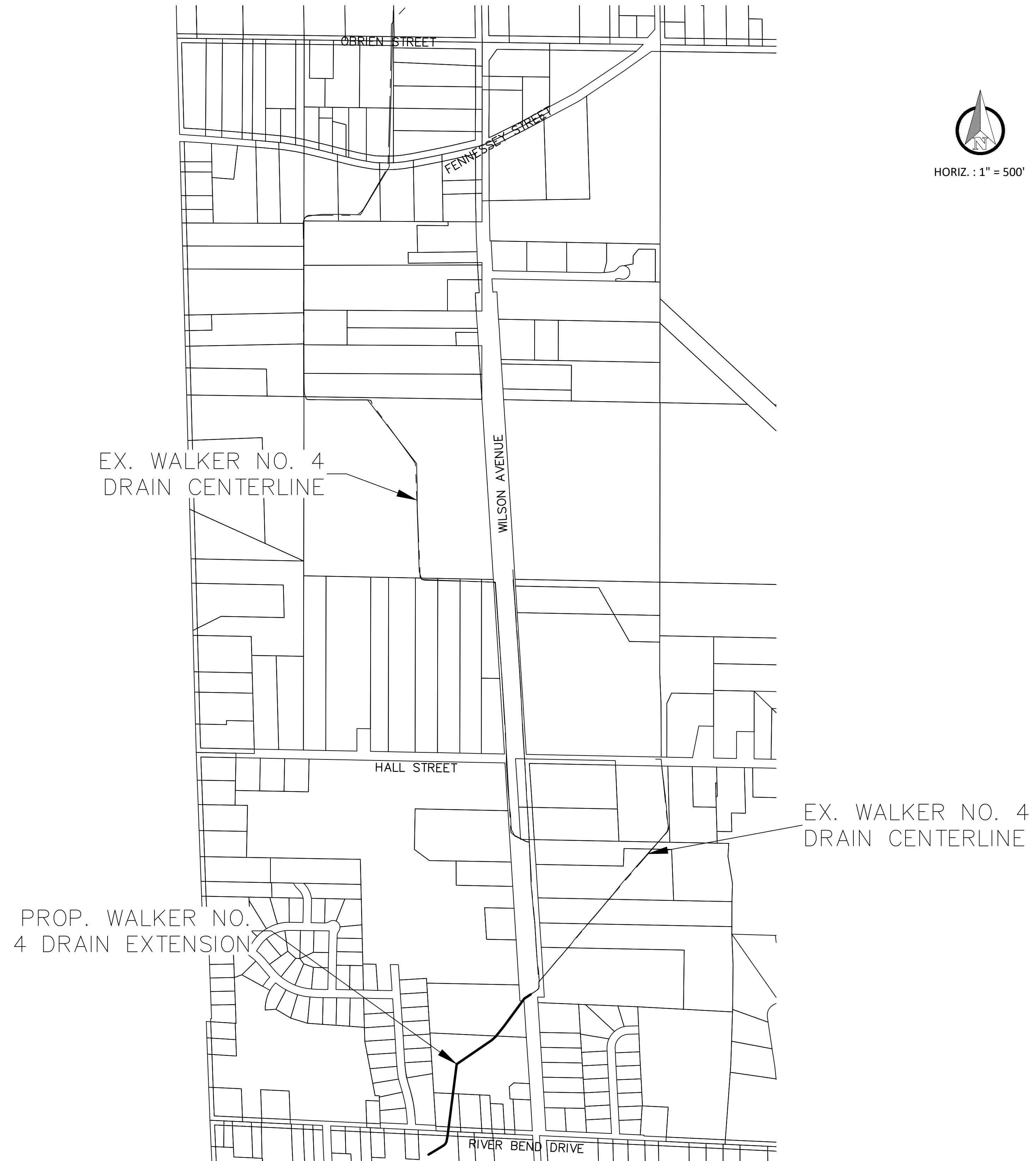


CITY OF WALKER KENT COUNTY, MICHIGAN

WALKER NO. 4 COUNTY DRAIN EXTENSION AND IMPROVEMENTS



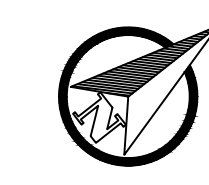

 J. Gritter

NO.	DATE	REVISION	BY
1	1/6/2023	FOR DRAIN COMMISSION REVIEW	NFB
2	9/14/2023	PER DRAIN COMMISSION	NFB
3	1/18/2024	REVISIONS FOR REVIEW	NFB
4	2/26/2024	PER KCDC/CITY OF WALKER DPW	NFB
5	2/28/2024	FOR BIDS	NFB

CITY OF WALKER
 KENT COUNTY, MI
**WALKER NO. 4 COUNTY DRAIN
 EXTENSION AND IMPROVEMENTS**
 COVER

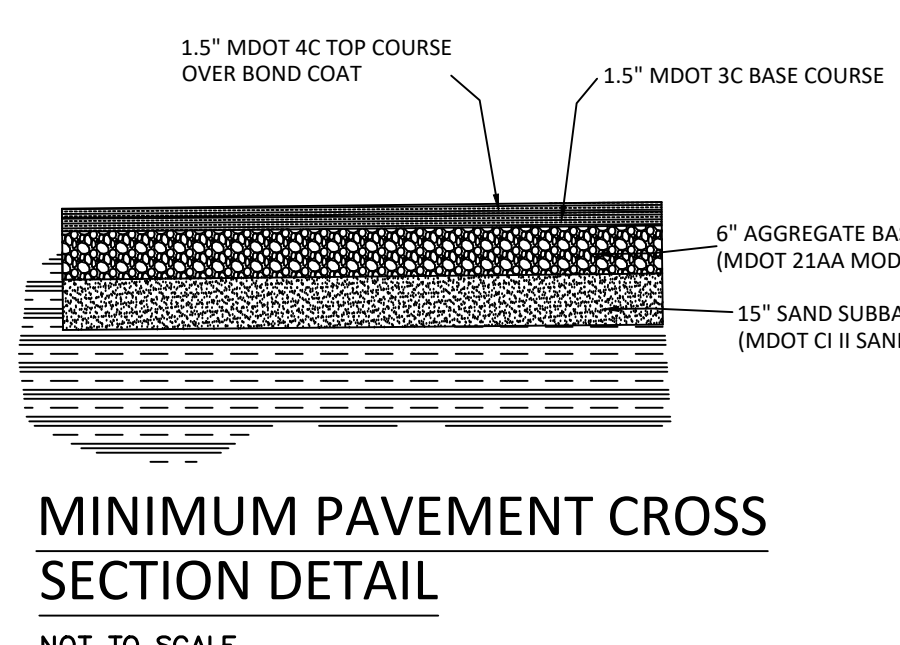
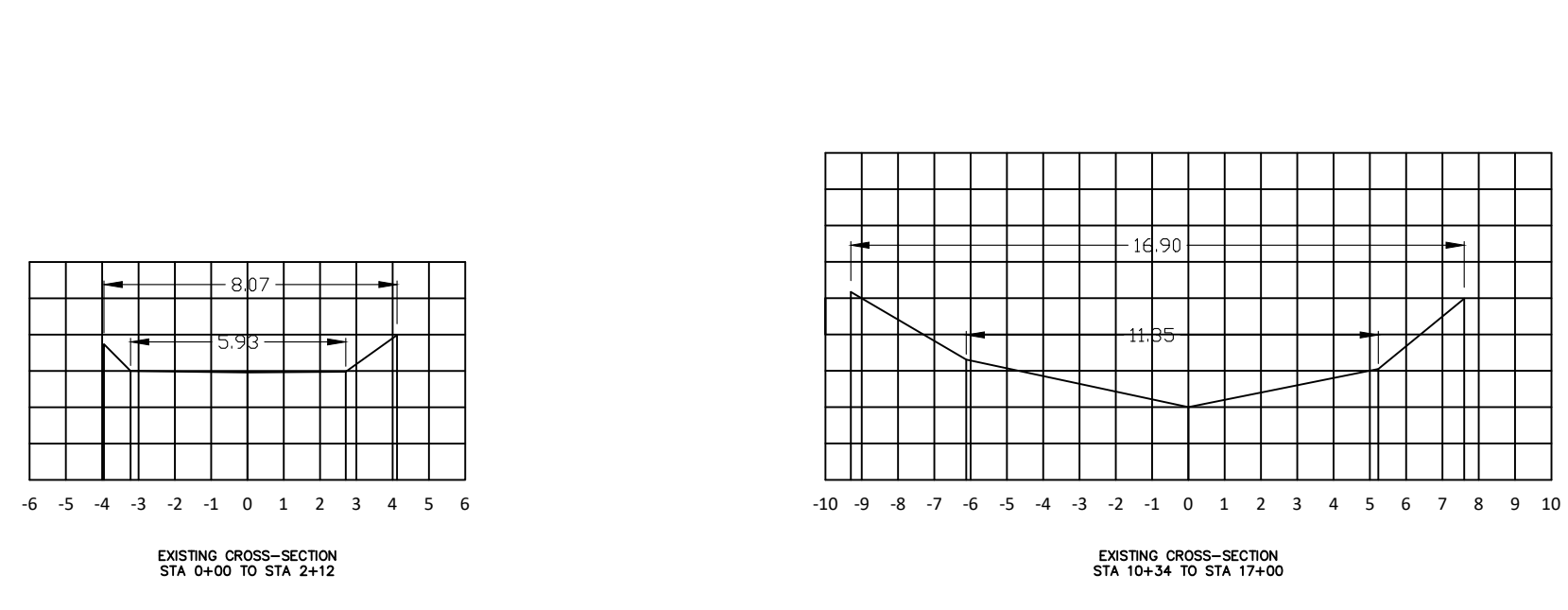
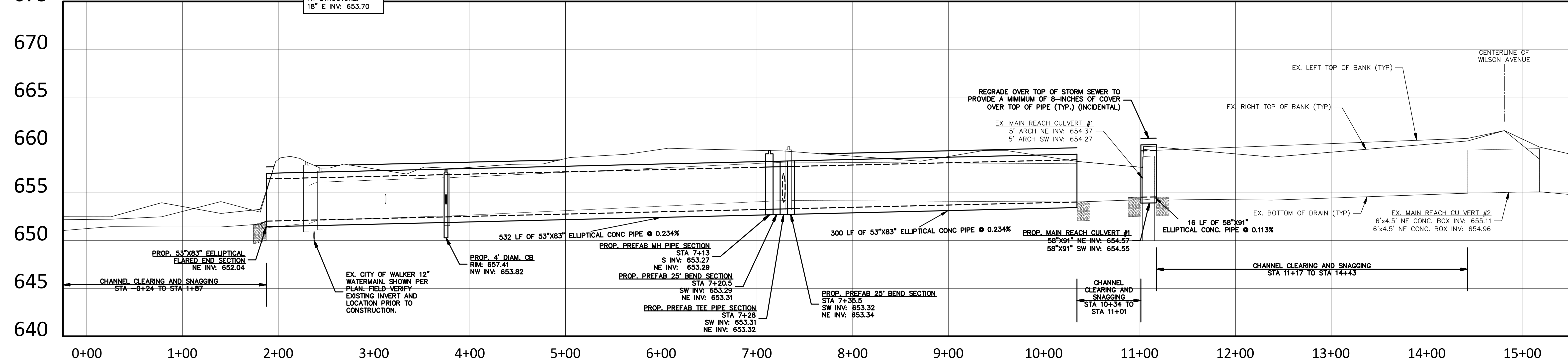
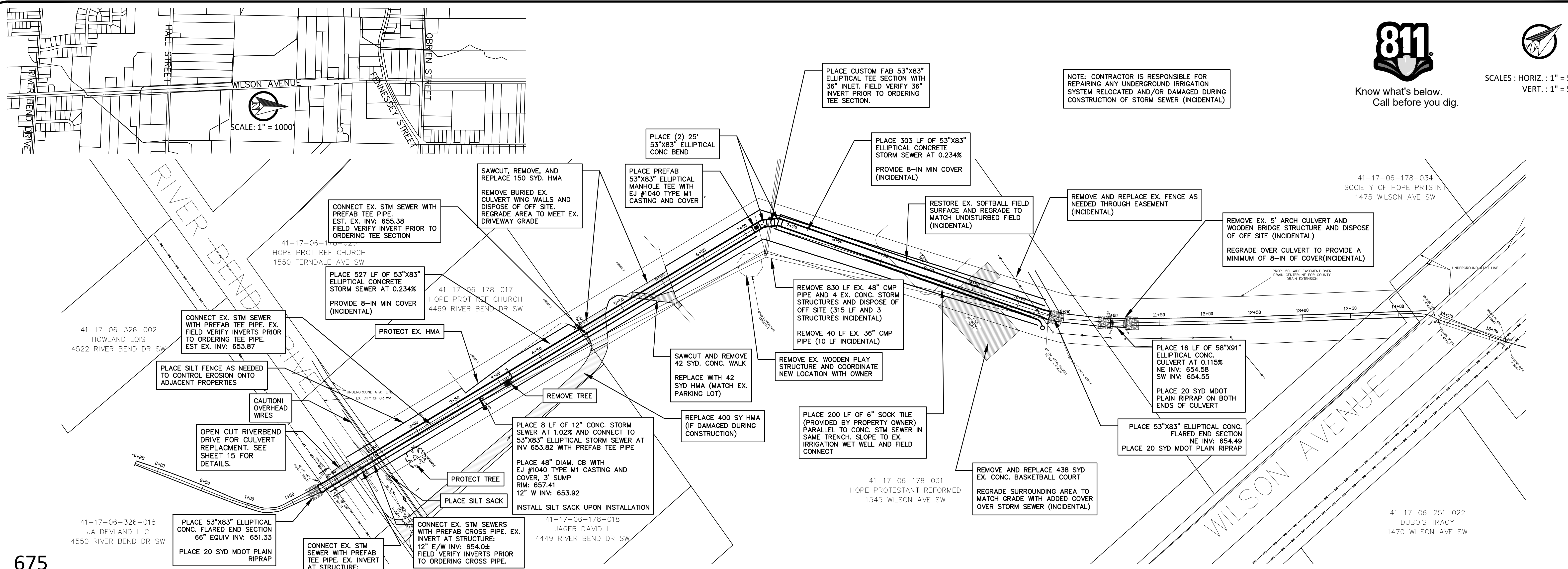

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FILE NO. 1066
 CHECKED JMG
 Sheet No. 1 OF 17



Know what's below.
Call before you dig.

SCALES: HORIZ. : 1" = 50'
VERT. : 1" = 5'

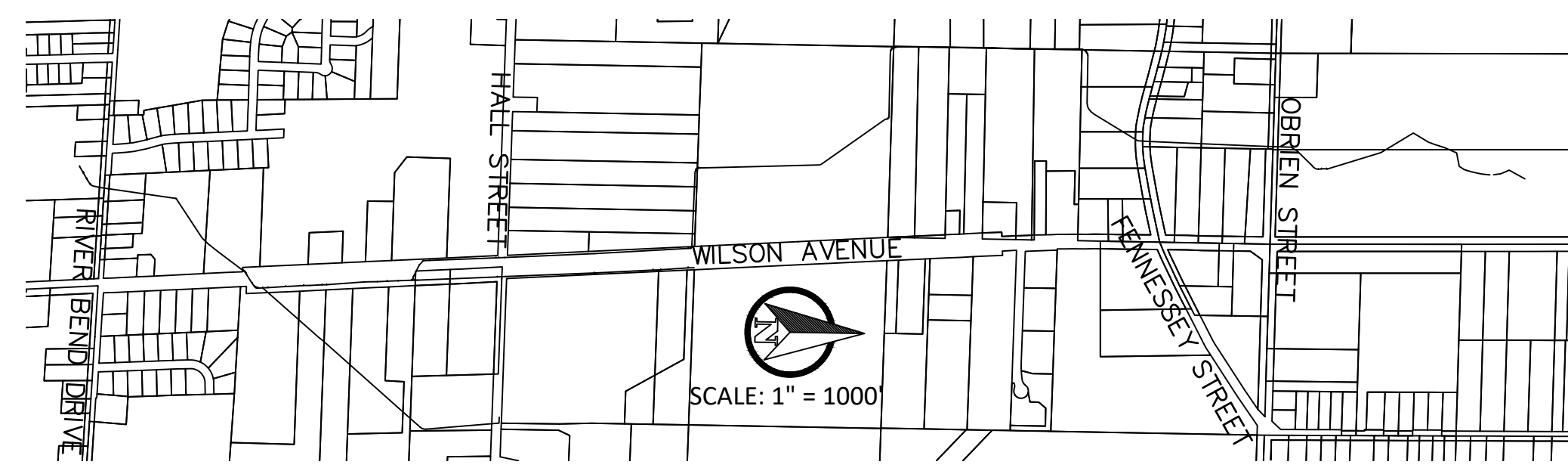


NO.	DATE	REVISION	BY
1	1/6/2023	FOR DRAIN COMMISSION REVIEW	NFB
2	9/14/2023	PER DRAIN COMMISSION	NFB
3	1/18/2024	REVISIONS FOR REVIEW	NFB
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5	2/28/2024	FOR BIDS	NFB

CITY OF WALKER
KENT COUNTY, MI
**WALKER NO. 4 COUNTY DRAIN
EXTENSION AND IMPROVEMENTS**
MAIN REACH
STA 0+00 TO STA 15+00

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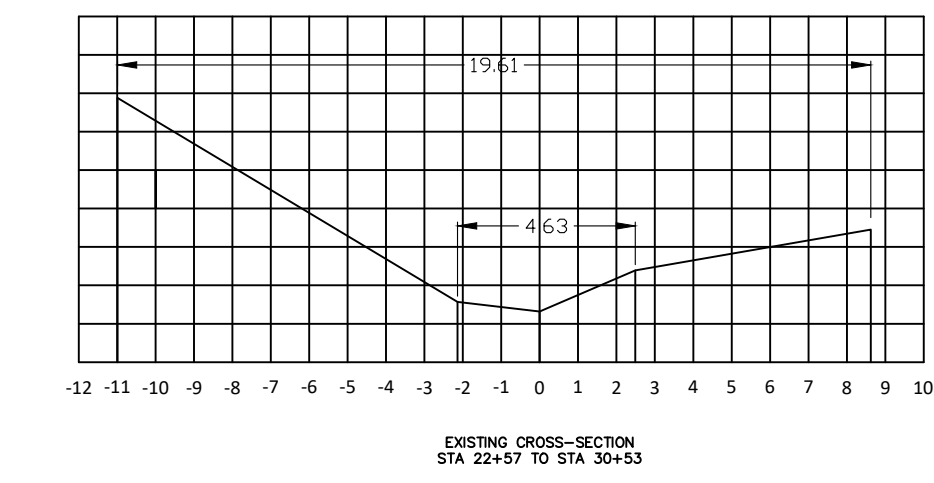
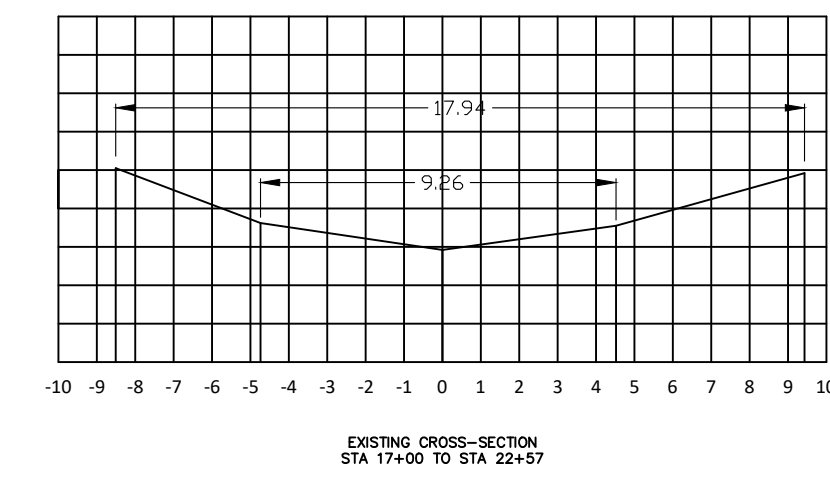
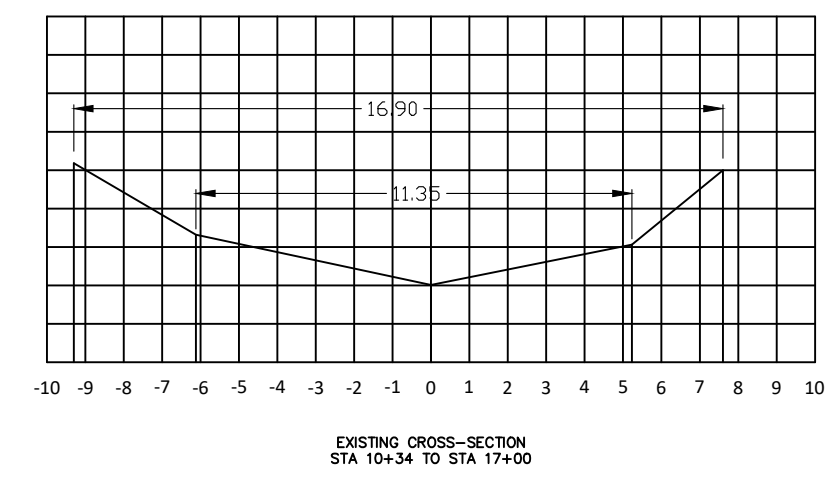
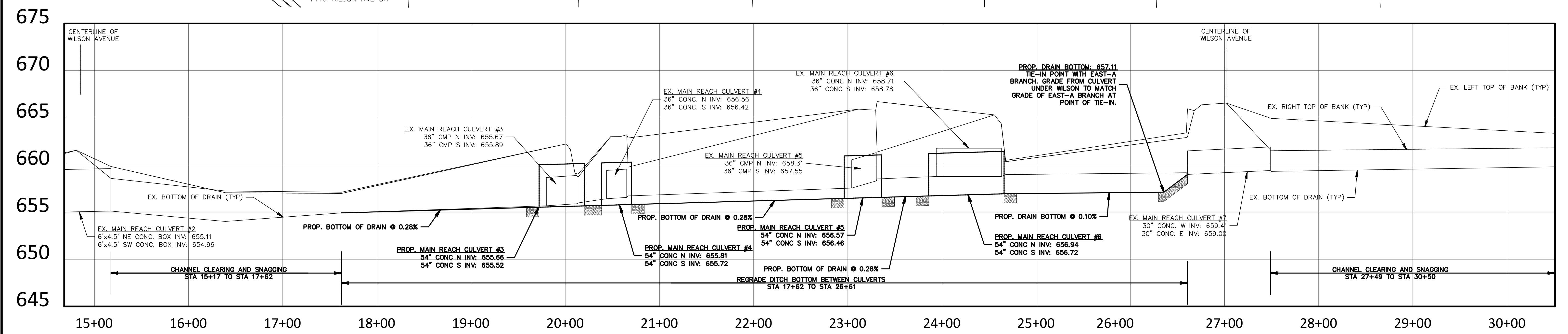
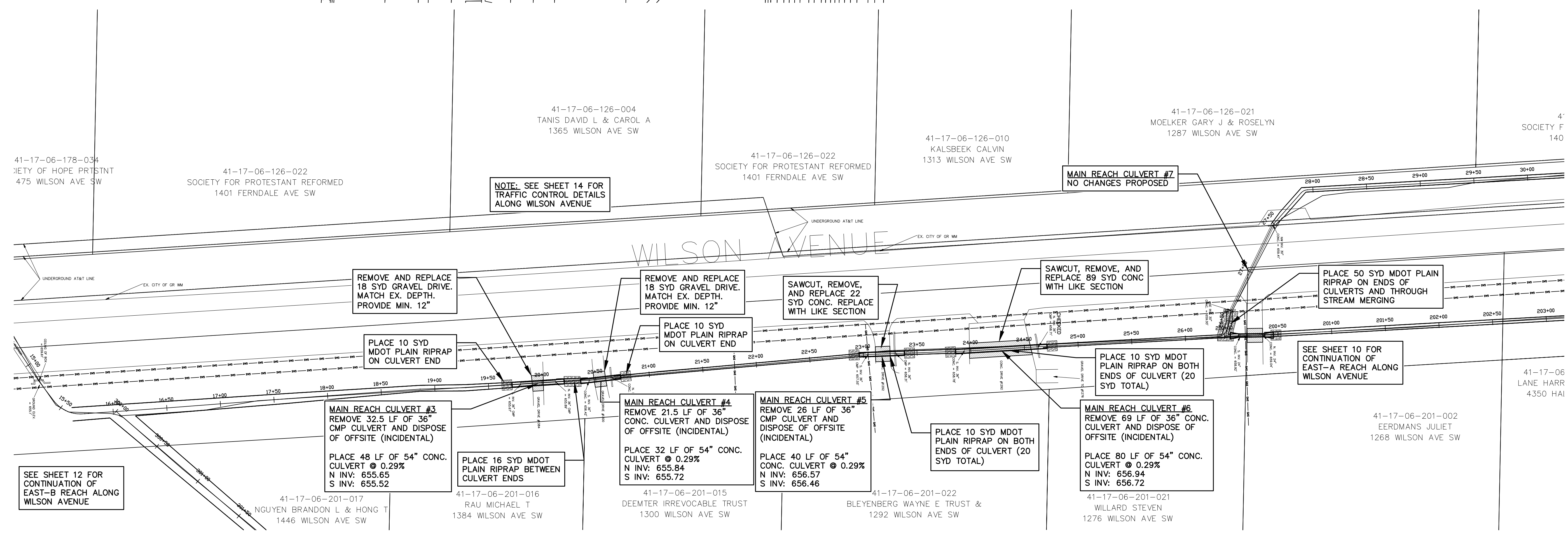
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Sheet No. 2 OF 17



SCALES : HORIZ. : 1" = 50'
VERT. : 1" = 5'



Know what's below.
Call before you dig.

