

# FINAL SITE PLAN FOR NORTH SITE

## THE DOWNS

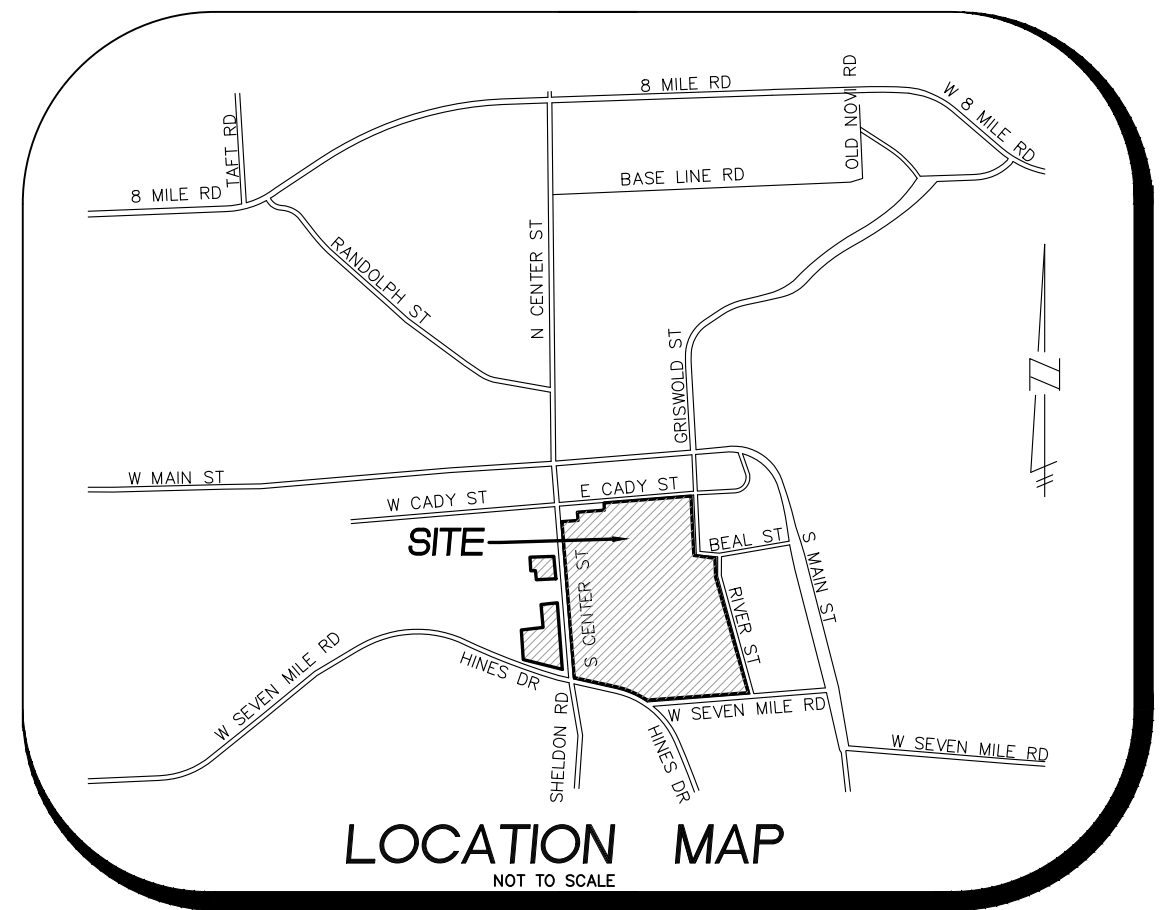
DOWNTOWN NORTHVILLE

SECTION 3, T1S, R8E, CITY OF NORTHVILLE WAYNE COUNTY, MICHIGAN

PREPARED FOR:

HUNTER PASTEUR, NORTHVILLE, LLC

32300 NORTHWESTERN HWY, SUITE 230  
FARMINGTON HILLS, MI 48334



LOCATION MAP  
NOT TO SCALE

### LEGAL DESCRIPTION

**OVERALL PARCEL:**  
PART OF LOT 72, ALL OF LOTS 73-78, PART OF LOT 79, ALL OF LOTS 80-81, AND PART OF LOT 82 OF "ASSESSOR'S NORTHVILLE PLAT NO. 1", AS RECORDED IN LIBER 66 OF PLATS, PAGE 45, WAYNE COUNTY RECORDS; ALSO PART OF LOT 171 AND ALL OF LOTS 172-196 AND PART OF LOT 197 OF "ASSESSOR'S NORTHVILLE PLAT NO. 2", AS RECORDED IN LIBER 66 OF PLATS, PAGE 44, WAYNE COUNTY RECORDS; ALSO ALL OF THAT PART VACATED CHURCH STREET AND VACATED BEAL AVENUE AS VACATED PER RESOLUTION RECORDED IN LIBER 20023, PAGE 101, WAYNE COUNTY RECORDS;

ALL OF THE AFOREMENTIONED BEING MORE PARTICULARLY DESCRIBED AS:  
COMMENCING AT THE NORTHWEST CORNER OF LOT 168 OF SAID "ASSESSOR'S NORTHVILLE PLAT NO. 2"; THENCE N84°53'43"E 174.61 FEET ALONG THE SOUTH LINE OF CADY STREET (60 FEET WIDE) TO THE NORTHWEST CORNER OF LOT 171 OF SAID "ASSESSOR'S NORTHVILLE PLAT NO. 2" FOR A POINT OF BEGINNING; THENCE ALONG THE SOUTH LINE OF SAID CADY STREET THE FOLLOWING THREE (3) COURSES; 1) N84°53'43"E 682.35 FEET, 2) N79°20'27"E 42.12 FEET, AND 3) N85°47'04"E 218.30 FEET; THENCE ALONG THE WESTERLY LINE OF GRISWOLD STREET (VARIABLE WIDTH) THE FOLLOWING FIVE (5) COURSES; 1) S02°21'07"E 193.33 FEET, 2) S86°05'00"W 3.01 FEET, 3) S04°22'00"E 133.89 FEET, 4) N85°43'59"E 15.98 FEET, AND 5) S04°24'37"E 129.36 FEET; THENCE N84°12'51"W 100.00 FEET ALONG THE NORTH LINE OF BEAL AVENUE (50 FEET WIDE); THENCE S05°47'09"W 50.00 FEET ALONG THE EASTERLY LINE OF THAT PORTION OF VACATED BEAL AVENUE PER RESOLUTION RECORDED IN LIBER 20023, PAGE 101, WAYNE COUNTY RECORDS; THENCE S84°12'51"E 289.65 FEET ALONG THE SOUTH LINE OF SAID BEAL AVENUE; THENCE ALONG THE WEST LINE OF RIVER STREET THE FOLLOWING THREE (3) COURSES; 1) S09°44'28"E 227.57 FEET, 2) S15°01'28"E 427.16 FEET, AND 3) S15°34'36"E 462.92 FEET; THENCE S85°45'58"W 238.48 FEET; THENCE N89°02'21"W 563.09 FEET; THENCE N43°05'04"W 95.18 FEET; THENCE ALONG THE SOUTH LINE OF SAID LOT 183 THE FOLLOWING FOUR (4) COURSES; 1) S78°36'11"W 254.94 FEET, 2) S78°39'12"W 117.60 FEET, 3) N77°44'48"W 142.02 FEET, AND 4) N57°47'56"W 135.76 FEET; THENCE N05°05'49"W 578.08 FEET ALONG THE EAST LINE OF CENTER STREET (60 FEET WIDE); THENCE N05°12'42"W 537.43 FEET CONTINUING ALONG THE EAST LINE OF SAID CENTER STREET; THENCE N84°59'05"E 130.92 FEET ALONG THE SOUTH LINE OF LOT 164 OF SAID "ASSESSOR'S NORTHVILLE PLAT NO. 2"; THENCE N04°02'34"W 179.19 FEET ALONG THE WEST LINE OF SAID LOT 174; THENCE N84°20'38"E 63.77 FEET ALONG THE SOUTH LINE OF LOTS 170 AND 171 OF SAID "ASSESSOR'S NORTHVILLE PLAT NO. 2"; THENCE N05°05'12"W 114.16 FEET; THENCE S84°53'43"W 24.00 FEET; THENCE N05°05'12"W 12.00 FEET ALONG THE WEST LINE OF SAID LOT 171 TO THE POINT OF BEGINNING.

**PARKING PARCEL:**  
LOT 223, LOT 224, LOT 226, LOT 227, LOT 228, AND PART OF LOT 225 OF "ASSESSOR'S NORTHVILLE PLAT NO. 3", AS RECORDED IN LIBER 66 OF PLATS, PAGE 43, WAYNE COUNTY RECORDS, MORE PARTICULARLY DESCRIBED AS: BEGINNING AT THE NORTHEAST CORNER OF SAID LOT 223; THENCE S05°05'49"E 485.34 FEET ALONG THE WEST LINE OF CENTER STREET; THENCE N05°05'12"W 87.83 FEET ALONG THE NORTH LINE OF EDWARD HINES DRIVE; THENCE CONTINUING ALONG THE NORTH LINE OF SAID EDWARD HINES DRIVE, 258.72 FEET ALONG A 1842.59 FOOT CURVE TO THE RIGHT, SAID CURVE HAVING A CENTRAL ANGLE OF 08°02'42", AND A CHORD WHICH BEARS N74°02'51"W 258.51 FEET; THENCE N04°38'15"W 228.14 FEET ALONG THE EAST LINE OF SOUTH WINDY STREET; THENCE N84°11'48"E 49.85 FEET; THENCE S04°32'04"E 29.85 FEET; THENCE N84°01'07"E 161.44 FEET ALONG THE NORTH LINE OF SAID LOT 226; THENCE N05°57'44"W 160.02 FEET ALONG THE WEST LINE OF SAID LOT 224; THENCE N82°12'58"E 115.10 FEET ALONG THE SOUTH LINE OF FAIRBROOK STREET TO THE POINT OF BEGINNING.

**VACANT PARCEL:**  
LOT 219 AND LOT 220 OF "ASSESSOR'S NORTHVILLE PLAT NO. 3", AS RECORDED IN LIBER 66 OF PLATS, PAGE 43, WAYNE COUNTY RECORDS, CITY OF NORTHVILLE, WAYNE COUNTY, MICHIGAN.

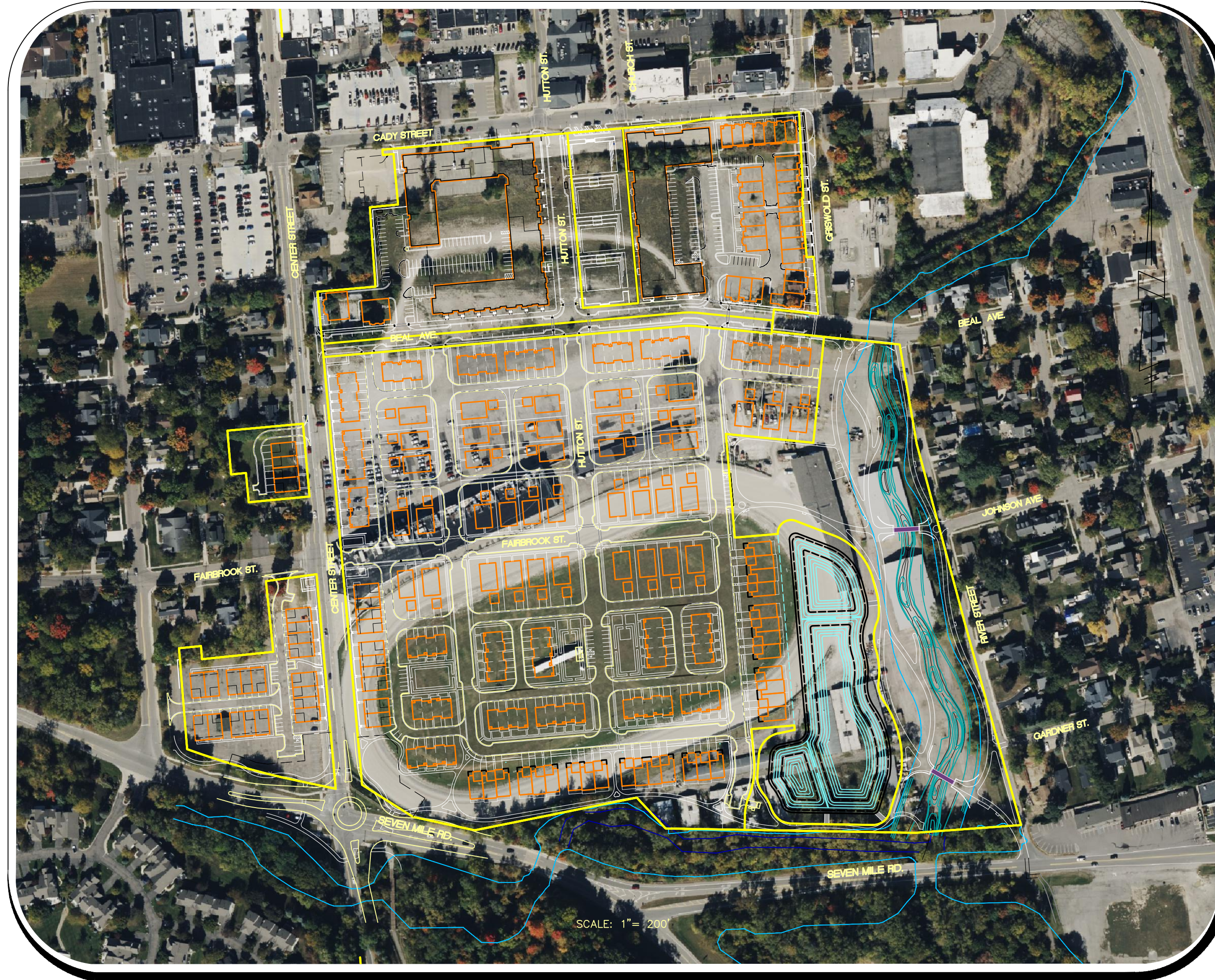
### WAYNE COUNTY DPS GENERAL NOTES:

- ALL WORK WITHIN THE WAYNE COUNTY ROAD RIGHT-OF-WAY (ROW) AND DRAIN EASEMENT SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARDS AND GENERAL SPECIFICATIONS, INCLUDING SOIL EROSION AND SEDIMENTATION CONTROL OF THE WAYNE COUNTY DEPARTMENT OF PUBLIC SERVICES, AND MDT 2012 SPECIFICATIONS FOR CONSTRUCTION.
- THESE PLANS ARE NOT VALID WITHOUT ATTACHMENT OF THE WAYNE COUNTY PERMIT SPECIFICATIONS FOR CONSTRUCTION WITHIN THE ROAD ROW, PARKS, DRAIN EASEMENT OR SANITARY SEWER UNDER JURISDICTION OF THE WAYNE COUNTY (07/01/85) REVISED 12/15/2004
- CONTRACTOR SHALL CONTACT MISS DIG AT 811 TO IDENTIFY AND FLAG / MARK THE LOCATIONS OF ALL UNDERGROUND UTILITIES AT THE PROPOSED CONSTRUCTION AREAS PRIOR TO START OF CONSTRUCTION, AND SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATIONS AND ELEVATIONS OF ALL UNDERGROUND UTILITIES, AND RESOLVE ANY CONFLICT BETWEEN THE PROPOSED WORK AND THE EXISTING UNDERGROUND OR ABOVEGROUND UTILITIES.
- CONTRACTOR SHALL MAINTAIN 18" MINIMUM VERTICAL CLEARANCE AND 3 FEET MINIMUM HORIZONTAL CLEARANCE BETWEEN THE PROPOSED AND EXISTING UTILITIES. ANY PROPOSED UTILITY PERMITTED TO CROSS UNDER THE ROAD OR DRAIN, MUST BE PLACED A MINIMUM OF 7 FEET BELOW THE LOWEST POINT OF THE ROAD, OR 8 FEET BELOW THE DRAIN BOTTOM. OVERHEAD WIRES/CABLES MUST BE INSTALLED 18 FEET MINIMUM ABOVE THE ROAD CENTERLINE. TO RELOCATE ANY UTILITY WITHIN THE ROAD ROW, THE CONTRACTOR SHALL COORDINATE THE RELOCATION WITH THE UTILITY COMPANY AND AS DIRECTED BY THE WAYNE COUNTY ENGINEER.
- ALL SURVEY MONUMENTS / CORNERS AND BENCH MARKS LOCATED WITHIN THE CONSTRUCTION AREA MUST BE PRESERVED IN ACCORDANCE WITH PUBLIC ACT 74 AS AMENDED (INCLUDING ACT 34, P.A. 2000) AND AS PER WAYNE COUNTY PERMIT RULE 1.5. THE PERMIT HOLDER AND CONTRACTOR SHALL COORDINATE THE WORK WITH A PROFESSIONAL SURVEYOR LICENSED IN THE STATE OF MICHIGAN DURING CONSTRUCTION ACTIVITIES FOR THE PURPOSE OF WITNESSING, PRESERVING OR REPLACING SURVEY MONUMENTS AND MONUMENT BOXES.
- EXPOSURE OF ANY UTILITIES UNDER THE PAVEMENT WILL NOT BE PERMITTED, UNLESS APPROVED BY THE WAYNE COUNTY ENGINEER. PAVEMENT REMOVAL AND REPLACEMENT SHALL BE PERFORMED PER APPLICABLE WAYNE COUNTY STANDARD DETAILS AS DIRECTED BY THE WAYNE COUNTY ENGINEER.
- CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS WITHIN THE WAYNE COUNTY ROAD ROW AND DRAIN EASEMENT WITH 3" TOPSOIL, 1" THM SEED MIX AND MULCH. SLOPES STEEPER THAN 1 ON 3 SHALL BE RESTORED BY PLACING SOD ON 2" TOPSOIL.
- ALL BACKFILLS UNDER OR WITHIN 3 FEET OF THE PROPOSED OR EXISTING PAVEMENT, CURB OR SIDEWALK SHALL CONFORM TO THE WAYNE COUNTY TRENCH "B" BACKFILL REQUIREMENTS. TRENCH "A" BACKFILL MAY BE USED WITHIN THE ROAD ROW AREAS UNDER CONDITIONS OTHER THAN THOSE SPECIFIED FOR TRENCH "B".
- CONTRACTOR IS RESPONSIBLE FOR RESTORING OR REPLACING ALL DISTURBED LANDSCAPED AREAS, SPRINKLER SYSTEMS, FENCES, SIGNS, MAIL BOXES, ETC. WITHIN THE WAYNE COUNTY ROAD ROW AND / OR AS DIRECTED BY THE COUNTY ENGINEER.
- CONTRACTOR SHALL MAINTAIN TWO-WAY TRAFFIC AT ALL TIMES. OTHERWISE, DETOURING TRAFFIC MUST BE PER APPROVED PLANS. ALL SIGNING AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF M.M.U.T.C.D.
- MAINTAIN A SAFE AND ADEQUATE TRAVEL ROUTE FOR PEDESTRIANS AT ALL TIMES THROUGHOUT THE PROJECT DURATION.
- OVERNIGHT VEHICLE PARKING AND STORAGE OF CONSTRUCTION MATERIALS AND EQUIPMENTS ARE NOT PERMITTED WITHIN THE WAYNE COUNTY ROADS RIGHTS-OF-WAY.
- CONTRACTOR SHOULD OBTAIN SOIL EROSION AND SEDIMENTATION CONTROL PERMIT FROM THE WAYNE COUNTY DOE. CONTACT MR. JOHN JONES AT (734) 326-5565.
- CONTRACTOR SHALL NOTIFY THE WAYNE COUNTY TRAFFIC SIGNAL SHOP AT (734) 955-2154 AT LEAST 72 HOURS PRIOR TO START OF WORK AT OR NEAR ANY SIGNALIZED INTERSECTIONS.
- CONTRACTOR SHALL NOTIFY WAYNE COUNTY 72 HOURS PRIOR TO START OF CONSTRUCTION. CONTACT THE PERMIT OFFICE AT (734) 595-8504 EXTENSION 2009.

### BENCHMARKS

- RIM OF SANITARY MANHOLE AT THE INTERSECTION OF CENTER STREET AND FAIRBROOK STREET. MANHOLE IS 3.5' EAST OF THE CENTERLINE OF CENTER STREET AND 17.5' SOUTH OF THE CENTERLINE OF FAIRBROOK STREET. ELEVATION 780.07' (NAVD88)
- RIM OF SANITARY MANHOLE AT THE INTERSECTION OF RIVER STREET AND BEAL STREET. MANHOLE IS 10' NORTH OF THE CENTERLINE OF BEAL STREET AND 1' WEST OF THE CENTERLINE OF RIVER STREET. ELEVATION 777.58' (NAVD88)

NOTE: ALL ELEVATIONS SHOWN THROUGHOUT THE PLAN SET ARE ON NAVD88 DATUM.



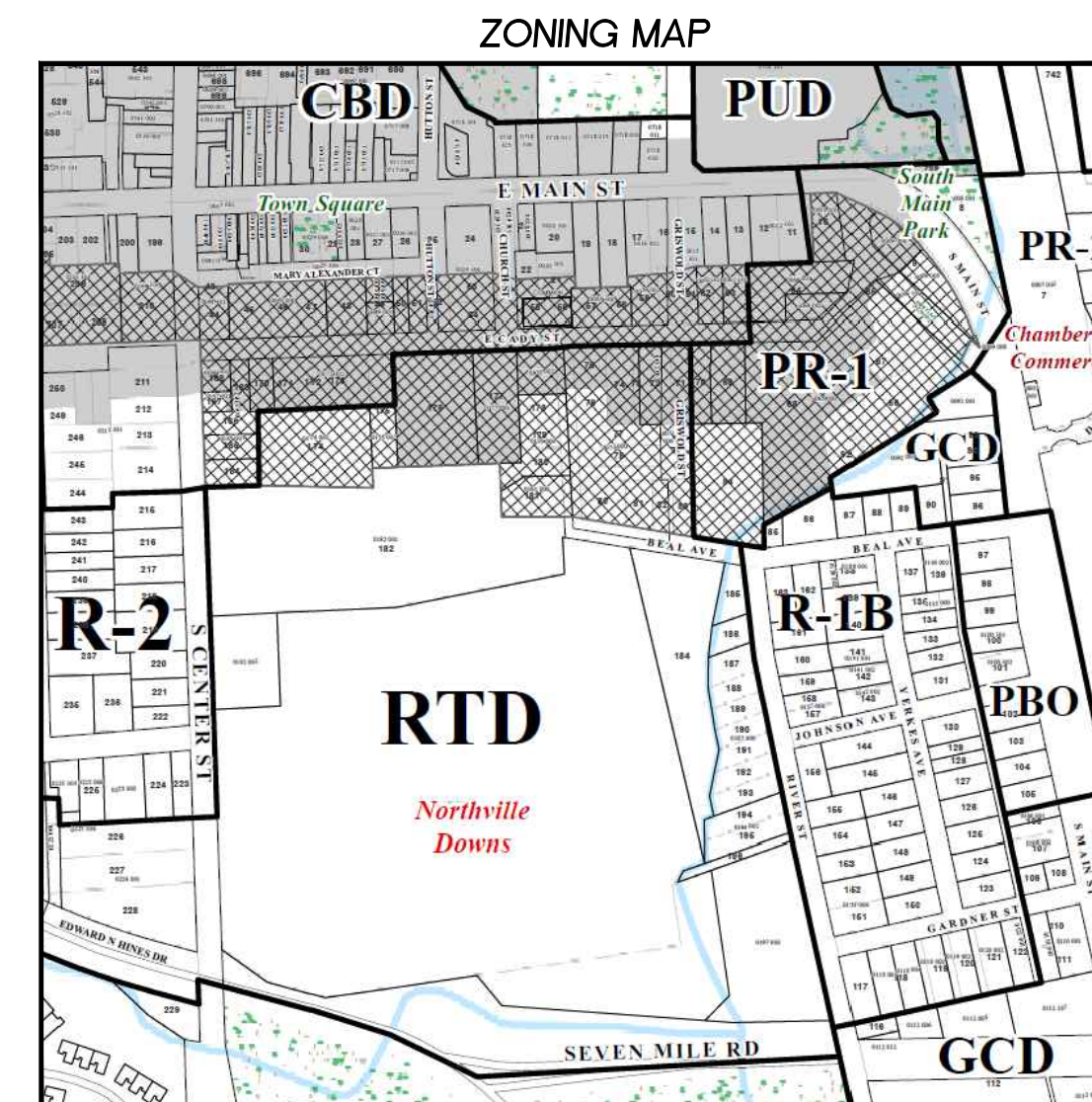
SCALE: 1" = 200'

### SHEET INDEX

- COVER SHEET
- 2-5. TOPOGRAPHIC SURVEY PLANS
- TREE TAG LIST
- 6A-6B. BOUNDARY SURVEY
- DEMOLITION PLAN
- 7A. TREE LOCATION SURVEY
- OVERALL SITE PLAN
- 8A. COMPOSITE UTILITY PLAN
- GRADING AND PAVING PLAN
10. GRADING AND PAVING PLAN
- HUTTON & BEAL ROAD CROSS SECTIONS
- 12-17. ROAD & WATER MAIN PLAN AND PROFILE
- 18-21. SANITARY SINKER PLAN AND PROFILE
- 22-26. STORM SEWER PLAN AND PROFILE
27. STORM SEWER CALCULATIONS
28. DRAINAGE DISTRIBUTION PLAN
29. STORM WATER MANAGEMENT PLAN - BASIN 3
- 30-31. UNDERGROUND DETENTION DETAILS - BASIN 3
32. STORM WATER MANAGEMENT PLAN - BASIN 4
- 33-34. UNDERGROUND DETENTION DETAILS - BASIN 4
35. STORM WATER MANAGEMENT PLAN - BASIN 5
- 36-37. UNDERGROUND DETENTION DETAILS - BASIN 5
38. STORM WATER MAINTENANCE EXHIBIT
39. FLOODPLAIN PLAN
40. PHASING PLAN
41. EMERGENCY VEHICLE ACCESS PLAN
42. ACCESSIBLE ROUTE PLAN
- 43-44. SOIL BORINGS
45. OPEN SPACE PLAN
46. DETAIL GRADING PLAN
- ND-ND 2. NOTES AND DETAILS
- WC-1. WAYNE COUNTY STANDARD DETAILS
- WC-2. WAYNE COUNTY STANDARD DETAILS
- M-1. ADA RAMP DETAILS

CITY OF NORTHVILLE STANDARD DETAILS  
SANITARY SEWER CONSTRUCTION DETAILS  
STORM SEWER CONSTRUCTION DETAILS  
WATER MAIN CONSTRUCTION DETAILS

ACCORDING TO THE FLOOD INSURANCE RATE MAP NUMBER 26163C0185E THIS SITE IS LOCATED IN A 100-YEAR FLOOD PLAIN.



LEGEND	
R-1A to R-1B	First Density Residential District
R-2	Second Density Residential District
R-3	Third Density Residential District
R-4	Fourth Density Residential District
PBO	Professional & Business Office District
OR	Office/Research District
LCB	Local Commercial District
CBD	Central Business District
GCD	General Commercial District
RTD	Race Track District
PR-1 to PR-2	Performance Regulated Industrial District
PUD	Planned Unit Development
□	Conditional Rezoning
□	Boundary of the Historic District
□	Cady Street Overlay (CSO-1, CSO-2)
□	Central Business District Overlay

**Hunter Pasteur HOMES**

THE FORBES COMPANY

**Toll Brothers**  
AMERICA'S LUXURY HOME BUILDER

**SKL SEIBER KEAST LEHNER ENGINEERING | SURVEYING**

CLINTON TOWNSHIP OFFICE  
17001 NINETEEN MILE ROAD, SUITE 3  
CLINTON TOWNSHIP, MI 48038  
586.412.7050

FARMINGTON HILLS OFFICE  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
248.308.3331

ARCHITECT ENGINEER BY:  
**ELKUS MANFREDI ARCHITECTS**  
25 DRYDOCK AVENUE SUITE 710E  
BOSTON, MA 02210  
PHONE: 617.638.3488

SURVEY PROVIDED BY:  
**ALPINE ENGINEERING, INC.**  
46892 WEST ROAD, SUITE 109  
NOVI, MI 48375  
PHONE: 248.926.3765

ENVIRONMENTAL CONSULTANT BY:  
**BARR ENGINEERING CO.**  
3005 BOARDWALK DRIVE, SUITE 100  
ANN ARBOR, MI 48108  
PHONE: 734.922.4400

LANDSCAPE PLAN PROVIDED BY:  
**GRISSIM METZ ANDRIESE ASSOCIATES**  
15000 EDWARD N. HINES DR., SUITE A  
PLYMOUTH, MI 48170  
PHONE: 248.347.7010

### AGENCY PERMITS REQUIRED

TITLE	DATE	PERMIT NO.	STATUS
1. EGLE PERMIT - PART 301 INLAND LAKE & STREAMS	TBD	TBD	TBD
2. EGLE PERMIT - ACT 399 WATER PERMIT	TBD	TBD	TBD
3. EGLE PERMIT - PART 41 - SANITARY SEWER	TBD	TBD	TBD
4. OCWRC HRSDS SANITARY CONNECTION CHAPTER 21 DRAIN	TBD	TBD	TBD
5. WAYNE COUNTY DEPT. OF ENV. - 7 MILE INTERCEPTOR CONNECTION	TBD	TBD	TBD
6. WAYNE COUNTY SOIL EROSION AND SEDIMENTATION CONTROL PERMIT	TBD	TBD	TBD
7. WAYNE COUNTY STORM WATER MANAGEMENT PERMIT TO CONSTRUCT, OPERATE, USE AND/OR MAINTAIN	7/24/2023	R21-315	APPROVED
8. CITY OF NORTHVILLE FIRE	TBD	TBD	TBD

Total North Site (BASIN 3, 4 & 5) Land Use Summary		
Characteristic	Existing Conditions	Proposed Conditions
Total Development Area (ac)	10.23	10.23
Impervious Area (ac)	2.65	8.09
Total Pervious Area (ac)	7.58	2.14
Pervious Area Breakdown by Cover Type		
Meadow/fallow/natural areas (non-cultivated)	2.6	N/A
Predominant NRCS Soil Type (A, B, C, or D)	Type A	N/A
Improved areas (turf grass, landscape, rpw crops)	0.3	2.14
Predominant NRCS Soil Type (A, B, C, or D)	N/A	Type A
Wooded Areas	0.88	N/A
Predominant NRCS Soil Type (A, B, C, or D)	Type A	N/A
Calculated BANK FULL Volume (cubic feet)		42279
BANKFULL Volume Provided (cubic feet)		42279

### REVISIONS

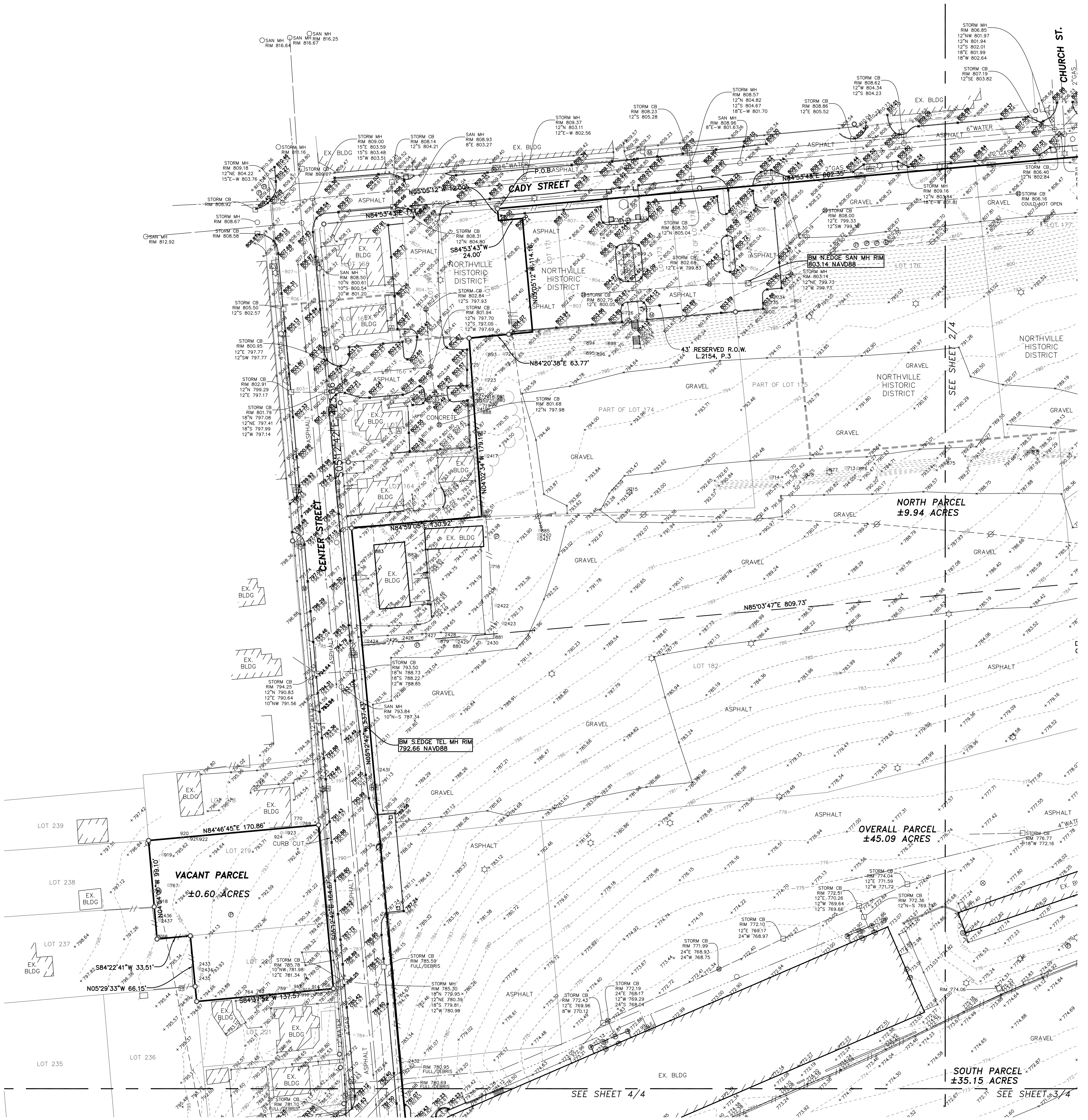
NO.	ITEM	DATE
1.	100% SCHEMATIC DESIGN	06-10-2022
2.	50% DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

### ENGINEER'S SEAL





- LEGEND**
- EX. CATCH BASIN
  - EX. MANHOLE
  - EX. END SECTION
  - EX. OVERFLOW STRUCTURE
  - EX. CLEANOUT
  - EX. HYDRANT
  - EX. WATER SHUTOFF
  - EX. FIRE DEPT. CONNECTION
  - EX. WATER WELL
  - EX. LIGHTPOLE
  - EX. UTILITY POLE
  - EX. GUY ANCHOR
  - EX. TRAFFIC SIGNAL
  - EX. GAS SHUTOFF
  - EX. GAS VENT
  - EX. HANDHOLE
  - EX. PEDESTAL
  - EX. TRANSFORMER
  - EX. GENERATOR
  - EX. GAS METER
  - EX. ELECTRIC METER
  - EX. AIR CONDITIONER
  - EX. RAILROAD SIGNAL
  - EX. SIGN
  - EX. POST/BOLLARD
  - EX. FLAGPOLE
  - EX. MAILBOX
  - EX. PARKING METER
  - EX. SATELLITE DISH
  - EX. SOIL BORING
  - EX. MONITOR WELL
  - FOUND IRON
  - SET IRON
  - EX. BOULDER
  - EX. TREE STUMP
  - EX. TREE
  - EX. TREE TAG & NUMBER
  - EX. TREE LINE
  - EX. FENCE
  - EX. SANITARY SEWER
  - EX. STORM SEWER
  - EX. WATER MAIN
  - EX. ELECTRIC CABLE
  - EX. COMMUNICATION
  - EX. GAS LINE
  - EX. OVERHEAD LINE
  - HISTORIC DISTRICT BOUNDARY



**UTILITY NOTE:**  
 GAS MAIN AND WATER MAIN ARE SHOWN ON SURVEY AS DIGITIZED FROM UTILITY MAP. LOCATION OF LINES ARE APPROXIMATE AND HAVE NOT BEEN VERIFIED IN THE FIELD.

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**ALPINE ENGINEERING INC.**  
 CIVIL ENGINEERS & LAND SURVEYORS

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 SITE ENGINEERING  
 INDUSTRIAL & MULTI-UNIT  
 LAND SURVEYING  
 CONSTRUCTION LAYOUT

**SURVEYING**  
 ALTA SURVEYS  
 BOUNDARY SURVEYS  
 TOPOGRAPHIC SURVEYS  
 PARCEL SPLITS

**RESIDENTIAL**  
 SUBDIVISIONS  
 SITE CONDOMINIUM  
 MULTI-FAMILY  
 LOT PLANS  
 CONSTRUCTION LAYOUT

46892 WEST ROAD  
 SUITE 109  
 NOVI, MICHIGAN 48377

(248) 926-3701 (BUS)  
 (248) 926-3765 (FAX)  
 WWW.ALPINE-INC.NET

**811**  
 Know what's below  
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CLIENT: HUNTER PASTEUR, NORTHVILLE, LLC

**TOPOGRAPHIC SURVEY (NW)**

SECTION: 3

TOWNSHIP: 15  
 CITY OF NORTHVILLE  
 WAYNE COUNTY  
 MICHIGAN

RANGE: 8E

REVISED	4/29/19 ADDED UTILITIES
	3/13/23 REVISED BOUNDARY
DATE: 7-3-18	
DRAWN BY: JRJ	
CHECKED BY: JDH	
FBK: 340	
CHF: MJ	
SCALE: HOR 1" = 50 FT. VER 1" = 10 FT.	2
	17-549







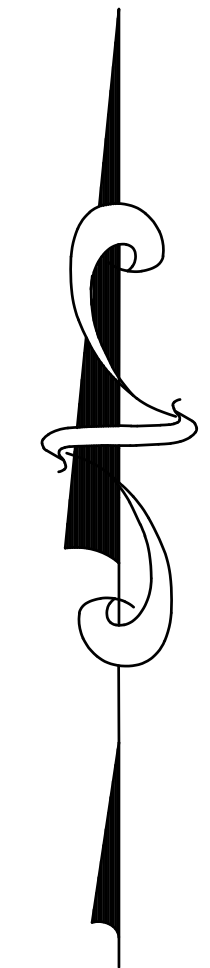
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LAND SURVEYING  
CONSTRUCTION LAYOUT

**RESIDENTIAL**  
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SITE CONDOMINIUM  
MULTI-FAMILY  
LAND PLANS  
CONSTRUCTION LAYOUT

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SUITE 109  
NOVI, MICHIGAN 48377

**811**  
Know what's below  
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CLIENT: HUNTER PASTEUR, NORTHVILLE, LLC

**TOPOGRAPHIC SURVEY (SE)**

RANGE: 8E  
TOWNSHIP: 15S  
CITY OF NORTHVILLE  
WAYNE COUNTY  
MICHIGAN

SECTION: 3

REVISED	
4/29/19 ADDED UTILITIES	
3/13/23 REVISED BOUNDARY	
DATE: 7-3-18	
DRAWN BY: JRV	
CHECKED BY: JDH	
FBK: 340	4
CHF: MJ	
SCALE: HOR 1"=50 FT. VER 1"=5 FT.	17-549



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  - EX. GAS SHUTOFF
  - EX. GAS VENT
  - EX. HANDHOLE
  - EX. PEDESTAL
  - EX. TRANSFORMER
  - EX. GENERATOR
  - EX. GAS METER
  - EX. ELECTRIC METER
  - EX. AIR CONDITIONER
  - EX. RAILROAD SIGNAL
  - EX. SIGN
  - EX. POST/BOLLARD
  - EX. FLAGPOLE
  - EX. MAILBOX
  - EX. PARKING METER
  - EX. SATELLITE DISH
  - EX. SOIL BORING
  - EX. MONITOR WELL
  - FOUND IRON
  - SET IRON
  - EX. BOULDER
  - EX. TREE STUMP
  - EX. TREE
  - EX. TREE TAG & NUMBER
  - EX. TREE LINE
  - EX. FENCE
  - EX. SANITARY SEWER
  - EX. STORM SEWER
  - EX. WATER MAIN
  - EX. ELECTRIC CABLE
  - EX. COMMUNICATION
  - EX. GAS LINE
  - EX. OVERHEAD LINE



**UTILITY NOTE:**  
 GAS MAIN AND WATER MAIN ARE SHOWN ON SURVEY AS DIGITIZED FROM UTILITY MAP. LOCATION OF LINES ARE APPROXIMATE AND HAVE NOT BEEN VERIFIED IN THE FIELD.

**NOTICE:**  
 CONSTRUCTION SITE SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR NEITHER THE OWNER NOR THE ENGINEER SHALL BE EXPECTED TO ASSUME ANY RESPONSIBILITY FOR SAFETY OF THE WORK, OF PERSONS ENGAGED IN THE WORK, OF ANY NEARBY STRUCTURES, OR OF ANY OTHER PERSONS.

**NOTE:**  
 THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AS DISCLOSED BY AVAILABLE UTILITY COMPANY RECORDS AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE COMPANY. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. THE CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER IMMEDIATELY IF A CONFLICT IS APPARENT.

**COMMERCIAL**  
 SITE PLANNING  
 SITE ENGINEERING  
 INDUSTRIAL & MULTI-UNIT  
 LAND SURVEYING  
 CONSTRUCTION LAYOUT

**SURVEYING**  
 ALTA SURVEYS  
 BOUNDARY SURVEYS  
 TOPOGRAPHIC SURVEYS  
 PARCEL SPLITS

**RESIDENTIAL**  
 SUBDIVISIONS  
 SITE CONDOMINIUM  
 MULTI-FAMILY  
 LOT PLANS  
 CONSTRUCTION LAYOUT

**ALPINE ENGINEERING INC.**  
 CIVIL ENGINEERS & LAND SURVEYORS

46892 WEST ROAD  
 SUITE 109  
 NOVI, MICHIGAN 48377

(248) 926-3701 (BUS)  
 (248) 926-3765 (FAX)  
 WWW.ALPINE-INC.NET

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

CLIENT: HUNTER PASTEUR, NORTHVILLE, LLC

**TOPOGRAPHIC SURVEY (SW)**

SECTION: 3

TOWNSHIP: 15  
 CITY OF NORTHVILLE  
 WAYNE COUNTY  
 MICHIGAN

RANGE: 8E

REVISED

4/29/19 ADDED UTILITIES

3/13/23 REVISED BOUNDARY

DATE: 7-3-18

DRAWN BY: JRV

CHECKED BY: JDH

FBK: 340

CHF: MJ

SCALE: HOR 1" = 50 FT.  
 VER 1" = 10 FT.

5

17-549



Tag #	Dia. (inches)	Common Name	Condition
701	9	Cottonwood	Poor
702	11	Cottonwood	Good
703	12	Black Locust	Good
704	7, 8	Cottonwood	Good
705	8	Cottonwood	Good
706	10	Maple	Good
707	60	Black Locust	Poor, Stump
708	8, 7	Black Locust	Good
709	6, 8, 8	Black Locust	Good
710	9, 12	Black Locust	Good
711	8	Black Locust	Good
712	10	Box Elder	Good
713	10	Black Locust	Good
714	7, 8, 11	Black Locust	Good
715	10	Black Locust	Good
716	8	Black Locust	Good
717	7, 8	Black Locust	Good
718	6, 14	Black Locust	Good
719	10	Tree of Heaven	Good
720	9	Tree of Heaven	Good
721	9	Tree of Heaven	Good
722	10	Tree of Heaven	Good
723	8	Black Locust	Good
724	8	Black Locust	Good
725	9	Black Locust	Good
726	13	Pear	Good
727	11	Pear	Good
728	10	Pear	Good
729	11	Pear	Good
730	9	Pear	Good
731	11	Pear	Good
732	10	Pear	Good
733	14	Blue Spruce	Good
734	11	Blue Spruce	Good
735	9	Blue Spruce	Good
736	8, 9	Black Locust	Good
737	8	Black Locust	Good
738	9	Black Locust	Good
739	9	Black Locust	Good
740	6, 7, 12	Black Locust	Good
741	8	Black Locust	Good
742	17	Tree of Heaven	Good
743	8	Black Locust	Good
744	10	Black Locust	Good
745	8	Black Locust	Good
746	11	Black Locust	Good
747	9	Black Locust	Good
748	6, 10	Black Locust	Good
749	9	Black Locust	Good
750	8	Black Locust	Good
751	8	Black Locust	Good
752	18	Tree of Heaven	Good
753	6, 11, 14	Black Locust	Good
754	6, 11	Black Locust	Good
755	17	Black Locust	Good
756	24	Black Locust	Good
757	9, 11	Black Locust	Good
758	9	Black Locust	Good
759	14	Ash	Good
760	10	Black Locust	Good
761	9	Norway Maple	Good
762	13	Norway Maple	Good
763	14	Ash	Good
764	20	Ash	Good
765	24	Walnut	Good
766	8	Norway Maple	Good
767	11	Catalpa	Good

Tag #	Dia. (inches)	Common Name	Condition
768	11, 14	Walnut	Good
769	11	Blue Spruce	Good
770	16	Blue Spruce	Good
771	9	Black Locust	Fair
772	7	Black Locust	Good
773	4, 5, 6	Cedar	Good
774	3, 5, 5, 7	Cedar	Good
775	7, 7	Cedar	Good
776	7, 7	Cedar	Good
777	7, 8	Cedar	Good
778	11	Apple	Fair
779	4, 7	Cedar	Good
780	6, 6	Cedar	Good
781	7, 8	Cedar	Good
782	17, 18	Box Elder	Fair
783	6, 6	Cedar	Good
784	19	Black Locust	Good
785	7	Cedar	Good
786	14	Box Elder	Fair
787	11	Box Elder	Fair
788	10	Black Locust	Good
789	15	Black Locust	Good
790	17	Box Elder	Good
791	16	Box Elder	Fair
792	13	Oak	Good
793	8, 11	Apple	Good
794	5, 8, 9	Apple	Fair
795	7	Cedar	Good
796	12	Cedar	Good
797	9	Cedar	Good
798	15	Box Elder	Fair
799	9	Maple	Good
800	13	Box Elder	Poor
801	7	Box Elder	Poor
802	12	Box Elder	Poor
803	6, 7	Cedar	Good
804	9	Cedar	Good
805	34	Black Locust	Good
806	17	Ash	Fair
807	9	Scotch Pine	Fair
808	21	Ash	Good
809	11	Scotch Pine	Fair
810	15	Ash	Good
811	27	Ash	Good
812	9	Scotch Pine	Poor
813	17	Ash	Good
814	14	Maple	Good
815	13	Scotch Pine	Poor
816	18	Maple	Good
817	20	Maple	Good
818	14	Scotch Pine	Poor
819	14, 22	Maple	Good
820	12	Maple	Good
821	19	Maple	Good
822	11	Scotch Pine	Fair
823	8, 12	Maple	Good
824	17	Scotch Pine	Good
825	23	Maple	Good
826	21	Maple	Good
827	18	Maple	Good
828	7	Scotch Pine	Fair
829	16	Maple	Good
830	14	Maple	Poor
831	21	Maple	Good
832	14	Scotch Pine	Good
833	16	Scotch Pine	Fair
834	11	Apple	Poor, Dead

Tag #	Dia. (inches)	Common Name	Condition
835	8	Blue Spruce	Good
836	12	Locust	Good
837	10	Cedar	Good
838	11	Cedar	Good
839	10	Cedar	Good
840	9	Cedar	Good
841	9	Cedar	Good
842	10	Cedar	Good
843	10	Cedar	Good
844	10	Cedar	Good
845	12	Cedar	Good
846	10	Cedar	Good
847	11	Cedar	Good
848	7	Cedar	Good
849	13	Cedar	Good
850	12	Cedar	Good
851	12	Cedar	Good
852	13	Cedar	Good
853	11	Cedar	Good
854	12	Cedar	Good
855	11	Cedar	Good
856	10	Cedar	Good
857	11	Cedar	Good
858	10	Cedar	Good
860	13	Cedar	Good
861	11	Cedar	Good
862	6	Tree of Heaven	Good
863	6, 7	Black Locust	Good
864		Catalpa	Good
865	6	Cottonwood	Good
866	7	Black Locust	Good
867	6	Cottonwood	Good
868	6	Cottonwood	Good
869	8	Cottonwood	Good
870	7	Cottonwood	Good
871	8	Cottonwood	Good
872	8	Cottonwood	Good
873	5, 8	Cottonwood	Good
874	6	Cottonwood	Good
875	4, 4, 5, 5, 6	Cottonwood	Good
876	6, 4	Cottonwood	Good
877	7	Black Locust	Good
878	8	Black Locust	Good
879	6	Box Elder	Good
880	5, 7, 10	Black Locust	Good
881	8	Black Locust	Good
882	17	Black Locust	Good
883	8	Tree of Heaven	Good
884	23	Black Locust	Good
885	4, 7, 8	Box Elder	Good
886	6, 6, 6	Box Elder	Good
887	6	Box Elder	Good
888	7	Tree of Heaven	Good
889	6	Tree of Heaven	Good
890	7	Tree of Heaven	Good
891	5, 6, 7	Tree of Heaven	Good
892	7	Box Elder	Good
893	6, 6	Elm	Good
894	6, 7	Black Locust	Good
895	6	Black Locust	Good
896	7, 7	Black Locust	Good
897	8	Black Locust	Good
898	6, 7, 8	Black Locust	Good
899	7	Pear	Good
900	7	Black Locust	Good
901	7, 7	Maple	Good
902	6	Black Locust	Good

Tag #	Dia. (inches)	Common Name	Condition
903	6	Black Locust	Good
904	7	Black Locust	Good
905	8	Tree of Heaven	Good
906	5, 6, 7	Black Locust	Good
907	7	Tree of Heaven	Good
908	8	Box Elder	Good
909	18	Locust	Good
910	11	Pear	Good
911	11	Pear	Good
912	9	Pear	Good
913	9	Box Elder	Good
914	4, 7	Black Locust	Good
915	6, 7	Maple	Good
916	7, 5	Maple	Good
917	5, 6, 5, 4	Maple	Good
918	7	Maple	Good
919	7	Ash	Good
920	6	Cedar	Good
921	5, 6	Cedar	Good
922	6	Cedar	Good
923	8	Cedar	Good
924	5, 6	Cedar	Good
925	7	Cedar	Good
2401	31	Maple	Good
2402	10	Walnut	Good
2403	48	Walnut	Good
2404	18	Box Elder	Good
2405	11, 20	Elm	Good
2406			Not Used
2407	12	Elm	Good
2408	16	Maple	Good
2409	28	Ash	Fair
2410	10, 20	Locust	Good
2411	9, 14	Locust	Fair
2412	6, 8, 10, 10, 13	Locust	Fair
2413	8, 8, 10, 10, 14	Locust	Fair
2414	15	Black Locust	Good
2415	32	Maple, no tag	Good
2416	12	Blue Spruce	Good
2417	40	Black Locust	Good
2418	11	Tree of Heaven	Good
2419	13	Tree of Heaven	Fair
2420	12	Black Locust	Good
2421	12	Black Locust	Good
2422	22	Catalpa	Good
2423	41	Maple	Good
2424	15	Norway Maple	Good
2425	14	Cedar	Good
2426	15	Norway Maple	Fair
2427	13	Cedar	Good
2428	15	Maple	Good
2429	12	Cedar	Good
2430	18	Maple	Good
2431	12	Norway Maple	Good
2432	15	Locust	Good
2433	13	Box Elder	Good
2434	27	Box Elder	Good
2435	12	Box Elder	Good
2436			Not Used
2437	10	Box Elder	Good
2438	37	Black Locust	Good
2439	17, 20, 21	Cottonwood	Good
2440	9, 10, 13	Cottonwood	Good
2441	9	Box Elder	Poor
2442	19	Blue Spruce	Good
2443	14	Maple	Good
2444	14	Maple	Good
2445	14	Maple	Good
2446	14	Maple	Good
2447	12	Norway Maple	Good

TREES  
REMOVED  
166  
TREES SAVED  
105

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CONSTRUCTION LAYOUT

**811**  
Know what's below  
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HUNTER PASTEUR, NORTHVILLE, LLC

TREE TAG LIST

SECTION: 3

NORTHVILLE DOWNS  
TOWNSHIP: 15  
CITY OF NORTHVILLE  
WAYNE COUNTY  
MICHIGAN

RANGE: BE

DATE: 1-19-22

DRAWN BY: JRV

CHECKED BY: JDH

FBK: 393

CHF: RDF

SCALE: HOR 1" = 40 FT.  
VER 1" = 4 FT.

6

17-549







**DESCRIPTIONS:**

**OVERALL PARCEL:**

PART OF LOT 72, ALL OF LOTS 73-78, PART OF LOT 79, ALL OF LOTS 80-81, AND PART OF LOT 82 OF "ASSESSOR'S NORTHVILLE PLAT NO. 1", AS RECORDED IN LIBER 66 OF PLATS, PAGE 45, WAYNE COUNTY RECORDS; ALSO PART OF LOT 171 AND ALL OF LOTS 172-196 AND PART OF LOT 197 OF "ASSESSOR'S NORTHVILLE PLAT NO. 2", AS RECORDED IN LIBER 66 OF PLATS, PAGE 44, WAYNE COUNTY RECORDS; ALSO ALL OF THAT PART VACATED CHURCH STREET AND VACATED BEAL AVENUE AS VACATED PER RESOLUTION RECORDED IN LIBER 20023, PAGE 101, WAYNE COUNTY RECORDS;

ALL OF THE AFOREMENTIONED BEING MORE PARTICULARLY DESCRIBED AS: COMMENCING AT THE NORTHWEST CORNER OF LOT 168 OF SAID "ASSESSOR'S NORTHVILLE PLAT NO.2"; THENCE N84°53'43"E 174.61 FEET ALONG THE SOUTH LINE OF CADY STREET (50 FEET WIDE) TO THE NORTHWEST CORNER OF LOT 171 OF SAID "ASSESSOR'S NORTHVILLE PLAT NO. 2" FOR A POINT OF BEGINNING; THENCE ALONG THE SOUTH LINE OF SAID CADY STREET THE FOLLOWING THREE (3) COURSES; 1) N84°53'43"E 682.35 FEET, 2) N79°20'27"E 42.12 FEET, AND 3) N85°47'04"E 218.30 FEET; THENCE ALONG THE WESTERLY LINE OF GRISWOLD STREET (VARIABLE WIDTH) THE FOLLOWING FIVE (5) COURSES; 1) S02°52'19"E 193.33 FEET, 2) S86°05'20"W 3.01 FEET, 3) S04°23'26"E 133.89 FEET, 4) N85°43'59"E 15.98 FEET, AND 5) S04°24'37"E 129.36 FEET; THENCE N84°12'51"W 100.00 FEET ALONG THE NORTH LINE OF BEAL AVENUE (50 FEET WIDE); THENCE S05°47'09"W 50.00 FEET ALONG THE EASTERLY LINE OF THAT PORTION OF VACATED BEAL AVENUE PER RESOLUTION RECORDED IN LIBER 20023, PAGE 101, WAYNE COUNTY RECORDS; THENCE S84°12'51"E 289.65 FEET ALONG THE SOUTH LINE OF SAID BEAL AVENUE; THENCE ALONG THE WEST LINE OF RIVER STREET THE FOLLOWING THREE (3) COURSES; 1) S09°44'28"E 227.57 FEET, 2) S15°01'28"E 427.16 FEET, AND 3) S15°34'36"E 462.92 FEET; THENCE S85°45'58"W 238.48 FEET; THENCE N89°00'21"W 563.09 FEET; THENCE N43°05'04"W 95.18 FEET; THENCE ALONG THE SOUTH LINE OF SAID LOT 183 THE FOLLOWING FOUR (4) COURSES; 1) S78°36'11"W 254.94 FEET, 2) S78°39'12"W 117.60 FEET, 3) N77°44'48"W 142.02 FEET, AND 4) N57°47'56"W 135.76 FEET; THENCE N05°05'49"W 578.08 FEET ALONG THE EAST LINE OF CENTER STREET (60 FEET WIDE); THENCE N05°12'42"W 537.43 FEET CONTINUING ALONG THE EAST LINE OF SAID CENTER STREET; THENCE N84°59'05"E 130.92 FEET ALONG THE SOUTH LINE OF LOT 164 OF SAID "ASSESSOR'S NORTHVILLE PLAT NO. 2"; THENCE N04°02'34"W 178.19 FEET ALONG THE WEST LINE OF SAID LOT 174; THENCE N84°20'38"E 63.77 FEET ALONG THE SOUTH LINE OF LOTS 170 AND 171 OF SAID "ASSESSOR'S NORTHVILLE PLAT NO. 2"; THENCE N05°05'12"W 114.16 FEET; THENCE S84°53'43"W 24.00 FEET; THENCE N05°05'12"W 12.00 FEET ALONG THE WEST LINE OF SAID LOT 171 TO THE POINT OF BEGINNING.

**PARKING PARCEL:**

LOT 223, LOT 224, PART OF LOT(S) 225, 226, 227, AND 228 OF "ASSESSOR'S NORTHVILLE PLAT NO. 3", AS RECORDED IN LIBER 66 OF PLATS, PAGE 43, WAYNE COUNTY RECORDS, MORE PARTICULARLY DESCRIBED AS: BEGINNING AT THE NORTHEAST CORNER OF SAID LOT 223; THENCE S05°05'49"E 485.34 FEET ALONG THE WEST LINE OF CENTER STREET; THENCE N78°06'14"W 87.93 FEET ALONG THE NORTH LINE OF EDWARD HINES DRIVE; THENCE CONTINUING ALONG THE NORTH LINE OF SAID EDWARD HINES DRIVE, 258.72 FEET ALONG A 1842.59 FOOT CURVE TO THE RIGHT, SAID CURVE HAVING A CENTRAL ANGLE OF 08°02'42", AND A CHORD WHICH BEARS N74°02'51"W 258.51 FEET; THENCE N04°38'15"W 228.14 FEET ALONG THE EAST LINE OF SOUTH WING STREET; THENCE N84°11'48"E 49.86 FEET; THENCE S04°32'04"E 29.85 FEET; THENCE N84°01'07"E 161.44 FEET ALONG THE NORTH LINE OF SAID LOT 226; THENCE N05°57'44"W 160.02 FEET ALONG THE WEST LINE OF SAID LOT 224; THENCE N82°12'58"E 115.10 FEET ALONG THE SOUTH LINE OF FAIRBROOK STREET TO THE POINT OF BEGINNING.

**VACANT PARCEL:**

LOT 219 AND LOT 220 OF "ASSESSOR'S NORTHVILLE PLAT NO. 3", AS RECORDED IN LIBER 66 OF PLATS, PAGE 43, WAYNE COUNTY RECORDS, CITY OF NORTHVILLE, WAYNE COUNTY, MICHIGAN.

**H.P. PARCEL:**

PART OF LOT 72, ALL OF LOTS 73-78, PART OF LOT 79, ALL OF LOTS 80-81, AND PART OF LOT 82 OF "ASSESSOR'S NORTHVILLE PLAT NO. 1", AS RECORDED IN LIBER 66 OF PLATS, PAGE 45, WAYNE COUNTY RECORDS; ALSO PART OF LOT 171 AND ALL OF LOTS 172-181 AND PART OF LOTS 182 AND 183 OF "ASSESSOR'S NORTHVILLE PLAT NO. 2", AS RECORDED IN LIBER 66 OF PLATS, PAGE 44, WAYNE COUNTY RECORDS, ALSO PART OF THAT PART OF VACATED CHURCH STREET AND VACATED BEAL AVENUE AS VACATED PER RESOLUTION RECORDED IN LIBER 20023, PAGE 101, WAYNE COUNTY RECORDS;

ALL OF THE AFOREMENTIONED BEING MORE PARTICULARLY DESCRIBED AS: COMMENCING AT THE NORTHWEST CORNER OF LOT 168 OF SAID "ASSESSOR'S NORTHVILLE PLAT NO. 2"; THENCE N84°53'43"E 174.61 FEET ALONG THE SOUTH LINE OF CADY STREET (50 FEET WIDE) TO THE NORTHWEST CORNER OF LOT 171 OF SAID "ASSESSOR'S NORTHVILLE PLAT NO. 2" FOR A POINT OF BEGINNING; THENCE ALONG THE SOUTH LINE OF SAID CADY STREET THE FOLLOWING THREE (3) COURSES; 1) N84°53'43"E 682.35 FEET, 2) N79°20'27"E 42.12 FEET, AND 3) N85°47'04"E 218.30 FEET; THENCE ALONG THE WESTERLY LINE OF GRISWOLD STREET (VARIABLE WIDTH) THE FOLLOWING FIVE (5) COURSES; 1) S02°52'19"E 193.33 FEET, 2) S86°05'20"W 3.01 FEET, 3) S04°23'26"E 133.89 FEET, 4) N85°43'59"E 15.98 FEET, AND 5) S04°24'37"E 129.36 FEET; THENCE N84°12'51"W 100.00 FEET ALONG THE NORTH LINE OF BEAL AVENUE (50 FEET WIDE); THENCE S05°47'09"W 50.00 FEET ALONG THE EASTERLY LINE OF THAT PORTION OF VACATED BEAL AVENUE PER RESOLUTION RECORDED IN LIBER 20023, PAGE 101, WAYNE COUNTY RECORDS, AND ITS SOUTHERLY EXTENSION; THENCE N84°12'51"W 166.13 FEET; THENCE 37.43 FEET ALONG A 200.00 FEET RADIUS CURVE TO THE LEFT, SAID CURVE HAVING A CENTRAL ANGLE OF 10°43'23" AND A CHORD WHICH BEARS N89°34'32"W 37.38 FEET; THENCE N05°12'42"W 809.59 FEET; THENCE N05°12'42"W 147.93 FEET ALONG THE EAST LINE OF CENTER STREET (50 FEET WIDE); THENCE N84°59'05"E 130.92 FEET ALONG THE SOUTH LINE OF LOT 164 OF SAID "ASSESSOR'S NORTHVILLE PLAT NO. 2"; THENCE N04°02'34"W 178.19 FEET ALONG THE WEST LINE OF SAID LOT 174; THENCE N84°20'38"E 63.77 FEET ALONG THE SOUTH LINE OF LOTS 170 & 171 OF SAID "ASSESSOR'S NORTHVILLE PLAT NO. 2"; THENCE N05°05'12"W 114.16 FEET; THENCE S84°53'43"W 24.00 FEET; THENCE N05°05'12"W 12.00 FEET ALONG THE WEST LINE OF SAID LOT 171 TO THE POINT OF BEGINNING.

**T.B. PARCEL:**

PART OF LOTS 182, 183, 184, 192, 193, 194, 195, 196, AND 197 OF "ASSESSOR'S NORTHVILLE PLAT NO. 2", AS RECORDED IN LIBER 66 OF PLATS, PAGE 44, WAYNE COUNTY RECORDS;

ALL OF THE AFOREMENTIONED BEING MORE PARTICULARLY DESCRIBED AS: COMMENCING AT THE NORTHWEST CORNER OF LOT 168 OF SAID "ASSESSOR'S NORTHVILLE PLAT NO. 2"; THENCE S05°12'42"E 453.66 FEET ALONG THE EAST LINE OF CENTER STREET (50 FEET WIDE) TO THE POINT OF BEGINNING; THENCE N85°03'47"E 809.59 FEET; THENCE 37.43 FEET ALONG A 200.00 FEET RADIUS CURVE TO THE RIGHT, SAID CURVE HAVING A CENTRAL ANGLE OF 10°43'23" AND A CHORD WHICH BEARS S89°34'23"E 37.38 FEET; THENCE S84°12'51"E 166.13 FEET; THENCE N05°47'09"E 5.00 FEET ALONG THE SOUTHERLY EXTENSION OF THE EASTERLY LINE OF THAT PORTION OF VACATED BEAL AVENUE PER RESOLUTION RECORDED IN LIBER 20023, PAGE 101, WAYNE COUNTY RECORDS; THENCE S84°12'51"E 118.47 FEET ALONG THE SOUTH LINE OF BEAL AVENUE (50 FEET WIDE); THENCE S05°47'07"W 240.01 FEET; THENCE N84°12'51"W 197.94 FEET; THENCE S04°56'13"E 234.48 FEET; THENCE N85°03'47"E 97.11 FEET; THENCE 59.23 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 30.04 FEET, AND A CHORD BEARING N54°29'43"E 50.09 FEET; THENCE S68°59'01"E 91.46 FEET; THENCE 136.24 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 145.00 FEET, AND A CHORD BEARING S42°03'58"E 131.28 FEET; THENCE S15°08'56"E 33.33 FEET; THENCE 49.88 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 145.00 FEET, AND A CHORD BEARING S05°16'28"E 49.73 FEET; THENCE 15.15 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 48.43 FEET, AND A CHORD BEARING S11°57'12"W 15.08 FEET; THENCE 59.41 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 82.69 FEET, AND A CHORD BEARING S04°30'55"W 58.14 FEET; THENCE 75.62 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 179.78 FEET, AND A CHORD BEARING S05°57'24"E 75.06 FEET; THENCE 46.43 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 60.73 FEET, AND A CHORD BEARING S12°41'17"E 45.31 FEET; THENCE 183.34 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 239.13 FEET, AND A CHORD BEARING S12°48'12"E 178.88 FEET; THENCE S17°29'02"W 83.39 FEET; THENCE 50.00 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 39.00 FEET, AND A CHORD BEARING S54°12'42"W 46.65 FEET; THENCE N89°03'37"W 180.08 FEET; THENCE 28.30 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 65.00 FEET, AND A CHORD BEARING N76°35'17"W 28.08 FEET; THENCE 37.01 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 55.27 FEET, AND A CHORD BEARING N36°30'22"W 36.33 FEET; THENCE 36.29 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 90.49 FEET, AND A CHORD BEARING N28°57'39"W 36.05 FEET; THENCE 21.97 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 72.56 FEET, AND A CHORD BEARING N28°49'35"W 21.89 FEET; THENCE 21.30 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 50.00 FEET, AND A CHORD BEARING N07°56'45"W 21.14 FEET; THENCE N04°15'38"E 46.31 FEET; THENCE 70.80 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 55.00 FEET, AND A CHORD BEARING N41°08'17"E 66.01 FEET; THENCE N78°00'55"E 38.36 FEET; THENCE N05°31'15"W 10.22 FEET; THENCE S85°03'47"W 97.02 FEET; THENCE S04°56'13"E 72.07 FEET; THENCE 77.03 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 175.00 FEET, AND A CHORD BEARING S07°40'21"W 76.41 FEET; THENCE S20°16'56"W 8.36 FEET; THENCE 42.08 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 125.00 FEET, AND A CHORD BEARING S10°38'17"W 41.88 FEET; THENCE S00°59'39"W 30.55 FEET; THENCE N89°00'21"W 178.17 FEET; THENCE N43°05'04"W 95.18 FEET; THENCE ALONG THE SOUTH LINE OF SAID LOT 183 THE FOLLOWING FOUR (4) COURSES; 1) S78°36'11"W 254.94 FEET, 2) S78°39'12"W 117.60 FEET, 3) N77°44'48"W 142.02 FEET, AND 4) N57°47'56"W 135.76 FEET; THENCE N05°05'49"W 578.08 FEET ALONG THE EAST LINE OF CENTER STREET (60 FEET WIDE); THENCE N05°12'42"W 389.50 FEET CONTINUING ALONG THE EAST LINE OF SAID CENTER STREET TO THE POINT OF BEGINNING.

**RIVER PARK:**

LOTS 185-191, AND PART OF LOTS 183, 184, 192, 193, 194, 195, 196, AND 197 OF "ASSESSOR'S NORTHVILLE PLAT NO. 2", AS RECORDED IN LIBER 66 OF PLATS, PAGE 44, WAYNE COUNTY RECORDS;

ALL OF THE AFOREMENTIONED BEING MORE PARTICULARLY DESCRIBED AS: BEGINNING AT THE NORTHEAST CORNER OF LOT 185 OF SAID "ASSESSOR'S NORTHVILLE PLAT NO. 2", SAID POINT ALSO BEING THE INTERSECTION OF THE SOUTH LINE OF BEAL AVENUE AND THE WEST LINE OF RIVER STREET; THENCE ALONG THE WEST LINE OF RIVER STREET THE FOLLOWING THREE (3) COURSES; 1) S09°44'28"E 227.57 FEET, 2) S15°01'28"E 427.16 FEET, AND 3) S15°34'36"E 462.92 FEET; THENCE S85°45'58"W 238.48 FEET; THENCE N89°00'21"W 563.09 FEET; THENCE N05°03'47"E 30.55 FEET; THENCE 42.08 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 125.00 FEET, AND A CHORD BEARING N10°38'17"E 41.88 FEET; THENCE N20°16'56"E 8.36 FEET; THENCE 77.03 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 175.00 FEET, AND A CHORD BEARING N07°40'21"E 76.41 FEET; THENCE N04°56'13"W 72.07 FEET; THENCE N85°03'47"E 97.02 FEET; THENCE S05°31'15"E 10.22 FEET; THENCE S78°00'55"W 38.26 FEET; THENCE 70.80 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 55.00 FEET, AND A CHORD BEARING S41°08'17"W 66.01 FEET; THENCE S04°15'38"W 46.31 FEET; THENCE 21.30 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 50.00 FEET, AND A CHORD BEARING S07°56'45"E 21.14 FEET; THENCE 21.97 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 72.56 FEET, AND A CHORD BEARING S28°49'35"E 21.89 FEET; THENCE 36.29 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 90.49 FEET, AND A CHORD BEARING S28°57'39"E 36.05 FEET; THENCE 37.01 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 55.27 FEET, AND A CHORD BEARING S36°30'22"E 36.33 FEET; THENCE 28.30 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 65.00 FEET, AND A CHORD BEARING S76°35'17"E 28.08 FEET; THENCE S89°03'37"E 180.08 FEET; THENCE 50.00 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 39.00 FEET, AND A CHORD BEARING N54°12'42"E 46.65 FEET; THENCE N17°29'02"E 83.39 FEET; THENCE 183.34 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 239.13 FEET, AND A CHORD BEARING N12°48'12"W 178.88 FEET; THENCE 46.43 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 60.73 FEET, AND A CHORD BEARING N12°41'17"E 45.31 FEET; THENCE 75.62 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 179.78 FEET, AND A CHORD BEARING N05°57'24"W 75.06 FEET; THENCE 59.41 FEET ALONG A CURVE TO THE RIGHT, WITH A RADIUS OF 82.69 FEET, AND A CHORD BEARING N04°30'55"E 58.14 FEET; THENCE 15.15 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 48.43 FEET, AND A CHORD BEARING N11°57'12"E 15.08 FEET; THENCE 49.88 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 145.00 FEET, AND A CHORD BEARING N05°16'28"W 49.73 FEET; THENCE N15°08'56"W 33.33 FEET; THENCE 136.24 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 145.00 FEET, AND A CHORD BEARING N42°03'58"W 131.28 FEET; THENCE N68°59'01"W 91.46 FEET; THENCE 59.23 FEET ALONG A CURVE TO THE LEFT, WITH A RADIUS OF 30.04 FEET, AND A CHORD BEARING S54°29'43"W 50.09 FEET; THENCE S85°03'47"W 97.11 FEET; THENCE N04°56'13"W 234.48 FEET; THENCE S84°12'53"E 197.94 FEET; THENCE N05°47'07"E 240.01 FEET; THENCE S84°12'51"E 171.18 FEET ALONG THE SOUTH LINE OF SAID BEAL AVENUE TO THE POINT OF BEGINNING.

**DESCRIPTIONS:**

**CENTRAL PARK:**

PART OF LOTS 176, 177, 180, 181, AND 182 OF "ASSESSOR'S NORTHVILLE PLAT NO. 2", AS RECORDED IN LIBER 66 OF PLATS, PAGE 44, WAYNE COUNTY RECORDS;

ALL OF THE AFOREMENTIONED BEING MORE PARTICULARLY DESCRIBED AS: COMMENCING AT THE NORTHWEST CORNER OF LOT 168 OF SAID "ASSESSOR'S NORTHVILLE PLAT NO.2"; THENCE N84°53'43"E 592.92 FEET ALONG THE SOUTH LINE OF CADY STREET (50 FEET WIDE) TO THE POINT OF BEGINNING; THENCE N84°53'43"E 125.00 FEET, CONTINUING ALONG THE SOUTH LINE OF SAID CADY STREET; THENCE S05°07'02"E 395.75 FEET; THENCE S85°03'47"W 125.00 FEET; THENCE N05°07'02"W 395.39 FEET TO THE POINT OF BEGINNING.

**GATEWAY EAST:**

PART OF LOT 183 OF "ASSESSOR'S NORTHVILLE PLAT NO. 2", AS RECORDED IN LIBER 66 OF PLATS, PAGE 44, WAYNE COUNTY RECORDS, DESCRIBED AS:

BEGINNING AT THE SOUTHWEST CORNER OF SAID LOT 183; THENCE N05°05'49"W 107.57 FEET ALONG THE EAST LINE OF CENTER STREET (60 FEET WIDE); THENCE N85°03'47"E 62.58 FEET; THENCE S45°15'29"E 36.23 FEET; THENCE S04°56'13"E 82.15 FEET; THENCE S57°47'56"E 66.10 FEET; THENCE S32°12'04"W 50.00 FEET; THENCE N57°47'56"W 135.76 FEET ALONG THE SOUTH LINE OF SAID LOT 183 TO THE POINT OF BEGINNING.

**GATEWAY WEST:**

PART OF LOT 228 OF "ASSESSOR'S NORTHVILLE PLAT NO. 3", AS RECORDED IN LIBER 66 OF PLATS, PAGE 43, WAYNE COUNTY RECORDS, MORE PARTICULARLY DESCRIBED AS: BEGINNING AT THE SOUTHEAST CORNER OF SAID LOT 228; THENCE N78°06'14"W 87.93 FEET ALONG THE NORTH LINE OF EDWARD HINES DRIVE; THENCE CONTINUING ALONG THE NORTH LINE OF SAID EDWARD HINES DRIVE 158.43 FEET ALONG A 1842.59 FOOT RADIUS CURVE TO THE RIGHT, WITH A CENTRAL ANGLE OF 04°55'35", AND A CHORD BEARING N75°36'25"W 158.38 FEET; THENCE N16°51'22"E 21.79 FEET; THENCE S73°08'38"E 14.41 FEET; THENCE S69°45'50"E 42.98 FEET; THENCE S81°36'51"E 25.75 FEET; THENCE N84°53'24"E 84.79 FEET; THENCE N05°05'49"W 58.96 FEET; THENCE N84°54'12"E 63.20 FEET; THENCE S05°05'49"E 127.94 FEET ALONG THE WEST LINE OF CENTER STREET (60 FEET WIDE) TO THE POINT OF BEGINNING.

**COMMERCIAL**  
SITE PLANNING  
SITE ENGINEERING  
INDUSTRIAL & MULTI-UNIT  
LAND SURVEYING  
CONSTRUCTION LAYOUT

**SURVEYING**  
ALTA SURVEYS  
BOUNDARY SURVEYS  
TOPOGRAPHIC SURVEYS  
PARCEL SPLITS

**RESIDENTIAL**  
SUBDIVISIONS  
SITE CONDOMINIUM  
MULTI-FAMILY  
PLOT PLANS  
CONSTRUCTION LAYOUT

**ALPINE ENGINEERING, INC.**  
CIVIL ENGINEERS & LAND SURVEYORS

46892 WEST ROAD  
SUITE 109  
NOVI, MICHIGAN 48377

(248) 928-3701 (BUS)  
(248) 928-3765 (FAX)  
WWW.ALPINE-INC.NET

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

CLIENT: HUNTER PASTEUR HOMES

**BOUNDARY SURVEY**

SECTION: 3

TOWNSHIP: 1S

VILLAGE OF NORTHVILLE  
WAYNE COUNTY  
MICHIGAN

RANGE: 8E

REVISED

DATE: 9-5-23

DRAWN BY: JDH

CHECKED BY: GLM

FBK:

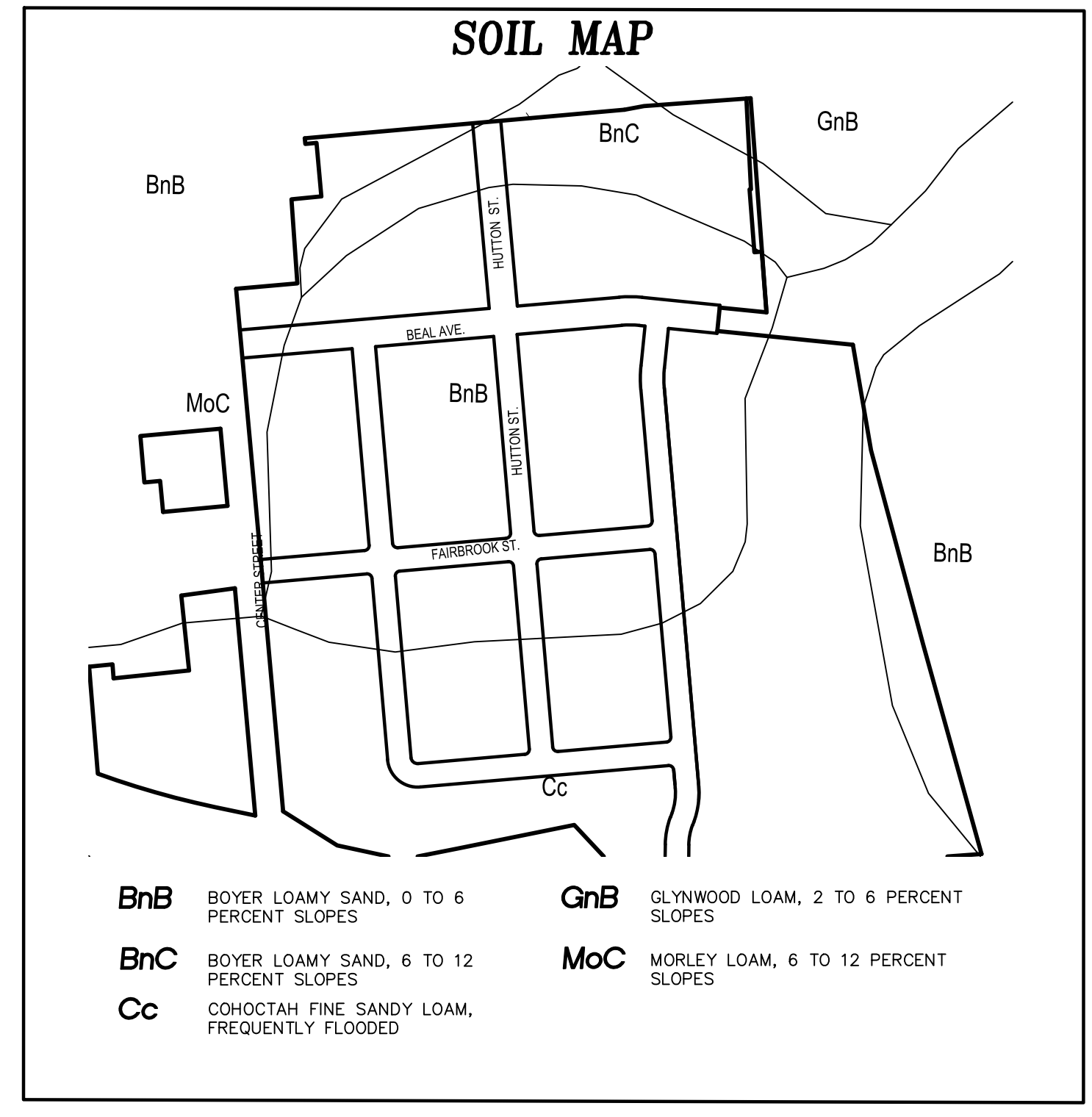
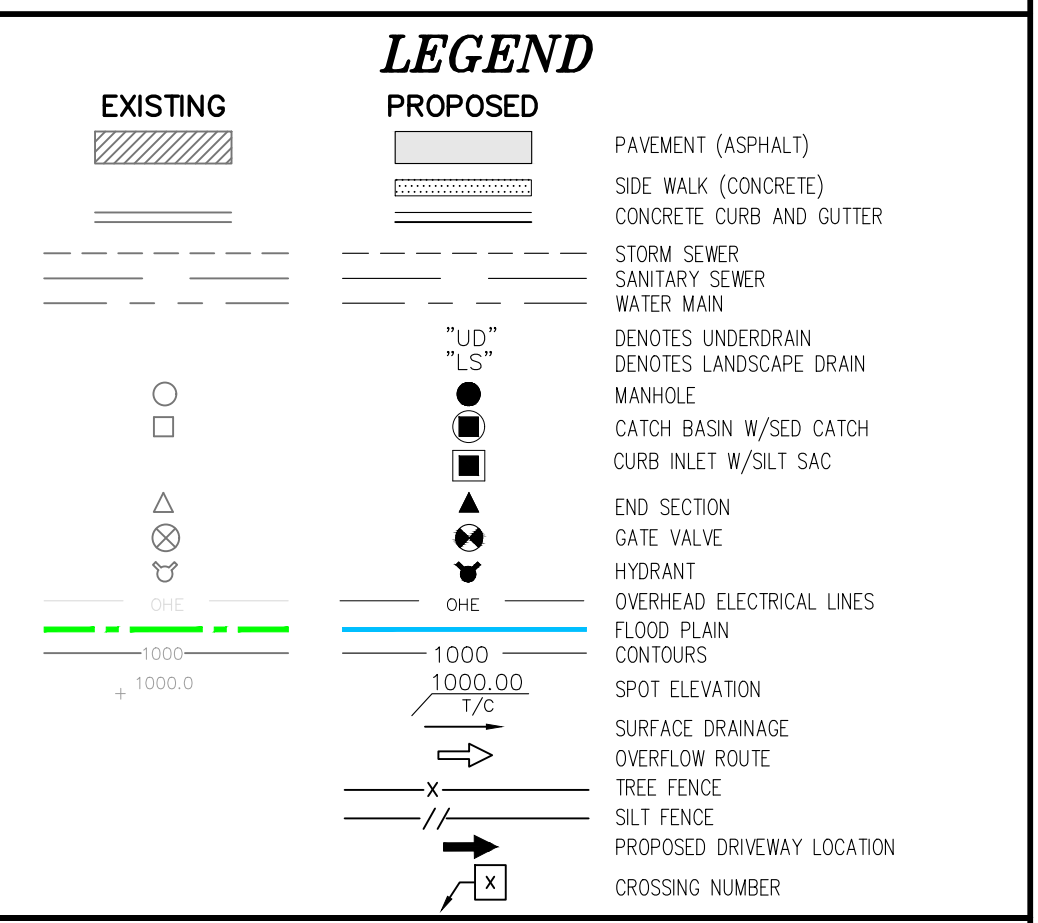
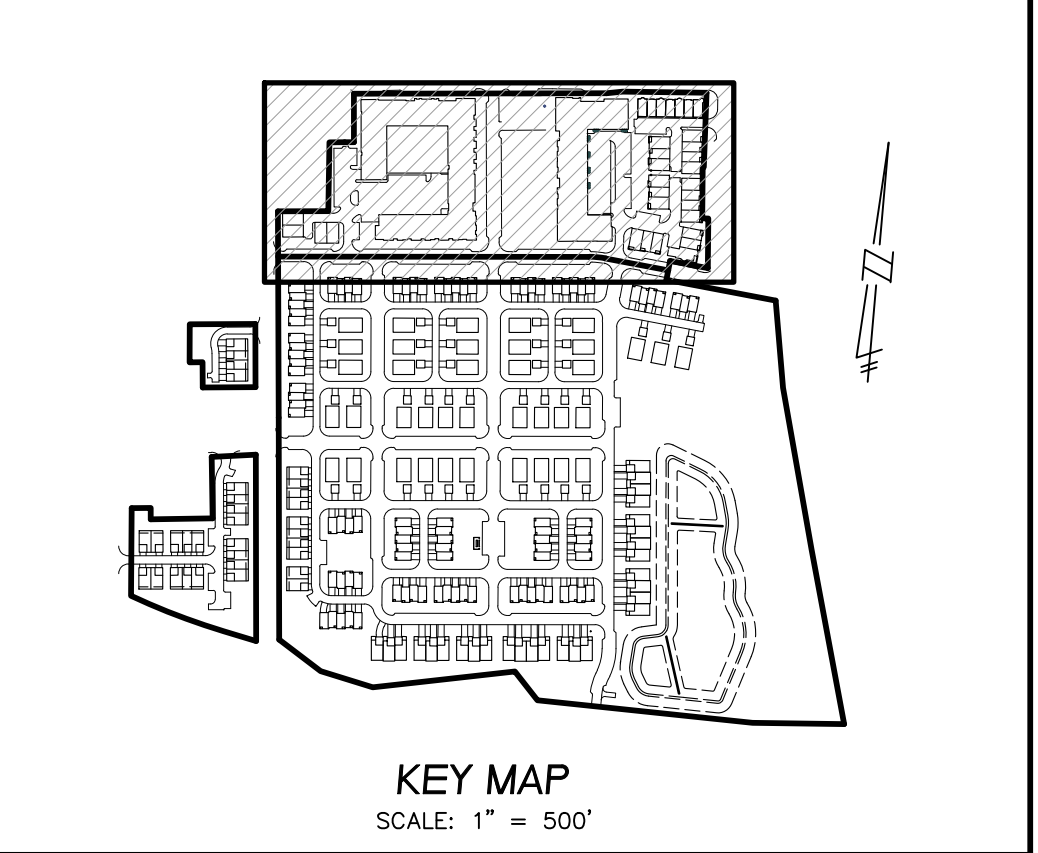
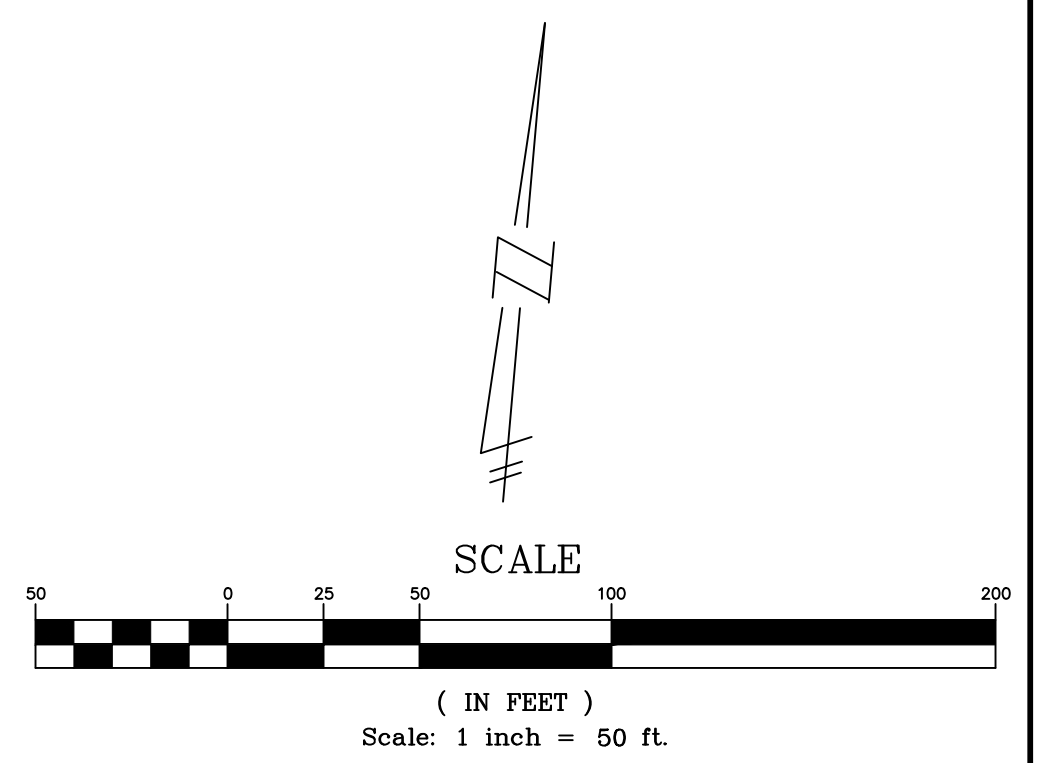
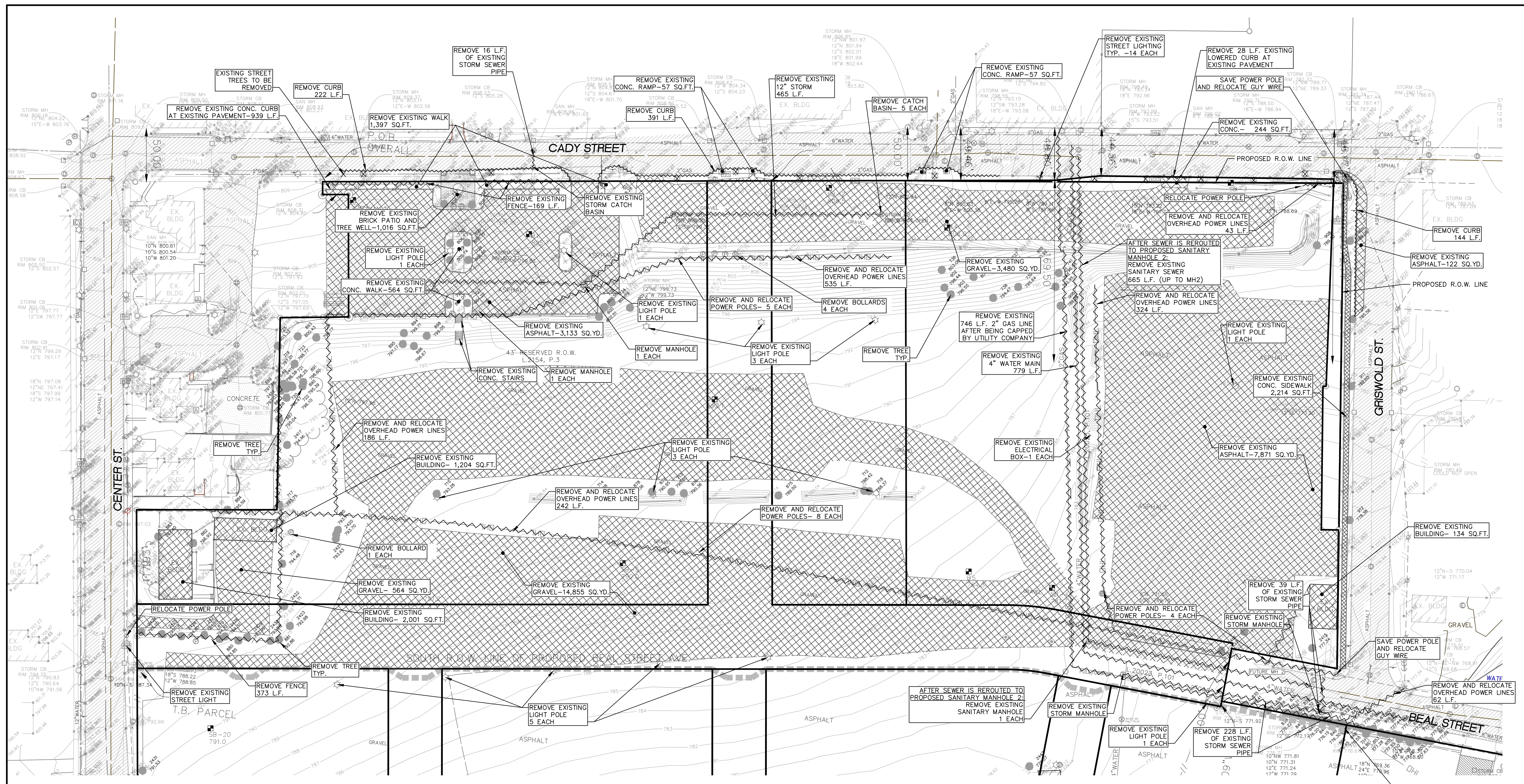
CHP: MJ

SCALE: HOR 1"=80 FT.  
VER 1"=8 FT.

**6B**

17-549





**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	100% SCHEMATIC DESIGN	06-10-2022
2.	50% DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.



