

LEGEND:

- 5' THICK CONCRETE WALK (E/C401)
- ASPHALT SURFACE (B/C401)
- BIKE PATH
- CURB & GUTTER (ACCEPT) (A/C401)
- CURB & GUTTER (REJECT) (A/C401)
- PROPOSED BIOINFILTRATION (B/C403)

GENERAL NOTES:

1. THE UNDERGROUND UTILITY INFORMATION SHOWN ON THIS DRAWING IS BASED ON FIELD LOCATIONS AND/OR RECORDS FURNISHED BY MUNICIPALITIES AND UTILITY COMPANIES. THE LOCATION AND ACCURACY OF WHICH CANNOT BE GUARANTEED. THERE MAY BE ADDITIONAL UNDERGROUND UTILITY INSTALLATIONS WITHIN THE PROJECT AREA THAT ARE NOT SHOWN.
2. VERIFY ACTUAL LOCATIONS AND INVERTS IN THE FIELD. ANY POTENTIAL ERRORS, OMISSIONS, OR DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
3. WORK TO BE COMPLETED IS INDICATED IN BOLD TYPE LINES AND EXISTING CONDITIONS ARE INDICATED BY LIGHT TYPE LINES.
4. ELECTRONIC CIVIL FILES ARE AVAILABLE UPON WRITTEN REQUEST. DO NOT USE ELECTRONIC CIVIL FILES TO LAYOUT FOUNDATIONS, COLUMN LINES, LIGHT POLES, OR OTHER NON CIVIL SITE WORK. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS OF BUILDING AND ARCHITECTURAL FEATURES.
5. DIMENSIONS ARE FROM FACE OF CURB OR EDGE OF PAVEMENT.
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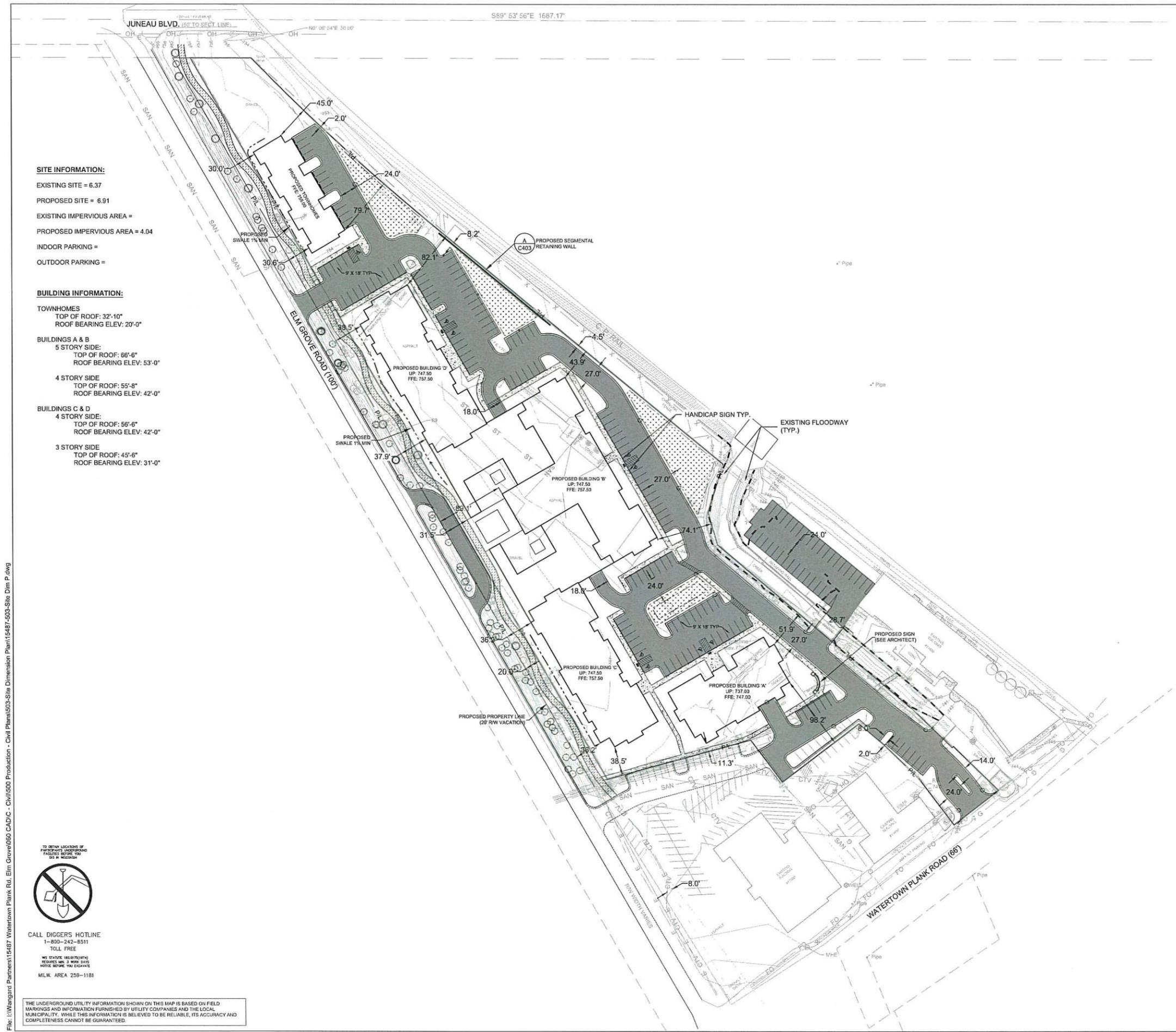
MULTI-FAMILY DEVELOPMENT
 WATERTOWN PLANK ROAD
 ELM GROVE, WISCONSIN

SITE PLAN

CITY SUBMITTAL 2-19-2016
 NO. REVISION DATE BY

DRAWING NO. 15487-503-Site Dim P.dwg
 DRAWN BY:
 DATE:
 PROJECT NO:
 CHECKED BY:
 APPROVED BY:
 SHEET NO.:

C 100



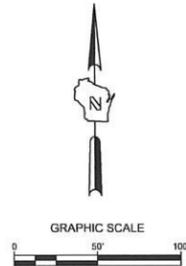
SITE INFORMATION:
 EXISTING SITE = 6.37
 PROPOSED SITE = 6.91
 EXISTING IMPERVIOUS AREA =
 PROPOSED IMPERVIOUS AREA = 4.04
 INDOOR PARKING =
 OUTDOOR PARKING =

BUILDING INFORMATION:
TOWNHOMES
 TOP OF ROOF: 32'-10"
 ROOF BEARING ELEV: 20'-0"
BUILDINGS A & B
 5 STORY SIDE:
 TOP OF ROOF: 66'-6"
 ROOF BEARING ELEV: 53'-0"
 4 STORY SIDE:
 TOP OF ROOF: 55'-8"
 ROOF BEARING ELEV: 42'-0"
BUILDINGS C & D
 4 STORY SIDE:
 TOP OF ROOF: 56'-6"
 ROOF BEARING ELEV: 42'-0"
 3 STORY SIDE:
 TOP OF ROOF: 45'-6"
 ROOF BEARING ELEV: 31'-0"

TO DENY LOCATIONS OF
 UTILITIES UNDERGROUND
 SEE RECORDS

CALL DIGGERS HOTLINE
 1-800-242-8511
 TOLL FREE
 NO SERVICE IN DISTRICTS
 REQUIRES MIN. 3 WORK DAYS
 NOTICE BEFORE TO EXCAVATE
 MILW. AREA 259-1181

THE UNDERGROUND UTILITY INFORMATION SHOWN ON THIS MAP IS BASED ON FIELD MARKINGS AND INFORMATION FURNISHED BY UTILITY COMPANIES AND THE LOCAL MUNICIPALITY. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, ITS ACCURACY AND COMPLETENESS CANNOT BE GUARANTEED.



LEGEND:

