MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

PLAN AND PROFILE OF

McCRACKEN ROAD

IN THE TOWN OF

MILLBURY

WORCESTER COUNTY

FEDERAL AID PROJECT NO. STP-0033(023)X

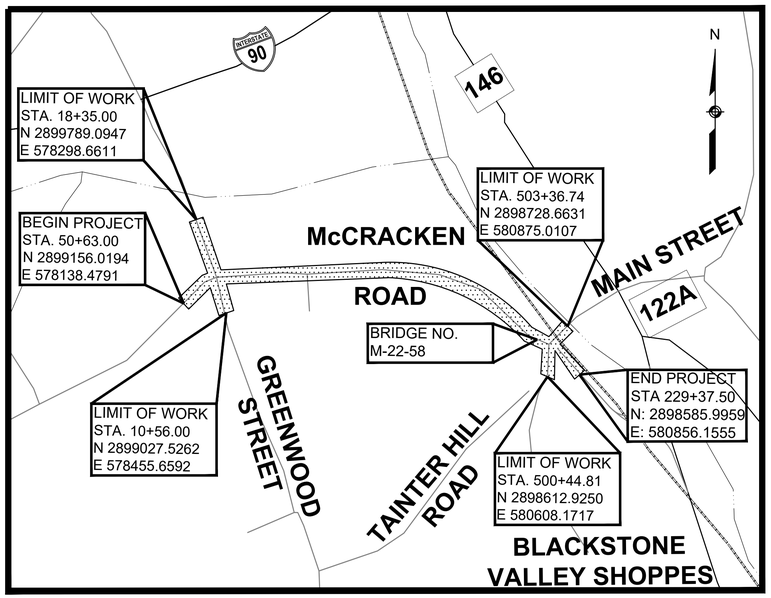
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	1	152
PROJECT FILE NO. 605377			

TITLE SHEET & INDEX

605377_HD(COV)_03-31-22.DWG Plotted on 8-Apr-2022 2:34 PM

INDEX



0 500 1,000 1,500 2,000

SCALE: 1" = 500'

LENGTH OF PROJECT = 3256.02 FEET = 0.617 MILES

THESE PLANS ARE SUPPLEMENTED BY THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK.

DESIGN DESIGNATION (McCRACKEN ROAD)

DESIGN SPEED	40 MPH
ADT (2014)	7,437
ADT (2024)	8,631
K	0.09
D	52.4% WB
T (PEAK HOUR)	5.3%
T (AVERAGE DAY)	4.1%
DHV	811
DDHV	425
FUNCTIONAL CLASSIFICATION	URBAN COLLECTOR

DESIGN DESIGNATION (GREENWOOD STREET)

DESIGN SPEED	25 MPH
ADT (2014)	6,438
ADT (2024)	7,472
K	0.09
D	55.6% SB
T (PEAK HOUR)	1.6%
T (AVERAGE DAY)	5.4%
DHV	672
DDHV	372
FUNCTIONAL CLASSIFICATION	URBAN COLLECTOR

DESIGN DESIGNATION (McCRACKEN ROAD (WEST))

DESIGN SPEED	25 MPH

DATE	DESCRIPTION	REV #

TEC The Engineering Corp
146 Dascomb Road
Andover, MA 01810
978-794-1792

vhb
120 Front Street
Suite 500
Worcester, MA 01608

massDOT Massachusetts Department of Transportation Highway Division

APPROVED

CHIEF ENGINEER DATE

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	JERSEY BARRIER ON BRIDGE OR JERSEY BARRIER
CB	CB	CATCH BASIN
		CATCH BASIN CURB INLET
FP	FP	FLAG POLE
GP	GP	GAS PUMP
MB	MB	MAIL BOX
		POST SQUARE
		POST CIRCULAR
WELL	WELL	WELL
EHH	EHH	ELECTRIC HANDHOLE
		FENCE GATE POST
GG	GG	GAS GATE
BHL #	BHL #	BORING HOLE
MW #	MW #	MONITORING WELL
TP #	TP #	TEST PIT
		HYDRANT
		LIGHT POLE
CO.BD.		COUNTY BOUND
		GPS POINT
C	C	CABLE MANHOLE
D	D	DRAINAGE MANHOLE
E	E	ELECTRIC MANHOLE
G	G	GAS MANHOLE
M	M	MISC MANHOLE
S	S	SEWER MANHOLE
T	T	TELEPHONE MANHOLE
W	W	WATER MANHOLE
MHB	MHB	MASSACHUSETTS HIGHWAY BOUND
MON		MONUMENT
SB		STONE BOUND
TB		TOWN OR CITY BOUND
		TRAVERSE OR TRIANGULATION STATION
TPL or GUY	TPL or GUY	TROLLEY POLE OR GUY POLE
HTP		TRANSMISSION POLE
UFB	UFB	UTILITY POLE W/ FIREBOX
UPDL	UPDL	UTILITY POLE WITH DOUBLE LIGHT
ULT	ULT	UTILITY POLE W / 1 LIGHT
UPL	UPL	UTILITY POLE
		BUSH
SIZE & TYPE		TREE
		STUMP
		SWAMP / MARSH
WG	WG	WATER GATE
	AV	AIR VENT
PM	PM	PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
100 99		CONTOURS
		UNDERGROUND DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
		UNDERGROUND WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCE STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
x	x	CHAIN LINK OR METAL FENCE
		WOOD FENCE
		HAY BALES/SILT FENCE
		TREE LINE OR LIMIT OF CLEARING AND GRUBBING
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLANE AND OVERLAY
		BANK OF RIVER OR STREAM
		BORDER OF WETLAND
		100 FT WETLAND BUFFER
		200 FT RIVERFRONT BUFFER
		STATE HIGHWAY LAYOUT
		TOWN OR CITY LAYOUT
		COUNTY LAYOUT
		RAILROAD SIDELINE
℄		TOWN OR CITY BOUNDARY LINE
		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT
		RETAINING WALL
		FILTER TUBES FOR EROSION CONTROL
		FULL DEPTH PAVEMENT
		WETLAND REPLICATION AREA
		WETLAND RESTORATION AREA
		INFILTRATION BASIN AREA
		STONE FOR PIPE ENDS

TRAFFIC SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
1	1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6' x 6' TYP UNLESS OTHERWISE SPECIFIED)
		VIDEO DETECTION CAMERA
		MICROWAVE DETECTOR
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
	*	EMERGENCY PREEMPTION CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD, (TYPE AS NOTED OR AS SPECIFIED)
RRSG	RRSG	RAILROAD SIGNAL
OR		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
	20'	MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (2 POSTS)
	20'	MAST ARM WITH LUMINAIRE
		OPTICAL PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL AND METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"x12" (OR AS NOTED)
		ELECTRIC HANDHOLE 12"x24" (OR AS NOTED)
		TRAFFIC SIGNAL CONDUIT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
	SL	STOP LINE
		YIELD LINE
	CW	CROSSWALK
	SWL	SOLID WHITE LINE - 6"
	SYL	SOLID YELLOW LINE - 6"
	BWL	BROKEN WHITE LINE - 6"
		BROKEN WHITE LINE - 3'X6" W/9' GAPS
	BYL	BROKEN YELLOW LINE - 6"
	DWL	DOTTED WHITE LINE - 6"
	DYL	DOTTED YELLOW LINE - 6"
	DWLEx	DOTTED WHITE LINE EXTENSION - 6"
	DYLEx	DOTTED YELLOW LINE EXTENSION - 6"
	DBYL	DOUBLE YELLOW LINE - 6"

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	2	152
PROJECT FILE NO. 605377			

LEGEND

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
BVW	BORDERING VEGETATED WETLANDS
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CIT	CHANGE IN TYPE
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DCB	DOUBLE CATCH BASIN
DCBCI	DOUBLE CATCH BASIN WITH CURB INLET
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DMH	DRAINAGE MANHOLE
DW	STEADY DON'T WALK - PORTLAND ORANGE
DWY	DRIVEWAY
ELEV (or EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (or EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FES	FLARED END SECTION
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
INV	INVERT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACH BASIN
LP	LIGHT POLE
LT	LEFT
LSA	LANDSCAPED AREA
MAX	MAXIMUM
MB	MAILBOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
MSE	MECHANICALLY STABILIZED EARTH
NIC	NOT IN CONTRACT
NO.	NUMBER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT

ABBREVIATIONS (cont.)

GENERAL

PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PT	POINT OF TANGENCY
PVC	POINT OF VERTICAL CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY
R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT OF WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/TRUCK %
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEEL CHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

TRAFFIC SIGNAL

CAB.	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY DON'T WALK
FDW	FLASHING DON'T WALK
FR	FLASHING CIRCULAR RED
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FY	FLASHING CIRCULAR AMBER
FYL	FLASHING AMBER LEFT ARROW
FYR	FLASHING AMBER RIGHT ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
PED	PEDESTRIAN
PTZ	PAN, TILE, ZOOM
R	STEADY CIRCULAR RED
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALK
Y	STEADY CIRCULAR AMBER
YL	STEADY AMBER LEFT ARROW

GENERAL NOTES

1. TOPOGRAPHICAL INFORMATION FROM A SURVEY PROVIDED BY VANASSE HANGEN BRUSTLIN, INC. OF WATERTOWN, MA IN MARCH, 2012. THE HORIZONTAL COORDINATE SYSTEM IS ON THE MASS GRID SYSTEM NAD83 AND THE VERTICAL COORDINATE SYSTEM IS NAVD 1988.

2. 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 SHALL 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.

3. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.

4. THE CONTRACTOR SHALL ALTER THE MASONRY OF THE TOP SECTION OF ALL EXISTING DRAINAGE STRUCTURES AS NECESSARY FOR CHANGES IN GRADE, AND RESET ALL WATER AND DRAINAGE FRAMES, GRATES AND BOXES TO THE PROPOSED FINISH SURFACE GRADE. REQUIRED NEW MASONRY SHALL BE CLAY BRICK.

5. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE, CATV AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.

6. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT NO EXPENSE TO THE OWNER.

7. THE TERM "PROPOSED" (PROP) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R).

8. SAWCUT SURFACES ABUTTING THE PAVEMENT TOP COURSE SHALL BE COATED WITH HMA JOINT SEALANT.

9. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED (RET), REMOVED AND RESET (R&R) OR REMOVED AND STACKED (R&S) AS NOTED ON THE PLANS.

10. LATERAL DRAIN PIPES SHALL BE INSTALLED WITH A PITCH OF 0.01 FOOT PER FOOT (MINIMUM) UNLESS NOTED OTHERWISE ON THE DRAWINGS.

11. EXISTING UTILITY POLES SHALL BE RELOCATED BY OTHERS.

12. TREES AND SHRUBS WITHIN THE LIMITS OF GRADING SHALL BE REMOVED ONLY UPON APPROVAL OF THE ENGINEER.

13. AFTER PAVEMENT MILLING OPERATIONS AND PRIOR TO PAVING OF THE INTERMEDIATE (BINDER) COURSE THE ENGINEER SHALL EVALUATE THE MILLED SURFACE AND SHALL APPLY THE APPROPRIATE REPAIR METHOD; IF REQUIRED.

14. EXISTING STATE, COUNTY, CITY, AND TOWN LOCATION LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATION ARE NOT GUARANTEED.

15. WHEN DRAINAGE STRUCTURES ARE PROPOSED TO BE REMOVED AND DISCARDED, ANY EXISTING PIPE CONNECTED TO THESE STRUCTURES SHALL BE ABANDONED UNLESS NOTED OTHERWISE.

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	3	152
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GENERAL NOTES & ABBREVIATIONS

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	4	152
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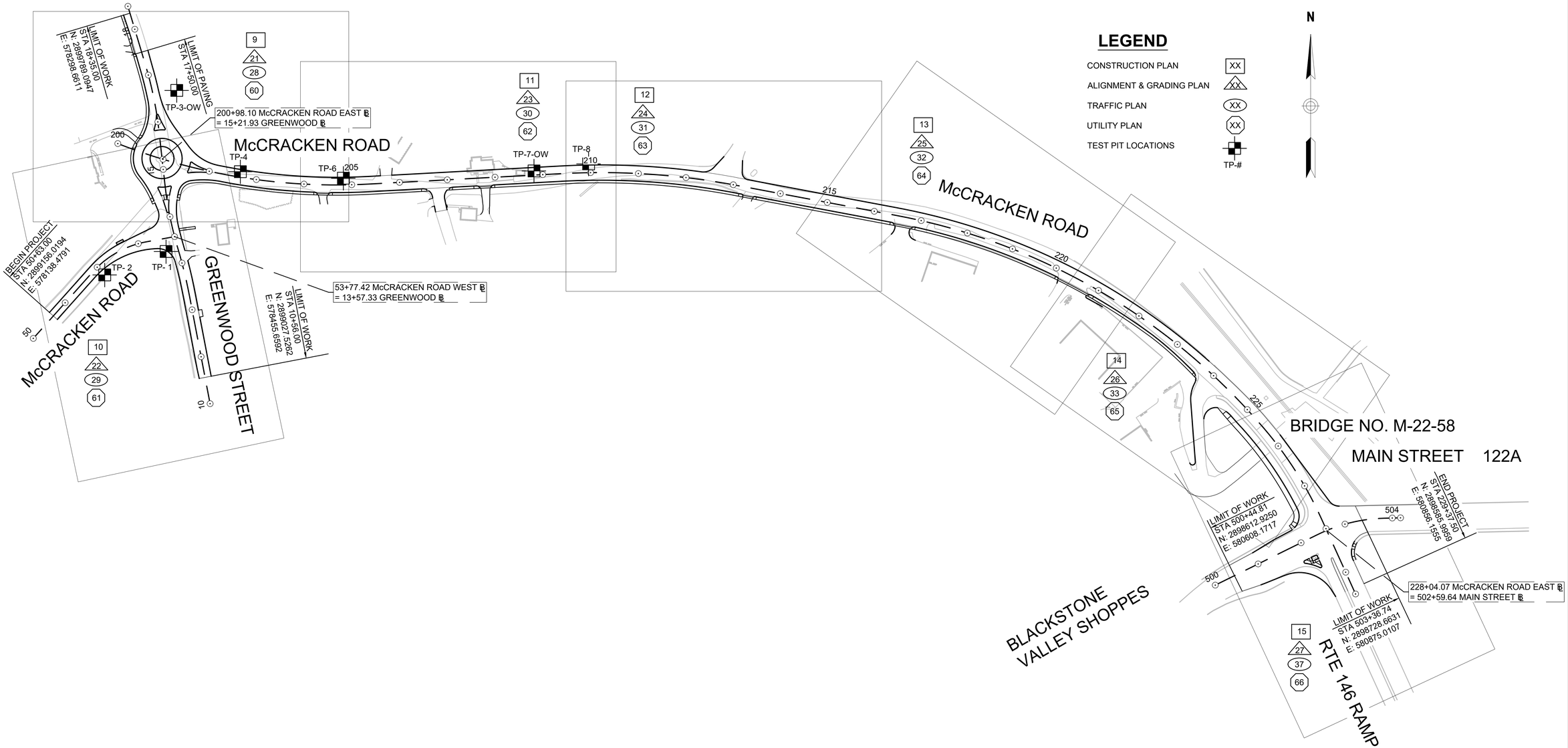
KEY PLAN



0 100 200 300 400

SCALE: 1" = 100'

605377_HDK(KEY).DWG Plotted on 11-Apr-2022 5:05 PM

TEST PIT LOG — TP-1

PAGE 1 OF 1

CLIENT: Vannese Hangen Brustlin, Inc. **PROJECT NAME:** Proposed McCracken Road Bridge Widening
LGCI PROJECT NUMBER: 1414 **PROJECT LOCATION:** Millbury, MA
DATE STARTED: 9/25/19 **DATE COMPLETED:** 9/25/19 **EXCAVATION SUBCONTRACTOR:** Town of Millbury DPW
TEST PIT LOCATION: Near Station 13 on Greenwood Street **EXCAVATION FOREMAN:** John Padone
COORDINATES: NA **EXCAVATOR TYPE/MODEL:** CAT 430 F IT
SURFACE EL.: 428 ft. (see note 1) **TOTAL DEPTH:** 9.5 ft. **WEATHER:** 60's / Cloudy
GROUNDWATER LEVELS: **TEST PIT DIMENSIONS:** 4'X8'
▽ **DURING EXCAVATION:** - **LOGGED BY:** HA **CHECKED BY:** CS
▼ **AT END OF EXCAVATION:** Not encountered

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth (ft / El.)	Material Description
0	427.5	E		Topsoil	0.0 / 428.0	0 ft. - 0.5 ft.: Topsoil
					0.5 / 427.5	0.5 ft. - 2 ft.: Silty SAND with Gravel (SM), fine to medium, trace coarse, 20-25% fines, 15-20% fine subrounded to angular gravel, trace organic soil, roots, orange to brown, moist (subsoil)
2.5	425.0	E		Subsoil	2.0 / 426.0	
				Sand		2 ft. - 9.5 ft.: Silty SAND (SM), fine to medium, trace coarse, 20-25% fines, 5-10% fine subrounded gravel, trace roots, ~5% cobbles and boulders up to 1' in size, light brown, moist
5.0	422.5					
7.5	420.0				9.5 / 418.5	Bottom of test pit at 9.5 feet. Backfilled the test pit with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**
1. The ground surface elevation was interpolated to the nearest foot from plan sheets 1 to 3 of 4 titled: "Test Pit Locations, McCracken Road, Millbury," provided to LGCI by Vannese Hangen Brustlin, Inc. via e-mail on October 14, 2019.

TEST PIT LOG — TP-2

PAGE 1 OF 1

CLIENT: Vannese Hangen Brustlin, Inc. **PROJECT NAME:** Proposed McCracken Road Bridge Widening
LGCI PROJECT NUMBER: 1414 **PROJECT LOCATION:** Millbury, MA
DATE STARTED: 9/25/19 **DATE COMPLETED:** 9/25/19 **EXCAVATION SUBCONTRACTOR:** Town of Millbury DPW
TEST PIT LOCATION: Near Station 52 on McCracken Road **EXCAVATION FOREMAN:** John Padone
COORDINATES: NA **EXCAVATOR TYPE/MODEL:** CAT 430 F IT
SURFACE EL.: 420 ft. (see note 1) **TOTAL DEPTH:** 8.5 ft. **WEATHER:** 60's / Cloudy
GROUNDWATER LEVELS: **TEST PIT DIMENSIONS:** 4'X9'
▽ **DURING EXCAVATION:** 7.0 ft. / El. 413.0 ft. Seeping in **LOGGED BY:** HA **CHECKED BY:** CS
▼ **AT END OF EXCAVATION:** 7.8 ft. / El. 412.2 ft. Pooling

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth (ft / El.)	Material Description
		E/M		Forest Mat	0.0 / 420.0	0 ft. - 0.7 ft.: FOREST MAT (OL), fibrous, 25-30% fines, 10-15% fine sand, roots, leaves, brown, moist
		E/M		Topsoil	0.7 / 419.3	0.7 ft. - 3 ft.: ORGANIC SOIL (OL), plastic, 15-20% fine sand, 25-30% cobbles and boulders up to 1.5' in size, roots, brown, moist (topsoil)
2.5	417.5	E/M			3.0 / 417.0	
		E		Silt		3 ft. - 7.3 ft.: Sandy SILT (ML), nonplastic, 40-45% fine sand, ~10% cobbles and boulders, up to 2.6' in size, light brown, moist
5.0	415.0	M				
7.5	412.5	M/D	1	Sand	7.3 / 412.7	7.3 ft. - 8.5 ft.: Silty SAND (SM), fine to medium, 30-35% fines, 5-10% fine to coarse gravel, brown, moist
					8.5 / 411.5	REMARK 1: Encountered large boulder, excavator unable to remove at 8.2'. Excavator able to excavate around boulder. Bottom of test pit at 8.5 feet. Backfilled the test pit with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**
1. The ground surface elevation was interpolated to the nearest foot from plan sheets 1 to 3 of 4 titled: "Test Pit Locations, McCracken Road, Millbury," provided to LGCI by Vannese Hangen Brustlin, Inc. via e-mail on October 14, 2019.

TEST PIT LOG — TP-3-OW

PAGE 1 OF 1

CLIENT: Vannese Hangen Brustlin, Inc. **PROJECT NAME:** Proposed McCracken Road Bridge Widening
LGCI PROJECT NUMBER: 1414 **PROJECT LOCATION:** Millbury, MA
DATE STARTED: 9/25/19 **DATE COMPLETED:** 9/25/19 **EXCAVATION SUBCONTRACTOR:** Town of Millbury DPW
TEST PIT LOCATION: Near Station 17 on Greenwood Street **EXCAVATION FOREMAN:** John Padone
COORDINATES: NA **EXCAVATOR TYPE/MODEL:** CAT 430 F IT
SURFACE EL.: 413 ft. (see note 1) **TOTAL DEPTH:** 10.7 ft. **WEATHER:** 60's / Raining
GROUNDWATER LEVELS: **TEST PIT DIMENSIONS:** 4'X9'
▽ **DURING EXCAVATION:** - **LOGGED BY:** HA **CHECKED BY:** CS
▼ **AT END OF EXCAVATION:** 10.7 ft. / El. 402.3 ft.

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth (ft / El.)	Material Description
0	412.5	E		Forest Mat	0.0 / 413.0	0 ft. - 0.6 ft.: FOREST MAT (OL), fibrous, nonplastic, ~15% fines, 20-25% fine sand, roots, leaves, brown to black, moist
		E		Subsoil	0.6 / 412.4	0.6 ft. - 1.5 ft.: Silty SAND (SM), fine, 15-20% fines, trace organic soil, roots, orange to brown, moist
2.5	410.0	E/M			1.5 / 411.5	
		E/M		Sand		1.5 ft. - 7 ft.: Poorly Graded SAND with Silt (SP-SM), fine, 10-15% fines, trace roots, ~15% cobbles and boulders up to 3' in size, light brown, moist
5.0	407.5					
7.5	405.0	E/M				7 ft. - 10.7 ft.: Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, 10-15% fines, ~25% fine to coarse subrounded gravel, ~15% cobbles up to 1' in size, brown, moist to wet
10.0	402.5				10.7 / 402.3	Bottom of test pit at 10.7 feet. Backfilled the test pit with excavated material. Installed 10 feet of perforated screen.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**
1. The ground surface elevation was interpolated to the nearest foot from plan sheets 1 to 3 of 4 titled: "Test Pit Locations, McCracken Road, Millbury," provided to LGCI by Vannese Hangen Brustlin, Inc. via e-mail on October 14, 2019.
2. OW designates that a perforated PVC pipe was installed in the test pit excavation during back filling.

MILLBURY
MCCRACKEN ROAD

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MA	STP-0033(023)X	5	152
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TEST PIT LOGS

TEST PIT LOG — TP-4

PAGE 1 OF 1

CLIENT: Vannese Hangen Brustlin, Inc. **PROJECT NAME:** Proposed McCracken Road Bridge Widening
LGCI PROJECT NUMBER: 1414 **PROJECT LOCATION:** Millbury, MA
DATE STARTED: 9/25/19 **DATE COMPLETED:** 9/25/19 **EXCAVATION SUBCONTRACTOR:** Town of Millbury DPW
TEST PIT LOCATION: Near station 203 on McCracken Road **EXCAVATION FOREMAN:** John Padone
COORDINATES: NA **EXCAVATOR TYPE/MODEL:** CAT 430 F IT
SURFACE EL.: 414 ft. (see note 1) **TOTAL DEPTH:** 10.3 ft. **WEATHER:** 60's / Cloudy
GROUNDWATER LEVELS: **TEST PIT DIMENSIONS:** 4'X8'
▽ **DURING EXCAVATION:** - **LOGGED BY:** HA **CHECKED BY:** CS
▼ **AT END OF EXCAVATION:** Not encountered

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth (ft / El.)	Material Description
0	412.5	E		Forest Mat	0.0 / 414.0	0 ft. - 0.2 ft.: FOREST MAT (OL), fibrous, 20-25% fines, 10-15% fine sand, roots, leaves, brown, moist
		E		Topsoil	0.2 / 413.8	0.2 ft. - 3.6 ft.: Organic Soil (OL), fine, trace medium, 20-25% fines, ~15% cobbles and boulders up to 1.8' in size, roots, dark brown, moist
2.5	410.0	E		Subsoil	3.6 / 410.4	3.6 ft. - 4.8 ft.: Silty SAND (SM), fine, 25-30% fines, roots, trace organic soil, orange to brown, moist
5.0	407.5	E		Sand	4.8 / 409.2	4.8 ft. - 7.1 ft.: Poorly Graded SAND with Silt (SP-SM), fine, trace medium, 10-15% fines, ~10% cobbles and boulders up to 2' in size, trace roots, light brown, moist
7.5	405.0	E				7.1 ft. - 10.3 ft.: Silty SAND (SM), fine to medium, trace coarse, ~15% fines, ~10% fine to coarse subrounded to angular gravel, trace roots, brown, moist
10.0					10.3 / 403.7	Bottom of test pit at 10.3 feet. Backfilled the test pit with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**
1. The ground surface elevation was interpolated to the nearest foot from plan sheets 1 to 3 of 4 titled: "Test Pit Locations, McCracken Road, Millbury," provided to LGCI by Vannese Hangen Brustlin, Inc. via e-mail on October 14, 2019.

TEST PIT LOG — TP-6

PAGE 1 OF 1

CLIENT: Vannese Hangen Brustlin, Inc. **PROJECT NAME:** Proposed McCracken Road Bridge Widening
LGCI PROJECT NUMBER: 1414 **PROJECT LOCATION:** Millbury, MA
DATE STARTED: 9/25/19 **DATE COMPLETED:** 9/25/19 **EXCAVATION SUBCONTRACTOR:** Town of Millbury DPW
TEST PIT LOCATION: Near station 205 on McCracken Road **EXCAVATION FOREMAN:** John Padone
COORDINATES: NA **EXCAVATOR TYPE/MODEL:** CAT 430 F IT
SURFACE EL.: 414 ft. (see note 1) **TOTAL DEPTH:** 9 ft. **WEATHER:** 60's / Cloudy
GROUNDWATER LEVELS: **TEST PIT DIMENSIONS:** 4'X6'
▽ **DURING EXCAVATION:** - **LOGGED BY:** HA **CHECKED BY:** CS
▼ **AT END OF EXCAVATION:** Not encountered

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth (ft / El.)	Material Description
0	412.5	E		Forest Mat	0.0 / 414.0	0 ft. - 0.1 ft.: FOREST MAT (OL), fibrous, 35-40% fines, 10-15% fine sand, roots, leaves, black, moist
2.5	410.0	E		Fill	0.1 / 413.9	0.1 ft. - 7 ft.: Organic Soil (OL), fine to medium, trace coarse, 35-40% fines, 25-30% cobbles and boulders up to 2.3' in size, trace organic soil, trace roots, trace asphalt, plastic, metal, black, moist
5.0	407.5	M				
7.5	405.0	M				7 ft. - 9 ft.: Silty SAND (SM), fine to medium, trace coarse, 35-40% fines, 20-25% cobbles and boulders, up to 1.9' in size, organic soil, roots, dark brown, moist
					9.0 / 405.0	Bottom of test pit at 9.0 feet. Backfilled the test pit with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**
1. The ground surface elevation was interpolated to the nearest foot from plan sheets 1 to 3 of 4 titled: "Test Pit Locations, McCracken Road, Millbury," provided to LGCI by Vannese Hangen Brustlin, Inc. via e-mail on October 14, 2019.

TEST PIT LOG — TP-7-OW

PAGE 1 OF 1

CLIENT: Vannese Hangen Brustlin, Inc. **PROJECT NAME:** Proposed McCracken Road Bridge Widening
LGCI PROJECT NUMBER: 1414 **PROJECT LOCATION:** Millbury, MA
DATE STARTED: 9/19/19 **DATE COMPLETED:** 9/19/19 **EXCAVATION SUBCONTRACTOR:** Town of Millbury DPW
TEST PIT LOCATION: Near station 209 on McCracken Road **EXCAVATION FOREMAN:** John Padone
COORDINATES: NA **EXCAVATOR TYPE/MODEL:** CAT 430 F IT
SURFACE EL.: 409 ft. (see note 1) **TOTAL DEPTH:** 7 ft. **WEATHER:** 60's / Raining
GROUNDWATER LEVELS: **TEST PIT DIMENSIONS:** 4'X8'
▽ **DURING EXCAVATION:** - **LOGGED BY:** HA **CHECKED BY:** CS
▼ **AT END OF EXCAVATION:** 6.4 ft. / El. 402.6 ft.

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth (ft / El.)	Material Description
0	407.5	E		Forest Mat	0.0 / 409.0	0 ft. - 0.2 ft.: FOREST MAT (OL), fibrous, nonplastic, 20-25% fines, 25-30% fine to medium sand, wood, roots, leaves, black, moist
2.5	405.0	E/M		Fill	0.2 / 408.8	0.2 ft. - 3 ft.: Silty SAND (SM), fine, trace medium, 35-40% fines, organic soil, metal, glass, roots, 15% cobbles and boulders up to 4.5' in size, black, moist to wet
5.0	402.5	M/D		Buried Organic Soil	3.0 / 406.0	3 ft. - 3.4 ft.: ORGANIC SOIL (OL), plastic, 15-20% fine sand, roots, black, moist
		M/D			3.4 / 405.6	3.4 ft. - 6 ft.: Silty SAND (SM), fine to medium, 20-25% fines, 5-10% fine to coarse, subrounded gravel, 10-15% cobbles and boulders, up to 1.1' in size, light brown, moist to wet
		D		Sand		
		D/V			6 / 403.0	6 ft. - 7 ft.: Silty SAND (SM), fine to medium, trace coarse, 25-30% fines, 5-10% cobbles up to 3" in size, light brown, wet
					7.0 / 402.4	Bottom of test pit at 7.0 feet. Backfilled the test pit with excavated material. Installed 6 feet of perforated screen.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**
1. The ground surface elevation was interpolated to the nearest foot from plan sheets 1 to 3 of 4 titled: "Test Pit Locations, McCracken Road, Millbury," provided to LGCI by Vannese Hangen Brustlin, Inc. via e-mail on October 14, 2019.
2. OW designates that a perforated PVC pipe was installed in the test pit excavation during back filling.

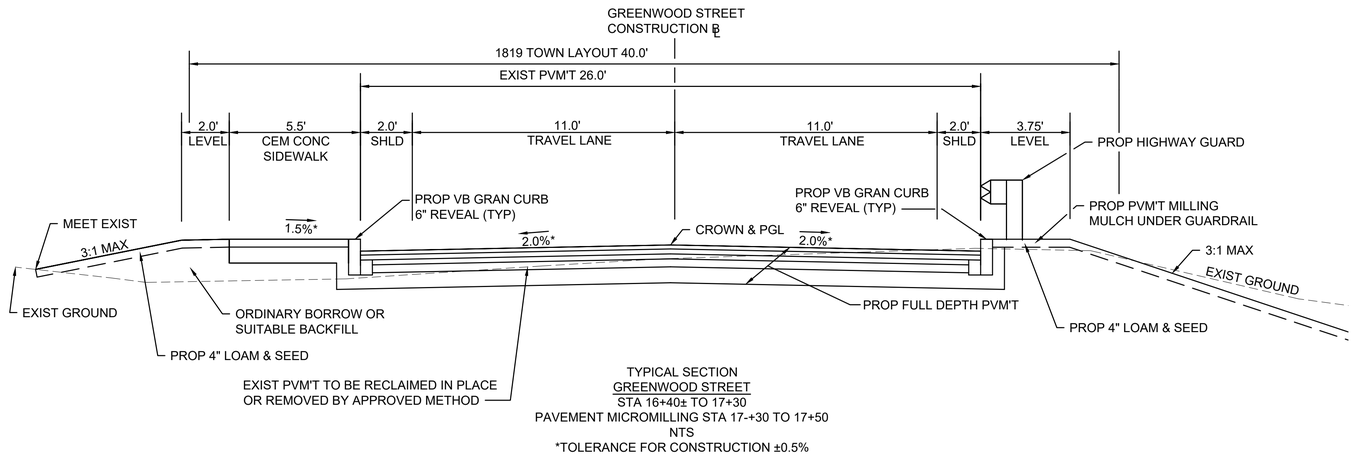
TEST PIT LOG — TP-8

PAGE 1 OF 1

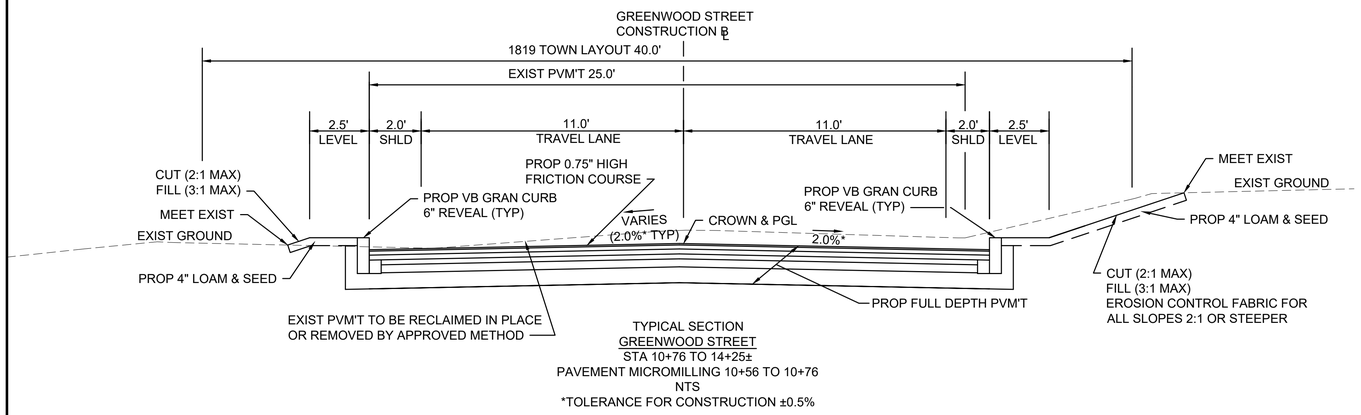
CLIENT: Vannese Hangen Brustlin, Inc. **PROJECT NAME:** Proposed McCracken Road Bridge Widening
LGCI PROJECT NUMBER: 1414 **PROJECT LOCATION:** Millbury, MA
DATE STARTED: 9/19/19 **DATE COMPLETED:** 9/19/19 **EXCAVATION SUBCONTRACTOR:** Town of Millbury DPW
TEST PIT LOCATION: Near station 210 on McCracken Road **EXCAVATION FOREMAN:** John Padone
COORDINATES: NA **EXCAVATOR TYPE/MODEL:** CAT 430 F IT
SURFACE EL.: 415 ft. (see note 1) **TOTAL DEPTH:** 9.8 ft. **WEATHER:** 60's / Raining
GROUNDWATER LEVELS: **TEST PIT DIMENSIONS:** 6'X12'
▽ **DURING EXCAVATION:** - **LOGGED BY:** HA **CHECKED BY:** BM
▼ **AT END OF EXCAVATION:** Not encountered

Depth (ft)	El. (ft)	Excavation Effort	Remark	Strata	Depth (ft / El.)	Material Description
		E/M		Topsoil	0.0 / 414.6	0 ft. - 0.4 ft.: Topsoil
		E/M			0.4 / 414.4	0.4 ft. - 3.2 ft.: Silty SAND (SM), fine to medium, trace coarse, 25-30% fines, ~10% fine to coarse soil, subrounded to angular gravel, trace organic soil, plastic, wire, roots, ~20% cobbles and boulders up to 3.3' in size , brown, moist
		M		Fill		
2.5	412.5	E				
		E			3.2 / 411.8	
				Buried Organic Soil		3.2 ft. - 4.8 ft.: Silty SAND (SM), fine, trace medium, 20-25% fines, 5-10% fine to coarse subrounded gravel, trace organic soil, trace roots, ~5% cobbles and boulders up to 1' in size, orange to brown moist
5.0	410.0	E			4.8 / 410.2	
		E/M		Sand		4.8 ft. - 8 ft.: Silty SAND (SM), fine, trace medium, 15-20% fines, ~5% coarse subangular gravel, ~5% cobbles up to 8" in size, trace roots, light brown, moist
7.5	407.5					
		M				8 ft. - 9.8 ft.: Silty SAND with Gravel (SM), fine to medium, trace coarse, 25-30% fines, 15-20% fine subrounded to angular gravel, light brown to gray, moist
					9.8 / 405.2	Bottom of test pit at 9.8 feet. Backfilled the test pit with excavated material.

GENERAL COMMENTS: **E = Easy, M - Moderate, D = Difficult, V = Very Difficult**
1. The ground surface elevation was interpolated to the nearest foot from plan sheets 1 to 3 of 4 titled: "Test Pit Locations, McCracken Road, Millbury," provided to LGCI by Vannese Hangen Brustlin, Inc. via e-mail on October 14, 2019.



TYPICAL SECTION
GREENWOOD STREET
STA 16+40± TO 17+30
PAVEMENT MICROMILLING STA 17-+30 TO 17+50
NTS
*TOLERANCE FOR CONSTRUCTION ±0.5%



TYPICAL SECTION
GREENWOOD STREET
STA 10+76 TO 14+25±
PAVEMENT MICROMILLING 10+56 TO 10+76
NTS
*TOLERANCE FOR CONSTRUCTION ±0.5%

PAVEMENT NOTES

PROPOSED FULL DEPTH PAVEMENT

SURFACE: 5" HOT MIX ASPHALT*
(2" SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC-12.5-P) OVER
3" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC-19.0)) OVER

BASE: 5" SUPERPAVE BASE COURSE - 37.5 (SBC 37.5)

SUBBASE: 4" DENSE GRADED CRUSHED STONE OVER
8" GRAVEL BORROW, TYPE b OR RECLAIMED PVM'T BORROW
24" SPECIAL BORROW (IN AREAS OF NEW CONSTRUCTION OR REALIGNMENT)

ASPHALT EMULSION FOR TACK COAT (RS-1) AT 0.07
GAL/SY OVER SMOOTH SURFACE

PROPOSED FINE MILLING & OVERLAY

SURFACE: 2" HOT MIX ASPHALT
(2" SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC-12.5-P))

1 3/4" MICROMILLING DEPTH

ASPHALT EMULSION FOR TACK COAT (RS-1) AT 0.08
GAL/SY OVER EXISTING PAVEMENT OR MILLING SURFACE

PROPOSED FULL DEPTH PAVEMENT - WIDENING (LESS THAN 4.00' WIDE)

SURFACE: 5" HOT MIX ASPHALT
(2" SUPERPAVE SURFACE COURSE - 12.5 POLYMER (SSC-12.5-P)
3" SUPERPAVE INTERMEDIATE COURSE - 19.0 (SIC-19.0))

BASE: 8" HIGH EARLY STRENGTH CEMENT
CONCRETE BASE COURSE

SUBBASE: 12" GRAVEL BORROW, TYPE b.

ASPHALT EMULSION FOR TACK COAT (RS-1) AT 0.08
GAL/SY OVER EXISTING PAVEMENT OR MILLING SURFACE

PROPOSED HMA DRIVEWAY

SURFACE: 4" HOT MIX ASPHALT
(1 ½" SUPERPAVE SURFACE COURSE - 9.5 (SSC-9.5)
2 ½" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC-12.5))

SUBBASE: 8" GRAVEL BORROW TYPE b

PROPOSED CEMENT CONCRETE WALK/ WHEELCHAIR RAMP

SURFACE: 4" CEMENT CONCRETE
AIR ENTRAINED 4000 PSI, 3/4", 610

FOUNDATION: 8" GRAVEL BORROW, TYPE b

PROPOSED CEMENT CONCRETE WALK AT DRIVEWAY

SURFACE: 6" CEMENT CONCRETE
AIR ENTRAINED 4000 PSI, 3/4", 610

FOUNDATION: 8" GRAVEL BORROW, TYPE b

PROPOSED STAMPED CEMENT CONCRETE PAVEMENT

SURFACE: 8" CEMENT CONCRETE
AIR ENTRAINED 4000 PSI,
3/4", 610 (REINFORCED)

FOUNDATION: 8" GRAVEL BORROW, TYPE b

PROPOSED STAMPED CEMENT CONCRETE ISLAND

SURFACE: 6" CEMENT CONCRETE
AIR ENTRAINED 4000 PSI,
3/4", 610 (COLOR/STAMPED)

FOUNDATION: 8" GRAVEL BORROW, TYPE b

PROPOSED HOT MIX ASPHALT WALK

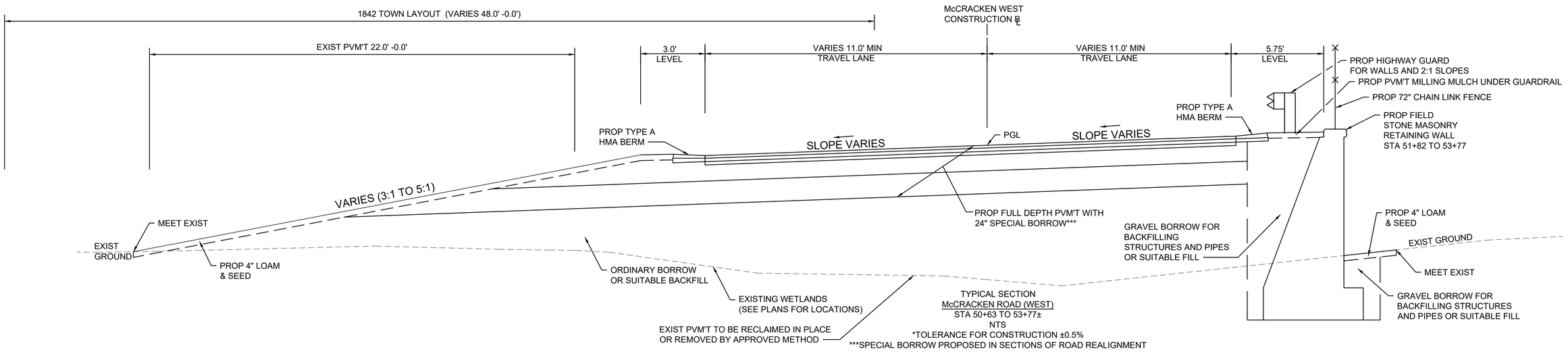
SURFACE: 3" HOT MIX ASPHALT
1 ½" SUPERPAVE SURFACE COURSE - 9.5 (SSC-9.5)
1 ¾" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC-12.5)

SUBBASE: 8" GRAVEL BORROW TYPE b

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	6	152
PROJECT FILE NO. 605377			

TYPICAL SECTIONS & PAVEMENT NOTES



TYPICAL SECTION
McCRACKEN ROAD (WEST)
STA 50+63 TO 53+77±
NTS
*TOLERANCE FOR CONSTRUCTION ±0.5%
***SPECIAL BORROW PROPOSED IN SECTIONS OF ROAD REALIGNMENT

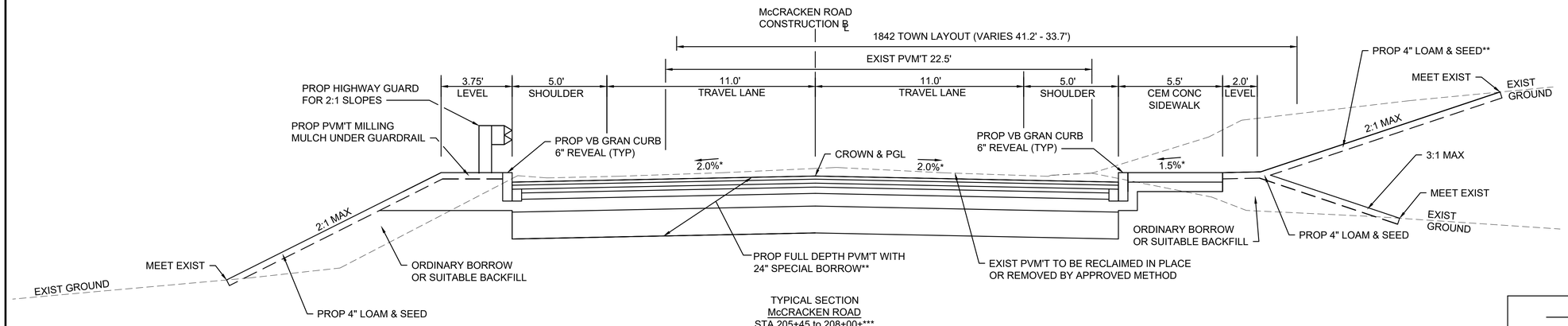
605377_HD(TYP).DWG Plotted on 11-Apr-2022 5:06 PM

MILLBURY
MCCRACKEN ROAD

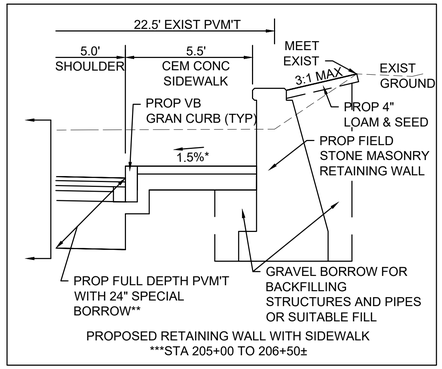
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	7	152
PROJECT FILE NO. 605377			

TYPICAL SECTIONS & PAVEMENT NOTES

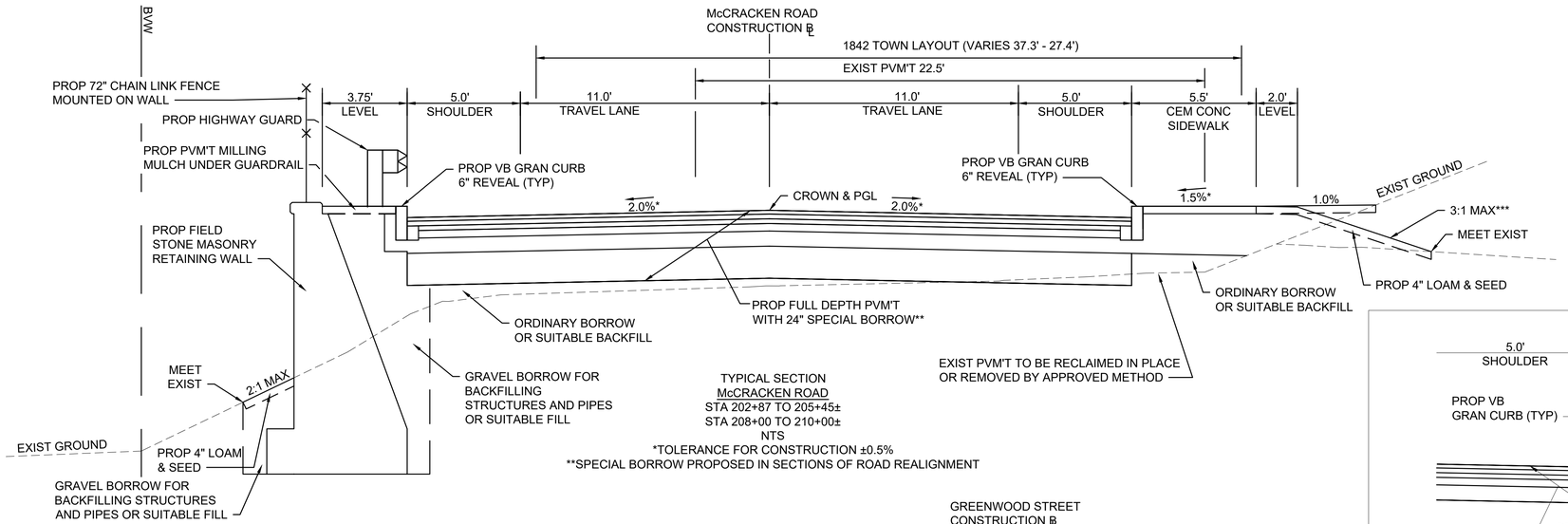
SEE SHEET 5 FOR PAVEMENT NOTES



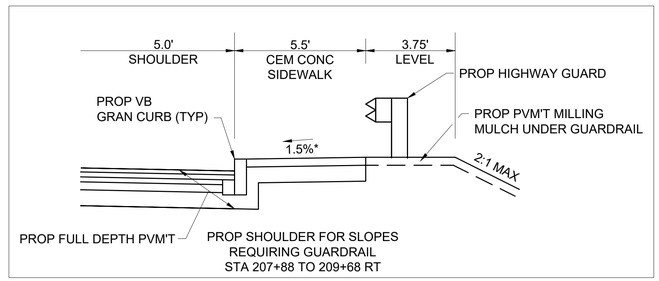
TYPICAL SECTION
McCRACKEN ROAD
STA 205+45 to 208+00±***
NTS
*TOLERANCE FOR CONSTRUCTION ±0.5%
**SPECIAL BORROW PROPOSED IN SECTIONS OF ROAD REALIGNMENT

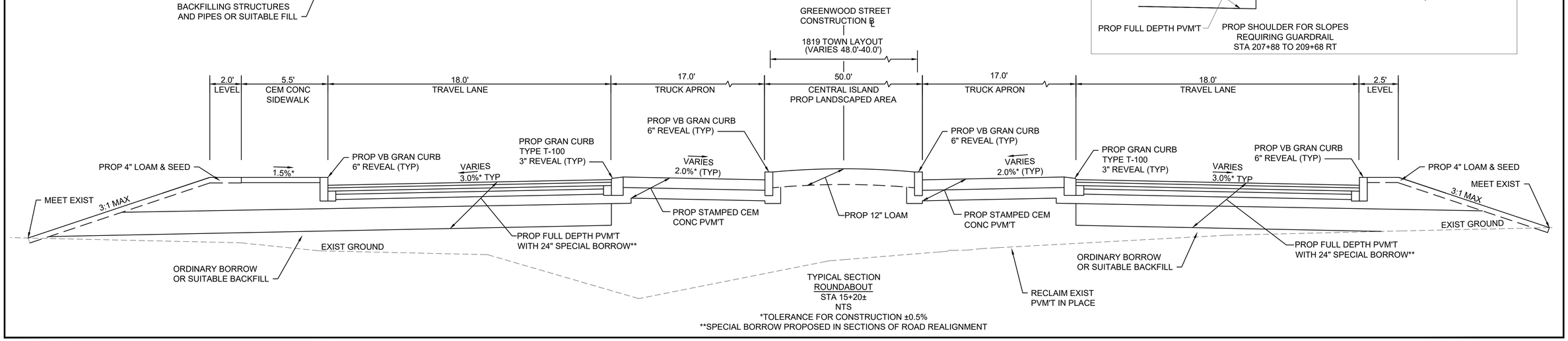


PROPOSED RETAINING WALL WITH SIDEWALK
***STA 205+00 TO 206+50±



TYPICAL SECTION
McCRACKEN ROAD
STA 202+87 TO 205+45±
STA 208+00 TO 210+00±
NTS
*TOLERANCE FOR CONSTRUCTION ±0.5%
**SPECIAL BORROW PROPOSED IN SECTIONS OF ROAD REALIGNMENT





TYPICAL SECTION
ROUNDABOUT
STA 15+20±
NTS
*TOLERANCE FOR CONSTRUCTION ±0.5%
**SPECIAL BORROW PROPOSED IN SECTIONS OF ROAD REALIGNMENT

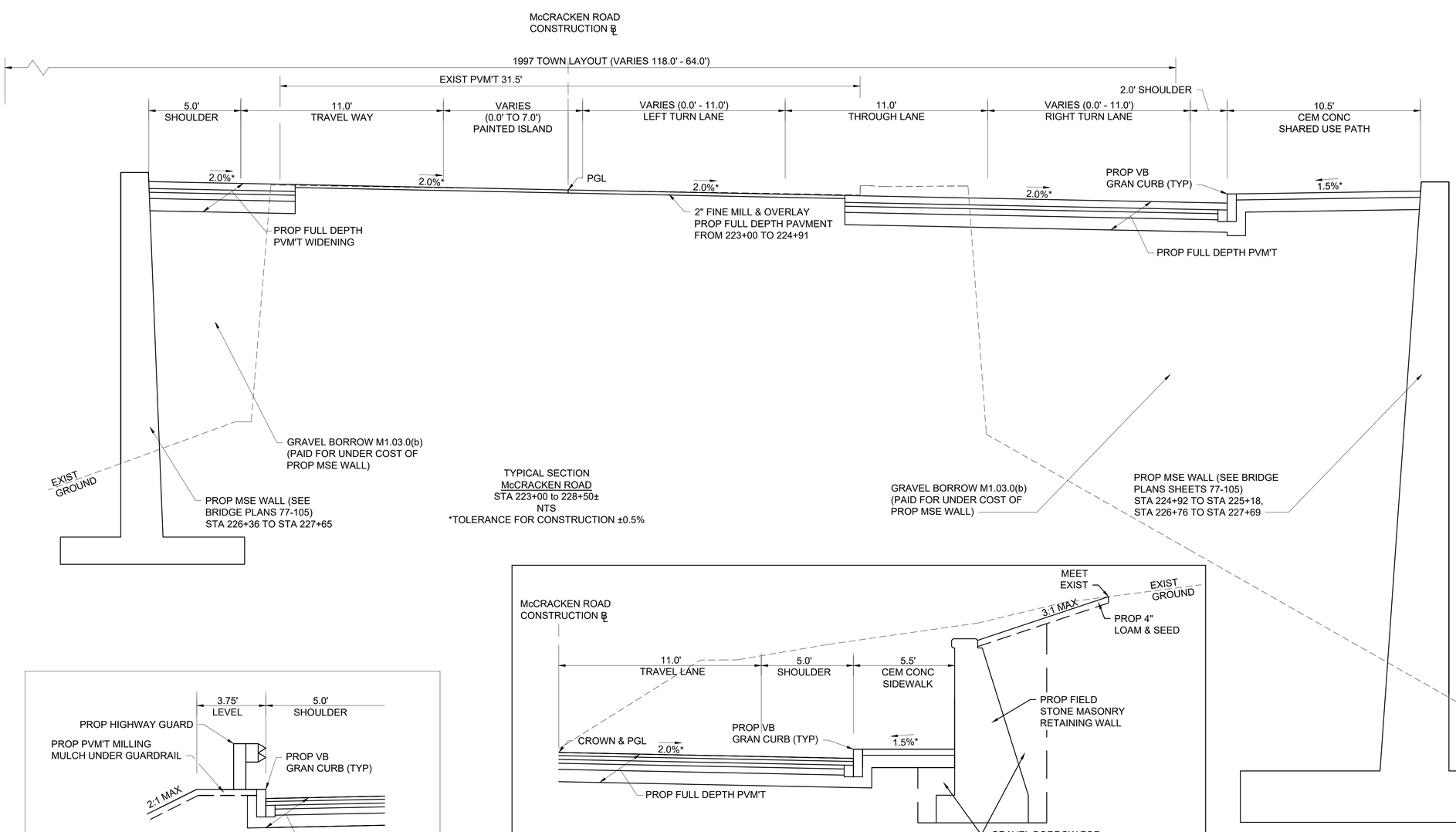
MILLBURY
MCCRACKEN ROAD

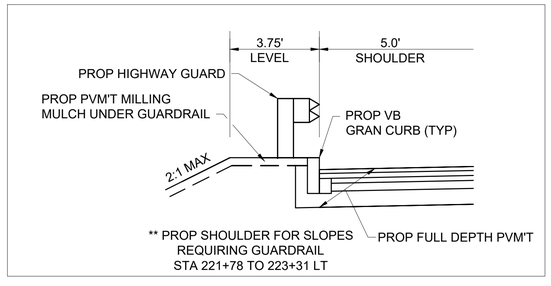
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	8	152
PROJECT FILE NO. 605377			

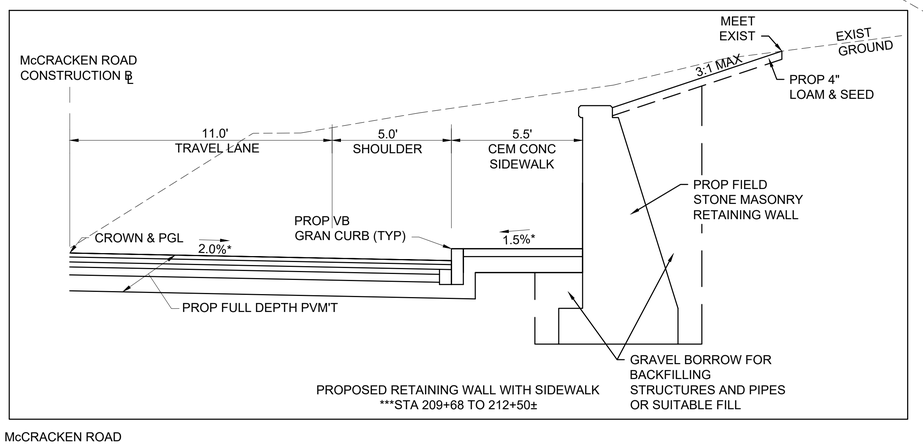
TYPICAL SECTIONS & PAVEMENT NOTES

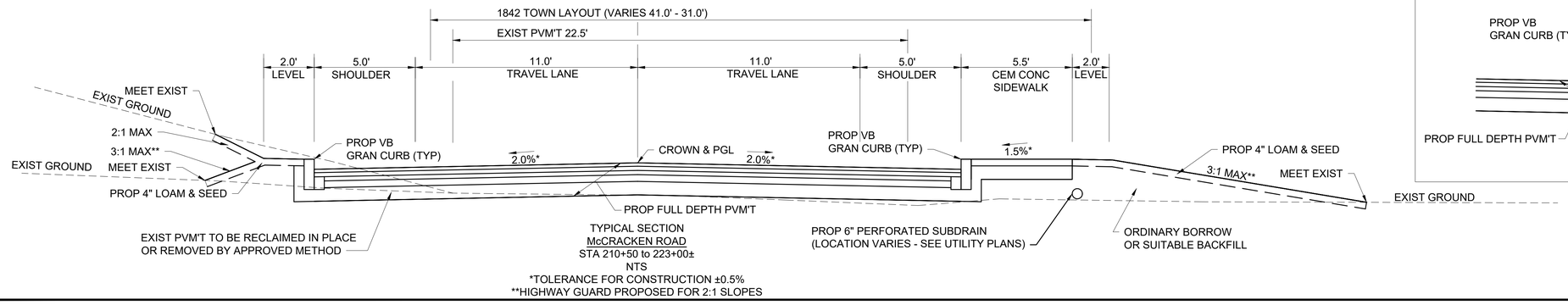
SEE SHEET 5 FOR PAVEMENT NOTES

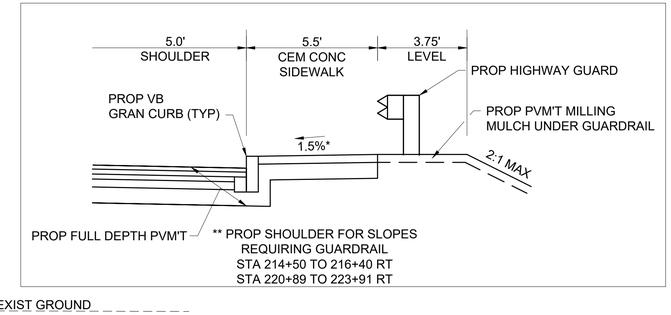
605377_HD(TYP).DWG Plotted on 11-Apr-2022 5:06 PM











HIGHWAY GUARD DETAILS
TANGENT END STA 17+32 RT
HIGHWAY GUARD STA 17+19 RT TO 205+59 LT
TRAILING END 205+59 LT

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
SEE SHEET 60

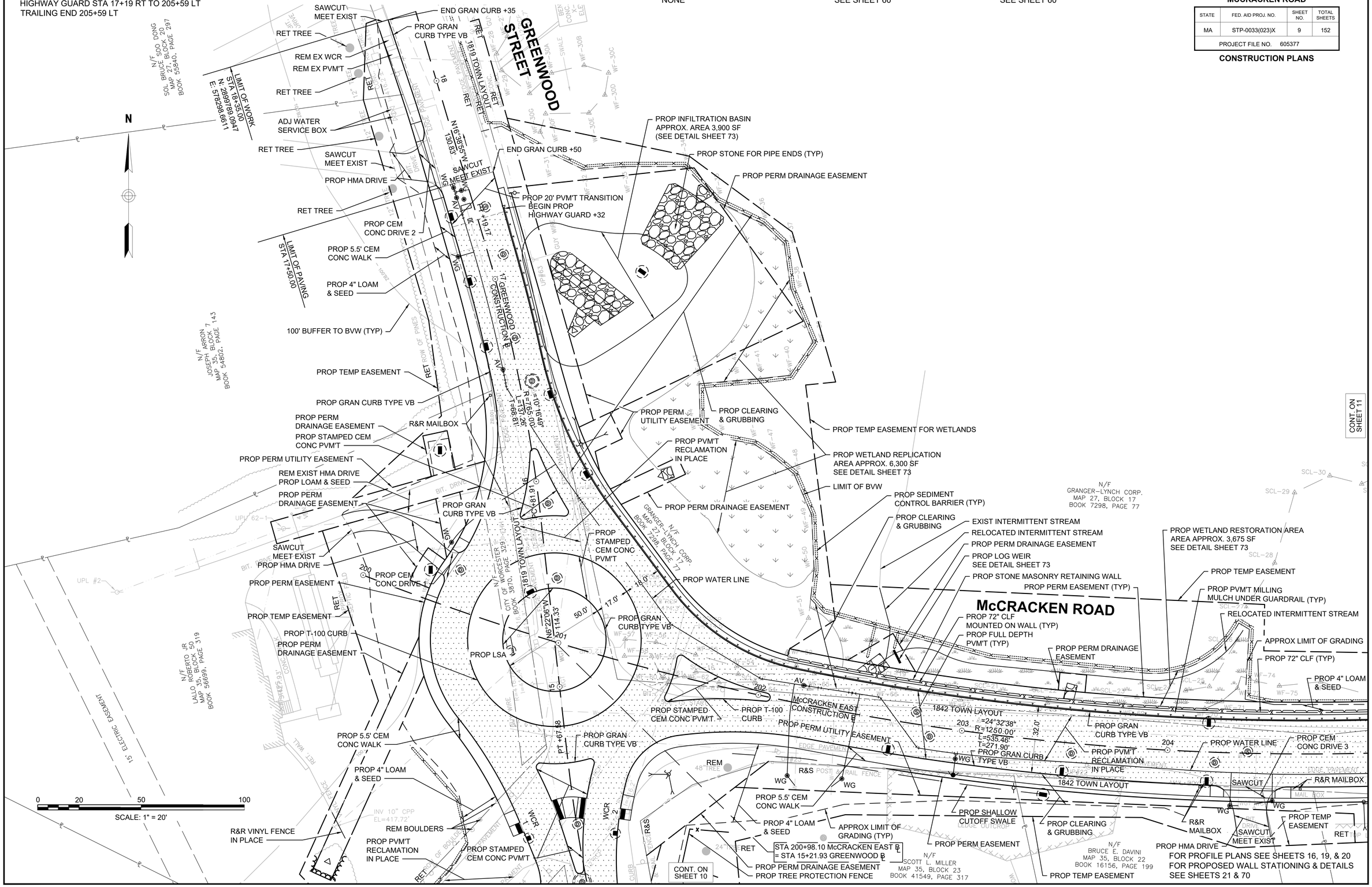
DRAINAGE DETAILS
SEE SHEET 60

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	9	152
PROJECT FILE NO. 605377			

CONSTRUCTION PLANS

605377_HD(GEN).DWG Plotted on 11-Apr-2022 5:07 PM

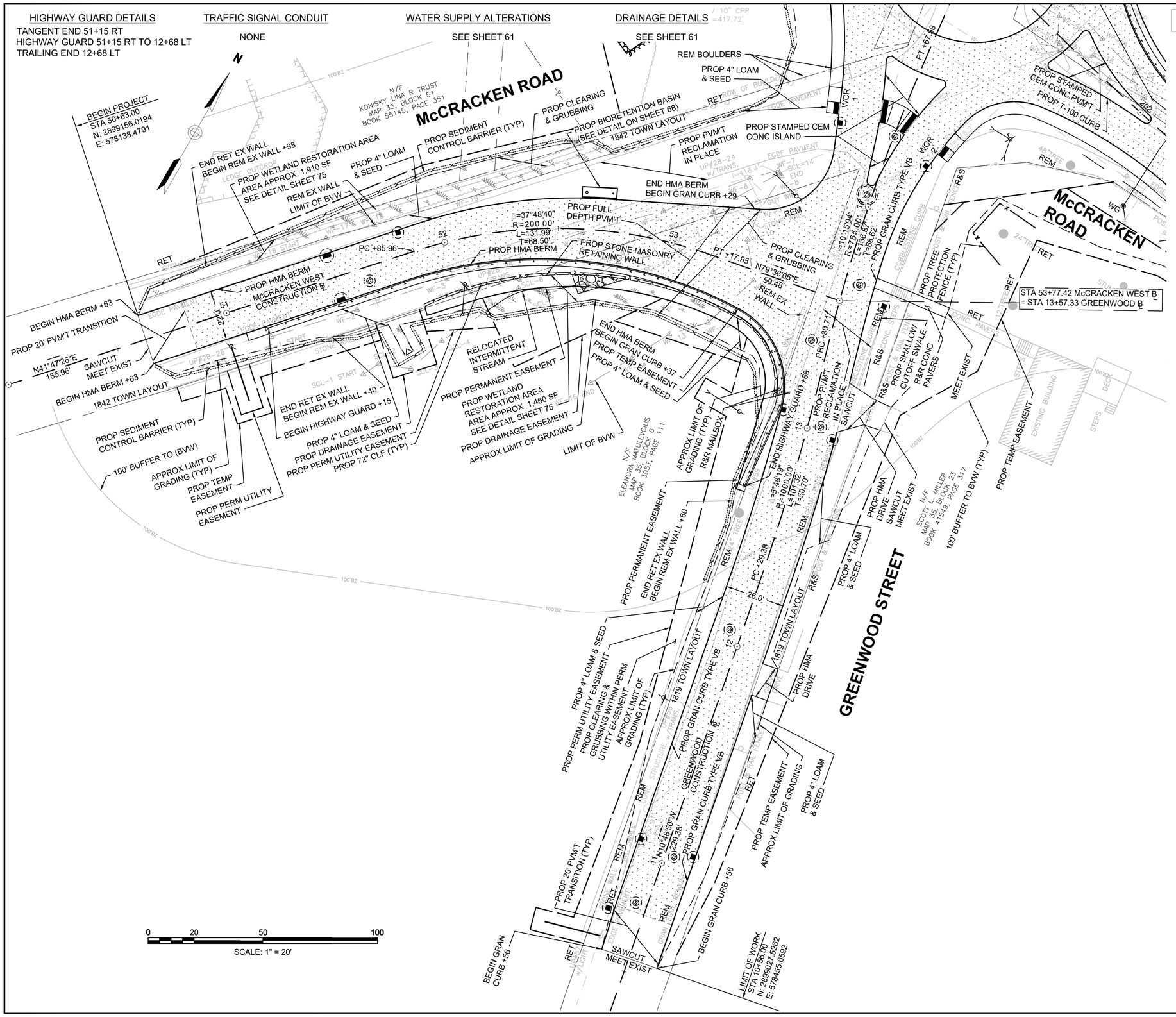


HIGHWAY GUARD DETAILS
TANGENT END 51+15 RT
HIGHWAY GUARD 51+15 RT TO 12+68 LT
TRAILING END 12+68 LT

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
SEE SHEET 61

DRAINAGE DETAILS
SEE SHEET 61



CONT. ON SHEET 9

FOR PROFILE PLANS SEE SHEETS 19 & 20
FOR PROPOSED WALL STATIONING & DETAILS SEE SHEETS 22 & 70

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	10	152
PROJECT FILE NO. 605377			

CONSTRUCTION PLANS

605377_HDI(GEN).DWG Plotted on 11-Apr-2022 5:07 PM

HIGHWAY GUARD DETAILS

TRAILING END 205+59 LT,
207+88 RT, 209+68 RT,
HIGHWAY GUARD 17+67 RT TO
205+59 LT, 207+38 TO 210+62 LT,
207+88 TO 209+68 RT
TANGENT END 207+38 LT, 210+62 LT

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE SHEET 62

DRAINAGE DETAILS

SEE SHEET 62

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	11	152
PROJECT FILE NO. 605377			

CONSTRUCTION PLANS

605377_HD(GEN).DWG Plotted on 11-Apr-2022 5:08 PM

N

McCRACKEN ROAD

PROP WETLAND REPLICATION AREA
AREA APPROX. 7,400 SF
SEE DETAIL SHEET 74

PROP TEMP EASEMENT

PROP STONE FOR
PIPE ENDS (TYP)

PROP SEDIMENT
CONTROL BARRIER (TYP)

PROP INFILTRATION
BASIN APPROX.
AREA 4,900 SF
(SEE DETAIL SEET 74)

N/F
BETTINA M. WHITE AND
JIMMY DIAZ
MAP 35, BLOCK 8
BOOK 42186, PAGE 297

N/F
GRANGER-LYNCH CORP.
MAP 35, BLOCK 10
BOOK 7298, PAGE 77

PROP WETLAND RESTORATION AREA
AREA APPROX. 3,675 SF
SEE DETAIL SHEET 73

PROP WETLAND
RESTORATION AREA
AREA APPROX. 545 SF
SEE DETAIL SHEET 74

LIMIT OF BVW

PROP TEMP EASEMENT

PROP PERM EASEMENT

PROP STONE
MASONRY RETAINING WALL

END PROP HIGHWAY
GUARD +59

PROP PERM
DRAINAGE
EASEMENT

PROP PVM'T MILLING
MULCH UNDER GUARDRAIL (TYP)

RELOCATED INTERMITTENT STREAM

APPROX LIMIT OF GRADING

PROP 72" CLF (TYP)

PROP 4" LOAM & SEED

PROP 4" LOAM & SEED
PROP 8' GRAVEL ACCESS PATH

APPROX LIMIT OF GRADING

PROP TREE PROTECTION FENCE

RET TREE

SAWCUT
MEET EXIST

PROP 4" LOAM
& SEED

RET

PROP HMA DRIVE

R&R MAILBOX

SAWCUT

PROP GRAN CURB TYPE VB

PROP WATER LINE

PROP CEM
CONC DRIVE 3

PT +35.46

McCRACKEN EAST
CONSTRUCTION E

N86°53'47"E
403.47'

