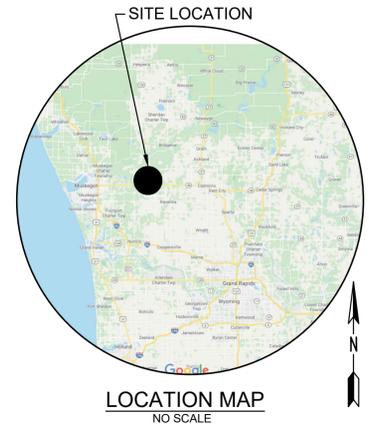


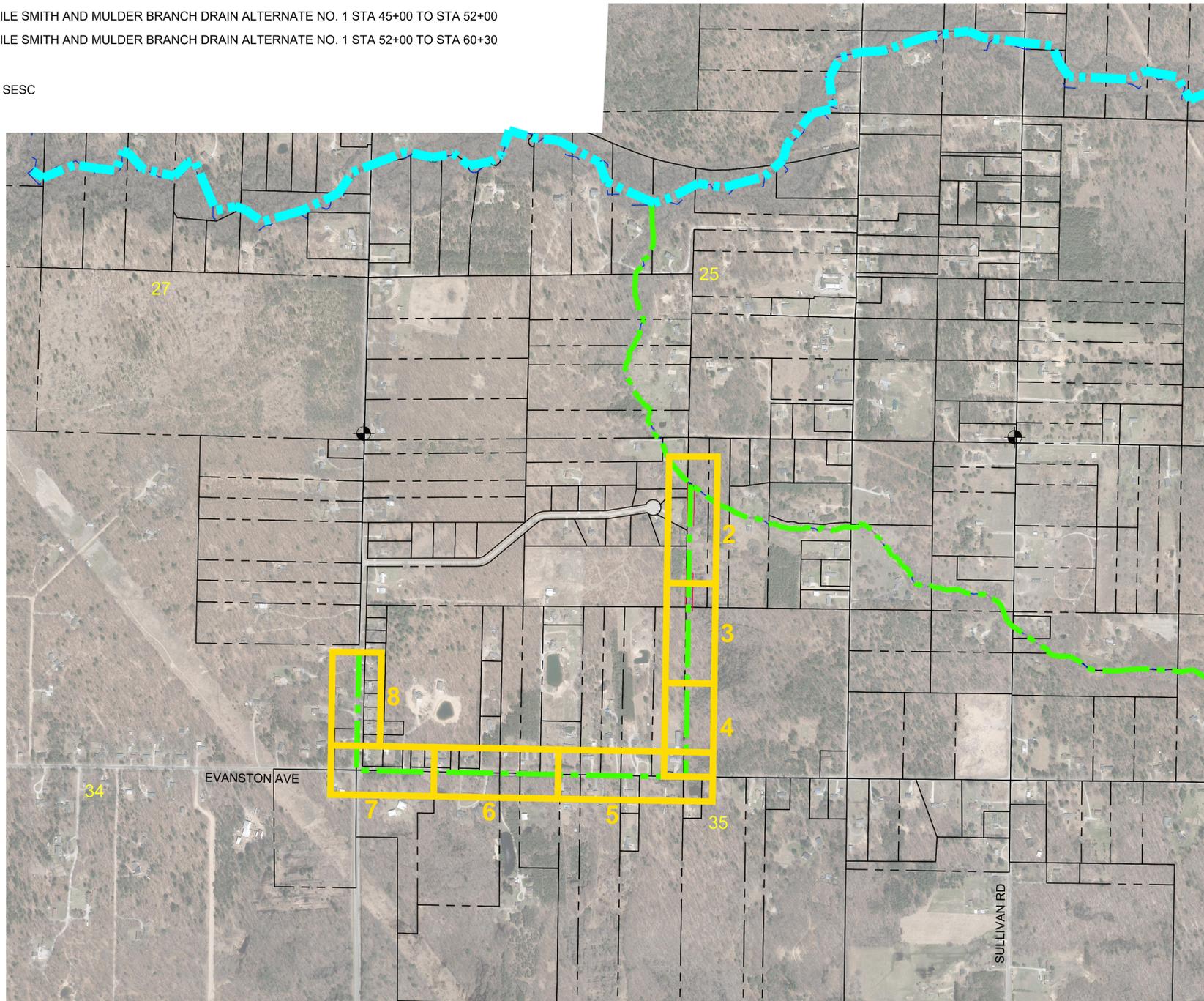


**BRENDA M. MOORE**  
**MUSKEGON COUNTY DRAIN COMMISSIONER**  
**STEPHANIE BARRETT, DEPUTY DRAIN COMMISSIONER**  
**BLACK CREEK DRAIN DRAINAGE DISTRICT**  
**DIVISION 12**  
**SMITH & MULDER BRANCH DRAIN**  
 PART OF EGELSTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
 MUSKEGON COUNTY, MICHIGAN



LIST OF DRAWINGS

- 1 COVER SHEET
- 2 PLAN & PROFILE SMITH & MULDER BRANCH DRAIN STA 1+00 TO STA 9+00
- 3 PLAN & PROFILE SMITH & MULDER BRANCH DRAIN STA 9+00 TO STA 17+00
- 4 PLAN & PROFILE SMITH & MULDER BRANCH DRAIN STA 17+00 TO STA 24+50
- 5 PLAN & PROFILE SMITH & MULDER BRANCH DRAIN STA 24+50 TO STA 35+00
- 6 PLAN & PROFILE SMITH & MULDER BRANCH DRAIN STA 35+00 TO STA 45+00
- 7 PLAN & PROFILE SMITH AND MULDER BRANCH DRAIN ALTERNATE NO. 1 STA 45+00 TO STA 52+00
- 8 PLAN & PROFILE SMITH AND MULDER BRANCH DRAIN ALTERNATE NO. 1 STA 52+00 TO STA 60+30
- 9 DETAILS
- 10 DETAILS AND SESC



LIST OF CONTACTS

**OWNER**  
 MUSKEGON COUNTY DRAIN COMMISSIONER  
 BRENDA M MOORE  
 PHONE: 231-724-6219  
 STEPHANIE BARRETT  
 PHONE: 231-724-6319  
 CENTRAL SERVICES BUILDING  
 141 E APPLE AVENUE  
 MUSKEGON, MI 49442

**ELECTRIC**  
 CONSUMERS ENERGY  
 MICHELLE ANDREE  
 700 E STERNBERG RD  
 NORTON SHORES, MI 49441  
 PHONE: 231-332-2621

**GAS DISTRIBUTION**  
 DTE ENERGY GAS  
 VINCE DUCA  
 2359 OLTHOFF DRIVE  
 MUSKEGON, MI 49444  
 PHONE: 231-777-4034

**CABLE TELEVISION**  
 COMCAST  
 JON CHARLAND  
 700 W BROADWAY AVE  
 MUSKEGON, MI 49442  
 PHONE: 231-375-5112

**GAS TRANSMISSION**  
 DTE ENERGY GAS  
 TYLER GAGE, PE  
 444 WEALTHY STREET  
 GRAND RAPIDS, MI 49503  
 PHONE: 989-330-3231  
 tyler.gage@dteenergy.com

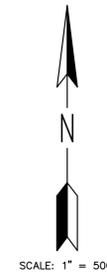
**ROADS**  
 MUSKEGON COUNTY ROAD COMMISSION  
 PAUL R BOUMAN, PE  
 7700 E APPLE AVENUE  
 MUSKEGON, MI 49442  
 PHONE: 231-788-2381

**TELEPHONE**  
 FRONTIER COMMUNICATIONS  
 DAVID FLERMOEN  
 860 TERRACE STREET  
 MUSKEGON, MI 49444  
 PHONE: 231-727-1319

**ENGINEER**  
 Eng., Inc.  
 RYAN C McENHILL, PE  
 16930 ROBBINS ROAD  
 SUITE 105  
 GRAND HAVEN, MI 49417  
 PHONE: 616-743-7070  
 mcenhillr@engdot.com

LEGEND

- BLACK CREEK DRAIN CENTERLINE
- BRANCH DRAIN CENTERLINE
- MUNICIPAL BOUNDARY
- PARCEL LINE
- ROAD
- SECTION LINE
- SECTION NUMBER
- SECTION CORNER
- SHEET LOCATION



*Ryan C. McEnhill*  
 RYAN C MCENHILL, P.E. #56096

6-25-20

DATE

RYAN C MCENHILL, P.E. #56096

**COVER SHEET**

NO	REVISIONS	BY	DATE	Drawn	Check	Approved
				SPM		
				Use		
				5/20/20		

4663 Grand Oak Drive Suite A109  
 Lansing, MI 48911  
 517.687.1100  
 16930 Robbins Road Suite 105  
 Grand Haven, MI 49417  
 616.743.7070  
 engdot.com



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 MUSKEGON COUNTY DRAIN COMMISSIONER  
 STEPHANIE BARRETT, DEPUTY DRAIN COMMISSIONER  
**BLACK CREEK DRAIN DRAINAGE DISTRICT**  
 DIVISION 12  
 SMITH & MULDER BRANCH DRAIN