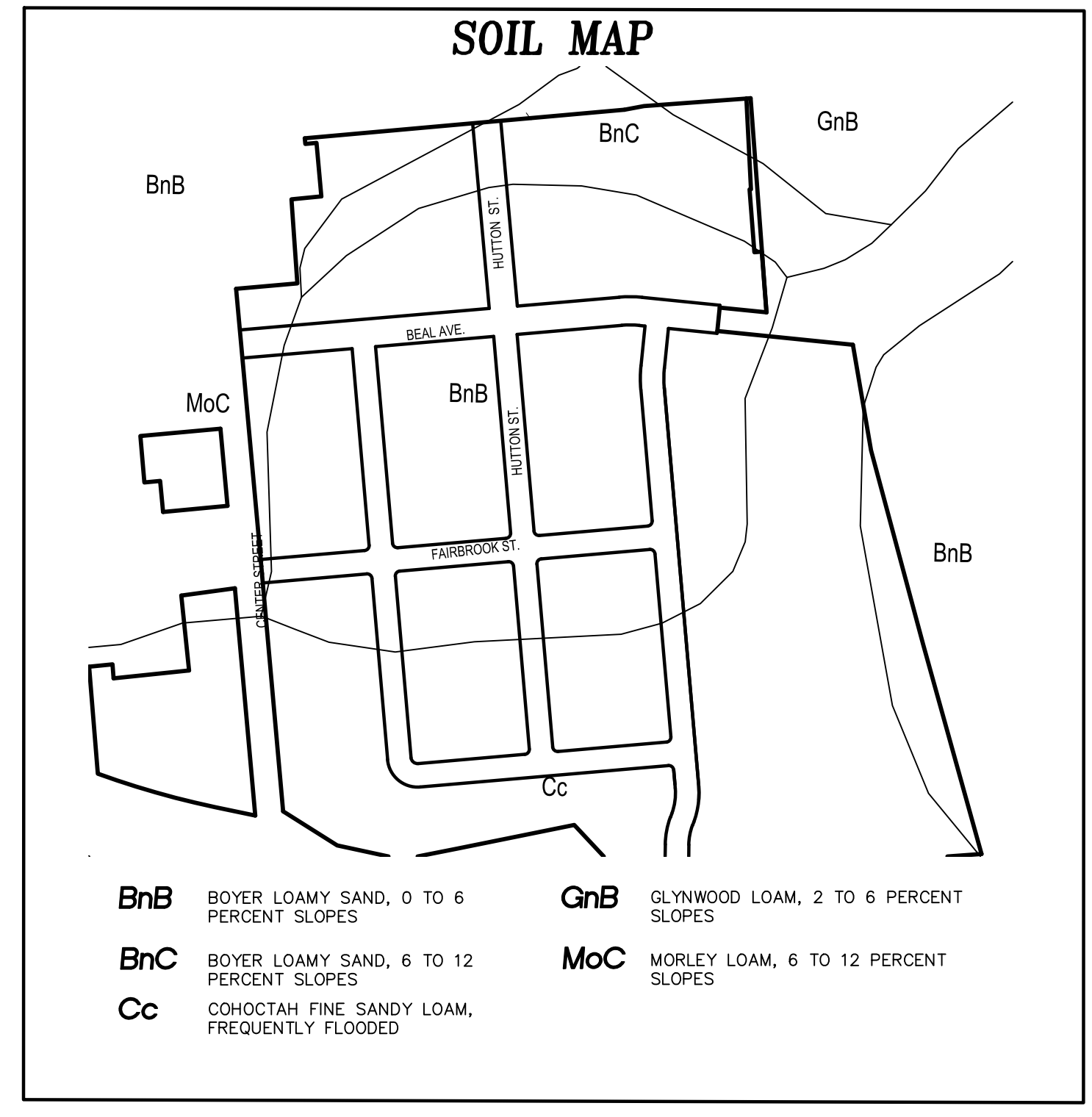
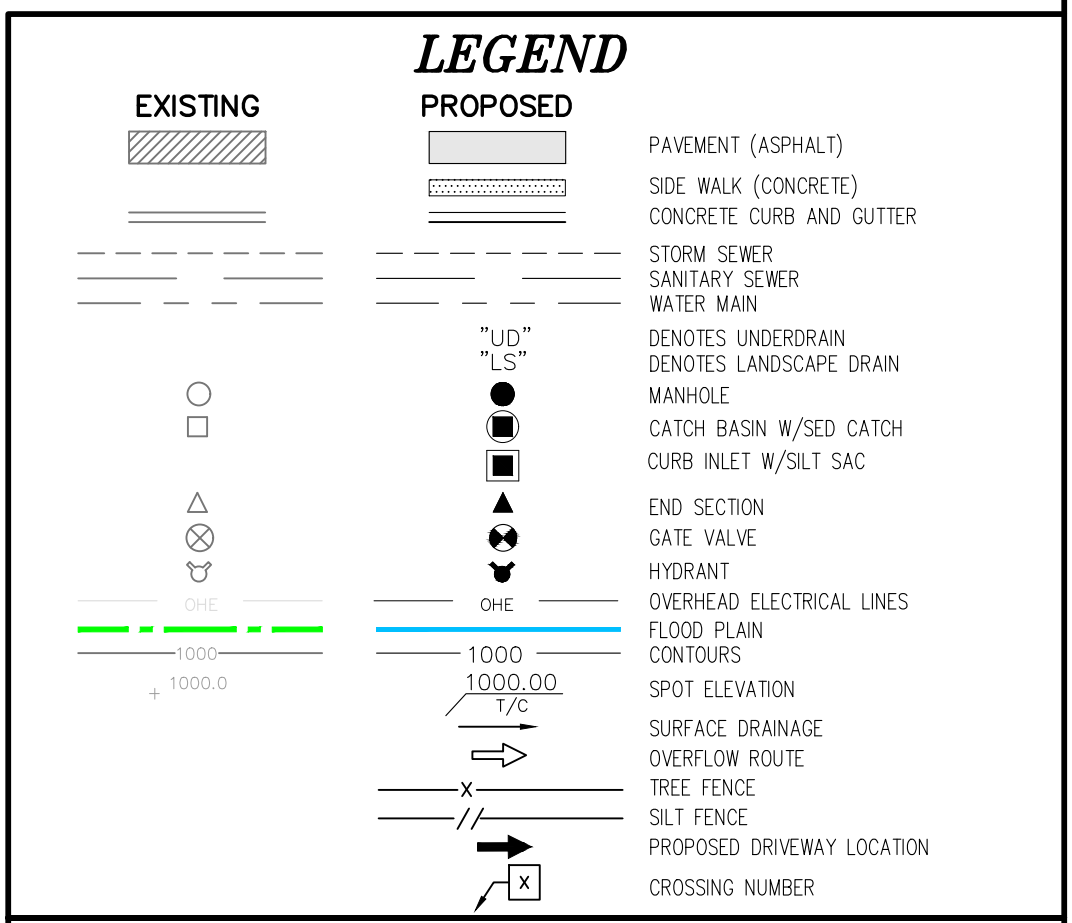
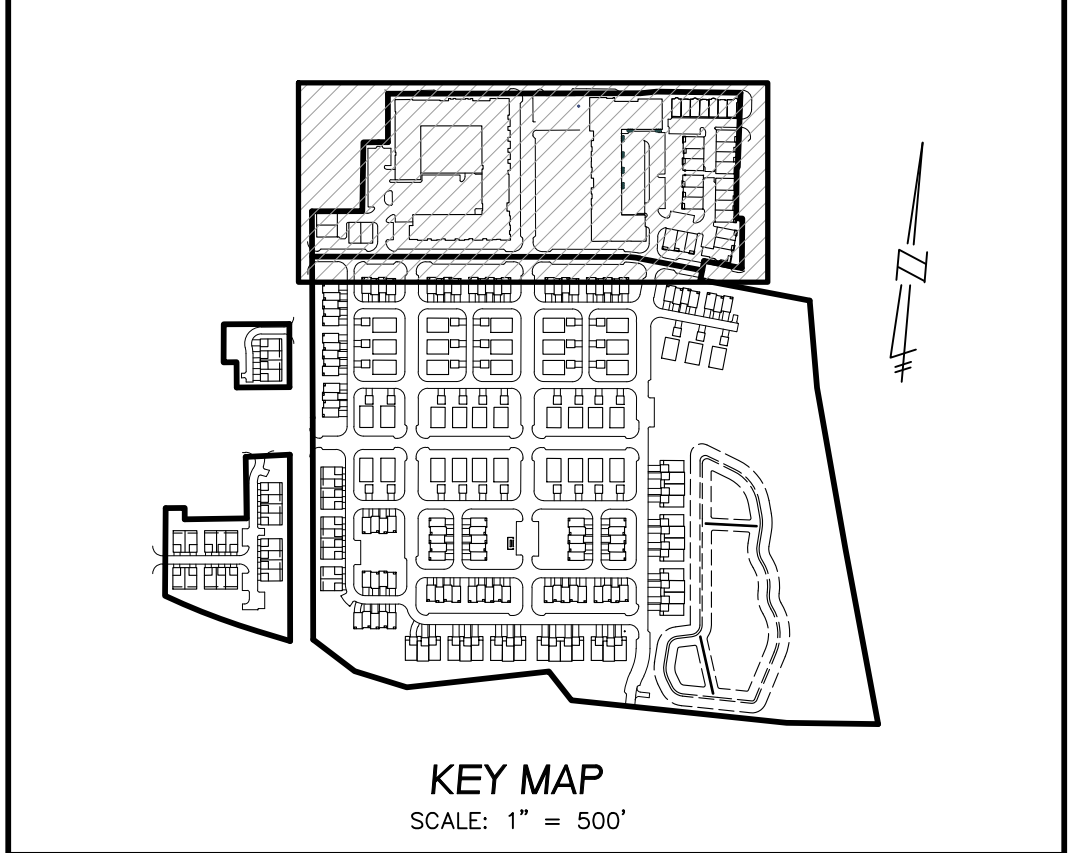
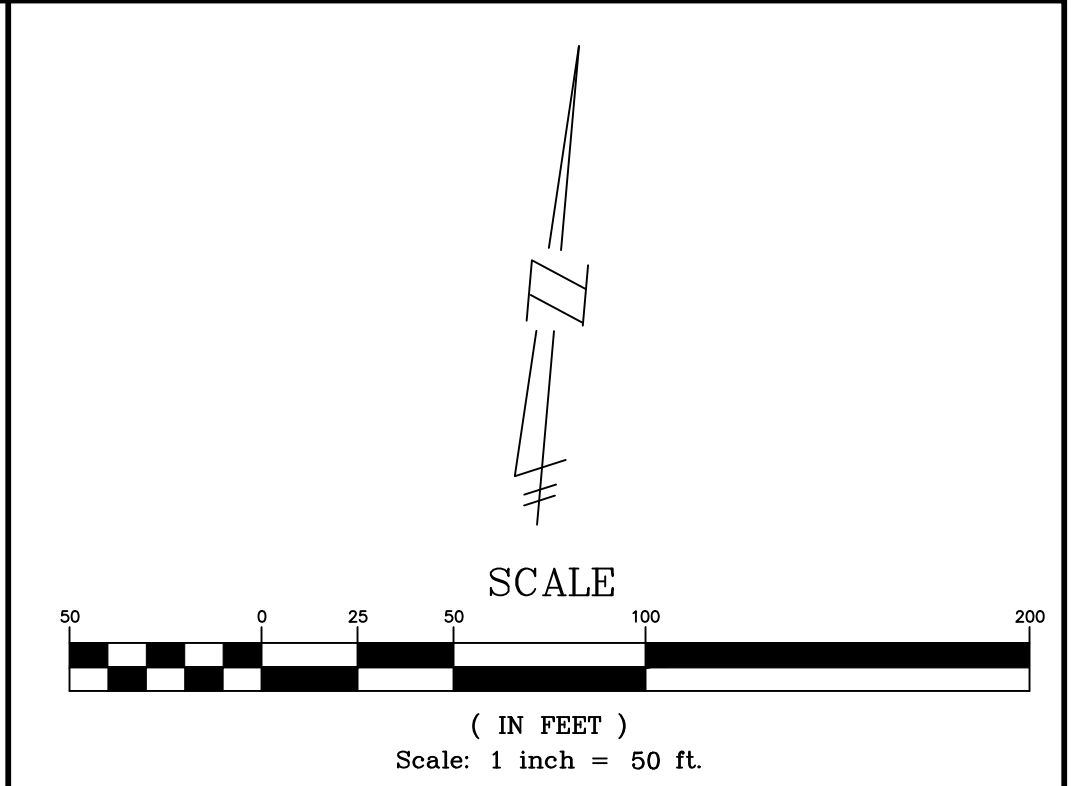
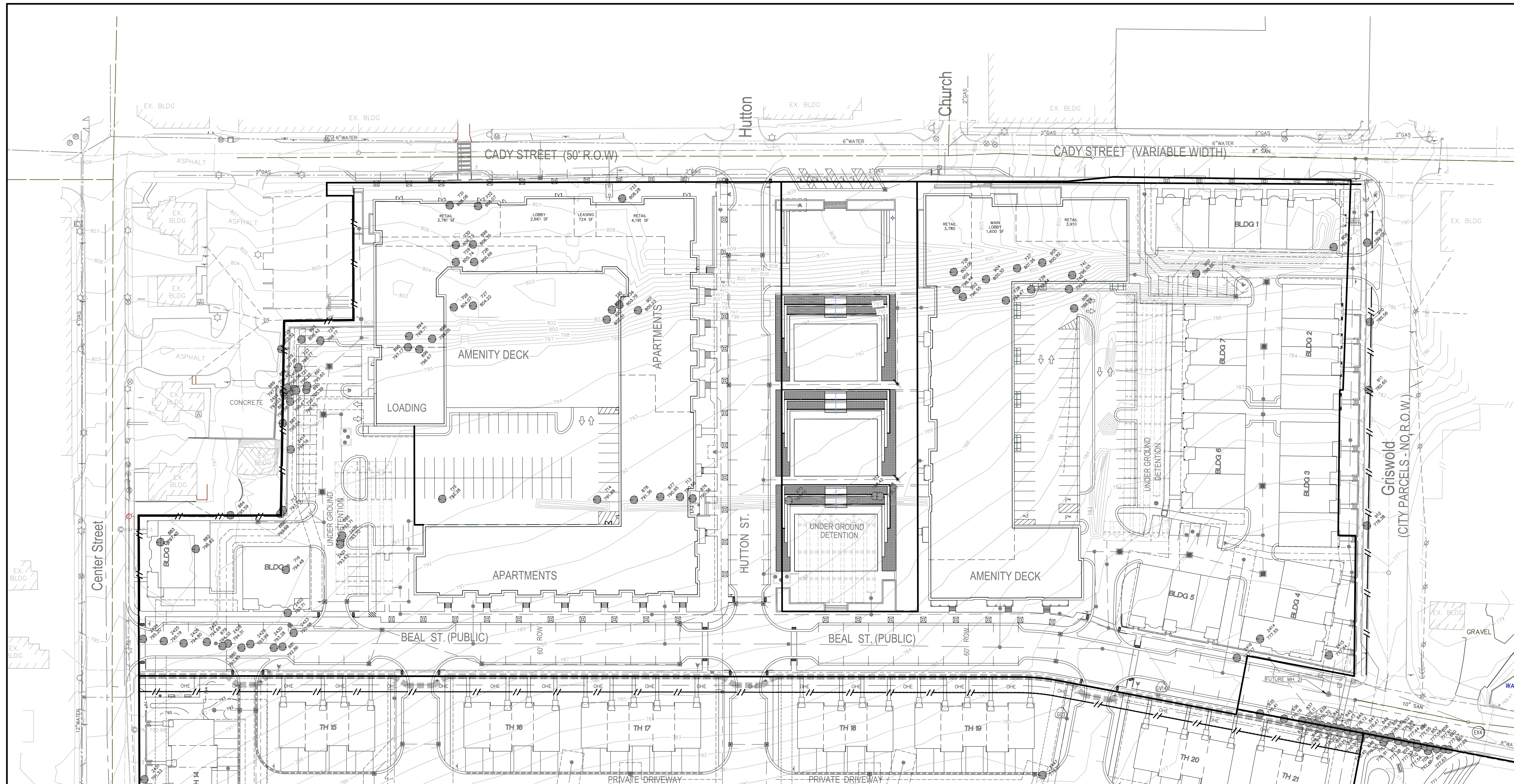
DATE: 04-25-23 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: E.E. FILE: 21001-DEM0-FSP-PH1.DWG

**DEMOLITION PLAN**

**SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

**SHEET**  
7





**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	100% SCHEMATIC DESIGN	06-10-2022
2.	50% DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.



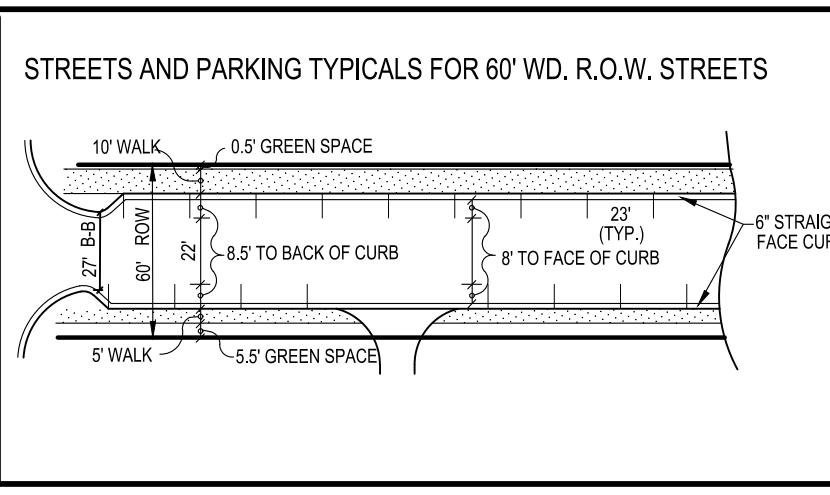
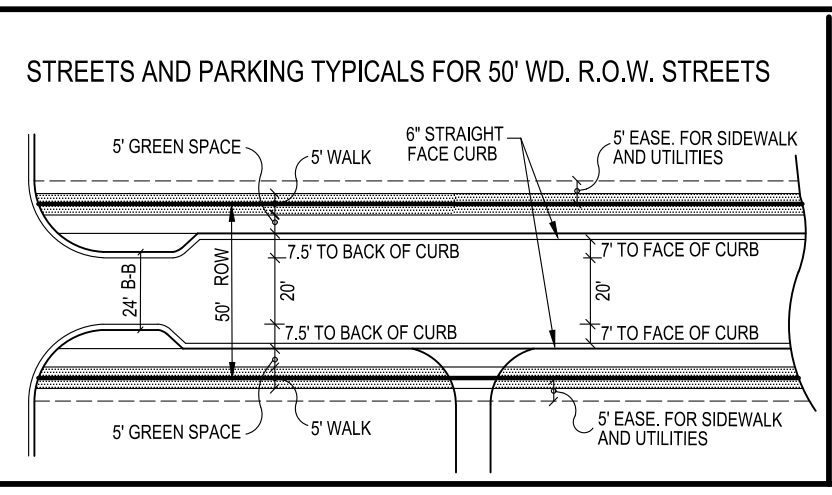
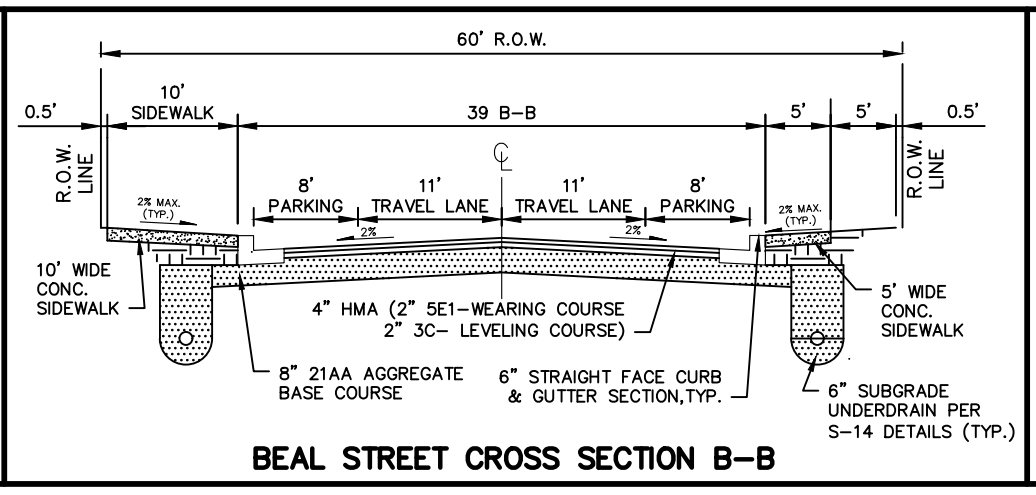
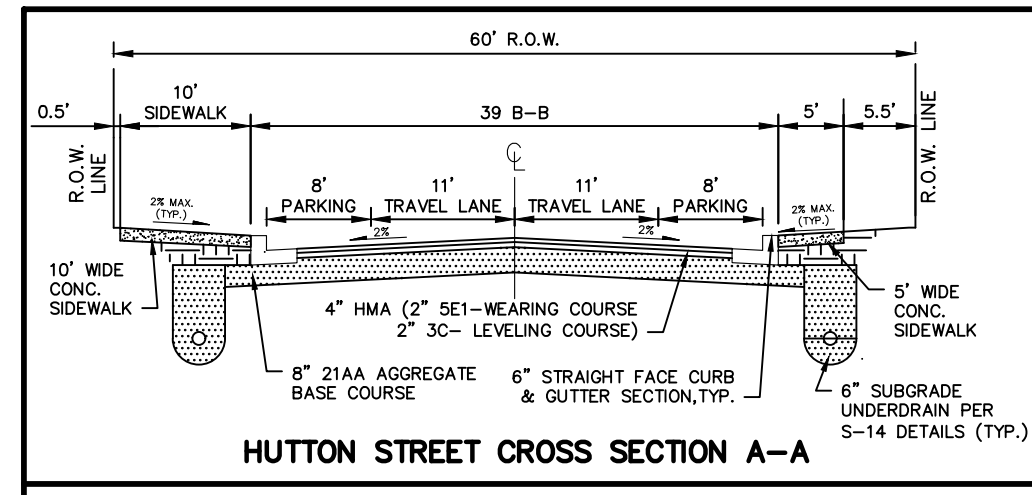
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CHECKED BY: E.E. FILE: 21001-TRB-FDM-FSP-PH1.DWG

**TREE LOCATION SURVEY**

**SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

**SHEET**  
**7A**





**THE DOWNS SANITARY BASIS DESIGN - NORTH ONLY**

USAGE		
COMMERCIAL (GROSS)	13,339 S.F.	
RESTAURANT (8358 S.F.)	40 REU	
APARTMENTS UNITS	178 Units	
ROW HOUSES	31 Units	
NE CONDOMINIUMS	42 Units	
EQUIVALENT SINGLE FAMILY UNITS (REU)		106.80
NW APARTMENTS	at 0.60 units/Apt Unit	42
NE CONDOMINIUM BUILDING		42
ROW HOUSES	at 0.40 units/1000 s.f.	31
COMMERCIAL		5.34
RESTAURANT		40
<b>TOTAL RESIDENTIAL REU</b>		<b>225.1</b>
POPULATION		
NW APARTMENTS	= 2.8 people/unit	225.1 units
ROW HOUSES	= 630.4 people x	
COMMERCIAL	= 63,038 gal/day	100 gal/cap/day
RESTAURANT	= 0.0975 cfs	
<b>AVERAGE FLOW</b>		<b>0.0975 cfs</b>
PEAK FACTOR	= (18+SQRT(P/1000))+(4+SQRT(P/1000))	40
<b>PEAK FLOW</b>		<b>3.92 cfs</b>
(CAPACITY OF A 8" PIPE @ 0.40 IS 0.76 CFS)		
<b>THEFORE PIPE CAPACITY IS SUFFICIENT.</b>		

**EXISTING PARKING LOT REPLACEMENT:**

EXISTING SPACES WITHIN CADY STREET SURFACE LOT = 92 SPACES  
 REQUIRED SPACES WITHIN 600 FT. FROM SURFACE LOT = 92 SPACES

**NEW PUBLIC SPACES PROVIDED:**

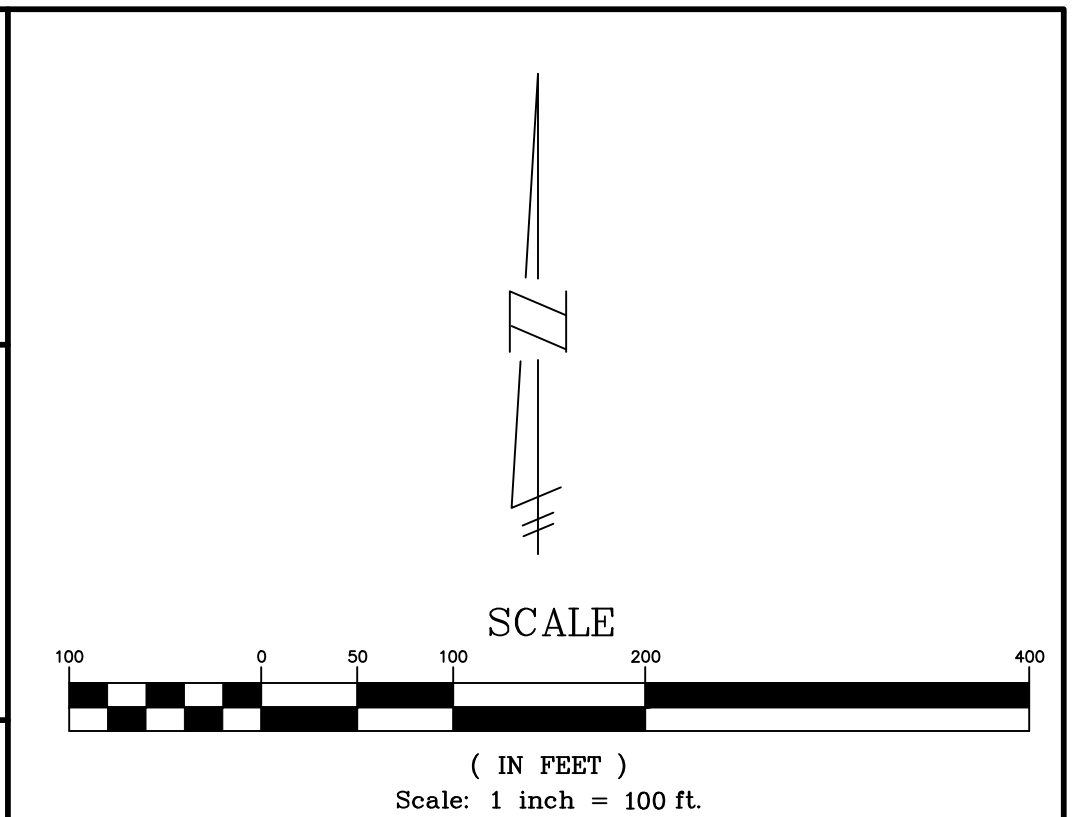
HUTTON SOUTH OF CADY = 39 SPACES  
 BEAL BETWEEN CENTER AND GRISWOLD = 47 SPACES  
 CADY STREET = 6 SPACES  
 TOTAL SPACES PROVIDED = 92 SPACES

SHARED DRIVE LANE / BIKE LANE ARE PROVIDED ON THE FOLLOWING ROADS:

- 1) FAIRBROOK STREET
- 2) HUTTON STREET
- 3) GRISWOLD STREET
- 4) BEAL STREET
- 5) CADY STREET

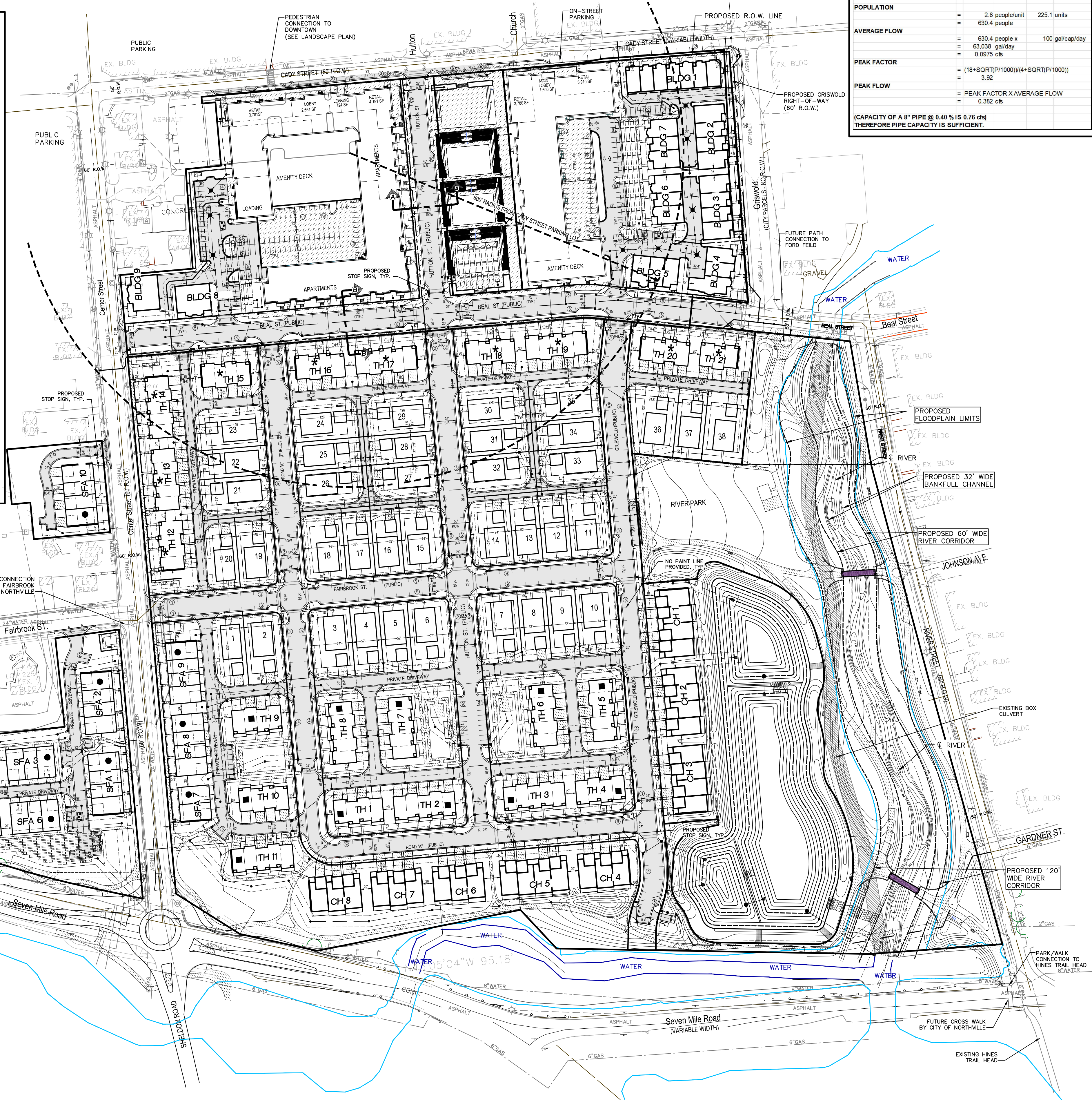
(SEE LANDSCAPE PLANS FOR STREETScape CROSS SECTIONS AND DETAILS)

- NOTE: CENTER STREET HAS EXISTING DEDICATED BIKE LANES.



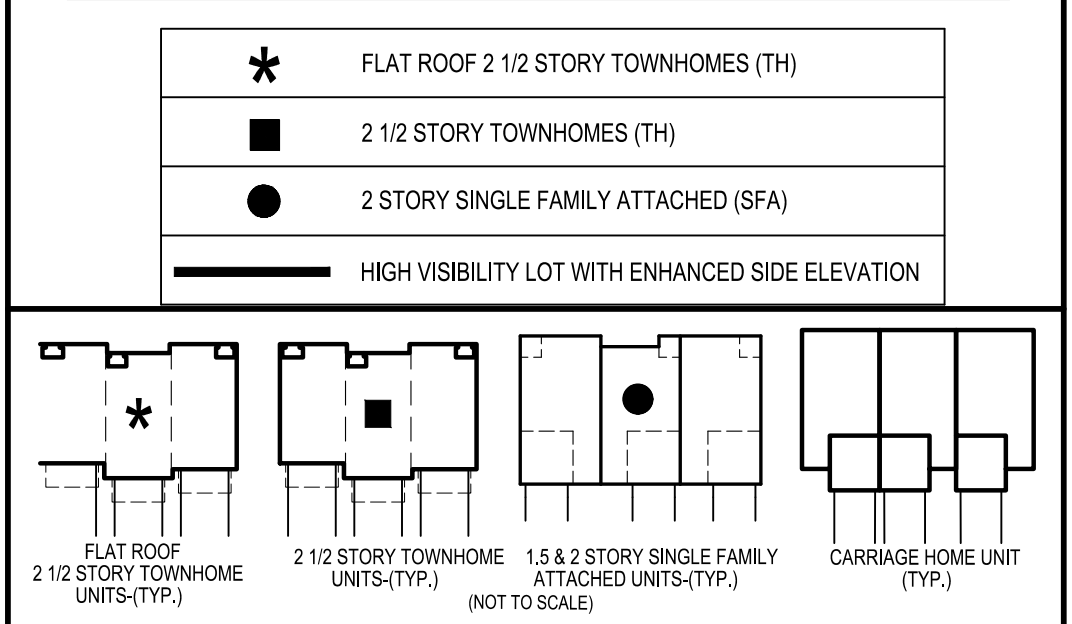
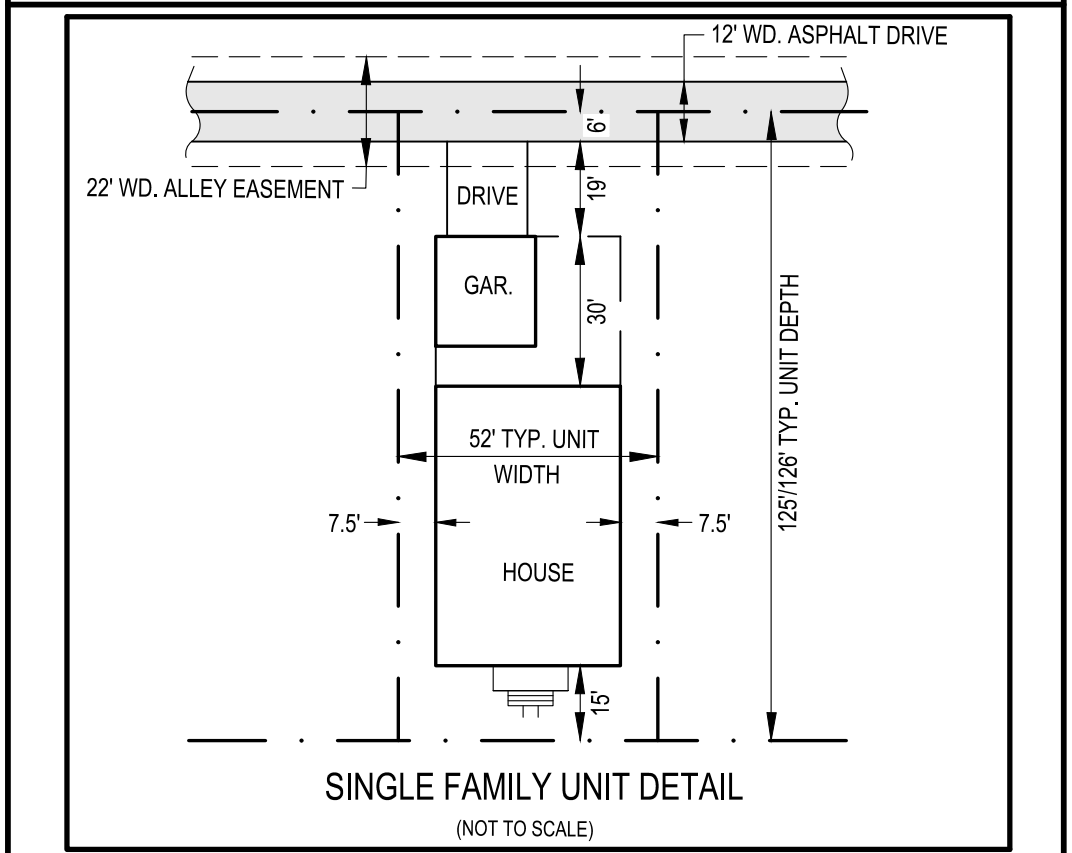
**The Downs North**  
 Quantity Summary

<b>SANITARY SEWER</b>	
ITEM	QUANTITY
1 8" PVC SDR 23.5 HOUSE LEAD	265 L.F.
2 8" PVC SDR 26 HOUSE LEAD	120 L.F.
3 8" PVC SDR 26 SANITARY SEWER	1,342 L.F.
4 10" PVC SDR 26 SANITARY SEWER	495 L.F.
5 4" DIA. MANHOLE	20 EA.
6 5" DIA. MANHOLE	1 EA.
<b>WATER MAIN</b>	
ITEM	QUANTITY
1 8" WATER MAIN D.I. CL 54	2,951 L.F.
2 1" DOMESTIC WATER SERVICE-TYPE "K" COPPER	232 L.F.
3 1 1/2" CW FUTURE PARK	82 L.F.
4 4" DOMESTIC WATER SERVICE-TYPE "K" COPPER	81 L.F.
5 8" FIRE LINE	81 L.F.
6 HYDRANT, VALVE & BOX	8 EA.
7 8" G.V.&W./TSV	6 EA.
8 8" G.V.&W./TSV	6 EA.
9 8" 12" TSV&W	1 EA.
<b>STORM SEWER</b>	
ITEM	QUANTITY
1 6" PVC	62 L.F.
2 10" PVC	48 L.F.
3 12" PVC	19 L.F.
4 12" C-76 CL 4	2,408 L.F.
5 15" C-76 CL 4	345 L.F.
6 18" C-76 CL 4	1,076 L.F.
7 24" C-76 CL 4	56 L.F.
8 2" DIA. INLET	7 EA.
9 4" DIA. CATCH BASIN	25 EA.
10 4" DIA. MANHOLE	26 EA.
11 6" DIA. MANHOLE	1 EA.
12 6" OVERFLOW MH	3 EA.
13 UG BASIN	3 EA.
<b>PAVING</b>	
ITEM	QUANTITY
1 ASPHALT PAVEMENT (4" ON 8")	11,549 S.Y.
2 6" STRAIGHT FACE CONC. CURB & GUTTER	7147 L.F.
3 4" STRAIGHT FACE CONC. CURB & GUTTER	528 L.F.
<b>SIDEWALK AND PATHWAY</b>	
ITEM	QUANTITY
1 4" CONCRETE SIDEWALK	67,286 S.F.
2 CONCRETE PAVING (DRIVE WAY APPROACH)	924 S.F.
<b>STREET SIGNS</b>	
ITEM	QUANTITY
1 STOP SIGNS	6 EA.



**SITE SUMMARY**

SITE AREA	= 48.12 AC
LESS PUBLIC R.O.W.	= 6.82 AC
NET SITE AREA	= 41.30 AC
EXISTING ZONING	CB, RTD, R-2, CSO
PROPOSED ZONING	PUD
<b>DEVELOPMENT BREAKDOWN</b>	
NW APARTMENTS	= 3.36 AC
UNITS SHOWN	= 178 UNITS
DENSITY SHOWN	= 52.98 DU/AC
<b>SETBACKS</b>	
FRONT YARD	= 10' (COMMERCIAL - CSO DISTRICT)
SIDE YARD	N/A
REAR YARD	N/A
<b>RESIDENTIAL USE</b>	
COMMERCIAL / RETAIL USE	= 2,972 SF
GARAGE AREA	= 71,688 SF
TOTAL BUILDING AREA	= 310,853 SF
OUTDOOR AMENITY TERRACE	= 19,811 SF
<b>NE CONDOMINIUM BUILDING</b>	
UNITS SHOWN	= 1.85 AC
DENSITY SHOWN	= 42 UNITS
DENSITY SHOWN	= 22.70 DU/AC
<b>SETBACKS</b>	
FRONT YARD	= 10' (COMMERCIAL - CSO DISTRICT)
SIDE YARD	N/A
REAR YARD	N/A
<b>RESIDENTIAL USE</b>	
COMMERCIAL / RETAIL USE	= 119,934 SF
GARAGE AREA	= 7,660 SF
TOTAL BUILDING AREA	= 13,510 SF
OUTDOOR AMENITY TERRACE	= 141,104 SF
OUTDOOR AMENITY TERRACE	= 6,104 SF
<b>ROW HOUSES</b>	
UNITS SHOWN	= 2.27 AC
DENSITY SHOWN	= 31 UNITS
DENSITY SHOWN	= 13.66 DU/AC
<b>SETBACKS</b>	
FRONT YARD	= 15' (CADY STREET)
BUILDING SEPARATION	= 10' (GRISWOLD ST. PROP. ROW)
REAR YARD	= 12'
REAR YARD	N/A
<b>RESIDENTIAL USE</b>	
COMMERCIAL / FLEX USE	= 27,313 SF
COMMERCIAL / FLEX USE	= 2,084 SF
<b>TOWN HOMES / SF ATTACHED</b>	
TOWN HOMES	= 12.12 AC
TOWN HOMES	= 94 UNITS
SF ATTACHED	= 32 UNITS
DENSITY SHOWN	= 10.40 DU/AC
<b>SETBACKS</b>	
FRONT YARD	= 10' MIN.
BUILDING SEPARATION	= 20'
REAR YARD	N/A
<b>CARRIAGE HOMES</b>	
CARRIAGE HOMES	= 3.08 AC
CARRIAGE HOMES	= 28 UNITS
DENSITY SHOWN	= 9.09 DU/AC
<b>SETBACKS</b>	
FRONT YARD	= 19'
BUILDING SEPARATION	= 20'
REAR YARD	N/A
<b>SINGLE FAMILY HOMES</b>	
LOTS SHOWN	= 6.97 AC
DENSITY SHOWN	= 38 UNITS
DENSITY SHOWN	= 5.45 LOTS/AC
<b>SETBACKS</b>	
FRONT YARD	= 15'
SIDE YARD	= 7.5' (15' TOTAL)
REAR YARD	= 19' (FROM ALLEY)
<b>TOTAL RESIDENTIAL</b>	
TOTAL OVERALL NET DENSITY	= 443 UNITS
TOTAL OVERALL NET DENSITY	= 30.73 UNITS/AC
TOTAL OVERALL GROSS DENSITY	= 9.21 UNITS/AC



**THE DOWNS**  
 SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
 WAYNE COUNTY, MICHIGAN

**REVISIONS**

NO.	ITEM	DATE
1.	TOBE SCHEMATIC DESIGN	06-10-2022
2.	S08 DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

**UTILITY WARNING**

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

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

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF AND/OR RELOCATION OF ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION.

DATE: 04-25-23 DESIGNED BY: S.M. JOB NUMBER: 21-001  
 CHECKED BY: F.E. FILE: 21001-0A-RSP-PH1.DWG

**OVERALL SITE PLAN**

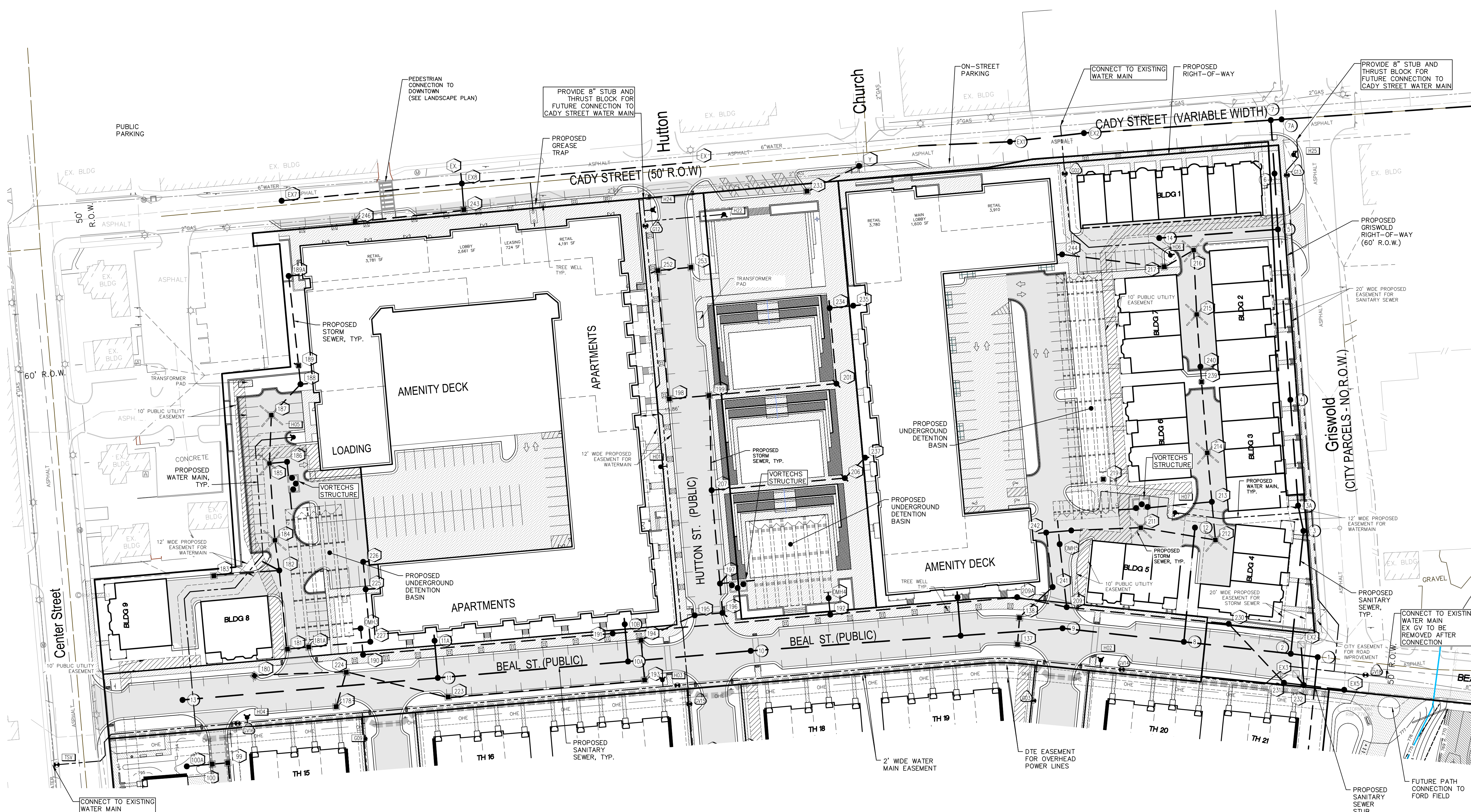
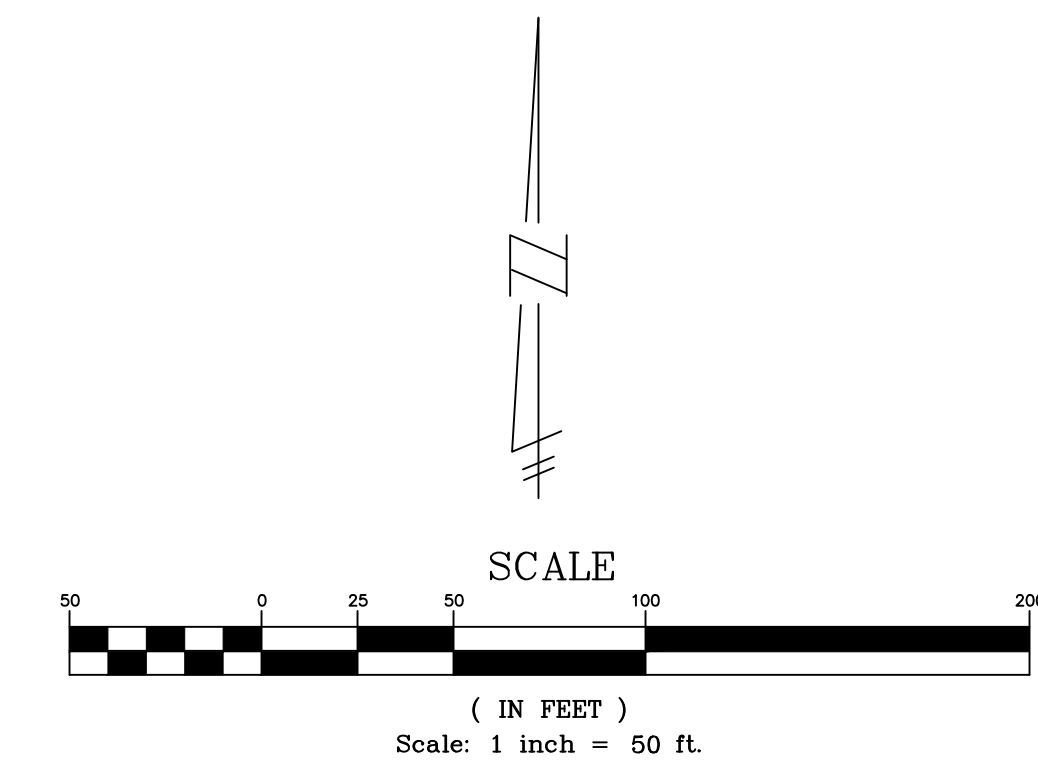
TOWNHOMES / SF ATTACHED / CARRIAGE	
GARAGES / DRIVES	= 504 SPACES (2 GAR / 2 DRIVE)
GARAGES ONLY	= 56 SPACES (2 GAR)
PARKING SPACES	= 47 SPACES
	= 607 SPACES
<b>SINGLE FAMILY HOMES</b>	
GARAGES / DRIVES	= 152 SPACES (2 GAR / 2 DRIVE)
PARKING SPACES	= 8 SPACES
	= 160 SPACES
<b>TOTAL PARKING PROVIDED</b>	<b>= 1,494 SPACES</b>
<b>TOTAL PUBLIC PARKING PROVIDED</b>	<b>= 332 SPACES</b>

**SEIBER KEAST LEHNER**  
 ENGINEERING | SURVEYING

39205 COUNTRY CLUB DRIVE, SUITE C8  
 FARMINGTON HILLS, MI 48331  
 PHONE: 248.308.3331

**SHEET**  
 8





**LEGEND**

EXISTING	PROPOSED	DESCRIPTION
[Symbol]	[Symbol]	PAVEMENT (ASPHALT)
[Symbol]	[Symbol]	SIDE WALK (CONCRETE)
[Symbol]	[Symbol]	CONCRETE CURB AND GUTTER
[Symbol]	[Symbol]	STORM SEWER
[Symbol]	[Symbol]	SANITARY SEWER
[Symbol]	[Symbol]	WATER MAIN
[Symbol]	[Symbol]	"UD" UNDERDRAIN
[Symbol]	[Symbol]	"LS" LANDSCAPE DRAIN
[Symbol]	[Symbol]	CATCH BASIN W/SED CATCH
[Symbol]	[Symbol]	CURB INLET W/SILT SAC
[Symbol]	[Symbol]	END SECTION
[Symbol]	[Symbol]	GATE VALVE
[Symbol]	[Symbol]	HYDRANT
[Symbol]	[Symbol]	OVERHEAD ELECTRICAL LINES
[Symbol]	[Symbol]	1000 FLOOD PLAIN
[Symbol]	[Symbol]	1000.00 SPOT ELEVATION
[Symbol]	[Symbol]	T/F SURFACE DRAINAGE
[Symbol]	[Symbol]	OVERFLOW ROUTE
[Symbol]	[Symbol]	TREE FENCE
[Symbol]	[Symbol]	SILT FENCE
[Symbol]	[Symbol]	PROPOSED DRIVEWAY LOCATION
[Symbol]	[Symbol]	CROSSING NUMBER

**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	100% SCHEMATIC DESIGN	06-10-2022
2.	50% DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

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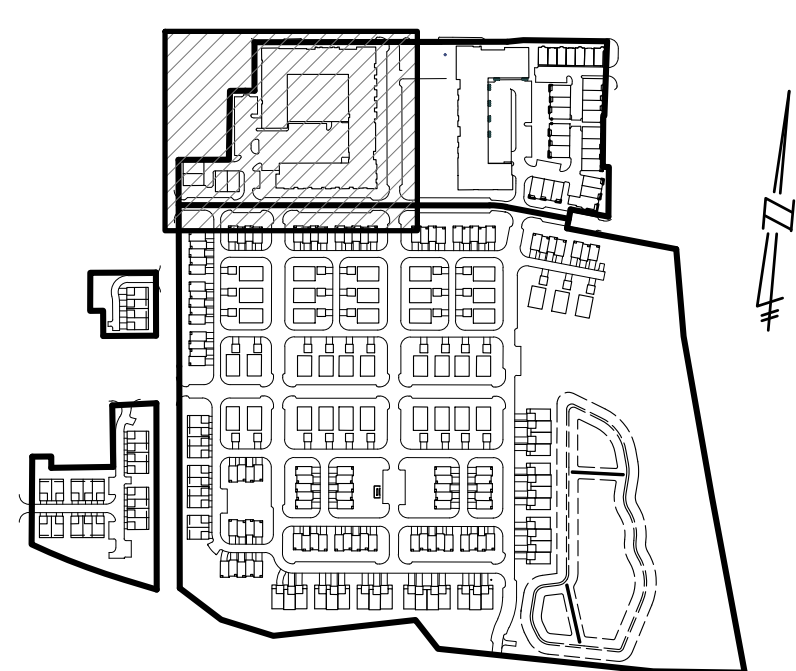
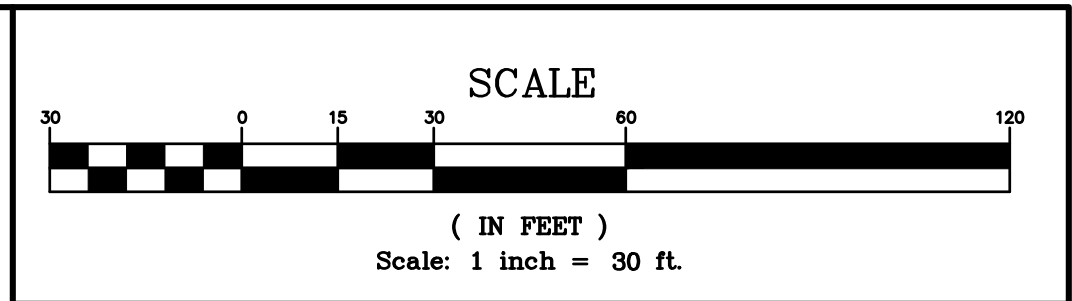
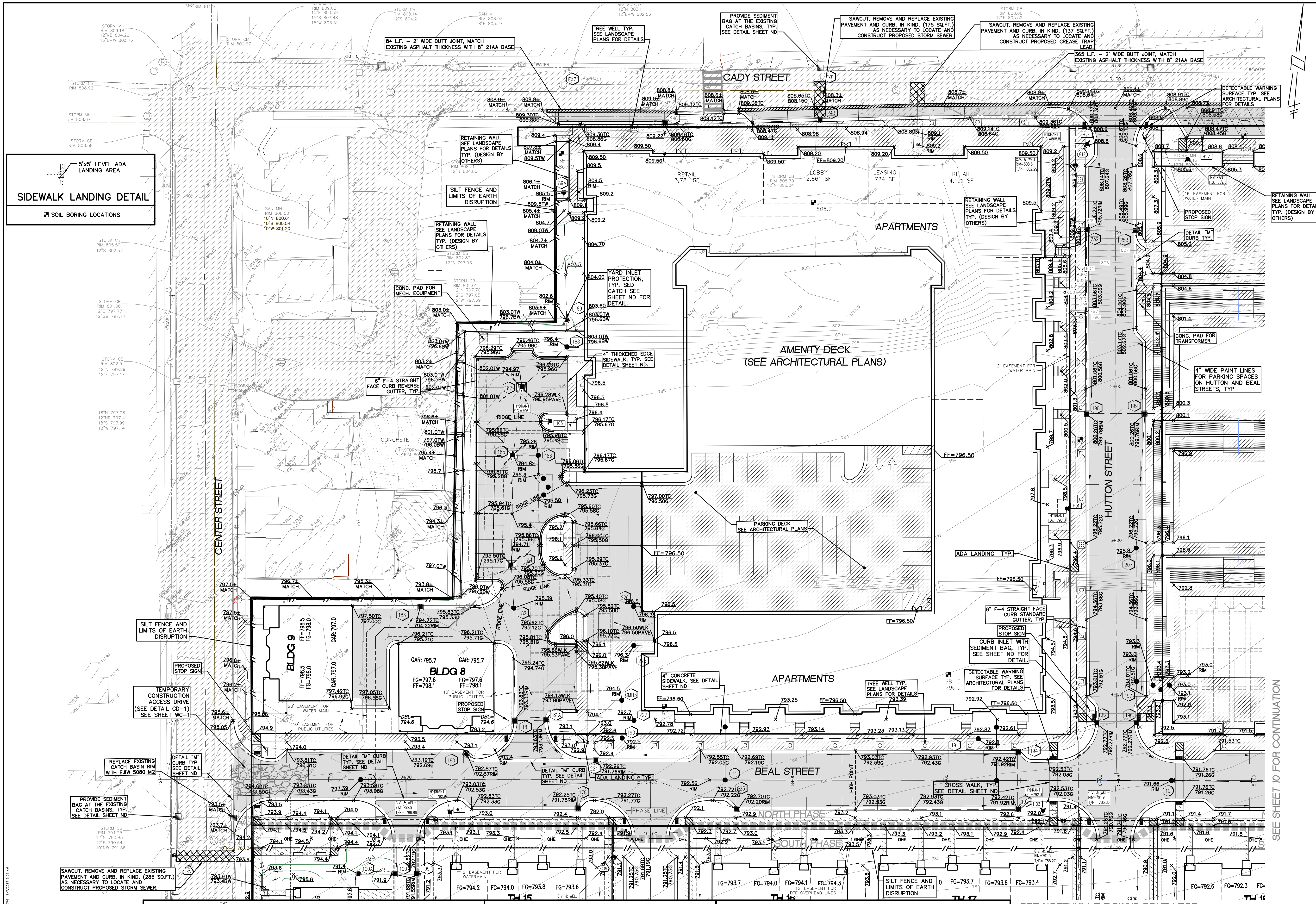
DATE: 04-25-23 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: E.E. FILE: 21001-CI-RSP-PH.DWG

**COMPOSITE UTILITY PLAN**

**SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

**SHEET**  
**8A**

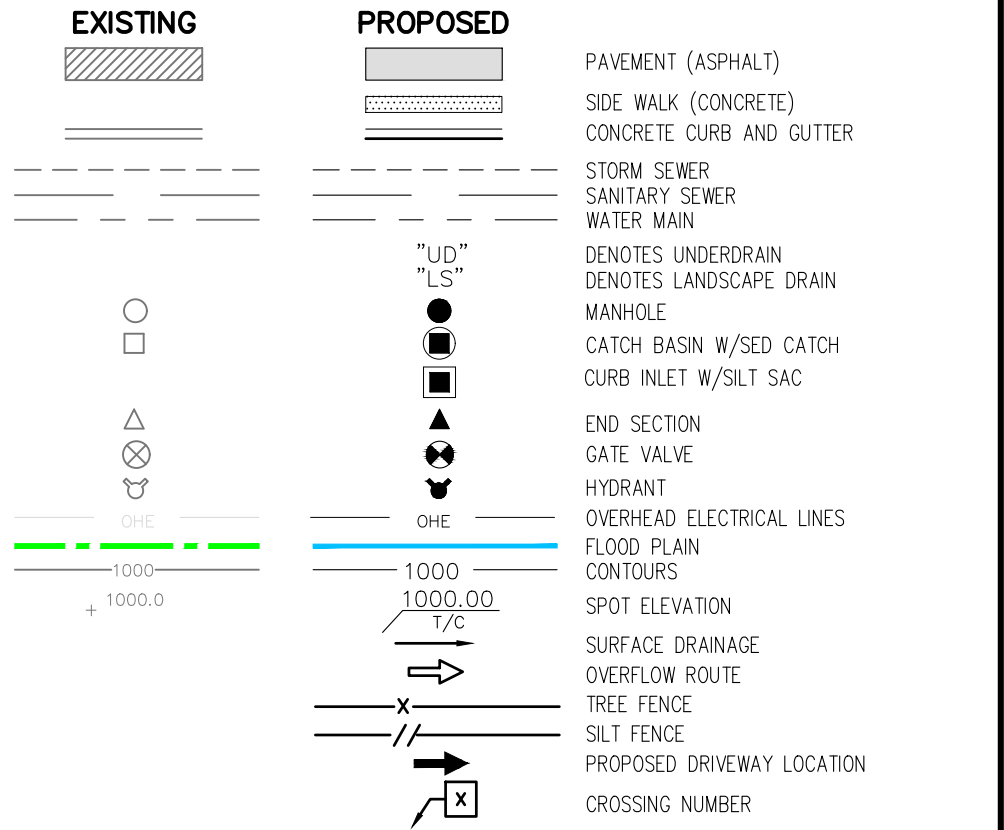




**NOTES**

- SEE SHEET ND FOR SESC DETAILS, SEQUENCE OF CONSTRUCTION AND NOTES & DETAILS.
- SIDEWALKS**  
ALL INTERSECTIONS SIDEWALK RAMPS AND SIDEWALKS ALONG OPEN SPACES SHALL BE INSTALLED BY THE DEVELOPER
- SIDEWALKS AND RAMP CONSTRUCTION**  
SHALL BE ACCORDANCE WITH ADA STANDARDS.
- MAINTAIN A MAXIMUM 1V:4H GROUND SLOPE.
- SEE SHEET ND FOR STANDARD OPERATING PROCEDURES, SOIL EROSION SEQUENCE OF CONSTRUCTION AND SOIL EROSION CONTROL NOTES.
- THE DEVELOPER IS RESPONSIBLE FOR RESOLVING ANY DRAINAGE PROBLEMS ON ADJACENT PROPERTIES WHICH ARE A RESULT OF THE DEVELOPER'S ACTIVITIES.
- SEE SHEET ND FOR SOIL EROSION CONTROL DETAILS.
- USE SEDCATCH'S SEDCAGE FOR ALL YARD CATCH BASINS.
- USE HANES GEO COMPONENTS INLET PRO SEDIMENT BAGS FOR PAVEMENT CATCH BASINS.
- ALL STORM WATER RUNOFF FROM DEVELOPED AREAS WILL BE DIRECTED TO THE STORM WATER DETENTION BASIN AND DISCHARGE TO THE MIDDLE OF ROUGE RIVER.

**LEGEND**



**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING	
NO.	DESCRIPTION	DATE	BY
1.	FINAL DESIGN	02-03-2023	S.M.
2.	50% DESIGN DEVELOPMENT	02-03-2023	R.R.
3.	FINAL SITE PLAN	04-14-2023	R.R.
4.	REV PER CITY REVIEW	09-08-2023	R.R.

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

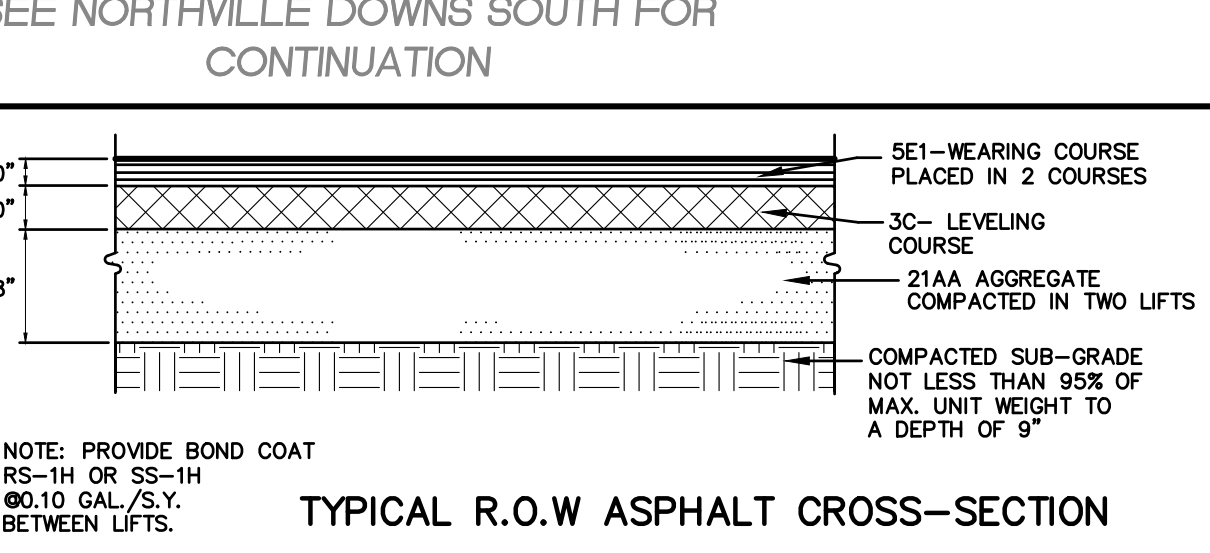
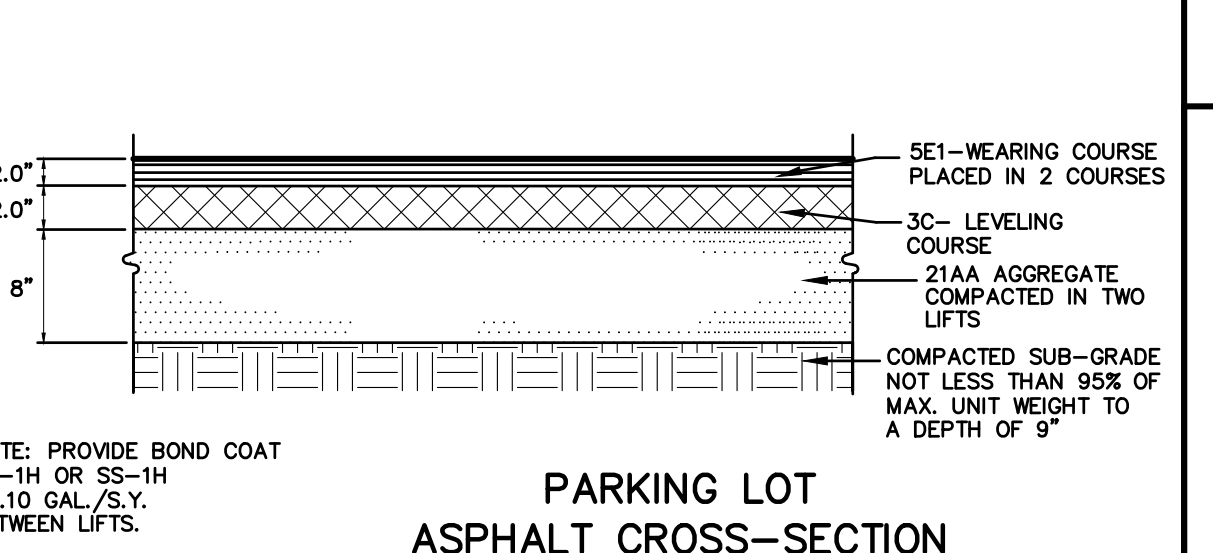
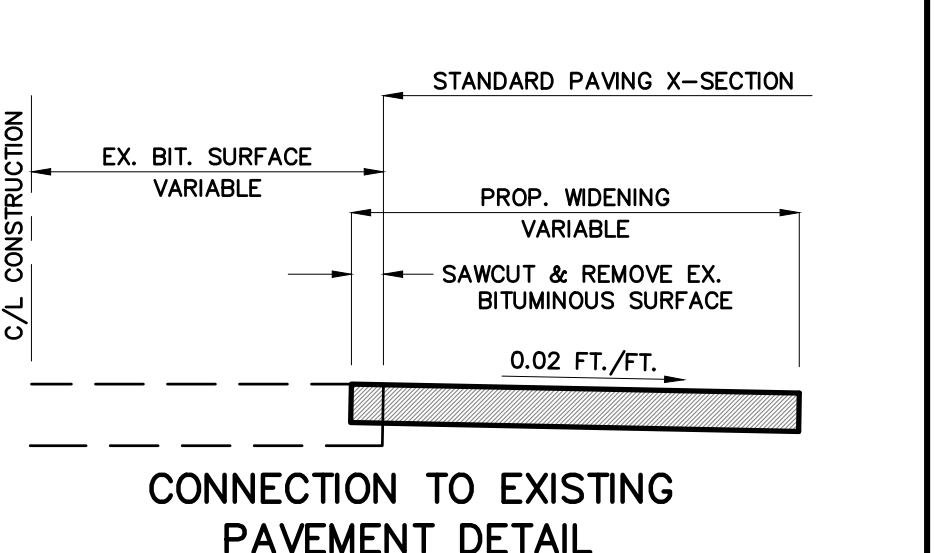
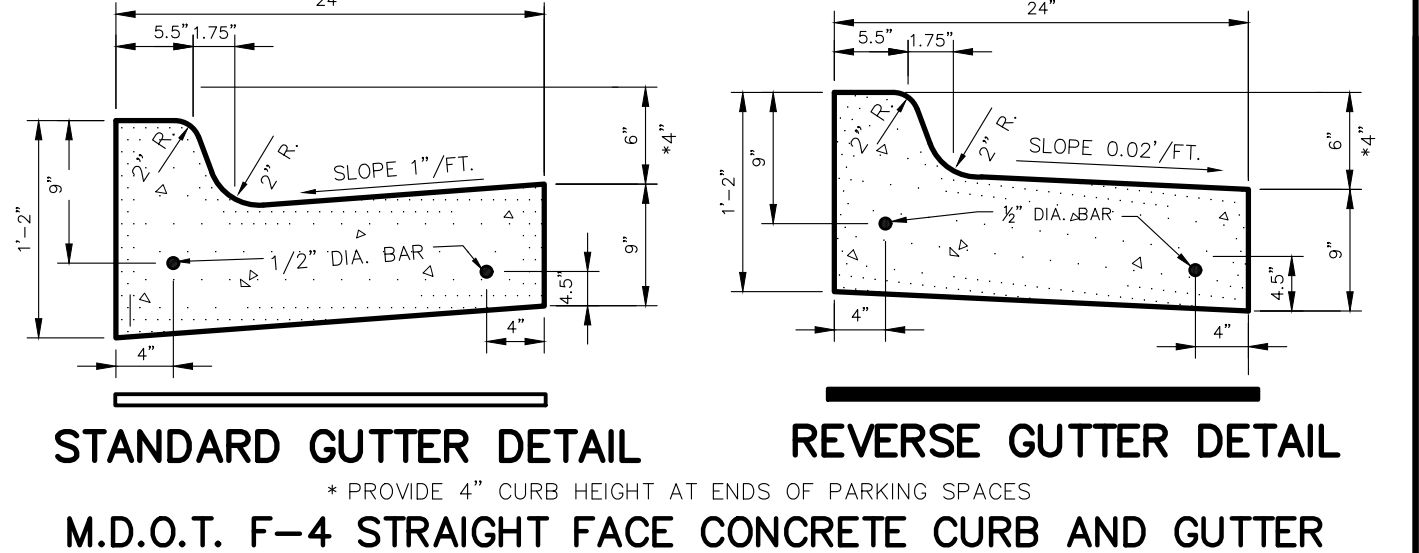
**811** Know what's below. Call before you dig.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF AND/OR RELOCATION OF ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION.

**Sidewalk Requirements**

1. THE MAXIMUM CROSS SLOPE FOR ALL SIDEWALK AND DRIVEWAY CROSSEWALKS IS 2%.
2. THE MAXIMUM RUNNING SLOPE FOR ALL SIDEWALK AND DRIVEWAY CROSSEWALKS IS 5%.
3. THE 5' X 5' ADA LANDING AREAS HAVE A MAXIMUM SLOPE IN ALL DIRECTIONS OF 2%.
4. THE MAXIMUM SLOPE FOR A RAMP IS 8% FOR MAXIMUM DISTANCE OF 6 FEET.

THE CONTRACTOR SHALL CHECK THE FORMS TO ENSURE THAT THESE SLOPE REQUIREMENTS ARE MET BEFORE ANY CONCRETE IS PLACED.



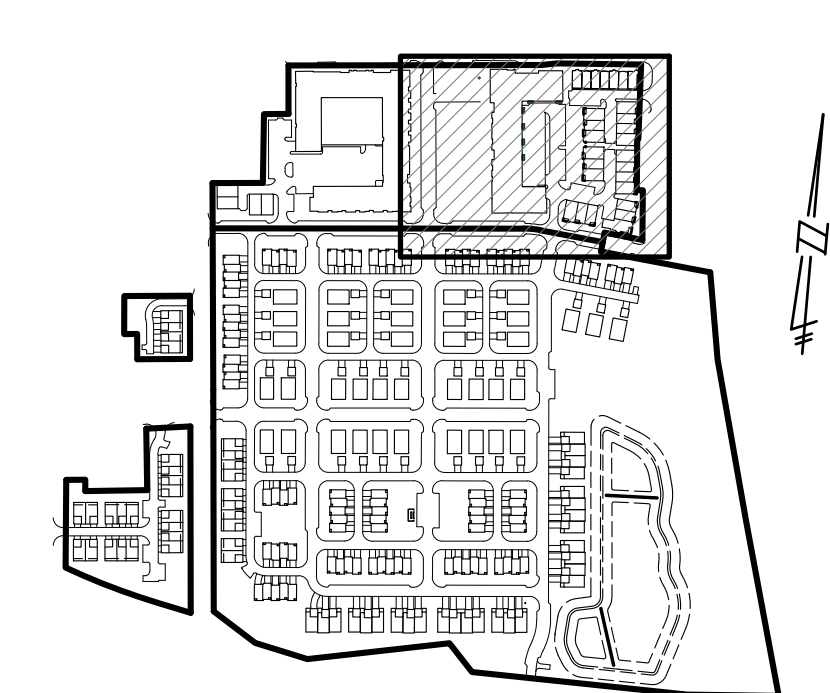
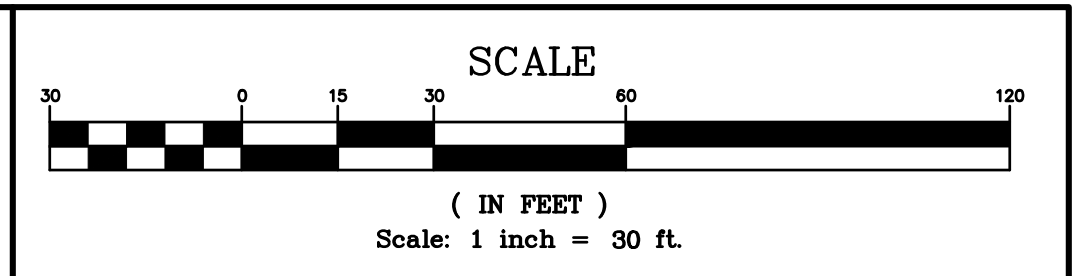
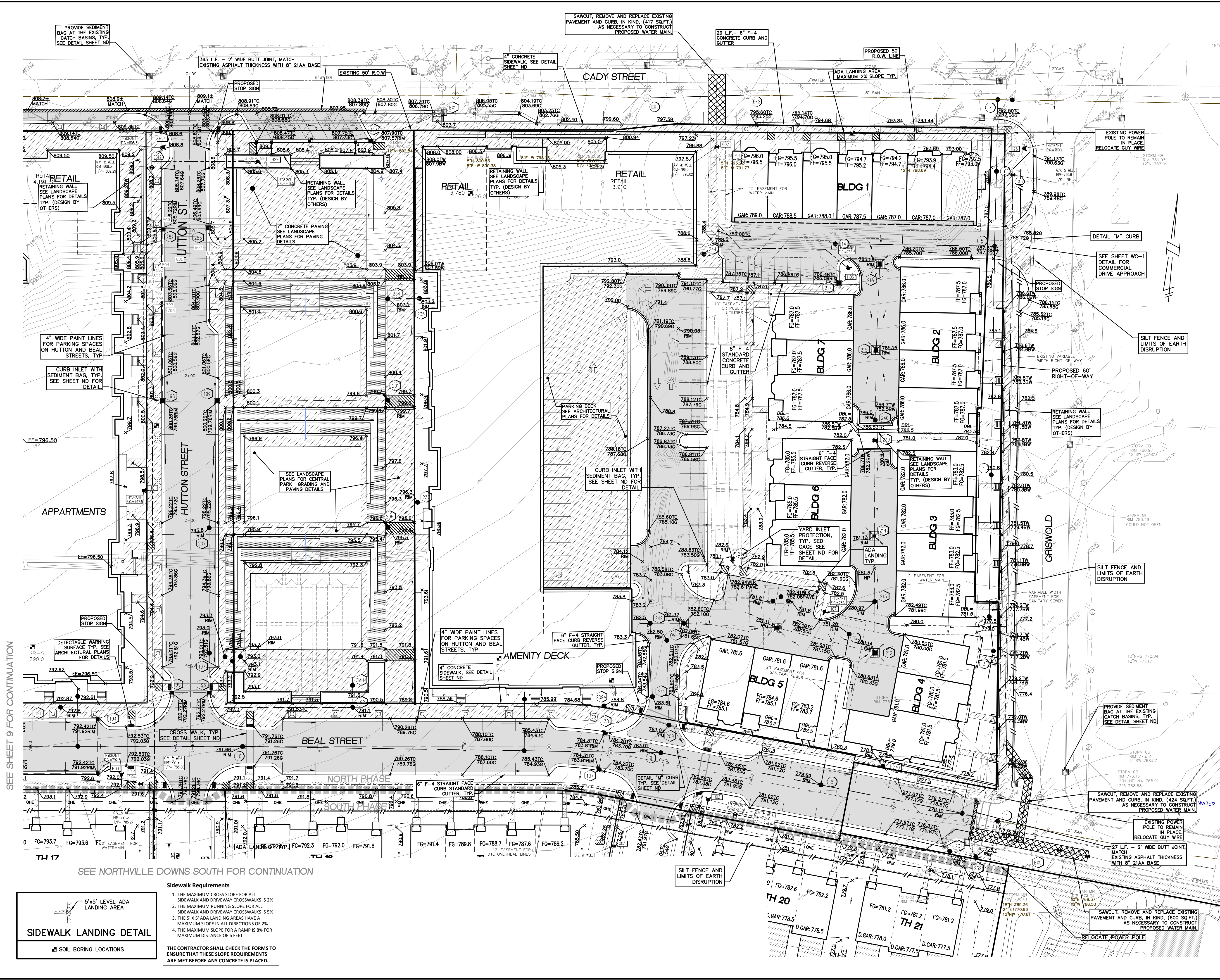
DATE: 04-25-23  
DESIGNED BY: S.M.  
CHECKED BY: R.R.JOB NUMBER: 21-001  
FILE: 2101-GR-SP.DWG

**GRADING AND PAVING PLAN**

**SEIBER KEAST LEHNER**  
ENGINEERING I SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

**SHEET 9**



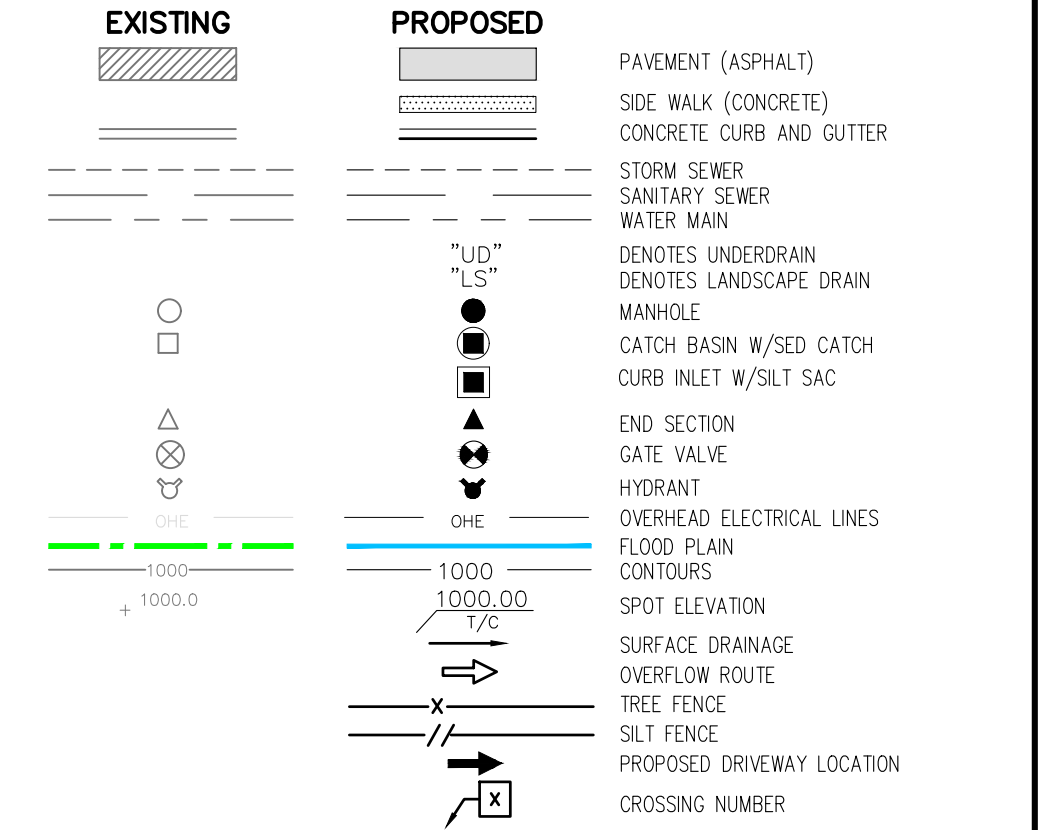


KEY MAP  
SCALE: 1" = 50'

**NOTES**

- SEE SHEET ND FOR SESC DETAILS, SEQUENCE OF CONSTRUCTION AND NOTES & DETAILS.
- SIDEWALKS**  
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**LEGEND**



**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING	
NO.	DESCRIPTION	DATE	BY
1	100% SCHEDULING DESIGN	08-10-2022	S.M.
2	50% DESIGN DEVELOPMENT	02-03-2023	R.B.
3	FINAL SITE PLAN	04-14-2023	R.B.
4	REV PER CITY REVIEW	09-08-2023	R.B.

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

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DATE: 04-25-23 DESIGNED BY: S.M. CHECKED BY: R.B. JOB NUMBER: 21-001 PILE: 21001-GR-SP.DWG

**GRADING AND PAVING PLAN**

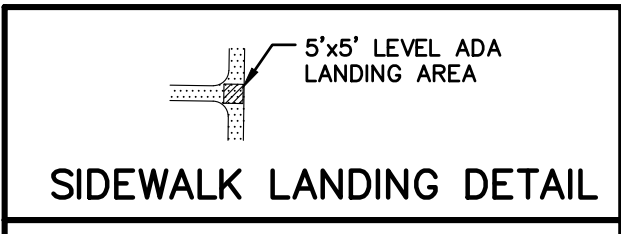
**SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING

39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

SHEET  
**10**

SEE SHEET 9 FOR CONTINUATION

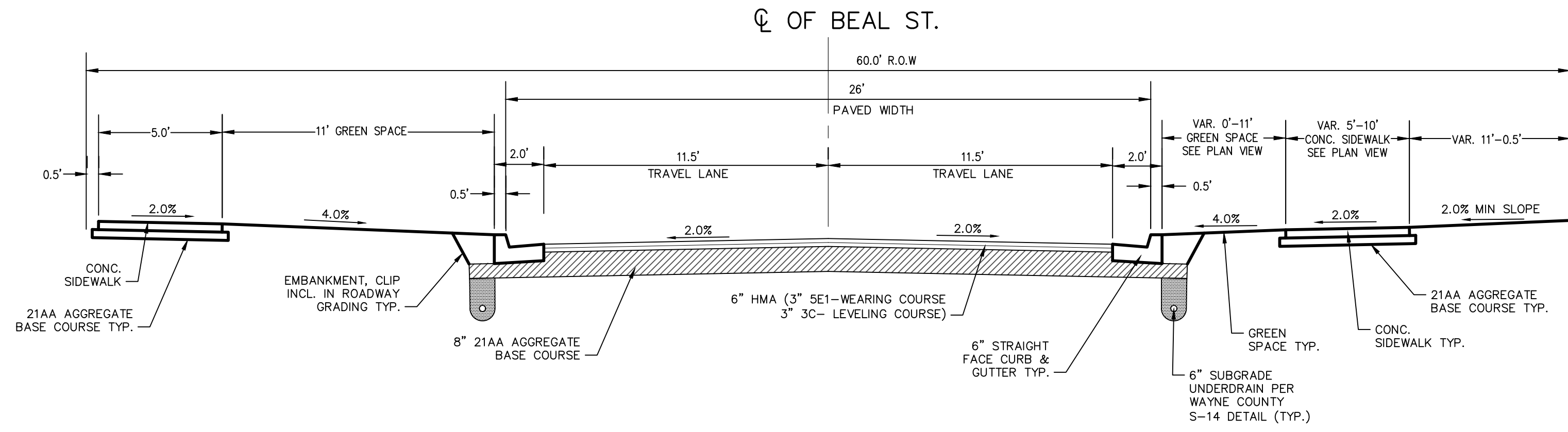
SEE NORTHVILLE DOWNS SOUTH FOR CONTINUATION



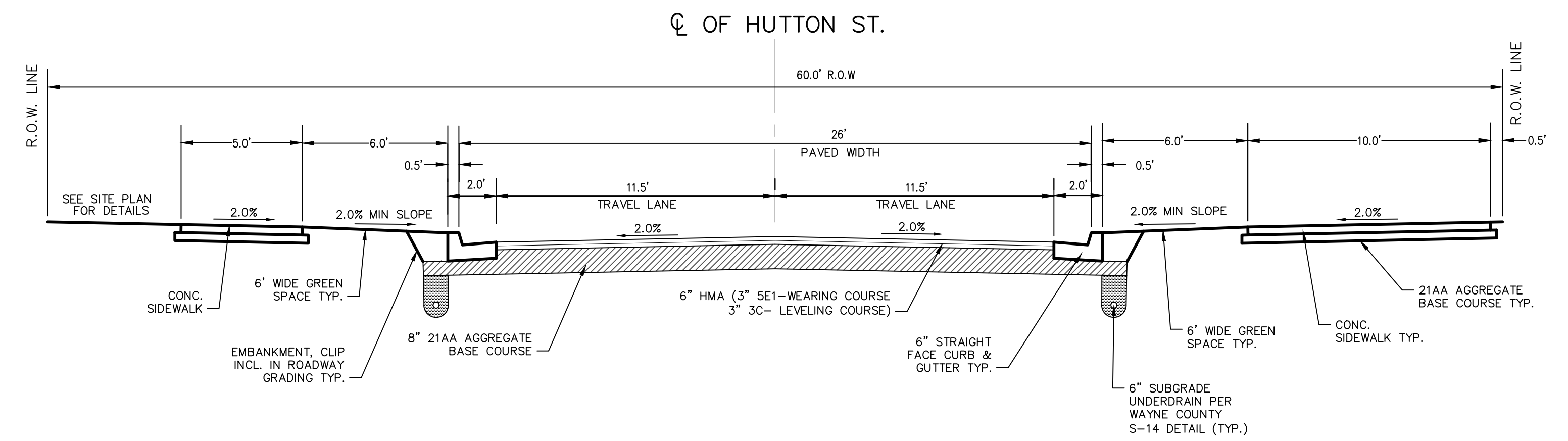
- Sidewalk Requirements**
1. THE MAXIMUM CROSS SLOPE FOR ALL SIDEWALK AND DRIVEWAY CROSSWALKS IS 2%
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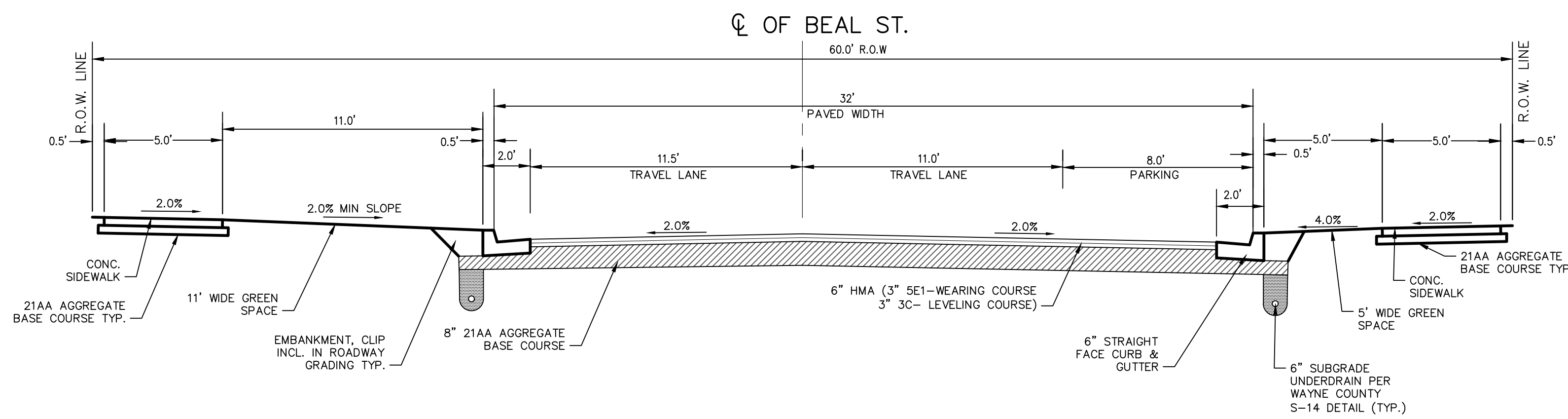
ROAD CROSS-SECTION  
BEAL STREET- STANDARD CROSS SECTION



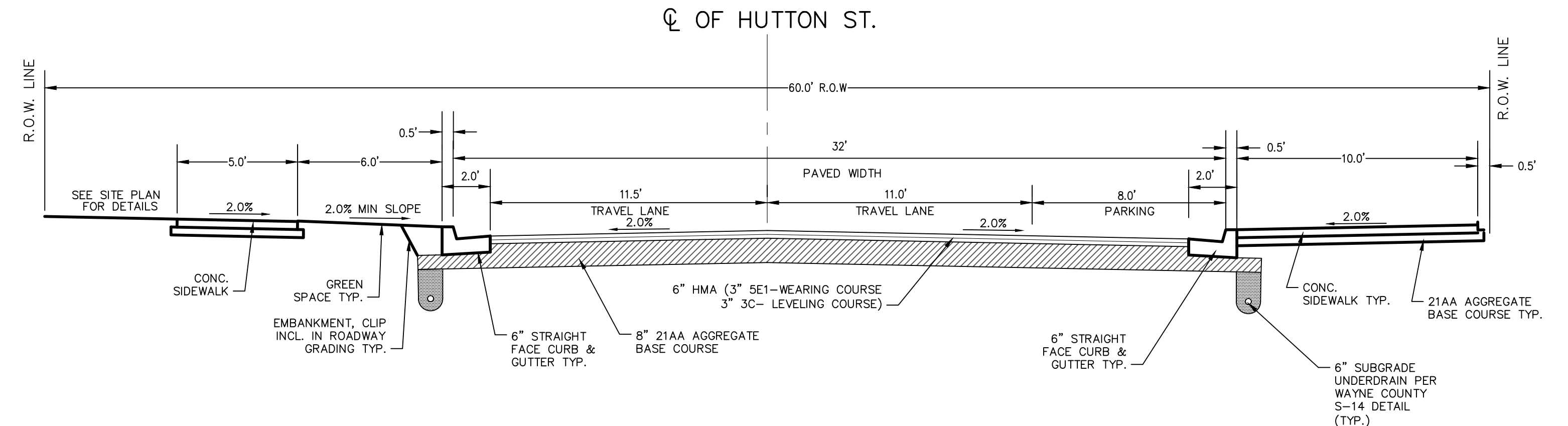
ROAD CROSS-SECTION  
HUTTON STREET- STANDARD CROSS SECTION



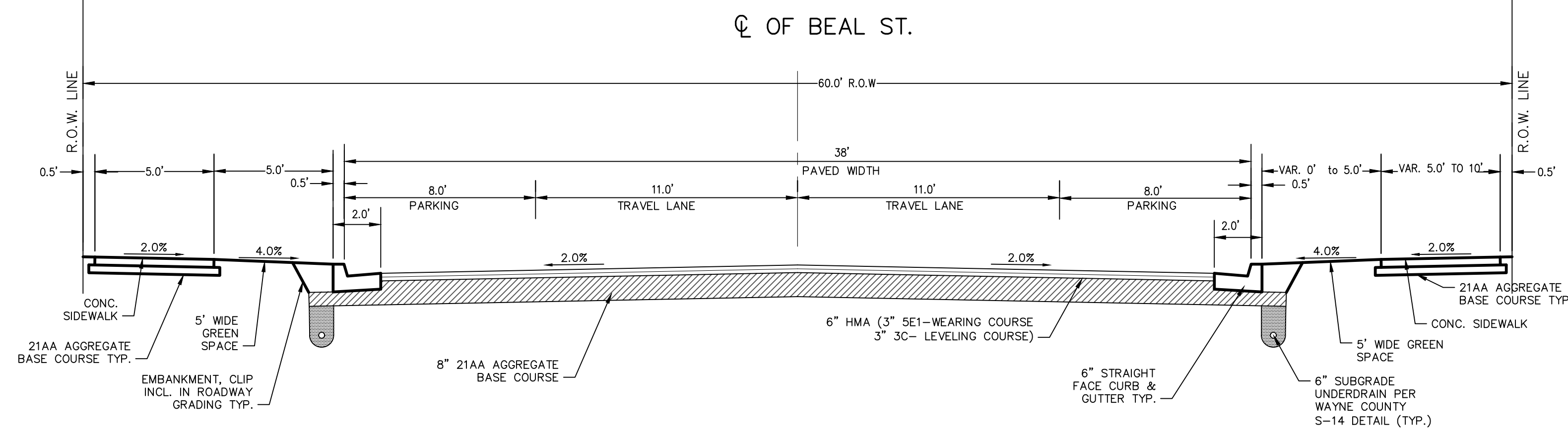
ROAD CROSS-SECTION  
BEAL STREET- PARKING ONE SIDE



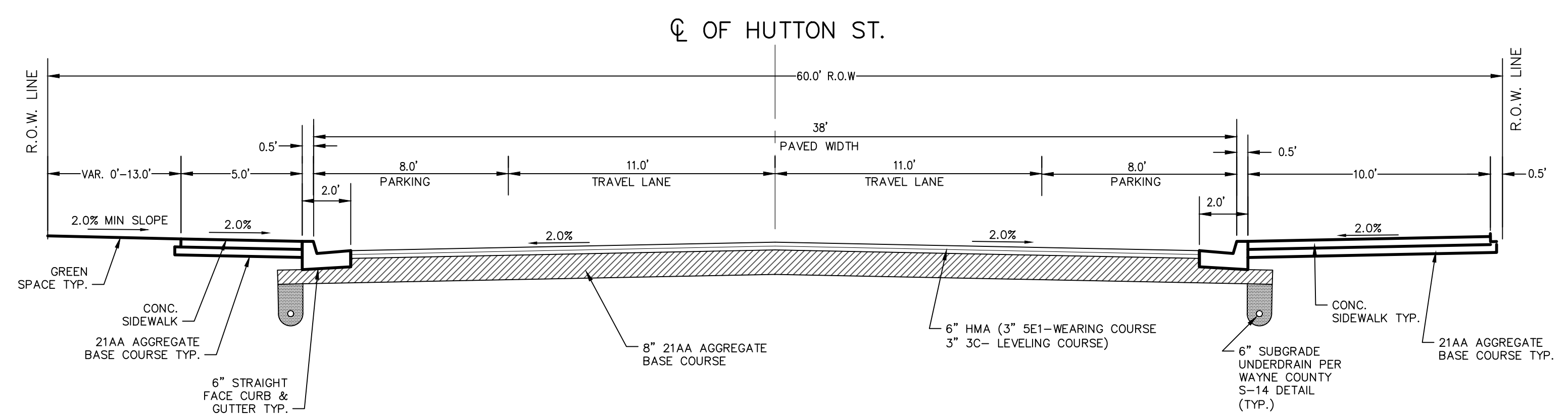
ROAD CROSS-SECTION  
HUTTON STREET- PARKING ONE SIDE



ROAD CROSS-SECTION  
BEAL STREET- PARKING BOTH SIDES



ROAD CROSS-SECTION  
HUTTON STREET- PARKING BOTH SIDES



**THE DOWNS**

SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS

NO.	ITEM	DATE
1.	100% SCHEMATIC DESIGN	06-10-2022
2.	50% DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

UTILITY WARNING

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DATE: 04-25-23 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: E.E. FILE: 21001-RD-CS.DWG

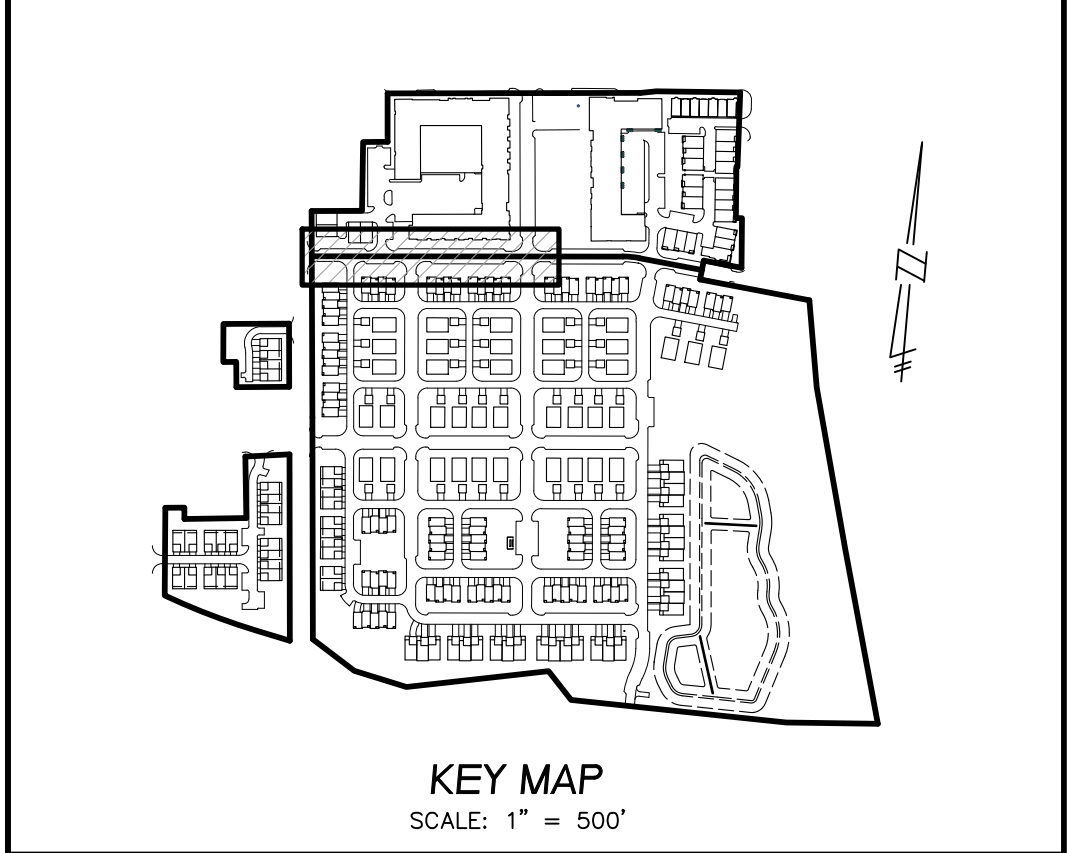
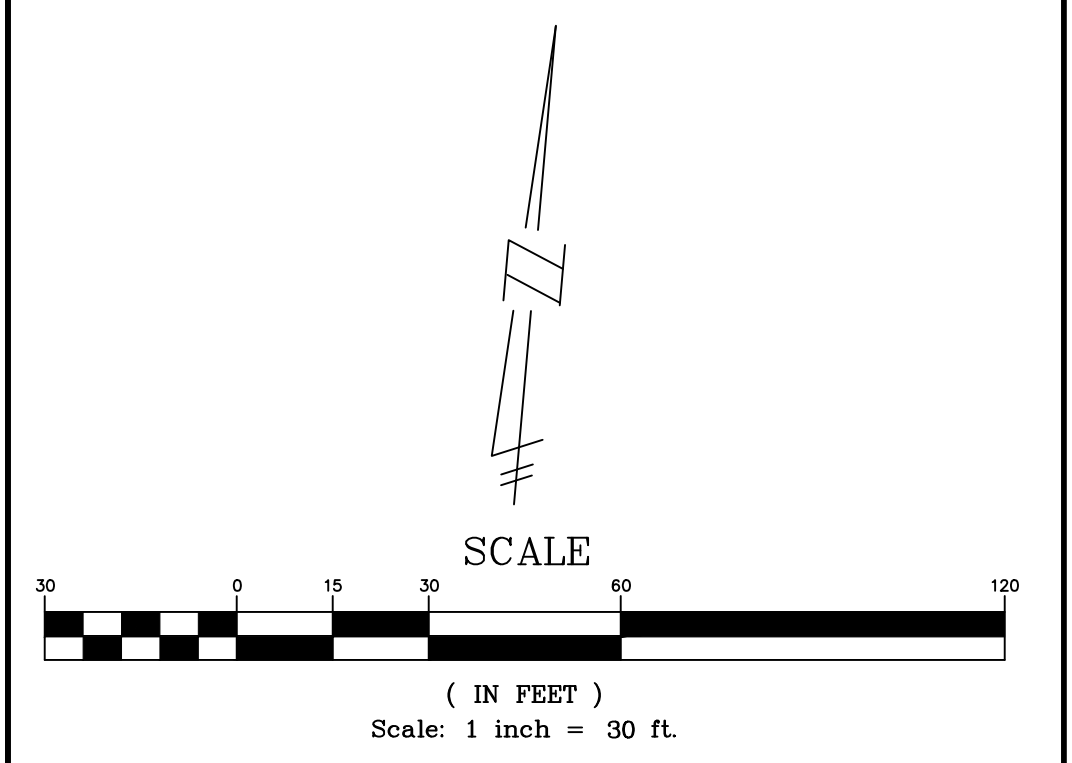
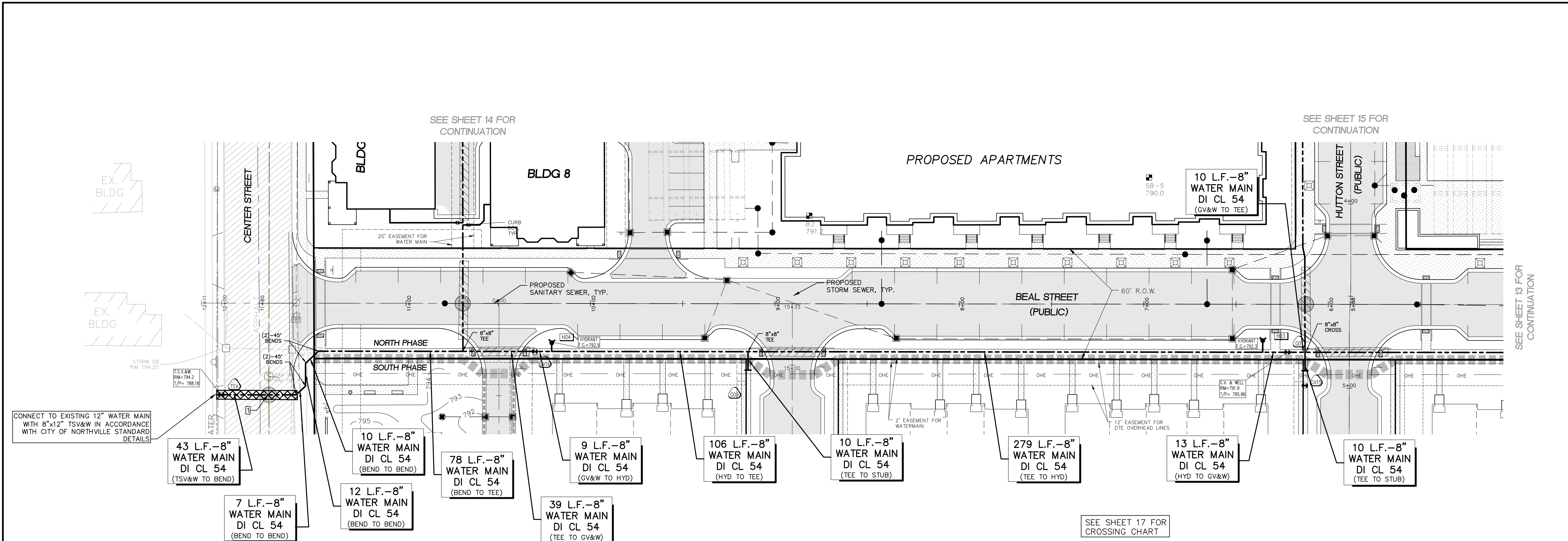
HUTTON & BEAL ROAD CROSS SECTIONS

**SKL SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

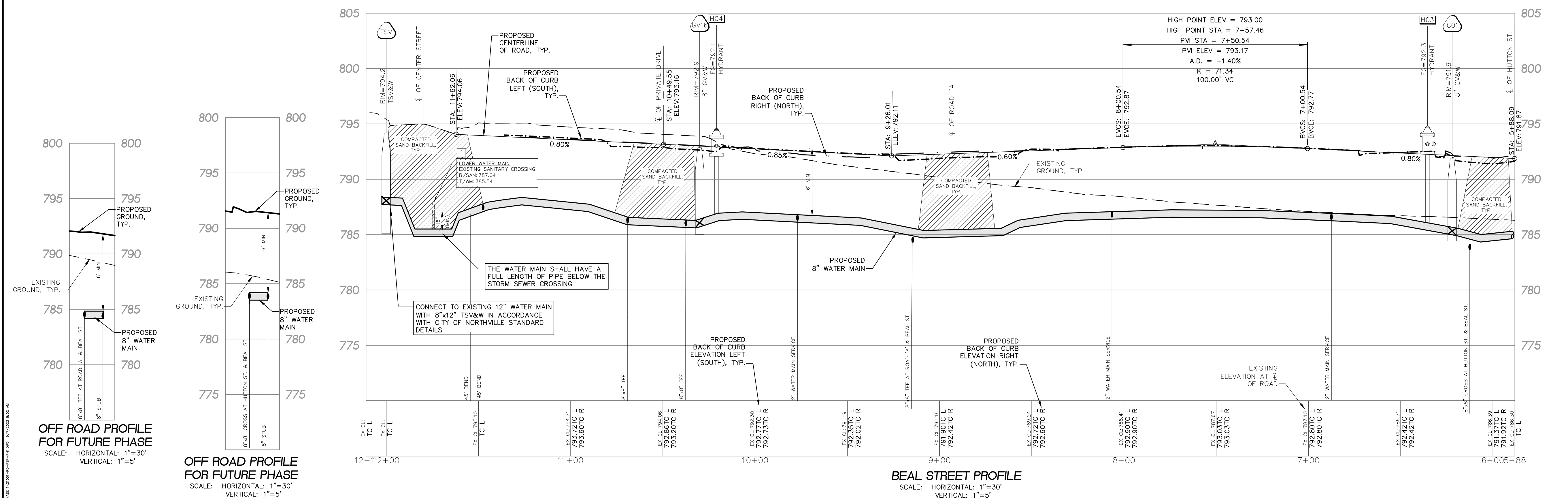
SHEET

11





NOTES:  
 ALL TRENCHES WITHIN 1 ON 1 SLOPE FROM TOP OF CURBS SHALL BE BACKFILLED WITH GRANULAR MATERIAL CLASS II AND COMPACTED TO 95% OF MAXIMUM UNIT WEIGHT.  
 MAINTAIN 6" COVER OVER ALL WATER MAIN.  
 ALL WATER SERVICE LEADS SHALL BE MIN. 1" SEAMLESS COPPER WATER TUBE, ASTM DESIGNATION: B88, TYPE K, ANNEALED.