R&D SHRUB

REM TREES

REM STUMP

PROP STONE MASONRY
RETAINING WALL

PROP GRAN CURB TYPE VB

SAWCUT

R&R MAILBOX

PROP TEMP
EASEMENT

PROP FOOTING SUBDRAIN

APPROX LIMIT OF GRADING

PROP PERM EASEMENT

PROP PERM UTILITY EASEMENT

PROP HMA DRIVE

PROP 5.5' CEM
CONC WALK

PROP TEMP
EASEMENT

PROP FULL
DEPTH PVM'T

PROP LOAM
& SEED

PROP HMA WALK

PROP TREE
PROTECTION
FENCE

PROP CEM
CONC DRIVE 4

PROP 4" LOAM
& SEED

BENCHMARK
"UP#20
R/R PIKE SET
ELEV.=425.06'

N/F
CURSHARAN AND
HARSIMRIT DHALLIWAL
MAP 35, BLOCK 20
BOOK 25617, PAGE 317

END GRAN CURB +72

SAWCUT
MEET EXIST

BEGIN GRAN CURB +96

SAWCUT
MEET EXIST

PROP TEMP
EASEMENT

SAWCUT
MEET EXIST

PROP PERM UTILITY
EASEMENT

N/F
RICHARD P. AND CHERYL A. GOSSELIN
MAP 35, BLOCK 21
BOOK 11947, PAGE 137

N/F
CHRISTOPHER M. AND
LYN A. DAVIDSON
MAP 35, BLOCK 24
BOOK 26194, PAGE 200

100' BUFFER TO BVW

1956 TOWN LAYOUT

LAURA LANE

N/F
MATHEW B. HUNTER
MAP 35, BLOCK 15
BOOK 19414, PAGE 110

POOL

1956 TOWN LAYOUT

N/F
ALFRED W. AND
TAKEKO NELSON
MAP 35, BLOCK 9
BOOK 4509, PAGE 374

REM EXISTING
STRUCTURE

REM APPROX
SEPTIC FIELD

REM BIRD
HOUSE

REM FENCE

PROP 4" LOAM & SEED

PROP BOUND

PROP FULL
DEPTH PVM'T

R&R WALL

1842 TOWN LAYOUT

BEGIN HIGHWAY
GUARD +38

REM FLAGS

REM BERM

REM BOUND

N86°53'47"E
535.39'

PROP GRAN
CURB TYPE VB

PROP CLEARING
& GRUBBING

PC +38.93

PROP WATER LINE

PROP GRAN
CURB TYPE VB

PROP PVM'T MILLING MULCH
UNDER GUARDRAIL (TYP)

R&R STONE
WALL

RET EX STONE WALL

BEGIN PROP
HIGHWAY GUARD +88

PROP 5.5' CEM
CONC WALK

PROP PERM
UTILITY
EASEMENT

PROP HMA
DRIVE

PROP PVM'T
RECLAMATION
IN PLACE

PROP PVM'T
MILLING MULCH
UNDER GUARDRAIL

PROP 4" LOAM
& SEED

PROP HEADWALL
REM EX HEADWALL

APPROX LIMIT
OF GRADING

PROP SEDIMENT
CONTROL BARRIER (TYP)

PROP PERM DRAINAGE EASEMENT

LIMIT OF BVW

PROP TEMP EASEMENT
END HIGHWAY GUARD +68

100' BUFFER TO BVW (TYP)

N/F
L-5, INC.
MAP 35, BLOCK 14
BOOK 32828, PAGE 53

PROP PERM UTILITY EASEMENT
PROP TEMP EASEMENT
PROP PERM EASEMENT
PROP STONE MASONRY
RETAINING WALL

PROP 72" CLF (TYP)

PROP STONE FOR
PIPE ENDS (TYP)

PROP TEMP
EASEMENT

PROP PERM
DRAINAGE
EASEMENT

LIMIT OF BVW

PROP WETLAND
RESTORATION AREA
AREA APPROX. 545 SF
SEE DETAIL SHEET 74

CONT. ON
SHEET 12

CONT. ON
SHEET 9

0 20 50 100
SCALE: 1" = 20'

FOR PROFILE PLANS SEE SHEET 16
FOR PROPOSED WALL STATIONING & DETAILS SEE SHEETS 23 & 70

HIGHWAY GUARD DETAILS

TRAILING END 209+68 RT, 216+41 RT
HIGHWAY GUARD 207+50 TO 210+62 LT,
207+88 TO 209+68 RT, 214+57 TO 216+41 RT
TANGENT END 210+62 LT, 214+57 RT

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE SHEET 63

DRAINAGE DETAILS

SEE SHEET 63

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	12	152
PROJECT FILE NO. 605377			

CONSTRUCTION PLANS

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N

McCRACKEN ROAD

N/F GRANGER-LYNCH CORP. MAP 35, BLOCK 10 BOOK 7298, PAGE 77

N/F GRANGER-LYNCH CORP. MAP 35, BLOCK 11 BOOK 7298, PAGE 77

CONT. ON SHEET 11

CONT. ON SHEET 13

LIMIT OF BVW

100' BUFFER TO BVW (TYP)

PROP PERM UTILITY EASEMENT
PROP TEMP EASEMENT
PROP PERM EASEMENT
PROP STONE MASONRY RETAINING WALL
PROP TEMP EASEMENT
END HIGHWAY GUARD +62
RET BOUND
PROP SEDIMENT CONTROL BARRIER (TYP)
APPROX LIMIT OF GRADING
PROP 4" LOAM & SEED
PROP PVM'T MILLING MULCH UNDER GUARDRAIL (TYP)
PROP WATER LINE
PROP GRAN CURB TYPE VB
=13°45'58"
R=1520.00'
L=365.20'
T=183.48'
210
211
212
213 PT +04.13
214
215
216
32.0'
REM
REM LEDGE
STONE WALL/ TOP LEDGE
R&R STONE WALL
RET EX STONE WALL
PROP STONE MASONRY RETAINING WALL
PROP TEMP EASEMENT
END HIGHWAY GUARD +68
PROP CLEARING & GRUBBING
PROP PERM EASEMENT
PROP 5.5' CEM CONC WALK
APPROX LIMIT OF GRADING
PROP LOAM & SEED
PROP HMA DRIVE
SAWCUT MEET EXIST
PROP TEMP EASEMENT
PROP PERM UTILITY EASEMENT
PROP LOAM & SEED
McCRACKEN EAST CONSTRUCTION E
PROP CEM CONC DRIVE 5
PROP WATER LINE
PROP GAS LINE (BO)
REM TREE
SAWCUT
1842 TOWN LAYOUT
END GRAN CURB +72
PROP FULL DEPTH PVM'T
REM PORTION OF ROW OF CEDARS
R&R
SAWCUT MEET EXIST
BEGIN GRAN CURB +10
RET
RET FLAG POLE
RET SIGN
RET WOOD FENCE
R&D
PROP TEMP EASEMENT
PROP PERM EASEMENT
PROP 4" LOAM & SEED
PROP PERM UTILITY EASEMENT
BENCHMARK FIRE HYDRANT X-CUT SET B.O.M.O. ELEV.=413.74'
PROP TEMP EASEMENT
APPROX LIMIT OF GRADING
END R&R GRAN CURB
BEGIN GRAN CURB +68
PROP 5.5' CEM CONC WALK
S79°20'15"E
343.51'
PROP FULL DEPTH PVM'T
BEGIN HIGHWAY GUARD +57
PROP SHALLOW CUTOFF SWALE
PROP SEDIMENT CONTROL BARRIER (TYP)
PROP PERM UTILITY EASEMENT
PROP LOAM & SEED
PROP CLEARING & GRUBBING
PROP 72" CLF (TYP)
APPROX 1980 SF OF WETLAND IMACT
LIMIT OF BVW
RET WOOD FENCE

0 20 50 100
SCALE: 1" = 20'

FOR PROFILE PLANS SEE SHEET 17
FOR PROPOSED WALL STATIONING & DETAILS SEE SHEETS 24 & 70

HIGHWAY GUARD DETAILS

TANGENT END 214+57 RT
HIGHWAY GUARD 214+57 TO 216+41 RT
TRAILING END 216+41 RT
R&R HIGHWAY GUARD 220+89 TO 223+91 RT

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE SHEET 64

DRAINAGE DETAILS

SEE SHEET 64

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	13	152
PROJECT FILE NO. 605377			

CONSTRUCTION PLANS

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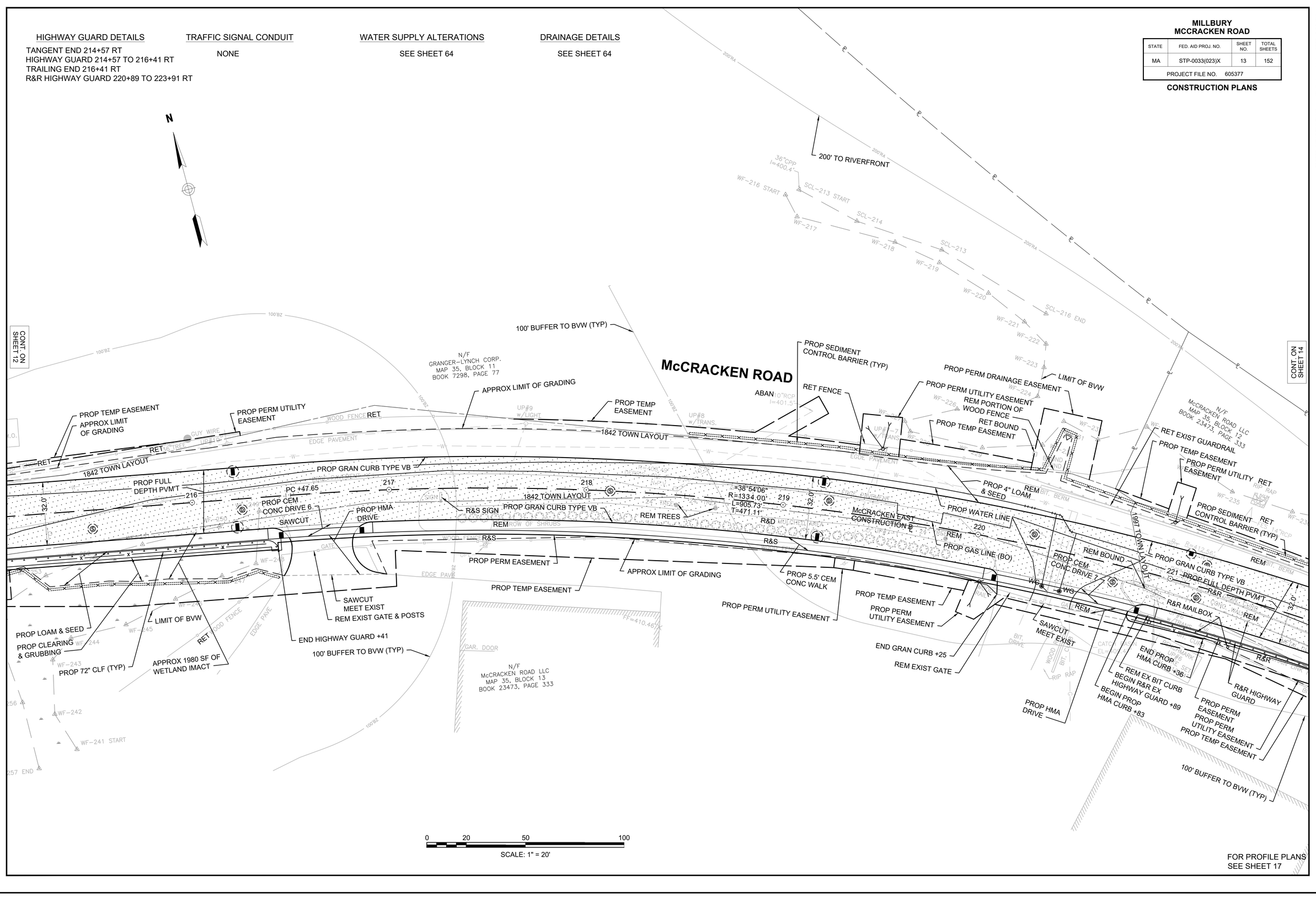


FOR PROFILE PLANS
SEE SHEET 17

HIGHWAY GUARD DETAILS

R&R HIGHWAY GUARD 221+78 TO 223+31 LT, 220+89 TO 224+60 RT

TRAFFIC SIGNAL CONDUIT

NONE

WATER SUPPLY ALTERATIONS

SEE SHEET 65

DRAINAGE DETAILS

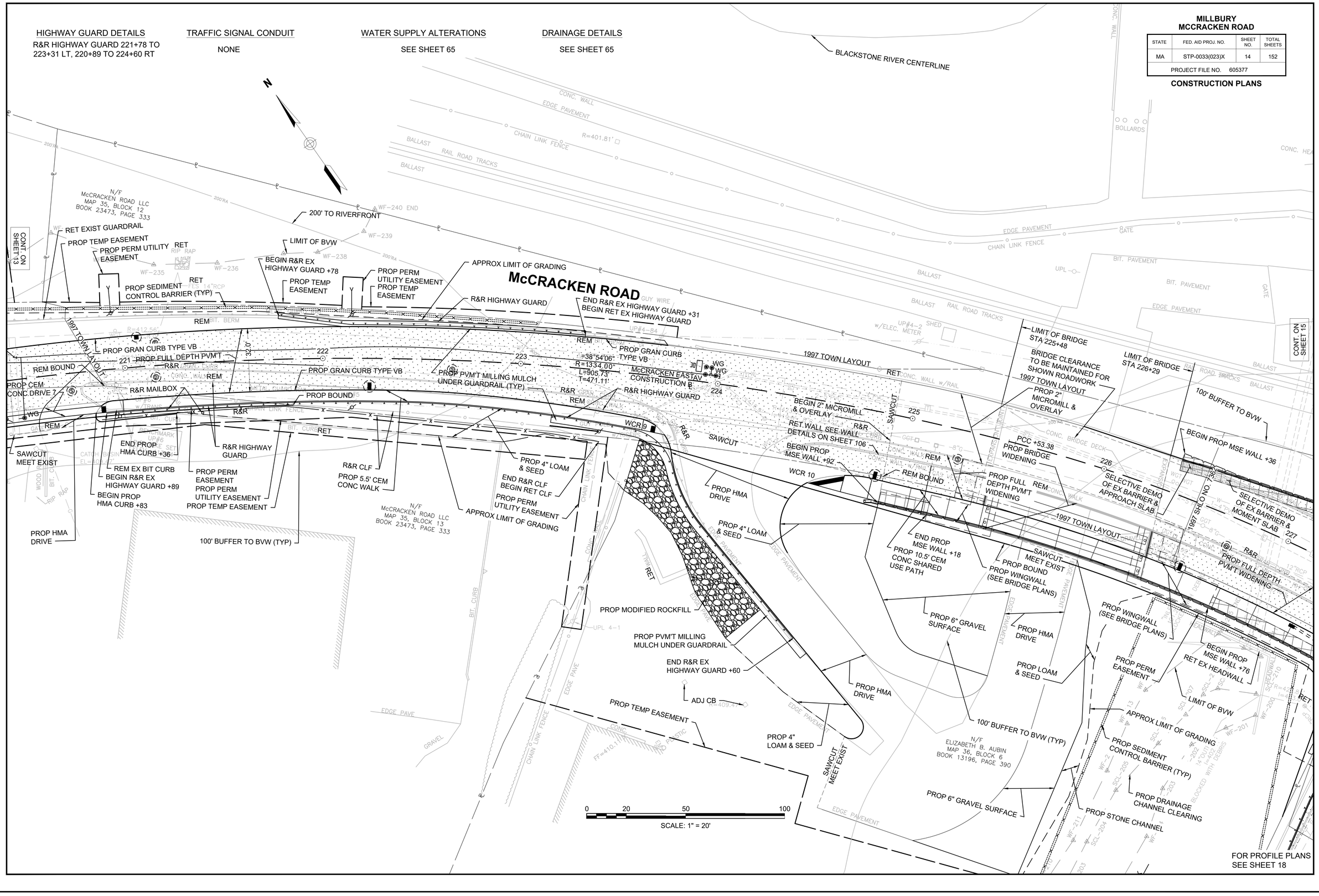
SEE SHEET 65

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	14	152
PROJECT FILE NO. 605377			

CONSTRUCTION PLANS

605377_HD(GEN).DWG Plotted on 11-Apr-2022 5:08 PM



FOR PROFILE PLANS SEE SHEET 18

HIGHWAY GUARD DETAILS

R&R HIGHWAY GUARD 501+00 TO 501+57 LT, 229+00 TO 229+38 RT
PROP TRANSITION TO RIGID BARRIER 501+57 LT

TRAFFIC SIGNAL CONDUIT

SEE SHEET 37

WATER SUPPLY ALTERATIONS

SEE SHEET 66

DRAINAGE DETAILS

SEE SHEET 66

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	15	152
PROJECT FILE NO. 605377			

CONSTRUCTION PLANS

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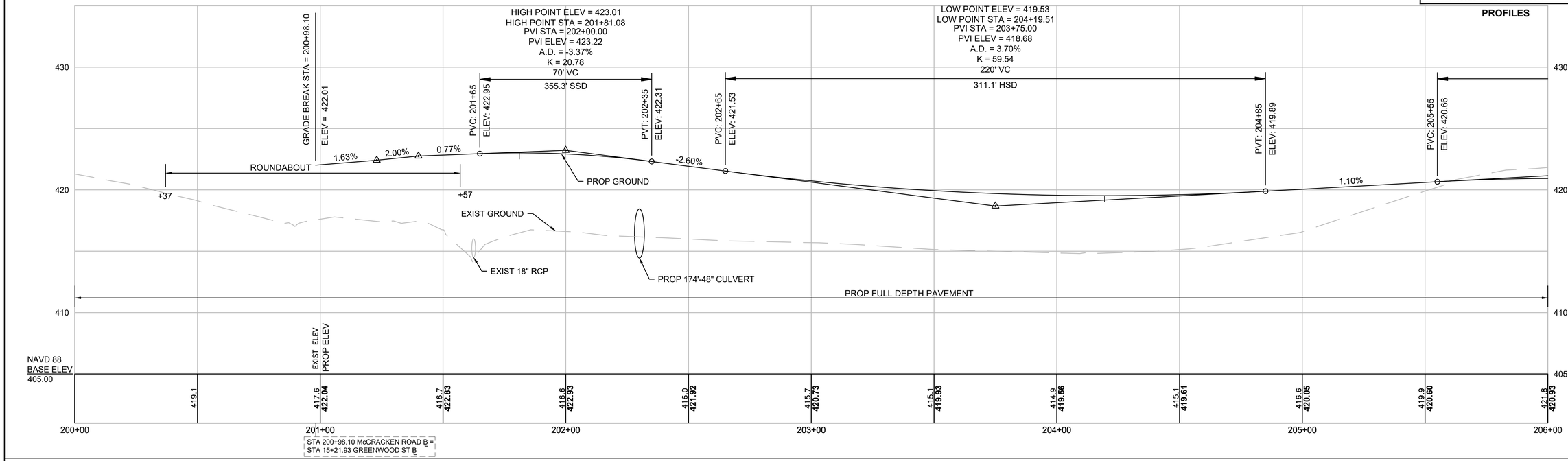
ROUTE 122A (MAIN STREET)
1997 SHLO NO. 7362
McCRACKEN ROAD
ROUTE 146 RAMP
BLACKSTONE VALLEY SHOPPES
N/F PROV./ WORCESTER RAILROAD
N/F COMMONWEALTH OF MASSACHUSETTS MAP 36, BLOCK 5 BOOK 18449, PAGE 214
N/F COMMONWEALTH OF MASSACHUSETTS BOOK 19449 BOOK 313
N/F ROUTE 146 MILLBURY LLC MAP 44, BLOCK 31 BOOK 24293, PAGE 105
N/F ELIZABETH B. AUBIN MAP 36, BLOCK 6 BOOK 13196, PAGE 390
LIMIT OF WORK STA 503+36.74 N: 2898728.6631 E: 580875.0107
LIMIT OF WORK STA 500+44.81 N: 2898612.9250 E: 580608.1717
LIMIT OF BRIDGE STA 225+48
LIMIT OF BRIDGE STA 226+29
BRIDGE CLEARANCE TO BE MAINTAINED FOR SHOWN ROADWORK 1997 TOWN LAYOUT
100' BUFFER TO BVW
BEGIN PROP MSE WALL +36
END PROP MSE WALL 227+65
PROP FULL DEPTH PVM'T WIDENING
PROP 2" MICROMILL & OVERLAY
SAWCUT MEET EXIST
SELECTIVE DEMO OF EX BARRIER & MOMENT SLAB
SELECTIVE DEMO OF EX BARRIER
SELECTIVE DEMO OF EX BARRIER & APPROACH SLAB
McCRACKEN EAST CONSTRUCTION R=800.00' L=223.94' T=112.71'
PT +77.32 =16°02'18"
PC +53.38
PROP BRIDGE WIDENING
PROP FULL DEPTH PVM'T WIDENING
REM BOUND
REM CONC. WALK
PROP WINGWALL (SEE BRIDGE PLANS)
END PROP MSE WALL +18
PROP 10.5' CEM CONC SHARED USE PATH
PROP HMA DRIVE
PROP 6" GRAVEL SURFACE
PROP LOAM & SEED
PROP 4" LOAM & SEED
CONT. ON SHEET 14
PROP HMA DRIVE
PROP 6" GRAVEL SURFACE
PROP 4" LOAM & SEED
SAWCUT MEET EXIST
PROP BOUND
PROP WINGWALL (SEE BRIDGE PLANS)
BEGIN PROP MSE WALL +76
RET EX HEADWALL
LIMIT OF BVW
PROP PERM EASEMENT
APPROX LIMIT OF GRADING
PROP SEDIMENT CONTROL BARRIER (TYP)
100' BUFFER TO BVW (TYP)
PROP DRAINAGE CHANNEL CLEARING
PROP STONE CHANNEL
PROP TEMP EASEMENT
PROP F&G
PROP 72" CLF
END PROP MSE WALL 227+69
END TRANSITION TO RIGID BARRIER +95
END R&R EX HIGHWAY GUARD BEGIN TRANSITION TO RIGID BARRIER +57
PROP BOUND
R&R GUARDRAIL
BEGIN R&R EX HIGHWAY GUARD +00
SAWCUT MEET EXIST
PROP TEMP EASEMENT
R&S EX STRAIN POLE
SELECTIVE DEMO OF EX BARRIER
PROP FULL DEPTH PVM'T WIDENING
PROP 2" MICROMILL & OVERLAY
RET
BEGIN GRAN CURB +53
END GRAN CURB +89
REM EX WCR
WCR 12
R&R
SAWCUT MEET EXIST
RET EX ISLAND
REM EX ISLAND
PROP GRAN CURB TYPE VB
END R&R EX HIGHWAY GUARD 229+38
BEGIN R&R EX HIGHWAY GUARD 229+00
R&R GUARDRAIL
PROP FULL DEPTH PVM'T WIDENING
PROP CEM CONC ISLAND
REM CONC BASE
REM EX SIGNAL CABINET
R&R BO
R&R BOLLARDS (TYP)
R&R BO
APPROX LIMIT OF GRADING
PROP TEMP EASEMENT
END PROJECT STA 229+37.50 N: 2898585.9959 E: 580856.1555
N88°36'21"E 33.95'
PT +83.36
Δ=24°54'41" R=335.00' L=145.65' T=74.00'
S24°23'52"E 172.68'
PC +37.71
N63°41'40"E 237.71'
501
502
503
504
SCALE: 1" = 20'
0 20 50 100
FOR PROFILE PLANS SEE SHEET 18

MILLBURY
MCCRACKEN ROAD

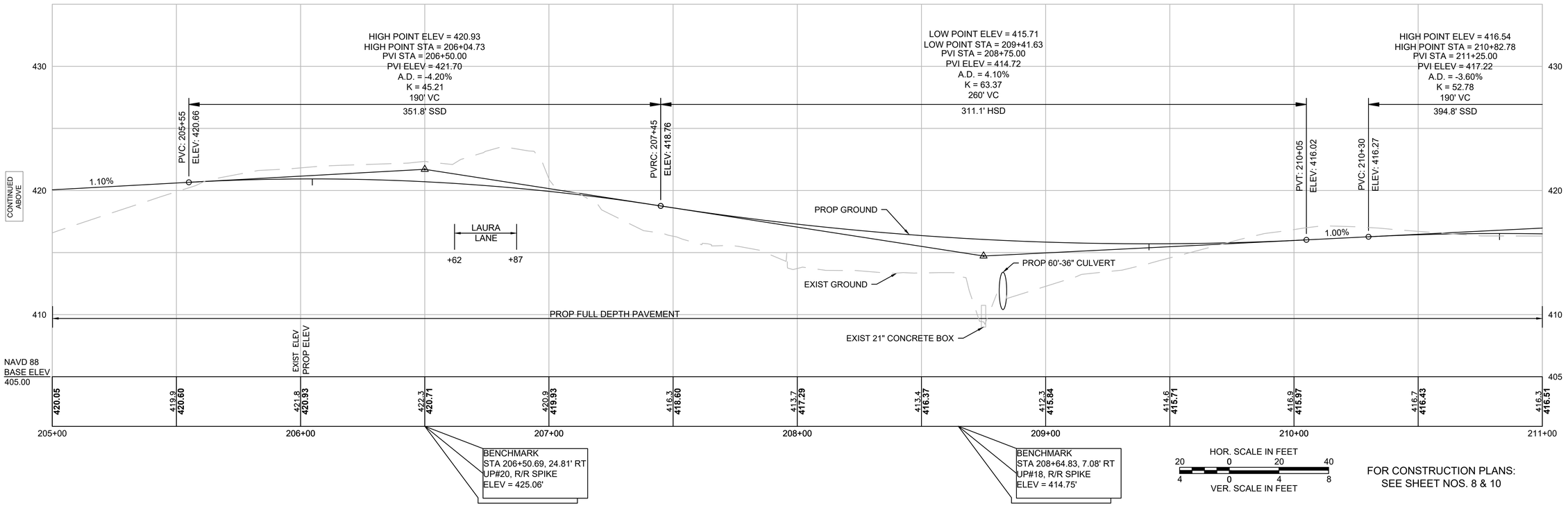
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	16	152
PROJECT FILE NO. 605377			

McCRACKEN ROAD

PROFILES



McCRACKEN ROAD



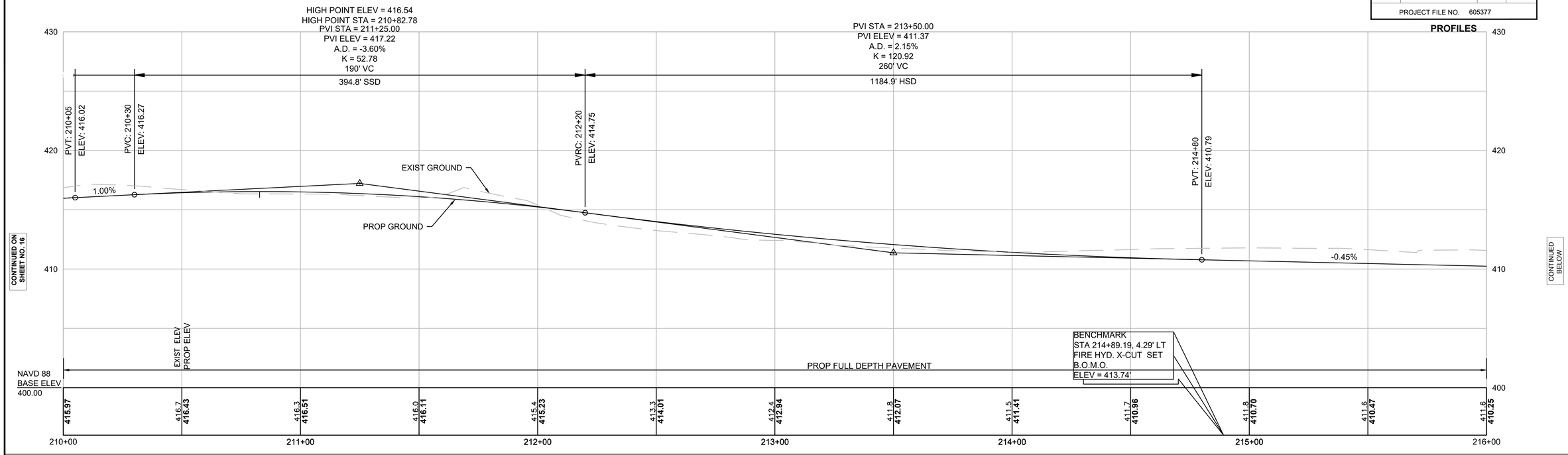
FOR CONSTRUCTION PLANS:
SEE SHEET NOS. 8 & 10

McCRACKEN ROAD

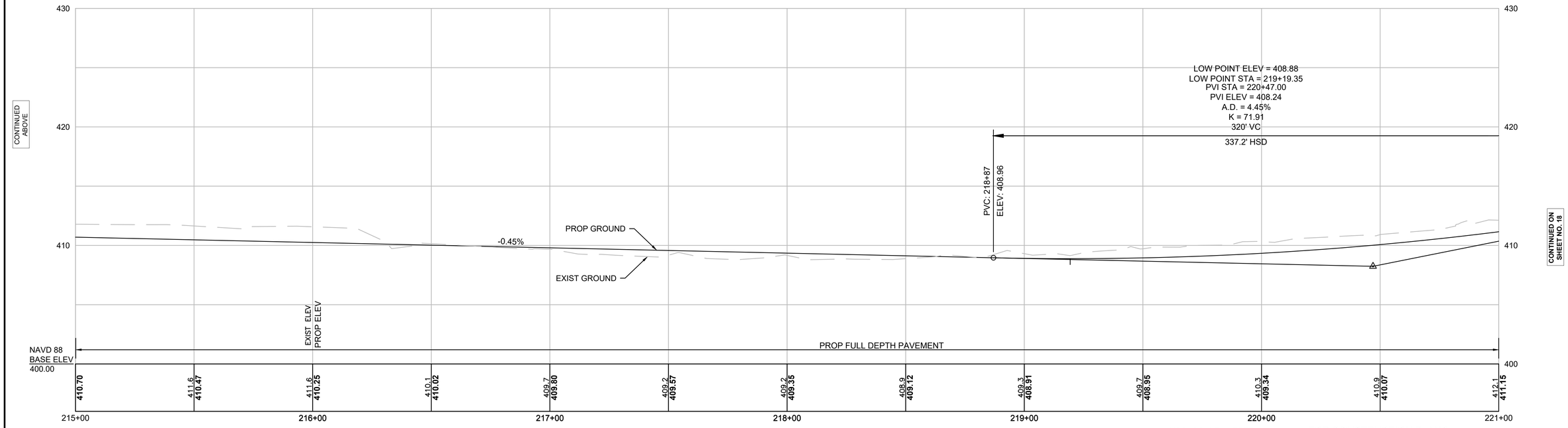
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	17	152
PROJECT FILE NO. 605377			

PROFILES



McCRACKEN ROAD



HOR. SCALE IN FEET
20 0 20 40

4 0 4 8
VER. SCALE IN FEET

FOR CONSTRUCTION PLANS:
SEE SHEET NOS. 10 &11

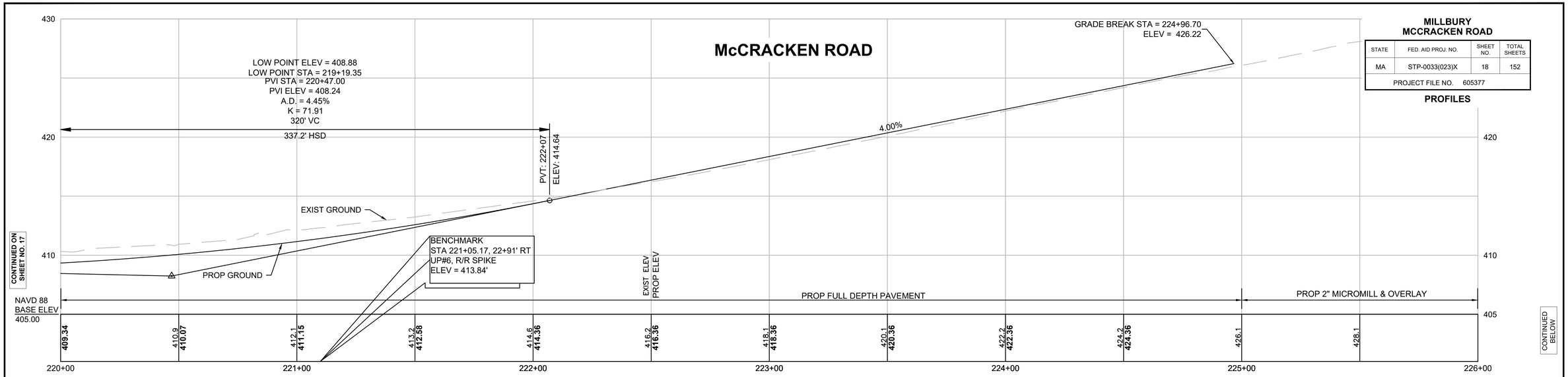
605377_HD(PROF).DWG Plotted on 11-Apr-2022 5:09 PM

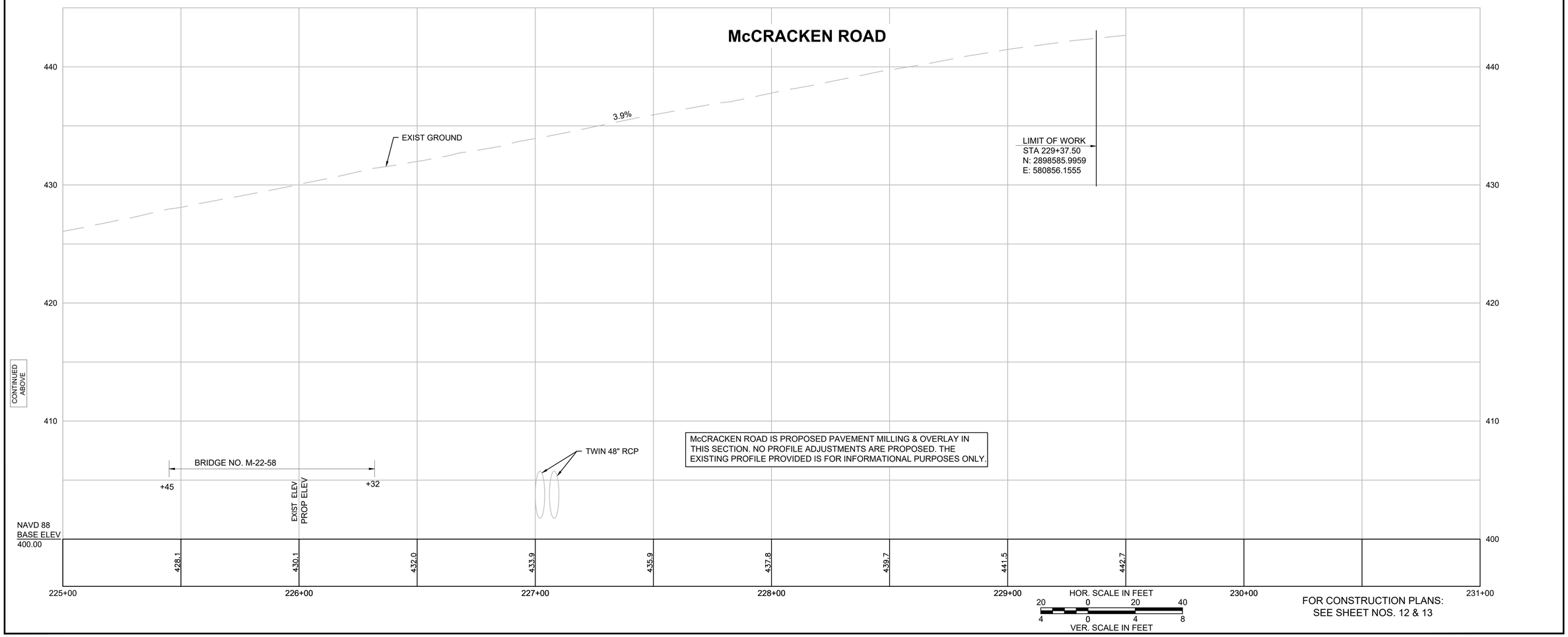
McCRACKEN ROAD

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	18	152
PROJECT FILE NO. 605377			

PROFILES





FOR CONSTRUCTION PLANS:
SEE SHEET NOS. 12 & 13

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	19	152
PROJECT FILE NO. 605377			

PROFILES

GREENWOOD STREET

LIMIT OF WORK
STA 10+56.00
N: 2899027.5262
E: 578455.6592

GRADE BREAK STA = 10+75.00
ELEV = 465.22

-13.95%

PVC: 12+45
ELEV: 441.50

PVI STA = 13+45.00
PVI ELEV = 427.55
A.D. = 11.00%
K = 18.18
200' VC
122.7' HSD

McCRACKEN ROAD
+31
+79

ROUNDABOUT
+63
+83

McCRACKEN ROAD
+00
+42

PVT: 14+45
ELEV: 424.60

GRADE BREAK STA = 14+80.93
ELEV = 423.54

GRADE BREAK STA = 14+97.93
ELEV = 423.20

GRADE BREAK STA = 15+47.93
ELEV = 420.73

GRADE BREAK STA = 15+64.93
ELEV = 421.07

PVC: 15+90
ELEV: 420.33

-2.95%
-2.00%
-4.95%
2.00%
-2.95%

PROP GROUND
EXIST GROUND
PROP 174'-48" CULVERT
PROP FULL DEPTH PAVEMENT
EXIST 18" RCP

CONTINUED ON SHEET NO. 20

	EXIST ELEV	461.9	455.0	447.6	440.5	433.6	427.2	422.3	419.8	418.0	417.3	417.3
NAVD 88 BASE ELEV 410.00	PROP ELEV	**461.73**	**454.76**	**447.78**	**440.81**	**434.66**	**429.89**	**426.49**	**424.46**	**423.10**	**420.77**	**420.05**

480 470 460 450 440 430 420 410

10+00 11+00 12+00 13+00 14+00 15+00 16+00

STA 13+57.33 GREENWOOD ST ℄ =
STA 53+77.42 McCRACKEN ROAD WEST ℄

HOR. SCALE IN FEET
20 0 20 40
VER. SCALE IN FEET
4 0 4 8

FOR CONSTRUCTION PLANS:
SEE SHEET NOS. 8 & 9

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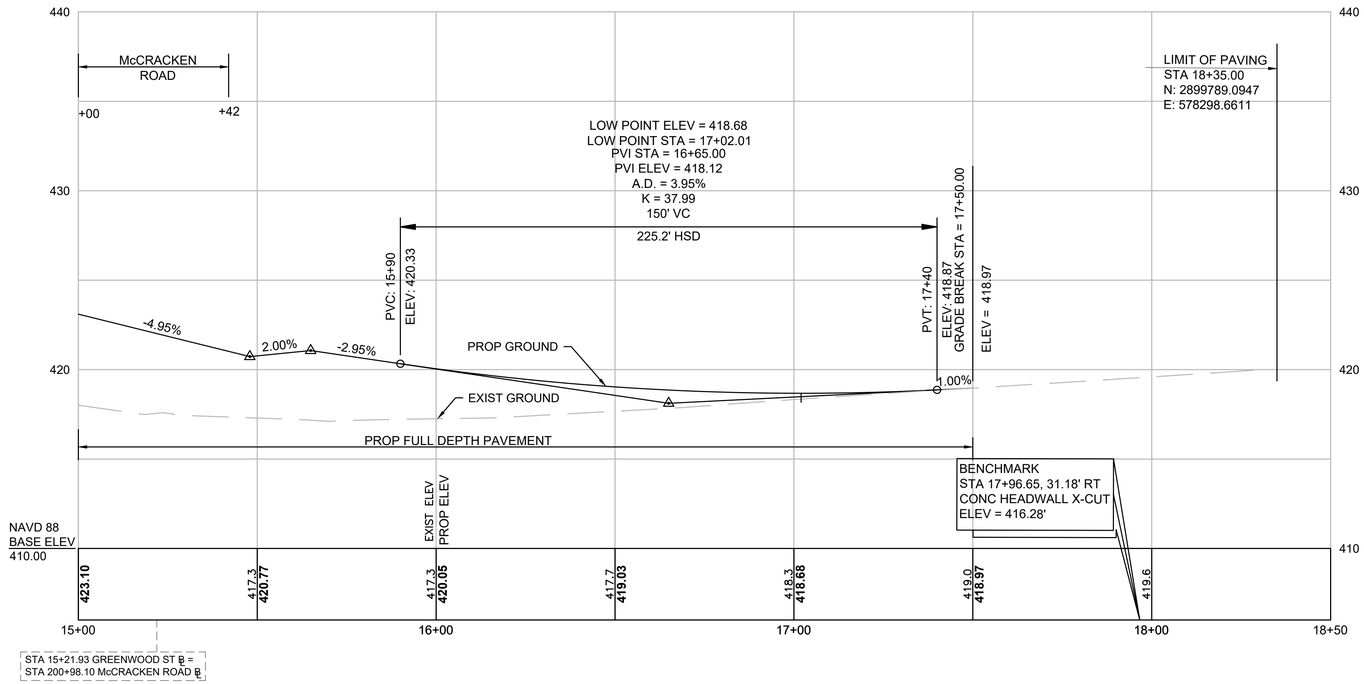
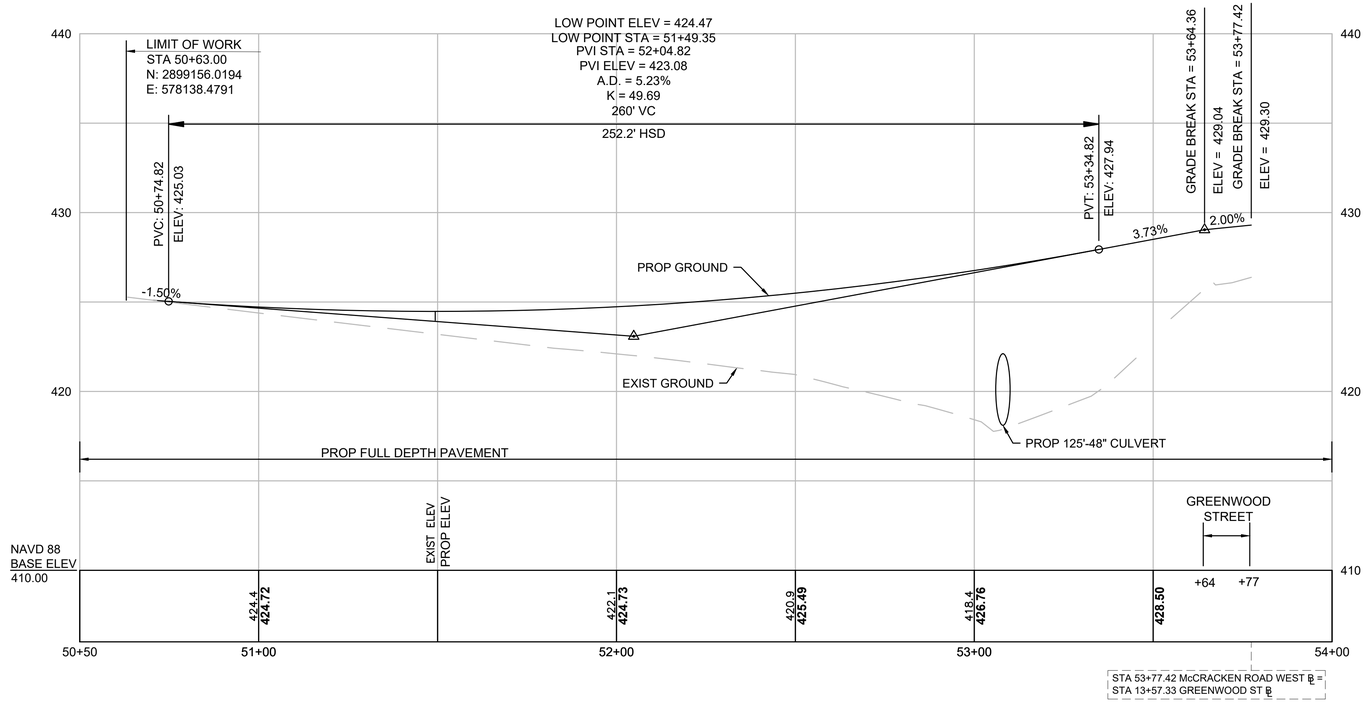
CONTINUED ON SHEET NO. 19

GREENWOOD STREET



FOR CONSTRUCTION PLANS:
SEE SHEET NOS. 8 & 9

McCRACKEN ROAD (WEST)



HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

FOR CONSTRUCTION PLANS:
SEE SHEET NOS. 9

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GREENWOOD CONSTRUCTION BASELINE DATA							
STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
13+30.71	2899296.225	578399.113	R=765.00' Δ=10°15'04" L=136.87' T=68.62'		14+67.58	2899430.172	578371.876
14+67.58	2899430.172	578371.876		N6° 22' 06"W 114.33'	15+81.91	2899543.799	578359.195
15+81.91	2899543.799	578359.195	R=765.00' Δ=10°16'49" L=137.26' T=68.81'		17+19.17	2899678.119	578331.847
17+19.17	2899678.119	578331.847		N16° 38' 55"W 130.83'	18+50.00	2899803.466	578294.364

MCCRACKEN EAST CONSTRUCTION BASELINE DATA							
STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
200+00.00	2899516.429	578273.224	R=1250.00' Δ=24°32'38" L=535.46' T=271.90'		205+35.46	2899431.763	578797.814

Curve Table			
Curve #	Delta	Radius	Length
6	85° 40' 12"	30.00	44.86
8	15° 41' 54"	200.00	54.80
9	75° 05' 20"	60.00	78.63
10	47° 26' 20"	110.00	91.08
12	2° 19' 36"	600.00	24.37
14	24° 24' 21"	200.00	85.19
16	41° 45' 12"	100.00	72.87
17	67° 58' 40"	30.00	35.59
18	18° 28' 01"	200.00	64.46
42	166° 13' 54"	2.00	5.80
43	9° 35' 05"	200.00	33.46
44	123° 45' 01"	2.00	4.32
45	22° 29' 43"	60.00	23.56
46	121° 44' 33"	2.00	4.25
47	19° 38' 40"	150.00	51.43
48	126° 00' 37"	2.00	4.40

Curve Table			
Curve #	Delta	Radius	Length
44	123° 45' 01"	2.00	4.32
45	22° 29' 43"	60.00	23.56
46	121° 44' 33"	2.00	4.25
47	19° 38' 40"	150.00	51.43
48	126° 00' 37"	2.00	4.40
49	18° 02' 03"	60.00	18.89
50	119° 47' 25"	2.00	4.18
51	14° 23' 12"	120.00	30.13
52	155° 44' 36"	2.00	5.44
53	117° 53' 16"	2.00	4.12
54	18° 06' 59"	60.00	18.97
55	123° 45' 01"	2.00	4.32
56	12° 01' 37"	200.00	41.98
57	171° 15' 31"	2.00	5.98
58	22° 08' 09"	100.00	38.63
68	1° 27' 54"	987.00	25.24
69	9° 07' 23"	200.00	31.85

Point Table				
Point #	Northing	Easting	Elevation	Raw Description
8	2899417.9688	578724.4699	415.52	MRRS

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	21	152
PROJECT FILE NO. 605377			

ALIGNMENT & GRADING PLANS

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CONT. ON SHEET 23

McCRACKEN ROAD

GREENWOOD STREET

MEET EXISTING +35.0 14.0' LT

MEET EXISTING +50.0 13.7' RT

LIMIT OF WORK STA 18+35.00 N: 2899789.0947 E: 578298.6611

LIMIT OF PAVING STA 17+50.00

PT +97.68 12.78' LT

PC +71.94 12.50' LT

N16°38'55"W 130.83'

SAWCUT MEET EXIST

PT +19.17

PT +18.03 13.00' LT

PT +19.42 13.00' LT

17 GREENWOOD CONSTRUCTION ℄

PRC +60.82 13.00' RT

PCC +48.45 13.00' LT

16+34.56 13.73' LT 419.00' BC

16+01.84 3.85' LT 420.00' BC

16+01.10 21.65' LT 420.00' BC

R=765.00' L=137.26'

CC +13.86 1.03' RT

16+35.71 15.11' RT 419.00' BC

16+04.87 5.59' RT 420.00' BC

16+09.40 21.89' RT 420.00' BC

CC +84.47 7.76' LT

PT +82.84 56.50' LT ELEV. = 421.4'

15+60.84 18.11' LT 421.00' BC

CC +83.63 11.88' RT

PC +81.91

PC +81.66 35.15' RT

15+79.29 36.54' RT 421.00' BC

15+42.23 15.81' RT 422.00' BC

15+42.47 37.11' RT 422.00' BC

15+43.98 57.19' RT 422.00' BC

420.9' 15+96, 95'± LT

R=40.00' L=43'±

R=30.00' L=30'±

420.9' 15+85, 91'± LT

PT +75.94 63.79' LT ELEV. = 421.1'

R=6.00' L=5'±

N6°22'06"W 114.33'

15+67.14 41.02' LT 421.00' BC

15+42.96 14.96' LT 421.00' BC

15+47.80 2.50' RT 421.00' BC

R=6.00' L=8'±

PRC +63.43 44.27' LT

15+46.40 8.61' LT 420.50' BC

PC +46.70 39.57' LT

15+29.96 41.45' LT 422.00' BC

15+30.79 59.47' LT 422.00' BC

15+34.42 22.25' LT 422.00' BC

CC 200+97.70 0.92' LT

15+15.89 23.99' RT 423.00' BC

15+33.95 3.86' LT 422.00'

15+15.69 0.92' LT 423.00'

14+96.42 32.51' RT 423.00' BC

CC +59.50 8.27' LT

14+94.93 53.06' RT 423.00' BC

PRC +56.33 10.77' RT

PT +97.96 1.92' LT ELEV. = 422.19'

BEGIN PROP WALL & CLF STA 202+10

PCC +15.50 16.00' LT 421.55' BC

PRC +58.97 13.08' RT ELEV. = 423.19'

CC +03.88 0.29' RT

PT +99.36 2.86' RT

McCRACKEN EAST CONSTRUCTION ℄

14+91.02 50.80' LT 423.00' BC

14+94.57 30.98' LT 423.00' BC

PRC +90.57 50.53' LT

15+03.65 15.96' LT 423.00' BC

14+63.87 10.29' LT 424.00' BC

14+63.71 9.91' RT 424.00' BC

PT +67.68

CC +61.76 10.59' RT

424.35 BC 14+50

PCC +66.96 27.87' RT 423.62' BC

422.17 BC 202+21.70

421.85 BC 202+21.70

PRC +28.96 16.00' RT 421.28' BC

CC +62.52 13.58' LT

423.87 BC 14+50

PCC +41.92 28.07' LT

PC +29.97 6.97' LT

PCC +50.36 26.74' RT 424.04' BC

424.38 BC 14+50

PCC +18.15 22.23' LT

CC +11.25 2.30' LT

425.41 BC 14+14

STA 200+98.10 McCRACKEN EAST ℄ = STA 15+21.93 GREENWOOD ℄

PRC +21.87 16.00' RT

PRC +58.17 16.00' RT

TRAV NO.8 ELEV 415.52

R=1250.00' L=535.46'

SURVEY TRAVERSE

R=10.00' L=13'±

PT +31.25 23.06' RT

PT +32.75 28.11' RT

R=10.00' L=16'±

PC +48.38 25.96' RT

PT +48.38 29.01' RT

N/F LALLO ROBERTO JR MAP 35, BLOCK 50 BOOK 56699, PAGE 319

N/F JOSEPH ARRON MAP 35, BLOCK 7 BOOK 54802, PAGE 143

N/F SOU BRUCE SOO DONG MAP 27, BLOCK 20 BOOK 55840, PAGE 297

N/F CITY OF WORCESTER BOOK 3870, PAGE 329

N/F SCOTT L. MILLER MAP 35, BLOCK 23 BOOK 41549, PAGE 317

N/F BRUCE E. DAVINI MAP 35, BLOCK 22 BOOK 16156, PAGE 199

N/F GRANGER-LYNCH CORP. MAP 27, BLOCK 17 BOOK 7298, PAGE 77

BIT. DRIVE

CONC. WALK

RET. WALL

15' ELECTRIC EASEMENT

FES

LEGEND

C# CURVE #

X WCR #

DX DRIVEWAY #

FOR WCR & DRIVEWAY DETAILS SEE SHEETS 77 TO 78

0 20 50 100

SCALE: 1" = 20'

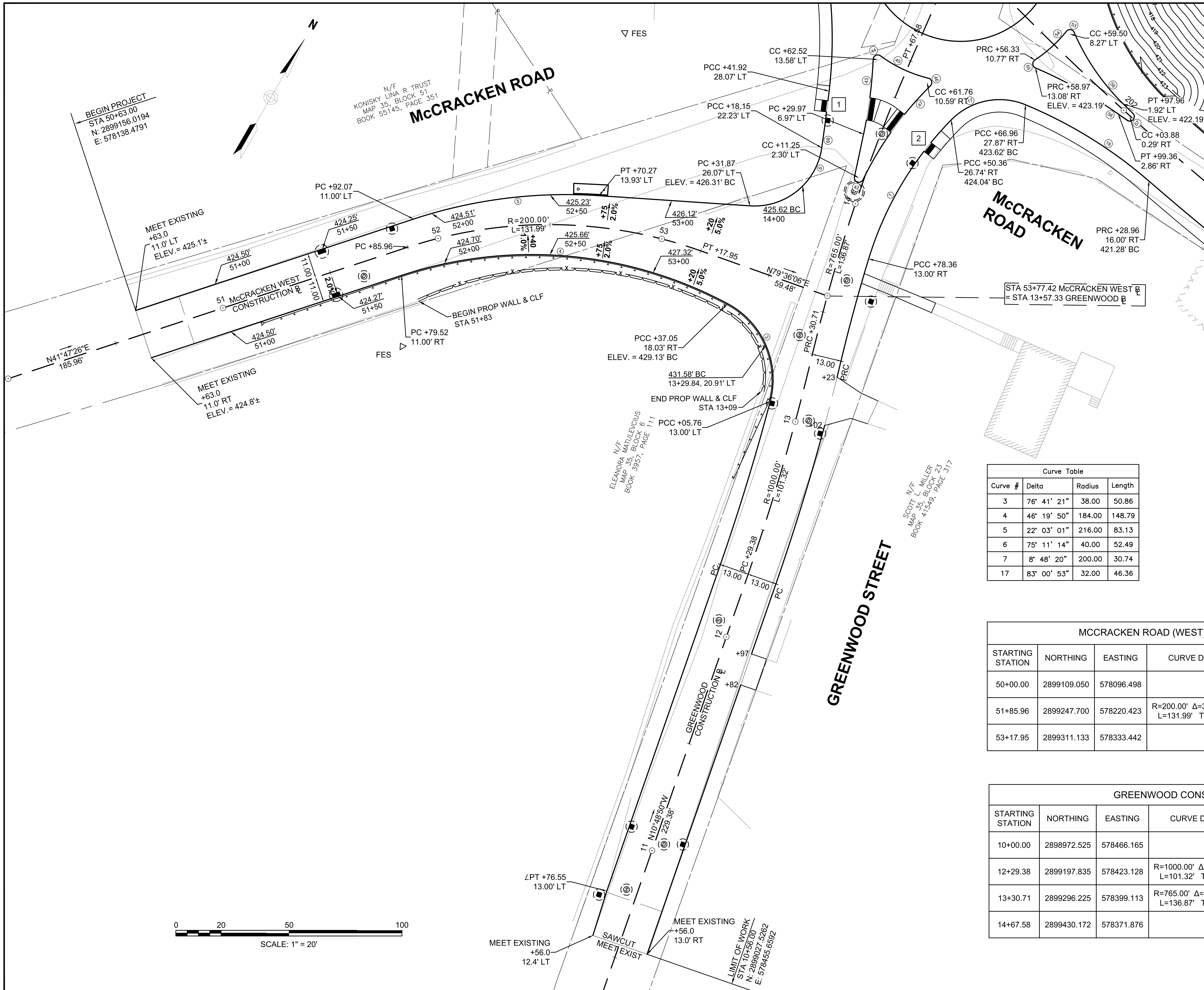
CONT. ON SHEET 22

CONT. ON SHEET 21

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	22	152
PROJECT FILE NO. 605377			

ALIGNMENT & GRADING PLANS



Curve Table

Curve #	Delta	Radius	Length
3	76° 41' 21"	38.00	50.86
4	46° 19' 50"	184.00	148.79
5	22° 03' 01"	216.00	83.13
6	75° 11' 14"	40.00	52.49
7	8° 48' 20"	200.00	30.74
17	83° 00' 53"	32.00	46.36

LEGEND

- (C#) CURVE #
- [X] WCR #
- (DX) DRIVEWAY #

FOR WCR & DRIVEWAY DETAILS SEE SHEETS 77 TO 78

MCCRACKEN ROAD (WEST) CONSTRUCTION BASELINE DATA

STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
50+00.00	2899109.050	578096.498		N41° 47' 26"E 185.96'	51+85.96	2899247.700	578220.423
51+85.96	2899247.700	578220.423	R=200.00' Δ=37°48'40" L=131.99' T=68.50'		53+17.95	2899311.133	578333.442
53+17.95	2899311.133	578333.442		N79° 36' 06"E 59.48'	53+77.42	2899321.868	578391.942

GREENWOOD CONSTRUCTION BASELINE DATA

STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
10+00.00	2898972.525	578466.165		N10° 48' 50"W 229.38'	12+29.38	2899197.835	578423.128
12+29.38	2899197.835	578423.128	R=1000.00' Δ=5°48'19" L=101.32' T=50.70'		13+30.71	2899296.225	578399.113
13+30.71	2899296.225	578399.113	R=765.00' Δ=10°15'04" L=136.87' T=68.62'		14+67.58	2899430.172	578371.876
14+67.58	2899430.172	578371.876		N6° 22' 06"W 114.33'	15+81.91	2899543.799	578359.195

605377_HD(ALIGN).DWG Plotted on 11-Apr-2022 5:11 PM

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	23	152
PROJECT FILE NO. 605377			

ALIGNMENT & GRADING PLANS

Plotted on 11-Apr-2022 5:11 PM

605377_HD(ALIGN).DWG

MCCRACKEN ROAD (EAST) CONSTRUCTION BASELINE DATA

STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
200+00.00	2899516.429	578273.224	R=1250.00' Δ=24°32'38" L=535.46' T=271.90'		205+35.46	2899431.763	578797.814
205+35.46	2899431.763	578797.814		N86° 53' 47"E 403.47'	209+38.93	2899453.609	579200.690
209+38.93	2899453.609	579200.690	R=1520.00' Δ=13°45'58" L=365.20' T=183.48'		213+04.13	2899429.595	579564.222

Curve Table

Curve #	Delta	Radius	Length
21	81° 32' 29"	20.00	28.46
22	99° 02' 22"	20.00	34.57

Point Table

Point #	Northing	Easting	Elevation	Raw Description
8	2899417.9688	578724.4699	415.52	MRRS
7	2899141.1996	578908.5196	422.57	MSTN

N
McCRACKEN ROAD
LAURA LANE
CONT. ON SHEET 21
CONT. ON SHEET 24
N/F BETTINA M. WHITE AND JIMMY DIAZ MAP 35, BLOCK 8 BOOK 42186, PAGE 297
N/F ALFRED W. AND TAKEKO NELSON MAP 35, BLOCK 9 BOOK 4509, PAGE 374
N/F GRANGER-LYNCH CORP. MAP 35, BLOCK 10 BOOK 7298, PAGE 77
N/F L-5, INC. MAP 35, BLOCK 14 BOOK 32828, PAGE 53
N/F MATHEW B. HUNTER MAP 35, BLOCK 15 BOOK 19414, PAGE 110
N/F CURSHARAN AND HARSIMRIT DHALLIWAL MAP 35, BLOCK 20 BOOK 25617, PAGE 317
N/F RICHARD P. AND CHERYL A. GOSSELIN MAP 35, BLOCK 21 BOOK 11947, PAGE 137
N/F CHRISTOPHER M. AND LYN A. DAVIDSON MAP 35, BLOCK 24 BOOK 26194, PAGE 200
N/F BRUCE E. DAVINI MAP 35, BLOCK 22 BOOK 16156, PAGE 199
R=24.00' L=38'±
PT +10.15 98.61' LT
PT +10.23 90.61' LT
R=16.00' L=26'±
PC +86.41 73.62' LT
PC +94.40 73.95' LT
FES
PROP BOUND N 2899457.8142 E 578945.8556 206+84.70, 18.00' LT
PROP BOUND N 2899473.5863 E 579107.3895 208+46.85, 25.00' LT
TRAV NO.7 ELEV 422.57
TRAV NO.8 ELEV 415.52
END PROP WALL & CLF STA 205+44
BEGIN PROP WALL & CLF STA 208+00
END PROP WALL & CLF STA 210+00
+88.78
+96.79
8.00
PT +61
+84
PT +35.46
R=1250.00' L=535.46'
N82°48'22"E 185.51'
SURVEY TRAVERSE
McCRACKEN EAST CONSTRUCTION B
N86°53'47"E 535.39'
N85°36'50"E 491.12'
R=1520.00' L=365.20'
PC +38.93
PC
PRC +21.87 16.00' RT
PRC +58.17 16.00' RT
PC +47.36 16.00' RT
PT +12.14 16.00' RT
PC +59.79 16.00' RT
PT +97.86 16.00' RT
16.00
204
205
206
207
208
209
210
BEGIN PROP WALL STA 205+00
END PROP WALL STA 206+51
PT +67.14 33.08' RT
ELEV. = 422.10' BC
422.68 206+68.91, 44.94' RT
MEET EXISTING +72.0 65.8' RT ELEV. = 423.2'±
421.84 BC 206+94.92, 55.03' RT
420.05 BC 206+95.00, 25.69' RT
PC +92.39 39.14' RT ELEV. = 421.35' BC
MEET EXISTING +96.1 62.5' RT ELEV. = 422.0'±
R=10.00' L=15'±
PT +69.77 25.43' RT
R=10.00' L=15'±
PC +87.87 25.48' RT
BEGIN PROP WALL STA 209+68
R=10.00' L=13'±
PT +31.25 23.06' RT
∠PT +32.75 28.11' RT
R=10.00' L=16'±
PC +48.38 25.96' RT
∠PT +48.38 29.01' RT
D3
D4
3
4
PORCH
CONC.
CHICKEN WIRE FENCE
WOOD FENCE

0 20 50 100

SCALE: 1" = 20'

LEGEND

- (C#) CURVE #
- [X] WCR #
- <DX> DRIVEWAY #

FOR WCR & DRIVEWAY DETAILS SEE SHEETS 77 TO 78

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	24	152
PROJECT FILE NO. 605377			

ALIGNMENT & GRADING PLANS

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N

Curve Table			
Curve #	Delta	Radius	Length
25	54° 56' 19"	30.00	28.77
26	80° 55' 07"	15.00	21.18

Point Table				
Point #	Northing	Easting	Elevation	Raw Description
6	2899478.7587	579398.2013	416.04	MSTN
5	2899407.1752	579605.2459	412.28	MRRS

CONT. ON SHEET 23

N/F
GRANGER-LYNCH CORP.
MAP 35, BLOCK 10
BOOK 7298, PAGE 77

McCRACKEN ROAD

END PROP WALL & CLF
STA 210+00

TRAV NO.6
ELEV 416.04

SURVEY TRAVERSE

210 — R=1520.00'
L=365.20'

211

212

16.00

S70°55'40"E
219.07'

BEGIN PROP WALL STA 209+68

N/F
L-5, INC.
MAP 35, BLOCK 14
BOOK 32828, PAGE 53

N/F
L-5, INC.
MAP 35, BLOCK 14
BOOK 32828, PAGE 53

END PROP WALL STA 212+55

PC +19.82
16.00' RT
R=5.00'
L=10'±

PT +24.47
22.82' RT

PC +44.72
20.12' RT

PT +54.39
28.96' LT
ELEV. = 413.57' BC

PRC +30.30
16.00' LT

MEET EXISTING
+71.1
54.6' LT
ELEV. = 409.4'±

410.90 BC
212+65.00
45.10' LT

409.83 BC
213+11.50,
41.74' LT

N/F
GRANGER-LYNCH CORP.
MAP 35, BLOCK 11
BOOK 7298, PAGE 77

MEET EXISTING
+09.7
53.2' LT
ELEV. = 408.4'±

PC +13.59
28.63' LT
ELEV. = 410.37' BC

PT +28.41
16.00' LT

412.18 BC
213+20

213 — PT +04.13

TRAV NO.5
ELEV 412.28

McCRACKEN EAST
CONSTRUCTION ℄

PT

R=5.00'
L=7'±

D5

PT +49.64
16.00' RT

214

16.00

S87°12'55"E
338.39'

215

SURVEY TRAVERSE

S79°20'15"E
343.51'

216

BEGIN PROP CLF
STA 215+20

CONT. ON SHEET 25

MCCRACKEN ROAD (EAST) CONSTRUCTION BASELINE DATA							
STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
209+38.93	2899453.609	579200.690	R=1520.00' Δ=13°45'58" L=365.20' T=183.48'		213+04.13	2899429.595	579564.222
213+04.13	2899429.595	579564.222		S79° 20' 15"E 343.51'	216+47.65	2899366.037	579901.804

LEGEND

- C# CURVE #
- X WCR #
- DX DRIVEWAY #

FOR WCR & DRIVEWAY DETAILS
SEE SHEETS 77 TO 78

0 20 50 100

SCALE: 1" = 20'

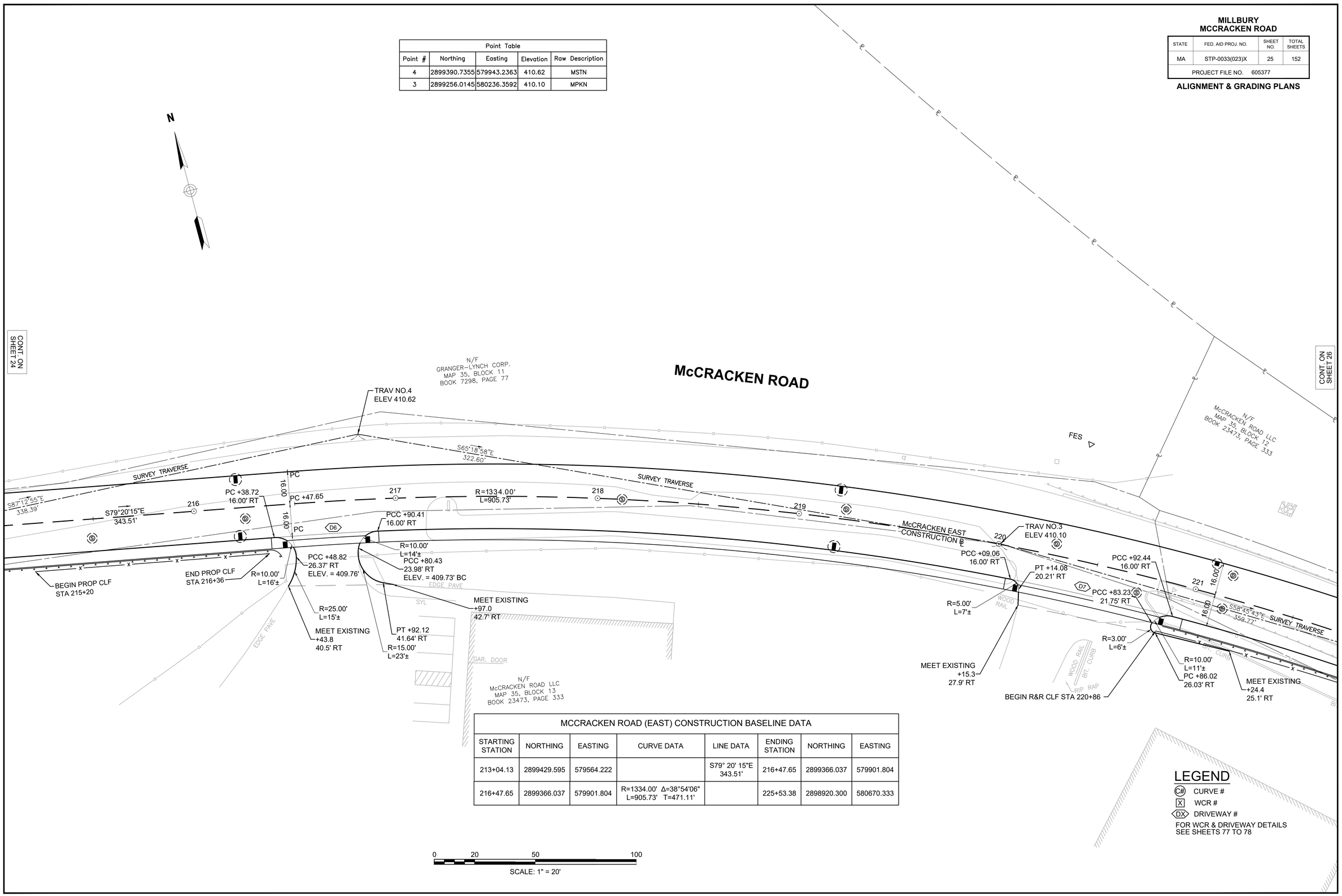
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	25	152
PROJECT FILE NO. 605377			

ALIGNMENT & GRADING PLANS

605377_HD(ALIGN).DWG Plotted on 11-Apr-2022 5:11 PM

Point Table				
Point #	Northing	Easting	Elevation	Raw Description
4	2899390.7355	579943.2363	410.62	MSTN
3	2899256.0145	580236.3592	410.10	MPKN



MCCRACKEN ROAD (EAST) CONSTRUCTION BASELINE DATA							
STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
213+04.13	2899429.595	579564.222		S79° 20' 15"E 343.51'	216+47.65	2899366.037	579901.804
216+47.65	2899366.037	579901.804	R=1334.00' Δ=38°54'06" L=905.73' T=471.11'		225+53.38	2898920.300	580670.333

LEGEND

- C# CURVE #
- X WCR #
- DX DRIVEWAY #

FOR WCR & DRIVEWAY DETAILS SEE SHEETS 77 TO 78

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	26	152
PROJECT FILE NO. 605377			