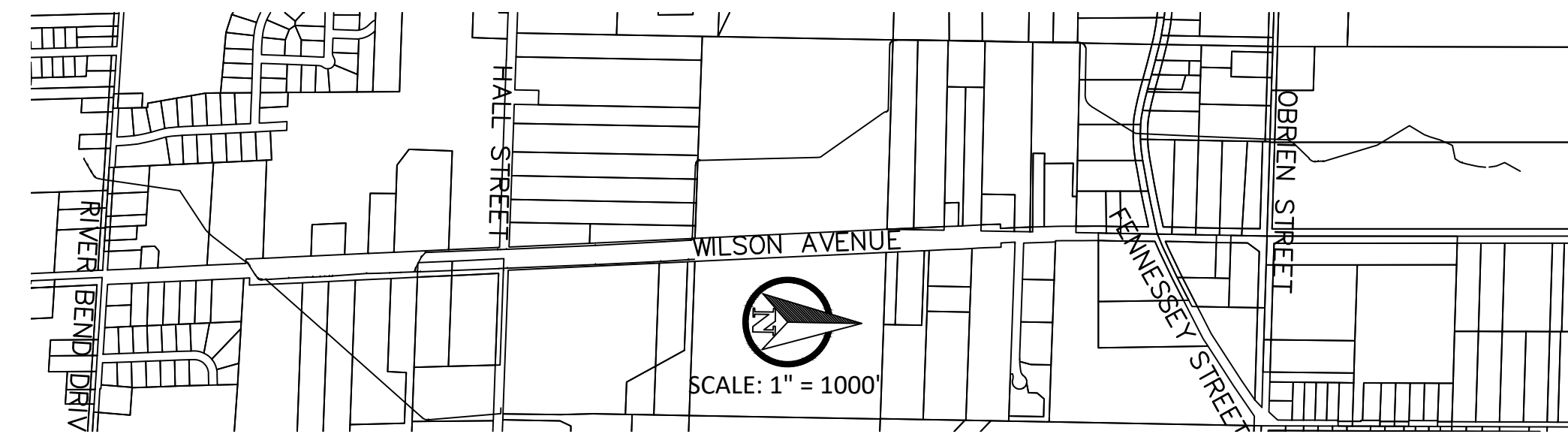


NO.	DATE	REVISION	BY
1	1/6/2023	FOR DRAIN COMMISSION REVIEW	NFB
2	9/14/2023	PER DRAIN COMMISSION	NFB
3	1/18/2024	REVISIONS FOR REVIEW	NFB
4	2/26/2024	PER KCDC/CITY OF WALKER DPW	NFB
5	2/28/2024	FOR BIDS	NFB

CITY OF WALKER
KENT COUNTY, MI
**WALKER NO. 4 COUNTY DRAIN
EXTENSION AND IMPROVEMENTS**
MAIN REACH
STA 15+00 TO STA 30+00

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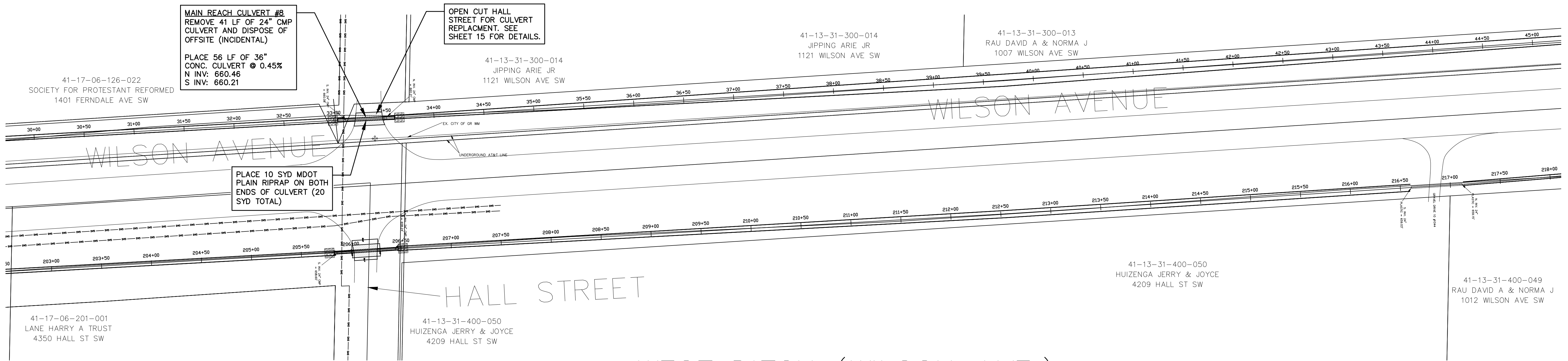
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Sheet No. 3 OF 17



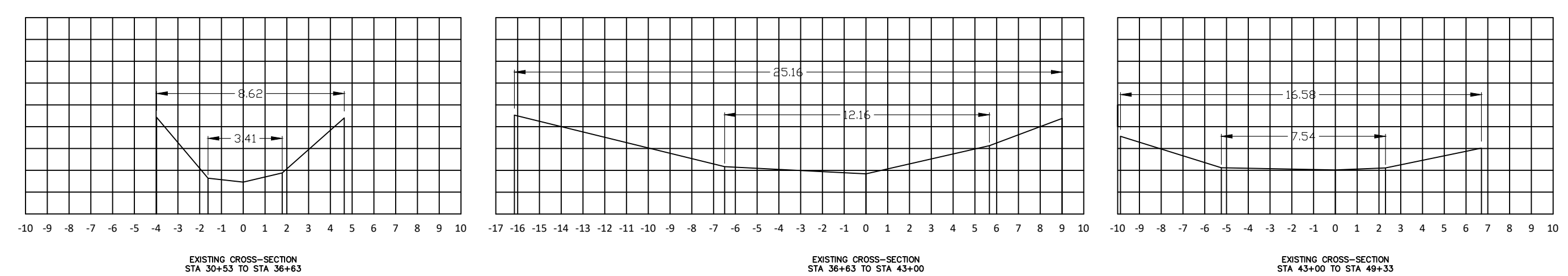
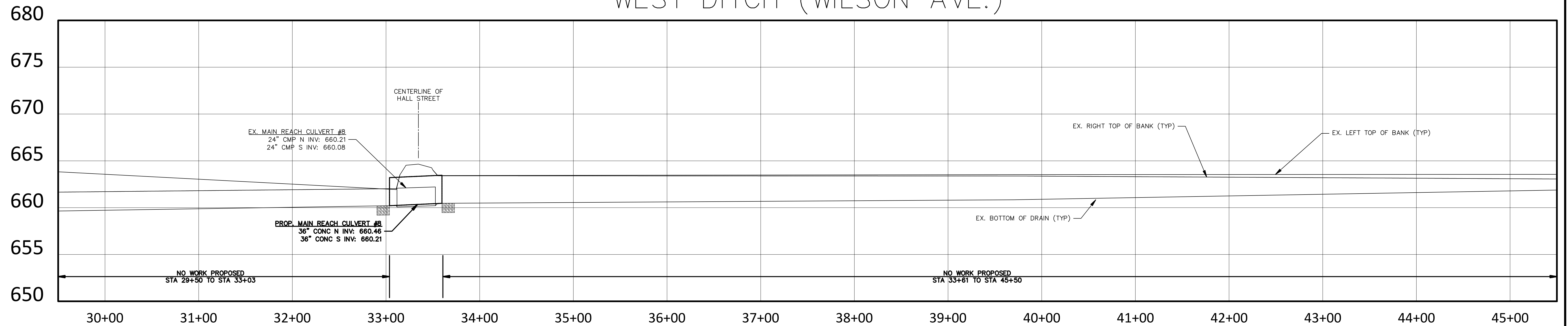
SCALES : HORIZ. : 1" = 50'
VERT. : 1" = 5'



Know what's below.
Call before you dig.



WEST DITCH (WILSON AVE.)



NO.	DATE	REVISION	BY
1	1/6/2023	FOR DRAIN COMMISSION REVIEW	NFB
2	9/14/2023	PER DRAIN COMMISSION	NFB
3	1/18/2024	REVISIONS FOR REVIEW	NFB
4	2/26/2024	PER KCDC/CITY OF WALKER DPW	NFB
5	2/28/2024	FOR BIDS	NFB

CITY OF WALKER
KENT COUNTY, MI
**WALKER NO. 4 COUNTY DRAIN
EXTENSION AND IMPROVEMENTS**
MAIN REACH
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FILE NO. 1066
CHECKED JMG
Sheet No. 4 OF 17

41-13-31-300-009
KAMP EVELYN
4521 HALL ST SW

41-13-31-300-004
GRANDVILLE PUBLIC SCHOOL
911 WILSON AVE SW

41-13-31-300-010
VANDERWALL EDWARD W & HIBBE
4467 HALL ST SW

41-13-31-300-011
CARDOSA JUAN ROBERTO
4441 HALL ST SW

41-13-31-300-012
RAU DAVID A & NORMA J
4409 HALL ST SW

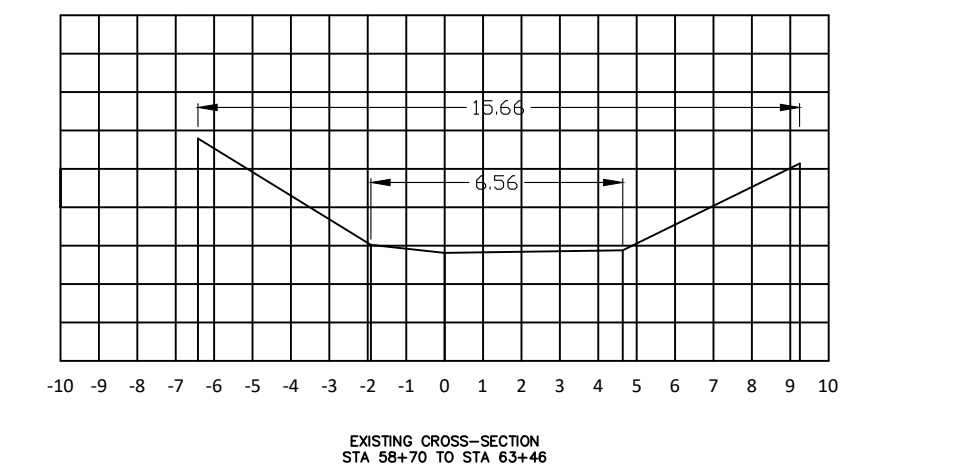
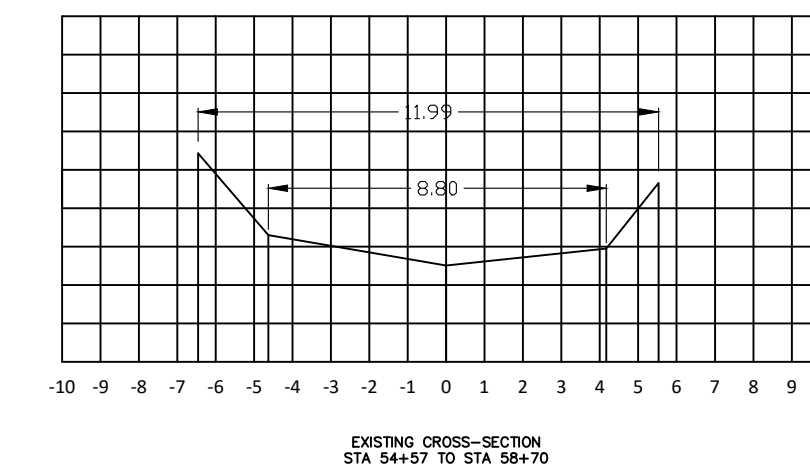
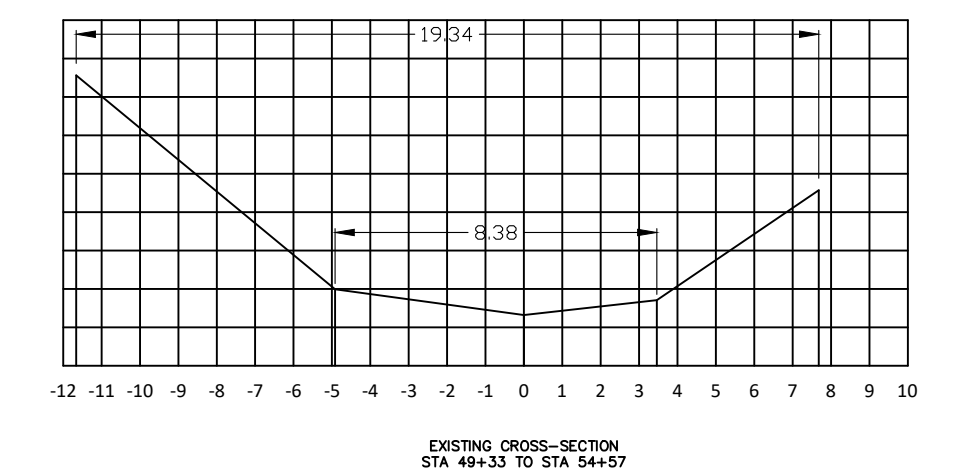
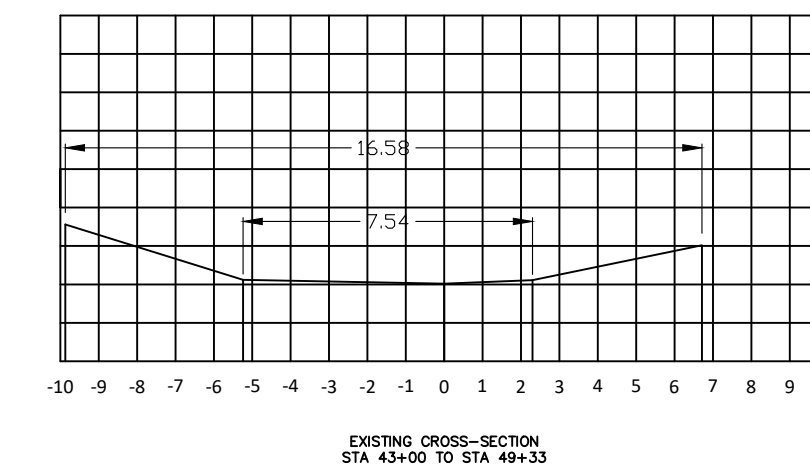
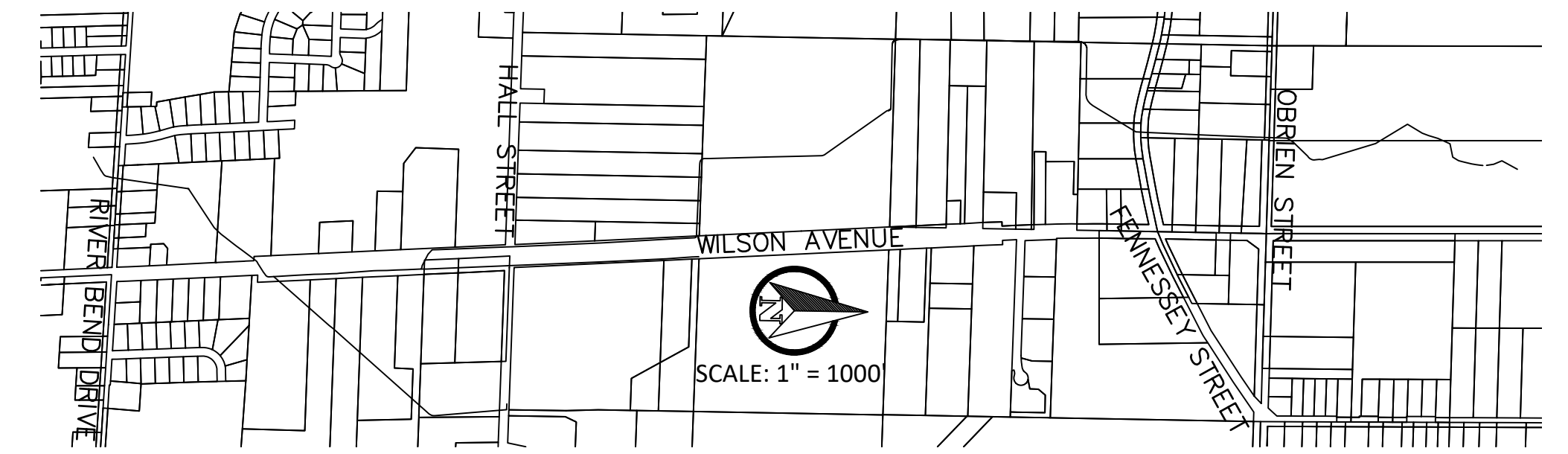
41-13-31-300-013
RAU DAVID A & NORMA J
1007 WILSON AVE SW

41-13-31-300-004
GRANDVILLE PUBLIC SCHOOL
911 WILSON AVE SW

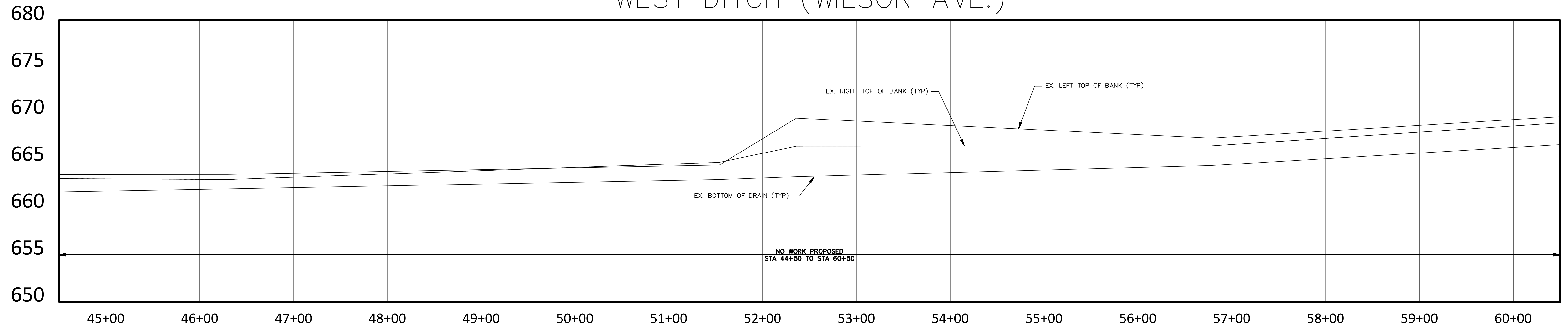


SCALES : HORIZ. : 1" = 50'
VERT. : 1" = 5'

Know what's below.
Call before you dig.



WEST DITCH (WILSON AVE.)

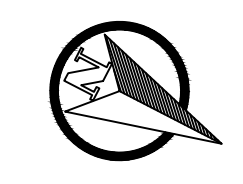


NO.	DATE	REVISION	BY
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2	9/14/2023	PER DRAIN COMMISSION	NFB
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4	2/26/2024	PER KCDC/CITY OF WALKER DPW	NFB
5	2/28/2024	FOR BIDS	NFB

CITY OF WALKER
KENT COUNTY, MI
**WALKER NO. 4 COUNTY DRAIN
EXTENSION AND IMPROVEMENTS**
MAIN REACH
STA 45+00 TO STA 60+00

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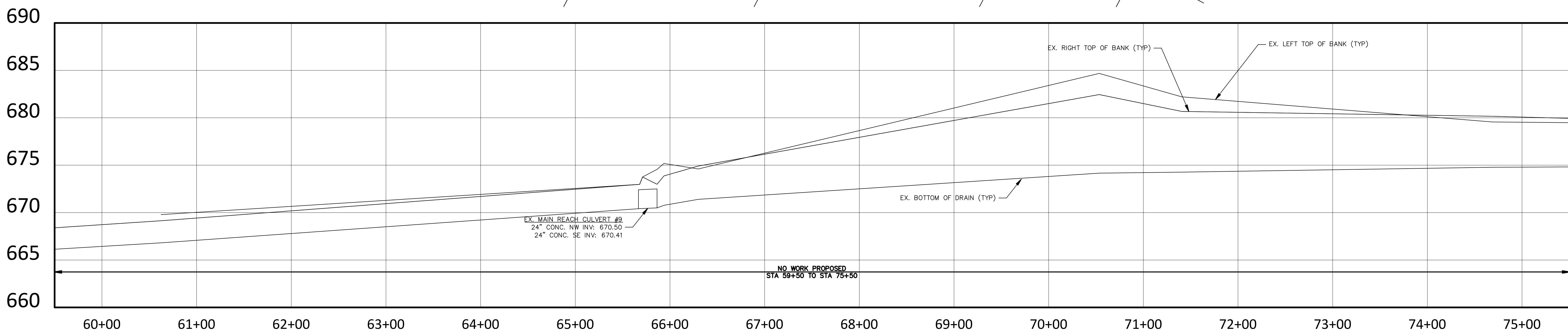
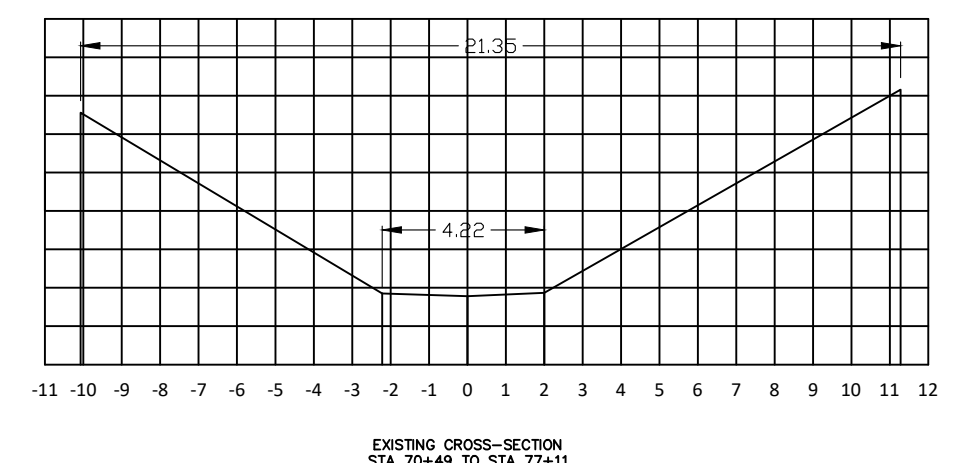
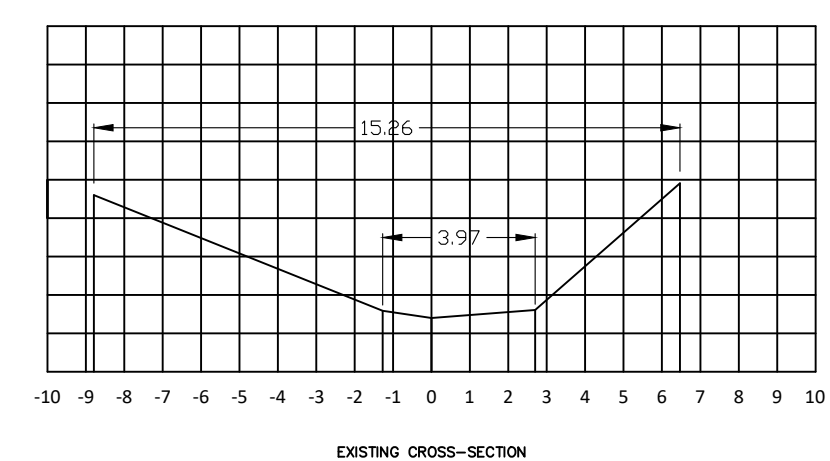
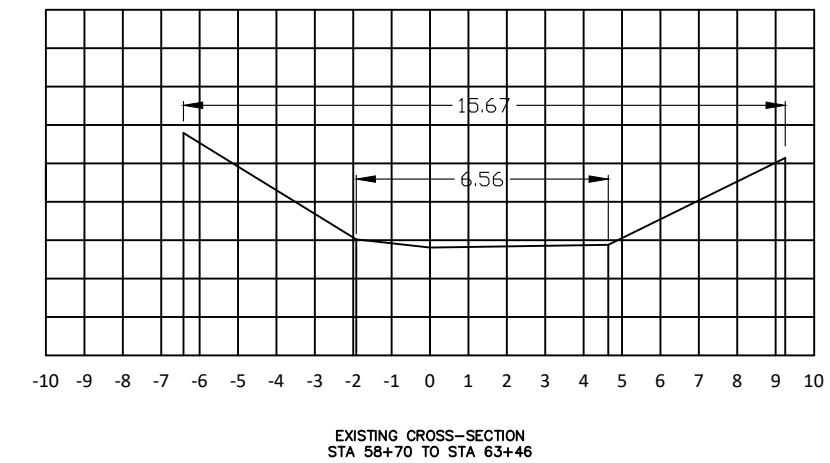
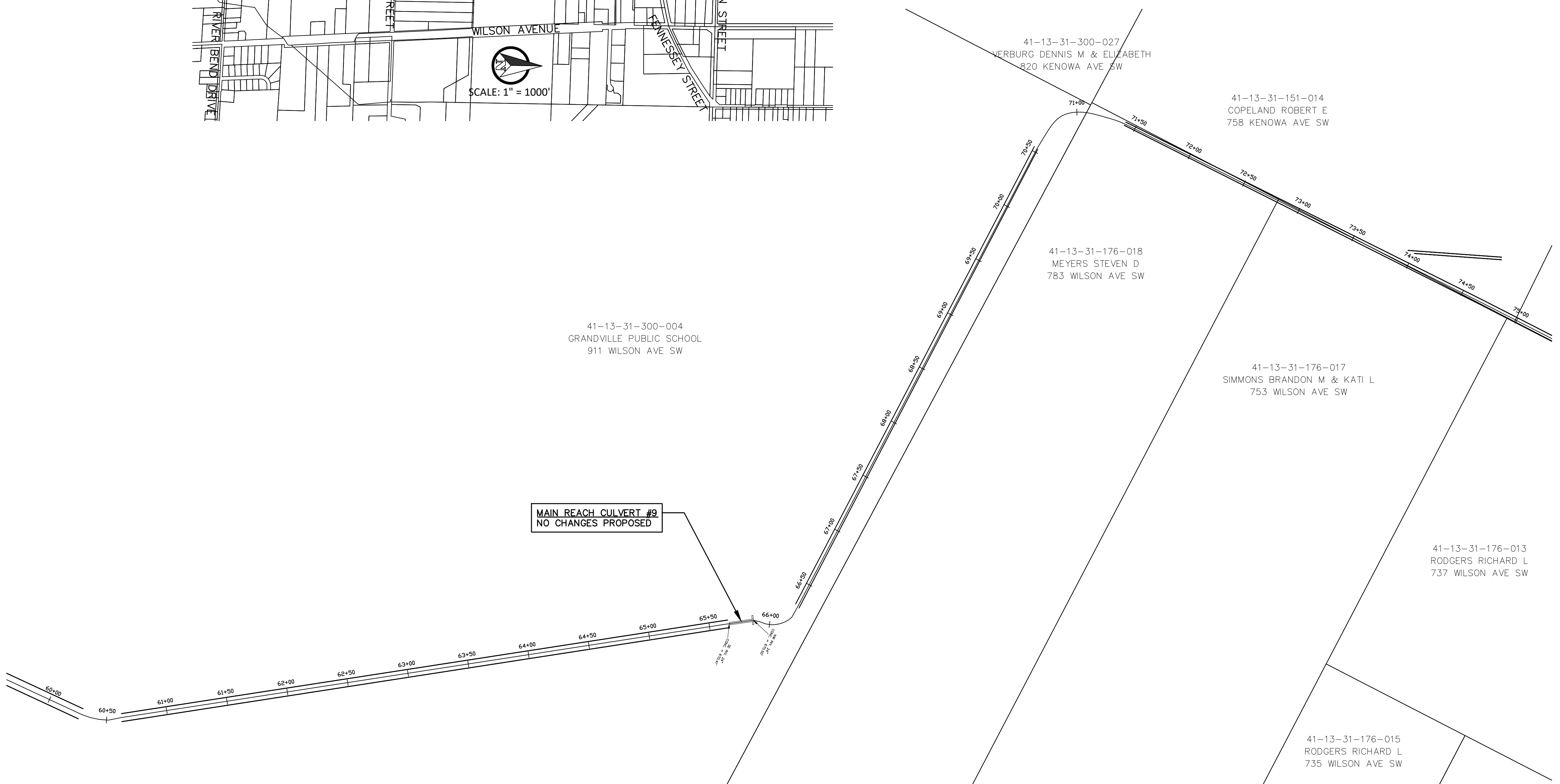
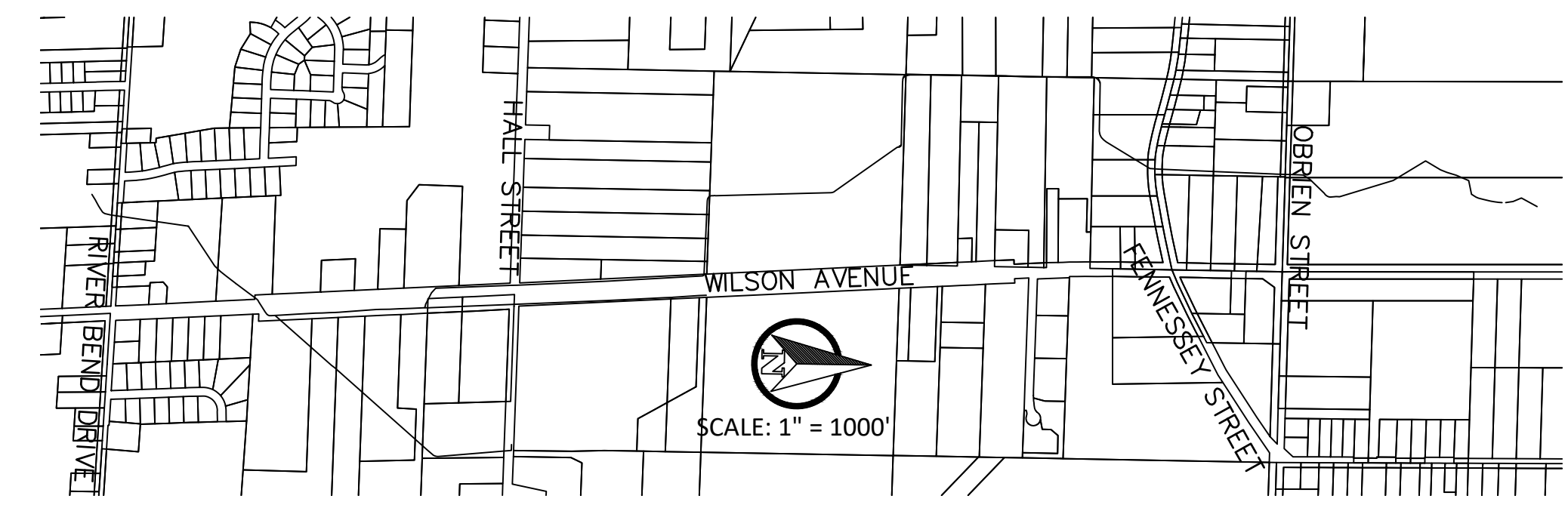
FILE NO. 1066
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Sheet No. 5 OF 17