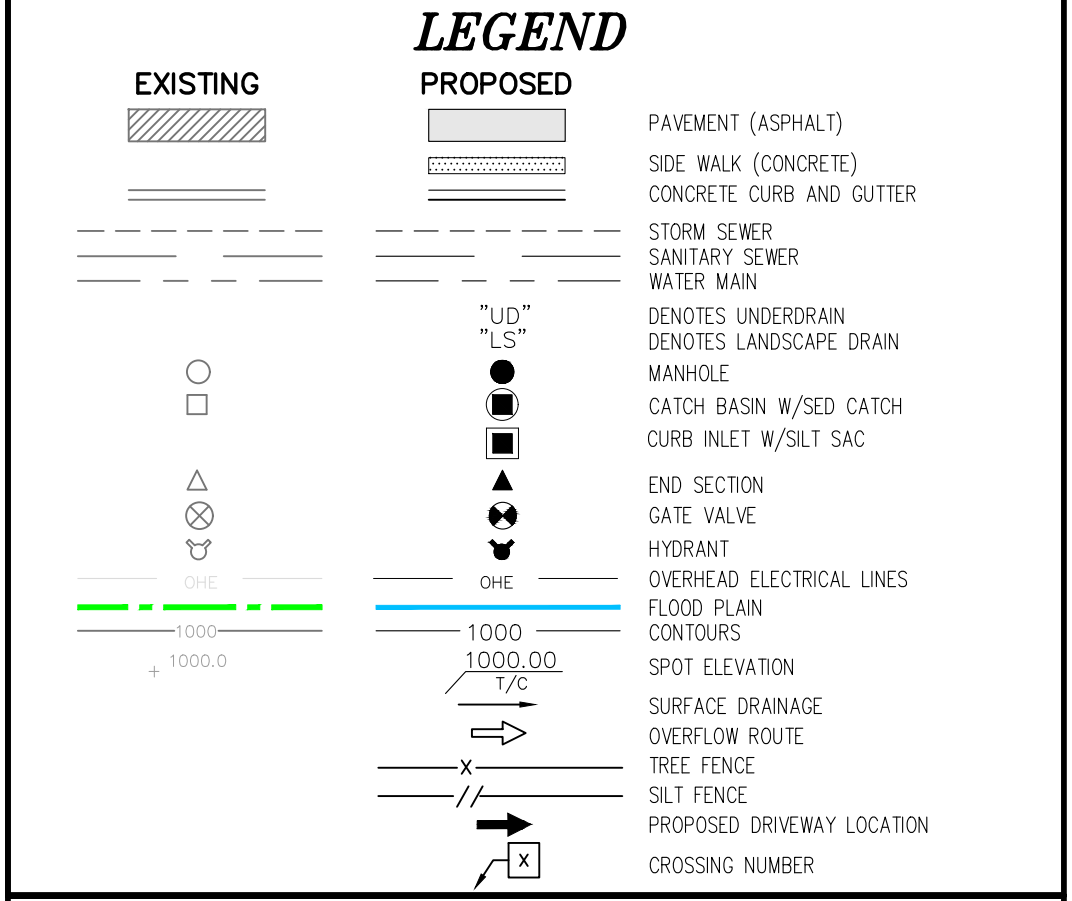


OFF ROAD PROFILE FOR FUTURE PHASE  
 SCALE: HORIZONTAL: 1"=30'  
 VERTICAL: 1"=5'

OFF ROAD PROFILE FOR FUTURE PHASE  
 SCALE: HORIZONTAL: 1"=30'  
 VERTICAL: 1"=5'

BEAL STREET PROFILE  
 SCALE: HORIZONTAL: 1"=30'  
 VERTICAL: 1"=5'

LOWER WATER MAIN AS NECESSARY TO MAINTAIN 18" MINIMUM VERTICAL SEPARATION BETWEEN UTILITIES.  
 COMPACTED SAND BACKFILL UNDER THE INFLUENCE OF ROADS. MATERIAL COMPACTED TO 95% MAXIMUM UNIT DENSITY.



**THE DOWNS**  
 SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
 WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	TITLE SCHEMATIC DESIGN	06-10-2022
2.	SITE DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

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

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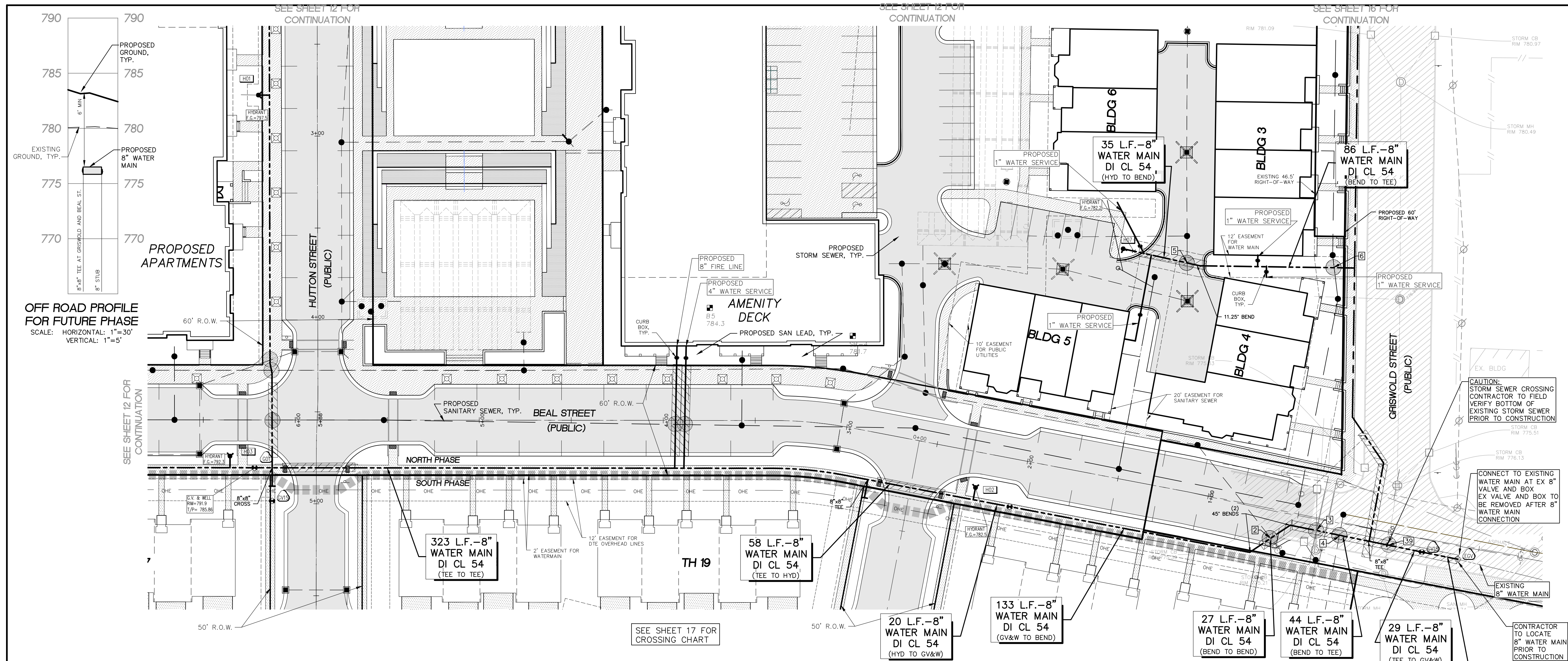
DATE: 04-25-23 DESIGNED BY: S.M. JOB NUMBER: 21-001  
 CHECKED BY: P.E. FILE: 21001-RD-ESP-PH.DWG

**ROAD & WATER MAIN PLAN AND PROFILE**

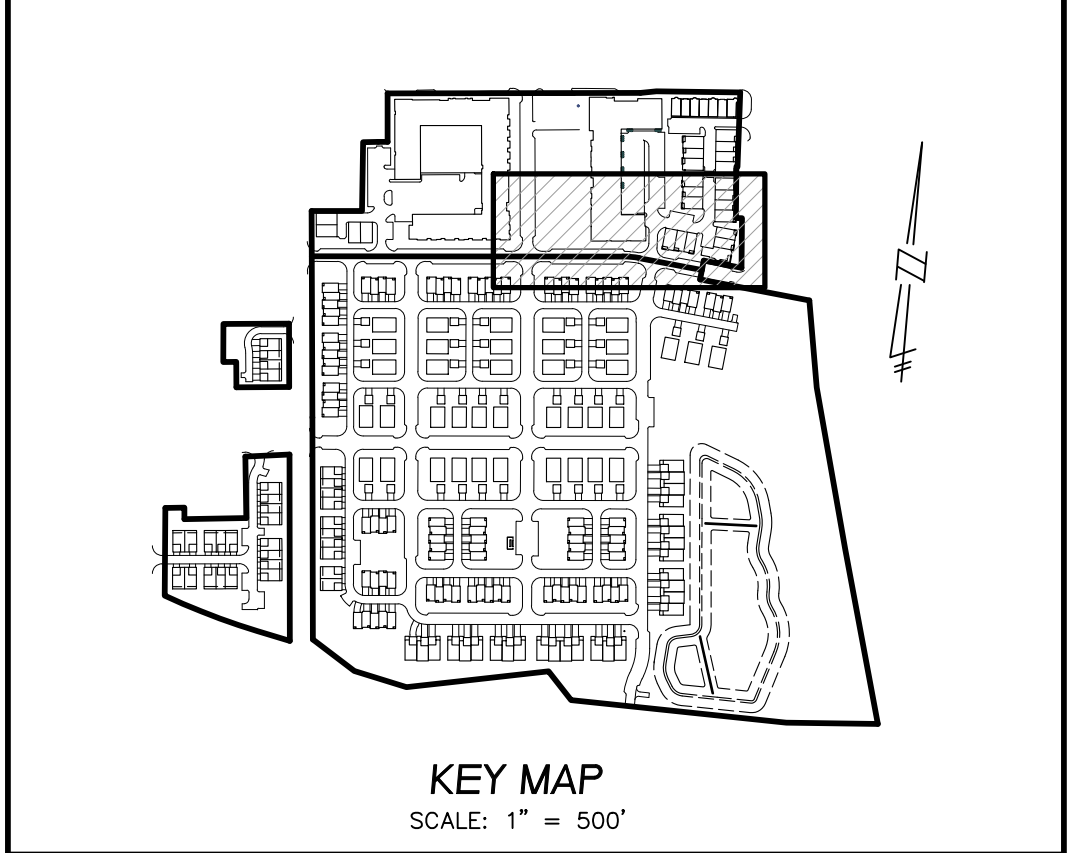
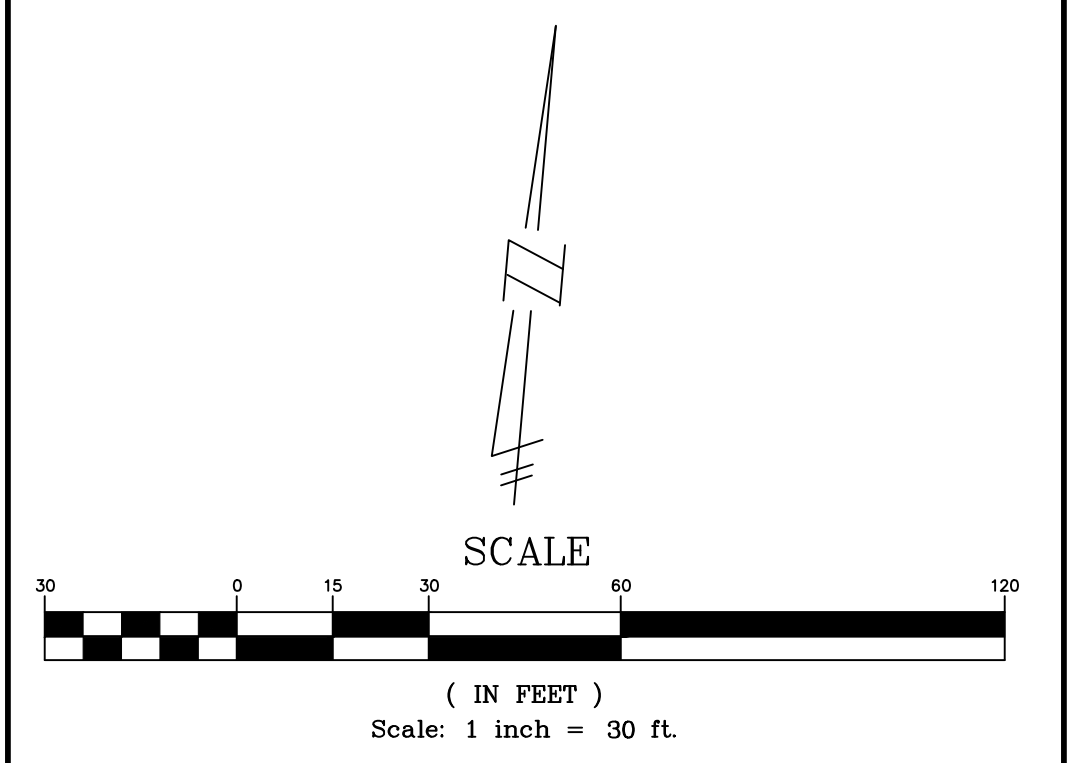
**SEIBER KEAST LEHNER**  
 ENGINEERING | SURVEYING  
 39205 COUNTRY CLUB DRIVE, SUITE C8  
 FARMINGTON HILLS, MI 48331  
 PHONE: 248.308.3331

SHEET  
**12**



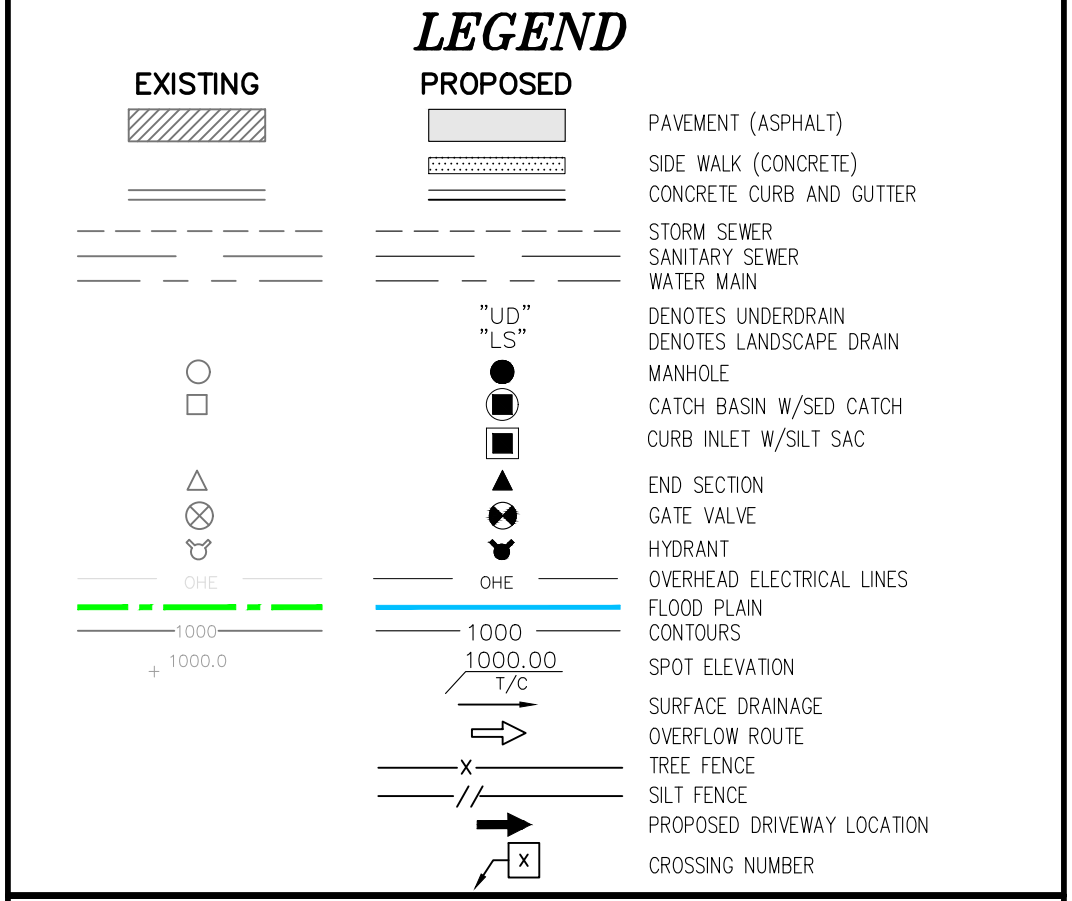


**OFF ROAD PROFILE FOR FUTURE PHASE**  
 SCALE: HORIZONTAL: 1"=30'  
 VERTICAL: 1"=5'



**NOTES:**  
 ALL TRENCHES WITHIN 1 ON 1 SLOPE FROM TOP OF CURBS SHALL BE BACKFILLED WITH GRANULAR MATERIAL CLASS II AND COMPACTED TO 95% OF MAXIMUM UNIT WEIGHT.  
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LOWER WATER MAIN AS NECESSARY TO MAINTAIN 18" MINIMUM VERTICAL SEPARATION BETWEEN UTILITIES.  
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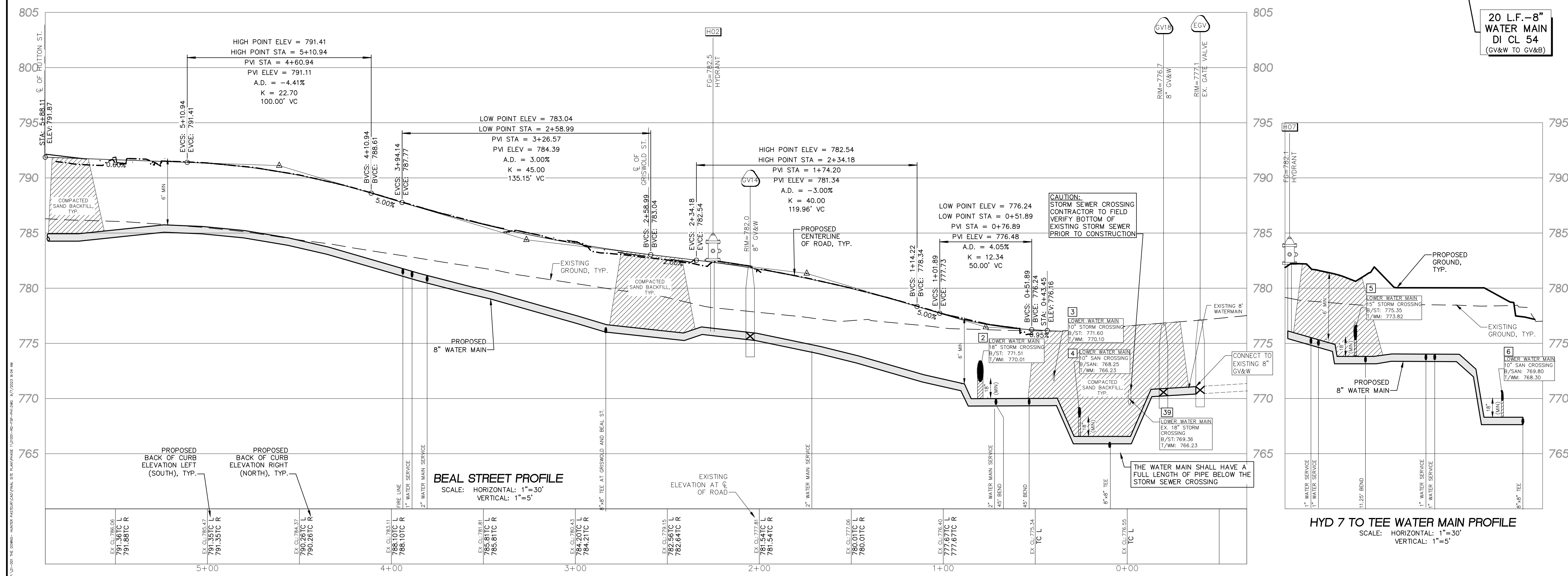


**THE DOWNS**  
 SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
 WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	TITLE SCHEMATIC DESIGN	06-10-2023
2.	S&E DESIGN DEVELOPMENT	02-03-2024
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

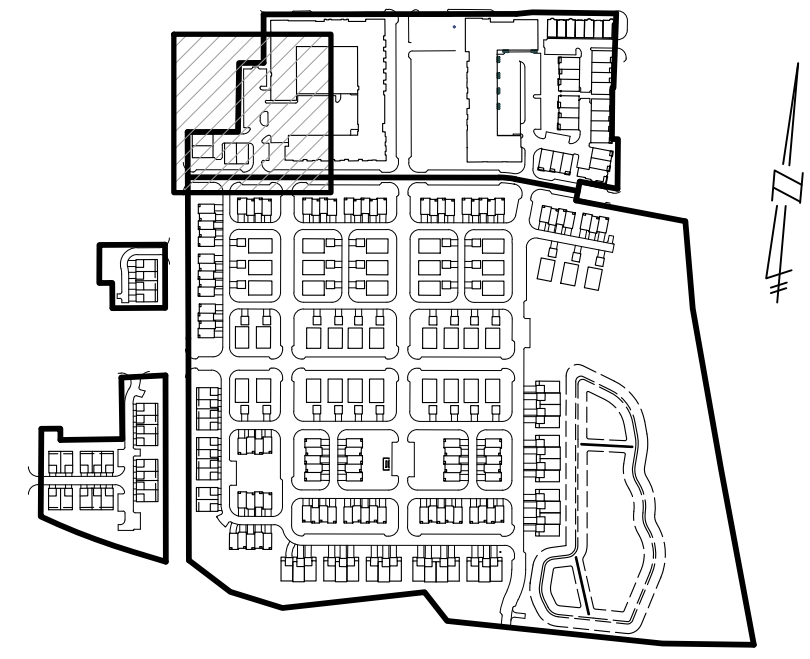
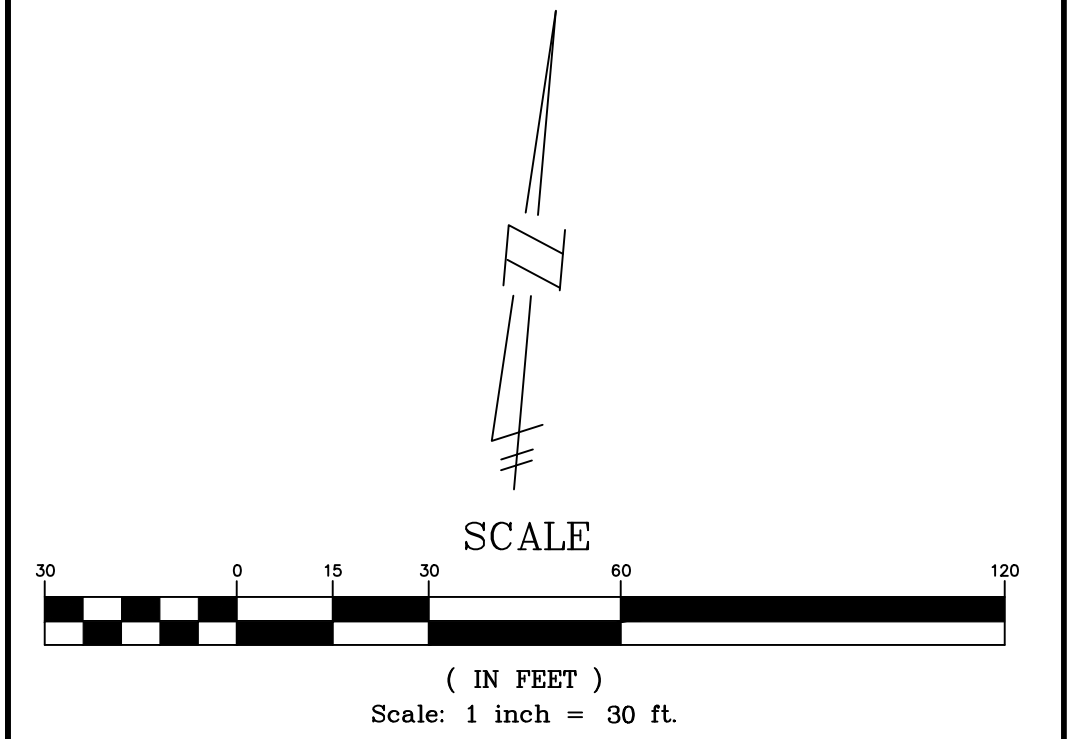
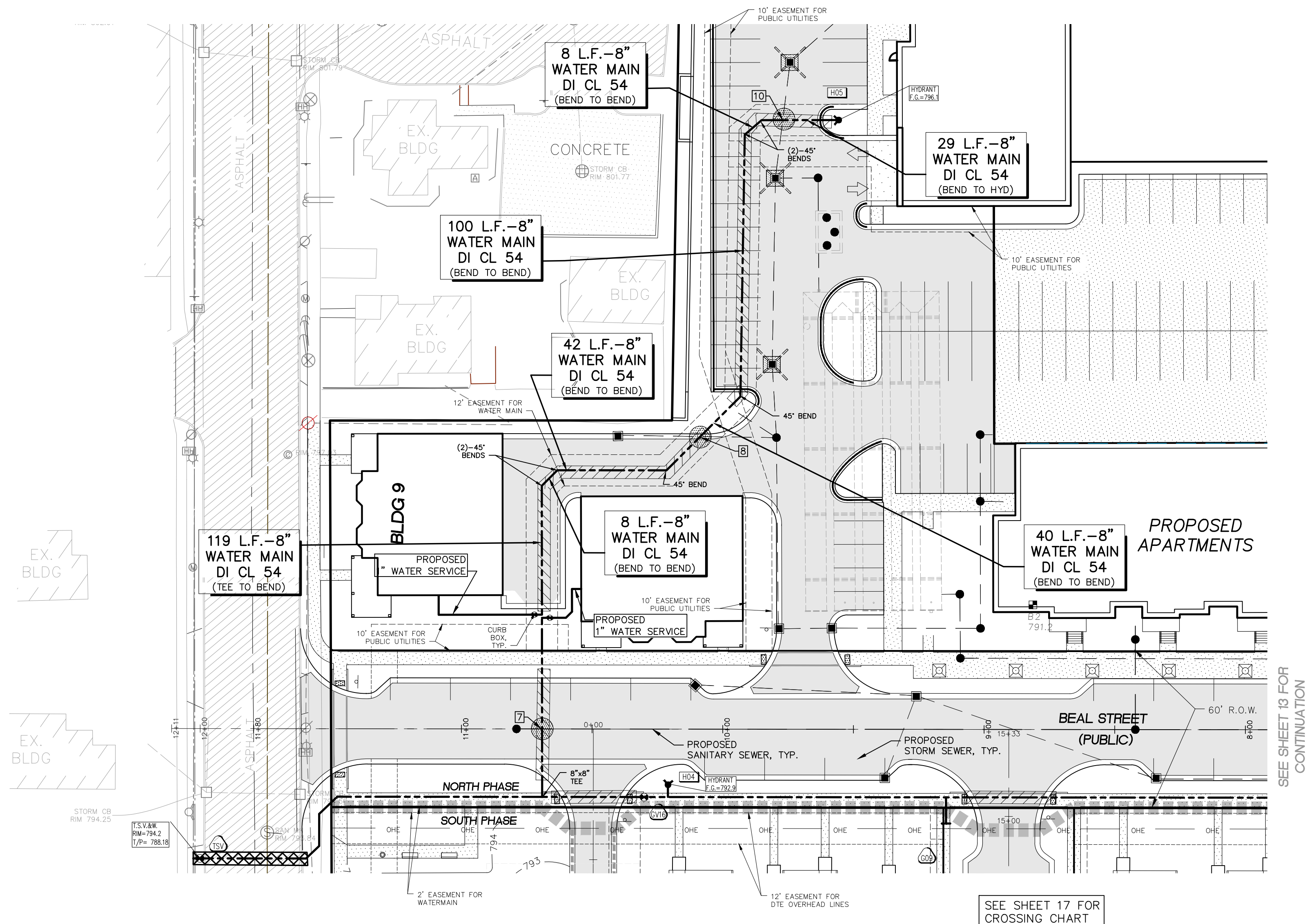
**ROAD & WATER MAIN PLAN AND PROFILE**



**BEAL STREET PROFILE**  
 SCALE: HORIZONTAL: 1"=30'  
 VERTICAL: 1"=5'

**HYD 7 TO TEE WATER MAIN PROFILE**  
 SCALE: HORIZONTAL: 1"=30'  
 VERTICAL: 1"=5'





**NOTES:**

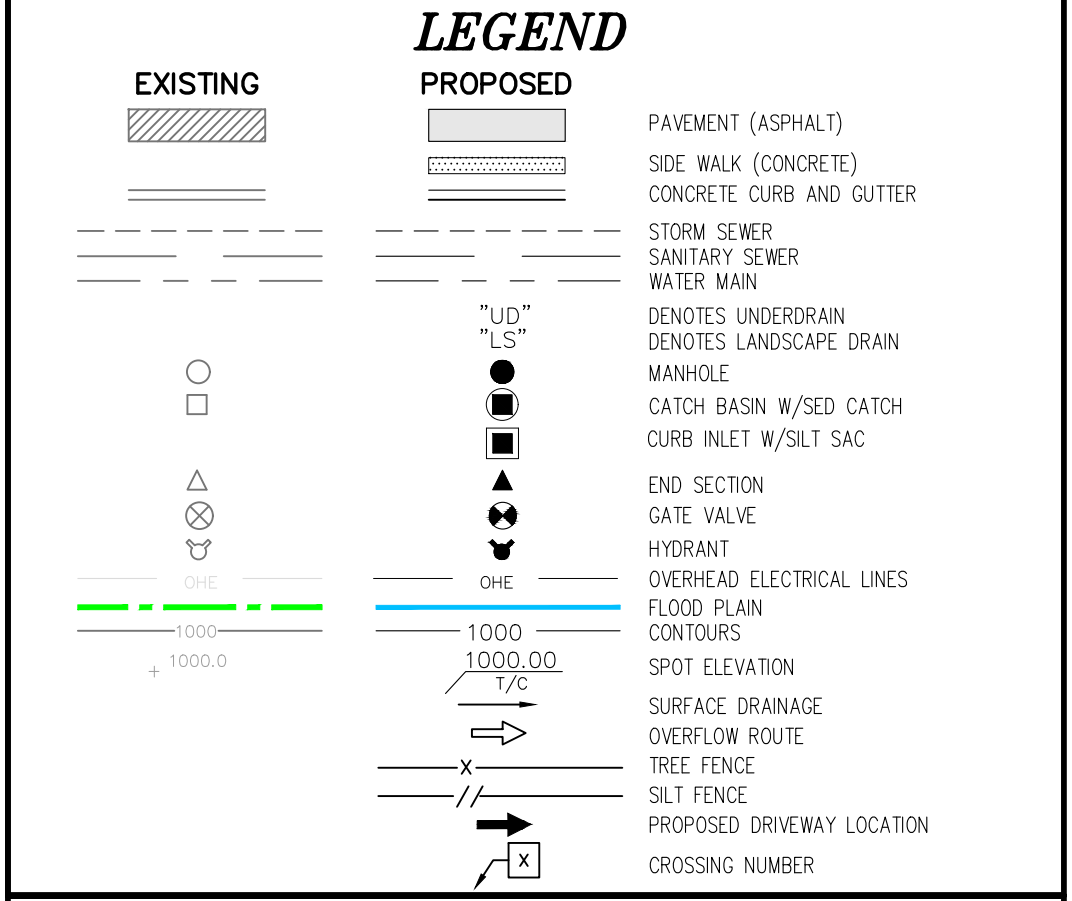
ALL TRENCHES WITHIN 1 ON 1 SLOPE FROM TOP OF CURBS SHALL BE BACKFILLED WITH GRANULAR MATERIAL CLASS II AND COMPACTED TO 95% OF MAXIMUM UNIT WEIGHT.

MAINTAIN 6" COVER OVER ALL WATER MAIN.

ALL WATER SERVICE LEADS SHALL BE MIN. 1" SEAMLESS COPPER WATER TUBE, ASTM DESIGNATION: B88, TYPE K, ANNEALED.

LOWER WATER MAIN AS NECESSARY TO MAINTAIN 18" MINIMUM VERTICAL SEPARATION BETWEEN UTILITIES.

COMPACTED SAND BACKFILL UNDER THE INFLUENCE OF ROADS. MATERIAL COMPACTED TO 95% MAXIMUM UNIT DENSITY.



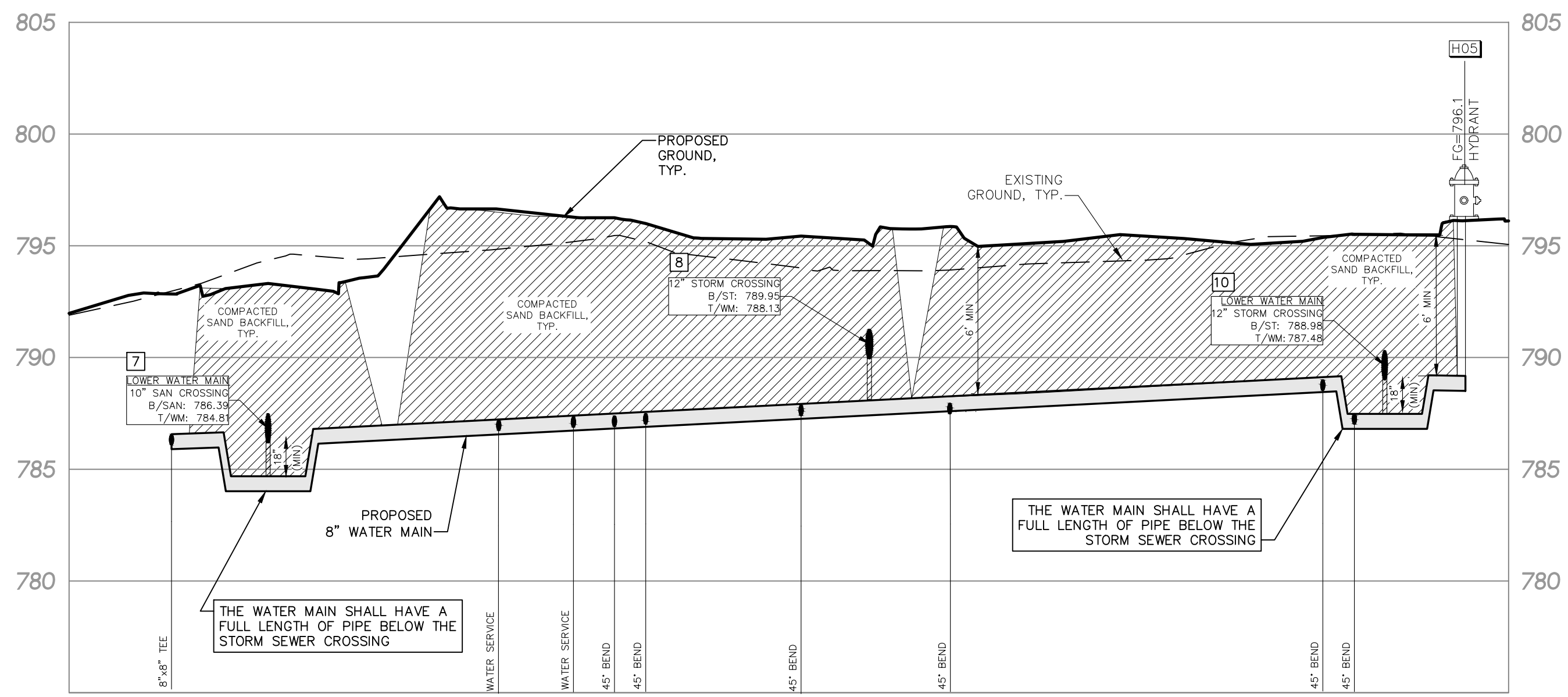
**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	10% SCHEMATIC DESIGN	06-10-2022
2.	50% DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

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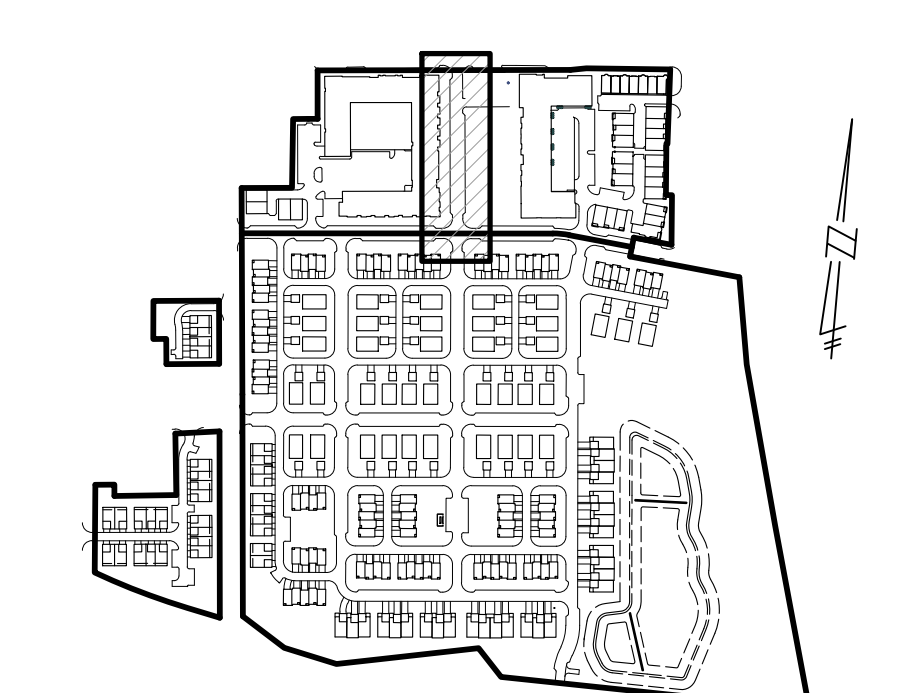
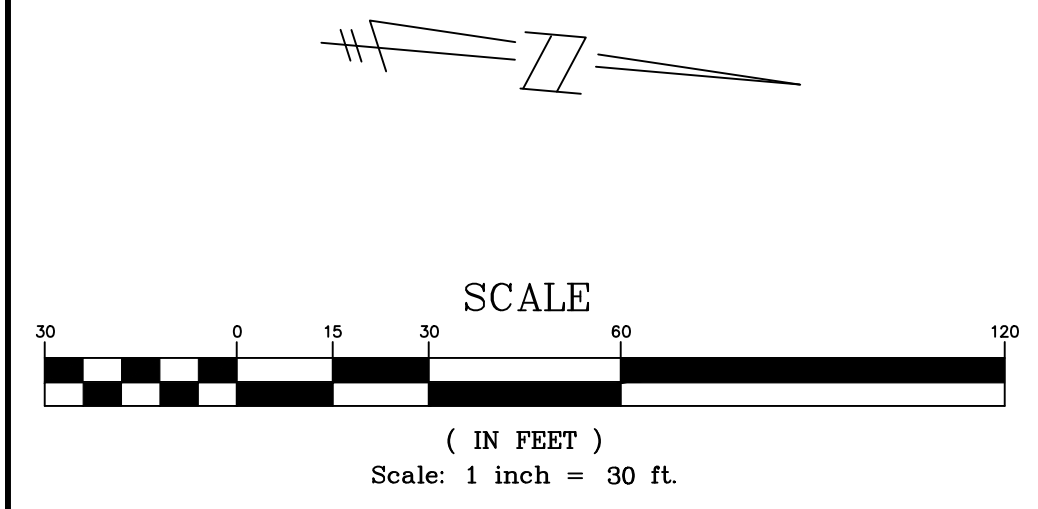
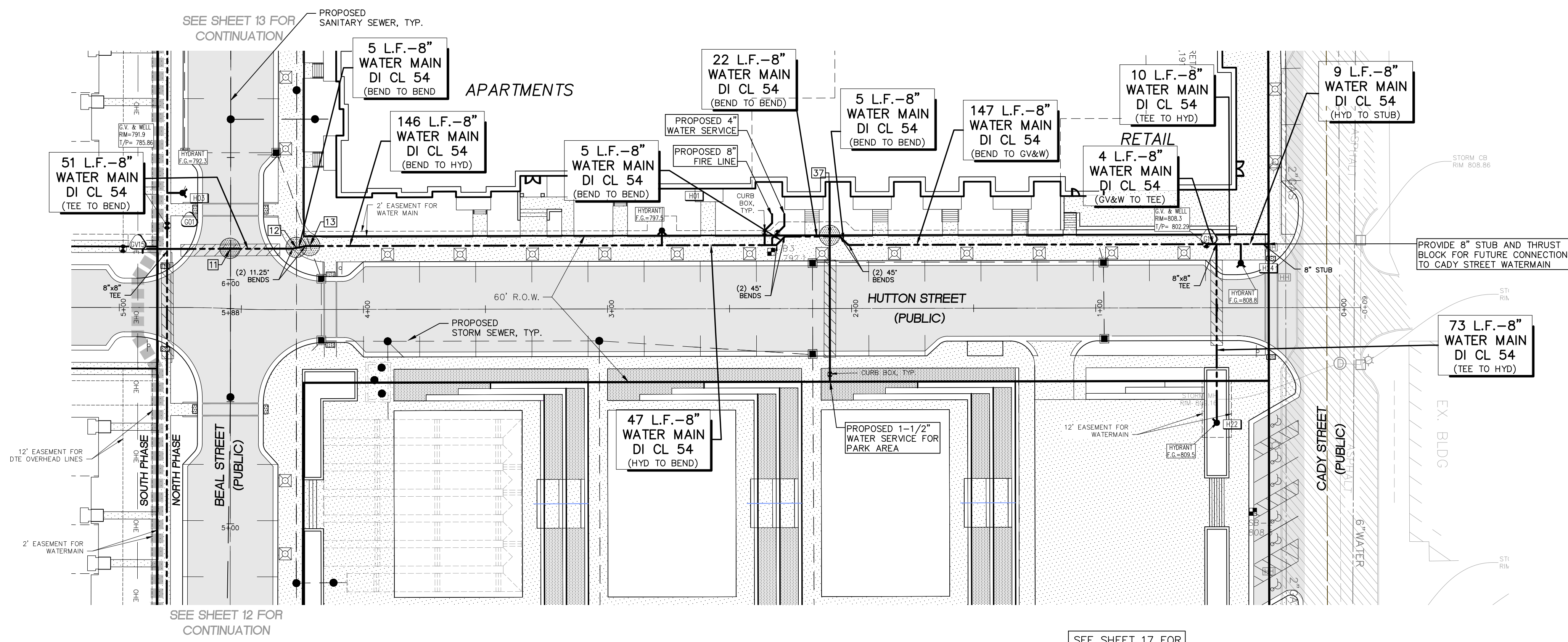


**WATERMAIN PROFILE**  
SCALE: HORIZONTAL: 1"=30'  
VERTICAL: 1"=5'

DATE: 04-25-22 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: E.E. FILE: 21001-RD-RSP-PH-DWG

**ROAD & WATER MAIN PLAN AND PROFILE**

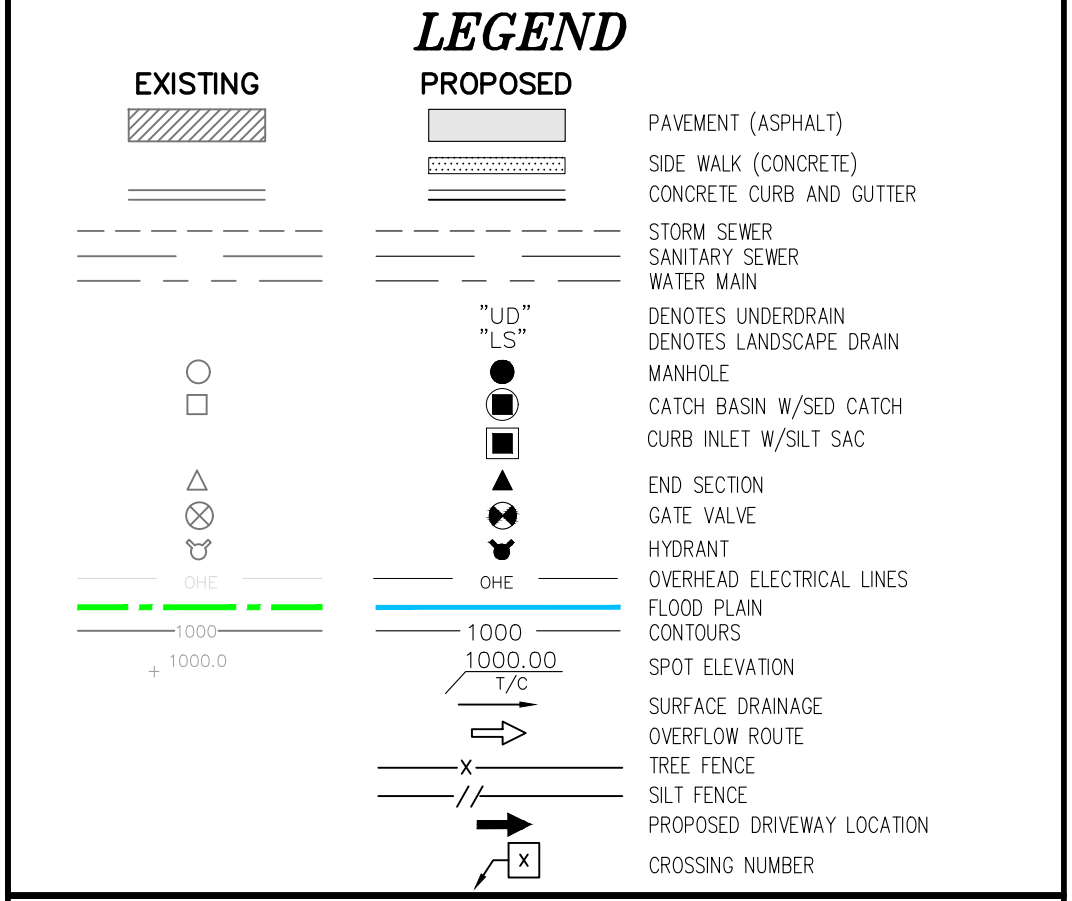




KEY MAP  
SCALE: 1" = 500'

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**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
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2.	SITE DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

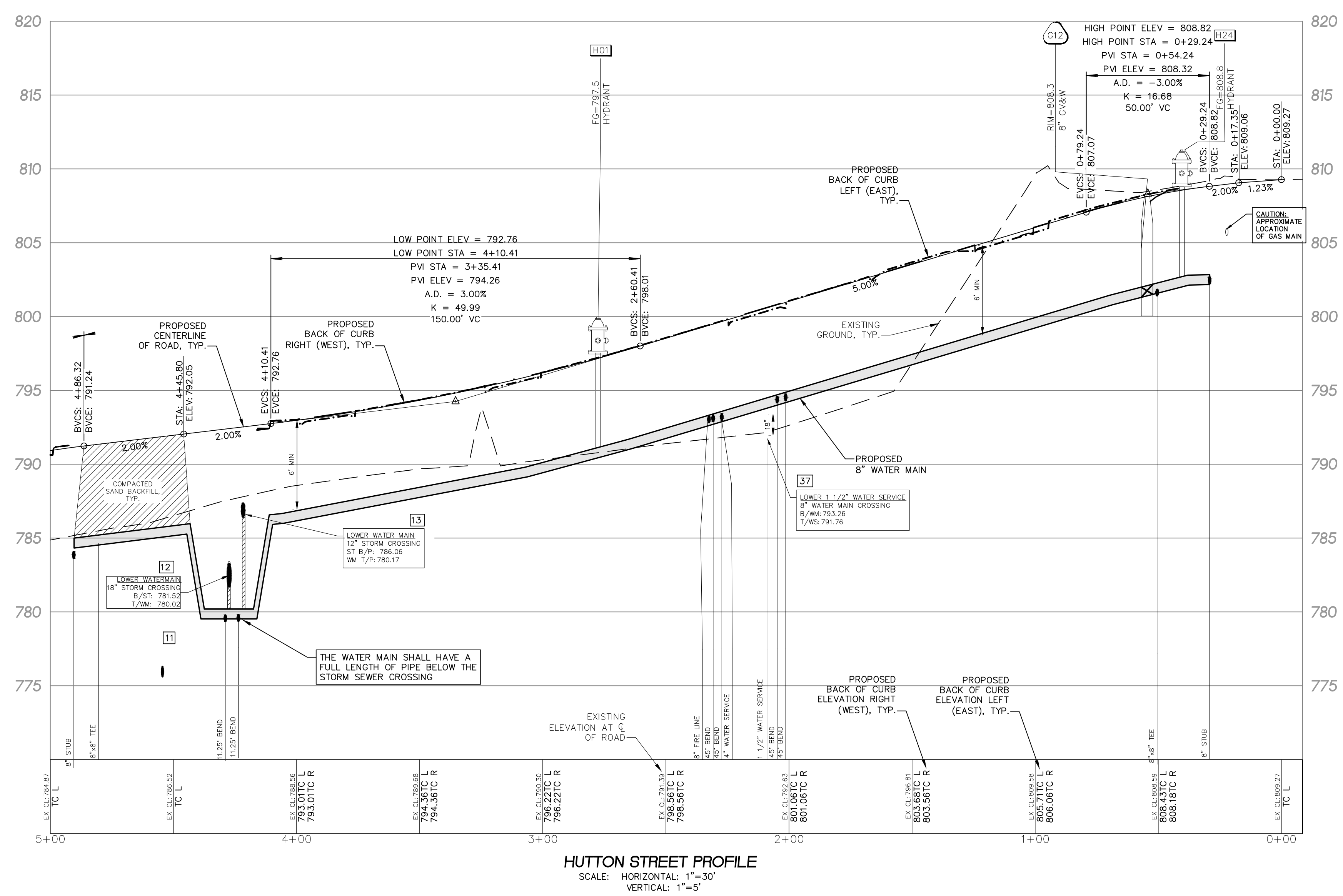
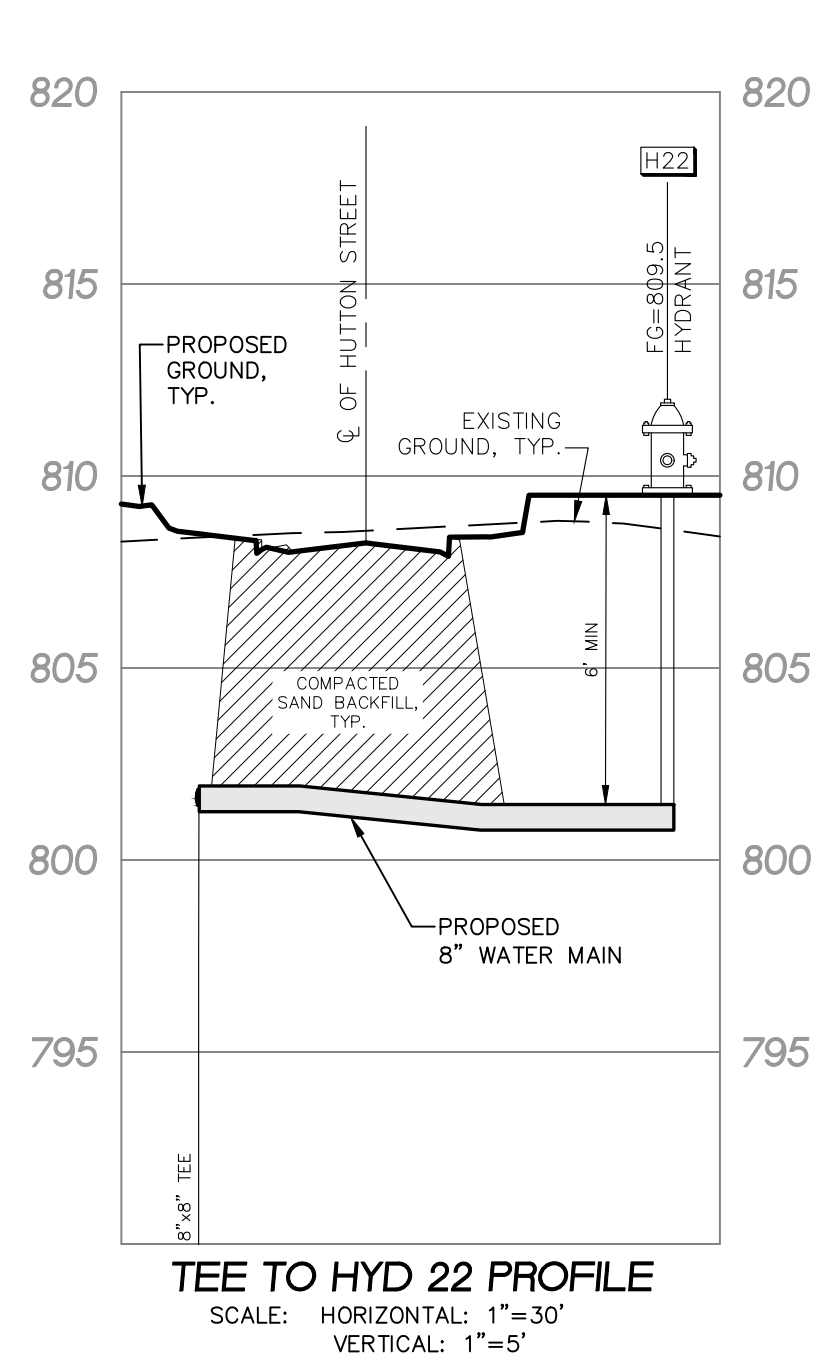
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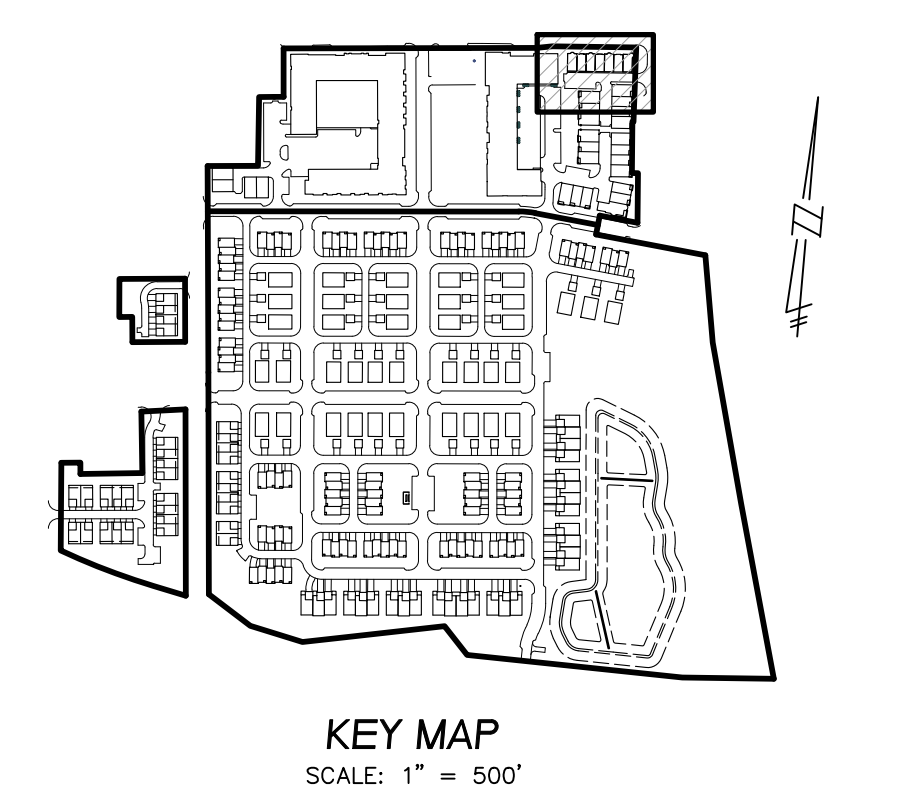
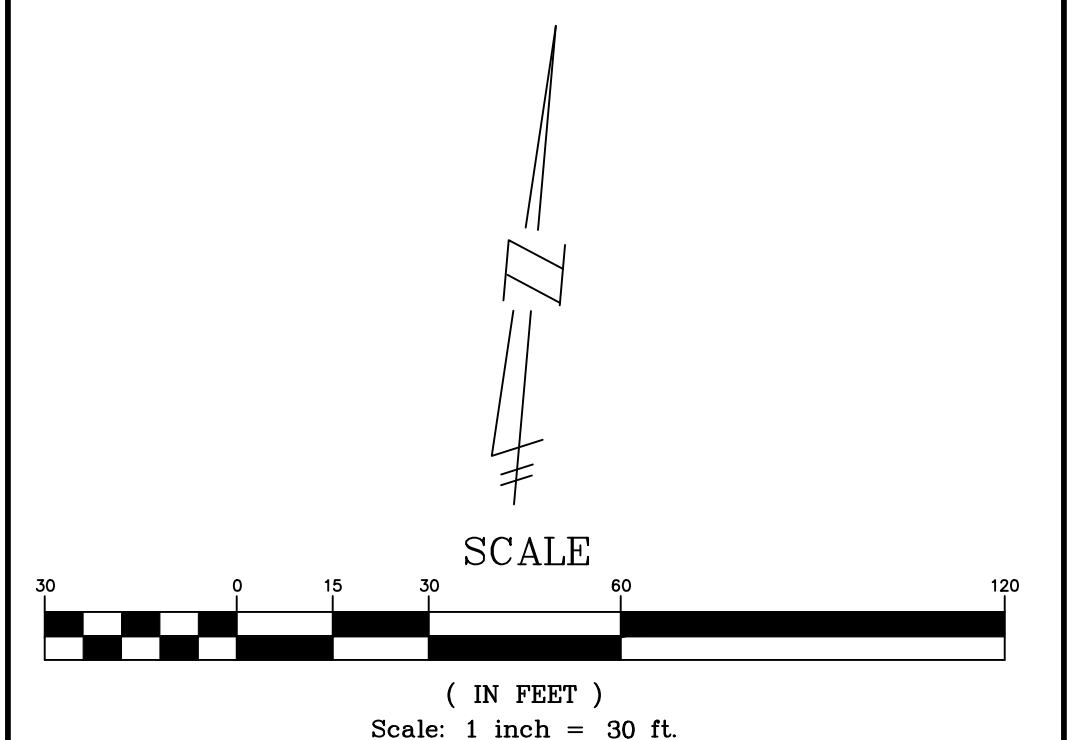
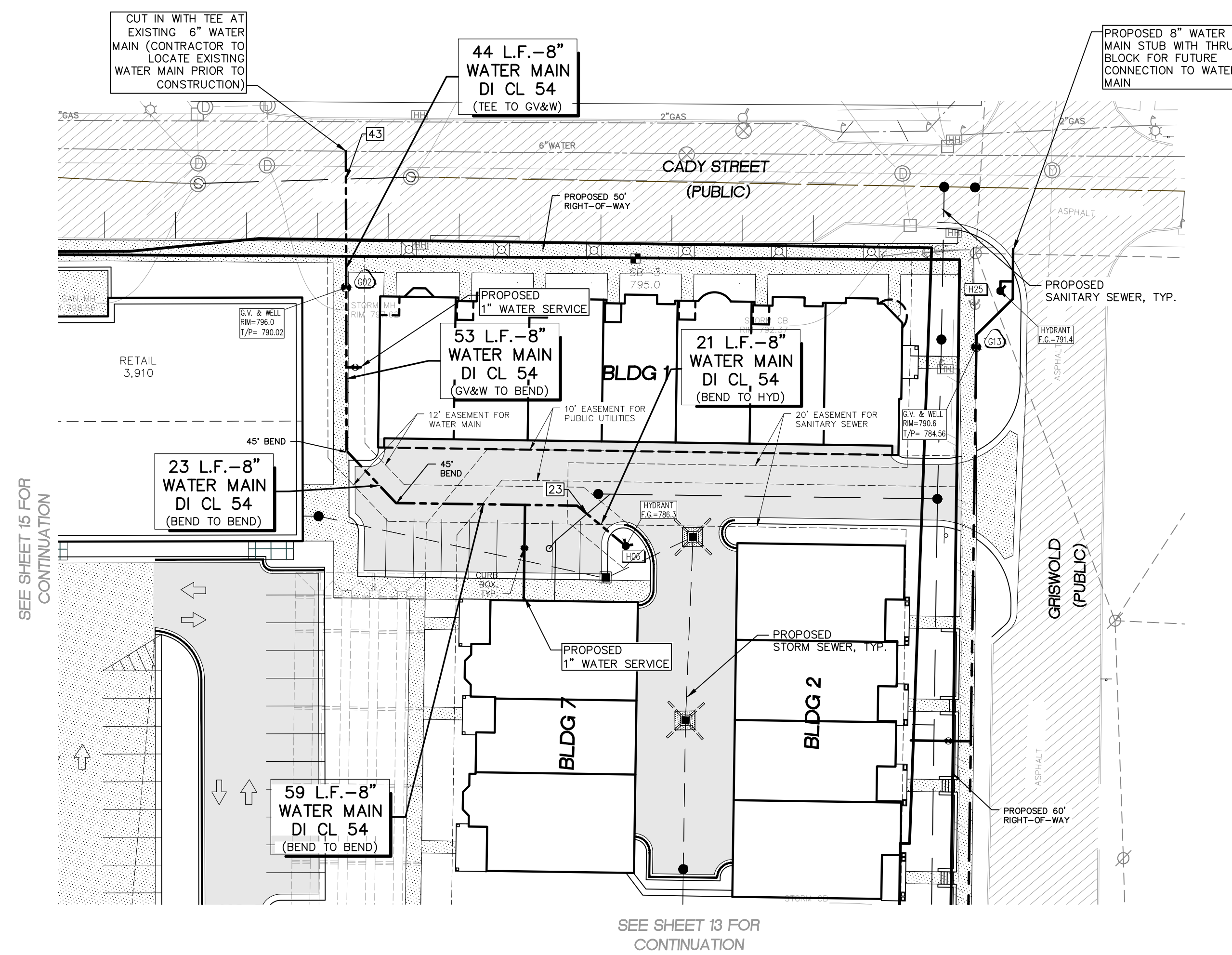
ROAD & WATER MAIN PLAN AND PROFILE





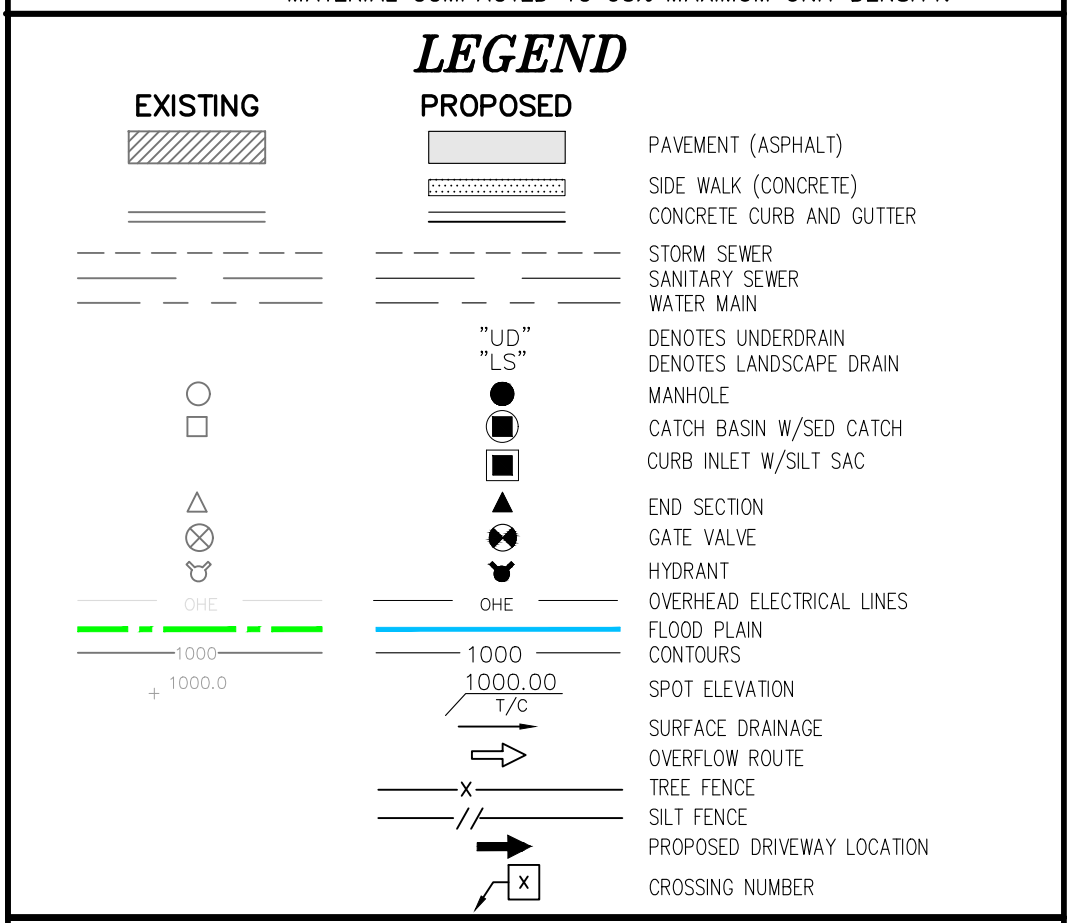




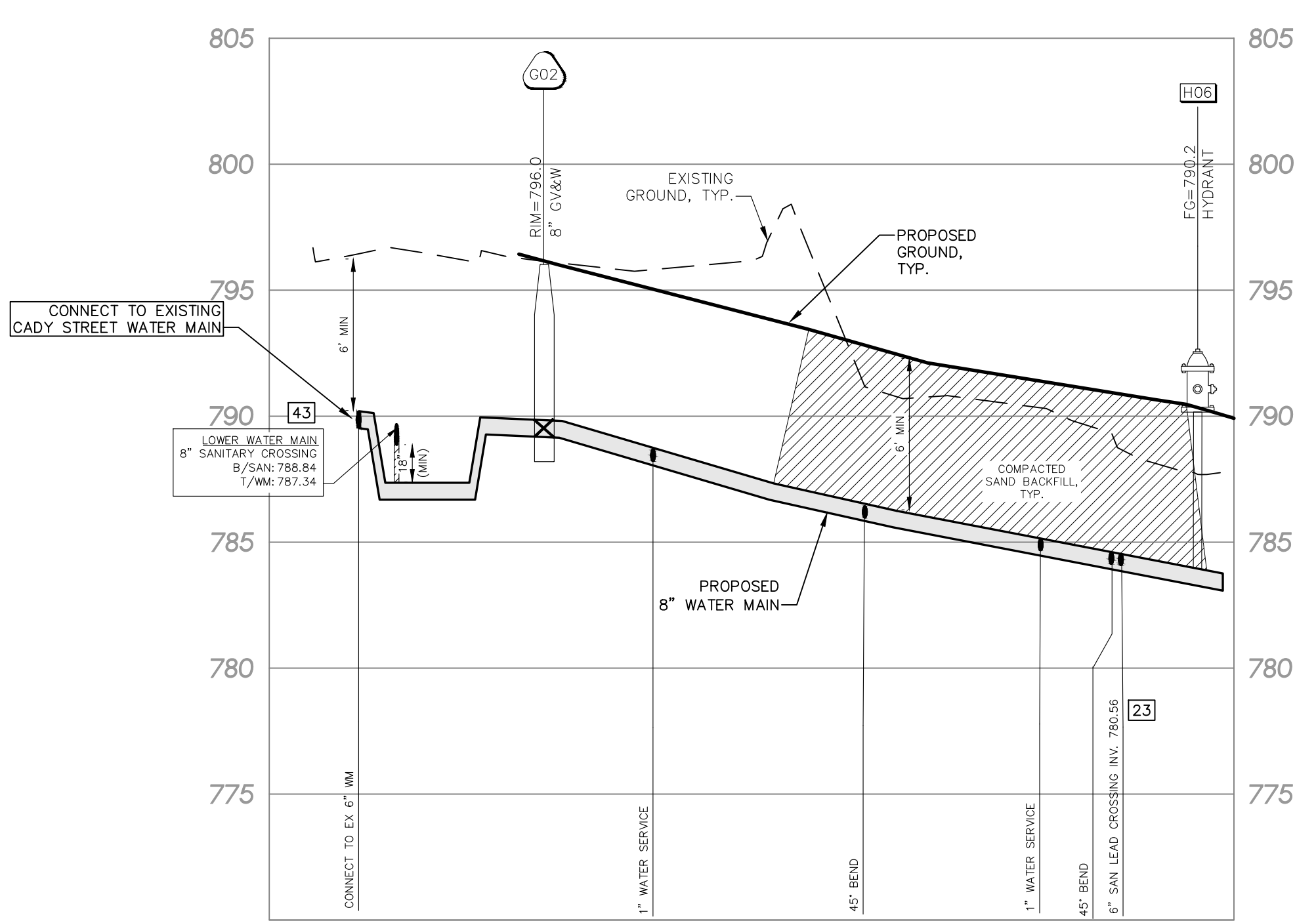


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CROSSING CHART NORTH					
CROSSING #	PIPE BELOW	T/PIPE ELEV.	PIPE ABOVE	B/PIPE ELEV.	SEPERATION
1	WM	785.54	EX. 8" SAN	787.04	1.50
2	WM	770.01	18" STORM	771.51	1.50
3	WM	770.10	12" STORM	771.60	1.50
4	WM	766.79	8" SAN	768.29	1.50
5	WM	773.82	12" STORM	775.32	1.50
6	WM	768.30	10" SAN	769.80	1.50
7	WM	784.81	10" SAN	786.31	1.50
8	WM	788.13	12" STORM	789.63	1.50
9	10" SAN	784.92	12" STORM	787.30	2.38
10	WM	787.48	12" STORM	788.98	1.50
11	8" SAN	774.53	WM	784.82	10.29
12	WM	780.02	18" STORM	781.52	1.50
13	WM	780.17	12" STORM	786.06	5.89
17	WM	766.23	EX. 10" SAN	768.84	2.61
18	WM	767.34	EX. 12" STORM	769.42	2.08
23	6" SAN LEAD	780.56	WM	782.88	2.32
24	8" SAN	771.16	12" STORM	775.71	4.55
25	8" SAN	770.40	18" STORM	771.90	1.50
26	8" SAN	773.18	12" STORM	779.57	6.39
27	8" SAN	769.82	EX. 12" STORM	771.69	1.87
28	10" SAN	785.93	12" STORM	787.52	1.59
29	8" SAN	774.57	12" STORM	786.35	11.78
30	15" STORM	784.63	12" STORM	788.21	3.58
31	18" STORM	783.65	12" STORM	786.11	2.46
33	18" STORM	777.37	12" STORM	778.87	1.5
34	15" STORM	775.68	12" STORM	777.29	1.61
35	8" SAN	769.12	24" STORM	770.75	1.63
36	8" SAN	769.83	18" STORM	771.52	1.69
37	WM SERVICE	791.76	WM	793.26	1.50
38	8" SAN	802.58	12" STORM	804.52	1.94
39	WM	766.23	EX. 18" STORM	769.36	3.13
40	18" STORM	783.83	8" SAN	786.05	2.22
41	8" SAN	778.38	18" STORM	782.40	4.02
42	8" SAN	775.17	18" STORM	782.28	7.11
43	WM	787.34	8" SAN	788.84	1.50



TEE TO H06 WATER MAIN PROFILE  
 SCALE: HORIZONTAL: 1"=30'  
 VERTICAL: 1"=5'

**THE DOWNS**  
 SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
 WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	TITLE SCHEMATIC DESIGN	06-10-2022
2.	SITE DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

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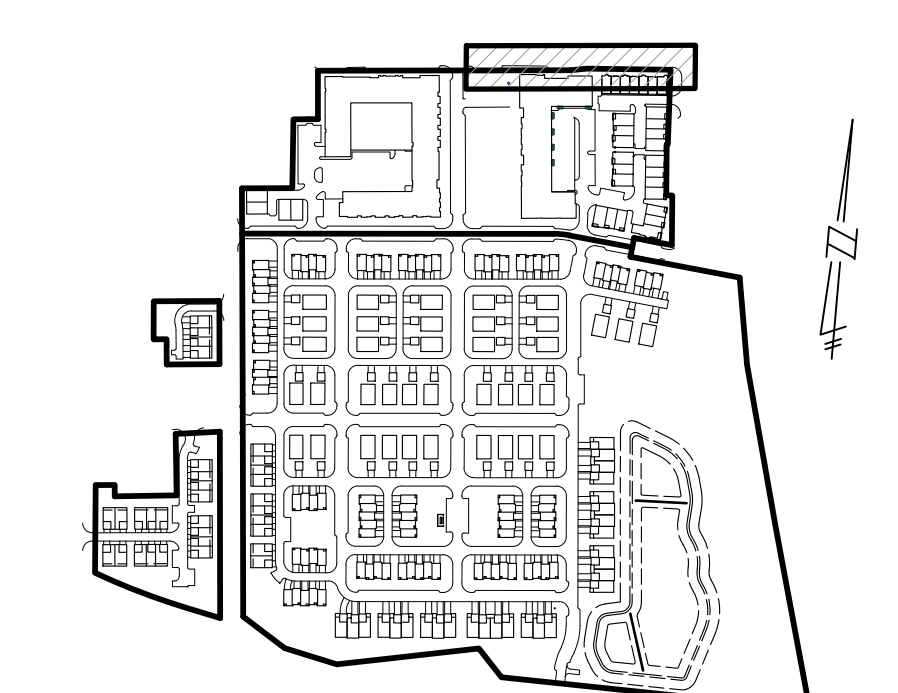
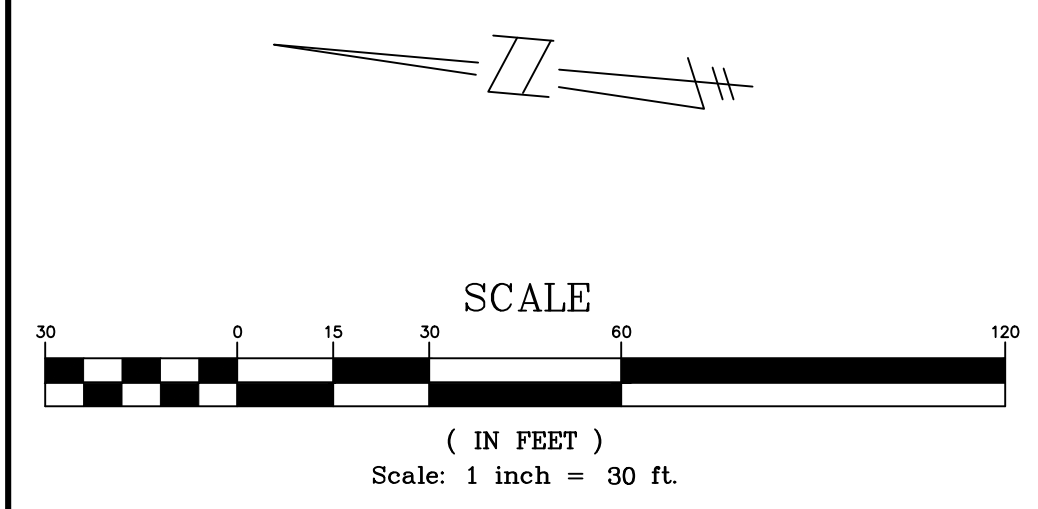
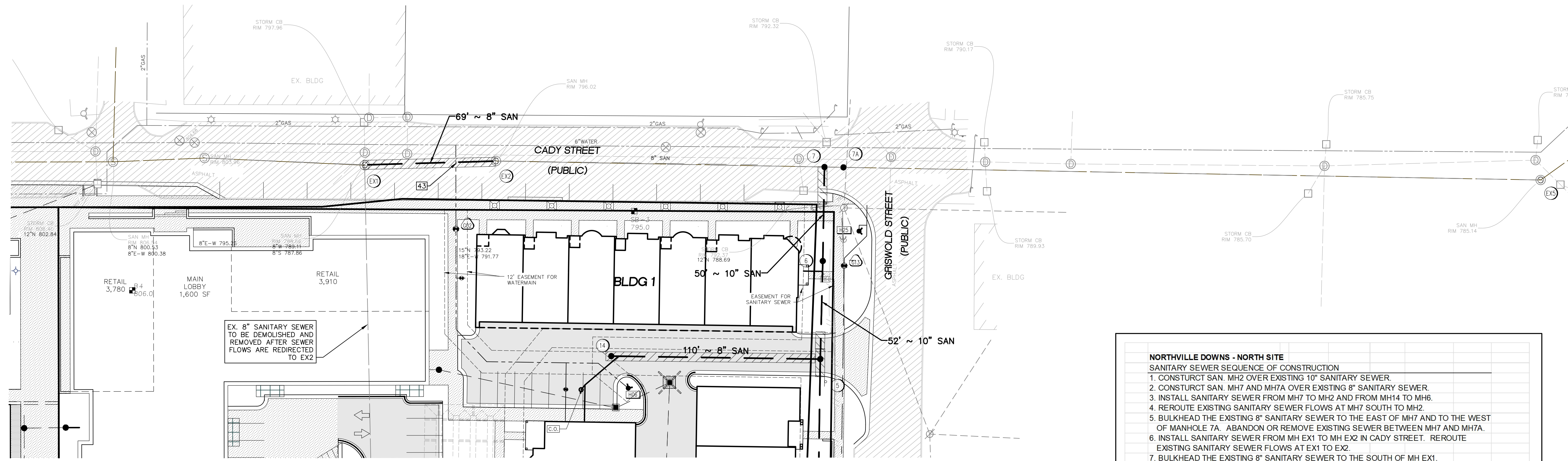
DATE: 04-25-22 DESIGNED BY: S.M. JOB NUMBER: 21-001  
 CHECKED BY: E.E. FILE: 21001-RD-RSP-PH.DWG

OFF ROAD WATER MAIN PLAN AND PROFILE

**SKL SEIBER KEAST LEHNER**  
 ENGINEERING | SURVEYING  
 39205 COUNTRY CLUB DRIVE, SUITE C8  
 FARMINGTON HILLS, MI 48331  
 PHONE: 248.308.3331

SHEET  
**17**

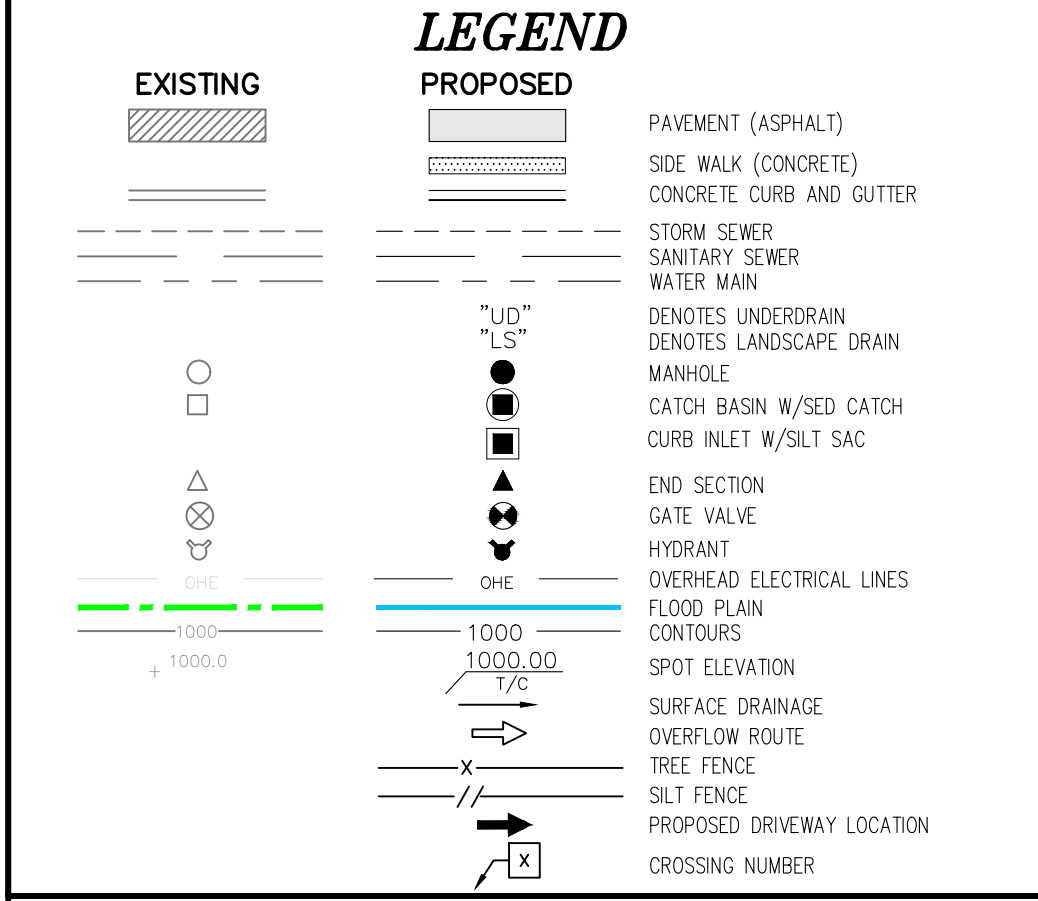




- NORTHVILLE DOWNS - NORTH SITE**  
**SANITARY SEWER SEQUENCE OF CONSTRUCTION**
1. CONSTRUCT SAN. MH2 OVER EXISTING 10" SANITARY SEWER.
  2. CONSTRUCT SAN. MH7 AND MH7A OVER EXISTING 8" SANITARY SEWER.
  3. INSTALL SANITARY SEWER FROM MH7 TO MH2 AND FROM MH4 TO MH6.
  4. REROUTE EXISTING SANITARY SEWER FLOWS AT MH7 SOUTH TO MH2.
  5. BULKHEAD THE EXISTING 8" SANITARY SEWER TO THE EAST OF MH7 AND TO THE WEST OF MANHOLE 7A. ABANDON OR REMOVE EXISTING SEWER BETWEEN MH7 AND MH7A.
  6. INSTALL SANITARY SEWER FROM MH EX1 TO MH EX2 IN CADY STREET. REROUTE EXISTING SANITARY SEWER FLOWS AT EX1 TO EX2.
  7. BULKHEAD THE EXISTING 8" SANITARY SEWER TO THE SOUTH OF MH EX1. DEMOLISH AND REMOVE 665 LF OF EXISTING SANITARY SEWER FROM MH EX1 TO SAN. MH 2.
  8. INSTALL SANITARY SEWER FROM MH13 TO MH2 AND FROM MH12 TO MH8.
  9. AFTER THE NORTH SANITARY SWER IS INSTALLED, SANITARY SEWER FLOWS WILL FLOW THROUGH THE EXISTING 10" SANITARY SEWER IN BEAL STREET.
  10. PROPOSED MH1 WILL BE INSTALLED AS A PART OF THE NORTHVILLE DOWNS SOUTH SITE TO REROUTE THE SANITARY FLOWS AROUND THE BEAL STREET BRIDGE TO ULTIMATELY DISCHARGE FLOWS IN THE OAKLAND COUNTY INTERCEPTOR WITHIN RIVER STREET.

**NOTES**  
 ALL SANITARY LEADS SHALL BE 6" DIA. PVC SDR 235 WITH A MINIMUM SLOPE OF 1%

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**THE DOWNS**  
 SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
 WAYNE COUNTY, MICHIGAN

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4.	REV PER CITY REVIEW	09-08-2023

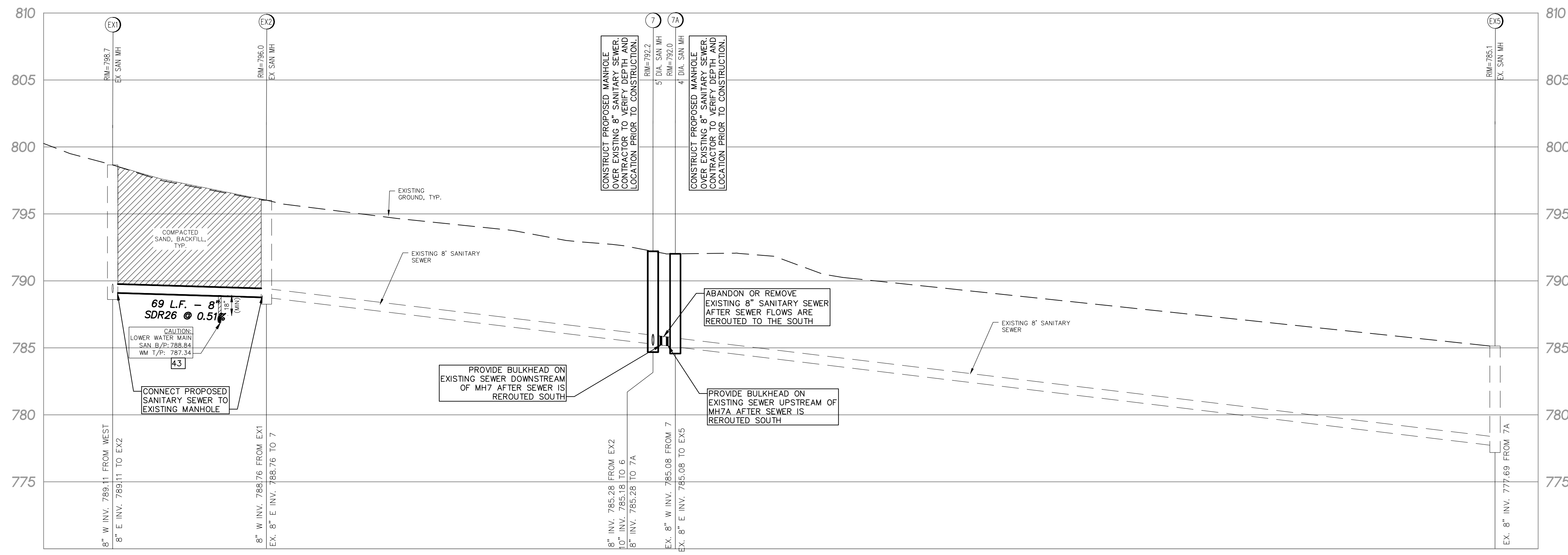
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DATE: 04-25-23 DESIGNED BY: S.M. JOB NUMBER: 21-001  
 CHECKED BY: E.E. FILE: 21001-SAN-FS9-PH1.DWG

**SANITARY SEWER PLAN AND PROFILE**

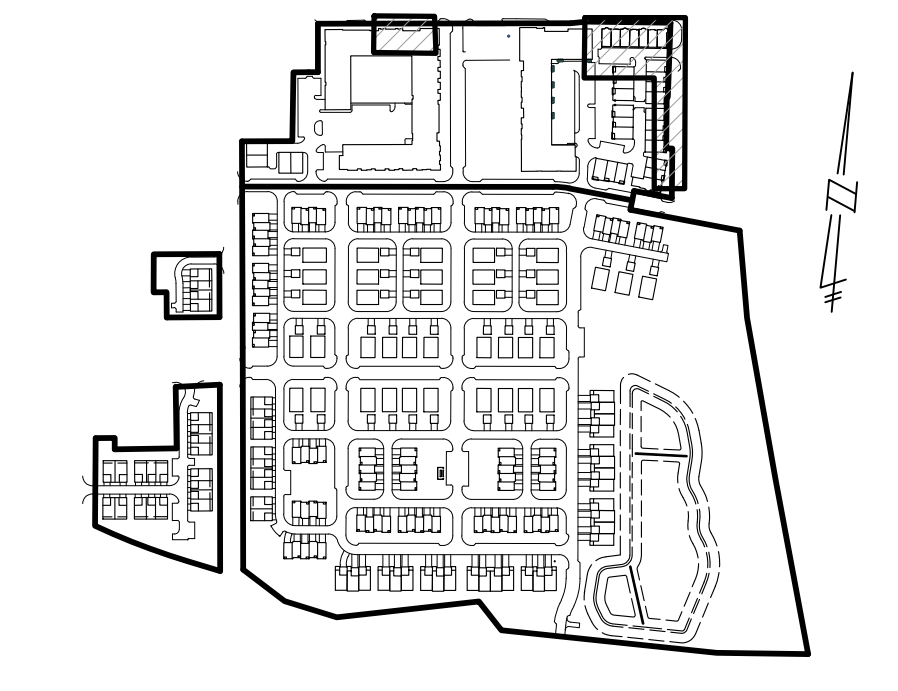
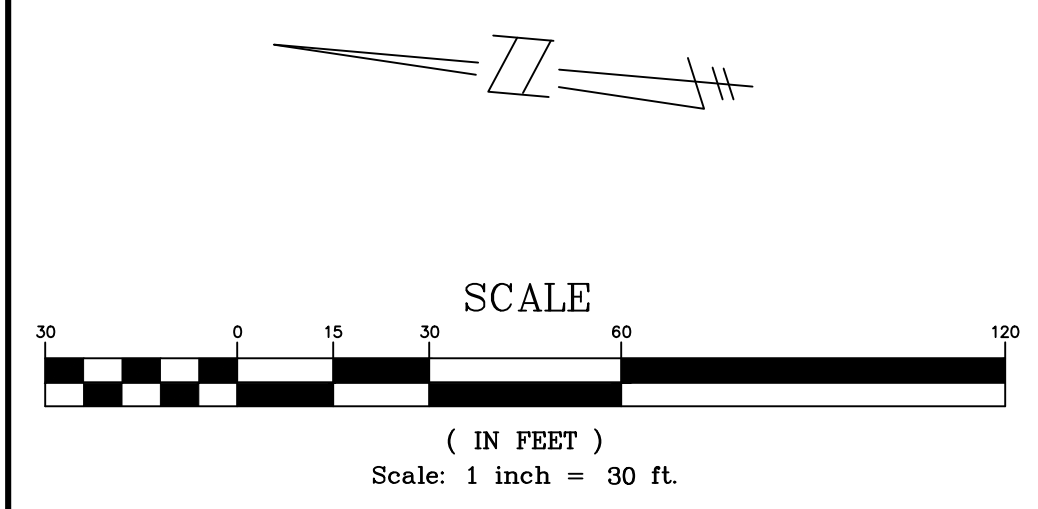
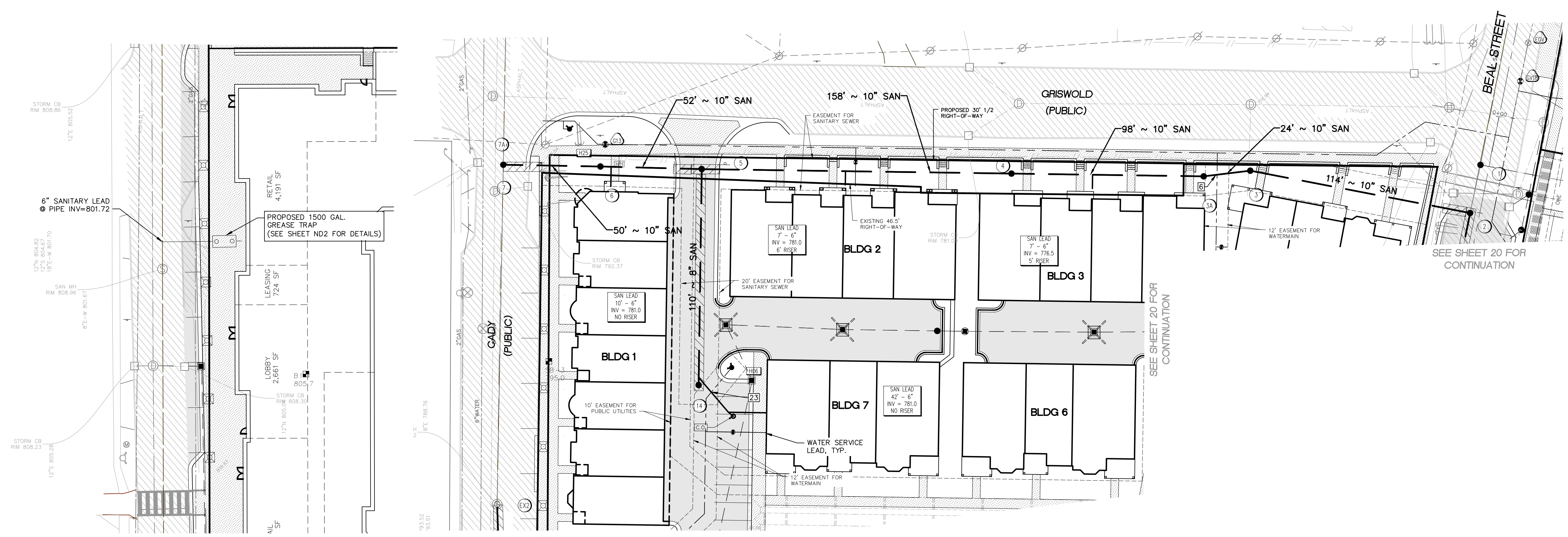


**SANITARY SEWER PROFILE**  
 SCALE: HORIZONTAL: 1"=30'  
 VERTICAL: 1"=5'

**SEIBER KEAST LEHNER**  
 ENGINEERING | SURVEYING  
 39205 COUNTRY CLUB DRIVE, SUITE C8  
 FARMINGTON HILLS, MI 48331  
 PHONE: 248.308.3331

**SHEET 18**





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**LEGEND**

EXISTING	PROPOSED	DESCRIPTION
[Symbol]	[Symbol]	PAVEMENT (ASPHALT)
[Symbol]	[Symbol]	SIDE WALK (CONCRETE)
[Symbol]	[Symbol]	CONCRETE CURB AND GUTTER
[Symbol]	[Symbol]	STORM SEWER
[Symbol]	[Symbol]	SANITARY SEWER
[Symbol]	[Symbol]	WATER MAIN
[Symbol]	[Symbol]	"UD" DENOTES UNDERDRAIN
[Symbol]	[Symbol]	"LS" DENOTES LANDSCAPE DRAIN
[Symbol]	[Symbol]	MANHOLE
[Symbol]	[Symbol]	CATCH BASIN W/SED CATCH
[Symbol]	[Symbol]	CURB INLET W/SILT SAC
[Symbol]	[Symbol]	END SECTION
[Symbol]	[Symbol]	GATE VALVE
[Symbol]	[Symbol]	HYDRANT
[Symbol]	[Symbol]	OVERHEAD ELECTRICAL LINES
[Symbol]	[Symbol]	FLOOD PLAN
[Symbol]	[Symbol]	CONTOURS
[Symbol]	[Symbol]	SPOT ELEVATION
[Symbol]	[Symbol]	T/F/E
[Symbol]	[Symbol]	SURFACE DRAINAGE
[Symbol]	[Symbol]	OVERFLOW ROUTE
[Symbol]	[Symbol]	TREE FENCE
[Symbol]	[Symbol]	SILT FENCE
[Symbol]	[Symbol]	PROPOSED DRIVEWAY LOCATION
[Symbol]	[Symbol]	CROSSING NUMBER