PROJECT NO.  
**16041**

SHEET NO.  
**DIVISION 12**

**1 OF 10**

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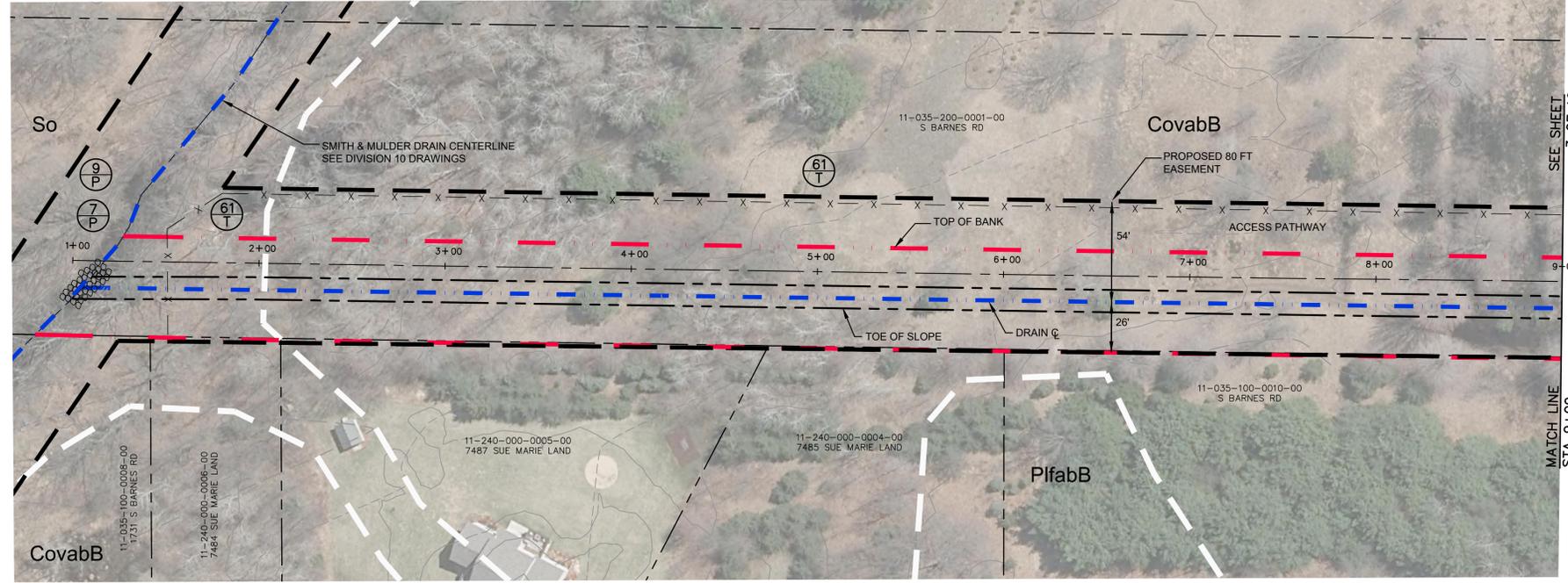


**811** Know what's below.  
Call before you dig.

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

BM #12956 ELEV = 663.40  
SET SPIKE E SIDE UTILITY POLE  
W SIDE BARNES RD 40' S OF  $\phi$   
MUSKEGON-NEWAYGO DRAIN  
BM #12957 ELEV = 663.27  
SET SPIKE E SIDE UTILITY POLE  
W SIDE BARNES RD 50' N OF  $\phi$   
MUSKEGON-NEWAYGO DRAIN

SCALE:  
1"=40' HORIZONTAL  
1"=4' VERTICAL



- GENERAL NOTES:
1. WORK FROM THE EAST SIDE OF THE DRAIN FROM STA 1+00 TO STA 9+00
  2. ACCESS CLEARING WILL BE REQUIRED THIS SHEET. NOTIFY ENGINEER OR INSPECTOR PRIOR TO ANY CLEARING.
  3. SPOILS TO BE PLACED AND LEVELED ALONG THE WORKING SIDE OF THE DRAIN, SO AS NOT TO AFFECT THE EXISTING DRAINAGE PATTERNS.
  4. LEVEL, MULCH AND SEED SPOILS WITH OPEN CHANNEL SEED MIX. SPOILS SHALL NOT BE GREATER THAN 8-INCH IN HEIGHT IN ANY GIVEN AREA.

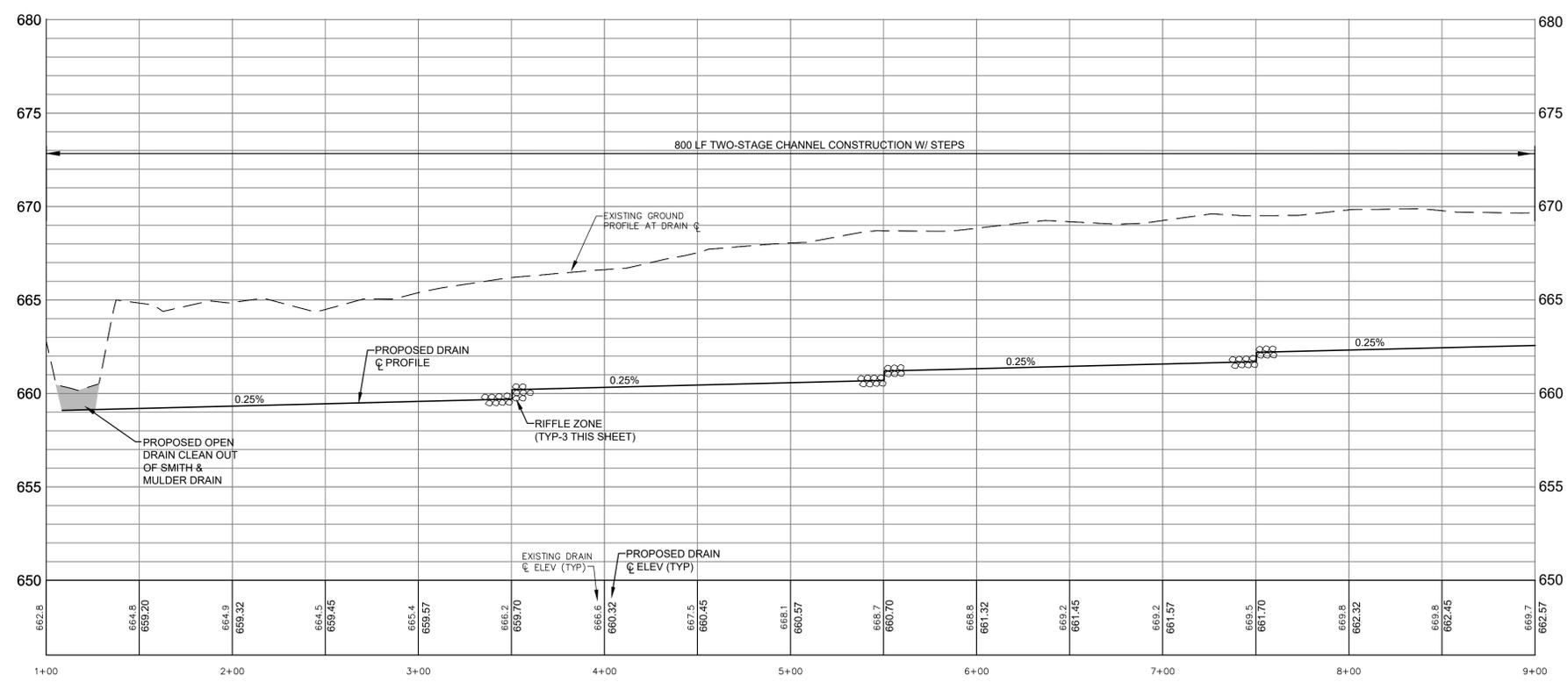
SOIL TYPES AND ABBREVIATIONS	
CovabB	Covert-Pipestone sands, 0 to 6 percent slopes
Ga	Granby loamy sand
PifabB	Plainfield sand, lake plain, 0 to 6 percent slopes
PifabD	Plainfield sand, lake plain, 6 to 18 percent slopes
PpsaaA	Pipestone-Covert-Saugatuck sands, 0 to 3 percent slopes
Ra	Roscommon and Au Gres Sands
Sa	Saranac loam

**LEGEND**

- = PROPERTY LINE OR R.O.W. LINE
- = EDGE OF PAVEMENT
- X - X - X - = FENCE
- - - - - = EXISTING GUARDRAIL
- ☒ = WETLANDS (AS MARKED BY OTHERS)
- +860 = EXISTING SPOT ELEVATION
- = EXISTING CONTOUR ELEVATION
- = EDGE OF WOODS
- ☐ = DECIDUOUS TREE
- ☐ = CONIFEROUS TREE
- ☐ = BUSH
- ☐ = STUMP
- GAS --- GAS --- GAS --- = EXISTING GAS LINE
- = EXISTING STORM SEWER
- = EXISTING SANITARY SEWER
- = EXISTING MANHOLE
- ⊕ = EXISTING STORM CATCH BASIN
- ⊕ = EXISTING WELL LOCATION
- ⊕ = EXISTING WATER VALVE
- ⊕ = EXISTING CURB STOP / METER
- ⊕ = EXISTING CATCH BASIN
- ⊕ = BENCH MARK LOCATION
- △ = EXISTING SIGN
- ⊕ = EXISTING MAILBOX
- ⊕ = EXISTING LIGHT POLE
- < = EXISTING GUY ANCHOR
- ⊕ = EXISTING UTILITY POLE
- ⊕ = EXISTING TELEPHONE PEDESTAL
- = EXISTING DRAIN  $\phi$
- = PROPOSED DRAIN  $\phi$
- = PROPOSED TOP OF BANK
- = PROPOSED TOE OF SLOPE
- La = SOIL TYPE
- ⊕ = PERMANENT SOIL EROSION CONTROL MEASURE OR RESTORATION DETAIL
- ⊕ = TEMPORARY SOIL EROSION CONTROL MEASURE
- = PROPOSED EASEMENT
- = PROPOSED RCP STORM SEWER
- ⊕ = PROPOSED MANHOLE
- ⊕ = PROPOSED CATCH BASIN