ALIGNMENT & GRADING PLANS

605377_HD(ALIGN).DWG Plotted on 11-Apr-2022 5:11 PM

Point Table				
Point #	Northing	Easting	Elevation	Raw Description
2	2899069.4400	580543.9700	420.61	MPKN

Curve Table			
Curve #	Delta	Radius	Length
30	3° 54' 27"	500.00	34.10
31	6° 15' 52"	805.50	88.07
32	72° 31' 07"	20.00	25.31
33	108° 35' 19"	25.00	47.38
34	33° 06' 39"	70.00	40.45
35	15° 48' 21"	764.00	210.76
63	7° 39' 29"	200.00	26.73
64	29° 39' 37"	40.00	20.71
65	165° 25' 22"	6.00	17.32
66	95° 29' 57"	15.00	25.00
70	27° 07' 48"	60.00	28.41
71	1° 35' 43"	1000.00	27.84

CONT. ON SHEET 25

CONT. ON SHEET 27

N/F
McCRACKEN ROAD LLC
MAP 35, BLOCK 12
BOOK 23473, PAGE 333

McCRACKEN ROAD

TRAV NO.2
ELEV 420.61

PCC +92.44
16.00' RT

221

16.00

16.00

S58°45'43"E SURVEY TRAVERSE
359.77'

222

223

R=1334.00'
L=905.73'

PCC +39.06
16.00' RT

PCC +73.57
16.72' RT

224

McCRACKEN EAST CONSTRUCTION

PCC +62.74
22.32' RT
ELEV. = 419.74'

PRC +87.14
33.89' RT
ELEV. = 424.94'

225

PCC +53.38

226

PC +15.71
34.32' RT
ELEV. = 426.44'

S31°45'45"E
402.54'

R=800.00'
L=223.94'

SURVEY TRAVERSE

227

PCC +83.23
21.75' RT

D7

R=3.00'
L=6'±

R=10.00'
L=11'±
PC +86.02
26.03' RT

MEET EXISTING
+24.4
25.1' RT

PROP BOUND
N 2899145.2338
E 580382.5190
221+84.43, 23.37' RT

BEGIN R&R CLF STA 220+86

END R&R CLF
STA 223+43

PRC +81.08
37.75' RT
ELEV. = 421.38' BC

PCC +58.70
39.09' RT

417.62 BC
224+46.00
50.50' RT

PCC +49.65
78.76' RT
ELEV. = 416.42' BC

+90.87
73.35' RT
ELEV. = 408.00'

PROP BOUND
N 2898881.9808
E 580636.6772
225+61.21, 50.43' RT

PT +70.25
97.29' RT
ELEV. = 414.54' BC

MEET EXISTING
+70.1
46.8' RT
ELEV. = 407.9'±

+16.02
107.00' RT
ELEV. = 408.00'

+32.05
115.25' RT
ELEV. = 408.00'

PT +71.99
117.16' RT
ELEV. = 407.00'

PROP BOUND
N 2898815.6064
E 580685.0764
226+48.97, 51.34' RT

PT +02.15
72.15' RT
ELEV. = 419.20' BC

415.68 BC
224+00.00
104.83' RT

PC +01.65
120.62' RT
ELEV. = 411.75' BC

PC +07.53
154.03' RT
ELEV. = 409.88' BC

MEET EXISTING
+00.6
164.2' RT
ELEV. = 408.8'±

PT +22.44
128.63' RT.
ELEV. = 410.17' BC

PC +52.50
132.01' RT
ELEV. = 407.87'

N/F
ELIZABETH B. AUBIN
MAP 36, BLOCK 6
BOOK 13196, PAGE 390

MEET EXISTING
+93.7
202.3' RT
ELEV. = 409.6'±

PROP BOUND
N 2898688.4169
E 580672.5880
501+36.01, 39.10' LT

MCCRACKEN ROAD (EAST) CONSTRUCTION BASELINE DATA							
STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
216+47.65	2899366.037	579901.804	R=1334.00' Δ=38°54'06" L=905.73' T=471.11'		225+53.38	2898920.300	580670.333
225+53.38	2898920.300	580670.333	R=800.00' Δ=16°02'18" L=223.94' T=112.71'		227+77.32	2898731.875	580789.989

BIT. CURB
WOOD RAIL
BIT. CURB
RIP RAP
CONC. WALL
TWIN
EDGE PAVE
EDGE PAVE
EDGE PAVE
CHAIN LINK FENCE
CONC
GRAVEL

LEGEND

- C# CURVE #
- X WCR #
- DX DRIVEWAY #

FOR WCR & DRIVEWAY DETAILS
SEE SHEETS 77 TO 78

0 20 50 100
SCALE: 1" = 20'

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	27	152
PROJECT FILE NO. 605377			

ALIGNMENT & GRADING PLANS

605377_HD(ALIGN).DWG Plotted on 11-Apr-2022 5:11 PM

N

ROUTE 122A (MAIN STREET)

McCRACKEN ROAD

ROUTE 146 RAMP

N/F PROV. / WORCESTER RAILROAD

N/F COMMONWEALTH OF MASSACHUSETTS MAP 36, BLOCK 5 BOOK 18449, PAGE 214

N/F COMMONWEALTH OF MASSACHUSETTS BOOK 19449 BOOK 313

N/F ROUTE 146 MILLBURY LLC MAP 44, BLOCK 31 BOOK 24293, PAGE 105

N/F ELIZABETH B. AUBIN MAP 36, BLOCK 6 BOOK 13196, PAGE 390

BLACKSTONE VALLEY SHOPPES

MAIN STREET (ROUTE 122A) CONSTRUCTION ℄

McCRACKEN EAST CONSTRUCTION ℄

SURVEY TRAVERSE

CONT. ON SHEET 26

LIMIT OF WORK STA 503+36.74 N: 2898728.6631 E: 580875.0107

LIMIT OF WORK STA 500+44.81 N: 2898612.9250 E: 580608.1717

N88°36'21"E 33.95'

PT +83.36

503

504

R=335.00' L=145.65'

PC +51.97 30.73' LT

437.26 BC 503+00

PT +69.02 44.63' LT

PC +48.54 43.79' RT

439.65 BC 503+00

PCC +72.81 26.06' LT

PT +84.41 24.73' RT

END PROJECT STA 229+37.50 N: 2898585.9959 E: 580856.1555

MEET EXISTING +37.5 24.8' LT

SAWCUT MEET EXIST

S24°23'52"E 172.68'

PT +77.32

227

228

229

PC +37.71

226

R=800.00' L=223.94'

PCC +53.38

PC +15.71 34.32' RT ELEV. = 426.44'

S31°45'45"E 402.54'

PCC +35.46 36.25' RT

TRAV NO.1 ELEV 436.19

435.94 BC 502+00

N63°41'40"E 237.71'

502

11

BEGIN PROP CLF STA 227+69

PT +90.70 31.92' LT

PROP BOUND N 2898815.6064 E 580685.0764 226+48.97, 51.34' RT

PROP BOUND N 2898881.9808 E 580636.6772 225+61.21, 50.43' RT

PROP BOUND N 2898722.9383 E 580720.9639 501+94.67, 48.60' LT

∠PT +49.81 30.61' LT

END PROP CLF STA 501+71

435.89 BC 501+50

PROP BOUND N 2898688.4169 E 580672.5880 501+36.01, 39.10' LT

435.75 BC 501+00

501

MEET EXISTING +99.8 26.0' LT

436.23 BC 500+50

SAWCUT MEET EXIST

435.94 BC 500+50

PC 228+66.78 40.03' RT

CC 502+15.27 40.00' RT

PRC 228+68.72 45.32' RT

PT +22.03 42.31' RT

438.61 BC 502+00

MEET EXISTING +37.5 40.1' RT

PT 501+90.50 37.00' RT

PRC 501+88.85 42.51' RT

436.16 BC 501+50

PCC +45.42 46.89' RT

PC +31.58 45.36' RT

435.17 BC 501+00

MEET EXISTING +86.0 41.7' RT

MCCRACKEN ROAD (EAST) CONSTRUCTION BASELINE DATA

STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
225+53.38	2898920.300	580670.333	R=800.00' Δ=16°02'18" L=223.94' T=112.71'		227+77.32	2898731.875	580789.989
227+77.32	2898731.875	580789.989		S24° 23' 52"E 172.68'	229+50.00	2898574.612	580861.319

MAIN STREET CONSTRUCTION BASELINE DATA

STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
500+00.00	2898593.096	580567.989		N63° 41' 40"E 237.71'	502+37.71	2898698.439	580781.083
502+37.71	2898698.439	580781.083	R=335.00' Δ=24°54'41" L=145.65' T=74.00'		503+83.36	2898733.032	580921.390
503+83.36	2898733.032	580921.390		N88° 36' 21"E 33.95'	504+17.31	2898733.858	580955.327

LEGEND

- C# CURVE #
- X WCR #
- DX DRIVEWAY #

FOR WCR & DRIVEWAY DETAILS SEE SHEETS 77 TO 78

Point Table				
Point #	Northing	Easting	Elevation	Raw Description
1	2898727.1857	580755.8673	436.19	MDHL

Curve Table			
Curve #	Delta	Radius	Length
35	15° 48' 21"	764.00	210.76
36	88° 37' 17"	35.00	54.14
37	53° 47' 52"	25.00	23.47
38	3° 59' 26"	200.00	13.93
39	75° 21' 55"	80.00	105.23
40	39° 56' 46"	44.00	30.68
41	19° 12' 34"	35.00	11.73
59	91° 56' 15"	3.00	4.81
60	146° 39' 58"	3.00	7.68
61	18° 10' 45"	100.00	31.73
62	139° 34' 32"	3.00	7.31

0 20 50 100

SCALE: 1" = 20'

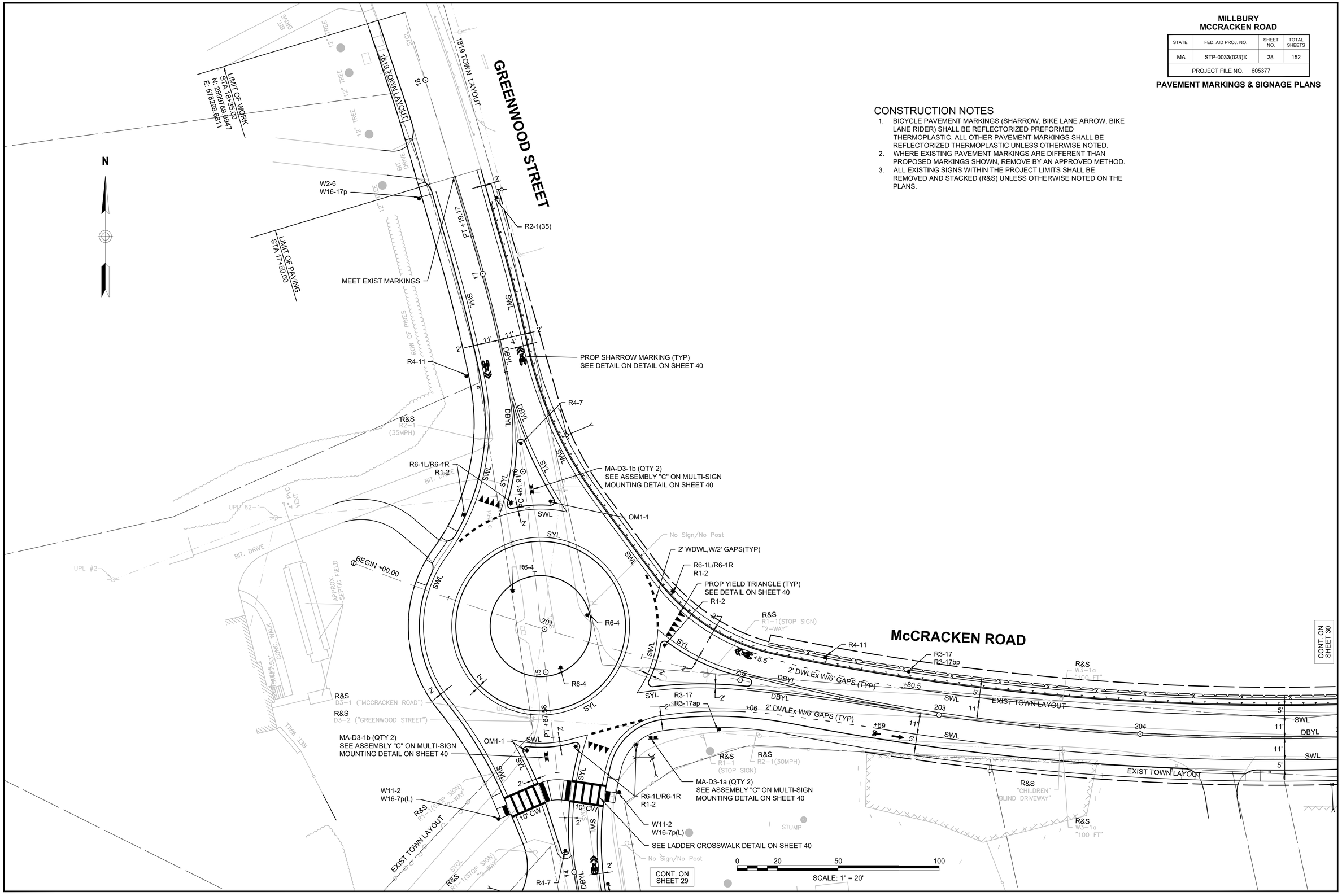
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	28	152
PROJECT FILE NO. 605377			

PAVEMENT MARKINGS & SIGNAGE PLANS

CONSTRUCTION NOTES

1. BICYCLE PAVEMENT MARKINGS (SHARROW, BIKE LANE ARROW, BIKE LANE RIDER) SHALL BE REFLECTORIZED PREFORMED THERMOPLASTIC. ALL OTHER PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC UNLESS OTHERWISE NOTED.
2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
3. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND STACKED (R&S) UNLESS OTHERWISE NOTED ON THE PLANS.



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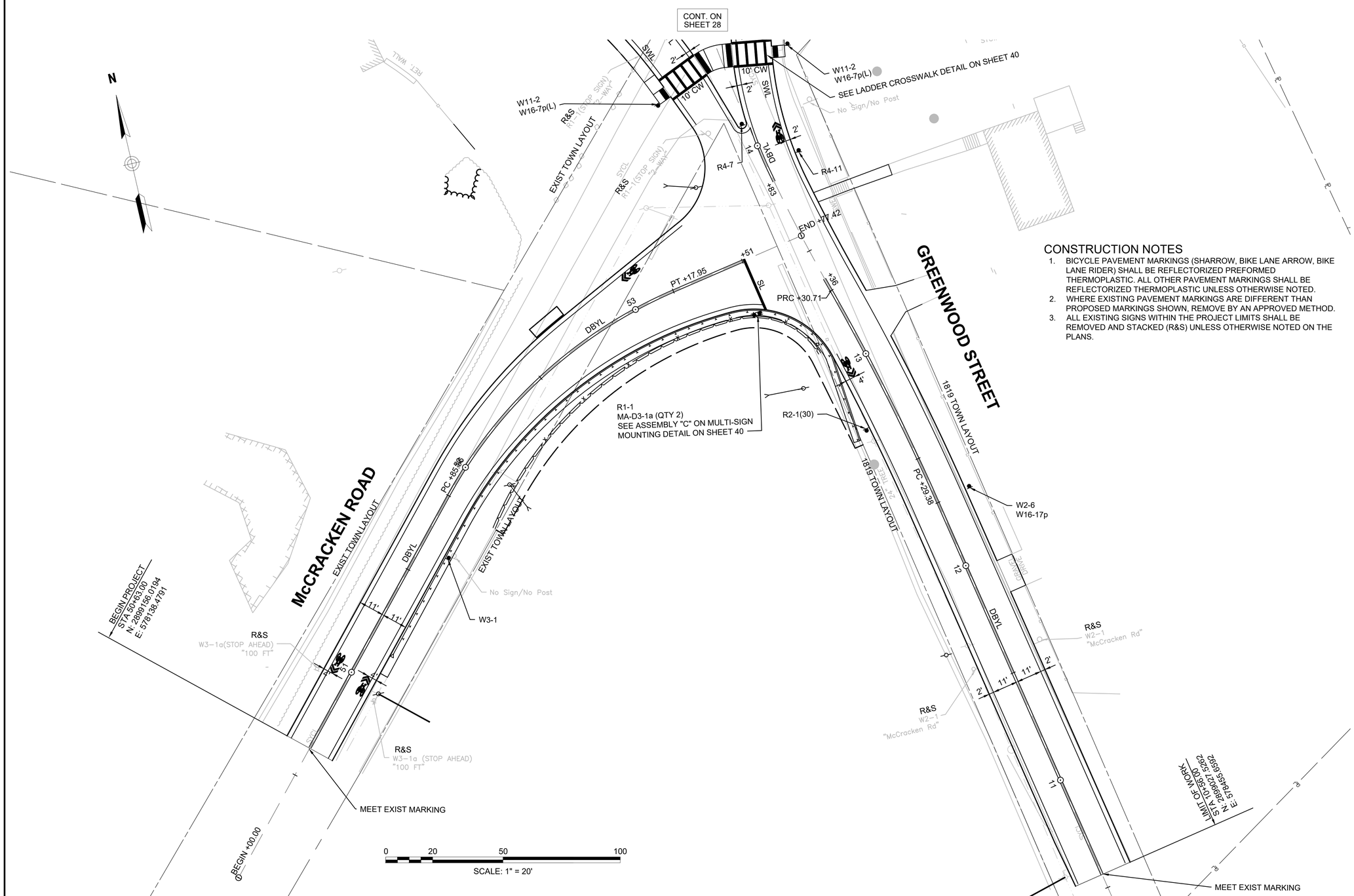
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	29	152
PROJECT FILE NO. 605377			

PAVEMENT MARKINGS & SIGNAGE PLANS



CONSTRUCTION NOTES

1. BICYCLE PAVEMENT MARKINGS (SHARROW, BIKE LANE ARROW, BIKE LANE RIDER) SHALL BE REFLECTORIZED PREFORMED THERMOPLASTIC. ALL OTHER PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC UNLESS OTHERWISE NOTED.
2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
3. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND STACKED (R&S) UNLESS OTHERWISE NOTED ON THE PLANS.

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	30	152
PROJECT FILE NO. 605377			

PAVEMENT MARKINGS & SIGNAGE PLANS

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N

CONT. ON SHEET 28

CONT. ON SHEET 31

McCRACKEN ROAD

LAURA LANE

EXIST TOWN LAYOUT

W2-6
W16-17p

R&S
"DO NOT BLOCK INTERSECTION"

R&S
"BLIND DRIVEWAY"

R&S
"GO CHILDREN SLOW"
W13-1P (20MPH)

R&S
D3 "LAURA LN"
"DO NOT BLOCK INTERSECTION"
MTD ON UP

R3-17

R1-1
MA-D3-1c (QTY 2)
SEE ASSEMBLY "A" ON MULTI-SIGN MOUNTING DETAIL ON SHEET 40

No Sign/No Post

204 205 206 207 208 209 210

PT +35.46

PC +38.93

+64

+95.5

2' DWLEx W/6' GAPS (TYP)

8' CW

SL

DBYL - 35'

DBYL

SWL

SYCL

5' 11' 11' 11' 5'

12' 12'

CHICKEN WIRE FENCE

WOOD FENCE

BIRD HOUSE

SHRUB

24" STUMP

24" TREE

FLAG

FLAG POST

PORCH

CONC.

FF=413.59

0 20 50 100

SCALE: 1" = 20'

CONSTRUCTION NOTES

1. BIKE LANE PAVEMENT MARKINGS (ARROW AND RIDER) SHALL BE REFLECTORIZED PREFORMED THERMOPLASTIC. ALL OTHER PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC UNLESS OTHERWISE NOTED.
2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
3. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND STACKED (R&S) UNLESS OTHERWISE NOTED ON THE PLANS.

MILLBURY
MCCRACKEN ROAD

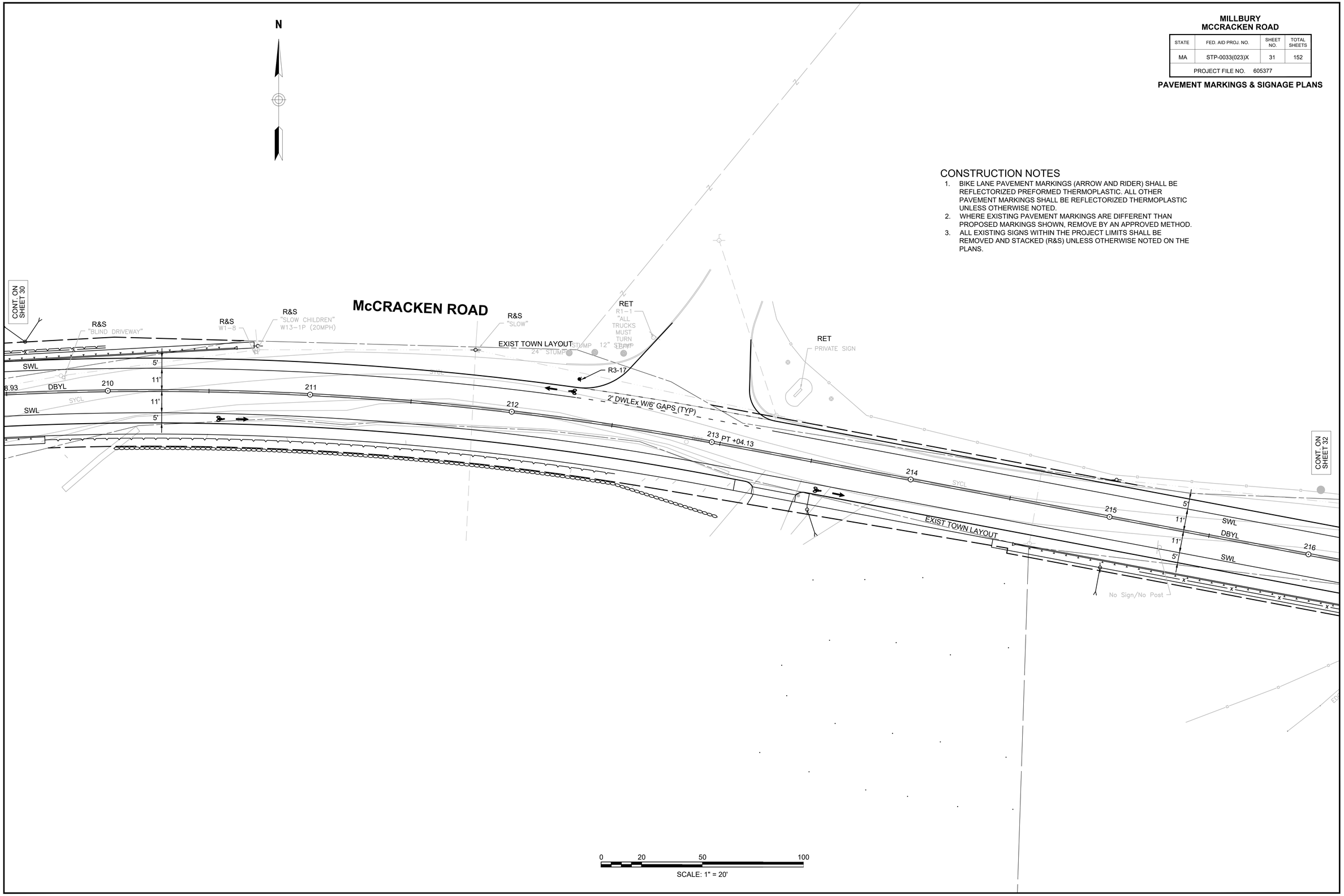
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	31	152
PROJECT FILE NO. 605377			

PAVEMENT MARKINGS & SIGNAGE PLANS

N

CONSTRUCTION NOTES

1. BIKE LANE PAVEMENT MARKINGS (ARROW AND RIDER) SHALL BE REFLECTORIZED PREFORMED THERMOPLASTIC. ALL OTHER PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC UNLESS OTHERWISE NOTED.
2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
3. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND STACKED (R&S) UNLESS OTHERWISE NOTED ON THE PLANS.



0 20 50 100

SCALE: 1" = 20'

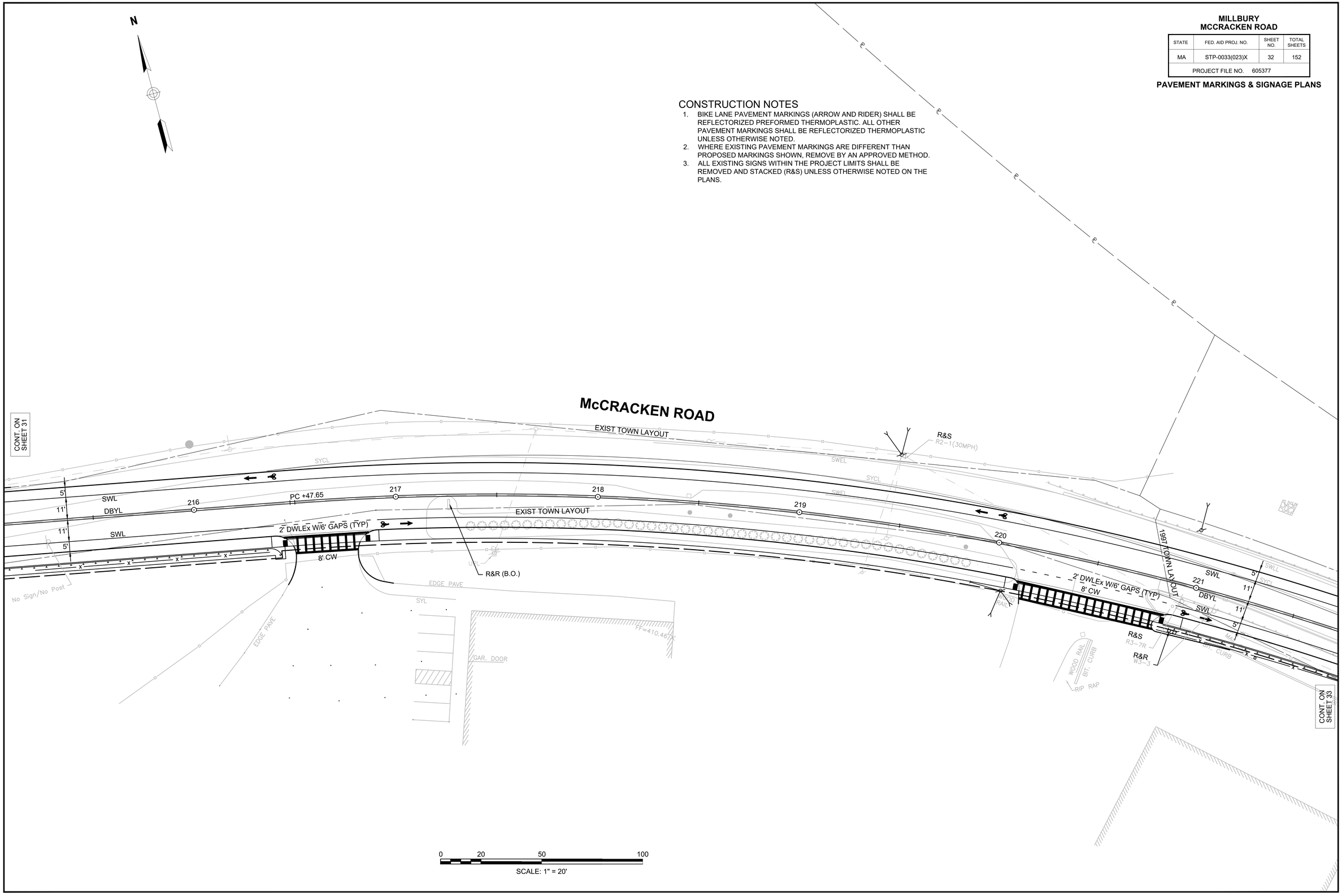
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	32	152
PROJECT FILE NO. 605377			

PAVEMENT MARKINGS & SIGNAGE PLANS

CONSTRUCTION NOTES

1. BIKE LANE PAVEMENT MARKINGS (ARROW AND RIDER) SHALL BE REFLECTORIZED PREFORMED THERMOPLASTIC. ALL OTHER PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC UNLESS OTHERWISE NOTED.
2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
3. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND STACKED (R&S) UNLESS OTHERWISE NOTED ON THE PLANS.



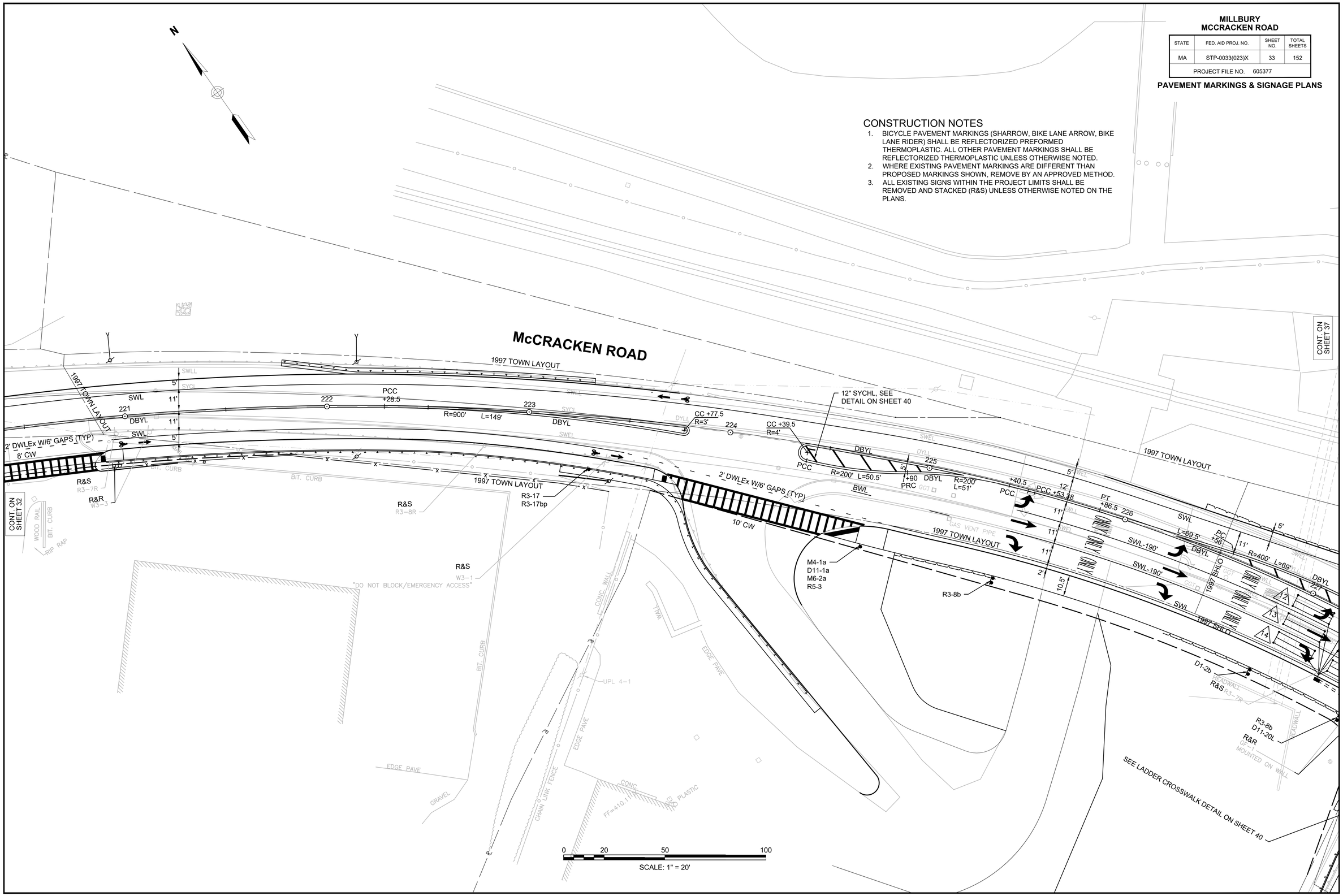
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	33	152
PROJECT FILE NO. 605377			

PAVEMENT MARKINGS & SIGNAGE PLANS

CONSTRUCTION NOTES

1. BICYCLE PAVEMENT MARKINGS (SHARROW, BIKE LANE ARROW, BIKE LANE RIDER) SHALL BE REFLECTORIZED PREFORMED THERMOPLASTIC. ALL OTHER PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC UNLESS OTHERWISE NOTED.
2. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
3. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND STACKED (R&S) UNLESS OTHERWISE NOTED ON THE PLANS.



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MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	34	152

PROJECT FILE NO. 605377

PAVEMENT MARKINGS & SIGNAGE PLANS

CONSTRUCTION NOTES

1. SEE SHEET 37 FOR TRAFFIC SIGNAL DATA.
2. ALL BICYCLE MARKINGS (STOP LINE, BIKE LANE ARROW, BIKE LANE RIDER, SHARROWS) SHALL BE REFLECTORIZED PREFORMED THERMOPLASTIC. ALL OTHER PAVEMENT MARKINGS SHALL BE REFLECTORIZED THERMOPLASTIC.
3. WHERE EXISTING PAVEMENT MARKINGS ARE DIFFERENT THAN PROPOSED MARKINGS SHOWN, REMOVE BY AN APPROVED METHOD.
4. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND STACKED (R&S) UNLESS OTHERWISE NOTED ON THE PLANS.

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MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	35	152
PROJECT FILE NO. 605377			

TRAFFIC SIGN SUMMARY

TRAFFIC SIGN SUMMARY

IDENTIFI–CATION NUMBER	SIZE OF SIGN WIDTH	SIZE OF SIGN HEIGHT	TEXT	TEXT DIMENSIONS (INCHES) LETTER HEIGHT	TEXT DIMENSIONS (INCHES) VERTICAL SPACING	TEXT DIMENSIONS (INCHES) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK–GROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
R1-1	30"	30"	STOP	SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			2	RED	WHITE	WHITE	P5-2	6.25	12.50
R1-2	36"X36"X36"		YIELD				7	WHITE	RED	WHITE	P5-7	4.50	31.50
R2-1(30)	24"	30"	SPEED LIMIT 30				1	WHITE	BLACK	BLACK	P5-1	5.00	5.00
R2-1(35)	24"	30"	SPEED LIMIT 35				1	WHITE	BLACK	BLACK	P5-1	5.00	5.00
R3-5L	30"	36"	ONLY				4	WHITE	BLACK	BLACK	4 MTD ON SPAN WIRE	7.50	30.00
R3-8b	48"	30"	ONLY ONLY ONLY				2	WHITE	BLACK	BLACK	P5-4 (TWO PER SIGN)	10.00	20.00
R3-9cp	30"	12"	BEGIN				1	WHITE	BLACK	BLACK	1 MTD W/OTHER	2.50	2.50
R3-17	30"	24"	BIKE LANE				6	BLACK --- WHITE	WHITE --- BLACK	WHITE --- BLACK	P5-6	5.00	30.00
R3-17ap	30"	12"	AHEAD				1	WHITE	BLACK	BLACK	1 MTD W/OTHER	2.50	2.50
R3-17bp	30"	12"	ENDS				2	WHITE	BLACK	BLACK	2 MTD W/OTHERS	2.50	5.00
R4-7	24"	30"					2	WHITE	BLACK	BLACK	P5-2	5.00	10.00
R4-11	30"	30"	MAY USE FULL LANE				3	WHITE	BLACK	BLACK	P5-3	6.25	18.75
R5-3	24"	24"	NO MOTOR VEHICLES				1	WHITE	BLACK	BLACK	1 MTD W/OTHERS	4.00	4.00
R6-1L	36"	12"	ONE WAY SEE NOTE 2				5	BLACK	WHITE	WHITE	5 MTD W/OTHERS	3.00	15.00
R6-1R	36"	12"	ONE WAY SEE NOTE 2				5	BLACK	WHITE	WHITE	5 MTD W/OTHERS	3.00	15.00
R6-4	30"	24"					3	WHITE	BLACK	NONE	P5-3	5.00	15.00

TRAFFIC SIGN SUMMARY (CONTINUED)

IDENTIFI–CATION NUMBER	SIZE OF SIGN WIDTH	SIZE OF SIGN HEIGHT	TEXT	TEXT DIMENSIONS (INCHES) LETTER HEIGHT	TEXT DIMENSIONS (INCHES) VERTICAL SPACING	TEXT DIMENSIONS (INCHES) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK–GROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
MA-R9-15	24"	24"		AS PER MASSDOT STANDARDS			1	WHITE	BLACK/ RED	BLACK	P5-1	4.00	4.00
R10-3e(L)	9"	15"	STATE CROSSING Watch For Vehicles / DON'T START Finish Crossing If Started TIME REMAINING To Finish Crossing / DON'T CROSS / PUSH BUTTON TO CROSS	SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			2	WHITE	WHITE/ BLACK/ ORANGE	BLACK	3 MTD ON TS POST/POLE	PAID UNDER ITEM 816.01	
R10-3e(R)	9"	15"	STATE CROSSING Watch For Vehicles / DON'T START Finish Crossing If Started TIME REMAINING To Finish Crossing / DON'T CROSS / PUSH BUTTON TO CROSS				2	WHITE	WHITE/ BLACK ORANGE	BLACK	1 MTD ON TS POST/POLE	PAID UNDER ITEM 816.01	
R10-11b	36"	36"	NO TURN ON RED				1	WHITE	BLACK	BLACK	1 MTD ON SPAN WIRE	9.00	9.00
W2-6	30"	30"					3	YELLOW	BLACK	BLACK	P5-3	6.25	18.75
W3-1	30"	30"					1	YELLOW	BLACK/ RED	BLACK	P5-1	6.25	6.25
W11-2	30"	30"					2	FLUOR-ESCENT YELLOW GREEN	BLACK	BLACK	P5-2	6.25	12.50
W16-7p(L)	24"	12"					2	FLUOR-ESCENT YELLOW GREEN	BLACK	BLACK	2 MTD W/OTHERS	2.00	4.00
W16-17p	24"	12"	ROUNDABOUT				3	YELLOW	BLACK	BLACK	3 MTD W/OTHERS	2.00	6.00
OM1-1	24"	24"					3	YELLOW	YELLOW CLUSTER	YELLOW	P5-3	4.00	12.00
			TRAFFIC SIGN SUMMARY CONTINUED ON NEXT SHEET										

NOTES:
1. HIGH INTENSITY REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION" FOR TEXT DIMENSIONS, AS AMENDED; THE 1977 MASSHIGHWAY DEPARTMENT CONSTRUCTION AND TRAFFIC STANDARD DETAILS, AS AMENDED, FOR SIGNS AND SUPPORTS; AND THE MASSHIGHWAY DEPARTMENT SIGN LISTINGS 1993 EDITION, AS AMENDED.
2. R6-1L AND R6-1R SIGNS TO BE PAINTED ONE-SIDE AND MOUNTED AS SHOWN IN ASSEMBLY TYPE "A" OF THE "MULTIPLE SIGN-MOUNTING DETAIL" ON SHEET 40.

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	36	152
PROJECT FILE NO. 605377			

TRAFFIC SIGN SUMMARY

TRAFFIC SIGN SUMMARY (CONTINUED)

IDENTIFICATION NUMBER	SIZE OF SIGN WIDTH	SIZE OF SIGN HEIGHT	TEXT	TEXT DIMENSIONS (INCHES) LETTER HEIGHT	TEXT DIMENSIONS (INCHES) VERTICAL SPACING	TEXT DIMENSIONS (INCHES) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK–GROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
MA-D3-1a	60"	12"	6" TOWN SEAL (TYP) McCracken Rd PAINTED ONE SIDE	6"C/4.5"C @85%	3" 3"	N/A	4	GREEN	WHITE	WHITE SEE NOTE 3	P5-4 2 MTD W/OTHERS SEE NOTE 4	PAID UNDER ITEM 874	
MA-D3-1b	60"	12"	Greenwood St PAINTED ONE SIDE	6"C/4.5"C @85%	3" 3"	N/A	4	GREEN	WHITE	WHITE	P5-4 2 MTD W/OTHERS SEE NOTE 4	PAID UNDER ITEM 874	
MA-D3-1c	36"	12"	Laura Ln PAINTED ONE SIDE	6"C/4.5"C @85%	3" 3"	N/A	2	GREEN	WHITE	WHITE	2 MTD W/OTHERS	PAID UNDER ITEM 874	
MA-D3-1d	36"	12"	Main St PAINTED BOTH SIDES	6"C/4.5"C	3" 3"	N/A	1	GREEN	WHITE	WHITE	1 MTD ON TS POLE	PAID UNDER ITEM 874	
MA-D3-1e	60"	12"	McCracken Rd PAINTED BOTH SIDES	6"C/4.5"C @85%	3" 3"	N/A	1	GREEN	WHITE	WHITE	1 MTD ON TS POLE	PAID UNDER ITEM 874	
D1-2b	30"	18"	Blackstone River ← Greenway / Shoppes → 3"X5.25" BICYCLE	2"D 2"D 2"D	2.5" 2" 2" 2" 3"	2"X3" @180° 2"X3" @0°	1	GREEN	WHITE	WHITE SEE NOTE 5	1 MTD W/OTHERS	3.75	3.75
D11-1a	18"	18"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			1	GREEN	WHITE	WHITE	P5-1	2.25	2.25
D11-20L	12"	18"	LEFT TURN MAY USE TURN BOX	AS PER MUTCD INTERIM APPROVAL IA-20			1	GREEN	WHITE	WHITE	1 MTD W/OTHERS	1.50	1.50
M4-1a	12"	6"	ALT	SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			1	GREEN	WHITE	WHITE	1 MTD W/OTHERS	0.50	0.50
M6-2a	12"	9"					1	GREEN	WHITE	WHITE	1 MTD W/OTHERS	0.75	0.75

TRAFFIC SIGN SUMMARY (CONTINUED)

IDENTIFICATION NUMBER	SIZE OF SIGN WIDTH	SIZE OF SIGN HEIGHT	TEXT	TEXT DIMENSIONS (INCHES) LETTER HEIGHT	TEXT DIMENSIONS (INCHES) VERTICAL SPACING	TEXT DIMENSIONS (INCHES) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK–GROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA IN SQUARE FEET
R&R R3–8lr			ONLY ONLY								P5-2		
R&R D6–1			TO 146 NORTH MASS PIKE WORCESTER								1–POST SEE ITEM 841.8		
R&R D8–1			146 SOUTH UXBRIDGE								1 MTD W/OTHERS		
R&R D6–2			SOUTH 146 UXBRIDGE PROVIDENCE RI								1–POST SEE ITEM 841.8		
RET D6–3			122A SOUTH MILLBURY CTR										
R&R GF–1			146 SOUTH Uxbridge Providence RI								MTD ON (tbd)		

NOTES:
1. HIGH INTENSITY REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION" FOR TEXT DIMENSIONS, AS AMENDED; THE 1977 MASSHIGHWAY DEPARTMENT CONSTRUCTION AND TRAFFIC STANDARD DETAILS, AS AMENDED, FOR SIGNS AND SUPPORTS; AND THE MASSHIGHWAY DEPARTMENT SIGN LISTINGS 1993 EDITION, AS AMENDED.
2. ALL SIGNS SHOWN GRAPHICALLY FOR INFORMATION ONLY. SIGN VENDOR SHALL FABRICATE ALL SIGNS IN ACCORDANCE WITH THE APPLICABLE STANDARDS.
3. MA-D3-1 SIGNS SHALL HAVE A 0.5" BORDER WITH A 1.5" RADIUS.
4. WHERE BACK TO BACK STREET NAME SIGNS ARE REQUIRED, SEE "MULTIPLE SIGN-MOUNTING DETAIL" ON SHEET 40.
5. D1-2b SIGN SHALL HAVE A 0.375" BORDER WTH A 1.5" RADIUS.

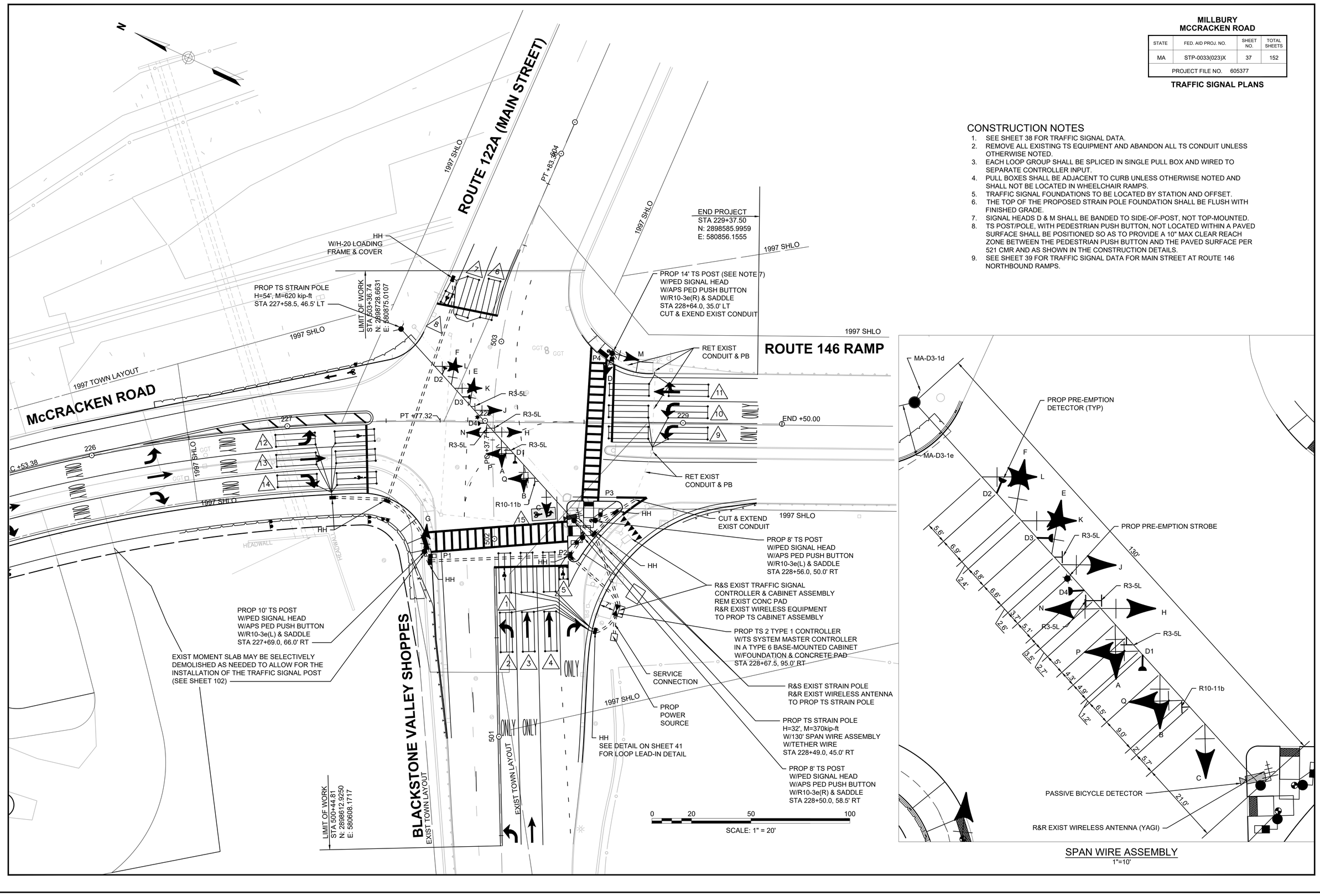
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	37	152
PROJECT FILE NO. 605377			

TRAFFIC SIGNAL PLANS

CONSTRUCTION NOTES

1. SEE SHEET 38 FOR TRAFFIC SIGNAL DATA.
2. REMOVE ALL EXISTING TS EQUIPMENT AND ABANDON ALL TS CONDUIT UNLESS OTHERWISE NOTED.
3. EACH LOOP GROUP SHALL BE SPLICED IN SINGLE PULL BOX AND WIRED TO SEPARATE CONTROLLER INPUT.
4. PULL BOXES SHALL BE ADJACENT TO CURB UNLESS OTHERWISE NOTED AND SHALL NOT BE LOCATED IN WHEELCHAIR RAMPS.
5. TRAFFIC SIGNAL FOUNDATIONS TO BE LOCATED BY STATION AND OFFSET.
6. THE TOP OF THE PROPOSED STRAIN POLE FOUNDATION SHALL BE FLUSH WITH FINISHED GRADE.
7. SIGNAL HEADS D & M SHALL BE BANDED TO SIDE-OF-POST, NOT TOP-MOUNTED.
8. TS POST/POLE, WITH PEDESTRIAN PUSH BUTTON, NOT LOCATED WITHIN A PAVED SURFACE SHALL BE POSITIONED SO AS TO PROVIDE A 10" MAX CLEAR REACH ZONE BETWEEN THE PEDESTRIAN PUSH BUTTON AND THE PAVED SURFACE PER 521 CMR AND AS SHOWN IN THE CONSTRUCTION DETAILS.
9. SEE SHEET 39 FOR TRAFFIC SIGNAL DATA FOR MAIN STREET AT ROUTE 146 NORTHBOUND RAMPS.



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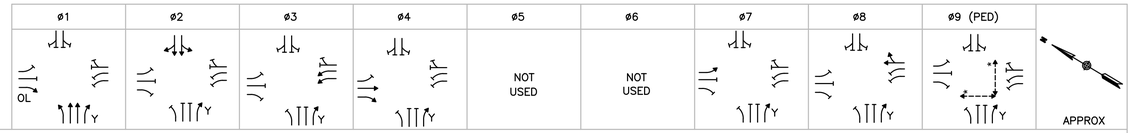


SEQUENCE AND TIMING FOR FULLY ACTUATED CONTROL (COORDINATED)

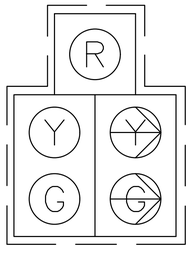
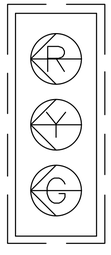
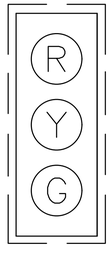
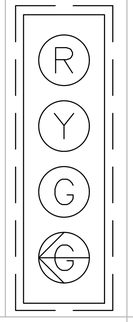
APPROACH	DIRECTION	HOUSING	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	FLASH
BLACKSTONE SHOPPES	EB	A	G	Y	R	R	R	R	R	R	R	R	R	R							R	R	R	R	R	R	R	R	R	FR
BLACKSTONE SHOPPES	EB	B,C,D	G	Y	R	R	R	R	R	R	R	R	R	R							R	R	R	R	R	R	R	R	R	FR
MAIN STREET (ROUTE 122A)	WB	E	R	R	R	G	Y	R	R	R	R	R	R	R							R	R	R	R	R	R	R	R	R	FR
MAIN STREET (ROUTE 122A)	WB	F,G	R	R	R	G	Y	R	R	R	R	R	R	R							R	R	R	R	R	R	R	R	R	FR
ROUTE 146 RAMP	NB	H,J	R	R	R	R	R	R	G	Y	R	R	R	R							R	R	R	R	R	R	R	R	R	FR
ROUTE 146 RAMP	NB	K,L,M	R	R	R	R	R	R	R	R	R	R	R	R							G	Y	R	R	R	R	R	R	R	FR
MCCRACKEN ROAD	SB	N	R	R	R	R	R	R	R	R	R	R	R	R							G	Y	R	R	R	R	R	R	R	FR
MCCRACKEN ROAD	SB	P	R	R	R	R	R	R	R	R	R	G	Y	R							R	R	R	R	R	R	R	R	R	FR
MCCRACKEN ROAD	SB	Q	R G	R Y	R	R	R	R	R	R	R	G	Y	R							R	R	R	R	R	R	R	R	R	FR
PEDESTRIAN X-ING	NB-SB	P1-P2	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW							DW	DW	DW	DW	DW	DW	W/FDW	DW	DW	OUT
PEDESTRIAN X-ING	EB-WB	P3-P4	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW							DW	DW	DW	DW	DW	DW	W/FDW	DW	DW	OUT
TIMING IN SECONDS																														
MINIMUM GREEN (INITIAL)			4			4			4			6									6			4			–			
PASSAGE TIME (VEHICLE)			3			3			2.5			4									4			2.5			–			
MAXIMUM 1			30			28			15			22									15			28			–			
MAXIMUM 2			40			25			20			20									15			30			–			
DYNAMIC MAX 3			50			27			28			30									30			28						
DYNAMIC MAX 4			55			–			30			–									–			30						
DYNAMIC STEP			5			5			5			5									5			5						
YELLOW CLEARANCE				4			4			3			3.5									3			4			3		
RED CLEARANCE					2			2.5			4			2.5									2			2				1
PEDESTRIAN WALK																											7			
PEDESTRIAN CLEARANCE																											17			
DETECTOR MEMORY			NON-LOCK			NON-LOCK			NON-LOCK			NON-LOCK									NON-LOCK			NON-LOCK			LOCK			
RECALL			OFF			MIN			OFF			OFF									OFF			OFF			OFF			

CONFLICT FLASH OPERATION ONLY

COORDINATION DATA			COORDINATION PHASE SPLIT TIMES								
TIMING PLAN	CYCLE	OFFSET	ø1	ø2	ø3	ø4	ø5	ø6	ø7	ø8	ø9(PED)
1/1/1 M-F 3PM-9PM	110	0	28(23)	31(24)	27(21)	24(14)			20(20)	31(15)	0(28)
MODE				COORD ø							

NOTES:
1. AUTOMATIC FLASHING OPERATION PER 2009 M.U.T.C.D., AS AMENDED.
2. * UPON PEDESTRIAN PUSH BUTTON ACTUATION
3. ø3 SHALL NOT RUN WITH ø7
4. OL = OVERLAP
5. Y = YIELD CONTROL
6. MAXIMUM 1 = NORMAL OPERATION
7. MAXIMUM 2 = DURING COORDINATION
8. DYNAMIC MAX 3= SATURDAY & SUNDAY 12:30-16:00
9. DYNAMIC MAX 4 = SATURDAY & SUNDAY 16:00-18:00
10. STOP AND GO OPERATION FOR 24 HOURS PER DAY. FLASHING OPERATION FOR EMERGENCY ONLY.
11. DURING PEDESTRIAN INTERVAL, FDW THROUGH YELLOW OPERATION SHALL NOT BE IN EFFECT.

SIGNAL HEAD DATA

Q	A,H,J,N	B,C,D,F,G,K,L,M,P	E	P1-P4
				 W/COUNTDOWN TIMER
ALL 12" LENS				

NOTES:
1. ALL SIGNAL HEADS SHALL BE EQUIPPED WITH 5"± NON-LOUVERED BACKPLATES. ALL BACKPLATES SHALL CONTAIN A 3" WIDE YELLOW REFLECTIVE BORDER.
2. ALL SIGNAL HEADS SHALL BE EQUIPPED WITH TUNNEL VISORS.
3. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED WITH L.E.D. MODULES.

PRE-EMPTION PHASING & PRIORITY

DETECTOR & PRIORITY	PRE-EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø1
D2	2		Ø2
D3	3		Ø3 & Ø8
D4	4		Ø4 & Ø7

EMERGENCY VEHICLE PRE-EMPTION OPERATION
1. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
2. PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH DETECTORS D1, D2, D3 OR D4 ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (D1 HIGHEST AND D4 LOWEST)
3. IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2, D3, D4) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE-EMPTION PHASE #1 (OR #2, #3, #4) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE-EMPTION PHASE CLEARANCES FOR THE ASSOCIATED PHASE(S) AS SHOWN IN THE SEQUENCE AND TIMING CHART AND SERVICE SUBSEQUENT EMERGENCY VEHICLE PRE-EMPTION PHASES AS NECESSARY.
4. MINIMUM GREEN AND NORMAL VEHICLE & PEDESTRIAN CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
5. PRE-EMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE-EMPTION GREEN IS ON.
6. EMERGENCY VEHICLE PRE-EMPTION SHALL OVERRIDE COORDINATION.

DETECTOR DATA

DETECTOR NO.	NO. SECTION/ SIZE	NO. OF TURNS	OPERATIONS	DELAY /EXT	CALL PHASE	LOOP CONNECTION
1	1-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø1	SINGLE
2	1-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø1	SINGLE
3	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø1	SERIES
4	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø1	SERIES
5	1-4'X6' QUADRUPOLE	2-4-2	PRESENCE	0	Ø1	SINGLE
6	1-6'X30' QUADRUPOLE	2-4-2	PRESENCE	0	Ø2	SINGLE
7	1-6'X30' QUADRUPOLE	2-4-2	PRESENCE	0	Ø2	SINGLE
8	1-4'X6' QUADRUPOLE	2-4-2	PRESENCE	0	Ø2	SINGLE
9	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø3	SERIES
10	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø3	SERIES
11	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø8	SERIES
12	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø7	SERIES
13	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø4	SERIES
14	2-6'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø4	SERIES

NOTE: DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY

SEQUENCE & TIMING NOTES:
1. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
2. THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
3. IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
4. IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	38	152
PROJECT FILE NO. 605377			

TRAFFIC SIGNAL PLANS

STRAIN POLE FOUNDATION DATA

POLE HEIGHT	BASE MOMENT	MAST ARM LOCATION	SOIL TYPE	FOUNDATION DIAMETER	FOUNDATION DEPTH	VERTICAL BARS
54 FT	620 kip-ft	227+58.5, 46.5' LT	WET SAND (DENSE)	4'-0"	16'-6"	18 - #9
32 FT	370 kip-ft	228+49.0, 45.0' LT	WET SAND (DENSE)	3'-6"	15'-0"	18 - #8
				OR		
				4'-0"	14'-6"	18 - #9

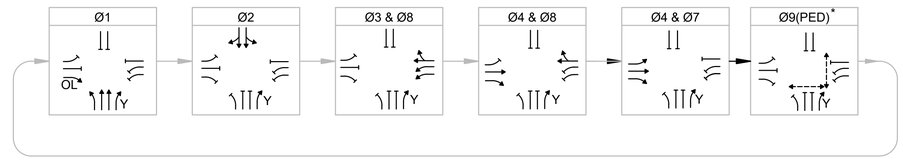
NOTES:
1. SEE SPECIAL PROVISION FOR ADDITIONAL INFORMATION.

PASSIVE DETECTION DATA

DETECTION ZONE	APPROACH/LANE	CAMERA	DELAY /EXT	CALL PHASE
15	McCRACKEN SHARED-USE PATH LEFT-TURN	C1	0	Ø1

NOTE: DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY

PREFERENTIAL PHASE SEQUENCE



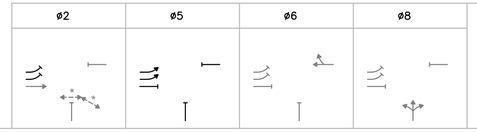
* UPON PEDESTRIAN PUSH BUTTON ACTUATION
Y = YIELD CONTROL
OL = OVERLAP

LIST OF MAJOR ITEMS REQUIRED

McCRACKEN ROAD AT N. MAIN STREET/ROUTE 146/BLACKSTONE SHOPPES

PAY ITEM	QUANTITY	DESCRIPTION
816.01	1	8Ø TS 2 TYPE 1 CONTROLLER IN A TYPE 6 BASE MOUNTED CABINET INCLUDING FOUNDATION AND CONCRETE PAD
	1	TS SYSTEM MASTER CONTROLLER
	1	R&R EXIST WIRELESS IN-CABINET EQUIPMENT TO PROP CABINET
	1	PROP TS STRAIN POLE, H=32' M=370 ft-k AND FOUNDATION
	1	PROP TS STRAIN POLE, H=54' M=620 ft-k AND FOUNDATION
	1	TS SPAN WIRE ASSEMBLY W/TETHER WIRE
	1	R&R EXIST EXIST WIRELESS ANTENNA TO PROP STRAIN POLE
	2	TS POST 8' STANDARD INCL. FOUNDATION
	1	TS POST 10' STANDARD INCL. FOUNDATION
	1	TS POST 14' STANDARD INCL. FOUNDATION
	13	SIGNAL HEAD, 3-SECTION, 12" LENSES
	1	SIGNAL HEAD, 4-SECTION, 12" LENSES
	1	SIGNAL HEAD, 5-SECTION, 12" LENSES
	4	PEDESTRIAN SIGNAL HEAD (L.E.D.)
	2	APS PEDESTRIAN PUSH BUTTON W/R10-3e(L) AND SIGN SADDLE
	2	APS PEDESTRIAN PUSH BUTTON W/R10-3e(R) AND SIGN SADDLE
	7	TYPE C, 2-CHANNEL CARD RACK LOOP DETECTOR AMPLIFIER
	22	WIRE LOOP DETECTOR
	1	PASSIVE BICYCLE DETECTION SYSTEM (1 DEVICE, VDP, & CABLES)
	1	MODIFY EXIST SERVICE CONNECTION (UNDERGROUND)
	4	EMERGENCY PRE-EMPTION OPTICAL DETECTORS & DETECTOR CABLE
	1	EMERGENCY PRE-EMPTION 4 CHANNEL PHASE SELECTOR
	1	EMERGENCY PRE-EMPTION SYSTEM CHASSIS
	1	EMERGENCY PRE-EMPTION STROBE (WHITE LENS)
804.3	425'±	3" CONDUIT, TYPE NM, SCHEDULE 80
811.22	5	HAND HOLE - SD2.022
	3	HAND HOLE - SD2.022, W/H-20 LOADING FRAME AND COVER

PLUS NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC CONTROL SIGNAL.



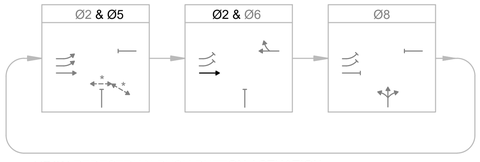
APPROX

EXISTING /PROPOSED SEQUENCE AND TIMING FOR FULLY ACTUATED CONTROL (COORDINATED)

APPROACH	DIRECTION	HOUSING	1	2	3	4	5	6	7	8	9	10	11	12	FLASH
McCRACKEN ROAD	EB	A,B,C	←R–	←R–	←R–	←G–	←Y–	←R–	←R–	←R–	←R–	←R–	←R–	←R–	←FR–
McCRACKEN ROAD	EB	D,E	↰G	Y	R	R	R	R	R	R	R	R	R	R	FY
N MAIN ST (ROUTE 122A)	WB	F	R	R	R	R	R	R	↑G	Y	R	R	R	R	FY
N MAIN ST (ROUTE 122A)	WB	G	R	R	R	R	R	R	G	Y	R	R	R	R	FY
ROUTE 146 NB RAMP	NB	H,J,K,L,M	R	R	R	R	R	R	R	R	R	G	Y	R	FR
PEDESTRIAN X–ING	EB–WB	P1–P2	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OUT
PEDESTRIAN X–ING	NB–SB	P3–P4	W	FDW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	OUT
TIMING IN SECONDS															
MINIMUM GREEN (INITIAL)			7			7			6			6			CONFLICT FLASH OPERATION ONLY
PASSAGE TIME (VEHICLE)			3			3			3			3			
MAXIMUM 1			30			30			30			30			
MAXIMUM 2			30			30			30			30			
YELLOW CLEARANCE				4			4			3.5			4		
RED CLEARANCE					1			1			1			1	
PEDESTRIAN WALK			5												
PEDESTRIAN CLEARANCE				19											
DETECTOR MEMORY			NON–LOCK			NON–LOCK			NON–LOCK			NON–LOCK			
RECALL			MIN			OFF			OFF			OFF			
COORDINATION DATA			COORDINATION PHASE SPLIT TIMES												
TIMING PLAN	CYCLE	OFFSET	ø2			ø5			ø6			ø8			
1/1/1 M–F 3PM–9PM	110	60	74			26			48			36			
MODE									COORD ø						

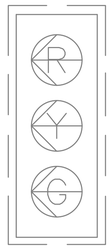
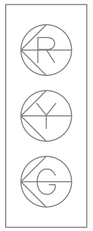
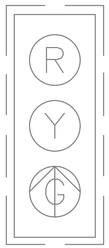
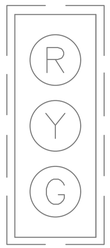
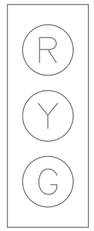
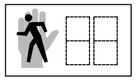
NOTES:
1. AUTOMATIC FLASHING OPERATION PER 2009 M.U.T.C.D., AS AMENDED.
2. * UPON PEDESTRIAN PUSH BUTTON ACTUATION
3. MAXIMUM 1 = NORMAL OPERATION
4. MAXIMUM 2 = NOT USED

EXISTING /PROPOSED PREFERENTIAL PHASE SEQUENCE



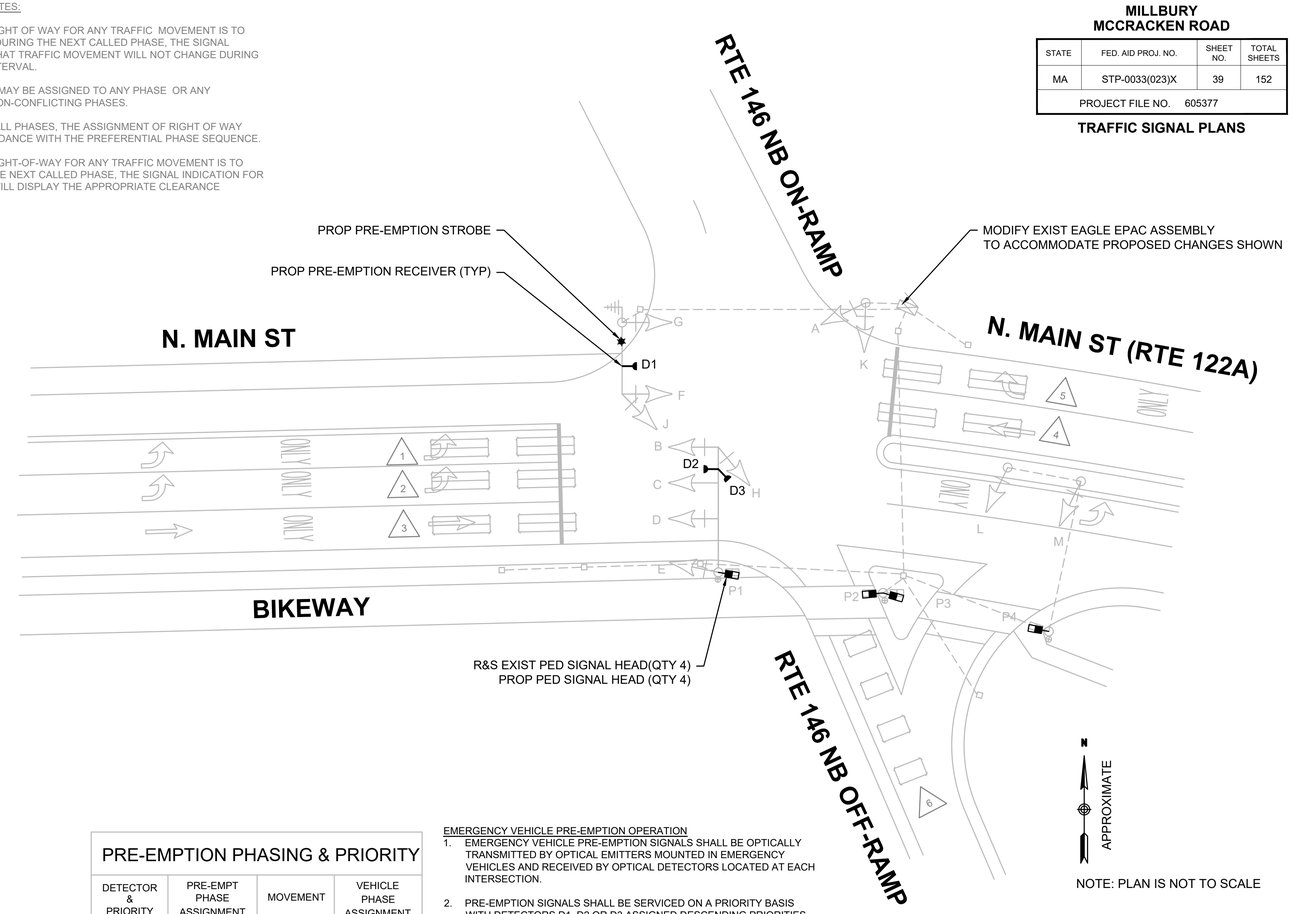
* UPON PEDESTRIAN PUSH BUTTON ACTUATION

EXISTING /PROPOSED SIGNAL HEAD DATA

A,B	C	D,E,F	G,H,J	K,L,M	P1-P4	P1-P4
					 R&S P1-P4	 W/COUNTDOWN TIMER
ALL 12" LENS						

SEQUENCE & TIMING NOTES:

1. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT WILL NOT CHANGE DURING THE CLEARANCE INTERVAL.
2. THE RIGHT OF WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON-CONFLICTING PHASES.
3. IF CALLS EXIST ON ALL PHASES, THE ASSIGNMENT OF RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE PREFERENTIAL PHASE SEQUENCE.
4. IF THE ASSIGNED RIGHT-OF-WAY FOR ANY TRAFFIC MOVEMENT IS TO CHANGE DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATION FOR THAT MOVEMENT WILL DISPLAY THE APPROPRIATE CLEARANCE INTERVALS.



NOTE: PLAN IS NOT TO SCALE

PRE-EMPTION PHASING & PRIORITY

DETECTOR & PRIORITY	PRE-EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1	↰	Ø6
D2	2	↑	Ø2 & Ø5
D3	3	↰↑↱	Ø8

EMERGENCY VEHICLE PRE-EMPTION OPERATION

1. EMERGENCY VEHICLE PRE-EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
2. PRE-EMPTION SIGNALS SHALL BE SERVICED ON A PRIORITY BASIS WITH DETECTORS D1, D2 OR D3 ASSIGNED DESCENDING PRIORITIES AS FOLLOWS: (D1 HIGHEST AND D3 LOWEST)
3. IN RESPONSE TO A PRE-EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2, D3) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE-EMPTION PHASE #1 (OR #2, #3) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE-EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE-EMPTION PHASE CLEARANCES FOR THE ASSOCIATED PHASE(S) AS SHOWN IN THE SEQUENCE AND TIMING CHART AND SERVICE SUBSEQUENT EMERGENCY VEHICLE PRE-EMPTION PHASES AS NECESSARY.
4. MINIMUM GREEN AND NORMAL VEHICLE CLEARANCE SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE-EMPTION DEMAND.
5. PRE-EMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE-EMPTION GREEN IS ON.
6. EMERGENCY VEHICLE PRE-EMPTION SHALL OVERRIDE COORDINATION.