SCALES : HORIZ. : 1" = 50'
VERT. : 1" = 5'



Know what's below.
Call before you dig.



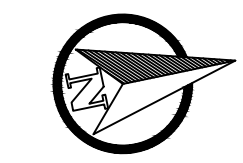
NO.	DATE	REVISION	BY
1	1/6/2023	FOR DRAIN COMMISSION REVIEW	NFB
2	9/14/2023	PER DRAIN COMMISSION	NFB
3	1/18/2024	REVISIONS FOR REVIEW	NFB
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5	2/28/2024	FOR BIDS	NFB

CITY OF WALKER
KENT COUNTY, MI
**WALKER NO. 4 COUNTY DRAIN
EXTENSION AND IMPROVEMENTS**
MAIN REACH
STA 60+00 TO STA 75+00



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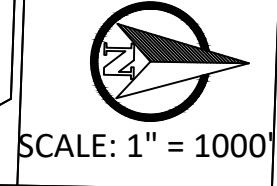
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Sheet No. 6 OF 17



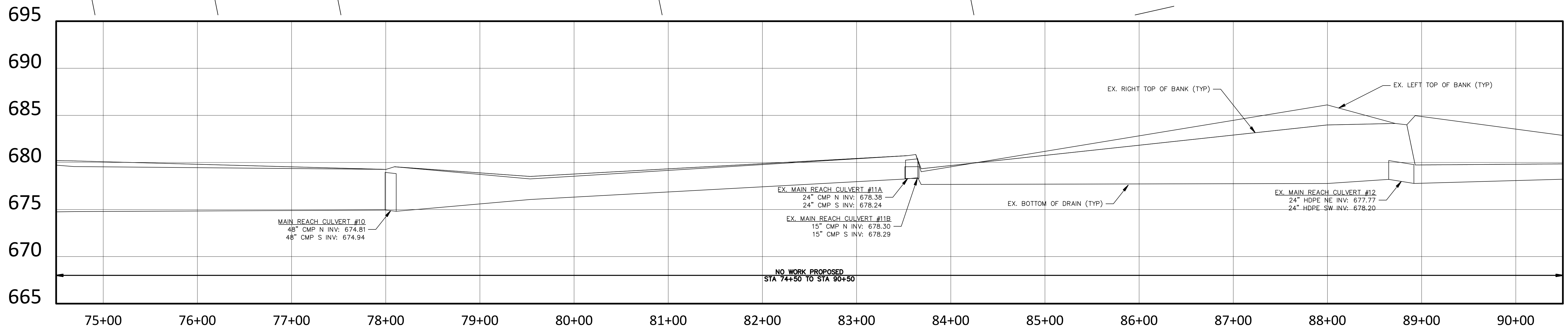
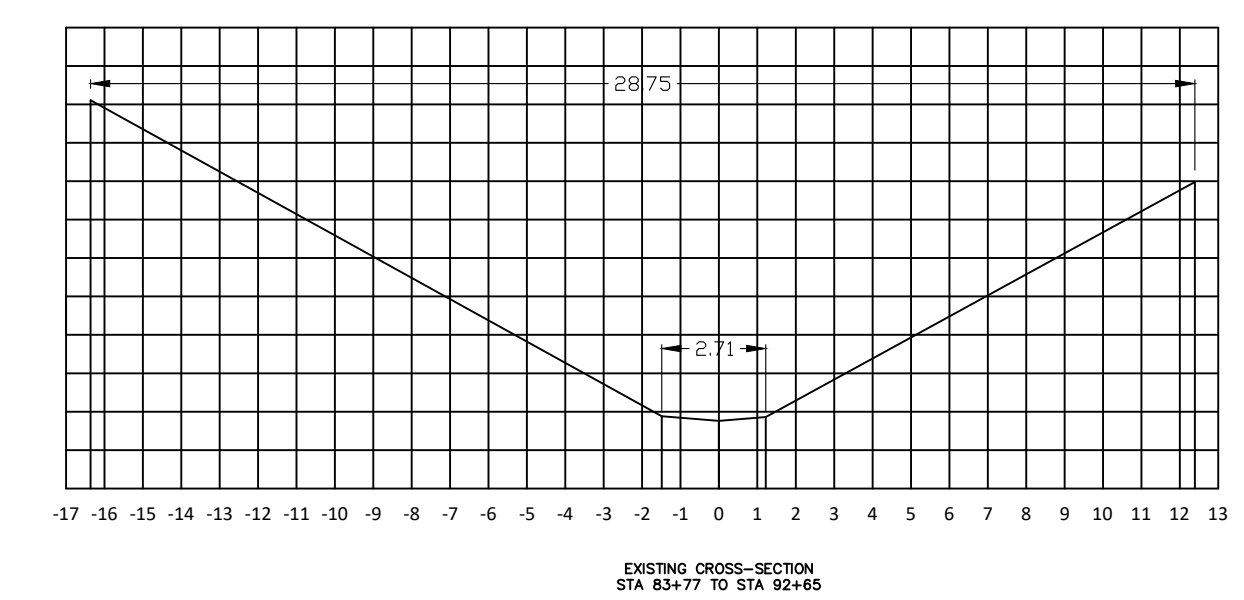
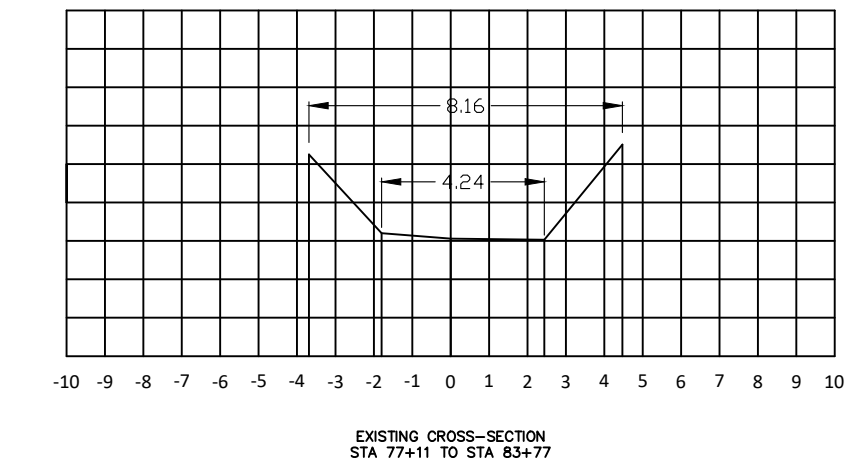
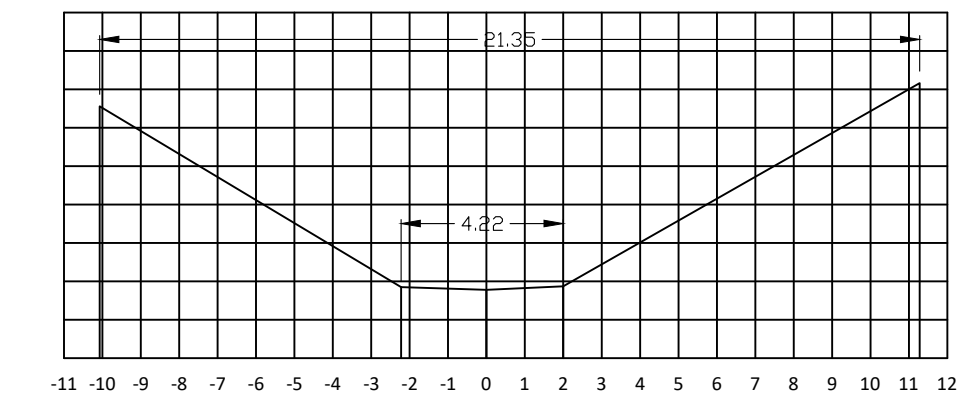
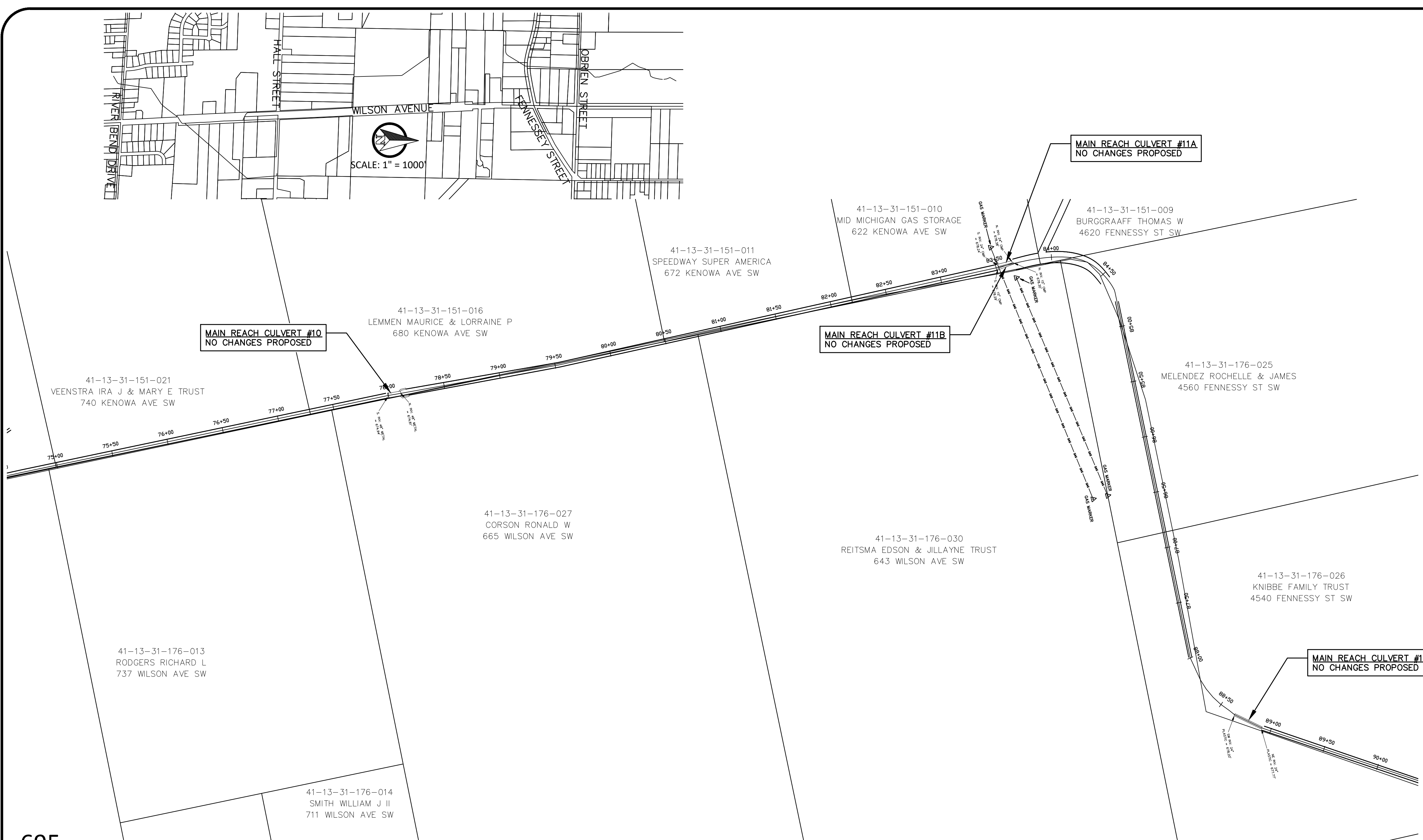
SCALES : HORIZ. : 1" = 50'
VERT. : 1" = 5'



Know what's below.
Call before you dig.



SCALE: 1" = 1000'



NO.	DATE	REVISION	BY
1	1/6/2023	FOR DRAIN COMMISSION REVIEW	NFB
2	9/14/2023	PER DRAIN COMMISSION	NFB
3	1/18/2024	REVISIONS FOR REVIEW	NFB
4	2/26/2024	PER KCDC/CITY OF WALKER DPW	NFB
5	2/28/2024	FOR BIDS	NFB

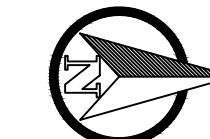
CITY OF WALKER
KENT COUNTY, MI
**WALKER NO. 4 COUNTY DRAIN
EXTENSION AND IMPROVEMENTS**
MAIN REACH
STA 75+00 TO STA 90+00

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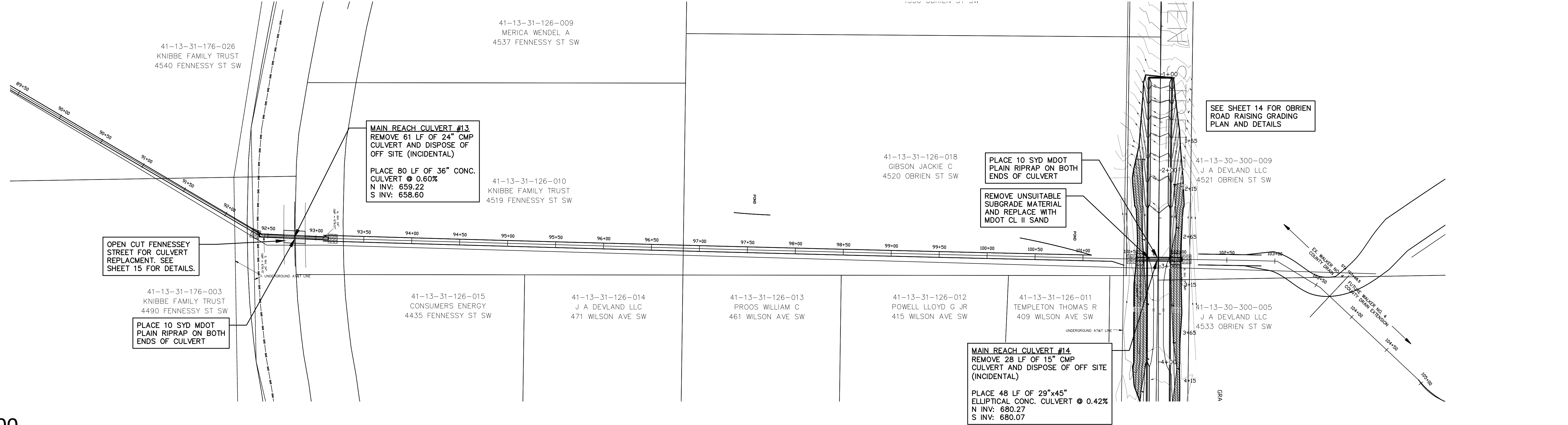
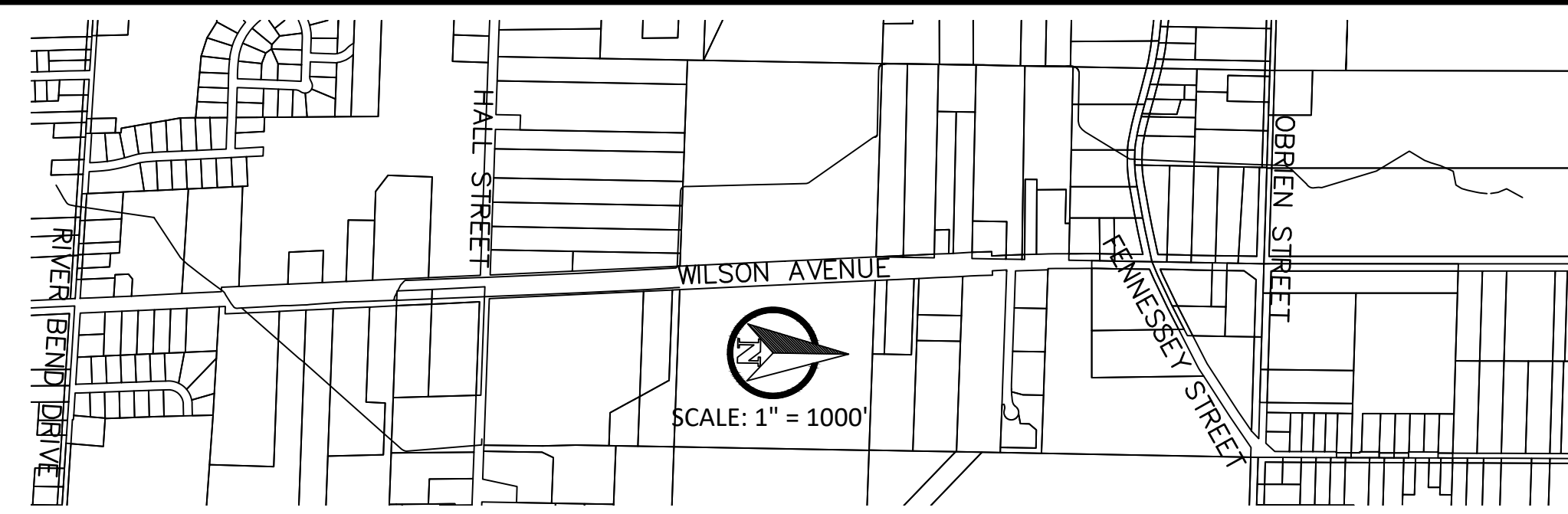
FILE NO. 1066
CHECKED JMG
Sheet No. 7 OF 17



Know what's below.
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SCALES : HORIZ. : 1" = 50'
VERT. : 1" = 5'



700

695

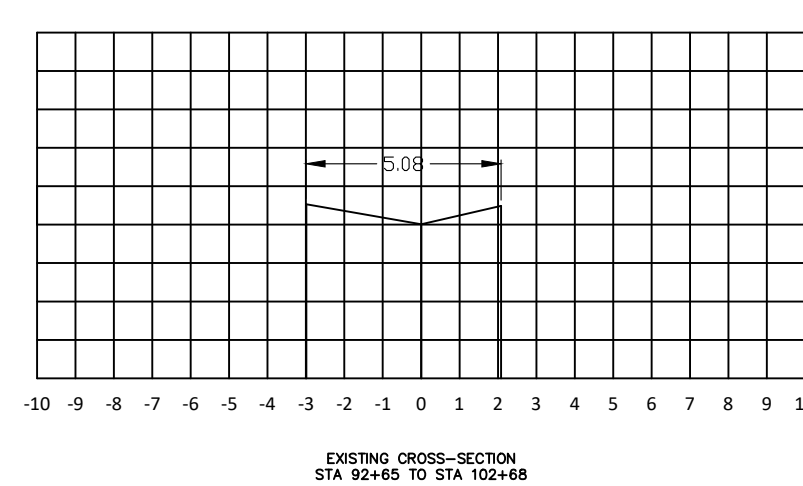
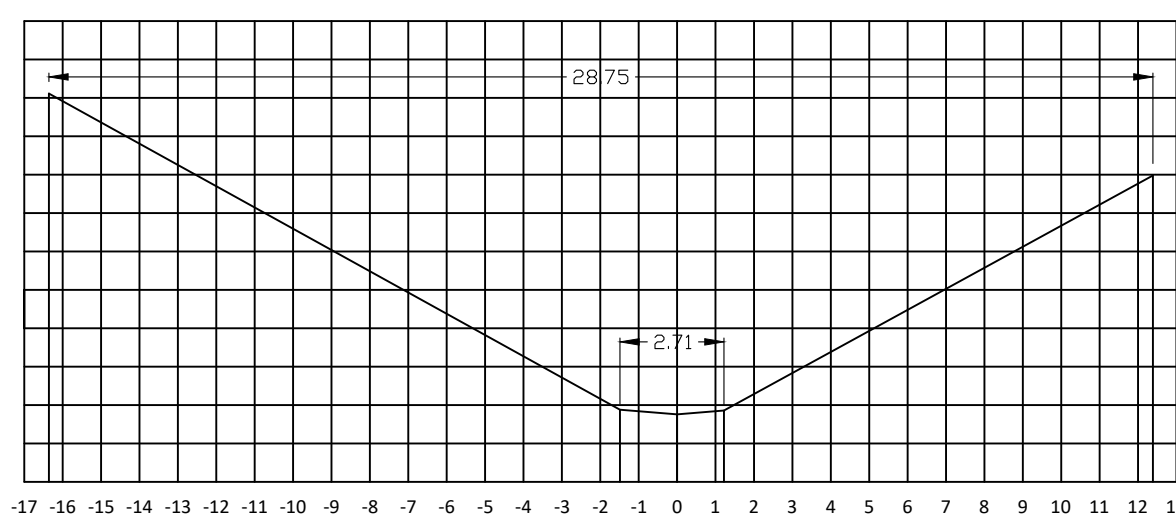
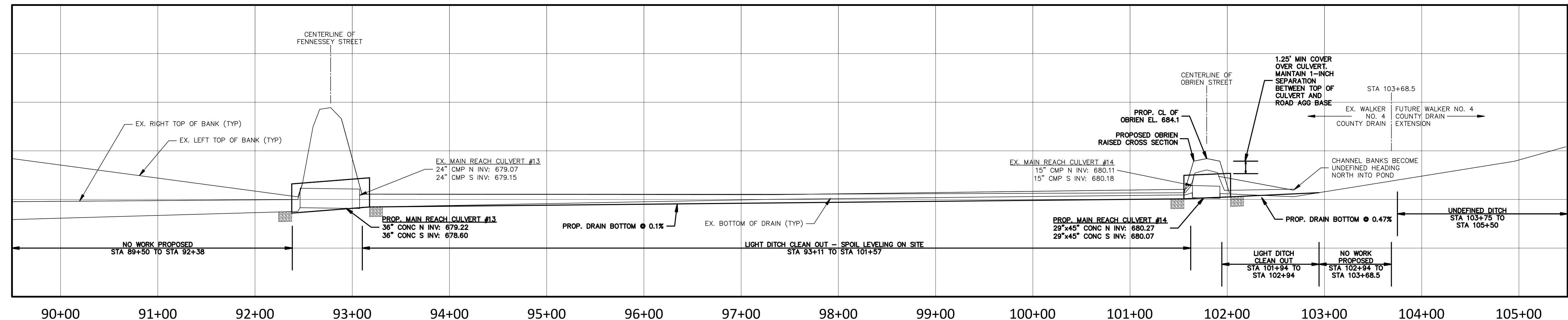
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685