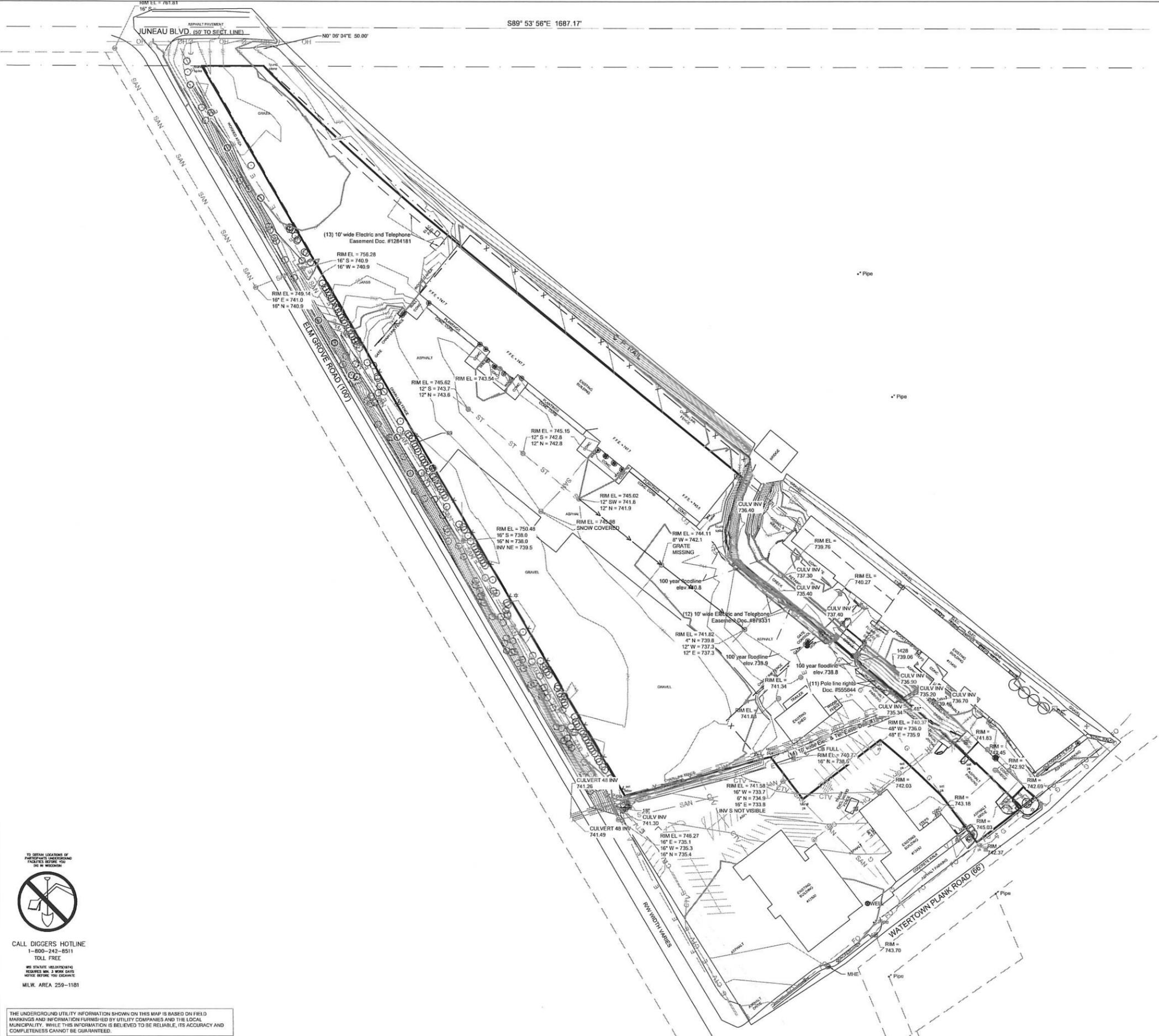
---	SECTION 1/4 SECTION LINE	○	MANHOLE	○	IRON PIPE FOUND/SET
---	PROPERTY LINE	■	CATCH BASIN	●	REBAR FOUND/SET
---	EASEMENT	●	CATCH BASIN (ROUND)	⊗	CHISELED CROSS FOUND/SET
-x-x-x-	CHAIN LINK FENCE	⊗	ROOF DRAIN	⊗	PK NAIL FOUND/SET
~~~~~	TREE LINE	⊗	HYDRANT	●	SPIKE/NAIL
OH	OVERHEAD UTILITY LINE	⊗	WATER VALVE	⊗	MONUMENT
E	ELECTRIC	⊗	GAS VALVE	⊗	BENCHMARK
T	TELEPHONE	⊗	UTILITY POLE	⊗	SIGN
FO	FIBER OPTIC	⊗	GUY WIRE	⊗	DECIDUOUS TREE
CTV	CABLE TV	⊗	GAS METER	⊗	CONIFEROUS TREE
SAN	SANITARY SEWER	⊗	ELECTRIC METER	⊗	BUSH
FM	FORCE MAIN	⊗	UTILITY PEDESTAL	⊗	POST
ST	STORM SEWER	⊗	TRAFFIC SIGNAL	⊗	
W	WATER MAIN	⊗	LIGHT POLE	⊗	
G	GAS	⊗	SOIL BORING	⊗	
---	EXISTING CONTOUR	⊗	MONITORING WELL	⊗	

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  3. DRAWING IS BASED ON FIELD SURVEY COMPLETED BY THE SIGMA GROUP ON JULY 14, 2015
  4. VERTICAL DATUM FOR THE PROJECT SURVEY IS NAVD 1988. BENCHMARK FOR THE PROJECT SURVEY IS THE CONCRETE MONUMENT WITH BRASS CAP AT THE NORTHEAST CORNER OF THE NORTHWEST 1/4 OF SECTION 25-7-20 WITH AN ELEVATION OF 762.31.

**MULTI FAMILY DEVELOPMENT  
 WATERTOWN PLANK ROAD  
 ELM GROVE, WISCONSIN**

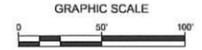
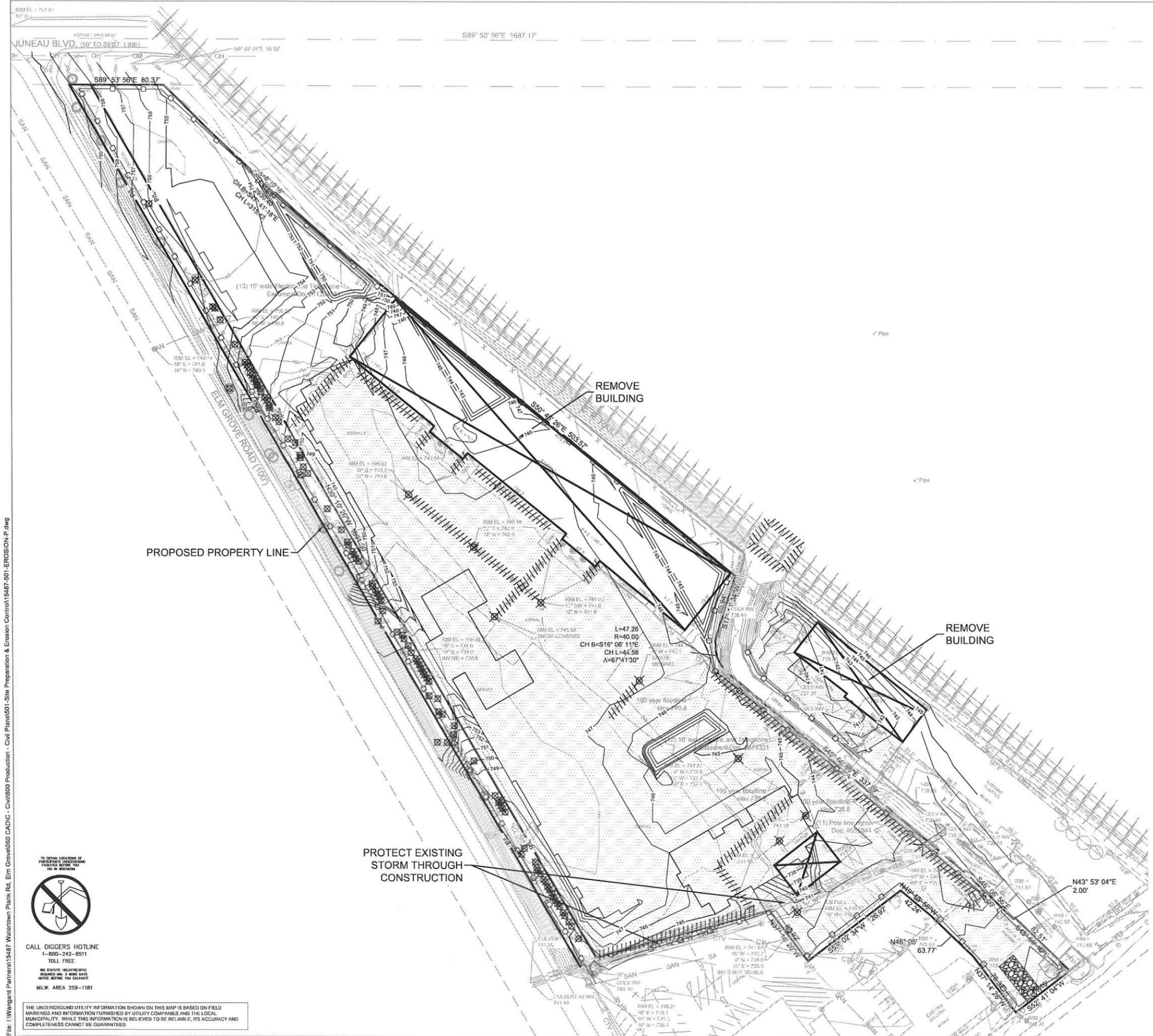
**SITE SURVEY**

CITY SUBMITTAL	2-19-2016
NO. REVISION	DATE BY
DRAWING NO.	15487-500-SURVEY-P.dwg
DRAWN BY:	
DATE:	
PROJECT NO:	
CHECKED BY:	
APPROVED BY:	
SHEET NO.:	<b>C 001</b>



File: I:\Wingard\Parthenon\15487 Watertown Plank Rd, Elm Grove\050 CAD/C - Civil\1500-Sub-Survey\15487-500-SURVEY-P.dwg  
 TO OBTAIN LOCATIONS OF FACILITIES MARKING FACILITY SURVEY YOU OR BY WISCONSIN  
 CALL DIGGERS HOTLINE  
 1-800-242-8511  
 TOLL FREE  
 WIS STATUTE 182.20(1)(b)(iv)  
 REQUIRES 30 DAY NOTICE BEFORE YOU DIGGERS  
 MILW. AREA 259-1181

THE UNDERGROUND UTILITY INFORMATION SHOWN ON THIS MAP IS BASED ON FIELD MARKINGS AND INFORMATION FURNISHED BY UTILITY COMPANIES AND THE LOCAL MUNICIPALITY. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, ITS ACCURACY AND COMPLETENESS CANNOT BE GUARANTEED.



- LEGEND:**
- PROPOSED SILT FENCE
  - PROPOSED INLET PROTECTION
  - PROPOSED TRACKING PAD
  - EXISTING CONTOUR
  - PROPOSED CONTOUR
  - UTILITY REMOVAL
  - STRUCTURE REMOVAL
  - PULVERIZE PAVEMENT

- GENERAL NOTES:**
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  5. SEE SHEET C400 FOR A COMPLETE LIST OF EROSION CONTROL NOTES AND DETAILS. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO START OF LAND DISTURBING ACTIVITIES.
  6. DO NOT BEGIN LAND DISTURBING ACTIVITIES UNTIL AN EROSION CONTROL PERMIT IS OBTAINED FROM LOCAL JURISDICTION.

MULTI FAMILY DEVELOPMENT  
 WATERTOWN PLANK ROAD  
 ELM GROVE, WISCONSIN

# EROSION CONTROL AND SITE PREPARATION PLAN

CITY SUBMITTAL 2-19-2016  
 NO. REVISION DATE BY

DRAWING NO: 15487-501-EROSION-P.dwg  
 DRAWN BY:  
 DATE:  
 PROJECT NO:  
 CHECKED BY:  
 APPROVED BY:  
 SHEET NO.:

**C 002**

File: \\Wangard\parron\15487\Watertown Plank Rd, Elm Grove\050 CAD\C - Civil\500 Production - Civil Plans\01-Site Preparation & Erosion Control\15487-501-EROSION-P.dwg

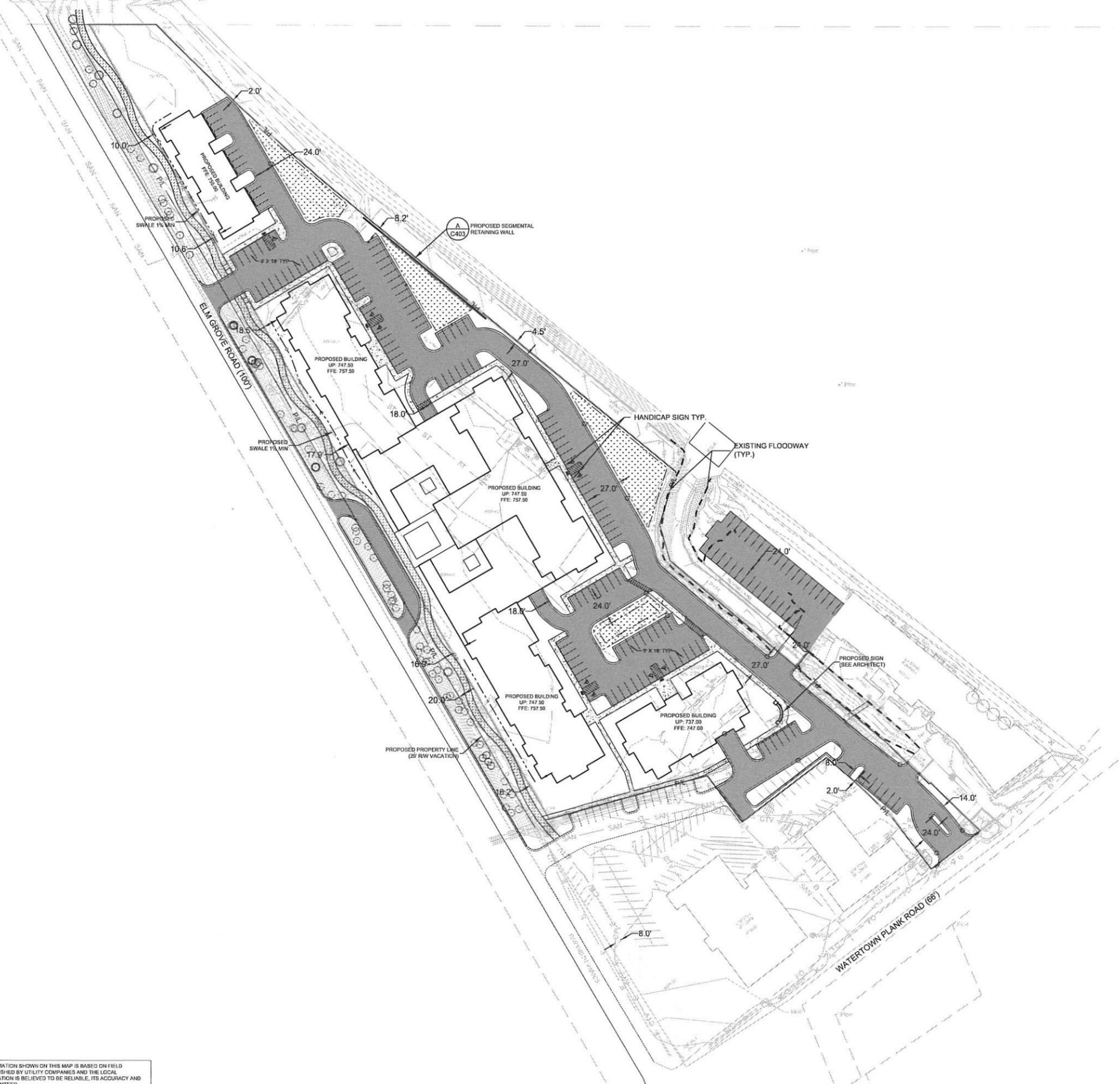


CALL DIGGERS HOTLINE  
 1-800-242-8511  
 TOLL FREE

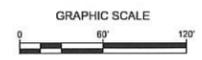
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589° 53' 56" E 1697.17'

JUNEAU BLVD.



**SITE INFORMATION:**  
EXISTING SITE = 6.37 AC  
PROPOSED SITE = 6.91 AC  
EXISTING IMPERVIOUS AREA = 5.25 AC  
PROPOSED IMPERVIOUS AREA = 4.45 AC  
INDOOR PARKING =  
OUTDOOR PARKING =



**LEGEND:**

- 5" THICK CONCRETE WALK (E C401)
- ASPHALT SURFACE (B C401)
- BIKE PATH
- CURB & GUTTER (ACCEPT) (A C401)
- CURB & GUTTER (REJECT) (A C401)
- PROPOSED BIOFILTRATION (B C403)

**GENERAL NOTES:**

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**THE SIGMA GROUP**  
Single Source. Sound Solutions.  
www.thesigmagroup.com  
1300 West Canal Street  
Milwaukee, WI 53233  
Phone: 414-643-4200  
Fax: 414-643-4210

MULTI FAMILY DEVELOPMENT  
WATERTOWN PLANK ROAD  
ELM GROVE, WISCONSIN

# SITE PLAN

CITY SUBMITTAL 2-19-2016  
NO. REVISION DATE BY

DRAWING NO.	15487-503-Site Dim P.dwg
DRAWN BY:	
DATE:	
PROJECT NO:	
CHECKED BY:	
APPROVED BY:	
SHEET NO.:	

## C 100



CALL DIGGERS HOTLINE  
1-800-242-8511  
TOLL FREE  
WE STAN BY OUR SERVICE  
FOR 30 YEARS  
NOTICE BEFORE YOU DIG  
MILW. AREA 259-1181

File: I:\Wingard\Partner\15487\Watertown Plank Rd, Elm Grove\0860 CAD/C - Civil\500 Production - Civil\Plan\503-Site Dimension Plan\15487-503-Site Dim P.dwg

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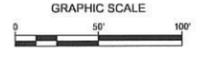
S89° 53' 58"E 1687.17'

JUNEAU BLVD.

ELM GROVE ROAD (100')

WATERTOWN PLANK ROAD (68')

**THE SIGMA GROUP**  
Single Source. Sound Solutions.  
www.thesigmagroup.com  
1300 West Canal Street  
Milwaukee, WI 53233  
Phone: 414-643-4200  
Fax: 414-643-4210



**LEGEND:**

-  5" THICK CONCRETE WALK (E C401)
-  ASPHALT SURFACE (B C401)
-  EXISTING CONTOUR
-  PROPOSED CONTOUR
-  PROPOSED CURB & GUTTER SPOT GRADE  
TIC: TOP OF CURB GRADE  
FL: FLOW LINE CURB GRADE
-  PROPOSED ASPHALT SPOT GRADE

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MULTI FAMILY DEVELOPMENT  
WATERTOWN PLANK ROAD  
ELM GROVE, WISCONSIN

**GRADING PLAN**

CITY SUBMITTAL 2-19-2016  
NO. REVISION DATE BY

DRAWING NO. 15487-505-GRADING-P.dwg

DRAWN BY:

DATE:

PROJECT NO.:

CHECKED BY:

APPROVED BY:

SHEET NO.:

**C 200**

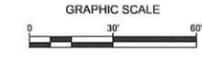


CALL DIGGERS HOTLINE  
1-800-242-8511  
TOLL FREE

WE STRIKE HEADS OFF!  
RESERVE ALL 3 HOUR DATE  
NOTICE BEFORE YOU DIG!  
MILW. AREA 259-1181

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File: \\Wangard\Parthena\15487 Watertown Plank Rd, Elm Grove\050-Grading - Civil\Plans\050-Grading-P.dwg



- LEGEND:**
- 5' THICK CONCRETE WALK (E C401)
  - ASPHALT SURFACE (B C401)
  - EXISTING CONTOUR
  - PROPOSED CONTOUR
  - PROPOSED CURB & GUTTER SPOT GRADE  
TIC: TOP OF CURB GRADE  
FL: FLOW LINE CURB GRADE
  - PROPOSED SPOT GRADE
  - PROPOSED TOP OF WALL GRADE
  - PROPOSED BOTTOM OF WALL GRADE

**GENERAL NOTES:**

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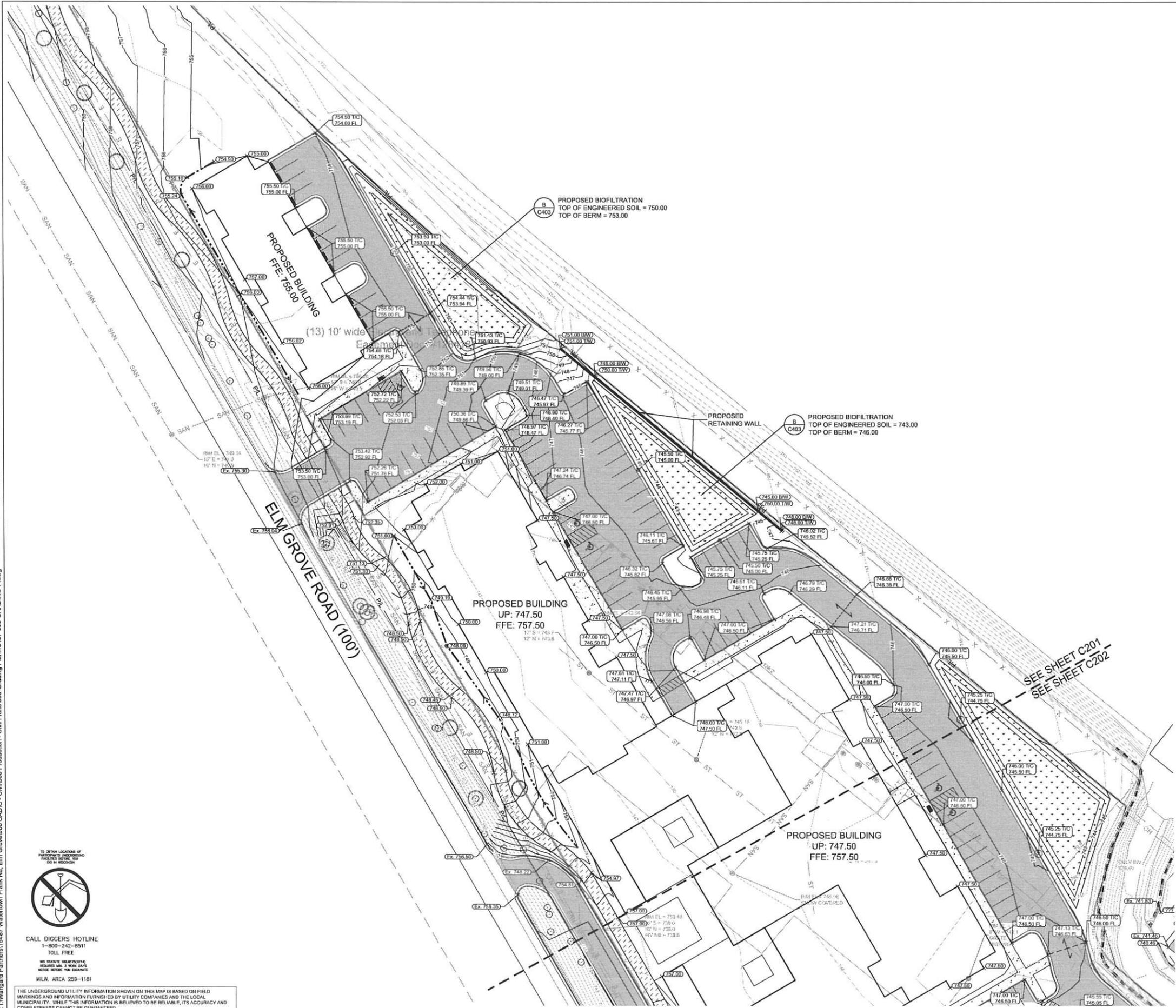
MULTI FAMILY DEVELOPMENT  
 WATERTOWN PLANK ROAD  
 ELM GROVE, WISCONSIN

**DETAILED GRADING PLAN - NORTH**

CITY SUBMITTAL 2-19-2016  
 NO. REVISION DATE BY

DRAWING NO. 15487-505-GRADING-P.dwg  
 DRAWN BY:  
 DATE:  
 PROJECT NO:  
 CHECKED BY:  
 APPROVED BY:  
 SHEET NO.:

**C 201**

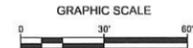


SEE SHEET C201  
 SEE SHEET C202



CALL DIGGERS HOTLINE  
 1-800-242-8511  
 TOLL FREE  
 WE STRIKE WHEN YOU STRIKE  
 NOTICE BEFORE YOU DIG  
 MILW. AREA 259-1181

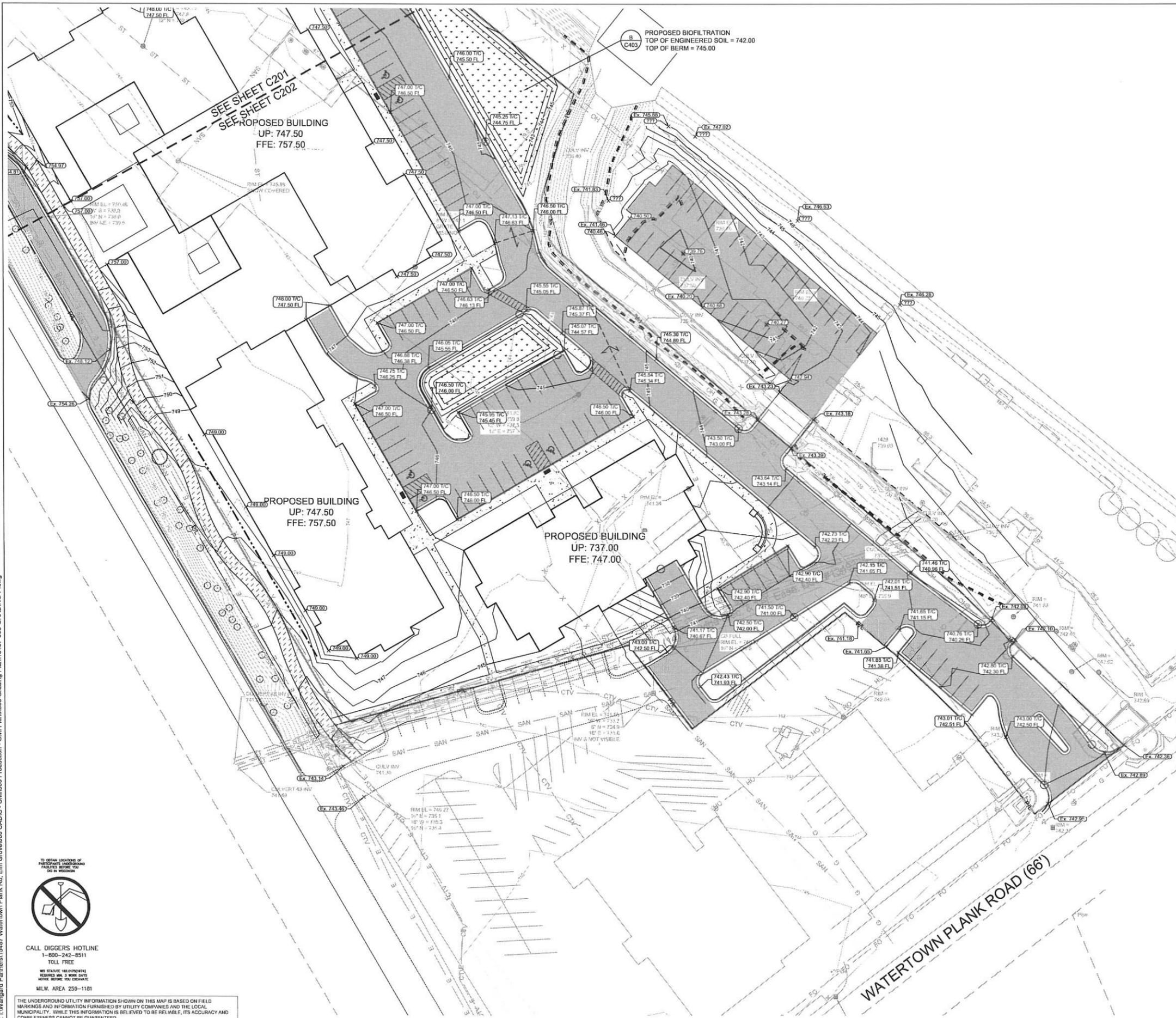
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- LEGEND:**
- 5" THICK CONCRETE WALK (E C401)
  - ASPHALT SURFACE (B C401)
  - EXISTING CONTOUR
  - PROPOSED CONTOUR
  - PROPOSED CURB & GUTTER SPOT GRADE  
TIC: TOP OF CURB GRADE  
FL: FLOW LINE CURB GRADE
  - PROPOSED ASPHALT SPOT GRADE

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7. EARTHWORK SHALL BE IN ACCORDANCE WITH GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.



File: I:\Wingard\Partner\15487 Watertown Plank Rd, Elm Grove\0505-Grading - Civil Plans\0505-Grading-Plan\15487-505-GRADING-P.dwg

TO OBTAIN LOCATIONS OF  
 PARTIALLY EXPOSED  
 FACILITIES BEFORE YOU  
 DIG OR PROCEED

**CALL DIGGERS HOTLINE**  
 1-800-242-8511  
 TOLL FREE

NO STATE REGISTRATION  
 REQUIRED IN IL. WORK STATE  
 NOTICE BEFORE YOU EXCAVATE  
 MILW. AREA 259-1181

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MULTI FAMILY DEVELOPMENT  
 WATERTOWN PLANK ROAD  
 ELM GROVE, WISCONSIN

**DETAILED GRADING PLAN - SOUTH**

CITY SUBMITTAL 2-19-2016  
 NO. REVISION DATE BY

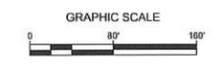
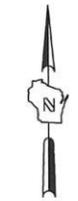
DRAWING NO. 15487-505-GRADING-P.dwg  
 DRAWN BY:  
 DATE:  
 PROJECT NO:  
 CHECKED BY:  
 APPROVED BY:  
 SHEET NO.:

**C 202**

SAP 53° 50' E 1687.17'

JUNEAU BLVD.

**THE SIGMA GROUP**  
 Single Source. Sound Solutions.  
 www.thesigmagroup.com  
 1300 West Canal Street  
 Milwaukee, WI 53233  
 Phone: 414-643-4200  
 Fax: 414-643-4210



**LEGEND:**

- SAN --- PROPOSED SANITARY SERVICE
- ST --- PROPOSED STORM SEWER
- W --- PROPOSED WATER SERVICE
- W --- PROPOSED WATER SERVICE 2
- PROPOSED STORM INLET
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE

**GENERAL NOTES:**

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2. VERIFY ACTUAL LOCATIONS AND INVERTS IN THE FIELD. ANY POTENTIAL ERRORS, OMISSIONS, OR DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
3. WORK TO BE COMPLETED IS INDICATED IN BOLD TYPE LINES AND EXISTING CONDITIONS ARE INDICATED BY LIGHT TYPE LINES.
4. ELECTRONIC CIVIL FILES ARE AVAILABLE UPON WRITTEN REQUEST. DO NOT USE ELECTRONIC CIVIL FILES TO LAYOUT FOUNDATIONS, COLUMN LINES, LIGHT POLES, OR OTHER NON CIVIL SITE WORK. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS OF BUILDING AND ARCHITECTURAL FEATURES.
5. ALL UTILITIES WITHIN 5 FEET OF PAVED AREAS SHALL REQUIRE GRANULAR BACKFILL. SLURRY BACKFILL IS REQUIRED FOR ALL WORK IN PUBLIC RIGHT OF WAY.
6. PRIVATE STORM INLETS IN PAVEMENT SHALL REQUIRE DRAIN TILE STUBS OF 10 FEET IN TWO DIRECTIONS FOR SUBDRAINAGE. RIM GRADE FOR STORM INLETS IN CURB AND GUTTER ARE FLOW LINE GRADES.
7. WORK IN PUBLIC RIGHT OF WAY SHALL FOLLOW MATERIAL AND INSTALLATION REQUIREMENTS PER MUNICIPAL AND/OR COUNTY.
8. PRIVATE STORM SEWER 12-INCH DIAMETER OR LARGER SHALL BE HDPE. BELOW 12-INCH DIAMETER SHALL BE PVC SDR-35 ASTM D3034. PRIVATE WATER MAIN SHALL BE CLASS 150 DR 18 PVC CONFORMING TO AWWA C-900. PRIVATE SANITARY SEWER SHALL BE PVC SDR-35 ASTM D3034.
9. COORDINATE FINAL LOCATION AND DESIGN OF PRIVATE UTILITY SERVICES (ELECTRIC, GAS, PHONE, CABLE) WITH UTILITY COMPANIES.

MULTI FAMILY DEVELOPMENT  
 WATERTOWN PLANK ROAD  
 ELM GROVE, WISCONSIN

**UTILITY PLAN**

CITY SUBMITTAL 2-19-2016  
 NO. REVISION DATE BY

DRAWING NO. 15487-UTILITY.dwg  
 DRAWN BY:  
 DATE:  
 PROJECT NO:  
 CHECKED BY:  
 APPROVED BY:  
 SHEET NO.:

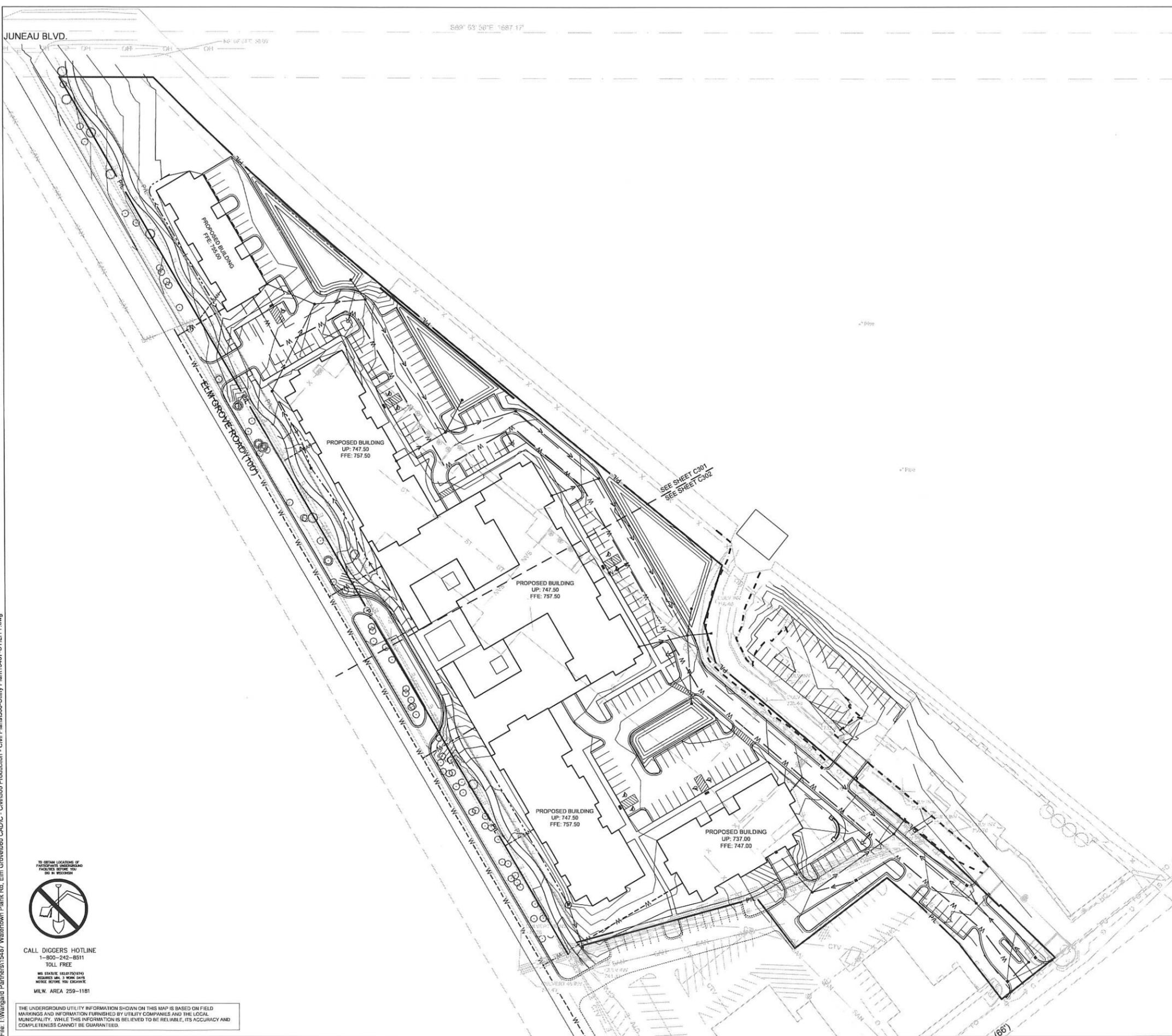
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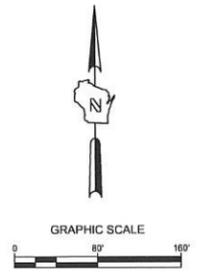
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CALL DIGGERS HOTLINE  
 1-800-242-8511  
 TOLL FREE  
 WE STAY 1626704740  
 REGISTER 481 3 WORK DAYS  
 NOTICE BEFORE YOU DIG!  
 MILW. AREA 259-1181

THE UNDERGROUND UTILITY INFORMATION SHOWN ON THIS MAP IS BASED ON FIELD MARKINGS AND INFORMATION FURNISHED BY UTILITY COMPANIES AND THE LOCAL MUNICIPALITY. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, ITS ACCURACY AND COMPLETENESS CANNOT BE GUARANTEED.