**SMITH & MULDER BRANCH DRAIN**

WORK ITEM	LOCATION	QUANTITY
TWO-STAGE CHANNEL CONSTRUCTION W/ STEPS	STA 1+00 TO 9+00	800 LF
RIFFLE ZONE	STA 3+50 STA 5+50 STA 7+50	3 EA



**PLAN AND PROFILE  
SMITH & MULDER BRANCH DRAIN  
STA 1+00 TO STA 9+00**

NO.	REVISIONS	DATE	BY

4063 Grand Oak Drive Suite A109  
Lansing, MI 48911  
517.887.1100

16930 Robbins Road Suite 105  
Grand Haven, MI 49417  
616.743.7070  
engdot.com

BRENDA M. MOORE  
MUSKEGON COUNTY DRAIN COMMISSIONER  
STEPHANIE BARRETT, DEPUTY DRAIN COMMISSIONER

BLACK CREEK CONSOLIDATED DRAIN DRAINAGE DISTRICT  
PART OF EGELSTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
MUSKEGON COUNTY, MICHIGAN

PROJECT NO.  
**16041**

SHEET NO.  
**2 OF 10**

DIVISION 12

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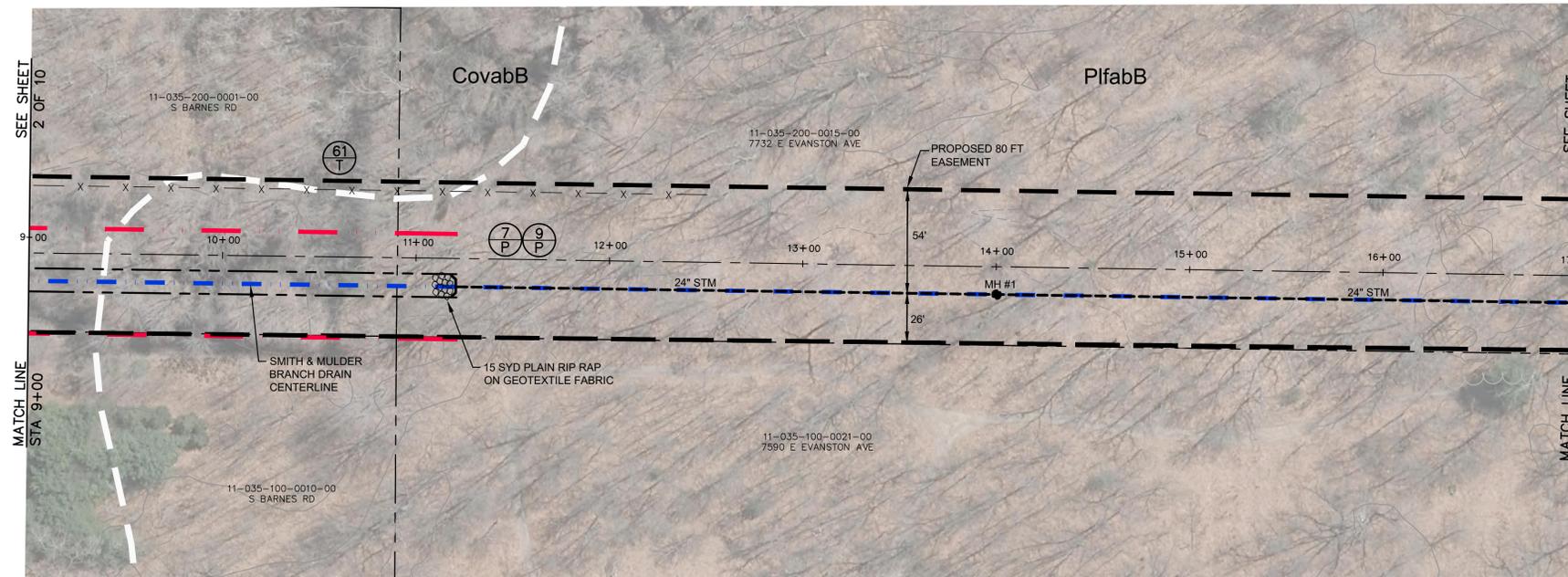
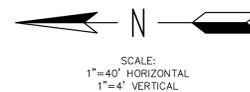


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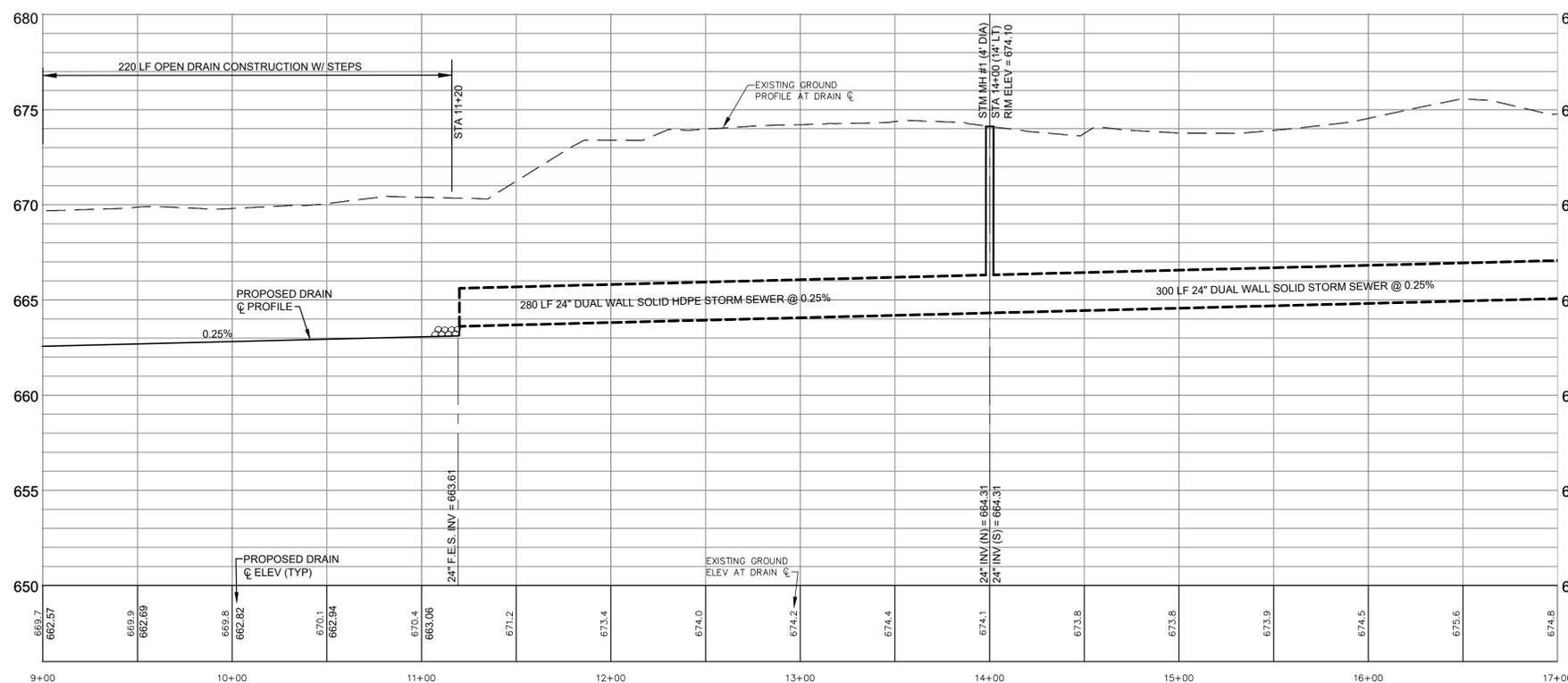
BM #12956 ELEV = 663.40  
SET SPIKE E SIDE UTILITY POLE  
W SIDE BARNES RD 40' S OF C  
MUSKEGON-NEWAYGO DRAIN  
BM #12957 ELEV = 663.27  
SET SPIKE E SIDE UTILITY POLE  
W SIDE BARNES RD 50' N OF C  
MUSKEGON-NEWAYGO DRAIN

- GENERAL NOTES:
- WORK FROM THE EAST SIDE OF THE DRAIN FROM STA 9+00 TO STA 17+00
  - ACCESS CLEARING WILL BE REQUIRED THIS SHEET. NOTIFY ENGINEER OR INSPECTOR PRIOR TO ANY CLEARING.
  - SPOILS TO BE PLACED AND LEVELED ALONG THE WORKING SIDE OF THE DRAIN, SO AS NOT TO AFFECT THE EXISTING DRAINAGE PATTERNS.
  - LEVEL, MULCH AND SEED SPOILS WITH OPEN CHANNEL SEED MIX. SPOILS SHALL NOT BE GREATER THAN 8-INCH IN HEIGHT IN ANY GIVEN AREA.