680

675

670



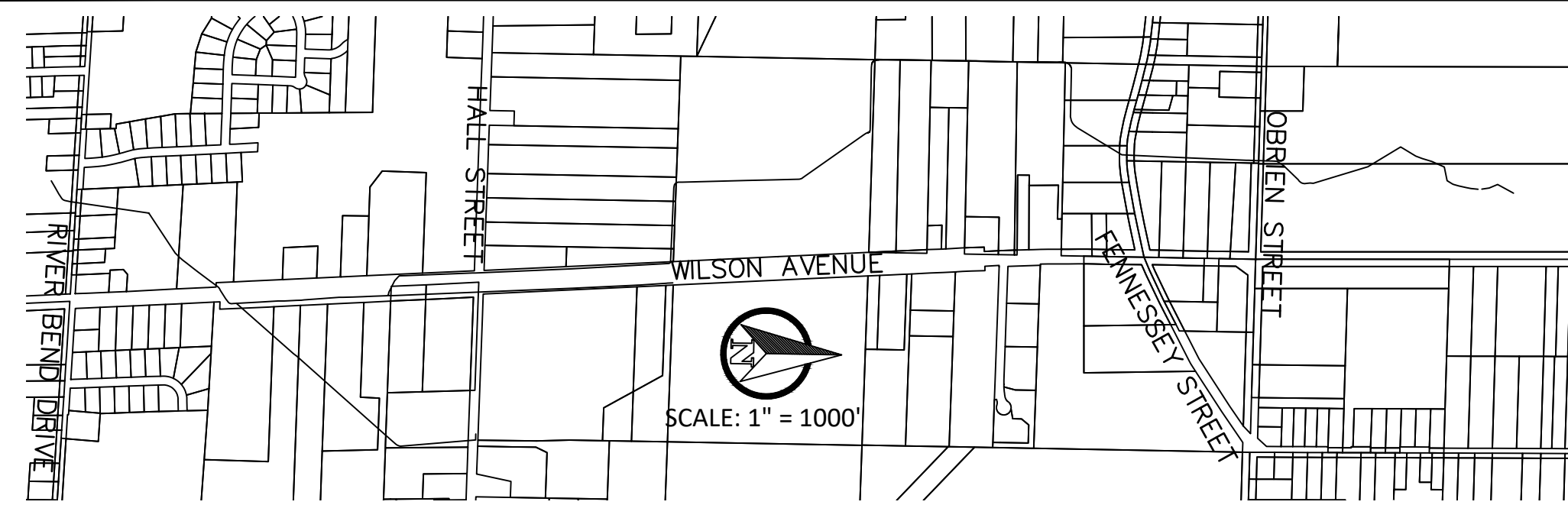
NO.	DATE	REVISION	BY
1	1/6/2023	FOR DRAIN COMMISSION REVIEW	NFB
2	9/14/2023	PER DRAIN COMMISSION	NFB
3	1/18/2024	REVISIONS FOR REVIEW	NFB
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5	2/28/2024	FOR BIDS	NFB

CITY OF WALKER
KENT COUNTY, MI
**WALKER NO. 4 COUNTY DRAIN
EXTENSION AND IMPROVEMENTS**
MAIN REACH
STA 90+00 TO STA 103+00

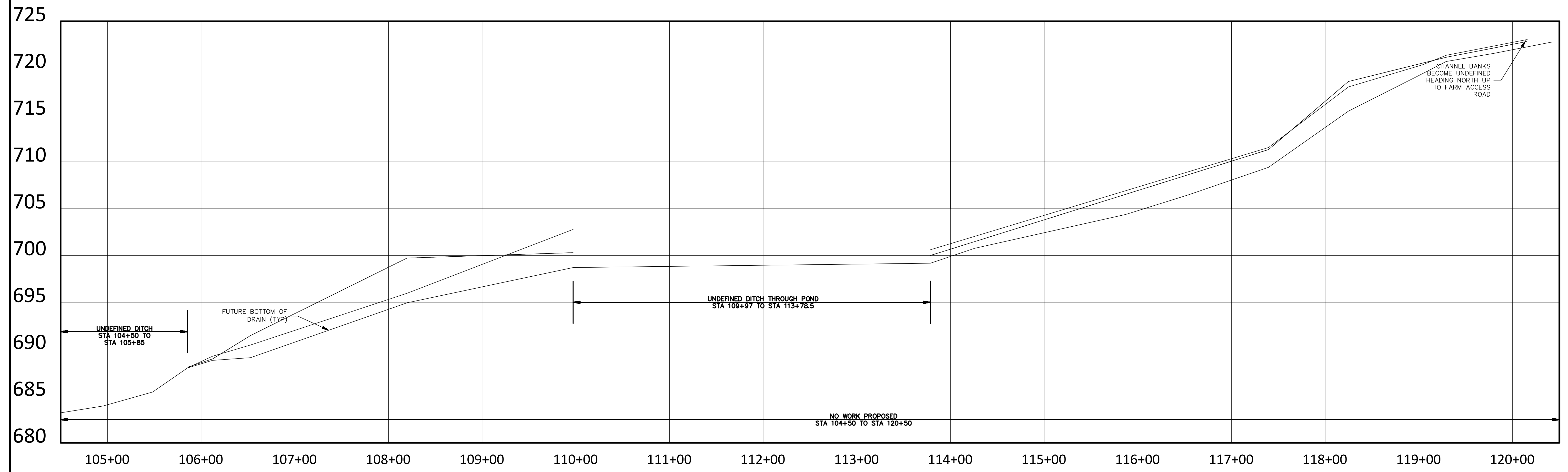
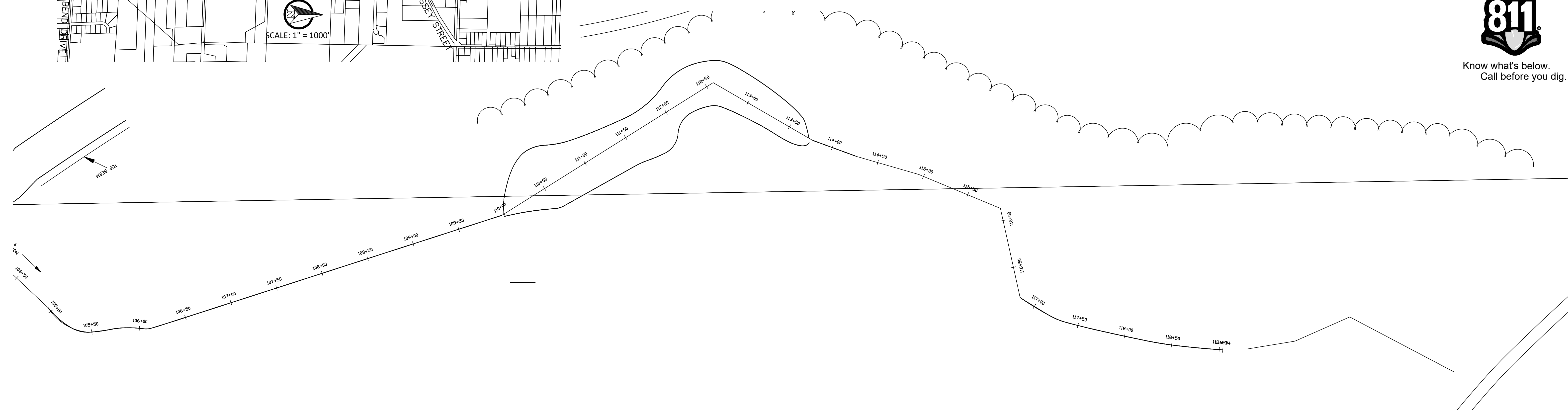


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FILE NO. 1066
CHECKED JMG
Sheet No. 8 OF 17



SCALES : HORIZ. : 1" = 50'
VERT. : 1" = 5'



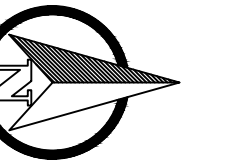
NO.	DATE	REVISION	BY
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CITY OF WALKER
KENT COUNTY, MI
**WALKER NO. 4 COUNTY DRAIN
EXTENSION AND IMPROVEMENTS**
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STA 90+00 TO STA 103+00



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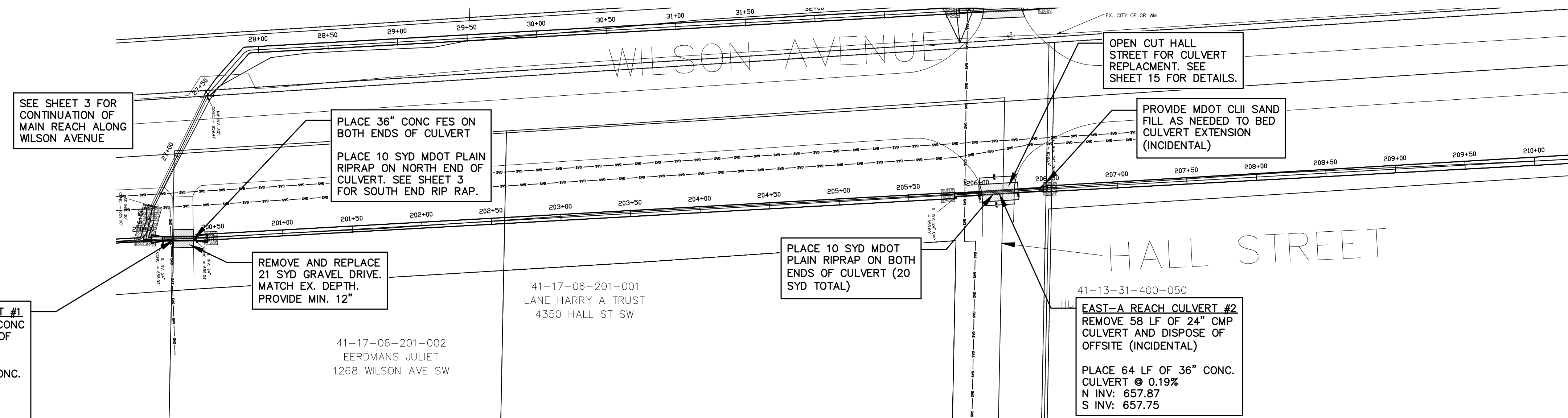
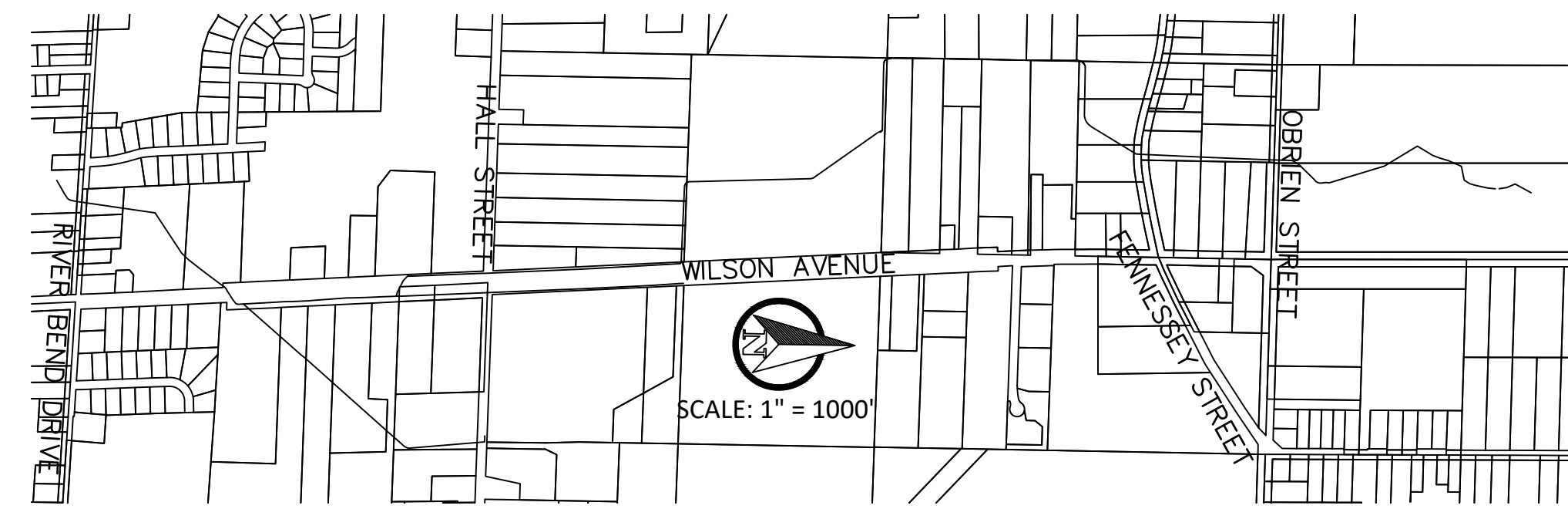
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Sheet No. 9 OF 17



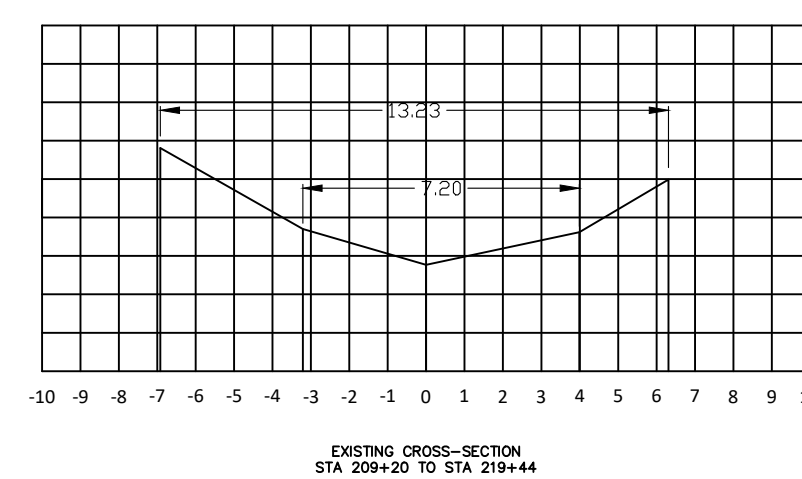
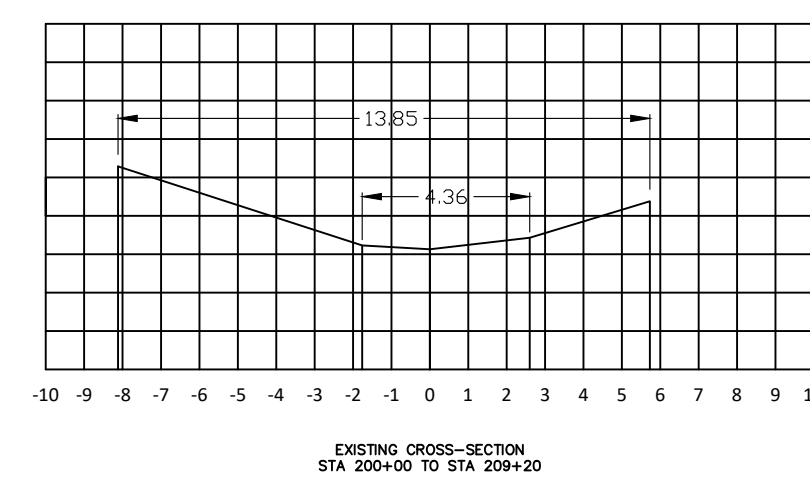
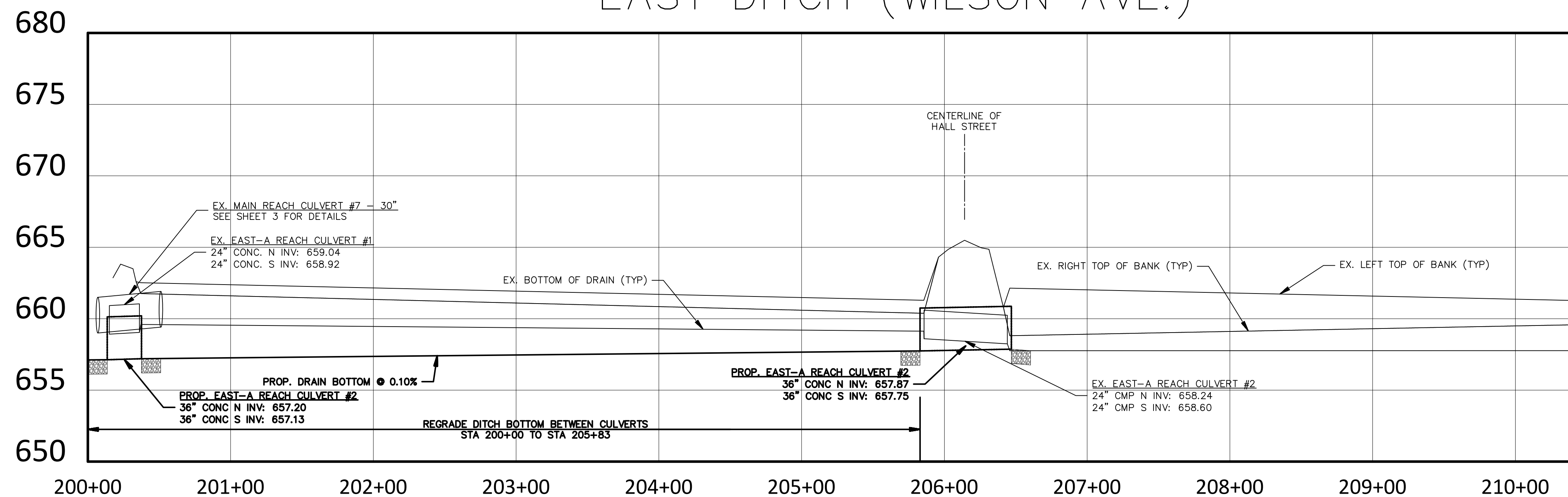
SCALES : HORIZ. : 1" = 50'
VERT. : 1" = 5'



Know what's below.
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EAST DITCH (WILSON AVE.)

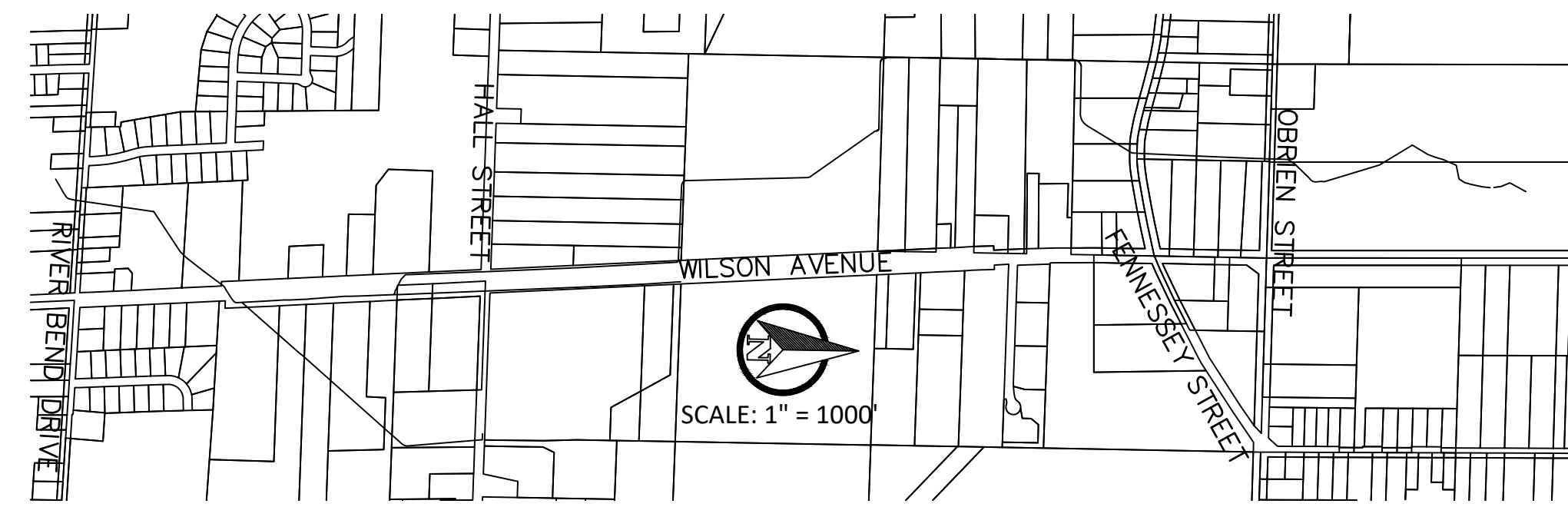


NO.	DATE	REVISION	BY
1	1/6/2023	FOR DRAIN COMMISSION REVIEW	NFB
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3	1/18/2024	REVISIONS FOR REVIEW	NFB
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5	2/28/2024	FOR BIDS	NFB

CITY OF WALKER
KENT COUNTY, MI
**WALKER NO. 4 COUNTY DRAIN
EXTENSION AND IMPROVEMENTS**
EAST-A REACH
STA 200+00 TO STA 210+00

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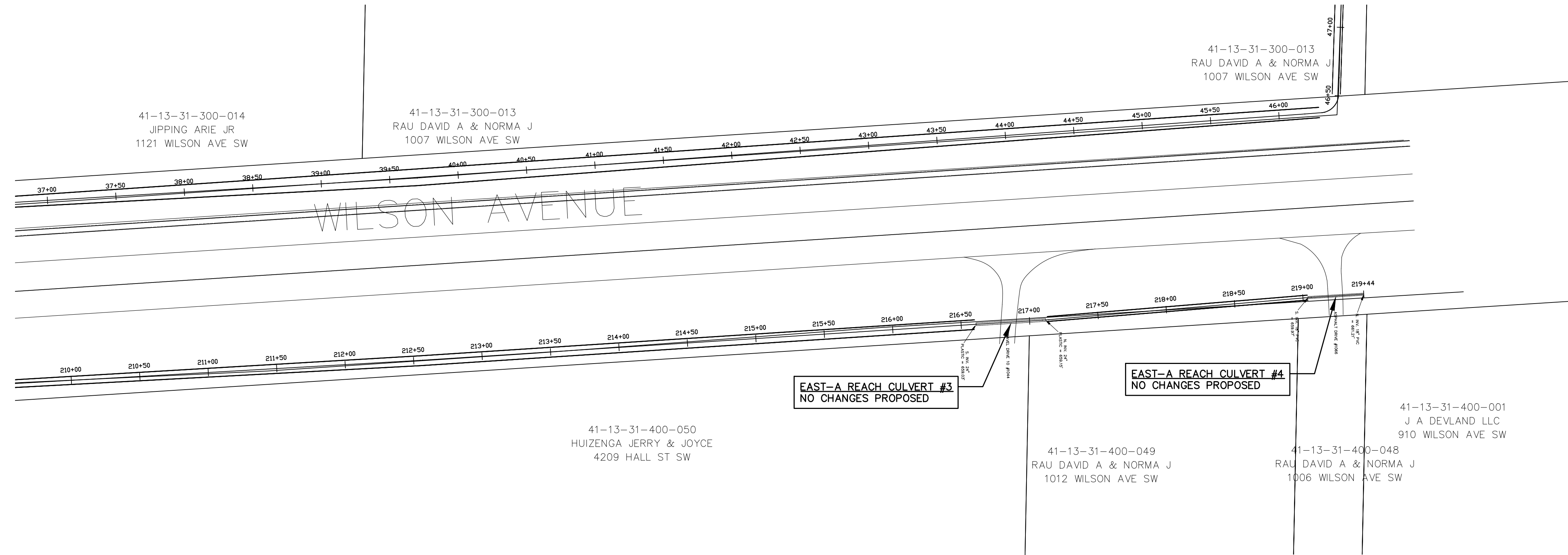
FILE NO. 1066
CHECKED JMG
Sheet No. 10 OF 17



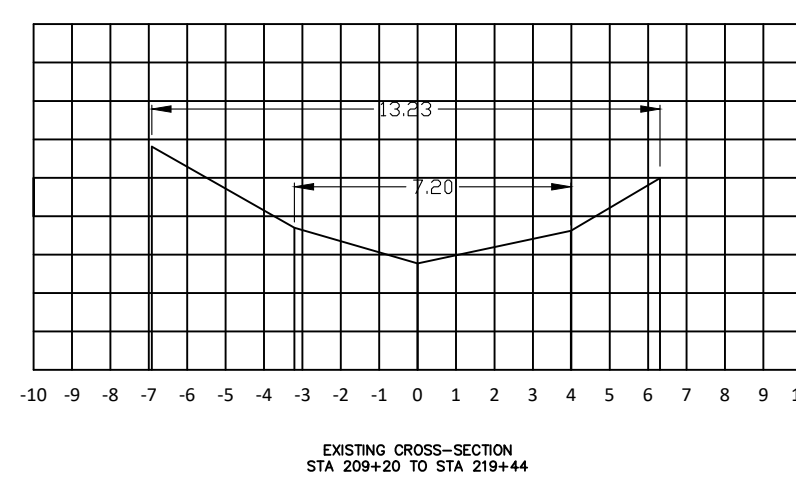
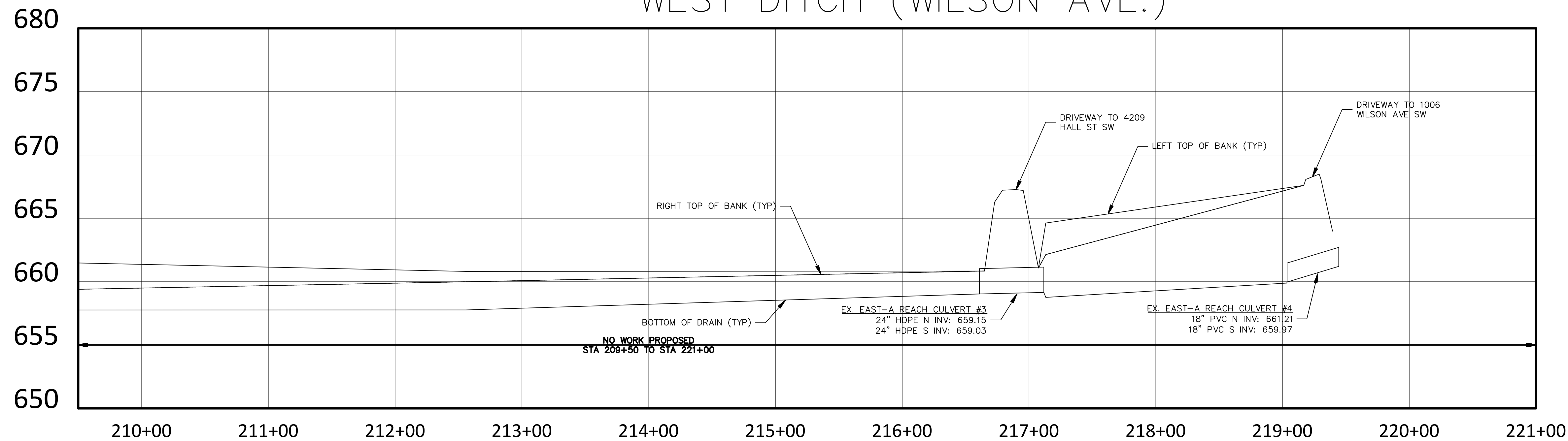
SCALES : HORIZ. : 1" = 50'
VERT. : 1" = 5'



Know what's below.
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WEST DITCH (WILSON AVE.)