- LEGEND:**
- W --- PROPOSED WATER SERVICE
  - SAN --- PROPOSED SANITARY SERVICE
  - ST --- PROPOSED STORM SEWER
  - E --- PROPOSED ELECTRICAL SERVICE
  - T --- PROPOSED TELEPHONE SERVICE
  - G --- PROPOSED GAS SERVICE
  - PROPOSED STORM INLET
  - PROPOSED STORM MANHOLE
  - PROPOSED SANITARY MANHOLE

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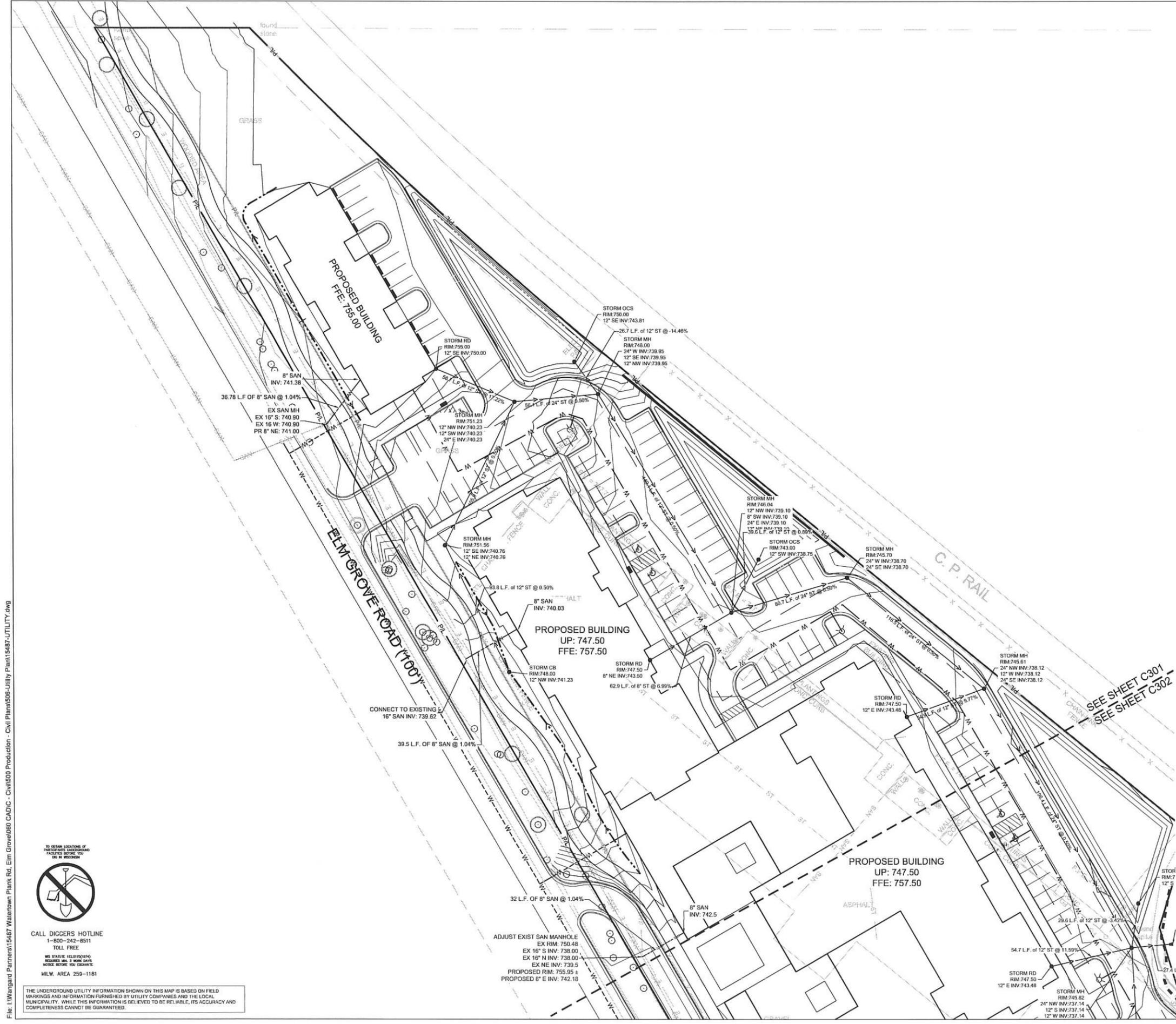
**MULTI FAMILY DEVELOPMENT  
 WATERTOWN PLANK ROAD  
 ELM GROVE, WISCONSIN**

**UTILITY PLAN**

CITY SUBMITTAL 2-19-2016  
 NO. REVISION DATE BY

DRAWING NO. 15487-UTILITY.dwg  
 DRAWN BY:  
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 CHECKED BY:  
 APPROVED BY:  
 SHEET NO.:

**C 301**



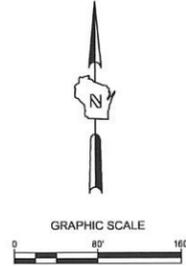
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CALL DIGGERS HOTLINE  
 1-800-242-8511  
 TOLL FREE

WE STAYVE 18207(242)  
 RECORDS AND 3 WORK DAYS  
 BEFORE THE EXPIRE  
 MILW. AREA 259-1181

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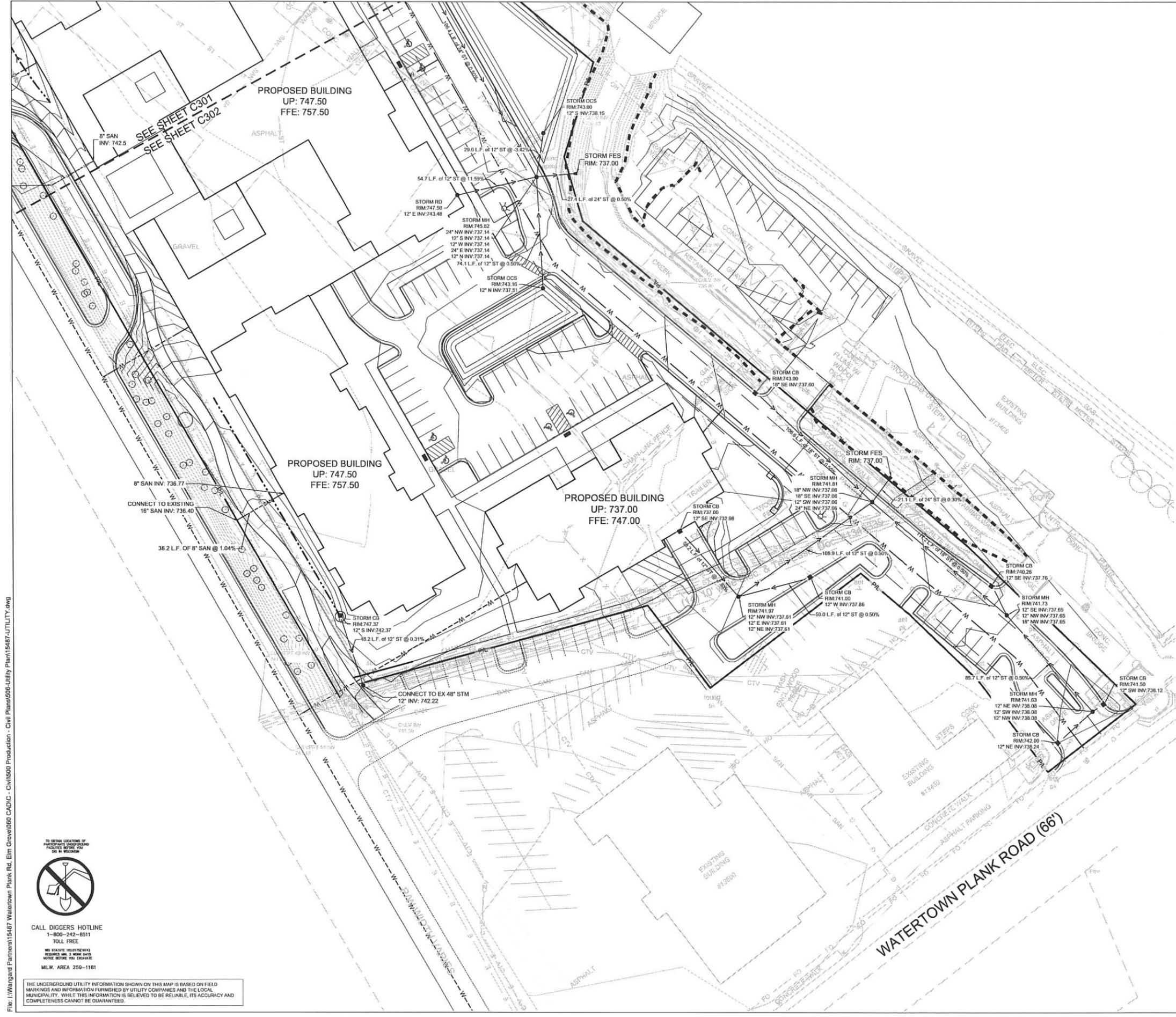
MULTI FAMILY DEVELOPMENT  
 WATERTOWN PLANK ROAD  
 ELM GROVE, WISCONSIN

**UTILITY PLAN**

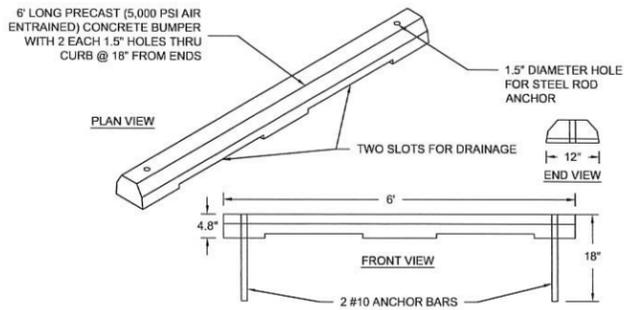
CITY SUBMITTAL 2-19-2016  
 NO. REVISION DATE BY

DRAWING NO. 15487-UTILITY.dwg  
 DRAWN BY:  
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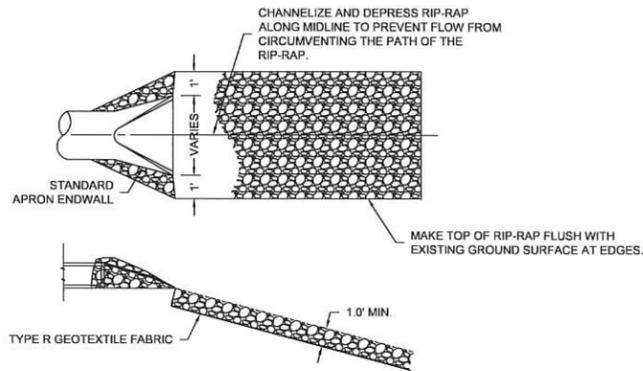
**C 302**



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 TO OBTAIN LOCATIONS OF PARTICIPATING UNDERGROUND UTILITIES, CONTACT THE LOCAL MUNICIPALITY. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, ITS ACCURACY AND COMPLETENESS CANNOT BE GUARANTEED.  
 CALL DIGGERS HOTLINE 1-800-242-8511 TOLL FREE  
 WE STAY 12/07/04  
 REC'D 3 WKS SAYS WORK BEFORE YOU EXCAVATE  
 MILW. AREA 250-1181

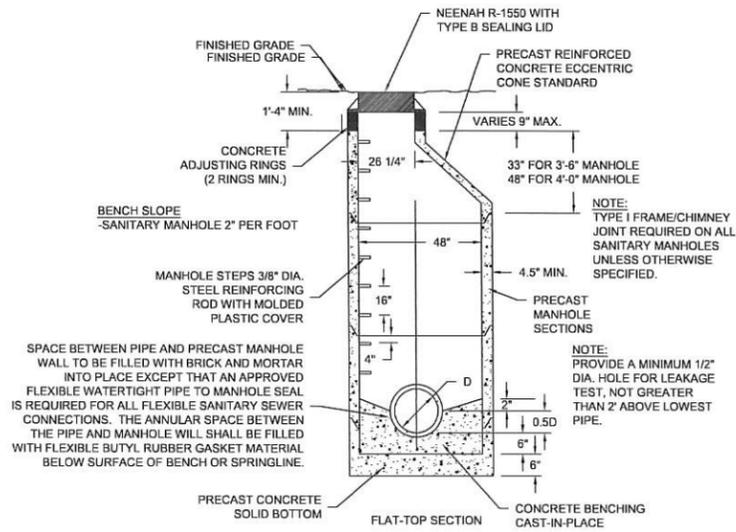


**A PRECAST CONCRETE PARKING BUMPER**  
 NOT TO SCALE



- NOTES:**
1. INSTALL RIPRAP WHERE SHOWN ON PLANS.
  2. FOR PERMANENT POOL (WET) DETENTION BASINS: EXTEND RIP-RAP FROM OUTFALL TO AT LEAST 5 FEET BEYOND THE NORMAL WATER LEVEL.
  3. INSTALL MEDIUM RIPRAP PER DOT STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION.
  4. INSTALL TYPE R GEOTEXTILE FABRIC PER DOT STANDARD SPECIFICATIONS PER HIGHWAY AND STRUCTURE CONSTRUCTION.
  5. WHERE RIP-RAP IS REQUIRED AT AN AREA PER PLAN, AND THERE IS NO OUTFALL PIPE, THE RIP RAP SHALL BE PLACED A MINIMUM 6 FEET WIDE.

**E RIP-RAP DISCHARGE APRON**  
 NOT TO SCALE



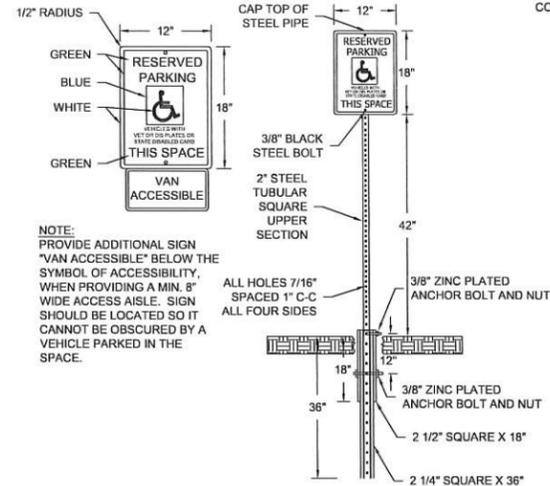
**F PRECAST SANITARY MANHOLE**  
 NOT TO SCALE

- NOTES:**
1. CONSTRUCT MANHOLE IN ACCORDANCE WITH FILE NO. 12 OF THE STATE STANDARD SPECIFICATIONS FOR SEWER AND WATER.
  2. ADJUST FRAME TO GRADE WITH CONCRETE RINGS OF VARIABLE THICKNESS. MAXIMUM RING HEIGHT = 6". MINIMUM RING HEIGHT = 2". CONCRETE RINGS SHALL BE REINFORCED WITH ONE LINE OF STEEL CENTERED WITHIN THE RING. WHERE NECESSARY RINGS SHALL BE GROOVED TO RECEIVE STEP. CONCRETE AND REINFORCEMENT STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION C-478.
  3. CONCRETE AND REINFORCEMENT STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION C-478.
  4. JOINTS SHALL BE WATERTIGHT AND SHALL BE MADE USING MORTAR, FLEXIBLE PLASTIC GASKETS OR RUBBER TYPE GASKETS FOR STORM MANHOLES.
  5. AREA OF CIRCUMFERENTIAL STEEL = 0.12 SQ. INCH PER LINEAL FOOT MIN.
  6. 3" OF BEDDING STONE UNDER BASE REQUIRED ON WET SUB-GRADE.
  7. ALL SANITARY MANHOLES SHALL BE PROVIDED WITH EXTERNAL CHIMNEY SEALS AND SELF-SEALING LIDS WITH CONCEALED PICK HOLES.

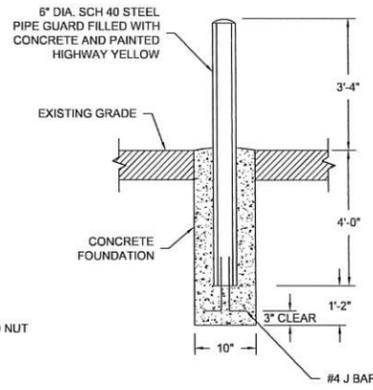
MANHOLE SIZES (UNLESS OTHERWISE NOTED)

PIPE DIA. [D]	MANHOLE DIA.	WALL THICKNESS
8" THRU 27"	3'-6"	4 1/2"
30"	4'-0"	5"
36"	5'-0"	6"
42"	6'-0"	7"

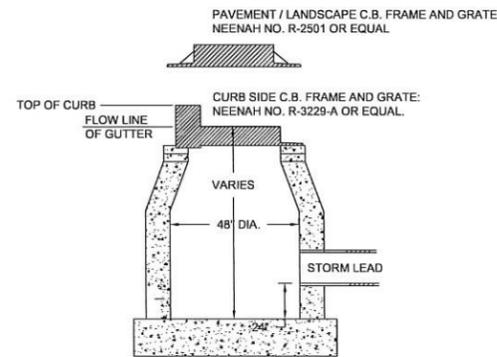
* ALL PUBLIC MANHOLES SHALL BE A MINIMUM OF 48" IN DIAMETER.



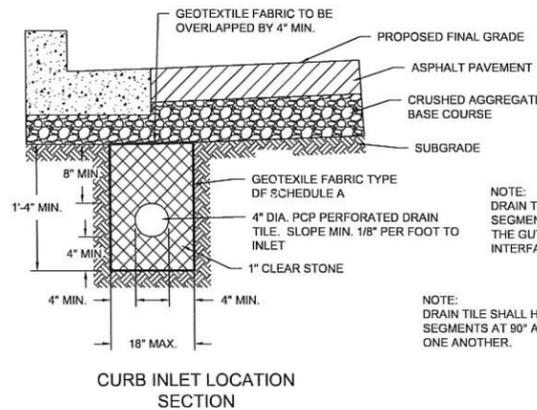
**B HANDICAP SIGN & POST**  
 NOT TO SCALE



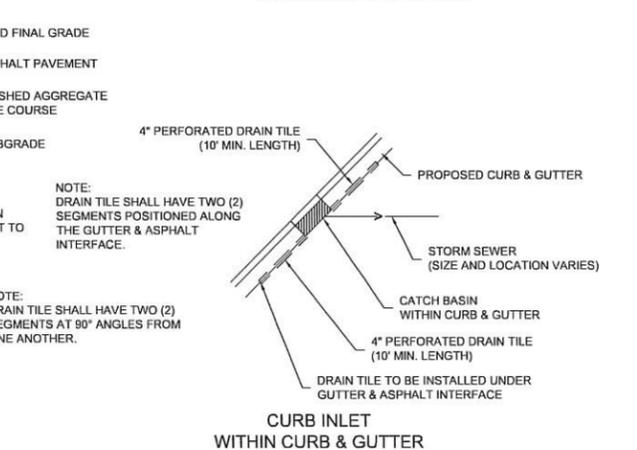
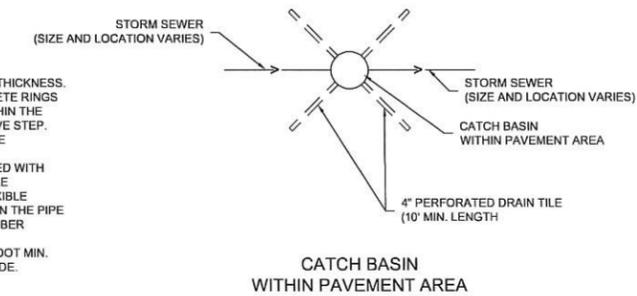
**C BOLLARD**  
 NOT TO SCALE



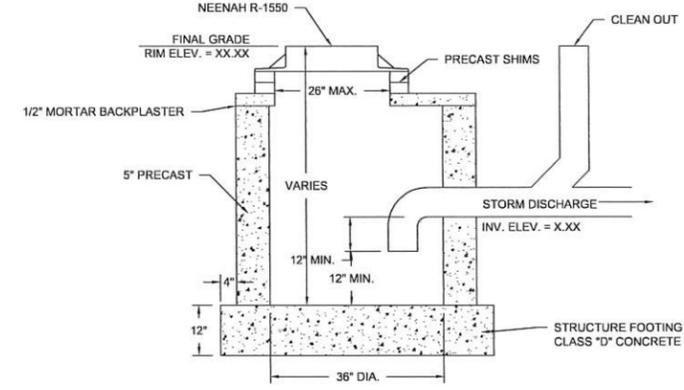
- NOTES:**
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  2. SPACE BETWEEN PIPE AND PRECAST MANHOLE WALL TO BE FILLED WITH BRICK MORTARED IN PLACE EXCEPT THAT AN APPROVED FLEXIBLE WATERTIGHT PIPE TO MANHOLE SEAL IS REQUIRED FOR ALL FLEXIBLE SANITARY SEWER CONNECTIONS. THE ANNULAR SPACE BETWEEN THE PIPE AND MANHOLE WALL SHALL BE FILLED WITH FLEXIBLE BUTYL RUBBER GASKET MATERIAL BELOW SURFACE OF BENCH OR SPRINGLINE.
  3. AREA OF CIRCUMFERENTIAL STEEL = 0.12 SQ. INCH PER LINEAL FOOT MIN.
  4. 3" OF BEDDING OF STONE UNDER BASE REQUIRED ON WET SUB-GRADE.



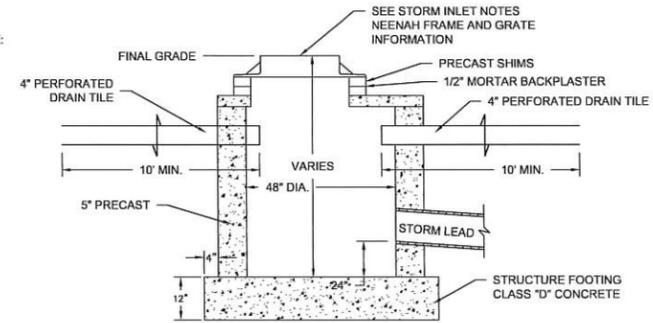
**G CATCH BASIN**  
 NOT TO SCALE



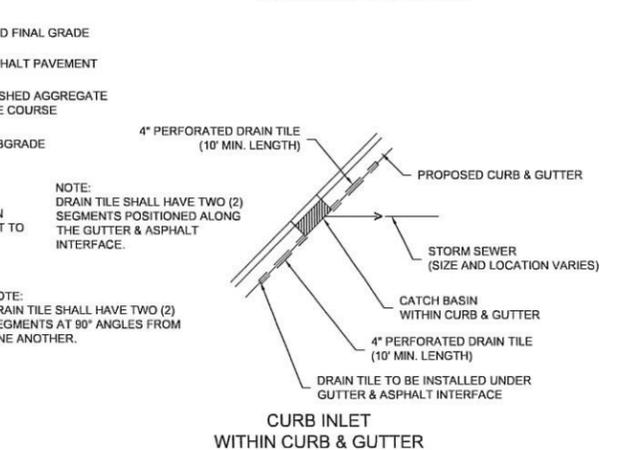
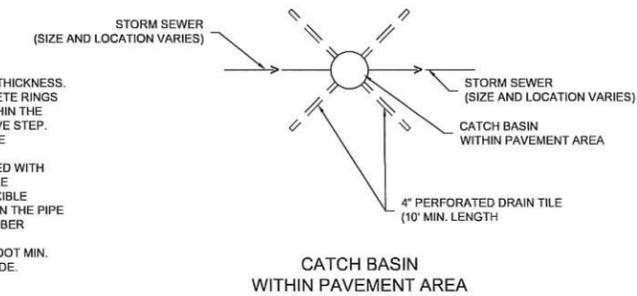
**G CATCH BASIN**  
 NOT TO SCALE



**D TRAPPED MANHOLE WITH SUMP**  
 NOT TO SCALE



- STORM INLET NOTES:**
1. PROPOSED STORM CURB INLET SHALL BE NEENAH R-3229-A, R-3015, OR R-3228-H.
  2. PROPOSED STORM AREA INLET SHALL BE NEENAH R-2502-D, R-2501.



**G CATCH BASIN**  
 NOT TO SCALE

MULTI FAMILY DEVELOPMENT  
 WATERTOWN PLANK ROAD  
 ELM GROVE, WISCONSIN

**DETAILS**

CITY SUBMITTAL 2-19-2016  
 NO. REVISION DATE BY

DRAWING NO. 15487-DETAILS.dwg

DRAWN BY:

DATE:

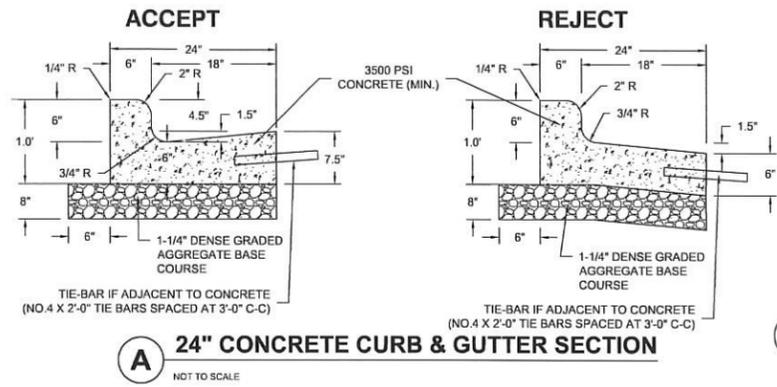
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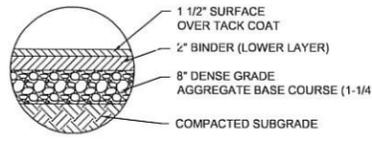
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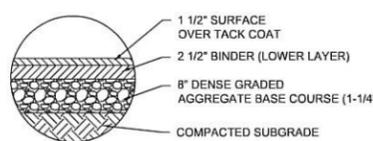
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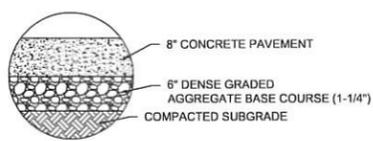
**A 24" CONCRETE CURB & GUTTER SECTION**  
 NOT TO SCALE



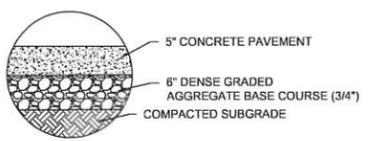
**B ASPHALT PAVEMENT SECTION**  
 NOT TO SCALE



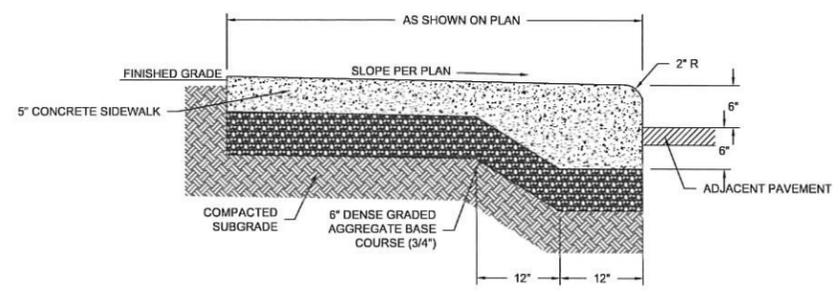
**C ASPHALT PAVEMENT SECTION (HEAVY DUTY)**  
 NOT TO SCALE



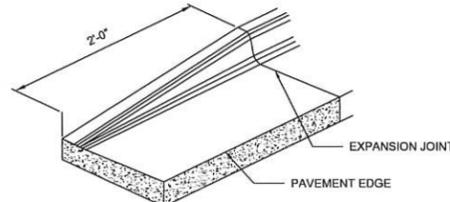
**D CONCRETE PAVEMENT SECTION**  
 NOT TO SCALE



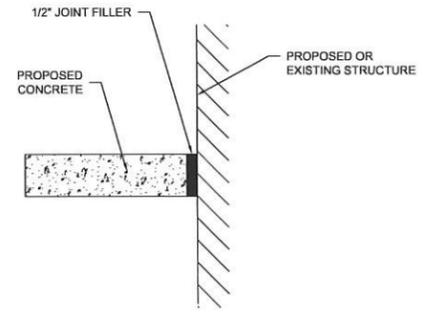
**E CONCRETE SIDEWALK SECTION**  
 NOT TO SCALE



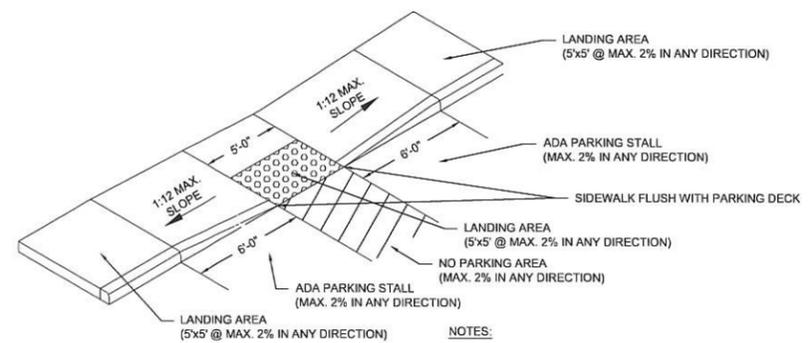
**F CONCRETE PAVEMENT WITH INTEGRAL CURB**  
 NOT TO SCALE



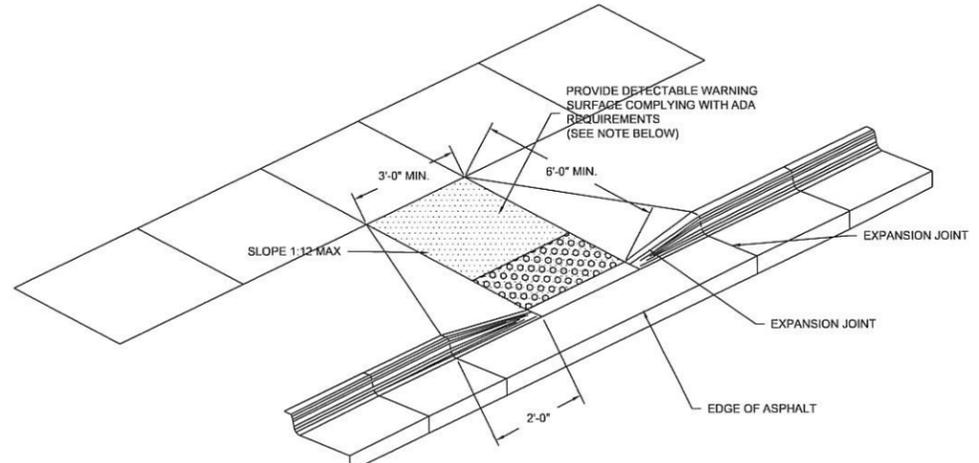
**G 2' CURB TAPER**  
 NOT TO SCALE



**H CONCRETE JOINT-INSULATION**  
 NOT TO SCALE



**I ADA RAMP DETAIL (TYPE 1)**  
 NOT TO SCALE



- NOTES:**
- PUBLIC ADA RAMP SHALL BE CONSTRUCTED PER CITY OF MILWAUKEE STANDARDS.
  - CONTRACTOR TO VERIFY ADA RAMP DETAIL WITH CITY AND ADJUST AS NEEDED.
  - PROVIDE DETECTABLE WARNING CONSISTING OF RAISED TRUNCATED DOMES OF SIZE, SPACING AND CONTRAST REQUIRED BY ADA GUIDELINES.
  - DETECTABLE WARNINGS SHALL BE PER CITY STANDARDS.

**J ADA CONCRETE RAMP (TYPE 2)**  
 NOT TO SCALE

MULTI FAMILY DEVELOPMENT  
 WATERTOWN PLANK ROAD  
 ELM GROVE, WISCONSIN

**DETAILS**

CITY SUBMITTAL 2-19-2016  
 NO. REVISION DATE BY

DRAWING NO. 15487-DETAILS.dwg  
 DRAWN BY:  
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 PROJECT NO:  
 CHECKED BY:  
 APPROVED BY:  
 SHEET NO.:

**C 401**

**GENERAL:**

- 1. EXISTING UTILITIES ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY, AND NO RESPONSIBILITY IS ASSUMED BY THE OWNER OR ENGINEER FOR THEIR ACCURACY OR COMPLETENESS.
2. CONTRACTOR IS RESPONSIBLE FOR MAKING THEIR OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. CONTRACTOR SHALL HAVE SITE MARKED BY DIGGER'S HOTLINE AND SHALL HAVE PRIVATE UTILITIES MARKED BY A PRIVATE UTILITY LOCATOR PRIOR TO CONSTRUCTION. CONTRACTOR SHALL VERIFY ALL ELEVATIONS, LOCATIONS, AND SIZES OF EXISTING UTILITIES AND SHALL CHECK ALL UTILITY CROSSINGS AND PROPOSED CONNECTIONS FOR CONFLICTS/DISCREPANCIES PRIOR TO INITIATING CONSTRUCTION. REPORT ANY CONFLICTS OR DISCREPANCIES TO THE ENGINEER SO REDESIGN MAY OCCUR IF NEEDED.
3. LENGTHS OF ALL UTILITIES ARE TO CENTER OF STRUCTURES OR FITTINGS AND MAY VARY SLIGHTLY FROM PLANS. LENGTHS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR.

**SITE CLEARING:**

- 1. EXCEPT FOR STRIPPED TOPSOIL OR OTHER MATERIALS INDICATED TO REMAIN ON OWNER'S PROPERTY, CLEARED MATERIALS SHALL BECOME CONTRACTOR'S PROPERTY AND SHALL BE REMOVED FROM PROJECT SITE.
2. MINIMIZE INTERFERENCE WITH ADJOINING ROADS, STREETS, WALKS, AND OTHER ADJACENT OCCUPIED OR USED FACILITIES DURING SITE-CLEARING OPERATIONS.
3. SALVAGE IMPROVEMENTS: CAREFULLY REMOVE ITEMS INDICATED TO BE SALVAGED AND STORE ON OWNER'S PREMISES WHERE INDICATED.
4. UTILITY LOCATOR SERVICE: NOTIFY UTILITY LOCATOR SERVICE FOR AREA WHERE PROJECT IS LOCATED BEFORE SITE CLEARING.
5. DO NOT COMMENCE SITE CLEARING OPERATIONS UNTIL TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES ARE IN PLACE.
6. PROTECT AND MAINTAIN BENCHMARKS AND SURVEY CONTROL POINTS FROM DISTURBANCE DURING CONSTRUCTION.
7. LOCATE AND CLEARLY FLAG TREES AND VEGETATION TO REMAIN OR TO BE RELOCATED.
8. PROTECT EXISTING SITE IMPROVEMENTS TO REMAIN FROM DAMAGE DURING CONSTRUCTION; RESTORE DAMAGED IMPROVEMENTS TO THEIR ORIGINAL CONDITION, AS ACCEPTABLE TO OWNER.
9. LOCATE, IDENTIFY, DISCONNECT, AND SEAL OR CAP OFF UTILITIES INDICATED TO BE REMOVED; ARRANGE WITH UTILITY COMPANIES TO SHUT OFF INDICATED UTILITIES.
10. EXISTING UTILITIES: DO NOT INTERRUPT UTILITIES SERVING FACILITIES OCCUPIED BY OWNER OR OTHERS UNLESS PERMITTED BY THE OWNER AND THEN ONLY AFTER ARRANGING TO PROVIDE TEMPORARY UTILITY SERVICES.
11. FILL DEPRESSIONS CAUSED BY CLEARING AND GRUBBING OPERATIONS WITH SATISFACTORY SOIL MATERIAL UNLESS FURTHER EXCAVATION OR EARTHWORK IS INDICATED; PLACE FILL MATERIAL IN HORIZONTAL LAYERS NOT EXCEEDING A LOOSE DEPTH OF 8 INCHES, AND COMPACT EACH LAYER TO A DENSITY EQUAL TO ADJACENT ORIGINAL GROUND.
12. REMOVE SOD AND GRASS BEFORE STRIPPING TOPSOIL.
13. STRIP TOPSOIL TO WHATEVER DEPTHS ARE ENCOUNTERED IN A MANNER TO PREVENT INTERMINGLING WITH UNDERLYING SUBSOIL OR OTHER WASTE MATERIALS.
14. STOCKPILE TOPSOIL MATERIALS AWAY FROM EDGE OF EXCAVATIONS WITHOUT INTERMIXING WITH SUBSOIL. GRADE AND SHAPE STOCKPILES TO DRAIN SURFACE WATER. COVER TO PREVENT WINDBLOWN DUST.
15. REMOVE EXISTING ABOVE- AND BELOW-GRADE IMPROVEMENTS AS INDICATED AND AS NECESSARY TO FACILITATE NEW CONSTRUCTION.
16. SAWCUT ALL PAVEMENTS FULL DEPTH PRIOR TO REMOVAL; SAWCUTS SHALL BE IN STRAIGHT LINES PERPENDICULAR AND/OR PARALLEL TO EXISTING PAVEMENT JOINTS AND PAVEMENT EDGES.
17. REMOVE SURPLUS SOIL MATERIAL, UNSUITABLE TOPSOIL, OBSTRUCTIONS, DEMOLISHED MATERIALS, AND WASTE MATERIALS INCLUDING TRASH AND DEBRIS, AND LEGALLY DISPOSE OF THEM OFF OWNER'S PROPERTY.
18. SEPARATE RECYCLABLE MATERIALS PRODUCED DURING SITE CLEARING FROM OTHER NONRECYCLABLE MATERIALS. STORE OR STOCKPILE WITHOUT INTERMIXING WITH OTHER MATERIALS AND TRANSPORT THEM TO RECYCLING FACILITIES.