**SMITH & MULDER BRANCH DRAIN**

WORK ITEM	LOCATION	QUANTITY
24 INCH RCP PIPE	STA 11+20 TO 17+00	580 LF
4 FOOT DIA STORM MANHOLE	STA 14+00	1 EA
TWO-STAGE CHANNEL CONSTRUCTION W/ STEPS	STA 9+00 TO 11+20	220 LF
PLAIN RIPRAP	STA 11+20	15 SYD



SOIL TYPES AND ABBREVIATIONS	
CovabB	Covert-Pipestone sands, 0 to 6 percent slopes
Ga	Granby loamy sand
PlfabB	Plainfield sand, lake plain, 0 to 6 percent slopes
PlfabD	Plainfield sand, lake plain, 6 to 18 percent slopes
PpsaaA	Pipestone-Covert-Saugatuck sands, 0 to 3 percent slopes
Ra	Roscommon and Au Gres Sands
Sa	Saranac loam

**LEGEND**

- = PROPERTY LINE OR R.O.W. LINE
- = EDGE OF PAVEMENT
- X - X - X - = FENCE
- = EXISTING GUARDRAIL
- = WETLANDS (AS MARKED BY OTHERS)
- +860 = EXISTING SPOT ELEVATION
- = EXISTING CONTOUR ELEVATION
- = EDGE OF WOODS
- = DECIDUOUS TREE
- = CONIFEROUS TREE
- = BUSH
- = STUMP
- GAS --- = EXISTING GAS LINE
- = EXISTING STORM SEWER
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- = EXISTING MANHOLE
- ⊕ = EXISTING STORM CATCH BASIN
- ⊙ = EXISTING WELL LOCATION
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- ⊕ = EXISTING SIGN
- ⊕ = EXISTING MAILBOX
- ⊕ = EXISTING LIGHT POLE
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- = PROPOSED MANHOLE
- ⊕ = PROPOSED CATCH BASIN

**PLAN AND PROFILE  
SMITH & MULDER BRANCH DRAIN  
STA 9+00 TO STA 17+00**

NO.	REVISIONS	BY	DATE

Drawn By	Date	Approved By	Date
GTO	6/23/17		

4063 Grand Oak Drive Suite A109  
Lansing, MI 48911  
577.887.1100

16930 Robbins Road Suite 105  
Grand Haven, MI 49417  
616.743.7070  
engdcl.com



BRENDA M. MOORE  
MUSKEGON COUNTY DRAIN COMMISSIONER  
STEPHANIE BARRETT, DEPUTY DRAIN COMMISSIONER  
BLACK CREEK CONSOLIDATED DRAIN DRAINAGE DISTRICT  
PART OF EGELSTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
MUSKEGON COUNTY, MICHIGAN

PROJECT NO.  
**16041**

SHEET NO.  
DIVISION 12  
**3 OF 10**



**811** Know what's below.  
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BM #12956 ELEV = 663.40  
SET SPIKE E SIDE UTILITY POLE  
W SIDE BARNES RD 40' S OF CL  
MUSKEGON-NEWAYGO DRAIN

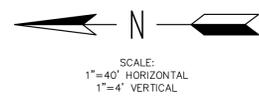
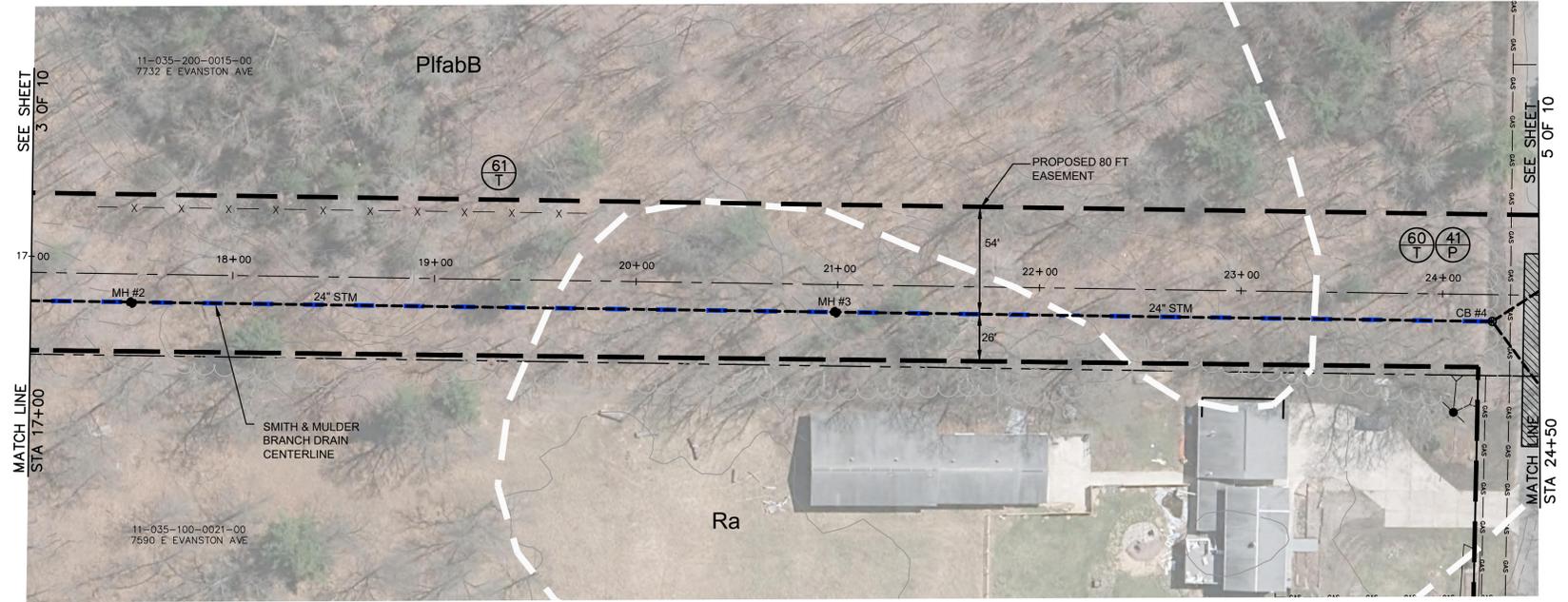
BM #12957 ELEV = 663.27  
SET SPIKE E SIDE UTILITY POLE  
W SIDE BARNES RD 50' N OF CL  
MUSKEGON-NEWAYGO DRAIN

- GENERAL NOTES:
- WORK FROM THE EAST SIDE OF THE DRAIN FROM STA 17+00 TO STA 23+00
  - ACCESS CLEARING WILL BE REQUIRED. NOTIFY ENGINEER OR INSPECTOR PRIOR TO ANY CLEARING.
  - SPOILS TO BE PLACED AND LEVELED ALONG THE WORKING SIDE OF THE DRAIN, SO AS NOT TO AFFECT THE EXISTING DRAINAGE PATTERNS. LEVEL, MULCH AND SEED SPOILS WITH OPEN CHANNEL SEED MIX. SPOILS SHALL NOT BE GREATER THAN 8-INCH IN HEIGHT IN ANY GIVEN AREA.

SOIL TYPES AND ABBREVIATIONS	
CovabB	Covert-Pipestone sands, 0 to 6 percent slopes
Ga	Granby loamy sand
PifabB	Plainfield sand, lake plain, 0 to 6 percent slopes
PifabD	Plainfield sand, lake plain, 6 to 18 percent slopes
PpsaaA	Pipestone-Covert-Saugatuck sands, 0 to 3 percent slopes
Ra	Roscommon and Au Gres Sands
Sa	Saranac loam