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4	2/26/2024	PER KCDC/CITY OF WALKER DPW	NFB
5	2/28/2024	FOR BIDS	NFB

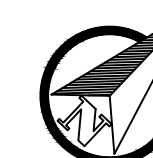
CITY OF WALKER
KENT COUNTY, MI
**WALKER NO. 4 COUNTY DRAIN
EXTENSION AND IMPROVEMENTS**
EAST-A REACH
STA 210+00 TO STA 221+00

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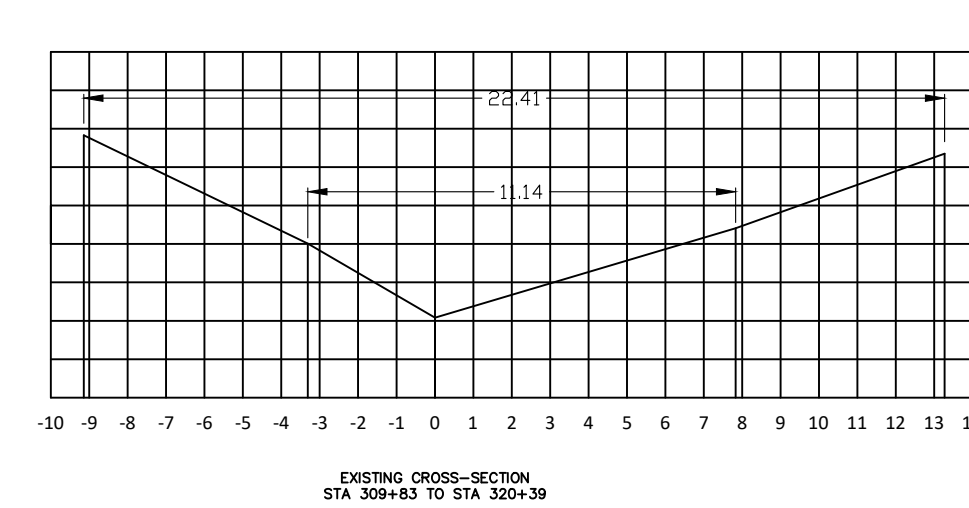
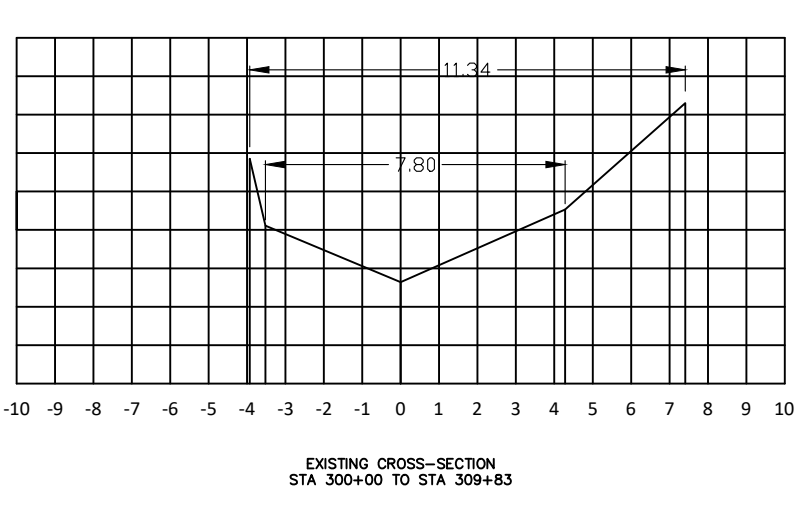
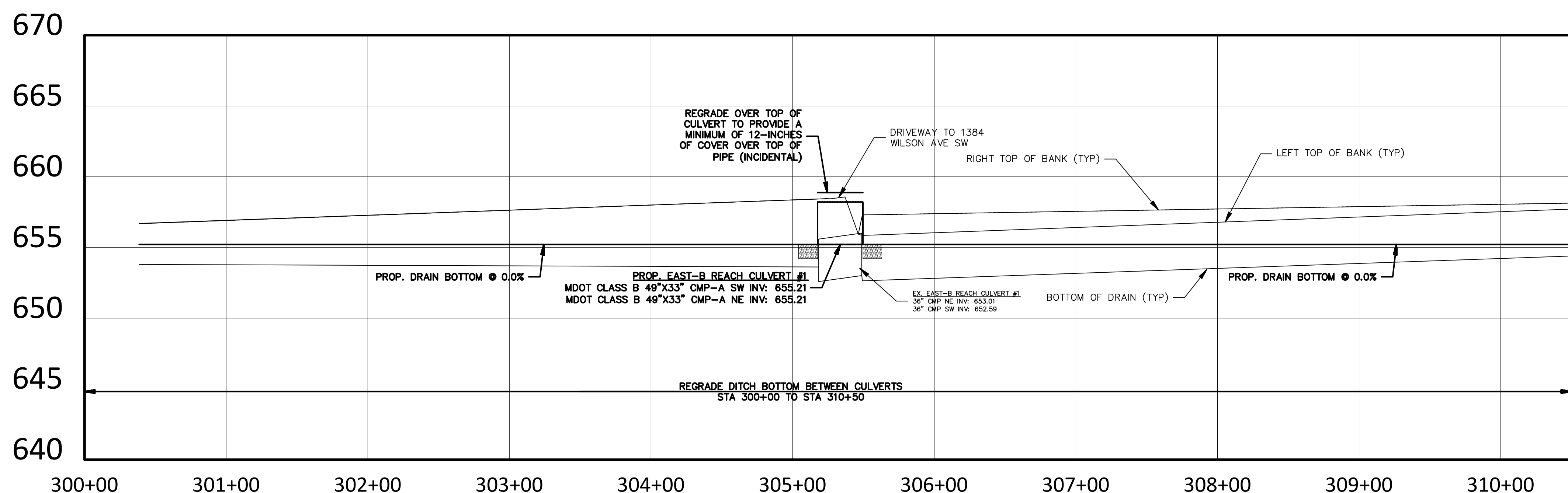
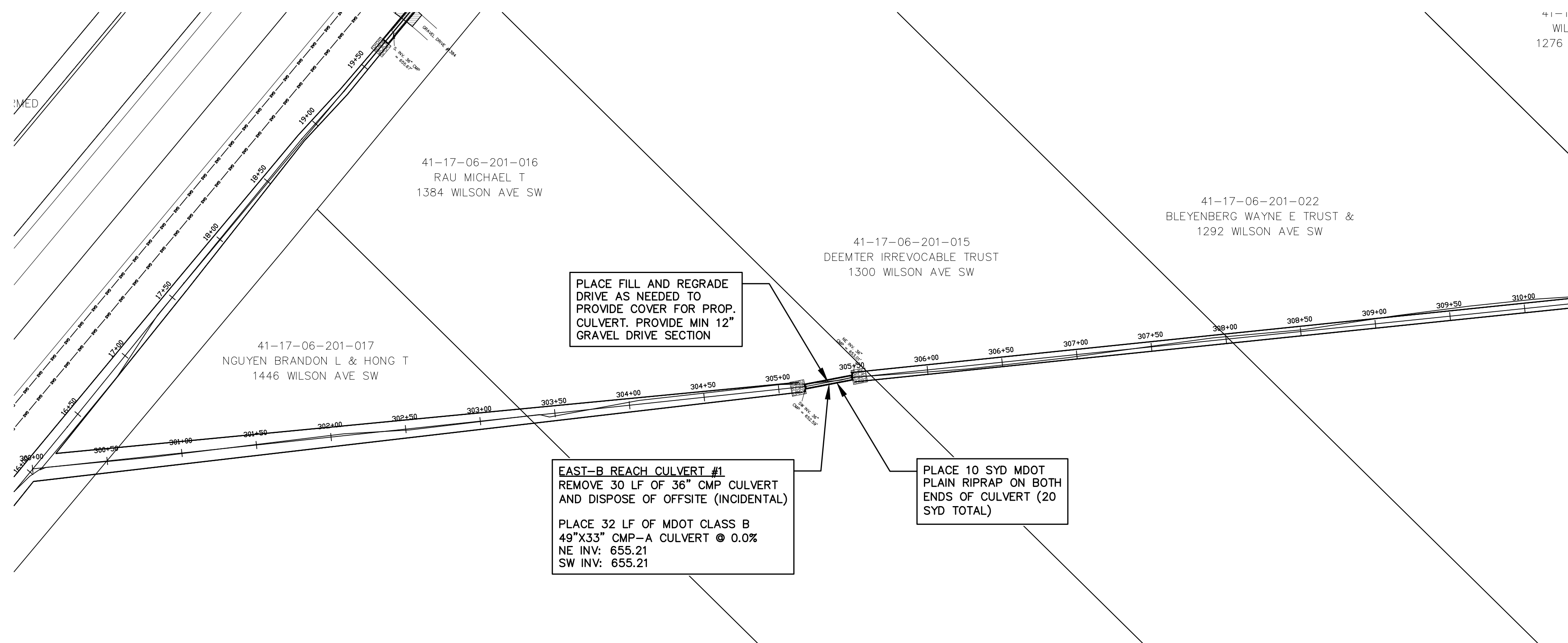
FILE NO. 1066
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Sheet No. 11 OF 17



Know what's below.
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SCALES : HORIZ. : 1" = 50'
VERT. : 1" = 5'



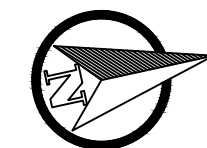
NO.	DATE	REVISION	BY
1	1/6/2023	FOR DRAIN COMMISSION REVIEW	NFB
2	9/14/2023	PER DRAIN COMMISSION	NFB
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4	2/26/2024	PER KCDC/CITY OF WALKER DPW	NFB
5	2/28/2024	FOR BIDS	NFB

CITY OF WALKER
KENT COUNTY, MI
**WALKER NO. 4 COUNTY DRAIN
EXTENSION AND IMPROVEMENTS**
EAST-B REACH
STA 300+00 TO STA 310+00



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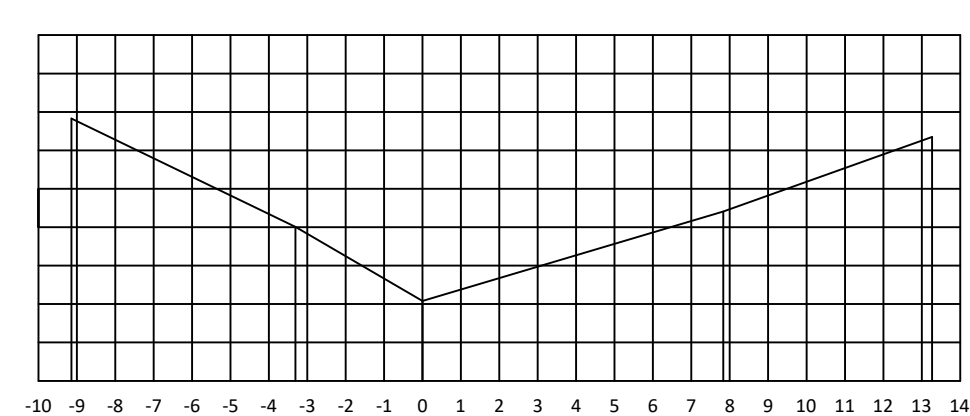
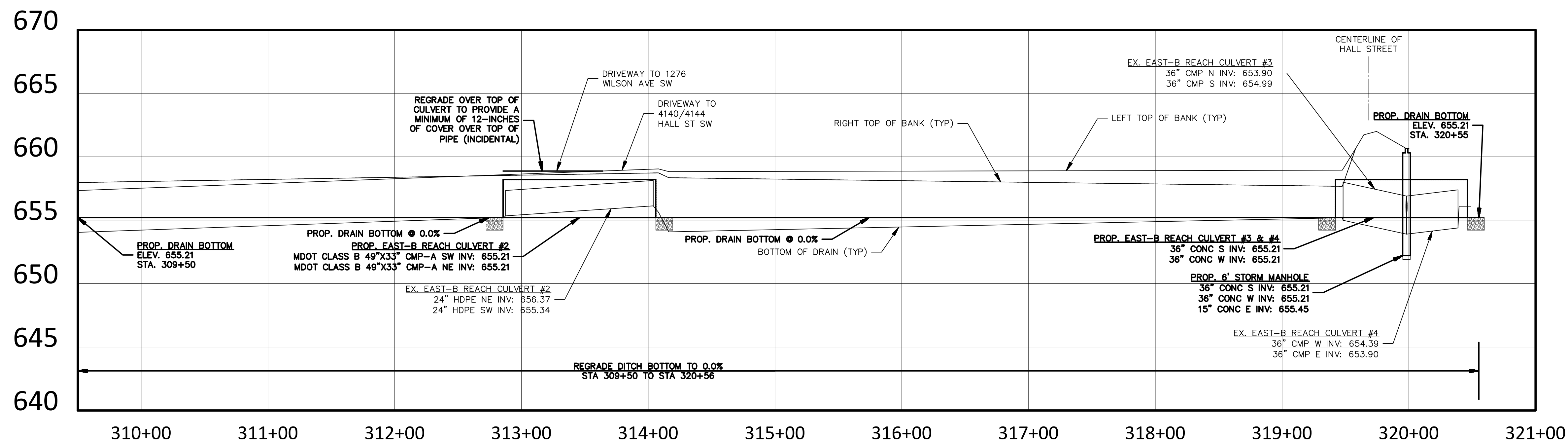
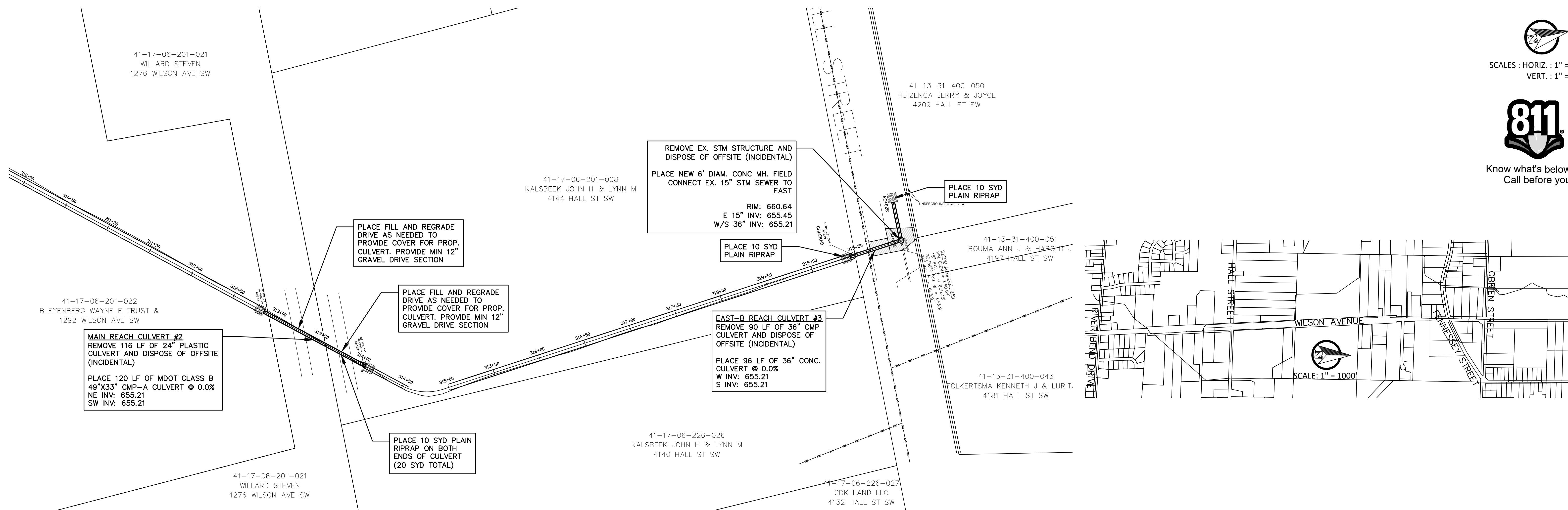
FILE NO. 1066
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Sheet No. 12 OF 17



SCALES : HORIZ. : 1" = 50'
VERT. : 1" = 5'



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EXISTING CROSS-SECTION
STA. 309+50 TO STA. 320+56

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1	1/6/2023	FOR DRAIN COMMISSION REVIEW	NFB
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CITY OF WALKER
KENT COUNTY, MI
**WALKER NO. 4 COUNTY DRAIN
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EAST-B REACH
STA 310+00 TO STA 321+00



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FILE NO. 1066
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Sheet No. 13 OF 17

41-13-30-300-009
J A DEVLAND LLC
4521 OBRIEN ST SW

41-13-30-300-005
J A DEVLAND LLC
4533 OBRIEN ST SW

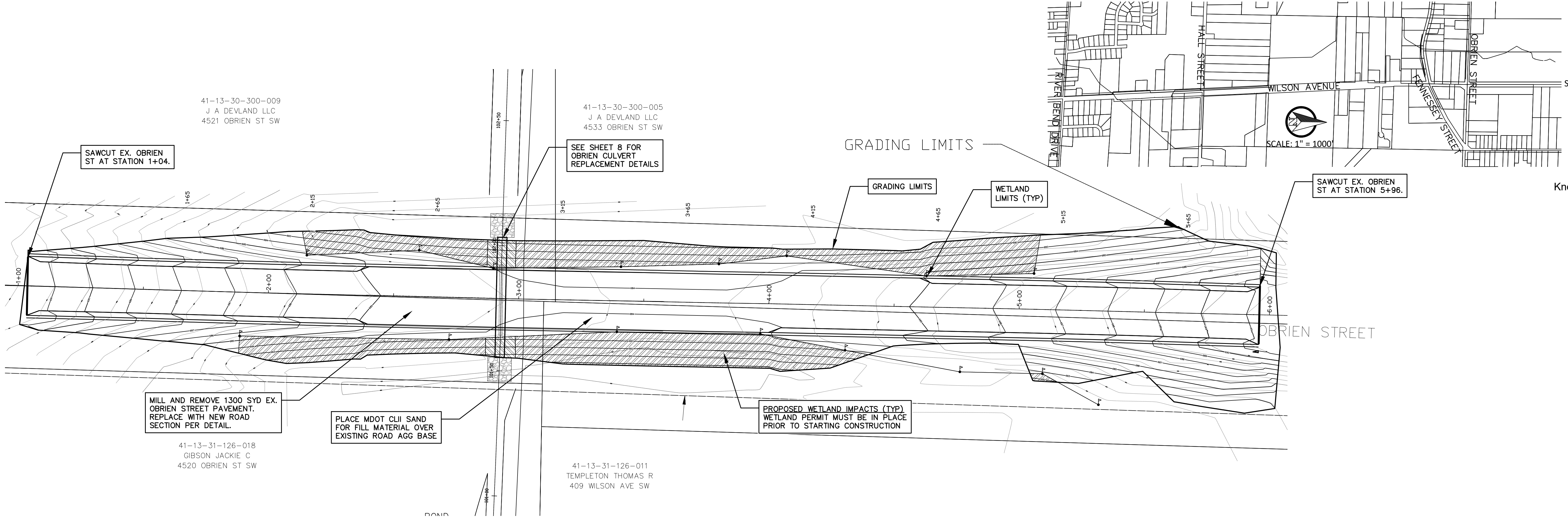
41-13-31-126-018
GIBSON JACKIE C
4520 OBRIEN ST SW

41-13-31-126-011
TEMPLETON THOMAS R
409 WILSON AVE SW

SCALES : HORIZ. : 1" = 20'



Know what's below.
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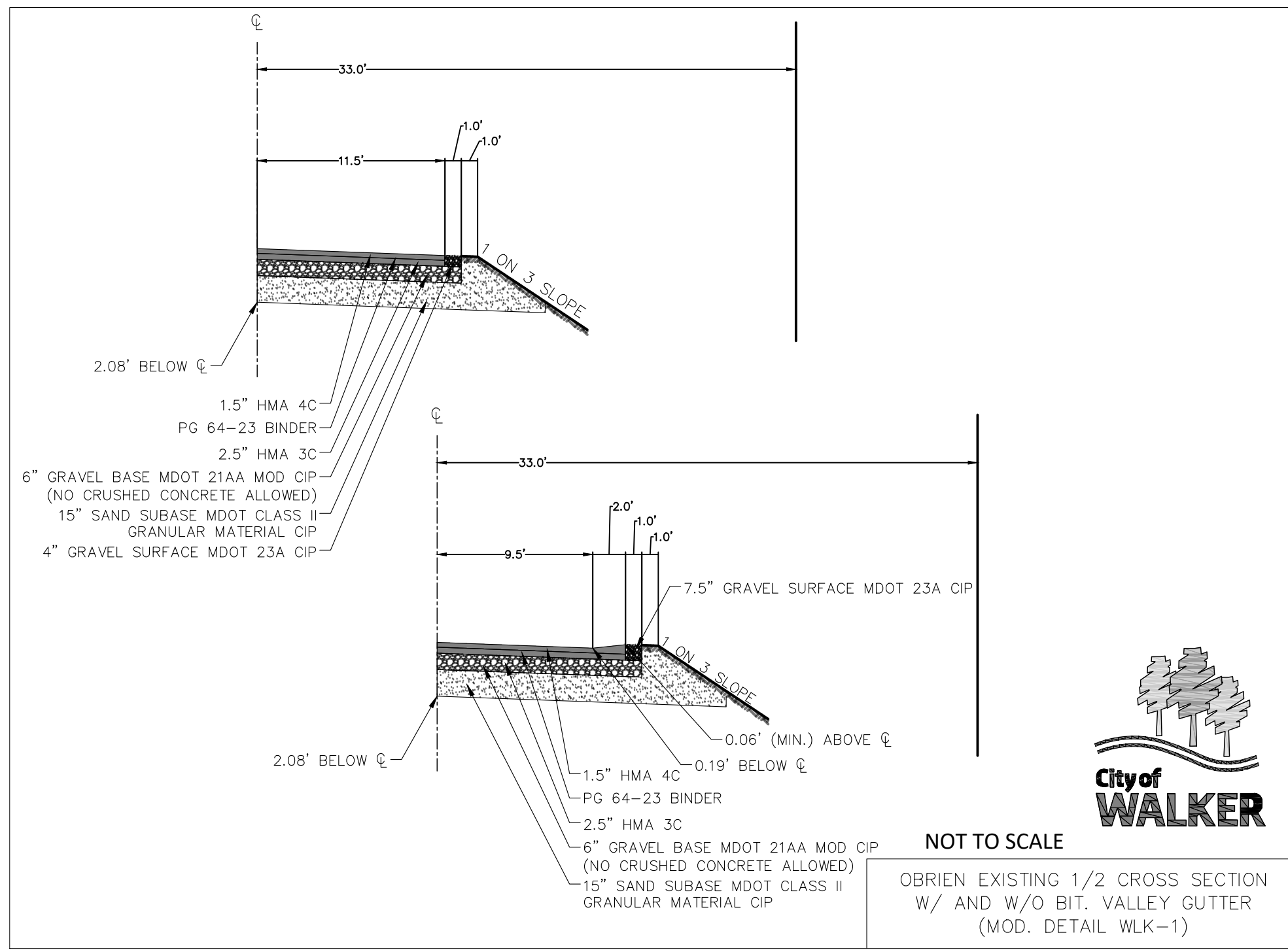
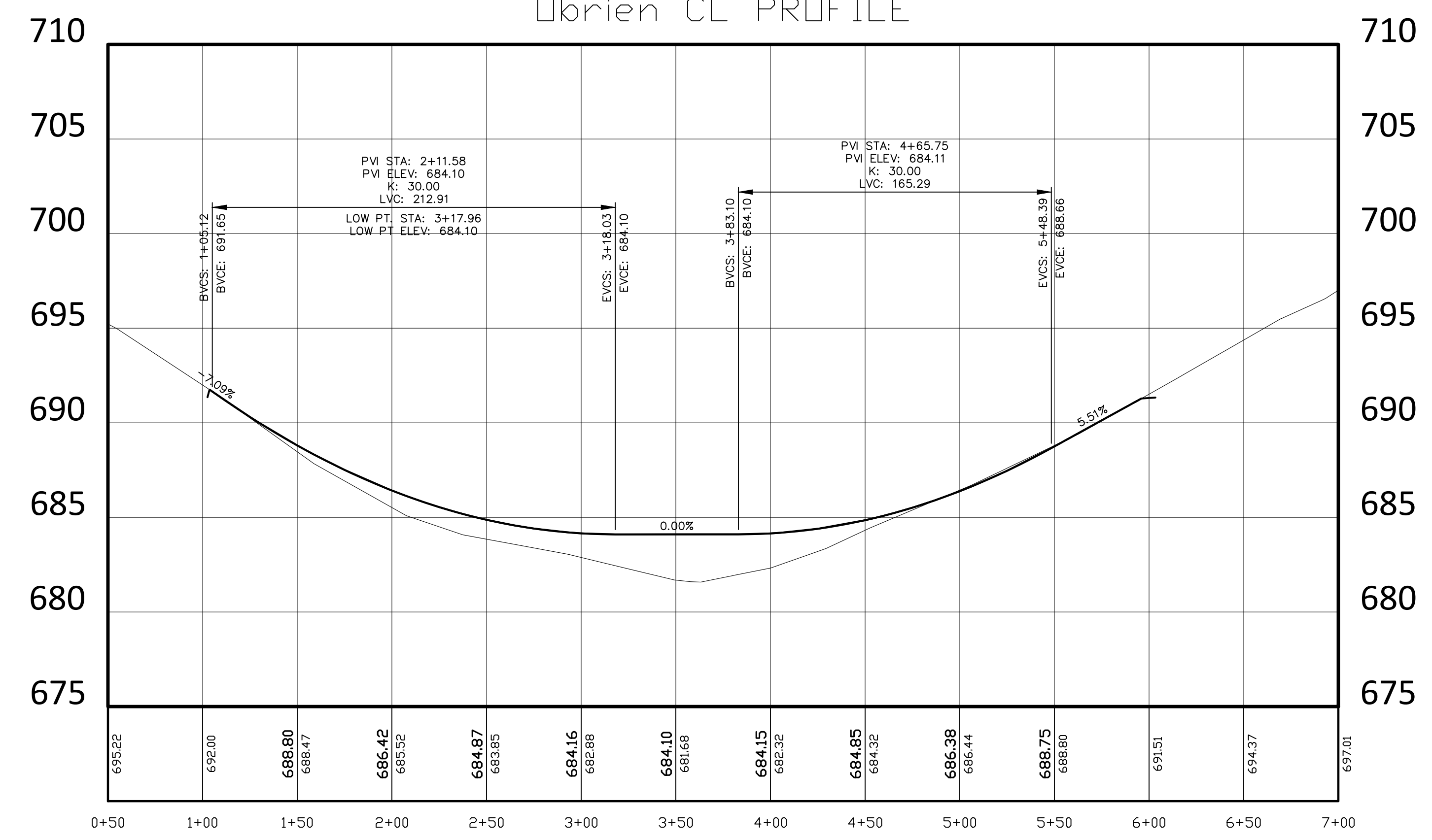


MILL AND REMOVE 1300 SYD EX. OBRIEN STREET PAVEMENT. REPLACE WITH NEW ROAD SECTION PER DETAIL.