**SITE WATER SERVICE:**

- 1. COMPLY WITH STANDARDS OF STATE PLUMBING CODE (SPS CH. 382, 384), LOCAL WATER UTILITY REQUIREMENTS AND STANDARDS OF AUTHORITIES HAVING JURISDICTION FOR FIRE-SUPPRESSION AND WATER SERVICE PIPING INCLUDING MATERIALS, FITTINGS, APPURTENANCES, INSTALLATION, TESTING, SERVICE TAPS, ETC. IN CASE OF CONFLICT BETWEEN THESE SPECIFICATIONS AND STATE PLUMBING CODE OR LOCAL JURISDICTIONAL AUTHORITY, STATE PLUMBING CODE AND LOCAL JURISDICTIONAL AUTHORITY REQUIREMENTS GOVERN.
2. DO NOT INTERRUPT SERVICE TO FACILITIES OCCUPIED BY OWNER OR OTHERS UNLESS PERMITTED BY OWNERS OF SUCH FACILITIES AND THEN ONLY AFTER ARRANGING TO PROVIDE TEMPORARY WATER-DISTRIBUTION SERVICE.
3. WATER SERVICE PIPING MAY BE EITHER DUCTILE IRON WATER PIPE OR PVC WATER PIPE AS ALLOWED BY THE LOCAL WATER UTILITY.
4. DUCTILE IRON WATER PIPE CONFORMING TO THE REQUIREMENTS OF THE AMERICAN NATIONAL STANDARD FOR DUCTILE IRON PIPE, CENTRIFUGALLY CAST, AWWA C151/A21.51 - LATEST REVISION AND REQUIREMENTS OF CHAPTER 8.18.0 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION.
a. CLASS 52
b. CEMENT MORTAR LINING AND INTERNAL AND EXTERNAL BITUMINOUS COATS IN ACCORDANCE WITH SECTION 51.8 OF AWWA C151.
c. PUSH-ON GASKET PIPE
d. PLAIN RUBBER GASKETS
e. BONDING STRAPS TO PROVIDE ELECTRICAL CONDUCTIVITY WITHOUT FIELD TESTING
5. JOINTS FOR DUCTILE IRON PIPE: JOINTS SHALL BE RUBBER GASKET JOINTS, CONFORM TO THE REQUIREMENTS OF AMERICAN NATIONAL STANDARD FOR RUBBER GASKET JOINTS FOR DUCTILE IRON PRESSURE PIPE AND FITTINGS (ANSI/AWWA C111/A21.11, LATEST EDITION)
6. FITTINGS FOR DUCTILE IRON PIPE: CONFORM TO THE REQUIREMENTS OF AMERICAN NATIONAL STANDARD FOR DUCTILE IRON AND GRAY IRON FITTINGS, 3" THROUGH 48" FOR WATER ANSI/AWWA C110/A21.10, LATEST EDITION); CLASS 250 MECHANICAL JOINT PIPE FITTINGS; CEMENT LINED; ALL BELLS; ENTIRE FITTING TAPPED; CONDUCTIVE MECHANICAL JOINT (NO LEAD) RUBBER GASKETS, FLANGES, AND BOLTS.
7. PVC AWWA PIPE: AWWA C900, CLASS 200 WITH BELL END WITH GASKET AND WITH SPIGOT END AND MEETING REQUIREMENTS OF CHAPTER 8.20.0 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN. FITTINGS SHALL BE IN ACCORDANCE WITH CHAPTER 8.22.0 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN. PUSH-ON-JOINT, DUCTILE IRON FITTINGS: AWWA C110 AND C111. MECHANICAL JOINT, DUCTILE IRON FITTINGS: AWWA C153, DUCTILE-IRON COMPACT PATTERN. GLANDS, GASKETS AND BOLTS: AWWA C111, DUCTILE IRON GLANDS, RUBBER GASKETS AND STEEL BOLTS.
8. GATE VALVES: CONFORM TO AWWA C-500 AND STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN SUITABLE FOR DIRECT BURY.
9. VALVE BOXES: CAST IRON CONFORMING TO ASTM DESIGNATION A-48, CLASS 20 AND STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN.
10. FIRE HYDRANTS: N/A
11. WATER MAIN CONNECTION: TAP WATER MAIN WITH SIZE AND LOCATION INDICATED ON PLAN IN ACCORDANCE WITH LOCAL WATER UTILITY REQUIREMENTS. COORDINATE CONNECTION WITH LOCAL WATER UTILITY.
12. GENERAL WATER PIPE INSTALLATION: IN ACCORDANCE WITH CHAPTER 4.3.0 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN.
13. INSTALL DUCTILE-IRON, WATER-SERVICE PIPING ACCORDING TO AWWA C600 AND CHAPTER 4.4.0 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN.
14. ALL DUCTILE IRON PIPE SHALL BE ENCASED IN POLYETHYLENE PER AWWA C105, LATEST EDITION AND IN ACCORDANCE WITH CHAPTER 4.4.4 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN. ALL JOINTS AND FITTINGS SHALL HAVE POLYETHYLENE ENCASEMENT INSTALLED PER MANUFACTURER'S REQUIREMENTS AND PROCEDURES.
15. INSTALL PVC AWWA PIPE ACCORDING TO ASTM F645 AND AWWA M23 AND CHAPTER 4.6.0 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN.
16. INSTALL THRUST RESTRAINT AT ALL OFFSET FITTINGS USING MECHANICAL JOINT RESTRAINTS. CONCRETE THRUST BLOCKS MAY ONLY BE USED IF ALLOWED BY LOCAL WATER UTILITY.
17. INSTALL WATER SERVICE PIPING SUCH THAT THERE IS A MINIMUM OF 6" OF COVER OVER THE TOP OF THE WATER SERVICE PIPING.
18. BEDDING AND COVER FOR WATER SERVICE PIPING SHALL BE IN ACCORDANCE WITH SECTION 4.3.3 AND FILE NO. 36 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION. TRENCH BACKFILL SHALL BE GRANULAR BACKFILL IN ACCORDANCE WITH SECTION 8.43.4 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION ON-SITE.

**SITE WATER SERVICE CONT.:**

- 19. INSTALL TRACER WIRE FOR NON-METALLIC WATER SERVICES IN ACCORDANCE WITH SPS SECTION 382.40(8)(K). TRACER WIRE INSULATION COLOR SHALL BE BLUE FOR POTABLE WATER SERVICE PIPING.
20. DUCTILE-IRON PIPING, RUBBER GASKETED JOINTS IN ACCORDANCE WITH SECTION 4.4.2 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN.
21. PVC PIPING GASKETED JOINTS: USING JOINING MATERIALS ACCORDING TO AWWA C900. CONSTRUCT JOINTS WITH ELASTOMERIC SEALS AND LUBRICANTS ACCORDING TO ASTM D2774 OR ASTM D3139 AND PIPE MANUFACTURER'S WRITTEN INSTRUCTIONS.
22. CONDUCT HYDROSTATIC TESTS IN ACCORDANCE WITH CHAPTER 4.15.0 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN.
23. CLEAN AND DISINFECT WATER SERVICE PIPING IN ACCORDANCE WITH SPS CHAPTER 82.40(8)(I) AND AWWA C651.

**SANITARY SEWERAGE:**

- 1. ALL PRIVATE SANITARY SEWER WORK SHALL BE IN ACCORDANCE WITH THE DEPARTMENT OF SAFETY AND PROFESSIONAL SERVICES (DPS) PLUMBING CODE - CHAPTERS SPS 382 AND SPS 384 AND LOCAL MUNICIPAL REQUIREMENTS.
2. ALL PUBLIC SANITARY SEWER WORK SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION (STANDARD SPECIFICATIONS) AND LOCAL MUNICIPAL REQUIREMENTS.
3. PVC SEWER PIPE AND FITTINGS: ASTM D 3034, SDR 35, WITH BELL-AND-SPIGOT ENDS WITH RUBBER GASKETED JOINTS IN ACCORDANCE WITH CHAPTER 8.10.0 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION. JOINTS SHALL CONFORM TO ASTM D-3212.
4. MANHOLES: STANDARD PRECAST REINFORCED CONCRETE MANHOLES CONFORMING TO ASTM C478, SECTION 8.39.0 OF THE STANDARD SPECIFICATIONS AND CONFORMING TO FILE NOS. 12, 13 AND 15 OF THE STANDARD SPECIFICATIONS. DIAMETER AND DEPTH AS INDICATED ON PLANS. MANHOLE SIZES TO BE VERIFIED BY CONTRACTOR AND SHOP DRAWINGS SHALL BE PROVIDED TO THE ENGINEER FOR REVIEW PRIOR TO ORDERING STRUCTURES.
5. MANHOLES DEEPER THAN FOUR FEET SHALL BE PROVIDED WITH MANHOLE STEPS CONFORMING TO SECTION 8.40.0 OF THE STANDARD SPECIFICATIONS.
6. SEWERS SHALL BE INSTALLED IN CONFORMANCE WITH SECTION 3.2.0 OF THE STANDARD SPECIFICATIONS. INSTALL PROPER SIZE INCREASERS, REDUCERS AND COUPLINGS WHERE DIFFERENT SIZES OR MATERIALS OF PIPES AND FITTINGS ARE CONNECTED. INSTALL TRACER PIPE OVER NON-METALLIC PIPING IN ACCORDANCE WITH SPS SECTION 382.30(11)(H) AND 382.36(7)(D).
7. PIPE JOINT CONSTRUCTION: FOLLOW PIPING MANUFACTURER'S RECOMMENDATIONS; JOIN PVC SEWER PIPE ACCORDING TO ASTM D2321 AND ASTM D 3212 FOR ELASTOMERIC GASKET JOINTS. JOIN DISSIMILAR PIPE MATERIALS WITH NONPRESSURE-TYPE, FLEXIBLE COUPLINGS
8. PROVIDE AND INSTALL CLEANOUTS IN ACCORDANCE WITH SPS CHAPTER 382.35. INSTALL CLEANOUTS AND RISER EXTENSIONS FORM SEWER PIPES TO PROPOSED GRADE. INSTALL PIPING SO CLEANOUTS OPEN IN DIRECTION OF FLOW IN SEWER PIPE. USE LIGHT DUTY, TOP LOADING CLASSIFICATION CLEANOUTS IN EARTH OR UNPAVED FOOT TRAFFIC AREAS; USE MEDIUM DUTY, TOP-LOADING CLASSIFICATION CLEANOUTS IN PAVED FOOT TRAFFIC AREAS; USE HEAVY DUTY, TOP-LOADING CLASSIFICATION CLEANOUTS IN VEHICULAR TRAFFIC AREAS. SET CLEANOUT FRAMES AND COVERS IN PAVEMENT AREAS FLUSH WITH PAVEMENT SURFACE.
9. CLASS B COMPACTED TRENCH SECTION (FILE NO. 4 OF STANDARD SPECIFICATIONS) SHALL BE UTILIZED. BEDDING AND COVER MATERIAL SHALL BE IN ACCORDANCE WITH SECTION 8.43.0 OF THE STANDARD SPECIFICATIONS.
10. TRENCH BACKFILL MATERIAL SHALL BE GRANULAR BACKFILL IN ACCORDANCE WITH SECTION 8.43.4 OF THE STANDARD SPECIFICATIONS BENEATH AND WITHIN FIVE FEET OF PAVEMENT AREAS; COMPACTED SPOIL BACKFILL IN ACCORDANCE WITH SECTION 8.43.5 OF THE STANDARD SPECIFICATIONS MAY BE USED BENEATH LANDSCAPE AREAS.
11. MANHOLE INSTALLATION SHALL BE IN ACCORDANCE WITH SECTION 3.5.0 OF THE STANDARD SPECIFICATIONS. SET MANHOLE RIMS TO ELEVATIONS INDICATED ON PLANS.
12. AFTER INSTALLATION OF SEWER PIPE CLEAN ALL DEBRIS FROM SEWER AND INSPECT INTERIOR OF PIPING TO DETERMINE WHETHER LINE DISPLACEMENT OR OTHER DAMAGE HAS OCCURRED. CONDUCT DEFLECTION TESTING OF INSTALLED PIPE IN ACCORDANCE WITH SECTION 3.2.6(I)(4) OF THE STANDARD SPECIFICATIONS; REPLACE ANY PIPE SECTION NOT PASSING THE DEFLECTION TESTING USING NEW PIPE MATERIALS. TEST NEW BUILDING SEWER IN ACCORDANCE WITH SECTION 5.4.0 OF THE STANDARD SPECIFICATIONS. REPLACE LEAKING PIPE USING NEW PIPE MATERIALS AAND REPEAT TESTING UNTIL LEAKAGE IS WITHIN ALLOWANCES SPECIFIED.

**STORM DRAINAGE:**

- 1. ALL PRIVATE STORM SEWER WORK SHALL BE IN ACCORDANCE WITH THE DEPARTMENT OF SAFETY AND PROFESSIONAL SERVICES (DPS) PLUMBING CODE - CHAPTERS SPS 382 AND SPS 384 AND LOCAL MUNICIPAL REQUIREMENTS.
2. ALL PUBLIC STORM SEWER WORK SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION (STANDARD SPECIFICATIONS) AND LOCAL MUNICIPAL REQUIREMENTS.
3. PVC SEWER PIPE AND FITTINGS: ASTM D 3034, SDR 35, WITH BELL-AND-SPIGOT ENDS WITH RUBBER GASKETED JOINTS IN ACCORDANCE WITH CHAPTER 8.10.0 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION. JOINTS SHALL CONFORM TO ASTM D-3212.
4. REINFORCED CONCRETE PIPE: ASTM C75 WITH BELL AND SPIGOT ENDS AND GASKETED JOINTS WITH ASTM C443 RUBBER GASKETS IN ACCORDANCE WITH CHAPTER 8.6.0 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION.
5. HDPE PIPE: ADS N12 PIPE AS APPROVED ON THE DEPARTMENT OF SAFETY AND PROFESSIONAL SERVICES PLUMBING PRODUCT REGISTER.
6. CATCH BASINS: STANDARD PRECAST CONCRETE CATCH BASINS CONFORMING TO CHAPTER 3.6.0 OF THE STANDARD SPECIFICATIONS AND IN GENERAL CONFORMANCE WITH FILE NO. 26 OF THE STANDARD SPECIFICATIONS. DEPTH AND DIAMETER AS INDICATED ON PLANS. CATCH BASIN SIZES TO BE VERIFIED BY CONTRACTOR AND SHOP DRAWINGS SHALL BE PROVIDED TO THE ENGINEER FOR REVIEW PRIOR TO ORDERING STRUCTURES.
7. FRAMES AND GRATES: AS INDICATED ON PLANS, CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING SPECIFIED FRAME/GRATE IS COMPATIBLE WITH STRUCTURE; IF NOT, NOTIFY ENGINEER.
8. MANHOLES: STANDARD PRECAST REINFORCED CONCRETE MANHOLES CONFORMING TO ASTM C478, SECTION 8.39.0 OF THE STANDARD SPECIFICATIONS AND CONFORMING TO FILE NOS. 12, 13 AND 15 OF THE STANDARD SPECIFICATIONS. DIAMETER AND DEPTH AS INDICATED ON PLANS. MANHOLE SIZES TO BE VERIFIED BY CONTRACTOR AND SHOP DRAWINGS SHALL BE PROVIDED TO THE ENGINEER FOR REVIEW PRIOR TO ORDERING STRUCTURES.
9. MANHOLES AND CATCH BASINS DEEPER THAN FOUR FEET SHALL BE PROVIDED WITH MANHOLE STEPS CONFORMING TO SECTION 8.40.0 OF THE STANDARD SPECIFICATIONS.