**THE DOWNS**  
 SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
 WAYNE COUNTY, MICHIGAN

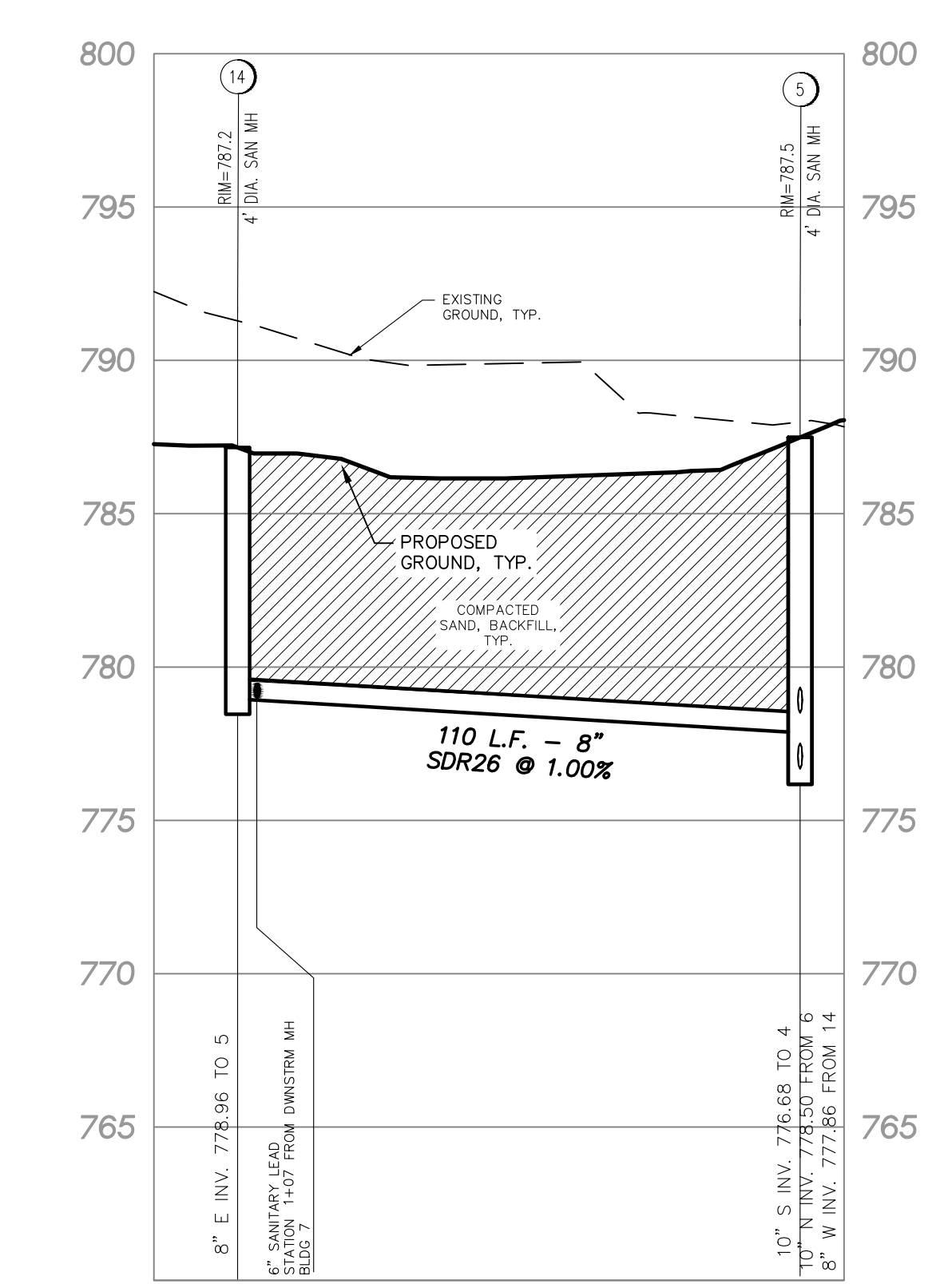
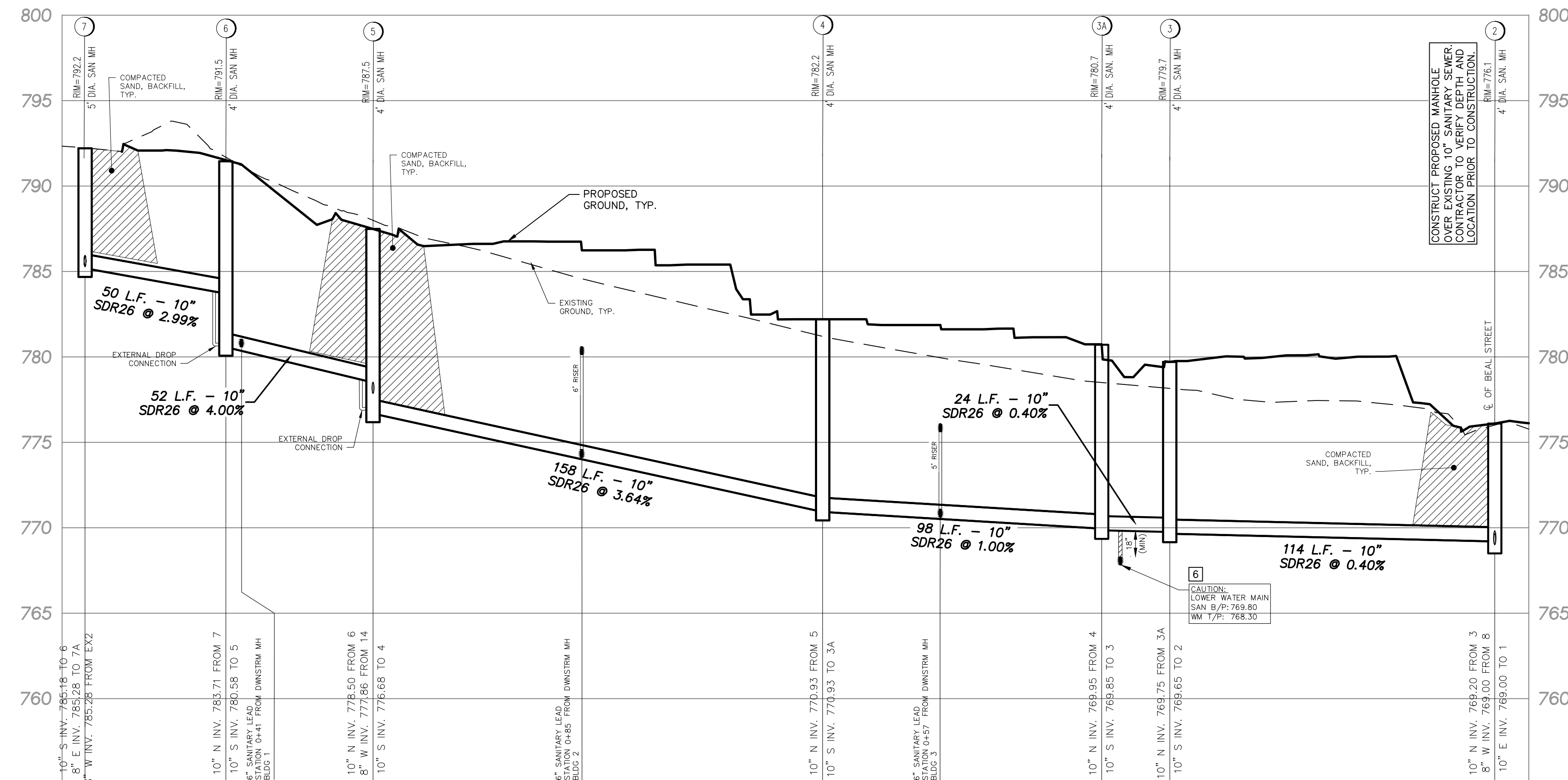
REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	100% SCHEMATIC DESIGN	06-10-2022
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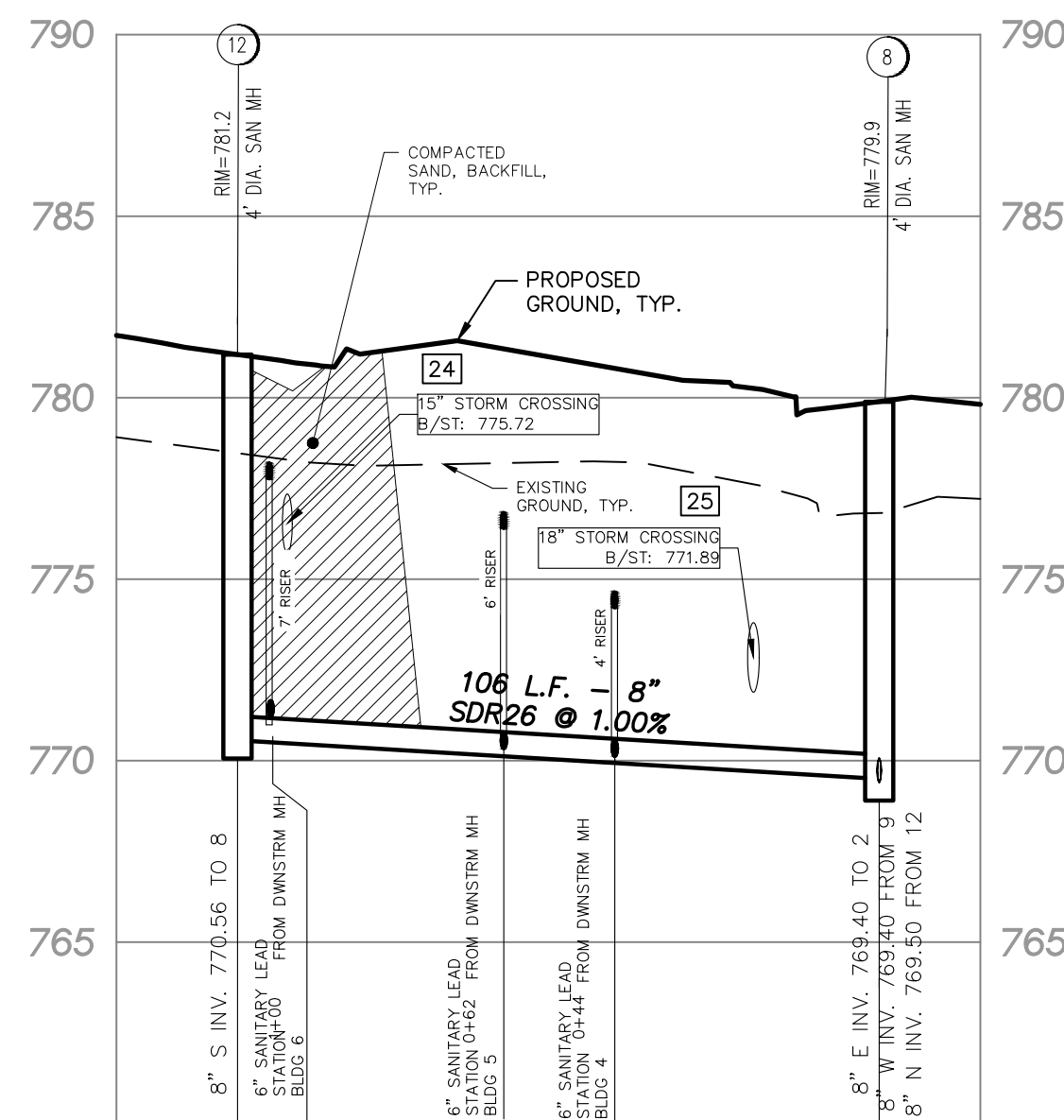
DATE: 04-25-23 DESIGNED BY: S.M. JOB NUMBER: 21-001  
 CHECKED BY: P.E. FILE: 21001-SAN-FS9-PH.DWG



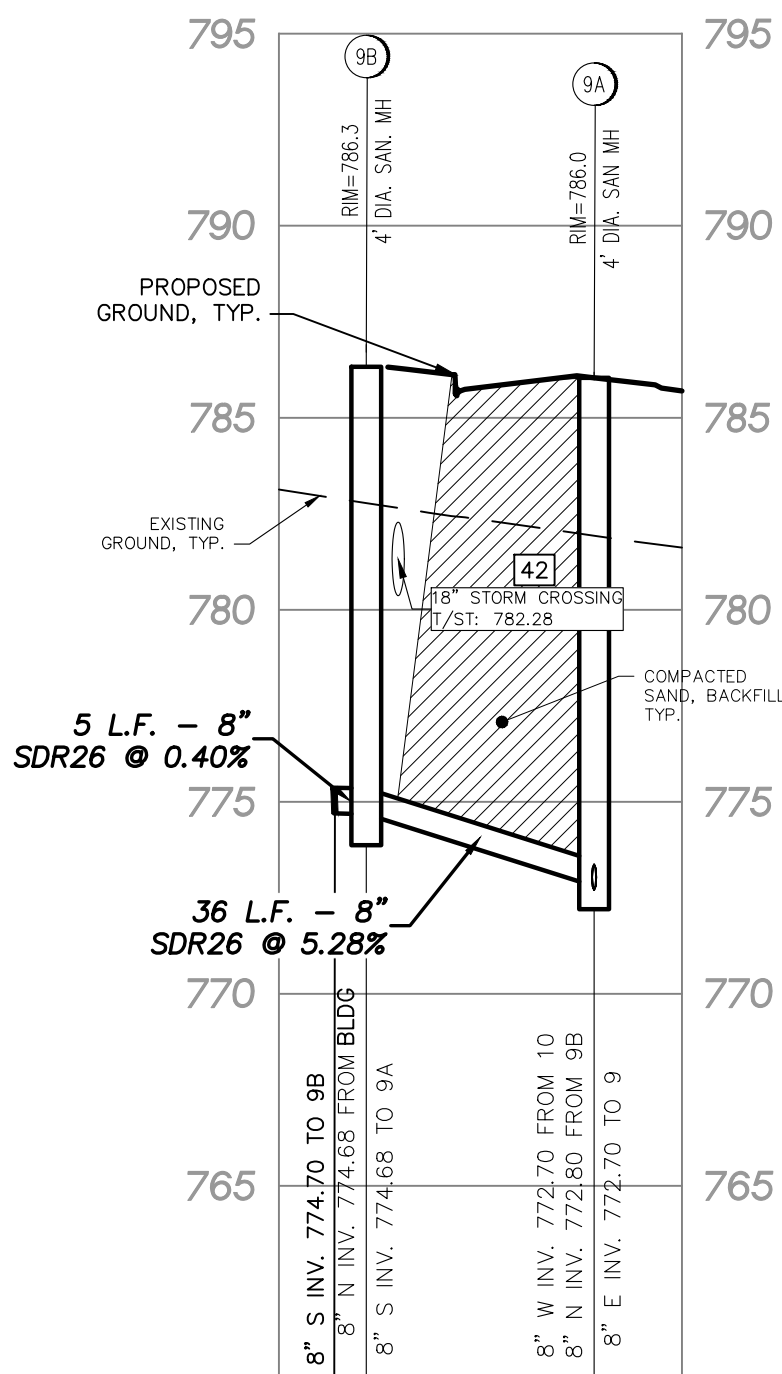
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**SANITARY SEWER PLAN AND PROFILE**

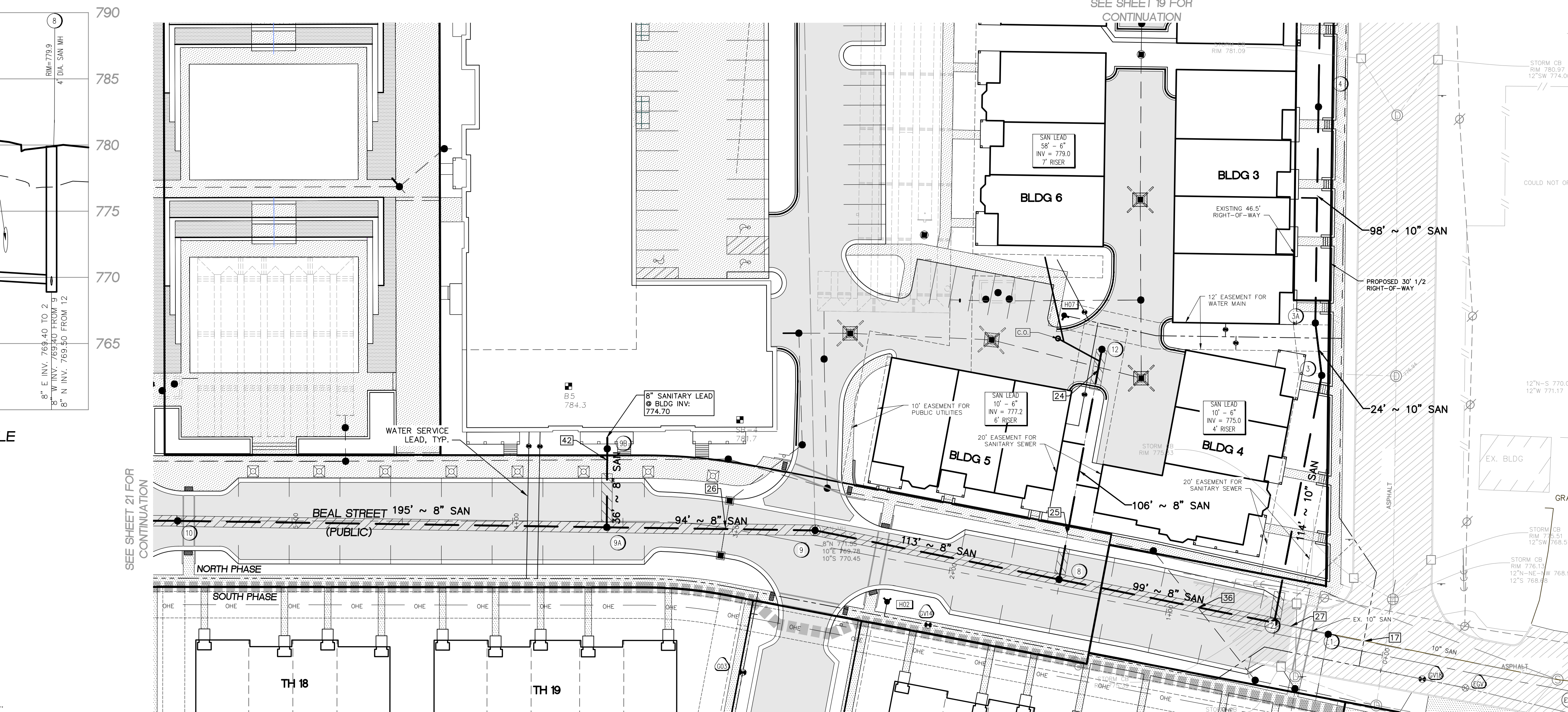




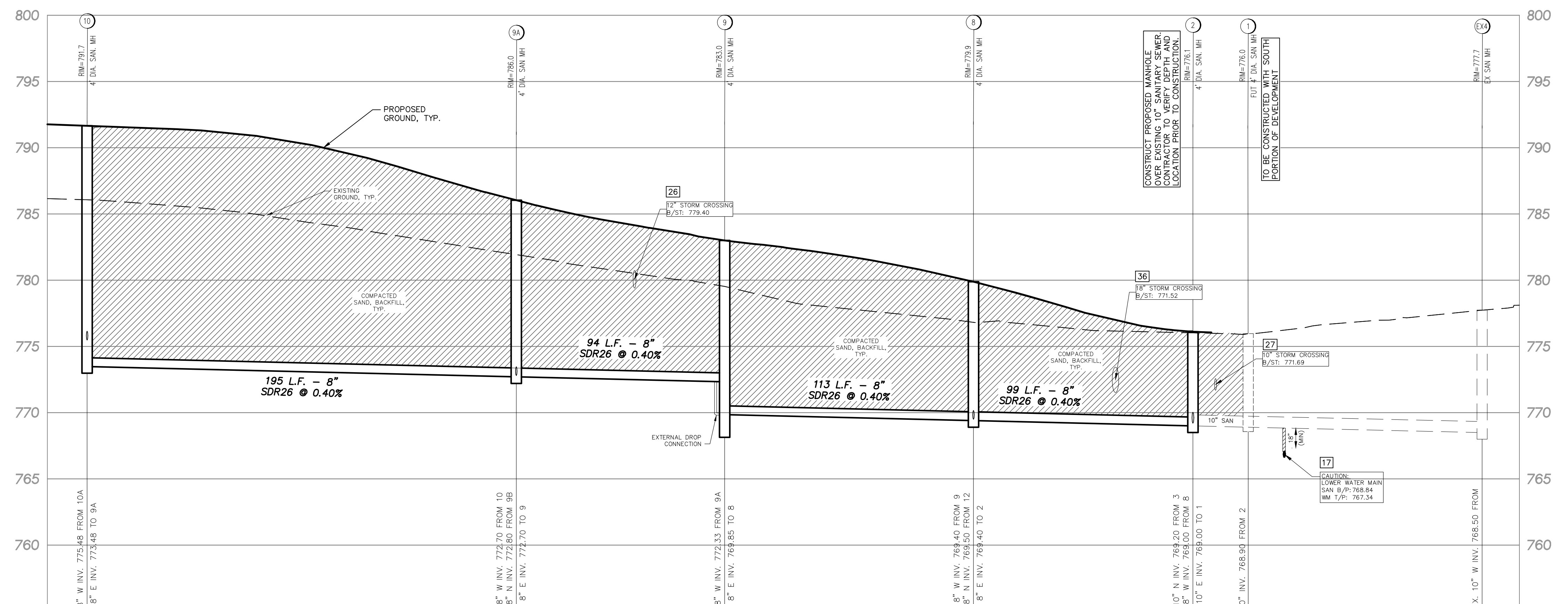
**SANITARY SEWER PROFILE**  
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VERTICAL: 1"=5'



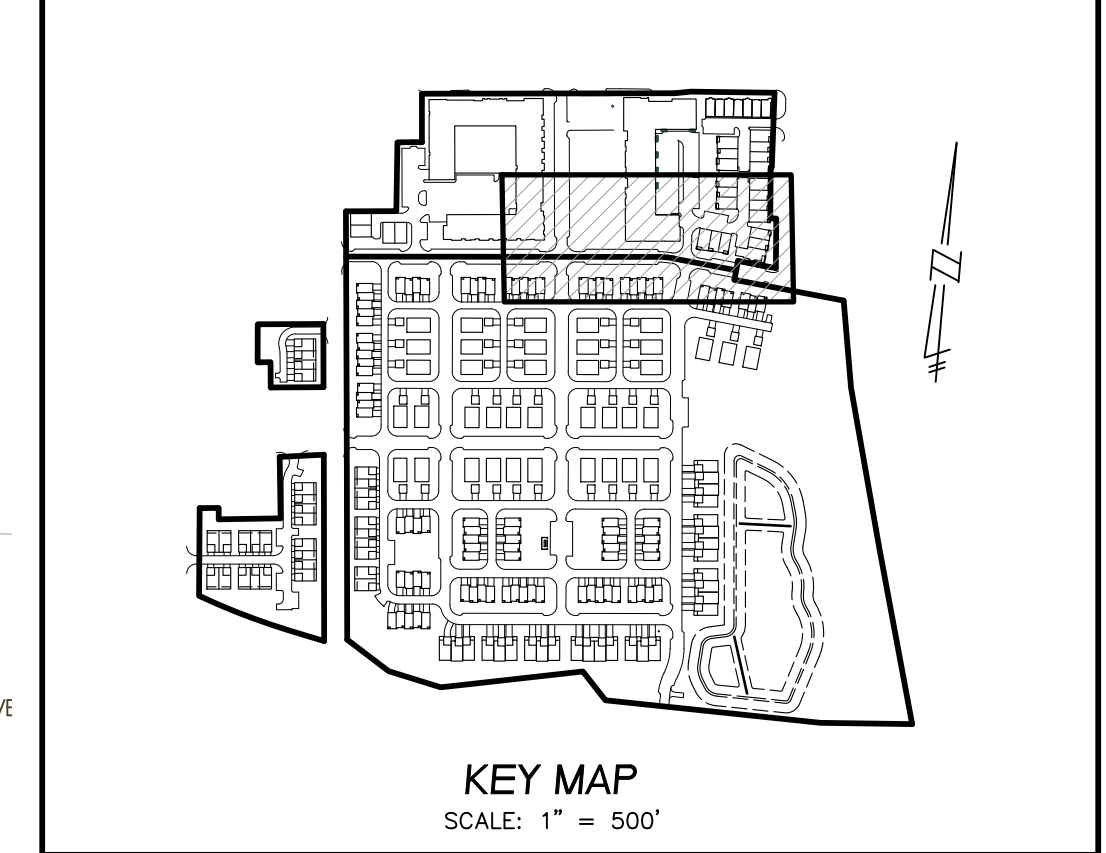
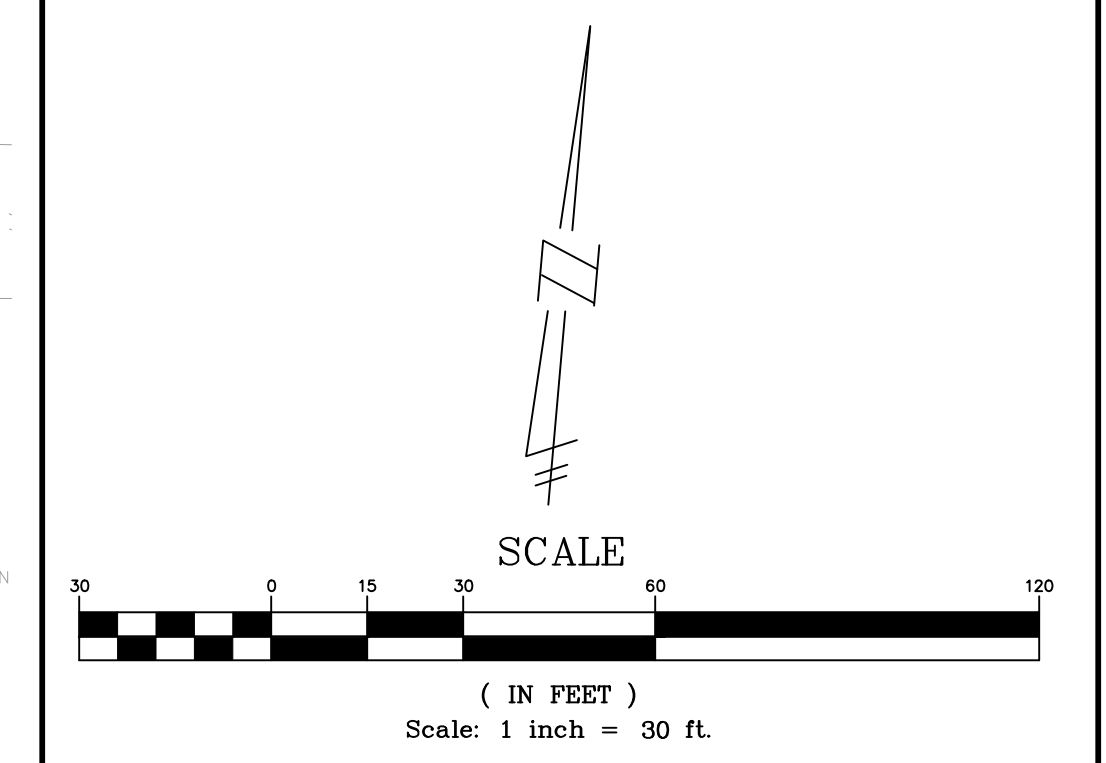
**SANITARY SEWER PROFILE**  
SCALE: HORIZONTAL: 1"=30'  
VERTICAL: 1"=5'



SEE SHEET 17 FOR CROSSING CHART



**SANITARY SEWER PROFILE**  
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VERTICAL: 1"=5'



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[Symbol]	[Symbol]	OVERHEAD ELECTRICAL LINES
[Symbol]	[Symbol]	FLOOD PLAN
[Symbol]	[Symbol]	CONTOURS
[Symbol]	[Symbol]	SPOT ELEVATION
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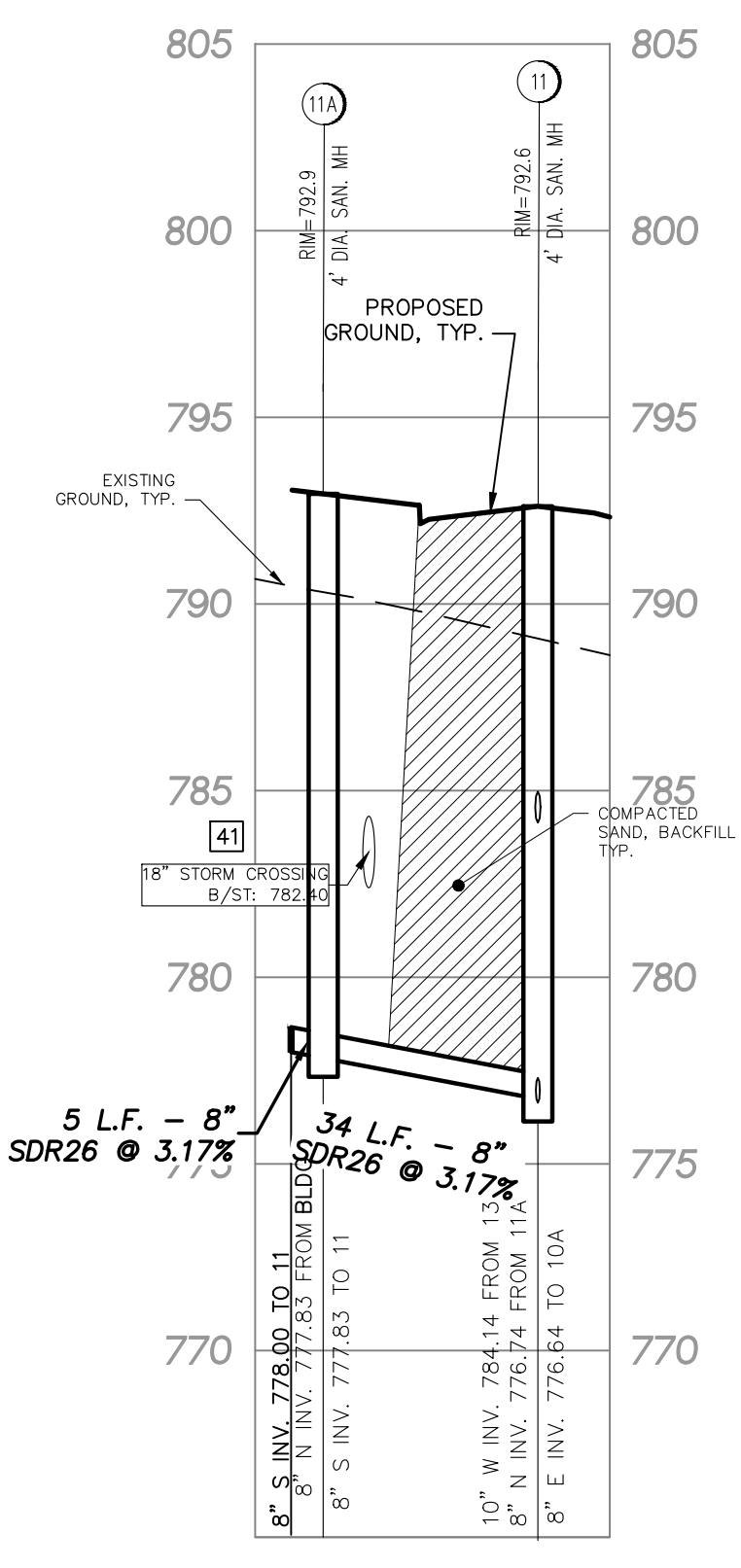
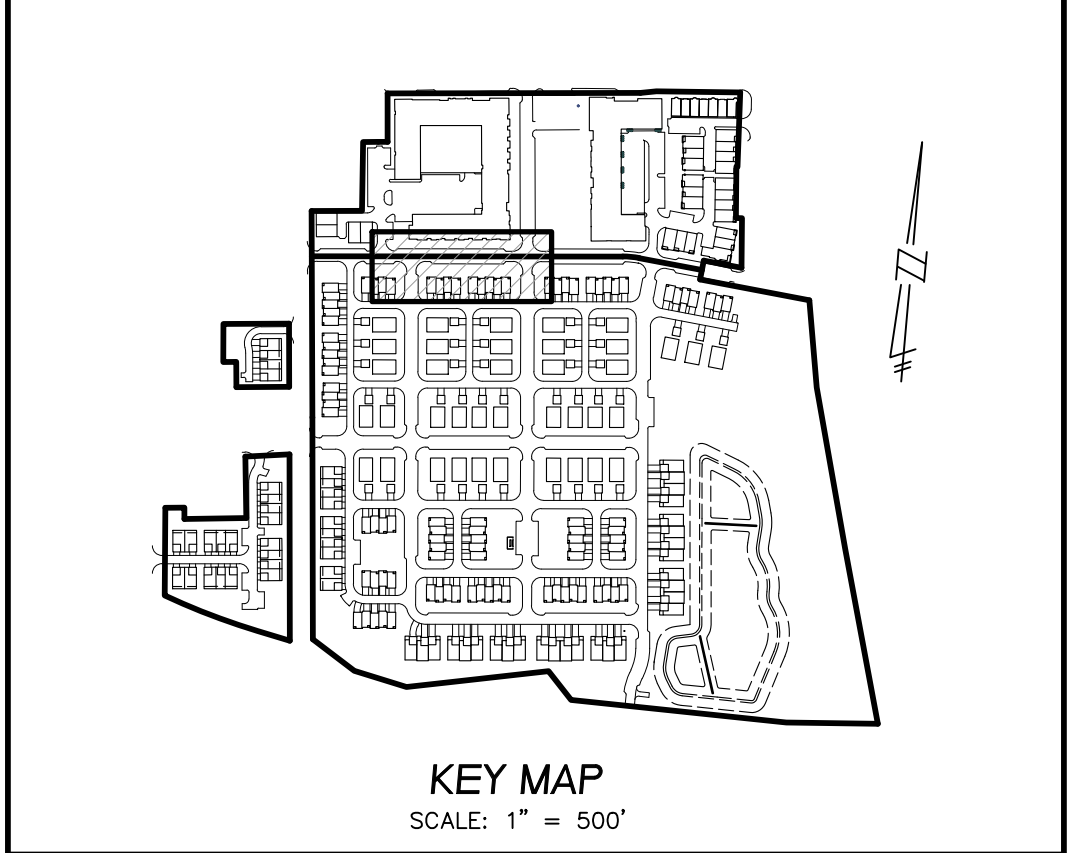
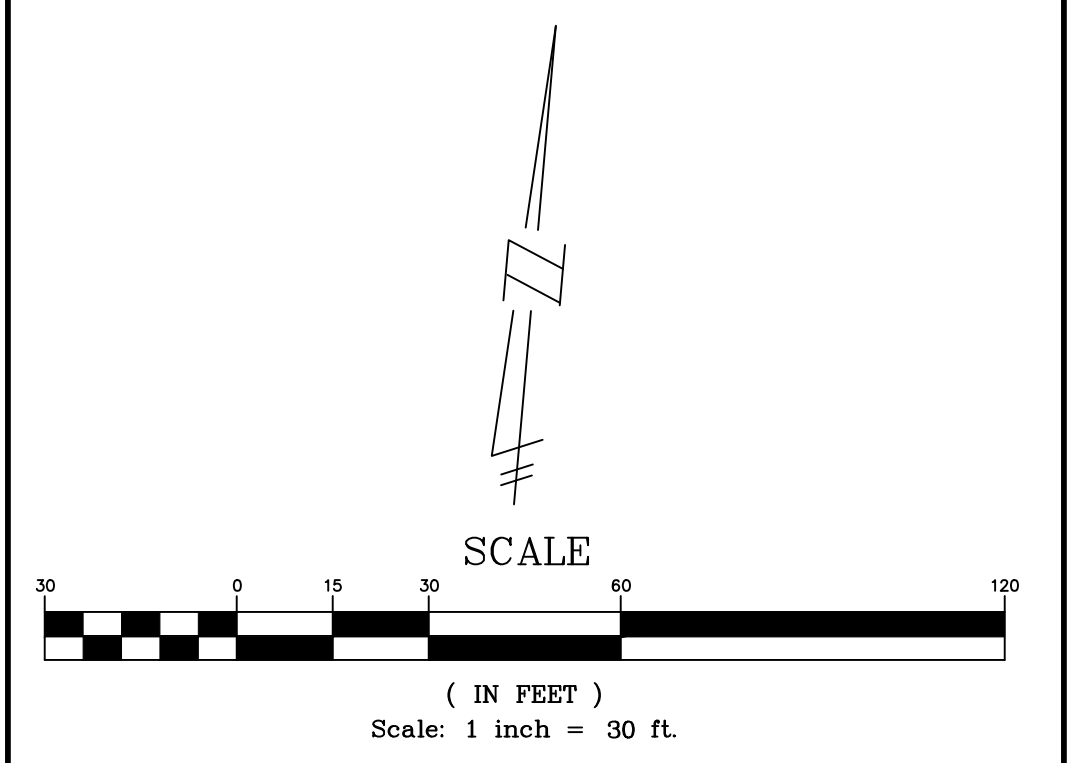
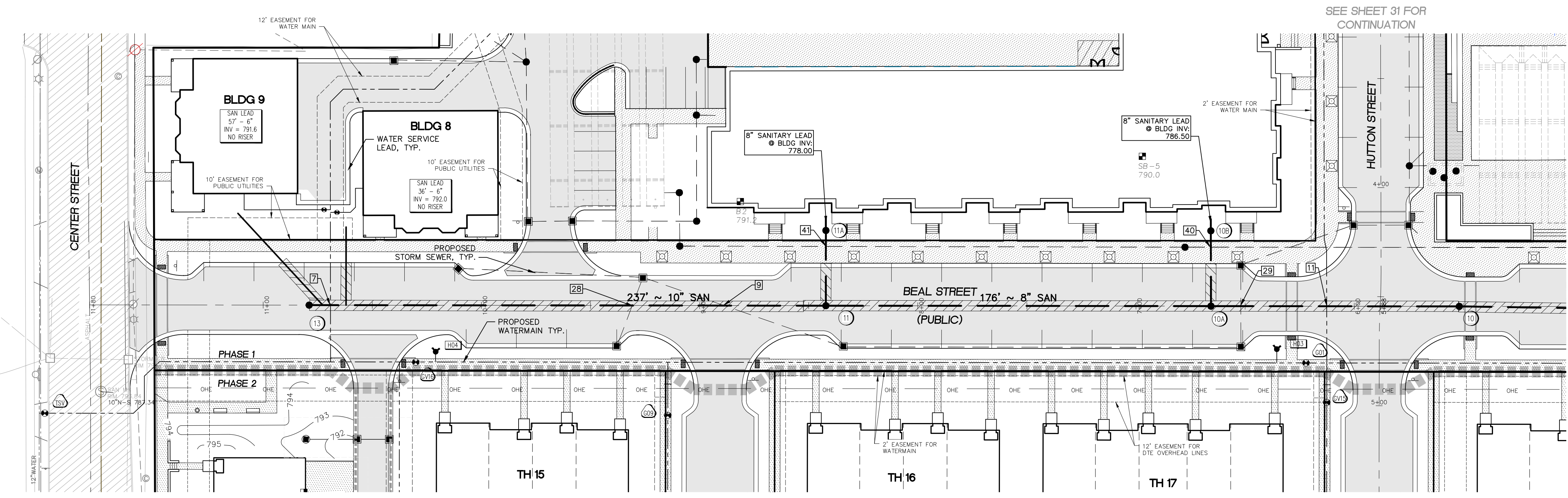
DATE: 04-25-23 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: P.E. FILE: 21001-SAN-FS9-PH1.DWG

**SANITARY SEWER PLAN AND PROFILE**

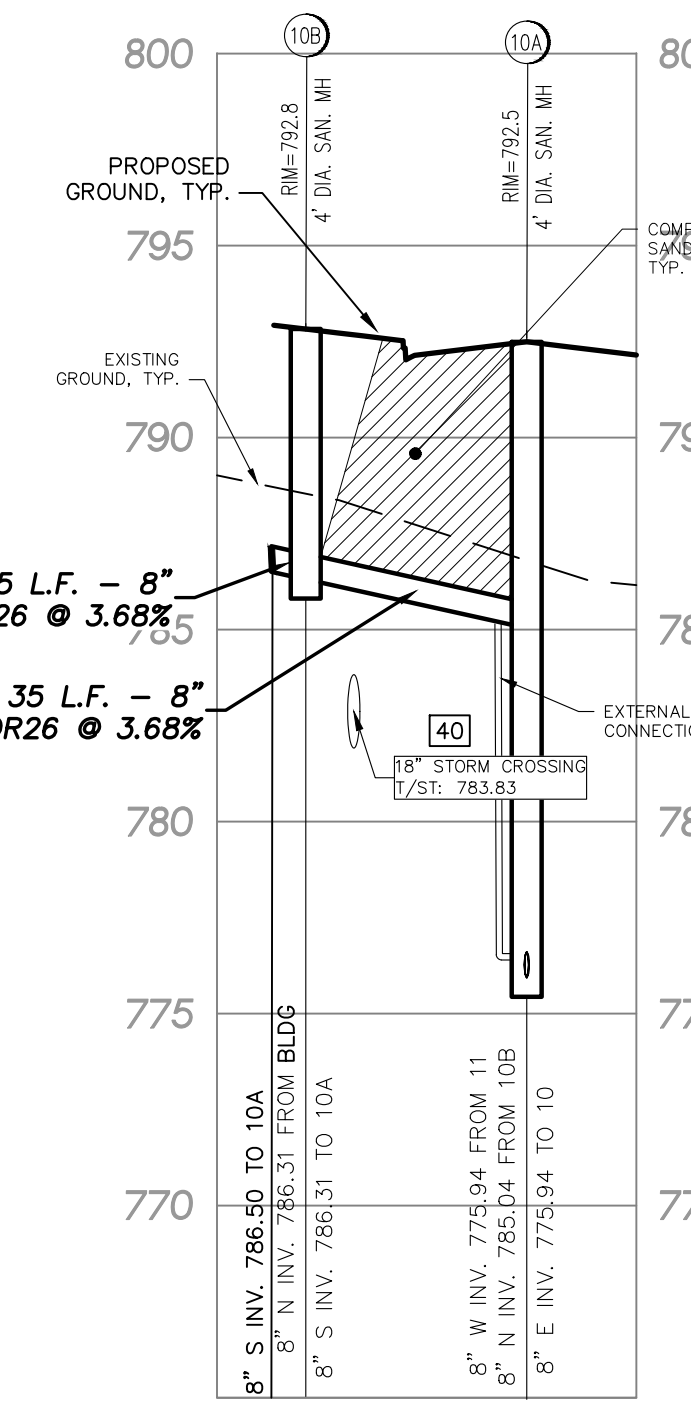
**SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

**SHEET 20**

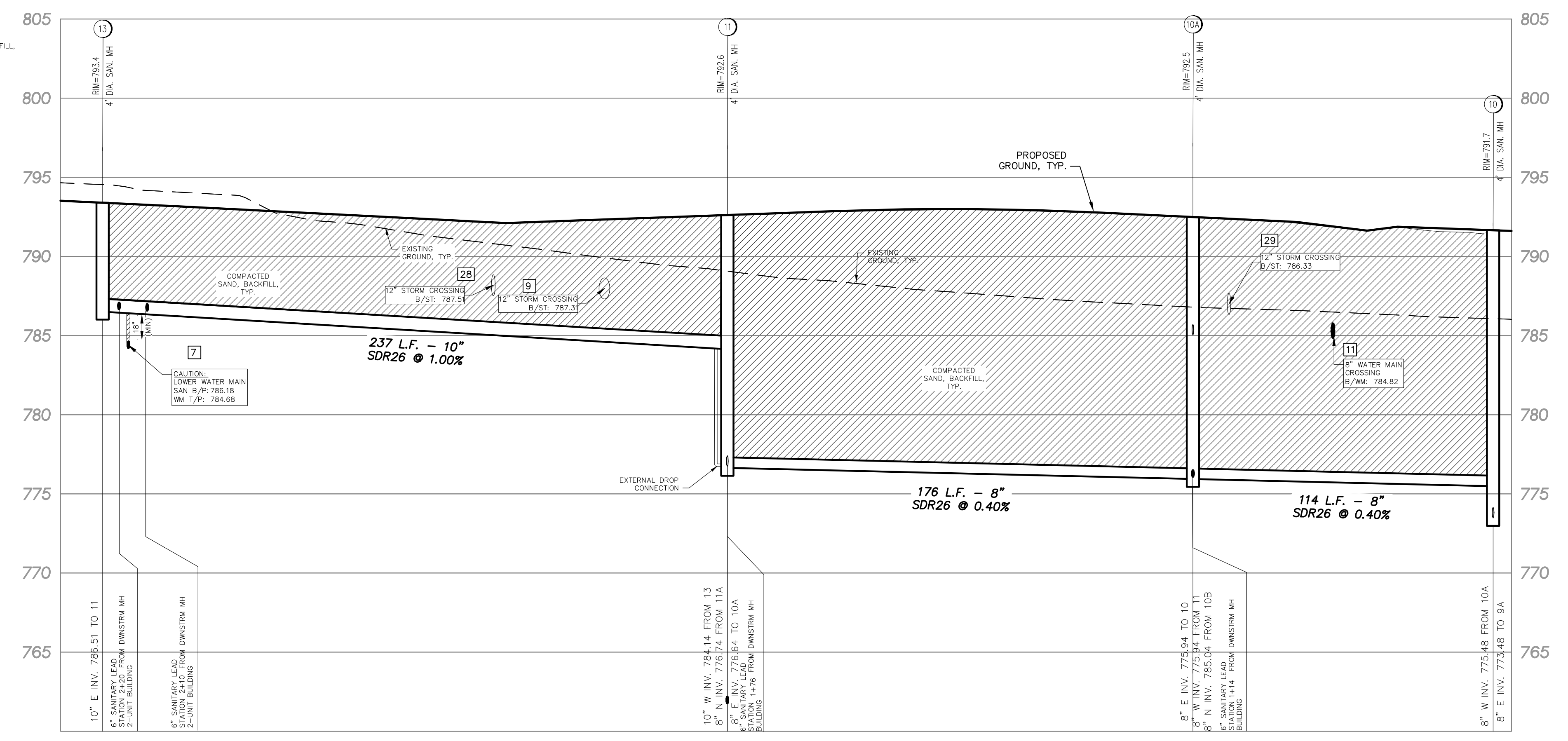




SANITARY SEWER PROFILE  
SCALE: HORIZONTAL: 1"=30'  
VERTICAL: 1"=5'



SANITARY SEWER PROFILE  
SCALE: HORIZONTAL: 1"=30'  
VERTICAL: 1"=5'



SANITARY SEWER PROFILE  
SCALE: HORIZONTAL: 1"=30'  
VERTICAL: 1"=5'

**NOTES**

ALL SANITARY LEADS SHALL BE 6" DIA. PVC SDR 235 WITH A MINIMUM SLOPE OF 1%

COMPACTED SAND BACKFILL UNDER THE INFLUENCE OF ROADS. MATERIAL COMPACTED TO 95% MAXIMUM UNIT DENSITY.

**LEGEND**

EXISTING	PROPOSED	DESCRIPTION
[Symbol]	[Symbol]	PAVEMENT (ASPHALT)
[Symbol]	[Symbol]	SIDE WALK (CONCRETE)
[Symbol]	[Symbol]	CONCRETE CURB AND GUTTER
[Symbol]	[Symbol]	STORM SEWER
[Symbol]	[Symbol]	SANITARY SEWER
[Symbol]	[Symbol]	WATER MAIN
[Symbol]	[Symbol]	DENOTES UNDERDRAIN
[Symbol]	[Symbol]	DENOTES LANDSCAPE DRAIN
[Symbol]	[Symbol]	MANHOLE
[Symbol]	[Symbol]	CATCH BASIN W/SED CATCH
[Symbol]	[Symbol]	CURB INLET W/SILT SAC
[Symbol]	[Symbol]	END SECTION
[Symbol]	[Symbol]	GATE VALVE
[Symbol]	[Symbol]	HYDRANT
[Symbol]	[Symbol]	OVERHEAD ELECTRICAL LINES
[Symbol]	[Symbol]	FLOOD PLAN
[Symbol]	[Symbol]	CONTOURS
[Symbol]	[Symbol]	SPOT ELEVATION
[Symbol]	[Symbol]	T/F
[Symbol]	[Symbol]	SURFACE DRAINAGE
[Symbol]	[Symbol]	OVERFLOW ROUTE
[Symbol]	[Symbol]	TREE FENCE
[Symbol]	[Symbol]	SILT FENCE
[Symbol]	[Symbol]	PROPOSED DRIVEWAY LOCATION
[Symbol]	[Symbol]	CROSSING NUMBER

**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	TITLE SCHEMATIC DESIGN	06-10-2022
2.	S&P DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

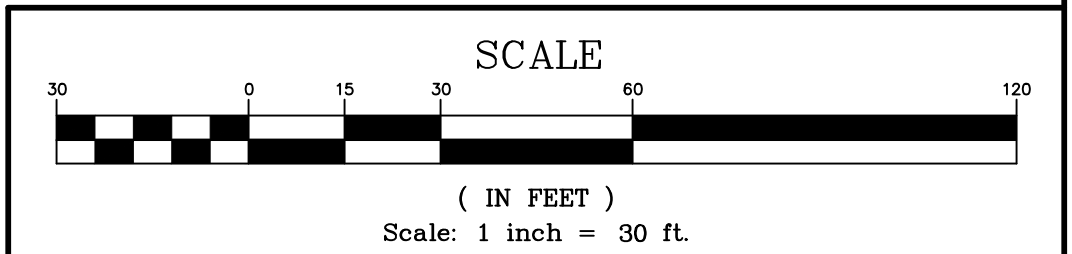
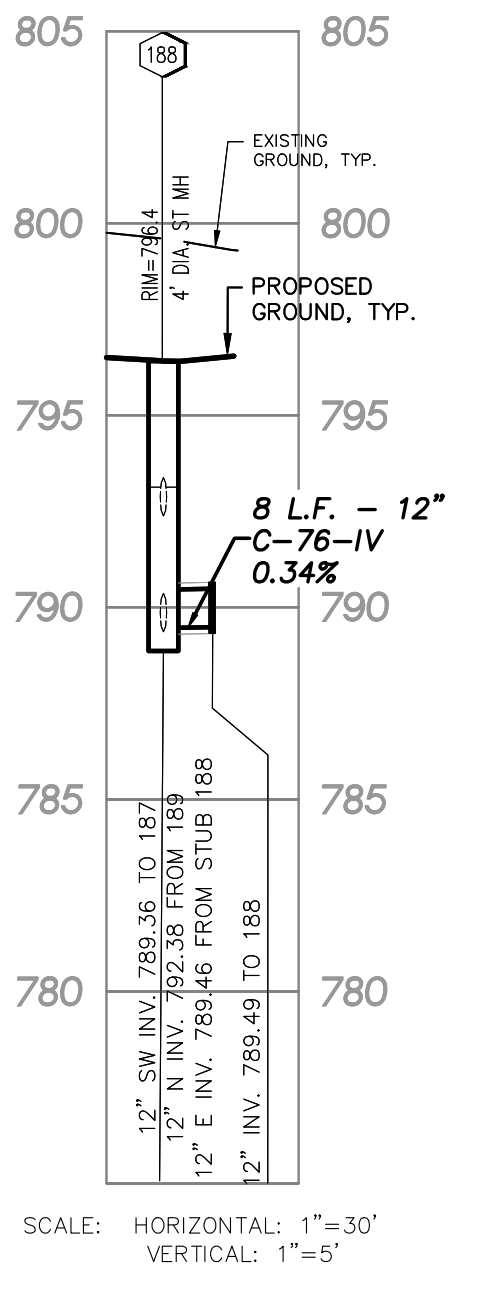
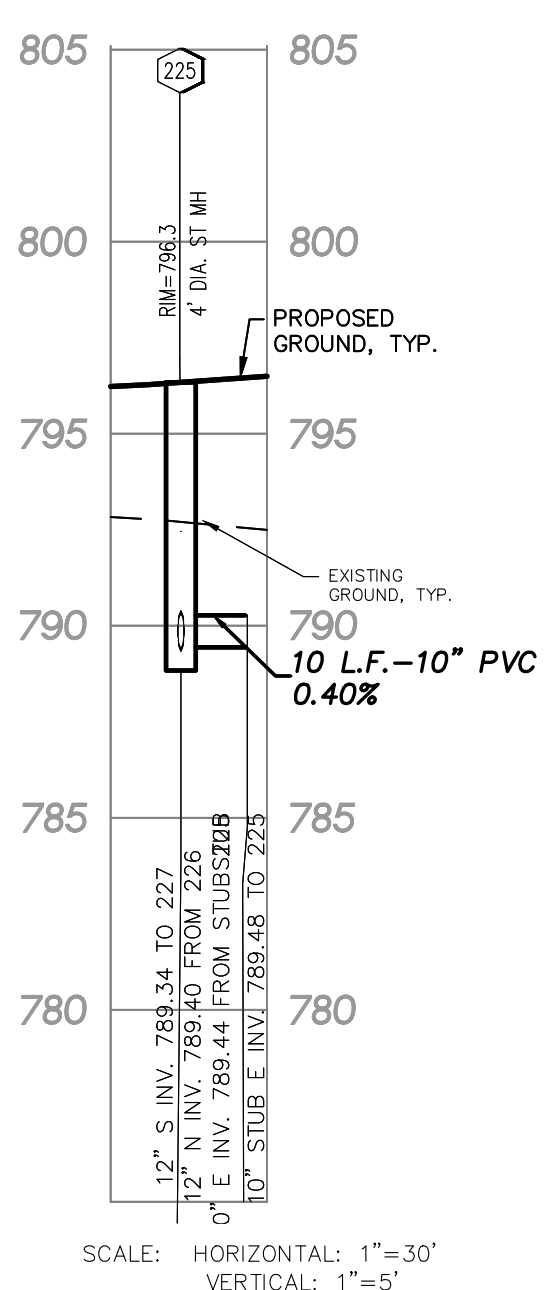
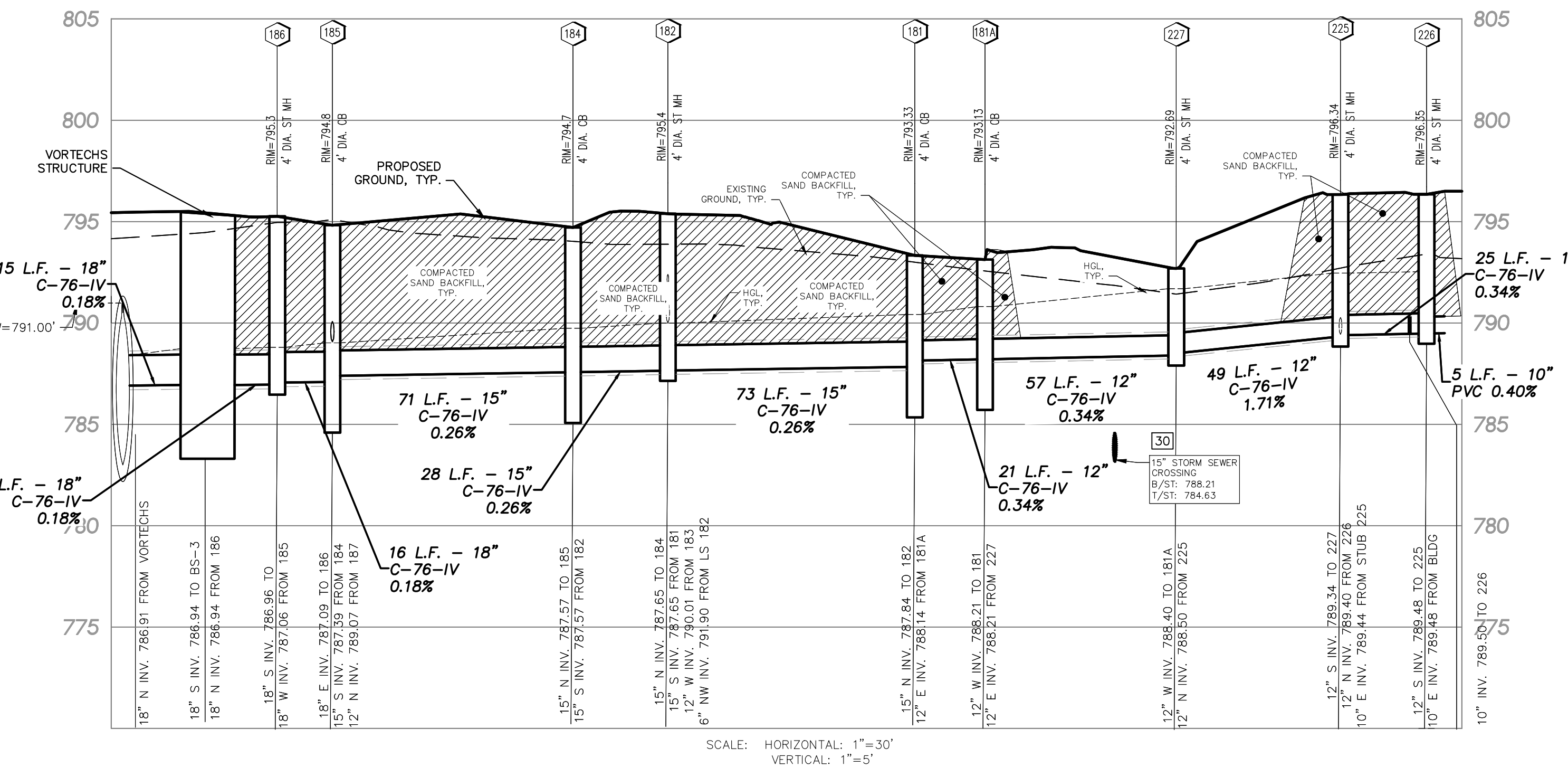
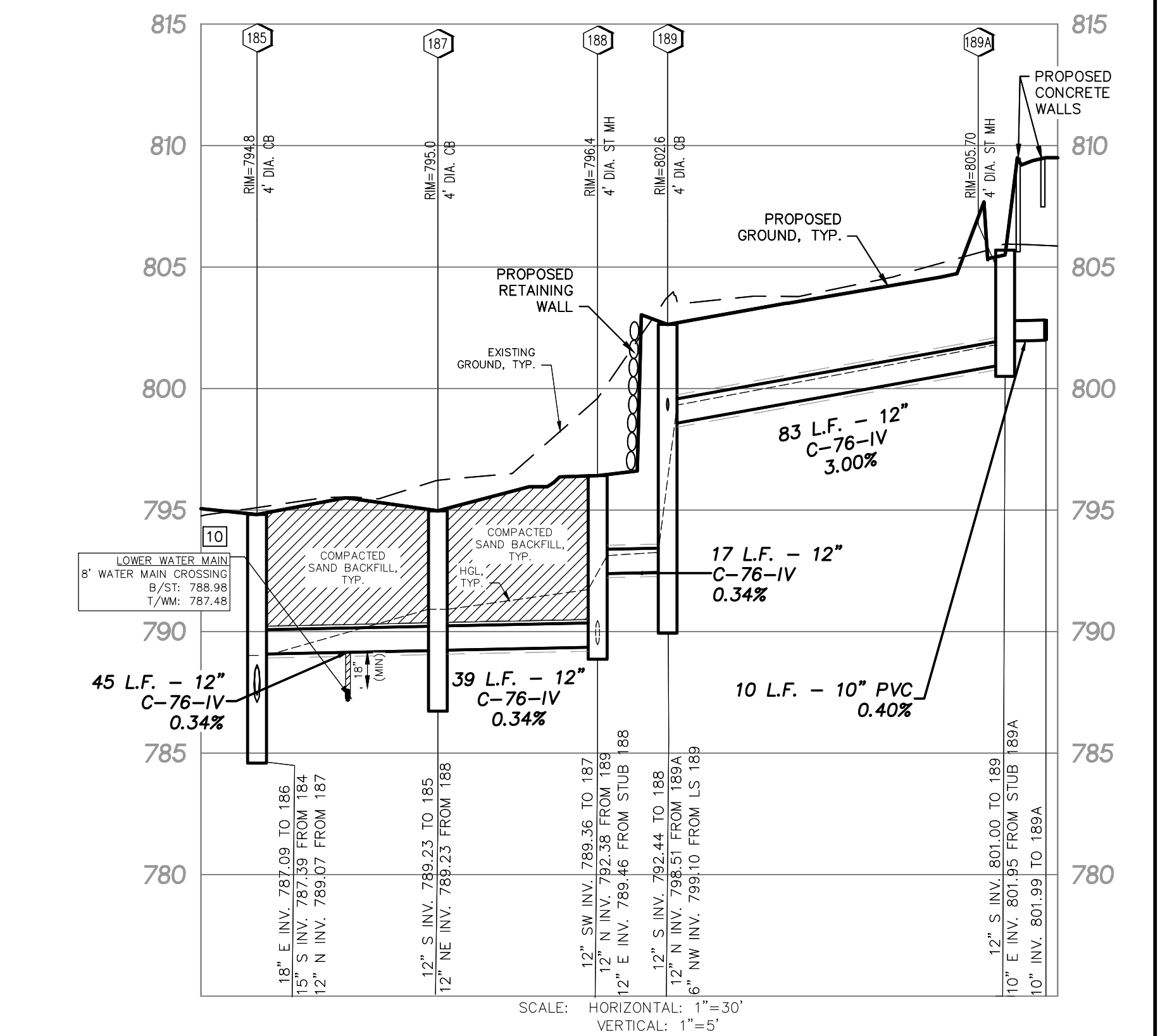
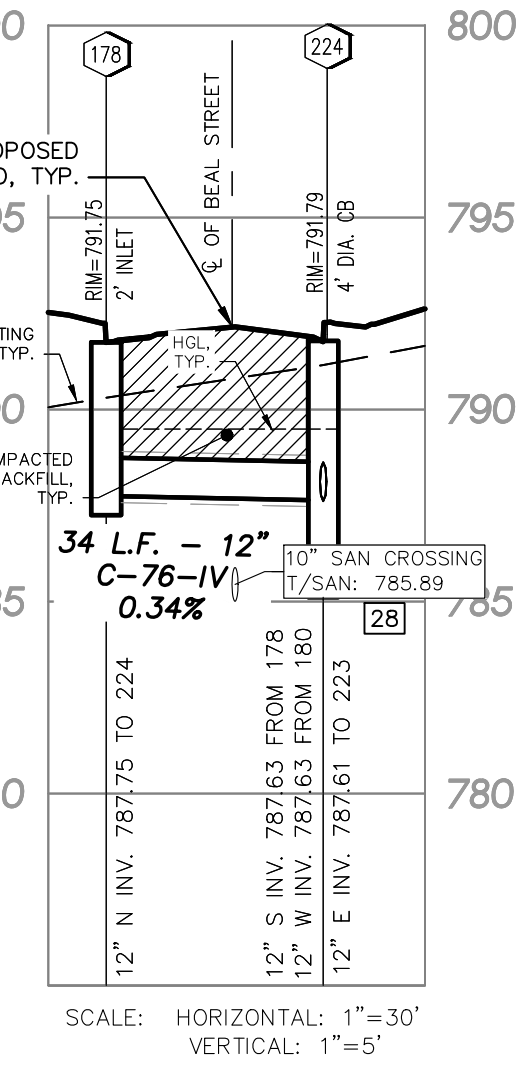
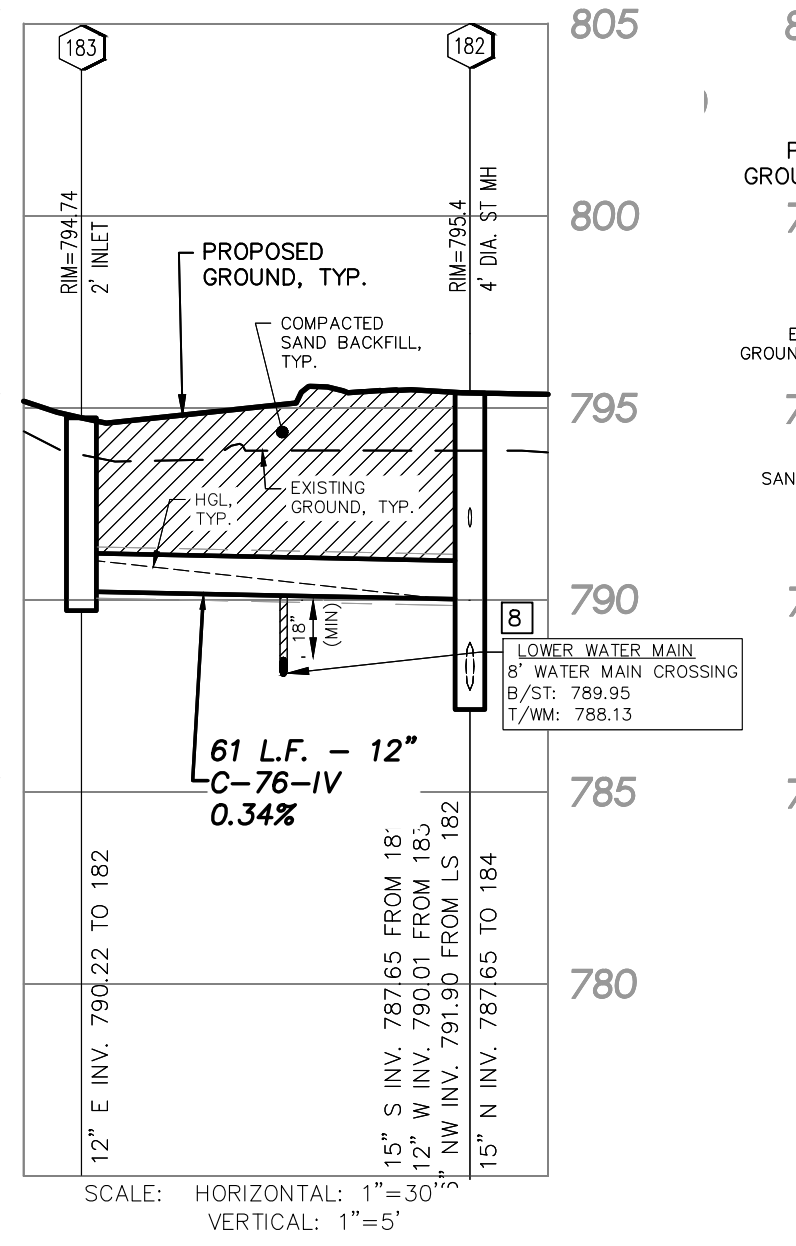
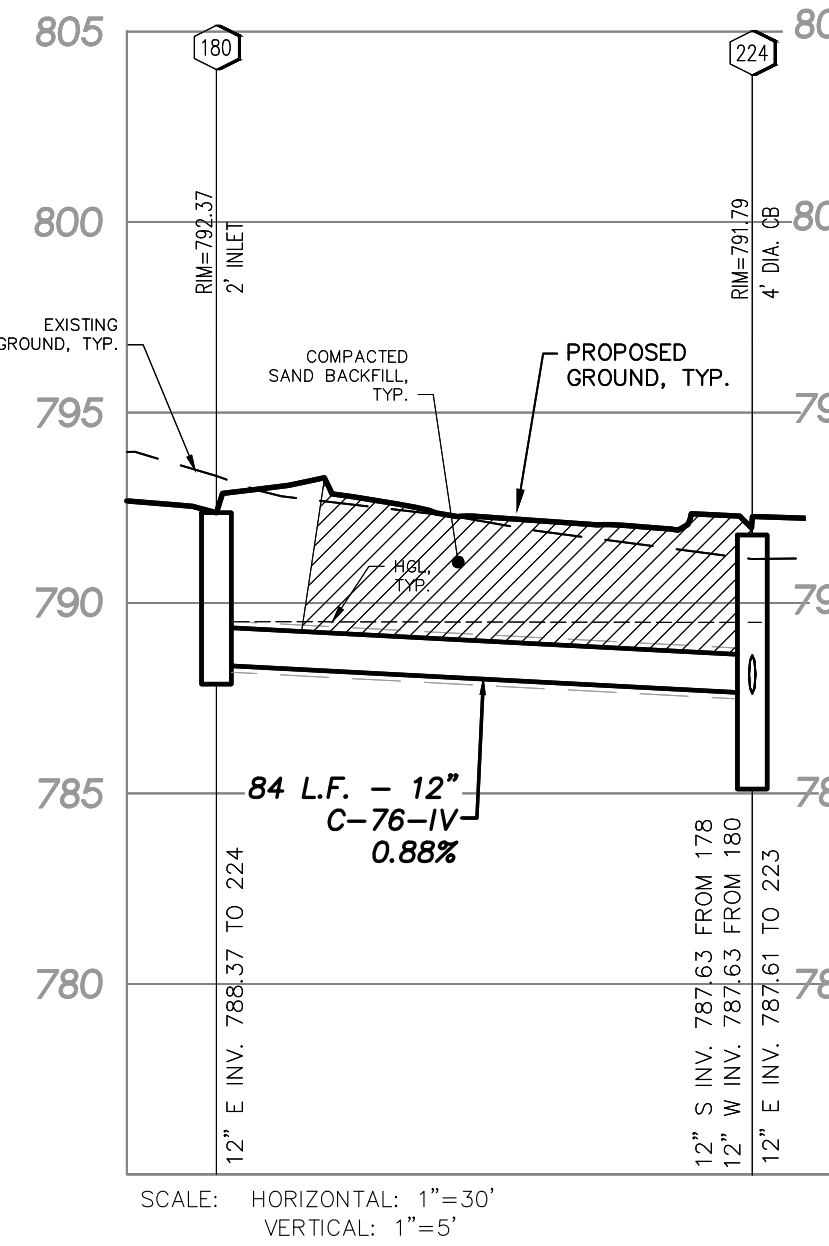
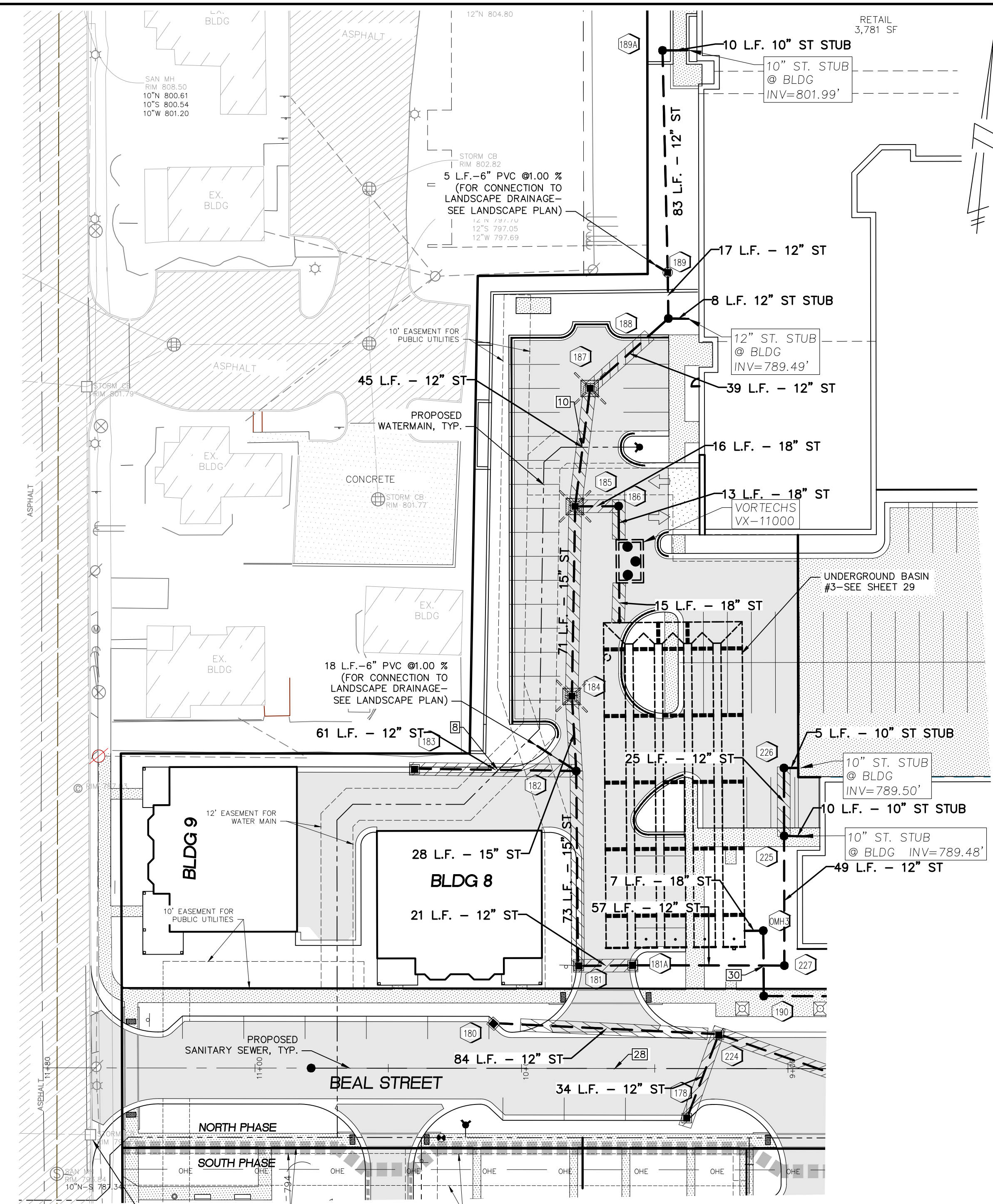
**811** Know what's below. Call before you dig.

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DATE: 04-25-23 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: P.E. FILE: 21001-SAN-FS9-PH1.DWG

**SANITARY SEWER PLAN AND PROFILE**





**LEGEND**

EXISTING	PROPOSED	DESCRIPTION
[Symbol]	[Symbol]	PAVEMENT (ASPHALT)
[Symbol]	[Symbol]	SIDE WALK (CONCRETE)
[Symbol]	[Symbol]	CONCRETE CURB AND GUTTER
[Symbol]	[Symbol]	STORM SEWER
[Symbol]	[Symbol]	SANITARY SEWER
[Symbol]	[Symbol]	WATER MAIN
[Symbol]	[Symbol]	DENOTES UNDERDRAIN
[Symbol]	[Symbol]	DENOTES LANDSCAPE DRAIN
[Symbol]	[Symbol]	MANHOLE
[Symbol]	[Symbol]	CATCH BASIN W/SED CATCH
[Symbol]	[Symbol]	CURB INLET W/SILT SACK
[Symbol]	[Symbol]	END SECTION
[Symbol]	[Symbol]	GATE VALVE
[Symbol]	[Symbol]	HYDRANT
[Symbol]	[Symbol]	OVERHEAD ELECTRICAL LINES
[Symbol]	[Symbol]	FLOOD PLAIN
[Symbol]	[Symbol]	CONTOURS
[Symbol]	[Symbol]	SPOT ELEVATION
[Symbol]	[Symbol]	T/E
[Symbol]	[Symbol]	SURFACE DRAINAGE
[Symbol]	[Symbol]	OVERFLOW ROUTE
[Symbol]	[Symbol]	TREE FENCE
[Symbol]	[Symbol]	SILT FENCE
[Symbol]	[Symbol]	PROPOSED DRIVEWAY LOCATION
[Symbol]	[Symbol]	CROSSING NUMBER

**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

**REVISIONS**

NO.	ITEM	DATE
1.	100% SCHEMATIC DESIGN	06-10-2022
2.	50% DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

**UTILITY WARNING**

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

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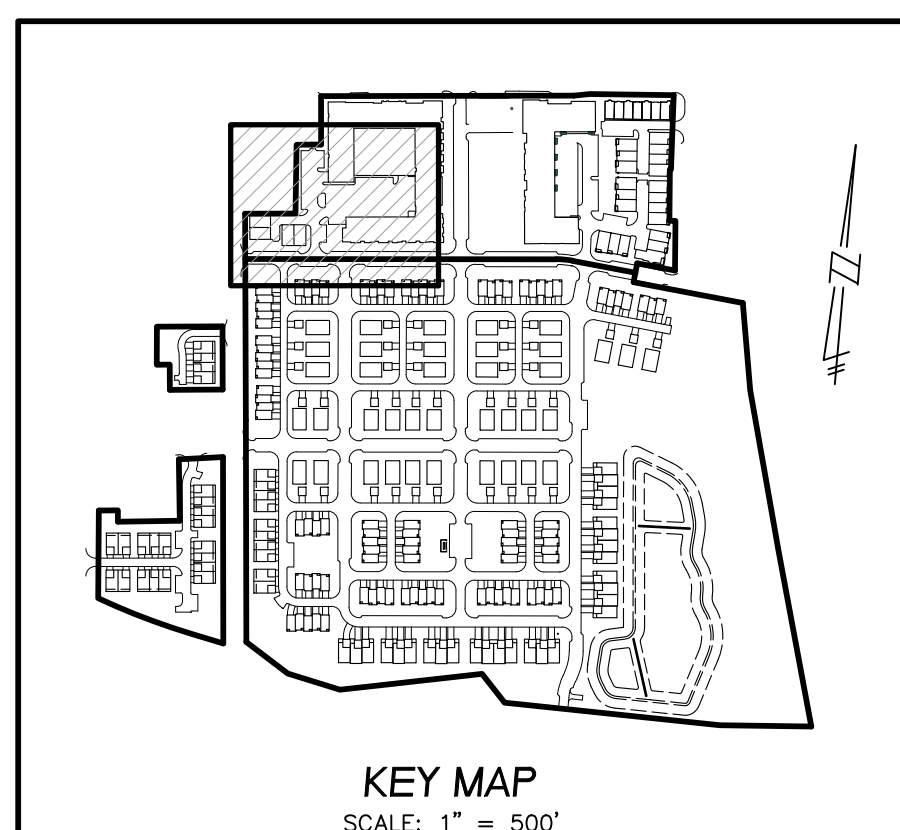
DATE: 04-25-23 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: E.E. FILE: 21001-ST-SP-PH.DWG

**STORM SEWER PLAN AND PROFILE**

**SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING

39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

**SHEET 22**

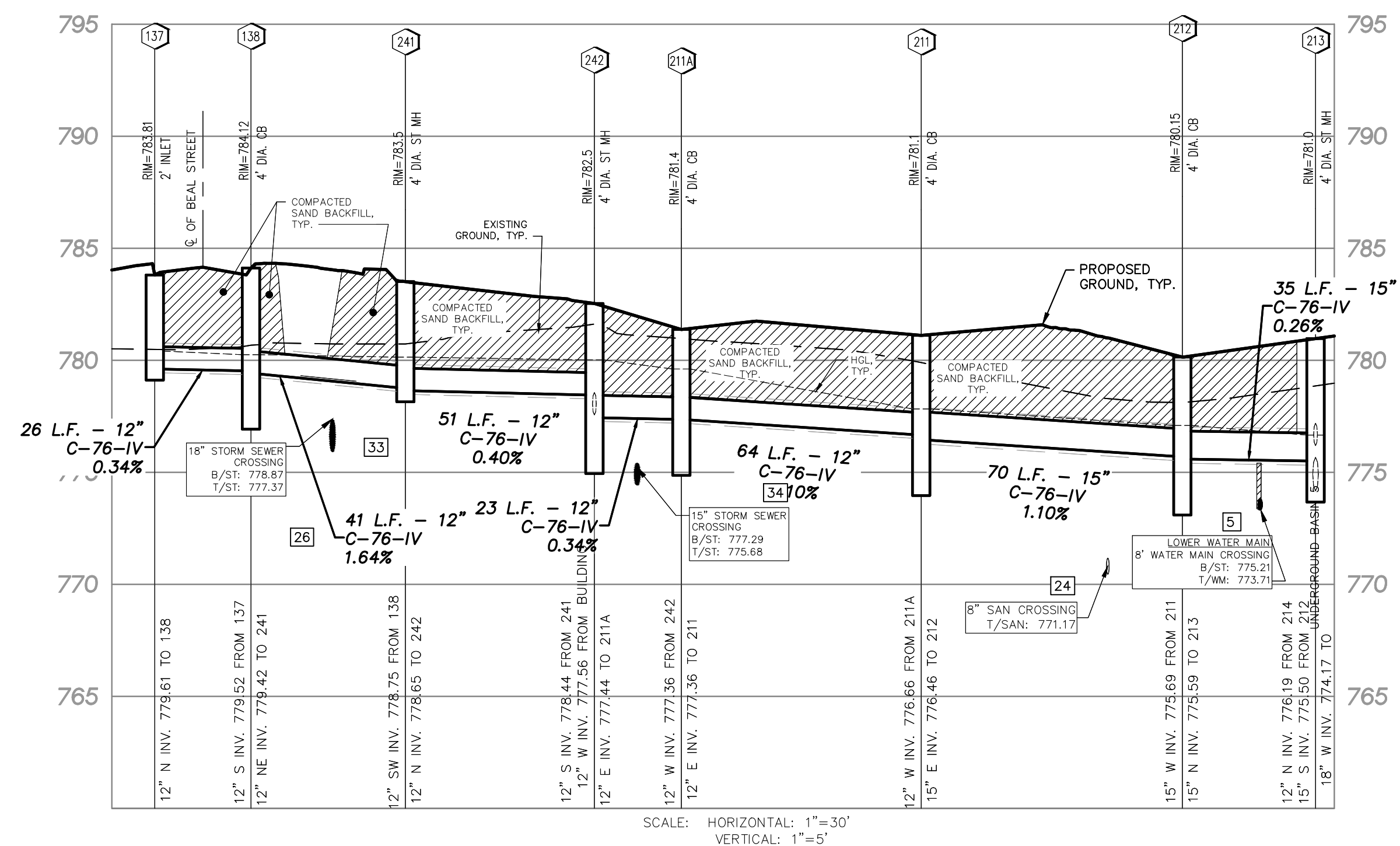
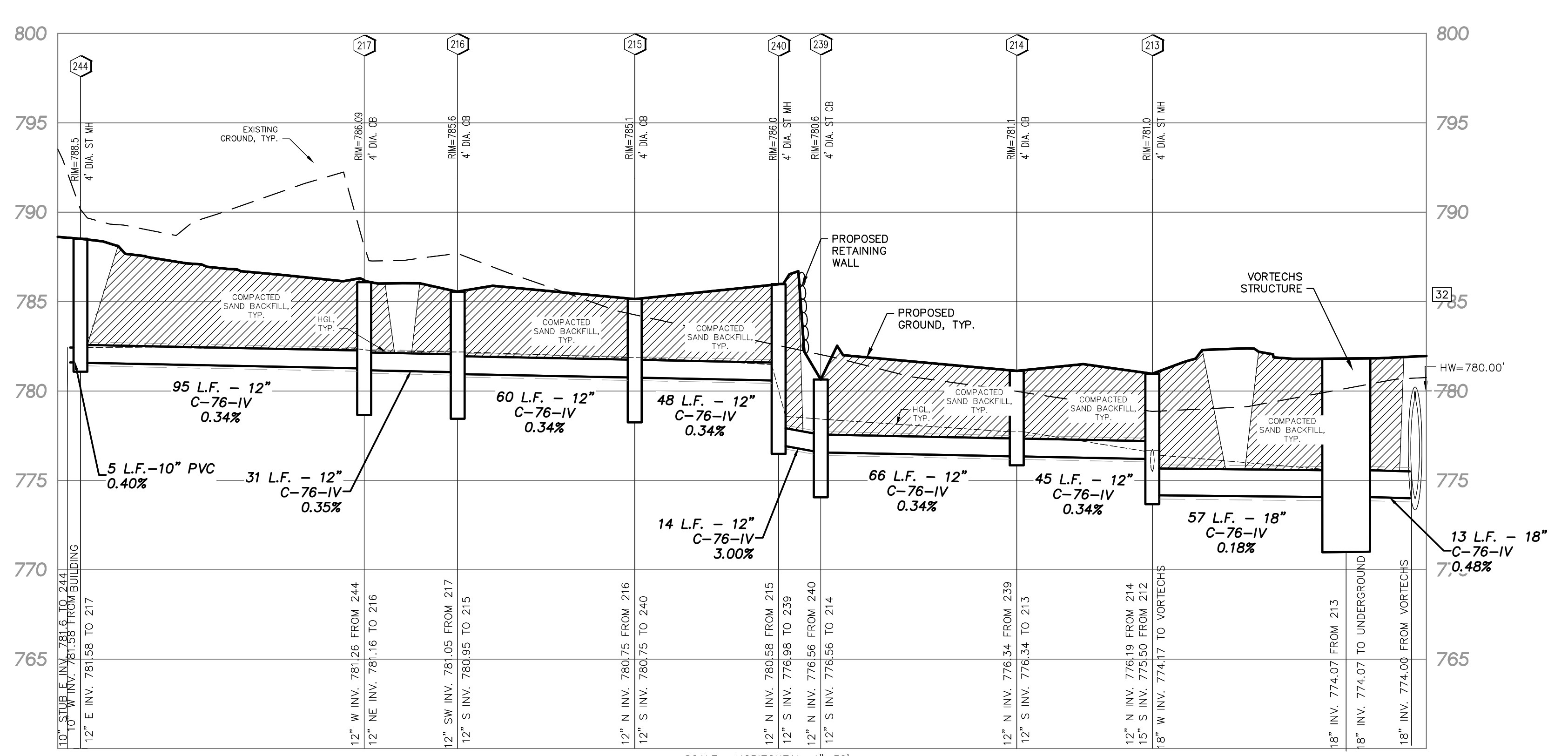
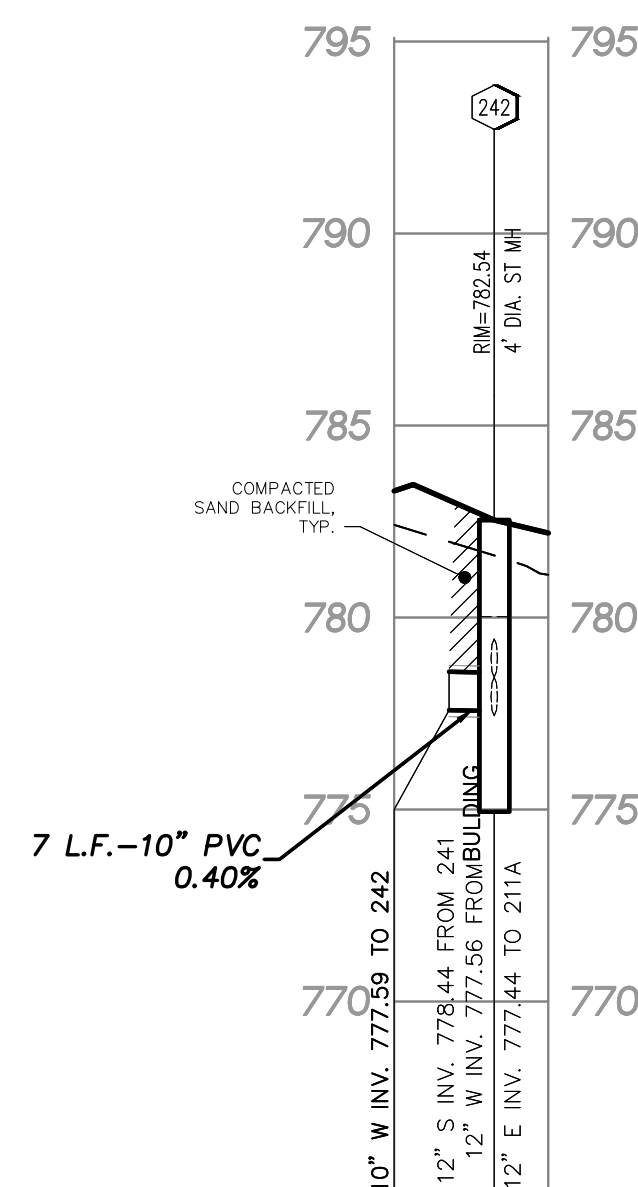
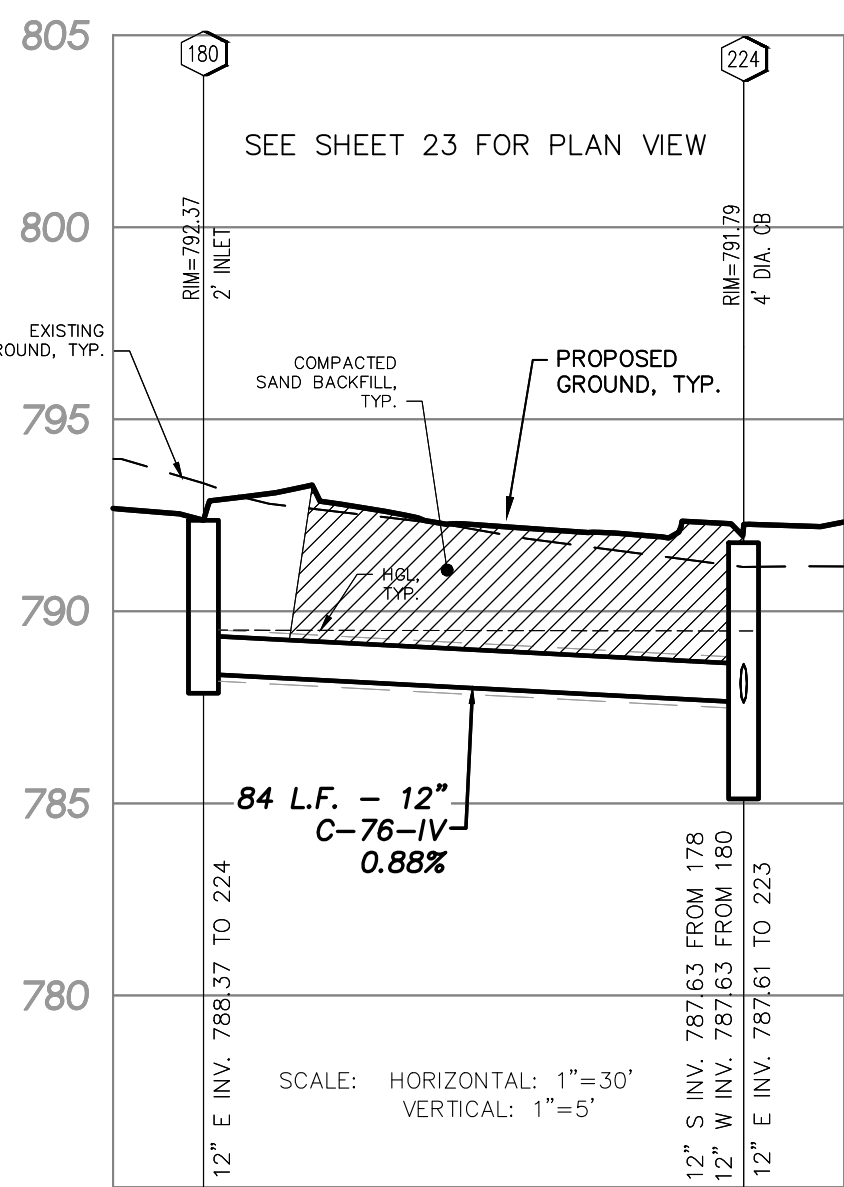
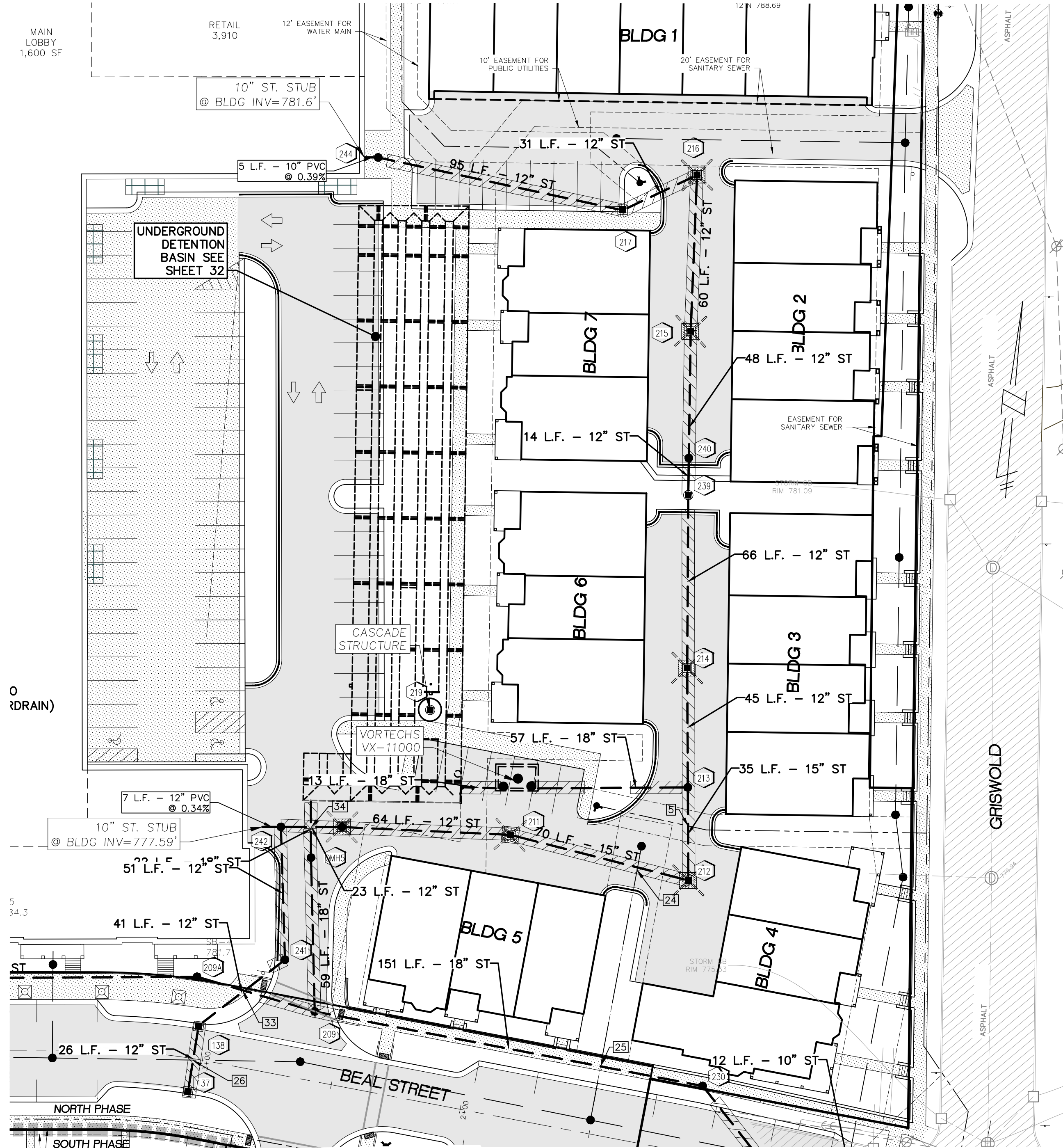


PLotted on: 04/25/23 10:45 AM. PLOT: 21001-ST-SP-PH.DWG. PLOT: 21001-ST-SP-PH.DWG. PLOT: 21001-ST-SP-PH.DWG.









SCALE  
( IN FEET )  
Scale: 1 inch = 30 ft.

**LEGEND**

EXISTING	PROPOSED	DESCRIPTION
[Symbol]	[Symbol]	PAVEMENT (ASPHALT)
[Symbol]	[Symbol]	SIDE WALK (CONCRETE)
[Symbol]	[Symbol]	CONCRETE CURB AND GUTTER
[Symbol]	[Symbol]	STORM SEWER
[Symbol]	[Symbol]	SANITARY SEWER
[Symbol]	[Symbol]	WATER MAIN
[Symbol]	[Symbol]	"UD" UNDERDRAIN
[Symbol]	[Symbol]	"LS" LANDSCAPE DRAIN
[Symbol]	[Symbol]	MANHOLE
[Symbol]	[Symbol]	CATCH BASIN W/SED CATCH
[Symbol]	[Symbol]	CURB INLET W/SILT SAC
[Symbol]	[Symbol]	END SECTION
[Symbol]	[Symbol]	GATE VALVE
[Symbol]	[Symbol]	HYDRANT
[Symbol]	[Symbol]	OVERHEAD ELECTRICAL LINES
[Symbol]	[Symbol]	FLOOD PLAIN
[Symbol]	[Symbol]	CONTOURS
[Symbol]	[Symbol]	SPOT ELEVATION
[Symbol]	[Symbol]	T/F
[Symbol]	[Symbol]	SURFACE DRAINAGE
[Symbol]	[Symbol]	OVERFLOW ROUTE
[Symbol]	[Symbol]	TREE FENCE
[Symbol]	[Symbol]	SILT FENCE
[Symbol]	[Symbol]	PROPOSED DRIVEWAY LOCATION
[Symbol]	[Symbol]	CROSSING NUMBER

**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	100% SCHEMATIC DESIGN	06-10-2022
2.	50% DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

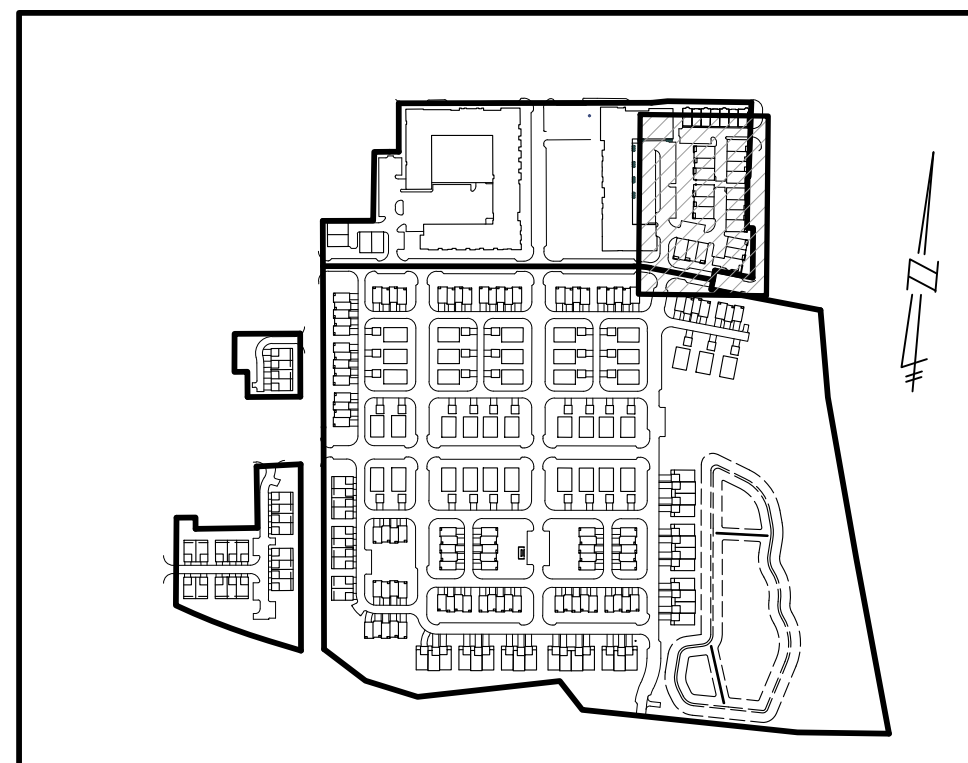
UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

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

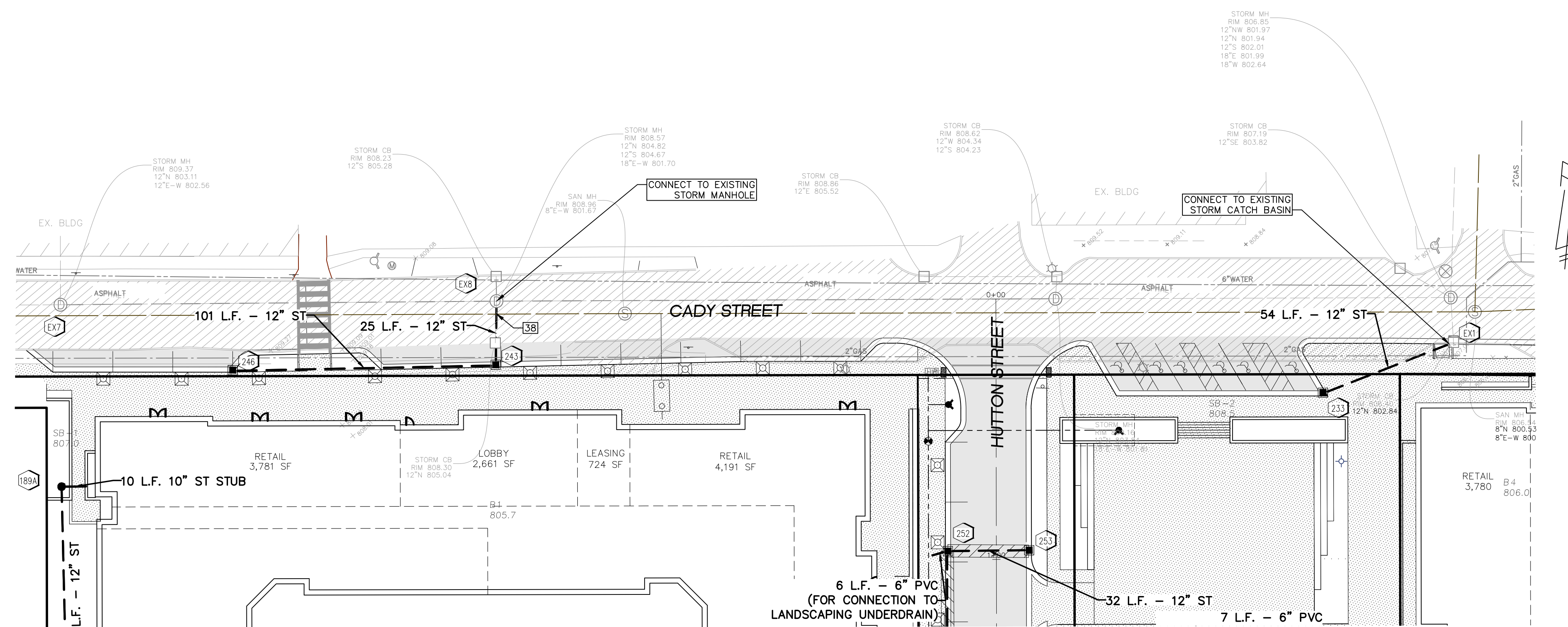
THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF AND/OR RELOCATION OF ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION.