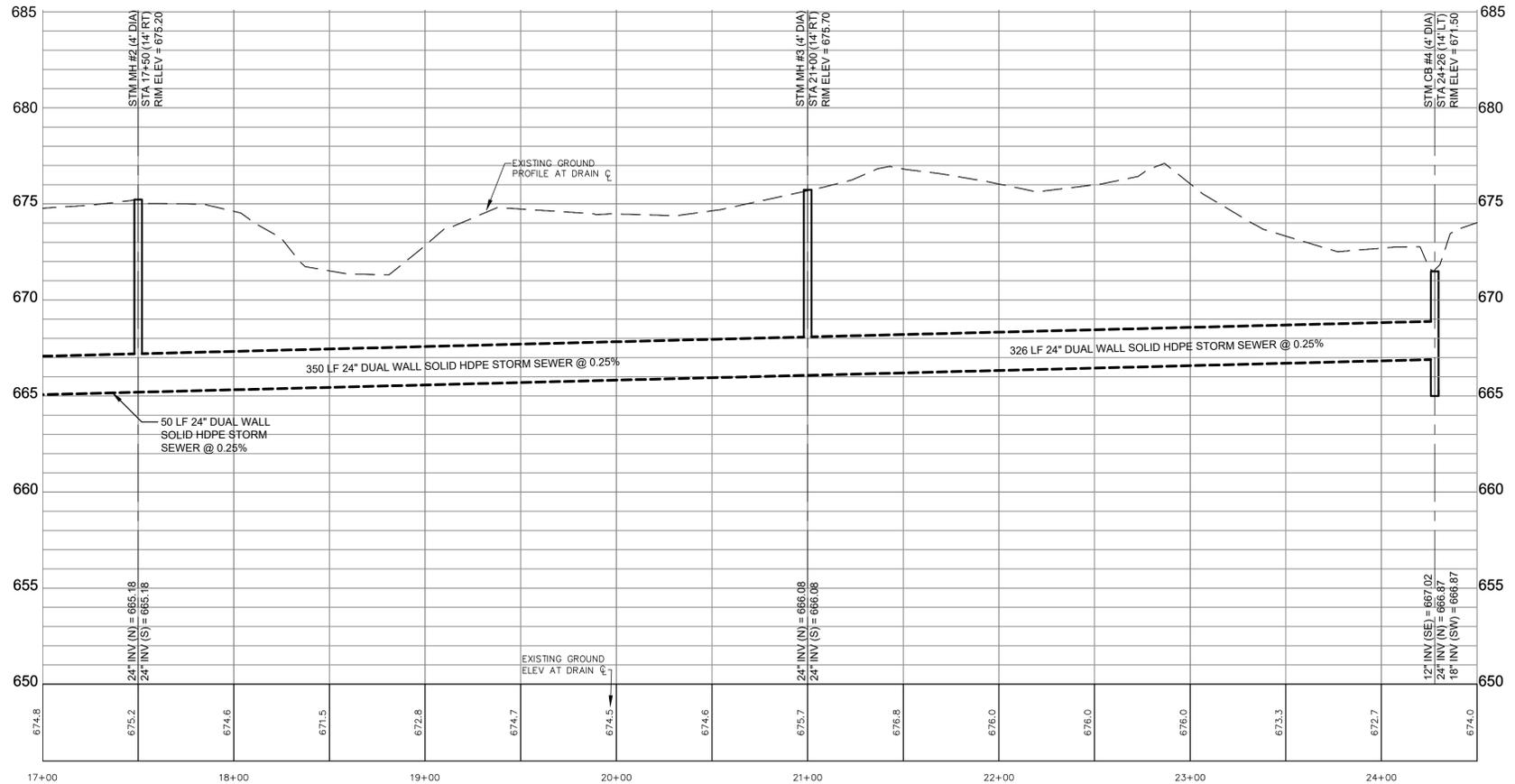
**LEGEND**

- = PROPERTY LINE OR R.O.W. LINE
- = EDGE OF PAVEMENT
- X - X - X - = FENCE
- - - - - = EXISTING GUARDRAIL
- ⊠ = WETLANDS (AS MARKED BY OTHERS)
- ⊠ = EXISTING SPOT ELEVATION
- ⊠ = EXISTING CONTOUR ELEVATION
- ⊠ = EDGE OF WOODS
- ⊠ = DECIDUOUS TREE
- ⊠ = CONIFEROUS TREE
- ⊠ = BUSH
- ⊠ = STUMP
- GAS --- = EXISTING GAS LINE
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- ⊠ = EXISTING STORM CATCH BASIN
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- ⊠ = PROPOSED CATCH BASIN



**SMITH & MULDER BRANCH DRAIN**

WORK ITEM	LOCATION	QUANTITY
24 INCH RCP PIPE	STA 17+00 TO 24+26	726 LF
4 FOOT DIA STORM MANHOLE	STA 17+50 STA 21+00	2 EA
4 FOOT DIA CATCH BASIN W/ 2' SUMP	STA 24+26	1 EA



**PLAN AND PROFILE  
SMITH & MULDER BRANCH DRAIN  
STA 17+00 TO STA 24+50**

NO.	REVISIONS	BY	DATE

4063 Grand Oak Drive Suite A109  
Lansing, MI 48911  
577.887.1100

16930 Robbins Road Suite 105  
Grand Haven, MI 49417  
616.743.7070  
engdot.com

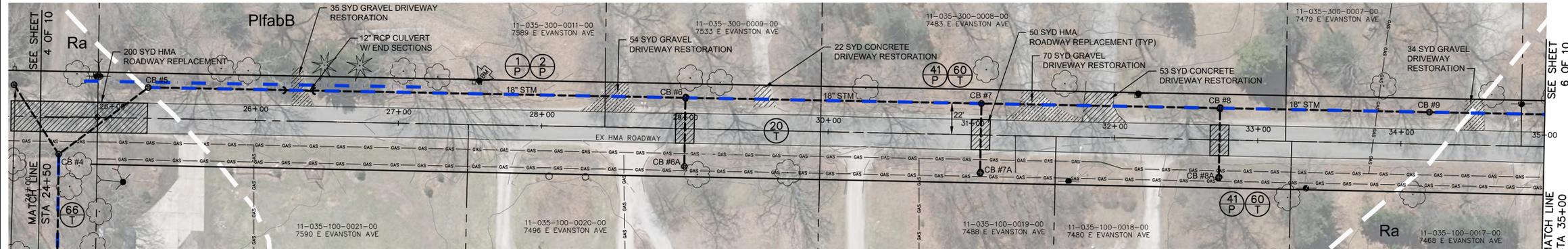
**Eng**  
Engineering & Surveying

BRENDA M. MOORE  
MUSKEGON COUNTY DRAIN COMMISSIONER  
STEPHANIE BARRETT, DEPUTY DRAIN COMMISSIONER  
BLACK CREEK CONSOLIDATED DRAIN DRAINAGE DISTRICT  
PART OF EGELSTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
MUSKEGON COUNTY, MICHIGAN

PROJECT NO.  
**16041**

SHEET NO.  
DIVISION 12  
**4 OF 10**

T:\Autocad Drawings\16041 - Black Creek\16041 Smith & Mulder Branch.dwg, 6/25/2020 12:46:17 PM, DWG To PDF.pc3



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BM #12956 ELEV = 663.40  
SET SPIKE E SIDE UTILITY POLE  
W SIDE BARNES RD 40' S OF E  
MUSKEGON-NEWAYGO DRAIN

BM #12957 ELEV = 663.27  
SET SPIKE E SIDE UTILITY POLE  
W SIDE BARNES RD 50' N OF E  
MUSKEGON-NEWAYGO DRAIN

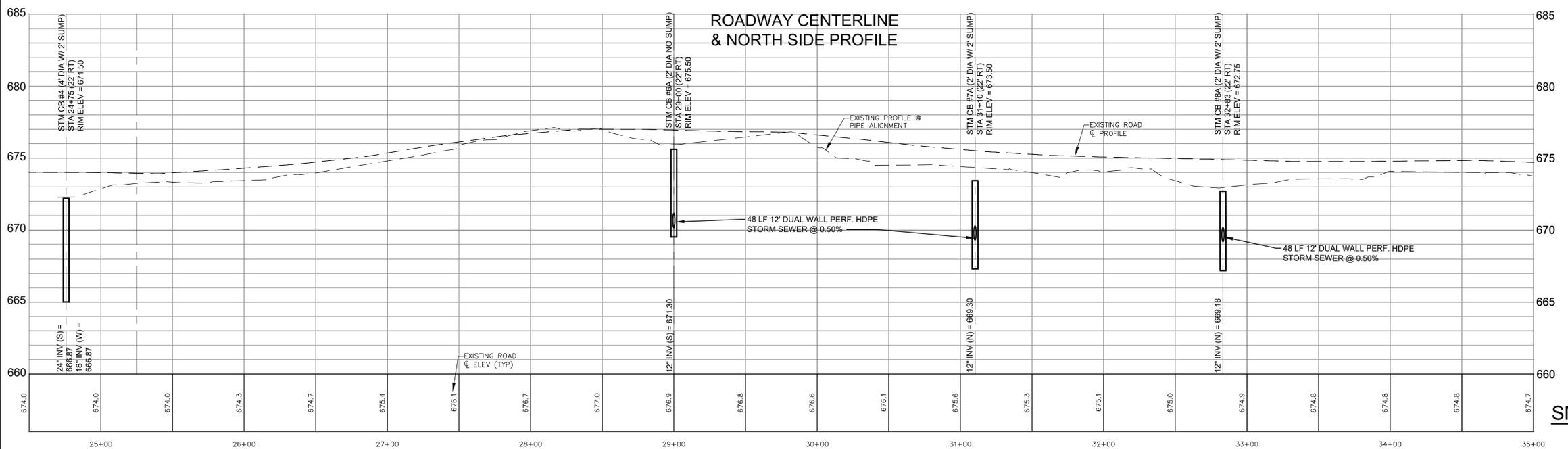
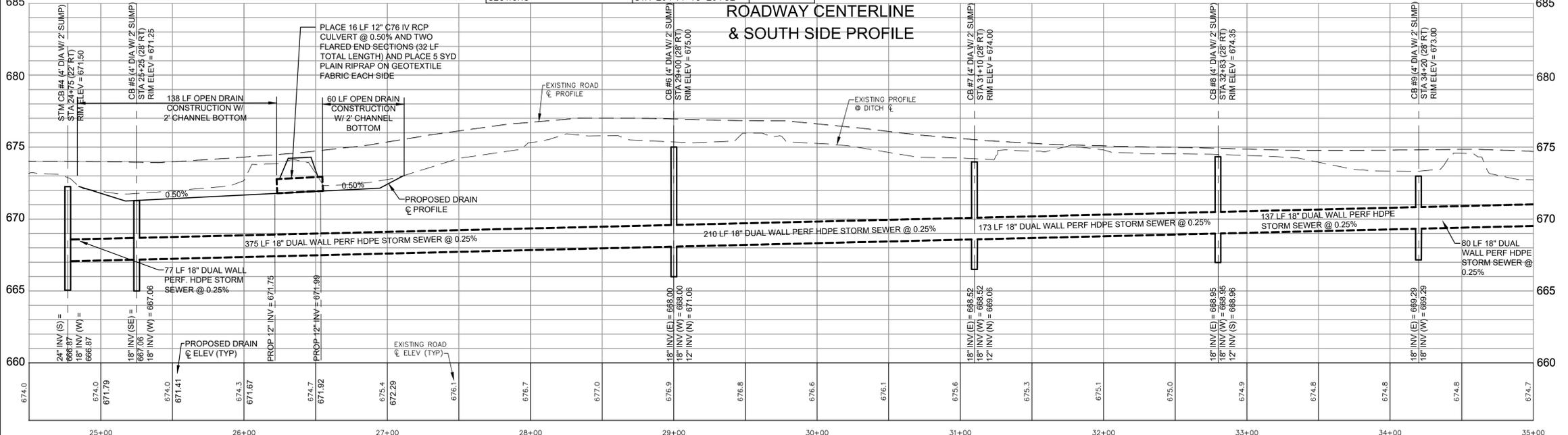
**SOUTH SIDE**

