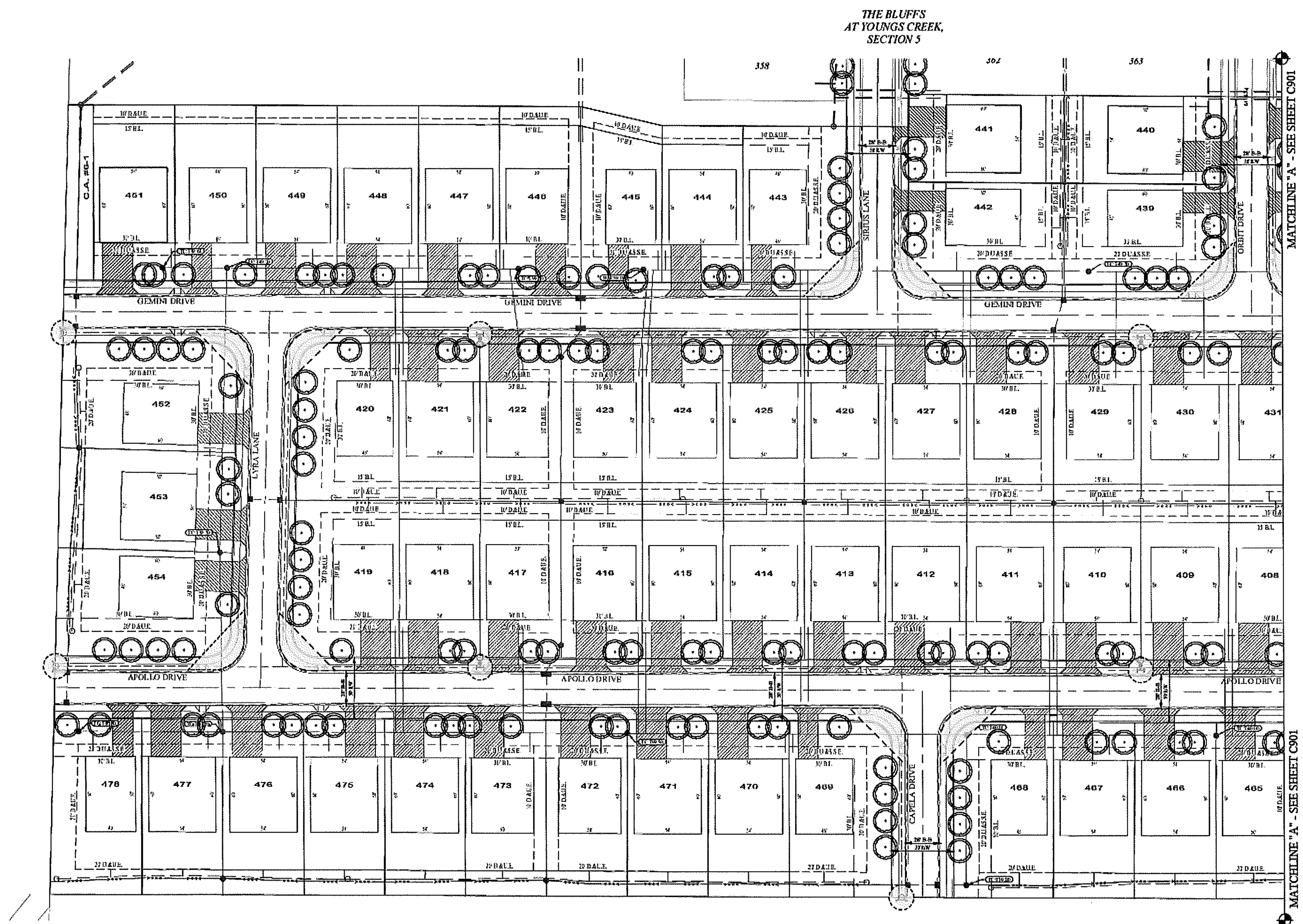

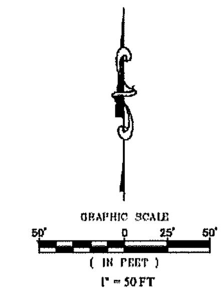

LEGEND

	PROPOSED SANITARY SEWER
	PROPOSED STORM SEWER
	PROPOSED WATER LINE
	PROPOSED HYDRANT w/ 6" VALVE
	PROPOSED GATE VALVE
	PROPOSED STREET TREE
	PLANT RESTRICTION ZONE. NO TREES INSIDE VISION CLEARANCE TRIANGLES OR PERIMETER STREET RIGHTS-OF-WAY. NO TREES WITHIN TEN (10) FEET OF FIRE HYDRANTS. NO TREES WITHIN FIVE (5) FEET OF ANY UNDERGROUND UTILITY SERVICE.

NOTES

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2. ALL STREET TREES WILL COMPLY WITH THE APPROVED CITY OF FRANKLIN PERMITTED STREET TREE LIST.

DATE	MARK	REVISIONS	BY

DAVID J. STOEPPELWERTH
REGISTERED
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STATE OF INDIANA
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STREET TREE PLAN
THE BLUFFS AT YOUNGS CREEK SECTION 6

FRANKLIN, FRANKIN TOWNSHIP — JOHNSON COUNTY, INDIANA

DRAWN BY:	CHECKED BY:
DCM	BKR

SHEET NO.
C901

S & A JOB NO.
83540MMA-S6

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