PLACE MDOT CLI SAND FOR FILL MATERIAL OVER EXISTING ROAD AGG BASE

PROPOSED WETLAND IMPACTS (TYP). WETLAND PERMIT MUST BE IN PLACE PRIOR TO STARTING CONSTRUCTION

Obrien CL PROFILE



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1	1/6/2023	FOR DRAIN COMMISSION REVIEW	NFB
2	9/14/2023	PER DRAIN COMMISSION	NFB
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5	2/28/2024	FOR BIDS	NFB

CITY OF WALKER
KENT COUNTY, MI
**WALKER NO. 4 COUNTY DRAIN
EXTENSION AND IMPROVEMENTS
OBRIEN ROAD RAISING PLAN**

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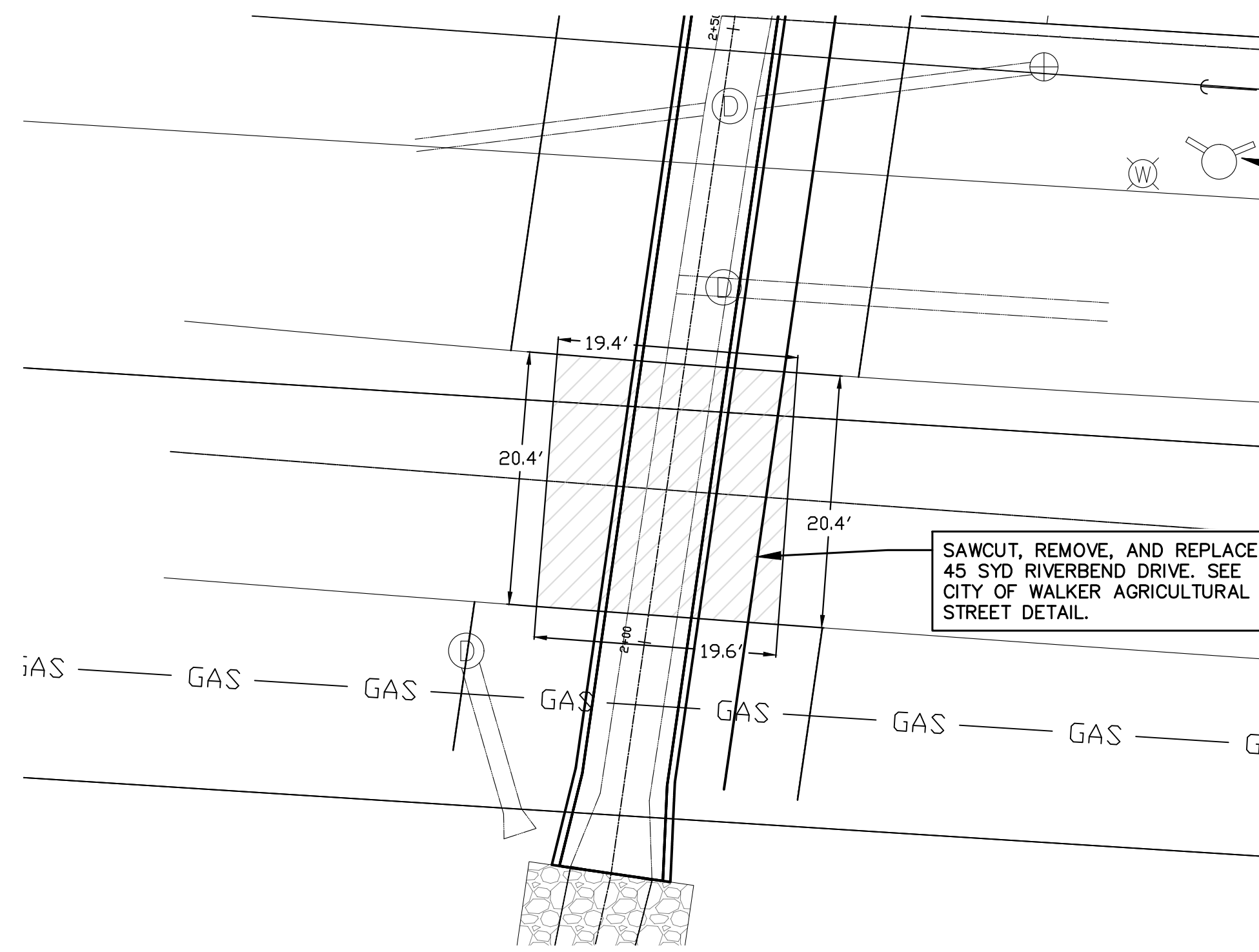
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Sheet No. 14 OF 17



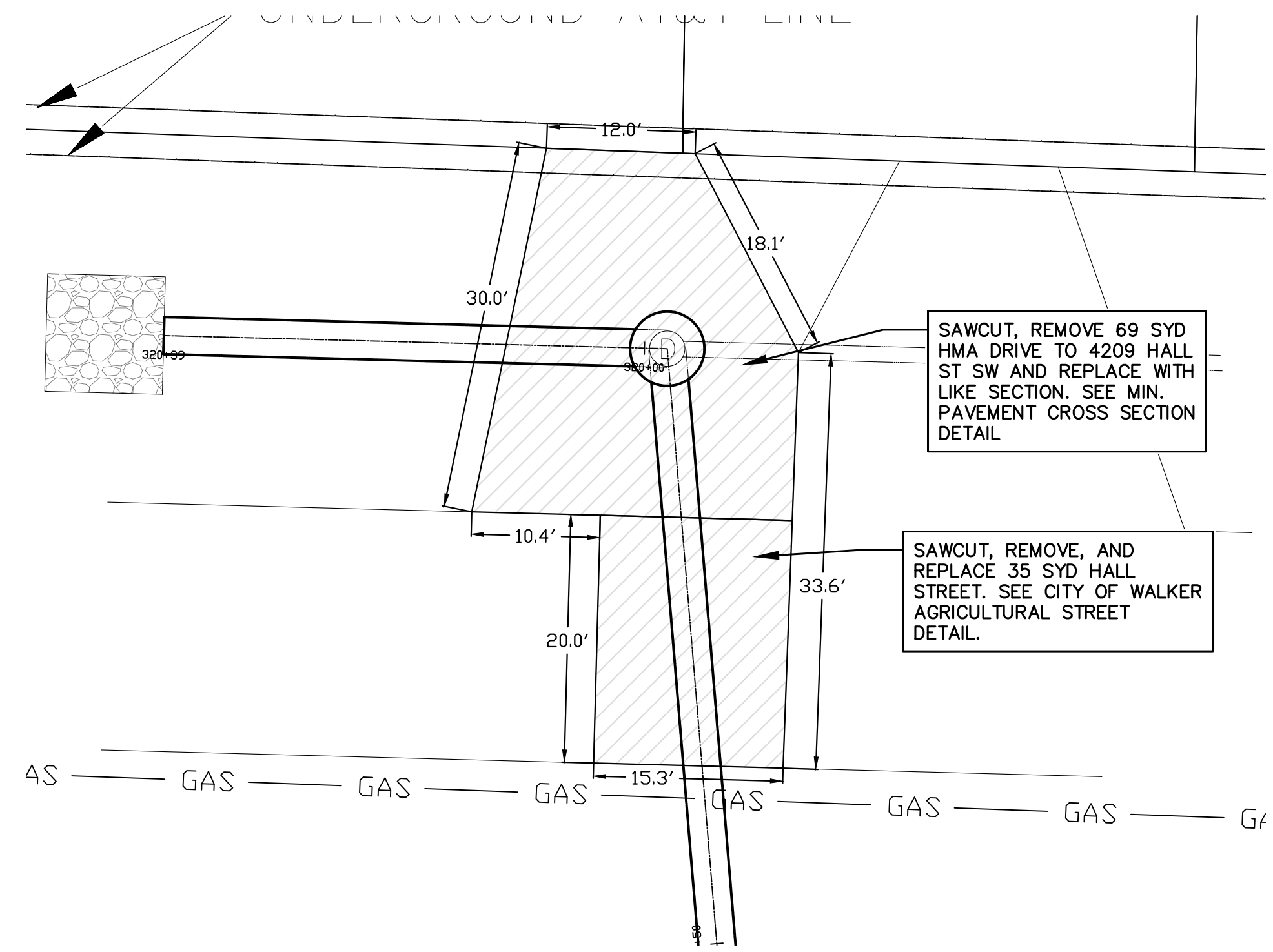
SCALES : HORIZ. : 1" = 10'
VERT. : 1" = 5'



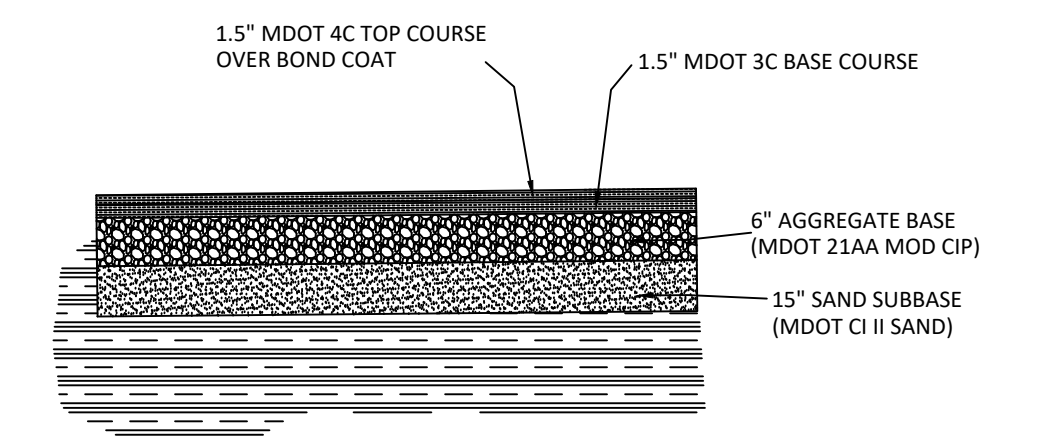
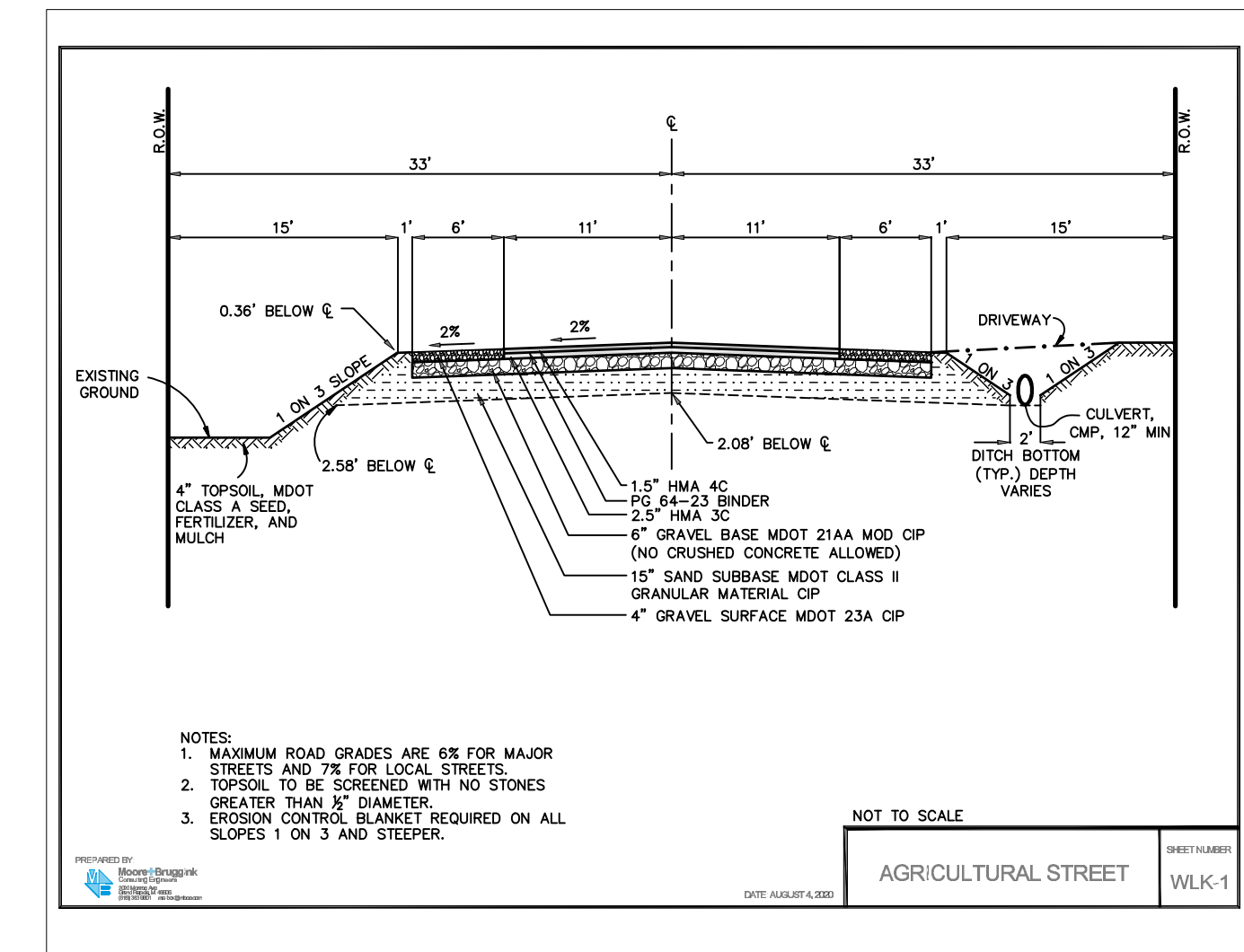
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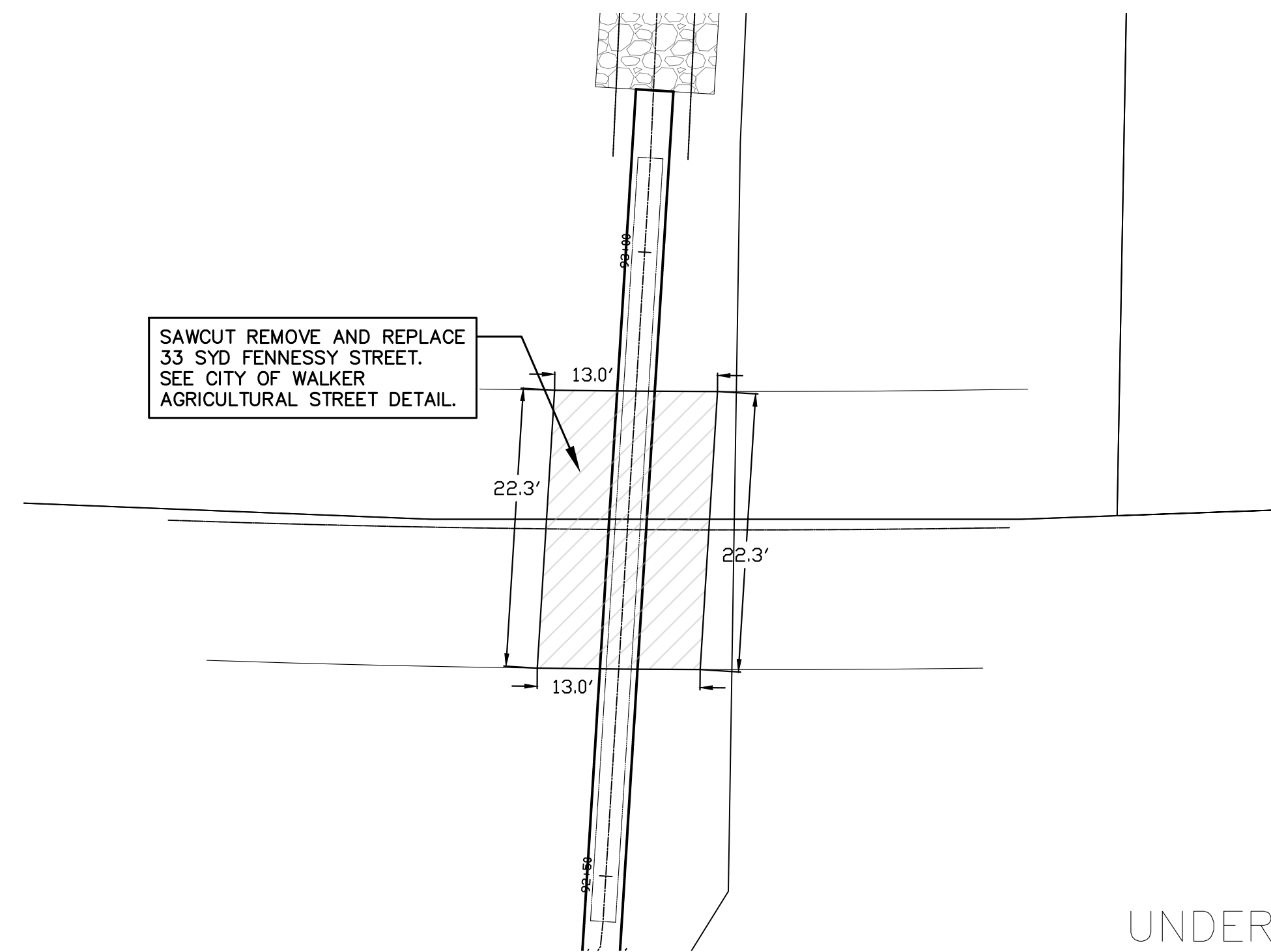
**RIVERBEND DRIVE
RECONSTRUCTION**



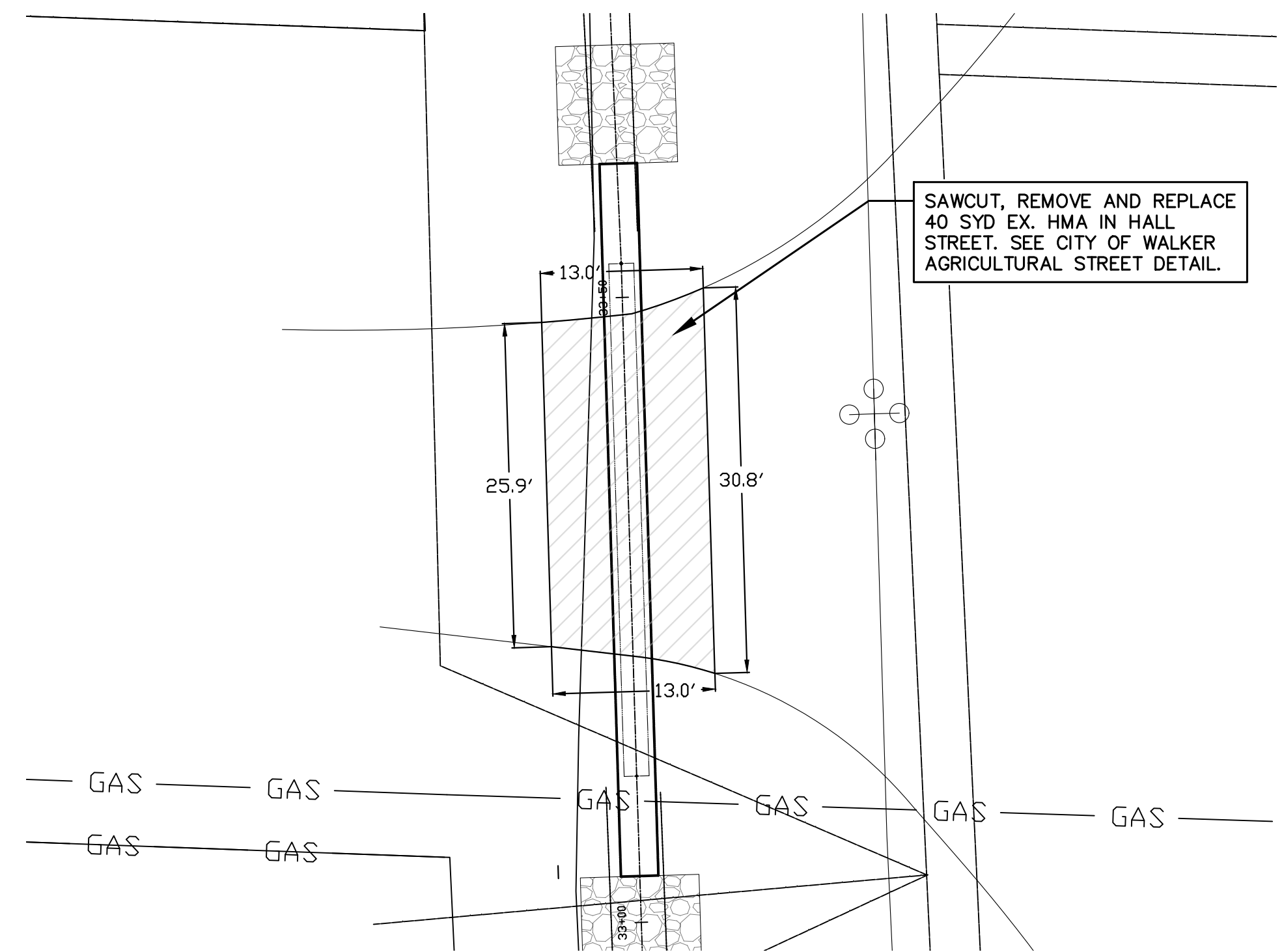
**HALL STREET - 1075 FT EAST OF WILSON
RECONSTRUCTION**



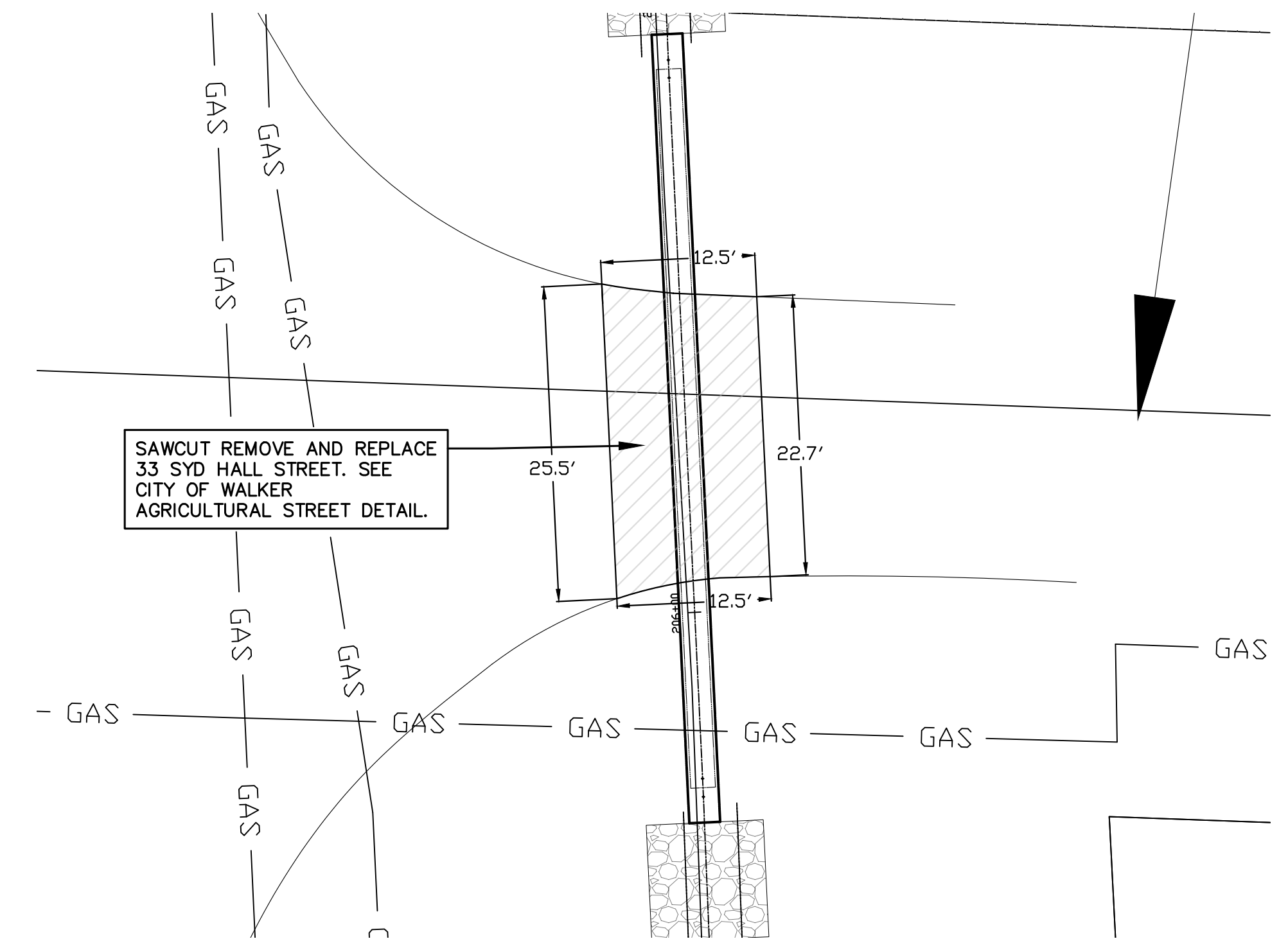
**MINIMUM PAVEMENT CROSS
SECTION DETAIL**
NOT TO SCALE



**FENNESSY STREET
RECONSTRUCTION**



**HALL STREET - WEST OF WILSON
RECONSTRUCTION**



**HALL STREET - EAST OF WILSON
RECONSTRUCTION**

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5	2/28/2024	FOR BIDS	NFB

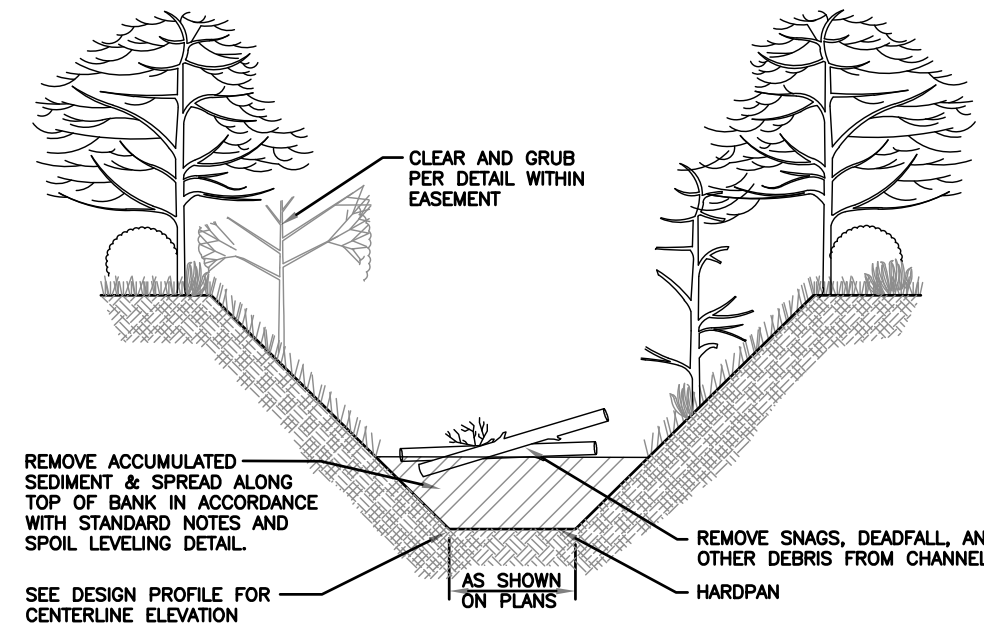
CITY OF WALKER
KENT COUNTY, MI
**WALKER NO. 4 COUNTY DRAIN
EXTENSION AND IMPROVEMENTS
ROAD OPEN CUT RECONSTRUCTION**