10. SEWERS SHALL BE INSTALLED IN CONFORMANCE WITH SECTION 3.2.0 OF THE STANDARD SPECIFICATIONS. INSTALL PROPER SIZE INCREASERS, REDUCERS AND COUPLINGS WHERE DIFFERENT SIZES OR MATERIALS OF PIPES AND FITTINGS ARE CONNECTED. INSTALL TRACER PIPE OVER NON-METALLIC PIPING IN ACCORDANCE WITH SPS SECTION 382.30(11)(H) AND 382.36(7)(D).
11. PROVIDE AND INSTALL CLEANOUTS IN ACCORDANCE WITH SPS CHAPTER 382.35. INSTALL CLEANOUTS AND RISER EXTENSIONS FORM SEWER PIPES TO PROPOSED GRADE. INSTALL PIPING SO CLEANOUTS OPEN IN DIRECTION OF FLOW IN SEWER PIPE. USE LIGHT DUTY, TOP LOADING CLASSIFICATION CLEANOUTS IN EARTH OR UNPAVED FOOT TRAFFIC AREAS; USE MEDIUM DUTY, TOP-LOADING CLASSIFICATION CLEANOUTS IN PAVED FOOT TRAFFIC AREAS; USE HEAVY DUTY, TOP-LOADING CLASSIFICATION CLEANOUTS IN VEHICULAR TRAFFIC AREAS. SET CLEANOUT FRAMES AND COVERS IN PAVEMENT AREAS FLUSH WITH PAVEMENT SURFACE.
12. CLASS B COMPACTED TRENCH SECTION (FILE NO. 4 OF STANDARD SPECIFICATIONS) SHALL BE UTILIZED. BEDDING AND COVER MATERIAL SHALL BE IN ACCORDANCE WITH SECTION 8.43.0 OF THE STANDARD SPECIFICATIONS.
13. TRENCH BACKFILL MATERIAL SHALL BE GRANULAR BACKFILL IN ACCORDANCE WITH SECTION 8.43.4 OF THE STANDARD SPECIFICATIONS BENEATH AND WITHIN FIVE FEET OF PAVEMENT AREAS; COMPACTED SPOIL BACKFILL IN ACCORDANCE WITH SECTION 8.43.5 OF THE STANDARD SPECIFICATIONS MAY BE USED BENEATH LANDSCAPE AREAS.
14. MANHOLE INSTALLATION SHALL BE IN ACCORDANCE WITH SECTION 3.5.0 OF THE STANDARD SPECIFICATIONS. SET MANHOLE RIMS TO ELEVATIONS INDICATED ON PLANS.
15. CATCH BASIN INSTALLATION SHALL BE IN ACCORDANCE WITH SECTION 3.6 OF THE STANDARD SPECIFICATIONS. CATCH BASIN EXCAVATION AND PREPARATION SHALL BE IN ACCORDANCE WITH SECTION 3.5.4(A) AND (B) OF THE STANDARD SPECIFICATIONS. FRAMES AND GRATES SHALL BE SET TO THE ELEVATIONS SHOWN ON THE PLANS.
16. AFTER INSTALLATION OF SEWER PIPE CLEAN ALL DEBRIS FROM SEWER AND INSPECT INTERIOR OF PIPING TO DETERMINE WHETHER LINE DISPLACEMENT OR OTHER DAMAGE HAS OCCURRED. CONDUCT DEFLECTION TESTING OF INSTALLED PIPE IN ACCORDANCE WITH SECTION 3.2.6(I)(4) OF THE STANDARD SPECIFICATIONS; REPLACE ANY PIPE SECTION NOT PASSING THE DEFLECTION TESTING USING NEW PIPE MATERIALS.

**EARTH MOVING:**

- 1. ALL EARTH WORK SHALL BE DONE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER AND PROVIDED REPORTS, IN THE FIELD AND THESE SPECIFICATIONS. IN CASE OF CONFLICT BETWEEN THESE SPECIFICATIONS AND THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER, THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER SHALL GOVERN.
2. CONTRACTOR SHALL PROVIDE MATERIAL TEST REPORTS FROM A QUALIFIED TESTING AGENCY INDICATING TEST RESULTS FOR CLASSIFICATION ACCORDING TO ASTM D2487 AND LABORATORY COMPACTION CURVES ACCORDING TO ASTM D 1557 FOR EACH ON-SITE AND OFF-SITE SOIL MATERIAL PROPOSED FOR FILL AND BACKFILL.
3. CONTRACTOR SHALL PROVIDE PREEXCAVATION PHOTOS OR VIDEOS SHOWING EXISTING CONDITIONS OF ADJOINING STRUCTURES AND SITE IMPROVEMENTS THAT MIGHT BE MISCONSTRUED AS DAMAGE CAUSED BY EARTHWORK OPERATIONS.
4. OLD BUILDING FOUNDATIONS, BUILDING REMNANTS OR UNSUITABLE BACKFILL MATERIAL SHALL BE COMPLETELY REMOVED FROM WITHIN AND A MINIMUM OF 10 FEET BEYOND THE NEW BUILDING PAD AREAS. THE RESULTING EXCAVATION SHALL BE BACKFILLED WITH COMPACTED ENGINEERED FILL.
5. FOUNDATIONS, FOUNDATION WALLS OR CONCRETE FLOOR SLABS SHALL BE REMOVED TO A MINIMUM OF TWO FEET BELOW PROPOSED SUBGRADE WITHIN PROPOSED PARKING AND GREENSPACE AREAS. BASEMENT SLABS LOCATED BELOW 2 FEET FROM PLANNED SUBGRADE ELEVATION MAY BE LEFT IN PLACE BUT SHALL BE BROKEN INTO MAXIMUM 6 INCH PIECES TO FACILITATE DRAINAGE.
6. SATISFACTORY SOILS FOR FILL: ASTM D 2487 SOIL CLASSIFICATION GROUPS GW, GP, GM, SW, SP, AND SM OR A COMBINATION OF THESE GROUPS; FREE OF ROCK OR GRAVEL LARGER THAN 3 INCHES IN ANY DIMENSION, DEBRIS, WASTE, FROZEN MATERIALS, VEGETATION, AND OTHER DELETERIOUS MATTER OR ANY SOIL GROUP OR COMBINATION OF GROUPS APPROVED OF BY THE PROJECT GEOTECHNICAL ENGINEER.
7. UNSATISFACTORY SOILS FOR FILL: SOIL CLASSIFICATION GROUPS GC, SC, CL, ML, OL, CH, MH, OH, AND PT ACCORDING TO ASTM D 2487 OR A COMBINATION OF THESE GROUPS UNLESS DEEMED SATISFACTORY BY THE PROJECT GEOTECHNICAL ENGINEER. UNSATISFACTORY SOILS ALSO INCLUDE SOILS NOT MAINTAINED WITHIN 3 PERCENT OF OPTIMUM SOIL MOISTURE CONTENT AT THE TIME OF COMPACTION.
8. AGGREGATE BASE COURSE BENEATH PAVEMENTS: SHALL BE 1-1/4" DENSE GRADED BASE COURSE CONFORMING TO SECTION 305 OF THE STATE OF WISCONSIN STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, LATEST EDITION.
9. ENGINEERED FILL: NATURALLY OR ARTIFICIALLY GRADED MIXTURE OF NATURAL OR CRUSHED GRAVEL, CRUSHED STONE, AND NATURAL OR CRUSHED SAND; ASTM D 2945; WITH AT LEAST 90 PERCENT PASSING A 1-1/2-INCH (37.5-MM) SIEVE AND NOT MORE THAN 12 PERCENT PASSING A NO. 200 SIEVE OR ANY SOIL, DEEMED ACCEPTABLE FOR ENGINEERED FILL BY THE PROJECT GEOTECHNICAL ENGINEER. ENGINEERED FILL SHALL BE FREE OF ORGANIC, FROZEN, OR OTHER DELETERIOUS MATERIAL AND HAVE A MAXIMUM PARTICLE SIZE LESS THAN 3 INCHES. CLAY FILLS SHALL HAVE A LIQUID LIMIT OF LESS THAN 49 AND PLASTICITY INDEX BETWEEN 11 AND 25.
10. BEDDING COURSE FOR SEWERS AND WATER SERVICE: NATURALLY OR ARTIFICIALLY GRADED MIXTURE OF NATURAL OR CRUSHED GRAVEL, CRUSHED STONE, AND NATURAL OR CRUSHED SAND CONFORMING TO THE REQUIREMENTS OF SECTION 8.43.2 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION.
11. DRAINAGE COURSE BENEATH BUILDING SLABS: NARROWLY GRADED MIXTURE OF WASHED, CRUSHED STONE, OR CRUSHED OR UNCRUSHED GRAVEL; ASTM D 448; COARSE-AGGREGATE GRADING SIZE 57; WITH 100 PERCENT PASSING A 1-1/2-INCH (37.5-MM) SIEVE AND 0 TO 5 PERCENT PASSING A NO. 8 SIEVE.
12. TRENCH BACKFILL MATERIAL SHALL BE GRANULAR BACKFILL IN ACCORDANCE WITH SECTION 8.43.4 OF THE STANDARD SPECIFICATIONS BENEATH AND WITHIN FIVE FEET OF PAVEMENT AREAS; COMPACTED SPOIL BACKFILL IN ACCORDANCE WITH SECTION 8.43.5 OF THE STANDARD SPECIFICATIONS MAY BE USED BENEATH LANDSCAPE AREAS.
13. PIPE COVER MATERIAL: CONFORM TO SECTION 8.43.3 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION.
14. PREVENT SURFACE WATER AND GROUND WATER FROM ENTERING EXCAVATIONS, FROM PONDING ON PREPARED SUBGRADES, AND FROM FLOODING PROJECT SITE AND SURROUNDING AREA.
15. SHORING, SHEETING AND BRACING: SHORE, BRACE OR SLOPE BANKS OF EXCAVATION TO PROTECT WORKMEN, BANKS, ADJACENT PAVING, STRUCTURES, AND UTILITIES TO MEET OSHA REQUIREMENTS. DESIGN OF TEMPORARY SUPPORT OF EXCAVATION IS THE RESPONSIBILITY OF THE CONTRACTOR.
16. EXCAVATE TO SUBGRADE ELEVATIONS REGARDLESS OF THE CHARACTER OF SURFACE AND SUBSURFACE CONDITIONS ENCOUNTERED. UNCLASSIFIED EXCAVATED MATERIALS MAY INCLUDE ROCK, SOIL MATERIALS, AND OBSTRUCTIONS. NO CHANGES IN THE CONTRACT SUM OR THE CONTRACT TIME WILL BE AUTHORIZED FOR ROCK EXCAVATION OR REMOVAL OF OBSTRUCTIONS.
17. PROOF-ROLL SUBGRADE BELOW THE BUILDING SLABS AND PAVEMENTS WITH FULLY LOADED TANDEM AXLE DUMP TRUCK OR RUBBER Tired VEHICLE OF SIMILAR SIZE AND WEIGHT, TYPICALLY 9 TONS/AXLE, WHERE COHESIVE SOILS ARE ENCOUNTERED OR WITH A SMOOTH DRUMMED VIBRATORY ROLLER WHERE GRANULAR SOILS ARE PRESENT. DO NOT PROOF-ROLL WET OR SATURATED SUBGRADES AND PROOFROLL IN DRY WEATHER. PROOF ROLL IN PRESENCE OF PROJECT GEOTECHNICAL ENGINEER OR TECHNICIAN. SOILS THAT ARE OBSERVED TO RUT OR DEFLECT EXCESSIVELY UNDER THE MOVING LOAD (TYPICALLY 5-1") SHALL BE UNDERCUT AND REPLACED WITH PROPERLY COMPACTED ENGINEERED FILL. IN PAVEMENT AREAS WHERE UNDERCUTS ARE PERFORMED, THE EDGES OF THE OVEREXCAVATIONS SHALL BE FEATHERED INTO THE SURROUNDING SUITABLE SOIL SO THAT EDGE FAILURE OF THE OVEREXCAVATED AREA DOES NOT OCCUR.
18. DUE TO CLAYEY SOILS, IF UNDERCUTS OCCUR WITHIN PAVEMENT AREAS AND THEY ARE BACKFILLED WITH GRANULAR SOILS, THE BOTTOM OF THE OVEREXCAVATION SHALL BE SLOPED TO A DRAIN TILE THAT IS IN KIND SLOPED TOWARD THE NEAREST STORM SEWER. MINIMUM SLOPES OF SUCH DRAIN TILES SHALL BE 0.5%.
19. CONVENTIONAL DISKING AND AERATION TECHNIQUES SHALL BE USED TO DRY SOILS BEFORE PROOF ROLLING. ALLOT FOR PROPER DRYING TIME IN PROJECT SCHEDULE.
20. ENGINEERED FILL SHALL BE PLACED IN MAXIMUM LIFTS OF EIGHT INCHES OF LOOSE MATERIAL AND COMPACTED WITHIN 3% OF OPTIMUM SOIL MOISTURE CONTENT VALUE AND A MINIMUM OF 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE MODIFIED PROCTOR TEST ASTM D1557. EACH LIFT OF COMPACTED ENGINEERED FILL SHALL BE OBSERVED AND TESTED BY A QUALIFIED GEOTECHNICAL ENGINEER OR TECHNICIAN.
21. EXISTING OLD FILL MATERIAL SHALL BE REMOVED BELOW FOOTINGS OR FOUNDATION SUPPORTING FILL. ENGINEERED FILL BELOW FOOTINGS SHOULD HAVE AN IN-PLACE DENSITY OF 95% OF THE MAXIMUM DRY DENSITY AND A MOISTURE CONTENT WITHIN 3% OF OPTIMUM AS DETERMINED BY ASTM D1557. ENGINEERED FILL BELOW FOOTINGS SHALL BE EVALUATED BY IN-FIELD DENSITY TESTS DURING CONSTRUCTION.
22. WHERE UNSUITABLE BEARING SOILS ARE ENCOUNTERED IN A FOOTING EXCAVATION, THE EXCAVATION SHALL BE DEEPEMED TO COMPETENT BEARING SOIL AND THE FOOTING LOWERED OR AN OVEREXCAVATION AND BACKFILL PROCEDURE PERFORMED. OVEREXCAVATION AND BACKFILL TREATMENT REQUIRES WIDENING THE DEEPEMED EXCAVATION IN ALL DIRECTIONS AT LEAST 6 INCHES BEYOND THE EDGE OF THE FOOTING FOR EACH 12 INCHES OF OVEREXCAVATION DEPTH. THE OVEREXCAVATION SHALL BE BACKFILLED UP TO FOOTING BASE ELEVATION IN MAXIMUM 8 INCH LOOSE LIFTS WITH SUITABLE GRANULAR FILL MATERIAL AND COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY AND A MOISTURE CONTENT WITHIN 3% OF OPTIMUM AS DETERMINED BY ASTM D1557. SOILS AT FOUNDATION BEARING ELEVATION IN THE FOOTING EXCAVATIONS SHALL BE OBSERVED AND TESTED BY A QUALIFIED GEOTECHNICAL ENGINEER OR TECHNICIAN.
23. A MINIMUM OF FOUR INCHES OF DRAINAGE COURSE MAT SHALL BE PLACED BELOW BUILDING FLOOR SLABS. DRAINAGE COURSE SHALL BE COMPACTED TO A MINIMUM OF 95% COMPACTION WITH RESPECT TO THE MODIFIED PROCTOR (ASTM D1557)
24. UTILITY TRENCHES FOR SEWER AND WATER SHALL CONFORM TO CLASS B COMPACTED TRENCH SECTION IN ACCORDANCE WITH FILE NO. 4 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION.
25. BACKFILL UTILITY TRENCHES IN 4 TO 6 INCH LOOSE LIFTS COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557. BACKFILL SHALL BE MOISTURE CONDITIONED TO BE WITH 3% OF OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D1557.
26. UTILITY BEDDING PLACEMENT: CONFORM TO SECTION 3.2.6 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, LATEST EDITION. BEDDING MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 90% COMPACTION WITH RESPECT TO THE MODIFIED PROCTOR (ASTM D1557).
27. COMPACTION TESTING OF UTILITY TRENCHES SHALL BE PERFORMED FOR EVERY 200 CUBIC YARDS OF BACKFILL PLACED OR EACH LIFT WITHIN 200 LINEAR FEET OF TRENCH, WHICHEVER IS LESS.