DATE: 04-25-23 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: E.E. FILE: 21001-ST-SP-PH.DWG

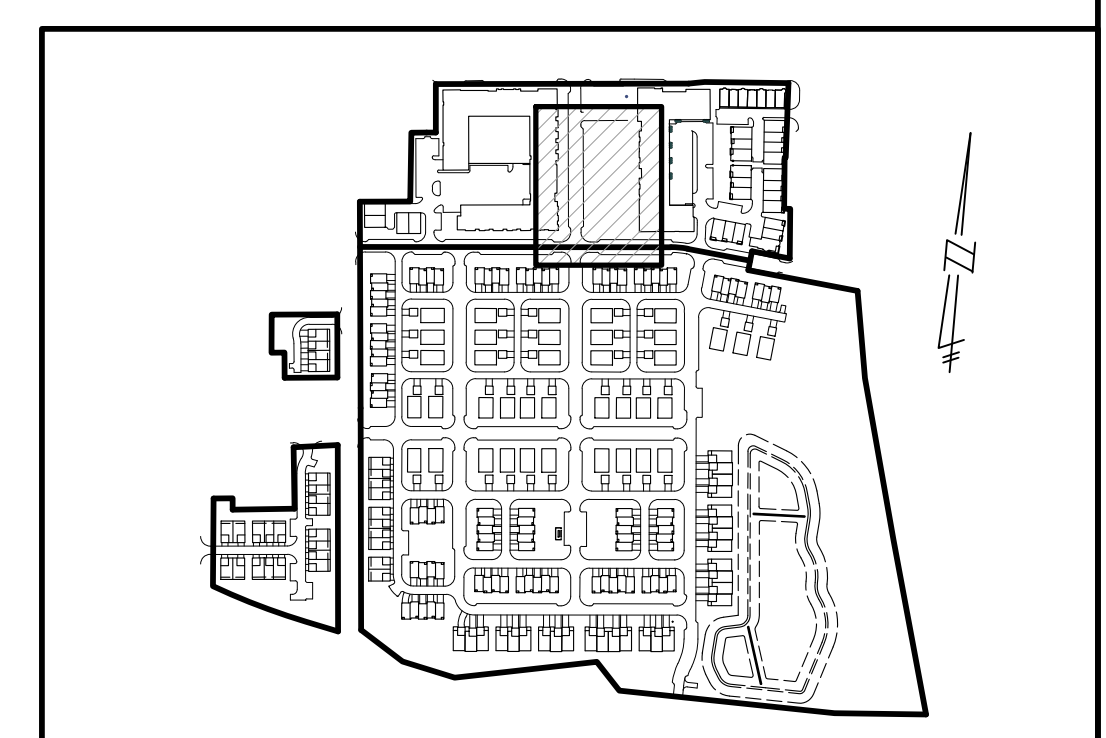
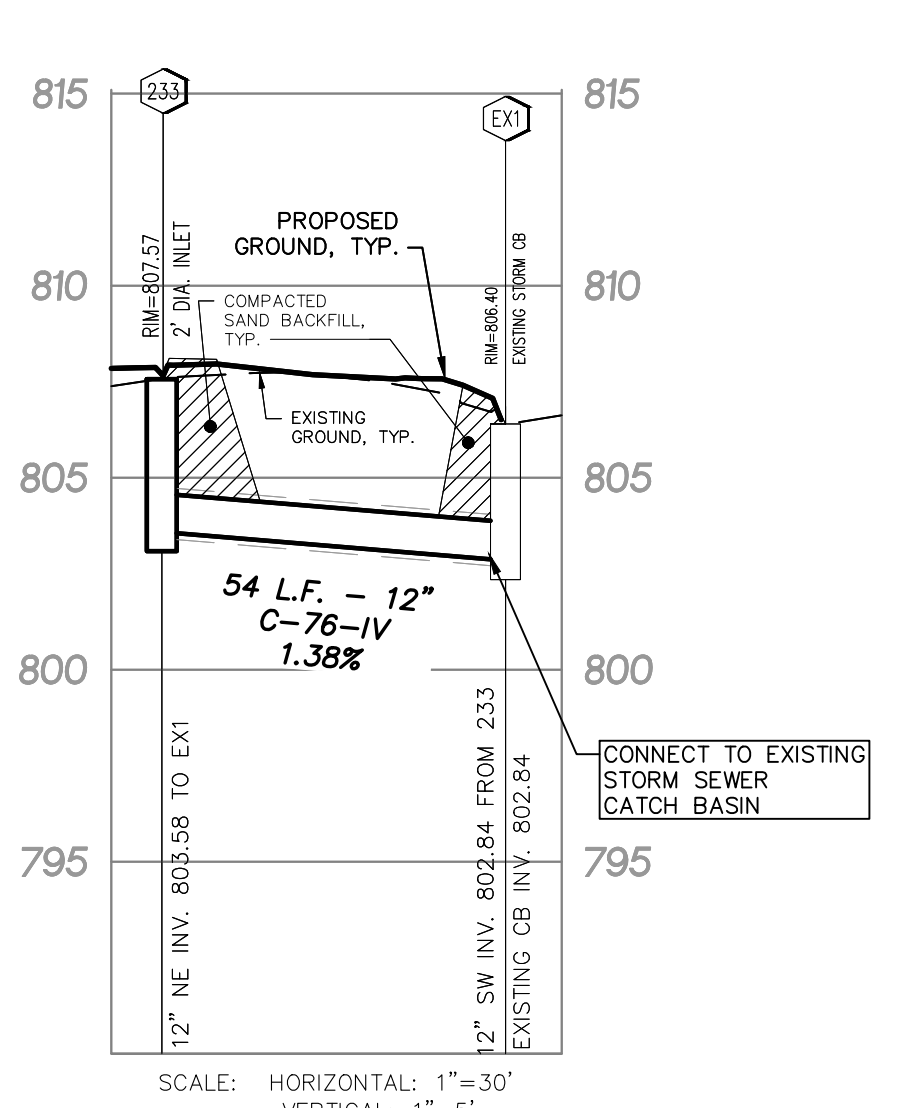
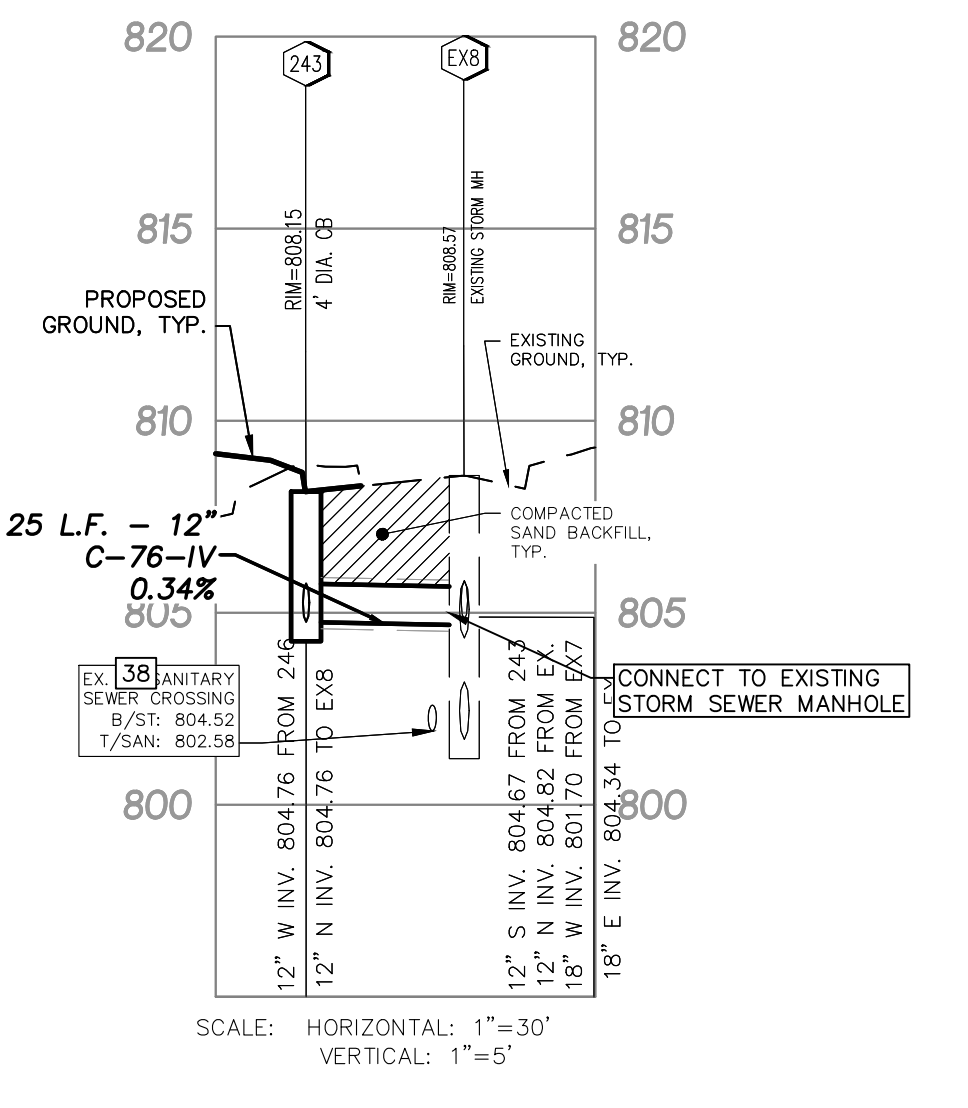
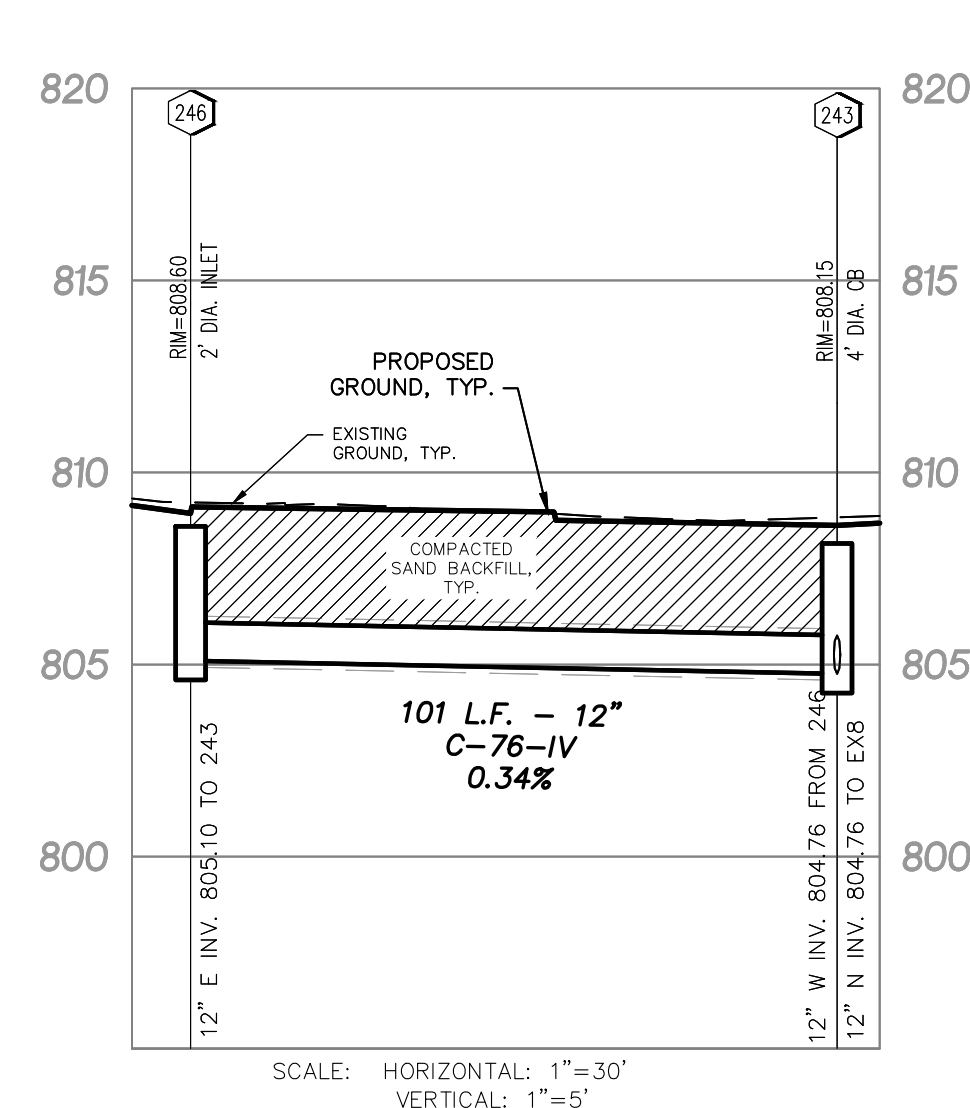
**STORM SEWER PLAN AND PROFILE**







SEE SHEET 17 FOR CROSSING CHART



KEY MAP  
SCALE: 1" = 500'

**LEGEND**

EXISTING	PROPOSED	DESCRIPTION
[Hatched Box]	[Hatched Box]	PAVEMENT (ASPHALT)
[Dashed Line]	[Dashed Line]	SIDE WALK (CONCRETE)
[Solid Line]	[Solid Line]	CONCRETE CURB AND GUTTER
[Dashed Line]	[Dashed Line]	STORM SEWER
[Dashed Line]	[Dashed Line]	SANITARY SEWER
[Dashed Line]	[Dashed Line]	WATER MAIN
[Circle]	[Circle]	"UD" UNDERDRAIN
[Circle]	[Circle]	"LS" LANDSCAPE DRAIN
[Circle]	[Circle]	MANHOLE
[Circle]	[Circle]	CATCH BASIN W/SED CATCH
[Circle]	[Circle]	CURB INLET W/SILT SAC
[Circle]	[Circle]	END SECTION
[Circle]	[Circle]	GATE VALVE
[Circle]	[Circle]	HYDRANT
[Circle]	[Circle]	OVERHEAD ELECTRICAL LINES
[Circle]	[Circle]	FLOOD PLAN
[Circle]	[Circle]	CONTOURS
[Circle]	[Circle]	SPOT ELEVATION
[Circle]	[Circle]	1000.00
[Circle]	[Circle]	1000.00
[Circle]	[Circle]	1/4"
[Circle]	[Circle]	SURFACE DRAINAGE
[Circle]	[Circle]	OVERFLOW ROUTE
[Circle]	[Circle]	TREE FENCE
[Circle]	[Circle]	SILT FENCE
[Circle]	[Circle]	PROPOSED DRIVEWAY LOCATION
[Circle]	[Circle]	CROSSING NUMBER

**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	TITLE SCHEMATIC DESIGN	06-10-2022
2.	S&P DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

DATE: 04-25-22 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: E.E. FILE: 21001-ST-SP-PH.DWG

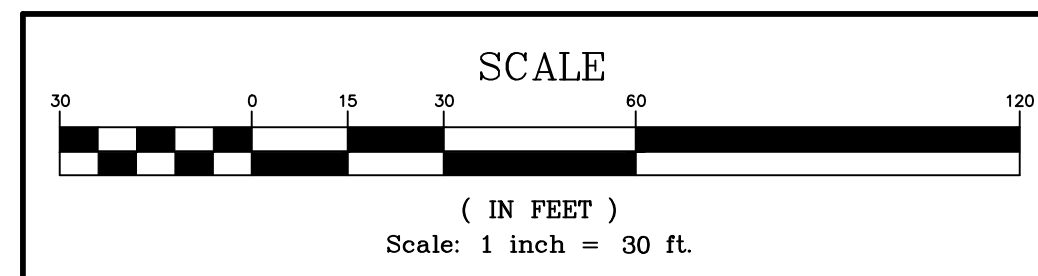
**STORM SEWER PLAN AND PROFILE**

**SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

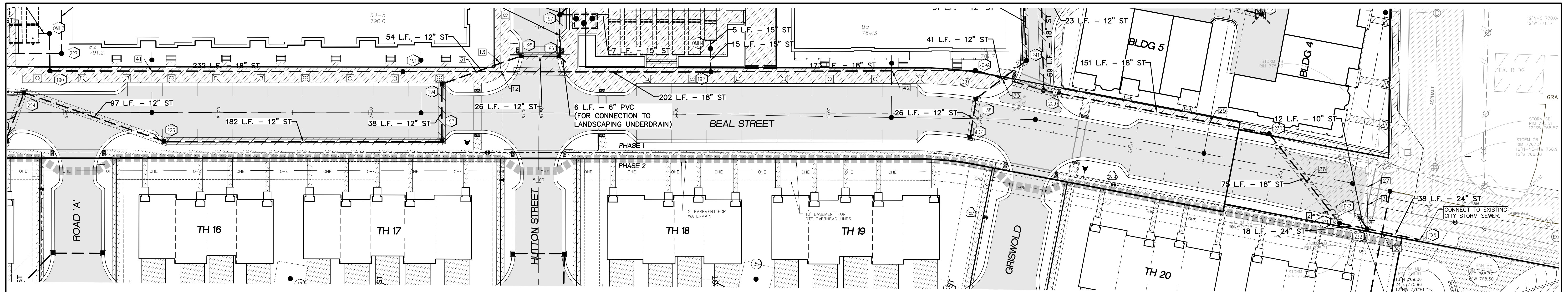
**811** Know what's below.  
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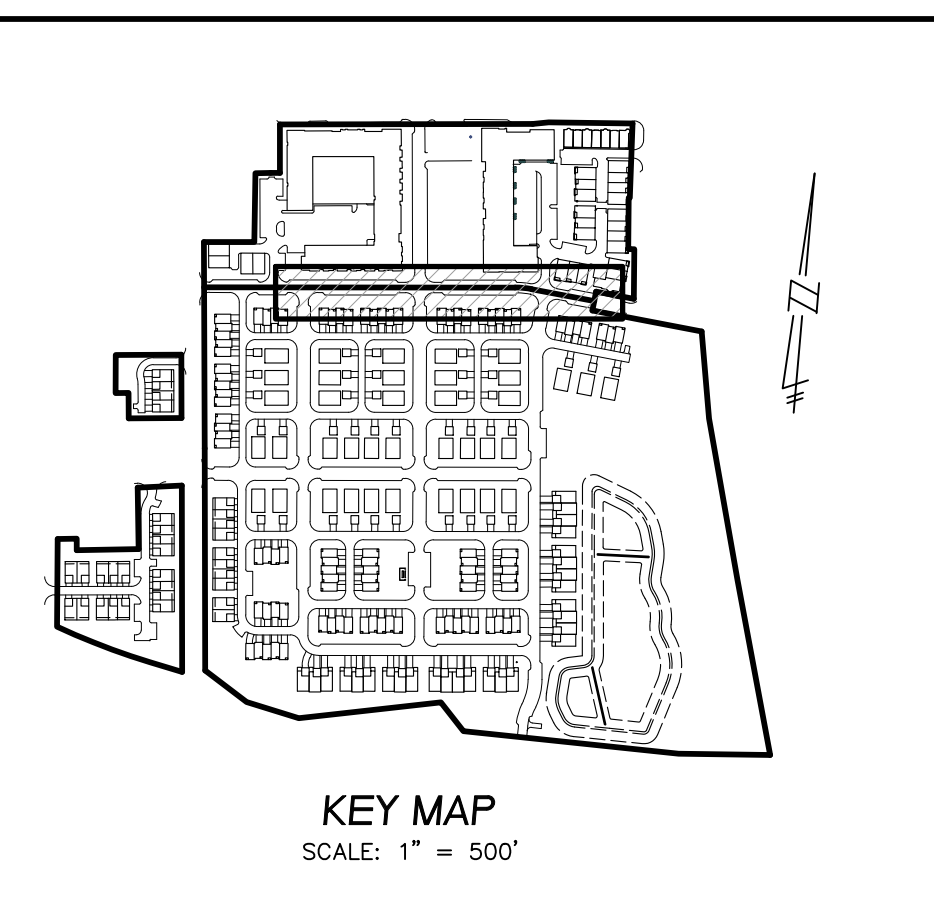
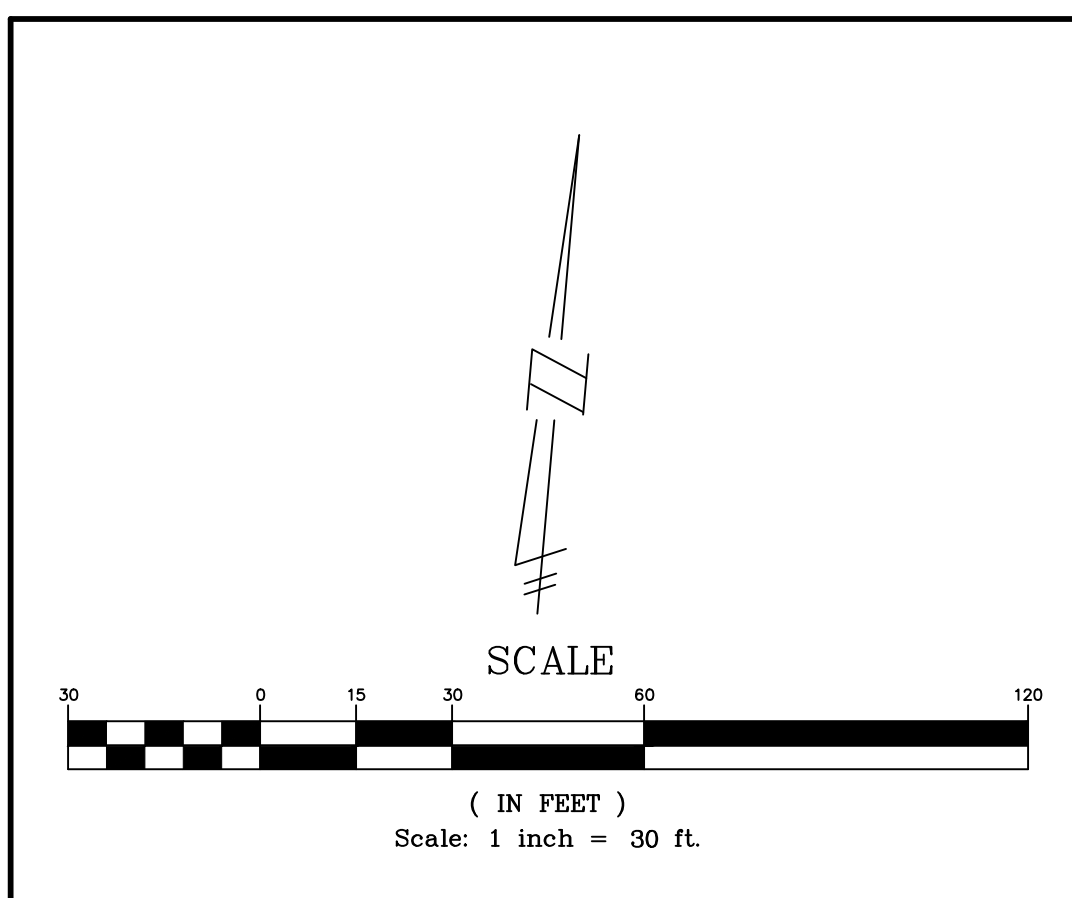
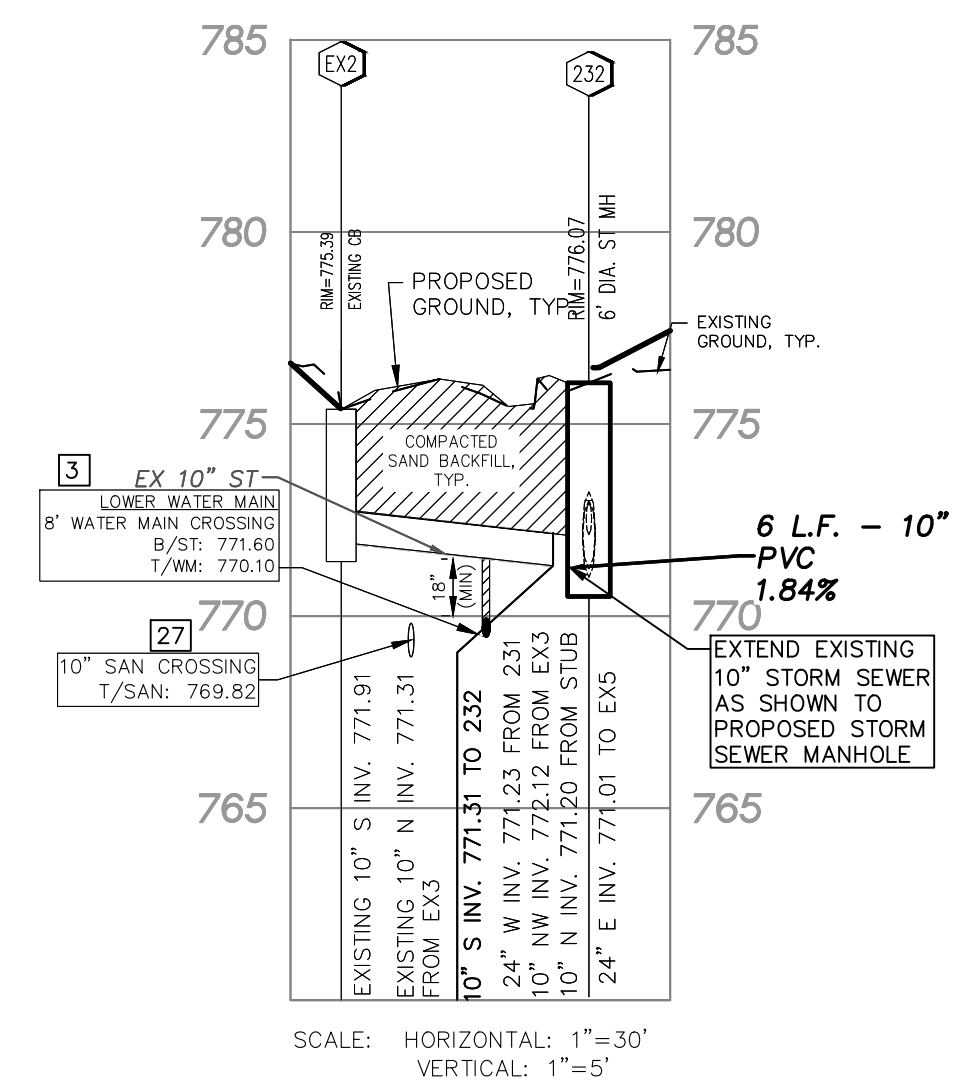
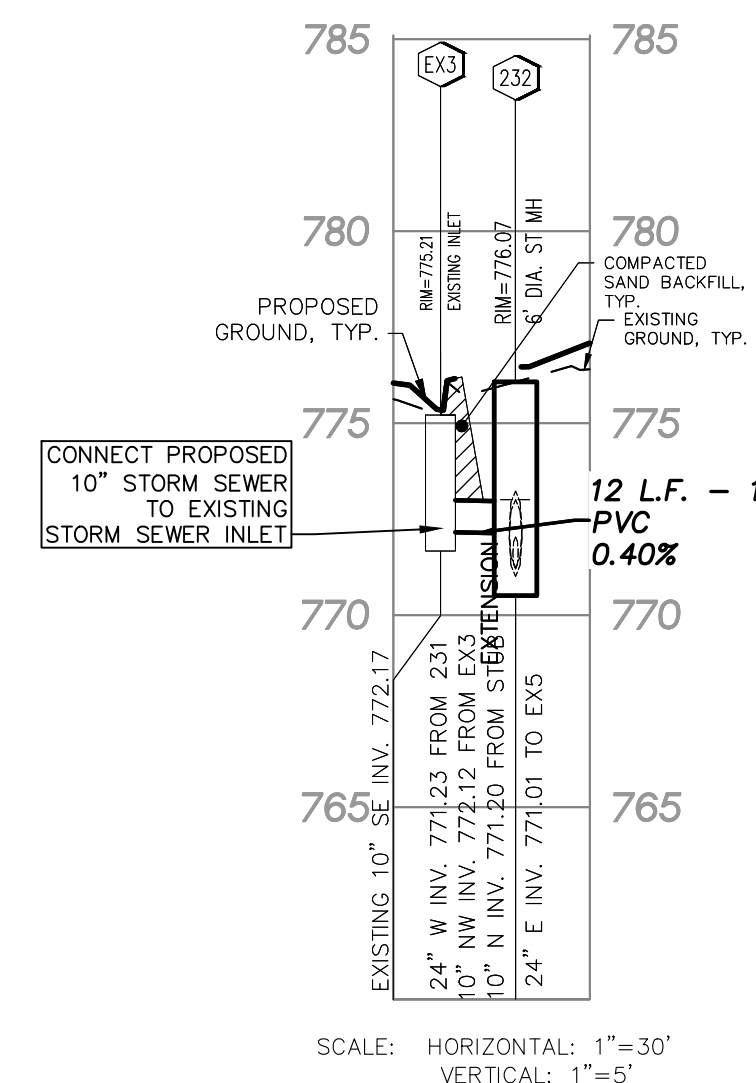
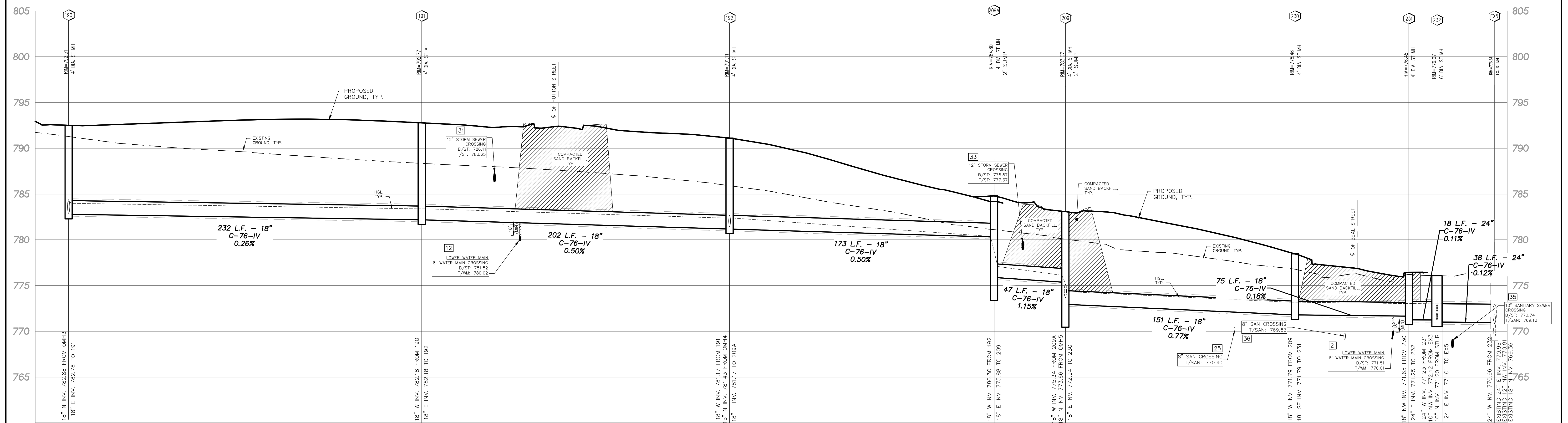
**SHEET 25**







SEE SHEET 17 FOR CROSSING CHART



**LEGEND**

EXISTING	PROPOSED	DESCRIPTION
[Symbol]	[Symbol]	PAVEMENT (ASPHALT)
[Symbol]	[Symbol]	SIDE WALK (CONCRETE)
[Symbol]	[Symbol]	CONCRETE CURB AND GUTTER
[Symbol]	[Symbol]	STORM SEWER
[Symbol]	[Symbol]	SANITARY SEWER
[Symbol]	[Symbol]	WATER MAIN
[Symbol]	[Symbol]	MANHOLE
[Symbol]	[Symbol]	CATCH BASIN
[Symbol]	[Symbol]	CURB INLET W/SILT SAC
[Symbol]	[Symbol]	END SECTION
[Symbol]	[Symbol]	GATE VALVE
[Symbol]	[Symbol]	HYDRANT
[Symbol]	[Symbol]	FLOOD PLAIN
[Symbol]	[Symbol]	CONTOURS
[Symbol]	[Symbol]	SPOT ELEVATION
[Symbol]	[Symbol]	1/2"
[Symbol]	[Symbol]	SURFACE DRAINAGE
[Symbol]	[Symbol]	OVERFLOW ROUTE
[Symbol]	[Symbol]	TREE FENCE
[Symbol]	[Symbol]	SILT FENCE
[Symbol]	[Symbol]	PROPOSED DRIVEWAY LOCATION
[Symbol]	[Symbol]	LIMIT OF DISTURBANCE

**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	100% SCHEMATIC DESIGN	06-10-2022
2.	50% DESIGN DEVELOPMENT	10-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

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DATE: 04-25-23 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: E.E. FILE: 21001-ST-PSP-PH.DWG

**DETENTION BASIN OUTLET STORM SEWER PIPE**

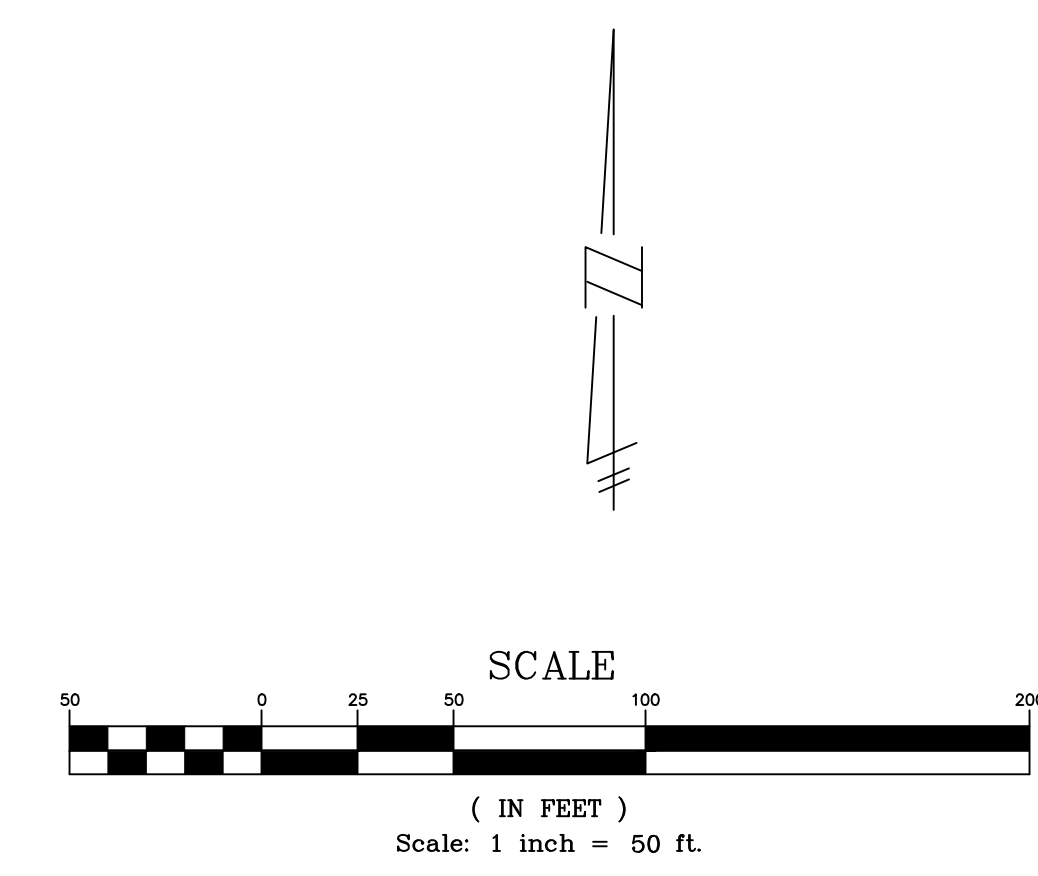
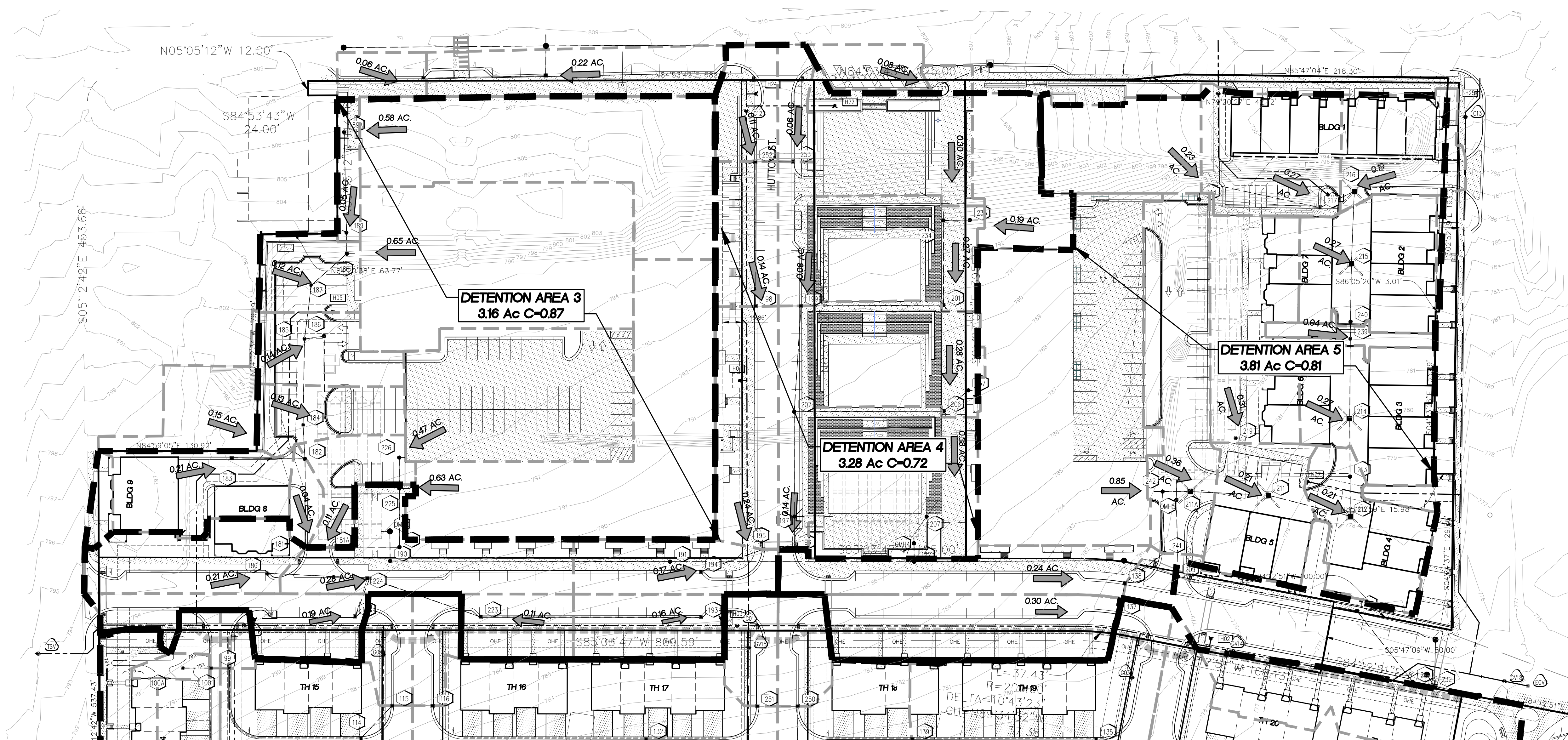
**SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

SHEET  
**26**







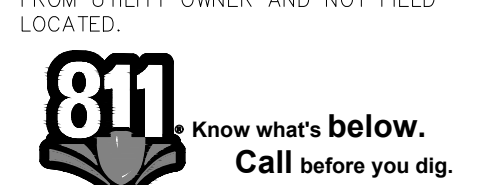


EXISTING		PROPOSED		
				PAVEMENT (ASPHALT)
				SIDE WALK (CONCRETE)
				CONCRETE CURB AND GUTTER
				STORM SEWER
				SANITARY SEWER
				WATER MAIN
				"UD" DENOTES UNDERDRAIN
				"LS" DENOTES LANDSCAPE DRAIN
				MANHOLE
				CATCH BASIN W/SED CATCH
				CURB INLET W/SILT SAC
				END SECTION
				GATE VALVE
				HYDRANT
				OVERHEAD ELECTRICAL LINES
				FLOOD PLAIN
				CONTOURS
				SPOT ELEVATION
				SURFACE DRAINAGE
				OVERFLOW ROUTE
				TREE FENCE
				SILT FENCE
				PROPOSED DRIVEWAY LOCATION
				CROSSING NUMBER

**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
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UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

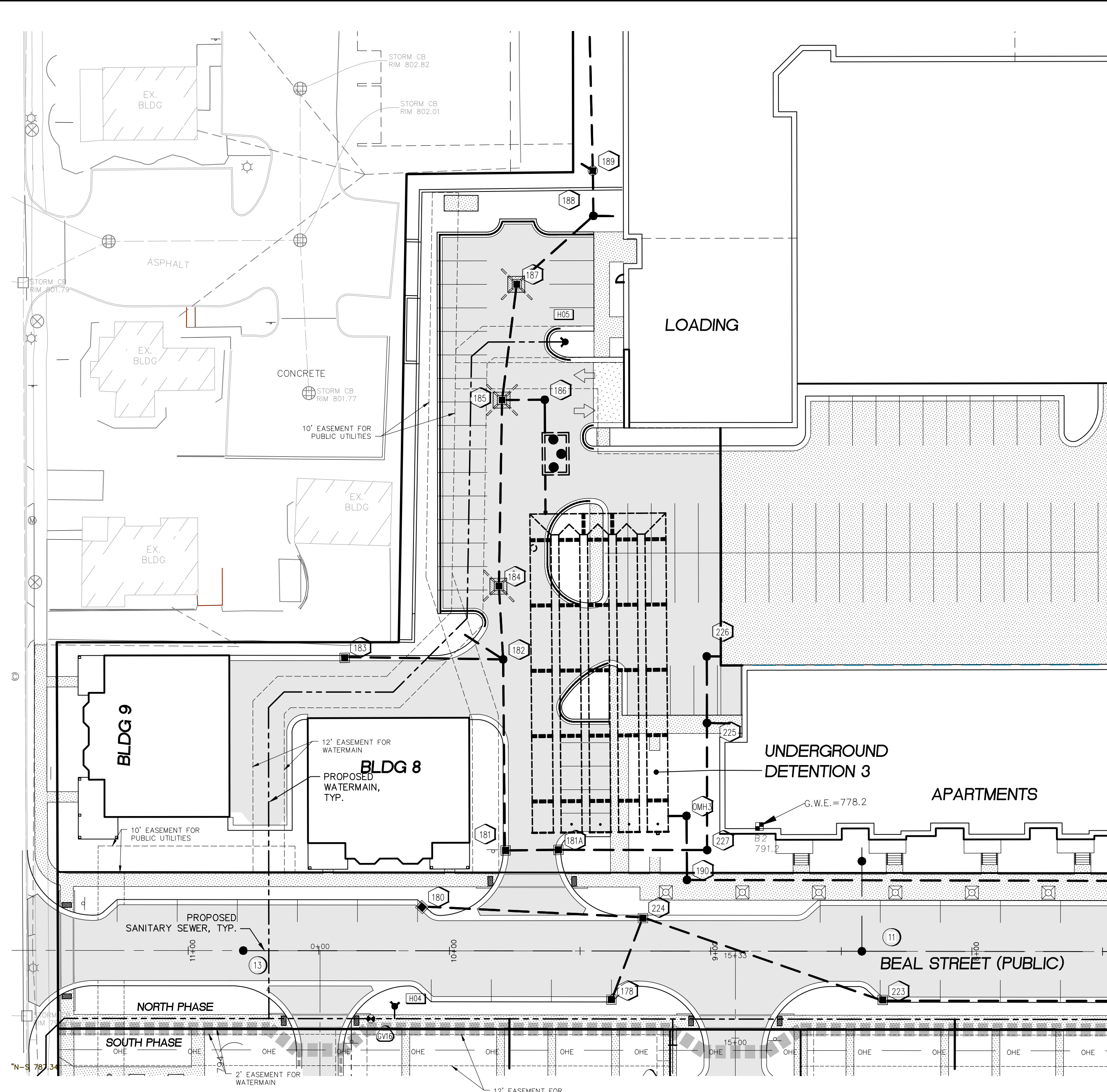


DATE: 04-25-23 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: E.E. PTLR: 21001-00-ESP-PH.DWG

**DRAINAGE DISTRIBUTION PLAN**

<b>SEIBER KEAST LEHNER</b> ENGINEERING   SURVEYING 39205 COUNTRY CLUB DRIVE, SUITE C8 FARMINGTON HILLS, MI 48331 PHONE: 248.308.3331	<b>SHEET</b>  <b>28</b>
--	-------------------------------





**OUTLET DESIGN**

**BANK FULL FLOOD FLOW RESTRICTOR ORIFICE SIZING**

Average Discharge Rate (Qave):  $Q_{ave} = \frac{Q_{max}}{4} = \frac{14230}{4} = 3557.5$  cfs

Average Head (h<sub>ave</sub>):  $h_{ave} = 0.5 \times (Z_{bf} - Z_{out}) = 0.5 \times (786.22 - 783) = 1.61$  ft

Bank Full Flood Orifice Area (A<sub>o</sub>):  $A_o = \frac{Q_{ave}}{1.483 \sqrt{2gh}} = \frac{3557.5}{1.483 \sqrt{2 \times 32.2 \times 1.61}} = 0.0136$  sf

Bank Full Flood Orifice Diameter (d):  $d = \sqrt{\frac{4A_o}{\pi}} = 1.125$  in

The actual average release rate through the orifice for the assumed condition is:  $A = \frac{\pi}{4} d^2 = 0.0099$  sf

Actual holding time for the bank full flood for the assumed condition is:  $T_{100} = \frac{V_{100}}{Q_{100}} = \frac{14230}{3557.5} = 3.99$  hrs

**100-YEAR FLOOD CONTROL ORIFICE SIZING**

Orifice = Gall = 0.47 cfs

Maximum Head on BF Orifice:  $h_{max} = 2.100 - Z_{out} = 7.91$  ft

100-yr flow through Bank Full Orifice:  $Q_{100} = A_o \sqrt{2gh} = 0.0136 \sqrt{2 \times 32.2 \times 7.91} = 0.199$  cfs

100-yr Head above BF (Head on 100-Yr Orifice):  $h_{100} = Z_{max} - Z_{bf} = 7.90 - 786.22 = 4.69$  ft

Remaining flow through 100-yr Orifice:  $Q_{res} = Q_{100} - Q_{BF} = 0.199 - 0.47 = 0.26$  cfs

Flood Control Orifice Area (A):  $A = \frac{Q_{res}}{1.483 \sqrt{2gh}} = 0.026$  square feet

Flood Control Orifice Diameter (d):  $d = \sqrt{\frac{4A}{\pi}} = 1.25$  in

The actual maximum release rate through the orifice for the assumed condition is:  $A = \frac{\pi}{4} d^2 = 0.0085$  sf

**FLOOD RESTRICTOR OUTLET PIPE SIZING**

SUM OF ALL FLOWS + OFFSITE FLOW INTO BASIN (10' W): 12.24 cfs

TIME TO FILL THE BASIN = 50.16 min

Outlet velocity is between 2.5 fps and 8.0 fps, outlet pipe adequate



Pipe Information:

Diameter	96	inches
Out-to-out length	122	feet
Out-to-out width	52	feet
Pipe Spacing	3	feet
Number of Manifolds	1	each
Number of Barrels	5	each
Desired increment for calcs	1	in
System Invert	783	

8/31/2023

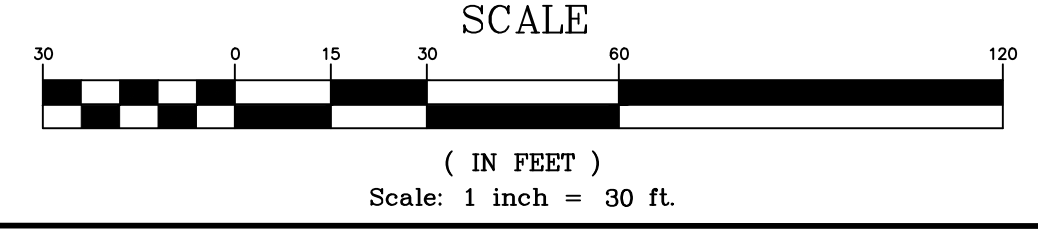
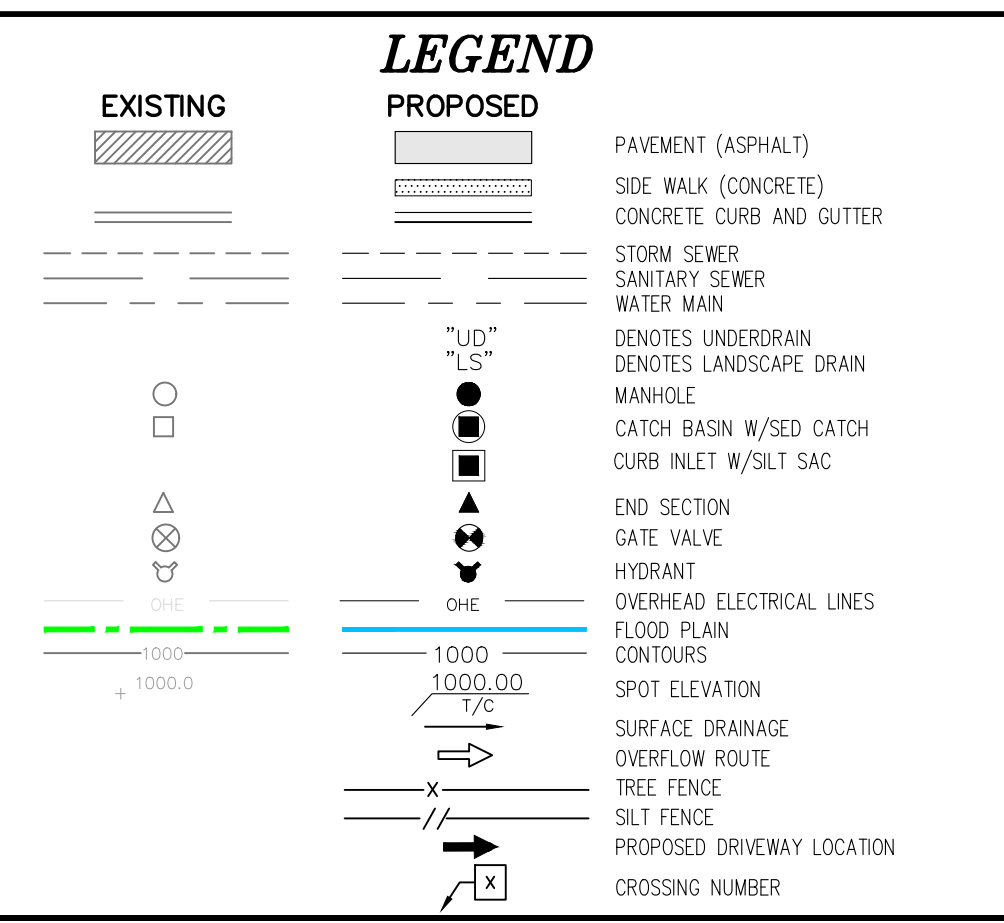
Depth (ft)	Elevation (ft)	Cumulative Storage (cft)	Average Surface Area (sf)
0.00	783.00	0.00	674.00
0.06	783.06	181.70	2431.80
0.17	783.17	398.00	2740.10
0.25	783.25	586.30	2972.70
0.33	783.33	802.30	3165.50
0.42	783.42	1039.50	3332.50
0.50	783.50	1447.20	3480.70
0.58	783.58	1742.20	3614.60
0.67	783.67	2049.30	3736.90
0.75	783.75	2365.50	3849.60
0.83	783.83	2699.20	3954.10
0.92	783.92	3034.30	4051.40
1.00	784.00	3365.80	4142.50
1.08	784.08	3704.60	4227.50
1.17	784.17	4050.30	4306.30
1.25	784.25	4402.50	4379.10
1.33	784.33	4760.70	4446.20
1.42	784.42	5125.30	4507.90
1.50	784.50	5496.00	4564.50
1.58	784.58	5872.20	4616.40
1.67	784.67	6254.50	4663.80
1.75	784.75	6642.50	4706.90
1.83	784.83	7036.70	4745.90
1.92	784.92	7436.70	4780.00
2.00	785.00	7842.00	4809.40
2.08	785.08	8252.20	4834.30
2.17	785.17	8667.00	4854.90
2.25	785.25	9086.00	4871.40
2.33	785.33	9509.00	4884.00
2.42	785.42	9936.00	4892.80
2.50	785.50	10367.00	4900.00
2.58	785.58	10802.00	4905.80
2.67	785.67	11241.00	4910.40
2.75	785.75	11684.00	4913.80
2.83	785.83	12131.00	4916.10
2.92	785.92	12582.00	4917.40
3.00	786.00	13037.00	4917.70
3.08	786.08	13496.00	4917.10
3.17	786.17	13959.00	4915.60
3.25	786.25	14426.00	4913.20
3.33	786.33	14897.00	4909.90
3.42	786.42	15372.00	4905.80
3.50	786.50	15851.00	4900.90
3.58	786.58	16334.00	4895.30
3.67	786.67	16821.00	4889.00
3.75	786.75	17312.00	4882.00
3.83	786.83	17807.00	4874.30
3.92	786.92	18306.00	4866.00
4.00	787.00	18810.00	4857.20

4.08	787.08	19318.00	4847.30
4.17	787.17	19831.00	4837.00
4.25	787.25	20349.00	4825.30
4.33	787.33	20872.00	4812.20
4.42	787.42	21400.00	4797.70
4.50	787.50	21933.00	4781.90
4.58	787.58	22471.00	4764.80
4.67	787.67	23014.00	4746.40
4.75	787.75	23562.00	4726.70
4.83	787.83	24115.00	4705.80
4.92	787.92	24673.00	4683.60
5.00	788.00	25236.00	4660.20
5.08	788.08	25804.00	4635.60
5.17	788.17	26377.00	4609.80
5.25	788.25	26955.00	4582.80
5.33	788.33	27538.00	4554.60
5.42	788.42	28126.00	4525.20
5.50	788.50	28719.00	4494.60
5.58	788.58	29317.00	4462.80
5.67	788.67	29920.00	4429.80
5.75	788.75	30528.00	4395.60
5.83	788.83	31141.00	4360.20
5.92	788.92	31759.00	4323.60
6.00	789.00	32382.00	4285.80
6.08	789.08	33010.00	4246.80
6.17	789.17	33643.00	4206.60
6.25	789.25	34281.00	4165.20
6.33	789.33	34924.00	4122.60
6.42	789.42	35572.00	4078.80
6.50	789.50	36225.00	4033.80
6.58	789.58	36883.00	3987.60
6.67	789.67	37546.00	3940.20
6.75	789.75	38214.00	3891.60
6.83	789.83	38887.00	3841.80
6.92	789.92	39565.00	3790.80
7.00	790.00	40248.00	3738.60
7.08	790.08	40936.00	3685.20
7.17	790.17	41629.00	3630.60
7.25	790.25	42327.00	3574.80
7.33	790.33	43030.00	3517.80
7.42	790.42	43738.00	3459.60
7.50	790.50	44451.00	3400.20
7.58	790.58	45169.00	3339.60
7.67	790.67	45892.00	3277.80
7.75	790.75	46620.00	3214.80
7.83	790.83	47353.00	3150.60
7.92	790.92	48091.00	3085.20
8.00	791.00	48834.00	3018.60

BANK FULL Volume	14230	c.ft.
100-YR FLOOD Volume	36637	c.ft.

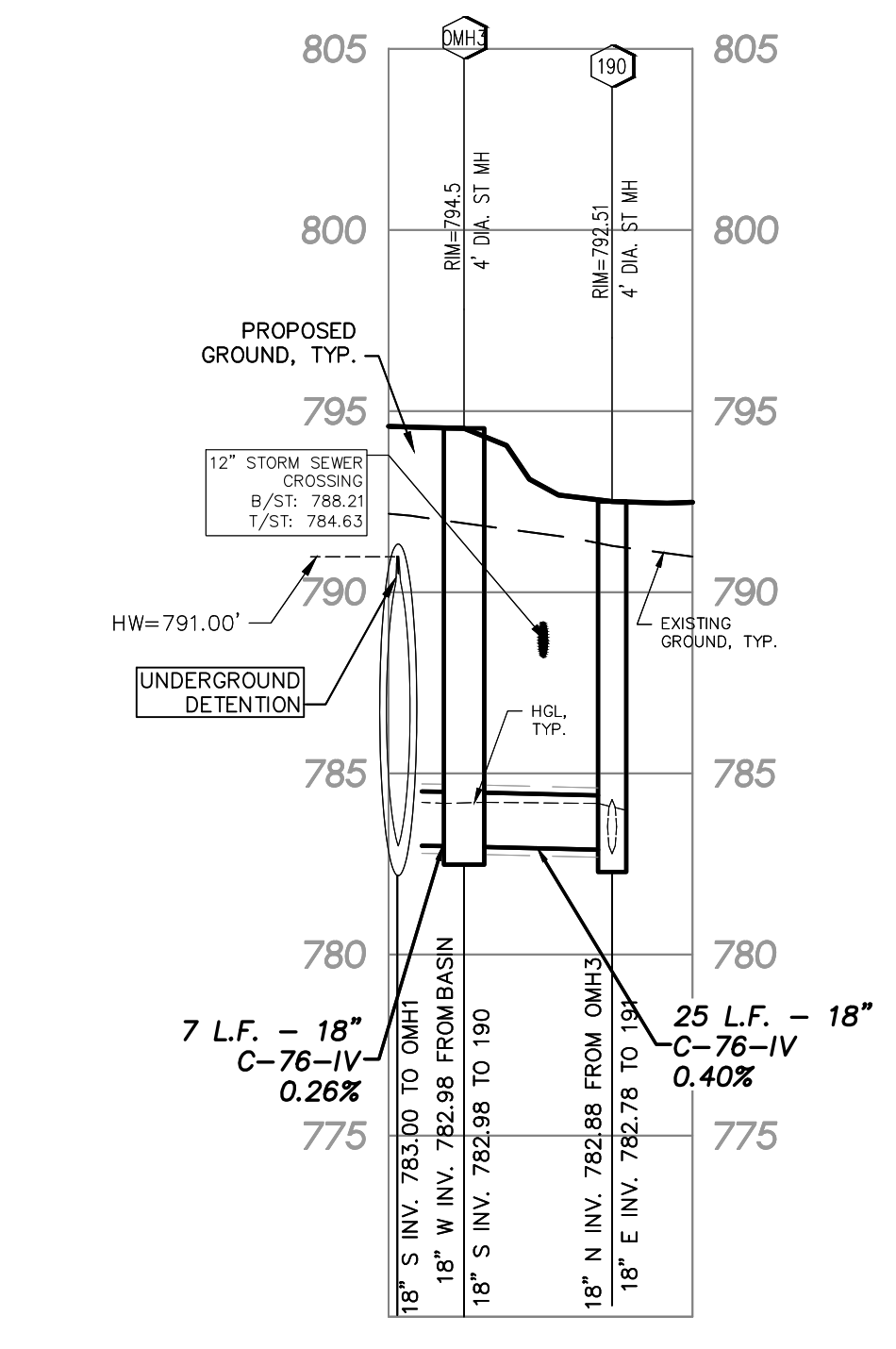
Bank Full depth (ft) Based on the interpolation the depth (ft) = 3.22

Flood Control depth (ft) Based on the interpolation the depth (ft) = 7.91



**THE DOWNS**

SECTION 3, T1S, R8E, CITY OF NORTHVILLE WAYNE COUNTY, MICHIGAN



**UNDER GROUND BASIN 3 Land Use Summary**

Characteristic	Existing Conditions	Proposed Conditions
Total Development Area (ac)	3.16	3.16
Impervious Area (ac)	0.67	2.83
Total Pervious Area (ac)	2.49	0.33

**Pervious Area Breakdown by Cover Type**

Cover Type	Existing Conditions	Proposed Conditions
Meadow/fallow/natural areas (non-cultivated)	0.73	N/A
Predominant NRCS Soil Type (A, B, C, or D)	Type A	N/A
Improved areas (turf grass, landscape, rpw crops)	0.12	0.33
Predominant NRCS Soil Type (A, B, C, or D)	N/A	Type A
Wooded Areas	0.58	N/A
Predominant NRCS Soil Type (A, B, C, or D)	Type A	N/A

Calculated BANK FULL Volume (cubic feet) = 14230  
BANKFULL Volume Provided (cubic feet) = 14230

**U.G. DETENTION BASIN CALCULATIONS: AREA 3**

Ac =	3.16	Ac	Area 3
C =	0.87		
Q <sub>in</sub> =	0.47	cfs	(0.15 cfs/Ac)
Q <sub>o</sub> = Q <sub>in</sub> / (Ac*C) =	0.17	(cfs/Ac Imp.)	
T <sub>100</sub> = 45 + sqrt(19845/Q <sub>o</sub> ) =	294.79	min	
V <sub>100</sub> = (17649 * T <sub>100</sub> ) / (1.50 * 45) - 40 * Q <sub>o</sub> * T <sub>100</sub> =	13,285	ft <sup>3</sup> /Ac Imp.	
V <sub>100</sub> = V <sub>s</sub> * Ac * C =	36,637	ft <sup>3</sup>	

**UG BASIN**

See Basin Detail Sheets Pipe Dia = 96 in

Pipe Storage Volume = 31,265 ft<sup>3</sup>

Backfill Storage Volume = 5,575 ft<sup>3</sup>

Total Storage Provided = 36,840 ft<sup>3</sup>

Basin Invert = 783.00 ft

Z-100 = 790.91 ft

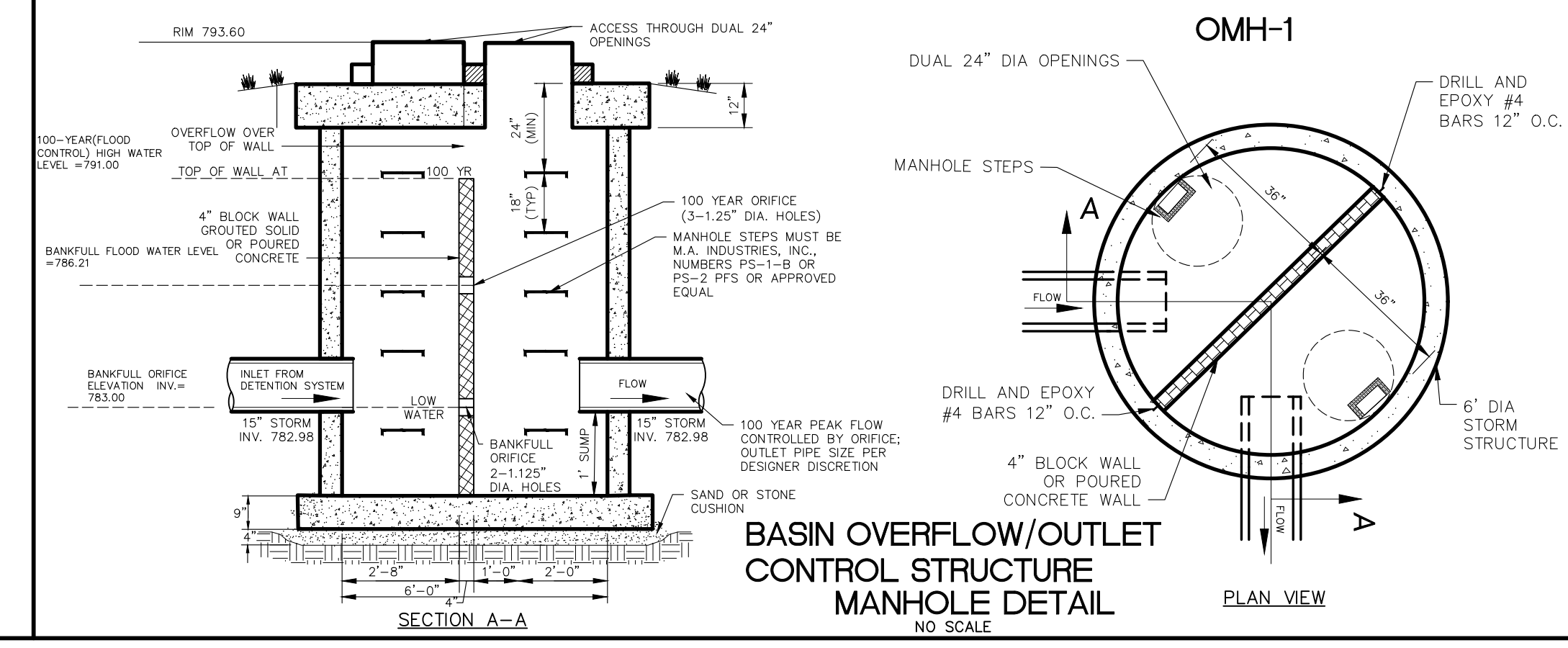
**DETERMINE BANK FULL FLOOD STORAGE VOLUME**

V<sub>100</sub> = 5160 \* Ac \* C = 14230.12 ft<sup>3</sup>

V<sub>100</sub> = 14230 ft<sup>3</sup>

Basin Invert = 783.00 ft

Z-bf = 786.22 ft



**REVISIONS**

NO.	ITEM	DATE
1.	100% SCHEMATIC DESIGN	06-10-2022
2.	50% DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

**UTILITY WARNING**

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

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

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF AND/OR RELOCATION OF ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION.

DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: E.E. FILE: 21001-SWM-PSW-100

**STORM WATER MANAGEMENT PLAN - BASIN 3**

**SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

**SHEET 29**



PIECE	STUB INVERT	SYSTEM INVERT
18"Ø STUB C1	786.25	783.00
18"Ø STUB E2	783.00	783.00

PIECE	RIM ELEV.	SYSTEM INVERT
30"Ø RISER D1	795.3	783.00
6"Ø RISER E3	794.4	783.00
6"Ø RISER F2	794.3	783.00
6"Ø RISER G2	793.8	783.00
6"Ø RISER H2	793.5	783.00

**ASSEMBLY**  
SCALE: 1" = 20'  
PIPE STORAGE: 31,265 CF  
STRUCTURAL BACKFILL STORAGE: 5,575 CF  
TOTAL STORAGE PROVIDED: 36,840 CF  
LOADING: H20  
PIPE INV. = 783.00'

ASSUMES 12" OF PERIMETER STONE WITH 20% Voids.  
ASSUMES NO STONE STORAGE ABOVE OR BELOW PIPE.

NOTES:  
• ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE.  
• ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD (EOR) PRIOR TO RELEASING FOR FABRICATION.  
• ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A888.  
• ALL RISERS AND STUBS ARE 25' ± 1/2" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.  
• RISERS TO BE FIELD TRIMMED TO GRADE AS REQUIRED, BY CONTRACTOR.  
• QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.  
• ALL ACCESS CASTINGS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND ARE NOT SUPPLIED BY CONTECH.  
• THIS CONTECH CMP PIPE DESIGN SUBMITTAL PACKAGE IS NOT APPLICABLE TO AND SHALL NOT BE USED BY OTHER MANUFACTURERS, AS IT IS THE PROPERTY OF CONTECH ENGINEERED SOLUTIONS LLC. FABRICATION DRAWINGS, PERFORMANCE DETAILS, MANUFACTURING PROCEDURES, AND FIELD OPERATIONS ARE SPECIFIC TO CONTECH'S CMP PRODUCT AND ARE NOT TO BE DUPLICATED.  
• RISERS ARE TO BE MANUFACTURED 12" BELOW GRADE AND INTERIOR TO BE PAINTED WITH ZINC RICH PAINT UNLESS OTHERWISE NOTED.  
• DUE TO SALTING AGENTS FOR SNOW AND ICE REMOVAL, ALL CMP WILL BE REQUIRED TO HAVE PE LINER AND/OR GEOMEMBRANE AS INDICATED ON SHEET 70 OR C2. THIS NOTE SUPERSEDES ANY OTHER RECOMMENDATIONS ON THIS TOPIC WITHIN THIS SUBMITTAL.

THE UNDERSIGNED HEREBY APPROVES THE ATTACHED (5) PAGES INCLUDING THE FOLLOWING:  
• PIPE STORAGE = 31,265 CF  
• MAINLINE PIPE GAGE = 14  
• WALL TYPE = PERFORATED  
• DIAMETER = 96"  
• FINISH = ALT2  
• CORRUGATION = 5x1

CUSTOMER \_\_\_\_\_ DATE \_\_\_\_\_

CONTECH ENGINEERED SOLUTIONS LLC  
1100 Centre Plaza Dr., Suite 400, West Chester, OH 45386  
953-538-1132 913-645-7000 913-645-7883 FAX

CONTECH CMP DETENTION SYSTEMS  
CONTECH PROPOSAL DRAWING

96"Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 677778-020 THE DOWNS DETROIT, MI SITE DESIGNATION: DET 3

PROJECT NO. 677778 ISS. NO. 020 DATE 1/24/2023  
DESIGNED: MSB APPROVED: MSB  
SHEET NO. P1 OF 5

DIAMETER	MIN COVER	CORR. PROFILE
6'-10"	12"	1 1/2" x 1/4"
12'-48"	12"	2 2/3" x 1/2"
64'-86"	12"	3" x 1", 5" x 1"
102'-144"	DB	3" x 1", 5" x 1"

**TYPICAL BACKFILL DETAIL**  
NOT TO SCALE

BACKFILL REQUIREMENTS FOLLOW THE GUIDELINES OF AASHTO LRFD BRIDGE DESIGN (SEC 12) AND CONSTRUCTION (SEC 26)

- MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE.  
THE MINIMUM TRENCH WIDTH (12.6.6.1):  
PIPE ≤ 12", D + 12"  
PIPE ≥ 12", 12" + 12"
- MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE (12.6.6.2):  
PIPE ≤ 24", 3.0D  
PIPE ≥ 24", 144", D + 40"  
PIPE ≥ 144", D + 150"
- THE FOUNDATION UNDER THE PIPE AND SIDE BACKFILL SHALL BE ADEQUATE TO SUPPORT THE LOADS ACTING UPON IT (26.5.2).
- BEDDING MATERIAL SHALL BE A RELATIVELY LOOSE GRANULAR MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE, AND A MINIMUM OF TWICE THE CORRUGATION DEPTH IN THICKNESS, WITH THE MAXIMUM PARTICLE SIZE OF ONE-HALF OF THE CORRUGATION DEPTH (26.5.3).
- PERFORATED CORRUGATED STEEL PIPE (CSP / HEL-COR).
- HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELLED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION (26.5.4).
- INITIAL BACKFILL FOR PIPE EMBEDMENT TO BE FREE DRAINING ANGULAR WASHED STONE 1/2" - 3" PARTICLE SIZE (WITH NO FINES AND NO CRUSHED CONCRETE) SUCH AS MDOT 6A, 6A, MDOT 50 OR APPROVED EQUAL, COMPACTED TO 90% STANDARD PROCTOR (T 99). ALL LIFTS PLACED IN A CONTROLLED MANNER. IT IS RECOMMENDED THAT LIFTS NOT EXCEED AN 8" UNCOMPACTED LIFT HEIGHT TO PREVENT UNIFORM LOADING, AND THE LESSEST OF 10 THE DIAMETER OR 24" AS THE MAXIMUM DIFFERENTIAL SIDE-TO-SIDE (26.5.4).
- INITIAL BACKFILL ABOVE PIPE MAY INCLUDE ROAD BASE MATERIAL AND RIGID PAVEMENT IF APPLICABLE. SEE TABLE ABOVE.
- TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT (12.6.6.3).
- FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS FOR THE ENGINEER OF RECORD (26.5.4.1).

NOTES:  
• GEOTEXTILE SHALL BE USED TO WRAP TRENCH ONLY TO PREVENT SOIL MIGRATION INTO VARYING SOIL TYPES (PROJECT ENGINEER).  
• FOR MULTIPLE BARREL INSTALLATIONS THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE PIPE DIA./2 BUT NO LESS THAN 12", OR 36" FOR PIPE DIAMETERS 72" AND LARGER. CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING (TABLE C12.6.7.1).

CONTECH ENGINEERED SOLUTIONS LLC  
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953-538-1132 913-645-7000 913-645-7883 FAX

CONTECH CMP DETENTION SYSTEMS  
CONTECH PROPOSAL DRAWING

96"Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 677778-020 THE DOWNS DETROIT, MI SITE DESIGNATION: DET 4

PROJECT NO. 677778 ISS. NO. 020 DATE 1/24/2023  
DESIGNED: MSB APPROVED: MSB  
SHEET NO. P2 OF 5

**PLAIN END CMP RISER PIPE**  
NOT TO SCALE

GENERAL NOTES:  
1. DELIVERED BAND STYLE AND FASTENER TYPE MAY VARY BY FABRICATION PLANT.  
2. JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.  
3. BAND MATERIAL AND GAGE TO BE SAME AS RISER MATERIAL.  
4. IF RISER HAS A HEIGHT OF COVER OF 10' OR MORE, USE A SLIP JOINT.  
5. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:  
• 12" THRU 48" 1-PIECE  
• 54" THRU 84" 3-PIECES  
• 96" 2-PIECES  
6. ALL RISER JOINT COMPONENTS WILL BE FIELD ASSEMBLED.  
7. MANHOLE RISERS IN APPLICATIONS WHERE TRAFFIC LOADS ARE IMPOSED REQUIRE SPECIAL DESIGN CONSIDERATIONS.  
8. DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES.

**12" RISER BAND DETAIL**  
NOT TO SCALE

**2 2/3"x1/2" RE-ROLLED END HEL-COR PIPE**  
NOT TO SCALE

GENERAL NOTES:  
1. JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.  
2. BAND MATERIALS AND/OR COATING CAN VARY BY LOCATION. CONTACT YOUR CONTECH REPRESENTATIVE FOR AVAILABILITY.  
3. BANDS ARE SHAPED TO MATCH THE PIPE ARCH WHEN APPLICABLE.  
4. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:  
• 12" THRU 48" 1-PIECE  
• 54" THRU 84" 3-PIECES  
• 102" THRU 144" 3-PIECES  
5. BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS.  
6. ALL CMP IS ROLLED TO HAVE ANNULAR END CORRUGATIONS OF 2 2/3"x1/2"  
7. DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.  
8. ORDER SHALL DESIGNATE GASKET OPTION, IF REQUIRED (SEE DETAILS ABOVE).

**H-12 HUGGER BAND DETAIL**  
NOT TO SCALE

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CONTECH CMP DETENTION SYSTEMS  
CONTECH PROPOSAL DRAWING

96"Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 677778-020 THE DOWNS DETROIT, MI SITE DESIGNATION: DET 4

PROJECT NO. 677778 ISS. NO. 020 DATE 1/24/2023  
DESIGNED: MSB APPROVED: MSB  
SHEET NO. P3 OF 5

**CONSTRUCTION LOADING DIAGRAM**  
NOT TO SCALE

PIPE SPAN INCHES	AXLE LOADS (KIPS)			
	18-50	50-75	75-110	110-150
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

**MATERIAL SPECIFICATION**  
NOT TO SCALE

**MANHOLE CAP DETAIL**  
NOT TO SCALE

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CONTECH CMP DETENTION SYSTEMS  
CONTECH PROPOSAL DRAWING

96"Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 677778-020 THE DOWNS DETROIT, MI SITE DESIGNATION: DET 4

PROJECT NO. 677778 ISS. NO. 020 DATE 1/24/2023  
DESIGNED: MSB APPROVED: MSB  
SHEET NO. P4 OF 5

**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHWILLE WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	TOUR SCHEMATIC DESIGN	06-10-2022
2.	S05 DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

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THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF AND/OR RELOCATION OF ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION.

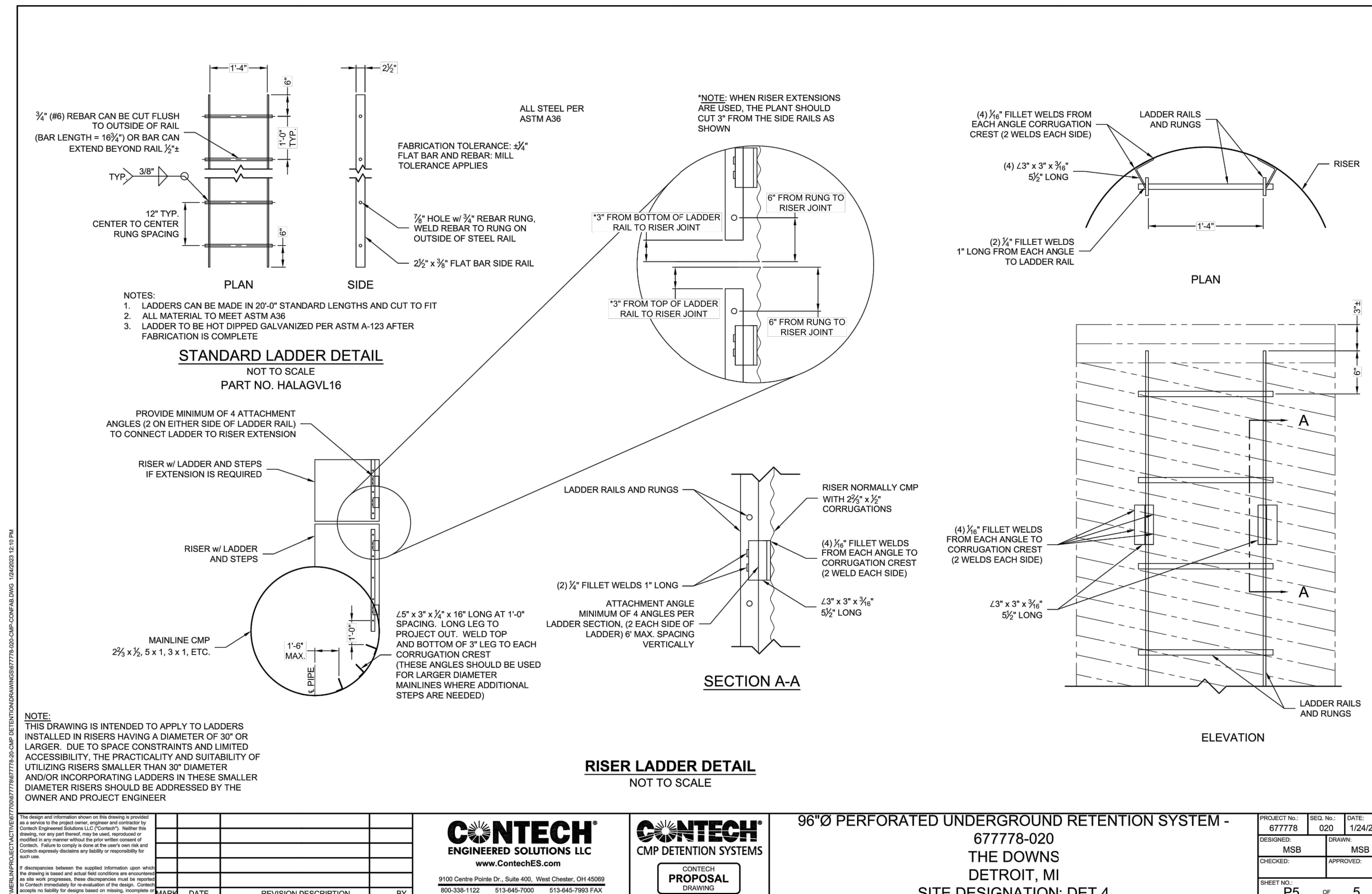
DATE: 04-25-23 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: R.E. FILE: 21001-SW-1250.DWG

**UNDERGROUND DETENTION DETAILS-BASIN 3**

SEIBER KEAST LEHNER ENGINEERING | SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8 FARMINGTON HILLS, MI 48331 PHONE: 248.308.3331

SHEET 30





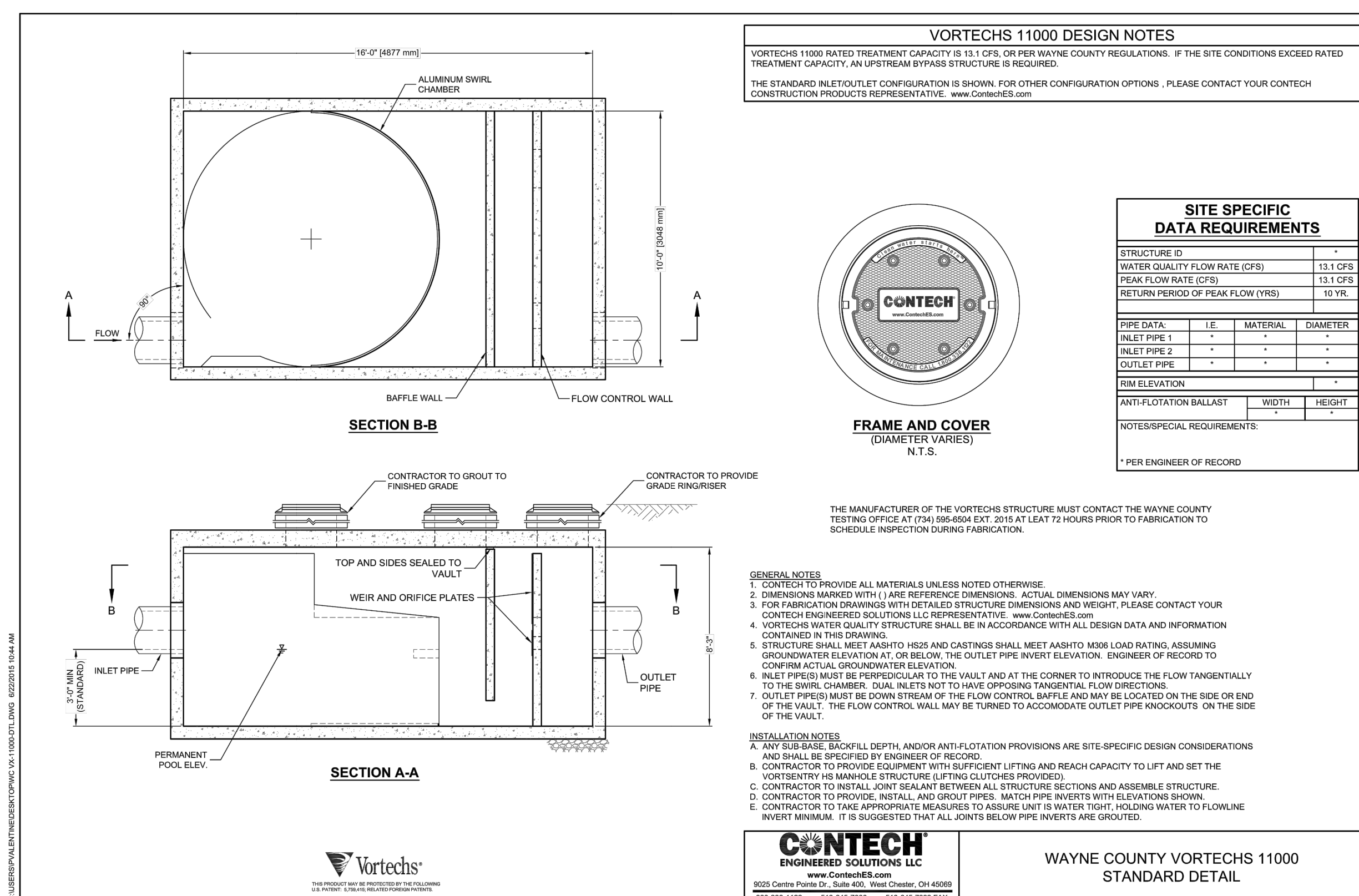
Project: The Downs  
Location: Northville, MI



Wayne County  
Manufactured Treatment Device Sizing Calculation

Area 3
10-year flowrate (cfs) 12.24
Recommended Model VX-11000

Vortechs™ Model	Peak Flow (cfs)
1000	1.2
2000	2.1
3000	3.4
4000	4.5
5000	6.4
7000	8.3
9000	10.5
11000	13.1
16000	18.8



2/1/2023

**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	100% SCHEMATIC DESIGN	06-10-2022
2.	50% DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

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

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF AND/OR RELOCATION OF ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION.

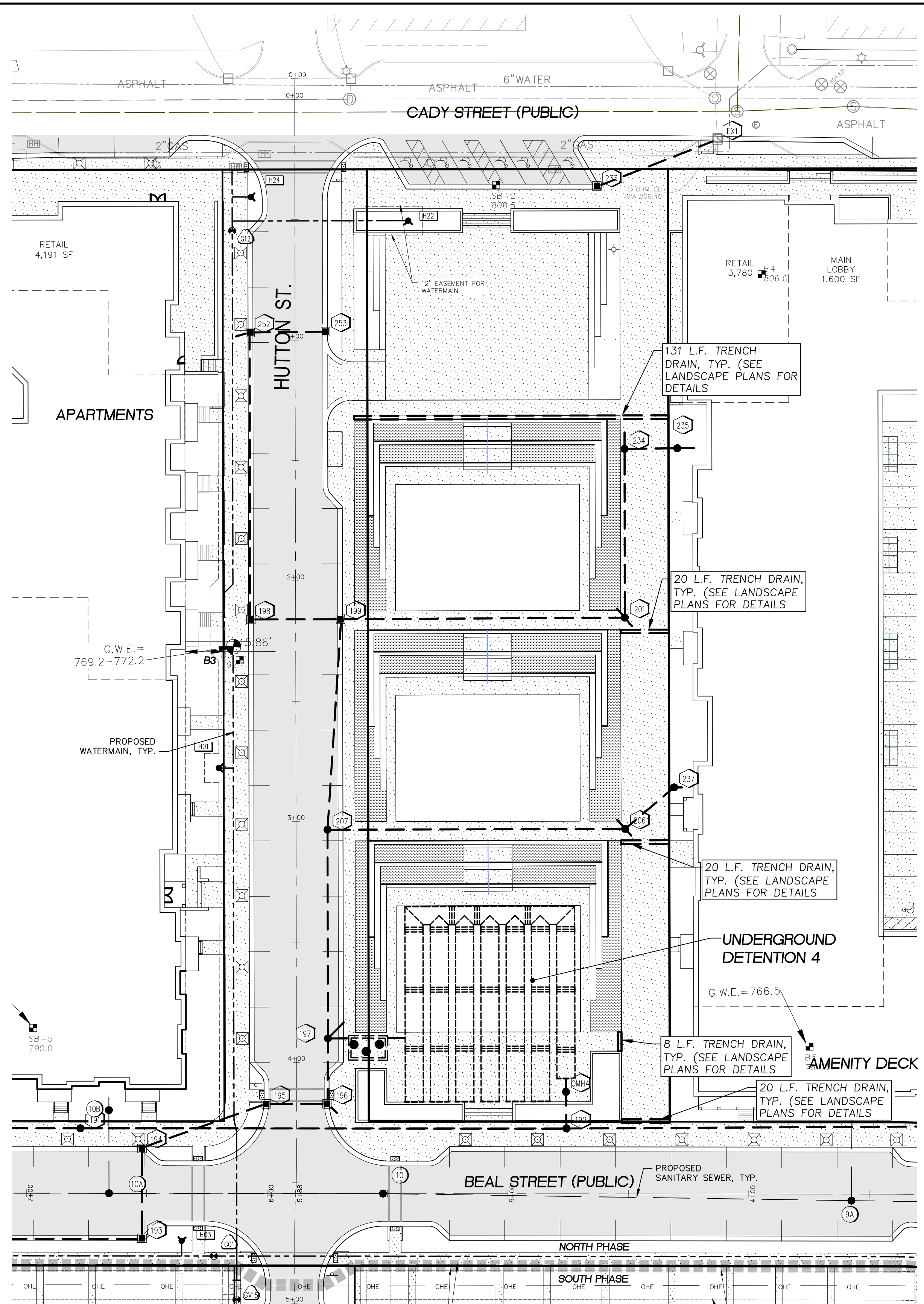
DATE: 04-25-23 DESIGNED BY: S.M. CHECKED BY: E.E. JOB NUMBER: 21-001 FILE: 21001-SWM-PSW.DWG

**UNDERGROUND DETENTION DETAILS-BASIN 3**

**SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

SHEET  
31





**OUTLET DESIGN**

**BANK FULL FLOOD FLOW RESTRICTOR ORIFICE SIZING**

Average Discharge Rate (Save):  $Q_{avg-yr} = \frac{Total\ Bank\ Full\ Flood\ Volume}{18000}$  [cf, average discharge rate over a 40-hour period]

Average Head (h<sub>avg</sub>):  $h_{avg} = 0.5 \times (Z_{sf} - Z_{rf})$  [Bank full elevation ft. resulting from storm volume table - First Flush Elevation, ft.]

Bank Full Flood Orifice Area (A):  $A = \frac{Q_{avg-yr}}{0.62 \times \sqrt{2 \times g \times h_{avg}}}$  [A=orifice area in square feet]

Bank Full Flood Orifice Diameter (d):  $d = \sqrt{\frac{4A}{\pi}}$

The actual average release rate through the orifice for the assumed condition is:

Actual Area (square feet):  $A = \frac{Q_{avg-yr}}{0.62 \times \sqrt{2 \times g \times h_{avg}}}$

Actual holding time for the bank full flood for the assumed condition is:

**100-YR FLOOD CONTROL ORIFICE SIZING**

Maximum Head on BF Orifice:  $h_{max} = 2100 - 2H = 6.15$  ft

100-yr flow through Bank Full Orifice:  $Q_{100-yr} = 0.62 \times \sqrt{2 \times g \times h_{max}}$  = 0.135 cfs

100-yr Head above BF (Head on 100-Yr Orifice):  $h_{100} = 788.96 - 784.61 = 4.37$  ft

Remaining flow through 100-Yr Orifice:  $Q_{100} = Q_{100} - Q_{100}$  [cubic feet per second]

Flood Control Orifice Area (A):  $A = \frac{Q_{100}}{0.62 \times \sqrt{2 \times g \times h_{100}}}$  [A=100-year orifice area in square feet]

Flood Control Orifice Diameter (d):  $d = \sqrt{\frac{4A}{\pi}}$  = 1 inches

The actual maximum release rate through the orifice for the assumed condition is:

Actual Area (square feet):  $A = \frac{Q_{100}}{0.62 \times \sqrt{2 \times g \times h_{100}}}$

Actual holding time for the bank full flood for the assumed condition is:

Total 100-yr Outlet:  $Q_{100} = 0.62 \times \sqrt{2 \times g \times h_{100}} = 0.135$  cfs Flow through 100-yr Outlet

OUTLET PIPESIZING:  $Q_{actual} = Q_{100} = 0.471$  cfs  $Q_{all} = 0.493$  cfs ok

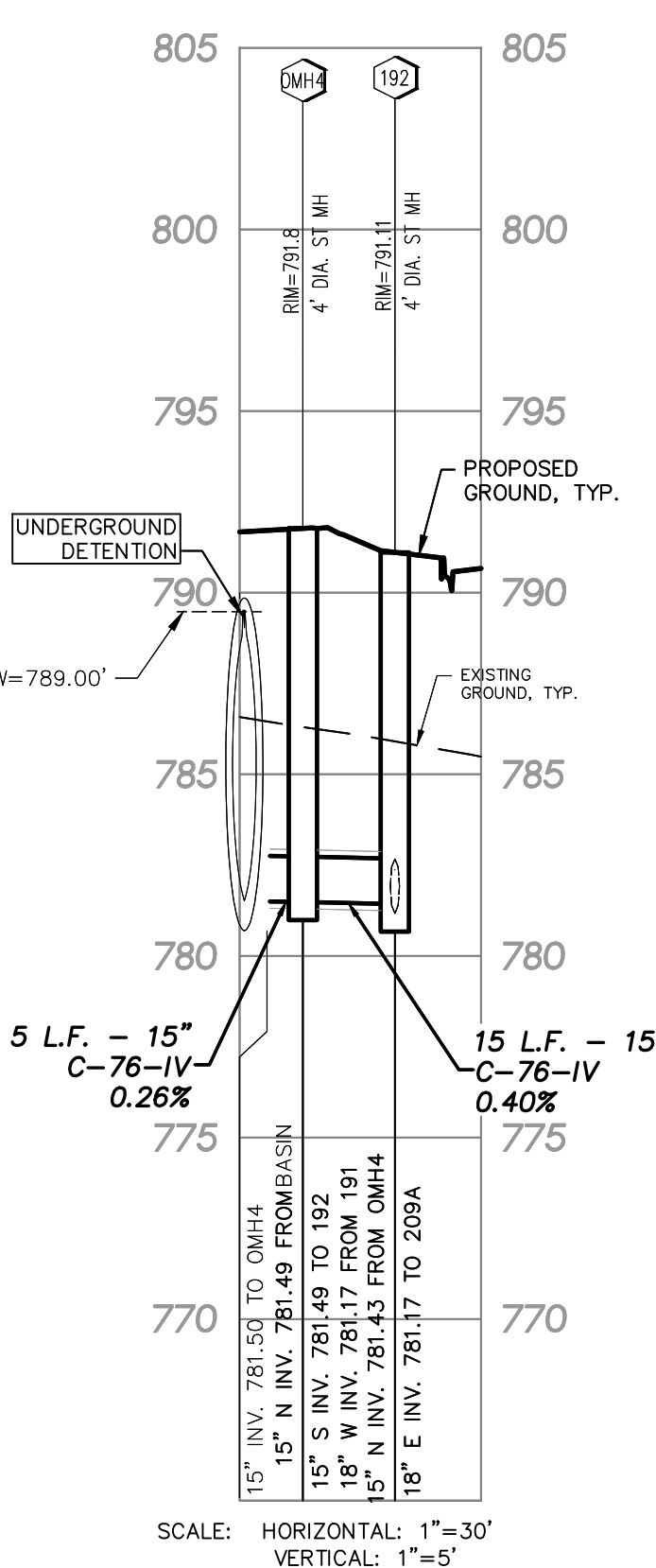
SUM OF ALL FLOWS INTO BASIN (10 YR) = 5.66 cfs  
 TIME TO FILL THE BASIN = 52.22 min  
 T<sub>50%</sub> = 17.56 min  
 T<sub>75%</sub> = 65.78 min  
 I<sub>50%</sub> = 1.69 lb/hr  
 Q<sub>10-yr</sub> = 3.98 cfs

Size of pipe = 15 inch  
 Area = 1.77 sq ft  
 Invert of pipe = 781.50 ft  
 Spring line of pipe = 782.15 ft  
 I = 0.36% = 7.89 ft/mi  
 Capacity, Q = 0.62 \* A \* sqrt(2 \* g \* h) = 66.12 cfs

Area = 1.77 sq ft  
 Hydraulic Radius = diam/4 = 0.31 ft  
 Manning's Coefficient (n) = 0.013  
 Q = 0.57 cfs  
 Minimum Slope = 0.36% (1/270) = 1.488 ft/mi  
 Outlet Velocity = Q/A = 3.24 fps  
 Outlet velocity is between 2.5 fps and 8.0 fps, outlet pipe adequate

**UNDER GROUND BASIN 4 Land Use Summary**

Characteristic	Existing Conditions	Proposed Conditions
Total Development Area (ac)	3.28	3.28
Impervious Area (ac)	0.12	2.26
Total Pervious Area (ac)	3.16	1.03
<b>Pervious Area Breakdown by Cover Type</b>		
Meadow/fallow/natural areas (non-cultivated)	1.4	N/A
Predominant NRCS Soil Type (A, B, C, or D)	Type A	N/A
Improved areas (turf grass, landscape, rpw crops)	0	1.03
Predominant NRCS Soil Type (A, B, C, or D)	N/A	Type A
Wooded Areas	0.07	N/A
Predominant NRCS Soil Type (A, B, C, or D)	Type A	N/A
Calculated BANK FULL Volume (cubic feet)		12125
BANKFULL Volume Provided (cubic feet)		12125



FIRST FLUSH Volume	4,260 c.ft.
BANK FULL Volume	12,125 c.ft.
100-YR FLOOD Volume	30,229 c.ft.