WORK ITEM	LOCATION	QUANTITY
OPEN DRAIN CONSTRUCTION	STA 24+82 TO 26+20 STA 26+52 TO 27+15	198 LF
4 FOOT DIA CATCH BASIN	STA 25+25 STA 29+00 STA 31+10 STA 32+83 STA 34+20	5 EA
2 FOOT DIA CATCH BASIN	STA 24+32	1 EA
12 INCH C76 IV RCP CULVERT	STA 26+28 TO 26+44	16 LF
18 INCH DUAL WALL PERF HDPE STORM SEWER	STA 24+75 TO 35+00	1,052 LF

**NORTH SIDE**

WORK ITEM	LOCATION	QUANTITY
2 FOOT DIA STORM CATCH BASIN	STA 29+00 STA 31+10 STA 32+83	3 EA
4 FOOT DIA STORM CATCH BASIN	STA 24+75	1 EA
12 INCH DUAL WALL PERF HDPE STORM SEWER	STA 24+32 STA 29+00 STA 31+10 STA 32+83	200 LF

**E EVANSTON AVE**  
(66' R.O.W.)



**SOIL TYPES AND ABBREVIATIONS**

CovabB	Covert-Pipestone sands, 0 to 6 percent slopes
Ga	Granby loamy sand
PifabB	Plainfield sand, lake plain, 0 to 6 percent slopes
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  - = CONIFEROUS TREE
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  - = STUMP
  - - - - - = EXISTING GAS LINE
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  - - - - - = EXISTING SANITARY SEWER
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  - ⊙ = BENCH MARK LOCATION
  - ⊙ = EXISTING SIGN
  - ⊙ = EXISTING MAILBOX
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  - = PROPOSED DRAIN
  - = PROPOSED TOP OF BANK
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  - ⊙ = PERMANENT SOIL EROSION CONTROL MEASURE OR RESTORATION DETAIL
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  - = PROPOSED EASEMENT
  - = PROPOSED RCP STORM SEWER
  - ⊙ = PROPOSED MANHOLE
  - ⊙ = PROPOSED CATCH BASIN

**REVISIONS**

NO.	DATE	BY	DATE	BY

4063 Grand Oak Drive Suite A109  
Lansing, MI 48911  
517.887.1100

16930 Robbins Road Suite 105  
Grand Haven, MI 49417  
616.743.7070  
engdot.com

**Eng**  
Engineering & Surveying

BRENDA M. MOORE  
MUSKEGON COUNTY DRAIN COMMISSIONER

STEPHANIE BARRETT, DEPUTY DRAIN COMMISSIONER

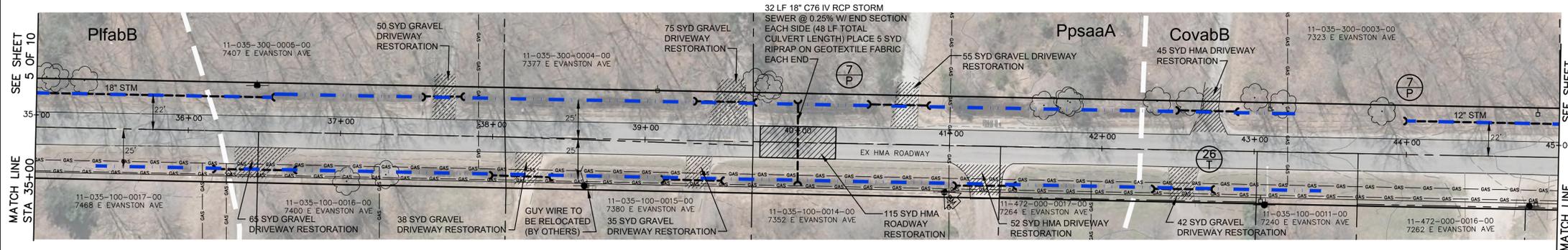
BLACK CREEK CONSOLIDATED DRAIN DRAINAGE DISTRICT

PART OF EGGLESTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
MUSKEGON COUNTY, MICHIGAN

PROJECT NO.  
**16041**

SHEET NO.  
**5 OF 10**

**PLAN AND PROFILE**  
**SMITH & MULDER BRANCH DRAIN**  
**STA 24+50 TO STA 35+00**



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

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

BM #2 ELEV = 672.91  
SET SPIKE S SIDE UTILITY POLE N SIDE  
EVANSTON AVE E SIDE DRIVE #7360

**SOUTH SIDE ALTERNATE NO. 1**

WORK ITEM	LOCATION	QUANTITY
OPEN DRAIN CONSTRUCTION	STA 43+25 TO 44+00	75 LF
12 INCH DUAL WALL PERF HDPE STORM SEWER	STA 44+00 TO 45+00	100 LF
12 INCH RCP END SECTION	STA 44+00	1 EA

**SOUTH SIDE**

WORK ITEM	LOCATION	QUANTITY
18 INCH DUAL WALL PERF HDPE STORM SEWER	STA 35+00 TO 36+55	155 LF
OPEN DRAIN CONSTRUCTION	STA 36+55 TO 37+50 STA 37+90 TO 39+35 STA 39+75 TO 40+55 STA 40+95 TO 42+55 STA 42+95 TO 43+25	510 LF
15 INCH C76 IV RCP CULVERT	STA 40+55 TO 40+95 STA 42+55 TO 42+95	48 LF
PLAIN RIPRAP ON GEOTEXTILE FABRIC	STA 37+50 STA 37+90 STA 39+35 STA 39+75 STA 40+55 STA 40+95 STA 42+55 STA 42+95	24 SYD
18 INCH RCP CULVERT	STA 37+50 TO 37+90 STA 39+35 TO 39+75 STA 40+00	80 LF
15 INCH RCP END SECTIONS	STA 40+55 TO 40+63 STA 40+87 TO 40+95 STA 42+55 TO 42+63 STA 42+87 TO 42+95	4 EA

**NORTH SIDE**

WORK ITEM	LOCATION	QUANTITY
18 INCH RCP END SECTIONS	STA 37+50 TO 37+58 STA 37+82 TO 37+90 STA 39+35 TO 39+43 STA 39+67 TO 39+75 STA 40+00 STA 36+55	6 EA
GRAVEL DRIVEWAY RESTORATION	STA 37+75 STA 39+50 STA 40+75	180 SYD
HMA DRIVEWAY RESTORATION	STA 42+75	45 SYD
HMA ROADWAY RESTORATION	STA 39+75 TO 40+25	115 SYD

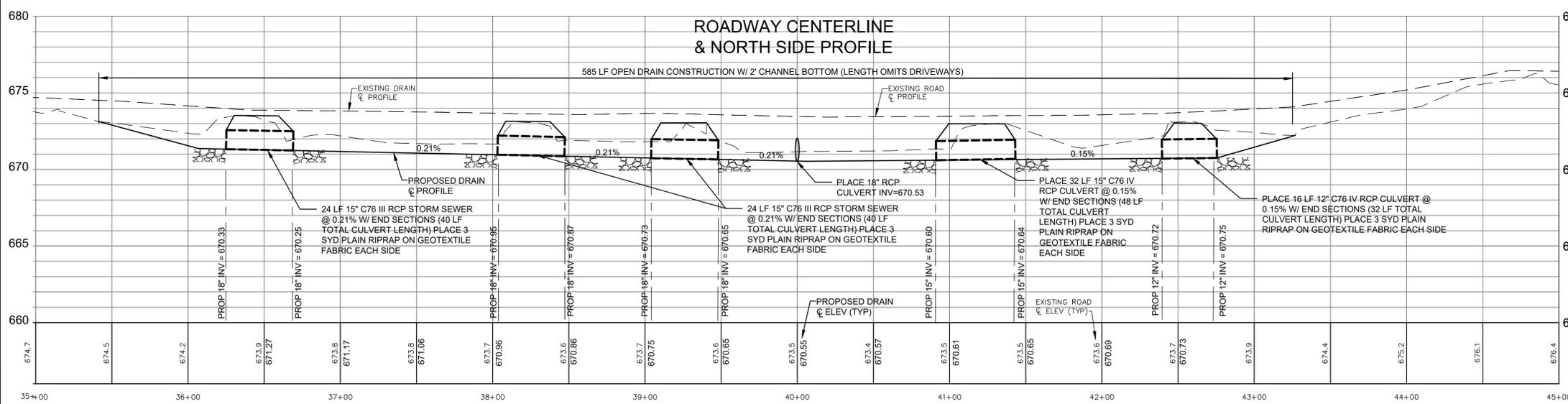
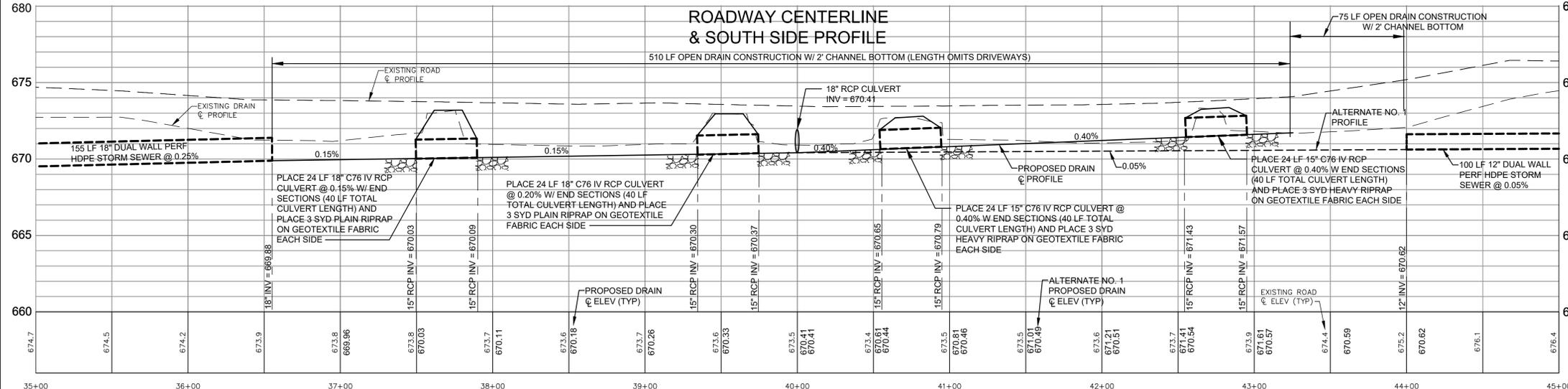
**NORTH SIDE**