EXISTING /PROPOSED LOOP DETECTOR DATA

DETECTOR NO.	NO. SECTION/ SIZE	NO. OF TURNS	OPERATIONS	DELAY /EXT	CALL PHASE	LOOP CONNECTION
1	2-5'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø5	SERIES
2	2-5'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø5	SERIES
3	2-5'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø2	SERIES
4	2-5'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø6	SERIES
5	2-5'X20' QUADRUPOLE	2-4-2	PRESENCE	0	Ø6	SERIES
6	4-6'X10'	3	PRESENCE	0	Ø8	SERIES/ PARALLEL

NOTE: DELAY AND EXTENSION TIMINGS SHALL BE PROGRAMMED IN THE CONTROLLER ONLY

LIST OF MAJOR ITEMS REQUIRED

NORTH MAIN STREET (RTE 122A) AT ROUTE 146 NB RAMPS

PAY ITEM	QUANTITY	DESCRIPTION
816.02	1	MODIFY EXIST EAGLE EPAC 300 (M42, 3.32h) TS CONTROLLER TO ACCOMMODATE PROPOSED CHANGES SHOWN
	4	PEDESTRIAN SIGNAL HEAD (L.E.D.)
	3	EMERGENCY PRE-EMPTION OPTICAL DETECTORS & DETECTOR CABLE
	1	EMERGENCY PRE-EMPTION 4 CHANNEL PHASE SELECTOR
	1	EMERGENCY PRE-EMPTION SYSTEM CHASSIS
	1	EMERGENCY PRE-EMPTION STROBE (WHITE LENS)
	1	MAINTAIN EXISTING SIGNAL

PLUS NECESSARY DUCT, CABLE, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC CONTROL SIGNAL.

MILLBURY
MCCRACKEN ROAD

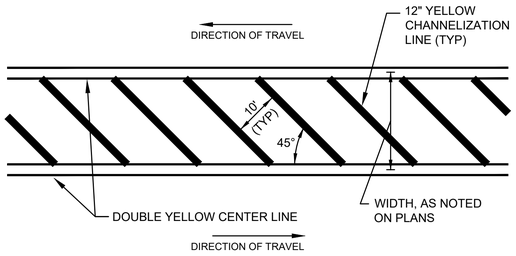
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	39	152
PROJECT FILE NO. 605377			

TRAFFIC SIGNAL PLANS

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	40	152
PROJECT FILE NO. 605377			

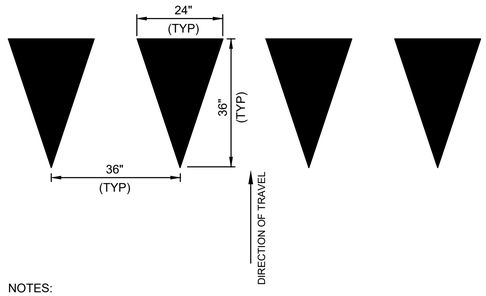
TRAFFIC DETAILS



NOTES:
1. ALL 12" LINES SHALL BE APPLIED IN ONE APPLICATION, NO COMBINATION OF LINES (e.g. TWO - 6" LINES) WILL BE ACCEPTED.

CHANNELIZED MARKINGS - MEDIAN

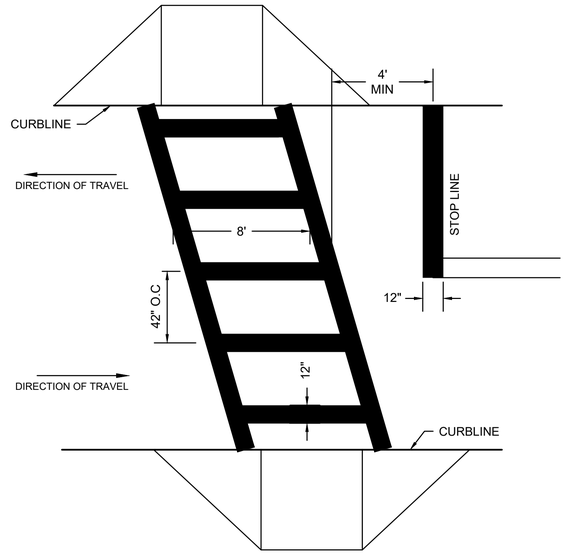
SCALE: NTS DWG: PM-13 DATE: OCT 2015



NOTES:
1. YIELD LINES SHALL CONSIST OF A ROW OF SOLID WHITE TRIANGLES.
2. IF APPLICABLE, YIELD LINES SHALL BE PLACED 4-FEET IN ADVANCE OF THE NEAREST CROSSWALK LINE.
3. IN THE ABSENCE OF A MARKED CROSSWALK, YIELD LINES SHALL BE PLACED AS SHOWN ON THE PLANS.

YIELD LINE TRIANGLES

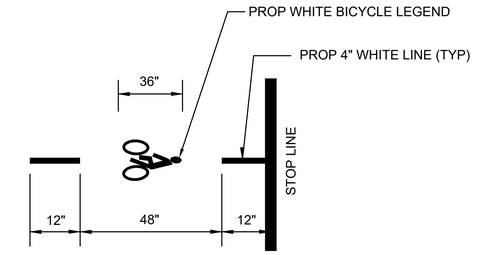
SCALE: NTS



NOTES:
1. ALL EXISTING CROSSWALK MARKINGS SHALL BE FULLY ERADICATED BY APPROVED METHOD PRIOR TO THE APPLICATION OF PROPOSED MARKINGS.
2. ALL 12" THERMOPLASTIC/RECESSED POLYUREA LINES SHALL BE APPLIED IN ONE APPLICATION, NO COMBINATION OF LINES (e.g. TWO - 6" LINES) WILL BE ACCEPTED.
3. LAYOUT OF CROSSWALKS SHALL BE ORIENTATED IN THE DIRECTION OT TRAVEL AND LOCATED OUTSIDE OF THE WHEEL PATH OF VEHICLES. LAYOUT SHALL BE APPROVED BY MASSDOT PRIOR TO APPLICATION OF THERMOPLASTIC OR RECESSED POLYUREA.
4. ALL CROSSWALKS INSTALLED SHALL CONFORM TO THE RELEVANT PROVISIONS OF THE MASSACHUSETTS HIGHWAY DEPARTMENT "STANDARD SPECIFICATION FOR HIGHWAY AND BRIDGES" DATED 1988, SECTION 860 FOR REFLECTORIZED LINE (THERMO-PLASTIC) & MATERIAL M7.01.20, LATEST REVISIONS.

LADDER CROSSWALK

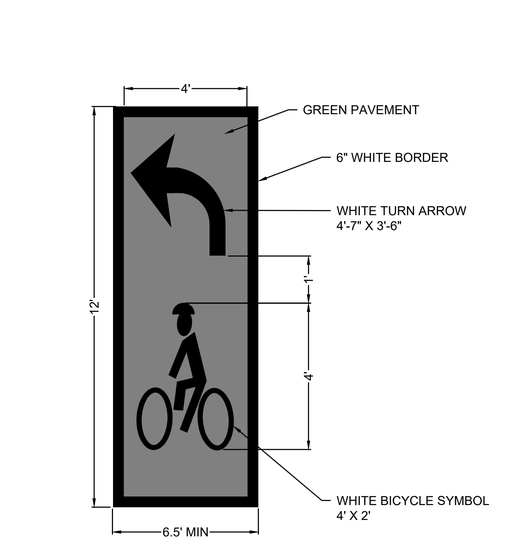
SCALE: N.T.S. DWG: PM-26 DATE: APRIL 2017



NOTES:
1. BICYCLE LEGEND SHALL CONFORM TO THE 2004 EDITION OF STANDARD HIGHWAY SIGNS AND SCALED APPROPRIATELY TO OBTAIN REQUIRED HEIGHT OF MARKINGS.
2. BICYCLE LEGEND SHALL BE PREFORMED REFLECTORIZED THERMOPLASTIC.

BICYCLE LEGEND DETAIL

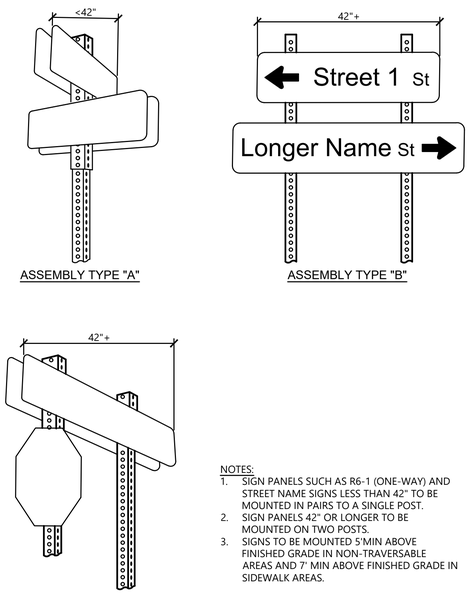
SCALE: N.T.S.



NOTES:
1. LEGEND MARKINGS SHALL BE REFLECTORIZED PREFORMED THERMOPLASTIC.
2. PAVEMENT SHALL BE PAINTED GREEN IN COLOR AS INTERIM APPROVED BY FHWA. SEE PLANS FOR LIMITS OF PAINTED LANES.

TWO-STAGE TURN QUEUE BOX

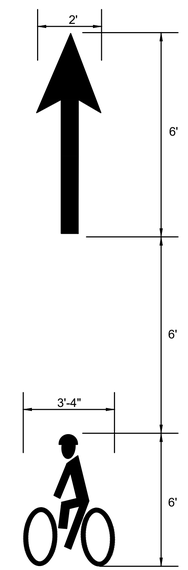
SCALE: N.T.S. DWG: PM-25 DATE: NOV 2016



NOTES:
1. SIGN PANELS SUCH AS R6-1 (ONE-WAY) AND STREET NAME SIGNS LESS THAN 42" TO BE MOUNTED IN PAIRS TO A SINGLE POST.
2. SIGN PANELS 42" OR LONGER TO BE MOUNTED ON TWO POSTS.
3. SIGNS TO BE MOUNTED 5'MIN ABOVE FINISHED GRADE IN NON-TRAVERSABLE AREAS AND 7' MIN ABOVE FINISHED GRADE IN SIDEWALK AREAS.

MULTIPLE SIGN MOUNTING DETAIL

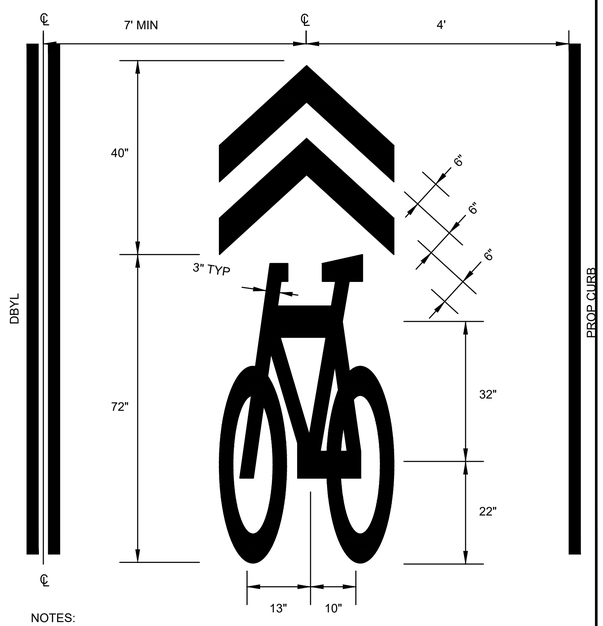
SCALE: N.T.S. DWG: PM-36 DATE: APRIL 2020



NOTES:
1. SEE MUTCD FIGURE 9C-6 FOR MORE INFORMATION.
2. BIKE LANE MARKINGS SHALL BE REFLECTORIZED PREFORMED THERMOPLASTIC.

BIKE LANE PAVEMENT MARKINGS

SCALE: N.T.S. DWG: PM-11 DATE: NOV 2015



NOTES:
1. SEE MUTCD FIGURE 9C-9 FOR MORE INFORMATION.
2. SHARED LANE MARKINGS SHALL BE PREFORMED REFLECTORIZED THERMOPLASTIC.

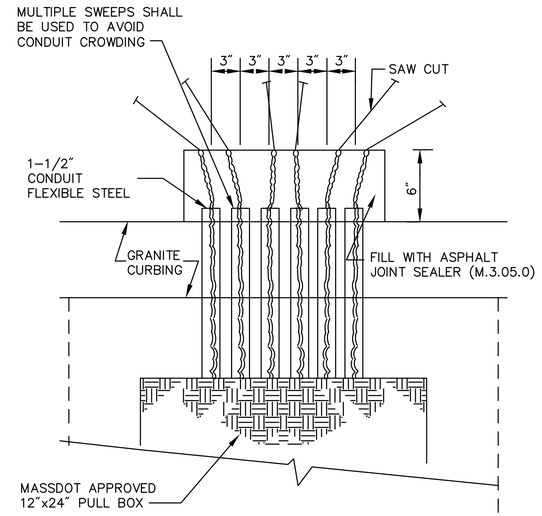
SHARROW PAVEMENT MARKING LAYOUT

SCALE: NTS DWG: PM-14 DATE: MARCH 2015

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	41	152
PROJECT FILE NO. 605377			

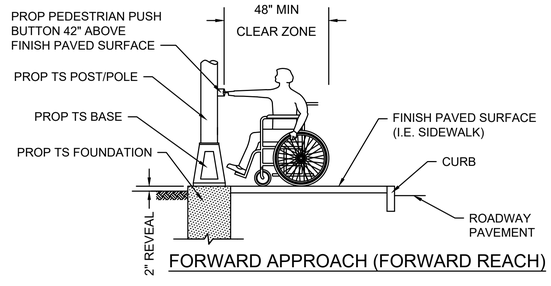
TRAFFIC DETAILS



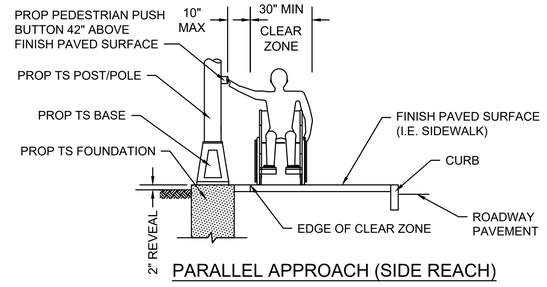
NOTE: SEE LOOP DETECTOR DETAIL SHEET FOR ADDITIONAL INFORMATION.

LOOP DETECTOR LEAD-IN - MORE THAN FOUR

SCALE: N.T.S. DATE: OCT 2015



FORWARD APPROACH (FORWARD REACH)



PARALLEL APPROACH (SIDE REACH)

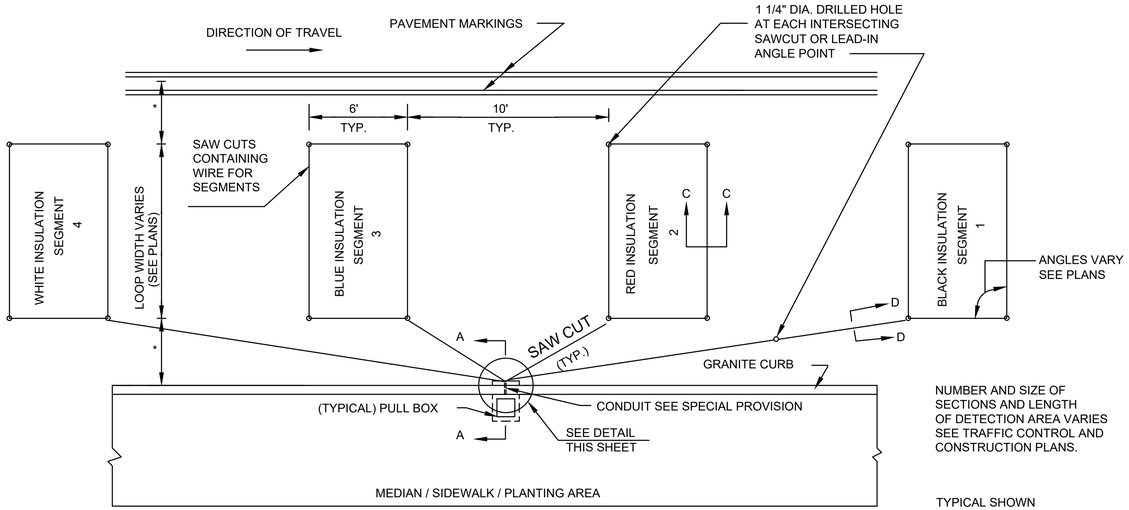
NOTE:
A CLEAR GROUND SPACE SHALL CONSIST OF A STABLE AND FIRM AREA, COMPLYING WITH 521 CMR 6.5 (FORWARD REACH) OR 521 CMR 6.6 (SIDE REACH) AND SHALL BE PROVIDED AT EACH OF THE PEDESTRIAN PUSH BUTTONS.

a) WHERE A FORWARD APPROACH IS PROVIDED, PEDESTRIAN PUSH BUTTONS SHALL ABUT AND BE CENTERED ON THE CLEAR GROUND SPACE.

b) WHERE A PARALLEL APPROACH IS PROVIDED, PEDESTRIAN PUSH BUTTONS SHALL BE WITHIN TEN INCHES (10") HORIZONTALLY OF AND CENTERED ON THE CLEAR GROUND SPACE.

PEDESTRIAN PUSH BUTTON CLEAR ZONE

SCALE: N.T.S. DWG: PM-10 DATE: APRIL 2013

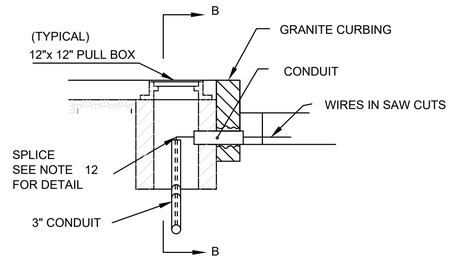


* OFFSETS FROM CURB TO LOOP AND EDGE OF LANE TO LOOP EQUAL IF NOT SHOWN.

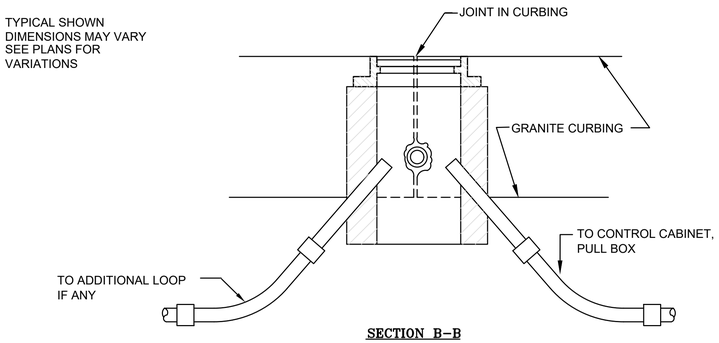
PLAN OF SEGMENTED DETECTOR DETAIL
NOT TO SCALE

NUMBER AND SIZE OF SECTIONS AND LENGTH OF DETECTION AREA VARIES SEE TRAFFIC CONTROL AND CONSTRUCTION PLANS.

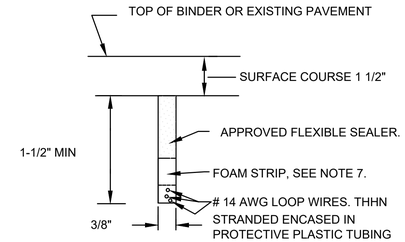
TYPICAL SHOWN DIMENSIONS MAY VARY SEE PLANS FOR VARIATIONS



SECTION A–A
NOT TO SCALE

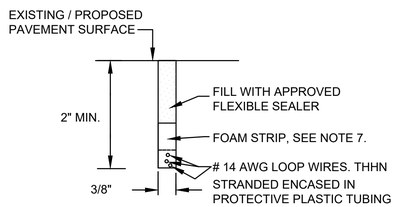


SECTION B–B
NOT TO SCALE



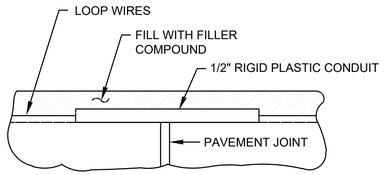
SECTION C–C & D–D

LOOPS IN BINDER COURSE OR EXISTING PAVEMENT TO BE RESURFACED
NOT TO SCALE

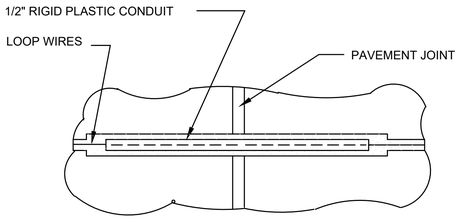


SECTION C–C & D–D

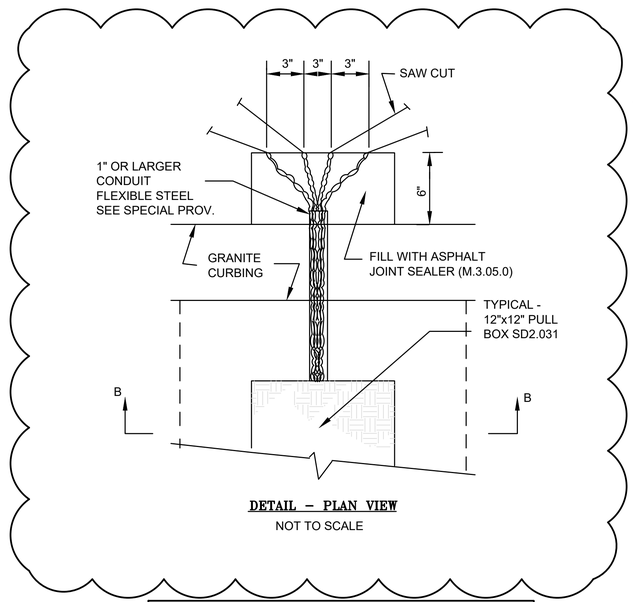
LOOPS IN SURFACE COURSE
NOT TO SCALE



VERTICAL SECTION
TREATMENT AT PAVEMENT JOINTS
NOT TO SCALE



PLAN
TREATMENT AT PAVEMENT JOINTS
NOT TO SCALE



DETAIL – PLAN VIEW
NOT TO SCALE

SEE DETAIL ON SHEET 40 FOR HAND HOLES/PULL BOXES W/MORE THAN 4 LOOP LEAD–IN WIRES

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	42	152
PROJECT FILE NO.	605377		

TRAFFIC DETAILS
LOOP DETECTOR DETAILS

DETECTOR NOTES

1. IN HANDHOLE, SPLICE ALL SEGMENTS TO TYPE II-SHIELDED LOOP DETECTOR DETECTOR LEAD-IN CABLE. SEGMENTS SHALL BE SPLICED IN PARALLEL, IN SERIES, OR IN A COMBINATION OF PARALLEL & SERIES AS SHOWN ON THE PLAN SHEET FOR EACH DETECTOR. NUMBER OF TURNS OF WIRE SHALL ALSO BE AS SHOWN ON THE PLAN SHEET FOR EACH DETECTOR. SEE NOTE 12.
2. SEE SPECIAL PROVISIONS FOR REQUIREMENTS OF DETECTOR AMPLIFIER
3. LEAD IN WIRES SHALL BE TWISTED FROM SEGMENT TO SPLICE WITH SHIELDED CABLE FIVE TURNS PER FOOT. LEAD-IN SHALL BE TYPE II (M8. 16. II).
4. BEFORE STARTING ANY SPLICING, THE ELECTRICAL CONTRACTOR SHALL FURNISH DATA SHEETS ON THE MATERIALS AND/OR METHODS TO BE USED IN ACCORDANCE WITH THE DEPARTMENTS STANDARD OPERATING PROCEDURES FOR APPROVAL OF SHOP DRAWINGS SEE SECTION 815.64, ESPECIALLY PARAGRAPH 1.
5. THE METALLIC SHIELD WHICH SHALL ENCASE THE DETECTOR LEADS FROM A SPLICE (TYPICALLY LOCATED IN A PULL BOX NEAR THE ROADWAY COMPONENT OF THE DETECTOR) TO THE CONTROLLER, AND THE DRAIN WIRE UNDER THE METALLIC SHIELD, SHALL NOT BE GROUNDED TO THE EARTH GROUNDING BUSS IN THE CONTROLLER, AND THE SHIELD AND DRAIN WIRE SHALL BE CAREFULLY INSULATED FROM THE TRANSFORMER NEUTRAL OR FROM EARTH GROUND AT ALL POINTS ALONG IT'S LENGTH. SPECIFICALLY, THIS INCLUDES CAREFUL INSULATION OF THE EXPOSED PORTION OF THE SHIELD AND THE AND THE DRAIN WIRE AT THE END AWAY FROM THE CONTROLLER WHERE IT IS SPLICED TO WIRES LEADING TO THE ROADWAY COMPONENT OF THE DETECTOR. THIS IS IMPORTANT TO AVOID A GROUND RETURN LOOP.
6. FILL ALL CONDUIT OPENINGS WITH DUCT SEAL.
7. AFTER SAW CUTS ARE COMPLETE, BLOW OUT WATER WITH OIL - FREE COMPRESSED AIR UNTIL CUTS ARE CLEAN AND DRY. INSERT WIRE INTO CLEAN SLOT WITH A BLUNT, SMOOTH, ROUND EDGED TOOL OF WOOD OR PLASTIC SUCH AS A PAINT STIRRER. DO NOT USE A SCREWDRIVER, THEN INSERT FOAM PLASTIC HOLD DOWN STRIPS, SIMILAR TO ETHA FOAM SB STRIPS SHALL BE ABOUT 2" LONG, PLACED IN THE SLOT ABOUT EVERY 2 FEET THEN POUR SEALER, TAKING CARE TO ELIMINATE BUBBLES.
8. THE COMBINED ROADWAY LOOP, TWISTED LEAD-IN WIRES, SPLICE AND SHIELDED LEAD-IN CABLE SHALL HAVE A RESISTANCE TO GROUND OF AT LEAST 100 MEGOHMS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.
9. FOR INSTALLATION OF SINGLE (ONE SEGMENT) SMALL WIRE LOOP DETECTOR DETAIL IS THE SAME
10. CUT LOOPS IN BINDER AND FILL WITH APPROVED FLEXIBLE SEALER.
11. DETECTOR WIRE SHALL BE A DIFFERENT COLOR FOR EACH SEGMENT OF A DETECTOR GROUP. SEE DETAIL
12. SPLICING PATTERN P = SERIES/PARALLEL: SPLICE SEGMENTS 1 AND 3 OF AN INDIVIDUAL DETECTOR IN SERIES. SPLICE SEGMENTS 2 AND 4 IN SERIES. SPLICE THE RESULTANT TWO GROUPS IN PARALLEL. SPLICE THE RESULTANT COMBINATION TO ONE LEAD-IN CABLE. CONNECT THIS CABLE TO AN OTHERWISE UNUSED AMPLIFIER CHANNEL.

SPLICING PATTERN S = SERIES: SPLICE ALL SEGMENTS (TYPICALLY FOUR, BUT MAY BE LESS) OF AN INDIVIDUAL DETECTOR IN SERIES. SPLICE THE RESULTANT COMBINATION TO ONE LEAD-IN CABLE TO AN OTHERWISE UNUSED AMPLIFIER CHANNEL.

THIS PLAN NOT DESIGNED BY VANASSE HANGEN BRUSTLIN, INC. IT WAS PROVIDED BY MASSDOT AND ALL INFORMATION CONTAINED HEREIN IS ASSUMED TO BE CORRECT.

605377_HDILDTL).DWG 11-Apr-2022

MILLBURY
MCCRACKEN ROAD

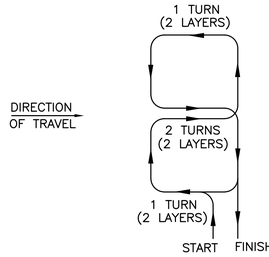
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	43	152
PROJECT FILE NO.	605377		

TRAFFIC DETAILS
BICYCLE DETECTOR DETAILS

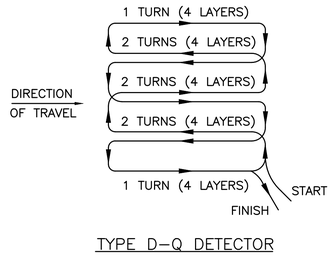
11-Apr-2022

605377_HD(BDTL).DWG

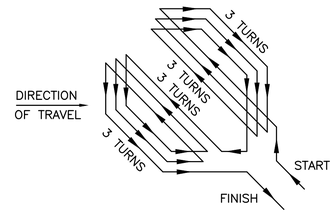
WINDING DETAILS



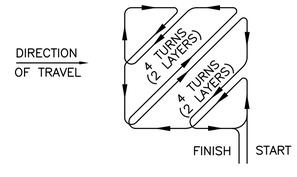
TYPE Q DETECTOR



TYPE D–Q DETECTOR

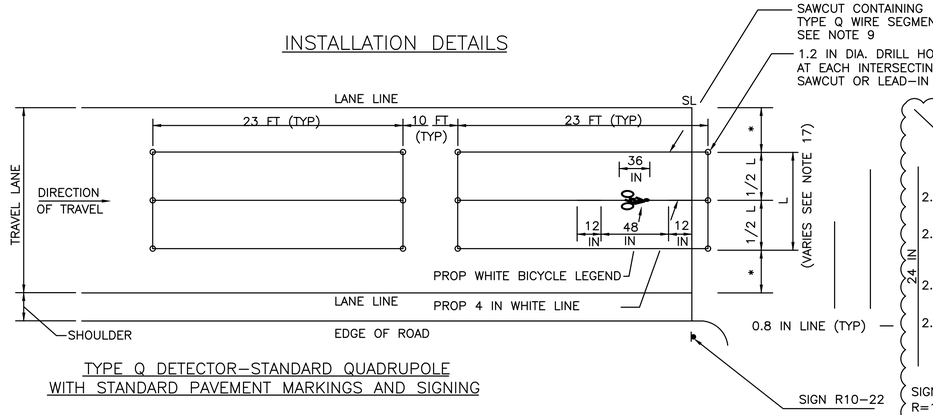


TYPE D–1 DETECTOR

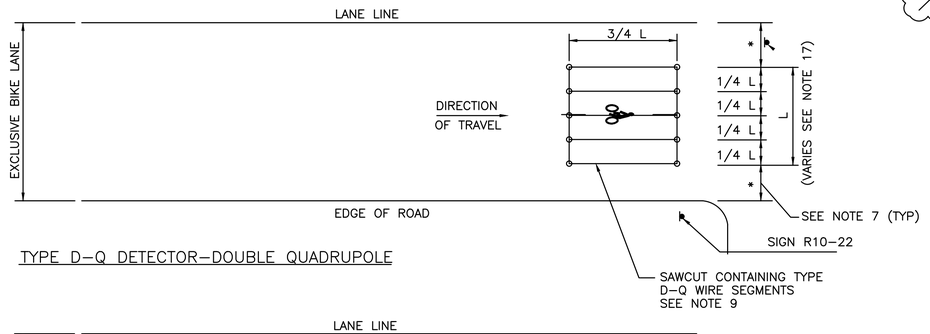


TYPE D–2 DETECTOR

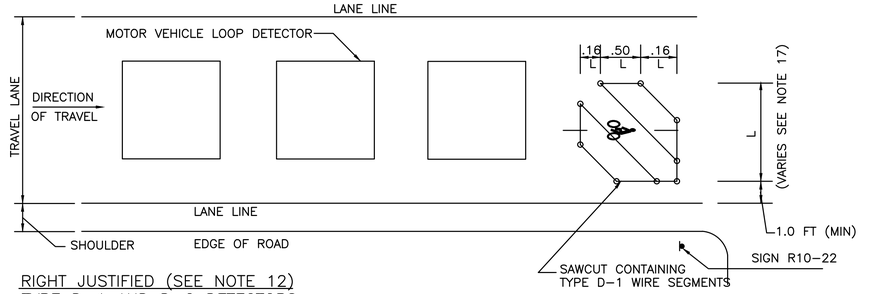
INSTALLATION DETAILS



TYPE Q DETECTOR–STANDARD QUADRUPOLE
WITH STANDARD PAVEMENT MARKINGS AND SIGNING

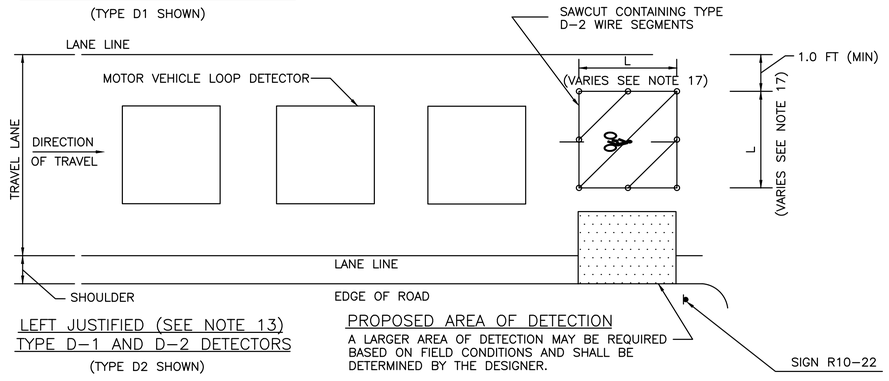


TYPE D–Q DETECTOR–DOUBLE QUADRUPOLE



RIGHT JUSTIFIED (SEE NOTE 12)
TYPE D–1 AND D–2 DETECTORS

(TYPE D1 SHOWN)

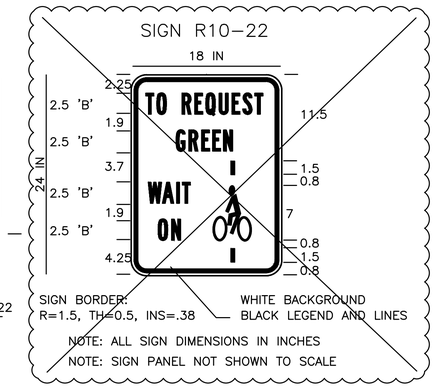


LEFT JUSTIFIED (SEE NOTE 13)
TYPE D–1 AND D–2 DETECTORS

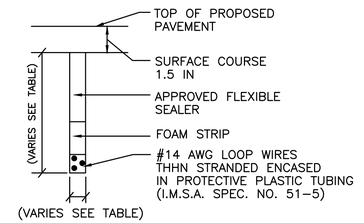
(TYPE D2 SHOWN)

PROPOSED AREA OF DETECTION

A LARGER AREA OF DETECTION MAY BE REQUIRED BASED ON FIELD CONDITIONS AND SHALL BE DETERMINED BY THE DESIGNER.



SIGN NOT REQUIRED



SECTION THRU LOOP DETECTOR

SAWCUT SLOT DEPTH GUIDE		
TURNS OF WIRE	SLOT SIZE	
	DEPTH (IN)	WIDTH (IN)
1	1.5	0.5
2	1.5	0.5
3	1.5	0.5
4	2.0	0.5
5	2.0	0.5
6	2.0	0.5
7	2.0	0.5
8	2.0	0.5

BICYCLE LOOP DETECTOR DETAILS

NOTES:

1. REFER TO VEHICLE LOOP DETECTOR DETAIL SHEET FOR ADDITIONAL NOTES AND CONSTRUCTION DETAILS.
2. ALL DETAILS ARE GRAPHICAL WITH NO SCALE.
3. THE NUMBER, SIZE, LOCATION AND LENGTH OF DETECTION AREA VARIES AND SHALL BE DETERMINED BY THE DESIGNER REFER TO TRAFFIC SIGNAL PLAN.
4. BICYCLE LOOPS SHALL BE CONNECTED TO SEPARATE LOOP DETECTOR AMPLIFIERS CAPABLE OF HIGHER LEVELS OF SENSITIVITY.
5. BICYCLE LOOPS SHALL BE INSTALLED IN THE BASE COURSE OF EXISTING PAVEMENT. THE EXISTING PAVEMENT SHALL BE COLD PLANED TO THE BASE COURSE AND SAWCUT FOR LOOP INSTALLATION.
6. SIGNS AND PAVEMENT MARKINGS SHALL BE INSTALLED FOR ALL BICYCLE DETECTORS TO INFORM CYCLISTS OF THE DETECTION AREA.
7. * OFFSETS FROM LANE LINE EQUAL UNLESS OTHERWISE NOTED. SEE PLANS.
8. TYPE Q DETECTORS SHALL BE WIRED IN A FIGURE EIGHT PATTERN WITH A DOUBLE LAYER DESIGN ("2–4–2") WITH 2 TURNS IN THE PERIMETER SLOTS AND 4 TURNS IN THE CENTER SLOT AS SHOWN IN THE WINDING DETAIL.
9. BICYCLES WILL BE DETECTED WITHIN 4 IN. OF THE INTERIOR LONGITUDINAL LOOP WIRES FOR TYPE Q AND D–Q DETECTORS.
10. PROVIDE 3 TURNS FOR TYPE D–1 DETECTORS.
11. INSTALL 2 LAYERS OF WIRE WOUND IN THE SAME DIRECTION IN BOTH LAYERS FOR TYPE D–2 DETECTORS. THE RESULT IS 4 TURNS IN EACH DIAGONAL.
12. RIGHT JUSTIFIED LOOP DETECTORS SHALL BE CONSIDERED FOR THE FOLLOWING CONDITIONS:
    a) BICYCLE STOPPING ON THE RIGHT SIDE OF A THRU TRAVEL LANE.
    b) BICYCLE STOPPING ON THE RIGHT SIDE OF AN EXCLUSIVE LEFT TURN LANE.
13. LEFT JUSTIFIED LOOP DETECTORS SHALL BE CONSIDERED FOR THE FOLLOWING CONDITIONS:
    a) BICYCLE STOPPING ON THE LEFT SIDE OF A SHARED LEFT/THRU LANE.
    b) BICYCLE STOPPING JUST TO THE RIGHT OF THE CENTERLINE WHEN TURNING LEFT ON A TWO–LANE ROADWAY.
14. RECTANGULAR LOOP DETECTORS SHALL BE CONSIDERED FOR BICYCLES STOPPING ON EITHER THE LEFT OR RIGHT SIDE OF A TWO–LANE ROADWAY. THE MINIMUM OFFSET FROM LANE LINE OR CURB LINE SHALL BE 1.0 FT.
15. PAVEMENT CORES OR TEST PITS MAY BE REQUIRED TO DETERMINE THE DEPTH OF EXISTING PAVEMENT AND CONFIRM THAT THE DETECTION OPTION CHOSEN AND CORRESPONDING WINDING PATTERN CAN BE ACCOMMODATED.
16. THESE DETAILS APPLY TO BICYCLE LOOPS INSTALLED IN ROADWAYS. PUSH BUTTON ACTUATION SHALL BE CONSIDERED FOR RECREATIONAL BIKE PATHS.
17. THE MINIMUM DIMENSION FOR L SHALL BE 6 FT MIN. FOR DETECTORS TYPE D–Q, D–1 & D–2. FINAL DIMENSIONS SHALL BE DETERMINED BY THE DESIGN ENGINEER.

GENERAL NOTES

1. ALL CONSTRUCTION SIGNING, TEMPORARY TRAFFIC CONTROL DEVICES, AND ROADSIDE ELEMENTS SHALL CONFORM WITH THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AS AMENDED, THE MASSDOT STANDARD DETAILS AND DRAWINGS FOR THE DEVELOPMENT OF TEMPORARY TRAFFIC CONTROL PLANS, THE LATEST REVISIONS OF THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, (AASHTO) ROADSIDE DESIGN GUIDE, AASHTO POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS, AND NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 OR THE AASHTO MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. WORK HOURS SHALL BE AS PER CONTRACT DOCUMENTS UNLESS OTHERWISE APPROVED BY MASSDOT AND THE TOWN. NO WORK IMPACTING THE TRAVEL WAY WILL BE ALLOWED DURING PEAK TRAFFIC PERIODS. PEAK PERIODS ARE DEFINED AS MONDAY THRU FRIDAY, 6:00AM TO 9:00AM AND 3:00PM TO 7:00PM.
3. NO WORK SHALL OCCUR WITHIN THE PUBLIC WAY THE DAY BEFORE, AFTER OR ON A STATE RECOGNIZED HOLIDAY UNLESS OTHERWISE APPROVED BY THE ENGINEER.
4. ALL DRUMS OUTSIDE TAPERS SHALL BE SET AT 20' ON CENTER MAX. UNLESS OTHERWISE NOTED OR ADJUSTED BY THE ENGINEER.
5. ALL DRUMS SHALL BE APPROXIMATELY PLACED AND MOVED AS NECESSARY TO MAINTAIN SAFE AND REASONABLE ABUTTER ACCESS. WORK MAY REQUIRE ADDITIONAL SIGNS, DRUMS AND OTHER TRAFFIC CONTROL DEVICES, GRADING AND TEMPORARY PAVEMENT FOR PASSAGE OF PEDESTRIAN, VEHICULAR AND EMERGENCY TRAFFIC THROUGH THE WORK AREAS, BOTH DURING AND AFTER WORKING HOURS, TO MAINTAIN SUCH ACCESS.
6. THE FIRST 10 DRUMS ON TAPERS SHALL BE REFLECTORIZED DRUMS WITH SEQUENTIAL FLASHING WARNING LIGHTS AND SHALL BE OPERATING, AT A MINIMUM, BETWEEN DUSK AND DAWN, WHEN TAPER IS DEPLOYED.
7. REFLECTORIZED CONES SHALL BE A MINIMUM OF 36 INCHES IN HEIGHT.
8. CONES MAY BE USED IN LIEU OF DRUMS OUTSIDE OF TAPER AREAS.
9. THE CONTRACTOR SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OR RESTRICTION OF ACCESS.
10. FOR DROP-OFFS 3" OR LESS WITHIN THE CLEAR ZONE, CONDITION MAY BE MITIGATED WITH W8-9 (LOW SHOULDER) SIGN OR TEMPORARY CHANNELIZATION DEVICES. FOR DROP-OFFS GREATER THAN 3" BUT NO MORE THAN 36", DETERMINE WHETHER IT IS MORE COST EFFECTIVE TO INSTALL BOTH W8-9 SIGN OR W8-9 SIGN WITH A 2H:1V (MIN) WEDGE IN ACCORDANCE WITH MASSDOT WORK ZONE SAFETY GUIDE OR TO REMOVE THE HAZARD. FOR DROP-OFFS 36" OR GREATER USE TEMPORARY BARRIER IN ACCORDANCE WITH MASSDOT WORK ZONE POSITIVE PROTECTION GUIDELINES.
11. CONSTRUCTION CLEAR ZONE SHALL BE IN ACCORDANCE WITH MASSDOT BOSTON TRAFFIC GUIDELINES AS FOLLOWS:
    4' IF POSTED SPEED IS LESS THAN 35 MPH
    8' IF POSTED SPEED IS 35 MPH
12. ALL TEMP BARRIERS SHALL MEET OR EXCEED MASH TL-2 REQUIREMENTS IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
13. THE CONTRACTOR SHALL PROVIDE TEMPORARY IMPACT ATTENUATORS TO PROTECT ALL BLUNT-ENDS OF TEMPORARY BARRIER OR AS REQUIRED BY THE ENGINEER. TEMPORARY IMPACT ATTENUATORS SHALL BE DESIGNED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO THE START OF WORK. ALL TEMPORARY IMPACT ATTENUATORS SHALL BE DESIGNED TO MEET OR EXCEED MASH TEST LEVEL 2 (TL-2) IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
14. 11' MINIMUM LANE WIDTHS SHALL BE MAINTAINED UNLESS OTHERWISE NOTED.
15. TEMPORARY TRAFFIC CONTROL DEVICES AND SIGNS SHALL BE COVERED OR REMOVED DURING NON-WORKING HOURS WHEN NOT IN USE.
16. SIGNS INSTALLED ON PORTABLE STANDS REQUIRE 12 INCH MINIMUM MOUNTING HEIGHT FROM THE ROADWAY SURFACE TO THE BOTTOM OF THE SIGN.
17. SIGNS INSTALLED ON PORTABLE STANDS PLACED AMONG CHANNELIZATION DEVICES REQUIRE A 36 INCH MINIMUM MOUNTING HEIGHT FROM THE ROADWAY SURFACE TO THE BOTTOM OF THE SIGN.
18. SIGNS MOUNTED ON POSTS REQUIRE A MINIMUM 84 INCH MOUNTING HEIGHT FROM THE ROADWAY OR SIDEWALK SURFACE TO THE BOTTOM OF THE SIGN. CONTRACTOR SHALL MAINTAIN A MINIMUM SIDEWALK HORIZONTAL CLEAR WIDTH OF 36" AT ALL TIMES.
19. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN NCHRP 350 AND/OR MASH CRASH TESTED SIGN SUPPORTS AND INSTALLED IN ACCORDANCE WITH THE MUTCD.
20. W21-7 SIGNS SHALL BE INSTALLED IN ADVANCE (100' MIN) OF AREAS WHERE UTILITY CASTINGS HAVE BEEN RAISED IN ADVANCE OF PAVING OPERATIONS OR AS REQUESTED BY THE ENGINEER.
21. W8-15 SIGNS SHALL BE INSTALLED IN ADVANCE (100' MIN) OF PAVEMENT MILLING AREAS OR AS REQUESTED BY THE ENGINEER.
22. TEMPORARY MARKINGS SHALL BE WATER-BORNE PAINT OR SURFACE-APPLIED REMOVEBLE TAPE, AS APPROVED BY THE ENGINEER.
23. ALL TEMPORARY CROSSWALKS AND STOP LINES SHALL BE 12 INCHES WIDE.
24. ALL TEMPORARY DOUBLE YELLOW LINES (DBYL) SHALL BE 6 INCHES WIDE.
25. W20-1c, MA-R2-10a OR MA-R2-10e SIGNS SHOWN ON ADVANCE SIGN SCHEMATIC MAY BE USED IN LIEU OF THOSE SIGNS SHOWN ON TYPICAL DETAILS ON THE TEMPORARY TRAFFIC CONTROL PLANS IF MINIMUM SIGN SPACING IS MET.
26. CONTRACTOR SHALL SECURE WORK AREAS BY APPROPRIATE MEANS, TO PREVENT UNAUTHORIZED ACCESS AT ALL TIMES.
27. THERE IS NO DESIGNATED BICYCLE LANE ON THE ROADWAY WITHIN THE PROJECT LIMITS. BICYCLES ARE EXPECTED TO SHARE THE ROAD WITH GENERAL VEHICULAR TRAFFIC.
28. NIGHTTIME WORK SHALL REQUIRE PRIOR APPROVAL FROM MASSDOT.
29. ILLUMINATION REQUIRED FOR NIGHTTIME WORK APPROVED BY THE ENGINEER SHALL BE DIFFUSED OR ANTI-GLARE LIGHTING AND IN ACCORDANCE WITH MASSDOT STANDARDS.
30. TEMPORARY PORTABLE RUMBLE STRIP ARRAY CONSISTS OF THREE TRANSVERSELY PLACED RUMBLE STRIPS EVENLY SPACED. SPACING SHALL BE 10 FT ON CENTER OR AS DIRECTED BY THE ENGINEER.
31. WHEN UTILIZING TYPICAL TRAFFIC CONTROL DETAILS FOR DAILY SETUPS, COVER EXISTING CONFLICTING ADVANCE WARNING SIGNS AS REQUIRED TO COMPLETE THE WORK.
32. CONTRACTOR SHALL NOT ALLOW PUBLIC ACCESS ON PORTIONS OF NEWLY BUILT SIDEWALK UNTIL ALL SIDEWALKS WITHIN THE PROJECT LIMITS ARE FULLY CONSTRUCTED AND ADAAG COMPLIANT OR AS DIRECTED BY THE ENGINEER.
33. CONTRACTOR TO CONDUCT TEST PITS TO EVALUATE LIMITS OF LEDGE IN AREAS WHERE STONE MASONRY WALLS ARE PROPOSED TO DETERMINE IF A SUITABLE ROCK FACE CAN BE MAINTAINED.

SUGGESTED ROUNDABOUT CONSTRUCTION STAGING NOTES

SEE SHEETS 48-51 FOR SUGGESTED ROUNDABOUT STAGING.

STAGE 1:
1. RELOCATE EXIST UTILITY POLES (BY OTHERS).

STAGE 2:
1. CONSTRUCT PROPOSED DRAINAGE SWALES AND DETENTION BASINS TO MAINTAIN WATER QUALITY AND DRAINAGE DURING CONSTRUCTION.
2. CONSTRUCT WETLAND REPLICATION AREAS.
3. CONSTRUCT RETAINING WALLS IN NORTHEAST AND SOUTHWEST CORNERS TO SUPPORT FILL.
4. INSTALL FILL TO EXISTING ROAD GRADE.
5. CONSTRUCT TEMP HMA ROADWAY CONNECTION BETWEEN MCCRACKEN ROAD (WEST) AND GREENWOOD STREET (SOUTH) IN THE FINAL FOOTPRINT AT EXISTING ROADWAY GRADE.
6. CONSTRUCT TEMPORARY DRAINAGE CONNECTION FROM GREENWOOD STREET (SOUTH) UPLAND OF THE TEMP ROADWAY CONNECTION TO THE AREA OF THE PROPOSED HEADWALL IN THE SOUTHWEST CORNER OF THE INTERSECTION TO COLLECT ROADWAY DRAINAGE DURING CONSTRUCTION.

STAGE 3:
1. INSTALL PROPOSED UTILITIES (WATER, SEWER) WHEN POSSIBLE.
2. RELOCATE McCRACKEN ROAD (WEST) TO THE TEMP HMA ROADWAY CONNECTION AT GREENWOOD STREET (SOUTH).
3. CONSTRUCT THE WEST SIDE OF GREENWOOD STREET BETWEEN THE TEMPORARY ROADWAY AND NORTHERN PROJECT LIMITS. INSTALL FILL TO MEET EXIST ROAD GRADE.

STAGE 4:
1. CLOSE AND DETOUR ALL ROADWAYS DAILY, DURING OFF-PEAK TRAFFIC HOURS, TO INSTALL FILL ACROSS THE ENTIRE PROPOSED ROADWAY FOOTPRINT IN MANAGEABLE INCREMENTS UP TO FINAL SUB-BASE ELEVATION.
2. MAINTAIN PROPERTY SIDE-SLOPE STABILIZATION DAILY.
3. INSTALL PROPOSED DRAINAGE SYSTEM INCLUDING 48" CULVERT AND HEADWALLS WHEN POSSIBLE DURING BACKFILL OPERATIONS. MAINTAIN MINIMUM COVER OVER NEWLY INSTALLED DRAINAGE.
4. INSTALL PROPOSED UTILITIES (WATER, SEWER) WHEN POSSIBLE.
5. CONSTRUCT PAVEMENT BASE COURSE AND INTERMEDIATE COURSES AND ADJUST DRAINAGE SYSTEM AS NECESSARY.
6. SAWCUT AND INSTALL PROPOSED CURB AND SIDEWALK. (NOTE: NEW PORTIONS OF SIDEWALK SHALL REMAIN CLOSED TO PEDESTRIANS UNTIL COMPLETION OF THE PROJECT.)

STAGE 5:
1. SAWCUT AND INSTALL CENTER CIRCULATING ISLAND AND IMPLEMENT ROUNDABOUT TRAFFIC FLOW WITH TEMP SIGNS, PCMS, AND ARROW BOARDS. FORM SPLITTER ISLANDS ON EACH APPROACH USING REFLECTORIZED DRUMS. INSTALL FINAL SIGNS IN CENTER ISLAND AND ALONG ROADWAY EDGES WHERE POSSIBLE. INSTALL TEMPORARY SIGNS IN FINAL SIGNS LOCATIONS WITHIN SPLITTER ISLANDS ON ALL APPROACHES.
2. SAWCUT AND INSTALL T-100 APRON CURB AND APRON. DETOURS TO REMAIN IN PLACE FOR TRUCKS WHILE CENTER ISLAND APRON CONCRETE HARDENS.
3. SAWCUT AND INSTALL SPLITTER ISLANDS ON ALL APPROACHES.
4. MICRO-MILL TRANSITION AREAS.
5. ADJUST DRAINAGE STRUCTURES TO FINAL GRADE.
6. INSTALL FINAL PAVING, PAVEMENT MARKINGS, AND SIGNS.

SUGGESTED BRIDGE AND WALL CONSTRUCTION STAGING NOTES

SEE SHEETS 52-54 FOR SUGGESTED STAGING FOR THE RETAINING WALLS AND BRIDGE BETWEEN STA 225+00 AND 228+00. EXISTING CROSSWALK ON BLACKSTONE SHOPPES APPROACH AND SIDEWALK ALONG McCRACKEN ROAD TO BE CLOSED UNTIL FINAL SIDEWALK WITHIN PROJECT LIMITS ARE FULLY CONSTRUCTED AND ADA-ACCESSIBLE.

STAGE 1: WESTERLY RETAINING WALLS
1. CONSTRUCT WESTERLY MSE WALL, BRIDGE ABUTMENT, AND WINGWALL ON THE NORTH SIDE OF THE BRIDGE OFF-ROADWAY AND IN COORDINATION WITH THE ABUTTER TO MAINTAIN DRIVEWAY ACCESS.
2. CONSTRUCT WESTERLY MSE WALL, BRIDGE ABUTMENT, AND WING WALL ON THE SOUTH SIDE OF THE BRIDGE OFF-ROADWAY TO THE GREATEST EXTENT POSSIBLE, USING DAILY LANE CLOSURES WHEN REQUIRED. COORDINATE WITH THE ABUTTER FOR SIDEWALK AND CURB INSTALLATION, REFER TO GENERAL NOTES 5 AND 9.
3. EXISTING RETAINING WALLS TO BE RETAINED.

STAGE 2: BRIDGE WIDENING (SEE SHEET 86 FOR CONSTRUCTION SEQUENCE)

STAGE 3: EASTERLY RETAINING WALL
1. CONSTRUCT EASTERLY MSE WALL ON THE SOUTH SIDE OF THE BRIDGE OFF-ROADWAY. THE WORK ZONE WILL BE BEHIND THE TEMPORARY BARRIER AS SHOWN ON SHEET 54.
2. EXISTING RETAINING WALL TO BE RETAINED.

BUFFER SPACING

SPEED (MPH)	DISTANCE (FEET)
15	80
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495

MILLBURY
MCCRACKEN ROAD

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TEMPORARY TRAFFIC CONTROL PLAN
LEGEND AND GENERAL NOTES

LEGEND	
P	POLICE OFFICER
S	TRAFFIC SIGNAL
	REFLECTORIZED DRUM
	REFLECTORIZED DRUMS WITH SEQUENTIAL FLASHING WARNING LIGHTS (SEE NOTE 6)
	TEMPORARY CONSTRUCTION SIGN
	TRAFFIC CONE
	TYPE III BARRICADE
	ARROW BOARD (AB) (RIGHT OR LEFT)
	TEMPORARY PORTABLE RUMBLE STRIPS
	PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
	TEMPORARY BARRIER
	TEMPORARY IMPACT ATTENUATOR (TYPE NOTED)
	WORK AREA (PUBLIC ACCESS RESTRICTED)
	TRANSITION/BUFFER AREAS
	TRAFFIC FLOW
	CONSTRUCTION FENCE
NTS	NOT TO SCALE

ADVANCE SIGN SPACING

	DISTANCE BETWEEN SIGNS (FEET)		
ROADWAY	A	B	C
ROUTE 146	1,000	1,600	2,600
ALL OTHERS	350	350	350

LANE TAPER LENGTH FORMULAS

L= TAPER LENGTH IN FEET

W= WIDTH OF ROADWAY TO BE SHIFTED OR REDIRECTED IN FEET

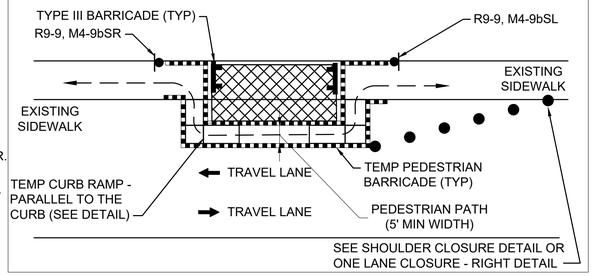
S= POSTED SPEED LIMIT IN MPH

POSTED SPEED	
40 MPH OR LESS	GREATER THAN 40 MPH
$L = \frac{WS^2}{60}$	L= WS

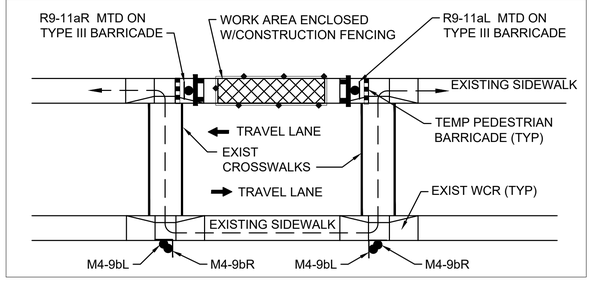
NOTES:

1. ADDITIONAL ADVANCE WARNING SIGNS MAY BE NECESSARY AS DETERMINED BY THE ENGINEER.
2. CONTROLS FOR PEDESTRIAN TRAFFIC ONLY, ARE SHOWN. VEHICULAR TRAFFIC SHALL BE MAINTAINED AS SHOWN ELSEWHERE.
3. STREET LIGHTING SHOULD BE CONSIDERED WHEN LOCATING CONTROL DEVICES.
4. ◄ — ► INDICATES DIRECTION OF PEDESTRIAN TRAVEL.
5. PROPOSED TEMPORARY CROSSWALKS SHALL BE 12" WIDE SURFACE APPLIED TAPE OR REFLECTORIZED PAINT AS DIRECTED BY THE ENGINEER.
6. ALL TEMPORARY PEDESTRIAN PATHWAYS SHALL COMPLY FULLY WITH ALL REQUIREMENTS OF THE MUTCD AND ALL APPLICABLE MAAB AND ADAAG REQUIREMENTS AND INCLUDE THE USE OF A COMPLIANT TEMPORARY PEDESTRIAN MANAGEMENT GUIDANCE SYSTEM AT ALL TIMES.
7. CONTRACTOR SHALL MAINTAIN AS WIDE OF A PEDESTRIAN ACCESS AS POSSIBLE AT ALL TIMES. EXCEPT WHERE NECESSARY, THE CONTRACTOR MAY TEMPORARILY REDUCE PEDESTRIAN PATHWAYS TO 4 FEET IN WIDTH (EXCLUDING CURB) FOR NO MORE THAN 200 LINEAR FEET AT A TIME IN ACCORDANCE WITH ALL STANDARDS. A 5' x 5' PASSING AREA SHALL BE PROVIDED IN INTERVALS NOT EXCEEDING 200 FEET.
8. TEMPORARY WHEELCHAIR RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH MASSDOT, MAAB, AND ADAAG REQUIREMENTS.
9. TEMPORARY PEDESTRIAN BARRICADE SHALL BE PAID FOR UNDER ITEM 852.11 TEMPORARY PEDESTRIAN BARRICADE.
10. TEMPORARY PEDESTRIAN CURB RAMPS SHALL BE PAID FOR UNDER ITEM 852.12 TEMPORARY PEDESTRIAN CURB RAMP.

PEDESTRIAN BYPASS TYPE I

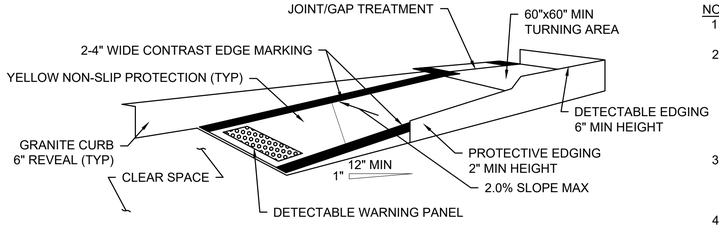


PEDESTRIAN BYPASS TYPE II

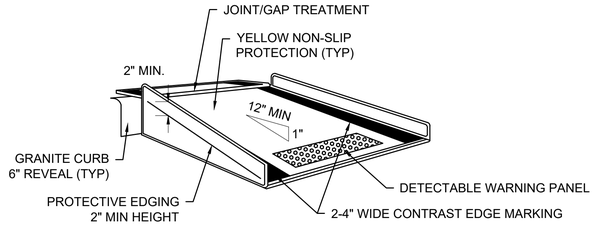


PEDESTRIAN BYPASS DETAIL

SCALE: NTS



TEMPORARY CURB RAMP-PARALLEL TO CURB



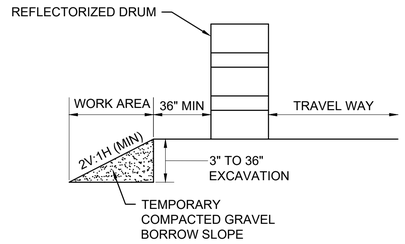
TEMPORARY CURB RAMP-PERPENDICULAR TO CURB

NOTES:

1. CURB RAMPS SHALL BE 60" MINIMUM WIDTH WITH A FIRM, STABLE AND NON-SLIP SURFACE.
2. PROTECTIVE EDGING WITH A 2" MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6" OR GREATER OR HAS A SIDE APRON SLOPE STEEPER THAN 1:3 (33%). PROTECTIVE EDGING SHOULD BE CONSIDERED WHEN THE CURB RAMPS OR LANDING PLATFORMS HAVE A VERTICAL DROP OF 3" OR MORE.
3. DETECTABLE EDGING WITH 6" MINIMUM HEIGHT AND CONTRASTING COLOR SHALL BE INSTALLED ON ALL CURB RAMP LANDINGS WHERE THE WALKWAY CHANGES DIRECTION (TURNS).
4. THE CURB RAMP WALKWAY AND LANDING AREA SURFACE SHALL BE OF A SOLID CONTINUOUS CONTRASTING COLOR ABUTTING UP TO THE EXISTING SIDEWALK.
5. CURB RAMPS AND LANDINGS SHOULD HAVE A 1:50 (2%) MAX CROSS-SLOPE.
6. CLEAR SPACE OF 48"x48" MINIMUM SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
7. WATER FLOW IN THE GUTTER SYSTEM SHALL HAVE MINIMAL RESTRICTION.
8. LATERAL JOINTS OR GAPS BETWEEN SURFACES SHALL BE LESS THAN 0.5" WIDTH.
9. CHANGES BETWEEN SURFACE HEIGHTS SHOULD NOT EXCEED 0.5" LATERAL EDGES SHOULD BE VERTICAL UP TO 0.25" HIGH, AND BEVELED AT 1:2 BETWEEN 0.25" AND 0.5" HEIGHT.
10. IF A TEMPORARY PEDESTRIAN RAMP LEADS TO A CROSSWALK, THEN A DETECTABLE WARNING PAD MUST BE ADHERED TO THE BASE OF THE RAMP. IF IT LEADS TO A PROTECTED PEDESTRIAN BYPASS THAT DOES NOT CONFLICT WITH VEHICULAR TRAFFIC, THEN A PAD SHALL NOT BE INSTALLED ON THE RAMP.

TEMPORARY CURB RAMPS

SCALE: NTS

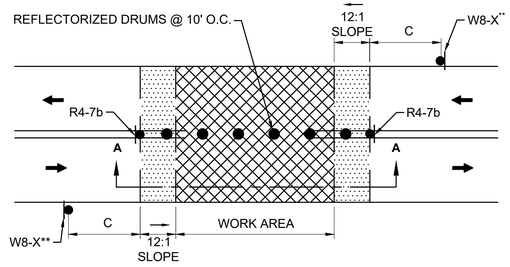


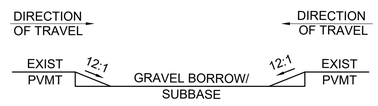
NOTE:

1. CONTRACTOR SHALL INSTALL W8-9 SIGN ON ALL ROADWAYS 350 FT IN ADVANCE OF THE START OF DROP-OFF CONDITION.

TYPICAL ROADWAY DROP-OFF PROTECTION

SCALE: NTS





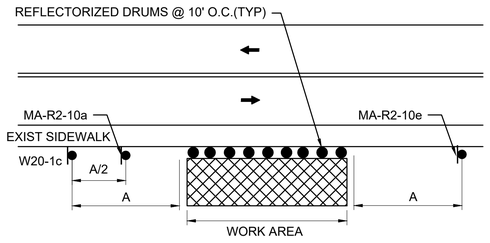
SECTION A-A

NOTES:

1. SQUARE OFF THE FULL WIDTH OF THE ROADWAY AT THE END OF WORK DAY.
2. ** CONTRACTOR SHALL INSTALL W8-1 AT LIMIT OF EXCAVATION OR W8-3, W8-8, W8-15, OR W8-24 SIGN, AS APPROPRIATE, ON ALL ROADWAYS IN ADVANCE OF THE TRANSITION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

TEMPORARY PAVEMENT TRANSITION

SCALE: NTS DWG: TTCP1g DATE: NOV 2020



NOTES:

1. SEE ADVANCE SIGN SPACING TABLE ON SHEET
2. W20-1c, MA-R2-10a AND MA-R2-10e SIGNS MAY BE OMITTED IF SIGNS SHOWN ON ADVANCE SIGN SCHEMATIC ARE IN PLACE AND MINIMUM SIGN SPACING IS MET.

OFF ROADWAY WORK - RIGHT

SCALE: NTS

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	45	152
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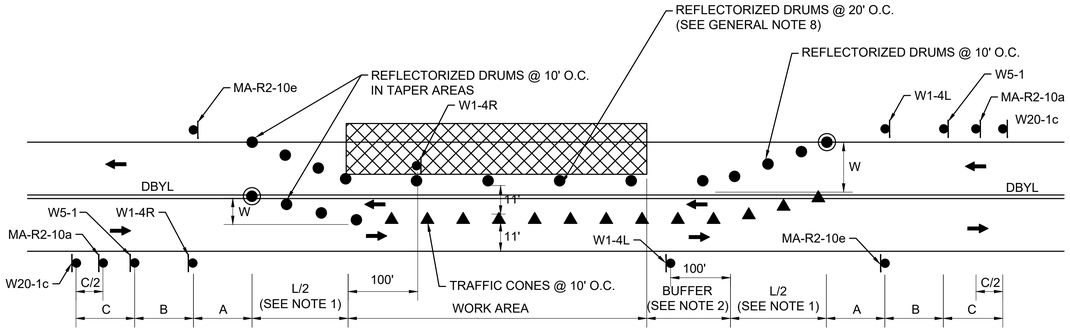
TEMPORARY TRAFFIC CONTROL PLAN TYPICAL DETAILS

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	46	152
PROJECT FILE NO. 605377			

TEMPORARY TRAFFIC CONTROL PLAN
TYPICAL DETAILS

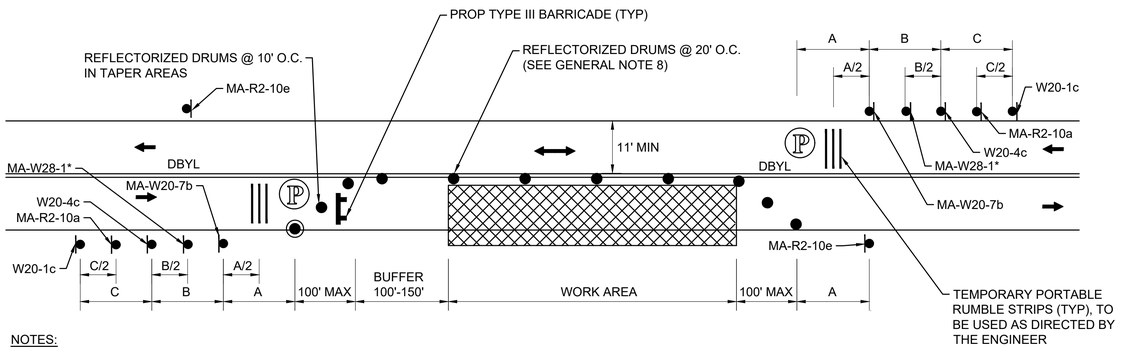


NOTES:

1. SEE TAPER LENGTH FORMULA ON SHEET 44.
2. SEE BUFFER SPACING CHART ON SHEET 44.
3. REFER TO ADVANCE SIGN SPACING TABLE ON SHEET 44.
4. W20-1c, MA-R2-10a AND MA-R2-10e SIGNS MAY BE OMITTED IF SIGNS SHOWN ON ADVANCE SIGN SCHEMATIC ARE IN PLACE AND MINIMUM SIGN SPACING IS MET.

TYPICAL TWO-WAY STREET LANE SHIFT

SCALE: NTS

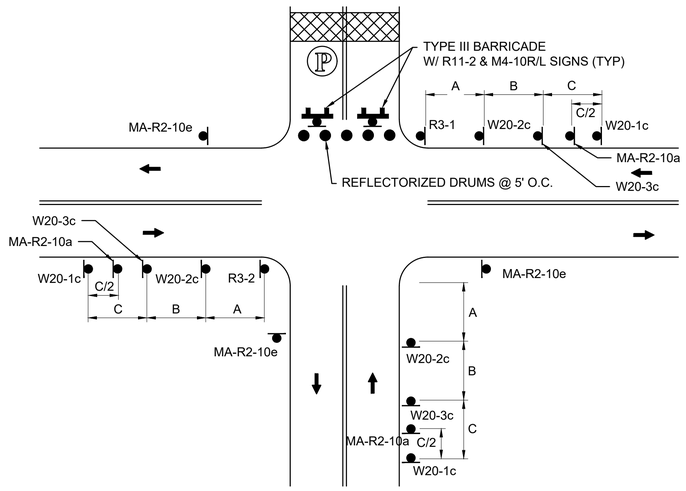


NOTES:

1. REFER TO ADVANCE SIGN SPACING TABLE ON SHEET 44.
2. SEE ADVANCE SIGN SPACING CHART ON SHEET 44.
3. * SIGN NOT NEEDED IF RUMBLE STRIPS NOT USED.
4. W20-1c, MA-R2-10a AND MA-R2-10e SIGNS MAY BE OMITTED IF SIGNS SHOWN ON ADVANCE SIGN SCHEMATIC ARE IN PLACE AND MINIMUM SIGN SPACING IS MET.