First Flush depth (ft)	Based on the interpolation the depth (ft) =	1.33
Bank Full depth (ft)	Based on the interpolation the depth (ft) =	3.11
Flood Control depth (ft)	Based on the interpolation the depth (ft) =	7.48

**CMP: Underground Detention System Storage Volume Estimation**

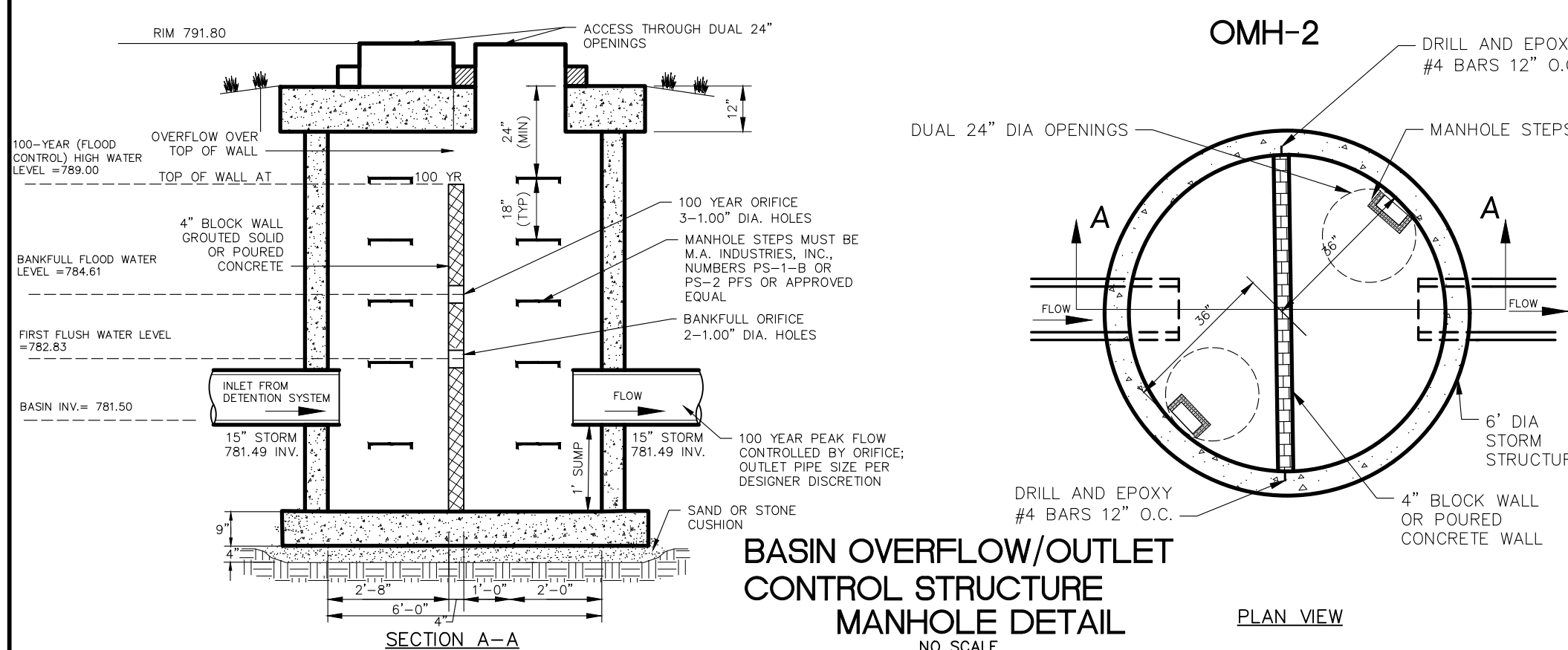
Pipe Information: Diameter 90 inches, Out-to-out length 79.79 feet, Out-to-out width 70.5 feet, Pipe spacing 1 feet, Number of Manholes 1 each, Number of Barrels 7 each

Store Information: Voids (percent) 50%, Storage storage: Depth below pipe 1 feet, Width around pipe 7 feet

Desired increment for calcs 1 in

System Invert 0.00

Depth (ft)	Elevation (ft)	Cumulative Storage (cf)	Average Surface Area (sf)
0.00	0.00	0.0	1,482.4
0.08	0.08	161.9	2,162.2
0.17	0.17	354.9	2,438.4
0.25	0.25	567.5	2,646.6
0.33	0.33	796.1	2,818.9
0.42	0.42	1,037.9	2,968.0
0.50	0.50	1,291.4	3,100.2
0.58	0.58	1,555.3	3,219.4
0.67	0.67	1,828.7	3,328.1
0.75	0.75	2,110.8	3,428.1
0.83	0.83	2,401.0	3,520.6
0.92	0.92	2,698.5	3,606.7
1.00	1.00	3,003.0	3,687.1
1.08	1.08	3,314.0	3,762.3
1.17	1.17	3,631.0	3,833.0
1.25	1.25	3,953.8	3,899.4
1.33	1.33	4,281.9	3,962.0
1.42	1.42	4,615.1	4,021.0
1.50	1.50	4,953.1	4,076.6
1.58	1.58	5,295.5	4,129.1
1.67	1.67	5,642.3	4,178.7
1.75	1.75	5,993.0	4,225.5
1.83	1.83	6,347.5	4,269.6
1.92	1.92	6,705.6	4,311.2
2.00	2.00	7,067.1	4,350.4
2.08	2.08	7,431.7	4,387.3
2.17	2.17	7,799.4	4,422.0
2.25	2.25	8,169.8	4,454.5
2.33	2.33	8,542.8	4,484.9
2.42	2.42	8,918.3	4,513.3
2.50	2.50	9,296.1	4,539.7
2.58	2.58	9,675.9	4,564.2
2.67	2.67	10,057.8	4,586.9
2.75	2.75	10,441.5	4,607.8
2.83	2.83	10,826.8	4,626.8
2.92	2.92	11,213.7	4,644.1
3.00	3.00	11,601.9	4,659.7
3.08	3.08	11,991.3	4,673.5
3.17	3.17	12,381.8	4,685.7
3.25	3.25	12,773.3	4,696.2
3.33	3.33	13,165.6	4,705.1
3.42	3.42	13,558.5	4,712.3
3.50	3.50	13,952.0	4,718.0
3.58	3.58	14,345.9	4,722.0
3.67	3.67	14,740.1	4,724.4
3.75	3.75	15,134.4	4,725.2
3.83	3.83	15,528.6	4,724.4
3.92	3.92	15,922.8	4,722.0
4.00	4.00	16,316.7	4,718.0
4.08	4.08	16,710.2	4,712.3
4.17	4.17	17,103.1	4,705.1
4.25	4.25	17,495.4	4,696.2
4.33	4.33	17,886.9	4,685.7
4.42	4.42	18,277.4	4,673.5
4.50	4.50	18,666.9	4,659.7
4.58	4.58	19,055.1	4,644.1
4.67	4.67	19,441.9	4,626.8
4.75	4.75	19,827.2	4,607.8
4.83	4.83	20,210.9	4,586.9
4.92	4.92	20,592.8	4,564.2
5.00	5.00	20,972.7	4,539.7
5.08	5.08	21,350.4	4,513.3
5.17	5.17	21,725.9	4,484.9
5.25	5.25	22,099.0	4,454.5
5.33	5.33	22,469.4	4,422.0
5.42	5.42	22,837.0	4,387.3
5.50	5.50	23,201.6	4,350.4
5.58	5.58	23,563.1	4,311.2
5.67	5.67	23,921.2	4,269.6
5.75	5.75	24,275.7	4,225.5
5.83	5.83	24,626.4	4,178.7
5.92	5.92	24,973.2	4,129.1
6.00	6.00	25,315.6	4,076.6
6.08	6.08	25,653.6	4,021.0
6.17	6.17	25,986.8	3,962.0
6.25	6.25	26,314.9	3,899.4
6.33	6.33	26,637.7	3,833.0
6.42	6.42	26,954.7	3,762.3
6.50	6.50	27,265.7	3,687.1
6.58	6.58	27,570.2	3,606.7
6.67	6.67	27,867.8	3,520.6
6.75	6.75	28,157.9	3,428.1
6.83	6.83	28,440.0	3,328.1
6.92	6.92	28,713.4	3,219.4
7.00	7.00	28,977.4	3,100.2
7.08	7.08	29,230.8	2,968.0
7.17	7.17	29,472.7	2,818.9
7.25	7.25	29,703.1	2,646.6
7.33	7.33	29,913.9	2,438.4
7.42	7.42	30,106.8	2,162.2
7.50	7.50	30,268.7	1,482.4



**U.G. DETENTION BASIN CALCULATIONS: AREA 4**

**BASIN 4 DESIGNED TO INFILTRATE FIRST FLUSH VOLUME**

Ac = 3.28  
 C = 0.72  
 Q<sub>10</sub> = 0.493 cfs (0.15 cfs/Ac)  
 Q<sub>100</sub> = Q<sub>10</sub> / (Ac \* C) = 12.865 ft<sup>3</sup>/Ac Imp.  
 T<sub>100</sub> = 45 + sqrt(15845/Q<sub>10</sub>) = 262.68 min  
 V<sub>100</sub> = (17649 \* T<sub>100</sub>) / (1745) - 40 \* Q<sub>10</sub> \* T<sub>100</sub> = 12,865 ft<sup>3</sup>/Ac Imp.  
 V<sub>100</sub> = V<sub>s</sub> \* Ac \* C = 30,229 ft<sup>3</sup>

**UG BASIN**  
 See Basin Pipe Dia = 90 in  
 Pipe Storage Volume = 25,469 ft<sup>3</sup>  
 Backfill Storage Volume = 4,799 ft<sup>3</sup>  
 Total Storage Provided = 30,268 ft<sup>3</sup>  
 Basin Invert = 781.50 ft  
 Z - 100 = 788.98 ft

**DETERMINE VOLUME REQUIRED - FIRST FLUSH**

Infiltrate First Flush Area = 3.28 Ac  
 V<sub>100</sub> = 1815 \* Ac \* C = 4,260 ft<sup>3</sup>  
 Q<sub>100</sub> = V<sub>100</sub> / 86400 = (4,260 ft<sup>3</sup>) / (86400) = 0.05 cfs

**UG BASIN FOOTPRINT AREA = 5611 sq. ft**  
 DESIGN INFILTRATION RATE = 1 in/hr (REF: SME SOIL REPORT DATE 08/04/2022)  
 OR = 0.08 ft/hr

**INFILTRATION FLOW RATE = 467.58 ft<sup>3</sup>/hr**

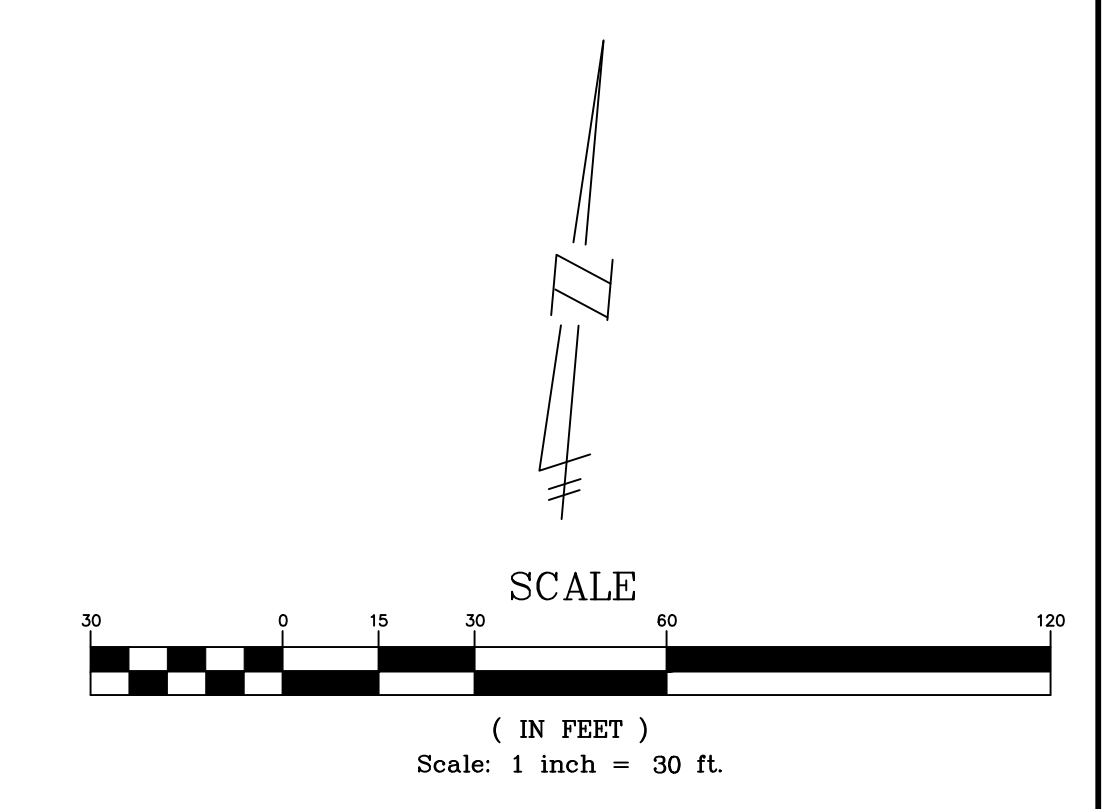
**TIME TO INFILTRATE THE FIRST FLUSH VOLUME = 9.11 hrs**

**DETERMINE BANK FULL FLOOD STORAGE VOLUME**

V<sub>100</sub> = 5160 \* Ac \* C = 12124.61 ft<sup>3</sup>  
 V<sub>10</sub> = 12,125 ft<sup>3</sup>  
 Basin Invert = 781.50 ft  
 Z - bf = 784.61 ft

**ADJUSTED BANK FULL FLOOD STORAGE VOLUME**

V<sub>100</sub> = V<sub>100</sub> - V<sub>10</sub> = 7864.86 ft<sup>3</sup>



**LEGEND**

EXISTING	PROPOSED	DESCRIPTION
[Symbol]	[Symbol]	PAVEMENT (ASPHALT)
[Symbol]	[Symbol]	SIDE WALK (CONCRETE)
[Symbol]	[Symbol]	CONCRETE CURB AND GUTTER
[Symbol]	[Symbol]	WATER MAIN
[Symbol]	[Symbol]	STORM SEWER
[Symbol]	[Symbol]	SANITARY SEWER
[Symbol]	[Symbol]	UNDERDRAIN
[Symbol]	[Symbol]	LANDSCAPE DRAIN
[Symbol]	[Symbol]	MANHOLE
[Symbol]	[Symbol]	CATCH BASIN W/SED CATCH
[Symbol]	[Symbol]	CURB INLET W/SILT SAC
[Symbol]	[Symbol]	END SECTION
[Symbol]	[Symbol]	GATE VALVE
[Symbol]	[Symbol]	HYDRANT
[Symbol]	[Symbol]	OVERHEAD ELECTRICAL LINES
[Symbol]	[Symbol]	FLOOD PLAIN
[Symbol]	[Symbol]	CONTOURS
[Symbol]	[Symbol]	SPOT ELEVATION
[Symbol]	[Symbol]	SURFACE DRAINAGE
[Symbol]	[Symbol]	OVERFLOW ROUTE
[Symbol]	[Symbol]	TREE FENCE
[Symbol]	[Symbol]	SILT FENCE
[Symbol]	[Symbol]	PROPOSED DRIVEWAY LOCATION
[Symbol]	[Symbol]	CROSSING NUMBER

**THE DOWNS**  
 SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
 WAYNE COUNTY, MICHIGAN

**REVISIONS**

NO.	ITEM	DATE
1.	100% SCHEMATIC DESIGN	06-10-2022
2.	50% DESIGN DEVELOPMENT	09-03-2022
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

**UTILITY WARNING**  
 UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

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

DATE: 04-25-23 DESIGNED BY: S.M. JOB NUMBER: 21-001  
 CHECKED BY: P.E. FILE: 21001-SWM-RPW.DWG

**STORM WATER MANAGEMENT PLAN - BASIN 4**

**SEIBER KEAST LEHNER**  
 ENGINEERING | SURVEYING  
 39205 COUNTRY CLUB DRIVE, SUITE C8  
 FARMINGTON HILLS, MI 48331  
 PHONE: 248.308.3331

**SHEET 32**



STUB INFORMATION		
PIECE	STUB INVERT	SYSTEM INVERT
15'0" STUB D2	785.65	781.50
15'0" STUB E2	781.50	781.50

RISER INFORMATION		
PIECE	RIM ELEV.	SYSTEM INVERT
30"0" RISER D1	793.0	781.50
30"0" RISER E3	791.6	781.50
6"0" RISER F3	791.9	781.50
6"0" RISER G3	792.1	781.50
6"0" RISER H3	792.2	781.50
6"0" RISER J3	792.4	781.50
6"0" RISER K3	792.6	781.50

**ASSEMBLY SCALE: 1" = 20'**  
**STRUCTURAL BACKFILL STORAGE: 4,799 CF**  
**TOTAL STORAGE PROVIDED: 30,268 CF**  
**LOADING: H20**  
**PIPE INV. = 781.50'S**

**CONTECH ENGINEERED SOLUTIONS LLC**  
 9100 Center Pointe Dr., Suite 400, West Chester, OH 45380  
 937-338-1122 937-340-7500 937-340-7697 FAX  
 www.conteches.com

**CONTECH CMP DETENTION SYSTEMS**  
 PROPOSAL

**90° PERFORATED UNDERGROUND RETENTION SYSTEM - 67778-030**  
**THE DOWNS**  
**DETROIT, MI**  
**SITE DESIGNATION: DET 4**

MARK	DATE	REVISION DESCRIPTION	BY
P1			

**TYPICAL SECTION VIEW NOT TO SCALE**

**TYPICAL MANWAY DETAIL NOT TO SCALE**

**PERFORATION DETAIL NOT TO SCALE**

**TYPICAL BACKFILL DETAIL NOT TO SCALE**

**BACKFILL REQUIREMENTS FOLLOW THE GUIDELINES OF AASHTO LRFD BRIDGE DESIGN (SEC 12) AND CONSTRUCTION (SEC 26)**

- MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTING OF HAUNCH MATERIALS UNDER THE PIPE. THE MINIMUM TRENCH WIDTH (12.6.5.1) PIPE ≤ 12" D + 16" PIPE > 12" D + 12"
- MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE (12.6.5.2): PIPE ≤ 24" D: 3.0 PIPE > 24" D + 4" D: 4.0 PIPE > 144" D + 10"
- THE FOUNDATION UNDER THE PIPE AND SIDE BACKFILL SHALL BE ADEQUATE TO SUPPORT THE LOADS ACTING UPON IT (26.5.2).
- BEDDING MATERIAL SHALL BE A RELATIVELY LOOSE GRANULAR MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE AND A MINIMUM OF TWICE THE CORROGATION DEPTH IN THICKNESS, WITH THE MAXIMUM PARTICLE SIZE OF ONE-HALF OF THE CORROGATION DEPTH (26.5.3, 26.5.3).
- PERFORATED CORRUGATED STEEL PIPE (CSP / IFL-COR).
- HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION (26.5.4).
- INITIAL BACKFILL FOR PIPE EMBEDMENT TO BE FREE DRAINING ANGULAR WASHED STONE 1/2" - 3/4" PARTICLE SIZE (WITH NO FINES AND NO CRUSHED CONCRETES) SUCH AS MOTD 66A, 6A, MOTD 55 OR APPROVED EQUIV. COMPACTED TO 90% STANDARD PROCTOR (T 99). ALL LIFTS PLACED IN A CONTROLLED MANNER. IT IS RECOMMENDED THAT LIFTS NOT EXCEED AN 8" UNCOMPACTED LIFT HEIGHT TO PREVENT UNEVEN LOADINGS, AND THE LESSER OF 1/3 THE DIAMETER OR 24" AS THE MAXIMUM DIFFERENTIAL SIDE-TO-SIDE (26.5.4).
- INITIAL BACKFILL ABOVE PIPE MAY INCLUDE ROAD BASE MATERIAL (AND RIGID PAVEMENT IF APPLICABLE). SEE TABLE ABOVE.
- TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT (12.6.6.3).
- FINAL BACKFILL MATERIAL, SECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD (26.4.4.1).

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**CONTECH CMP DETENTION SYSTEMS**  
 PROPOSAL

**90° PERFORATED UNDERGROUND RETENTION SYSTEM - 67778-030**  
**THE DOWNS**  
**DETROIT, MI**  
**SITE DESIGNATION: DET 4**

MARK	DATE	REVISION DESCRIPTION	BY
P2			

**CONNECTION DETAIL 7 1/2" TECHO SHOWN - MAY VARY**

**CONNECTION DETAIL (SBSBS)**

**PLAIN END CMP RISER PIPE**

**2 2/3"x1/2" RE-ROLLED END HEL-COR PIPE**

**12" RISER BAND DETAIL NOT TO SCALE**

**H-12 HUGGER BAND DETAIL NOT TO SCALE**

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**CONTECH CMP DETENTION SYSTEMS**  
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**90° PERFORATED UNDERGROUND RETENTION SYSTEM - 67778-030**  
**THE DOWNS**  
**DETROIT, MI**  
**SITE DESIGNATION: DET 4**

MARK	DATE	REVISION DESCRIPTION	BY
P3			

**CONSTRUCTION LOADING DIAGRAM NOT TO SCALE**

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-30	50-75	75-110	110-150
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

**CONSTRUCTION LOADING DIAGRAM NOT TO SCALE**

**MATERIAL SPECIFICATION NOT TO SCALE**

**MANHOLE CAP DETAIL NOT TO SCALE**

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**CONTECH CMP DETENTION SYSTEMS**  
 PROPOSAL

**90° PERFORATED UNDERGROUND RETENTION SYSTEM - 67778-030**  
**THE DOWNS**  
**DETROIT, MI**  
**SITE DESIGNATION: DET 4**

MARK	DATE	REVISION DESCRIPTION	BY
P4			

**THE DOWNS**  
**SECTION 3, T1S, R8E, CITY OF NORTHVILLE**  
**WAYNE COUNTY, MICHIGAN**

REVISIONS			UTILITY WARNING
NO.	ITEM	DATE	
1.	100% SCHEMATIC DESIGN	06-10-2022	UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.
2.	50% DESIGN DEVELOPMENT	02-03-2023	
3.	FINAL SITE PLAN	04-14-2023	
4.	REV PER CITY REVIEW	09-08-2023	

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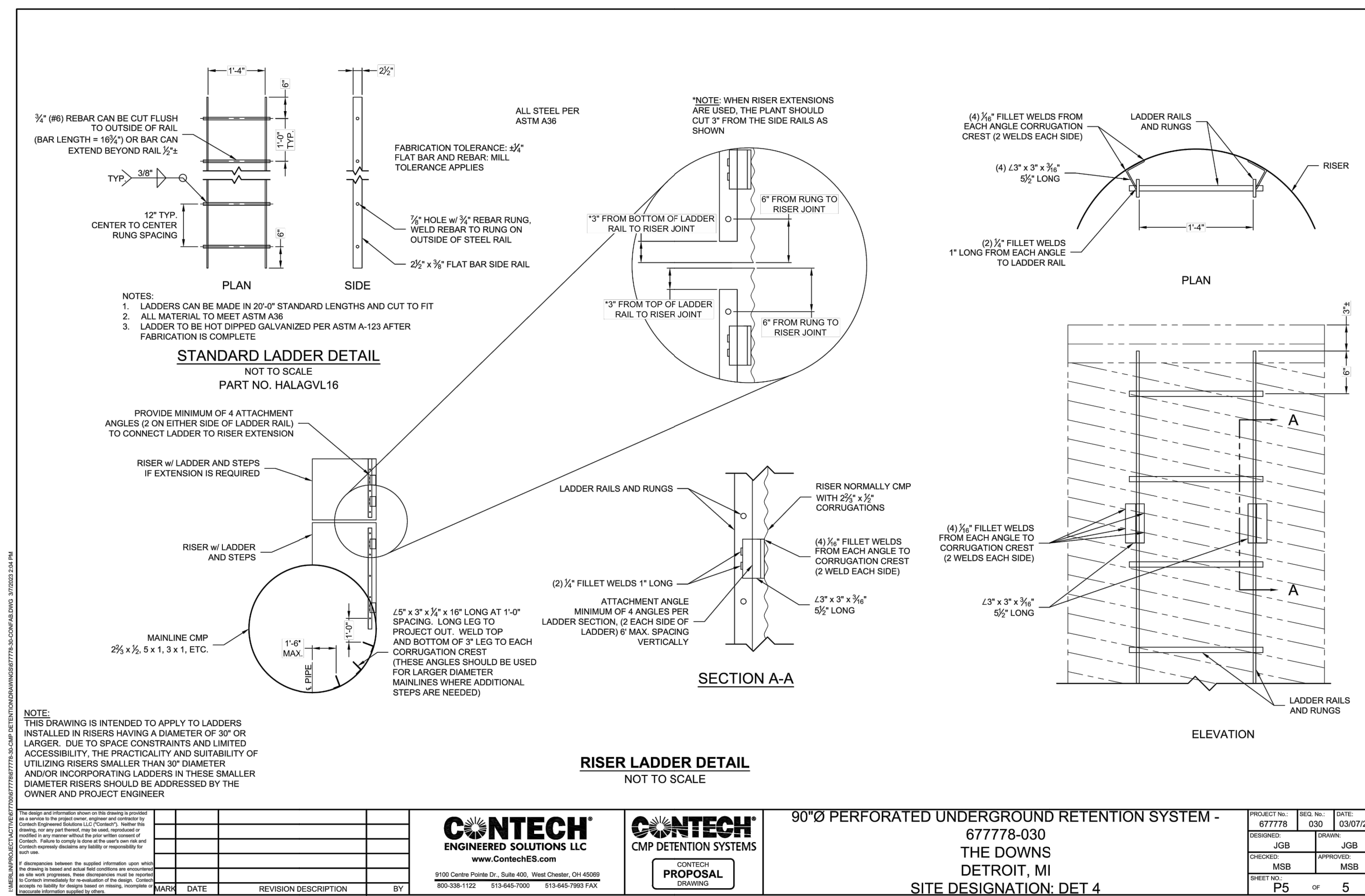
DESIGNED BY: S.M. JOB NUMBER: 21-001  
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 DATE: 04-25-23

**UNDERGROUND DETENTION DETAILS-BASIN 4**

**SEIBER KEAST LEHNER**  
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 PHONE: 248.308.3331

**SHEET 33**





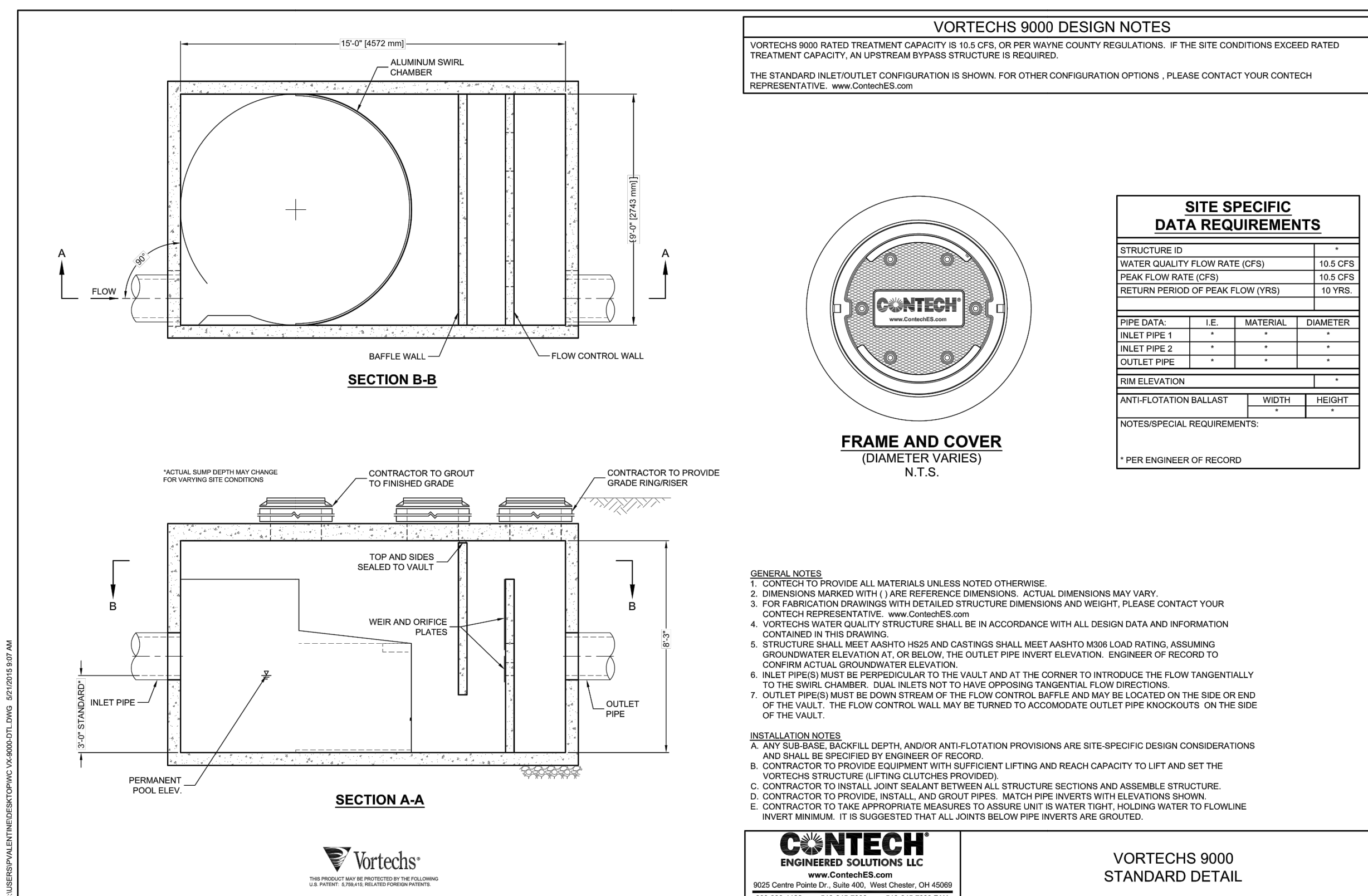
Project: The Downs  
Location: Northville, MI



Wayne County  
Manufactured Treatment Device Sizing Calculation

Area 4	9.66
10-year flowrate (cfs)	VX-9000
Recommended Model	

Vortechs™ Model	Peak Flow (cfs)
1000	1.2
2000	2.1
3000	3.4
4000	4.5
5000	6.4
7000	8.3
9000	10.5
11000	13.1
16000	18.8



2/1/2023

**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	ISSUE SCHEMATIC DESIGN	06-10-2022
2.	SOB DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

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

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF AND/OR RELOCATION OF ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION.

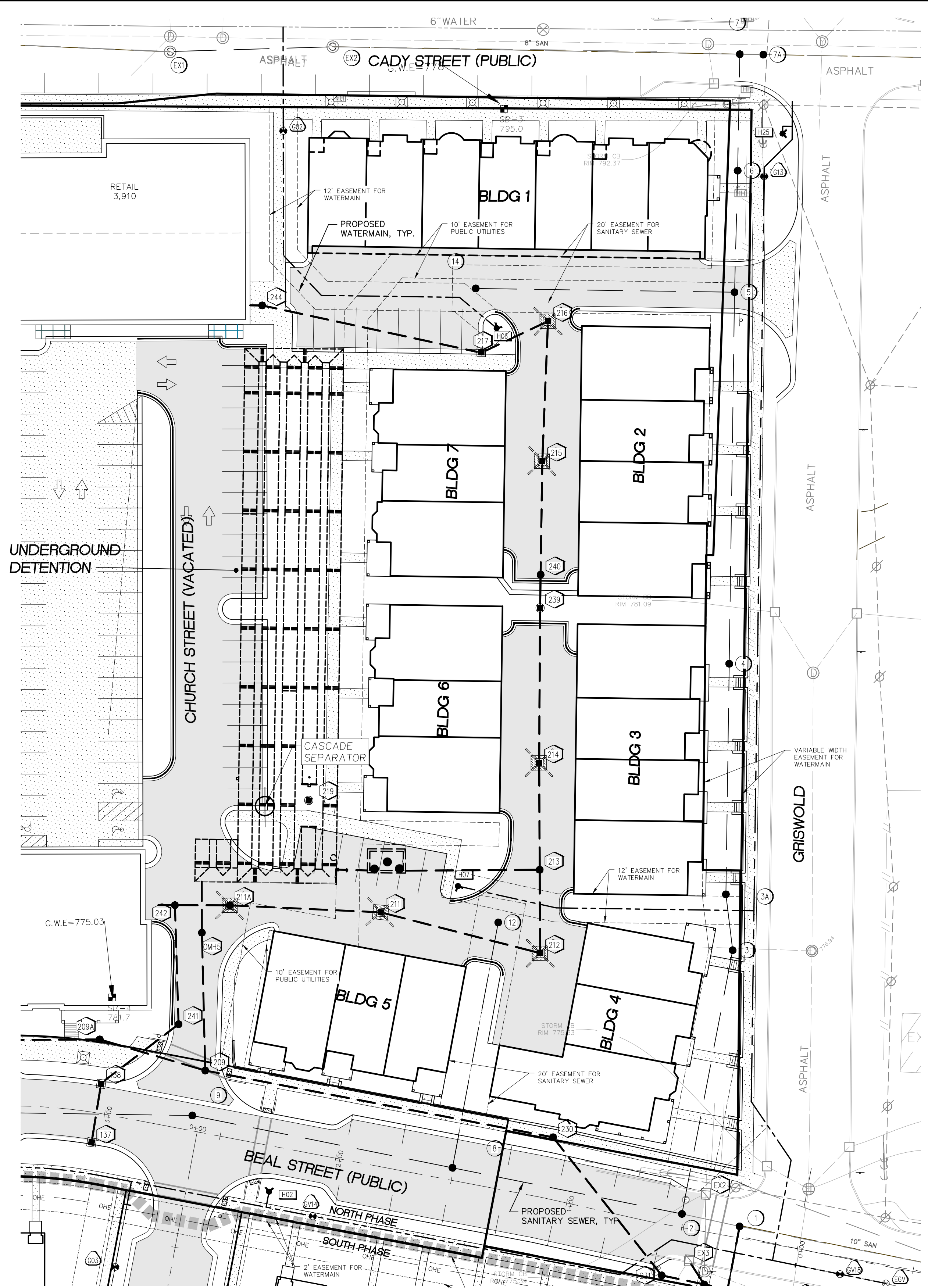
DATE: 04-25-22 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: E.E. FILE: 21001-SRM-FSD-DWG

**UNDERGROUND DETENTION  
DETAILS-BASIN 4**

**SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

SHEET  
34





UNDER GROUND BASIN 5 Land Use Summary		
Characteristic	Existing Conditions	Proposed Conditions
Total Development Area (ac)	3.81	3.81
Impervious Area (ac)	1.86	3.12
Total Pervious Area (ac)	1.95	0.69
Pervious Area Breakdown by Cover Type		
Meadow/fallow/natural areas (non-cultivated)	0.47	N/A
Predominant NRCS Soil Type (A, B, C, or D)	Type A	N/A
Improved areas (turf grass, landscape, rpw crops)	0.18	0.69
Predominant NRCS Soil Type (A, B, C, or D)	N/A	Type A
Wooded Areas	0.23	N/A
Predominant NRCS Soil Type (A, B, C, or D)	Type A	N/A
Calculated BANK FULL Volume (cubic feet)	15924	
BANKFULL Volume Provided (cubic feet)	15924	

**DETENTION BASIN CALCULATIONS: AREA 5**

Ac = 3.81 Ac Area 5  
 C = 0.81  
 Q<sub>in</sub> = 0.57 cfs (0.15 cfs/Ac)  
 Q<sub>in</sub> = Q<sub>in</sub> / (Ac \* C) = 0.19 (cfs/Ac Imp.)  
 T<sub>100</sub> = -45 + sqrt(19845/Q<sub>in</sub>) = 282.36 min  
 V<sub>S100</sub> = (17649 \* T) / (T + 45) - 40 \* Q<sub>in</sub> \* T<sub>100</sub> = 13,131 ft<sup>3</sup>/Ac Imp.  
 V<sub>T100</sub> = V<sub>S</sub> \* Ac \* C = 40,525 ft<sup>3</sup>

**UG BASIN**  
 See Basin Detail Sheets Pipe Dia = 72 in  
 Pipe Storage Volume = 33,449 ft<sup>3</sup>  
 Backfill Storage Volume = 7,179 ft<sup>3</sup>  
 Total Storage Provided = 40,628 ft<sup>3</sup>  
 Basin Invert = 774.00 ft  
 Z-100 = 779.97 ft

**DETERMINE BANK FULL FLOOD STORAGE VOLUME**  
 V<sub>bf</sub> = 5160 \* Ac \* C = 15924.28 ft<sup>3</sup>  
 V<sub>bf</sub> = 15924 ft<sup>3</sup>  
 Basin invert = 774.00 ft  
 Z-bf = 776.45 ft

**OUTLET DESIGN**

**BANK FULL FLOOD FLOW RESTRICTOR ORIFICE SIZING**  
 Average Discharge Rate (Q<sub>avg</sub>) = 0.111 cubic feet per second  
 Average Head (h<sub>avg</sub>) = 1.25 inches  
 Bank Full Flood Orifice Area (A) = 0.0001 square feet  
 Bank Full Flood Orifice Diameter (d) = 1.25 inches

**100-YEAR FLOOD CONTROL ORIFICE SIZING**  
 Maximum Head on SF Orifice = 5.67 ft  
 100-yr Flow through Bank Full Orifice = 0.207 cubic feet per second  
 100 year Head above BF (Head on 100-yr Orifice) = 3.53 ft  
 Remaining flow through 100 yr Orifice = 0.16 cubic feet per second

**FLOOD CONTROL ORIFICE AREA (A)**  
 A = 0.009 square feet  
 Flood Control Orifice Diameter (d) = 1.125 inches  
 The actual maximum release rate through the orifice for the assumed condition is = 0.16 cubic feet per second

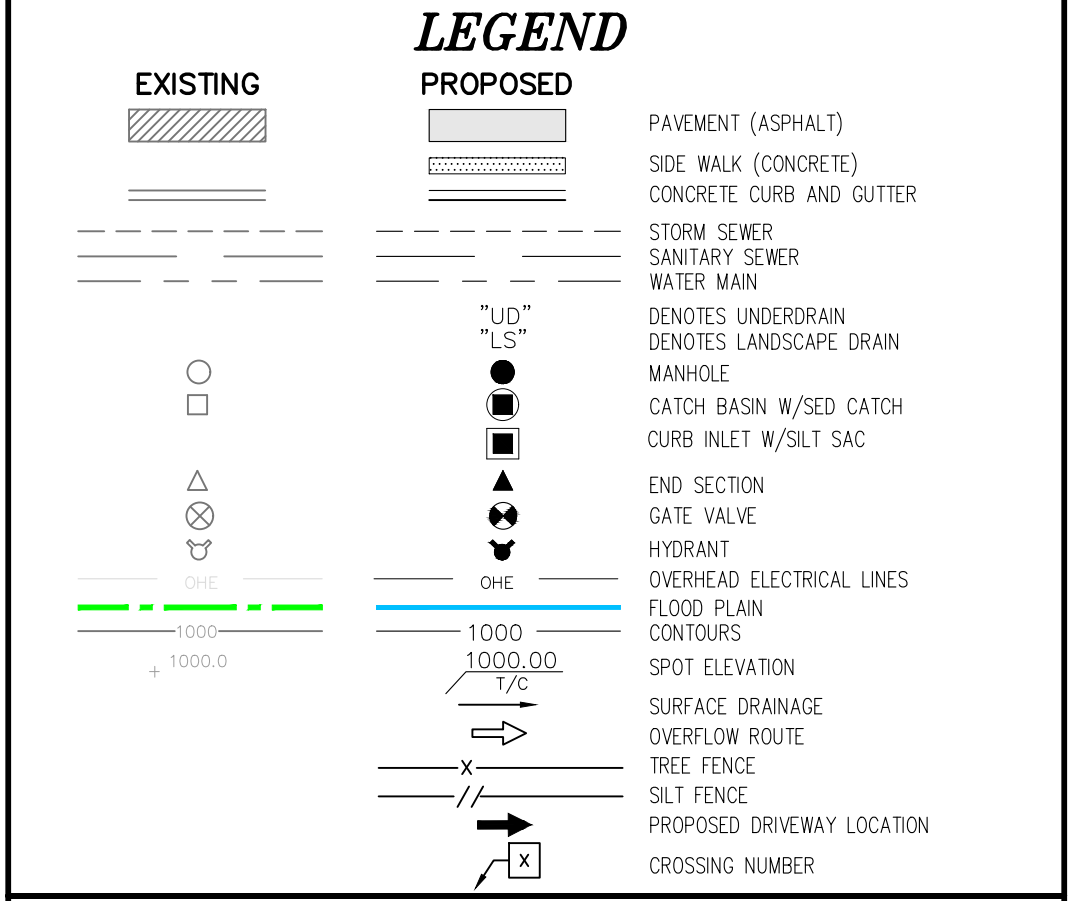
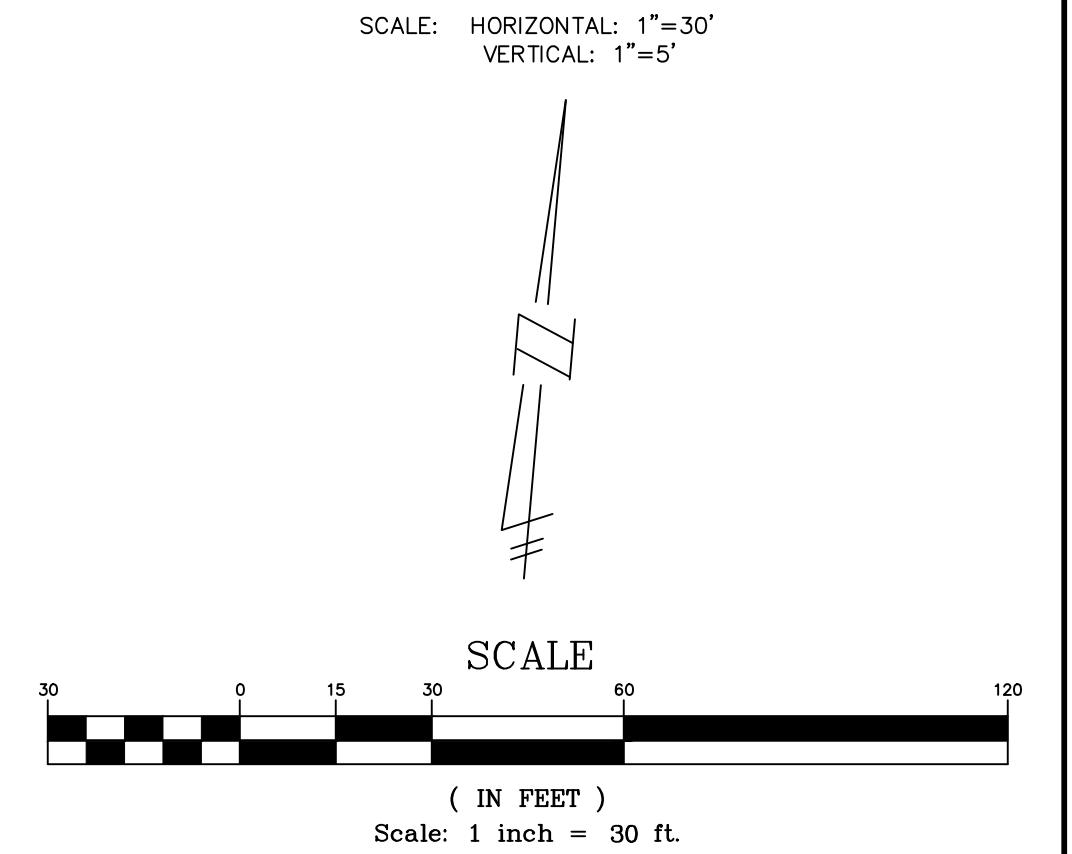
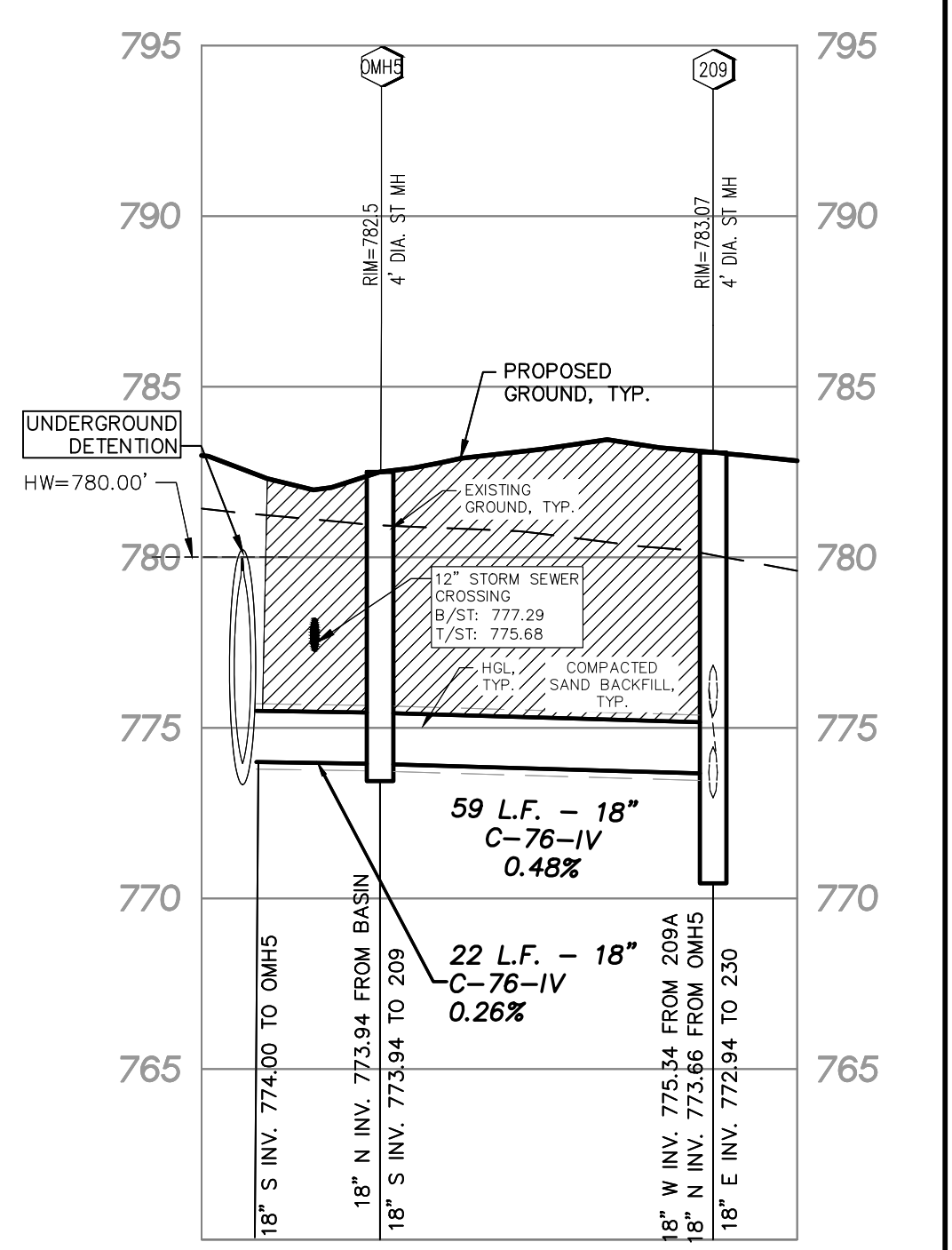
**SIZE OVERFLOW/OUTLET PIPE**  
 Size of all flows into basin (100 yr) = 32.20 cfs  
 Time to fill the basin = 16.81 min  
 Size of pipe = 18 inch  
 Area of pipe = 2.23 sq ft  
 Invert of pipe = 774.00 ft  
 Spring line of pipe = 778.75 ft  
 Invert of outlet = 774.00 ft  
 Spring line of outlet = 778.75 ft  
 Minimum slope = 0.23 %  
 Outlet velocity = 2.97 fps



**Pipe Information:** 8/31/2023  
 Diameter: 72 inches  
 Out-to-out length: 227 feet  
 Out-to-out width: 60 feet  
 Pipe Spacing: 3 feet  
 Number of Manifolds: 2 each  
 Number of Barrels: 7 each  
 Desired increment for calcs: 1 in  
 System Invert: 774

Depth (ft)	Elevation (ft)	Cumulative Storage (cft)	Average Surface Area (sq ft)
0.00	774.00	0.00	3549.50
0.08	774.08	285.30	4795.50
0.17	774.17	627.20	5299.20
0.25	774.25	1005.20	5677.10
0.33	774.33	1411.70	5986.30
0.42	774.42	1847.20	6236.10
0.50	774.50	2312.20	6432.20
0.58	774.58	2763.60	6583.80
0.67	774.67	3250.50	6695.50
0.75	774.75	3752.50	6763.70
0.83	774.83	4268.60	6793.60
0.92	774.92	4797.60	6793.00
1.00	775.00	5338.40	6761.40
1.08	775.08	5890.30	6704.30
1.17	775.17	6452.40	6617.30
1.25	775.25	7024.10	6500.10
1.33	775.33	7604.00	6353.90
1.42	775.42	8191.30	6179.30
1.50	775.50	8785.20	5978.50
1.58	775.58	9385.20	5753.00
1.67	775.67	9991.00	5505.00
1.75	775.75	10603.00	5236.00
1.83	775.83	11221.40	4947.00
1.92	775.92	11855.80	4639.00
2.00	776.00	12506.40	4313.00
2.08	776.08	13173.60	3970.00
2.17	776.17	13857.80	3611.00
2.25	776.25	14559.40	3237.00
2.33	776.33	15278.00	2849.00
2.42	776.42	16014.10	2448.00
2.50	776.50	16768.30	2034.00
2.58	776.58	17540.10	1607.00
2.67	776.67	18329.90	1167.00
2.75	776.75	19138.30	714.00
2.83	776.83	19955.80	247.00
2.92	776.92	20793.00	-187.00
3.00	777.00	21650.00	-573.00
3.08	777.08	22527.20	-1011.00
3.17	777.17	23425.00	-1491.00
3.25	777.25	24343.80	-2013.00
3.33	777.33	25283.00	-2577.00
3.42	777.42	26243.00	-3183.00
3.50	777.50	27224.00	-3831.00
3.58	777.58	28226.00	-4521.00
3.67	777.67	29249.00	-5253.00
3.75	777.75	30293.00	-6027.00
3.83	777.83	31358.00	-6843.00
3.92	777.92	32444.00	-7701.00
4.00	778.00	33551.00	-8601.00
4.08	778.08	34679.00	-9543.00
4.17	778.17	35828.00	-10527.00
4.25	778.25	37000.00	-11553.00
4.33	778.33	38195.00	-12621.00
4.42	778.42	39414.00	-13731.00
4.50	778.50	40657.00	-14883.00
4.58	778.58	41934.00	-16077.00
4.67	778.67	43245.00	-17313.00
4.75	778.75	44590.00	-18591.00
4.83	778.83	45970.00	-19911.00
4.92	778.92	47385.00	-21273.00
5.00	779.00	48835.00	-22677.00
5.08	779.08	50320.00	-24123.00
5.17	779.17	51840.00	-25611.00
5.25	779.25	53395.00	-27141.00
5.33	779.33	54985.00	-28713.00
5.42	779.42	56610.00	-30327.00
5.50	779.50	58270.00	-31983.00
5.58	779.58	59965.00	-33681.00
5.67	779.67	61695.00	-35421.00
5.75	779.75	63460.00	-37203.00
5.83	779.83	65260.00	-39027.00
5.92	779.92	67095.00	-40893.00
6.00	780.00	68965.00	-42801.00

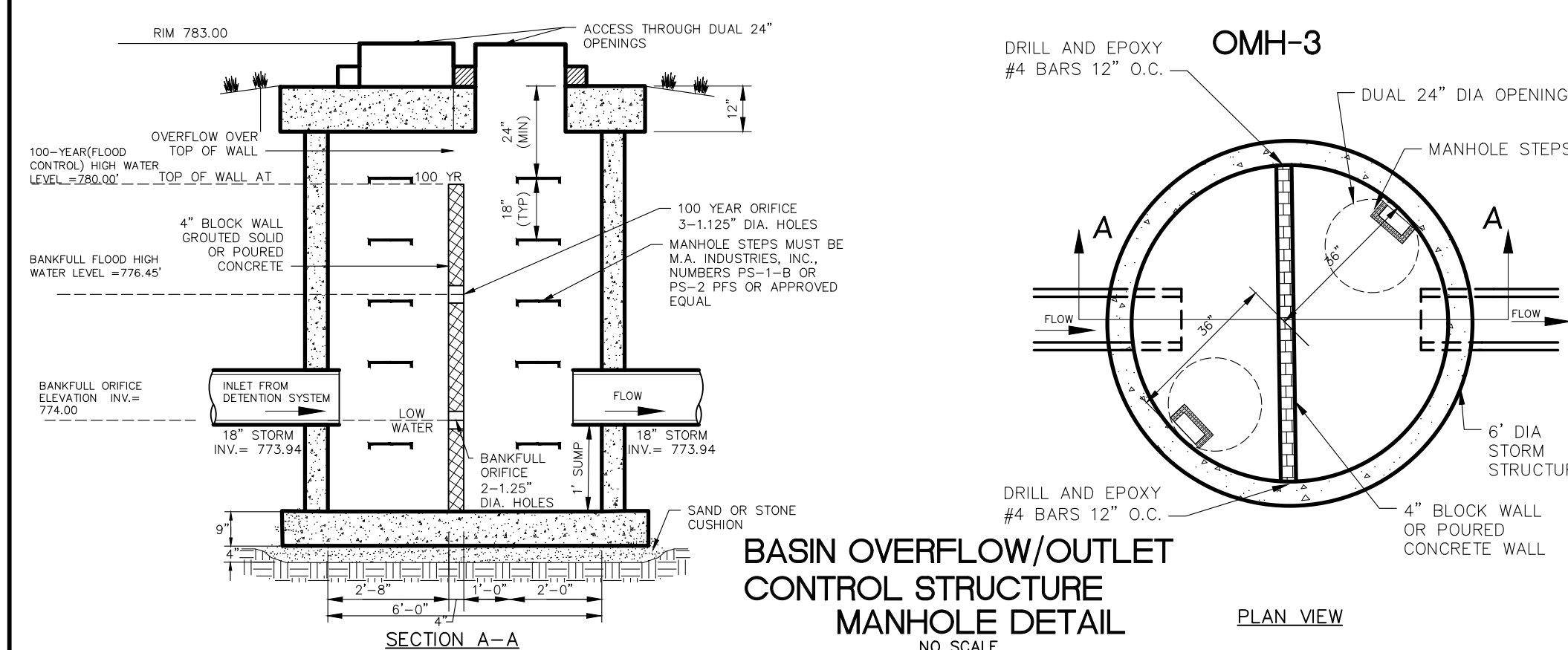
BANK FULL Volume	15924 c.f.t.
100-YR FLOOD Volume	40525 c.f.t.
Bank Full depth (ft)	Based on the interpolation the depth (ft) = 2.45
Flood Control depth (ft)	Based on the interpolation the depth (ft) = 5.97



**THE DOWNS**  
 SECTION 3, T1S, R8E, CITY OF NORTHWILLE  
 WAYNE COUNTY, MICHIGAN

NO.	ITEM	DATE
1.	100% SCHEMATIC DESIGN	06-10-2022
2.	50% DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

**STORM WATER MANAGEMENT PLAN - BASIN 5**





**STUB INFORMATION**

PIECE	STUB INVERT	SYSTEM INVERT
18" Ø STUB A1	774.00	774.00
18" Ø STUB C1	774.00	774.00
12" Ø STUB H2	779.00	774.00

**RISER INFORMATION**

PIECE	RIM ELEV.	SYSTEM INVERT
6" Ø RISER F1	796.90	774.00
6" Ø RISER G1	790.34	774.00
6" Ø RISER H1	783.19	774.00
30" Ø RISER J1	782.13	774.00
30" Ø RISER M2	783.01	774.00

**ASSEMBLY**  
SCALE: 1" = 20'  
STRUCTURAL BACKFILL STORAGE: 7,179 CF  
TOTAL STORAGE PROVIDED: 40,628 CF  
LOADING: H20  
PIPE INV. = 774.00±

**NOTES**

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE.
- ALL ELEVATIONS, DIMENSIONS AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD (EOR) PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A988.
- ALL RISERS AND STUBS ARE 2 2/3" x 1/2" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE AS REQUIRED, BY CONTRACTOR.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAIL PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL ACCESS CASTINGS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND ARE NOT SUPPLIED BY CONTECH.
- THIS CONTECH CMP PIPE DESIGN SUBMITTAL PACKAGE IS NOT APPLICABLE TO AND SHALL NOT BE USED BY OTHER MANUFACTURERS, AS IT IS THE PROPERTY OF CONTECH ENGINEERED SOLUTIONS LLC. FABRICATION DRAWINGS, PERFORMANCE DETAILS, MANUFACTURING PROCEDURES, AND FIELD OPERATIONS ARE SPECIFIC TO CONTECH'S CMP PRODUCT AND ARE NOT TO BE DUPLICATED.
- RISERS ARE TO BE MANUFACTURED 12" BELOW GRADE AND INTERIOR TO BE PAINTED WITH ZINC RICH PAINT UNLESS OTHERWISE NOTED.
- DUE TO SALTING AGENTS FOR SNOW AND ICE REMOVAL, ALL CMP WILL BE REQUIRED TO HAVE PE LAYER AND/OR GEOMEMBRANE AS INDICATED ON SHEET P-2 OR C-2. THIS NOTE SUPERSEDES ANY OTHER RECOMMENDATIONS ON THIS TOPIC WITH THIS SUBMITTAL.

**CONTECH ENGINEERED SOLUTIONS LLC**  
9100 Center Pointe Dr., Suite 400, West Chester, OH 45389  
937.538.1122 937.545.7550 937.545.7603 FAX

**72" Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 677778-040**  
THE DOWNS  
DETROIT, MI  
SITE DESIGNATION: DET 5

**TYPICAL SECTION VIEW**  
NOT TO SCALE

**TYPICAL MANWAY DETAIL**  
NOT TO SCALE

**PERFORATION DETAIL**  
NOT TO SCALE

**TYPICAL BACKFILL DETAIL**  
NOT TO SCALE

**BACKFILL REQUIREMENTS FOLLOW THE GUIDELINES OF AASHTO LRFD BRIDGE DESIGN (SEC 12) AND CONSTRUCTION (SEC 26)**

- MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE.  
PIPE ≤ 12" D + 16"  
PIPE > 12" 1.5D + 12"
- MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE (12.6.2):  
PIPE ≤ 24" 3.0D  
PIPE 24" - 144" D + 4'0"  
PIPE > 144" D + 10'0"
- THE FOUNDATION UNDER THE PIPE AND SIDE BACKFILL SHALL BE ADEQUATE TO SUPPORT THE LOADS ACTING UPON IT (26.5.2).
- BEDDING MATERIAL SHALL BE A RELATIVELY LOOSE GRANULAR MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE AND A MINIMUM OF TWICE THE CORRUGATION DEPTH IN THICKNESS, WITH THE MAXIMUM PARTICLE SIZE OF ONE-HALF OF THE CORRUGATION DEPTH (26.5.1, 26.5.3).
- PERFORATED CORRUGATED STEEL PIPE (CSP / HEL-COR).
- HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION (26.5.4).
- INITIAL BACKFILL FOR PIPE EMBEDED TO BE FREE DRAINING ANGULAR WASHED STONE 1/2" - 3/4" PARTICLE SIZE WITH NO FINES AND NO CRUSHED CONCRETE SUCH AS MDOT 6A, MDOT 50 OR APPROVED EQUAL, COMPACTED TO 90% STANDARD PROCTOR (T 99). ALL LIFTS PLACED IN A CONTROLLED MANNER. IT IS RECOMMENDED THAT LIFTS NOT EXCEED AN 8" UNCOMPACTED LIFT HEIGHT TO PREVENT UNIFORM LOADING, AND THE LESSER OF 1/3 THE DIAMETER OR 24" AS THE MAXIMUM DIFFERENTIAL, SPEC TO SIZE (26.5.1, 4).
- INITIAL BACKFILL ABOVE PIPE MAY INCLUDE ROAD BASE MATERIAL (AND RIGID PAVEMENT IF APPLICABLE), SEE TABLE ABOVE.
- TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT (12.6.3).
- FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS FOR THE ENGINEER OF RECORD (26.5.4.1).

**NOTES:**

- GEOTEXTILE SHALL BE USED TO WRAP TRENCH ONLY TO PREVENT SOIL MIGRATION INTO VARYING SOIL TYPES (PROJECT ENGINEER).
- FOR MULTIPLE BARREL INSTALLATIONS THE RECOMMENDED SPACING BETWEEN PARALLEL PIPE RIMS SHALL BE PIPE DIA/2 BUT NO LESSER THAN 12" OR 30" FOR PIPE DIAMETERS 72" AND LARGER. CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING (TABLE C12.6.7-1).

**CONTECH ENGINEERED SOLUTIONS LLC**  
9100 Center Pointe Dr., Suite 400, West Chester, OH 45389  
937.538.1122 937.545.7550 937.545.7603 FAX

**72" Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 677778-040**  
THE DOWNS  
DETROIT, MI  
SITE DESIGNATION: DET 5

**PLAIN END CMP RISER PIPE**

**CONNECTION DETAIL**  
7 1/2" TECHCO BAND - MAY VARY

**ELEVATION VIEW OF CMP AND RISER**

**CONNECTION DETAIL (SBSBS)**

**2 2/3"x1/2" RE-ROLLED END HEL-COR PIPE**

**CONNECTION DETAIL (SBSBS)**

**H-12 HUGGER BAND DETAIL**  
NOT TO SCALE

**GENERAL NOTES:**

- DELIVERED BAND STYLE AND FASTENER TYPE MAY VARY BY FABRICATION PLANT.
- JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.
- BAND MATERIAL AND GAGE TO BE SAME AS RISER MATERIAL.
- IF RISER HAS A HEIGHT OF COVER OF 12" OR MORE, USE A SLIP JOINT.
- BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
  - 12" THRU 48" 3-PIECE
  - 54" THRU 96" 3-PIECE
  - 96" THRU 144" 3-PIECE
- ALL RISER JOINT COMPONENTS WILL BE FIELD ASSEMBLED.
- MANHOLE RISERS IN APPLICATIONS WHERE TRAFFIC LOADS ARE IMPOSED REQUIRE SPECIAL DESIGN CONSIDERATIONS.
- DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES.

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THE DOWNS  
DETROIT, MI  
SITE DESIGNATION: DET 5

**CONSTRUCTION LOADING DIAGRAM**  
NOT TO SCALE

**CONSTRUCTION LOADS**

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT OF COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN INCHES	AXLE LOADS (KIP)				
	19-50	50-75	75-110	110-150	MINIMUM COVER (FT)
12-42	2.0	2.5	3.0	3.0	3.0
48-72	3.0	3.0	3.5	4.0	4.0
78-120	3.0	3.5	4.0	4.0	4.0
126-144	3.5	4.0	4.5	4.5	4.5

**MANHOLE CAP DETAIL**  
NOT TO SCALE

**ACCESS CASTING NOT SUPPLIED BY CONTECH**

**PLAN VIEW**

**NOTES:**

- REINFORCED CONCRETE COLLAR SHALL BE SIZED AND DESIGNED BY ENGINEER OF RECORD SO THAT THE LOADS ARE TRANSMITTED TO THE SOIL AND NOT THE RISER.
- REINFORCED CONCRETE COLLAR SHALL BE SIZED TO PROVIDE AN ADEQUATE BOTTOM AREA BASED ON THE ALLOWABLE BEARING CAPACITY OF THE SOIL.
- THE FLEXIBLE JOINT MATERIAL (RECYCLED VINYL OR EQUIVALENT) TO BE STIFF ENOUGH SO THAT THE CONCRETE CAN NEVER ENGAGE WITH THE RISER CORRUGATIONS.

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**72" Ø PERFORATED UNDERGROUND RETENTION SYSTEM - 677778-040**  
THE DOWNS  
DETROIT, MI  
SITE DESIGNATION: DET 5

**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

**REVISIONS**

NO.	ITEM	DATE
1.	TYPE SCHEMATIC DESIGN	06-10-2022
2.	SOE DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

**UTILITY WARNING**

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

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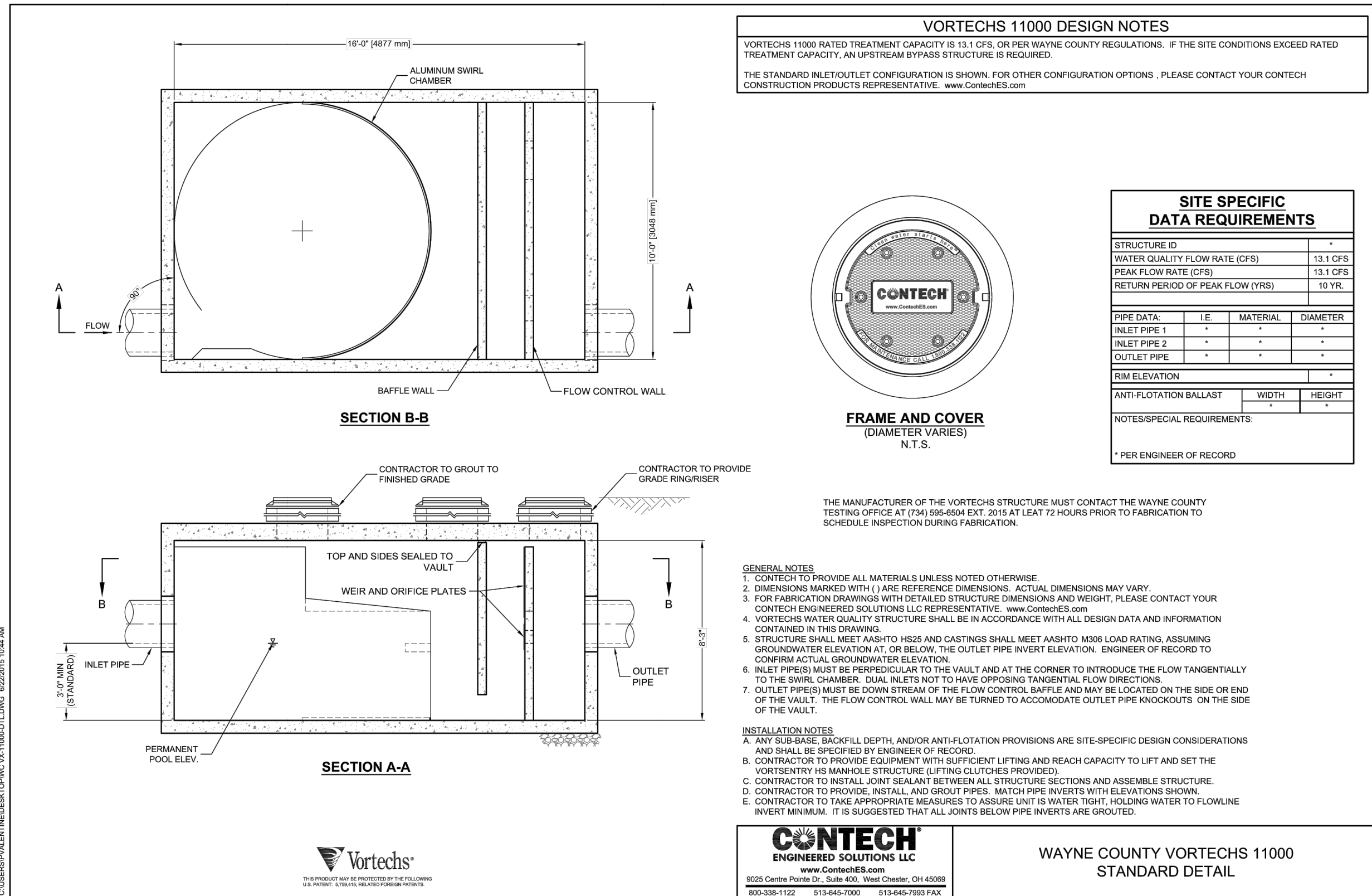
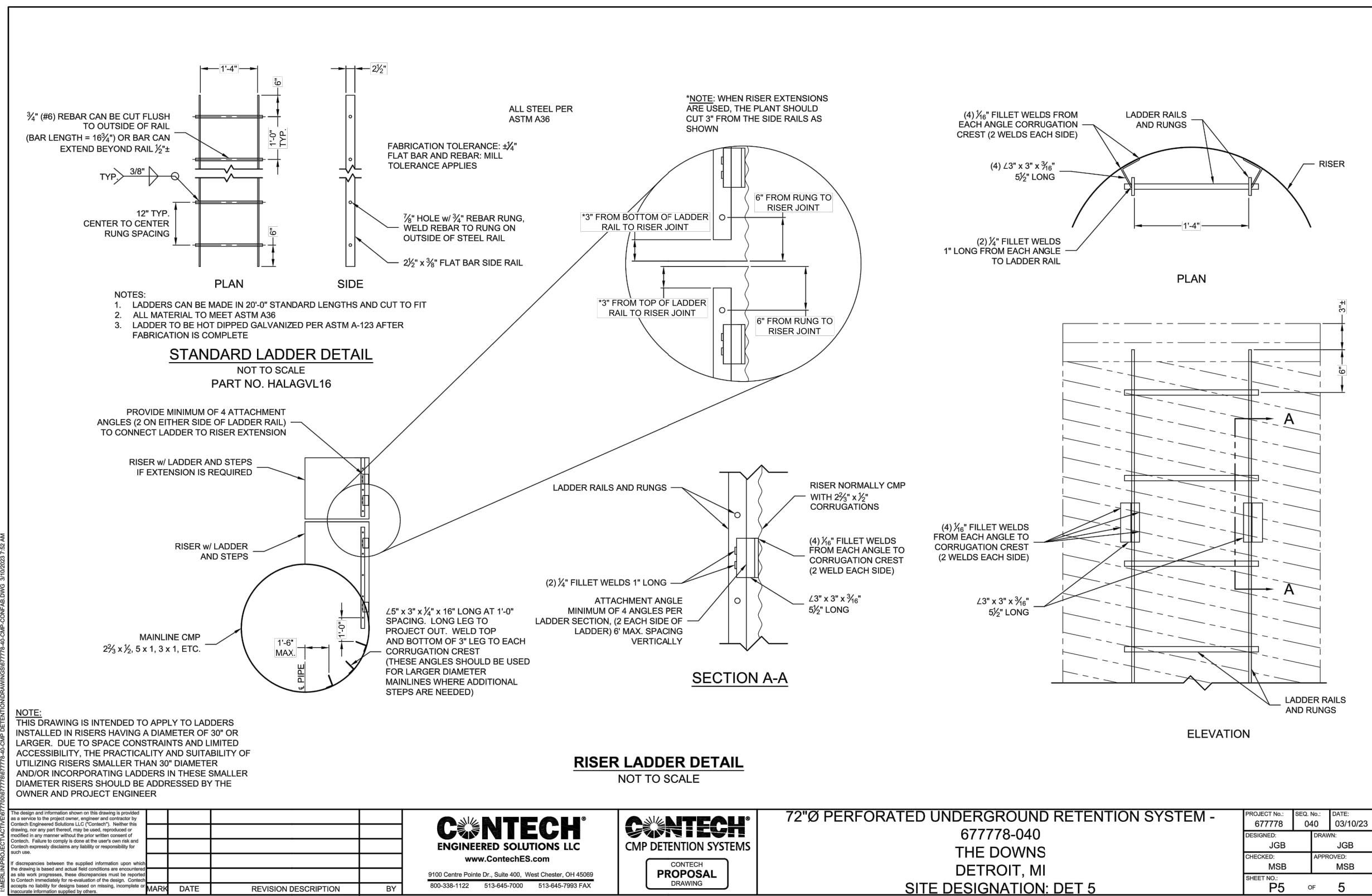
DESIGNED BY: S.M. JOB NUMBER: 21-01  
CHECKED BY: E.E. FILE: 21001-SRM-RSP.DWG

**UNDERGROUND DETENTION DETAILS-BASIN 5**

**SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

**SHEET 36**



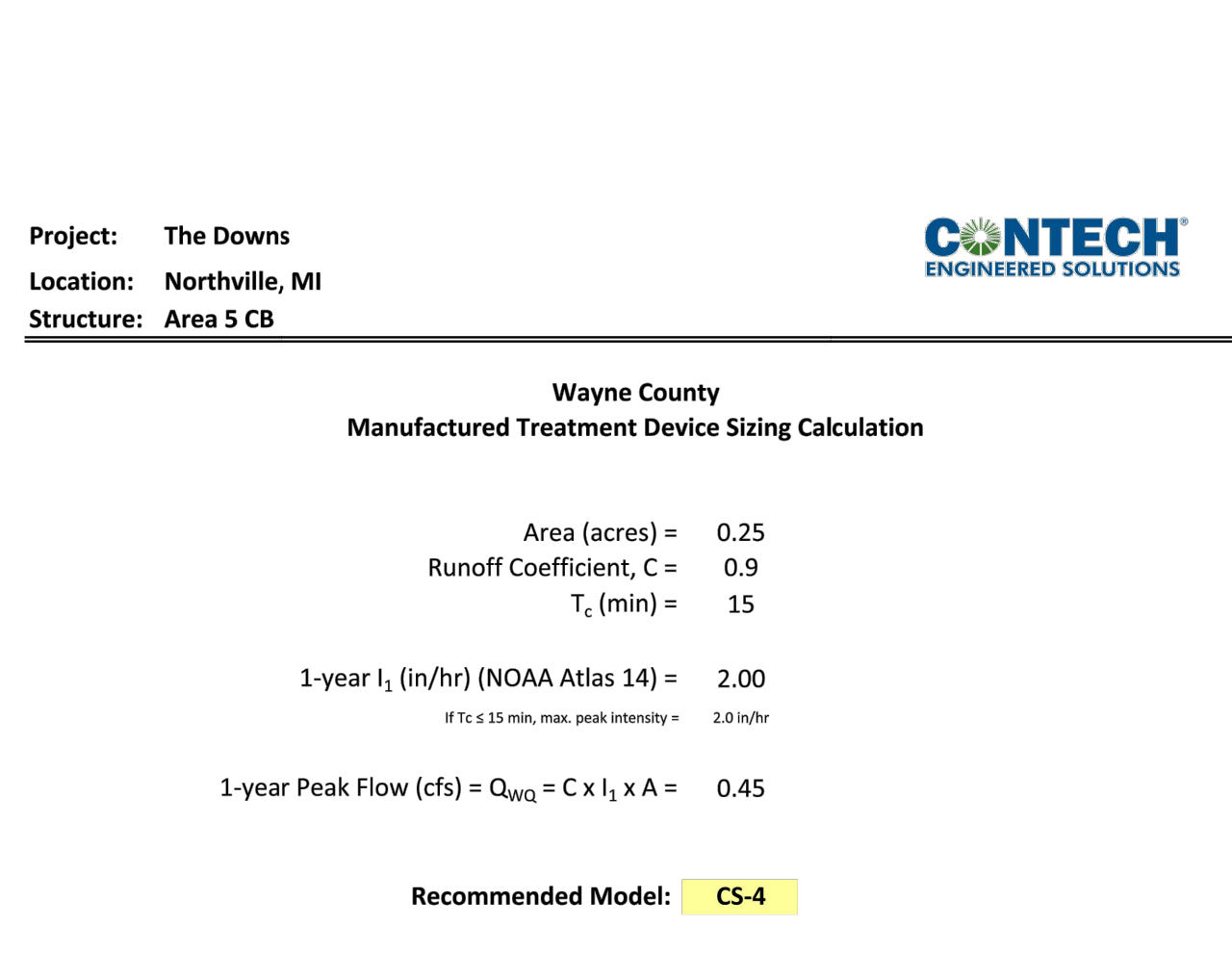
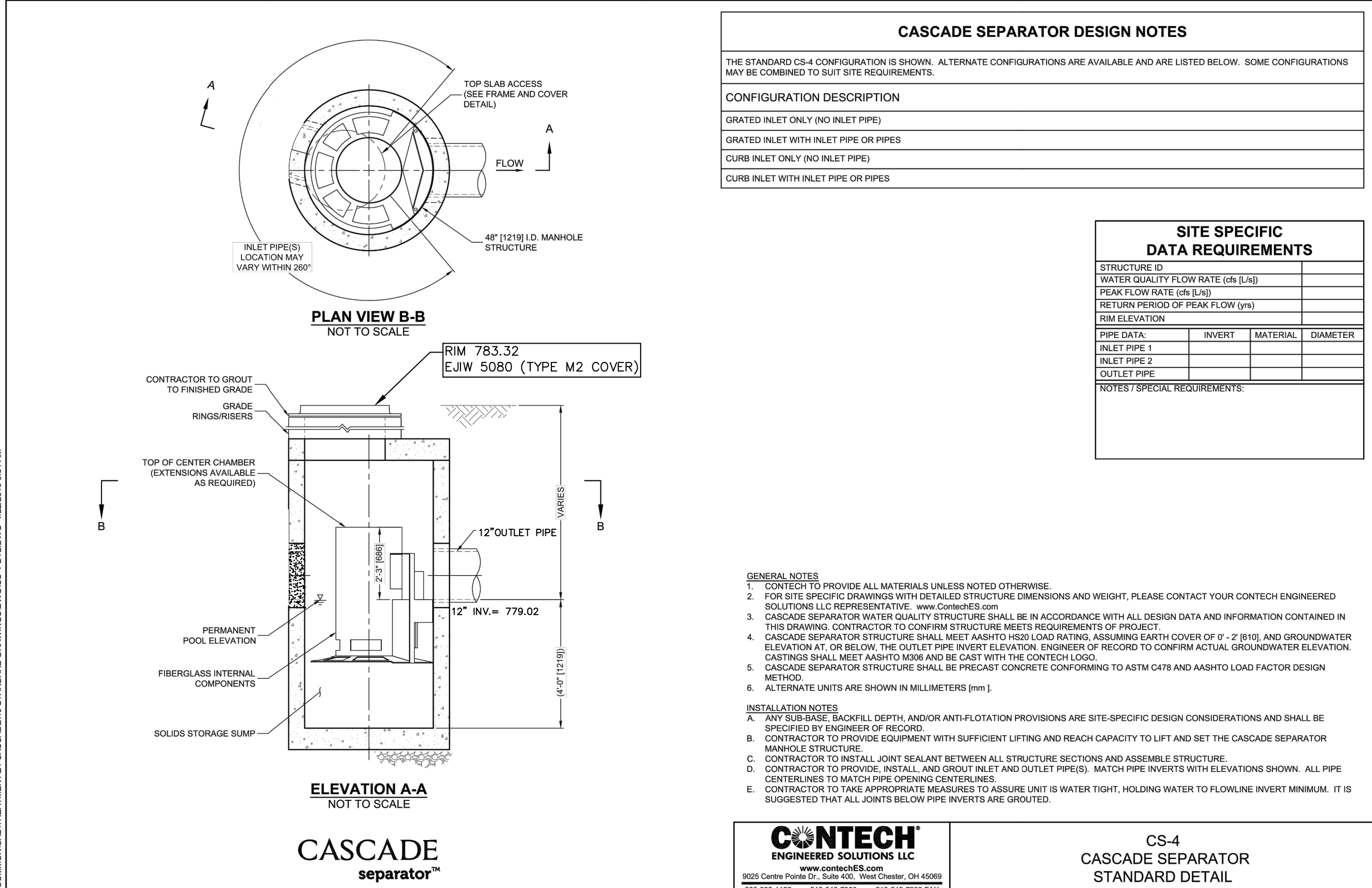


Project: The Downs  
Location: Northville, MI

Wayne County  
Manufactured Treatment Device Sizing Calculation

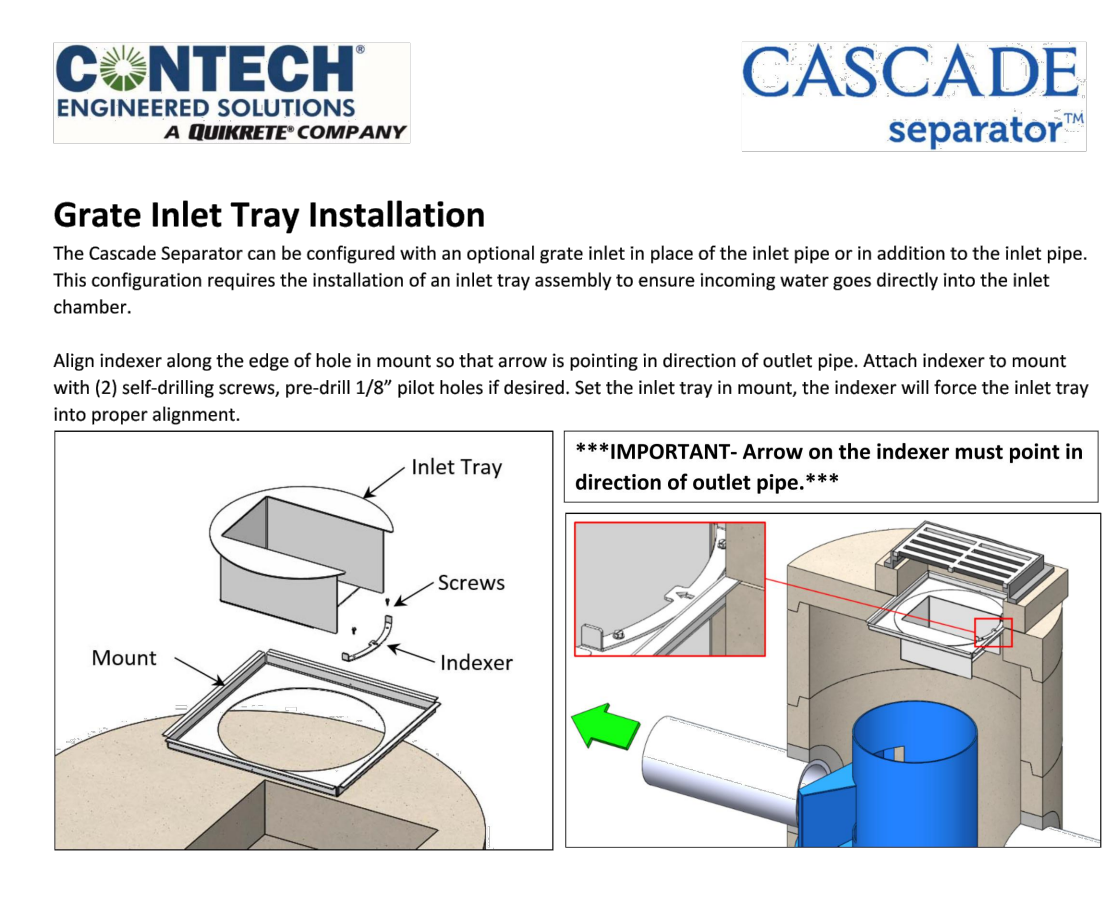
10-year flowrate (cfs)	14.67	8.18	Area 5
Recommended Model	VX-16000	VX-7000	VX-11000

Vortechs™ Model	Peak Flow (cfs)
1000	1.2
2000	2.1
3000	3.4
4000	4.5
5000	6.4
7000	8.3
9000	10.5
11000	13.1
15000	18.9



**CASCADE SEPARATOR™ MODEL SPECIFICATIONS PER NIDEP CERTIFICATION LETTER**

Model	MTR (cfs)
CS-4	1.80
CS-5	2.81
CS-6	4.05
CS-8	7.20
CS-10	11.3
CS-12	16.2



**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

**REVISIONS**

NO.	ITEM	DATE
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2.	50% DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

**UTILITY WARNING**

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**EXHIBIT B**  
**STORM WATER MANAGEMENT SYSTEM LONG-TERM MAINTENANCE PLAN**

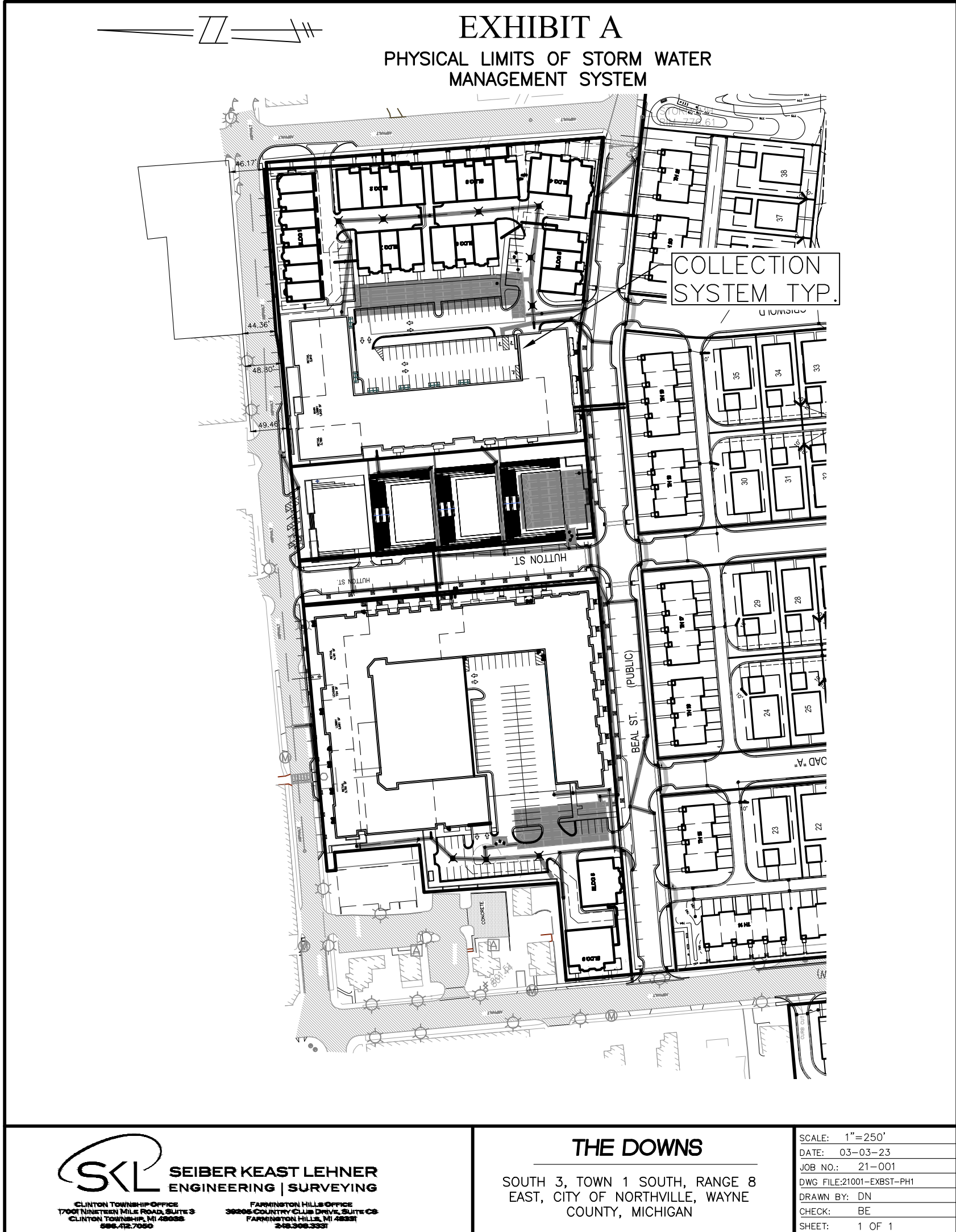
Wayne County DPS Permit No.: M-xxx  
Wayne County DPS Plan Review No.:

- A. Physical Limits of the Storm Water Management System**  
The storm water management system (SWMS) subject to this long-term maintenance plan (Plan) is depicted on Exhibit A to the permit and includes without limitation the storm sewers, catch basins, manholes, inlets, swales, buffer strip, mechanical separator, underground detention basin, outlet control structure and outlet pipe that conveys flow from the underground detention basin to the existing outlet and drains into MIDDLE ROUGE RIVER. For the purposes of this plan, this storm water management system (SWMS) and all of its components as shown in Exhibit A is referred to as "THE DOWNS".
- B. Time Frame for Long-Term Maintenance Responsibility**  
HUNTER PASTEUR, NORTHVILLE, LLC is responsible for maintaining THE DOWNS SWMS, including complying with applicable requirements of the local or Wayne County soil erosion and sedimentation control program until Wayne County releases the construction permit. Long-term maintenance responsibility for THE DOWNS SWMS commences when defined by the maintenance permit issued by the County. Long-term maintenance continues in perpetuity.
- C. Manner of Insuring Maintenance Responsibility**  
The City of Northville has assumed responsibility for long-term maintenance of THE DOWNS SWMS. The resolution, by which the City of Northville has assumed maintenance responsibility is attached to the permit as Exhibit C. HUNTER PASTEUR, NORTHVILLE, LLC, through a maintenance agreement with the City of Northville, has agreed to perform the maintenance activities required by this plan. The City of Northville retains the right to enter the property and perform the necessary maintenance of THE DOWNS SWMS. HUNTER PASTEUR, NORTHVILLE, LLC fails to perform the required maintenance activities. To ensure that THE DOWNS SWMS is maintained in proximity, the map of the physical limits of the storm water management system (Exhibit A), this plan (Exhibit B), the resolution attached as Exhibit C, and the maintenance agreement between the City of Northville and the property owner will be recorded with the Wayne County Register of Deeds. Upon recording, a copy of the recorded documents will be provided to the City and the County.
- D. Long-Term Maintenance Plan and Schedule**  
Table 1 identifies the maintenance activities to be performed, organized by category (monitoring/inspections, preventative maintenance and remedial actions). While performing maintenance, chemicals should not be applied to the underground detention basin, buffer strip, or watercourses or anywhere in the 25-foot buffer strip around surface water unless performed by a state of Michigan Licensed pesticide applicator and conducted under a valid aquatic nuisance control permit. Table 1 also identifies site-specific work needed to ensure that the storm water management system functions properly as designed.

TABLE 1 STORM WATER MANAGEMENT SYSTEM LONG-TERM MAINTENANCE SCHEDULE						
MAINTENANCE ACTIVITIES	SYSTEM COMPONENTS					FREQUENCY
	Storm Collection System (Sewers-solid waste and perforated, Swales, Catch Basins, VORTECHS Unit)	Underground Detention Basin	Outlet Control Structures & Outlet Pipe	Buffer Strip, Ripraps	Pavement Areas	
<b>Monitoring/Inspection</b>						
Inspect for Sediment Accumulation/Clogging of stones	X	X	X	X		Semi/Annually/As Needed*
Inspect For Floatables, Dead Vegetation & Debris	X	X	X	X		Annually & After Major Events
Inspect For Erosion and Integrity of System	X		X			Annually & After Major Events
Inspect All Components During Wet weather & Compare To as-Built Plans	X	X	X	X		Annually
Ensure Maintenance Access Remain Open/Clear	X	X	X	X		Annually
<b>Preventative Maintenance</b>						
Mowing	X					As Needed/per local Community Ordinance
Remove Accumulated sediments	X	X	X	X		As Needed**
Remove Floatables, Invasive & Dead Vegetation & Debris	X	X	X	X		As Needed
Replace or Wash & Reuse risers stone filters						Every 3 Years, or As Needed**
Sweeping of Paved Areas & Clean Oil Spills Immediately				X		As Needed
<b>Remedial Actions</b>						
Repair/Stabilize Areas of Erosion	X			X		As Needed
Replace Dead Plantings & Reseed Bare Areas	X					As needed
Structural Repairs	X	X	X	X		As Needed
Make Adjustments/Repairs to Ensure Proper Functioning	X	X	X	X		As Needed

**NOTES:** \* Manufactured treatment systems & underground detention basin to be cleaned according to manufacturer's recommendation; at a minimum, whenever sediment accumulates to a depth of 6-12 inches or if sediment resuspension is observed. \*\* Replace stones if they cannot be adequately cleaned.

<b>PROPERTY INFORMATION:</b> THE DOWNS E. Cady Street City of Northville, Wayne County, Michigan	<b>PROPERTY OWNER:</b> HUNTER PASTEUR, NORTHVILLE, LLC 32200 Northwestern Hwy, Suite 230, Farmington Hills, Michigan, 48334 Phone: (248) 539-5511	<b>ENGINEER:</b> Seiber Keast Lehner 39205 Country Club Dr, Suite C-8 Farmington Hills, MI 48331 Phone: (248) 308-3331	<b>DATE:</b> 02/24/2022  <b>SHEET</b> 1 OF 1
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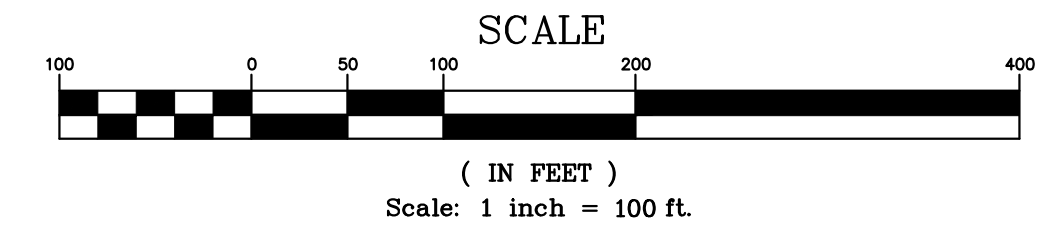


	<b>THE DOWNS</b>	SCALE: 1"=250'
	SOUTH 3, TOWN 1 SOUTH, RANGE 8 EAST, CITY OF NORTHVILLE, WAYNE COUNTY, MICHIGAN	DATE: 03-03-23 JOB NO.: 21-001 DWG. FILE: 21001-EXB2-PH1 DRAWN BY: DN CHECK: BE SHEET: 1 OF 1

<b>THE DOWNS</b> SECTION 3, T1S, R8E, CITY OF NORTHVILLE WAYNE COUNTY, MICHIGAN																
<b>REVISIONS</b>	<b>UTILITY WARNING</b>															
<table border="1"> <thead> <tr> <th>NO.</th> <th>ITEM</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>100% SCHEMATIC DESIGN</td> <td>06-10-2022</td> </tr> <tr> <td>2.</td> <td>50% DESIGN DEVELOPMENT</td> <td>02-03-2023</td> </tr> <tr> <td>3.</td> <td>FINAL SITE PLAN</td> <td>04-14-2023</td> </tr> <tr> <td>4.</td> <td>REV PER CITY REVIEW</td> <td>09-08-2023</td> </tr> </tbody> </table>	NO.	ITEM	DATE	1.	100% SCHEMATIC DESIGN	06-10-2022	2.	50% DESIGN DEVELOPMENT	02-03-2023	3.	FINAL SITE PLAN	04-14-2023	4.	REV PER CITY REVIEW	09-08-2023	<p>UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.</p> <p align="center">  Know what's below. Call before you dig.             </p> <p>THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF AND/OR RELOCATION OF ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION.</p>
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DATE: 04-25-23 DESIGNED BY: A.A. CHECKED BY: R.E.	JOB NUMBER: 21-001 DRAWING FILE: 21001-EXB2-PH1.DWG															
<b>STORM WATER MAINTENANCE EXHIBIT</b>																
	<b>SHEET</b> 38															
39205 COUNTRY CLUB DRIVE, SUITE C8 FARMINGTON HILLS, MI 48331 PHONE: 248.308.3331																

P:\21-001- THE DOWNS- HUNTER PASTEUR\21001-EXB2-PH1.DWG, 03/03/2023 10:28 AM





**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

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UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

**811** Know what's below.  
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DATE: 04-25-22 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: R.E. FILE: 21001-FLOOD PLAN-FSP-PH1-LAYO1.DWG

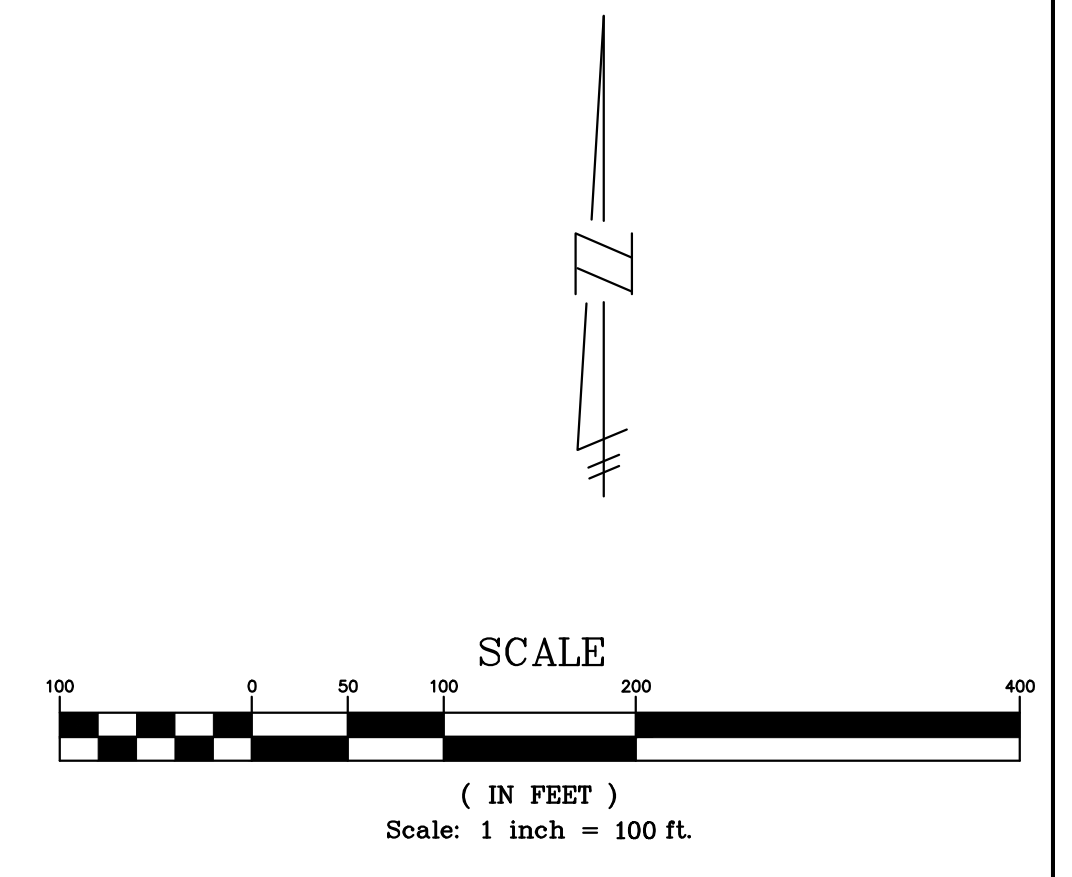
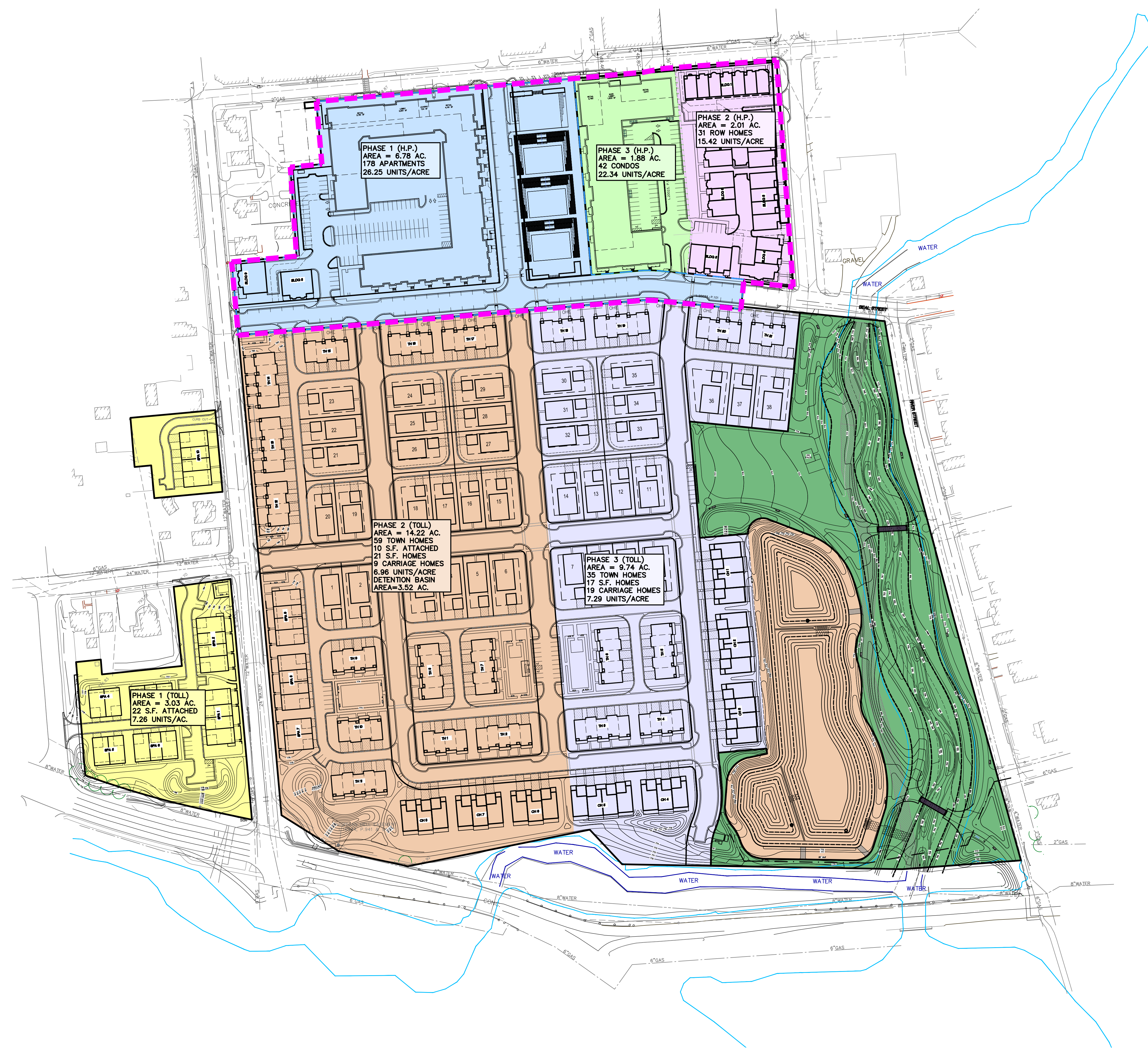
**FLOODPLAIN PLAN**

**SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

SHEET  
**39**

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HP/PERENNIAL	
	HP LAND DEVELOPMENT: APRIL 2024 – NOVEMBER 2024 (7 MONTHS)
	PHASE 1: NOVEMBER 2024 – DECEMBER 2026 (25 MONTHS) COMMENCEMENT OF LEASING: DECEMBER 2026 CENTRAL PARK: APRIL 2026 – OCTOBER 2026 (6 MONTHS) **CENTRAL PARK WILL BE CONTRACTED WITH THE CONTRACTOR OF THE NORTHWEST APARTMENT BUILDING
	PHASE 2: APRIL 2024 – MAY 2027 (37 MONTHS) DELIVERIES: AUGUST 2024 – MAY 2027 (33 MONTHS)
	PHASE 3: MARCH 2026 – NOVEMBER 2027 (32 MONTHS) DELIVERIES: NOVEMBER 2027 – NOVEMBER 2028 (12 MONTHS)
	RIVER PARK: JUNE 2024 – JUNE 2025 (12 MONTHS)  *ENVIRONMENTAL REMEDIATION & DEMO OF THE DOWNS TRACK: FEBRUARY 2024 – JULY 2024 (5 MONTHS)
TOLL BROTHERS	
	PHASE 1: JANUARY 2024 – AUGUST 2026 (32 MONTHS) DELIVERIES: JULY 2025 – OCTOBER 2026 (15 MONTHS)
	PHASE 2: SEPTEMBER 2024 – OCTOBER 2027 (37 MONTHS) DELIVERIES: MARCH 2026 – APRIL 2028 (25 MONTHS)
	PHASE 3: SEPTEMBER 2025 – JANUARY 2027 (16 MONTHS) DELIVERIES: JULY 2026 – JULY 2027 (12 MONTHS)

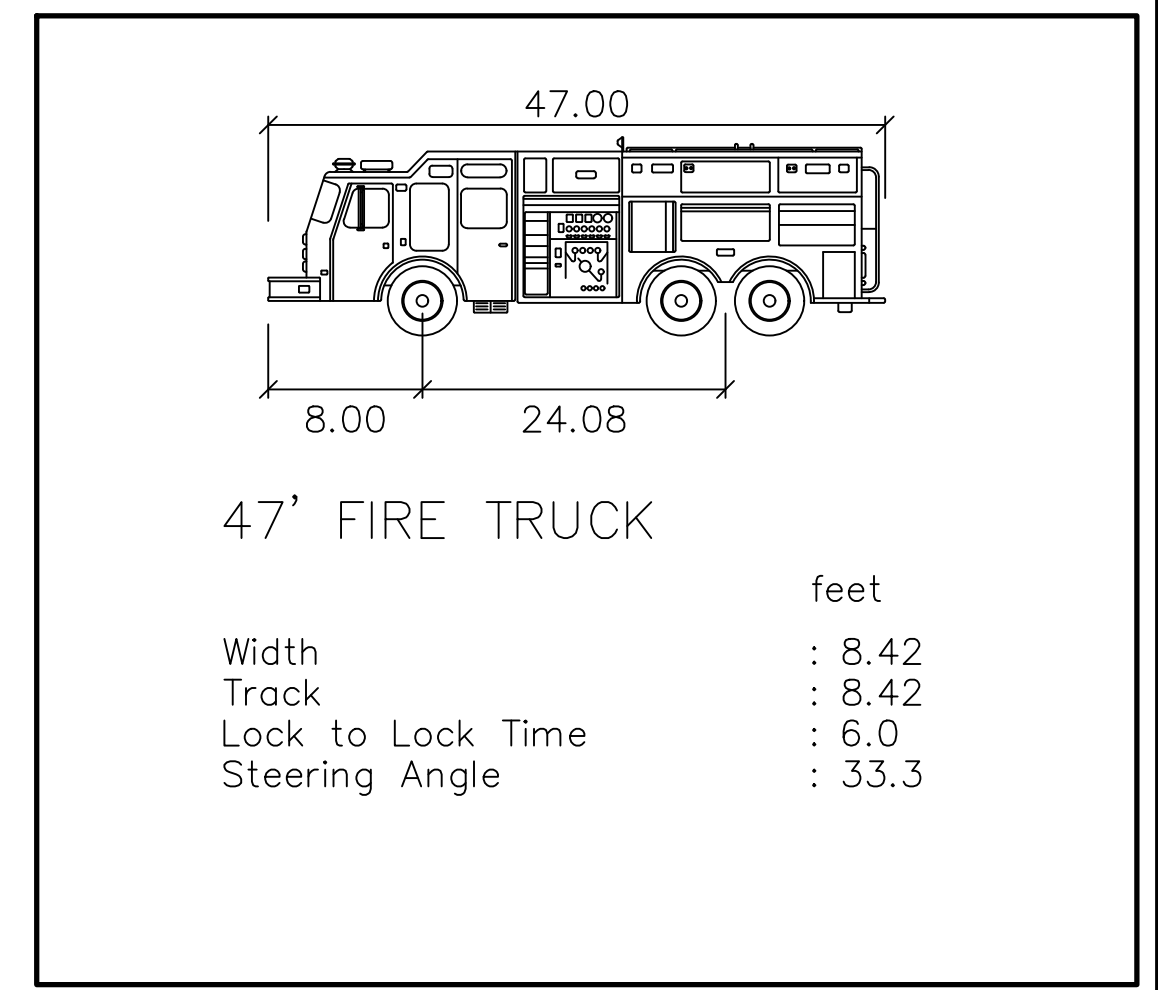
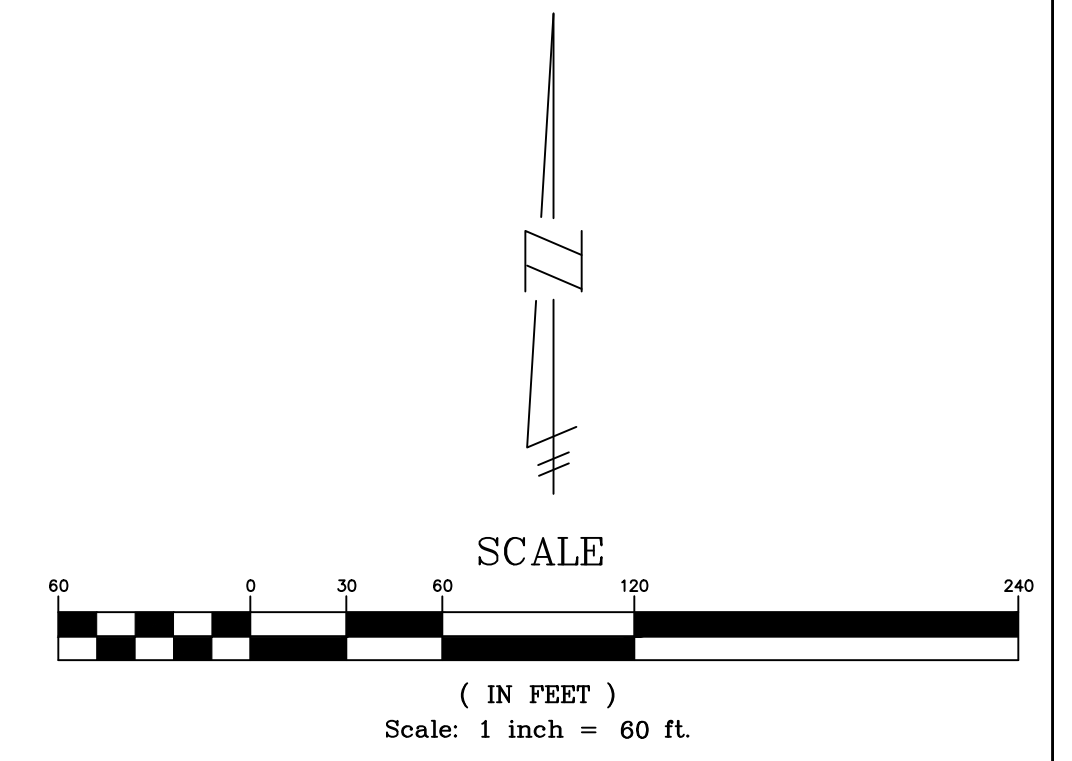
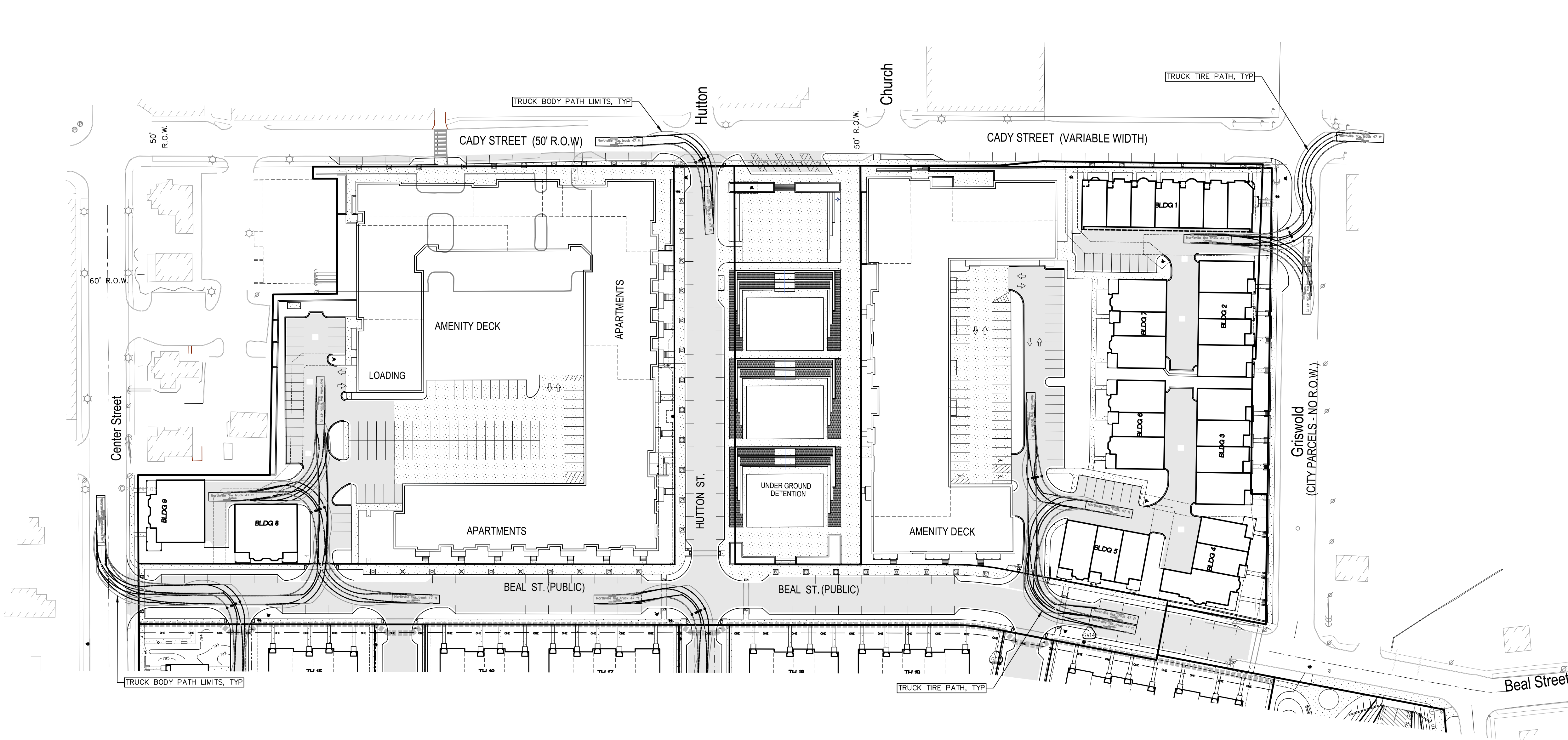
### THE DOWNS

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		CHECKED BY: R.E. FILE: 21001PH-FSP-PH.DWG
<b>PHASING PLAN</b>		
<b>SEIBER KEAST LEHNER</b> ENGINEERING   SURVEYING 39205 COUNTRY CLUB DRIVE, SUITE C8 FARMINGTON HILLS, MI 48331 PHONE: 248.308.3331		<b>SHEET</b>  40

157100 THE DOWNS - HANDED PASTORAL/CAVALRY DE. PLAN/PHASE 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**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	ISSUE SCHEMATIC DESIGN	08-10-2023
2.	SOME DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

**811** Know what's Below.  
Call before you dig.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF AND/OR RELOCATION OF ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION.