28. AGGREGATE BASE COURSE BENEATH PAVEMENTS SHALL BE PLACED AND COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT WITHIN 3% OF OPTIMUM AS DETERMINED BY ASTM D1557. AGGREGATE BASE SHALL BE OBSERVED AND TESTED BY A QUALIFIED GEOTECHNICAL ENGINEER OR TECHNICIAN.
29. GRADING GENERAL: UNIFORMLY GRADE AREAS TO A SMOOTH SURFACE, FREE OF IRREGULAR SURFACE CHANGES. COMPLY WITH COMPACTION REQUIREMENTS AND GRADE TO CROSS SECTIONS, LINES, AND ELEVATIONS INDICATED. SLOPE GRADES TO DIRECT WATER AWAY FROM BUILDINGS AND TO PREVENT PONDING.
30. TESTING AGENCY: CONTRACTOR SHALL ENGAGE A QUALIFIED INDEPENDENT GEOTECHNICAL ENGINEERING TESTING AGENCY TO PERFORM FIELD QUALITY-CONTROL TESTING.
31. FOOTING SUBGRADE TESTING: EACH ISOLATED FOOTING SHALL INCLUDE AT LEAST ONE TEST PROBE. TEST PROBES SHALL BE PERFORMED EVERY 20 LINEAR FEET IN CONTINUOUS FOOTINGS.
32. BUILDING SLAB AREA TESTING: AT SUBGRADE AND AT EACH COMPACTED FILL AND BACKFILL LAYER, AT LEAST 1 TEST PER LIFT FOR EVERY 2500 SQ. FT. OR LESS OF BUILDING SLAB, BUT IN NO CASE FEWER THAN 3 TESTS.
33. PAVEMENT AREA TESTING: AT SUBGRADE AND AT EACH COMPACTED FILL AND BACKFILL LAYER, AT LEAST ONE TEST FOR EVERY LIFT FOR EVERY 2,500 SQUARE FEET OF PAVEMENT AREA, BUT IN NO CASES FEWER THAN 3 TESTS.
34. UTILITY TRENCH BACKFILL TESTING: ONE TEST FOR EACH 200 CUBIC YARDS OF FILL BACKFILL PLACED OR ONE TEST PER 200 LINEAR FEET OF TRENCH FOR EACH LIFT; WHICHEVER IS LESS.
35. FOUNDATION WALL BACKFILL: AT EACH COMPACTED BACKFILL LAYER, AT LEAST 1 TEST PER LIFT FOR EACH 50 FEET OR LESS OF WALL LENGTH, BUT NO FEWER THAN 2 TESTS.
36. WHEN TESTING AGENCY REPORTS THAT SUBGRADES, FILLS, OR BACKFILLS HAVE NOT ACHIEVED DEGREE OF COMPACTION SPECIFIED, SCARIFY AND MOISTEN OR AERATE, OR REMOVE AND REPLACE SOIL TO DEPTH REQUIRED; RECOMPACT AND RETEST UNTIL SPECIFIED COMPACTION IS OBTAINED.
37. DISPOSAL: REMOVE SURPLUS SOIL AND WASTE MATERIAL, INCLUDING UNSATISFACTORY SOIL, TRASH, AND DEBRIS, AND LEGALLY DISPOSE OF IT OFF OWNER'S PROPERTY.



MULTI FAMILY DEVELOPMENT  
WATERTOWN PLANK ROAD  
ELM GROVE, WISCONSIN

SPECIFICATIONS

CITY SUBMITTAL 2-19-2016  
NO. REVISION DATE BY

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DATE:

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**CONCRETE PAVING:**

- 1. THE COMPOSITION, PLACING AND CONSTRUCTION OF CONCRETE PAVEMENTS SHALL BE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF SECTIONS 415, 416, 501, 601, AND 602 OF THE STATE OF WISCONSIN STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, LATEST EDITION (WISDOT STANDARD SPECIFICATIONS) AND LOCAL MUNICIPAL REQUIREMENTS AND SPECIFICATIONS.
- 2. CONTRACTOR SHALL PROVIDE PRODUCT DATA FOR EACH TYPE OF PRODUCT INDICATED - INCLUDE TECHNICAL DATA AND TESTED PHYSICAL AND PERFORMANCE PROPERTIES; JOB-MIX DESIGNS: CERTIFICATION THAT MIX MEETS OR EXCEEDS WISDOT STANDARD SPECIFICATIONS; AND MATERIAL CERTIFICATES CERTIFYING COMPLIANCE WITH WISDOT STANDARD SPECIFICATIONS.
- 3. MANUFACTURER QUALIFICATIONS: MANUFACTURER OF READY-MIXED CONCRETE PRODUCTS WHO COMPLIES WITH ASTM C 94/C 94M REQUIREMENTS FOR PRODUCTION FACILITIES AND EQUIPMENT AND APPROVED BY THE WISCONSIN DEPARTMENT OF TRANSPORTATION.
- 4. CONCRETE GRADE: GRADE A OR GRADE A-2 CONFORMING TO SECTION 501.3.1.3 OF THE WISDOT STANDARD SPECIFICATIONS
- 5. AGGREGATES: CONFORM TO SECTION 501 OF THE WISDOT STANDARD SPECIFICATIONS. PROVIDE AGGREGATES FROM A SINGLE SOURCE.
- 6. WATER: ASTM C 94/C 94M AND SECTION 501 OF THE WISDOT STANDARD SPECIFICATIONS.
- 7. AIR-ENTRAINING ADMIXTURE: ASTM C 260 AND SECTION 501 OF THE WISDOT STANDARD SPECIFICATIONS.
- 8. CHEMICAL ADMIXTURES: PER SECTION 501 OF THE WISDOT STANDARD SPECIFICATIONS.
- 9. CURING MATERIALS IN ACCORDANCE WITH SECTION 415.3.12 OF THE WISDOT STANDARD SPECIFICATIONS.
- 10. EXPANSION JOINT MATERIAL: CONFORM TO SECTION 415.2.2 OF THE WISDOT STANDARD SPECIFICATIONS.
- 11. MEASURE, BATCH, AND MIX CONCRETE MATERIALS AND CONCRETE IN ACCORDANCE WITH SECTION 501 OF THE WISDOT STANDARD SPECIFICATIONS.
- 12. GENERAL EXECUTION: CONFORM TO SECTION 415 OF THE WISDOT STANDARD SPECIFICATIONS.
- 13. PROOFROLL SUBGRADE AND AGGREGATE BASE AS OUTLINED IN EARTH MOVING SPECIFICATION PRIOR TO PLACEMENT OF PAVEMENTS.
- 14. SET, BRACE, AND SECURE EDGE FORMS, BULKHEADS, AND INTERMEDIATE SCREED GUIDES FOR PAVEMENT TO REQUIRED LINES, GRADES, AND ELEVATIONS. INSTALL FORMS TO ALLOW CONTINUOUS PROGRESS OF WORK AND SO FORMS CAN REMAIN IN PLACE AT LEAST 24 HOURS AFTER CONCRETE PLACEMENT.
- 15. CLEAN FORMS AFTER EACH USE AND COAT WITH FORM-RELEASE AGENT TO ENSURE SEPARATION FROM CONCRETE WITHOUT DAMAGE.
- 16. JOINTS GENERAL: FORM CONSTRUCTION, ISOLATION, AND CONTRACTION JOINTS AND TOOL EDGINGS TRUE TO LINE WITH FACES PERPENDICULAR TO SURFACE PLANE OF CONCRETE. CONSTRUCT TRANSVERSE JOINTS AT RIGHT ANGLES TO CENTERLINE, UNLESS OTHERWISE INDICATED. CONFORM TO SECTION 415 OF THE WISDOT STANDARD SPECIFICATIONS
- 17. CONSTRUCTION JOINTS: SET CONSTRUCTION JOINTS AT SIDE AND END TERMINATIONS OF PAVEMENT AND AT LOCATIONS WHERE PAVEMENT OPERATIONS ARE STOPPED FOR MORE THAN ONE-HALF HOUR UNLESS PAVEMENT TERMINATES AT ISOLATION JOINTS.
- 18. ISOLATION JOINTS: FORM ISOLATION JOINTS OF PREFORMED JOINT-FILLER STRIPS ABUTTING CONCRETE CURBS, CATCH BASINS, MANHOLES, INLETS, STRUCTURES, WALKS, OTHER FIXED OBJECTS, AND WHERE INDICATED.
- 19. CONTRACTION JOINTS: FORM WEAKENED-PLANE CONTRACTION JOINTS, SECTIONING CONCRETE INTO AREAS AS INDICATED. CONSTRUCT CONTRACTION JOINTS FOR A DEPTH EQUAL TO AT LEAST ONE-FOURTH OF THE CONCRETE THICKNESS TO MATCH JOINTING OF EXISTING ADJACENT CONCRETE PAVEMENT.
- 20. EDGING: TOOL EDGES OF PAVEMENT, GUTTERS, CURBS, AND JOINTS IN CONCRETE AFTER INITIAL FLOATING WITH AN EDGING TOOL TO A 1/4-INCH RADIUS. REPEAT TOOLING OF EDGES AFTER APPLYING SURFACE FINISHES. ELIMINATE TOOL MARKS ON CONCRETE SURFACES.
- 21. CURBING: COMPLY WITH SECTION 601 OF THE WISDOT STANDARD SPECIFICATIONS.
- 22. SIDEWALKS: COMPLY WITH SECTION 602 OF THE WISDOT STANDARD SPECIFICATIONS.
- 23. MOISTEN AGGREGATE TO PROVIDE A UNIFORM DAMPENED CONDITION AT TIME CONCRETE IS PLACED.
- 24. FINISH CURBING IN ACCORDANCE WITH SECTION 601.3.5 OF THE WISDOT STANDARD SPECIFICATIONS.
- 25. FINISH SIDEWALK AND PATIO IN ACCORDANCE WITH SECTION 602.3.2.3 OF THE WISDOT STANDARD SPECIFICATIONS (LIGHT BROOM FINISH).
- 26. FINISH CONCRETE VEHICULAR PAVEMENTS AND PADS IN ACCORDANCE WITH SECTION 415.3.8 OF THE WISDOT STANDARD SPECIFICATIONS (ARTIFICIAL TURF DRAG FINISH).
- 27. PROTECT AND CURE SIDEWALK IN ACCORDANCE WITH SECTION 602.3.2.6 OF THE WISDOT STANDARD SPECIFICATIONS.
- 28. PROTECT AND CURE CURBING IN ACCORDANCE WITH SECTION 601.3.7 OF THE WISDOT STANDARD SPECIFICATIONS.
- 29. PROTECT AND CURE VEHICULAR CONCRETE PAVING IN ACCORDANCE WITH SECTION 415.3.12 OF THE WISDOT STANDARD SPECIFICATIONS.
- 30. REMOVE AND REPLACE CONCRETE PAVEMENT THAT IS BROKEN, DAMAGED, OR DEFECTIVE OR THAT DOES NOT COMPLY WITH REQUIREMENTS IN THIS SECTION.
- 31. PROTECT CONCRETE FROM DAMAGE. EXCLUDE TRAFFIC FROM PAVEMENT FOR AT LEAST 7 DAYS AFTER PLACEMENT.
- 32. MAINTAIN CONCRETE PAVEMENT FREE OF STAINS, DISCOLORATION, DIRT, AND OTHER FOREIGN MATERIAL. SWEEP CONCRETE PAVEMENT NOT MORE THAN TWO DAYS BEFORE DATE SCHEDULED FOR SUBSTANTIAL COMPLETION INSPECTIONS.

**ASPHALTIC PAVING:**

- 1. THE COMPOSITION, PLACING AND CONSTRUCTION OF ASPHALTIC PAVEMENTS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTIONS 450, 455, 460, 465, AND 475 OF THE STATE OF WISCONSIN STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, LATEST EDITION (WISDOT STANDARD SPECIFICATIONS).
- 2. CONTRACTOR SHALL PROVIDE PRODUCT DATA FOR EACH TYPE OF PRODUCT INDICATED - INCLUDE TECHNICAL DATA AND TESTED PHYSICAL AND PERFORMANCE PROPERTIES; JOB-MIX DESIGNS: CERTIFICATION THAT MIX MEETS OR EXCEEDS WISDOT STANDARD SPECIFICATIONS; AND MATERIAL CERTIFICATES CERTIFYING COMPLIANCE WITH WISDOT STANDARD SPECIFICATIONS.
- 3. MANUFACTURER QUALIFICATIONS: MANUFACTURER SHALL BE REGISTERED WITH AND APPROVED BY THE DOT OF THE STATE IN WHICH PROJECT IS LOCATED.
- 4. ENVIRONMENTAL LIMITATIONS: DO NOT APPLY ASPHALT MATERIALS IF BASE COURSE IS WET OR EXCESSIVELY DAMP OR IF THE FOLLOWING CONDITIONS ARE NOT MET: APPLY TACK COAT WHEN AMBIENT TEMPERATURE IS ABOVE 50 DEGREES FARENHEIGHT AND WHEN TEMPERATURE HAS NOT BEEN BELOW 35 DEGREES FARENHEIGHT FOR 12 HOURS IMMEDIATELY PRIOR TO APPLICATION; PLACE ASPHALTIC CONCRETE SURFACE COURSE WHEN TEMPERATURE IS ABOVE 40 DEGREES FARENHEIGHT; BASE COURSE MAY BE PLACED WHEN AIR TEMPERATURE IS ABOVE 30 DEGREES FARENHEIGHT AND RISING. PROCEED WITH PAVEMENT MARKING ONLY ON CLEAN, DRY SURFACES. DO NOT APPLY BELOW THE MINIMUM PAVEMENT TEMPERATURE AS RECOMMENDED BY THE MANUFACTURER.
- 5. AGGREGATES SHALL BE IN ACCORDANCE WITH SECTION 460.2.2 OF THE WISDOT STANDARD SPECIFICATIONS.
- 6. ASPHALT MATERIALS SHALL BE IN ACCORDANCE WITH CHAPTER 455 OF THE WISDOT STANDARD SPECIFICATIONS.
- 7. PAVEMENT MARKING PAINT: PROVIDE PAINT FROM THE WISCONSIN DEPARTMENT OF TRANSPORTATION'S APPROVED PRODUCTS LIST. COLOR SHALL BE WHITE UNLESS INDICATED OTHERWISE ON PLANS.
- 8. HOT-MIX ASPHALT: ASPHALTIC BINDER COURSE AND SURFACE COURSE SHALL BE MIXTURE E-1 FOR REGULAR DUTY PAVEMENT AND E-1 FOR HEAVY DUTY PAVEMENT COMPLYING WITH THE WISDOT STANDARD SPECIFICATIONS.
- 9. AGGREGATE BASE COURSE BENEATH PAVEMENTS: SHALL BE 1-1/4" DENSE GRADED BASE COURSE CONFORMING TO SECTION 305 OF THE WISDOT STANDARD SPECIFICATIONS.
- 10. PAVEMENT PLACEMENT GENERAL: ASPHALT CONCRETE PAVING EQUIPMENT, WEATHER LIMITATIONS, JOB-MIX FORMULA, MIXING, CONSTRUCTION METHODS, COMPACTION, FINISHING, TOLERANCE AND PROTECTION SHALL CONFORM TO THE REQUIREMENTS OF THE APPROPRIATE SECTIONS OF THE WISDOT STANDARD SPECIFICATIONS.
- 11. PREPARE AND PROOFROLL SUBGRADES AND AGGREGATE BASE COURSE AS OUTLINED IN EARTH MOVING SPECIFICATIONS PRIOR TO PLACEMENT OF ASPHALT PAVEMENTS
- 12. SWEEP LOOSE GRANULAR PARTICLES FROM SURFACE OF AGGREGATE BASE COURSE PRIOR TO PAVEMENT PLACEMENT. DO NOT DISLUDGE OR DISTURB AGGREGATE EMBEDDED IN COMPACTED SURFACE OF BASE COURSE.
- 13. SPREAD AND FINISH ASPHALTIC MIXTURE IN ACCORDANCE WITH SECTION 450.3.2.5 OF THE WISDOT STANDARD SPECIFICATIONS. PAVEMENT THICKNESSES SHALL BE AS INDICATED ON THE PLANS.
- 14. PROMPTLY CORRECT SURFACE IRREGULARITIES IN PAVING COURSE BEHIND PAVER. USE SUITABLE HAND TOOLS TO REMOVE EXCESS MATERIAL FORMING HIGH SPOTS. FILL DEPRESSIONS WITH HOT-MIX ASPHALT TO PREVENT SEGREGATION OF MIX; USE SUITABLE HAND TOOLS TO SMOOTH SURFACE.
- 15. COMPACT ASPHALTIC PAVEMENT IN ACCORDANCE WITH SECTION 450.3.2.6 OF THE WISDOT STANDARD SPECIFICATIONS.