TYPICAL TWO-WAY STREET LANE CLOSURE ALTERNATING TRAFFIC

SCALE: NTS

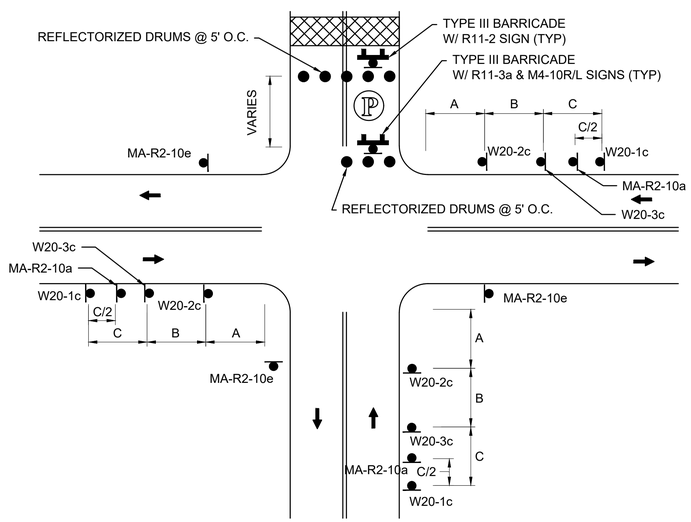


NOTES:

1. REFER TO ADVANCE SIGN SCHEMATIC ON SHEET 44.
2. W20-1c, MA-R2-10a AND MA-R2-10e SIGNS MAY BE OMITTED IF SIGNS SHOWN ON ADVANCE SIGN SCHEMATIC ARE IN PLACE AND MINIMUM SIGN SPACING IS MET.

TYPICAL LOCAL ROAD CLOSURE

SCALE: NTS

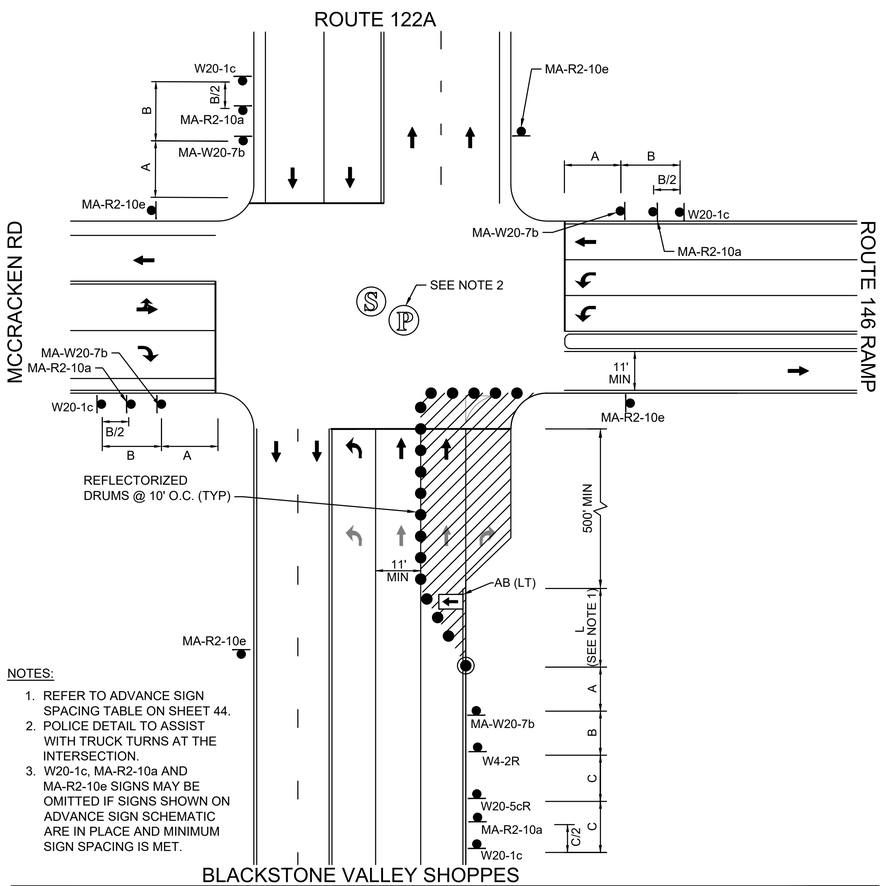


NOTES:

1. REFER TO ADVANCE SIGN SPACING TABLE ON SHEET 44.
2. W20-1c, MA-R2-10a AND MA-R2-10e SIGNS MAY BE OMITTED IF SIGNS SHOWN ON ADVANCE SIGN SCHEMATIC ARE IN PLACE AND MINIMUM SIGN SPACING IS MET.

TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS

SCALE: NTS

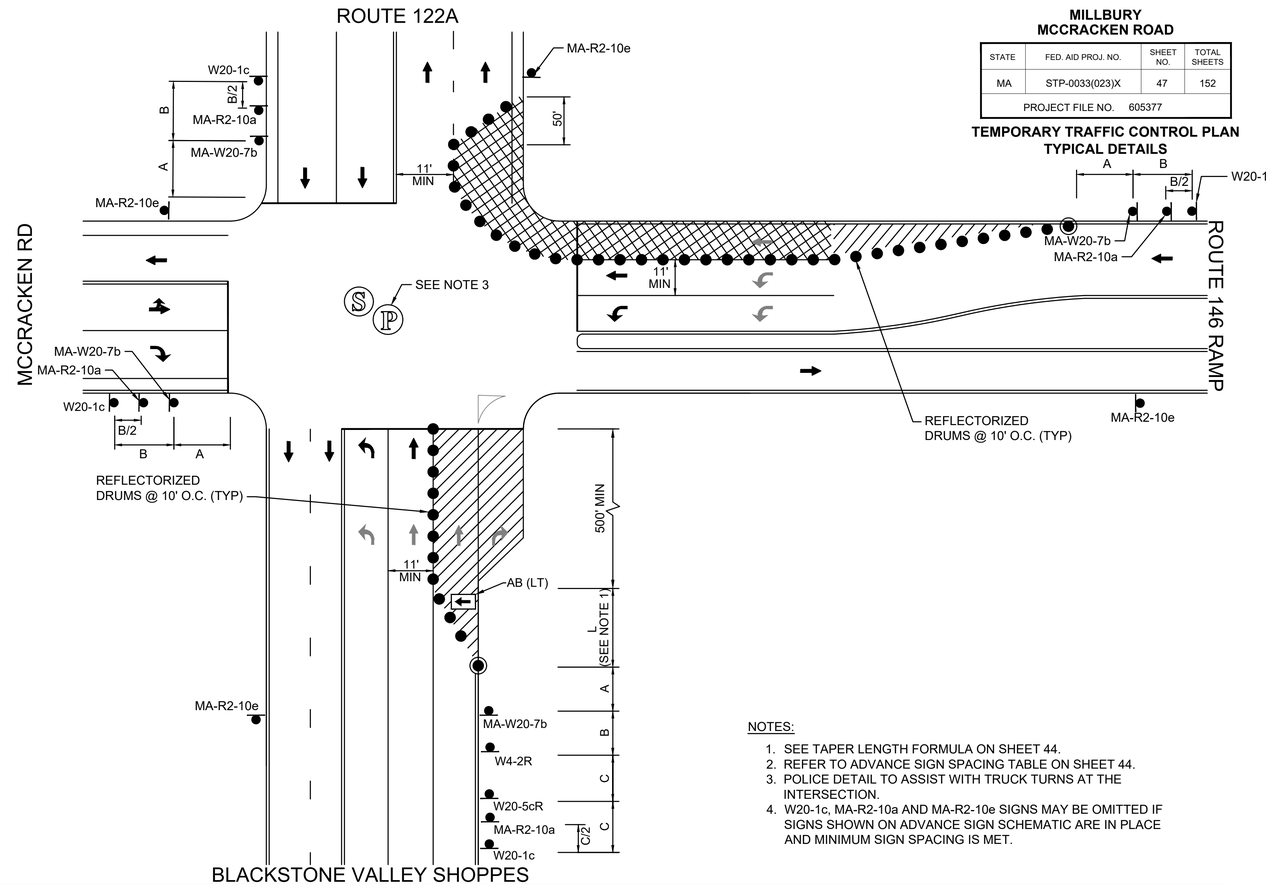


NOTES:

1. REFER TO ADVANCE SIGN SPACING TABLE ON SHEET 44.
2. POLICE DETAIL TO ASSIST WITH TRUCK TURNS AT THE INTERSECTION.
3. W20-1c, MA-R2-10a AND MA-R2-10e SIGNS MAY BE OMITTED IF SIGNS SHOWN ON ADVANCE SIGN SCHEMATIC ARE IN PLACE AND MINIMUM SIGN SPACING IS MET.

WORK ON THE NEAR SIDE OF INTERSECTION WITH MULTILANE APPROACH

SCALE: NTS

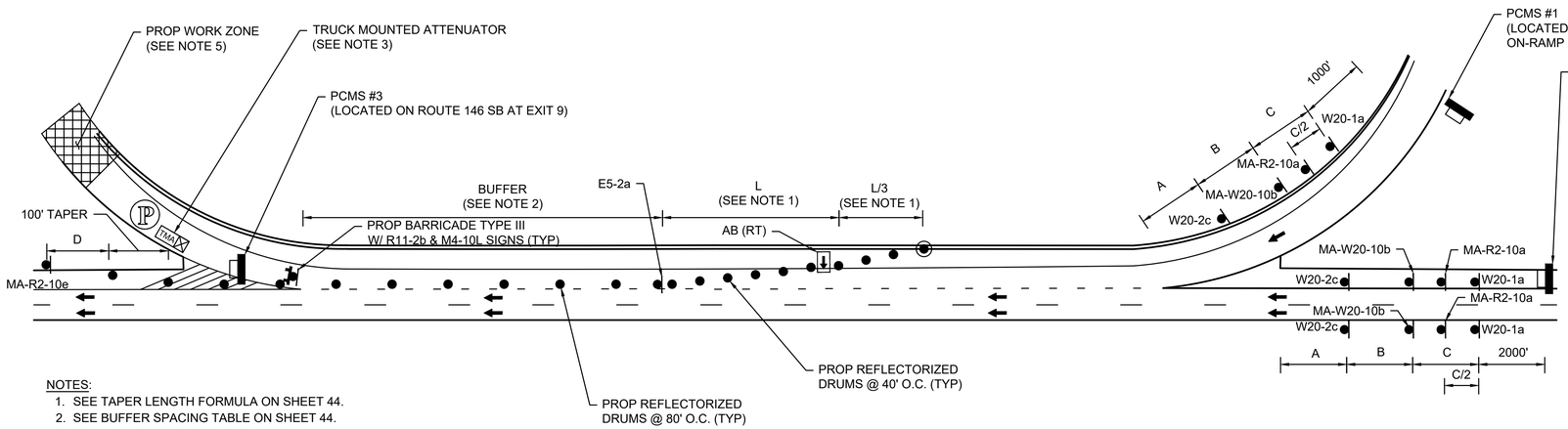


NOTES:

1. SEE TAPER LENGTH FORMULA ON SHEET 44.
2. REFER TO ADVANCE SIGN SPACING TABLE ON SHEET 44.
3. POLICE DETAIL TO ASSIST WITH TRUCK TURNS AT THE INTERSECTION.
4. W20-1c, MA-R2-10a AND MA-R2-10e SIGNS MAY BE OMITTED IF SIGNS SHOWN ON ADVANCE SIGN SCHEMATIC ARE IN PLACE AND MINIMUM SIGN SPACING IS MET.

WORK ON THE FAR SIDE OF INTERSECTION WITH MULTILANE APPROACH

SCALE: NTS



NOTES:

1. SEE TAPER LENGTH FORMULA ON SHEET 44.
2. SEE BUFFER SPACING TABLE ON SHEET 44.
3. SEE NOTES 27 & 28 ON SHEET 44.
4. SEE ADVANCE SIGN SPACING CHART ON SHEET 44.
5. REFER TO DETOUR PLAN ON SHEET 56 FOR ADDITIONAL INFORMATION.
6. W20-1c, MA-R2-10a AND MA-R2-10e SIGNS MAY BE OMITTED IF SIGNS SHOWN ON ADVANCE SIGN SCHEMATIC ARE IN PLACE AND MINIMUM SIGN SPACING IS MET.

PCMS #1, 2 & 3 MESSAGE TEXT

7 DAYS PRIOR TO START RAMP CLOSURE	EXIT 9 CLOSES	DAY DATE TIME
DURING RAMP CLOSURE	EXIT 9 CLOSED	USE EXIT 8

PCMS NOTES:

1. PCMS SHALL BE INSTALLED WITHIN THE EXISTING RIGHT-OF-WAY (ROW) OFF THE ROADWAY AT APPROX. LOCATIONS SHOWN OR AS DIRECTED BY MASSDOT. PCMS SHALL NOT BLOCK EXIST SIDEWALK.
2. DATE AND TIMES ON PCMS MESSAGING SHALL BE COORDINATED WITH MASSDOT HOC AND DISTRICT 3 AND THE TOWN OF MILLBURY.
3. CONTRACTOR SHALL PROVIDE PCMS A MINIMUM OF 7 DAYS PRIOR TO START OF CONSTRUCTION OR AS DIRECTED BY MASSDOT.
4. CONTRACTOR SHALL REMOVE ALL PCMS SHOWN AT THE COMPLETION OF CONSTRUCTION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

SINGLE LANE EXIT RAMP WITH ACCELERATION/DECELERATION LANE AND SHOULDER (ROUTE 146 SB EXIT 9)

SCALE: NTS

605377_HD(TTCP).DWG Plotted on 11-Apr-2022 5:17 PM

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	48	152
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SUGGESTED STAGING PLAN
ROUNDABOUT CONSTRUCTION
STAGE 2

STAGE 1:
UTILITY RELOCATION
(BY OTHERS)

N

CONSTRUCT WETLAND REPLICATION AREAS

CONSTRUCT RETAINING WALLS TO SUPPORT FILL.

CONSTRUCT TEMP HMA ROADWAY CONNECTION BETWEEN MCCRACKEN ROAD (WEST) AND GREENWOOD STREET (SOUTH) IN THE FINAL FOOTPRINT AT EXISTING ROADWAY GRADE

CONSTRUCT RETAINING WALLS TO SUPPORT FILL.

McCRACKEN ROAD (WEST)

McCRACKEN ROAD

GREENWOOD STREET

11' MIN

NOTE:
1. SEE SUGGESTED ROUNDABOUT STAGING CONSTRUCTION NOTES ON SHEET 44.

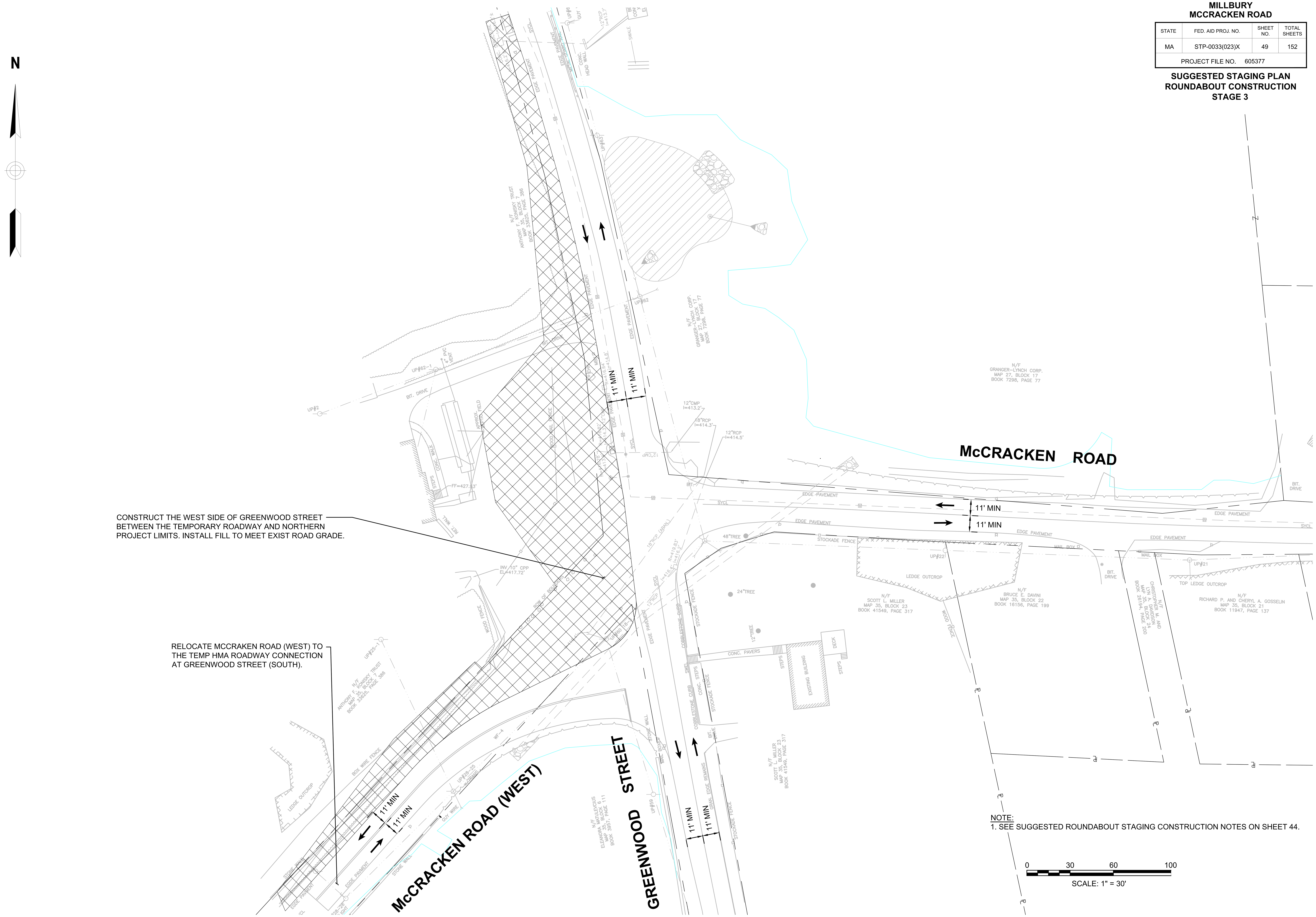
0 30 60 100
SCALE: 1" = 30'

605377_TTCP(STAGE2).DWG Plotted on 11-Apr-2022 5:18 PM

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	49	152
PROJECT FILE NO. 605377			

SUGGESTED STAGING PLAN
ROUNDABOUT CONSTRUCTION
STAGE 3



N
McCRACKEN ROAD
McCRACKEN ROAD (WEST)
GREENWOOD STREET
11' MIN
CONSTRUCT THE WEST SIDE OF GREENWOOD STREET BETWEEN THE TEMPORARY ROADWAY AND NORTHERN PROJECT LIMITS. INSTALL FILL TO MEET EXIST ROAD GRADE.
RELOCATE MCCRAKEN ROAD (WEST) TO THE TEMP HMA ROADWAY CONNECTION AT GREENWOOD STREET (SOUTH).
N/F GRANGER-LYNCH CORP. MAP 27, BLOCK 17 BOOK 7298, PAGE 77
N/F SCOTT L. MILLER MAP 35, BLOCK 23 BOOK 41549, PAGE 317
N/F BRUCE E. DAVINI MAP 35, BLOCK 22 BOOK 16156, PAGE 199
N/F RICHARD P. AND CHERYL A. GOSSELIN MAP 35, BLOCK 21 BOOK 11947, PAGE 137
EDGE PAVEMENT
STOCKADE FENCE
LEDGE OUTCROP
EXISTING BUILDING
CONC. PAVERS
0 30 60 100
SCALE: 1" = 30'

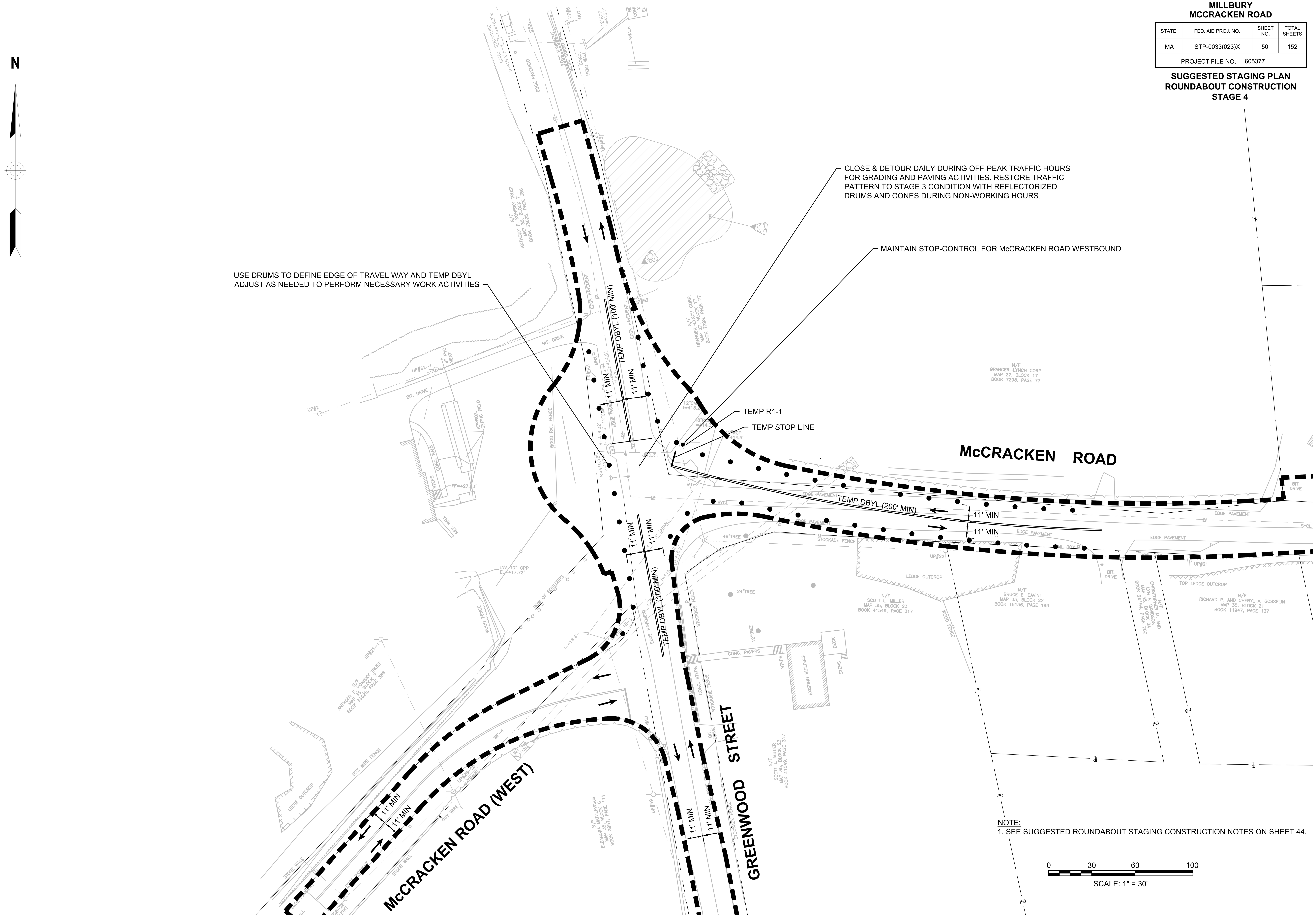
NOTE:
1. SEE SUGGESTED ROUNDABOUT STAGING CONSTRUCTION NOTES ON SHEET 44.

605377_TTCP(STAGE3).DWG Plotted on 11-Apr-2022 5:18 PM

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	50	152
PROJECT FILE NO. 605377			

SUGGESTED STAGING PLAN
ROUNDABOUT CONSTRUCTION
STAGE 4


N
CLOSE & DETOUR DAILY DURING OFF-PEAK TRAFFIC HOURS FOR GRADING AND PAVING ACTIVITIES. RESTORE TRAFFIC PATTERN TO STAGE 3 CONDITION WITH REFLECTORIZED DRUMS AND CONES DURING NON-WORKING HOURS.
MAINTAIN STOP-CONTROL FOR McCRACKEN ROAD WESTBOUND
USE DRUMS TO DEFINE EDGE OF TRAVEL WAY AND TEMP DBYL
ADJUST AS NEEDED TO PERFORM NECESSARY WORK ACTIVITIES
TEMP R1-1
TEMP STOP LINE
TEMP DBYL (100' MIN)
TEMP DBYL (200' MIN)
11' MIN
McCRACKEN ROAD
McCRACKEN ROAD (WEST)
GREENWOOD STREET
N/F GRANGER-LYNCH CORP. MAP 27, BLOCK 17 BOOK 7298, PAGE 77
N/F SCOTT L. MILLER MAP 35, BLOCK 23 BOOK 41549, PAGE 317
N/F BRUCE E. DAVINI MAP 35, BLOCK 22 BOOK 16156, PAGE 199
N/F RICHARD P. AND CHERYL A. GOSSELIN MAP 35, BLOCK 21 BOOK 11947, PAGE 137
EDGE PAVEMENT
STOCKADE FENCE
LEDGE OUTCROP
EXISTING BUILDING
0 30 60 100
SCALE: 1" = 30'

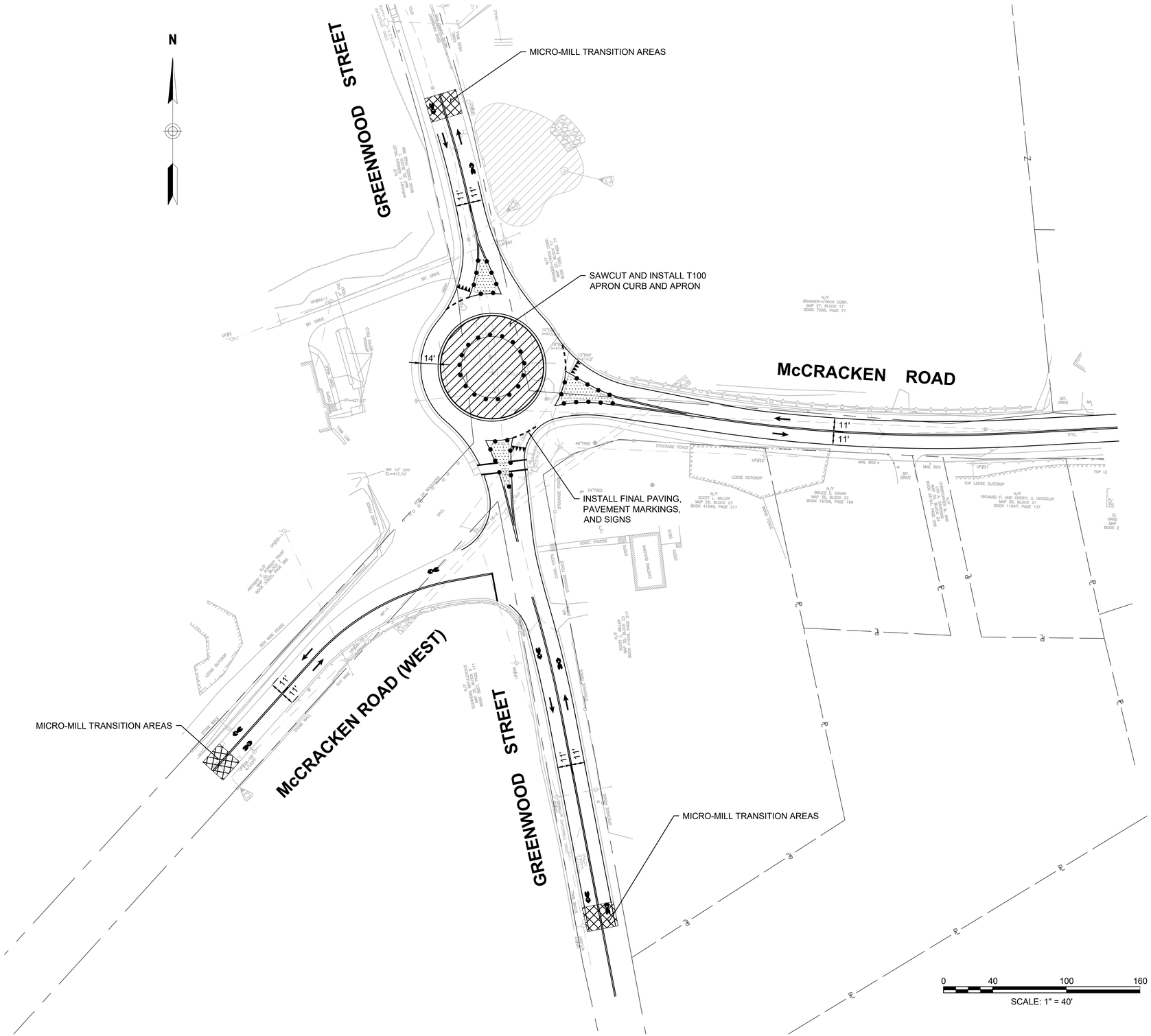
NOTE:
1. SEE SUGGESTED ROUNDABOUT STAGING CONSTRUCTION NOTES ON SHEET 44.

Plotted on 11-Apr-2022 5:19 PM
605377_TTCP(STAGE4).DWG

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	51	152
PROJECT FILE NO. 605377			

SUGGESTED STAGING PLAN ROUNDABOUT CONSTRUCTION STAGE 5



LEGEND	
	WORK AREA 1 (CONSTRUCT FIRST)
	WORK AREA 2 (CONSTRUCT SECOND)

NOTES:
1. SEE SUGGESTED ROUNDABOUT STAGING CONSTRUCTION NOTES ON SHEET 44.
2. DURING APRON CONSTRUCTION, RECOMMEND POLICE DETAILS FOR A MINIMUM OF 48 HOURS FOLLOWING EACH CONCRETE POUR TO DIRECT TRACTOR-TRAILERS AWAY FROM INTERSECTION TO MINIMIZE DAMAGE TO APRON.

PCMS #1
MESSAGE TEXT

DURING APRON CONSTRUCTION	MCCRCKN CLSD TO TRUCKS	NO ACCS TO 146/ SHOPPES

PCMS #2
MESSAGE TEXT

DURING APRON CONSTRUCTION	GREENWD CLSD TO TRUCKS	NO ACCS TO 146/ SHOPPES

PCMS #3, #4, #5
MESSAGE TEXT

DURING APRON CONSTRUCTION	MCCRCKN CLSD TO TRUCKS	122A/ SHOPPES OPEN

STAGE 5 PCMS NOTES:
1. PCMS SHALL BE AS LOCATED AS SHOWN ON THE STAGE 4 DETOUR PLAN ON SHEET 55.
2. PCMS MESSAGING SHALL BE COORDINATED WITH MASSDOT DISTRICT 3.

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	52	152
PROJECT FILE NO. 605377			

TEMPORARY TRAFFIC CONTROL PLAN
WESTERLY WALL CONSTRUCTION
BRIDGE STAGE 1

605377_TTCP(BR STG1).DWG Plotted on 11-Apr-2022 5:20 PM

N

McCRACKEN ROAD

ROUTE 122A (MAIN STREET)

ROUTE 146 RAMP

BLACKSTONE VALLEY SHOPPES

BIKEWAY

THIS WORK TO BE DONE OFF-ROADWAY

REFER TO TTCP GENERAL NOTE 26 THAT REQUIRES THE CONTRACTOR TO SECURE THE WORK AREA AT ALL TIMES

RETAIN EXIST VEHICLE DETECTION OR PROVIDE TEMP DETECTION

DRUM OFF ENTIRE RIGHT-TURN LANE

DRUM OFF ENTIRE LEFT-TURN LANE WITH REFLECTORIZED DRUMS @ 20'O.C.

REFLECTORIZED DRUMS @ 10'O.C. IN TAPER AREA

LANE SHIFT, L/2 = 1352+ 66' SAY 100' MIN

MA-R2-10e

MA-W20-7b

W20-1c

MA-R2-10a

AB (CAUTION)

PROP TYPE III BARRICADE W/R9-9

PROP TYPE III BARRICADE W/R9-9(MOD)

BUFFER = 200' MIN

RETAIN EXIST TRAFFIC SIGNAL HHs & CONDUIT UNTIL NEW TRAFFIC SIGNAL IS OPERATIONAL

14' MIN

100'

50'

UPL 4–1

0 50 100 150 200

SCALE: 1" = 50'

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	53	152

PROJECT FILE NO. 605377

TEMPORARY TRAFFIC CONTROL PLAN
BRIDGE WIDENING
BRIDGE STAGE 2

N
RAILROAD
McCRACKEN ROAD
ROUTE 122A (MAIN STREET)
ROUTE 146 SOUTHBOUND RAMPS
BLACKSTONE VALLEY SHOPPES
BIKEWAY
BIKEWAY
DISABLE EXIST RIGHT-LANE VEHICLE DETECTION AND RETAIN EXIST LEFT-LANE VEHICLE DETECTION OR PROVIDE TEMP VEHICLE DETECTION
ERADICATE EXIST MARKINGS WHERE IN CONFLICT WITH PROP MARKINGS
PROP TEMP LIMITED DEFLECTION BARRIER (TL-3)
SEE NOTE 1
SEE NOTE 2
PROP TYPE III BARRICADE W/R9-9(MOD)
12' MIN
12' MIN
TEMP DBYL
TEMP SWL
35' MIN RADIUS
MEET EXIST CENTERLINE MARKINGS
MAINTAIN ABUTTER ACCESS
SEE NOTE 1
TEMPORARY FENCE
35' MIN RADIUS
PROP WORK ZONE (TYP)
MAINTAIN ACCESS UNDER BRIDGE AT ALL TIMES
TEMP IMPACT ATTENUATOR, UNIDIRECTIONAL NON-REDIRECTIVE (TL-2)
MEET EXIST MARKING
RETAIN EXIST TRAFFIC SIGNAL HHs & CONDUIT UNTIL NEW TRAFFIC SIGNAL IS OPERATIONAL
26'
PROP TYPE III BARRICADE W/R9-9(MOD)
TEMP IMPACT ATTENUATOR, UNIDIRECTIONAL NON-REDIRECTIVE (TL-2)
SEE NOTE 1
SEE NOTE 1
UPL 4-1
0
40
100
160
SCALE: 1" = 40'

NOTES

1. FOR ADVANCE WARNING SIGNS (W20-1c. MA-R2-10a, AND MA-R2-10e) REFER TO ADVANCE SIGN PLAN ON SHEET 57.
2. CONTRACTOR TO PROVIDE SIGNAL MODIFICATIONS (WIRE LOOPS, SIGNAL HEADS, SIGNAL PHASING AND TIMINGS) AS DIRECTED BY THE ENGINEER.

605377_TTCP(BR STG2) - STG 2.DWG   Plotted on 11-Apr-2022 5:20 PM

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	54	152
PROJECT FILE NO. 605377			

TEMPORARY TRAFFIC CONTROL PLAN
EASTERLY RETAINING WALL CONSTRUCTION
BRIDGE STAGE 3

605377_TTCP(BR STG3) - STG 3.DWG Plotted on 11-Apr-2022 5:21 PM

N

MEET EXIST MARKINGS

100'

RAILROAD

McCRACKEN ROAD

TEMP IMPACT ATTENUATOR
UNIDIRECTIONAL, NON-REDIRECTIVE (TL-2)

TEMP DBYL

TEMP SWL

73'

ERADICATE STAGE 2 MARKINGS

PROP TEMP BARRIER (TL-2)

PROP WORK ZONE (TYP)

400'

BIKEWAY

TEMPORARY FENCE

PROP TEMP ARROW AND LEGEND (TYP)

CONTRACTOR TO PROVIDE TEMPORARY
VEHICLE DETECTION UNTIL FINAL LOOP
DETECTORS ARE INSTALLED AND FUNCTIONING

ROUTE 122A (MAIN STREET)

11' MIN

TRAFFIC FLOW ARROW (TYP)

TYPE II BARRICADE
W/R9-9(MOD)

BLACKSTONE VALLEY SHOPPES

BARRIER TAPER @ 5:1

SEE NOTE 2

TEMP IMPACT ATTENUATOR
UNIDIRECTIONAL, NON-REDIRECTIVE (TL-2)

REFLECTORIZED DRUMS @ 20'O.C. (TYP)

BIKEWAY

SEE NOTE 1

SEE NOTE 1

TRAFFIC FLOW ARROW (TYP)

ROUTE 146 RAMP

PROP REFLECTORIZED
DRUMS @ 20'O.C. (TYP)

COVER EXIST ARROW
AND LEGEND (TYP)

11' MIN

180'

SEE NOTE 1

20'

0 40 100 160

SCALE: 1" = 40'

NOTES

1. FOR ADVANCE WARNING SIGNS (W20-1c. MA-R2-10a, AND MA-R2-10e) REFER TO ADVANCE SIGN PLAN ON SHEET 57.
2. CONTRACTOR TO PROVIDE SIGNAL MODIFICATIONS (WIRE LOOPS, SIGNAL HEADS, SIGNAL PHASING AND TIMINGS) AS DIRECTED BY THE ENGINEER.

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	55	152
PROJECT FILE NO. 605377			

DETOUR PLAN
ROUNDABOUT CONSTRUCTION
STAGE 4

605377_HD(DETR) - ROUNDABOUT DETOUR.DWG Plotted on 11-Apr-2022 5:21 PM

N

LEGEND	
	MCCRACKEN ROAD EASTBOUND
	GREENWOOD STREET SOUTHBOUND
	MCCRACKEN ROAD WESTBOUND
	GREENWOOD STREET NORTHBOUND
S	TRAFFIC SIGNAL
P	POLICE OFFICER

WORCESTER
MILLBURY

AUBURN
MILLBURY

M4-9V SUPP(A) SUPP(D)
ELECTICAL TRANSMISSION LINE
M4-9R SUPP(A)
M4-9V SUPP(A) SUPP(D)
MONTCLAIR DR
MILLBURY ST
MILLBURY ST
M4-8a SUPP(C)
M4-9R SUPP(C) SUPP(D)
PCMS #1
(LOCATED ON OLD COMMON RD
AT SOUTHEAST CORNER OF INTERSECTION
IN GRASSY AREA BEHIND EXIST GUARDRAIL)
TYPE III BARRICADE
W/ R11-3a & M4-10L SIGNS
(SEE NOTE 2)
ELECTICAL TRANSMISSION LINE
OLD COMMON RD
AUBURN RD
W MAIN ST
CARLETON RD
W20-3c SUPP(D)
W20-2c SUPP(D)
M4-8a SUPP(D)
TYPE III BARRICADE
W/ R11-3a & M4-10L SIGNS
(SEE NOTE 2)
TYPE III BARRICADE
W/ R11-3a SIGN
(SEE NOTE 2)
TYPE III BARRICADE
W/ R11-2 SIGN
(SEE NOTE 3)
GREENWOOD STREET
S.W. CUTOFF
GREENWOOD STREET
M4-9SR SUPP(A) SUPP(B)
M4-9L SUPP(A) SUPP(B)
PROP WORK ZONE
(SEE NOTE 1)
EXTENT OF ROADWAY CLOSURE
LAURA LN
McCRACKEN ROAD
DWINELL RD
TYPE III BARRICADE
W/ R11-2 SIGN
(SEE NOTE 3)
PCMS #4
(LOCATED ON ROUTE 146 SB APPROX.
320' NORTH OF 'EXIT 9 ROUTE 122A SOUTH
MILLBURY CTR EXIT ONLY' OVERHEAD
STRUCTURE ON RIGHT SIDE IN GRASSY AREA
BEHIND EXIST GUARDRAIL)
TYPE III BARRICADE
W/ R11-3a & M4-10L SIGNS
(SEE NOTE 2)
PCMS #3
(LOCATED ON ROUTE 146 NB APPROX.
180' SOUTH OF 'EXIT 9 ROUTE 122A SOUTH
MILLBURY CTR EXIT ¼ MILE' OVERHEAD STRUCTURE
ON RIGHT SIDE IN GRASSY AREA BEHIND EXIST GUARDRAIL)
PCMS #2
LOCATED IN CENTER
MEDIAN BETWEEN GREENWOOD ST AND
OLD COMMON IN GRASSY AREA
TYPE III BARRICADE
W/ R11-3a & M4-10L SIGNS
(SEE NOTE 2)
W20-2c SUPP(D)
M4-9R SUPP(C)
ELMWOOD ST
W20-3c SUPP(D)
M4-8a SUPP(B)
PCMS #5
LOCATED IN SHOULDER
JUST NORTH OF SYCAMORE ST
W MAIN ST
BEACH ST
PARK HILL DRIVE
Lynch
F&D Salvage and JMA, Inc,
Blackstone Valley Shoppes
146 N MAIN STREET
MARTIN STREET
122A N MAIN STREET
TAINTER HILL ROAD
M4-9V(1) SUPP(B)
M4-9BR(1) SUPP(A)
M4-9SR(1) SUPP(A)
M4-9R SUPP(C)
M4-9L SUPP(C)
M4-9V SUPP(C)
M4-9V SUPP(C)
M4-9R SUPP(C)
M4-8a SUPP(A)
M4-9V(1) SUPP(B)
M4-9V SUPP(C)
M4-9R SUPP(C)
M4-9BR(1) SUPP(B) SUPP(C)
M4-9SR(1) SUPP(B) SUPP(C)
ELM ST
M4-9V SUPP(C)

600 0 600 1200
SCALE IN FEET

PCMS #1 MESSAGE TEXT

7 DAYS PRIOR TO CLOSURE	MCCRCKN CLOSURE BEGINS	DAY DATE TIME
DURING CLOSURE	MCCRCKN CLOSED AHEAD	NO ACCS TO 146/ SHOPPES

PCMS #2 MESSAGE TEXT

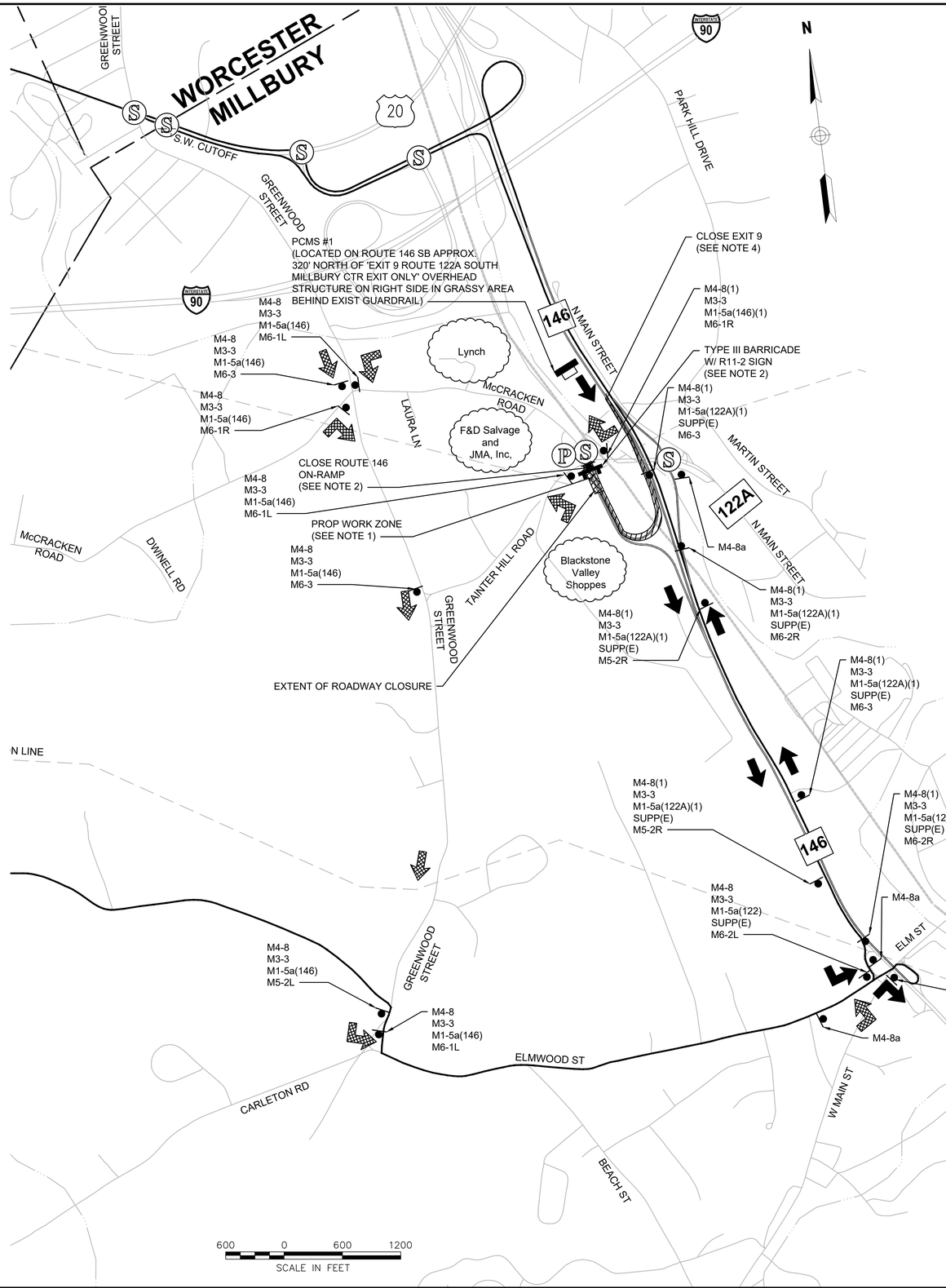
7 DAYS PRIOR TO CLOSURE	GREENWD CLOSURE BEGINS	DAY DATE TIME
DURING CLOSURE	GREENWD CLOSED AHEAD	NO ACCS TO 146/ SHOPPES

PCMS #3, #4, #5 MESSAGE TEXT

7 DAYS PRIOR TO CLOSURE	MCCRCKN CLOSURE BEGINS	DAY DATE TIME
DURING CLOSURE	MCCRCKN CLOSED AT MAIN	122A/ SHOPPES OPEN

NOTES:
1. DETOURS ARE INTENDED ONLY FOR FULL-DEPTH PAVEMENT CONSTRUCTION AS RELATED TO THE ROUNDABOUT. TRAFFIC SHALL BE RESTORED DURING NON-WORK HOURS. DURING APRON CONSTRUCTION, RECOMMEND POLICE DETAILS FOR A MINIMUM OF 48 HOURS FOLLOWING EACH CONCRETE POUR TO DIRECT TRACTOR-TRAILERS AWAY FROM INTERSECTION TO MINIMIZE DAMAGE TO THE APRON
2. REFER TO SHEET 46 FOR TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL.
3. REFER TO SHEET 46 FOR TYPICAL LOCAL ROAD CLOSURE DETAIL.

PCMS NOTES:
1. PCMS SHALL BE INSTALLED WITHIN THE EXISTING RIGHT-OF-WAY (ROW) OFF THE ROADWAY AT APPROX. LOCATIONS SHOWN OR AS DIRECTED BY MASSDOT. PCMS SHALL NOT BLOCK EXIST SIDEWALK.
2. DATE AND TIMES ON PCMS MESSAGING SHALL BE COORDINATED WITH MASSDOT HOC AND DISTRICT 3.
3. CONTRACTOR SHALL PROVIDE PCMS A MINIMUM OF 7 DAYS PRIOR TO START OF CONSTRUCTION OR AS DIRECTED BY MASSDOT.
4. CONTRACTOR SHALL REMOVE ALL PCMS SHOWN AT THE COMPLETION OF CONSTRUCTION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
5. CONTRACTOR TO PROVIDE TWO (2) ADDITIONAL PCMS FOR THE DURATION OF CLOSURE TO SUPPLEMENT PROPOSED DETOUR SIGNS, IF NECESSARY, AT LOCATIONS DIRECTED BY MASSDOT.



MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	56	152
PROJECT FILE NO. 605377			

DETOUR PLAN
ROUTE 146 RAMP CLOSURE

LEGEND	
	ROUTE 146 OFF RAMP
	ROUTE 146 ON RAMP
S	TRAFFIC SIGNAL
P	POLICE OFFICER

NOTES:
1. DETOUR IS INTENDED ONLY FOR PAVING OPERATIONS.
2. REFER TO SHEET 46 FOR TYPICAL LOCAL ROAD CLOSURE DETAIL.
3. REFER TO SHEET 46 FOR TYPICAL LOCAL ROAD CLOSURE WITH LOCAL ACCESS DETAIL.
4. REFER TO SHEET 47 FOR SINGLE LANE EXIT RAMP WITH ACCELERATION/DECELERATION LANE AND SHOULDER (ROUTE 146 SB EXIT 9) DETAIL.

PCMS #1
MESSAGE TEXT

7 DAYS PRIOR TO CLOSURE	EXIT 9 CLOSES	DAY DATE TIME
DURING CLOSURE	EXIT 9 CLOSED	USE EXIT 8

PCMS NOTES:
1. PCMS SHALL BE INSTALLED WITHIN THE EXISTING RIGHT-OF-WAY (ROW) OFF THE ROADWAY AT APPROX. LOCATIONS SHOWN OR AS DIRECTED BY MASSDOT. PCMS SHALL NOT BLOCK EXIST SIDEWALK.
2. DATE AND TIMES ON PCMS MESSAGING SHALL BE COORDINATED WITH MASSDOT HOC AND DISTRICT 3.
3. CONTRACTOR SHALL REMOVE ALL PCMS SHOWN AT THE COMPLETION OF CONSTRUCTION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
4. CONTRACTOR TO PROVIDE ADDITIONAL PCMS TO SUPPLEMENT PROPOSED DETOUR SIGNS, IF NECESSARY, AT LOCATIONS DIRECTED BY MASSDOT.

605377_HD(DETR) - RAMP DETOUR.DWG Plotted on 11-Apr-2022 5:22 PM

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	57	152
PROJECT FILE NO. 605377			

TEMPORARY TRAFFIC CONTROL PLAN
ADVANCED SIGN SCHEMATIC

605377_HD(TTCP).DWG Plotted on 11-Apr-2022 5:22 PM

N

INTERSTATE 90

WORCESTER-PROVIDENCE RAILROAD

BLACKSTONE RIVER

146

N MAIN STREET

W20-1c
175'
350'
MA-R2-10a
MA-R2-10e
700' FOR DAILY SETUPS
PROJECT LIMIT

GREENWOOD STREET

McCRACKEN ROAD

MA-R2-10e
100'
W20-1c
PROJECT LIMIT
700' FOR DAILY SETUPS
PROJECT LIMIT

LAURA LANE

700' FOR DAILY SETUPS
350'
MA-R2-10e
175'
MA-R2-10a
W20-1c

MA-R2-10e
MA-R2-10a
350'
175'
W20-1c

MAIN STREET 122A

MA-R2-10e
MA-R2-10a
W20-1c
175'
350'
PROJECT LIMIT
700' FOR DAILY SETUPS
PROP WORKZONE (TYP)

1000'
W20-1c
150'
MA-R2-10a
PROJECT LIMIT
MA-R2-10e

700' FOR DAILY SETUPS
MA-R2-10e
MA-R2-10a
350'
175'
W20-1c

MAIN STREET 122A

TAINTER HILL ROAD

BLACKSTONE VALLEY SHOPPES

ADVANCE SIGN SCHEMATIC

SIGNS TO BE INSTALLED AT THE PROJECT LIMITS AS SHOWN.
ALL ADVANCE SIGNS TO BE IN PLACE FOR THE DURATION OF THE PROJECT. THE CONTRACTOR SHALL COVER ANY ADVANCE SIGNAGE IF THE SIGNAGE FROM A DAILY OPERATIONAL SETUP CONFLICTS WITH THE ADVANCE SIGNING.
NTS

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	58	152
PROJECT FILE NO. 605377			

TEMPORARY TRAFFIC CONTROL PLAN
SIGN SUMMARY - 1 OF 2

605377_HD(TTCP).DWG Plotted on 11-Apr-2022 5:22 PM

TEMPORARY TRAFFIC CONTROL SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			COLOR		
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	BACK-GROUND	LEGEND	BORDER
R1-1	30"	30"	STOP	SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			RED	WHITE	WHITE
MA-R2-10a	48"	36"	WORK ZONE / SPEEDING FINES DOUBLED	AS PER MASSDOT STANDARD			FLUOR-ESCENT ORANGE / WHITE	BLACK	BLACK
MA-R2-10e	36"	48"	END ROAD WORK / DOUBLE FINES END				FLUOR-ESCENT ORANGE / WHITE	BLACK	BLACK
R3-1	24"	24"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			WHITE	RED/ BLACK	BLACK
R3-2	24"	24"					WHITE	RED/ BLACK	BLACK
R3-5L	30"	36"	ONLY				WHITE	BLACK	BLACK
R4-7b	24"	30"	KEEP RIGHT				WHITE	BLACK	BLACK
R5-1	36"	36"	DO NOT ENTER				WHITE	RED/ WHITE	BLACK
R6-1L	36"	12"	ONE WAY				WHITE	BLACK	BLACK
R9-9	24"	12"	SIDEWALK CLOSED				WHITE	BLACK	BLACK
R9-9(MOD)	24"	12"	CROSSWALK CLOSED				WHITE	BLACK	BLACK
R11-2	48"	30"	ROAD CLOSED				WHITE	BLACK	BLACK
R11-2b	48"	30"	RAMP CLOSED				WHITE	BLACK	BLACK
R11-3a	60"	30"	ROAD CLOSED AHEAD / LOCAL TRAFFIC ONLY				WHITE	BLACK	BLACK
W1-4L	36"	36"					FLUOR-ESCENT ORANGE	BLACK	BLACK
W1-4R	36"	36"					FLUOR-ESCENT ORANGE	BLACK	BLACK
W4-2R	36"	36"					FLUOR-ESCENT ORANGE	BLACK	BLACK
W5-1	36"	36"	ROAD NARROWS				FLUOR-ESCENT ORANGE	BLACK	BLACK

TEMPORARY TRAFFIC CONTROL SIGN SUMMARY (CONTINUED)

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			COLOR		
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	BACK-GROUND	LEGEND	BORDER
W8-1	36"	36"	BUMP	SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			FLUOR-ESCENT ORANGE	BLACK	BLACK
W8-3	36"	36"	PAVEMENT ENDS				FLUOR-ESCENT ORANGE	BLACK	BLACK
W8-8	36"	36"	ROUGH ROAD				FLUOR-ESCENT ORANGE	BLACK	BLACK
W8-9	36"	36"	LOW SHOULDER				FLUOR-ESCENT ORANGE	BLACK	BLACK
W8-15	36"	36"	GROOVED PAVEMENT				FLUOR-ESCENT ORANGE	BLACK	BLACK
W8-24	36"	36"	STEEL PLATE AHEAD				FLUOR-ESCENT ORANGE	BLACK	BLACK
W20-1a	36"	36"	ROAD WORK 1 MILE				FLUOR-ESCENT ORANGE	BLACK	BLACK
W20-1c	36"	36"	ROAD WORK AHEAD				FLUOR-ESCENT ORANGE	BLACK	BLACK
W20-2c	36"	36"	DETOUR AHEAD				FLUOR-ESCENT ORANGE	BLACK	BLACK
W20-3c	36"	36"	ROAD CLOSED AHEAD				FLUOR-ESCENT ORANGE	BLACK	BLACK
W20-4c	36"	36"	ONE LANE ROAD AHEAD				FLUOR-ESCENT ORANGE	BLACK	BLACK
W20-5cR	36"	36"	RIGHT LANE CLOSED AHEAD				FLUOR-ESCENT ORANGE	BLACK	BLACK
MA-W20-7b	36"	36"	POLICE OFFICER AHEAD	AS PER MASSDOT STANDARD			FLUOR-ESCENT ORANGE	BLACK	BLACK
MA-W20-10b	36"	36"	EXIT CLOSED ½ MILE				FLUOR-ESCENT ORANGE	BLACK	BLACK
W21-7	36"	36"	UTILITY WORK AHEAD	SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			FLUOR-ESCENT ORANGE	BLACK	BLACK
MA-W28-1	36"	36"	RUMBLE STRIPS AHEAD	AS PER MASSDOT STANDARD			FLUOR-ESCENT ORANGE	BLACK	BLACK

NOTES:
1. HIGH INTENSITY REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION" FOR TEXT DIMENSIONS, AS AMENDED; THE 1977 MASSHIGHWAY DEPARTMENT CONSTRUCTION AND TRAFFIC STANDARD DETAILS, AS AMENDED, FOR SIGNS AND SUPPORTS; THE MASSHIGHWAY DEPARTMENT SIGN LISTINGS 1993 EDITION, AS AMENDED; THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR MOUNTING REQUIREMENTS; AND THE 2017 MassDOT STANDARD SIGNS BOOK, AS AMENDED.
2. ALL SIGNS SHOWN GRAPHICALLY FOR INFORMATION ONLY. SIGN VENDOR SHALL FABRICATE ALL SIGNS IN ACCORDANCE WITH THE APPLICABLE STANDARDS.

MILLBURY
MCCRACKEN ROAD

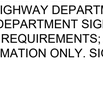
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	59	152
PROJECT FILE NO. 605377			

TEMPORARY TRAFFIC CONTROL PLAN
SIGN SUMMARY - 2 OF 2

TEMPORARY TRAFFIC CONTROL SIGN SUMMARY (CONTINUED)

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			COLOR		
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	BACK-GROUND	LEGEND	BORDER
M1-5a(122A)	30"	24"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			WHITE	BLACK	BLACK
M1-5a(122A)(1)	45"	36"							
M1-5a(146)	30"	24"					WHITE	BLACK	BLACK
M3-3	24"	12"					WHITE	BLACK	BLACK
M4-8	24"	12"					FLUOR-ESCENT ORANGE	BLACK	BLACK
M4-8(1)	30"	15"							
M4-8a	24"	18"					FLUOR-ESCENT ORANGE	BLACK	BLACK
M4-9L	30"	24"					FLUOR-ESCENT ORANGE	BLACK	BLACK
M4-9R	30"	24"					FLUOR-ESCENT ORANGE	BLACK	BLACK
M4-9BR	30"	24"					FLUOR-ESCENT ORANGE	BLACK	BLACK
M4-9BR(1)	48"	36"							
M4-9SL	30"	24"					FLUOR-ESCENT ORANGE	BLACK	BLACK
M4-9SR	30"	24"					FLUOR-ESCENT ORANGE	BLACK	BLACK
M4-9SR(1)	48"	36"							
M4-9V	30"	24"					FLUOR-ESCENT ORANGE	BLACK	BLACK
M4-9V(1)	48"	36"							
M4-10L	48"	18"					FLUOR-ESCENT ORANGE	BLACK	---
M4-10R	48"	18"					FLUOR-ESCENT ORANGE	BLACK	---
M5-2L	21"	15"					WHITE	BLACK	BLACK
M5-2R	21"	15"					WHITE	BLACK	BLACK
M6-1L	21"	15"					WHITE	BLACK	BLACK
M6-1R	21"	15"					WHITE	BLACK	BLACK
M6-2L	21"	15"					WHITE	BLACK	BLACK

TEMPORARY TRAFFIC CONTROL SIGN SUMMARY (CONTINUED)

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)			COLOR		
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.	BACK-GROUND	LEGEND	BORDER
M6-2R	21"	15"		SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION"; AS AMENDED			WHITE	BLACK	BLACK
M6-3	21"	15"					WHITE	BLACK	BLACK
E5-2a	48"	36"					FLUOR-ESCENT ORANGE	BLACK	BLACK
SUPP(A)	36"	24"		6"B@85% 6"C	4" 4" 4"	N/A	FLUOR-ESCENT ORANGE	BLACK	BLACK
SUPP(B)	36"	24"		6"C 6"C	4" 4" 4"	N/A	FLUOR-ESCENT ORANGE	BLACK	BLACK
SUPP(C)	36"	24"		6"B@85% 6"C	4" 4" 4"	N/A	FLUOR-ESCENT ORANGE	BLACK	BLACK
SUPP(D)	36"	24"		6"C 6"C	4" 4" 4"	N/A	FLUOR-ESCENT ORANGE	BLACK	BLACK
SUPP(E)	36"	24"		6"C 6"C	4" 4" 4"	N/A	FLUOR-ESCENT ORANGE	BLACK	BLACK

NOTES:
1. HIGH INTENSITY REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. SEE FHWA "STANDARD HIGHWAY SIGNS, 2004 EDITION" FOR TEXT DIMENSIONS, AS AMENDED; THE 1977 MASSHIGHWAY DEPARTMENT CONSTRUCTION AND TRAFFIC STANDARD DETAILS, AS AMENDED, FOR SIGNS AND SUPPORTS; THE MASSHIGHWAY DEPARTMENT SIGN LISTINGS 1993 EDITION, AS AMENDED; THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR MOUNTING REQUIREMENTS; AND THE 2017 MassDOT STANDARD SIGNS BOOK, AS AMENDED.
2. ALL SIGNS SHOWN GRAPHICALLY FOR INFORMATION ONLY. SIGN VENDOR SHALL FABRICATE ALL SIGNS IN ACCORDANCE WITH THE APPLICABLE STANDARDS.