DATE: 04-25-22 DESIGNED BY: S.M. JOD NUMBER: 21-001  
CHECKED BY: R.R. FILE: 21001-AT-FSP-PHI - AUTO TURN.DWG

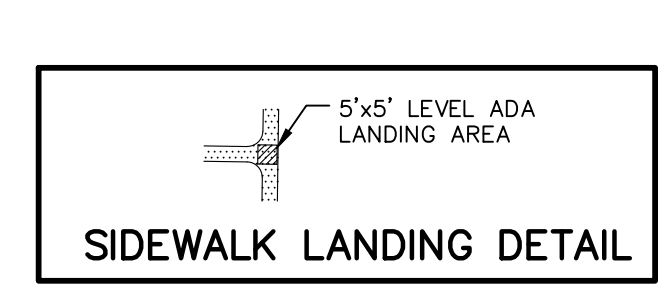
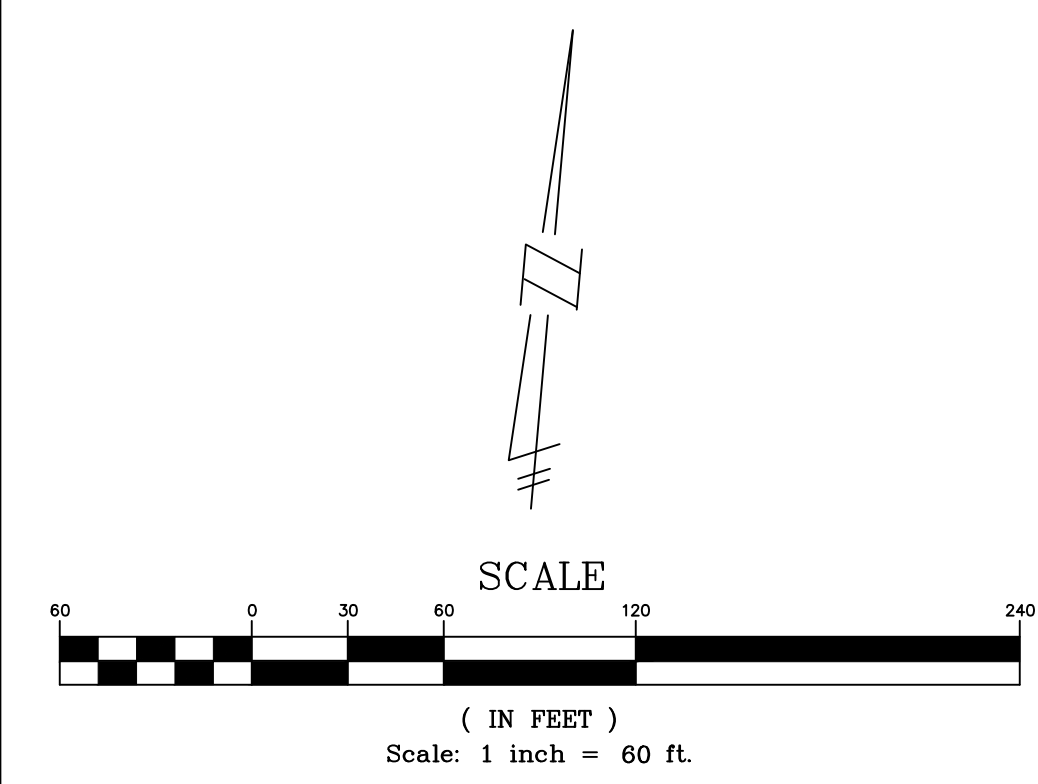
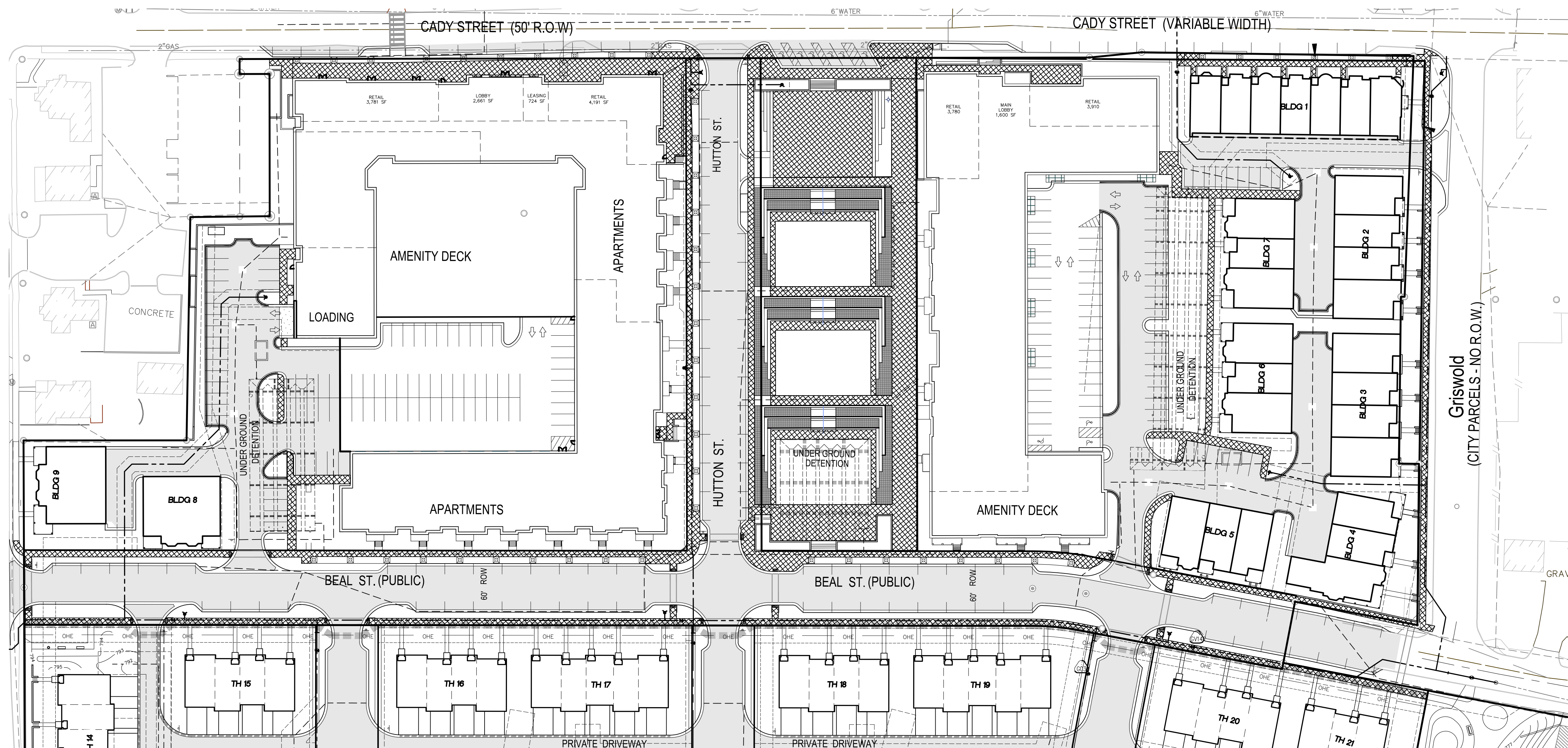
**EMERGENCY VEHICLE ACCESS PLAN**

**SKL SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

**SHEET**  
41

P:\21001 THE DOWNS\21001-AT-FSP-PHI\21001-AT-FSP-PHI - AUTO TURN.DWG 17/2023 10:30 AM

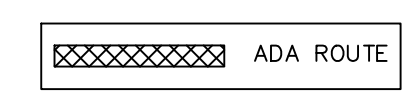




**Sidewalk Requirements**

1. THE MAXIMUM CROSS SLOPE FOR ALL SIDEWALK AND DRIVEWAY CROSSWALKS IS 2%
2. THE MAXIMUM RUNNING SLOPE FOR ALL SIDEWALK AND DRIVEWAY CROSSWALKS IS 5%
3. THE 5' X 5' ADA LANDING AREAS HAVE A MAXIMUM SLOPE IN ALL DIRECTIONS OF 2%
4. THE MAXIMUM SLOPE FOR A RAMP IS 8% FOR MAXIMUM DISTANCE OF 6 FEET

THE CONTRACTOR SHALL CHECK THE FORMS TO ENSURE THAT THESE SLOPE REQUIREMENTS ARE MET BEFORE ANY CONCRETE IS PLACED.



**THE DOWNS**  
SECTION 3, T15, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		
NO.	ITEM	DATE
1.	100% SCHEMATIC DESIGN	08-10-2022
2.	50% DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV. PER CITY REVIEW	09-08-2023

**UTILITY WARNING**

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

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

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF AND/OR RELOCATION OF ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION.

DATE: 04-25-22 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: R.E. FILE: 21001-AR-FSP - ACCESSIBLE ROUTE PLAN.DWG

**ACCESSIBLE ROUTE PLAN**

**SKL SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

SHEET  
**42**

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### BORING LOG TERMINOLOGY

**UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART**

**GRAVEL** (More than 50% of material is larger than No. 20 sieve size.)

**SAND** (More than 50% of material is smaller than No. 20 sieve size.)

**CLAYEY SAND** (More than 50% sand, less than 15% clay)

**SILT CLAYEY SAND** (More than 50% sand, less than 15% silt, more than 15% clay)

**SANDY SILT** (More than 50% silt, less than 15% sand, less than 15% clay)

**SILT CLAYEY SILT** (More than 50% silt, less than 15% clay, less than 15% sand)

**CLAY** (More than 15% clay)

**CLAYEY CLAY** (More than 15% clay, less than 15% silt, less than 15% sand)

**SILT CLAY** (More than 15% silt, less than 15% clay, less than 15% sand)

**CLAYEY SILT** (More than 15% silt, less than 15% clay, less than 15% sand)

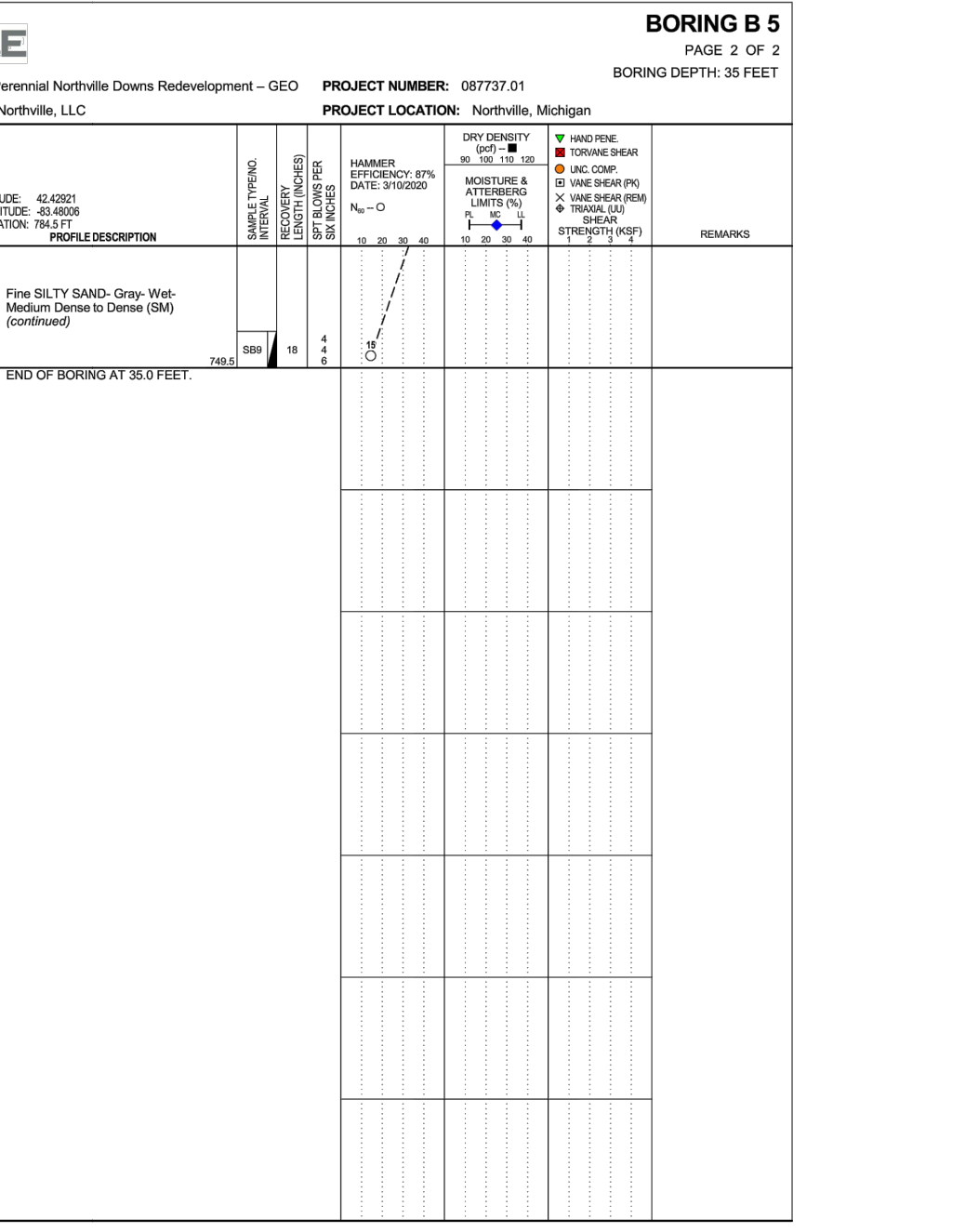
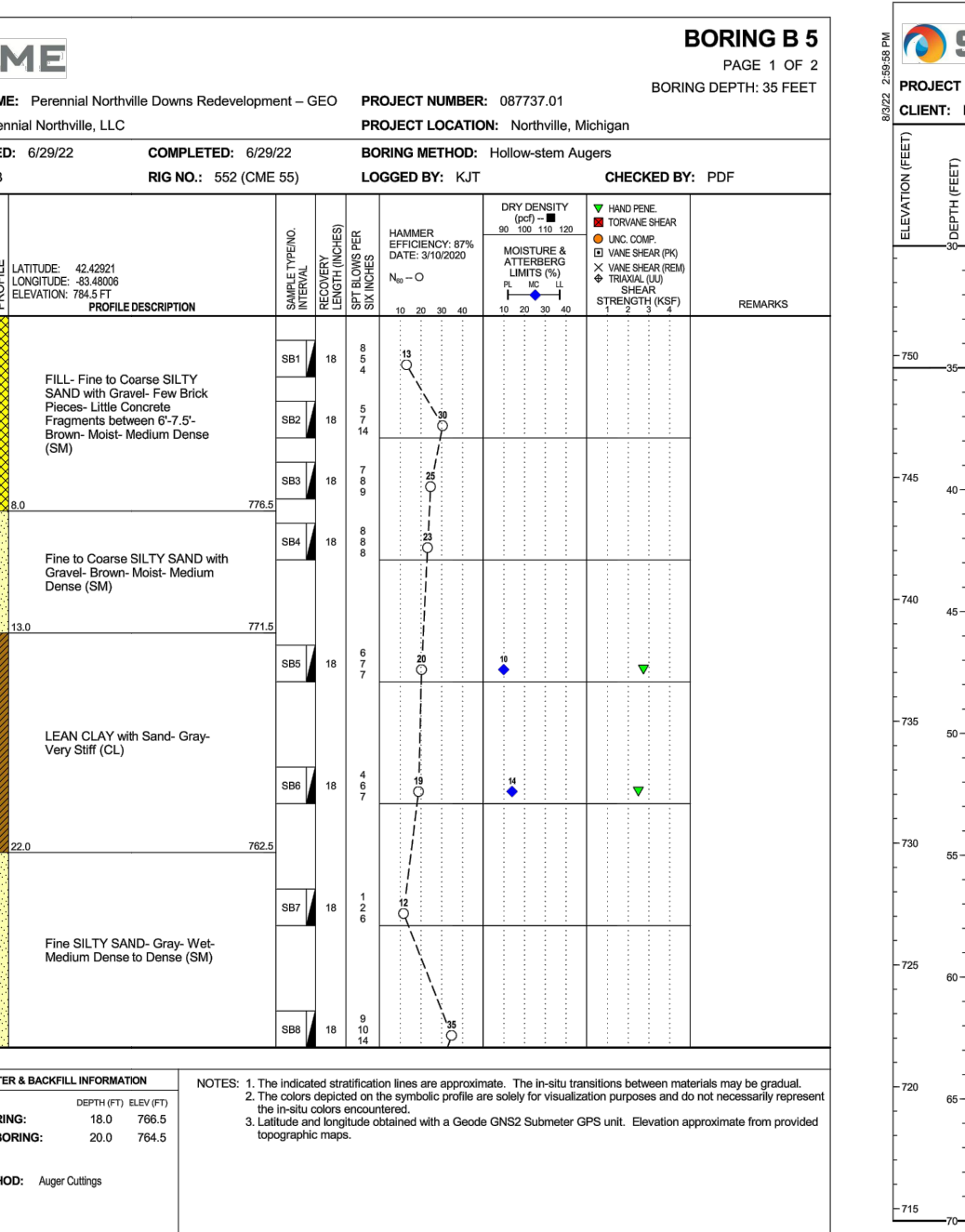
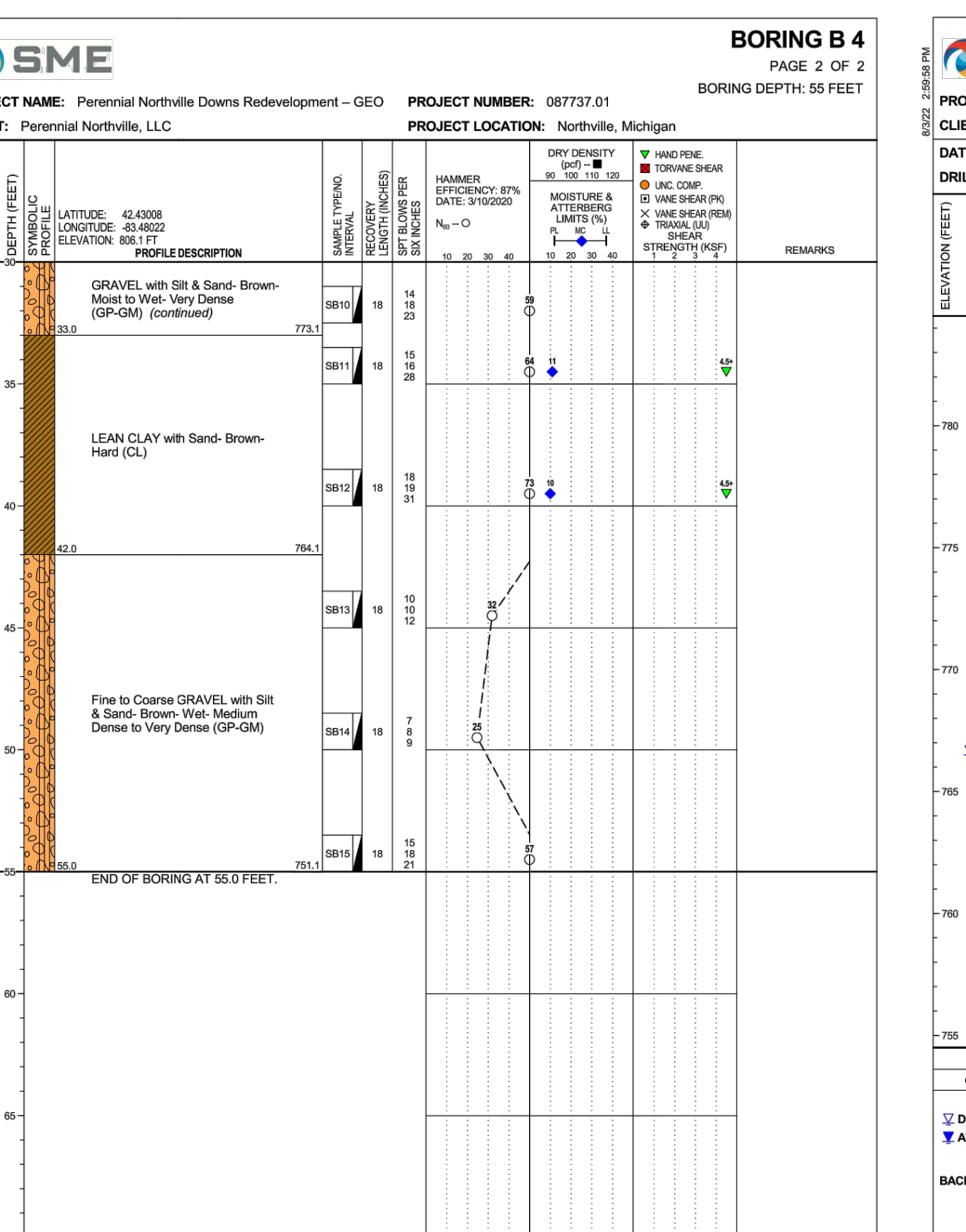
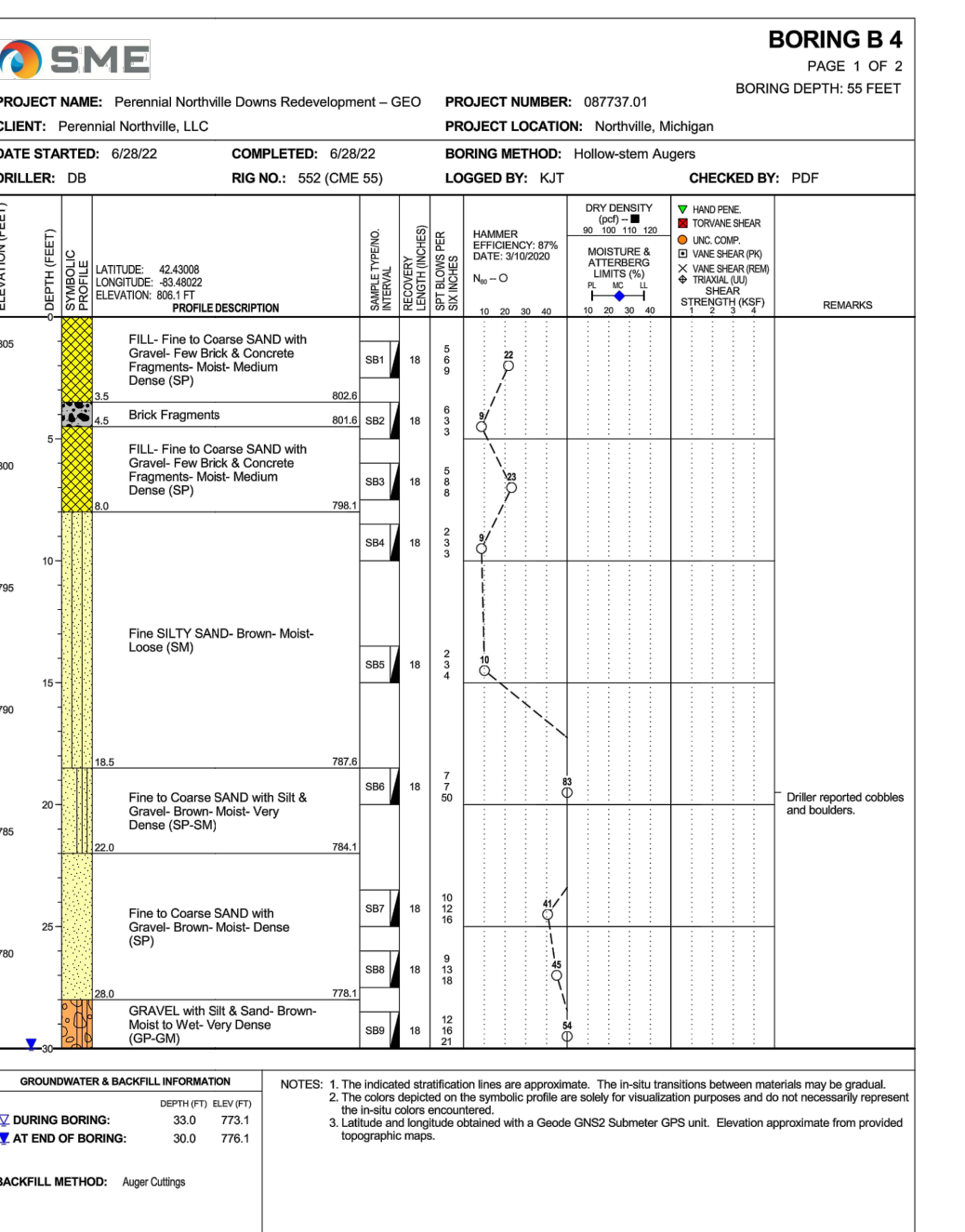
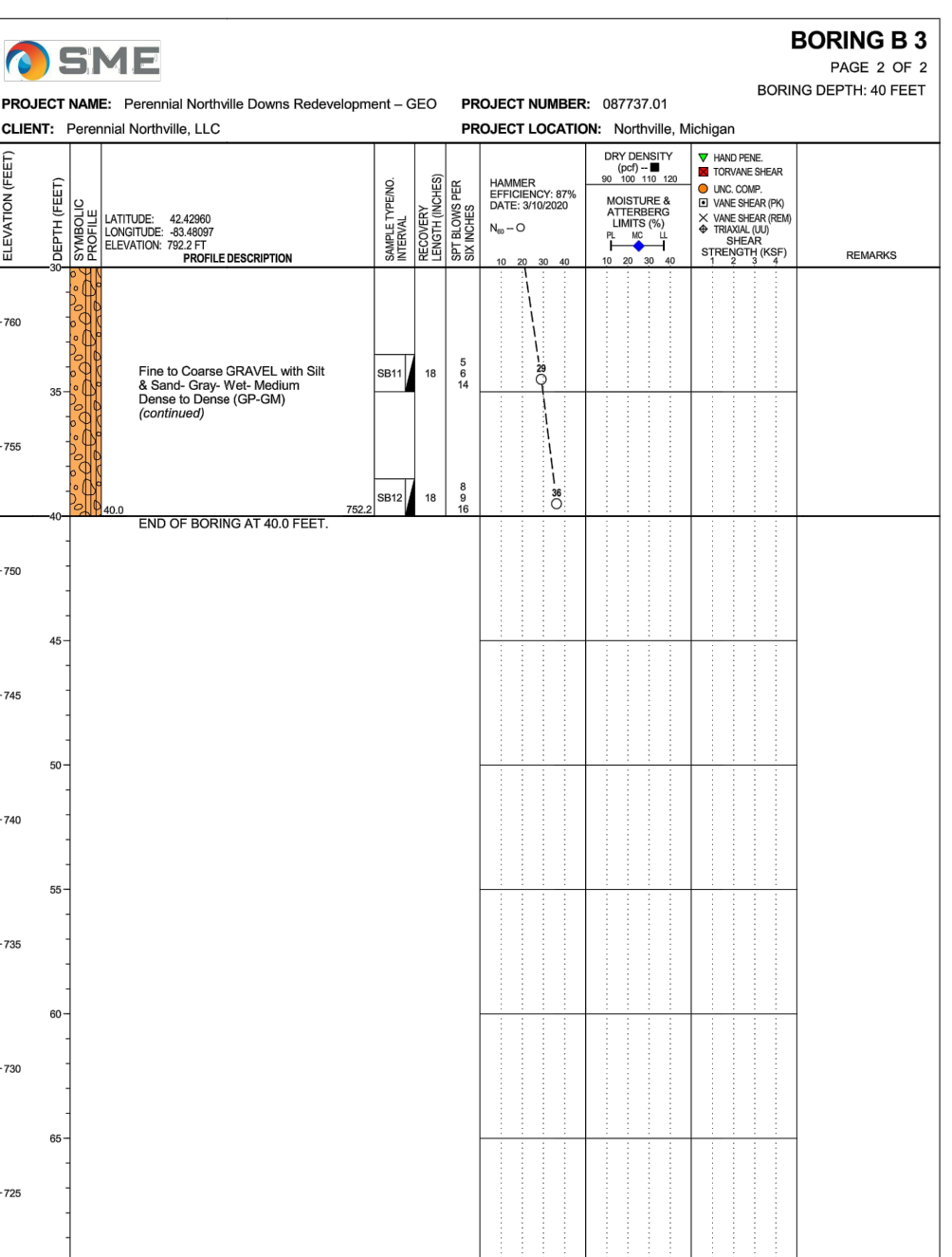
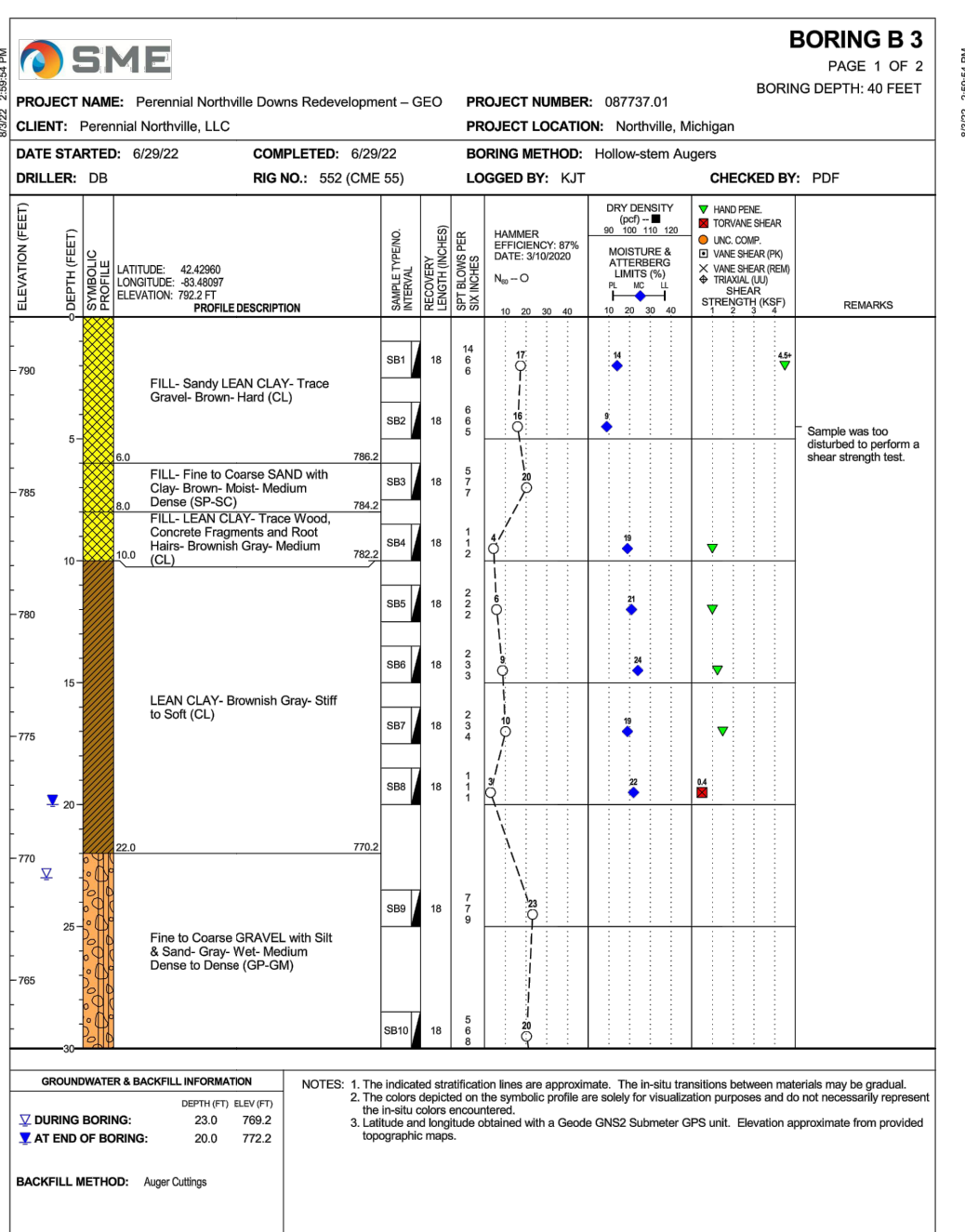
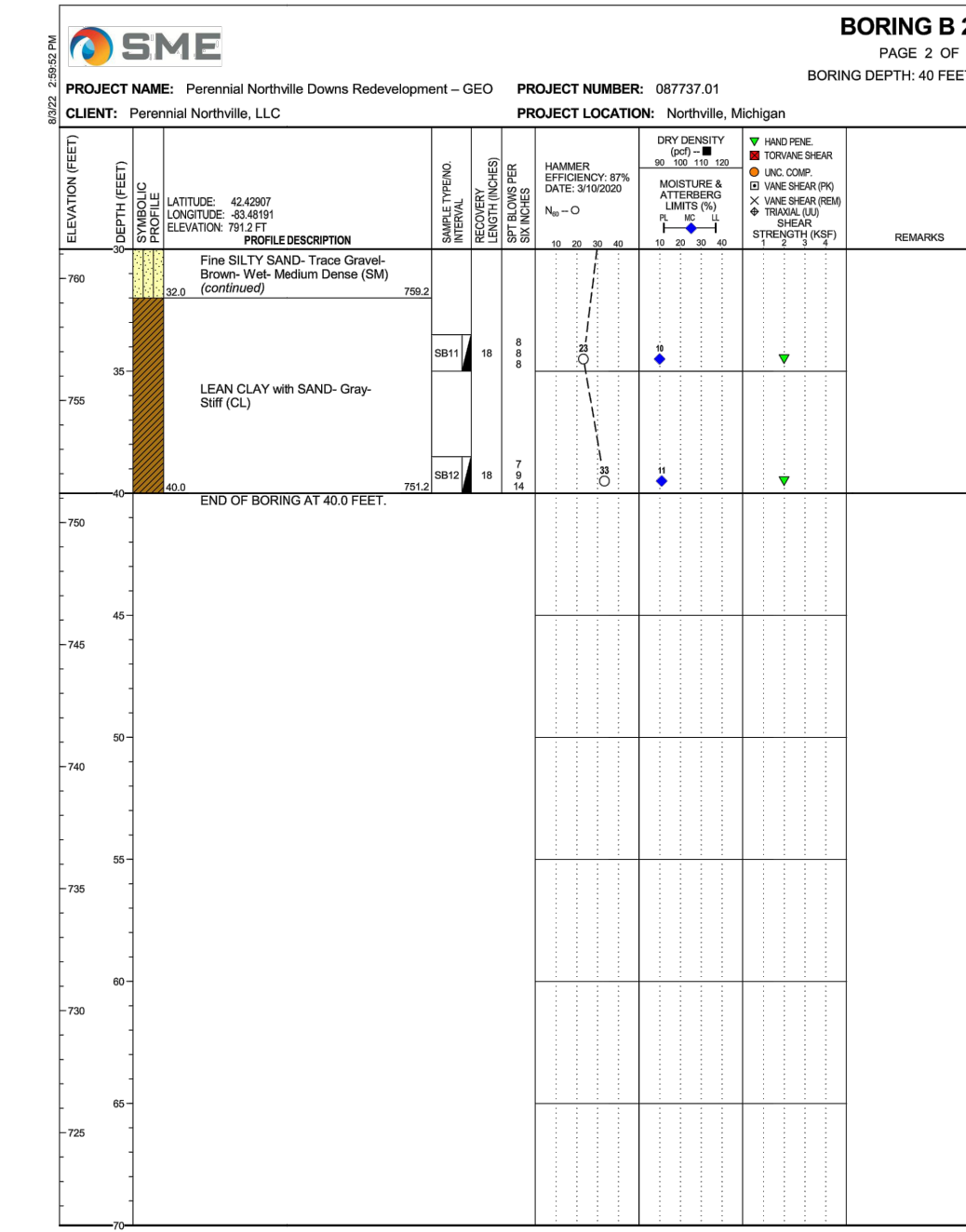
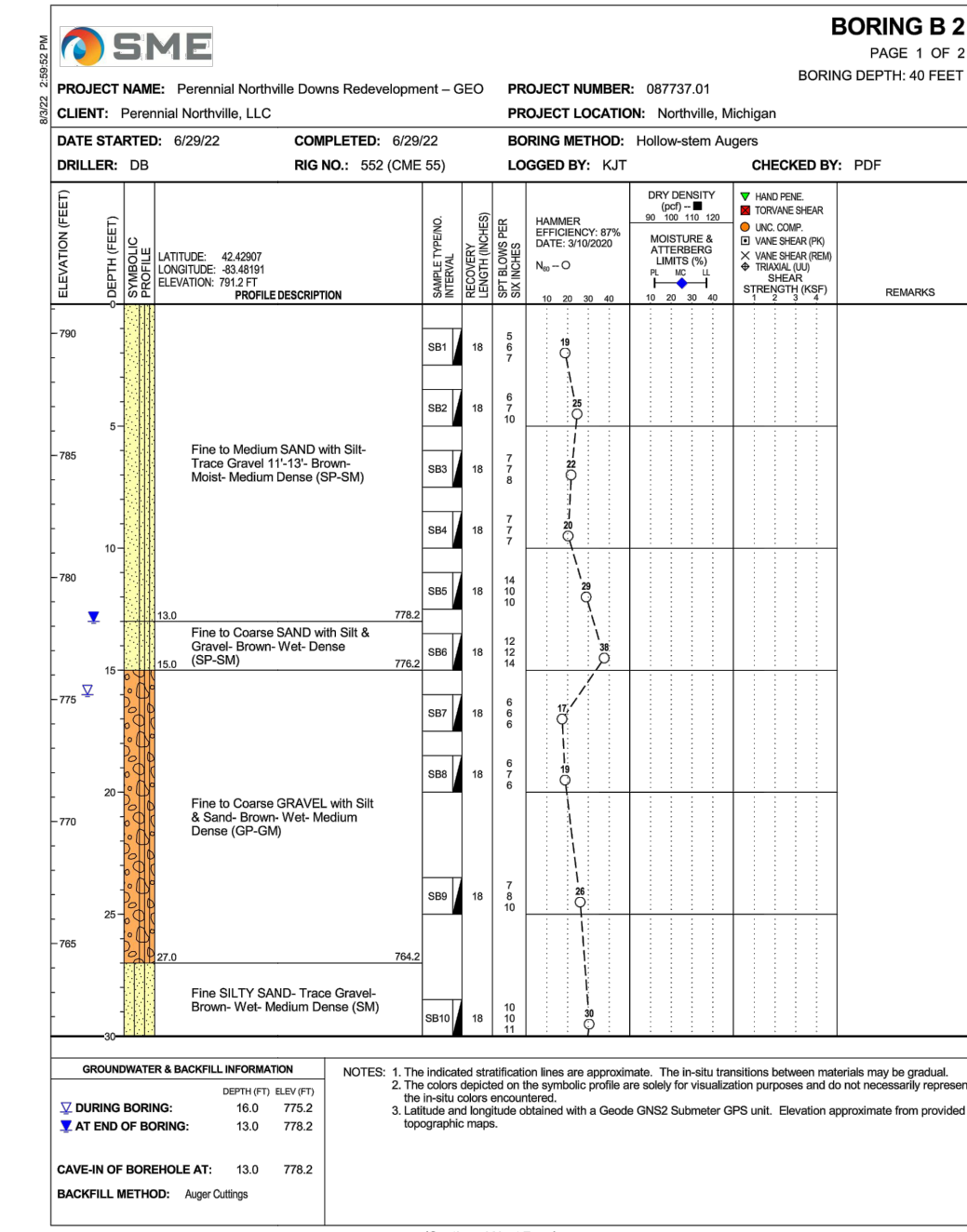
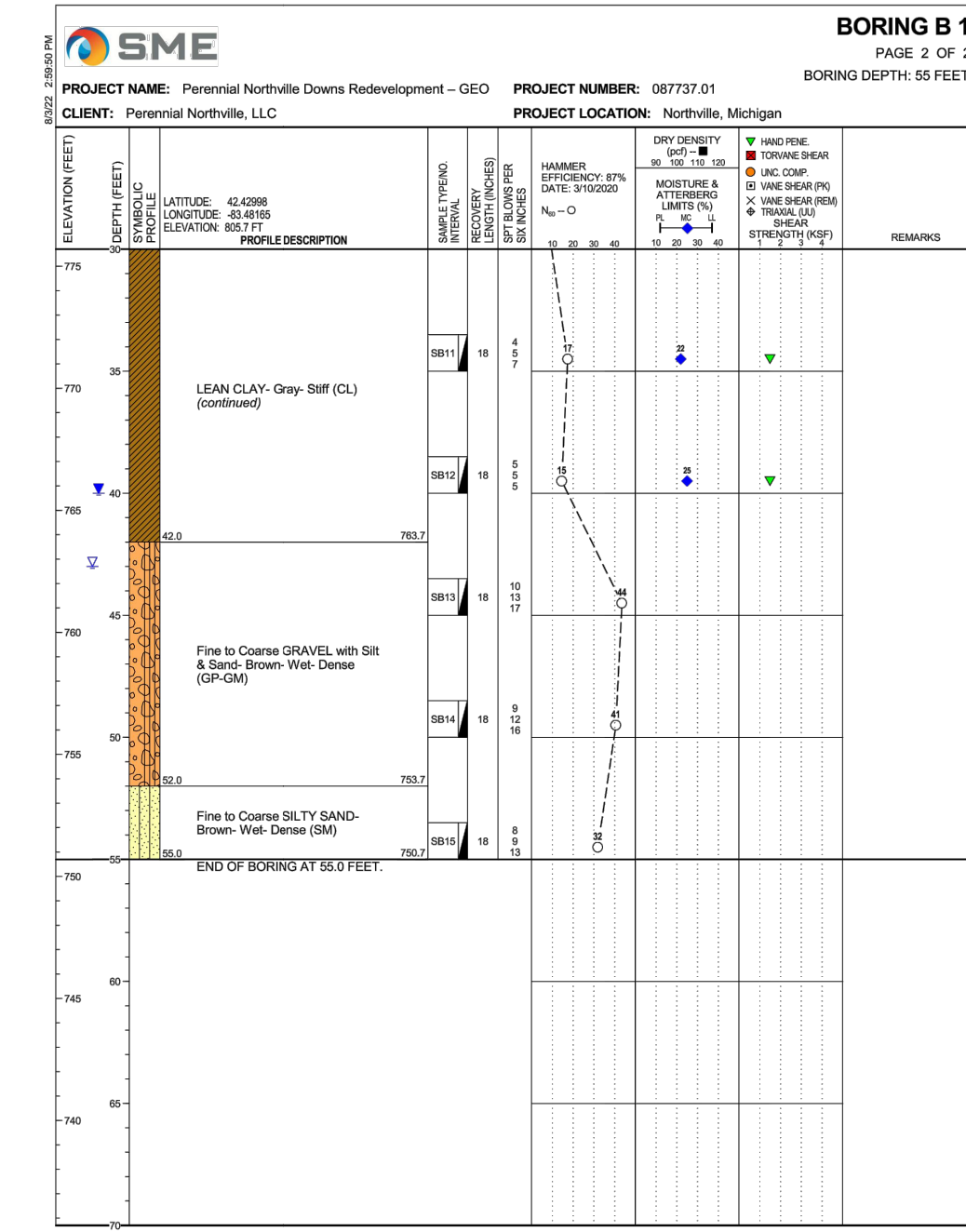
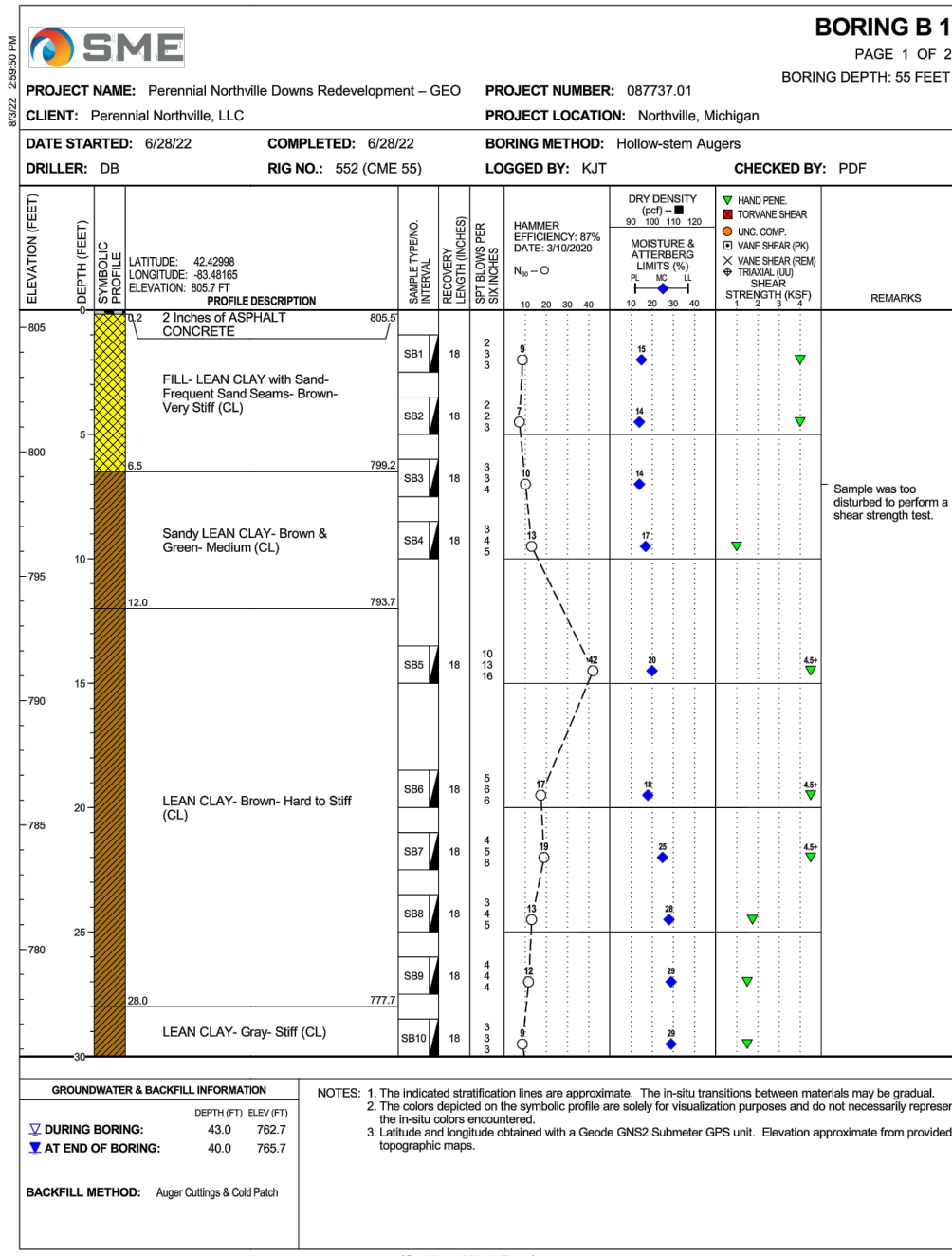
**OTHER MATERIAL SYMBOLS**

**LABORATORY CLASSIFICATION CRITERIA**

**MECHANICAL PROPERTIES**

**CLARIFICATION TERMINOLOGY AND CORRELATION**

**COMMISSIONER'S SIGNATURE**



**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		
NO.	ITEM	DATE
1.	100% SCHEMATIC DESIGN	06-10-2022
2.	50% DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

**UTILITY WARNING**

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

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

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF AND/OR RELOCATION OF ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION.

DATE: 04-25-23 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: R.E. FILE: 21001-88-SP - LAYOUT (2).DWG

**SOIL BORINGS**

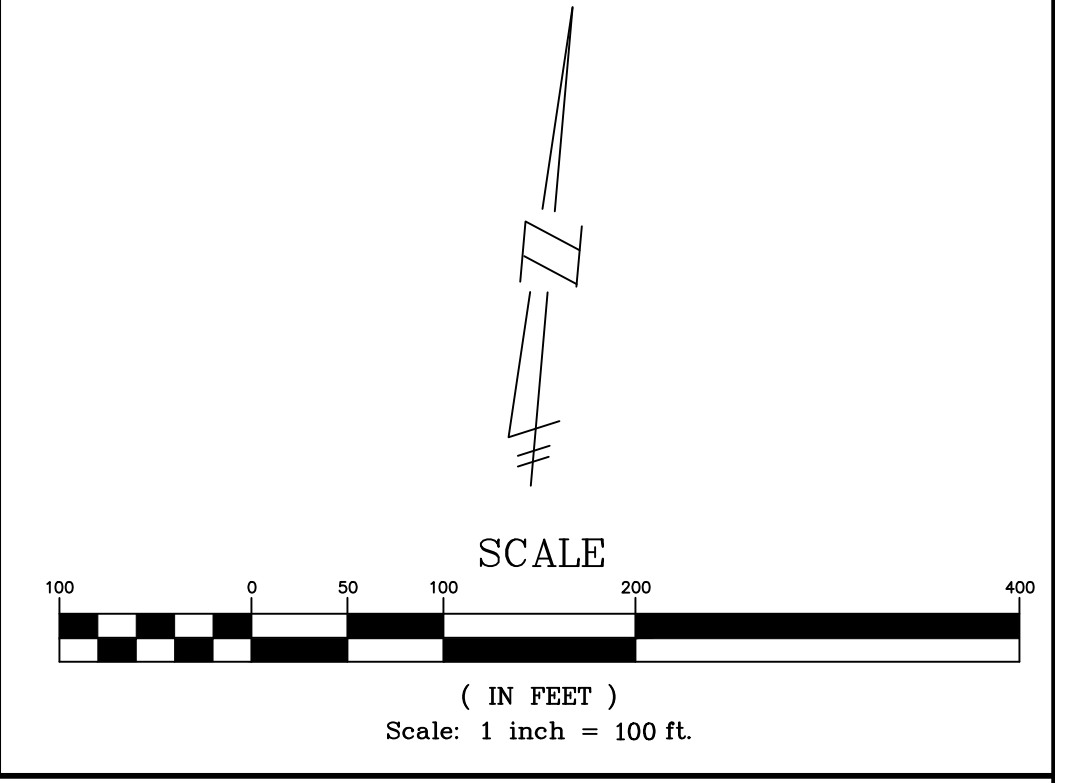
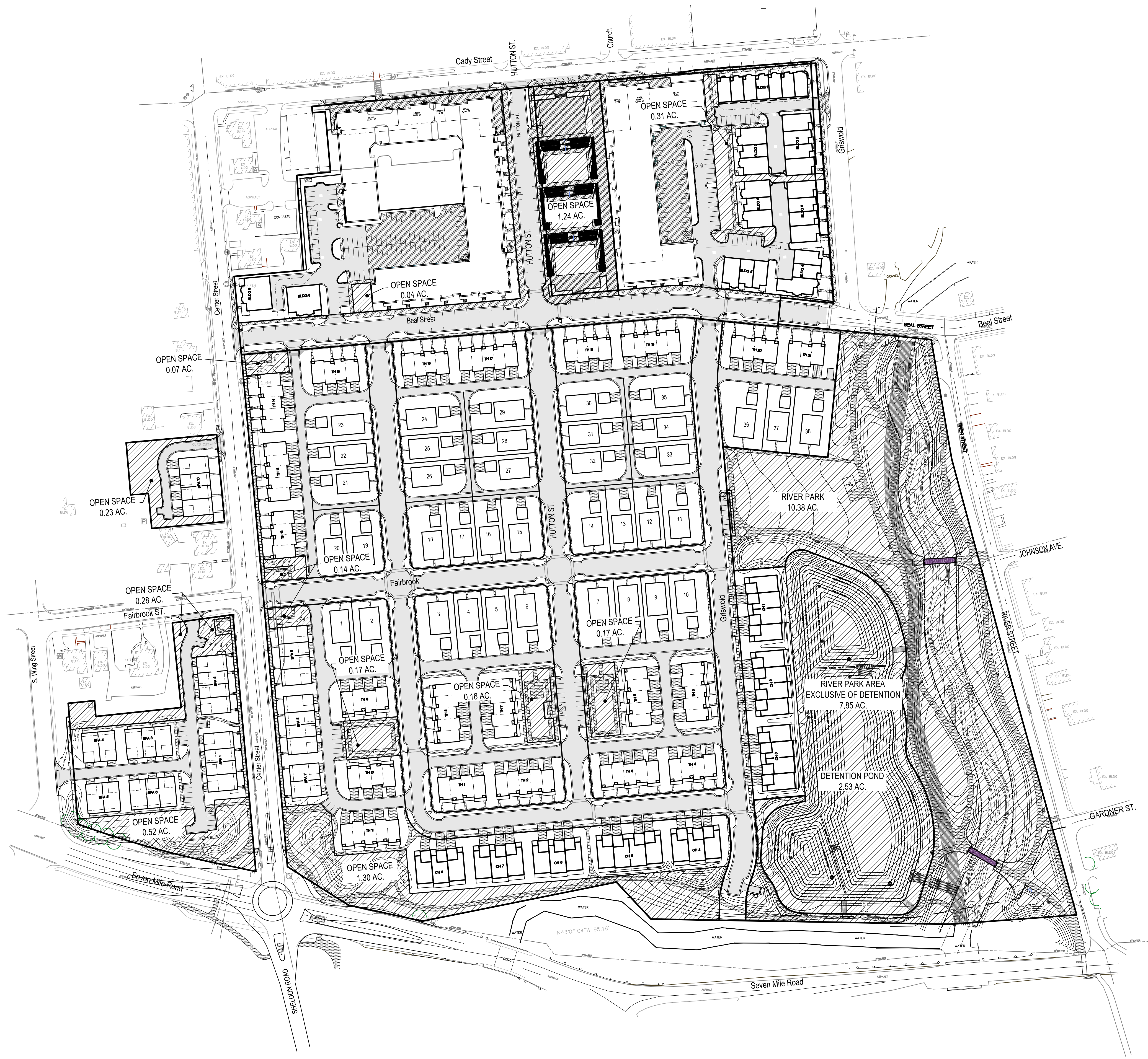
**SHEET 43**

PROJECT: THE DOWNS - NORTHVILLE, MICHIGAN  
 DRAWING: SOIL BORINGS - LAYOUT (2).DWG  
 DATE: 04/25/23 10:42 AM









OPEN SPACE SUMMARY	
SITE AREA	48.12 ACRES
OPEN SPACE SHOWN	15.01 ACRES
OPEN SPACE PERCENTAGE	31.19%
OPEN SPACE EXCLUDING DETENTION	12.49 ACRES
OPEN SPACE PERCENTAGE	25.96%

LEGEND	
EXISTING	PROPOSED
SIDE WALK (CONCRETE)	SIDE WALK (CONCRETE)
CONCRETE CURB AND GUTTER	CONCRETE CURB AND GUTTER
STORM SEWER	STORM SEWER
SANITARY SEWER	SANITARY SEWER
WATER MAIN	WATER MAIN
DENOTES UNDERDRAIN	DENOTES UNDERDRAIN
DENOTES LANDSCAPE DRAIN	DENOTES LANDSCAPE DRAIN
MANHOLE	MANHOLE
CATCH BASIN W/SED CATCH	CATCH BASIN W/SED CATCH
CURB INLET W/SILT SAC	CURB INLET W/SILT SAC
END SECTION	END SECTION
GATE VALVE	GATE VALVE
HYDRANT	HYDRANT
OVERHEAD ELECTRICAL LINES	OVERHEAD ELECTRICAL LINES
FLOOD PLAN	FLOOD PLAN
CONTOURS	CONTOURS
SPOT ELEVATION	SPOT ELEVATION
SURFACE DRAINAGE	SURFACE DRAINAGE
OVERFLOW ROUTE	OVERFLOW ROUTE
TREE FENCE	TREE FENCE
SILT FENCE	SILT FENCE
PROPOSED DRIVEWAY LOCATION	PROPOSED DRIVEWAY LOCATION
CROSSING NUMBER	CROSSING NUMBER

**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING
NO.	ITEM	DATE
1.	100% SCHEMATIC DESIGN	08-10-2023
2.	50% DESIGN DEVELOPMENT	02-03-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

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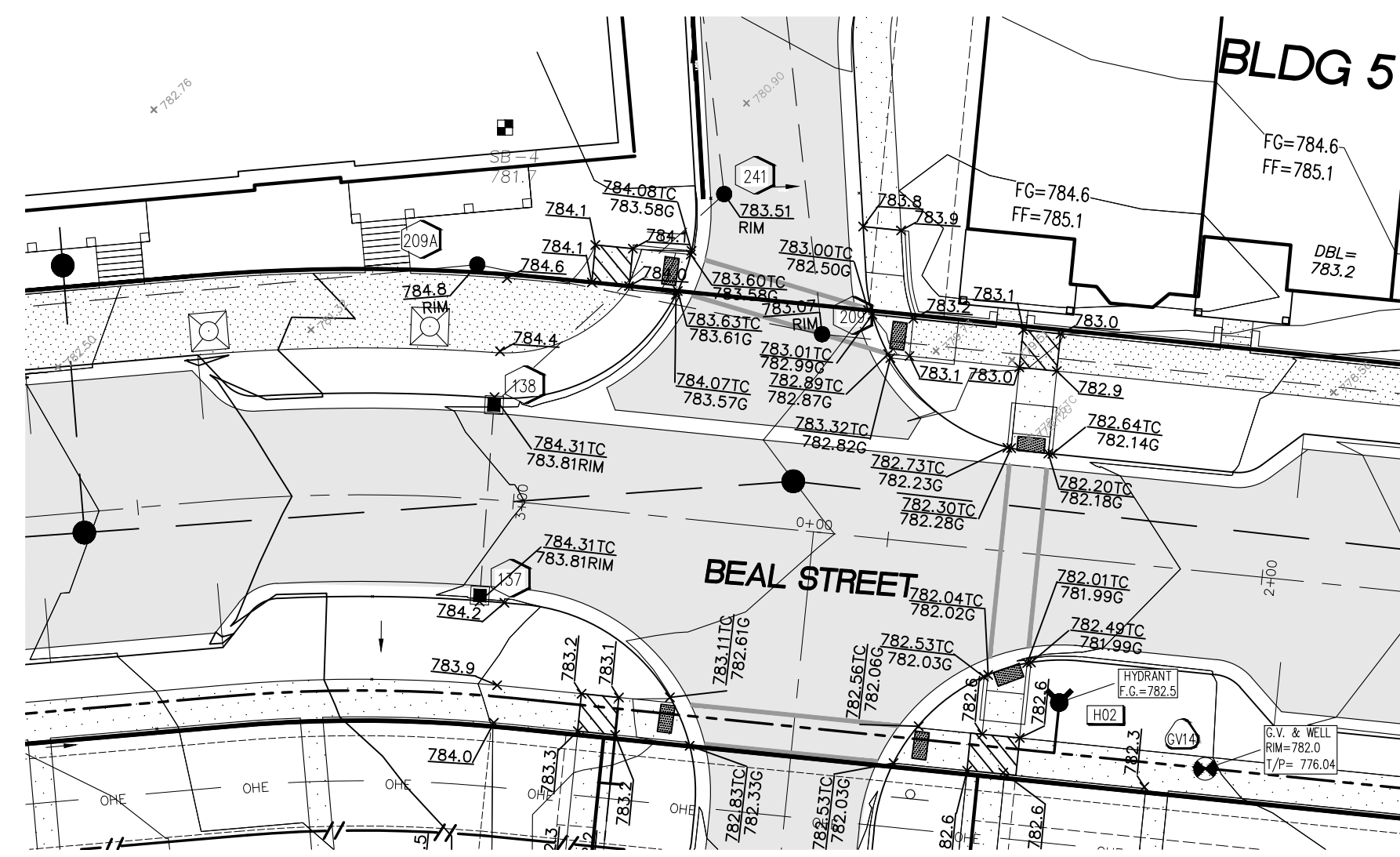
DATE: 04-25-22 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: R.E. FILE: 21001-05-FSP-PH1.DWG

**OPEN SPACE PLAN**

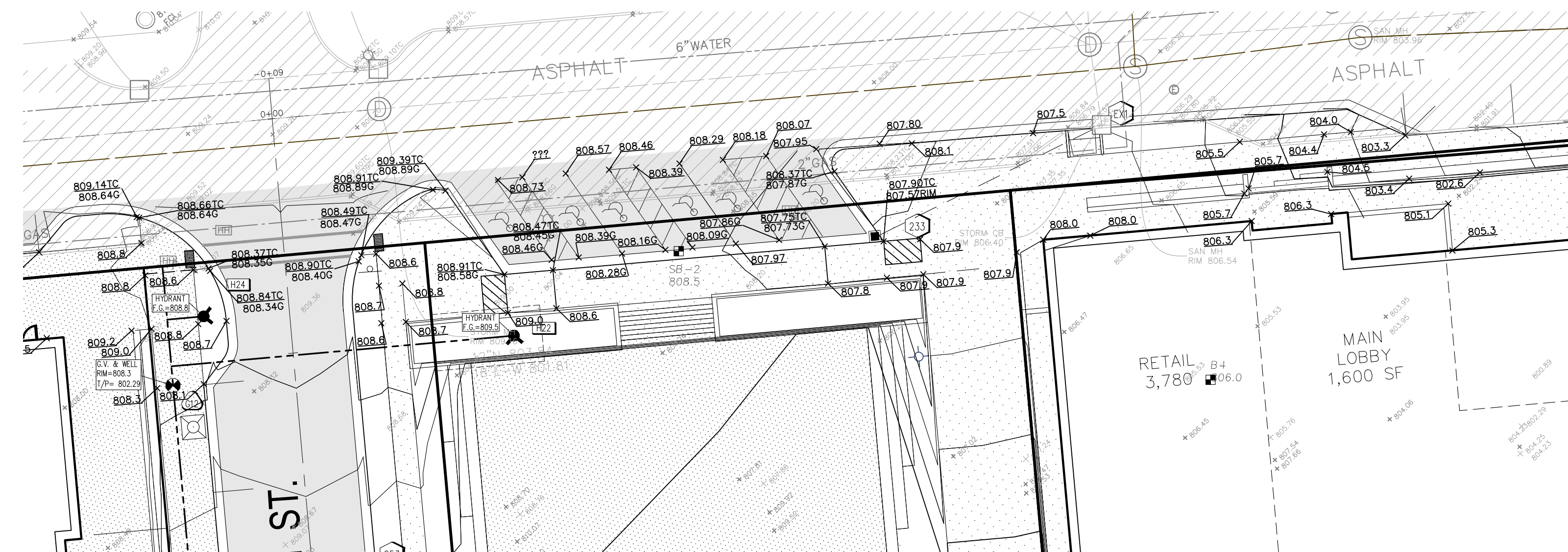
<b>SEIBER KEAST LEHNER</b> ENGINEERING   SURVEYING 39205 COUNTRY CLUB DRIVE, SUITE C8 FARMINGTON HILLS, MI 48331 PHONE: 248.308.3331	<b>SHEET</b>  45
--	------------------------

11/17/2010 THE DOWNS - NORTHVILLE, MICHIGAN. 100% SCHEMATIC DESIGN. 10/20/2023 10:30 AM. 10/20/2023 10:30 AM.

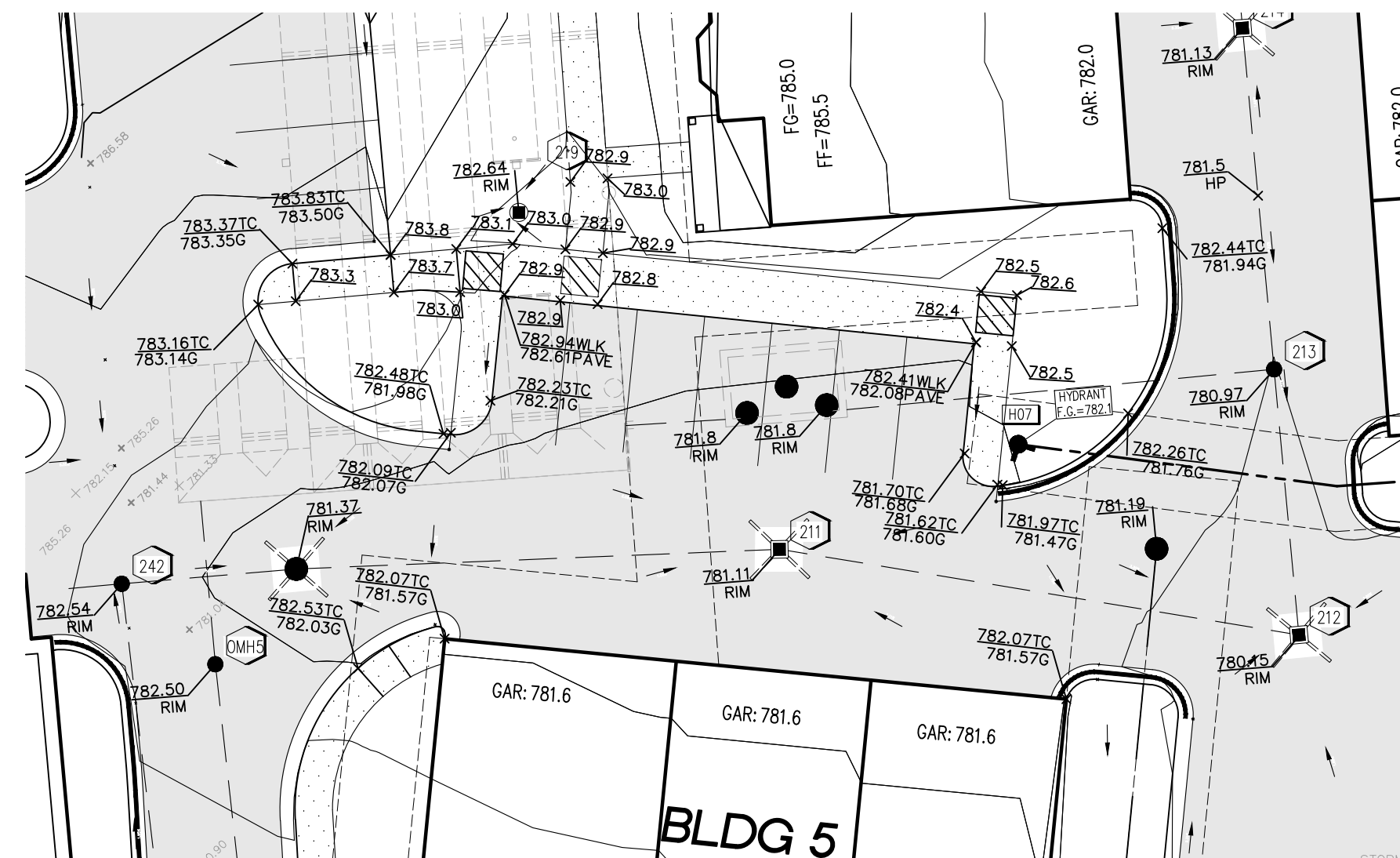




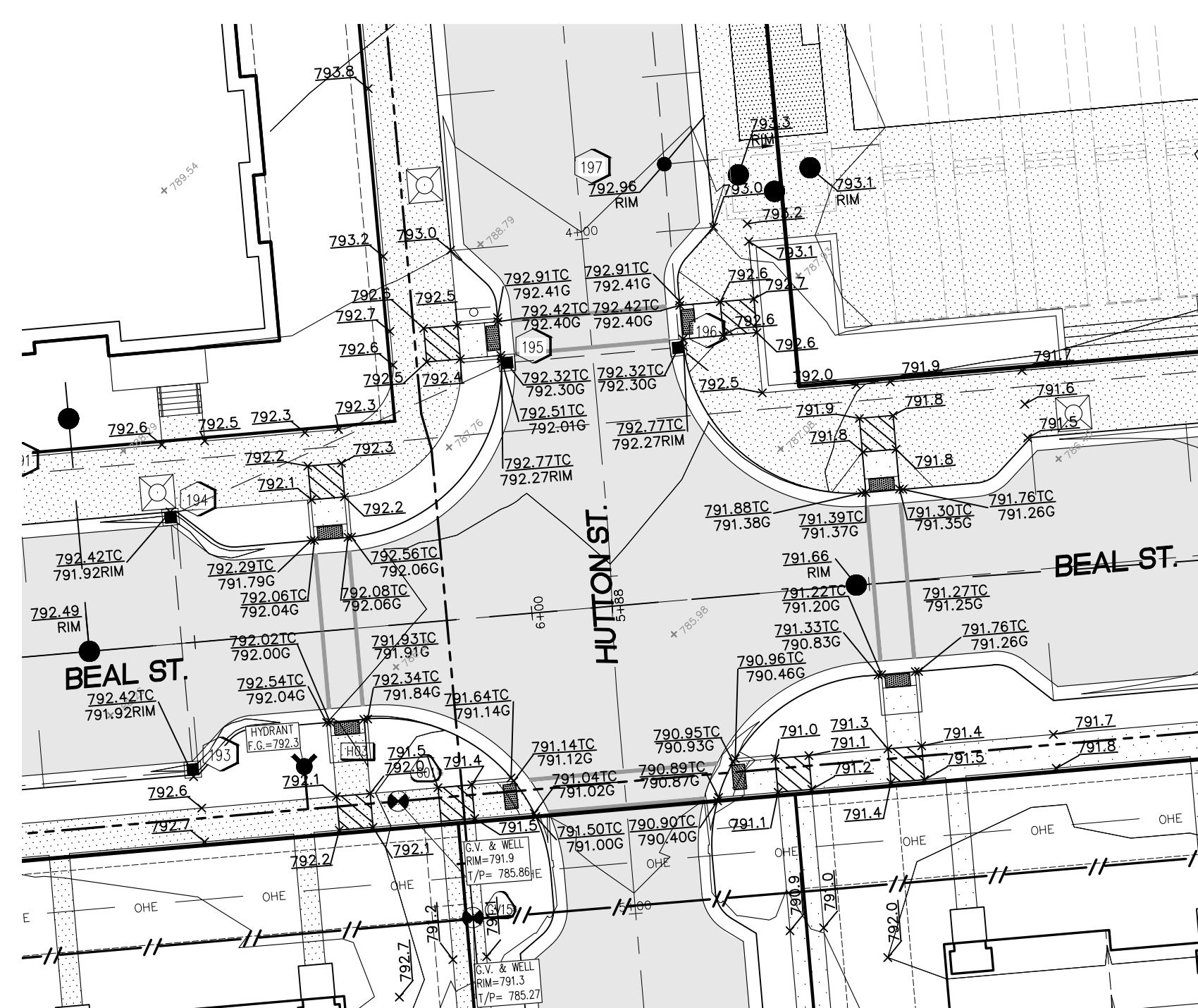
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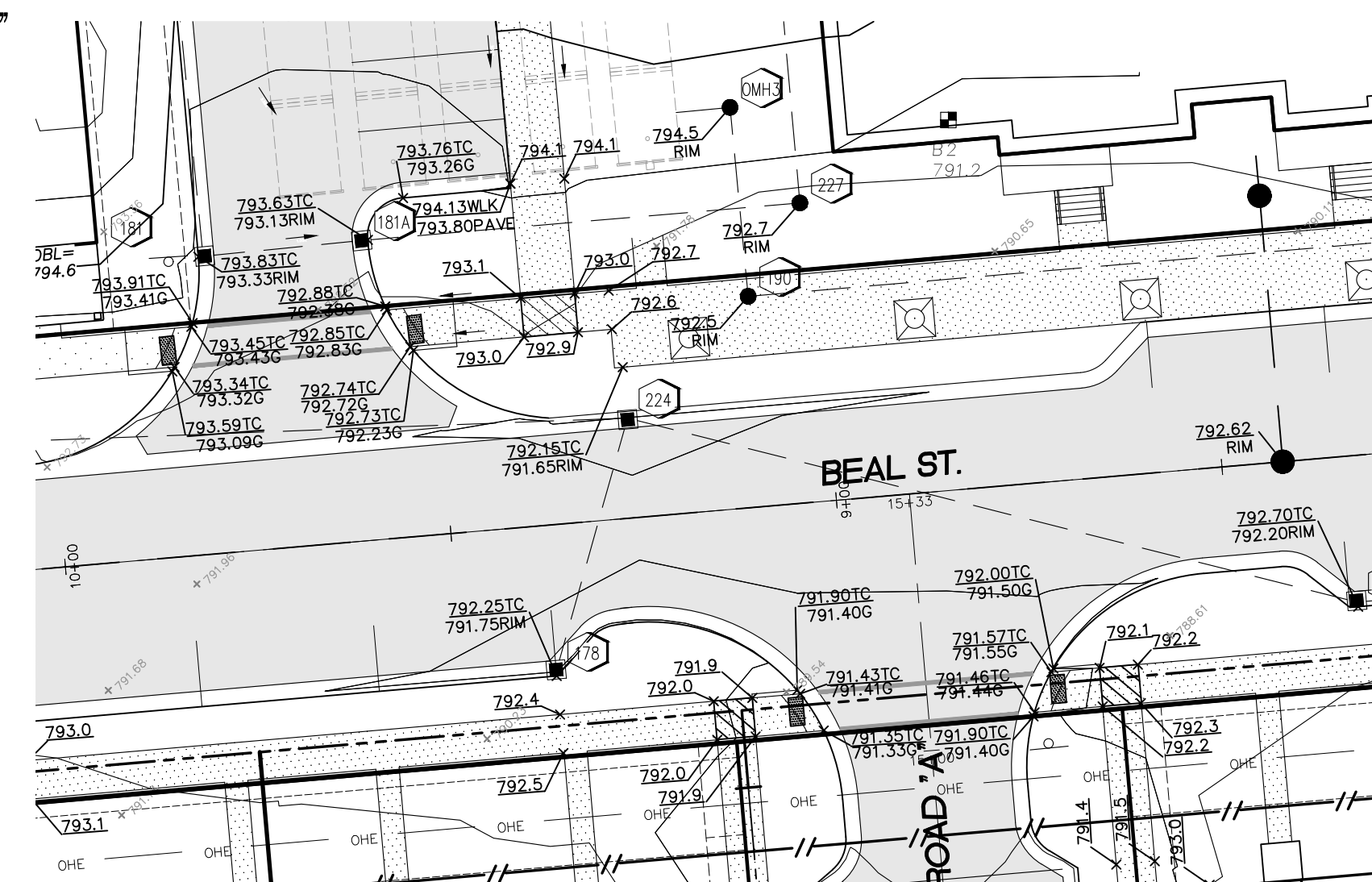
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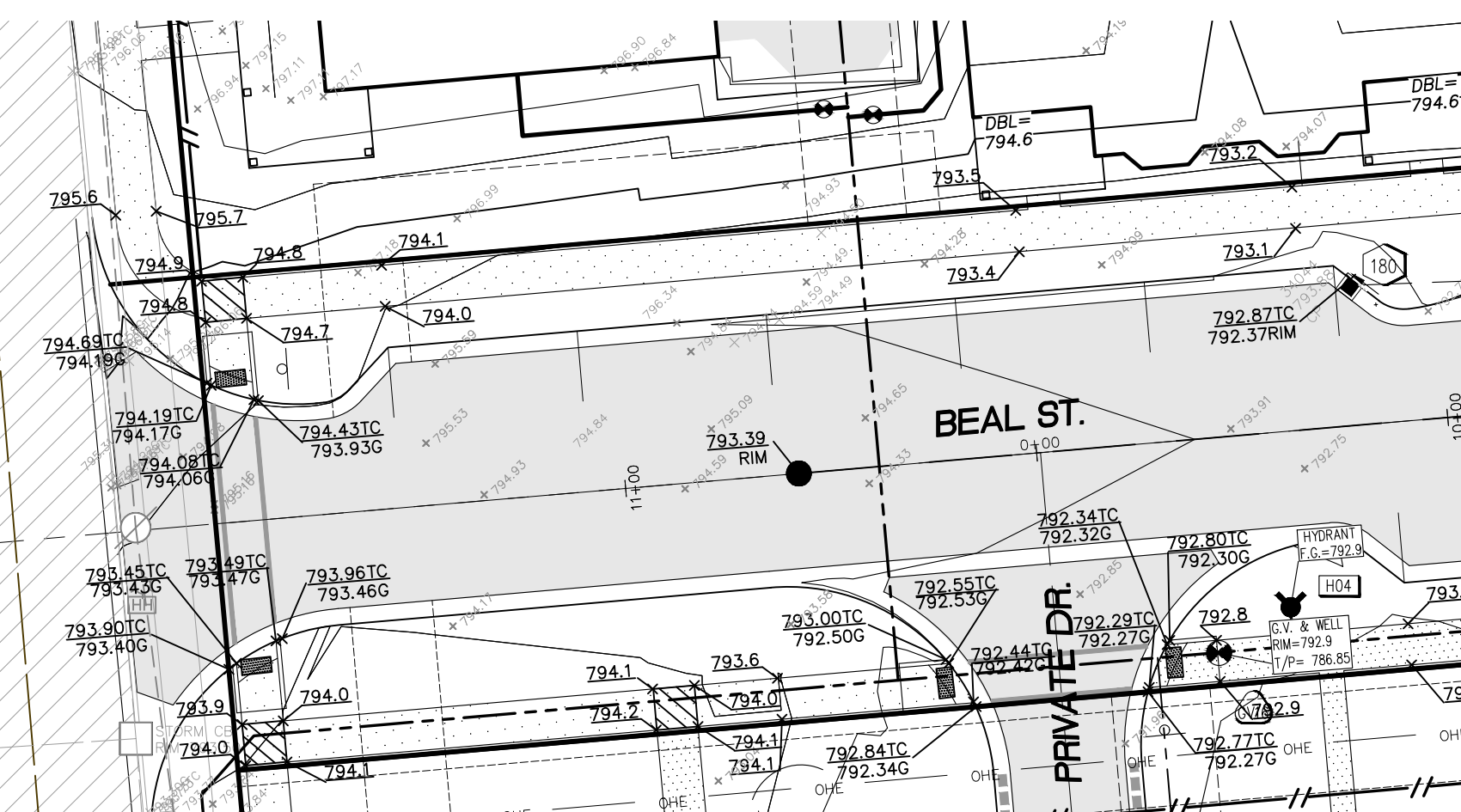
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DETAIL "E"



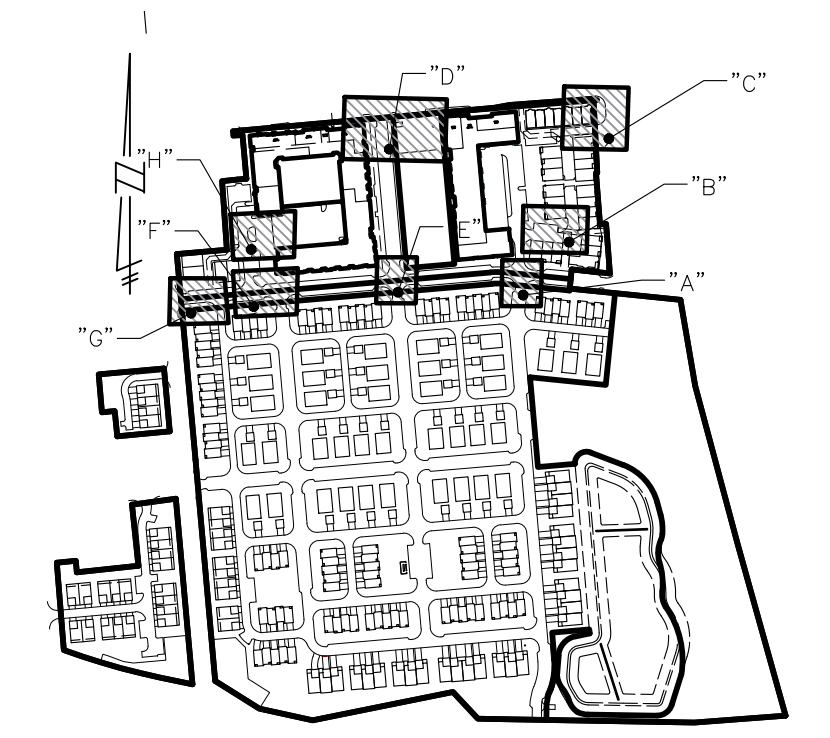
DETAIL "F"



DETAIL "G"



DETAIL "H"

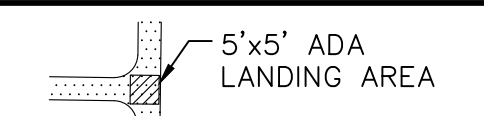


KEY MAP  
SCALE: 1"=500'

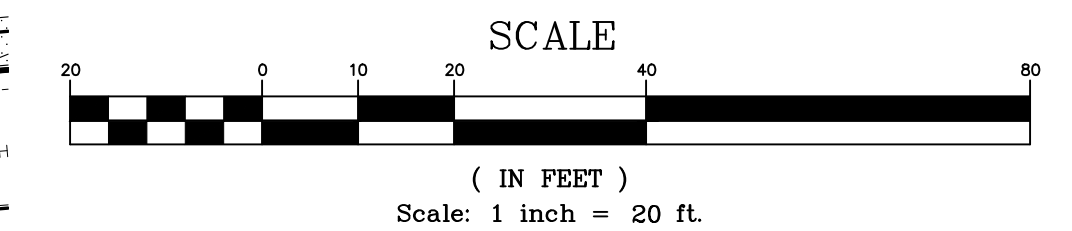
SIDEWALK REQUIREMENTS:

1. THE MAXIMUM CROSS SLOPE FOR ALL SIDEWALK AND DRIVEWAY CROSSWALKS IS 2%
2. THE RUNNING SLOPE FOR ALL SIDEWALK AND DRIVEWAY CROSSWALKS IS 5%
3. THE 5'x5' ADA LANDING AREAS HAVE A MAXIMUM SLOPE IN ALL DIRECTIONS OF 2%
4. THE MAXIMUM SLOPE FOR A RAMP IS 8% FOR MAXIMUM DISTANCE OF 6 FEET

THE CONTRACTOR SHALL CHECK THE FORMS TO ENSURE THAT THESE SLOPE REQUIREMENTS ARE MET BEFORE ANY CONCRETE IS PLACED.



5'x5' ADA LANDING AREA  
SIDEWALK LANDING DETAIL



SCALE

( IN FEET )  
Scale: 1 inch = 20 ft.

EXISTING		PROPOSED	
	ASPHALT		PAVEMENT (ASPHALT)
	CONCRETE CURB		SIDE WALK (CONCRETE)
	CONCRETE GUTTER		CONCRETE CURB AND GUTTER
	STORM SEWER		STORM SEWER
	SANITARY SEWER		SANITARY SEWER
	WATER MAIN		WATER MAIN
	UNDERDRAIN		UNDERDRAIN
	LANDSCAPE DRAIN		LANDSCAPE DRAIN
	MANHOLE		MANHOLE
	CATCH BASIN		CATCH BASIN
	CURB INLET		CURB INLET
	END SECTION		END SECTION
	GATE VALVE		GATE VALVE
	HYDRANT		HYDRANT
	OVERHEAD ELECTRICAL LINES		OVERHEAD ELECTRICAL LINES
	FLOOD PLAN CONTOURS		FLOOD PLAN CONTOURS
	SPOT ELEVATION		SPOT ELEVATION
	SURFACE DRAINAGE		SURFACE DRAINAGE
	OVERFLOW ROUTE		OVERFLOW ROUTE
	TREE FENCE		TREE FENCE
	SILT FENCE		SILT FENCE
	PROPOSED DRIVEWAY LOCATION		PROPOSED DRIVEWAY LOCATION
	CROSSING NUMBER		CROSSING NUMBER

**THE DOWNS**

SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS		UTILITY WARNING	
NO.	DESCRIPTION	DATE	REVISION
1.	100% SCHEMATIC DESIGN	06-10-2022	
2.	50% DESIGN DEVELOPMENT	02-03-2023	
3.	FINAL SITE PLAN	04-14-2023	
4.	REV. PER CITY REVIEW	09-08-2023	

UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER, AND NOT FIELD LOCATED.



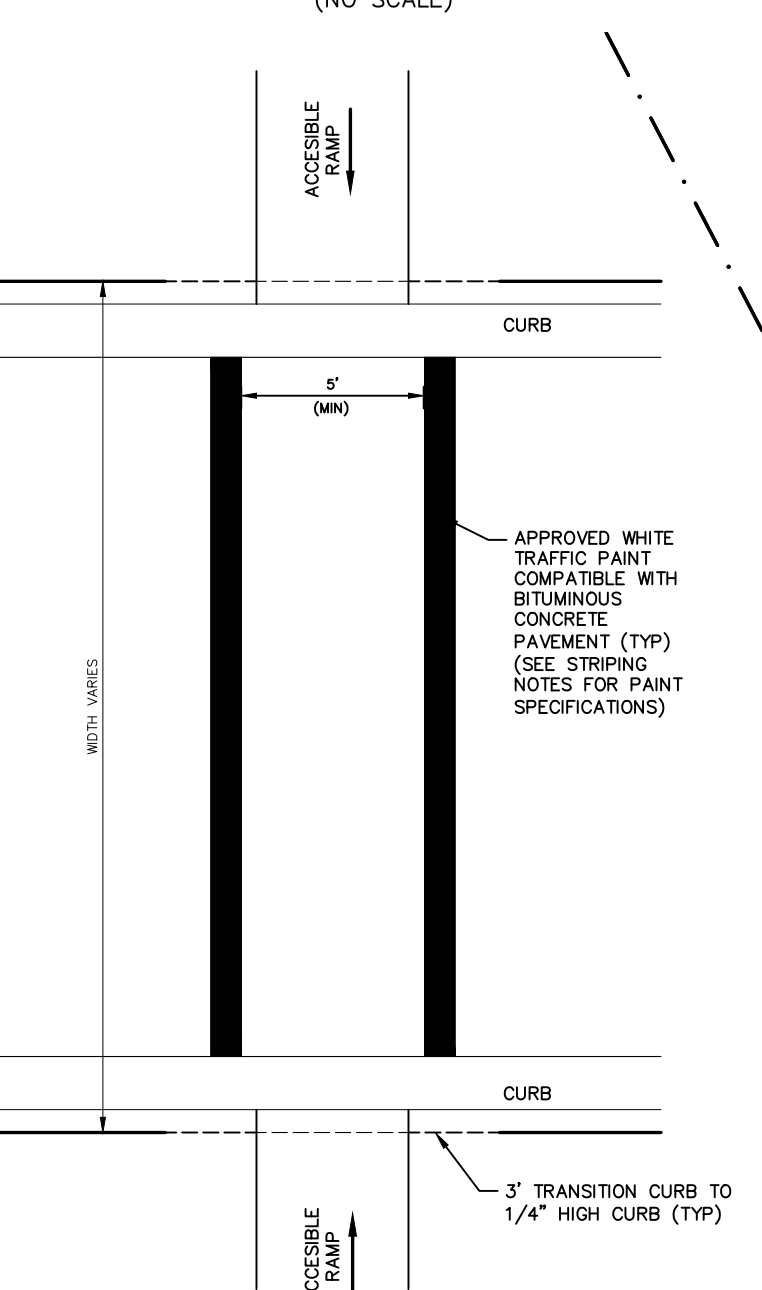
THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF AND/OR RELOCATION OF ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION.

DATE: 04-25-22 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: R.E. FILE: 21001-DETAIL-GR.DWG

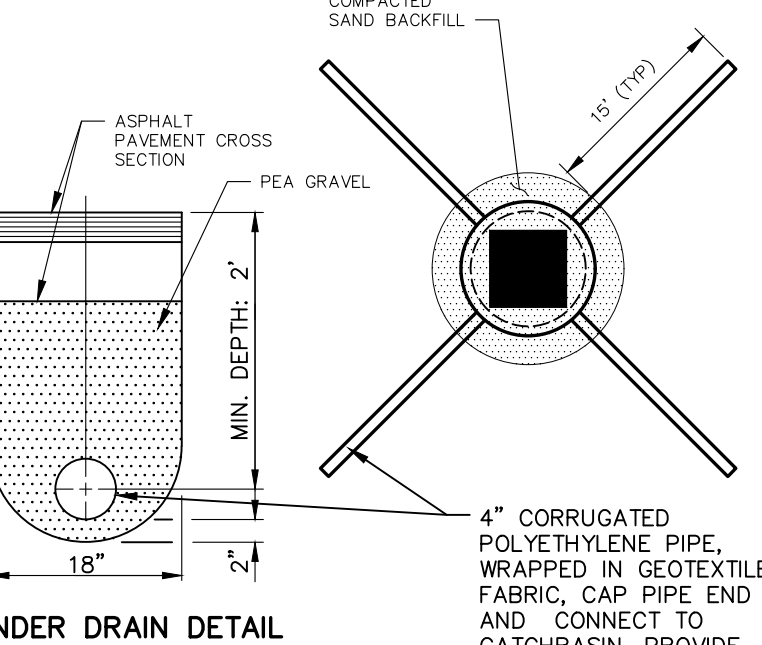
DETAIL GRADING PLAN



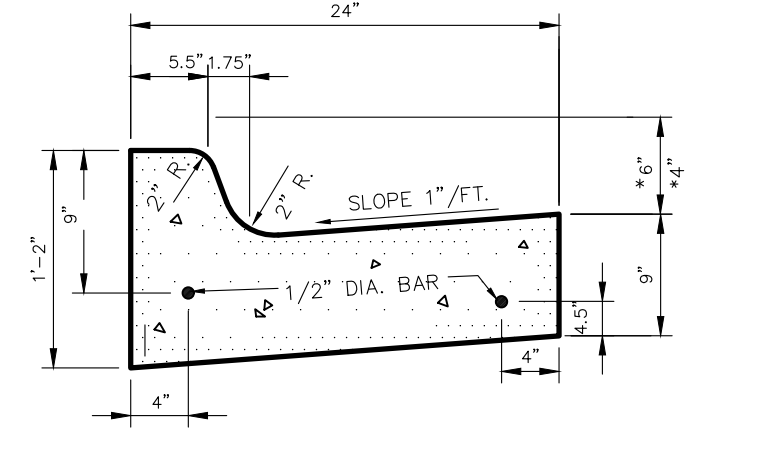
**CROSSWALK MARKING DETAIL (TYP)**  
(NO SCALE)



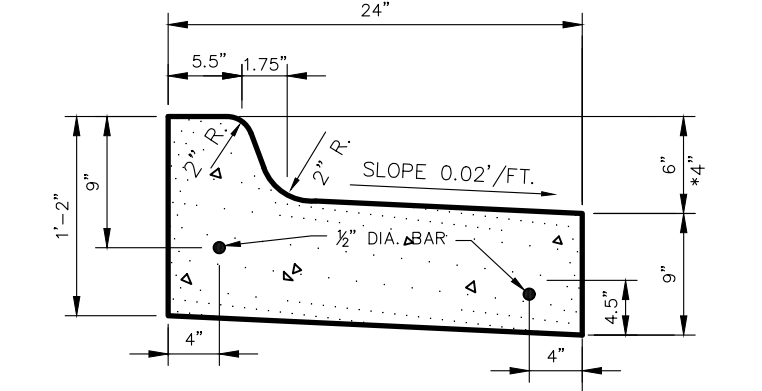
**STRIPING NOTES:**  
PARKING LOTS SHALL HAVE PARKING AREAS AND DRIVEWAYS MARKED BY PAINTED 4-INCH WIDE LINES ACCURATELY AND NEATLY ARRANGED AS INDICATED ON THE PLAN. LINES SHALL BE PAINTED WITH AN APPROVED WHITE TRAFFIC PAINT COMPATIBLE WITH BITUMINOUS CONCRETE SURFACES, SUCH AS SHERWIN WILLIAMS NO. B29W1; PPG TYPE 11-3 OR 11-4, OR AS APPROVED BY THE OWNER. PROTECT ALL PAINTED AREAS UNTIL PAINT IS COMPLETELY DRY. PARKING AREAS FOR THE PHYSICALLY HANDICAPPED SHALL BE PAINTED WITH BLUE PAINT FOR STRIPING AND WHEEL CHAIR SYMBOL. ALL PAINTED MARKINGS AND STRIPING SHALL BE PROVIDED IN TWO COATS. SEE SHEET ND2 FOR CROSS WALK DETAIL.