- 16. PROTECTION: AFTER FINAL ROLLING, DO NOT PERMIT VEHICULAR TRAFFIC ON PAVEMENT UNTIL IT HAS COOLED AND HARDENED. ERECT BARRICADES TO PROTECT PAVING FROM TRAFFIC UNTIL MIXTURE HAS COOLED ENOUGH NOT TO BECOME MARKED.
- 17. THICKNESS TOLERANCE: COMPACT EACH COURSE TO PRODUCE THE THICKNESS INDICATED WITHIN PLUS/MINUS 1/4 INCH FOR BINDER COURSE AND PLUS 1/4 INCH FOR SURFACE COURSE, NO MINUS.
- 18. SURFACE SMOOTHNESS TOLERANCE: COMPACT EACH COURSE TO PRODUCE A SURFACE SMOOTHNESS WITHIN THE FOLLOWING TOLERANCES AS DETERMINED BY USING A 10-FOOT STRAIGHTEDGE APPLIED TRANSVERSELY OR LONGITUDINALLY TO PAVED AREAS: BINDER COURSE: 1/4 INCH; SURFACE COURSE: 1/8 INCH. REMOVE AND REPLACE ALL HUMPS OR DEPRESSIONS EXCEEDING THE SPECIFIED TOLERANCES.
- 19. DO NOT APPLY PAVEMENT-MARKING PAINT UNTIL LAYOUT, COLORS, AND PLACEMENT HAVE BEEN VERIFIED WITH ENGINEER.
- 20. APPLY MARKINGS TO A DRY SURFACE FREE FROM FROST. REMOVE DUST, DIRT, OIL, GREASE, GRAVEL, DEBRIS OR OTHER MATERIAL THAT MAY PREVENT BONDING TO THE PAVEMENT.
- 21. APPLY PAINT AS THE MANUFACTURER SPECIFIES WITH MECHANICAL EQUIPMENT TO PRODUCE PAVEMENT MARKINGS, OF DIMENSIONS INDICATED, WITH UNIFORM, STRAIGHT EDGES. APPLY AT MANUFACTURER'S RECOMMENDED RATES AT A MINIMUM RATE OF 17.6 GALLONS/MILE FOR A CONTINUOUS 4" LINE.
- 22. TESTING AGENCY: CONTRACTOR SHALL ENGAGE A QUALIFIED INDEPENDENT TESTING AND INSPECTING AGENCY TO PERFORM FIELD TESTS AND INSPECTIONS AND TO PREPARE TEST REPORTS.

**SEGMENTAL RETAINING WALL:**

- 1. WORK SHALL CONSIST OF FURNISHING DETAILED DESIGN, MATERIALS, LABOR, EQUIPMENT AND SUPERVISION TO INSTALL A SEGMENTAL RETAINING WALL SYSTEM IN ACCORDANCE WITH PLANS AND SPECIFICATIONS AND IN REASONABLY CLOSE CONFORMITY WITH THE LINES, GRADES, DESIGN AND DIMENSIONS SHOWN ON PLANS.
- 2. MATERIALS SUBMITTALS: THE CONTRACTOR SHALL SUBMIT MANUFACTURERS' CERTIFICATIONS TWO WEEKS PRIOR TO START OF WORK STATING THAT THE SRW UNITS AND GEOSYNTHETIC REINFORCEMENT MEET THE REQUIREMENTS OF SECTION 2 OF THIS SPECIFICATION.
- 3. DESIGN SUBMITTAL: THE CONTRACTOR SHALL SUBMIT TWO SETS OF DETAILED DESIGN CALCULATIONS AND FINAL RETAINING WALL PLANS FOR APPROVAL AT LEAST TWO WEEKS PRIOR TO THE BEGINNING OF WALL CONSTRUCTION. ALL CALCULATIONS AND DRAWINGS SHALL BE PREPARED AND SEALED BY A PROFESSIONAL CIVIL ENGINEER (P.E.) - (WALL DESIGN ENGINEER) EXPERIENCED IN SRW DESIGN AND LICENSED IN THE STATE WHERE THE WALL IS TO BE BUILT.
- 4. SEGMENTAL RETAINING WALL (SRW) UNITS SHALL BE MACHINE FORMED, PORTLAND CEMENT CONCRETE BLOCKS SPECIFICALLY DESIGNED FOR RETAINING WALL APPLICATIONS. SRW UNITS SHALL BE VERSA-LOK STANDARD RETAINING WALL UNITS, KEYSTONE RETAINING WALL UNITS, ROCKWOOD RETAINING WALL UNITS OR APPROVED EQUAL.
- 5. COLOR AND STYLE OF SRW UNITS SHALL BE AS SELECTED BY ARCHITECT AND OWNER FROM MANUFACTURER'S FULL RANGE.
- 6. SRW UNITS SHALL BE CAPABLE OF BEING ERECTED WITH THE HORIZONTAL GAP BETWEEN ADJACENT UNITS NOT EXCEEDING 1/8 INCH.
- 7. SRW UNITS SHALL BE SOUND AND FREE OF CRACKS OR OTHER DEFECTS THAT WOULD INTERFERE WITH THE PROPER PLACING OF THE UNIT OR SIGNIFICANTLY IMPAIR THE STRENGTH OR PERMANENCE OF THE STRUCTURE. ANY CRACKS OR CHIPS OBSERVED DURING CONSTRUCTION SHALL FALL WITHIN THE GUIDELINES OUTLINED IN ASTM C 1372.
- 8. CONCRETE SRW UNITS SHALL CONFORM TO THE REQUIREMENTS OF ASTM 1372 AND HAVE A MINIMUM NET AVERAGE 28 DAYS COMPRESSIVE STRENGTH OF 3000 PSI. COMPRESSIVE STRENGTH TEST SPECIMENS SHALL CONFORM TO THE SAW-CUT COUPON PROVISIONS OF ASTM C140.
- 9. SRW UNITS' MOLDED DIMENSIONS SHALL NOT DIFFER MORE THAN +/- 1/8 INCH FROM THAT SPECIFIED, AS MEASURED IN ACCORDANCE WITH ASTM C 140. THIS TOLERANCE DOES NOT APPLY TO ARCHITECTURAL SURFACES, SUCH AS SPLIT FACES.
- 10. SRW UNITS SHALL BE INTERLOCKED WITH CONNECTION PINS. THE PINS SHALL CONSIST OF GLASS-REINFORCED NYLON MADE FOR THE EXPRESSED USE WITH THE SRW UNITS SUPPLIED.
- 11. GEOSYNTHETIC REINFORCEMENT SHALL CONSIST OF HIGH-TENACITY PET GEOGRIDS, HDPE GEOGRIDS, OR GEOTEXTILES MANUFACTURED FOR SOIL REINFORCEMENT APPLICATIONS. THE TYPE, STRENGTH AND PLACEMENT OF THE GEOSYNTHETIC REINFORCEMENT SHALL BE DETERMINED BY PROCEDURES OUTLINED IN THIS SPECIFICATION AND THE NCMA DESIGN MANUAL FOR SEGMENTAL RETAINING WALLS (3RD EDITION 2009) AND MATERIALS SHALL BE SPECIFIED BY WALL DESIGN ENGINEER IN THEIR FINAL WALL PLANS AND SPECIFICATIONS. THE MANUFACTURERS/SUPPLIERS OF THE GEOSYNTHETIC REINFORCEMENT SHALL HAVE DEMONSTRATED CONSTRUCTION OF SIMILAR SIZE AND TYPES OF SEGMENTAL RETAINING WALLS ON PREVIOUS PROJECTS.
- 12. THE TYPE, STRENGTH AND PLACEMENT OF THE REINFORCING GEOSYNTHETIC SHALL BE AS DETERMINED BY THE WALL DESIGN ENGINEER, AS SHOWN ON THE FINAL, P.E.-STAMPED RETAINING WALL PLANS.
- 13. MATERIAL FOR LEVELING PAD SHALL CONSIST OF COMPACTED SAND, GRAVEL, OR COMBINATION THEREOF (USCS SOIL TYPES GP, GW, SP, & SW) AND SHALL BE A MINIMUM OF 6 INCHES IN DEPTH. LEAN CONCRETE WITH A STRENGTH OF 200-300 PSI AND 3 INCHES THICK MAXIMUM MAY ALSO BE USED AS A LEVELING PAD MATERIAL. THE LEVELING PAD SHOULD EXTEND Laterally AT LEAST A DISTANCE OF 6 INCHES FROM THE TOE AND HEEL OF THE LOWERMOST SRW UNIT.
- 14. DRAINAGE AGGREGATE SHALL BE ANGULAR, CLEAN STONE OR GRANULAR FILL MEETING THE FOLLOWING GRADATION AS DETERMINED IN ACCORDANCE WITH ASTM D422:

SIEVE SIZE	PERCENT PASSING
1 INCH	100
3/4 INCH	75-100
NO. 4	0-60
NO. 40	0-50
NO. 200	0-5
- 15. THE DRAINAGE COLLECTION PIPE SHALL BE A PERFORATED OR SLOTTED PVC, OR CORRUGATED HDPE PIPE. THE DRAINAGE PIPE MAY BE WRAPPED WITH A GEOTEXTILE TO FUNCTION AS A FILTER. DRAINAGE PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM F 405 OR ASTM F 758.
- 16. THE REINFORCED SOIL MATERIAL SHALL BE FREE OF DEBRIS. UNLESS OTHERWISE NOTED ON THE FINAL, P.E.-SEALED, RETAINING WALL PLANS PREPARED BY THE WALL DESIGN ENGINEER, THE REINFORCED MATERIAL SHALL CONSIST OF THE INORGANIC USCS SOIL TYPES GP, GW, SW, SP, SM, MEETING THE FOLLOWING GRADATION, AS DETERMINED IN ACCORDANCE WITH ASTM D422:

SIEVE SIZE	PERCENT PASSING
1 INCH	100
NO. 4	20-100
NO. 40	0-50
NO. 200	0-35
- 17. THE MAXIMUM PARTICLE SIZE OF POORLY-GRADED GRAVELS (GP) (NO FINES) SHOULD NOT EXCEED 3/4 INCH UNLESS EXPRESSLY APPROVED BY THE WALL DESIGN ENGINEER AND THE LONG-TERM DESIGN STRENGTH (LTD) OF THE GEOSYNTHETIC IS REDUCED TO ACCOUNT FOR ADDITIONAL INSTALLATION DAMAGE FROM PARTICLES LARGER THAN THIS MAXIMUM.
- 18. THE PLASTICITY OF THE FINE FRACTION SHALL BE LESS THAN 20.
- 19. THE PH OF THE BACKFILL MATERIAL SHALL BE BETWEEN 3 AND 9 WHEN TESTED IN ACCORDANCE WITH ASTM G 51.
- 20. DRAINAGE GEOTEXTILE SHALL CONSIST OF GEOSYNTHETIC SPECIFICALLY MANUFACTURED FOR USE AS A PREAMBLE SOIL FILTER THAT RETAINS SOIL WHILE STILL ALLOWING WATER TO PASS THROUGHOUT THE LIFE OF THE STRUCTURE. THE TYPE AND PLACEMENT OF THE GEOTEXTILE FILTER MATERIAL SHALL BE AS REQUIRED BY THE WALL DESIGN ENGINEER IN THEIR FINAL WALL PLANS AND SPECIFICATIONS.
- 21. THE DESIGN ANALYSIS FOR THE FINAL, P.E.-STAMPED RETAINING WALL PLANS PREPARED BY THE WALL DESIGN ENGINEER SHALL CONSIDER THE EXTERNAL STABILITY AGAINST SLIDING AND OVERTURNING, INTERNAL STABILITY AND FACIAL STABILITY OF THE REINFORCED SOIL MASS, AND SHALL BE IN ACCORDANCE WITH ACCEPTABLE ENGINEERING PRACTICE AND THESE SPECIFICATIONS. THE INTERNAL AND EXTERNAL STABILITY ANALYSIS SHALL BE PERFORMED IN ACCORDANCE WITH THE "NCMA DESIGN MANUAL FOR SEGMENTAL RETAINING WALLS, 3RD EDITION" USING THE RECOMMENDED MINIMUM FACTORS OF SAFETY IN THIS MANUAL.
- 22. EXTERNAL STABILITY ANALYSIS FOR BEARING CAPACITY, GLOBAL STABILITY, AND TOTAL AND DIFFERENTIAL SETTLEMENT SHALL BE THE RESPONSIBILITY OF THE OWNER AND THE OWNER'S GEOTECHNICAL ENGINEER. THE GEOTECHNICAL ENGINEER SHALL PERFORM BEARING CAPACITY, SETTLEMENT ESTIMATES, AND GLOBAL STABILITY ANALYSIS BASED ON THE FINAL WALL DESIGN PROVIDED BY THE WALL DESIGN ENGINEER AND COORDINATE ANY REQUIRED CHANGES WITH THE WALL DESIGN ENGINEER.
- 23. THE GEOSYNTHETIC PLACEMENT IN THE WALL DESIGN SHALL HAVE 100% CONTINUOUS COVERAGE PARALLEL TO THE WALL FACE. GAPPING BETWEEN HORIZONTALLY ADJACENT LAYERS OF GEOSYNTHETIC (PARTIAL COVERAGE) WILL NOT BE ALLOWED.
- 24. CONTRACTOR'S FIELD CONSTRUCTION SUPERVISOR SHALL HAVE DEMONSTRATED EXPERIENCE AND BE QUALIFIED TO DIRECT ALL WORK AT THE SITE.
- 25. CONTRACTOR SHALL EXCAVATE TO THE LINES AND GRADES SHOWN ON THE PROJECT GRADING PLANS. CONTRACTOR SHALL TAKE PRECAUTIONS TO MINIMIZE OVER-EXCAVATION. OVER-EXCAVATION SHALL BE FILLED WITH COMPACTED INFILL MATERIAL, OR AS DIRECTED BY THE WALL DESIGN ENGINEER, AT THE CONTRACTOR'S EXPENSE.
- 26. CONTRACTOR SHALL VERIFY LOCATION OF EXISTING STRUCTURES AND UTILITIES PRIOR TO EXCAVATION. CONTRACTOR SHALL ENSURE ALL SURROUNDING STRUCTURES ARE PROTECTED FROM THE EFFECTS OF WALL EXCAVATION. EXCAVATION SUPPORT, IF REQUIRED, IS THE RESPONSIBILITY OF THE CONTRACTOR.
- 27. FOLLOWING THE EXCAVATION, THE FOUNDATION SOIL SHALL BE EXAMINED BY THE OWNER'S ENGINEER TO ASSURE ACTUAL FOUNDATION SOIL STRENGTH MEETS OR EXCEEDS THE ASSUMED DESIGN BEARING STRENGTH. SOILS NOT MEETING THE REQUIRED STRENGTH SHALL BE REMOVED AND REPLACED WITH INFILL SOILS, AS DIRECTED BY THE CONTRACTOR'S GEOTECHNICAL ENGINEER.
- 28. FOUNDATION SOIL SHALL BE PROOF-ROLLED AND COMPACTED TO 95% STANDARD PROCTOR DENSITY AND INSPECTED BY THE CONTRACTOR'S GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF LEVELING PAD MATERIALS.
- 29. LEVELING PAD SHALL BE PLACED AS SHOWN ON THE FINAL, P.E.-SEALED RETAINING WALL PLANS WITH A MINIMUM THICKNESS OF 6 INCHES. THE LEVELING PAD SHOULD EXTEND Laterally AT LEAST A DISTANCE OF 6 INCHES FROM THE TOE AND HEEL OF THE LOWERMOST SRW UNIT.
- 30. GRANULAR LEVELING PAD MATERIAL SHALL BE COMPACTED TO PROVIDE A FIRM, LEVEL BEARING SURFACE ON WHICH TO PLACE THE FIRST COURSE OF UNITS. WELL-GRADED SAND CAN BE USED TO SMOOTH THE TOP 1/4 INCH TO 1/2 INCH OF THE LEVELING PAD. COMPACTION WILL BE WITH MECHANICAL PLATE COMPACTORS TO ACHIEVE 95% OF MAXIMUM STANDARD PROCTOR DENSITY (ASTM D 698).
- 31. ALL SRW UNITS SHALL BE INSTALLED AT THE PROPER ELEVATION AND ORIENTATION AS SHOWN ON THE FINAL, P.E.-SEALED WALL PLANS AND DETAILS OR AS DIRECTED BY THE WALL DESIGN ENGINEER. THE SRW UNITS SHALL BE INSTALLED IN GENERAL ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE SPECIFICATIONS AND DRAWINGS SHALL GOVERN IN ANY CONFLICT BETWEEN THE TWO REQUIREMENTS.
- 32. FIRST COURSE OF SRW UNITS SHALL BE PLACED ON THE LEVELING PAD. THE UNITS SHALL BE LEVELED SIDE-TO-SIDE, FRONT-TO-REAR AND WITH ADJACENT UNITS, AND ALIGNED TO ENSURE INTIMATE CONTACT WITH THE LEVELING PAD. THE FIRST COURSE IS THE MOST IMPORTANT TO ENSURE ACCURATE AND ACCEPTABLE RESULTS. NO GAPS SHALL BE LEFT BETWEEN THE FRONT OF ADJACENT UNITS. ALIGNMENT MAY BE DONE BY MEANS OF A STRING LINE OR OFFSET FROM BASE LINE TO THE BACK OF THE UNITS.