WORK ITEM	LOCATION	QUANTITY
OPEN DRAIN CONSTRUCTION	STA 35+40 TO 36+25 STA 36+65 TO 38+05 STA 38+45 TO 39+05 STA 39+45 TO 40+95 STA 41+43 TO 42+40 STA 42+72 TO 43+25	585 LF
15 INCH RCP CULVERT	STA 36+25 TO 36+65 STA 38+05 TO 38+45 STA 39+05 TO 39+45 STA 40+95 TO 41+43	104 LF
12 INCH RCP CULVERT	STA 42+40 TO 42+72	16 LF
12 INCH RCP END SECTIONS	STA 42+40 TO 42+48 STA 42+64 TO 42+72	2 EA
15 INCH RCP END SECTIONS	STA 36+25 TO 36+33 STA 36+57 TO 36+65 STA 38+05 TO 38+13 STA 38+37 TO 38+45 STA 39+05 TO 39+13 STA 39+37 TO 39+45 STA 40+95 TO 41+03 STA 41+35 TO 41+43	8 EA
18 INCH RCP END SECTION	STA 40+00	1 EA

**GRAVEL DRIVEWAY RESTORATION**

WORK ITEM	LOCATION	QUANTITY
GRAVEL DRIVEWAY RESTORATION	STA 36+50 STA 36+25 STA 38+25 STA 42+50	180 EA
HMA DRIVEWAY RESTORATION	STA 41+25	52 EA
PLAIN RIPRAP ON GEOTEXTILE FABRIC	STA 36+25 STA 36+65 STA 38+05 STA 38+45 STA 39+05 STA 39+45 STA 40+95 STA 41+43 STA 42+40 STA 42+72	35 SYD

**E EVANSTON AVE (66' R.O.W.)**



**LEGEND**

- = PROPERTY LINE OR R.O.W. LINE
- = EDGE OF PAVEMENT
- X-X-X- = FENCE
- = EXISTING GUARDRAIL
- WETLANDS (AS MARKED BY OTHERS)
- = EXISTING SPOT ELEVATION
- = EXISTING CONTOUR ELEVATION
- = EDGE OF WOODS
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- = CONIFEROUS TREE
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**PLAN AND PROFILE**  
**SMITH & MULDER BRANCH DRAIN**  
**STA 35+00 TO STA 45+00**

**REVISIONS**

NO	DATE	BY	DATE	BY
1		GTO		
2		02/21/17		

4063 Grand Oak Drive Suite A109  
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**BRENDA M. MOORE**  
MUSKEGON COUNTY DRAIN COMMISSIONER

**STEPHANIE BARRETT, DEPUTY DRAIN COMMISSIONER**  
BLACK CREEK CONSOLIDATED DRAIN DRAINAGE DISTRICT  
PART OF EGELSTON, MOORLAND, RAVENNA & CASNOVIA TOWNSHIPS  
MUSKEGON COUNTY, MICHIGAN

PROJECT NO.  
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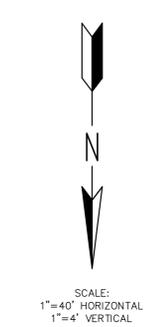
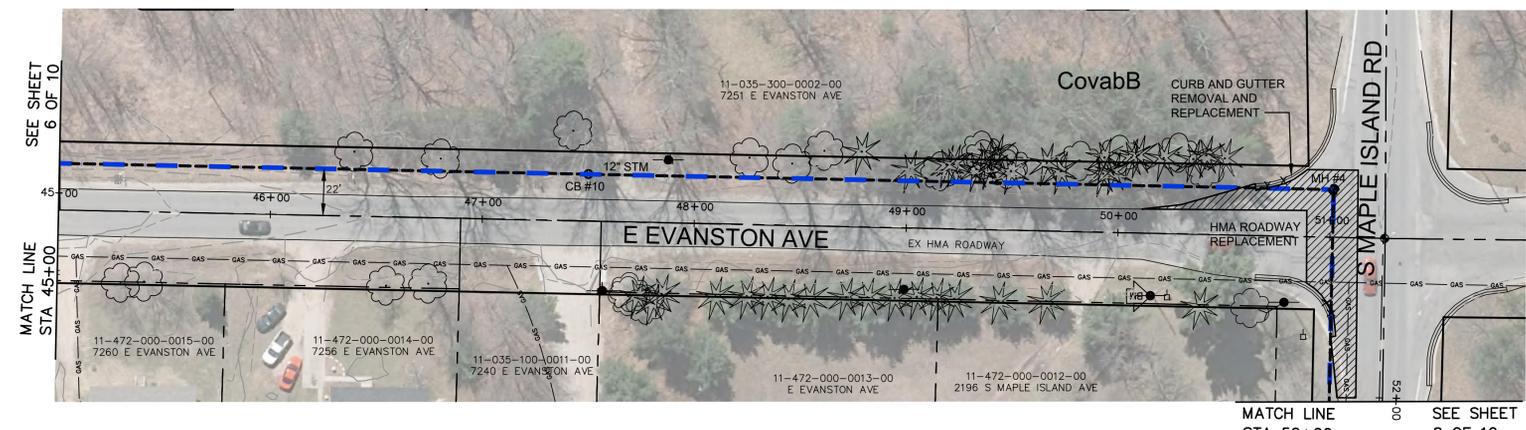
SHEET NO.  
**6 OF 10**

DIVISION 12



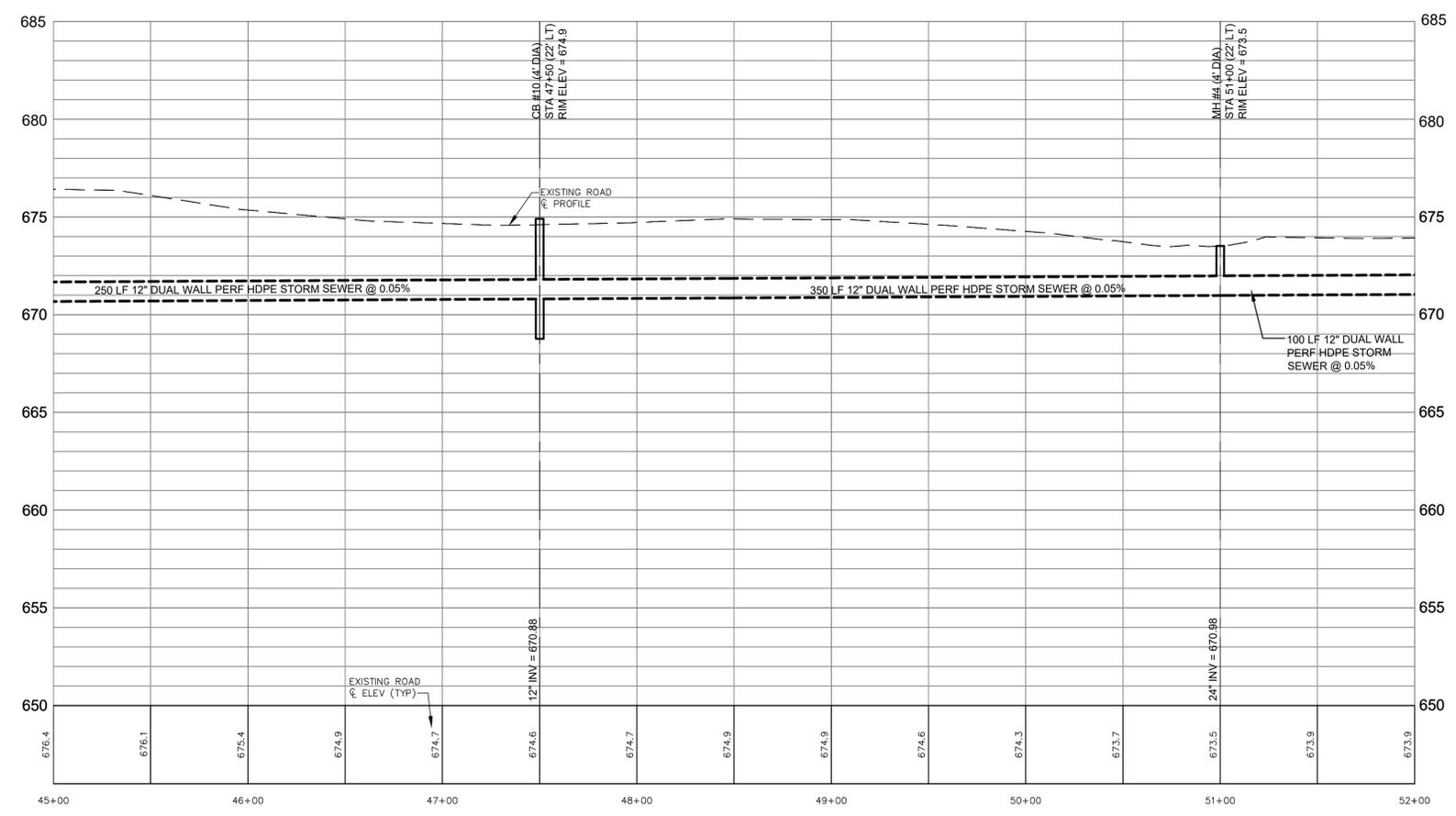
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**SMITH & MULDER BRANCH DRAIN  
ALTERNATE NO. 1**