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MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	60	152
PROJECT FILE NO. 605377			

UTILITY PLANS

605377_HDUTIL).DWG Plotted on 11-Apr-2022 5:24 PM

GREENWOOD SEWER STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
104	SMH	15+20.0 21.6 LT	422.67	(103) 411.60 (105) 411.55	411.50	
105	SMH	16+70.1 2.3 RT	418.82	(106) 412.60	411.55	
106	SMH	17+34.8 5.2 RT	419.01		413.40	

GREENWOOD DRAINAGE STRUCTURE DATA

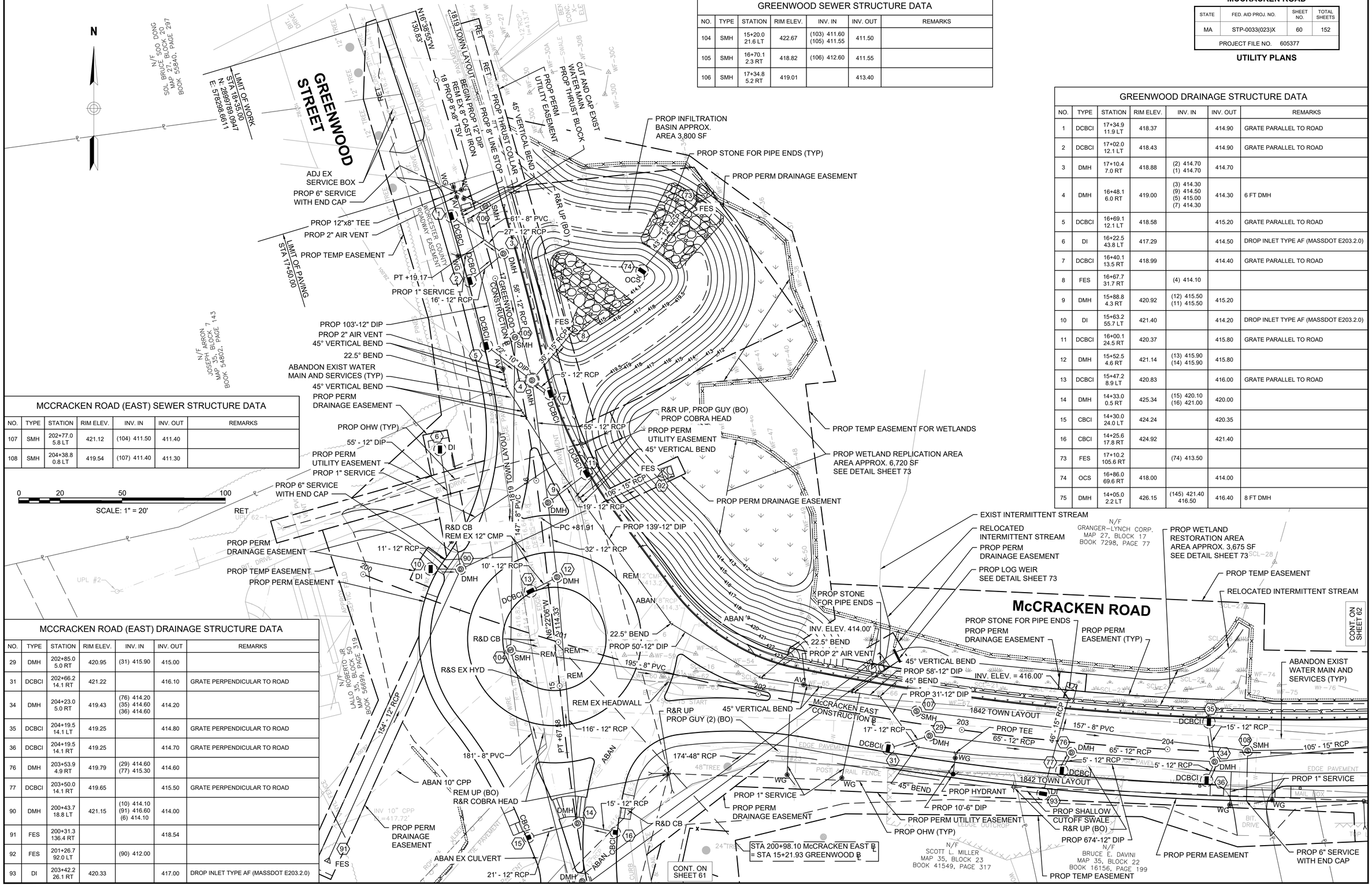
NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
1	DCBCI	17+34.9 11.9 LT	418.37		414.90	GRATE PARALLEL TO ROAD
2	DCBCI	17+02.0 12.1 LT	418.43		414.90	GRATE PARALLEL TO ROAD
3	DMH	17+10.4 7.0 RT	418.88	(2) 414.70 (1) 414.70	414.70	
4	DMH	16+48.1 6.0 RT	419.00	(3) 414.30 (9) 414.50 (5) 415.00 (7) 414.30	414.30	6 FT DMH
5	DCBCI	16+69.1 12.1 LT	418.58		415.20	GRATE PARALLEL TO ROAD
6	DI	16+22.5 43.8 LT	417.29		414.50	DROP INLET TYPE AF (MASSDOT E203.2.0)
7	DCBCI	16+40.1 13.5 RT	418.99		414.40	GRATE PARALLEL TO ROAD
8	FES	16+67.7 31.7 RT		(4) 414.10		
9	DMH	15+88.8 4.3 RT	420.92	(12) 415.50 (11) 415.50	415.20	
10	DI	15+63.2 55.7 LT	421.40		414.20	DROP INLET TYPE AF (MASSDOT E203.2.0)
11	DCBCI	16+00.1 24.5 RT	420.37		415.80	GRATE PARALLEL TO ROAD
12	DMH	15+52.5 4.6 RT	421.14	(13) 415.90 (14) 415.90	415.80	
13	DCBCI	15+47.2 8.9 LT	420.83		416.00	GRATE PARALLEL TO ROAD
14	DMH	14+33.0 0.5 RT	425.34	(15) 420.10 (16) 421.00	420.00	
15	CBCI	14+30.0 24.0 LT	424.24		420.35	
16	CBCI	14+25.6 17.8 RT	424.92		421.40	
73	FES	17+10.2 105.6 RT		(74) 413.50		
74	OCS	16+86.0 69.6 RT	418.00		414.00	
75	DMH	14+05.0 2.2 LT	426.15	(145) 421.40 416.50	416.40	8 FT DMH

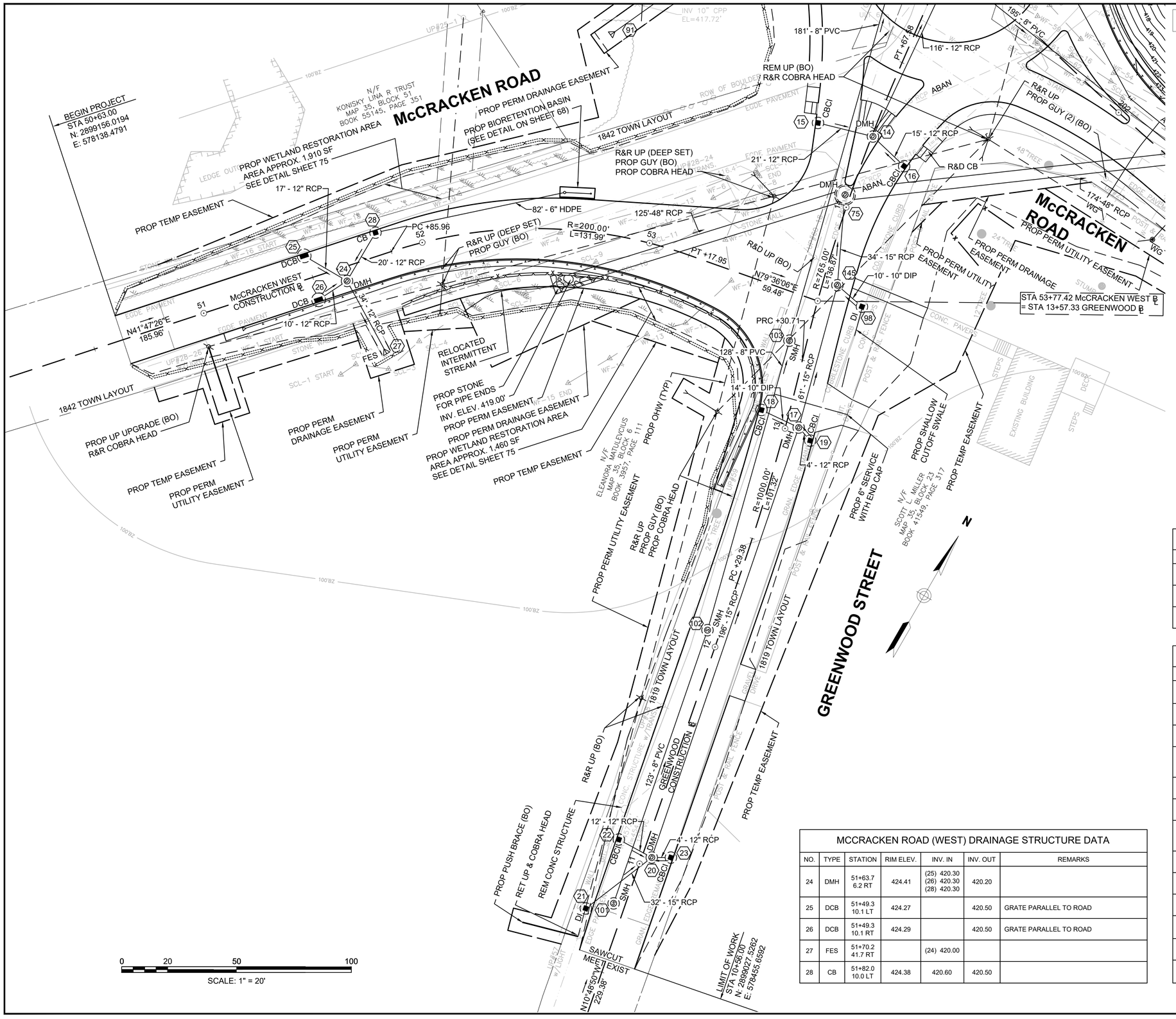
MCCRACKEN ROAD (EAST) SEWER STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
107	SMH	202+77.0 5.8 LT	421.12	(104) 411.50	411.40	
108	SMH	204+38.8 0.8 LT	419.54	(107) 411.40	411.30	

MCCRACKEN ROAD (EAST) DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
29	DMH	202+85.0 5.0 RT	420.95	(31) 415.90	415.00	
31	DCBCI	202+66.2 14.1 RT	421.22		416.10	GRATE PERPENDICULAR TO ROAD
34	DMH	204+23.0 5.0 RT	419.43	(76) 414.20 (35) 414.60 (36) 414.60	414.20	
35	DCBCI	204+19.5 14.1 LT	419.25		414.80	GRATE PERPENDICULAR TO ROAD
36	DCBCI	204+19.5 14.1 RT	419.25		414.70	GRATE PERPENDICULAR TO ROAD
76	DMH	203+53.9 4.9 RT	419.79	(29) 414.60 (77) 415.30	414.60	
77	DCBCI	203+50.0 14.1 RT	419.65		415.50	GRATE PERPENDICULAR TO ROAD
90	DMH	200+43.7 18.8 LT	421.15	(10) 414.10 (91) 416.60 (6) 414.10	414.00	
91	FES	200+31.3 136.4 RT			418.54	
92	FES	201+26.7 92.0 LT		(90) 412.00		
93	DI	203+42.2 26.1 RT	420.33		417.00	DROP INLET TYPE AF (MASSDOT E203.2.0)





MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	61	152
PROJECT FILE NO. 605377			

UTILITY PLANS

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GREENWOOD SEWER STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
101	SMH	10+80.0 5.0 LT	464.42		457.42	
102	SMH	12+05.9 5.5 LT	446.85	(101) 438.50	438.00	
103	SMH	13+37.6 7.5 LT	430.93	(102) 420.00	415.70	

GREENWOOD DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
14	DMH	14+33.0 0.5 RT	425.34	(15) 420.10 (16) 421.00	420.00	
15	CBCI	14+30.0 24.0 LT	424.24		420.35	
16	CBCI	14+25.6 17.8 RT	424.92		421.40	
17	DMH	13+01.9 5.6 RT	434.34	(18) 430.75 (19) 429.10 (20) 428.90	428.80	
18	CBCI	13+05.2 12.0 LT	433.87		430.85	
19	CBCI	12+97.8 12.0 RT	434.67		429.20	
20	DMH	11+04.3 4.1 RT	461.04	(22) 456.00 (23) 453.30 (21) 453.30	453.00	
21	DI	10+73.9 15.7 LT	465.33		453.70	DROP INLET TYPE DF (MASSDOT E203.6.0)
22	CBCI	11+07.0 12.0 LT	460.51		456.17	
23	CBCI	11+07.0 12.0 RT	460.51		453.50	
75	DMH	14+05.0 2.2 LT	426.15	(145) 421.40 416.50	416.40	8 FT DMH
98	DI	13+60.1 19.3 RT	428.83		424.80	DROP INLET TYPE DF (MASSDOT E203.6.0)
145	DMH	13+66.3 6.4 RT	428.50	(17) 424.10 (98) 424.60	424.00	

MCCRACKEN ROAD (WEST) DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
24	DMH	51+63.7 6.2 RT	424.41	(25) 420.30 (26) 420.30 (28) 420.30	420.20	
25	DCB	51+49.3 10.1 LT	424.27		420.50	GRATE PARALLEL TO ROAD
26	DCB	51+49.3 10.1 RT	424.29		420.50	GRATE PARALLEL TO ROAD
27	FES	51+70.2 41.7 RT		(24) 420.00		
28	CB	51+82.0 10.0 LT	424.38	420.60	420.50	

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605377_HD(UTIL).DWG

MCCRACKEN ROAD (EAST) DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
34	DMH	204+23.0 5.0 RT	419.43	(76) 414.20 (35) 414.60 (36) 414.60	414.20	
35	DCBCI	204+19.5 14.1 LT	419.25		414.80	GRATE PERPENDICULAR TO ROAD
36	DCBCI	204+19.5 14.1 RT	419.25		414.70	GRATE PERPENDICULAR TO ROAD
38	DMH	205+31.8 5.0 LT	420.30	(34) 413.60 (78) 414.00	413.50	
39	DMH	207+95.1 5.7 LT	417.28	(81) 411.20 (40) 412.50 (97) 411.76	411.10	
40	CBCI	207+91.5 15.0 LT	417.18		412.60	
41	CBCI	207+99.1 15.0 RT	417.01		412.30	
42	DMH	208+07.7 5.5 LT	417.01	(44) 408.20 (39) 411.00 (41) 412.10	408.20	
43	FES	207+99.1 49.8 LT		(42) 408.00		
44	DMH	209+38.0 6.0 LT	415.59	(46) 410.10 (45) 410.90 (49) 409.10	408.90	
45	DCBCI	209+41.6 14.1 RT	415.42		411.10	GRATE PERPENDICULAR TO ROAD
46	CBCI	209+41.6 15.0 LT	415.41		410.20	
78	DCBCI	205+30.5 14.1 RT	420.11		414.80	GRATE PERPENDICULAR TO ROAD
79	FES	207+38.3 118.9 LT		(80) 406.50		
80	OCS	207+32.9 75.4 LT	411.54		407.00	
81	DMH	207+15.0 5.0 LT	419.49	(38) 412.10 (82) 415.90	411.80	
82	CIT	206+99.8 29.0 RT	420.26	(83) 416.40	416.30	
83	EX CB	206+73.1 63.6 RT	421.84		418.90	
97	CB	207+80.0 41.1 RT	415.23		412.25	

N
McCRACKEN ROAD
LAURA LANE
PROP WETLAND REPLICATION AREA
AREA APPROX. 7,400 SF
SEE DETAIL ON SHEET 74
PROP TEMP EASEMENT
LIMIT OF 100-YEAR FLOODPLAIN IMPACT
PROP STONE FOR PIPE ENDS (TYP)
PROP WETLAND RESTORATION AREA
AREA APPROX. 545 SF
SEE DETAIL SHEET 74
PROP WETLAND RESTORATION AREA
AREA APPROX. 3,675 SF
SEE DETAIL SHEET 73
PROP 8' GRAVEL ACCESS PATH
PROP PERM DRAINAGE EASEMENT
PROP PERM UTILITY EASEMENT
PROP PERM EASEMENT
R&R UP (DEEP SET) (BO)
PROP GUYS (2) (BO)
PROP HEADWALL
INV. ELEV. 410.30'
REM EX HEADWALL
PROP PERM DRAINAGE EASEMENT
INV. ELEV. = 415.50'
PROP 6" SERVICE WITH END CAP
PROP 1" SERVICE
1842 TOWN LAYOUT
N86°53'47"E
535.39'
McCRACKEN EAST CONSTRUCTION B
PROP 674'-12" DIP
PROP 30'-12" DIP
194' - 8" PVC
R=1520.00'
L=365.20'
45° VERTICAL BEND
45° BEND
PROP OHW (TYP)
REM UP (BO)
60' - 36" RCP
REM BOX CULVERT
PROP MASONRY PLUG
ABAN EX PIPE
INV. ELEV. = 416.00'
R&R UP
PROP GUY (BO)
ABANDON EXIST WATER MAIN AND SERVICES (TYP)
R&R UP (DEEP SET) (SEE NOTE 1) (BO)
R&R COBRA HEAD
PROP FOOTING SUBDRAIN 130'-6" PERFORATED CORRUGATED PLASTIC
CONNECT TO EXIST 1" WATER LINE
UPGRADE UP W/ PROP GUY (BO)
REM EX HEADWALL
PROP HEADWALL
INV. ELEV. 410.60'
PROP SUBDRAIN
INV. ELEV. 414.00'
223'-6" PERFORATED CORRUGATED PLASTIC (SEE MASSDOT STD DETAIL E 209.1.0)
1956 TOWN LAYOUT
CONT. ON SHEET 60
CONT. ON SHEET 63
N/F GRANGER-LYNCH CORP. MAP 35, BLOCK 10 BOOK 7298, PAGE 77
N/F BETTINA M. WHITE AND JIMMY DIAZ MAP 35, BLOCK 8 BOOK 42186, PAGE 297
N/F ALFRED W. AND TAKEKO NELSON MAP 35, BLOCK 9 BOOK 4509, PAGE 374
N/F BRUCE E. DAVINI MAP 35, BLOCK 22 BOOK 16156, PAGE 199
N/F CHRISTOPHER M. AND LYN A. DAVIDSON MAP 35, BLOCK 24 BOOK 26194, PAGE 200
N/F RICHARD P. AND CHERYL A. GOSSELIN MAP 35, BLOCK 21 BOOK 11947, PAGE 137
N/F CURSHARAN AND HARSIMRIT DHALLIWAL MAP 35, BLOCK 20 BOOK 25617, PAGE 317
N/F MATHEW B. HUNTER MAP 35, BLOCK 15 BOOK 19414, PAGE 110
N/F L-5, INC. MAP 35, BLOCK 14 BOOK 32828, PAGE 53
SCALE: 1" = 20'

MCCRACKEN ROAD (EAST) SEWER STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
108	SMH	204+38.8 0.8 LT	419.54	(107) 411.40	411.30	
109	SMH	206+62.0 2.2 RT	420.52	(108) 410.48	410.38	
110	SMH	208+94.4 1.0 RT	415.86	(109) 408.46	408.36	

NOTES:
1. PRIOR TO CONSTRUCTION OF THE WALL THE CONTRACTOR WILL BE REQUIRED TO COORDINATE WITH NATIONAL GRID TO ASSIST IN THE INSTALLATION OF THIS POLE. THIS COORDINATION MAY REQUIRE THE CONTRACTOR TO EXCAVATE THE GRADE DOWN TO FINAL/PROPOSED ELEVATION AT THE POLE LOCATION, IN ORDER FOR NATIONAL GRID TO INSTALL THIS DEEP SET POLE.

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	63	152
PROJECT FILE NO. 605377			

UTILITY PLANS

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N

McCRACKEN ROAD

CONT. ON SHEET 62

CONT. ON SHEET 64

N/F GRANGER-LYNCH CORP. MAP 35, BLOCK 10 BOOK 7298, PAGE 77

N/F GRANGER-LYNCH CORP. MAP 35, BLOCK 11 BOOK 7298, PAGE 77

N/F L-5, INC. MAP 35, BLOCK 14 BOOK 32828, PAGE 53

PROP TEMP EASEMENT
PROP PERM UTILITY EASEMENT
PROP PERM EASEMENT
R&R UP (DEEP SET) (BO)
PROP GUYS (2) (BO)
R&R UP (BO)
45° BEND
45° VERTICAL BEND
PROP 30'-12" DIP
194' - 8" PVC
R=1520.00'
L=365.20'
249' - 12" RCP
PROP 314'-12" DIP
SMH
PROP 1" SERVICE
45° BEND
PROP SUBDRAIN INV. ELEV. 414.00'
PROP TEMP EASEMENT
223'-6" PERFORATED CORRUGATED PLASTIC (SEE MASSDOT STD DETAIL E 209.1.0)
ABANDON EXIST WATER MAIN AND SERVICES (TYP)
UPGRADE EXIST UP (BO)
RET EXIST GUY
CUT AND CAP EXIST WATER LINE
PROP THRUST BLOCK
END PROP 12" DIP
BEGIN EX 10" DIP
PROP REDUCER
22.5° BEND
PROP 6" SERVICE WITH END CAP
SAWCUT MEET EXIST
PROP 5'-12" DIP
PROP 23'-12" DIP
PROP 6" GAS RELAY
*SEE NOTE 1 BELOW
CBCI
DMH
8' - 12" RCP
17' - 12" RCP
155' - 8" PVC
DCBCI
PROP SUBDRAIN INV. ELEV. 413.00'
112'-6" PERFORATED CORRUGATED PLASTIC
PROP PERM EASEMENT
BEGIN PROP 8" GAS MAIN
*SEE NOTE 1 BELOW
PROP TEE
213 PT +04.13
ADJ (BO)
293' - 8" PVC
PROP 6" SERVICE WITH END CAP
RET UPDL
RET COBRA HEAD
McCRACKEN EAST CONSTRUCTION B
PROP OHW (TYP)
PROP PERM UTILITY EASEMENT
PROP STUB POLE
PROP GUY (BO)
PROP TEMP EASEMENT
PROP OHW (TYP)
PROP PERM
UTILITY EASEMENT
1842 TOWN LAYOUT
PROP 200'-12" DIP
214
134' - 12" RCP
16' - 12" RCP
5' - 12" RCP
PROP HYD
PROP 7'-6" DIP
PROP TEE
R&S HYD
R&R UP (BO)
S79°20'15"E
343.51'
215
171' - 12" RCP
216
259' - 8" PVC
PROP SHALLOW CUTOFF SWALE
PROP 8" GAS MAIN
*SEE NOTE 1 BELOW
R&R UP (DEEP SET) (BO)
PROP GUY (BO)
PROP SEDIMENT CONTROL BARRIER (TYP)
PROP PERM UTILITY EASEMENT
RET WOOD FENCE
BENCHMARK FIRE HYDRANT X-CUT SET B.O.M.O. ELEV.=413.74'

MCCRACKEN ROAD (EAST) SEWER STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
111	SMH	210+92.6 5.0 RT	416.43	(110) 410.00	410.00	
112	SMH	212+51.9 7.5 RT	413.81	(111) 408.60	407.30	
113	SMH	215+48.8 9.5 RT	410.29	(112) 404.10	404.00	

MCCRACKEN ROAD (EAST) DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
49	DMH	211+90.3 5.9 LT	415.32	(51) 410.90 (50) 410.90	410.80	
50	DCBCI	211+96.7 14.1 RT	415.02	412.50	411.10	GRATE PERPENDICULAR TO ROAD
51	CBCI	211+97.8 15.0 LT	414.98		411.00	
54	DMH	214+50.0 4.9 RT	410.86	(84) 407.30 (56) 407.20 (57) 407.20	407.20	
56	DCBCI	214+50.0 14.1 RT	410.68		407.30	GRATE PERPENDICULAR TO ROAD
57	CBCI	214+50.0 15.0 LT	410.66		407.30	
84	DCBCI	213+12.2 14.1 RT	412.42	410.00	408.20	GRATE PERPENDICULAR TO ROAD

NOTES:
1. WORK BETWEEN STATION 220+00 TO 222+00 IS TO BE COVERED USING EVERSOURCE GAS' FORCE ACCOUNT. ALL OTHER WORK OUTSIDE THESE LIMITS DONE BY EVERSOURCE GAS IS TO BE FUNDED BY EVERSOURCE AS AN UPGRADE PROJECT.

0 20 50 100

SCALE: 1" = 20'

MILLBURY
MCCRACKEN ROAD

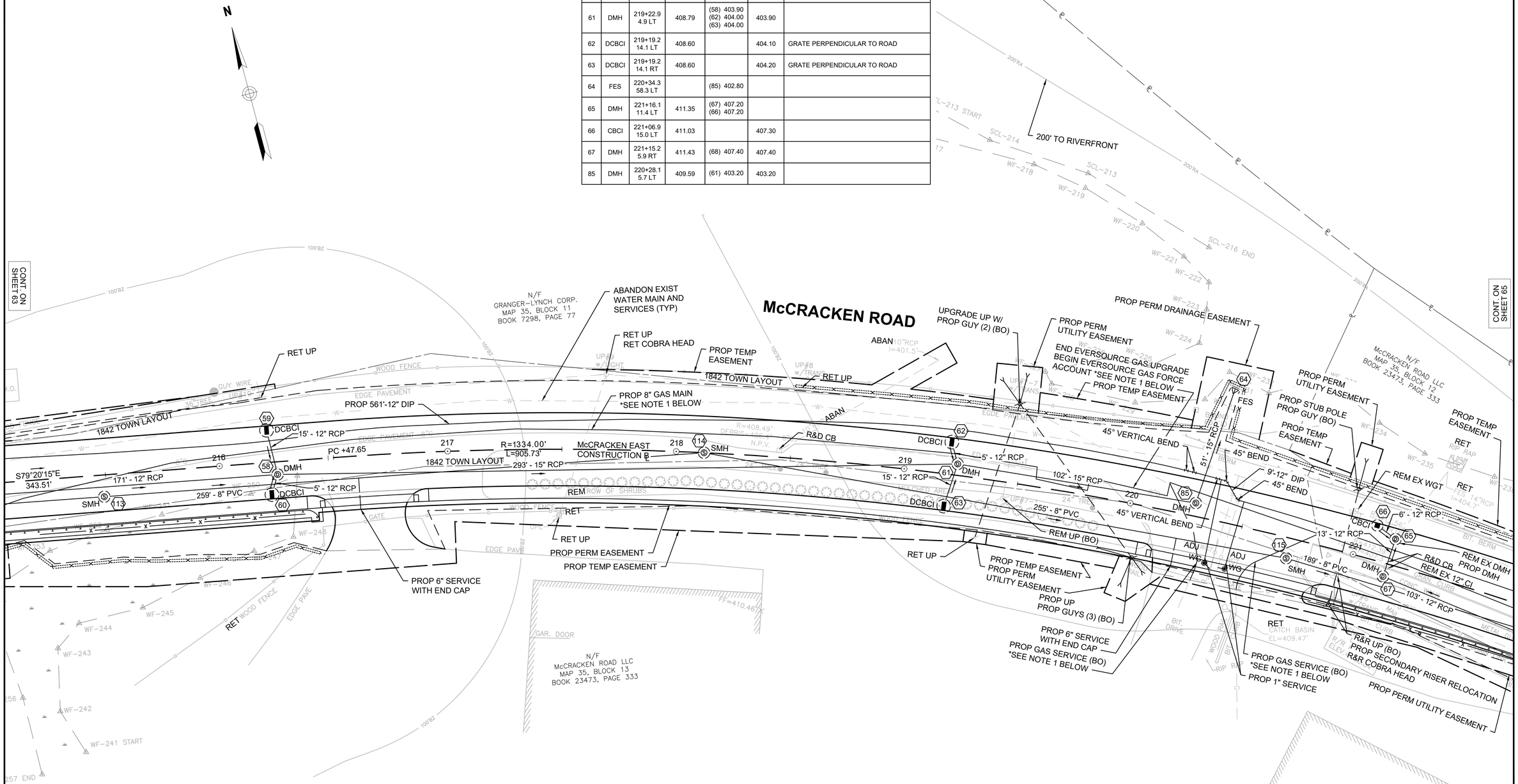
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	64	152
PROJECT FILE NO. 605377			

UTILITY PLANS

605377_HD(UTIL).DWG Plotted on 11-Apr-2022 5:25 PM

MCCRACKEN ROAD (EAST) DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
58	DMH	216+25.1 5.6 RT	410.02	(54) 405.80 (60) 405.90 (59) 406.10	405.80	
59	DCBCI	216+21.7 14.1 LT	409.87		405.90	GRATE PERPENDICULAR TO ROAD
60	DCBCI	216+22.0 14.1 RT	409.87		406.10	GRATE PERPENDICULAR TO ROAD
61	DMH	219+22.9 4.9 LT	408.79	(58) 403.90 (62) 404.00 (63) 404.00	403.90	
62	DCBCI	219+19.2 14.1 LT	408.60		404.10	GRATE PERPENDICULAR TO ROAD
63	DCBCI	219+19.2 14.1 RT	408.60		404.20	GRATE PERPENDICULAR TO ROAD
64	FES	220+34.3 58.3 LT		(85) 402.80		
65	DMH	221+16.1 11.4 LT	411.35	(67) 407.20 (66) 407.20		
66	CBCI	221+06.9 15.0 LT	411.03		407.30	
67	DMH	221+15.2 5.9 RT	411.43	(68) 407.40	407.40	
85	DMH	220+28.1 5.7 LT	409.59	(61) 403.20	403.20	



NOTES:
1. WORK BETWEEN STATION 220+00 TO 222+00 IS TO BE COVERED USING EVERSOURCE GAS' FORCE ACCOUNT. ALL OTHER WORK OUTSIDE THESE LIMITS DONE BY EVERSOURCE GAS IS TO BE FUNDED BY EVERSOURCE AS AN UPGRADE PROJECT.

MCCRACKEN ROAD (EAST) SEWER STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
113	SMH	215+48.8 9.5 RT	410.29	(112) 404.10	404.00	
114	SMH	218+12.2 0.0 RT	409.29	(113) 403.00	403.00	
115	SMH	220+72.0 9.0 RT	410.32	(114) 402.50	402.50	

MCCRACKEN ROAD (EAST) DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
65	DMH	221+16.1 11.4 LT	411.35	(67) 407.20 (66) 407.20		
66	CBCI	221+06.9 15.0 LT	411.03		407.30	
67	DMH	221+15.2 5.9 RT	411.43	(68) 407.40	407.40	
68	DCBCI	222+23.7 14.1 RT	415.02		409.60	GRATE PERPENDICULAR TO ROAD
69	EX DMH	224+26.3 13.9 RT	423.13	(70) 419.00		
70	DCBCI	224+87.2 32.0 RT	424.94		419.50	GRATE PERPENDICULAR TO ROAD
71	DMH	226+72.3 15.0 RT	432.53	(72) 427.70	427.60	
72	DCBCI	226+53.9 33.5 RT	431.46		427.85	GRATE PERPENDICULAR TO ROAD

MCCRACKEN ROAD (EAST) SEWER STRUCTURE DATA

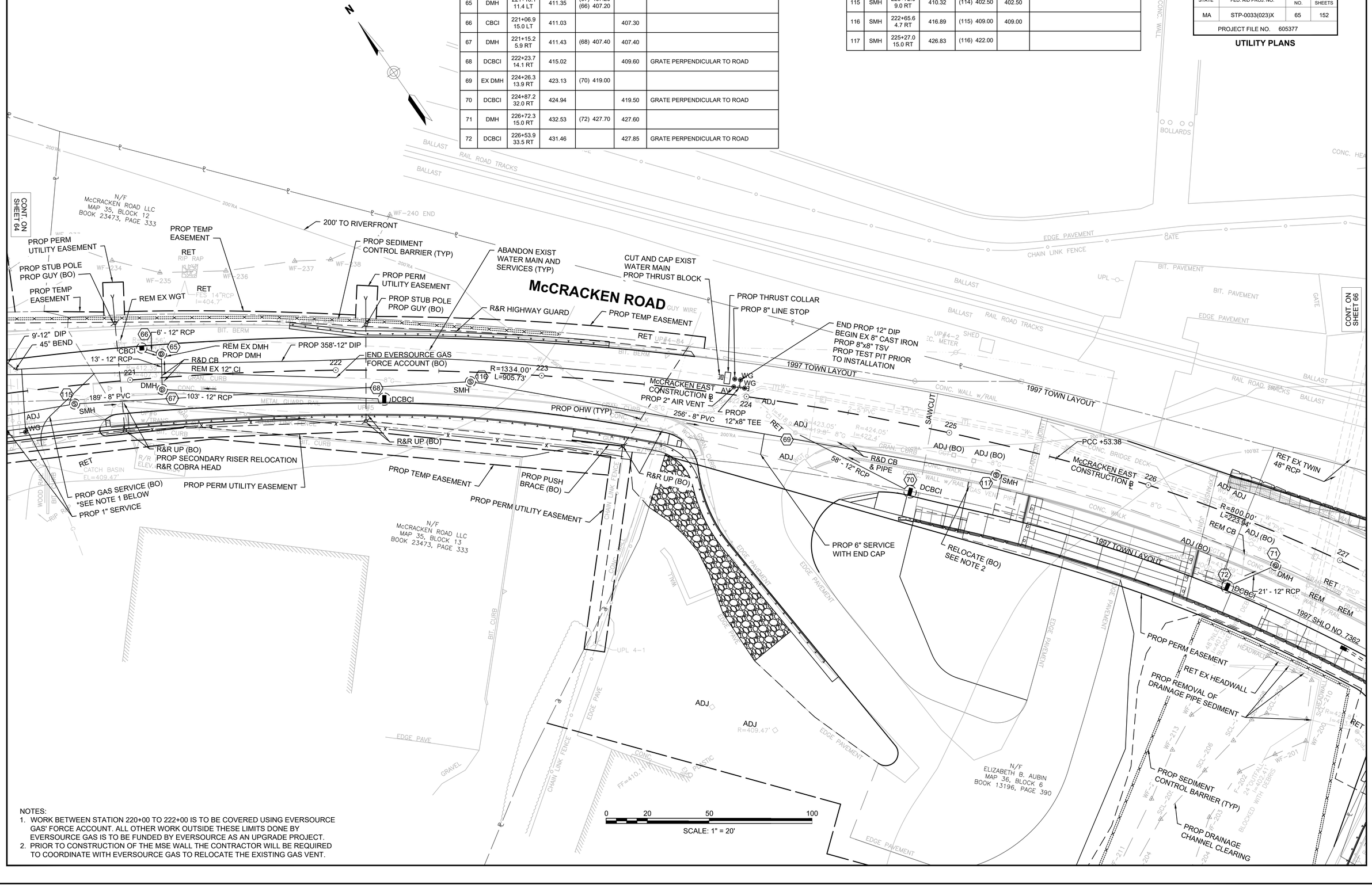
NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
115	SMH	220+72.0 9.0 RT	410.32	(114) 402.50	402.50	
116	SMH	222+65.6 4.7 RT	416.89	(115) 409.00	409.00	
117	SMH	225+27.0 15.0 RT	426.83	(116) 422.00		

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	65	152
PROJECT FILE NO. 605377			

UTILITY PLANS

605377_HD(UTIL).DWG Plotted on 11-Apr-2022 5:25 PM



NOTES:
1. WORK BETWEEN STATION 220+00 TO 222+00 IS TO BE COVERED USING EVERSOURCE GAS' FORCE ACCOUNT. ALL OTHER WORK OUTSIDE THESE LIMITS DONE BY EVERSOURCE GAS IS TO BE FUNDED BY EVERSOURCE AS AN UPGRADE PROJECT.
2. PRIOR TO CONSTRUCTION OF THE MSE WALL THE CONTRACTOR WILL BE REQUIRED TO COORDINATE WITH EVERSOURCE GAS TO RELOCATE THE EXISTING GAS VENT.

MILLBURY
MCCRACKEN ROAD

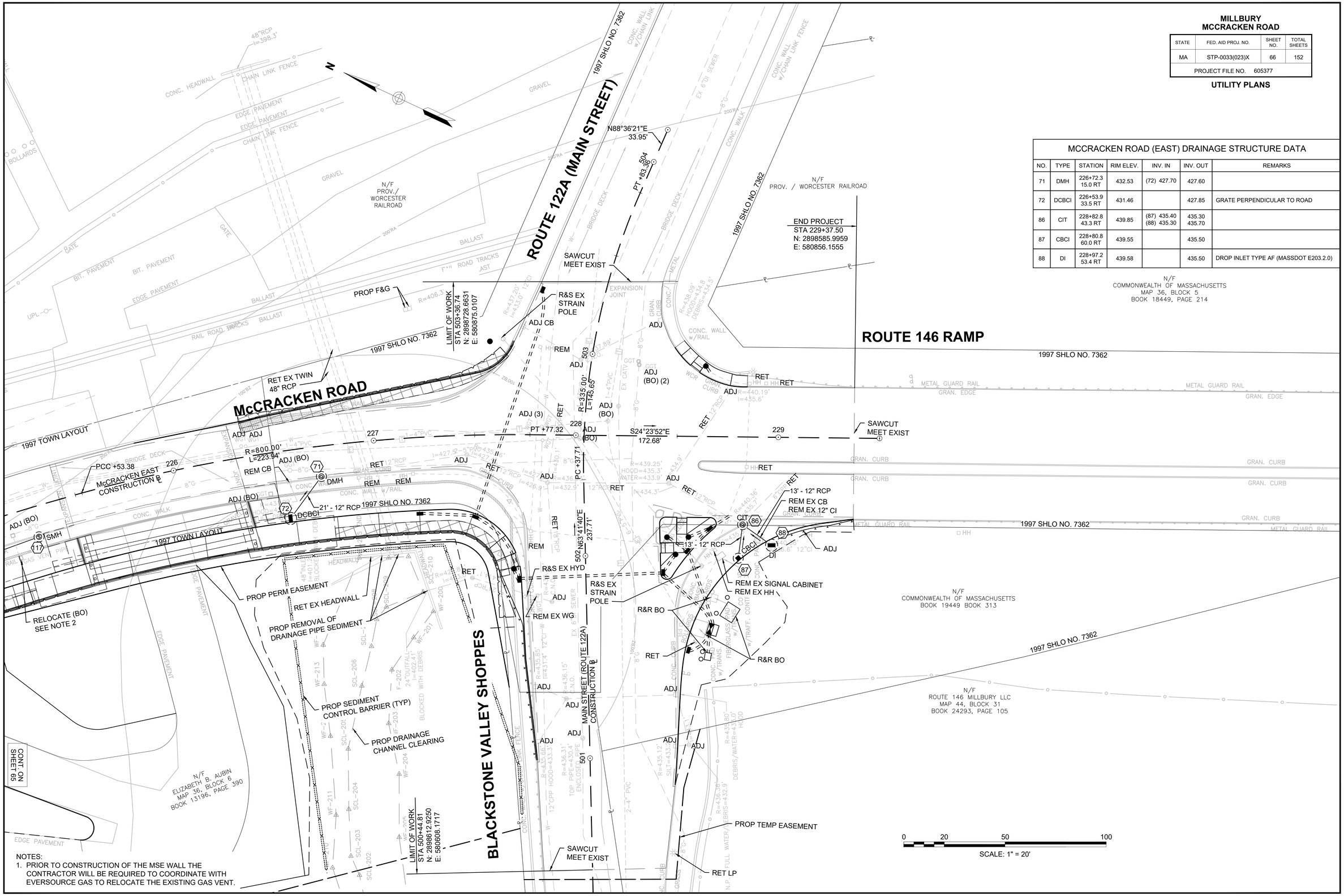
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	66	152
PROJECT FILE NO. 605377			

UTILITY PLANS

605377_HDUTIL.DWG Plotted on 11-Apr-2022 5:25 PM

MCCRACKEN ROAD (EAST) DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. IN	INV. OUT	REMARKS
71	DMH	226+72.3 15.0 RT	432.53	(72) 427.70	427.60	
72	DCBCI	226+53.9 33.5 RT	431.46		427.85	GRATE PERPENDICULAR TO ROAD
86	CIT	228+82.8 43.3 RT	439.85	(87) 435.40 (88) 435.30	435.30 435.70	
87	CBCI	228+80.8 60.0 RT	439.55		435.50	
88	DI	228+97.2 53.4 RT	439.58		435.50	DROP INLET TYPE AF (MASSDOT E203.2.0)

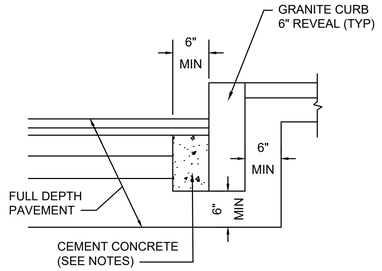


NOTES:
1. PRIOR TO CONSTRUCTION OF THE MSE WALL THE CONTRACTOR WILL BE REQUIRED TO COORDINATE WITH EVERSOURCE GAS TO RELOCATE THE EXISTING GAS VENT.

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	67	152
PROJECT FILE NO. 605377			

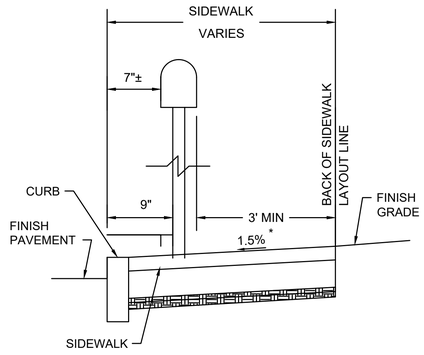
CONSTRUCTION DETAILS



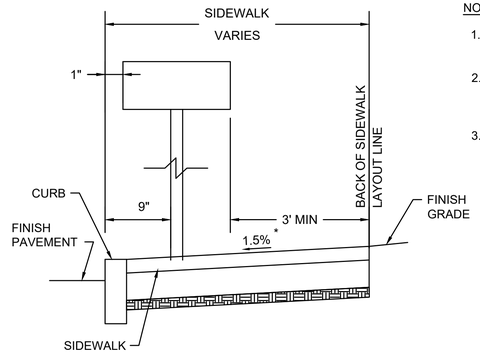
NOTES:
1. TO BE PLACED IF CURB IS INSTALLED AFTER HOT MIX ASPHALT
2. CONCRETE SHALL BE INCLUDED IN PRICE BID FOR GRANITE CURB
3. ANY DESIGNATED CEMENT CONCRETE THAT IS ACCEPTABLE UNDER SECTION M4 OF THE STANDARD SPECIFICATIONS MAY BE USED. ALL TEST REQUIREMENTS ARE WAIVED. HOT MIX ASPHALT SHALL NOT BE USED AS A SUBSTITUTE.

GRANITE CURB IN FULL DEPTH PAVEMENT

SCALE: N.T.S. DWG: CURB-05 DATE: MARCH 2013



MAILBOX PARALLEL TO CURB



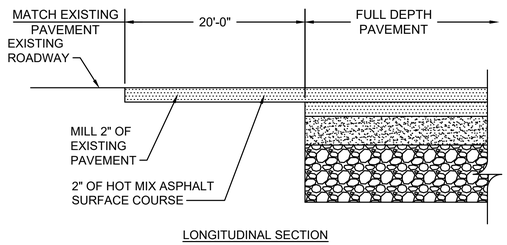
MAILBOX PERPENDICULAR TO CURB

* TOLERANCE FOR CONSTRUCTION ±0.5%

NOTES:
1. MINIMUM CLEAR PATH ON ALL SIDEWALK SHALL BE 36" EXCLUDING THE CURB. THE CLEAR PATH SHALL BE MEASURED TO FIRST VERTICAL FACE ENCOUNTERED ON THE MAILBOX OR PAPER TUBE (INCLUDING ALL PROTRUSIONS LESS THAN 6'-8" IN HEIGHT).
2. CONTRACTOR SHALL VERIFY LOCATION OF ALL MAILBOXES AND PAPER TUBES TO BE SET WITHIN THE SIDEWALK PRIOR TO FINAL PLACEMENT TO PROVIDE A MINIMUM CLEAR PATH OF 36". CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY LOCATION THAT CANNOT MEET THE CLEARANCE REQUIREMENTS.
3. REFER TO MASSDOT STANDARD DETAIL E 504.1.0 FOR ADDITIONAL INFORMATION.

SIDEWALK CLEARANCE MAILBOXES AND PAPER TUBES

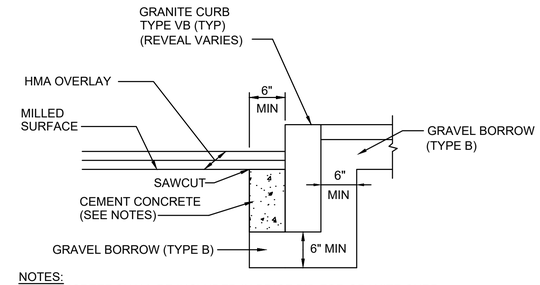
SCALE: N.T.S. DWG: WALK-05 DATE: JUNE 2018



LONGITUDINAL SECTION

FULL DEPTH PAVEMENT TRANSITION

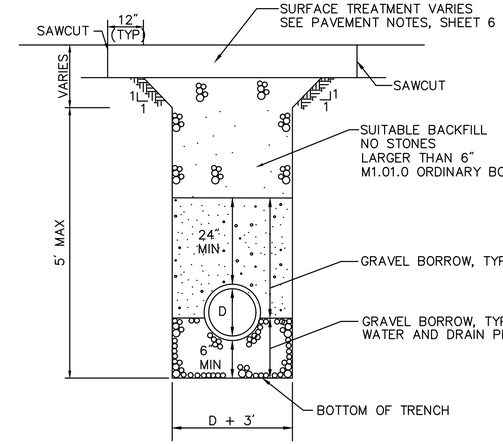
SCALE: N.T.S. DWG: PVMT-03 DATE: OCT. 2012



NOTES:
1. CONCRETE SHALL BE INCLUDED IN PRICE BID FOR GRANITE CURB.
2. SAWCUT 6" FROM CURB LINE AND REMOVE EXISTING PAVEMENT AND GRAVEL. REPLACE WITH CEMENT CONCRETE.
3. ANY DESIGNATED CEMENT CONCRETE THAT IS ACCEPTABLE UNDER SECTION M4 OF THE STANDARD SPECIFICATIONS MAY BE USED. ALL TEST REQUIREMENTS ARE WAIVED. HOT MIX ASPHALT SHALL NOT BE USED AS A SUBSTITUTE.

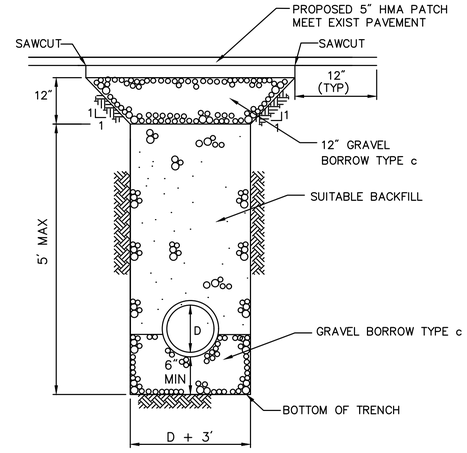
GRANITE CURB IN PAVEMENT MILLING AND OVERLAY

SCALE: N.T.S. DWG: CURB-04 DATE: APRIL 2003



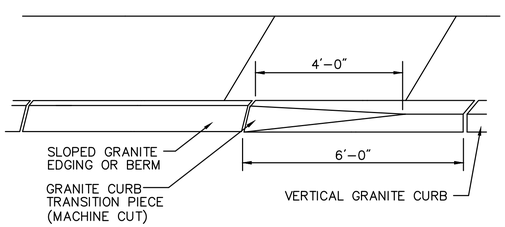
DRAINAGE TRENCH DETAIL - FULL DEPTH PAVEMENT

SCALE: N.T.S.



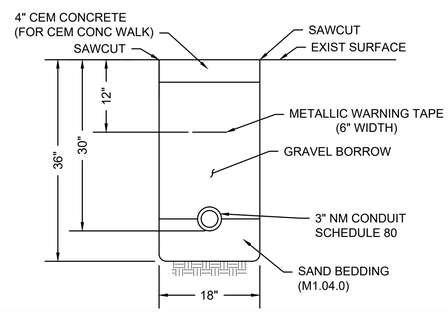
TRENCH IN MICROMILL & PVM'T OVERLAY AREA

SCALE: N.T.S. DWG: TRENCH-04 DATE: OCT. 2012



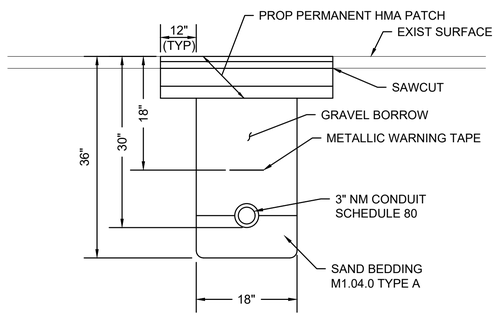
SPLAYED END GRANITE CURB

SCALE: N.T.S. DWG: CURB-07 DATE: OCT. 2012



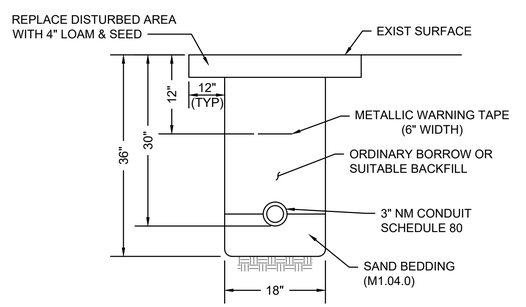
CONDUIT IN SIDEWALK

SCALE: N.T.S.



CONDUIT CROSSING ROADWAY/DRIVEWAY

SCALE: N.T.S. DWG: TRENCH-01 DATE: MARCH 2013



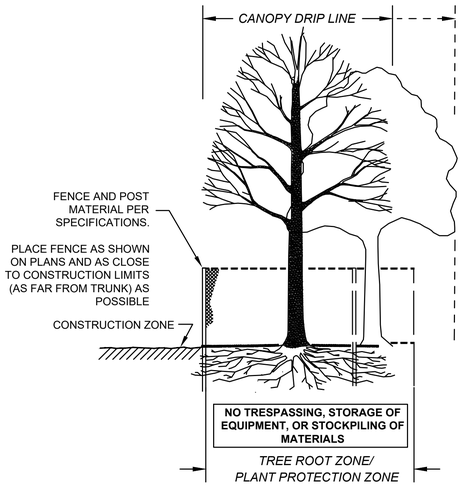
CONDUIT IN GRASS

SCALE: N.T.S.

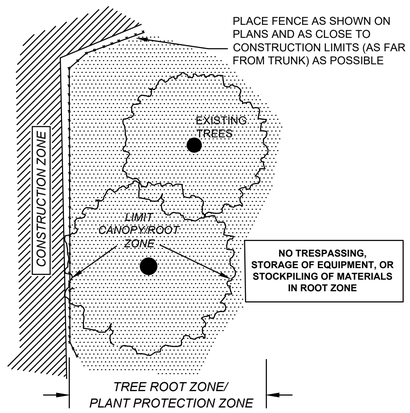
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	68	152
PROJECT FILE NO. 605377			

CONSTRUCTION DETAILS



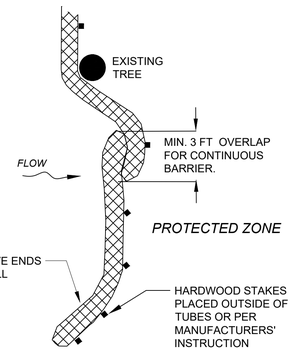
SECTION - FENCE PROTECTION OF ROOT ZONE



PLAN VIEW - FENCE PROTECTION OF ROOT ZONE

TREE PROTECTION DETAILS

NOT TO SCALE

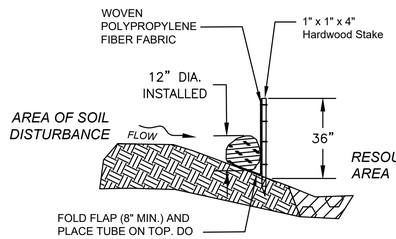


PLACE TUBE ALONG CONTOURS AND PERPENDICULAR TO FLOW.

ADJUST LOCATION AS REQUIRED FOR OPTIMUM EFFECTIVENESS. DO NOT INSTALL IN WATERWAYS.

PLACE STAKES AS NEEDED TO SECURE TUBES IN PLACE.

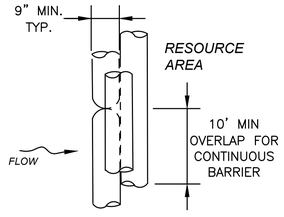
PLAN VIEW



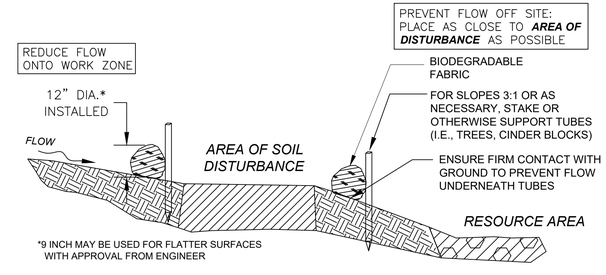
SECTION

COMPOST FILTER TUBE & SILT FENCE

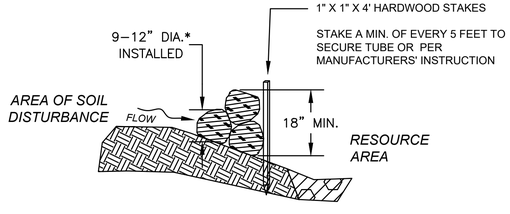
NOT TO SCALE



PLAN VIEW



SECTION



SECTION

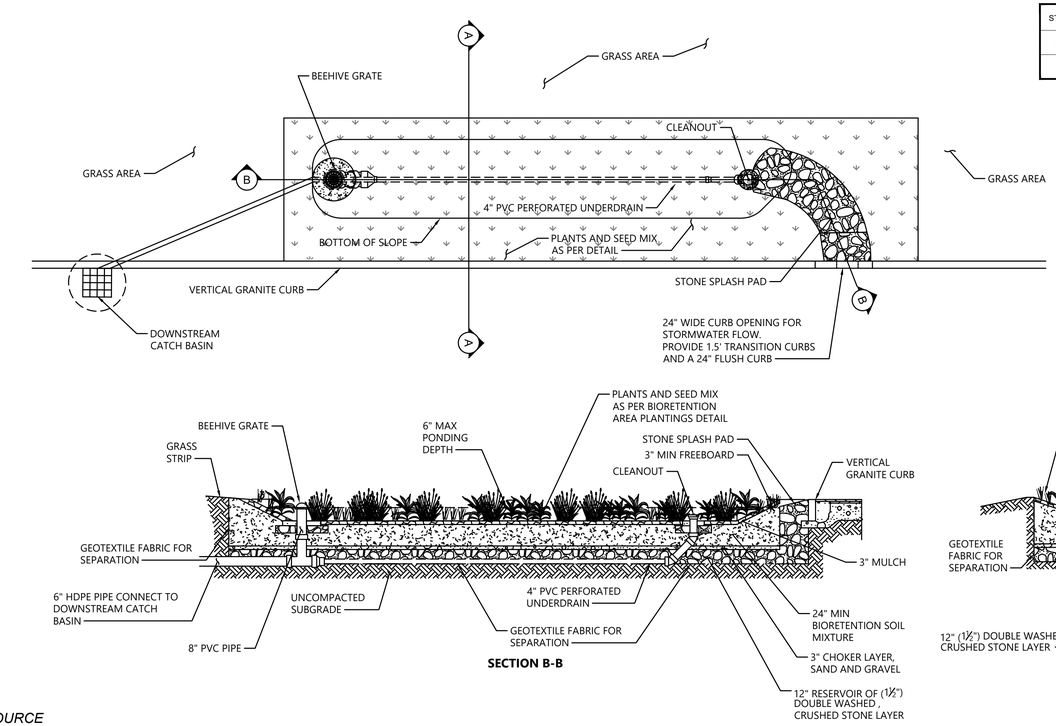
SEDIMENT BARRIERS - COMPOST FILTER TUBES

NOT TO SCALE

20181210_MassDOT

COMPOST FILTER TUBE BERM (SLOPES 2:1 OR STEEPER)

NOT TO SCALE

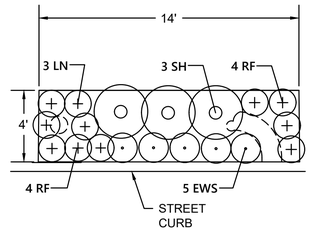


BIORETENTION BASIN

SCALE: N.T.S.

PLANT SCHEDULE BIORETENTION BASINS

BIORETENTION BASINS	QTY	BOTANICAL NAME	COMMON NAME	SIZE
EWS	5	Echinacea purpurea `White Swan`	White Swan Purple Coneflower	1 GAL.
LN	5	Liatris novae-anglae	Northern Blazing Star	1 GAL.
RF	8	Rudbeckia fulgida `Goldsturm`	Goldsturm Black-eyed Susan	1 GAL.
SH	2	Sporobolus heterolepis	Prairie Dropseed	2 GAL.



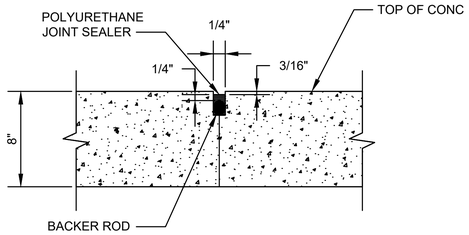
BIORETENTION BASIN PLANTINGS

SCALE: N.T.S.

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	69	152
PROJECT FILE NO. 605377			

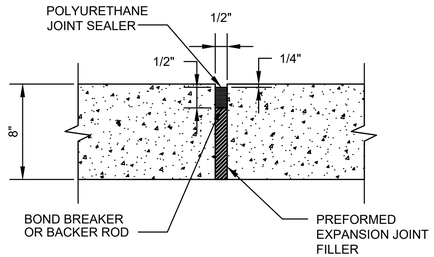
CONSTRUCTION DETAILS



NOTE: REINFORCEMENT SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINTS.

SEALED CONSTRUCTION JOINT DETAILS

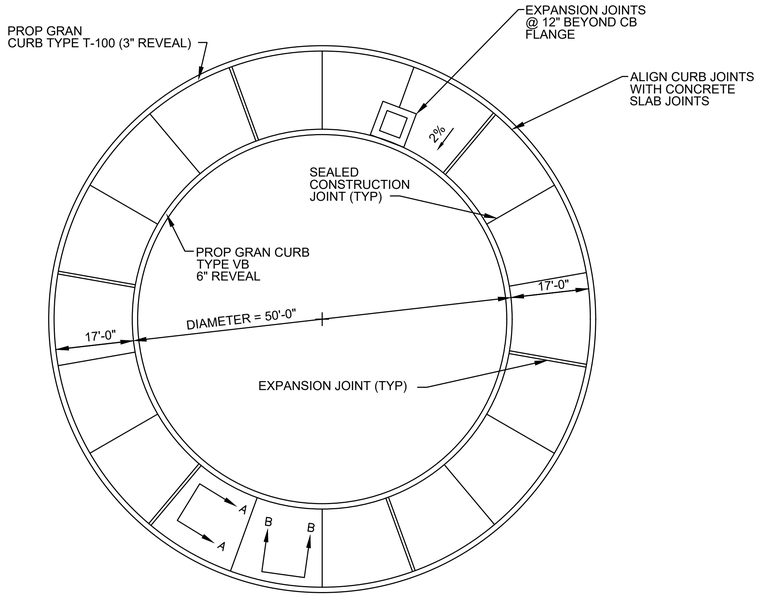
SCALE: N.T.S. DWG: -- DATE: OCT. 2012



NOTE: REINFORCEMENT SHALL END 2" CLEAR OF EXPANSION JOINT.

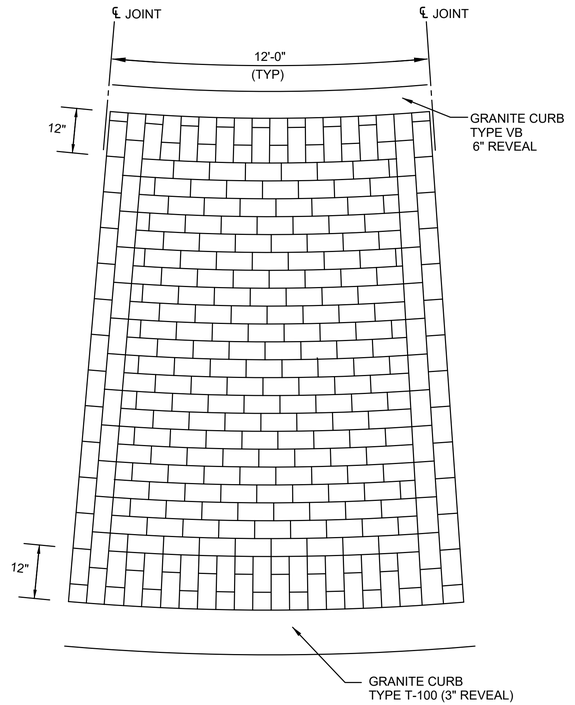
EXPANSION CONTROL JOINT

SCALE: N.T.S. DWG: DATE: APR. 2014



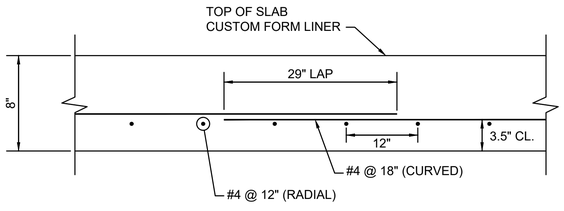
JOINT LAYOUT

SCALE: N.T.S. DWG: -- DATE: APR. 2014

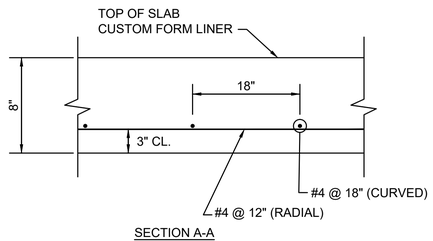


STAMPED CEMENT CONCRETE PAVEMENT

SCALE: N.T.S. DWG: -- DATE: APR. 2014



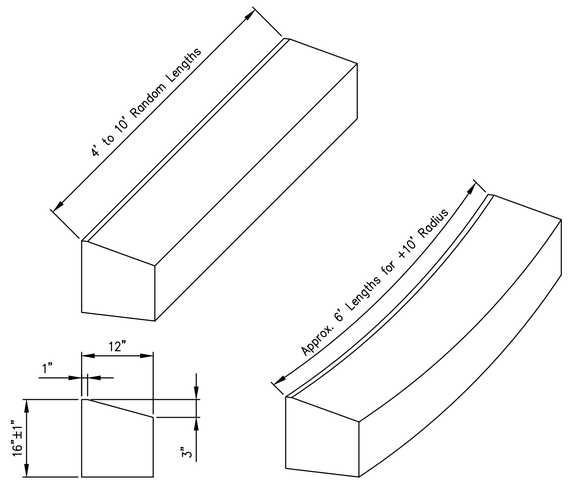
SECTION B-B



SECTION A-A

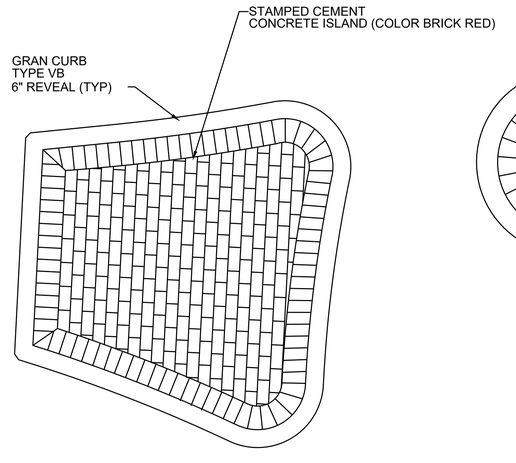
CONCRETE PAVEMENT REINFORCING DETAILS

SCALE: N.T.S. DWG: -- DATE: OCT. 2012



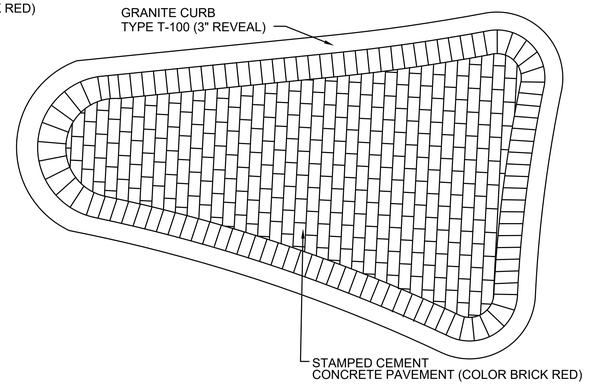
TYPE T-100 TRAVERSABLE GRANITE CURBING

SCALE: N.T.S. DWG: -- DATE:



STAMPED CEMENT CONCRETE ISLAND PATTERN

SCALE: N.T.S. DWG: -- DATE: APR. 2014



STAMPED CEMENT CONCRETE PAVEMENT

SCALE: N.T.S. DWG: -- DATE: APR. 2014

CEMENTED STONE MASONRY WALL SUMMARY						
	START LOCATION	END LOCATION	H*	FTG. WIDTH (0.5H)	W	D
WALL 1	STA 51+83 RT 25.67'	STA 53+63 RT 49.42'	10.20 Ft	5.10 Ft	1.75 Ft	1.50 Ft
WALL 2	STA 202+15 LT 21.74'	STA 205+44 LT 21.74'	11.10 Ft	5.55 Ft	1.75 Ft	1.50 Ft
WALL 3	STA 208+00 LT 21.74'	STA 210+00 LT 21.74'	9.34 Ft	4.67 Ft	1.75 Ft	1.50 Ft
WALL 4	STA 205+00 RT 22.17'	STA 206+50 RT 31.82'	9.00 Ft	4.50 Ft	1.75 Ft	1.50 Ft
WALL 5	STA 209+68 RT 23.50'	STA 212+55 RT 23.50'	9.17 Ft	4.59 Ft	2.00 Ft	2.00 Ft
WALL 6	STA 224+91.80 RT 45.72'	STA 225+71.95 RT 108.59'				
WALL 7	STA 226+37.41 RT 46.97'	STA 26+38.94 RT 117.12'				

WALL NO. 1 LAYOUT TABLE				
NUMBER	STATION	OFFSET	TOP OF WALL	GROUND @ WALL FACE
1	51+83.15	25.67 RT	424.83	420.46
2	52+50	24.27 RT	425.00	420.52
3	53+00	21.20 RT	427.53	419.82
4	53+36.20	23.71 RT	430.02	426.61
5	53+63.11	49.42 RT	434.07	433.40

WALL NO. 2 LAYOUT TABLE				
NUMBER	STATION	OFFSET	TOP OF WALL	GROUND @ WALL FACE
1	202+15.5	21.74 Lt	422.97	414.38
2	202+50	21.74 Lt	422.16	413.51
3	203+00	21.74 Lt	420.97	413.57
4	203+50	21.74 Lt	420.20	414.17
5	204+00	21.74 Lt	420.20	412.59
6	204+50	21.74 Lt	420.20	413.50
7	205+00	21.74 Lt	420.20	412.07
8	205+44.13	21.74 Lt	420.78	418.13

WALL NO. 3 LAYOUT TABLE				
NUMBER	STATION	OFFSET	TOP OF WALL	GROUND @ WALL FACE
1	208+00	21.74 Lt	417.51	413.47
2	208+50	21.74 Lt	416.61	413.44
3	208+82.73	21.74 Lt	416.20	409.40
4	208+90.79	21.74 Lt	416.20	409.40
5	209+00	21.74 Lt	416.20	412.91
6	209+50	21.74 Lt	416.20	412.78
7	210+00	21.74 Lt	416.20	413.48

WALL NO. 4 LAYOUT TABLE				
NUMBER	STATION	OFFSET	TOP OF WALL	GROUND @ WALL FACE
1	205+00	22.17 RT	422.52	420.30
2	205+50	21.71 RT	426.48	420.88
3	205+84.54	21.71 RT	427.38	421.14
4	206+00	24.11 RT	427.66	421.21
5	206+50	31.82 RT	426.72	421.14

WALL NO. 5 LAYOUT TABLE				
NUMBER	STATION	OFFSET	TOP OF WALL	GROUND @ WALL FACE
1	209+68.05	23.50 RT	416.14	416.05
2	210+00	23.50 RT	422.49	416.26
3	210+50	23.50 RT	420.65	416.72
4	211+00	23.50 RT	421.53	416.80
5	211+50	23.50 RT	425.83	416.40
6	212+00	23.50 RT	422.78	415.54
7	212+50	23.50 RT	419.56	414.30
8	212+55	23.50 RT	416.67	414.19

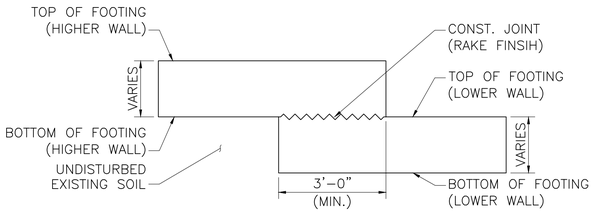
MILLBURY
McCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	70	152
PROJECT FILE NO. 605377			

CEMENTED STONE MASONRY WALL SECTION

NOTES:

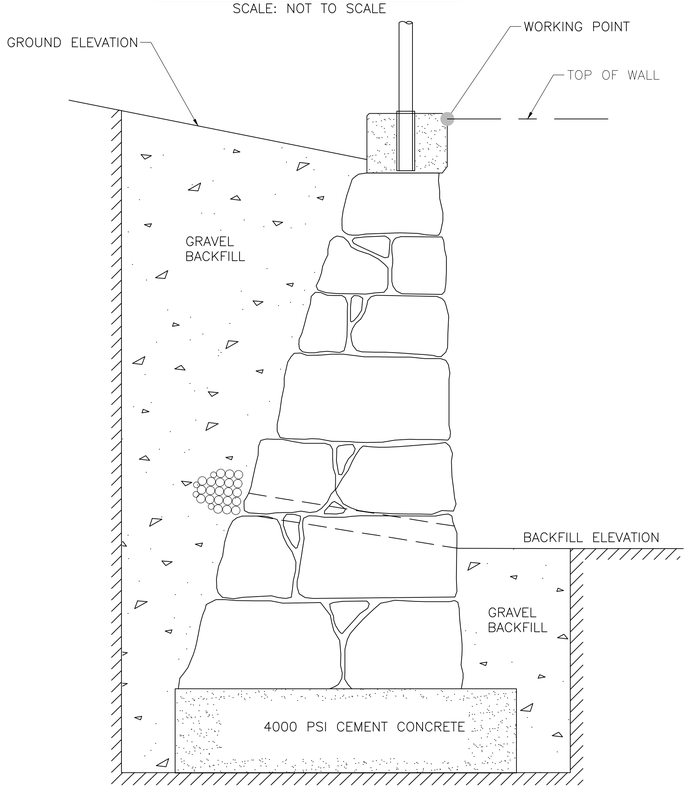
1. COPING OVERHANG TO BE APPROXIMATELY 3" FOR WALLS 10' OR MORE IN HEIGHT AND APPROXIMATELY 2" FOR WALLS LESS THAN 10' IN HEIGHT; IN A CONTINUOUS WALL OF VARYING HEIGHT THE OVERHANG WILL BE APPROXIMATELY 2" TO 3" FOR THE ENTIRE LENGTH.
2. TO BE FOUND ON SUITABLE SOIL.
3. COPING SHALL BE CAST-IN-PLACE WITH A MINIMUM DEPTH OF 12". THE LENGTH OF GALVANIZED PIPE SLEEVES FOR FENCE POSTS SHALL BE EQUAL TO THE DEPTH OF COPING.
4. THE DIMENSIONS SHOWN IN THE TABLE BELOW VARY FROM THOSE SPECIFIED ON THE MASSDOT STANDARD CONSTRUCTION DETAILS.



STEPPED-UP FOOTING DETAIL

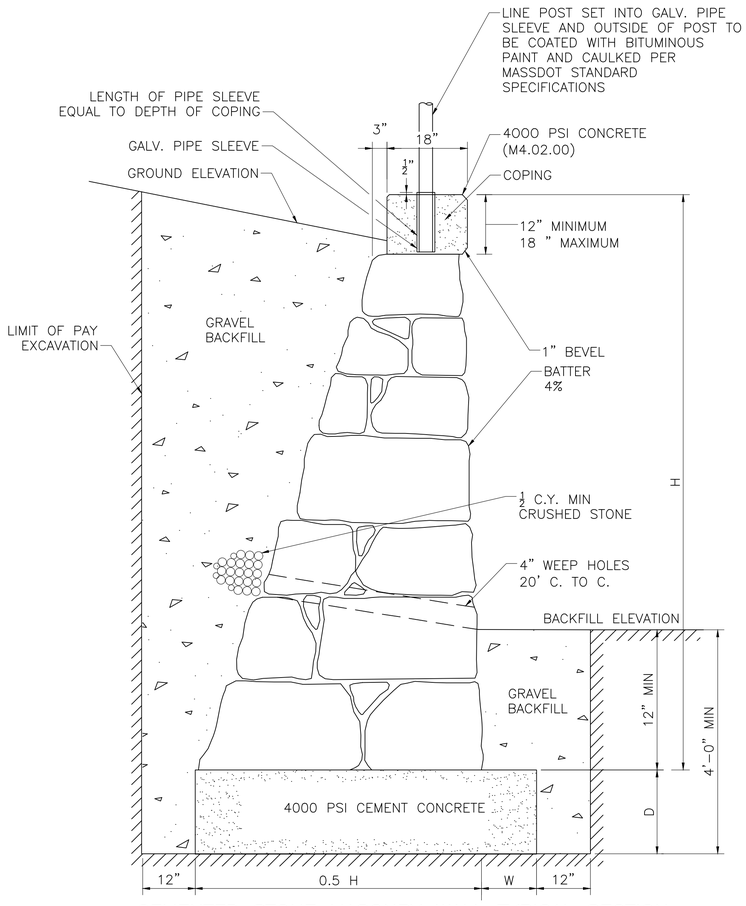
SCALE: NOT TO SCALE

* H SHOWN IS THE MAX ALLOWABLE HEIGHT. H VARIES AS NEEDED TO FOLLOW THE PROPOSED ROADWAY GRADE. WHERE REQUIRED TO FOLLOW ROADWAY GRADE, THE FOOTING SHALL BE STEPPED.