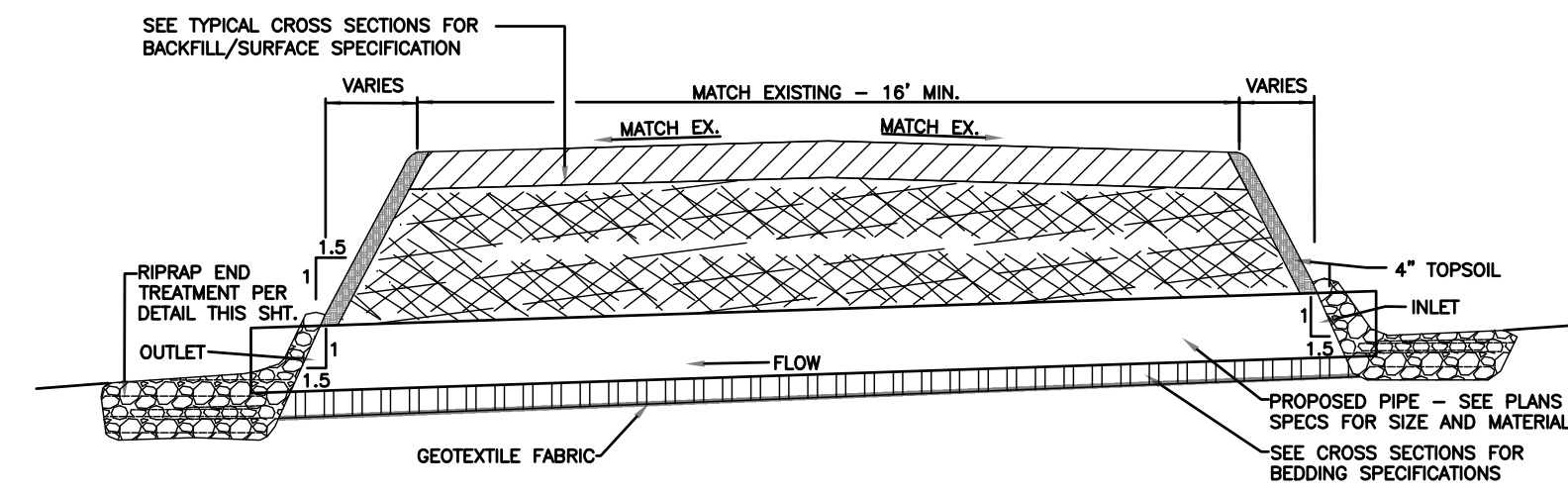
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Sheet No. 15 OF 17

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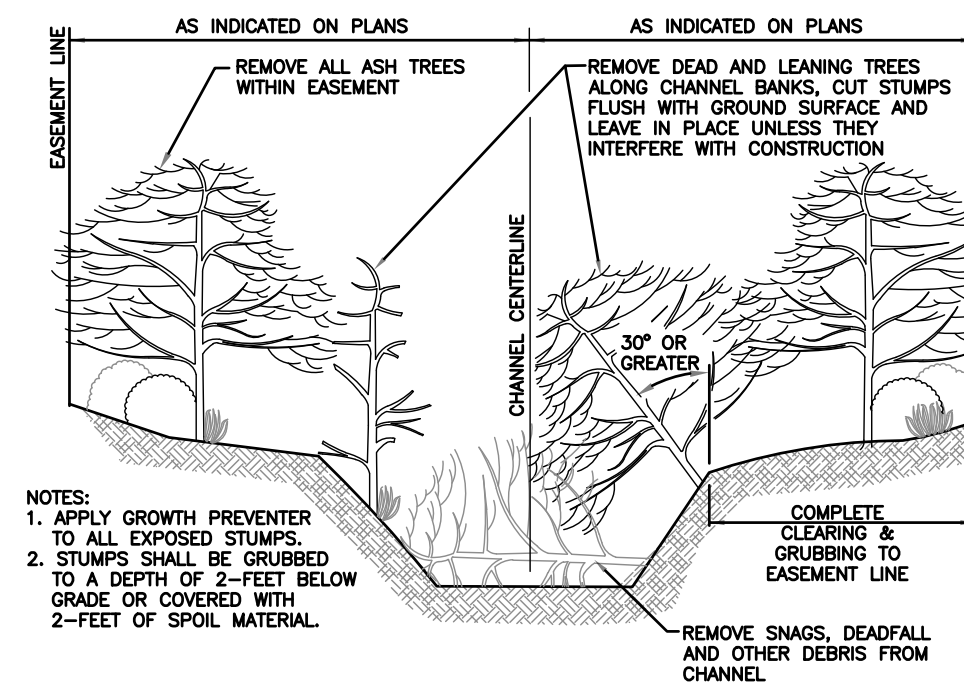
SEDIMENT REMOVAL DETAIL
NOT TO SCALE



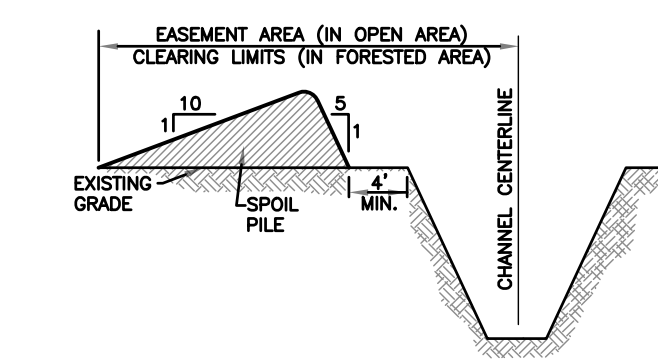
TYPICAL CULVERT INSTALLATION
NOT TO SCALE

GENERAL NOTES:

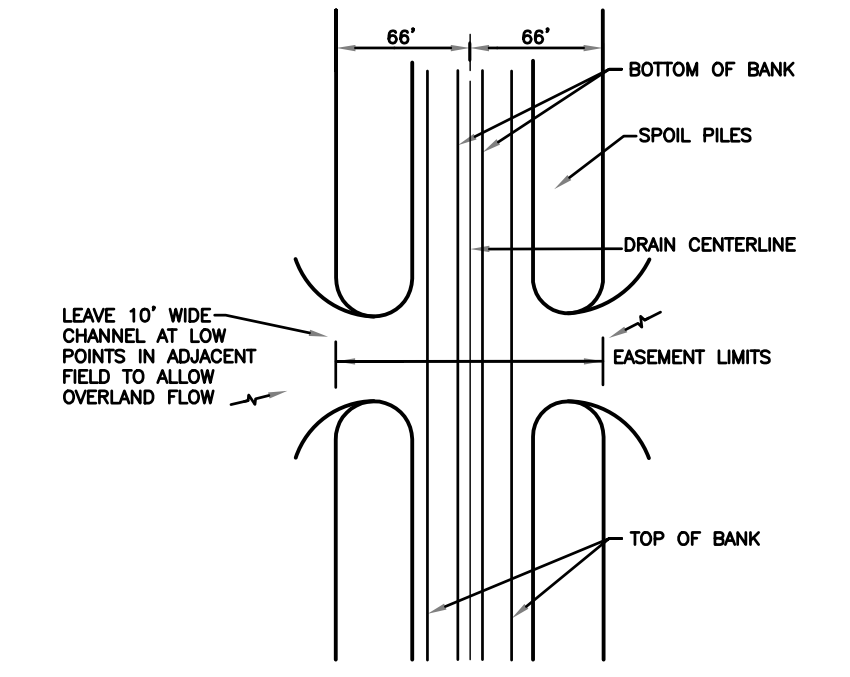
- IF PROPERTY OWNER REQUESTS CLEARED OR EXCAVATED MATERIAL, CONTRACTOR SHALL OBTAIN A LAND OWNER AGREEMENT FOUND IN THE SPECIFICATIONS. CLEARED MATERIAL CLAIMED BY PROPERTY OWNER SHALL BE PLACED OUTSIDE THE DRAIN EASEMENT BY THE CONTRACTOR. EXCAVATED MATERIAL CLAIMED BY THE PROPERTY OWNER SHALL BE SPREAD IN ACCORDANCE WITH THE AGREED UPON INSTRUCTIONS IN THE LAND OWNER AGREEMENT.
- ALL TREES SHALL BE CUT FLUSH WITH AND PARALLEL TO THE GROUND AND DYED GROWTH PREVENTER SHALL BE APPLIED TO ALL EXPOSED STUMPS. STUMPS OUTSIDE OF CHANNELS SECTION SHALL BE GRUBBED OR COVERED WITH 2- FEET OF SPOIL MATERIAL. ALL WOODY DEBRIS MATERIAL SHALL BE CHIPPED OR BURNED.
- CONTRACTOR SHALL SPREAD SPOILS EVENLY WITHIN THE EASEMENT LIMITS IN OPEN AREAS AND WITHIN CLEARING LIMITS IN WOODED AREAS. NO SPOIL SHALL BE PLACED ON LAWN AREAS. THE CONTRACTOR SHALL ENSURE THAT OVERLAND FLOW TO THE DRAIN IS MAINTAINED. SEE DETAILS.
- IF DRAIN IS ACCESSED ACROSS A PROPERTY AND NOT ALONG THE DRAIN ALIGNMENT A LAND OWNER AGREEMENT FORM GRANTING ACCESS MUST BE OBTAINED.
- UNLESS OTHERWISE NOTED, CONTRACTOR MAINTAINS POSSESSION OF ALL REMOVED OR DEMOLISHED MATERIAL CONSISTING OF, BUT NOT LIMITED TO DRAINAGE PIPE, STRUCTURES, HEADWALLS, ETC.
- CONTRACTOR SHALL ENSURE DRAINS REMAIN OPERATIONAL THROUGHOUT THE COURSE OF CONSTRUCTION.
- CONTRACTOR SHALL PROVIDE ALL TRAFFIC CONTROL DEVICES AS REQUIRED BY THE KENT COUNTY ROAD COMMISSION AND SHALL COORDINATE A TRAFFIC CONTROL PLAN THROUGH THE PERMIT PROCESS WITH THE KENT COUNTY ROAD COMMISSION.
- RIPRAP MAY BE CRUSHED COBBLESTONE, LIMESTONE OR CRUSHED CONCRETE PER SPECIFICATIONS.
- QUANTITIES WILL NOT BE PAID ABOVE THE CONTRACT AMOUNT UNLESS AUTHORIZED BY THE OWNER/ENGINEER.



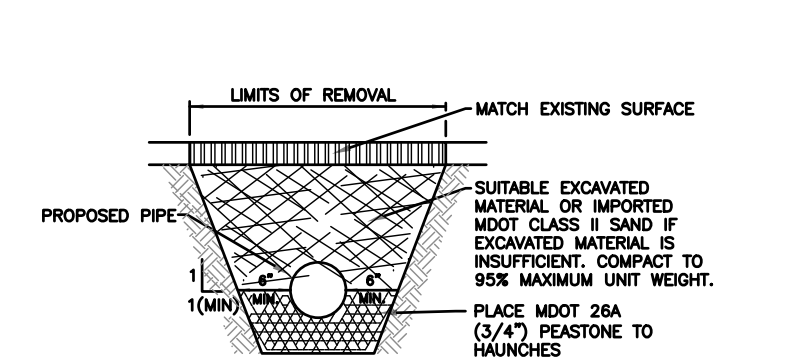
SELECTIVE CLEARING, GRUBBING & SNAGGING DETAIL
NOT TO SCALE



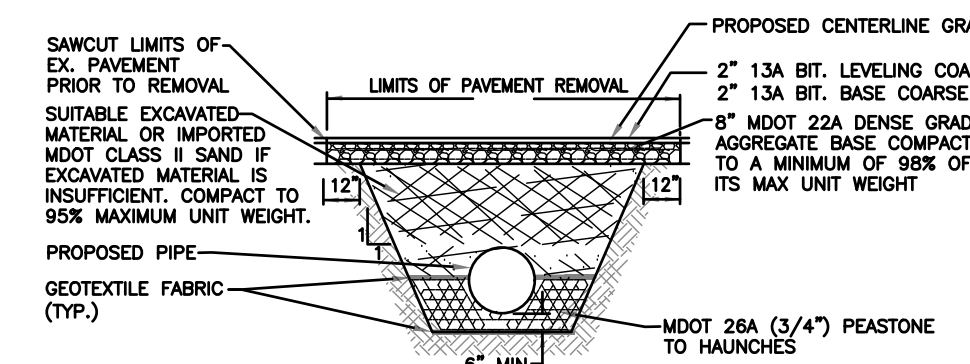
CROSS SECTION-SPOIL LEVELING AREA
NOT TO SCALE



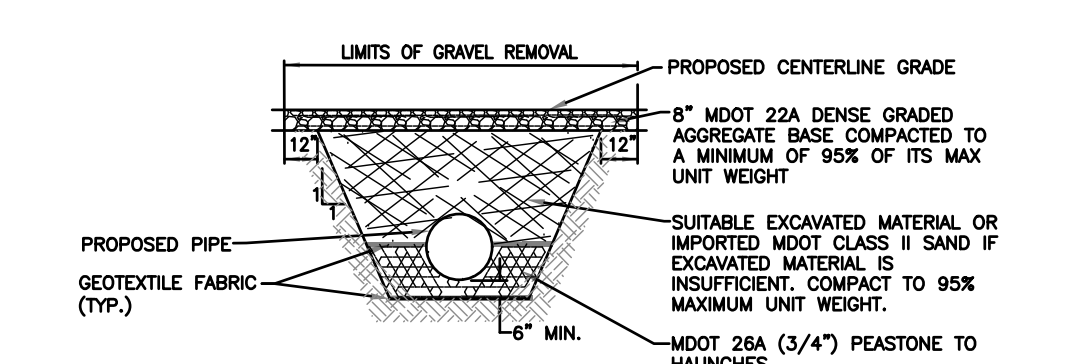
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NOT TO SCALE



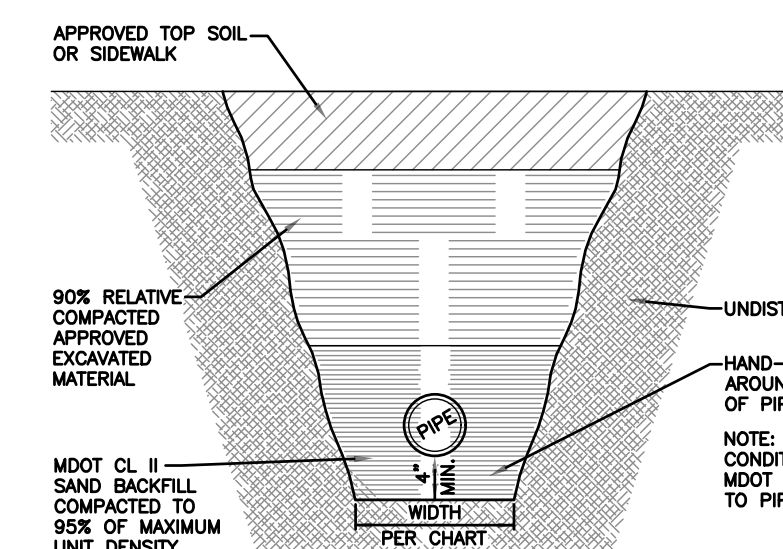
TYPICAL PRIVATE CROSSING CROSS SECTION
NOT TO SCALE



TYPICAL TRAIL/PAVED DRIVE CROSS SECTION
NOT TO SCALE



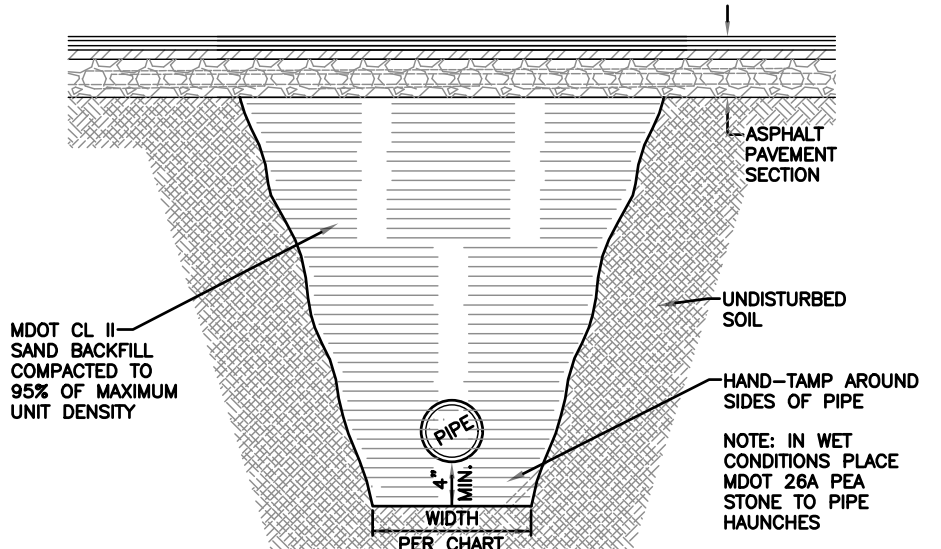
TYPICAL GRAVEL DRIVEWAY CROSS SECTION
NOT TO SCALE



TYPICAL TRENCH DETAIL
NOT TO SCALE

MINIMUM TRENCH WIDTH OR PER MANUFACTURERS SPECIFICATIONS PIPE DIAMETER	TRENCH WIDTH
4"	21"
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	38"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
60"	96"

NOTE: EXCAVATIONS THAT WILL BE ENTERED BY PERSONNEL SHOULD BE BASED ON OSHA REQUIREMENTS FOR TYPE "C" SOIL.



TYPICAL TRENCH DETAIL UNDER ASPHALT SURFACES ONLY
NOT TO SCALE

NOT TO SCALE

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5	2/28/2024	FOR BIDS	NFB

CITY OF WALKER
KENT COUNTY, MI
**WALKER NO. 4 COUNTY DRAIN
EXTENSION AND IMPROVEMENTS
DETAILS**

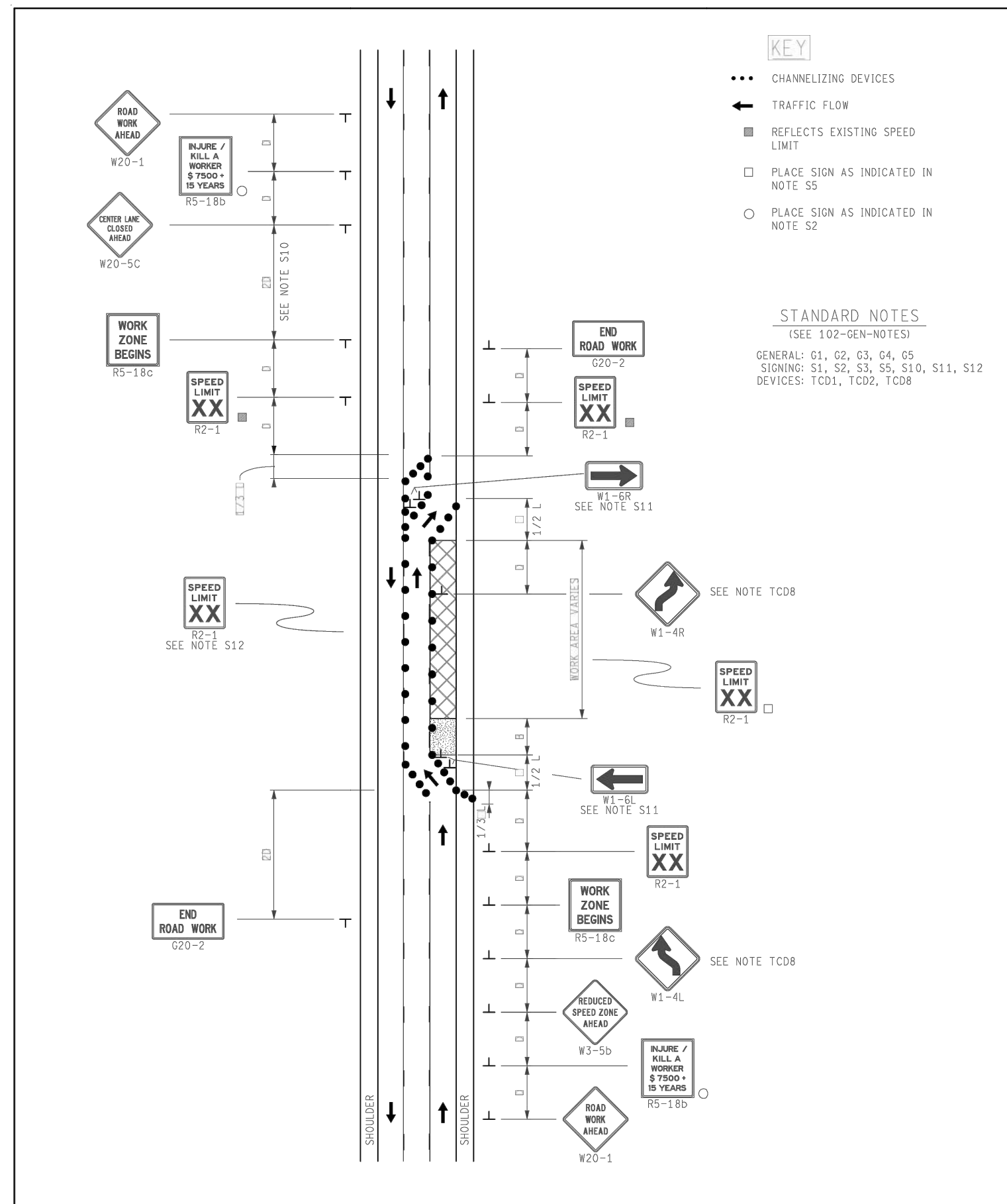


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THE FOLLOWING NOTES APPLY IF CALLED FOR ON THE TRAFFIC TYPICAL

GENERAL NOTES

01: SEE SPACING CHARTS FOR COMMON VALUES INCLUDING:
 D = DISTANCE BETWEEN TRAFFIC CONTROL DEVICES
 L = MINIMUM LENGTH OF TAPER
 B = LENGTH OF LONGITUDINAL BUFFER ROLL AHEAD DISTANCE

02: DISTANCE BETWEEN SIGNS, "D", THE VALUES FOR WHICH ARE SHOWN IN TYPICAL SPACING CHARTS, ARE APPROXIMATE AND MAY NEED ADJUSTING AS DIRECTED BY THE ENGINEER.

03: ALL TEMPORARY SIGNS, TYPE III BARRICADES, THEIR SUPPORT SYSTEMS AND LIGHTING MUST MEET NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM REPORT 350 (NCHRP 350) TEST LEVEL 3, OR MANUAL FOR ASSESSING SAFETY HARDWARE HANDBOOK 11-3 AS WELL AS THE CURRENT EDITION OF THE MICHIGAN MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS, INITIAL DESIGN AND MATERIALS APPROVED BY MDT WILL BE ALLOWED.

04: DO NOT STORE EQUIPMENT, MATERIALS OR PERFORM WORK IN ESTABLISHED BUFFER AREAS.

05: ALL EXISTING PAVEMENT MARKINGS WHICH ARE IN CONFLICT WITH EITHER PROPOSED CHANGES IN TRAFFIC PATTERNS OR PROPOSED TEMPORARY TRAFFIC MARKINGS SHALL BE REMOVED BEFORE ANY CHANGE IS MADE IN THE TRAFFIC PATTERNS. EXCEPTION WILL BE MADE FOR TRAFFIC PATTERNS FOR WORK LESS THAN THREE DAYS THAT ARE ADEQUATELY DELINEATED BY OTHER TRAFFIC CONTROL DEVICES.