**PARKING LOT CATCH BASIN DETAIL**



**STANDARD GUTTER DETAIL**



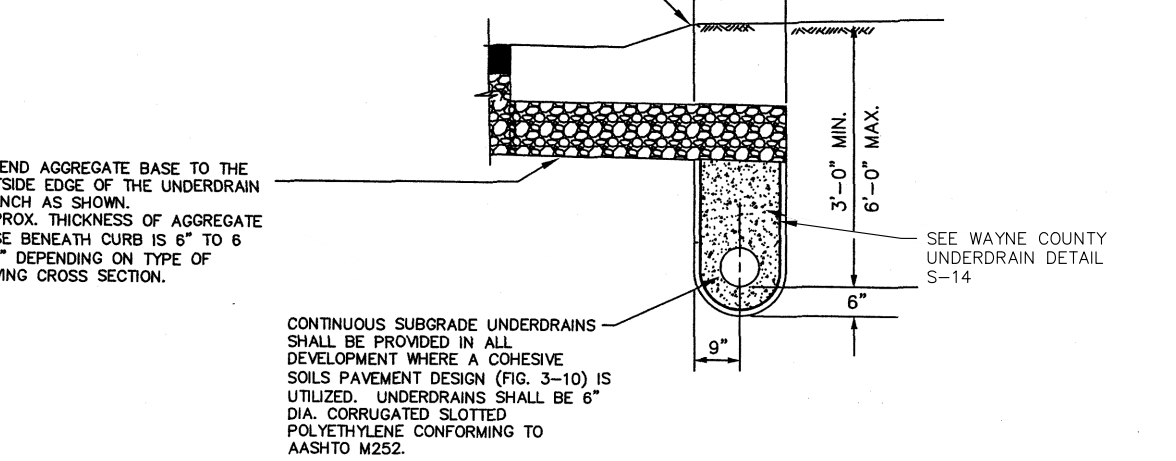
**REVERSE GUTTER DETAIL**



**STANDARD OPERATING PROCEDURES:**

- AS PART OF THE PROJECT, A BROOM SWEEPER WILL BE AS NEEDED.
- THE MAIN ROADWAYS FOR THE PROJECT WILL BE INSTALLED PRIOR TO ABOVE GROUND CONSTRUCTION.
- AS EACH HOME IS COMPLETED THE AREA AROUND THE HOME SHALL BE LANDSCAPED TO ESTABLISH VEGETATION.
- THE CATCH BASIN FILTERS WILL BE CHECKED AND MAINTAINED ON A REGULAR BASIS.
- THE CURB WILL BE BACK FILLED APPROXIMATELY 6" BELOW TOP OF CURB GRADE (SEE DETAIL THIS SHEET).
- THE STANDARD OPERATING PROCEDURES WILL BE STRICTLY ADHERED TO.
- THESE PROCEDURES DO NOT RESTRICT WAYNE COUNTY LEMD IN ANY MANNER FROM MODIFYING, ELIMINATING OR ADDING TO THESE STANDARD OPERATING PROCEDURES OR REQUIRING SESC MEASURES TO BE INSTALLED.

NOTE: 1. UNDERDRAIN MUST BE INSTALLED PRIOR TO CURB & GUTTER FOR PAVEMENT CROSS SECTION



**SEQUENCE OF CONSTRUCTION FOR SOIL EROSION CONTROL UNDER DRAIN DETAIL**

- Install all soil erosion and tree protection fencing as per approved plans. Clear only what is necessary to install fencing.
- Strip and stockpile topsoil in a location approved by the owner/engineer. Placement of additional control measures must be installed on and around the stockpile.
- Construct underground detention basin and Vortechs structure along with applicable storm sewer (short storm sewer lengths, outlet over flow structure). Grade to final elevations, distribute topsoil, seed and stake straw mulch blankets on the slopes of the basin.
- Install utilities (water main, storm sewer, sanitary sewer) complete.
- Install, as per approved plans, the catch basin inlet filters. Inspect and maintain filters as directed to prevent clogging and unnecessary flooding.
- Grade roadway limits and install pavement complete.
- Install all public utilities (gas, electric, telephone, cable) complete.
- Stabilize temporarily or permanently ALL disturbed areas within five (5) days of final grade.
- Inspect and maintain all soil erosion and sedimentation control measures weekly and after every storm event throughout the construction of the project.
- Removal of control measures may only take place once the entire site is fully stabilized. Upon full stabilization is complete, remove the stand pipe and gravel filter. The developer is responsible for all soil erosion control measures.
- All soil erosion controls must be removed from the road right(s)-of-way prior to City of Northville acceptance of the streets(s) for routine maintenance.
- Vegetation must be acceptably established prior to final release of the construction deposit by the City of Northville.

**INSPECTION & MAINTENANCE SCHEDULE FOR SOIL EROSION CONTROL**

CONTRACTOR SHALL MAINTAIN ALL SOIL EROSION CONTROLS WEEKLY AFTER EVERY STORM EVENT.

**RIP-RAP**

INSPECTIONS SHOULD BE MADE OF ALL RIP-RAPPED SITES IMMEDIATELY AFTER THE FIRST RAINFALL FOLLOWING INSTALLATION. THIS IS PARTICULARLY IMPORTANT IN AREAS WHERE RIP-RAP THAT IS DISPLACED DURING THE STORM WOULD IMPACT CULVERTS. THEREFORE, RIP-RAP SITES SHOULD BE CHECKED FOLLOWING STORMS, ESPECIALLY THOSE WHICH ARE NEAR OR EXCEED STORM FREQUENCY USED IN THE DESIGN. DISPLACED RIP-RAP SHOULD BE REMOVED FROM ITS DOWNSTREAM LOCATION AND NEW RIP-RAP PLACED ACCORDING TO THE ENGINEERED SPECIFICATIONS.

**SPOIL PILES**

WHEN VEGETATION STABILIZATION IS PROMPTLY AND EFFECTIVELY APPLIED, VERY LITTLE MAINTENANCE IS REQUIRED. THE GUIDELINES BELOW SHOULD BE FOLLOWED ON ALL SITES: (1) PERIODIC INSPECTIONS SHOULD BE DONE TO ENSURE EXCESSIVE EROSION HASN'T OCCURRED. IF RUN OFF OR WIND EROSION HAS OCCURRED, REDUCE THE SIDE OF SLOPES OF THE SPOIL PILE, OR STABILIZE THE SPOIL PILE WITH PIECES OF SOIL LAD PERPENDICULAR TO THE SLOPE, AND STAKED. (2) WHEN FILTER FENCING IS USED AROUND A SPOIL PILE, PERIODIC CHECKS SHOULD BE MADE TO ENSURE THAT PILING HAS NOT OCCURRED UNDER FENCING, AND TO ENSURE THE FENCE HAS NOT COLLAPSED DUE TO SOIL SLIPPING. ACCESS BY CONSTRUCTION EQUIPMENT, REPAIR ANY DAMAGED FENCING IMMEDIATELY. (3) BERMS AT THE BASE OF THE SPOIL PILE WHICH BECAME DAMAGED SHOULD BE REPLACED.

**CATCH BASIN FILTERS**

EFFECTIVE FILTERS WILL COLLECT SEDIMENT, PARTICULARLY WHEN THE SOIL IS SANDY. THESE FILTERS MUST BE CLEANED PERIODICALLY, SO THEY DON'T BECOME CLOGGED AND CAUSE FLOODING CONDITIONS, PIPING, OR OVERTOPPING OF THE CONTROL STRUCTURES. MAINTENANCE OF THESE ITEMS REQUIRES INSPECTION WEEKLY OR AFTER EACH RAIN EVENT. ALSO, THESE ITEMS ARE REUSABLE IF MAINTAINED CORRECTLY. THEY CAN BE REMOVED, EMPTIED, CLEANED AND REPLACED WITHOUT PURCHASING NEW ONES.

**SILT FENCE**

SILT FENCES SHOULD BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND SEVERAL TIMES DURING PROLONGED RAINFALLS. IF THE FENCE IS SAGGING OR THE SOIL HAS REACHED ONE HALF THE HEIGHT OF THE FABRIC, THE SOIL BEHIND THE FABRIC MUST BE REMOVED AND DISPOSED OF IN A STABLE UPLAND SITE. THE SOIL CAN BE ADDED TO THE SPOIL PILE. IF THE FABRIC IS BEING UNDERCUT (i.e. IF THE WATER IS SEEPING UNDER THE FENCE), THE FENCE SHOULD BE REMOVED AND REINSTALLED FOLLOWING THE GIVEN PROCEDURES. FABRIC WHICH DECOMPOSES OR OTHERWISE BECOMES INEFFECTIVE SHOULD BE REMOVED AND REPLACED WITH NEW FILTER FABRIC IMMEDIATELY. FILTER FENCES SHOULD BE REMOVED ONCE VEGETATION IS WELL ESTABLISHED AND THE UP-SLOPE AREA IS FULLY STABILIZED OR UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

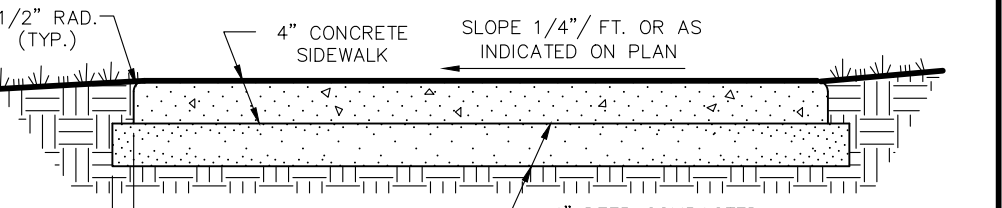
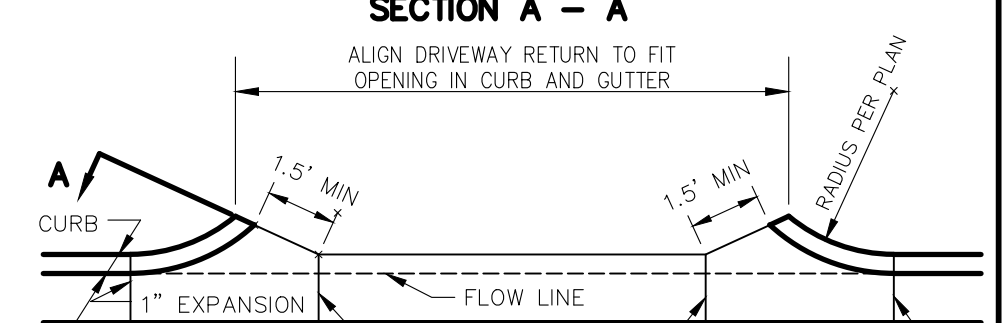
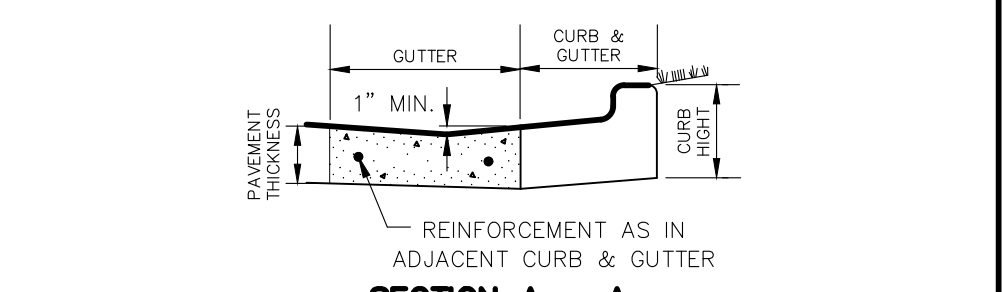
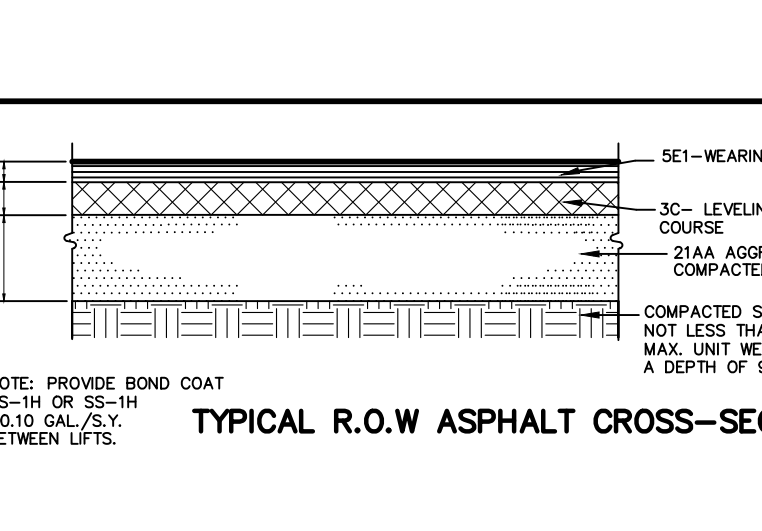
**SEEDING, SODDING & MULCHING**

SEEDED, SODDED OR MULCHED AREAS SHOULD BE CHECKED FOLLOWING EACH RAIN TO ENSURE THE MATERIAL IS STAYING IN PLACE. ADDITIONAL TRACKING MATERIALS OR NETTING MAY BE NEEDED TO BE APPLIED TO HOLD THE AFOREMENTIONED MATERIALS IN PLACE. MAINTENANCE PROCEDURES SHOULD ALSO BE FOLLOWED FOR THE BMP'S WHICH WERE IMPLEMENTED TO KEEP ERODED SOIL OR CONCENTRATED RUNOFF AWAY FROM THESE TARGET AREAS.

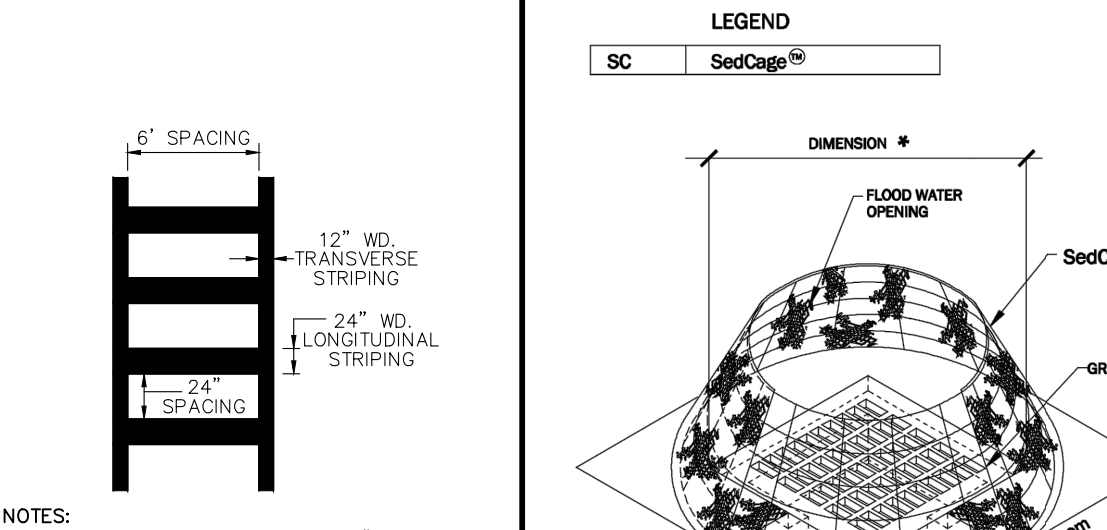
**ACCESS ROAD**

PROPER MAINTENANCE INCLUDES ADDING ADDITIONAL LAYERS OF STONE WHEN THE ORIGINAL STONE BECOMES COVERED WITH MUD. AFTER EACH STORM EVENT, INSPECT THE ROAD FOR EROSION AND MAKE ANY NECESSARY REPAIRS. IT IS ALSO IMPORTANT TO CHECK AND MAINTAIN ANY BMP'S WHICH ARE USED IN CONJUNCTION WITH THIS BMP, ESPECIALLY THOSE FOR DRAINAGE. ALL SEDIMENT DROPPED OR GROZED ONTO PUBLIC RIGHT-OF-WAY SHOULD BE REMOVED IMMEDIATELY BY SWEEPING.

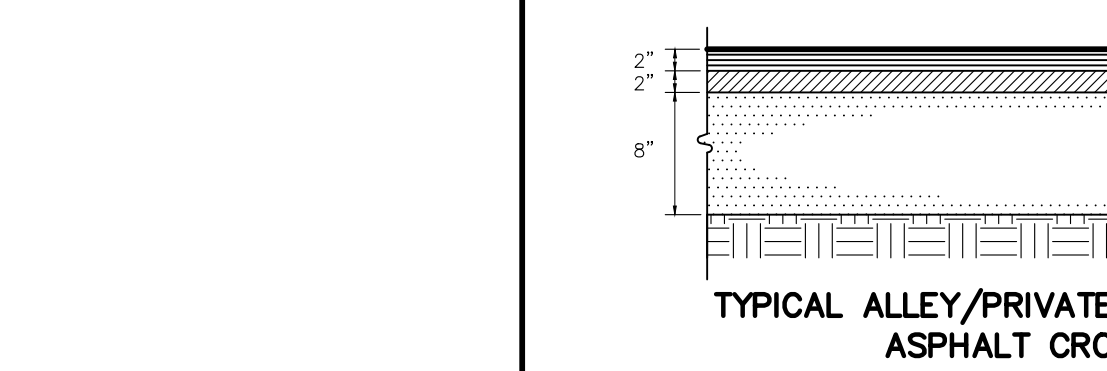
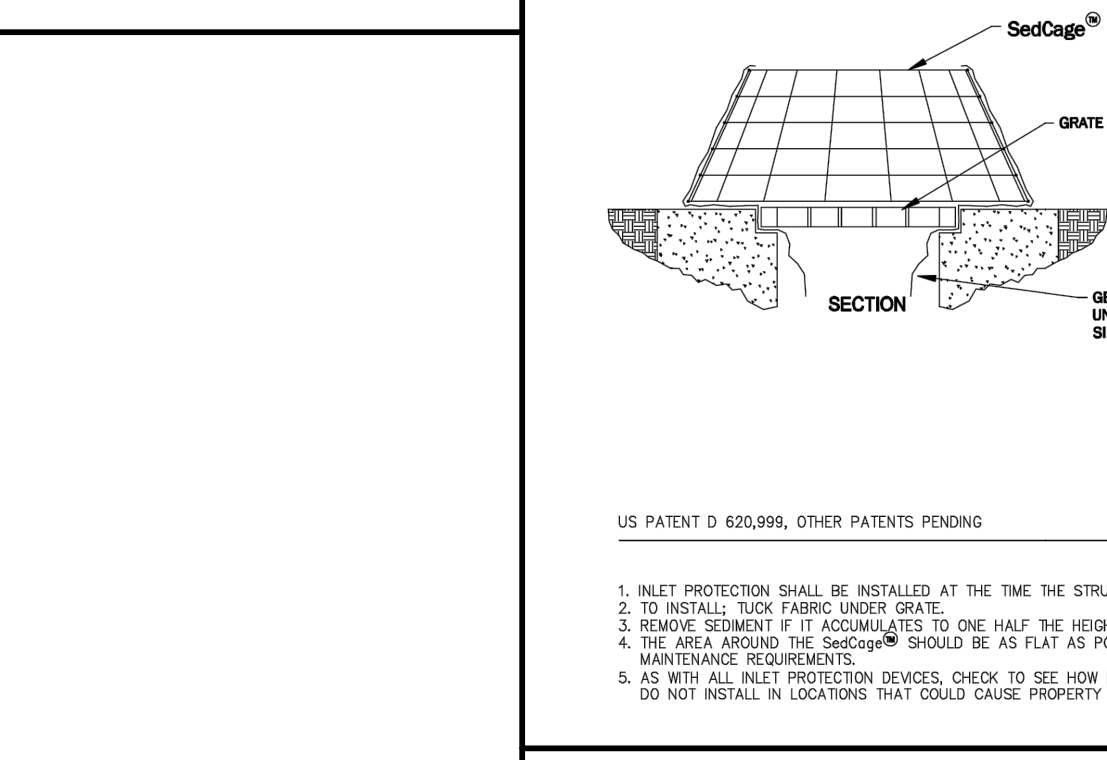
**TYPICAL R.O.W ASPHALT CROSS-SECTION**



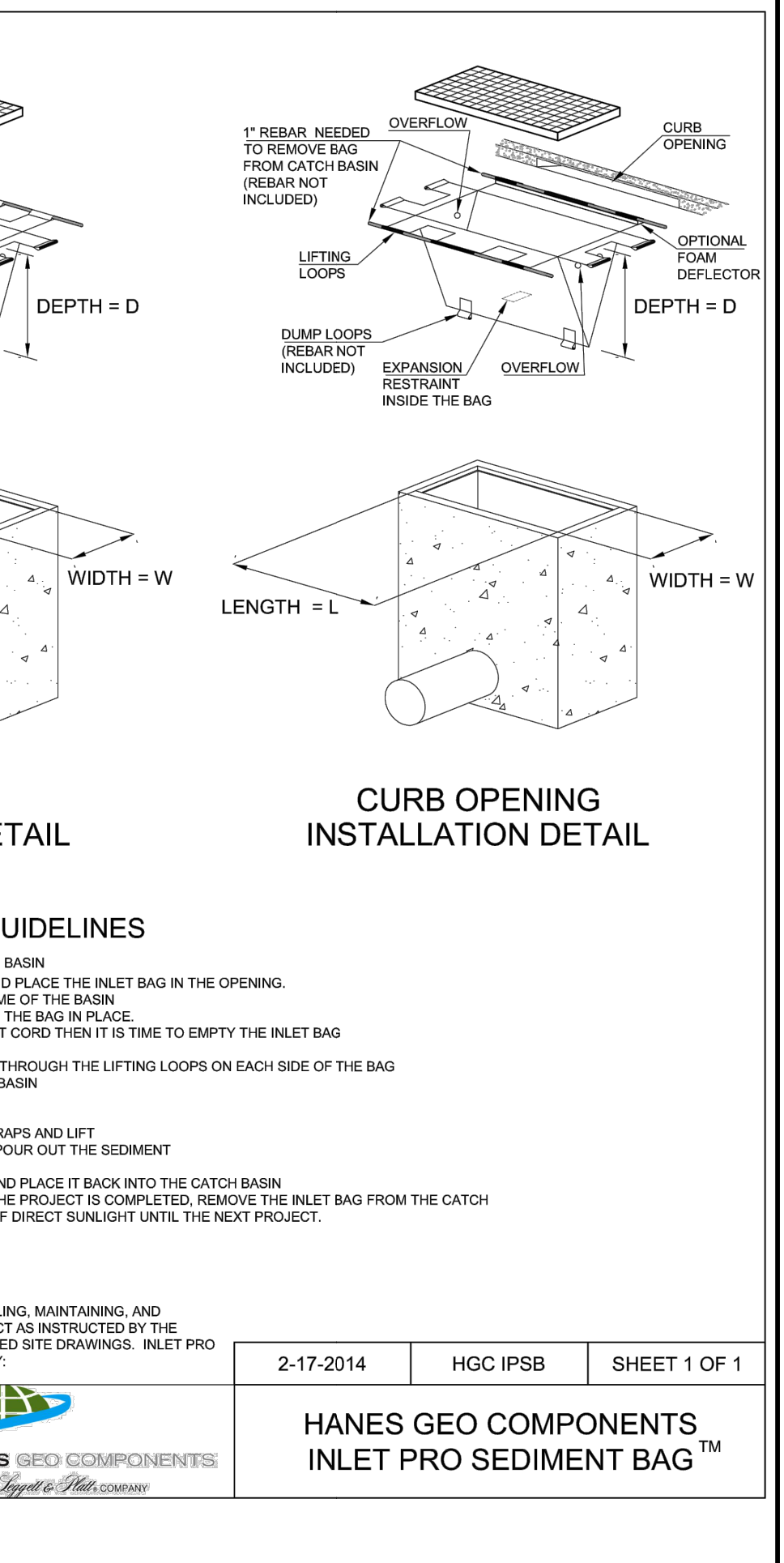
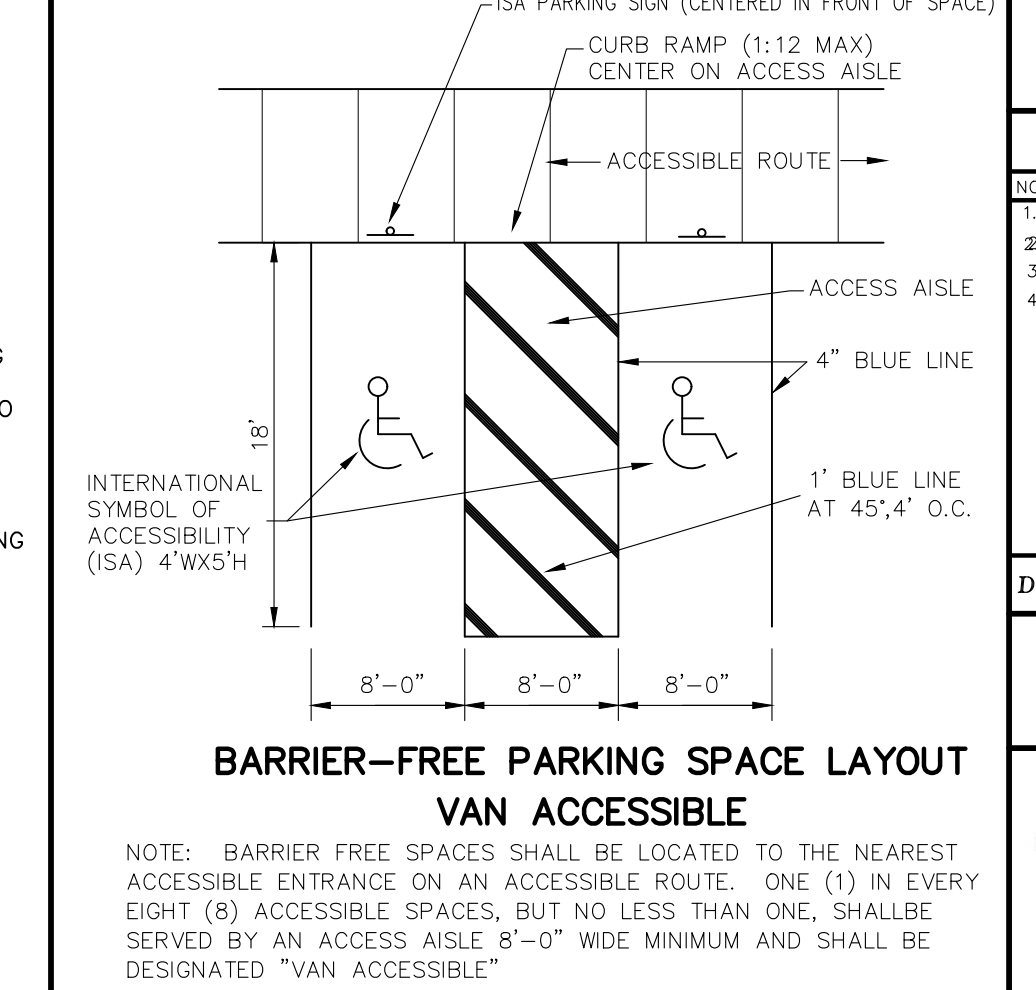
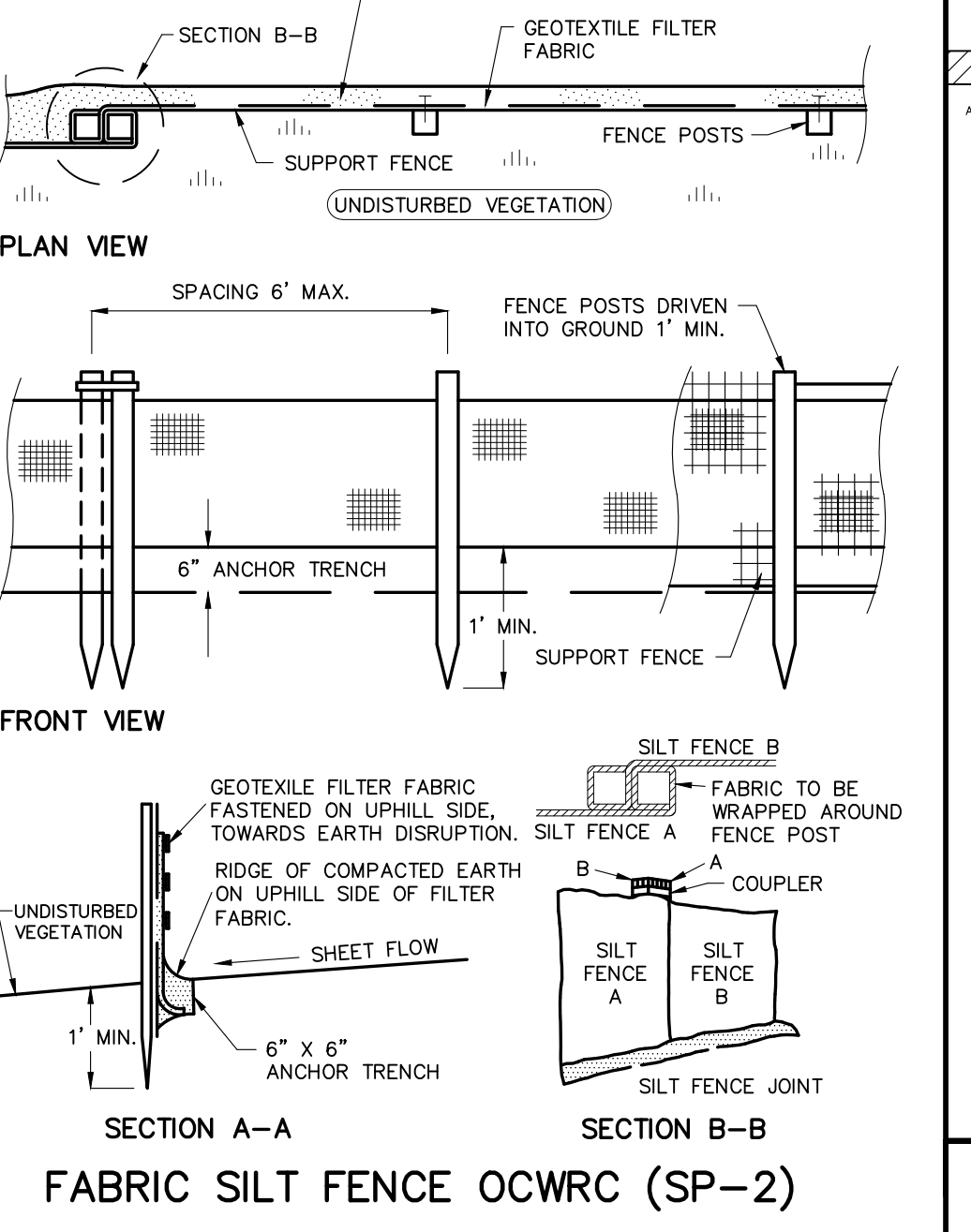
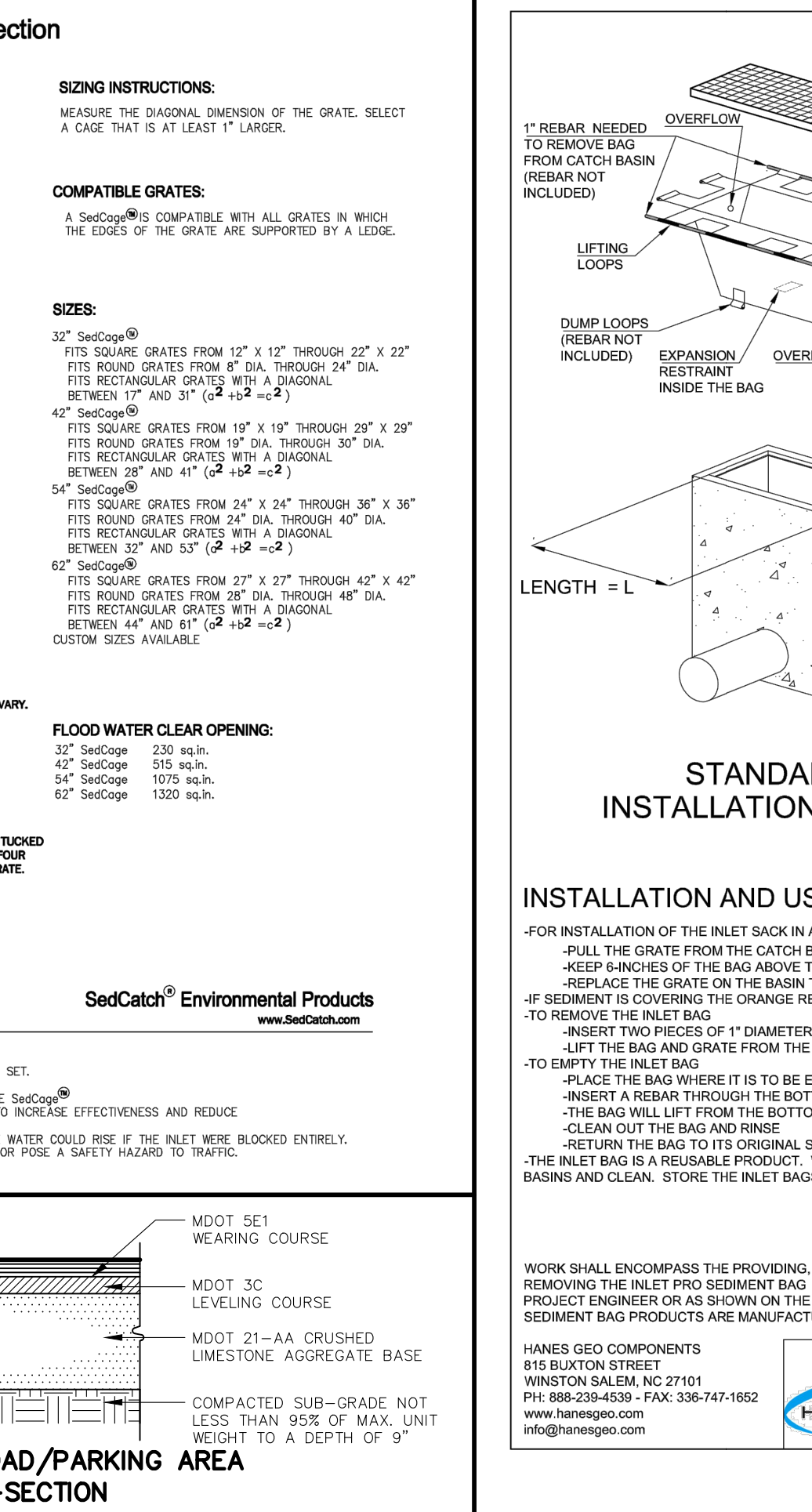
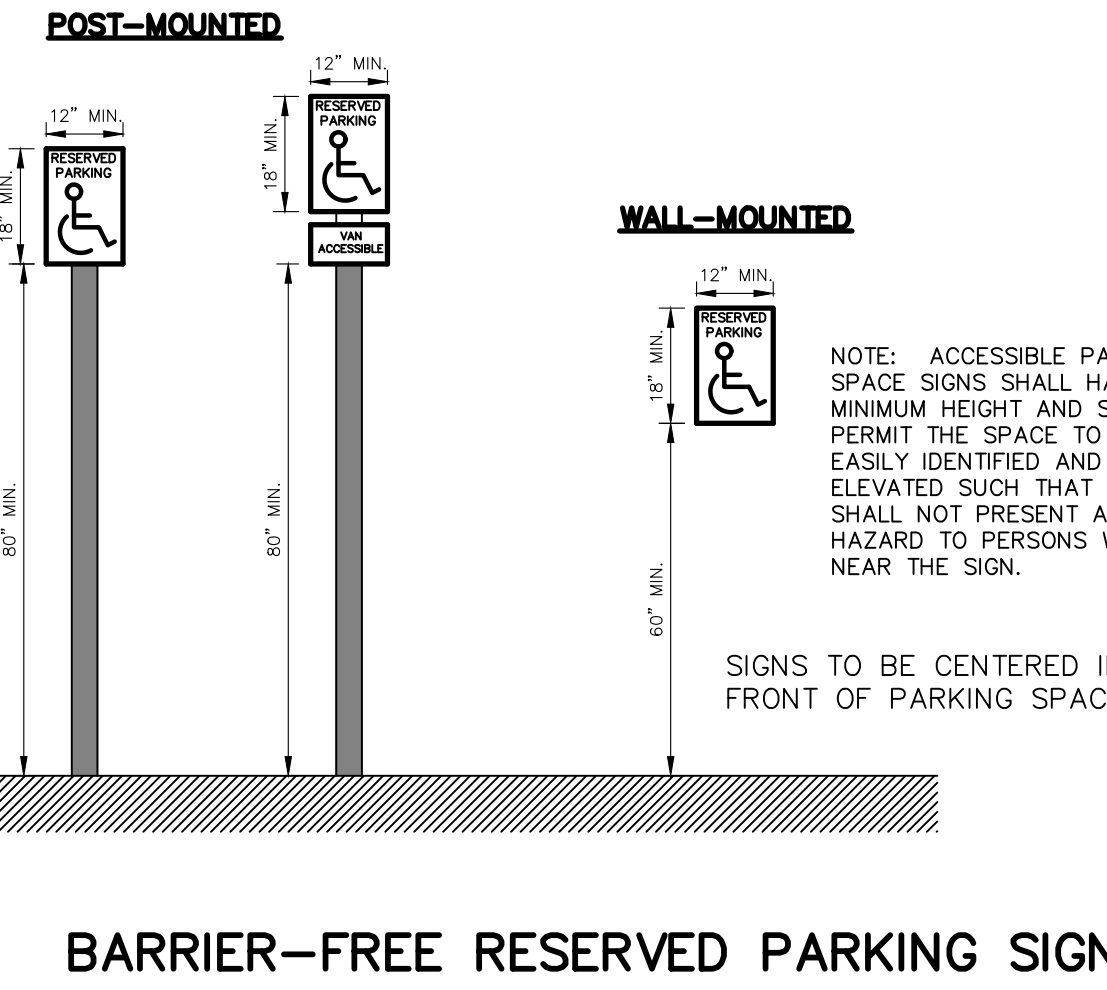
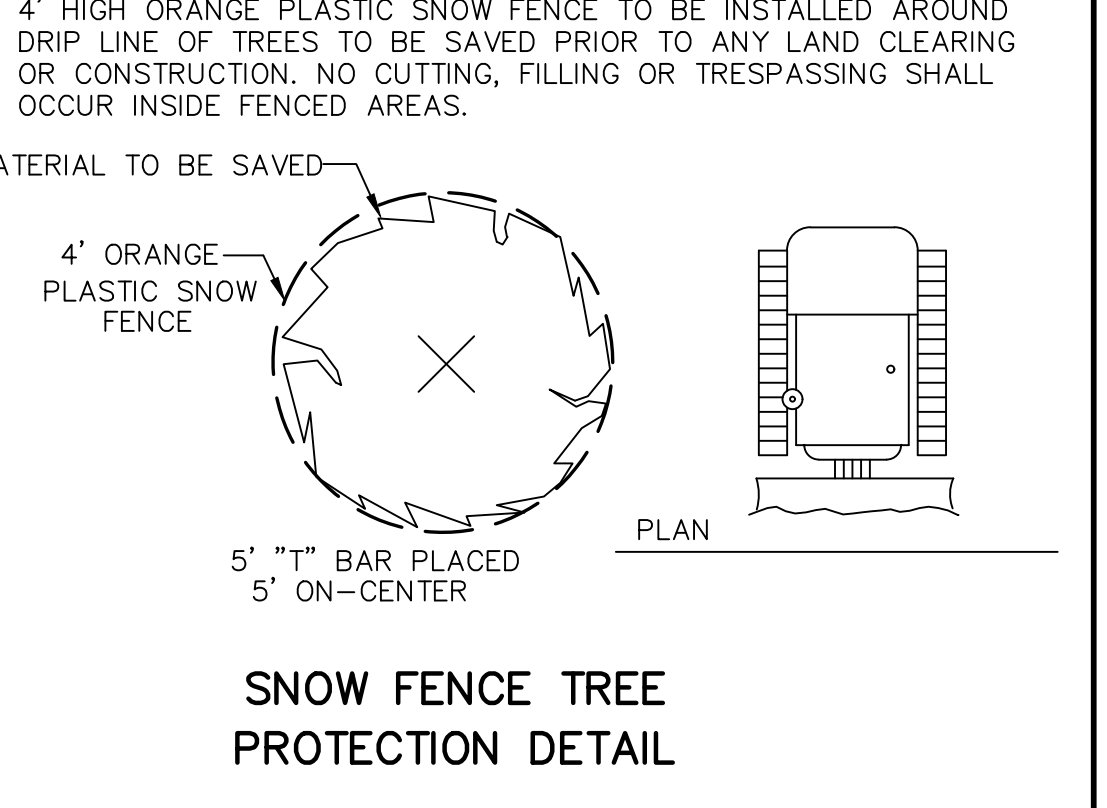
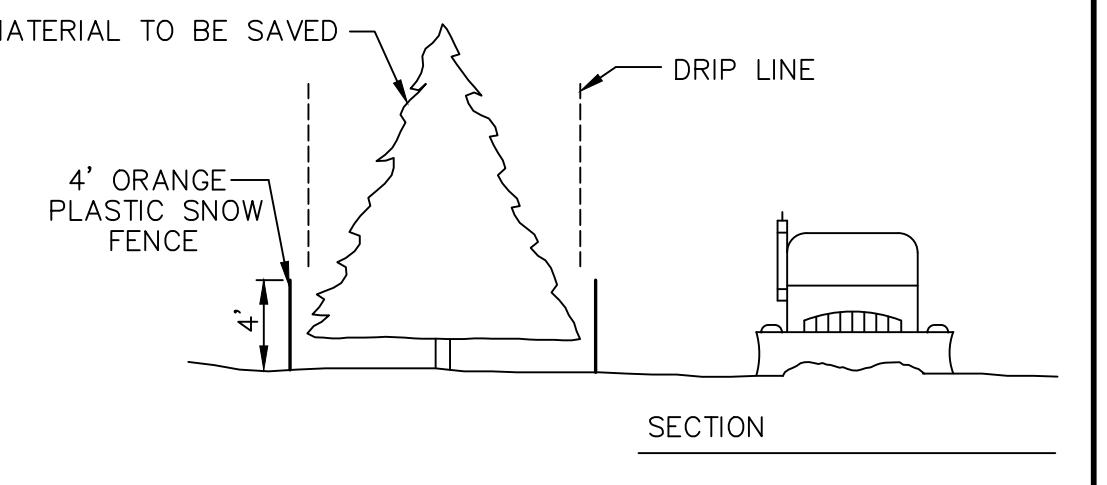
**CROSSWALK DETAIL**



**SED-CATCH® SedCage® - Yard Inlet Protection**



Start Day	End Day	SEQUENCE OF CONSTRUCTION FOR SOIL EROSION CONTROL:
8/01/2023	8/03/2023	Install mud tracking mat at construction entrance.
8/01/2023	8/05/2023	Install silt fence and tree fence as shown on the Soil Erosion Control Plan.
8/01/2023	8/30/2023	Clearing/Grubbing and Demo
9/01/2023	9/8/2023	Strip topsoil in areas to be graded.
9/9/2023	9/30/2023	Mass grading. Establish vegetation in all disturbed areas. Vegetation shall be established within 5 days of final grade, or whenever disturbed areas will remain unchanged for 30 days or greater.
10/01/2023	10/30/2023	Install underground detention basins
11/1/2023	11/30/2023	Install sanitary sewer. Immediately establish vegetation on all offsite areas at completion.
11/15/2023	11/30/2023	Install water main. Immediately establish vegetation on all offsite areas at completion.
12/01/2023	01/15/2024	Grading/Road Preparation (The grade behind the curb shall be excavated 6 inches below the top of curb and temporary seed and mulch shall be placed in the area from back of curb to 10 feet off back of curb.)
12/15/2023	1/15/2024	Install storm sewer. Install silt sacks on all roadway catch basins and inlets and install Streamguard Exten filters on yard catch basins. Establish vegetation on swales and ditches. Immediately establish vegetation on all disturbed areas with an approved seed mix. Install erosion blankets where required on all steep slopes.
4/01/2024	4/30/2024	Install road stone base.
5/01/2024	5/30/2024	Install road paving.



NO.	ITEM	DATE
1.	PRELIMINARY DESIGN	06-10-2022
2.	ADDITIONAL INFORMATION DRIVE	09-05-2023
3.	FINAL SITE PLAN	04-14-2023
4.	REV PER CITY REVIEW	09-08-2023

DATE: 04-25-23 DESIGNED BY: S.M. CHECKED BY: P.E. JOB NUMBER: 21-001 FILE: 21001-ND-FSP.DWG

**REVISIONS**

**UTILITY WARNING**  
UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.

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

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF AND/OR RELOCATION OF ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION.

**NOTES AND DETAILS**

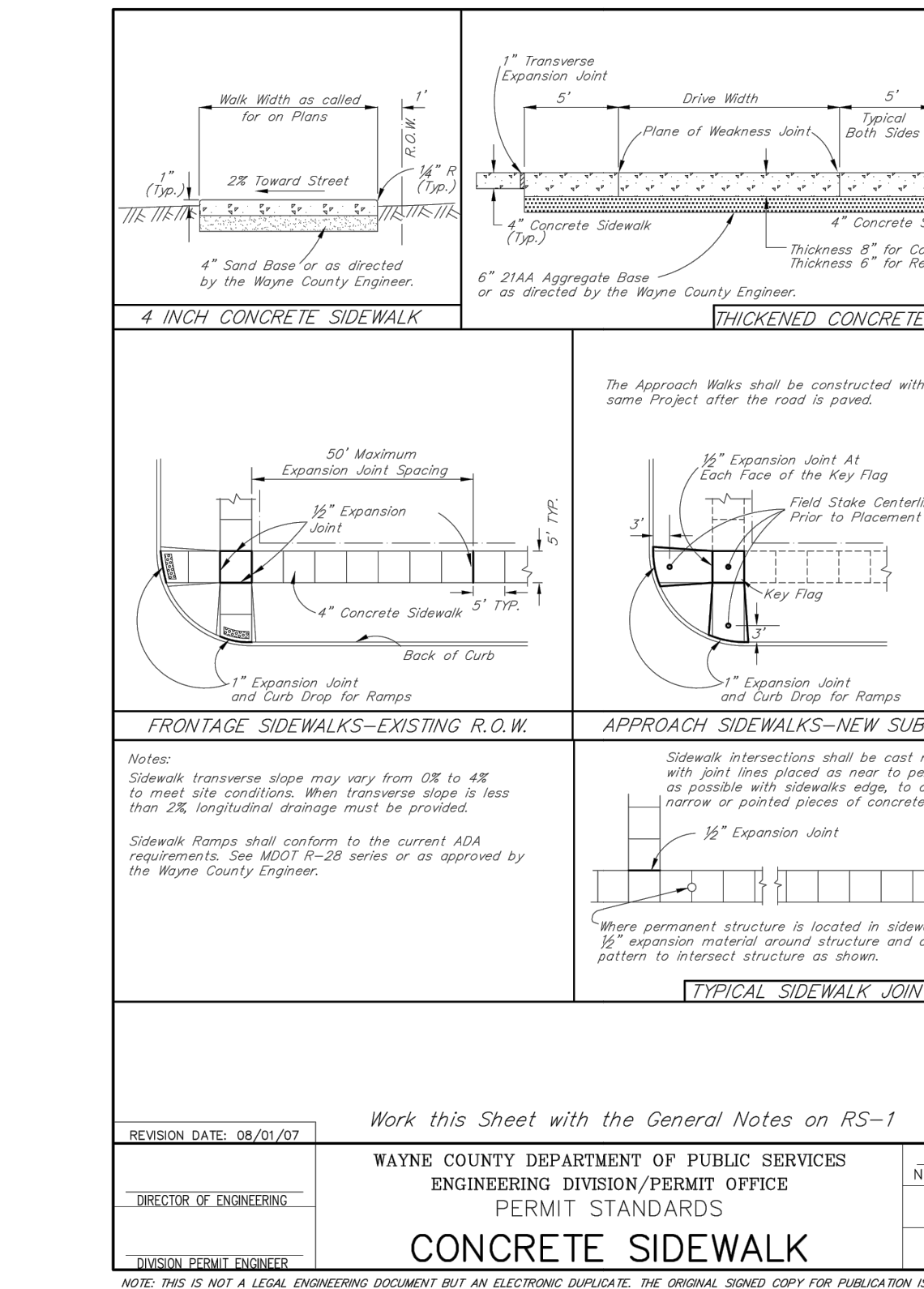
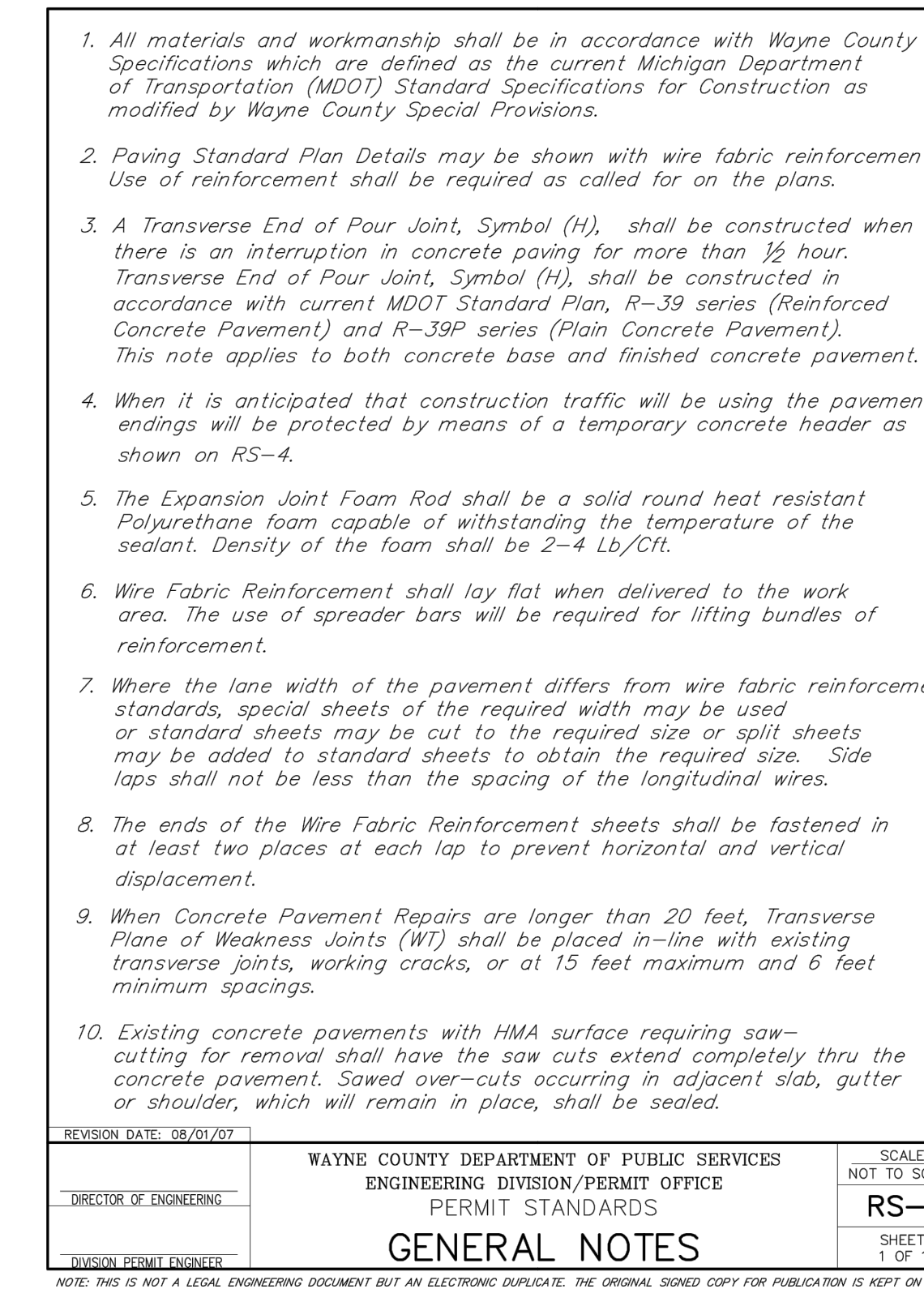
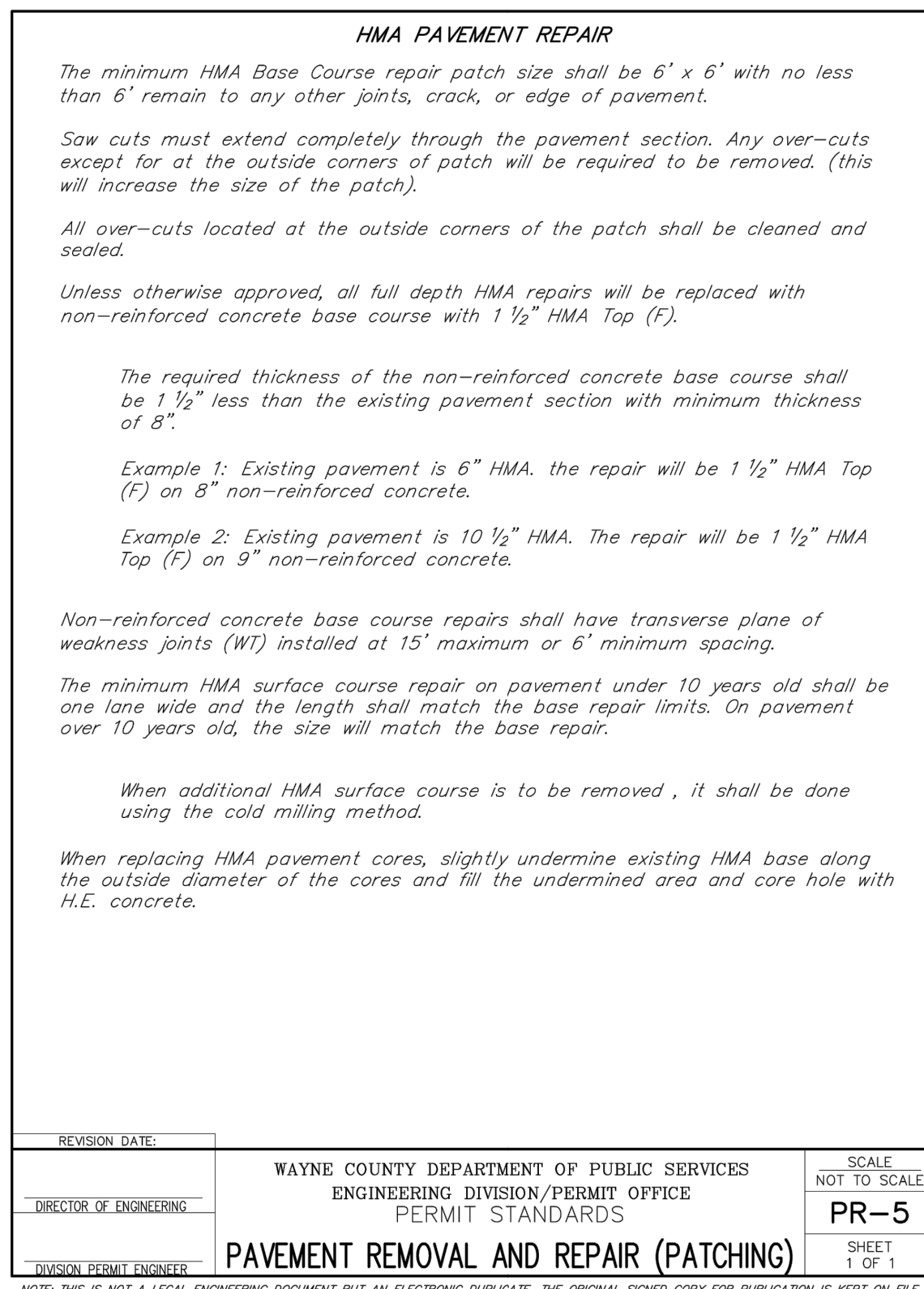
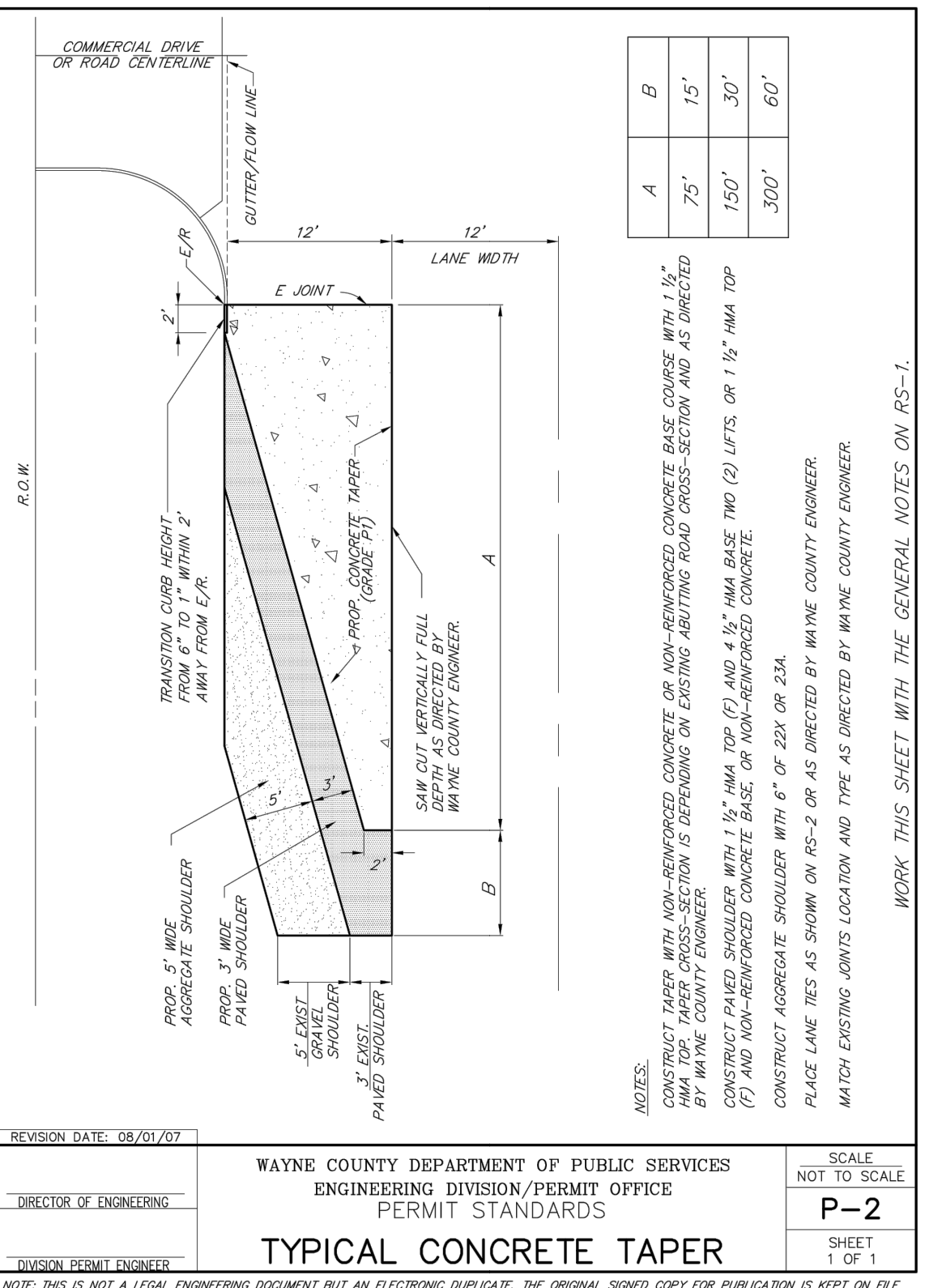
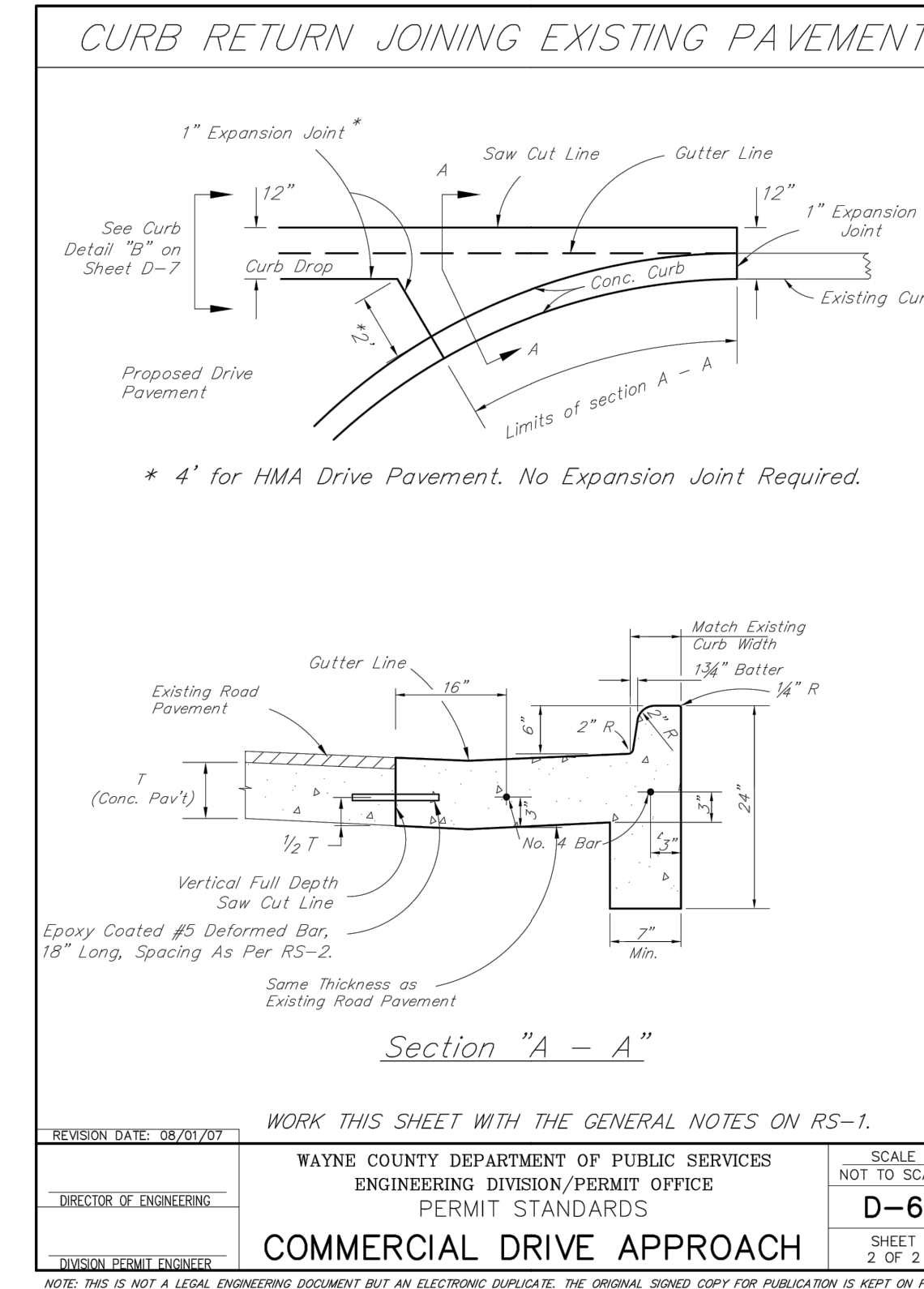
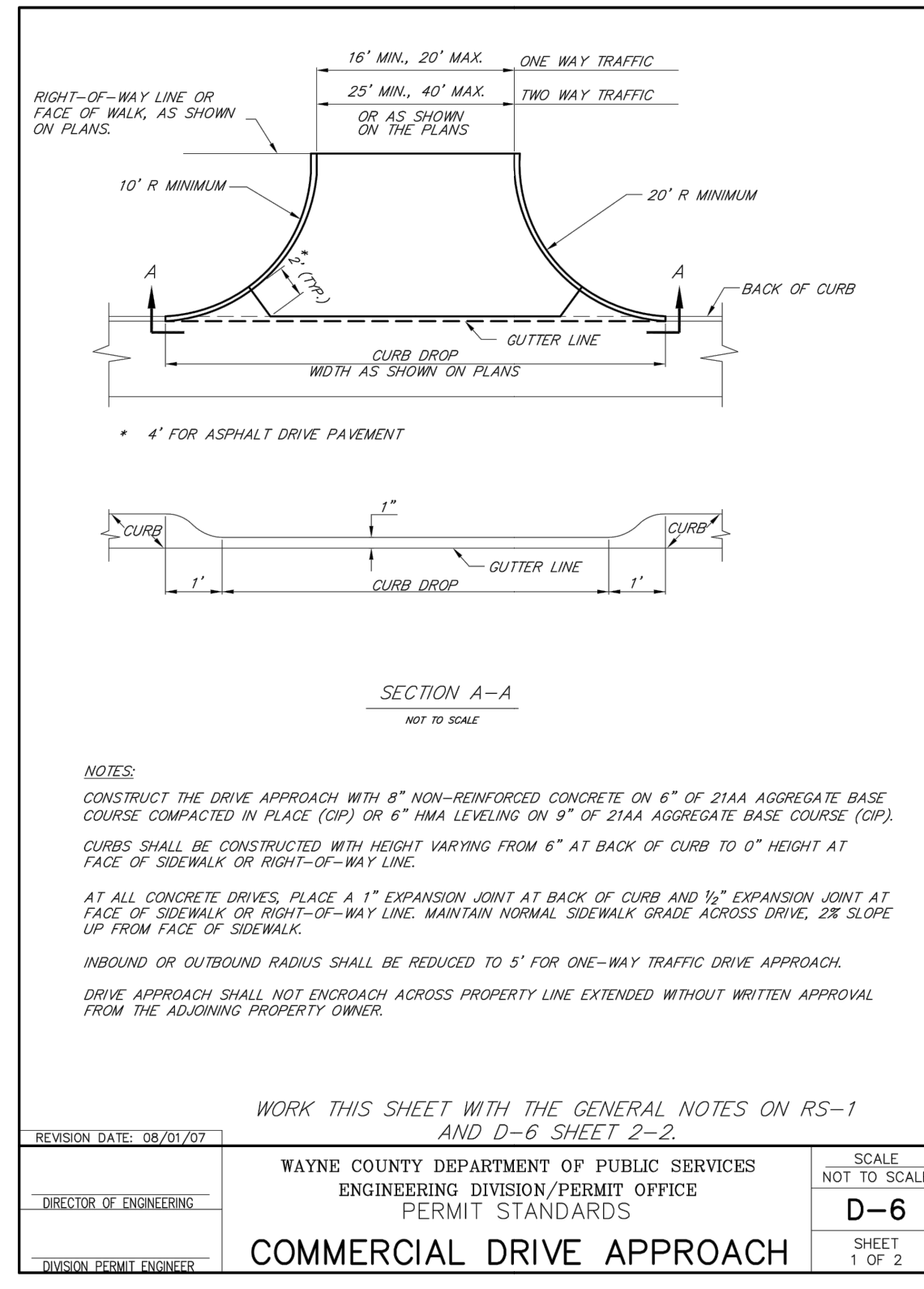
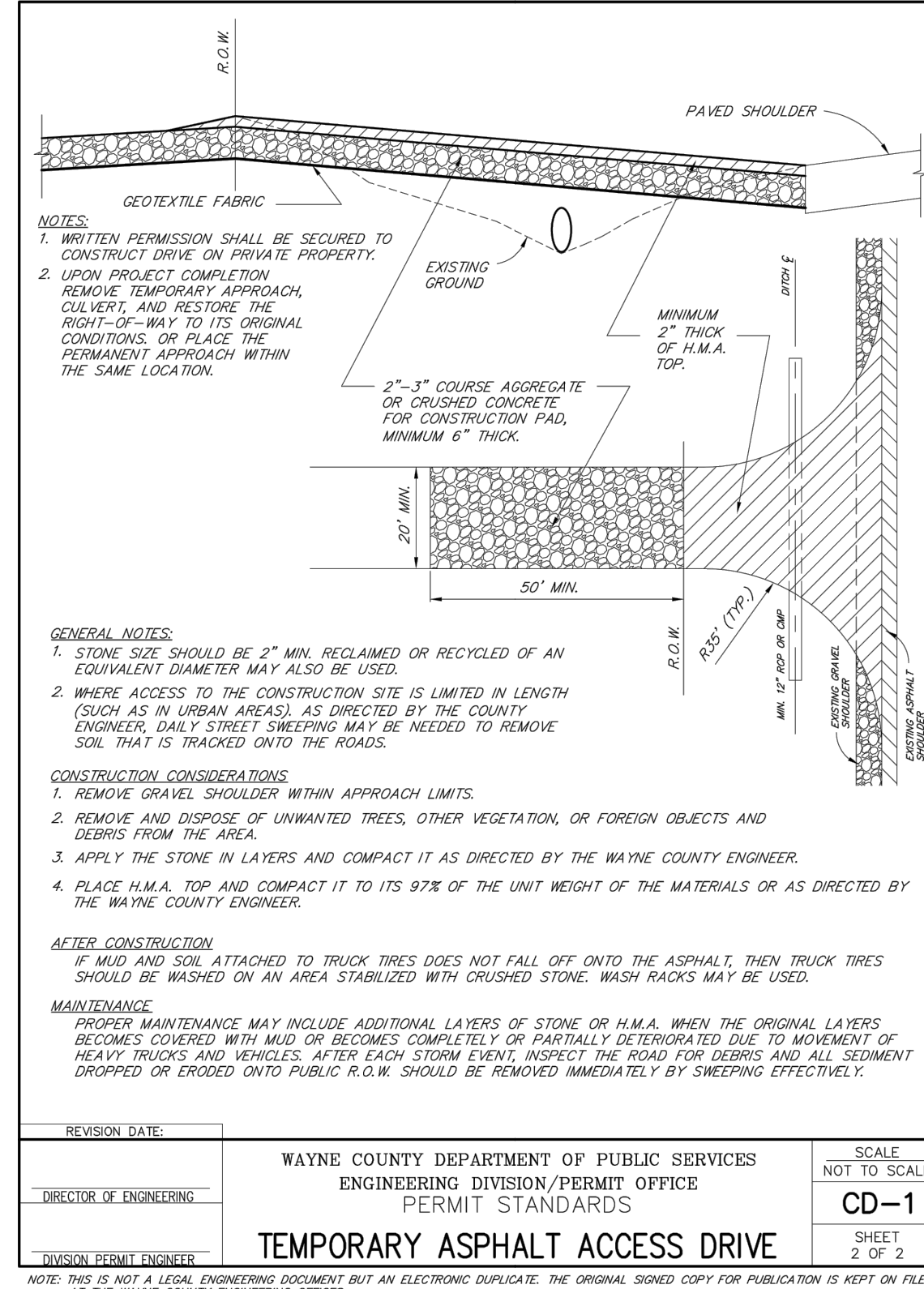
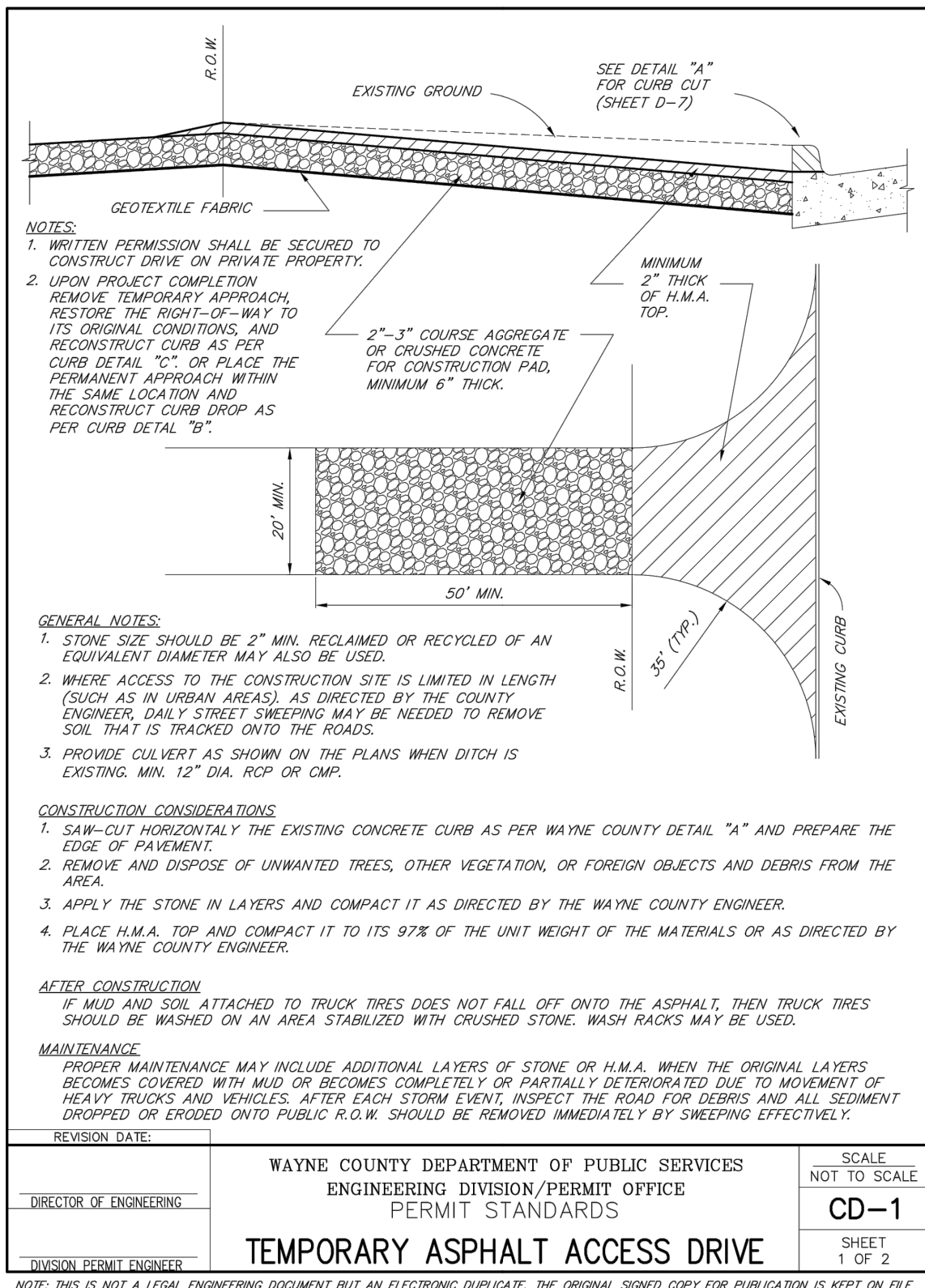
**SEIBER KEAST LEHNER**  
ENGINEERING | SURVEYING  
39205 COUNTRY CLUB DRIVE, SUITE C8  
FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

**SHEET ND**









**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS			UTILITY WARNING
NO.	ITEM	DATE	UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THE PLAN, WERE OBTAINED FROM UTILITY OWNER AND NOT FIELD LOCATED.  <b>811</b> Know what's below. Call before you dig.  THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF AND/OR RELOCATION OF ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION.
1.	TYPE SCHEMATIC DESIGN	06-10-2022	
2.	SOB DESIGN DEVELOPMENT	02-03-2023	
3.	FINAL SITE PLAN	04-14-2023	
4.	REV PER CITY REVIEW	09-08-2023	

DATE: 04-25-22 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: E.E. FILE: 21001-ND-PSP.DWG

**WAYNE COUNTY STANDARD DETAILS**

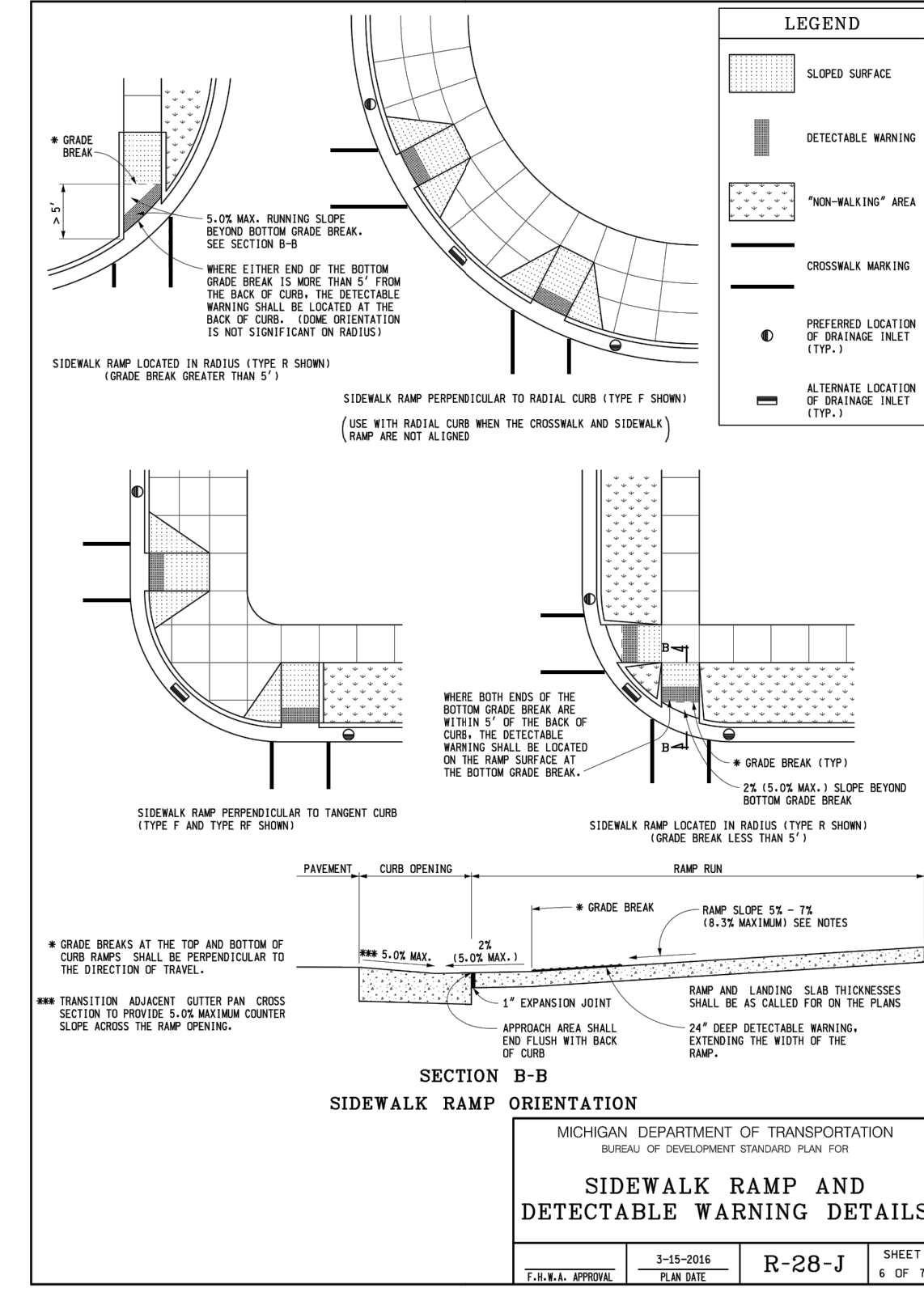
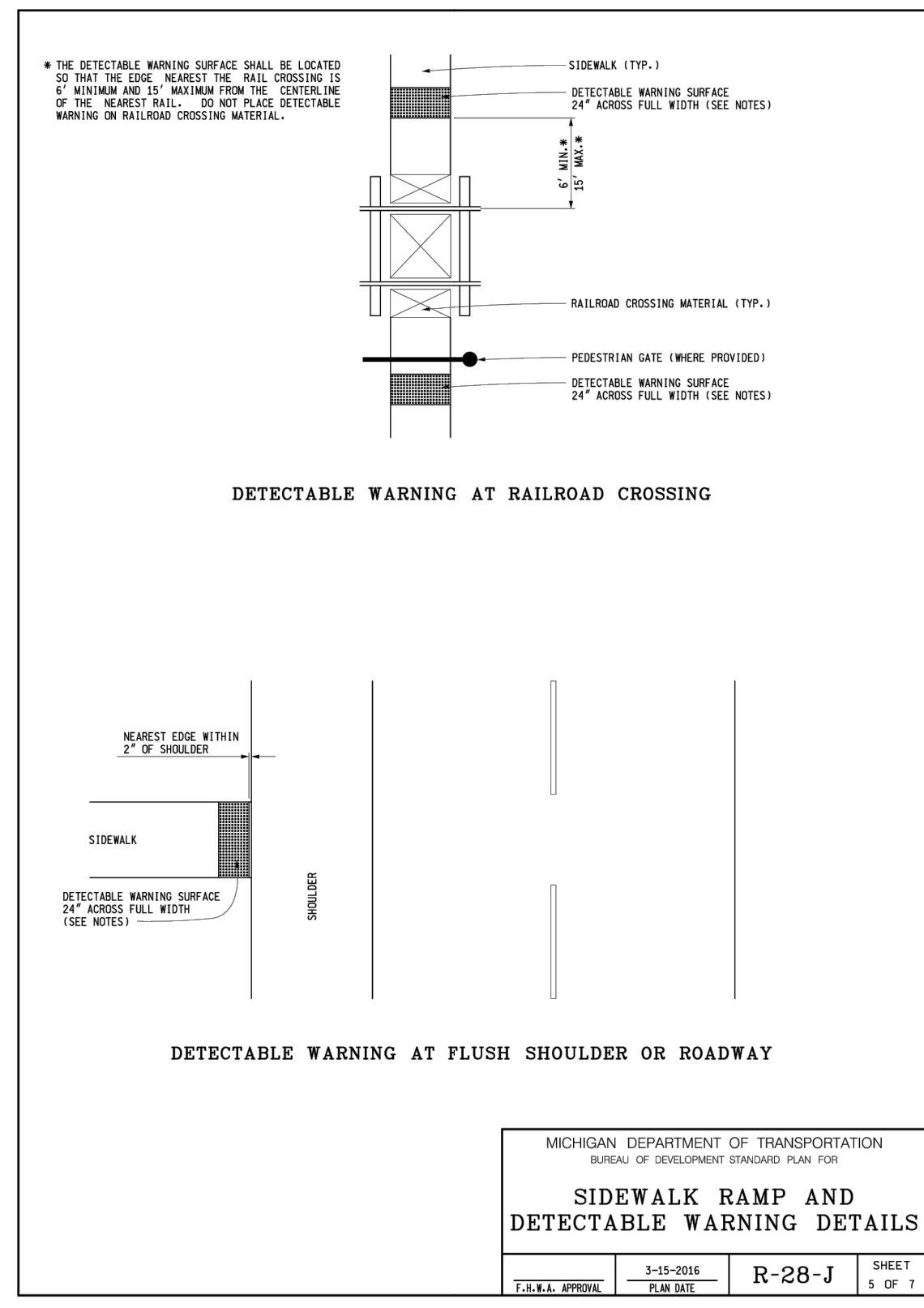
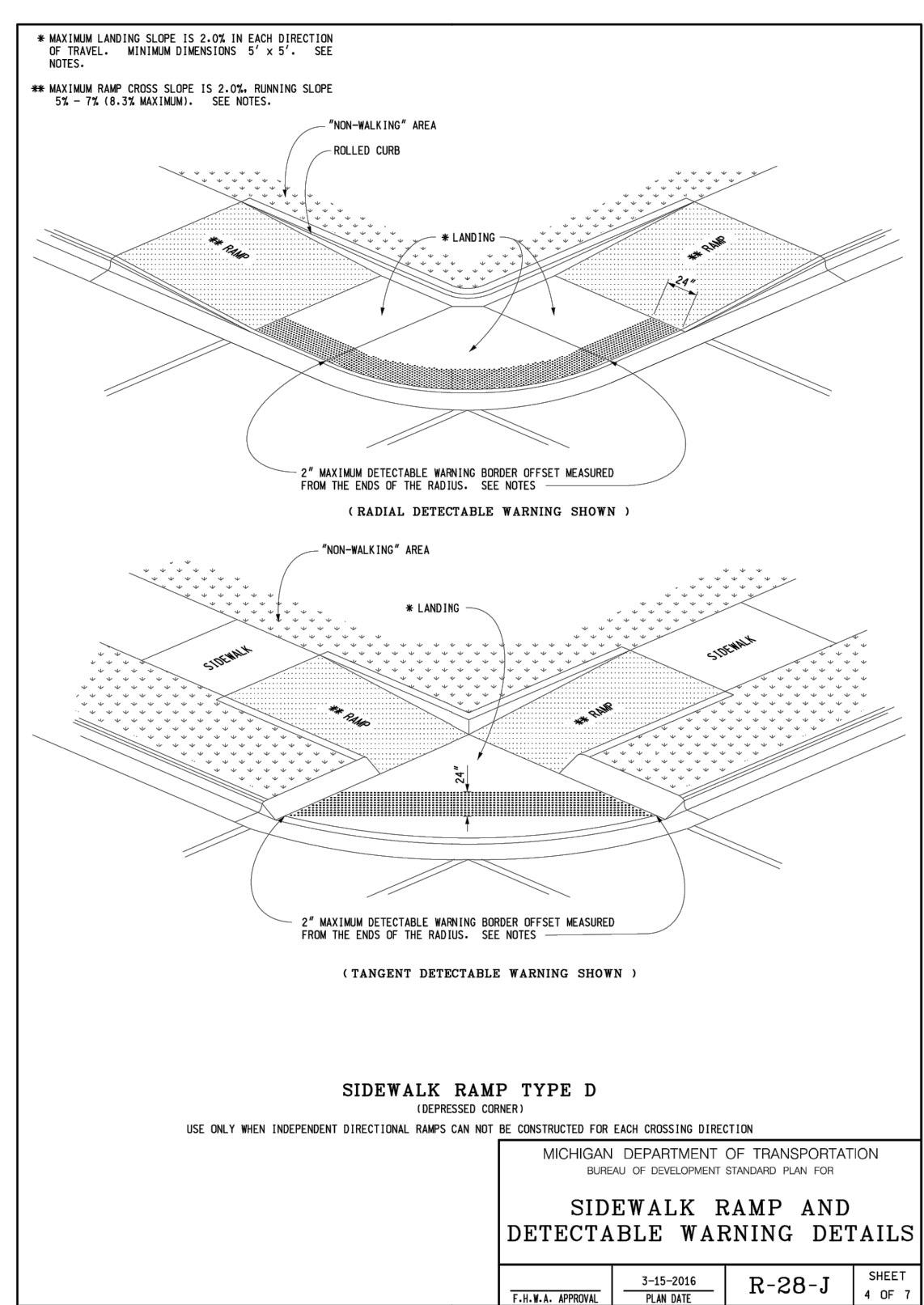
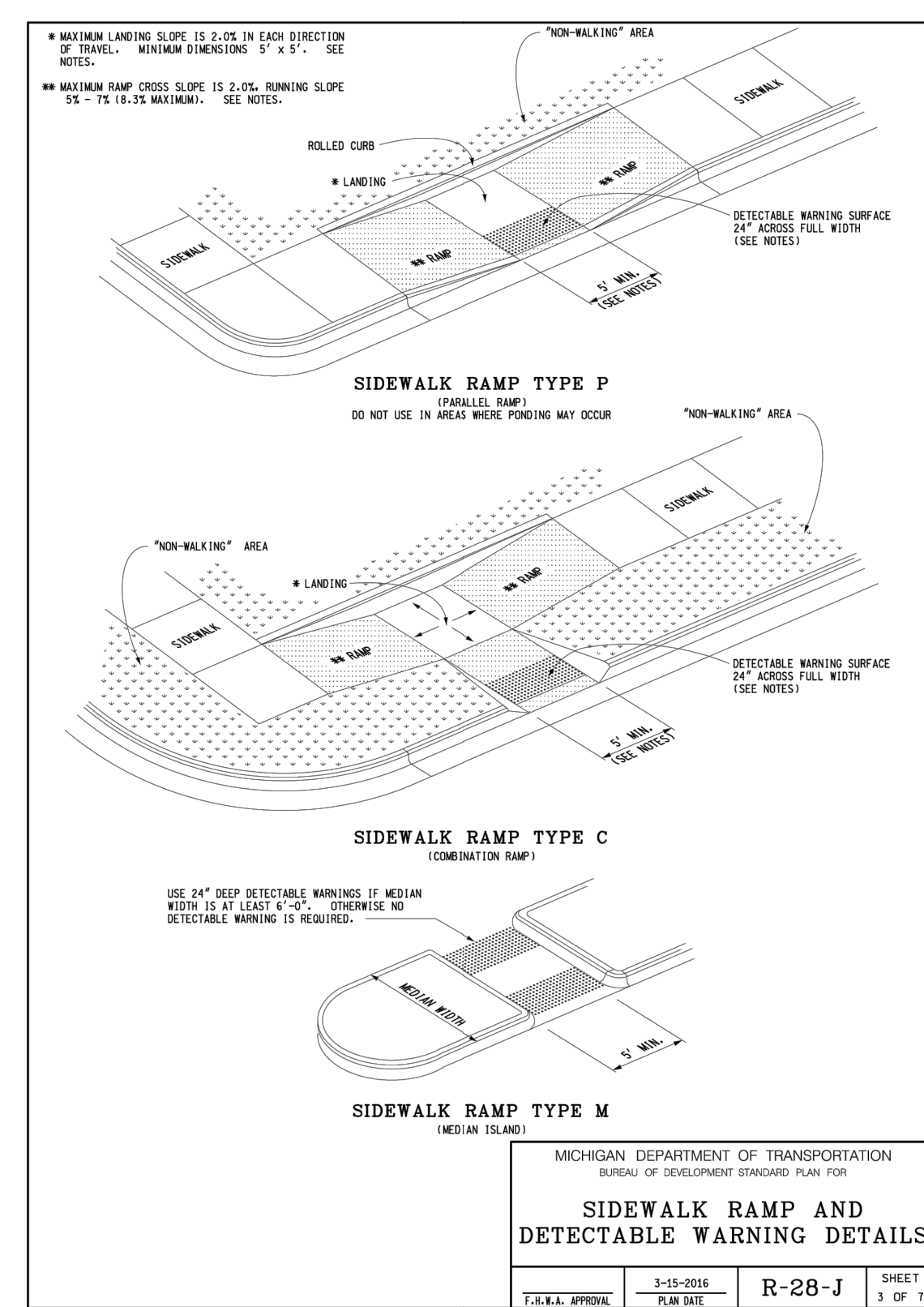
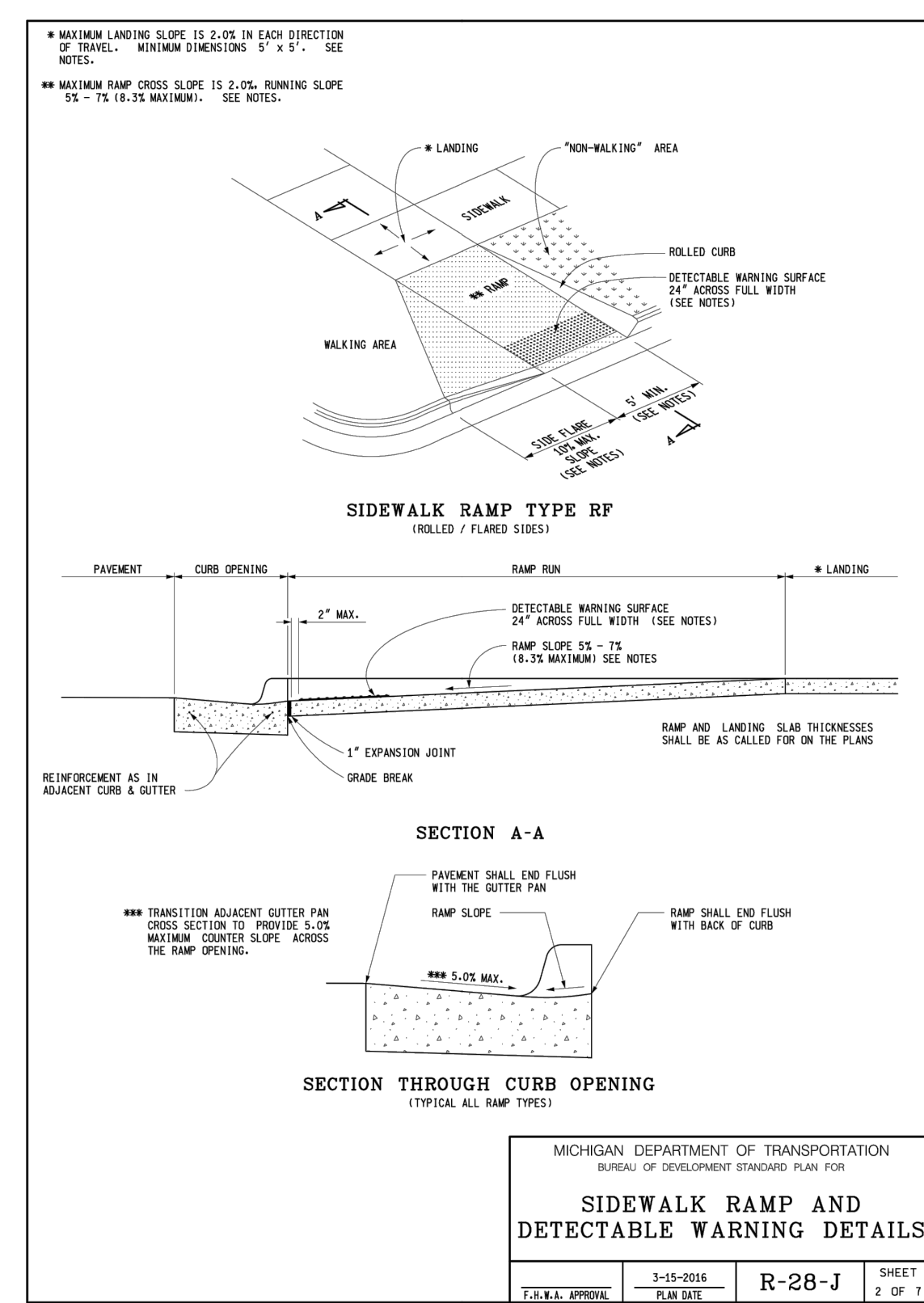
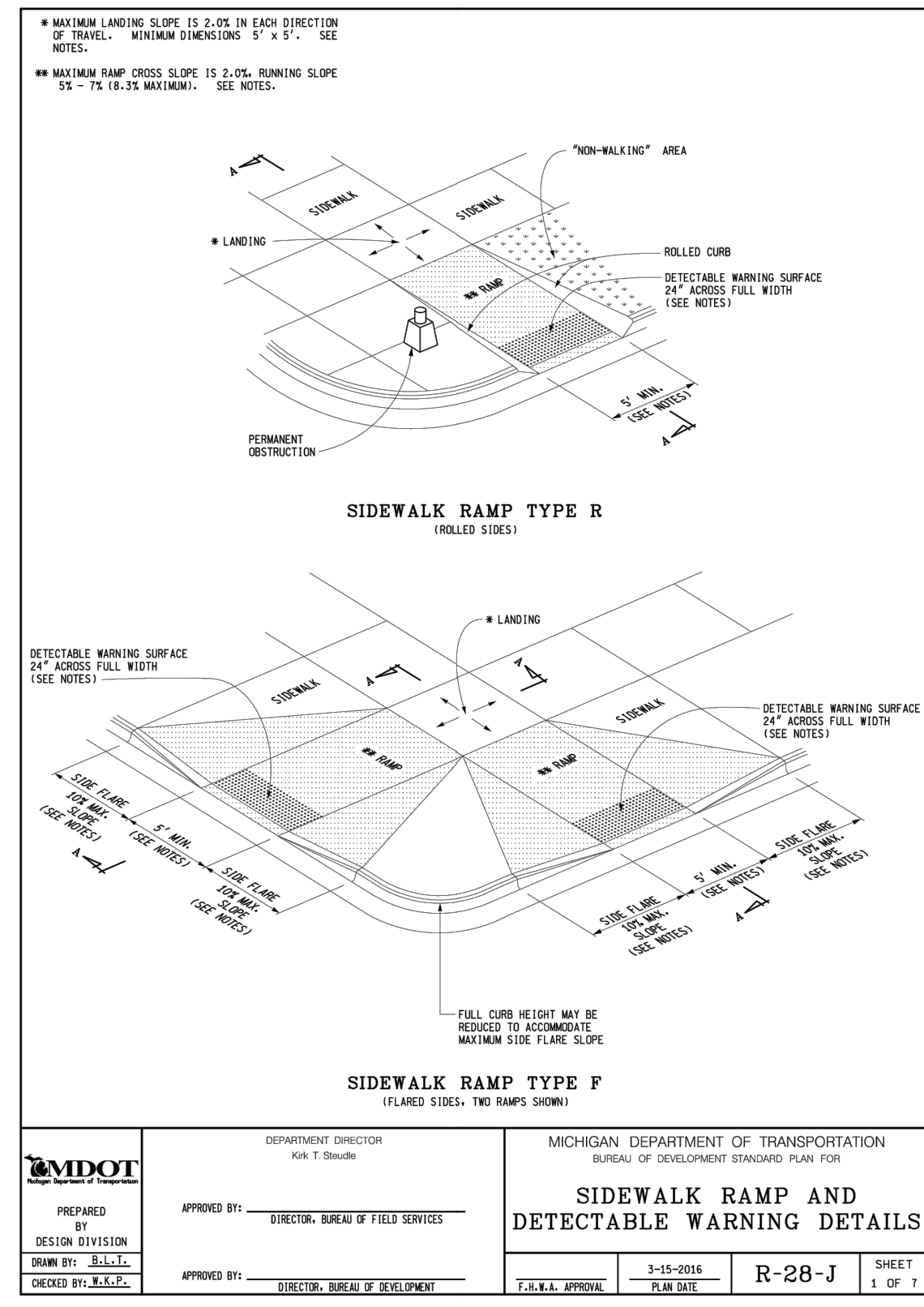
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SHEET **WC-1**









**THE DOWNS**  
SECTION 3, T1S, R8E, CITY OF NORTHVILLE  
WAYNE COUNTY, MICHIGAN

REVISIONS			UTILITY WARNING
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1.	LOGIC SCHEMATIC DESIGN	06-10-2022	
2.	SOPE DESIGN DEVELOPMENT	02-03-2023	
3.	FINAL SITE PLAN	04-14-2023	
4.	REV PER CITY REVIEW	09-08-2023	

DATE: 04-25-22 DESIGNED BY: S.M. JOB NUMBER: 21-001  
CHECKED BY: F.E. FILE: 21001-ND-PSP.DWG

**ADA RAMP DETAILS**

**SEIBER KEAST LEHNER**  
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FARMINGTON HILLS, MI 48331  
PHONE: 248.308.3331

SHEET  
**M-1**

THE DOWNS: NORTHVILLE, MICHIGAN. SECTION 3, T1S, R8E. CITY OF NORTHVILLE, WAYNE COUNTY, MICHIGAN. 1/17/2023 10:42 AM