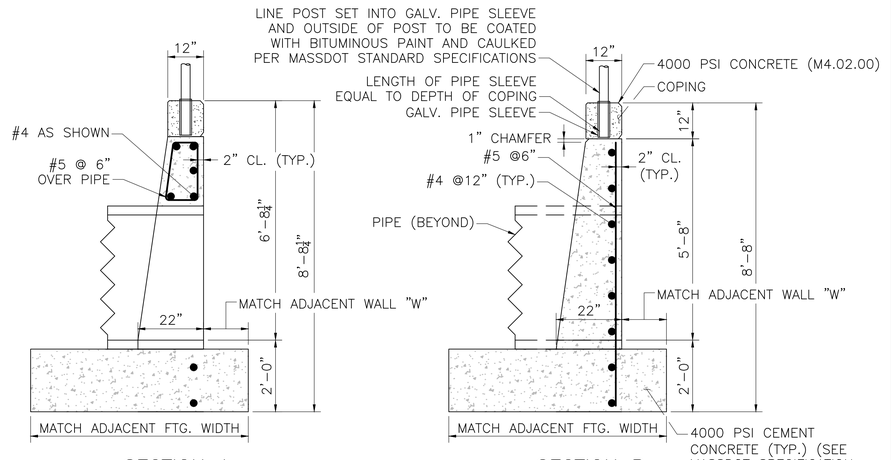
CEMENTED STONE MASONRY WALL LAYOUT DETAIL

SCALE: NOT TO SCALE



CEMENTED STONE MASONRY WALL TYPICAL SECTION

SCALE: NOT TO SCALE

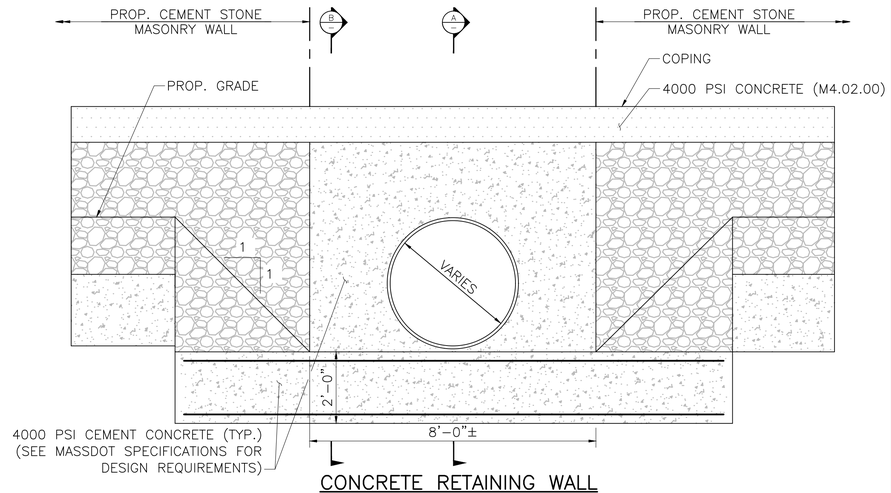


SECTION A

SCALE: 1/2" = 1'-0"

SECTION B

SCALE: 1/2" = 1'-0"

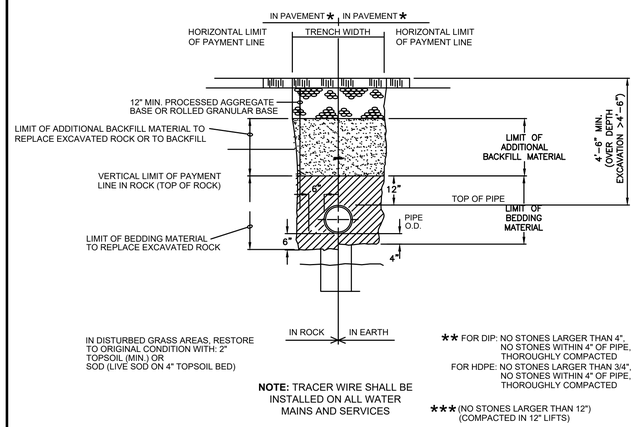


CONCRETE RETAINING WALL DETAIL WITH OPENING

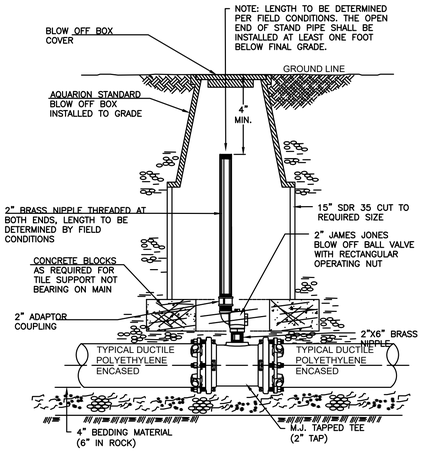
SCALE: 1/2" = 1'-0"

605377_BR13_MASONRY WALLS.DWG Plotted on 11-Apr-2022 8:57 AM

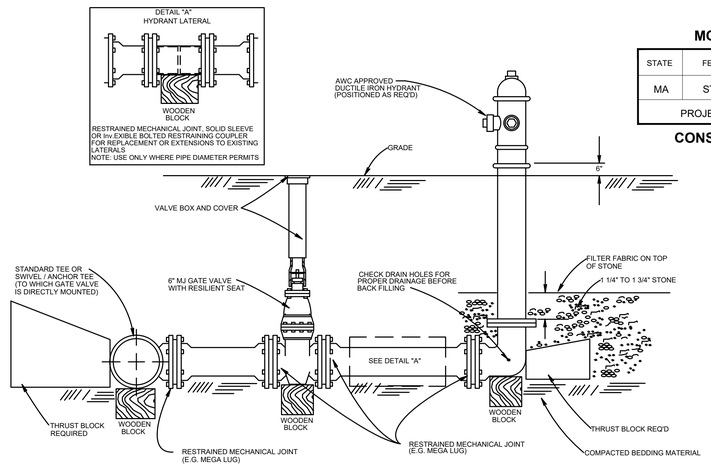
605377_HDI(DET).DWG Plotted on 11-Apr-2022 5:26 PM



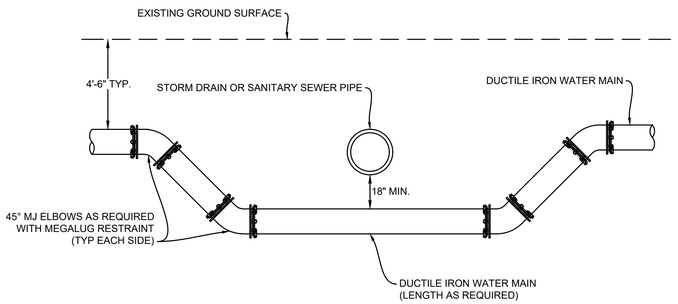
TYPICAL TRENCH DETAIL (AWC SD-1)
NOT TO SCALE



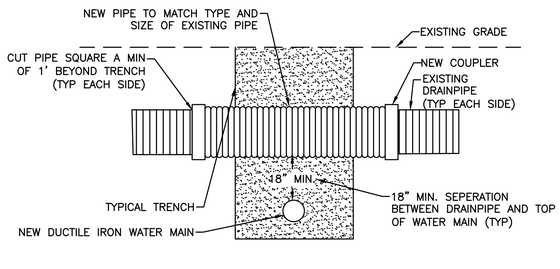
ON LINE AIR VENT / BLOW-OFF DETAIL (AWC SD-4)
NOT TO SCALE



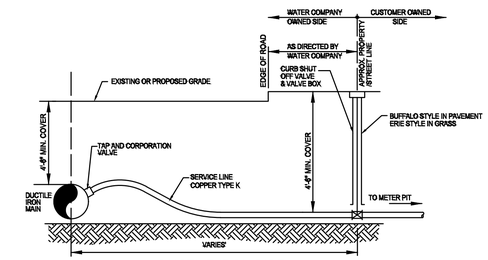
HYDRANT ASSEMBLY DETAIL (AWC SD-8)
NOT TO SCALE



TYPICAL STORM DRAIN CROSSING WITH OFFSETS DETAIL
NOT TO SCALE

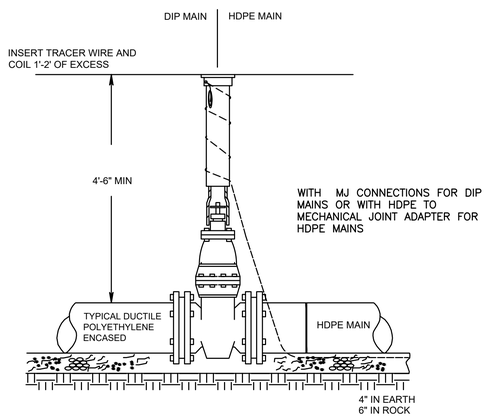


REPAIR OF UNKNOWN STORM DRAIN
NOT TO SCALE



DUCTILE IRON PIPE

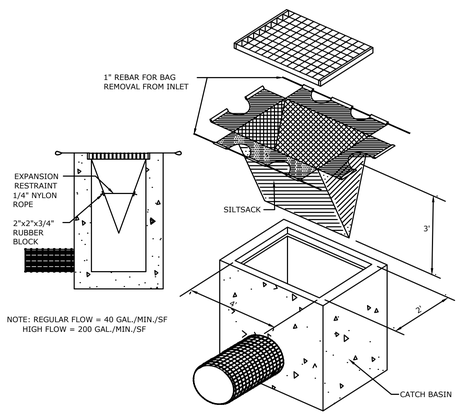
WATER SERVICE LINE DETAIL (AWC SD-20)
NOT TO SCALE



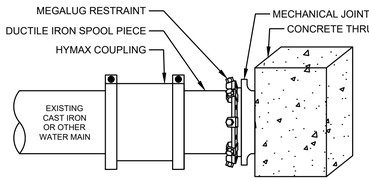
NOTE: ONLY INSTALLED ON MAINS 12" AND SMALLER

NOTE: FOR CONTINUOUS HDPE MAINS, INSTALL TRACER WIRE UNDER ALL VALVES AND FITTINGS. FOR TERMINATION POINTS, INSTALL TRACER WIRE AROUND VALVE BOXES AS SHOWN ABOVE.

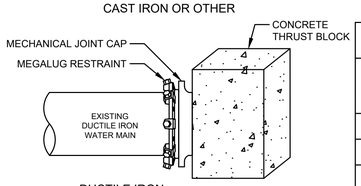
GATE VALVE DETAIL (AWC SD-2)
NOT TO SCALE



SILT SACK DETAIL (AWC SD-26)
NOT TO SCALE



CAST IRON OR OTHER



DUCTILE IRON

NOTES:

1. 2500 PSI CONCRETE TO BE USED
2. BLOCK DIMENSIONS ARE BASED UPON SOIL BEARING PRESSURE OF 2000 PSI AND WATER PRESSURE OF 150 PSI. WHERE SOIL BEARING PRESSURE IS LESS OR WATER PRESSURE IS GREATER, A SPECIAL DESIGN WILL BE REQUIRED.
3. FOR USE ON ABANDONED LINES AND DEAD ENDS WHERE NO EXTENSION IS CONTEMPLATED.
4. ALL THRUST BLOCKS TO BE POURED AGAINST UNDISTURBED EARTH.

TYPICAL CUT AND CAP DETAIL
NOT TO SCALE

THRUST BLOCK INFO

PIPE SIZE (IN)	MIN. CONC. VOL. (CF)	MIN. BEARING SURFACE (SF)
6	2.5	2
8	4	3.75
10	5.1	5
12	10.8	8.75
16	23	15

DUCTILE IRON PIPE RESTRAINT TABLE FOR REDUCERS

LARGER PIPE SIZE	SMALLER PIPE SIZE	RESTRAINT LENGTH REQUIRED ON LARGER SIDE OF REDUCER
8"	6"	30 FT
10"	6"	55 FT
12"	6"	75 FT
16"	6"	110 FT
10"	8"	30 FT
12"	8"	55 FT
16"	8"	95 FT
12"	10"	30FT
16"	10"	80 FT
16"	12"	60FT

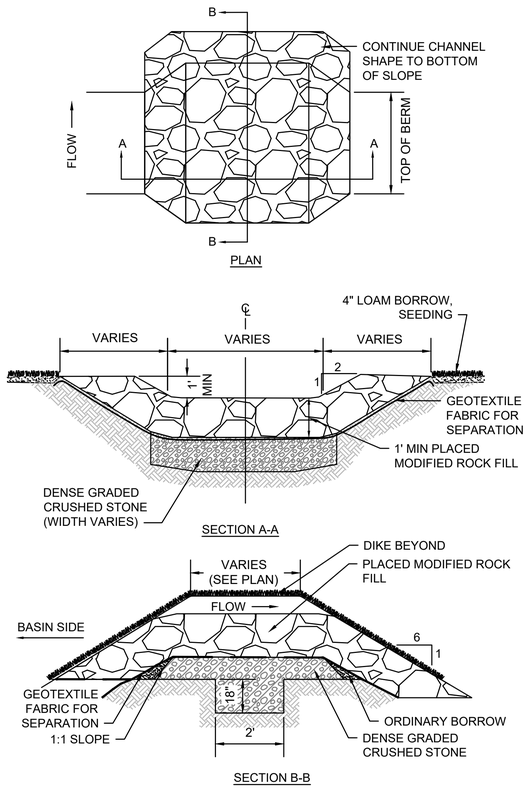
DUCTILE IRON PIPE RESTRAINT TABLE FOR HORIZONTAL BENDS AND DEAD ENDS

PIPE SIZE	11-1/4° HORZ. BEND	22-1/2° HORZ. BEND	45° HORZ. BEND	90° HORZ. BEND	DEAD END
6"	5 FT	5 FT	10 FT	25 FT	55 FT
8"	5 FT	10 FT	15 FT	35 FT	75 FT
10"	5 FT	10 FT	20 FT	40 FT	90 FT
12"	5 FT	10 FT	20 FT	45 FT	105 FT
16"	10 FT	15 Ft	25 FT	60 FT	135 FT

MILLBURY
MCCRACKEN ROAD

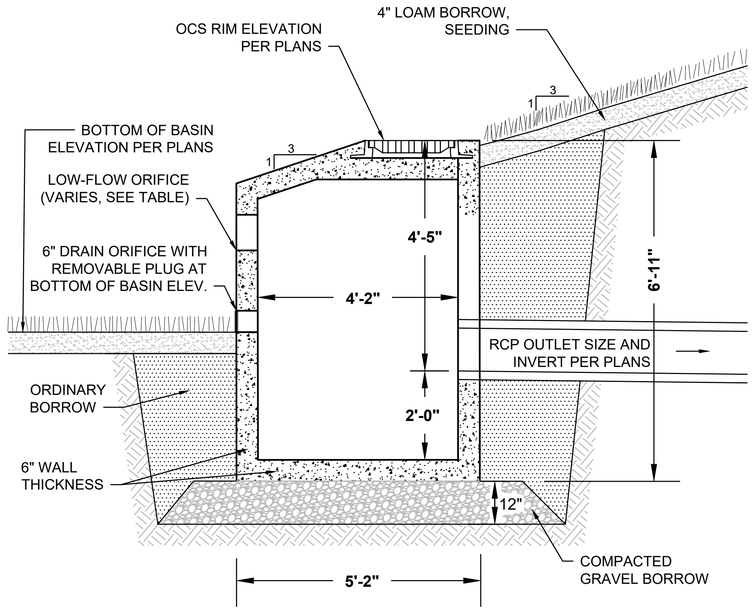
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	72	152
PROJECT FILE NO. 605377			

CONSTRUCTION DETAILS



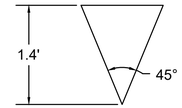
OVERFLOW STONE SPILLWAY

SCALE: N.T.S. SOURCE: VHB DATE: AUGUST 5 2015

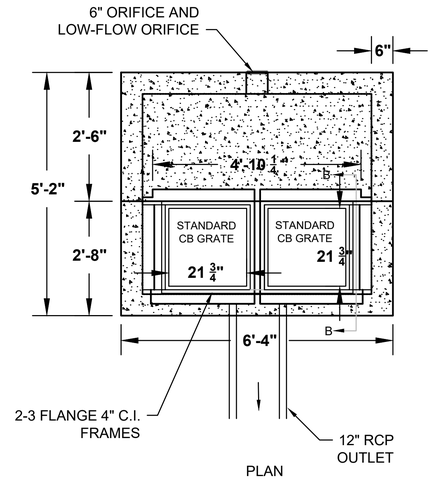


LOW-FLOW ORIFICE TABLE

BASIN NO.	STRUCTURE NO.	LOW--FLOW ORIFICE INVERT	ORIFICE SIZE
P1	74	415.7	6" DIA.
P2	80	408.6	8



V-NOTCH ORIFICE

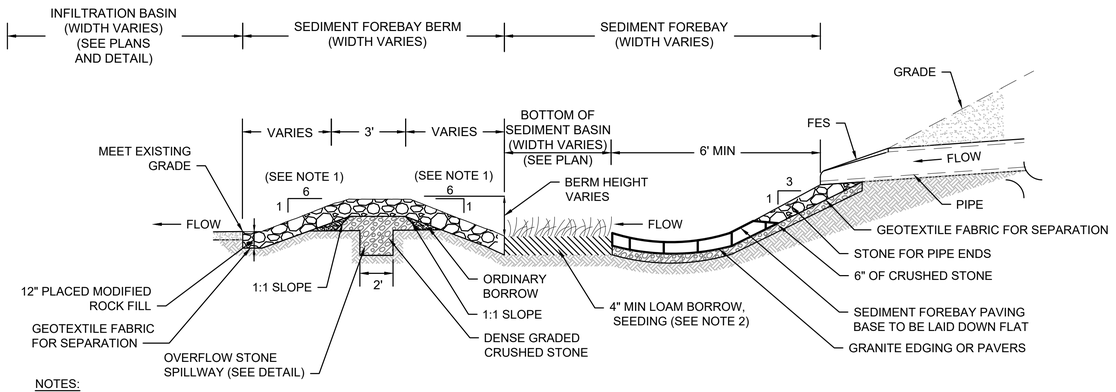


NOTES:

1. MANUFACTURER TO DESIGN STRUCTURE WITH APPROPRIATE REINFORCED STEEL CAPABLE OF HANDLING HS-20 LOADING.
2. 4000 PSI CEMENT CONCRETE (SEE MASSDOT SPECIFICATIONS FOR DESIGN REQUIREMENTS).

OUTLET CONTROL STRUCTURE

SCALE: N.T.S. SOURCE: VHB DATE: JULY 9 2019

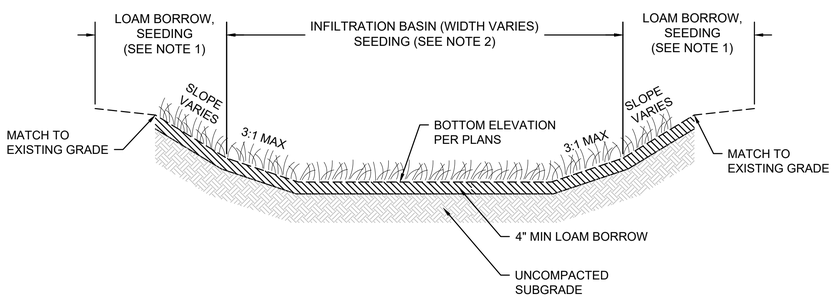


NOTES:

1. STEEPER TRAVERSE SLOPES ARE PERMISSIBLE (3:1 MAXIMUM) WITH LONGITUDINAL ROADSIDE BARRIERS, OR AREAS OUTSIDE THE CLEAR ZONE, OR ON LOW SPEED FACILITIES.
2. PLACE LOAM BORROW TO A MINIMUM DEPTH OF 4". SEEDED WITH ITEM 765.457, SEEDING - INFILTRATION BASIN BOTTOM/SWALE MIX.

SEDIMENT FOREBAY WITH GRANITE EDGING BASE

SCALE: N.T.S. SOURCE: VHB DATE: AUGUST 7 2015



NOTES:

1. SIDES OF BASIN SHALL BE SEEDED WITH ITEM 765., SEEDING.
2. BOTTOM OF BASIN SHALL BE SEEDED WITH ITEM 765.457, SEEDING- INFILTRATION BASIN BOTTOM/SWALE MIX

INFILTRATION BASIN- TYPICAL SECTION

SCALE: N.T.S. SOURCE: VHB DATE: AUGUST 6 2015

MILLBURY
MCCRACKEN ROAD

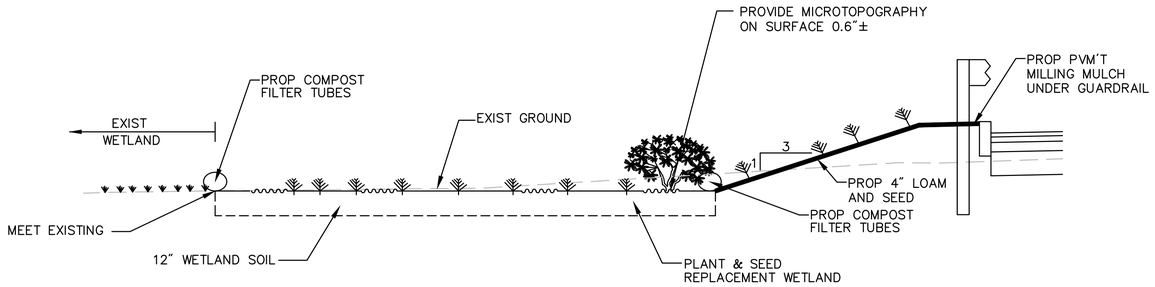
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	73	152
PROJECT FILE NO. 605377			

CONSTRUCTION DETAILS
WETLAND REPLICATION DETAIL

605377_HDI(WETLAND).DWG Plotted on 14-Jun-2022 5:22 PM

PLANT LEGEND

TREES	COMMON / BOTANICAL NAME	SIZE
	Red Maple / Acer rubrum	3 - 4` HT.
	Black Tupelo / Nyssa sylvatica	3 - 4` HT.
	Swamp White Oak / Quercus bicolor	3 - 4` HT.
SHRUBS	**COMMON / BOTANICAL NAME**	**SIZE**
	Speckled Alder / Alnus incana	24 - 30" HT.
	Winterberry / Ilex verticillata	24 - 36" HT.
	Willow / Salix discolor	24 - 36" HT.
	Highbush Blueberry / Vaccinium corymbosum	24 - 36" HT.



TYPICAL SECTION AT WETLAND REPLACEMENT AREA

SCALE: N.T.S.

PLANT SCHEDULE REPLICATON AREA 'A'

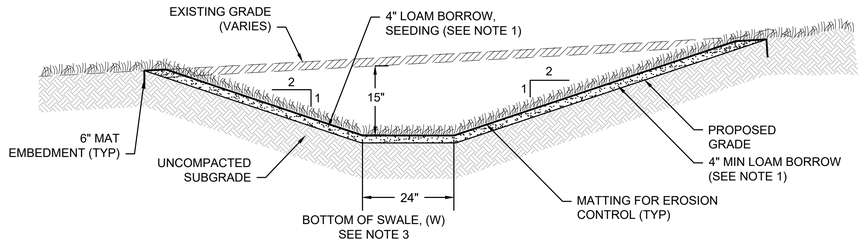
TREES	COMMON / BOTANICAL NAME	SIZE
4	Red Maple / Acer rubrum	3 - 4` HT.
4	Black Tupelo / Nyssa sylvatica	3 - 4` HT.
4	Swamp White Oak / Quercus bicolor	3 - 4` HT.
SHRUBS	**COMMON / BOTANICAL NAME**	**SIZE**
18	Speckled Alder / Alnus incana	24 - 30" HT.
18	Winterberry / Ilex verticillata	24 - 36" HT.
18	Willow / Salix discolor	24 - 36" HT.
18	Highbush Blueberry / Vaccinium corymbosum	24 - 36" HT.
TOTAL PLANTS 84		
	WETLAND SEED MIXTURE	2.5 LBS

PLANT SCHEDULE RESTORATION AREA 3

TREES	COMMON / BOTANICAL NAME	SIZE
5	Red Maple / Acer rubrum	3 - 4` HT.
5	Black Tupelo / Nyssa sylvatica	3 - 4` HT.
5	Swamp White Oak / Quercus bicolor	3 - 4` HT.
SHRUBS	**COMMON / BOTANICAL NAME**	**SIZE**
8	Speckled Alder / Alnus incana	24 - 30" HT.
9	Winterberry / Ilex verticillata	24 - 36" HT.
9	Willow / Salix discolor	24 - 36" HT.
6	Highbush Blueberry / Vaccinium corymbosum	24 - 36" HT.
TOTAL PLANTS 47		
	WETLAND SEED MIXTURE	1.5 LBS

REPLACEMENT WETLAND PLAN NOTES

1. SEE SPECIAL PROVISIONS FOR ITEMS 755.35, 755.75, AND 755.76 FOR REPLACEMENT WETLAND PLAN NOTES.

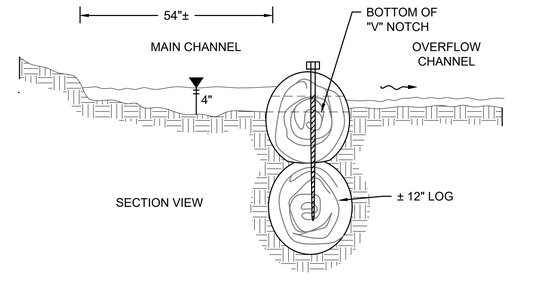


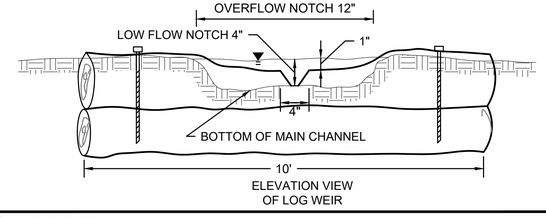
NOTES:

1. PLACE LOAM BORROW TO A MINIMUM DEPTH OF 4". SEEDED WITH ITEM 765.553 WETLAND/BASIN MIX - RIPARIAN (E253).

RELOCATED INTERMITTENT STREAM SECTION

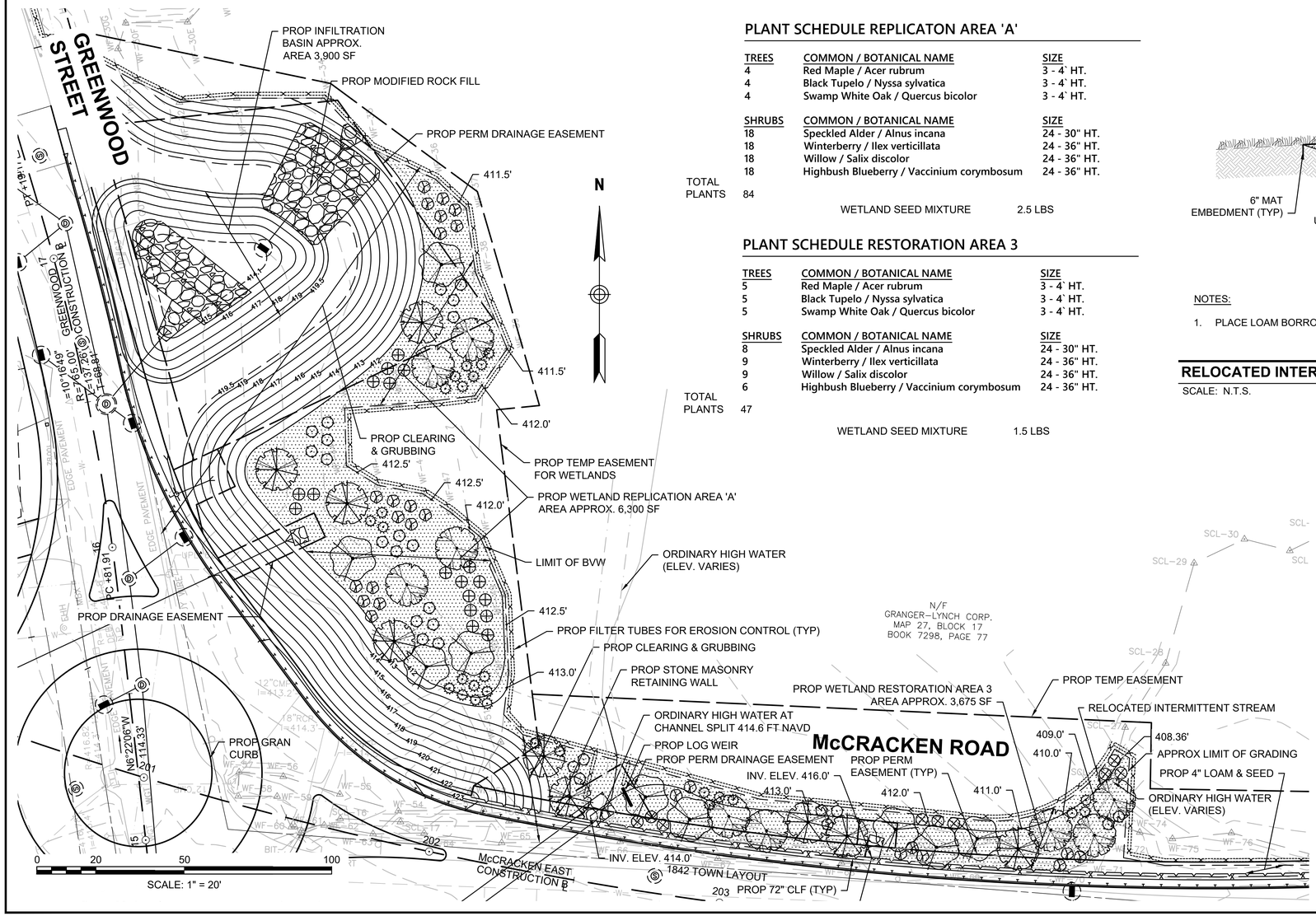
SCALE: N.T.S. SOURCE: VHB DATE: SEPTEMBER 2019

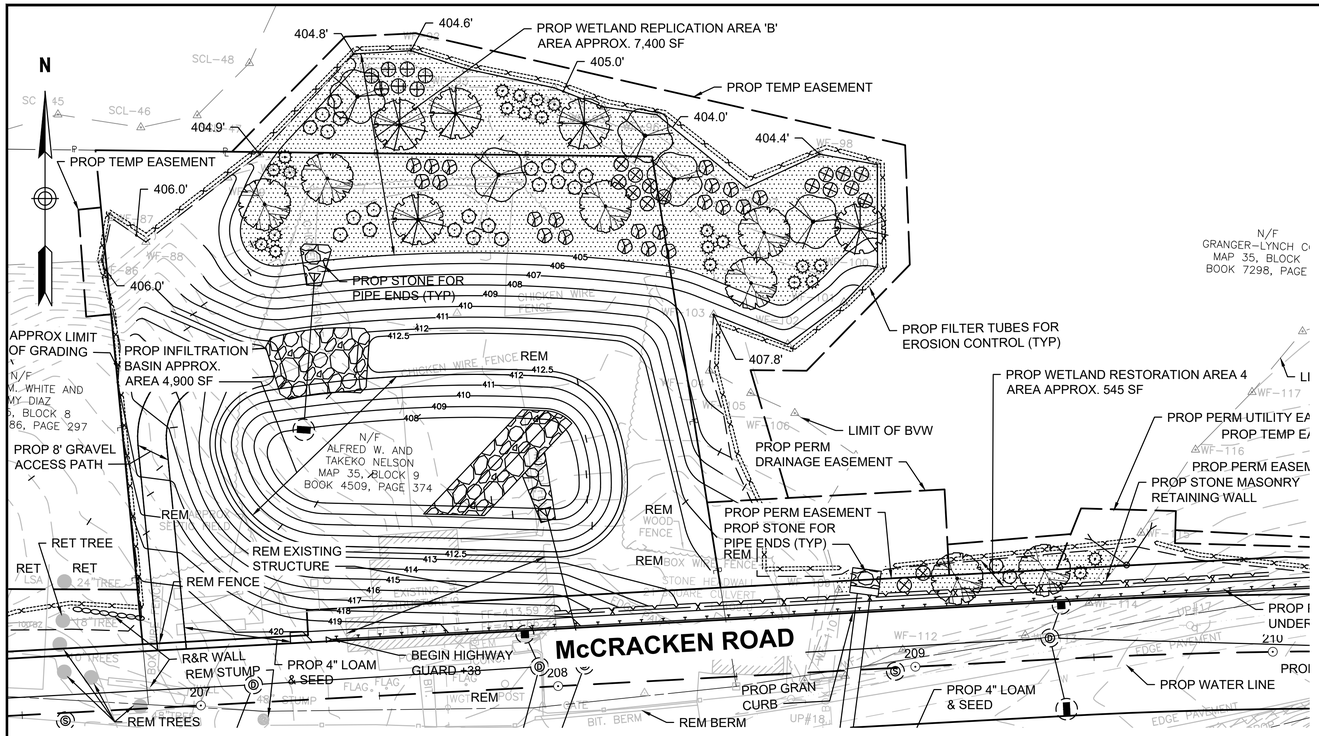




LOG WEIR DETAIL

SCALE: N.T.S.





PLANT SCHEDULE REPLICATION AREA 'B'

	TREES	COMMON / BOTANICAL NAME	SIZE
	5	Red Maple / Acer rubrum	3 - 4` HT.
	5	Black Tupelo / Nyssa sylvatica	3 - 4` HT.
	5	Swamp White Oak / Quercus bicolor	3 - 4` HT.
	SHRUBS	**COMMON / BOTANICAL NAME**	**SIZE**
	21	Speckled Alder / Alnus incana	24 - 30" HT.
	21	Winterberry / Ilex verticillata	24 - 36" HT.
	21	Willow / Salix discolor	24 - 36" HT.
	21	Highbush Blueberry / Vaccinium corymbosum	24 - 36" HT.
TOTAL PLANTS	99		
		WETLAND SEED MIXTURE	3.0 LBS

PLANT SCHEDULE RESTORATION AREA 4

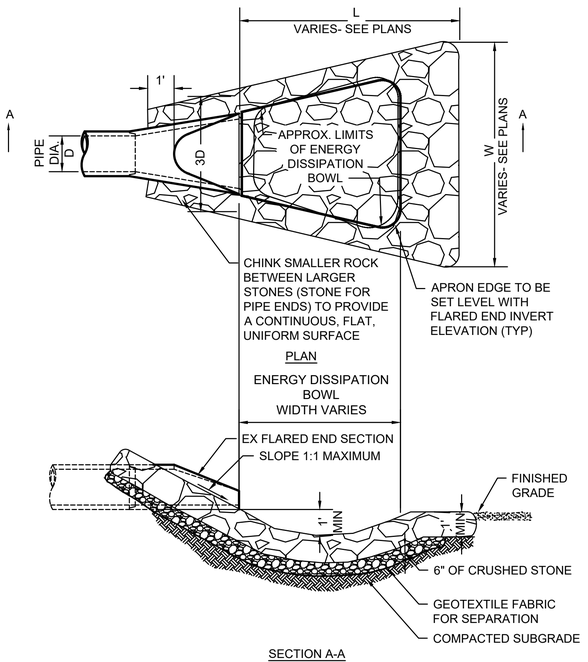
	TREES	COMMON / BOTANICAL NAME	SIZE
	2	Red Maple / Acer rubrum	3 - 4` HT.
	SHRUBS	**COMMON / BOTANICAL NAME**	**SIZE**
	2	Winterberry / Ilex verticillata	24 - 36" HT.
	2	Willow / Salix discolor	24 - 36" HT.
	2	Highbush Blueberry / Vaccinium corymbosum	24 - 36" HT.
TOTAL PLANTS	8		
		WETLAND SEED MIXTURE	4 OZ.

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	74	152
PROJECT FILE NO. 605377			

CONSTRUCTION DETAILS
WETLAND REPLICATION DETAIL

605377_HDI(WETLAND).DWG Plotted on 11-Apr-2022 5:28 PM

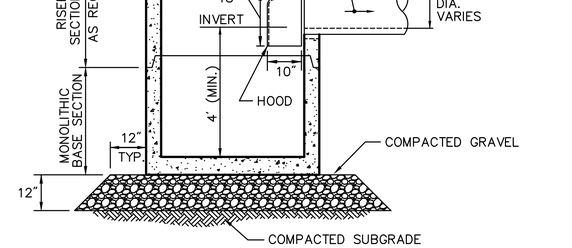


FLARED END SECTION (FES) WITH STONE FOR PIPE ENDS

SCALE: N.T.S. SOURCE: VHB DATE: AUGUST 7 2015

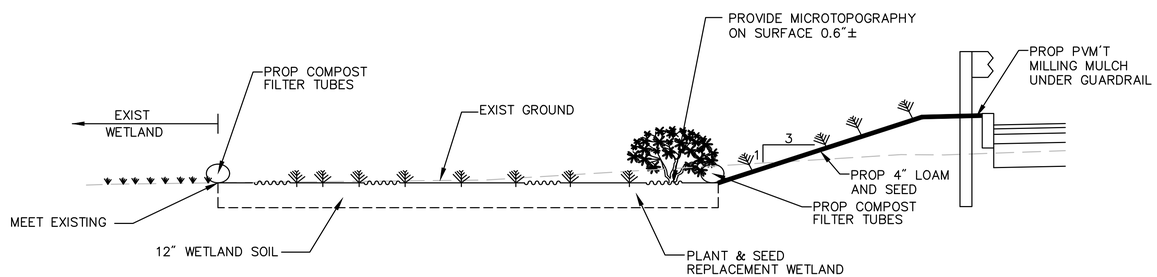
PLANT LEGEND

TREES	COMMON / BOTANICAL NAME	SIZE
	Red Maple / Acer rubrum	3 - 4` HT.
	Black Tupelo / Nyssa sylvatica	3 - 4` HT.
	Swamp White Oak / Quercus bicolor	3 - 4` HT.
SHRUBS	**COMMON / BOTANICAL NAME**	**SIZE**
	Speckled Alder / Alnus incana	24 - 30" HT.
	Winterberry / Ilex verticillata	24 - 36" HT.
	Willow / Salix discolor	24 - 36" HT.
	Highbush Blueberry / Vaccinium corymbosum	24 - 36" HT.



DOUBLE GRATE CATCH BASIN WITH HOOD

SCALE: N.T.S.



TYPICAL SECTION AT WETLAND REPLACEMENT AREA

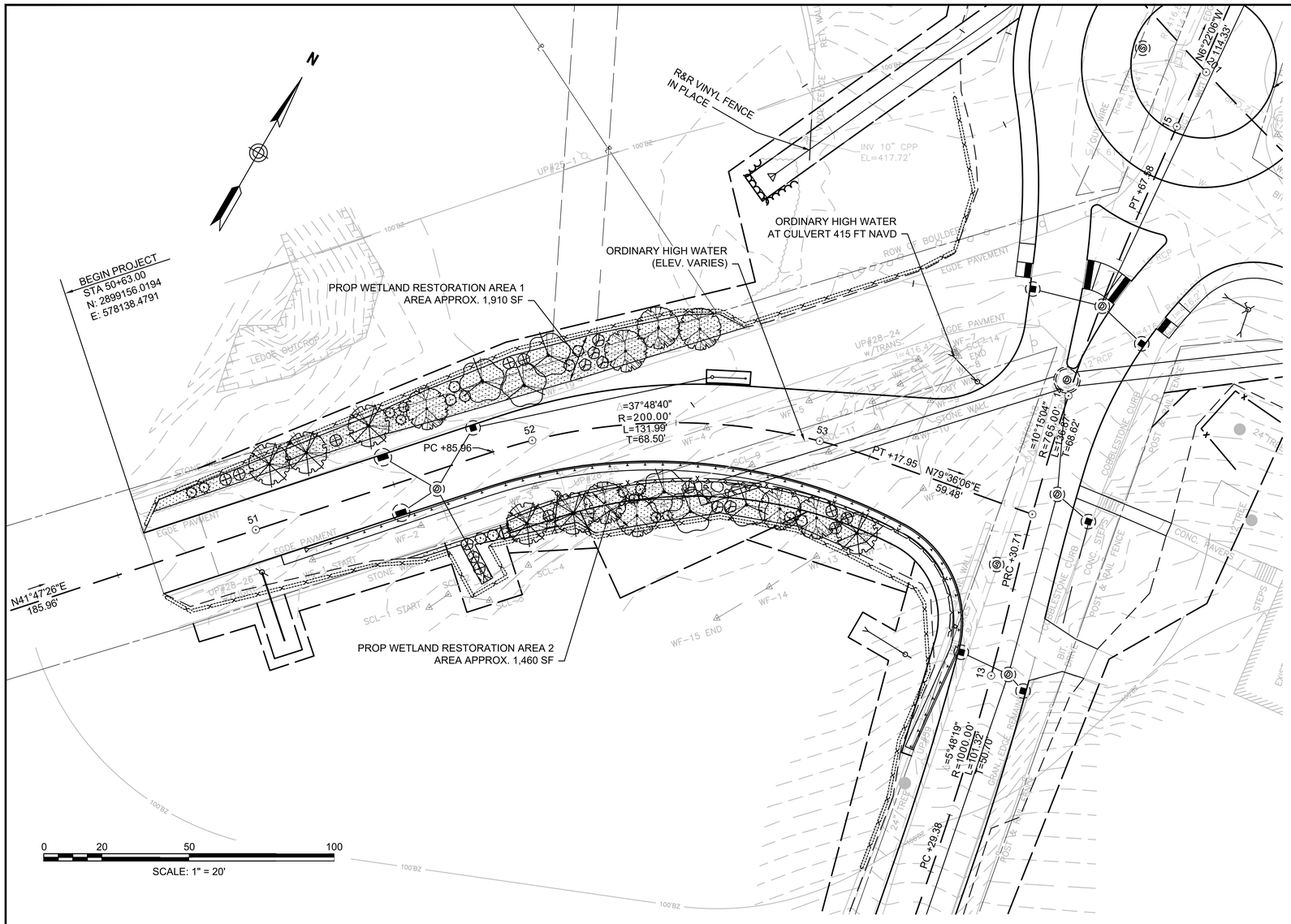
SCALE: N.T.S.

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	75	152
PROJECT FILE NO. 605377			

CONSTRUCTION DETAILS
WETLAND REPLICATION DETAIL

605377_HDI(WETLAND).DWG Plotted on 11-Apr-2022 5:28 PM



PLANT SCHEDULE RESTORATION AREA 1

TREES	COMMON / BOTANICAL NAME	SIZE
4	Red Maple / Acer rubrum	3 - 4` HT.
3	Black Tupelo / Nyssa sylvatica	3 - 4` HT.
3	Swamp White Oak / Quercus bicolor	3 - 4` HT.
SHRUBS	**COMMON / BOTANICAL NAME**	**SIZE**
4	Speckled Alder / Alnus incana	24 - 30" HT.
5	Winterberry / Ilex verticillata	24 - 36" HT.
5	Willow / Salix discolor	24 - 36" HT.
5	Highbush Blueberry / Vaccinium corymbosum	24 - 36" HT.

TOTAL PLANTS 29

WETLAND SEED MIXTURE 12 OZ.

PLANT SCHEDULE RESTORATION AREA 2

TREES	COMMON / BOTANICAL NAME	SIZE
4	Red Maple / Acer rubrum	3 - 4` HT.
3	Black Tupelo / Nyssa sylvatica	3 - 4` HT.
3	Swamp White Oak / Quercus bicolor	3 - 4` HT.
SHRUBS	**COMMON / BOTANICAL NAME**	**SIZE**
5	Speckled Alder / Alnus incana	24 - 30" HT.
5	Winterberry / Ilex verticillata	24 - 36" HT.
5	Willow / Salix discolor	24 - 36" HT.
5	Highbush Blueberry / Vaccinium corymbosum	24 - 36" HT.

TOTAL PLANTS 30

WETLAND SEED MIXTURE 14 OZ.

PLANT LEGEND

TREES	COMMON / BOTANICAL NAME	SIZE
	Red Maple / Acer rubrum	3 - 4` HT.
	Black Tupelo / Nyssa sylvatica	3 - 4` HT.
	Swamp White Oak / Quercus bicolor	3 - 4` HT.
SHRUBS	**COMMON / BOTANICAL NAME**	**SIZE**
	Speckled Alder / Alnus incana	24 - 30" HT.
	Winterberry / Ilex verticillata	24 - 36" HT.
	Willow / Salix discolor	24 - 36" HT.
	Highbush Blueberry / Vaccinium corymbosum	24 - 36" HT.

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	76	152
PROJECT FILE NO. 605377			

INVASIVE SPECIES KEY PLAN

KEY.DWG Plotted on 11-Apr-2022 5:29 PM

LEGEND

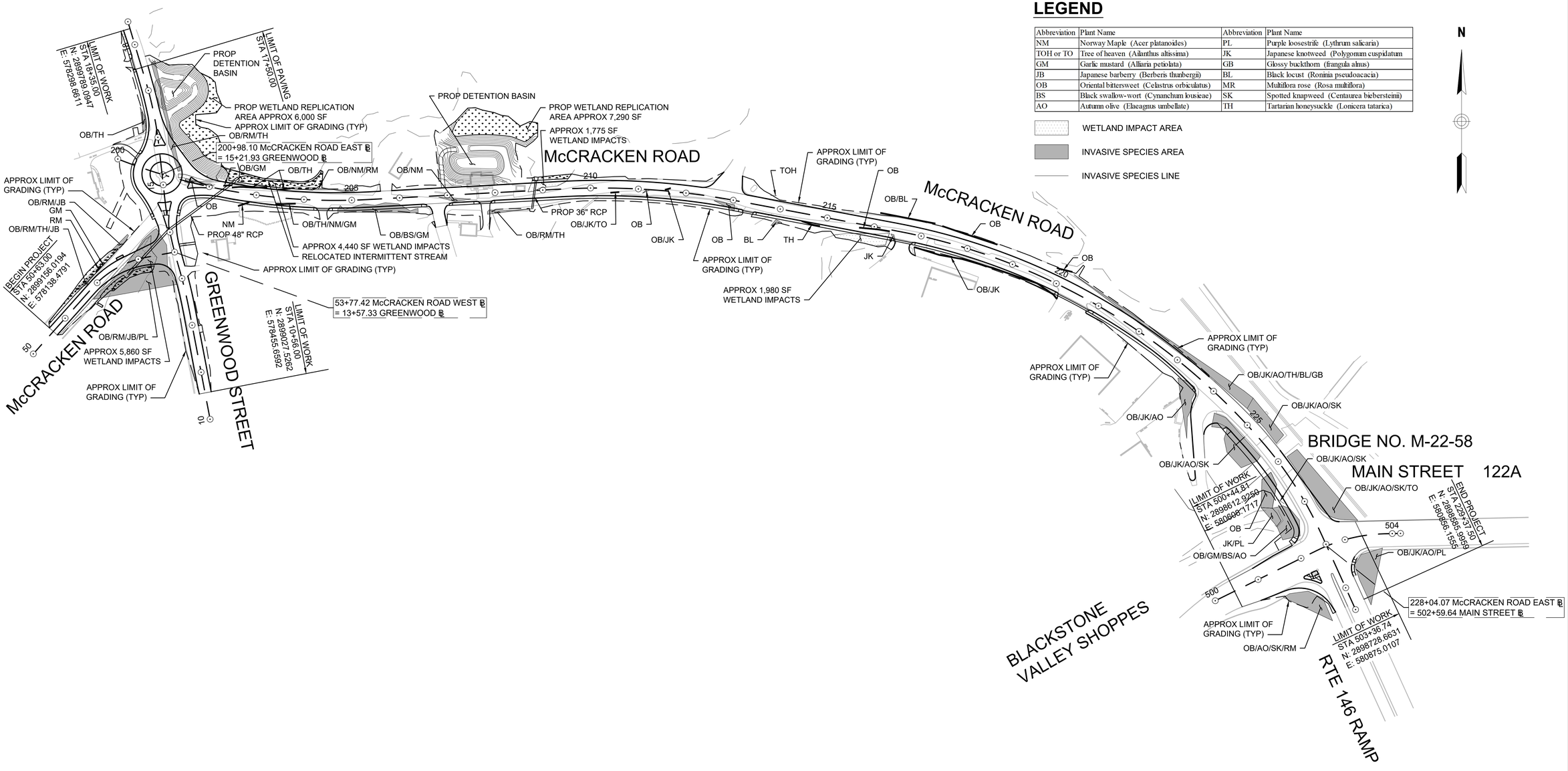
Abbreviation	Plant Name	Abbreviation	Plant Name
NM	Norway Maple (Acer platanoides)	PL	Purple loosestrife (Lythrum salicaria)
TOH or TO	Tree of heaven (Ailanthus altissima)	JK	Japanese knotweed (Polygonum cuspidatum
GM	Garlic mustard (Alliaria petiolata)	GB	Glossy buckthorn (frangula alnus)
JB	Japanese barberry (Berberis thunbergii)	BL	Black locust (Roninia pseudoacacia)
OB	Oriental bittersweet (Celastrus orbiculatus)	MR	Multiflora rose (Rosa multiflora)
BS	Black swallow-wort (Cynanchum lousieae)	SK	Spotted knapweed (Centaurea biebersteinii)
AO	Autumn olive (Elaeagnus umbellate)	TH	Tartarian honeysuckle (Lonicera tatarica)

WETLAND IMPACT AREA

INVASIVE SPECIES AREA

INVASIVE SPECIES LINE

N



0 100 200 300 400

SCALE: 1" = 100'

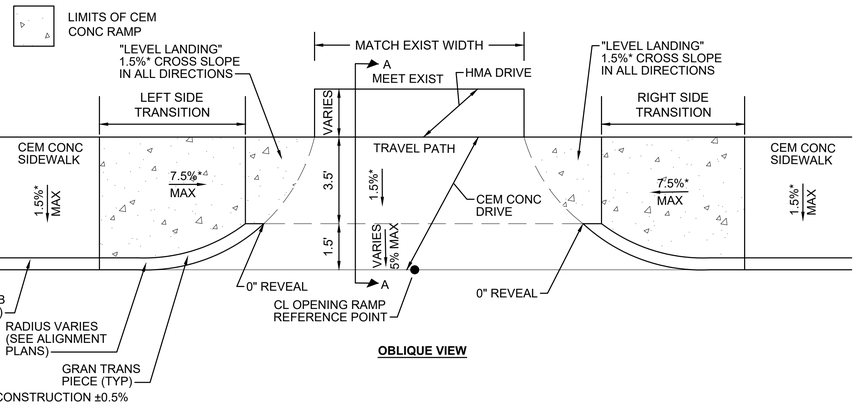
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	77	152
PROJECT FILE NO. 605377			

CONSTRUCTION DETAILS

605377_HD(DET).DWG Plotted on 11-Apr-2022 5:30 PM

LEGEND



OBLIQUE VIEW

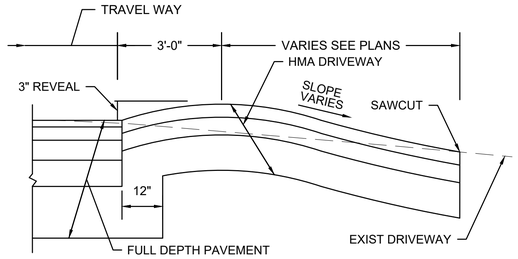
*TOLERANCE FOR CONSTRUCTION ±0.5%

CEMENT CONCRETE WALK AT DRIVE

SCALE: NTS

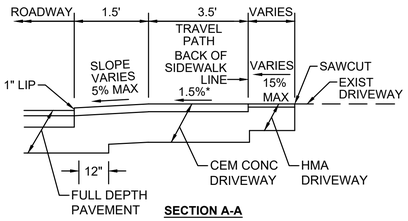
DRIVEWAY WITH SIDEWALK DATA					
NO.	LOCATION (REF POINT)	SIDEWALK WIDTH	ROADWAY GUTTER	LEFT SIDE TRANS	RIGHT SIDE TRANS
D1	15+63.6 44.1' LT	5.5'	-2.95%	11'-0"	6'-6"
D2	17+59.4 12.6' LT	5.5'	1.37%	6'-6"	9'-0"
D3	204+40.0 16.0' RT	5.5'	0.28%	7'-8"	6'-6"
D4	207+78.8 16.0' RT	5.5'	-2.95%	6'-6"	11'-0"
D5	213+34.7 16.0' RT	5.5'	1.62%	6'-6"	9'-0"

NOTE:
1. ROADWAY GUTTER SLOPES ARE IN THE DIRECTION OF THE BASELINE.
2. CURB REVEAL IS 6"

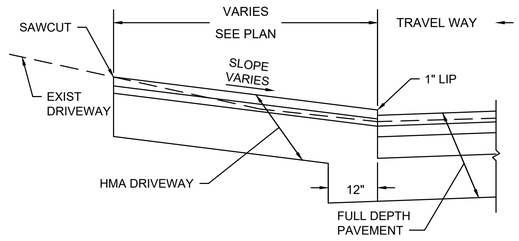


TYPICAL DRIVEWAY SECTION WITHOUT SIDEWALK TYPE 1

SCALE: N.T.S.

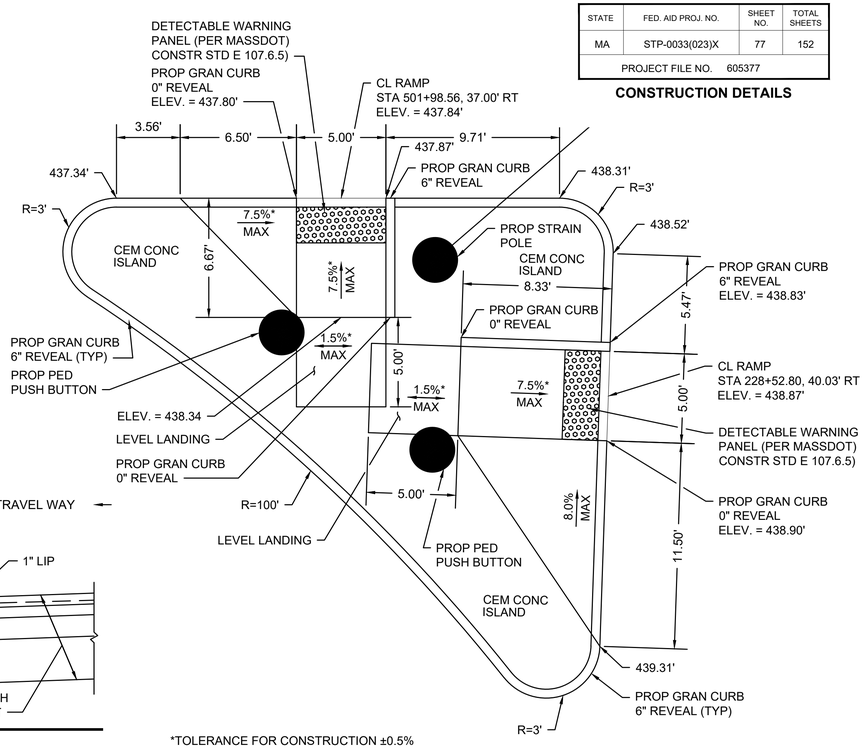


SECTION A-A



TYPICAL DRIVEWAY SECTION WITHOUT SIDEWALK TYPE II

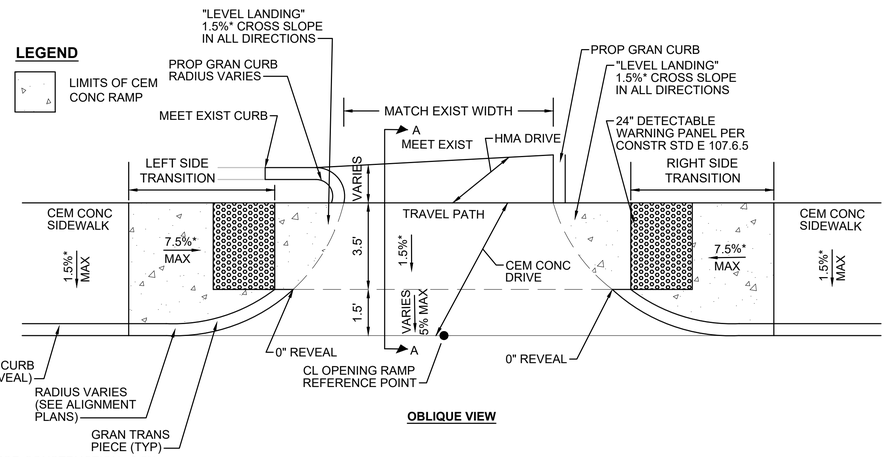
SCALE: N.T.S. DWG: DRIVE-03 DATE: JUNE 2013



*TOLERANCE FOR CONSTRUCTION ±0.5%

REFUGE ISLAND DETAIL

SCALE: N.T.S.

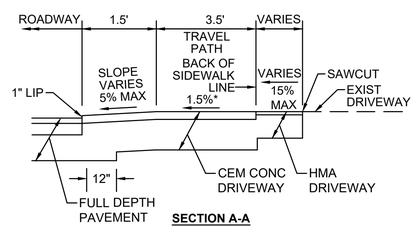


OBLIQUE VIEW

*TOLERANCE FOR CONSTRUCTION ±0.5%

CEMENT CONCRETE DRIVE WITH DETECTABLE WARNING PANELS

SCALE: NTS



SECTION A-A

DRIVEWAY WITH SIDEWALK DATA					
NO.	LOCATION (REF POINT)	SIDEWALK WIDTH	ROADWAY GUTTER	LEFT SIDE TRANS	RIGHT SIDE TRANS
D6	216+69.0 16' RT	5.5'	-0.45%	6'-6"	7'-8"
D7	220+50.8 16' RT	5.5'	2.10%	11'-0"	6'-6"

NOTE:
1. ROADWAY GUTTER SLOPES ARE IN THE DIRECTION OF THE BASELINE.
2. CURB REVEAL IS 6"

DETECTABLE WARNING PANELS

NTS

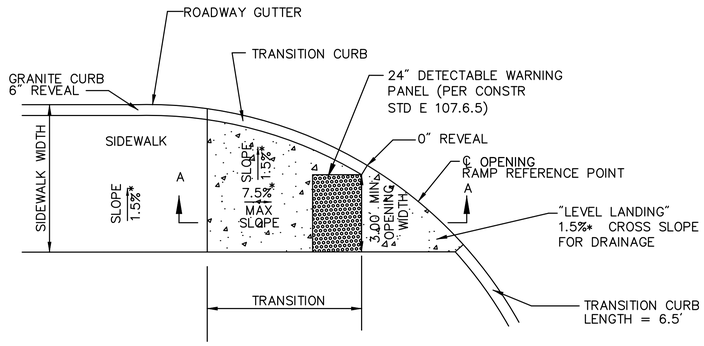
NOTES:

1. DETECTABLE WARNING PANELS ARE REQUIRED TO BE CONSTRUCTED ON ALL PROPOSED WHEELCHAIR RAMPS AND ARE TO BE INSTALLED IN ACCORDANCE WITH MASSDOT OCT 2017 CONSTRUCTION STANDARD E 107.6.5.
2. PANELS MAY BE CONCRETE PRECAST OR CAST IN PLACE OR OTHER SUITABLE MATERIAL PERMANENTLY APPLIED TO THE RAMP. THERE MUST BE A MINIMUM 70% CONTRAST IN LIGHT REFLECTANCE BETWEEN THE DETECTABLE WARNING AND AN ADJOINING SURFACE.
3. NO SEPARATE PAYMENT SHALL BE MADE FOR DETECTABLE WARNING PANELS, BUT ALL COSTS IN CONNECTION THERE WITH SHALL BE INCLUDED WITH ITEM 701.2.

LEGEND

LIMITS OF CEMENT CONCRETE WHEELCHAIR RAMP

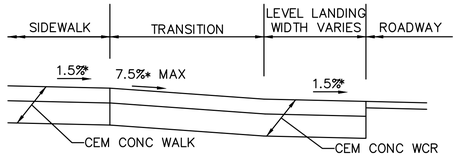
LIMITS OF DETECTABLE WARNING PANEL (SEE SPECIFICATIONS FOR COLOR)



* TOLERANCE FOR CONSTRUCTION ±0.5%

WHEELCHAIR RAMP DATA						
NO.	LOCATION	SIDEWALK WIDTH	ROADWAY GUTTER	REVEAL	TRANSITION	℄ OPENING ELEVATION
3	206+58.74 19.55′ RT	5.5′	−1.19%	6″	9′0″	420.83
4	207+00.76 19.55′ RT	5.5′	−2.12%	6″	6′6″	420.13
9	223+74.06 26.82′ RT	5.5′	3.97%	6″	6′6″	420.76
10	224+62.21 37.72′ RT	10.5′	3.97%	6″	14′0″	424.31

NOTE: ROADWAY GUTTER SLOPES ARE IN DIRECTION OF THE BASELINE



SECTION A–A

* TOLERANCE FOR CONSTRUCTION ±0.5%

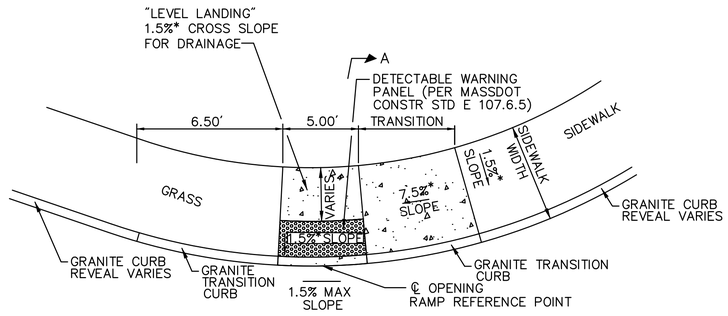
WHEELCHAIR RAMP
SINGLE DIRECTION

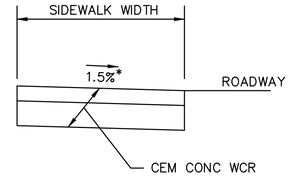
SCALE: NOT TO SCALE
DATE: OCT 2008
DWG: WCR–04

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	78	152
PROJECT FILE NO. 605377			

CONSTRUCTION DETAILS





SECTION A–A

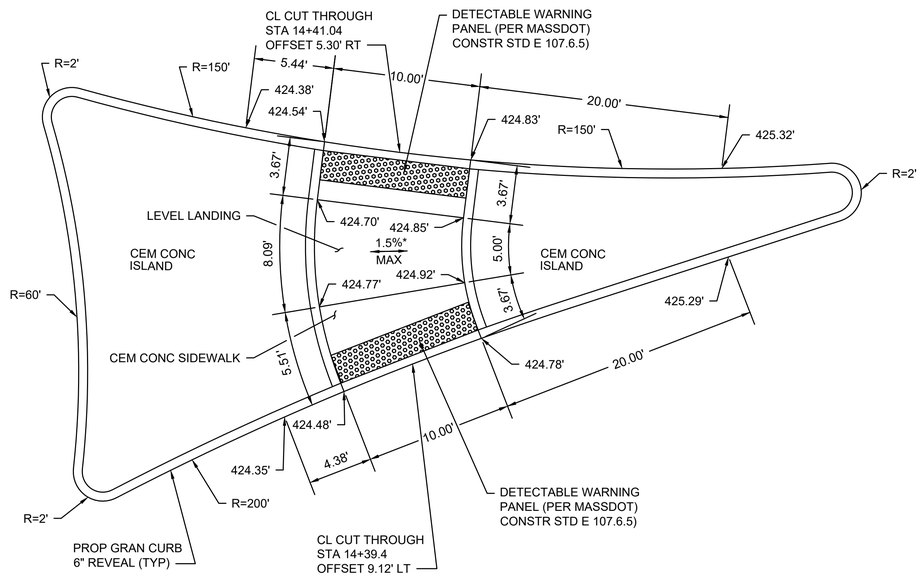
* TOLERANCE FOR CONSTRUCTION ±0.5%

WHEELCHAIR RAMP DATA								
NO.	LOCATION	SIDEWALK WIDTH	ROADWAY GUTTER	LEFT REVEAL	LEFT TRANSITION	RIGHT REVEAL	RIGHT TRANSITION	℄ OPENING ELEVATION
1	14+35.60 26.37′ LT	5.5′	−2.67%	6″	–	6″	6′6″	423.80
2	14+34.88 21.38′ RT	5.5′	−2.73%	6″	6′6″	6″	–	424.53
11	501+98.79 32.72′ LT	5.5′	0.55%	6″	–	6″	7′8″	435.94

NOTE: ROADWAY GUTTER SLOPES ARE IN DIRECTION OF THE BASELINE

WHEELCHAIR RAMP
WIDTH LESS THAN 6.5 FT – CURVED – ONE SIDE TRANSITION

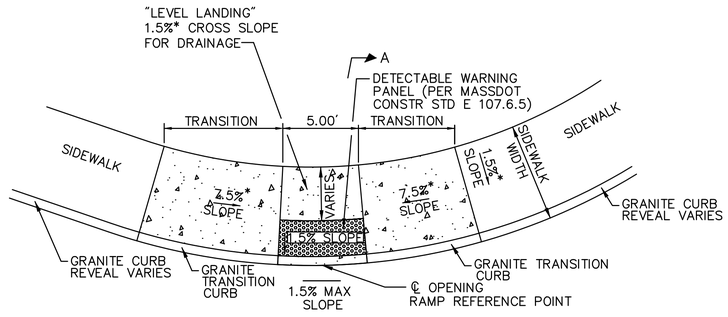
SCALE: NOT TO SCALE
DATE: OCT 2008
DWG: WCR–03

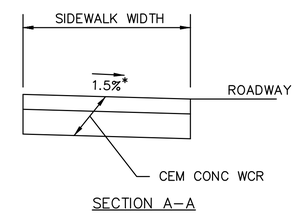


*TOLERANCE FOR CONSTRUCTION ±0.5%

CUT THROUGH DETAIL AT STA. 14+40

SCALE: N.T.S.





SECTION A–A

* TOLERANCE FOR CONSTRUCTION ±0.5%

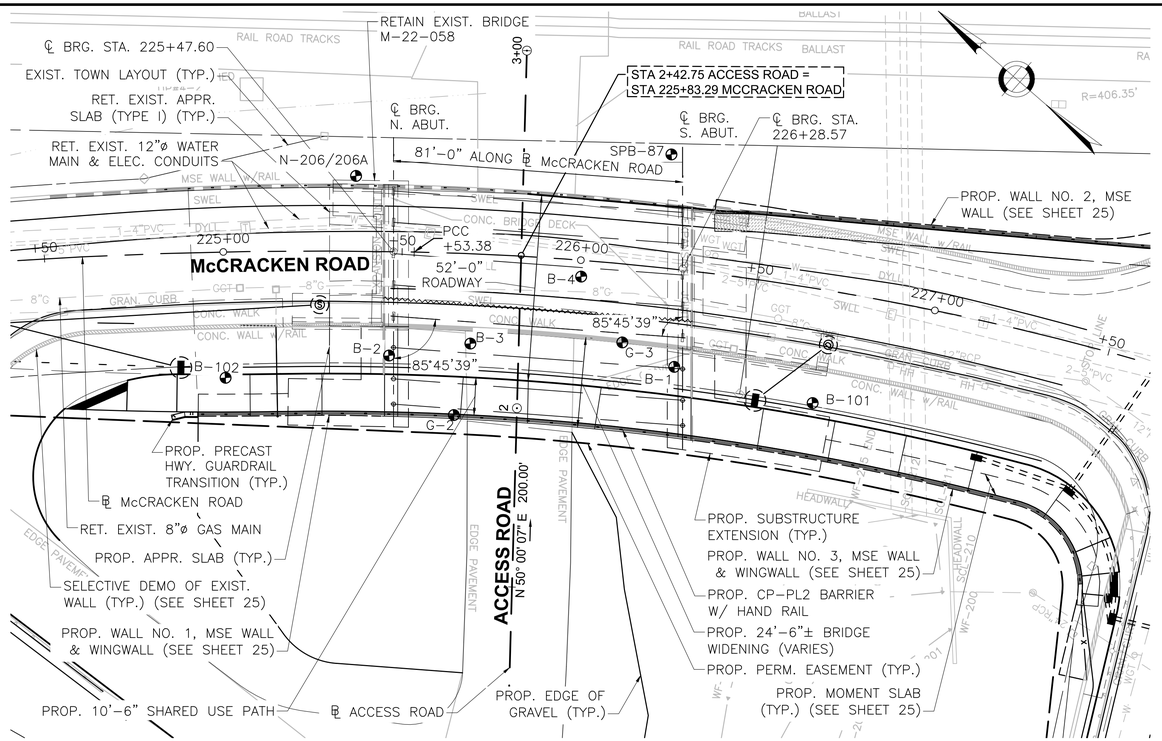
WHEELCHAIR RAMP DATA								
NO.	LOCATION	SIDEWALK WIDTH	ROADWAY GUTTER	LEFT REVEAL	LEFT TRANSITION	RIGHT REVEAL	RIGHT TRANSITION	℄ OPENING ELEVATION
12	228+58.46 33.31′ LT	5.5′	3.02%	6″	6′6″	6″	14′0″	439.65

NOTE: ROADWAY GUTTER SLOPES ARE IN DIRECTION OF THE BASELINE

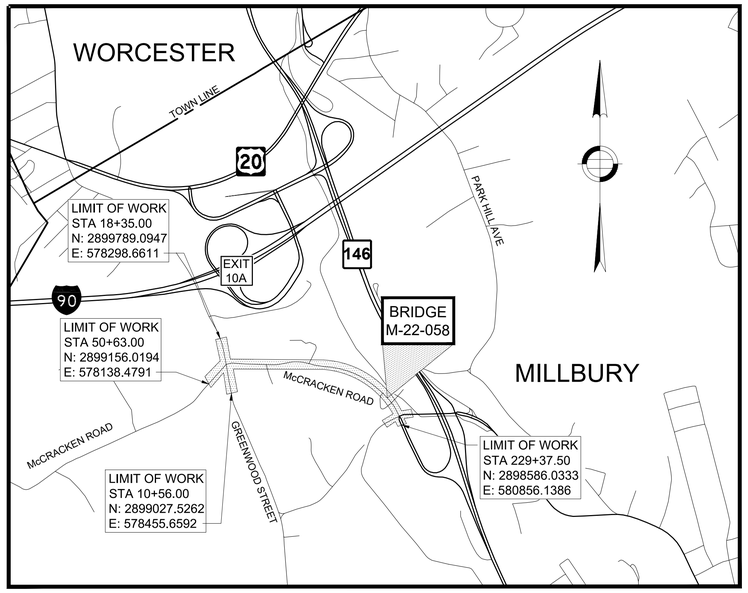
WHEELCHAIR RAMP
WIDTH LESS THAN 6.5 FT – CURVED – TWO SIDE TRANSITION

SCALE: NOT TO SCALE
DATE:
DWG:

605377_HD(DET).DWG Plotted on 11-Apr-2022 5:30 PM



KEY PLAN
SCALE: 1"=20'



LOCUS MAP
SCALE: 1"=1000'

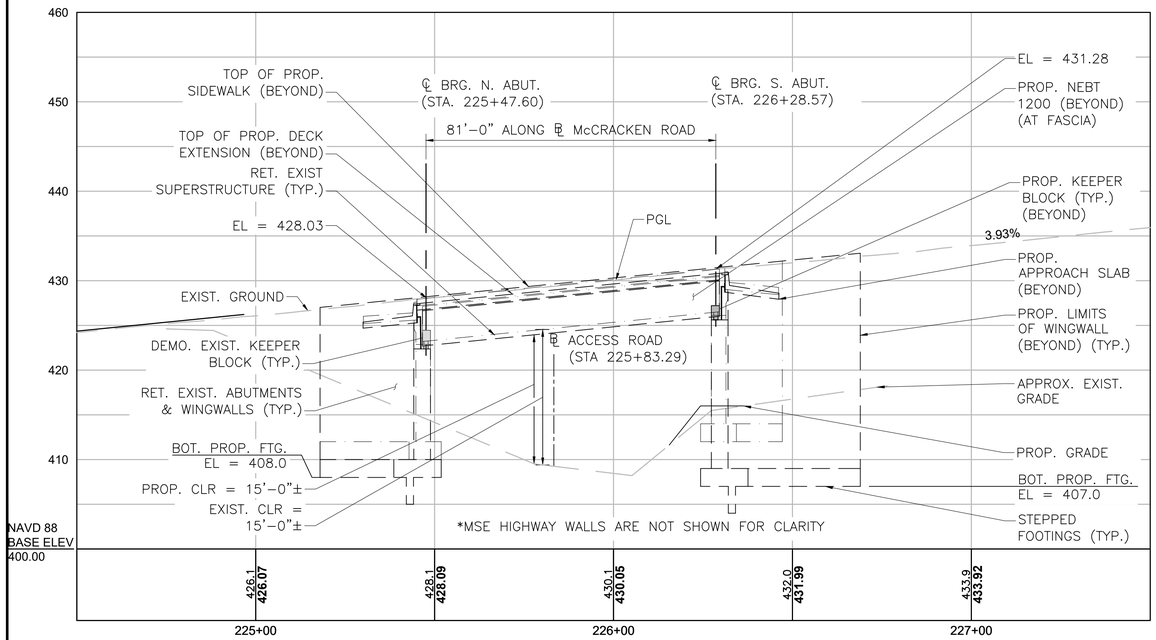
MILLBURY
McCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	79	152
PROJECT FILE NO. 605377			

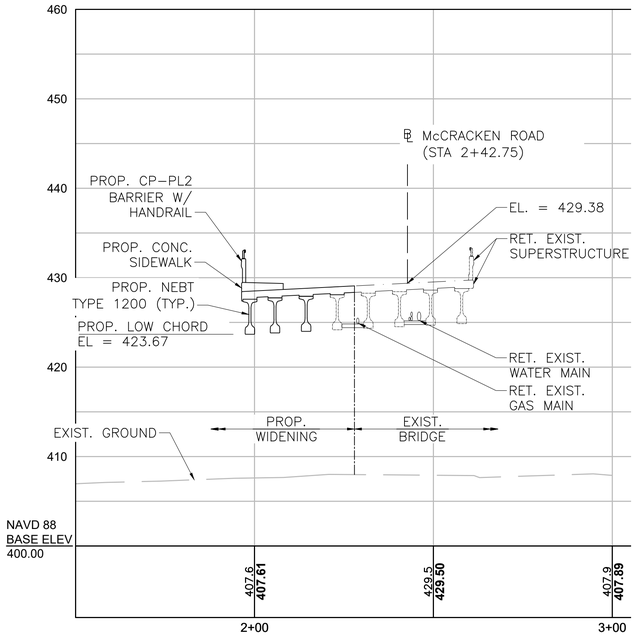
KEY PLAN & PROFILE

SHEET INDEX

SHEET NUMBER & DESCRIPTION



McCRACKEN ROAD PROFILE
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=8'



ACCESS ROAD PROFILE
HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=8'

APRIL 16, 2022	ISSUED FOR CONSTRUCTION

MassDOT Massachusetts Department of Transportation Highway Division

PROPOSED BRIDGE REHABILITATION

MILLBURY

McCRACKEN ROAD
OVER LUMBER YARD ACCESS ROAD

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION
10 PARK PLAZA BOSTON, MASS

TEC The Engineering Corp

TITLE: CHIEF ENGINEER

SHEET 1 OF 29 SHEETS BRIDGE NO. M-22-058 (AJ0)

ISSUED FOR CONSTRUCTION (SF) APRIL 16, 2022

605377_BR1_KEY PLAN & PROFILE.DWG Plotted on 11-Apr-2022 8:52 AM

GENERAL NOTES

DESIGN:
IN ACCORDANCE WITH THE 2002 SPECIFICATIONS OF THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (17TH EDITION) FOR HIGHWAY BRIDGES FOR HS20 LOADING AS APPROVED BY THE STATE BRIDGE ENGINEER.