WORK ITEM	LOCATION	QUANTITY
12" DUAL WALL PERF HDPE STORM SEWER	STA 45+00 TO 52+00	800 LF
4 FOOT DIA CATCH BASIN	STA 47+50	1 EA
4 FOOT DIA STORM MANHOLE	STA 51+00	1 EA
HMA ROADWAY RESTORATION	STA 50+50 TO 51+50	225 SYD
CURB AND GUTTER REMOVAL AND REPLACEMENT	STA 50+50 TO 51+00	50 LF



SOIL TYPES AND ABBREVIATIONS	
CovabB	Covert-Pipestone sands, 0 to 6 percent slopes
Ga	Granby loamy sand
PlfabB	Plainfield sand, lake plain, 0 to 6 percent slopes
PlfabD	Plainfield sand, lake plain, 6 to 18 percent slopes
PpsaaA	Pipestone-Covert-Saugatuck sands, 0 to 3 percent slopes
Ra	Roscommon and Au Gres Sands
Sa	Saranac loam

**LEGEND**

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- WETLANDS (AS MARKED BY OTHERS)
- +860 = EXISTING SPOT ELEVATION
- = EXISTING CONTOUR ELEVATION
- = EDGE OF WOODS
- = DECIDUOUS TREE
- = CONIFEROUS TREE
- = BUSH
- = STUMP
- = EXISTING GAS LINE
- = EXISTING STORM SEWER
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engdca.com



BRENDA M. MOORE  
MUSKEGON COUNTY DRAIN COMMISSIONER

STEPHANIE BARRETT, DEPUTY DRAIN COMMISSIONER

BLACK CREEK CONSOLIDATED DRAIN DRAINAGE DISTRICT  
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MUSKEGON COUNTY, MICHIGAN

PROJECT NO.  
**16041**

SHEET NO.  
**7 OF 10**

DIVISION 12

**PLAN AND PROFILE  
SMITH & MULDER BRANCH DRAIN  
ALTERNATE NO. 1  
STA 45+00 TO STA 52+00**

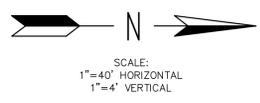
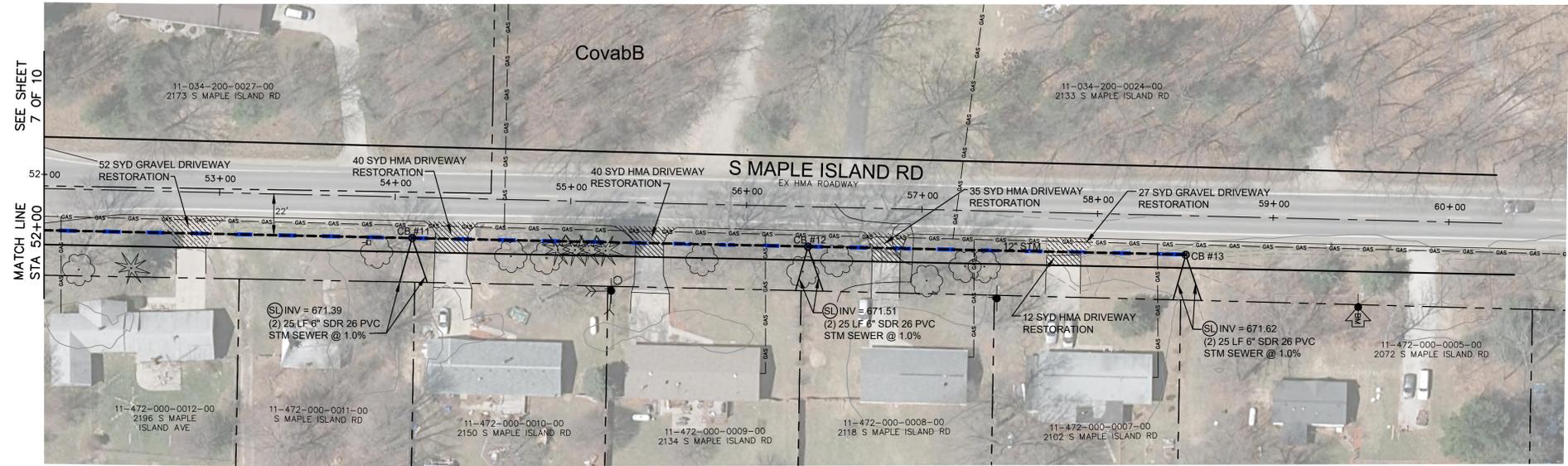
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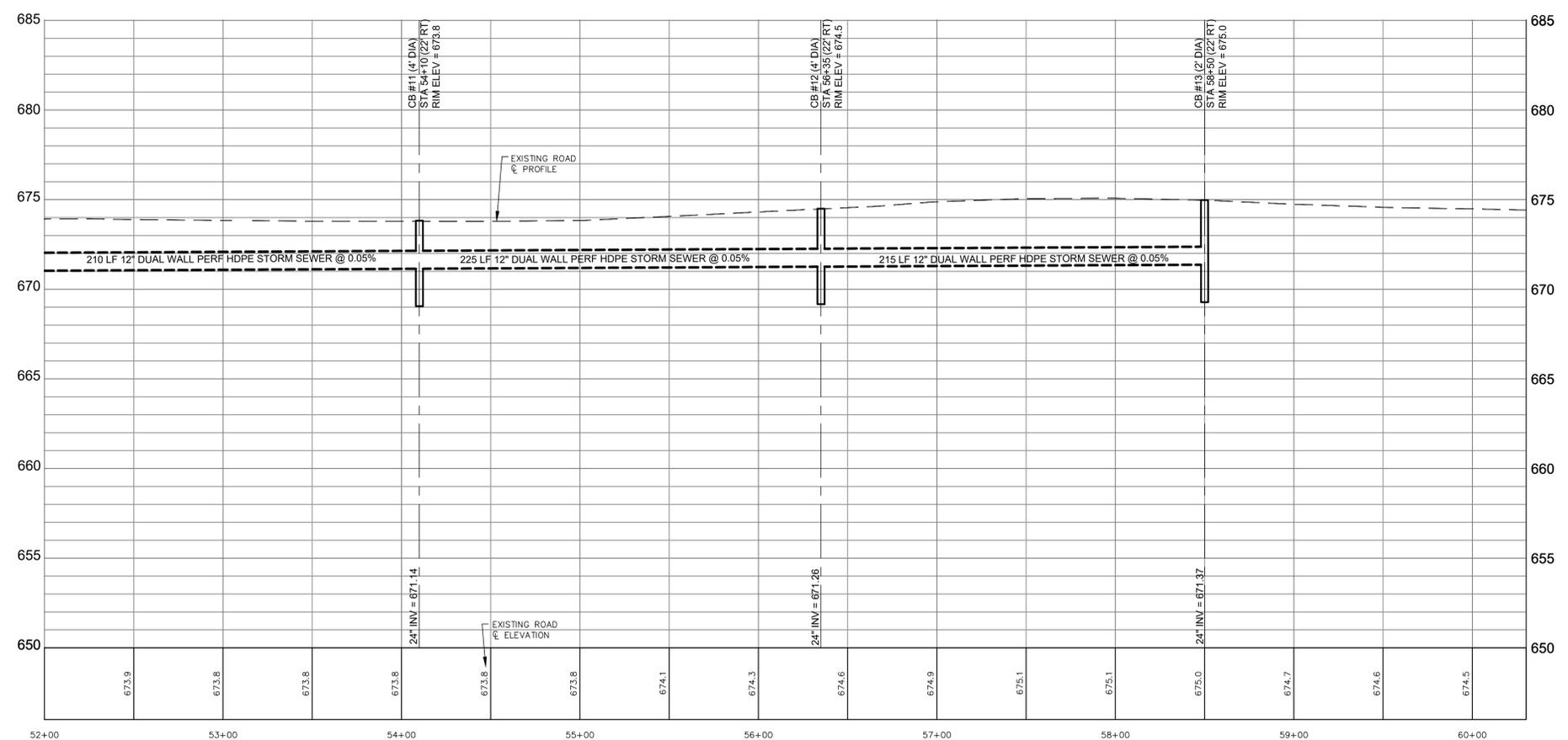
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**SMITH & MULDER BRANCH DRAIN  
ALTERNATE NO. 1**

WORK ITEM	LOCATION	QUANTITY
12" DUAL WALL PERF HDPE STORM SEWER	STA 52+00 TO 58+50	650 LF
2 FOOT DIA CATCH BASIN	STA 58+50	3 EA
4 FOOT DIA CATCH BASIN	STA 54+10 STA 56+35	2 EA
6" SDR 26 PVC STORM SEWER SERVICE	STA 54+10 STA 56+35 STA 58+50	150 LF
GRAVEL DRIVEWAY RESTORATION	STA 53+00 STA 57+75	79 SYD
HMA DRIVEWAY RESTORATION	STA 54+25 STA 55+50 STA 56+75	115 SYD



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PROJECT NO.  
**16041**

SHEET NO.  
**8 OF 10**

DIVISION 12

**PLAN AND PROFILE  
SMITH & MULDER BRANCH DRAIN  
STA 52+00 TO STA 60+30**

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