SIGN NOTES

S1: ALL NON-APPLICABLE SIGNING WITHIN THE CIA MUST BE MODIFIED TO FIT CONDITIONS, COVERED, OR REMOVED FOR GUIDANCE SEE THE WORK ZONE SAFETY AND MOBILITY MANUAL, SECTIONS 6.01.09 AND 6.01.10.

S2: RS-180 SIGNS ARE ONLY REQUIRED ON FREEWAY PROJECTS WITH A DURATION OF 15 DAYS OR LONGER ON NON-FREEWAY PROJECTS WITH A DURATION OF 30 DAYS OR LONGER. TO APPLY THIS TYPICAL WITHOUT RS-180 SIGNS, REMOVE THE SIGNS AND CONSOLIDATE THE SEQUENCE AS APPROPRIATE.

S3: RS-180 IS ONLY REQUIRED IN THE INITIAL SIGNING SEQUENCE IN THE WORK ZONE. OMIT THIS SIGN IN SUBSEQUENT SEQUENCES IN THE SAME WORK ZONE.

S4: ADDITIONAL SIGNING AND/OR ELONGATED SIGNING SEQUENCES SHOULD BE USED WHEN TRAFFIC VOLUMES ARE SIGNIFICANT ENOUGH TO CREATE BACKUPS BEYOND THE RS-180 SIGNS.

S5: PLACE ADDITIONAL SPEED LIMIT SIGNS REFLECTING THE WORK ZONE SPEED AFTER EACH MAJOR CROSSROAD THAT INTERSECTS THE WORK ZONE, OR AFTER EACH ENTRANCE RAMP THAT COMES OFF THE FREEWAY WHERE THE REDUCED SPEED IS IN EFFECT. PLACE ADDITIONAL SPEED LIMIT SIGNS AT INTERVALS ALONG THE ROADWAY SIGN THAT NO SPEED LIMIT SIGNS ARE MORE THAN 2 MILES APART. WHEN REDUCED SPEED LIMITS ARE UTILIZED IN THE WORK AREA, PLACE ADDITIONAL SPEED LIMIT SIGNS RETURNING TRAFFIC TO ITS NORMAL SPEED BEYOND THE LIMITS OF THE WORK AREA AS INDICATED, IF PERMANENT SIGNS DISPLAYING THE CORRECT SPEED LIMIT ARE POSTED, OMIT ALL W3-50 AND R2-1 SIGNS AND REDUCE SPACING ACCORDINGLY.

S6: FABRICATE SPECIAL SIGNS IN ACCORDANCE WITH CURRENT SIGNING DESIGN STANDARDS.

S7: PLACE ADDITIONAL R2-3 SIGNS AT A MAXIMUM 500' SPACING THROUGHOUT THE WORK ZONE.

S8: WHEN SPEED LIMIT SIGNS CANNOT BE PLACED SIDE BY SIDE AS SHOWN, PLACE THEM "D" DISTANCE APART.

S9: STOP SIGNS NOT REQUIRED IF SIGNALS ARE ON 4-WAY FLASHING RED. STOP AHEAD SIGNS ARE NOT REQUIRED IF THERE IS ADEQUATE VISIBILITY OF THE STOP SIGN OR IF SIGNALS ARE BEING USED TO CONTROL TRAFFIC.

S10: PLACE REDUCED SPEED ZONE AHEAD SIGN (W3-50) WHEN USING A SPEED REDUCTION IN THIS DIRECTION.

S11: THE NUMBER OF W1-6 SHIFT SIGNS TO PLACE FOR A SHIFT IS AS FOLLOWS:
 SHIFTS 4 FT OR LESS: PLACE ONE (W1-6RUL)
 SHIFTS 5 FT TO 12 FT: PLACE TWO (W1-6RUL)
 SHIFTS MORE THAN 12 FT: PLACE THREE OR MORE (W1-6RUL) SIGNS DEPENDING UPON LENGTH OF SHIFT AND AS PER THE ENGINEER.

S12: PLACE R2-1 SIGNS AS DETAILED IN NOTE S5 WHEN THERE IS A SPEED REDUCTION IN THIS DIRECTION.

TRAFFIC REGULATOR NOTES

TR1: TRAFFIC REGULATORS MUST FOLLOW ALL THE REQUIREMENTS IN THE STANDARD SPECIFICATIONS, THE STANDARD PLANS AND APPLICABLE SPECIAL PROVISIONS, THE CURRENT EDITIONS OF THE TRAFFIC REGULATOR'S INSTRUCTION MANUAL AND THE VIDEO TAP TO SAFELY REGULATE TRAFFIC IN NIGHTTIME. THE MAXIMUM DISTANCE BETWEEN THE TRAFFIC REGULATORS IS DETERMINED BY THE ROADWAY ADT, GEOMETRICS, AND AS DIRECTED BY THE ENGINEER.

TR2: PROVIDE APPROPRIATE BALLON LIGHTING TO SUFFICIENTLY ILLUMINATE TRAFFIC REGULATOR STATIONS WHEN TRAFFIC REGulating IS ALLOWED DURING THE HOURS OF DARKNESS.

TR3: PROVIDE EITHER A STOP/ON AHEAD OR A RED/YELLOW LENS AHEAD, MEETING THE REQUIREMENTS OF THE MUTCD.

TEMPORARY TRAFFIC CONTROL DEVICE NOTES

TC01: THE MAXIMUM DISTANCE IN FEET BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD NOT EXCEED 1.0 TIMES THE WORK ZONE SPEED LIMIT IN MPH FOR ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT LESS THAN 45 MPH AND SHOULD NOT EXCEED 50 FEET ON ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT OF 45 MPH OR GREATER. THE SPACING FOR 42 INCH CHANNELIZING DEVICES TAPERS ARE NOT TO EXCEED 25 FEET AT NIGHT.

TC02: THE MAXIMUM DISTANCE IN FEET BETWEEN CHANNELIZING DEVICES IN A TANGENT SHOULD NOT EXCEED THREE TIMES THE WORK ZONE SPEED LIMIT IN MPH FOR ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT LESS THAN 45 MPH AND SHOULD NOT EXCEED 150 FEET ON ROADWAYS WITH A POSTED WORK ZONE SPEED LIMIT OF 45 MPH OR GREATER. THE SPACING FOR 42 INCH CHANNELIZING DEVICES TANGENTS ARE NOT TO EXCEED 50 FEET AT NIGHT.

TC03: TYPE III BARRICADES MUST BE LIGHTED FOR OVERNIGHT CLOSURES.

TC04: WHEN THE HAUL ROAD IS NOT IN USE, PLACE LIGHTED TYPE III BARRICADES WITH "ROAD CLOSED" EXTENDING COMPLETELY ACROSS THE HAUL ROAD.

TC05: USE OBJECT MARKER SIGNS IN LIEU OF THE TYPE B HIGH INTENSITY LIGHT SHOWN IN THE STANDARD PLAN FOR TEMPORARY CONCRETE BARRIER OR-55, AND R-192 WHICH USED WITH A TANGENT SYSTEM. THE OBJECT MARKERS MUST BE A MINIMUM OF 12 INCHES IN WIDTH AND 36 INCHES IN HEIGHT AND HAVE ORANGE AND WHITE RETROREFLECTIVE SHEETING. THE RETROREFLECTIVE SHEETING MUST HAVE ALTERNATING DIAGONAL ORANGE AND WHITE STRIPES SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION VEHICULAR TRAFFIC IS TO PASS.

TC06: PLACE LIGHTED ARROW PANELS AS CLOSE TO THE BEGINNING OF TAPERS AS PRACTICAL, BUT NOT IN A MANNER THAT WILL OBSCURE OR CONFUSE APPROACHING MOTORISTS WHEN PHYSICAL LIMITATIONS RESTRICT PLACEMENT. IN CURBED SECTIONS, IF ARROW BOARDS CANNOT BE PLACED BEHIND CURB, PLACE ARROW BOARD IN THE CLOSED LANE AS CLOSE TO THE BEGINNING OF TAPER AS POSSIBLE.

TC07: ADDITIONAL TYPE III BARRICADES MAY BE REQUIRED TO COMPLETELY CLOSE OFF ROAD FROM EDGE OF PAVEMENT TO EDGE OF PAVEMENT.

TC08: WHEN THE SHIFTED SECTION IS SHORTER THAN 600 FEET, A DOUBLE REVERSE CURVE SIGN (W2-11) CAN BE USED INSTEAD OF THE FIRST REVERSE CURVE SIGN, AND THE SECOND REVERSE CURVE SIGN CAN BE OMITTED.

TC09: RUMBLE STRIPS ARE TO BE PLACED AS SPECIFIED IN THE CONTRACT. IF NOT SPECIFIED IN THE CONTRACT, PLACE RUMBLE STRIPS AS SHOWN, AND IN ACCORDANCE WITH THE RUMBLE STRIP MANUFACTURER'S RECOMMENDATIONS. AN ARRAY OF RUMBLE STRIPS CONTAINS THREE RUMBLE STRIPS. PLACE THE RUMBLE STRIPS IN THE ARRAY AT A CONSISTENT DISTANCE BETWEEN 10' AND 20' APART.

TC10: SEE THE WORK ZONE SAFETY AND MOBILITY MANUAL, PORTABLE CHANGEABLE MESSAGE SIGN GUIDELINES FOR RECOMMENDED AND CORRECT POUND MESSAGE SIGN STAGGER PATTERN THAT ARE ON OPPOSING SIDES OF THE ROAD 1000 FEET FROM EACH OTHER.

RAMP NOTES

RMP1: WHEN CONDITIONS ALLOW, RS-1 SIGNS MUST BE REMOVED OR COVERED AND CHANNELIZING DEVICES MUST BE POSITIONED TO ENABLE RAMP TRAFFIC TO DIVERGE IN A FREE MANNER.

RMP2: STOP AND YIELD CONDITIONS SHOULD BE AVOIDED WHENEVER PRACTICAL. WHEN CONDITIONS WARRANT, R1-1 SIGNS MAY BE USED IN PLACE OF R1-2 SIGNS. WHEN R-1 SIGNS ARE USED, W3-1 SIGNS MUST BE USED IN PLACE OF R2-2 SIGNS. CONSIDERATION SHOULD BE GIVEN TO CLOSING THE RAMP TO CONCRETE WORK TO ALLOW AN ADEQUATE MERGE DISTANCE. WORK SHOULD BE EXPEDITED TO AVOID THE STOP AND/OR YIELD CONDITIONS.

THE FOLLOWING NOTES APPLY IF CALLED FOR ON THE TRAFFIC TYPICAL

SIGNAL NOTES

S101: EXISTING SIGNAL MUST BE EITHER 4-WAY FLASHING RED, BAGGED, OR TURNED OFF.

S102: SIGNAL IS IN OPERATION.

S103: DELINEATE THE WORK ZONE AREA WITH 28 INCH CONES FOR DAYTIME WORK, OR 42 INCH CHANNELIZING DEVICES FOR NIGHTTIME WORK.

S104: THE CONTRACTOR MUST HAVE A DESIGNATED SPOTTER IF THE AERIAL BUCKET TRUCK IS LOCATED OVER ACTIVE TRAVEL LANES.

S105: THE LOWEST POINT OF THE BUCKET MAY NOT TRAVEL BELOW 14 FOOT VERTICAL CLEARANCE. THE CONTRACTOR MUST UTILIZE AN ALTERNATE SET UP OR PLACE THE INTERSECTION IN A 4 WAY STOP IF THE 14 FOOT VERTICAL CLEARANCE IS COMPROMISED. USE TRAFFIC REGULATORS TO CONTROL TRAFFIC THROUGH THE INTERSECTION WHEN TRAFFIC IS PLACED IN A 4 WAY STOP.

S106: DELINEATE THE TRUCK WITH CHANNELIZING DEVICES. THE POSITION OF THE TRUCK MAY BE MOVED TO FACILITATE WORK.

MAINTENANCE AND SURVEYING NOTES

MS1: WHENEVER STOPPING SIGHT DISTANCE EXISTS TO THE REAR, THE SHADOW VEHICLES SHOULD MAINTAIN THE RECOMMENDED DISTANCE FROM THE WORK AREA AND PROCEED AT THE SAME SPEED. THE SHADOW VEHICLE SHOULD SLOW DOWN AND TRAVEL AT A FURTHER DISTANCE TO PROVIDE ADEQUATE SIGHT DISTANCE IN ADVANCE OF VERTICAL OR HORIZONTAL CURVES.

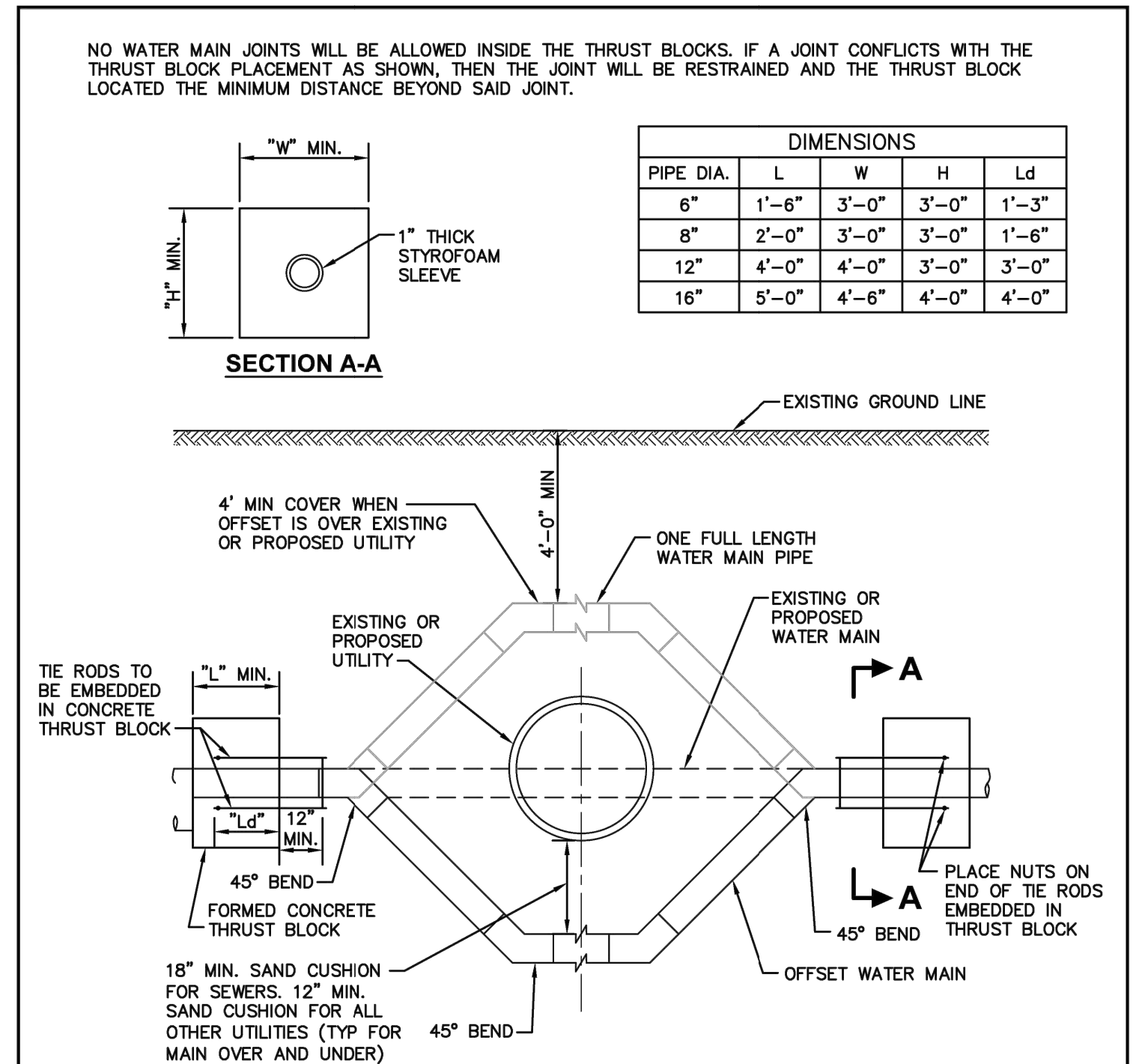
MS2: WORKERS OUTSIDE OF VEHICLES SHOULD WORK WITHIN 150' OF WORK VEHICLES WITH AN ACTIVATED BEACON, BETWEEN THE "BEGIN WORK CONVOY" SIGN AND THE "END WORK CONVOY" SIGN, OR BETWEEN THE "WORK ZONE BEGINS" AND "END ROAD WORK" SIGN.

MS3: WORK OR SHADOW VEHICLES WITH OR WITHOUT A TMA MAY BE USED TO SEPARATE THE WORK SPACE FROM TRAFFIC. IF USED, THE VEHICLES SHOULD BE PARKED ACCORDING TO THE ROLL AHEAD DISTANCE TABLES.

MS4: WORK AND SHADOW VEHICLES SHALL BE APPROPRIATELY EQUIPPED WITH AN ACTIVATED AMBER BEACON.

MS5: WHEN WORKERS ARE OUTSIDE THEIR VEHICLES IN AN EXISTING LANE WHILE A MOBILE OPERATION IS OCCURRING DURING THE NIGHTTIME HOURS, CHANNELIZING DEVICES TO DELINEATE OPEN OR CLOSED LANES AT 50 FT SPACING MUST BE USED. AN EXAMPLE OF AN OPERATION (BUT NOT LIMITED TO) IS THE LAYOUT OF CONCRETE PATCHES.

MS6: W2-1 AND W2-1-1 SIGNS MAY BE SUBSTITUTED AS DETERMINED BY THE TYPE OF WORK TAKING PLACE AS PER THE ENGINEER.



MDOT Michigan Department of Transportation

NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO. 137-CLT-SHIFT-OLC

DATE: DECEMBER 2021

SHEET: 1 OF 1

LANE SHIFT ON A 3-LANE UNDIVIDED ROADWAY

MDOT Michigan Department of Transportation

NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO. 102-GEN-NOTES

DATE: MAY 2022

SHEET: 1 OF 2

TRAFFIC TYPICALS NOTE SHEET

MDOT Michigan Department of Transportation

NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO. 102-GEN-NOTES

DATE: MAY 2022

SHEET: 2 OF 2

TRAFFIC TYPICALS NOTE SHEET

DISTANCE BETWEEN TRAFFIC SIGNS, "D"

"D" DISTANCES D (FEET)	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)										
	25	30	35	40	45	50	55	60	65	70	75
	250	300	350	400	450	500	550	600	650	700	750

GUIDELINES FOR LENGTH OF LONGITUDINAL BUFFER SPACE, "B"

"B" LENGTHS B (FEET)	SPEED, MPH (PRIOR TO WORK AREA)											
	20	25	30	35	40	45	50	55	60	65	70	75
	33	50	83	132	181	230	279	329	411	476	542	625

* POSTED SPEED, OFF-PEAK 85TH PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED.

MINIMUM MERGING TAPER LENGTH, "L" (FEET)

OFFSET (FEET)	POSTED SPEED LIMIT, MPH (PRIOR TO WORK AREA)										
	25	30	35	40	45	50	55	60	65	70	75
1	11	15	21	27	45	50	55	60	65	70	75
2	21	30	41	54	90	100	110	120	130	140	150
3	32	45	62	80	135	150	165	180	195	210	225
4	42	60	82	107	180	200	220	240	260	280	300
5	53	75	103	134	225	250	275	300	325	350	375
6	63	90	123	160	270	300	330	360	390	420	450
7	73	105	143	187	315	350	385	420	455	490	525
8	84	120	164	214	360	400	440	480	520	560	600
9	94	135	184	240	405	450	495	540	585	630	675
10	105	150	205	267	450	500	550	600	650	700	750
11	115	165	225	294	495	550	605	660	715	770	825
12	125	180	245	320	540	600	660	720	780	840	900
13	136	195	266	347	585	650	715	780	845	910	975
14	146	210	286	374	630	700	770	840	910	980	1050
15	157	225	307	400	675	750	825	900	975	1050	1125

THE FORMULAS FOR THE MINIMUM LENGTH OF A MERGING TAPER IN DERIVING THE "L" VALUES SHOWN IN THE ABOVE TABLES ARE AS FOLLOWS:

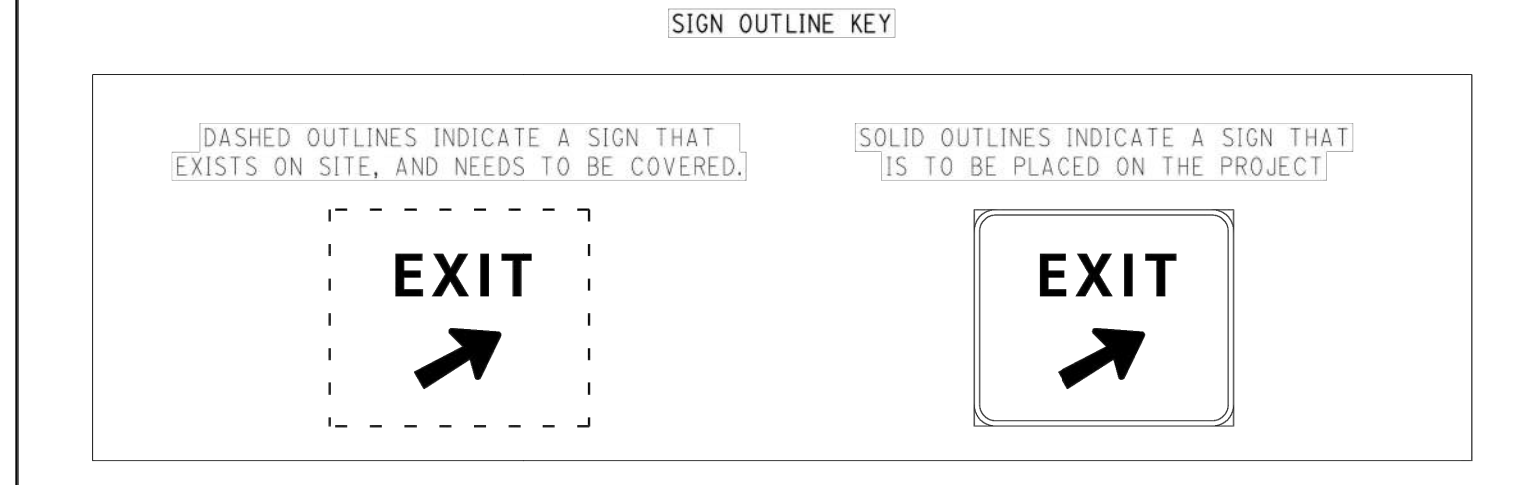
"L" = $\frac{W \times S^2}{60}$ WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 40 MPH OR LESS

"L" = $W \times S$ WHERE POSTED SPEED PRIOR TO THE WORK AREA IS 45 MPH OR GREATER

L = MINIMUM LENGTH OF MERGING TAPER
 S = POSTED SPEED LIMIT IN MPH PRIOR TO WORK AREA
 W = WIDTH OF OFFSET

MAXIMUM SPACING FOR CHANNELIZING DEVICES

WORK ZONE SPEED LIMIT	DAYTIME 42" DEVICE SPACING (FT)		NIGHTTIME 42" DEVICE SPACING (FT)	
	TAPER	TANGENT	TAPER	TANGENT
< 45 MPH	1 x SPEED LIMIT	2 x SPEED LIMIT	25 FEET	50 FEET
≥ 45 MPH	50 FEET	100 FEET	25 FEET	50 FEET



NOT TO SCALE

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MAINTAINING TRAFFIC TYPICAL

NO. 101-GEN-SPACING-CHARTS

DATE: MAY 2021

SHEET: 1 OF 3

"B", "D" AND "L" TABLES CHANNELIZING DEVICE SPACING, SIGN BORDER KEY, AND ROLL-AHEAD SPACING

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NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO. 101-GEN-SPACING-CHARTS

DATE: MAY 2021

SHEET: 2 OF 3

"B", "D" AND "L" TABLES CHANNELIZING DEVICE SPACING, SIGN BORDER KEY AND ROLL-AHEAD SPACING

MDOT Michigan Department of Transportation

NOT TO SCALE

MAINTAINING TRAFFIC TYPICAL

NO. 101-GEN-SPACING-CHARTS

DATE: MAY 2021

SHEET: 3 OF 3

"B", "D" AND "L" TABLES CHANNELIZING DEVICE SPACING, SIGN BORDER KEY AND ROLL-AHEAD SPACING

NOTES:

- WHEN THE MINIMUM CLEARANCE AND COVER CANNOT BE OBTAINED, THE WATER MAIN IS TO BE RELOCATED UNDER THE UTILITY.
- ON EXISTING WATER MAIN, THE 45° BEND SHALL BE RESTRAINED AS SHOWN IN THIS DETAIL, INCLUDING THRUST BLOCKS AND AS SPECIFIED IN SECTION 4.3. ON NEW CONSTRUCTION, THRUST BLOCKS SHALL NOT BE USED AND THE WATER MAIN SHALL BE RESTRAINED WITH MECHANICAL JOINT RESTRAINT AND RESTRAIN GLANDS AS SPECIFIED IN SECTION 4.3.
- IF THE RODS ARE USED FOR JOINT RESTRAINT, SEE TABLE 4.3-6 IN SECTION 4.3 FOR NUMBER OF THE RODS REQUIRED PER JOINT. ALSO, SEE THE ROD DETAIL ON STANDARD DETAIL W-15.

WATER MAIN OFFSET

N.T.S.

APPROVED BY: [Signature]

ORIGINAL APPROVAL DATE: 1/4/2021

LAST REVISION DATE: 1/23/2023

City of Grand Rapids
Public Services
Engineering Department

W-10

SCALES: HORIZ. : 1" = 50'
 VERT. : 1" = 5'

NO.	DATE	REVISION	BY
1	1/6/2023	FOR DRAIN COMMISSION REVIEW	NFB
2	9/14/2023	PER DRAIN COMMISSION	NFB
3	1/18/2024	REVISIONS FOR REVIEW	NFB
4	2/26/2024	PER KCDC/CITY OF WALKER DPW	NFB
5	2/28/2024	FOR BIDS	NFB

CITY OF WALKER
KENT COUNTY, MI

**WALKER NO. 4 COUNTY DRAIN
EXTENSION AND IMPROVEMENTS
TRAFFIC CONTROL AND DETAILS**

VK CIVIL Vriesman & Korhorn

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 Kalamazoo, MI (269) 697-7120

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