- 33. ALL EXCESS DEBRIS SHALL BE CLEANED FROM TOP OF UNITS AND THE NEXT COURSE OF UNITS INSTALLED ON TOP OF THE UNITS BELOW.

**SEGMENTAL RETAINING WALL CONT.:**

- 34. CONNECTION PINS SHALL BE INSERTED THROUGH THE PIN HOLES OF EACH UPPER-COURSE UNIT INTO RECEIVING SLOTS IN LOWER-COURSE UNITS. PINS SHALL BE FULLY SEATED IN THE PIN SLOT BELOW. UNITS SHALL BE PUSHED FORWARD TO REMOVE ANY LOOSENESS IN THE UNIT-TO-UNIT CONNECTION.
  - 35. PRIOR TO PLACEMENT OF NEXT COURSE, THE LEVEL AND ALIGNMENT OF THE UNITS SHALL BE CHECKED AND CORRECTED WHERE NEEDED.
  - 36. LAYOUT OF CURVES AND CORNERS SHALL BE INSTALLED IN ACCORDANCE WITH THE WALL PLAN DETAILS OR IN GENERAL ACCORDANCE WITH TYPICAL MANUFACTURER INSTALLATION GUIDELINES. WALLS MEETING AT CORNERS SHALL BE INTERLOCKED BY OVERLAPPING SUCCESSIVE COURSES.
  - 37. PROCEDURES ABOVE SHALL BE REPEATED UNTIL REACHING TOP OF WALL UNITS, JUST BELOW THE HEIGHT OF THE CAP UNITS. GEOSYNTHETIC REINFORCEMENT, DRAINAGE MATERIALS, AND REINFORCED BACKFILL SHALL BE PLACED IN SEQUENCE WITH UNIT INSTALLATION.
  - 38. ALL GEOSYNTHETIC REINFORCEMENT SHALL BE INSTALLED AT THE PROPER ELEVATION AND ORIENTATION AS SHOWN ON THE FINAL P.E.-SEALED RETAINING WALL PLAN PROFILES AND DETAILS, OR AS DIRECTED BY THE WALL DESIGN ENGINEER.
  - 39. AT THE ELEVATIONS SHOWN ON THE FINAL PLANS, (AFTER THE UNITS, DRAINAGE MATERIAL AND BACKFILL HAVE BEEN PLACED TO THIS ELEVATION) THE GEOSYNTHETIC REINFORCEMENT SHALL BE LAID HORIZONTALLY ON COMPACTED INFILL AND ON TOP OF THE CONCRETE SRW UNITS, TO WITHIN 1 INCH OF THE FRONT FACE OF THE UNIT BELOW. EMBEDMENT OF THE GEOSYNTHETIC IN THE SRW UNITS SHALL BE CONSISTENT WITH SRW MANUFACTURER'S RECOMMENDATIONS. CORRECT ORIENTATION OF THE GEOSYNTHETIC REINFORCEMENT SHALL BE VERIFIED BY THE CONTRACTOR TO BE IN ACCORDANCE WITH THE GEOSYNTHETIC MANUFACTURER'S RECOMMENDATIONS. THE HIGHEST-STRENGTH DIRECTION OF THE GEOSYNTHETIC MUST BE PERPENDICULAR TO THE WALL FACE.
  - 40. GEOSYNTHETIC REINFORCEMENT LAYERS SHALL BE ONE CONTINUOUS PIECE FOR THEIR ENTIRE EMBEDMENT LENGTH. SPLICES OF THE GEOSYNTHETIC IN THE DESIGN STRENGTH DIRECTION (PERPENDICULAR TO THE WALL FACE) SHALL NOT BE PERMITTED. ALONG THE LENGTH OF THE WALL, HORIZONTALLY ADJACENT SECTIONS OF GEOSYNTHETIC REINFORCEMENT SHALL BE BUTTED IN A MANNER TO ASSURE 100% COVERAGE PARALLEL TO THE WALL FACE.
  - 41. TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOSYNTHETIC REINFORCEMENT. A MINIMUM OF 6 INCHES OF BACKFILL IS REQUIRED PRIOR TO OPERATION OF TRACKED VEHICLES OVER THE GEOSYNTHETIC. TURNING SHOULD BE KEPT TO A MINIMUM. RUBBER-TIRED EQUIPMENT MAY PASS OVER THE GEOSYNTHETIC REINFORCEMENT AT SLOW SPEEDS (LESS THAN 5 MPH).
  - 42. THE GEOSYNTHETIC REINFORCEMENT SHALL BE FREE OF WRINKLES PRIOR TO PLACEMENT OF SOIL FILL. THE NOMINAL TENSION SHALL BE APPLIED TO THE REINFORCEMENT AND SECURED IN PLACE WITH STAPLES, STAKES OR BY HAND TENSIONING UNTIL REINFORCEMENT IS COVERED BY 6 INCHES OF FILL.
  - 43. DRAINAGE AGGREGATE SHALL BE INSTALLED TO THE LINE, GRADES AND SECTIONS SHOWN ON THE FINAL P.E.-SEALED RETAINING WALL PLANS. DRAINAGE AGGREGATE SHALL BE PLACED TO THE MINIMUM THICKNESS SHOWN ON THE CONSTRUCTION PLANS BETWEEN AND BEHIND UNITS (A MINIMUM OF 1 CUBIC FOOT FOR EACH EXPOSED SQUARE FOOT OF WALL FACE UNLESS OTHERWISE NOTED ON THE FINAL WALL PLANS).
  - 44. DRAINAGE COLLECTION PIPES SHALL BE INSTALLED TO MAINTAIN GRAVITY FLOW OF WATER OUTSIDE THE REINFORCED-SOIL ZONE. THE DRAINAGE COLLECTION PIPE SHALL BE INSTALLED AT THE LOCATIONS SHOWN ON THE CONSTRUCTION DRAWINGS. THE DRAINAGE COLLECTION PIPE SHALL DAYLIGHT INTO A STORM SEWER OR ALONG A SLOPE, AT AN ELEVATION BELOW THE LOWEST POINT OF THE PIPE WITHIN THE AGGREGATE DRAIN. DRAINAGE LATERALS SHALL BE SPACED AT A MAXIMUM 50-FOOT SPACING ALONG THE WALL FACE.
  - 45. THE REINFORCED BACKFILL SHALL BE PLACED AS SHOWN IN THE FINAL WALL PLANS IN THE MAXIMUM COMPACTED LIFT THICKNESS OF 8 INCHES AND SHALL BE COMPACTED TO A MINIMUM OF 95% OF STANDARD PROCTOR DENSITY (ASTM D 698) AT A MOISTURE CONTENT WITHIN -1% POINT TO +3% POINTS OF OPTIMUM. THE BACKFILL SHALL BE PLACED AND SPREAD IN SUCH A MANNER AS TO ELIMINATE WRINKLES OR MOVEMENT OF THE GEOSYNTHETIC REINFORCEMENT AND THE SRW UNITS.
  - 46. ONLY HAND-OPERATED COMPACTION EQUIPMENT SHALL BE ALLOWED WITHIN 3 FEET OF THE BACK OF THE WALL UNITS. COMPACTION WITHIN THE 3 FEET BEHIND THE WALL UNITS SHALL BE ACHIEVED BY AT LEAST THREE PASSES OF A LIGHTWEIGHT MECHANICAL TAMPER, PLATE, OR ROLLER.
  - 47. AT THE END OF EACH DAY'S OPERATION, THE CONTRACTOR SHALL SLOPE THE LAST LEVEL OF BACKFILL AWAY FROM THE WALL FACING AND REINFORCED BACKFILL TO DIRECT WATER RUNOFF AWAY FROM THE WALL FACE.
  - 48. AT COMPLETION OF WALL CONSTRUCTION, BACKFILL SHALL BE PLACED LEVEL WITH FINAL TOP OF WALL ELEVATION. IF FINAL GRADING, PAVING, LANDSCAPING AND/OR STORM DRAINAGE INSTALLATION ADJACENT TO THE WALL IS NOT PLACED IMMEDIATELY AFTER WALL COMPLETION, TEMPORARY GRADING AND DRAINAGE SHALL BE PROVIDED TO ENSURE WATER RUNOFF IS NOT DIRECTED AT THE WALL NOR ALLOWED TO COLLECT OR POOL BEHIND THE WALL UNTIL FINAL CONSTRUCTION ADJACENT TO THE WALL IS COMPLETED.
  - 49. SRW CAPS SHALL BE PROPERLY ALIGNED AND GLUED TO UNDERLYING UNITS WITH VERSA-LOK ADHESIVE, A FLEXIBLE, HIGH-STRENGTH CONCRETE ADHESIVE. RIGID ADHESIVE OR MORTAR ARE NOT ACCEPTABLE.
  - 50. CAPS SHALL OVERHANG THE TOP COURSE OF UNITS BY 3/4 INCH TO 1 INCH. SLIGHT VARIATION IN OVERHANG IS ALLOWED TO CORRECT ALIGNMENT AT THE TOP OF THE WALL.
  - 51. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT CONSTRUCTION BY OTHERS ADJACENT TO THE WALL DOES NOT DISTURB THE WALL OR PLACE TEMPORARY CONSTRUCTION LOADS ON THE WALL THAT EXCEED DESIGN LOADS, INCLUDING LOADS SUCH AS WATER PRESSURE, TEMPORARY GRADES, OR EQUIPMENT LOADING. HEAVY PAVING OR GRADING EQUIPMENT SHALL BE KEPT A MINIMUM OF 3 FEET BEHIND THE BACK OF THE WALL FACE. EQUIPMENT WITH WHEEL LOADS IN EXCESS OF 150 PSF LIVE LOAD SHALL NOT BE OPERATED WITHIN 10 FEET OF THE FACE OF THE RETAINING WALL DURING CONSTRUCTION ADJACENT TO THE WALL. CARE SHOULD BE TAKEN BY THE GENERAL CONTRACTOR TO ENSURE WATER RUNOFF IS DIRECTED AWAY FROM THE WALL STRUCTURE UNTIL FINAL GRADING AND SURFACE DRAINAGE COLLECTION SYSTEMS ARE COMPLETED.
- BIOFILTRATION BASIN:**
- 1. BIOFILTRATION BASIN SHALL BE CONSTRUCTED IN GENERAL ACCORDANCE WITH WDNR TECHNICAL STANDARD 1004: BIOTRENTATION FOR INFILTRATION AND THESE SPECIFICATIONS.
  - 2. ENGINEERED SOIL MIX SHALL CONSIST OF A MIX OF 70 TO 85% SAND AND 15 TO 30% COMPOST BASED ON VOLUME. SAND SHALL MEET THE REQUIREMENTS FOR FINE AGGREGATE SAND SPECIFIED SECTION 501.2.5.3.4 OF THE WISCONSIN STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, LATEST EDITION OR MEET ASTM C33 (FINE AGGREGATE CONCRETE SAND).
  - 3. ENGINEERED SOIL MIX SHALL BE FREE OF ROCKS, STUMPS, ROOTS, BRUSH OR OTHER MATERIAL OVER ONE INCH IN DIAMETER. NO OTHER MATERIALS SHALL BE MIXED WITH THESE PLANTING SOIL THAT MAY BE HARMFUL TO PLANT GROWTH OR BE A HINDRANCE TO PLANTING OR MAINTENANCE.
  - 4. PEA GRAVEL SHALL BE GRADED SUCH THAT MINIMUM PARTICLE SIZE IS LARGE ENOUGH TO PREVENT FALLING THROUGH PERFORATIONS OF THE UNDERDRAIN PIPE.
  - 5. BIOFILTRATION BASIN DRAIN PIPE: 6-INCH SCHEDULE 40 PVC PIPE MEETING PERFORATION REQUIREMENTS OF AASHTO M278 HIGHWAY UNDERDRAIN SPECIFICATIONS WITH 3/8" PERFORATIONS ON 6" CENTERS WITH 4 HOLES PER ROW.
  - 6. BEEHIVE INLET: NEENAH R-258I, OR EQUAL.
  - 7. RISER STRUCTURE: 36" DIAMETER PRECAST CATCH BASIN STRUCTURE WITH 24" TOP OPENING TO ACCOMMODATE BEEHIVE INLET. IN GENERAL ACCORDANCE WITH FILE NO. 26 OF THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN.
  - 8. GRAVEL STORAGE LAYER (IF INDICATED ON PLANS): COURSE AGGREGATE #2 IN ACCORDANCE WITH SECTION 501.2.5.3.4 OF THE WISCONSIN STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION.
  - 9. FILTER FABRIC: GEOTEXTILE FABRIC IN ACCORDANCE WITH SECTION 645.2.4 OF WISCONSIN STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, LATEST EDITION
  - 10. EXCAVATE TO GRADES AS INDICATED ON PLANS.
  - 11. CONSTRUCTION SITE RUNOFF FROM DISTURBED AREAS SHALL NOT BE ALLOWED TO ENTER THE BIOFILTRATION BASIN. RUNOFF FROM PERVIOUS AREAS SHALL BE DIVERTED FROM THE BASIN UNTIL THE PERVIOUS AREAS HAVE UNDERGONE FINAL STABILIZATION.
  - 12. CONSTRUCTION SHALL BE SUSPENDED DURING PERIODS OF RAINFALL OR SNOWMELT. CONSTRUCTION SHALL REMAIN SUSPENDED IF PONDED WATER IS PRESENT OR IF RESIDUAL SOIL MOISTURE CONTRIBUTES SIGNIFICANTLY TO THE POTENTIAL FOR SOIL SMEARING, CLUMPING OR OTHER FORMS OF COMPACTION.
  - 13. COMPACTION AND SMEARING OF THE SOIL BENEATH THE FLOORS AND SIDE SLOPES OF THE BASIN, AND COMPACTION OF THE ENGINEERED SOILS IN THE BASIN SHALL BE MINIMIZED. DURING SITE DEVELOPMENT, THE AREA DEDICATED TO THE BIOFILTRATION BASIN SHALL BE CORDONED OFF TO PREVENT ACCESS BY HEAVY EQUIPMENT. ACCEPTABLE EQUIPMENT FOR CONSTRUCTING THE BIOFILTRATION BASIN INCLUDES EXCAVATION HOES, LIGHT EQUIPMENT WITH TURF-TYPE TIRES, MARSH EQUIPMENT OR WIDE-TRACK LOADERS.
  - 14. IF COMPACTION OCCURS AT THE BASE OF THE BIOFILTRATION BASIN, THE SOIL SHALL BE REFRACUTURED TO A DEPTH OF AT LEAST 12 INCHES. IF SMEARING OCCURS, THE SMEARED AREAS OF THE INTERFACE SHALL BE CORRECTED BY RAKING OR ROTO-TILLING.
  - 15. PRIOR TO PLACING IN THE BIOFILTRATION BASIN, THE ENGINEERED SOIL SHALL BE PREMIXED AND THE MOISTURE CONTENT SHALL BE LOW ENOUGH TO PREVENT CLUMPING AND COMPACTION DURING PLACEMENT.
  - 16. THE ENGINEERED SOIL MIX SHALL BE PLACED IN LIFTS NOT EXCEEDING 12 INCHES.
  - 17. STEPS MAY BE TAKEN TO INDUCE MILD SETTLING OF THE ENGINEERED SOIL BED AS NEEDED TO PREPARE A STABLE PLANTING MEDIUM AND TO STABILIZE THE PONDING DEPTH. VIBRATING PLATE-STYLE COMPACTORS SHALL NOT BE UTILIZED.
  - 18. ANY SEDIMENT ACCUMULATED IN THE BASIN DUE TO CONSTRUCTION ACTIVITIES SHOULD BE REMOVED AND THE ENGINEERED SOIL SHALL BE DEEP TILLED PRIOR TO PLANTING.



MULTI FAMILY DEVELOPMENT  
WATERTOWN PLANK ROAD  
ELM GROVE, WISCONSIN

**SPECIFICATIONS**

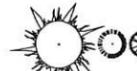
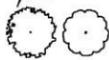
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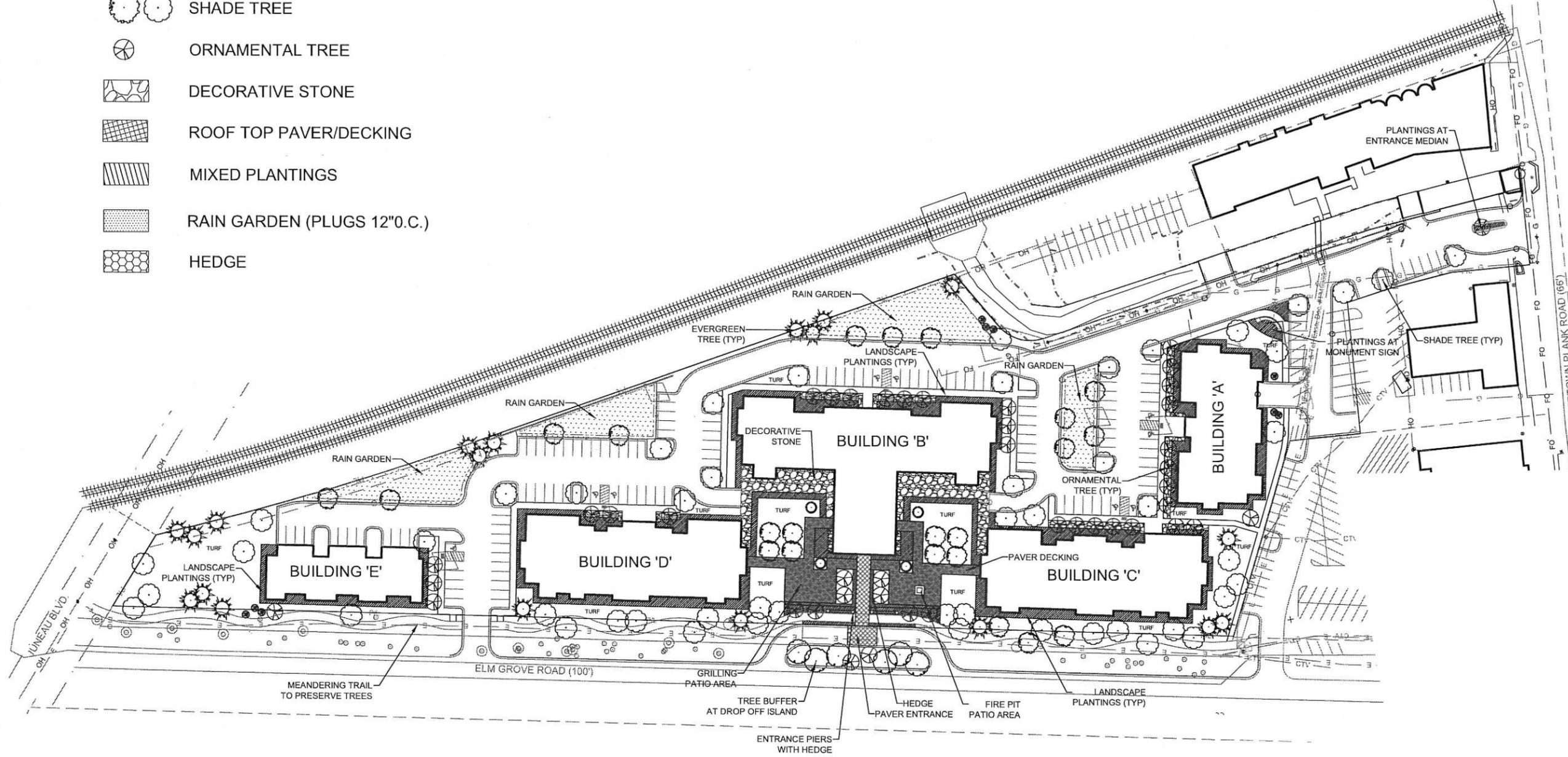
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# LEGEND

-  EVERGREEN TREE
-  SHADE TREE
-  ORNAMENTAL TREE
-  DECORATIVE STONE
-  ROOF TOP PAVER/DECKING
-  MIXED PLANTINGS
-  RAIN GARDEN (PLUGS 12"0.C.)
-  HEDGE



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MULTI FAMILY DEVELOPMENT  
 WATERTOWN PLANK ROAD  
 ELM GROVE, WISCONSIN

PRELIMINARY LANDSCAPE PLAN

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