ALL MSE WALL TO BE DESIGNED BY OTHERS SHALL BE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS (8TH EDITION) FOR HL-93 LOADING.

BENCHMARK:
ALL BENCHMARK ELEVATIONS REFERENCE NAVD88

- RAILROAD SPIKE SET IN U.P. #6; EL = 413.84
- RAILROAD SPIKE SET IN U.P. #18 EL = 414.45
- RAILROAD SPIKE SET IN U.P. #20 EL = 425.06

ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988.

DATE:
TO BE PLACED ON THE INSIDE FACE OF THE NORTHWEST HIGHWAY GUARDRAIL TRANSITION. A SHEET SHOWING SIZE AND CHARACTERS OF NUMERALS WILL BE FURNISHED. THE DATE USED SHALL BE THE LATEST YEAR OF CONTRACT COMPLETION AS OF THE DATE THE FIRST HIGHWAY GUARDRAIL TRANSITION IS CONSTRUCTED.

MASSDOT SURVEY NOTEBOOKS:
SURVEY PREPARED BY VANASSE HANGEN BRUSTLIN, INC OF WATERTOWN, MA, DATED MARCH 2012 (ORIGINAL), AND APRIL 2019 (SUPPLEMENTARY). ELECTRONIC SURVEY FILES ARE AVAILABLE UPON REQUEST FROM MASSDOT.

EXISTING PLANS:
PLANS FOR THE EXISTING BRIDGE ARE AVAILABLE AND MAY BE SEEN AT THE OFFICE OF THE STATE BRIDGE ENGINEER, MASSDOT-HIGHWAY DIVISION, 10 PARK PLAZA, BOSTON, MASSACHUSETS.

SCALES:
SCALES NOTED ON THE PLANS ARE NOT APPLICABLE TO REDUCED SIZE PRINTS. DIVIDE SCALES BY TWO FOR HALF-SIZE PRINTS (A3).

FOUNDATIONS:
FOUNDATIONS MAY BE ALTERED, IF NECESSARY, TO SUIT CONDITIONS ENCOUNTERED DURING CONSTRUCTION, WITH THE APPROVAL OF THE ENGINEER.

UNSUITABLE MATERIAL:
ALL UNSUITABLE MATERIAL SHALL BE REMOVED WITHIN THE LIMITS OF THE FOUNDATIONS OF THE STRUCTURE, AS DIRECTED BY THE ENGINEER.

SEISMIC GROUND SHAKING HAZARD:
SEE GEOTECHNICAL REPORT PREPARED BY LAHLAF GEOTECHNICAL CONSULTING, INC. (LGCI), DATED DECEMBER 8, 2015; REVISED FEBRUARY 12, 2020.

DESIGN RETURN PERIOD: 1000 YEARS

DESIGN SPECTRA:
A_s = 0.101g
S_{DS} = 0.218g
S_{D1} = 0.091g
SITE CLASS = D
SEISMIC DESIGN CATEGORY (SDC) = A

ANCHOR BOLTS:
ALL ANCHOR BOLTS SHALL BE SET BY TEMPLATE BEFORE THE CONCRETE IS PLACED.

REINFORCEMENT:
REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 31 GRADE 60. UNLESS OTHERWISE NOTED ON THE CONSTRUCTION DRAWINGS, ALL BARS SHALL BE LAPPED AS FOLLOWS:

MODIFICATION CONDITION	#4 BARS	#5 BARS
1. NONE	21"	26"
2. 12" OF CONCRETE BELOW BARS	29"	36"
3. COATED BARS, COVER<3db, OR CLEAR SPACING<6db	31"	39"
4. COATED BARS, ALL OTHER CASES	25"	31"
5. CONDITION 2. AND 3.	35"	44"
6. CONDITION 2. AND 4.	34"	43"

IF THE ABOVE BARS ARE SPACED 6" OR MORE ON CENTER, THE LAP LENGTH SHALL BE 80% OF THE LAP LENGTH GIVEN ABOVE. ALL OTHER BARS SHALL BE LAPPED AS SHOWN ON THE CONSTRUCTION DRAWINGS.

PRECAST ELEMENTS:
THE FABRICATOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF LIFT HOOKS FOR ALL PRECAST ELEMENTS. UNDER NO CIRCUMSTANCES WILL THE REBAR ELEMENTS SHOWN ON THE PLANS BE USED TO LIFT THE PRECAST ELEMENTS.

ESTIMATED BRIDGE QUANTITIES (NOT GUARANTEED)		
ITEM DESCRIPTION	QTY.	UNIT
EARTH EXCAVATION	2400	CY
REINFORCED CONCRETE EXCAVATION	110	CY
GRAVEL BORROW	15	CY
GRAVEL BORROW FOR BRIDGE FOUNDATION	50	CY
GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES	860	CY
CONTROLLED DENSITY FILL - NON - EXCAVATABLE	3	CY
CRUSHED STONE FOR BRIDGE FOUNDATIONS	90	TON
SUPERPAVE BRIDGE PROTECTIVE COURSE - 12.5 (SPC-B-12.5)	5	TON
TEMPORARY BARRIER - LIMITED DEFLECTION (TL-3)	100	FT
DRILLING AND GROUTING DOWELS	120	EA
ALTERATION TO BRIDGE STRUCTURE NO. M-22-058 (AJ0)	1	LS
TEMPORARY PROTECTIVE SHIELDING	820	SF
WALL STRUCTURE, WALL NO. 1	1	LS
WALL STRUCTURE, WALL NO. 2	1	LS
WALL STRUCTURE, WALL NO. 3	1	LS

CONSTRUCTION JOINTS:
CONSTRUCTION JOINTS, OTHER THAN THOSE SHOWN ON THE PLANS, WILL NOT BE PERMITTED WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.

UTILITIES:
DURING CONSTRUCTION, THE CONTRACTOR SHALL LOCATE AND PROTECT FROM DAMAGE ALL UTILITIES THAT ARE TO REMAIN.

COATED BARS:
ALL REINFORCEMENT EXCEPT FOR THE APPROACH SLAB SHALL BE COATED.

CONSTRUCTION REQUIREMENTS AND PROCEDURES:
THE CONTRACTOR SHALL TAKE THE PROPER PRECAUTIONS TO INSURE THE STABILITY AND SAFE PERFORMANCE OF ALL STRUCTURAL ELEMENTS DURING DEMOLITION AND CONSTRUCTION.

CONCRETE MIX:

4000 PSI, 1½", 565 CEMENT CONCRETE	ABUTMENTS, WINGWALLS, APPROACH SLABS AND MOMENT SLABS
5000 PSI, ¾", 685 HP CEMENT CONCRETE	SHARED USE PATH, CP-PL2 BARRIER PARAPET AND PRECAST HIGHWAY GUARDRAIL TRANSITIONS
4000 PSI, ¾", 585 HP CEMENT CONCRETE	BRIDGE DECK AND DIAPHRAGMS
4000 PSI, ¾", 610 CEMENT CONCRETE	ABUTMENT BACKWALLS AND KEEPER BLOCKS

MILLBURY
McCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	80	152
PROJECT FILE NO. 605377			

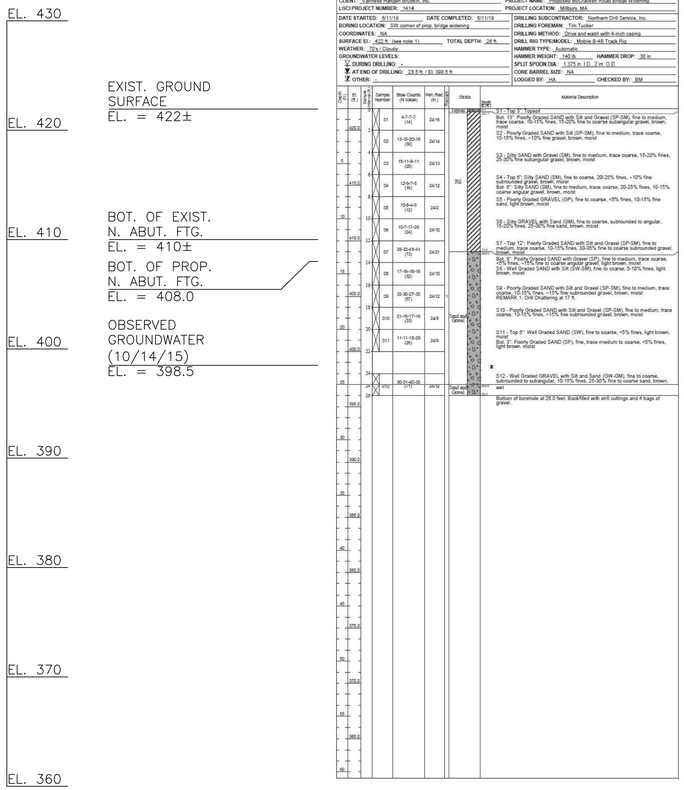
GENERAL NOTES

605377_BR2_GENERAL NOTES.DWG Plotted on 11-Apr-2022 8:52 AM

DATE	DESCRIPTION
APRIL 16, 2022	ISSUED FOR CONSTRUCTION
USE ONLY PRINTS OF LATEST DATE	

ISSUED FOR CONSTRUCTION (SF) APRIL 16, 2022

BORING 102 (B102)

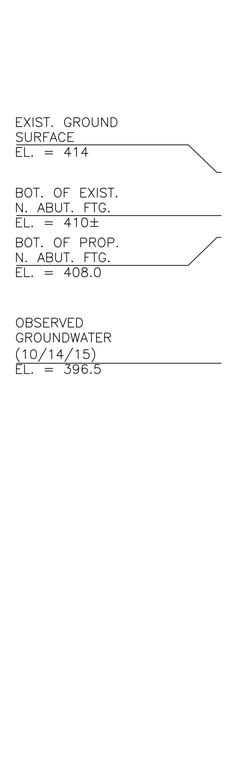


LGCI — BORING LOG — B-102 — PAGE 1 OF 2

CLIENT: Vanasse Hangen Brustlin, Inc. | PROJECT NAME: Proposed McCracken Road Bridge Widening
LGCI PROJECT NUMBER: 1414 | PROJECT LOCATION: Millbury, MA
DATE STARTED: 6/11/19 | DATE COMPLETED: 6/11/19 | DRILLING SUBCONTRACTOR: Northern Drill Service, Inc.
BORING LOCATION: SW corner of prop. bridge widening | DRILLING FOREMAN: Tim Tucker
COORDINATES: NA | DRILLING METHOD: Drive and wash with 4-inch casing
SURFACE EL: 422 ft (see note 1) | TOTAL DEPTH: 28 ft | DRILL RIG TYPE/MODEL: Mobile B-46 Track Rig
WEATHER: 72's / Cloudy | HAMMER TYPE: Automatic
GROUNDWATER LEVELS: | HAMMER WEIGHT: 140 lb | HAMMER DROP: 30 in.
▽ DURING DRILLING: - | SPLIT SPOON DIA.: 1.375 in I.D. 2 in O.D.
▼ AT END OF DRILLING: 23.5 ft / El. 398.5 ft | CORE BARREL SIZE: NA
▽ OTHER: - | LOGGED BY: NA | CHECKED BY: BM

Depth (ft)	Elevation (ft)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Strata	Material Description
0	420.0	S1	9-7-7-7 (14)	24/16	Topsoil	S1 - Top 3": Topsoil Bot. 13": Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, 10-15% fines, 15-20% fine to coarse subangular gravel, brown, moist
2		S2	13-10-20-18 (30)	24/14		S2 - Poorly Graded SAND with Silt (SP-SM), fine to medium, trace coarse, 10-15% fines, <15% fine gravel, brown, moist
4	418.0	S3	18-11-9-11 (20)	24/13		S3 - Silty SAND with Gravel (SM), fine to medium, trace coarse, 15-20% fines, 25-30% fine subangular gravel, brown, moist
6		S4	12-3-7-6 (10)	24/12	FILL	S4 - Top 8": Silty SAND (SM), fine to coarse, 20-25% fines, ~10% fine subrounded gravel, brown, moist Bot. 5': Silty SAND (SM), fine to medium, trace coarse, 20-25% fines, 10-15% fine subrounded gravel, brown, moist
8	414.0	S5	10-8-6-6 (14)	24/2		S5 - Poorly Graded GRAVEL (GP), fine to coarse, <5% fines, 10-15% fine sand, light brown, moist
10		S6	10-7-7-29 (34)	24/10		S6 - Silty GRAVEL with Sand (GM), fine to coarse, subrounded to angular, 15-20% fines, 25-30% fine sand, brown, moist
12	410.0	S7	28-22-8-9-41 (30)	24/21		S7 - Top 12": Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, 10-15% fines, 30-35% fine to coarse subrounded gravel, brown, moist Bot. 6": Poorly Graded SAND with Gravel (SP), fine to medium, trace coarse, 5-10% fines, 10-15% fine to coarse subrounded gravel, brown, moist
14		S8	17-16-16-16 (32)	24/10		S8 - Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, light brown, moist
16	406.0	S9	30-30-27-30 (57)	24/12	Sand and Gravel	S9 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, 10-15% fines, ~15% fine subrounded gravel, brown, moist REMARK 1: Drill Chattering at 15'
18		S10	21-16-17-16 (33)	24/9		S10 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, 10-15% fines, ~15% fine subrounded gravel, brown, moist
20	402.0	S11	11-11-15-26 (26)	24/9		S11 - Top 5': Well Graded SAND (SW), fine to coarse, <5% fines, light brown, moist Bot. 7': Poorly Graded SAND (SP), fine, trace medium to coarse, <5% fines, light brown, moist
22		S12	30-21-43-50 (71)	24/12		S12 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subrounded to subangular, 10-15% fines, 25-30% fine to coarse sand, brown, wet
24	398.0				Sand and Gravel	Bottom of borehole at 28.0 feet. Backfilled with drill cuttings and 4 bags of gravel.
26						
28	394.0					

BORING 2 (B2)



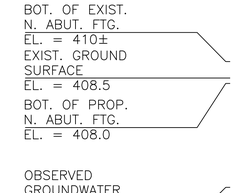
LGCI — BORING LOG — Boring B-2 — Page 1 of 2

Project: Proposed McCracken Road Bridge Widening, Millbury, MA
Client: Vanasse Hangen Brustlin, Inc. | LGCI Project No.: 1414
Drilling Subcontractor: Northern Drill Service, Inc. | Date Started: 10/14/2015
Drilling Foreman: Tim Tucker | Date Completed: 10/14/2015
LGCI Engineer: A.M. Lahlafi | Location: Western side of Northern Abutment
Ground Surface El: ~ 414' (see remarks 1 and 2) | Total Depth: 43 feet
Groundwater Depth: 17.5' (next day - 10/15/15) | Drill Rig Type: B-46 Mobile Drill Rig (ATV)
Drilling Method: 4" casing/drive and wash
Hammer Weight: 140 lbs | Split Spoon Diameter: ID - 1.375", OD - 2"
Hammer Type: Automatic | Rock Core Barrel Size: INX Diamond Core Bit
Drop: 30 inches

Depth Scale (ft)	Sample Depth (ft)	Sample No.	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Strata	Sample Description
	0-2	S1	5	7	9	15	24	9	Fill	S1 - Silty SAND with Gravel (SM), fine to medium, trace coarse, ~20% fines, ~15% fine to coarse gravel, trace of organics, brown, moist (fill)
	2-4	S2	24	43	10	9	24	5	Topsoil	S2 - Poorly Graded GRAVEL with Silt and Sand (GP-GM), fine to coarse, ~10% fines, ~30% fine to medium sand, metal pieces, brown, moist (fill)
5ft			Bottom of Northern Abutment							
	4-6	S3	9	9	8	7	24	11		S3 - Silty SAND (SM), fine to medium, ~25% fines, traces wood, organics, asphalt, brown to dark gray, moist (fill)
	6-8	S4	6	6	5	9	24	5		S4 - Silty SAND with Gravel (SM), mostly medium, ~15% fines, ~10% fine gravel, brown moist (appears to be reworked natural soil)
	8-10	S5	4	10	14	20	24	1		S5 - Stone at tip of sampler, mostly Well Graded GARVEL with SM
10ft	10-12	S6	17	25	15	11	24	6		S6 - Silty SAND with Gravel (SM), fine to coarse, ~15% fines, ~40% fine to coarse gravel, brown
	12-14	S7	16	13	11	11	24	12		S7 - Top 6": Similar to S6 Bot. 6": Well Graded SAND with Silt (SW-SM), fine to medium, ~10% fines, ~10% gravel, brown, moist
15ft	14-16	S8	17	15	16	17	24	0		S8 - No recovery - advanced 6" canplar - Poorly graded GRAVEL with Sand (GP), fine, ~5% fines, ~30% medium to coarse sand, brown, wet
20ft	19-21	S9	13	15	22	25	24	5	Sand and Gravel	S9 - Silty SAND with Gravel (SM), fine to medium, trace coarse, ~15% fines, ~20% fine gravel, metal scraps, brown, wet
	21-23	S10	38	37	34	42	24	12		S10 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, ~20% fines, ~30% fine to medium sand, grayish brown, wet
	24-26	S11	21	21	20	28	24	4		S11 - Well Graded SAND with Silt (SW-SM), fine to medium, 10-15% fines, ~10% fine gravel, dark gray, wet
30 ft	29-31	S12	9	9	11	12	24	13	Sand and Gravel	S12 - Well Graded SAND with Gravel (SW), medium to coarse, trace fine, ~1% fines, ~20% fine gravel, grayish brown, wet
										casing refusal at 33.5' Roller bit advanced to 33'
	33-38	C1					60	60	~41.8' Bedrock	C1 - 5,7,6,8,7 min./ft. - Hard, fresh, fine grained, slightly fractured, dark gray with white banding, GNISS, RQD=100%
35 ft										
40 ft	38-43	C2					60	58		C2 - 5,6,6,6,6 min./ft. - Hard, fresh, fine to medium grained, slightly to closely fractured, dark gray with white banding, GNISS, RQD=80%
45 ft										End of boring at 43 feet. Backfilled borehole with drill cuttings.
50 ft										

Remarks:

BORING 3 (B3)



LGCI — BORING LOG — Boring B-3 — Page 1 of 1

Project: Proposed McCracken Road Bridge Widening, Millbury, MA
Client: Vanasse Hangen Brustlin, Inc. | LGCI Project No.: 1414
Drilling Subcontractor: Northern Drill Service, Inc. | Date Started: 10/15/2015
Drilling Foreman: Tim Tucker | Date Completed: 10/16/2015
LGCI Engineer: A.M. Lahlafi/A. Jefferson | Location: in front of northern abutment
Ground Surface El: ~ 408.5 (see remark 1 and 2) | Total Depth: 22 feet
Groundwater Depth: 10' at the end of drilling | Drill Rig Type: B-46 Mobile Drill Rig (ATV)
Drilling Method: 4" casing/drive and wash
Hammer Weight: 140 lbs | Split Spoon Diameter: ID - 1.375", OD - 2"
Hammer Type: Automatic | Rock Core Barrel Size: INX Diamond Core Bit
Drop: 30 inches

Depth Scale/Depth (ft)	Sample No.	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Strata	Sample Description
0-2	S1	6	10	10	9	24	14	Topsoil	S1 - Top 3": Topsoil Bot. 13": Well Graded SAND with Silt and Gravel (SW-SM), fine to medium, trace coarse, 10-15% fines, ~25% fine to coarse gravel, traces of brick, brown, moist (fill)
2-4	S2	10	13	13	14	24	22	FILL	S2 - Poorly Graded SAND (SP), medium to coarse, trace fine, 10-15% fine gravel, grayish brown, moist (appears to be reworked natural soil)
4-6	S3	9	10	8	8	24	12		S3 - Top 7": Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, ~$\frac{3}{4}$3% fine gravel, 2 very fine roots near top of sample, brown, moist Mid. 5": similar to top 7" - no roots
6-8	S4	12	7	10	8	24	16		Bot. 6": Well Graded SAND with Gravel (SW), fine to medium, trace coarse, ~15% fine gravel, brown, moist
8-11	S5	14	15	17	14	24	11		S4 - Well Graded SAND (SW), fine to medium, trace coarse, brown, moist
									S5 - Well Graded SAND with Silt and Gravel (SW-SM), fine to medium, trace coarse, ~10% fines, 15-20% fine gravel, subrounded to angular, tan to gray, wet
14-16	S6	10	8	8	10	24	9	Sand and Gravel	S6 - Poorly Graded SAND with Silt (SP-SM), medium, trace coarse, 10-15% fines, ~10% fine gravel, subrounded, gray, wet
									4" casing refusal at 16'
									Advanced roller bit to 22'. Drilling wash returned rock chips (gray & white) - possible boulder
22-	S7	25/0"				0	0	16.8'	S7 - No recovery
									Bottom of boring at 22'. Backfilled borehole with drill cuttings.

Remarks:
1. Ground surface elevation interpolated from plan titled: "Millbury, McCracken Road. Construction Plans," sheet 13 of 39; provided to us by VHB on October 26, 2015. Elevations interpolated to the nearest 1/2 foot.
2. Boring performed at elevation about 6 inches higher than roadway.

NOTE: EXISTING GROUND SURFACE ELEVATION IS LOWER THAN BOTTOM OF FOOTING ELEVATIONS DUE TO SLOPED FILL IN FRONT OF ABUTMENTS.

1. LOCATION OF BORINGS SHOWN ON THE PLAN THUS: ◔
2. BORINGS ARE TAKEN FOR THE PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
3. WATER LEVELS SHOWN ON THE BORING LOGS WERE OBSERVED AT THE TIME OF TAKING BORINGS AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.
4. FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS REQUIRED TO DRIVE A 1$\frac{3}{8}$" I.D. SPLIT SPOON SAMPLER 6" USING A 140 POUND WEIGHT FALLING 30".
5. BORING SAMPLES B1, B2, B3, B4, B101 AND B102 ARE STORED AT STORAGE FACILITY LOCATED ON ROUTE 114 (219 WINTHROP AVE.) IN LAWRENCE, MA. THE CONTRACTOR MAY EXAMINE THE SOIL AND ROCK SAMPLES BY CONTACTING THE MASSDOT GEOTECHNICAL SECTION AT 10 PARK PLAZA, BOSTON, MA.
6. BORINGS B1, B2, B3 AND B4 WERE MADE IN OCTOBER 2015. BORINGS B101 AND B102 WERE MADE IN JUNE 2019. BORINGS G–1, G–2 AND G–3 WERE MADE IN DECEMBER 1996. BORING SPB–87 WAS MADE IN JUNE 1995. BORING N–206 WAS MADE IN MARCH 1995. BORING N–206A WAS MADE IN APRIL 1995.
7. BORINGS B1, B2, B3, B4, B101 AND B102 WERE MADE BY NORTHERN DRILL SERVICES INC., 130 EAST MAIN STREET, NORTHBOROUGH, MA, 01532. BORINGS G–1, G–2, G–3 AND SPB–87 WERE MADE BY GUILD DRILLING CO., INC. EAST PROVIDENCE, RI. BORINGS N–206 AND N–206A WERE MADE BY GREEN ENVIRONMENTAL QUINCY, MA.
8. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT. EXISTING BRIDGE PLANS AND BORINGS DRILLED PRIOR TO 2015 (OR IN 1995 AND 1996) REFERENCE THE NATIONAL GEODETIC VERTICAL DATUM (NGVD) OF 1929. THE TWO DATUMS ARE RELATED AS FOLLOWS:

   EL. (NAVD 1988) = EL. (NGVD 1929) – 0.64 FEET

MILLBURY
McCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP–0033(023)X	81	152
PROJECT FILE NO. 605377			

BORING LOGS (1 OF 5)

DATE	DESCRIPTION
APRIL 16, 2022	ISSUED FOR CONSTRUCTION

USE ONLY PRINTS OF LATEST DATE

SHEET 3 OF 29 SHEETS BRIDGE NO. M–22–058 (AJ0)

ISSUED FOR CONSTRUCTION (SF) APRIL 16, 2022

605377_BR3_BORING LOGS.DWG Plotted on 11-Apr-2022 8:52 AM

BORING G-1

EL. 430
EL. 420
EL. 410
EL. 400
EL. 390
EL. 380
EL. 370
EL. 360

EXIST. GROUND SURFACE
EL. 407.0

ELEVATION
(NAVD88)

GUILD DRILLING CO., INC.
100 WATER STREET • EAST PROVIDENCE, R.I.

SHEET 1 OF 1

TO MASSACHUSETTS HIGHWAY DEPART. | ADDRESS South Boston, Mass. | HOLE NO. G-1
PROJECT NAME Route 146 | LOCATION Millbury - Worcester, Mass. | PROJ. NO. 93159
REPORT SENT TO above | OUR JOB NO. 97-167 (Scale 1" = 6.0') | SURF. ELEV. 407.64

GROUND WATER OBSERVATIONS
At 1.0 after ____ Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	NW	S/S	NV-II
Size I.D.	3"	1-3/8"	
Hammer Wt.	300#	140#	BIT
Hammer Fall	24"	30"	Dia.

DATE
Start 12/9/96 - 7:00 AM
Complete 12/10/96 - 3:00 PM
Boring Foreman K. Allen
Inspector/Engr. E. Olson

LOCATION OF BORING N 438,367.00 - E 524,291.99 | Total Time: 14.5 Hours

Depth	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev./ Depth	SOIL OR ROCK IDENTIFICATION Remarks include color, gradation, type of soil etc. Rock-color, type, condition, hardness, drilling time, seams, etc.	SAMPLE No.	Pen*	Rec.*
		0.0-1.5	D	2	1	4			Moist loose, Brown FINE to COARSE SAND, some fine gravel, trace inorganic silt	1		
								4.0				
5		4.5-6.0	D	9	11	9			Wet medium dense, Brown FINE SAND	2		
10		10.0-11.5	D	7	8	8				3		
15		15.0-16.5	D	8	7	12				4		
								19.0				
20		20.0-21.5	D	7	6	5			Wet medium dense, Brown FINE SAND, some fine to coarse gravel, trace inorganic silt	5		
								24.0				
25		25.0-26.5	D	7	9	10			Wet medium dense, Brown FINE to COARSE SAND, some fine to coarse gravel, trace inorganic silt	6		
30		30.0-31.5	D	11	22	28	Min/Ft		* becomes dense	7		
		32.5-37.5	C				6	32.0	(Top of Bedrock)	C1		
35							7		Gray GRANITE SCHIST			
							6		48" Recovery - 80%			
		37.5-42.5	C				7					
							6		52" Recovery - 86.7%	C2		
							5					
							4					
							3					
							5	42.5	Bottom of Boring 42.5'			

*BORING G-1 IS NOT LOCATED IN THE KEY PLAN VIEW. SEE EXISTING BRIDGE PLANS FOR BORING LOCATION.

BORING G-2

EXIST. GROUND SURFACE
EL. 413.96

BOT. OF EXIST.
N. ABUT. FTG.
EL. 409.37±

BOT. OF PROP.
N. ABUT. FTG.
EL. 407.37

GUILD DRILLING CO., INC.
100 WATER STREET • EAST PROVIDENCE, R.I.

SHEET 1 OF 1

TO MASSACHUSETTS HIGHWAY DEPART. | ADDRESS South Boston, Mass. | HOLE NO. G-2
PROJECT NAME Route 146 | LOCATION Millbury - Worcester, Mass. | PROJ. NO. 93159
REPORT SENT TO above | OUR JOB NO. 97-167 (Scale 1" = 6.0') | SURF. ELEV. 414.59

GROUND WATER OBSERVATIONS
At ____ after ____ Hours
Hole Caved In
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	NW	S/S	NV-II
Size I.D.	3"	1-3/8"	
Hammer Wt.	300#	140#	BIT
Hammer Fall	24"	30"	Dia.

DATE
Start 11/25/96 - 10:15 AM
Complete 11/26/96 - 10:20 AM
Boring Foreman P. Brescia
Inspector/Engr. J. Murphy

LOCATION OF BORING N 438,224.95 - E 524,344.00 | Total Time: 8 Hours

Depth	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev./ Depth	SOIL OR ROCK IDENTIFICATION Remarks include color, gradation, type of soil etc. Rock-color, type, condition, hardness, drilling time, seams, etc.	SAMPLE No.	Pen*	Rec.*
		0.0-1.5	D	2	2	6			Moist loose, 1" Topsoil & Roots - Brown FINE to COARSE SAND and medium Gravel	1		
								4.0				
5		4.0-5.5	D	21	18	17			Dry dense, Brown COARSE to FINE SAND and fine to medium Gravel	2		
10		9.0-10.5	D	16	17	15				3		
15		14.0-15.5	D	14	20	25			Wet dense, Brown COARSE to FINE SAND and fine to medium Gravel, some coarse gravel, trace inorganic silt	4		
20		19.0-20.5	D	23	28	20				5		
25		24.0-25.5	D	15	23	29			* becomes very dense	6		
30		29.0-34.0	C				Min/Ft 5	28.8	(Refusal at 28.8' - Button Bit to 29')	C1		
							5.5		Gray GRANITE - Fractured			
							5		60" Recovery - 100%			
35		34.0-39.0	C				5			C2		
							5.5		47" Recovery - 78.3%			
							5					
							4.5					
							5					
							5	39.0	Bottom of Boring 39'			

GROUND SURFACE TO 29' USED NW CASING: THEN Cored

*GROUNDWATER DEPTH WAS NOT MEASURED FOR BORING G-2.

*SEE SHEET 3 FOR BORING LOG NOTES.

APRIL 16, 2022	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

BORING N–206

EL. 430
EL. 420
EL. 410
EL. 400
EL. 390
EL. 380
EL. 370
EL. 360
ELEVATION (NAVD88)

EXIST. GROUND SURFACE EL. 411.37±
BOT. OF EXIST. N. ABUT. FTG. EL. 409.37±
BOT. OF PROP. N. ABUT. FTG. EL. 407.37

GREEN ENVIRONMENTAL

BORING REPORT

216 Riccuti Drive
Quincy, Massachusetts 02169
Tel.: (617) 479-0550

JOB LOCATION: Worcester - Millbury
Route 146 / MA Turnpike Interchange
W3

JOB NO. : 2985
START DATE: MARCH 29, 1995
END DATE: MARCH 29, 1995
BORING NO: N-206
LINE AND STATION:
OFFSET:
GROUND ELEVATION:

MASSACHUSETTS HIGHWAY DEPARTMENT
CONTRACT NO. 95308

Scale 1"=5'

DEPTH FEET	Sample No.	Depth	BLOWS PER 6 IN. ON SAMPLER 0"-6"	6"-12"	12"-18"	18"-24"	MIN PER FOOT	STRATA CHANGE	FIELD IDENTIFICATION OF SOIL / ROCK	CASING BLOWS
	1	0-1'5"	6	7	6				Dry, mecium dense, brown, FINE TO COARSE SAND, some gravel, trace roots.	
								5'		
5	2	5'-6'6"	16	19	16				Dry, dense, brown, FINE TO COARSE SAND, trace gravel.	
								10'		
10	3	10'-11'6"	6	9	9				Wet, medium dense, brown, FINE SAND, trace coarse sand.	
								14'		
									*BOTTOM OF BORING: 14'	

WATER LEVEL: 6'
MONITORING WELL INSTALLED: No
DRILLING RIG TYPE: Skid
BORING STARTED: 11:00A.M.
BORING COMPLETED: 2:30 P.M.
TOTAL HOURS: 3.5
DRILLER: John Halsburda
HELPER: N/A
INSPECTOR: Kevin O'Malley

SAMPLER TYPE: SS
SAMPLER WEIGHT OF HAMMER: 140 lb
SAMPLER HAMMER FALL: 30"
SAMPLER ID: 1 3/8"
INSIDE LENGTH OF SAMPLER: 18"
DIAMOND BIT SIZE: N/A
CASING ID: 3"
WEIGHT OF HAMMER: 300 lb
HAMMER FALL: 24"

NOTES/CHANGED LOCATION: Number of samples: 3 Rock Cored: 0

*Hit water line at 14', hole relocated. Water line not marked.
See log for N-206A.

*GROUNDWATER DEPTH WAS NOT MEASURED FOR BORING N–206.

BORING N–206A

EXIST. GROUND SURFACE EL. 411.37±
BOT. OF EXIST. N. ABUT. FTG. EL. 409.37±
BOT. OF PROP. N. ABUT. FTG. EL. 407.37

GREEN ENVIRONMENTAL

BORING REPORT

216 Riccuti Drive
Quincy, Massachusetts 02169
Tel.: (617) 479-0550

JOB LOCATION: Worcester - Millbury
Route 146 / MA Turnpike Interchange
W3

JOB NO. : 2985
START DATE: APRIL 10, 1995
END DATE: APRIL 10, 1995
BORING NO: N-206A
LINE AND STATION:
OFFSET:
GROUND ELEVATION:

MASSACHUSETTS HIGHWAY DEPARTMENT
CONTRACT NO. 95308

Scale 1"=5'

DEPTH FEET	Sample No.	Depth	BLOWS PER 6 IN. ON SAMPLER 0"-6"	6"-12"	12"-18"	18"-24"	MIN PER FOOT	STRATA CHANGE	FIELD IDENTIFICATION OF SOIL / ROCK	CASING BLOWS
									No samples obtained from 0'-14', see hole # N-206.	
5										
10										
								14'		
	1	14'-15'	9	7				15'	Wet, medium dense, brown, COARSE TO FINE SAND.	
15	1A	15'-15'6"	8						Wet, medium dense, brown, FINE SAND.	
								19'		
	2	19'-20'6"	15	13	10				Wet, medium dense, brown, COARSE TO FINE SAND, trace gravel.	
20								20'6"	BOTTOM OF BORING: 20'6"	

WATER LEVEL:
MONITORING WELL INSTALLED: No
DRILLING RIG TYPE: AO II
BORING STARTED: 7:30 A.M.
BORING COMPLETED: 11:00 A.M.
TOTAL HOURS: 3.5
DRILLER: John Halsburda
HELPER: N/A
INSPECTOR: Kevin O'Malley

SAMPLER TYPE: SS
SAMPLER WEIGHT OF HAMMER: 140 lb
SAMPLER HAMMER FALL: 30"
SAMPLER ID: 1 3/8"
INSIDE LENGTH OF SAMPLER:
DIAMOND BIT SIZE:
CASING ID: 4"
WEIGHT OF HAMMER: 300 lb
HAMMER FALL: 24"

NOTES/CHANGED LOCATION: Number of samples: 2 Rock Cored: 0

*SEE SHEET 3 FOR BORING LOG NOTES.

*GROUNDWATER DEPTH WAS NOT MEASURED FOR BORING N–206A.

APRIL 16, 2022	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

EL. 430
EL. 420
EL. 410
EL. 400
EL. 390
EL. 380
EL. 370
EL. 360
ELEVATION (NAVD88)

BORING 4 (B4)

BOT. OF EXIST. S. ABUT. FTG. EL. = 412±
EXIST. GROUND SURFACE EL. = 408
BOT. OF PROP. S. ABUT. FTG. EL. = 407.0
OBSERVED GROUNDWATER (10/16/15) EL. = 397

LGCI — Lahlaf Geotechnical Consulting, Inc.

BORING LOG — Boring B-4, Page 1 of 2

Project: **Proposed McCraken Road Bridge Widening, Millbury, MA**
Client: **Vanasse Hangen Brustlin, Inc.** — LGCI Project No.: 1414

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	10/16/2015
Drilling Foreman:	Tim Tucker	Date Completed:	10/16/2015
LGCI Engineer:	Andrew Jefferson	Location:	in front of southern abutment
Ground Surface El:	~ 408' (see remark 1)	Total Depth:	28 feet
Groundwater Depth:	11' at the end of drilling	Drill Rig Type:	B-48 Mobile Drill Rig (ATV)
		Drilling Method:	4" casing/drive and wash
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	INX Diamond Core Bit
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows 0-6	Blows 6-12	Blows 12-18	Blows 18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	9	8	6	6	24	12		Fill	S1 - Poorly Graded SAND (SP), fine to medium, trace coarse, ~10% fine gravel, subrounded, light brown, moist
	2-4	S2	12	9	13	18	24	14		~4'	S2 - Similar to S1, ~5% fine gravel, trace coarse, ~5% fines
5ft	4-6	S3	6	6	7	10	24	12		Sand and Gravel	S3 - Poorly Graded SAND (SP), fine to medium, ~5% fines, light brown, moist
	6-8	S4	12	8	9	14	24	19			S4 - Similar to S3
10ft	9-11	S5	11	15	10	23	24	7			S5 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine trace coarse, ~10% fines, ~15% fine to medium sand, grayish brown, wet
15ft	14-16	S6	5	4	12	18	24	13			S6 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine, trace coarse, 10-15% fines, 30-35% medium to coarse sand, trace fine, grayish brown, wet
20ft	19-21	S7	19	32	23	17	24	9			S7 - Silty GRAVEL (GM), fine to coarse, 15-20% fines, 10-15% medium to coarse sand, olive gray, wet
	24-25.5	S8	15	16	17	25/0"	18	10			S8 - Poorly Graded SAND with Gravel (SP), fine, trace medium, 0-5% fines, 30-35% fine to coarse gravel, angular, tan, wet
										Sand	
									2	Bedrock	Advanced roller bit to 28'
											Bottom of boring at 28'. Backfilled borehole with drill cuttings.
30 ft											
35 ft											
40 ft											
45 ft											
50 ft											

Remarks:
2 - Drilling wash returned rock chips (gray & white).

NOTE: EXISTING GROUND SURFACE ELEVATION IS LOWER THAN BOTTOM OF FOOTING ELEVATIONS DUE TO SLOPED FILL IN FROM OF ABUTMENTS.

BORING 1 (B1)

EXIST. GROUND SURFACE EL. = 414
BOT. OF EXIST. S. ABUT. FTG. EL. = 412±
BOT. OF PROP. S. ABUT. FTG. EL. = 407.0

LGCI — Lahlaf Geotechnical Consulting, Inc.

BORING LOG — Boring B-1, Page 1 of 2

Project: **Proposed McCraken Road Bridge Widening, Millbury, MA**
Client: **Vanasse Hangen Brustlin, Inc.** — LGCI Project No.: 1414

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	10/15/2015
Drilling Foreman:	Tim Tucker	Date Completed:	10/15/2015
LGCI Engineer:	A.M. Lahlaf	Location:	Western of southern abutment
Ground Surface El:	~ 414' (see remark 1)	Total Depth:	44 feet
Groundwater Depth:	Not measured	Drill Rig Type:	B-48 Mobile Drill Rig (ATV)
		Drilling Method:	4" casing/drive and wash
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	INX Diamond Core Bit
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows 0-6	Blows 6-12	Blows 12-18	Blows 18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0-2	S1	1	1	3	2	24	8		Topsoil / Fill	S1 - Top 6": Topsoil. Bot. 2": Well Graded SAND with Silt and Gravel (SW-SM), fine to medium, trace coarse, ~10% fines, ~15% fine gravel, olive gray, moist (fill)
		Bottom of Southern Abutment									
	2-4	S2	3	5	10	11	24	13		~4.0'	S2 - Well Graded SAND with Silt and Gravel (SW-SM), fine to medium, trace coarse, ~10% fines, 15-20% fine gravel, olive gray, moist (fill)
5ft	4-6	S3	10	12	15	18	24	15		Buried Topsoil	S3 - Top 9": Silty SAND (SM), fine to medium, ~30% organic fines, traces of roots, dark brown to gray, moist (buried topsoil). Bot. 6": Well Graded SAND with Silt and Gravel (SW-SM), medium to coarse, trace fine, 5-10% fines, ~30% fine to coarse gravel, brown, wet
	6-8	S4	28	18	21	23	24	14		Sand and Gravel	S4 - Well Graded SAND with Silt and Gravel (SW-SM), medium to coarse, trace fine, 5-10% fines, ~40% fine to coarse gravel, brown, wet
	8-10	S5	16	18	14	14	24	12			S5 - Similar to S4, ~ 30% fine to coarse gravel
10ft	10-12	S6	12	10	16	25	24	16			S6 - Similar to S4, 25-30% fine to coarse gravel
	12-14	S7	23	26	18	18	24	18			S7 - Top 12": Similar to S4. Bot. 6": Well Graded SAND with Silt and Gravel (SW-SM), fine to medium, trace coarse, ~10% fines, 25-30% fine to coarse gravel, tan to brown, wet
15ft	14-16	S8	7	7	9	10	24	9			S8 - Poorly Graded SAND with Silt (SP), fine, trace medium, tan to brown, wet
	16-18	S9	18	29	27	41	24	17			S9 - Silty SAND with Gravel (SM), fine to medium, trace coarse, ~15% fines, 15-20% fine gravel, brown, wet
20ft	19-21	S10	12	14	57	27	24	9			S10 - Well Graded GRAVEL with Silt and Sand (GW-GM), fine to coarse, subrounded to angular, 5-10% fines, ~40% fine to coarse sand, dark gray to brown, wet
	24-24.4	S11	100/5"				5	0			S11 - No recovery
30 ft	29-31	S12	18	16	17	15	24	12		Sand and Gravel	S12 - Well Graded SAND with Silt and Gravel (SW-SM), medium to coarse, trace fine, ~10% fines, ~40% fine to coarse gravel, dark gray to brown, wet
										~33'	Casing refusal at 33'
35 ft	34-39	C1					60	60		Bedrock	Advanced roller bit to 34' and switched to 3" casing to core. C1 - 10,5,5,8,8 ft./min. - Hard, fresh to slightly weathered, closely to moderately fractured, fine to medium grained, dark gray with white banding, GNEISS with 45 degree moderately to widely spaced joints, RQD=72%
40 ft	39-44	C2					60	54			C2 - 6,6,5,5,7 ft./min. - Hard, fresh to slightly weathered, closely to slightly fractured, fine to medium grained, dark gray with white banding, GNEISS, ~45 degree moderately to widely spaced joints, RQD=83%
45 ft											Bottom of boring at 44 feet. Backfilled borehole with drill cuttings.
50 ft											

Remarks:

*GROUNDWATER DEPTH WAS NOT MEASURED FOR BORING B1.

BORING 101 (B101)

EXIST. GROUND SURFACE EL. = 416±
BOT. OF EXIST. S. ABUT. FTG. EL. = 412±
OBSERVED GROUNDWATER (6/11/19) EL. = 411.5
BOT. OF PROP. S. ABUT. FTG. EL. = 407.0

LGCI — Lahlaf Geotechnical Consulting, Inc.

BORING LOG — B-101, PAGE 1 OF 1

CLIENT:	Vannese Hangen Brustlin, Inc.	PROJECT NAME:	Proposed McCracken Road Bridge Widening
LGCI PROJECT NUMBER:	1414	PROJECT LOCATION:	Millbury, MA
DATE STARTED:	6/11/19 (DATE COMPLETED: 6/11/19)	DRILLING SUBCONTRACTOR:	Northern Drill Service, Inc.
BORING LOCATION:	SE corner of prop. bridge widening	DRILLING FOREMAN:	Tim Tucker
COORDINATES:	NA	DRILLING METHOD:	Drive and wash with 4-inch casing
SURFACE El.:	416 ft. (see note 1) (TOTAL DEPTH: 16 ft.)	DRILL RIG TYPE/MODEL:	Mobile B-48 Track Rig
WEATHER:	70's / Cloudy	HAMMER TYPE:	Automatic
GROUNDWATER LEVELS:		HAMMER WEIGHT:	140 lb. (HAMMER DROP: 30 in.)
DURING DRILLING:	-	SPLIT SPOON DIA.:	1.375 in. I.D., 2 in. O.D.
AT END OF DRILLING:	4.5 ft. / El. 411.5 ft.	CORE BARREL SIZE:	NA
OTHER:	-	LOGGED BY:	HA (CHECKED BY: BM)

Depth (ft.)	El. (ft.)	Sample Interval (ft.)	Sample Number	Blow Counts (N Value)	Pen./Rec. (in.)	Remark	Strata	Depth El.(ft.)	Material Description
		0.4	G1				Topsoil	0.4 415.6	G1 - Topsoil
	415.0		G2				Fill		G2 - Poorly Graded SAND with Gravel (SP-SM), fine, trace medium, <5% fines, ~15% subrounded gravel, roots, brown, moist
		2	S1	2-3-3-5 (6)	24/12				S1 - Silty SAND with Gravel (SM), fine to coarse, 20-25% fines, 25-30% fine to coarse subrounded gravel, roots, brown, moist
5	410.0	4	S2	14-24-33-32 (57)	24/17				S2 - Top 5": Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, 5-10% fines, 25-30% fine to coarse gravel, brown, moist. Bot. 12": Poorly Graded SAND with Gravel (SP), fine to medium, trace coarse, <5% fines, 15-20% fine to coarse gravel, brown, moist
		6	S3	27-49-36-42 (85)	24/15	1	Buried Topsoil	7.0	S3 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to medium, trace coarse, 10-15% fines, 15-20% fine to coarse angular to subangular gravel, brown, wet. Silty SAND (SM), fine to medium, 15-20% organic fines, ~10% coarse angular gravel, brown, wet. REMARK 1: Casing refusal at 7.5 ft. switched to open hole
		8	S4	48-56-48-100/2" (104)	20/18	2	Fill	8.0 408.0	S4 - Top 7": Well Graded SAND (SW), fine to coarse, <5% fines, ~5% fine subrounded gravel, light brown, wet. Bot. 11": Silty SAND with Gravel (SM), fine to medium, trace coarse, 25-30% fines, 20-25% fine to coarse subangular gravel, asphalt, brown, wet. REMARK 2: Drill chattering from 9.5 ft. to 10ft.
10	405.0	9.7 10	S5	9-20-30-53 (50)	24/14		Sand and Gravel	10.0 406.0	S5 - Top 8": Silty SAND with Gravel (SM), fine to medium, trace coarse, 15-20% fines, 20-25% fine gravel, brown, wet. Bot. 6": Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 25-30% fine to coarse gravel, brown, wet
		12	S6	63-43-44-43 (87)	24/13				S6 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, 30-35% subrounded gravel, light brown, wet
15	400.0	14	S7	26-28-19-27 (47)	24/12			16.0	S7 - Poorly Graded SAND with Silt and Gravel (SP-SM), medium to coarse, trace fine, 10-15% fines, 35-40% fine to coarse gravel, brown, wet
		16							Bottom of borehole at 16.0 feet. Backfilled with drill cuttings and 1 bag of gravel.
20	395.0								
25									

GENERAL NOTES:
1. The ground surface elevation was interpolated to the nearest foot from the drawing titled: "Millbury, McCracken Road, Construction Plans," sheet 13 of 39, provided to LGCI by VHB on October 26, 2015.
2. G1 and G2 are grab samples from the disturbed soil resultting from creating a level pad for the drill rig, and have no SPT N-values.

*SEE SHEET 3 FOR BORING LOG NOTES.

APRIL 16, 2022	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

MILLBURY
McCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	85	152
PROJECT FILE NO. 605377			

BORING LOGS (5 OF 5)

BORING G-3

EL. 430
EL. 420
EL. 410
EL. 400
EL. 390
EL. 380
EL. 370
EL. 360

EXIST. GROUND SURFACE EL. = 411.74

BOT. OF EXIST. S. ABUT. FTG. EL. = 411.37±

BOT. OF PROP. S. ABUT. FTG. EL. = 406.37

OBSERVED GROUNDWATER (11/26/96) EL. = 399.14

ELEVATION (NAVD88)

GUILD DRILLING CO., INC.
100 WATER STREET • EAST PROVIDENCE, R.I.

SHEET 1 OF 1

TO MASSACHUSETTS HIGHWAY DEPART. | ADDRESS South Boston, Mass. | HOLE NO. G-3
PROJECT NAME Route 146 | LOCATION Millbury - Worcester, Mass. | PROJ. NO. 93159
REPORT SENT TO above | OUR JOB NO. 97-167 (Scale 1" = 6.0') | SURF. ELEV. 412.37

GROUND WATER OBSERVATIONS
At 12.6 after 1/3 Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	NW	S/S	NV-II
Size I.D.	3"	1-3/8"	
Hammer Wt.	300#	140#	BIT
Hammer Fall	24"	30"	Dia.

DATE
Start 11/26/96 - 10:50 AM
Complete 11/27/96 - 1:15 PM
Boring Foreman P. Brescia
Inspector/Engr. E. Olson

LOCATION OF BORING N 438,192.00 - E 524,392.01 Total Time: 10 Hours

Depth	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev./ Depth	SOIL OR ROCK IDENTIFICATION Remarks include color, gradation, type of soil etc. Rock-color, type, condition, hardness, drilling time, seams, etc.	SAMPLE No.	Pen"	Rec."
		0.0-1.5	D	3	4	6			Dry loose, 6" Topsoil & Roots - Dark Brown COARSE to FINE SAND, trace fine to medium gravel	1		
5		4.0-5.5	D	18	16	17		3.5	Dry dense, Brown COARSE to FINE SAND and fine to medium Gravel	2		
10		9.0-10.5	D	11	14	18			Dry dense, Brown FINE to COARSE SAND, some fine gravel	3		
15		14.0-15.5	D	33	24	50		14.0	Wet very dense, Brown COARSE SAND and fine to coarse Gravel, Cobbles, trace inorganic silt	4		
20		19.0-20.5	D	43	33	30				5		
25		24.0-25.5	D	19	31	24				6		
30		29.0-29.7	D	22	120/2"	(Ref.)	Min/Ft	29.7	Wet very dense, Brown COARSE to FINE SAND and fine to medium Gravel, some Granite fragments	7		
		30.5-35.5	C				5		(Top of Rock - Button Bit to 30.5') Gray GRANITE 60" Recovery - 100%	C1		
							4.5					
							4.5					
							5					
35							5					
		35.5-40.5	C				4.5		60" Recovery - 100%	C2		
							5.5					
							5.5					
							5.5	40.5	Bottom of Boring 40.5'			

GROUND SURFACE TO 29.7' USED NW CASING: THEN B.B. to 30.5' & Cored

BORING SPB-87

BOT. OF EXIST. S. ABUT. FTG. EL. = 411.37±

EXIST. GROUND SURFACE EL. = 408.37

BOT. OF PROP. S. ABUT. FTG. EL. = 406.37

OBSERVED GROUNDWATER (6/29/95) EL. = 397.37

GUILD DRILLING CO., INC.
100 WATER STREET • EAST PROVIDENCE, R.I.

SHEET 1 OF 1

TO MASSACHUSETTS HIGHWAY DEPART. | ADDRESS South Boston, Mass. | HOLE NO. SPB-87
PROJECT NAME Route 146-Mass. Pike-Bikeway | LOCATION Worcester / Millbury, Mass. | PROJ. NO. 93159
REPORT SENT TO Research & Materials | OUR JOB NO. 96-38 (Scale 1" = 6.0') | SURF. ELEV. 409

GROUND WATER OBSERVATIONS
At 11.0' after Comp. Hours
At ____ after ____ Hours

	CASING	SAMPLER	CORE BAR.
Type	NW	S/S	NV-II
Size I.D.	3"	1-3/8"	
Hammer Wt.	300#	140#	BIT
Hammer Fall	24"	30"	Dia.

DATE
Start 6/29/95 - 7:00 AM
Complete 6/29/95 - 12:30 PM
Boring Foreman G. Brouillette
Inspector/Engr. J. Jordan

LOCATION OF BORING Line & Station: 16+35 - Offset: 20' LT. Total Time: 5.5 Hours

Depth	Casing Blows per foot	Sample Depths From - To	Type of Sample	Blows per 6" on Sampler From 0-6	6-12	To 12-18	Moisture Density or Consist.	Strata Change Elev./ Depth	SOIL OR ROCK IDENTIFICATION Remarks include color, gradation, type of soil etc. Rock-color, type, condition, hardness, drilling time, seams, etc.	SAMPLE No.	Pen"	Rec."
		0.0-1.5	D	18	16	18			Dry dense, 1" Black Top - Brown FINE to COARSE SAND and fine to coarse Gravel	1		
5		4.0-5.5	D	9	11	15			* becomes Moist medium dense	2		
10		9.0-10.5	D	11	11	11		9.0	Wet medium dense, Brown FINE SAND	3		
15		14.0-15.5	D	22	11	9		14.0	Wet medium dense, Brown FINE to COARSE SAND and fine to coarse Gravel, trace inorganic silt	4		
20		19.0-20.5	D	16	14	17			* becomes dense	5		
25		24.0-25.5	D	17	20	23	Min/Ft			6		
		26.5-31.5	C				9	26.5	Gray GNEISS 58" Recovery - 96.7%	C1		
30							7					
							7					
							6		60" Recovery - 100%			
							6					
		31.5-36.5	C				5			C2		
35							7					
							7					
							7					
							8	36.5	Bottom of Boring 36.5'			

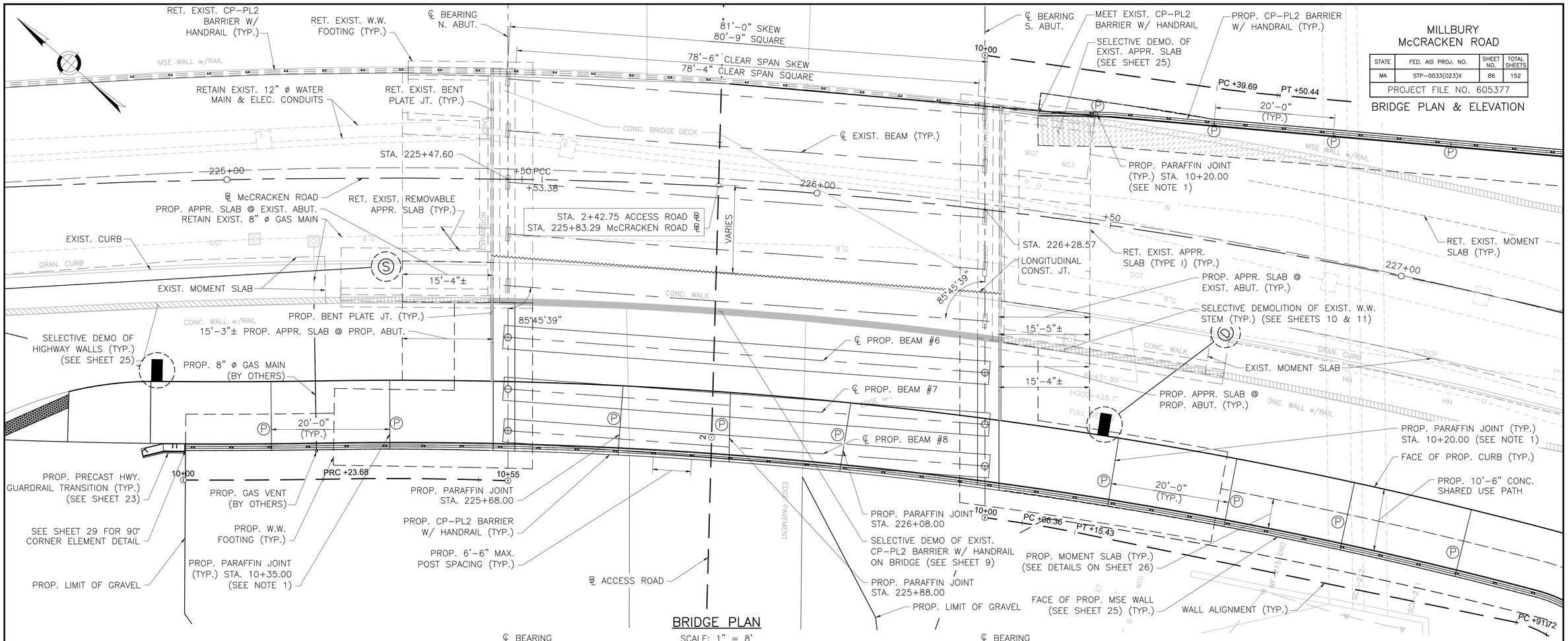
*SEE SHEET 3 FOR BORING LOG NOTES.

APRIL 16, 2022	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

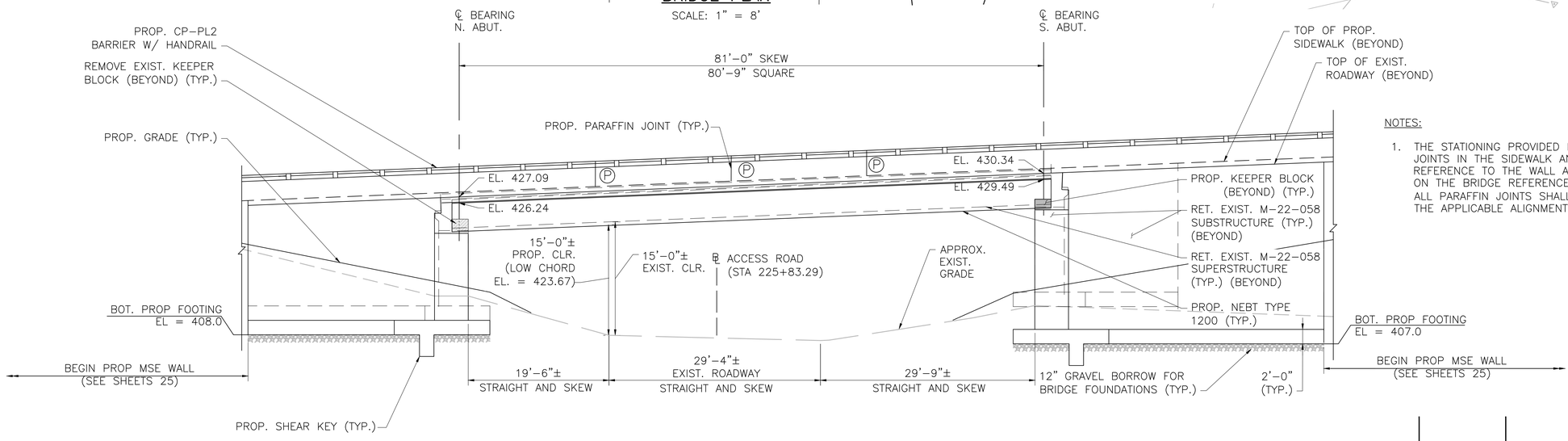
MILLBURY
McCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	86	152
PROJECT FILE NO. 605377			

BRIDGE PLAN & ELEVATION



BRIDGE PLAN
SCALE: 1" = 8'



ELEVATION (LOOKING EAST)
SCALE: 1" = 8'

NOTES:

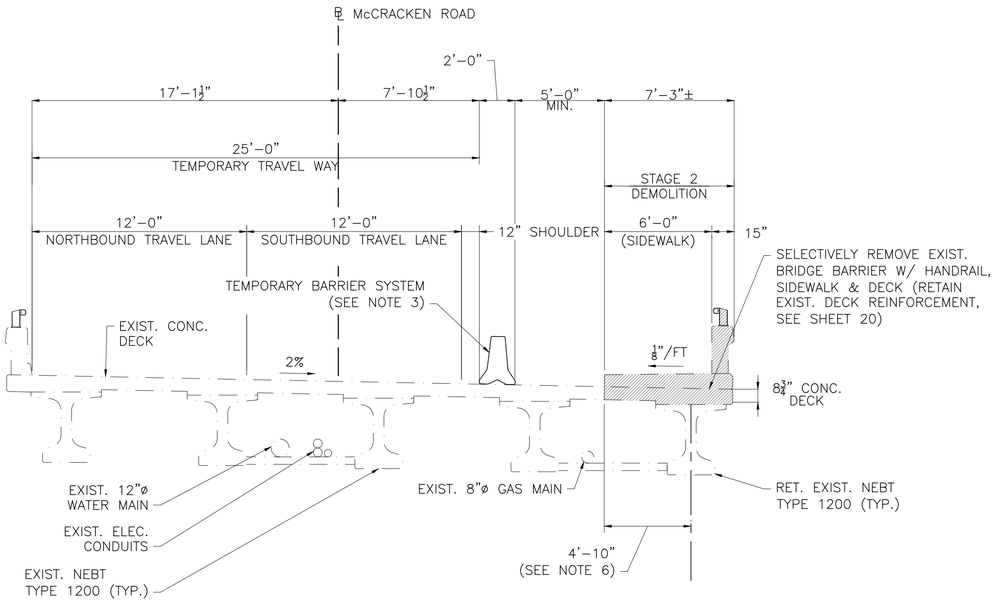
1. THE STATIONING PROVIDED FOR THE LAYOUT OF PARAFFIN JOINTS IN THE SIDEWALK AND SAFETY CURB ARE IN REFERENCE TO THE WALL ALIGNMENTS, PARAFFIN JOINTS ON THE BRIDGE REFERENCE THE ROADWAY ALIGNMENT. ALL PARAFFIN JOINTS SHALL BE SPACED 20'-0" ALONG THE APPLICABLE ALIGNMENT UNLESS OTHERWISE SPECIFIED.

DATE	DESCRIPTION
APRIL 16, 2022	ISSUED FOR CONSTRUCTION
USE ONLY PRINTS OF LATEST DATE	

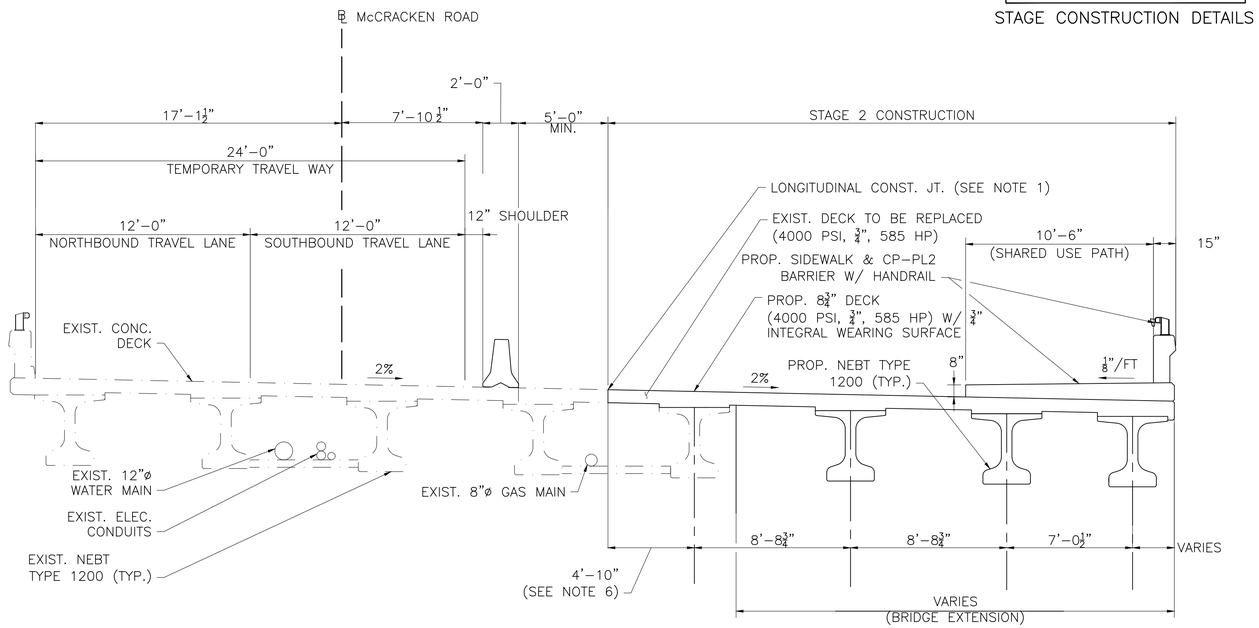
MILLBURY
McCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	87	152
PROJECT FILE NO. 605377			

STAGE CONSTRUCTION DETAILS



STAGE 2 – DEMOLITION (LOOKING SOUTH)
SCALE: ¼" = 1'-0"



STAGE 2 – CONSTRUCTION (LOOKING SOUTH)
SCALE: ¼" = 1'-0"

NOTES:
1. ALL EXISTING DECK REINFORCING EXTENDING BEYOND THE LONGITUDINAL CONSTRUCTION JOINT SHALL REMAIN FOR USE IN LAPPING WITH PROPOSED DECK REINFORCING. ALL EXISTING SIDEWALK AND BRIDGE RAIL REINFORCING SHALL BE REMOVED (SEE SHEET 20).
2. TEMPORARY PROTECTIVE SHIELDING SYSTEM NOT SHOWN FOR CLARITY. CONTRACTOR TO DESIGN TEMPORARY SHIELDING SYSTEM (PER SECTION 994.1 OF THE SPECIAL PROVISIONS).
3. TEMPORARY BARRIER SYSTEM SHALL BE DELTA BLOCK DB 80 F-SHAPE IN 12'-6" LONG (OR APPROVED EQUAL). BARRIER LENGTH OF NEED SHALL CONFORM TO MANUFACTURER'S RECOMMENDATIONS TO ENSURE PROPER BARRIER FUNCTION.
4. THE TEMPORARY BARRIER SHALL HAVE A DYNAMIC DEFLECTION OF 5'-0" MAX.
5. THE TEMPORARY BARRIER SHALL HAVE A MAXIMUM BARRIER WIDTH OF 2'-0".
6. THE LIMIT OF STAGE 2 DEMOLITION AND STAGE 2 CONSTRUCTION SHOULD BE MEASURED AS 4'-10" FROM THE CENTERLINE OF THE EXISTING BEAM AS SHOWN AND SHOULD BE PARALLEL TO THE BEAM. THE DISTANCE MEASURED FROM THE BASELINE, EDGE OF BRIDGE OR ANY OTHER COMPONENT WHICH HAS HORIZONTAL CURVATURE WILL VARY, SEE PLAN VIEW ON SHEET 8.

STAGE 2 CONSTRUCTION SEQUENCE

1. ALL WESTERLY MSE WALLS, BRIDGE ABUTMENTS, AND WINGWALLS ON THE NORTH SIDE OF THE BRIDGE OFF-ROADWAY AND ON THE SOUTH SIDE OF THE BRIDGE OFF-ROADWAY TO THE GREATEST EXTENT POSSIBLE SHALL BE CONSTRUCTED DURING STAGE 1, PRIOR TO THE BRIDGE WIDENING WORK NOTED BELOW IN STAGE 2.
2. INSTALL TEMPORARY BARRIER SYSTEM, CREATING 2 – 12'-0"± TEMPORARY TRAVEL LANES ON THE EAST SIDE OF THE BRIDGE.
3. INSTALL TEMPORARY PROTECTIVE SHIELDING SYSTEM.
4. SELECTIVELY REMOVE THE BRIDGE BARRIER W/ HANDRAIL, SIDEWALK, AND CONCRETE DECK DIRECTLY BENEATH SIDEWALK TO THE LIMITS SHOWN ON THE PLANS, EXPOSING EXISTING DECK REINFORCEMENT. ALL EXISTING DECK REINFORCEMENT SHALL BE RETAINED. EXISTING REINFORCEMENT STILL EMBEDDED SHALL BE RETAINED TO BE LAPPED WITH THE PROPOSED DECK REINFORCEMENT. EXISTING REINFORCEMENT THAT IS NOT STILL EMEDDED MAY BE RE-USED.
5. SELECTIVELY DEMOLISH THE EXISTING KEEPER BLOCKS ON THE WEST EDGE OF THE BEAM SEATS.
6. SELECTIVELY DEMOLISH THE TOE OF THE EXISTING U-WINGWALL TO ALLOW FOR INSTALLATION OF PROPOSED ABUTMENT EXTENSION.
7. EXCAVATE AROUND THE EXISTING SUBSTRUCTURE AS REQUIRED FOR INSTALLATION OF PROPOSED SUBSTRUCTURE AND MSE WALLS.
8. INSTALL FORMS AND REINFORCEMENT FOR PROPOSED CONCRETE SUBSTRUCTURE.
9. PLACE CONCRETE FOR PROPOSED SUBSTRUCTURE (INCLUDING THE BACKWALLS AND KEEPER BLOCKS).
10. BACKFILL BEHIND PROPOSED SUBSTRUCTURE AND PROPOSED MSE WALLS.
11. ERECT CONCRETE NEBT TYPE 1200 BEAMS IN PROPOSED LOCATIONS.
12. INSTALL FORMS AND REINFORCEMENT FOR THE PROPOSED CONCRETE DECK. (LAP PROPOSED TRANSVERSE DECK REINFORCEMENT WITH EXISTING TRANSVERSE DECK REINFORCEMENT).
13. PLACE CONCRETE FOR PROPOSED DECK EXTENSION.
14. REMOVE FORMS ONCE CONCRETE HAS CURED AS REQUIRED BY DESIGN.
15. REPEAT STEPS 12 THROUGH 13 FOR THE PROPOSED SIDEWALK, CP-PL2 BRIDGE BARRIER W/ HANDRAIL AND BACKWALL ABOVE THE CONSTRUCTION JOINT.
16. INSTALL THE PROPOSED APPROACH SLAB EXTENSION FOR BOTH THE EXISTING ABUTMENT AND PROPOSED ABUTMENT SECTIONS. THE EXISTING ABUTMENT SECTION SHALL BE CONNECTED TO THE EXISTING ABUTMENT AND APPROACH SLAB BY DRILLING AND DOWELING.
17. INSTALL HANDRAIL ON TOP OF CP-PL2 PARAPET.
18. REMOVE TEMPORARY PROTECTIVE SHIELDING AND TEMPORARY BARRIER SYSTEM.
19. ALL EASTERLY MSE WALLS SHALL BE CONSTRUCTED DURING STAGE 3, AFTER THE BRIDGE WIDENING WORK NOTED ABOVE IN STAGE 2 IS COMPLETED.

DATE	DESCRIPTION
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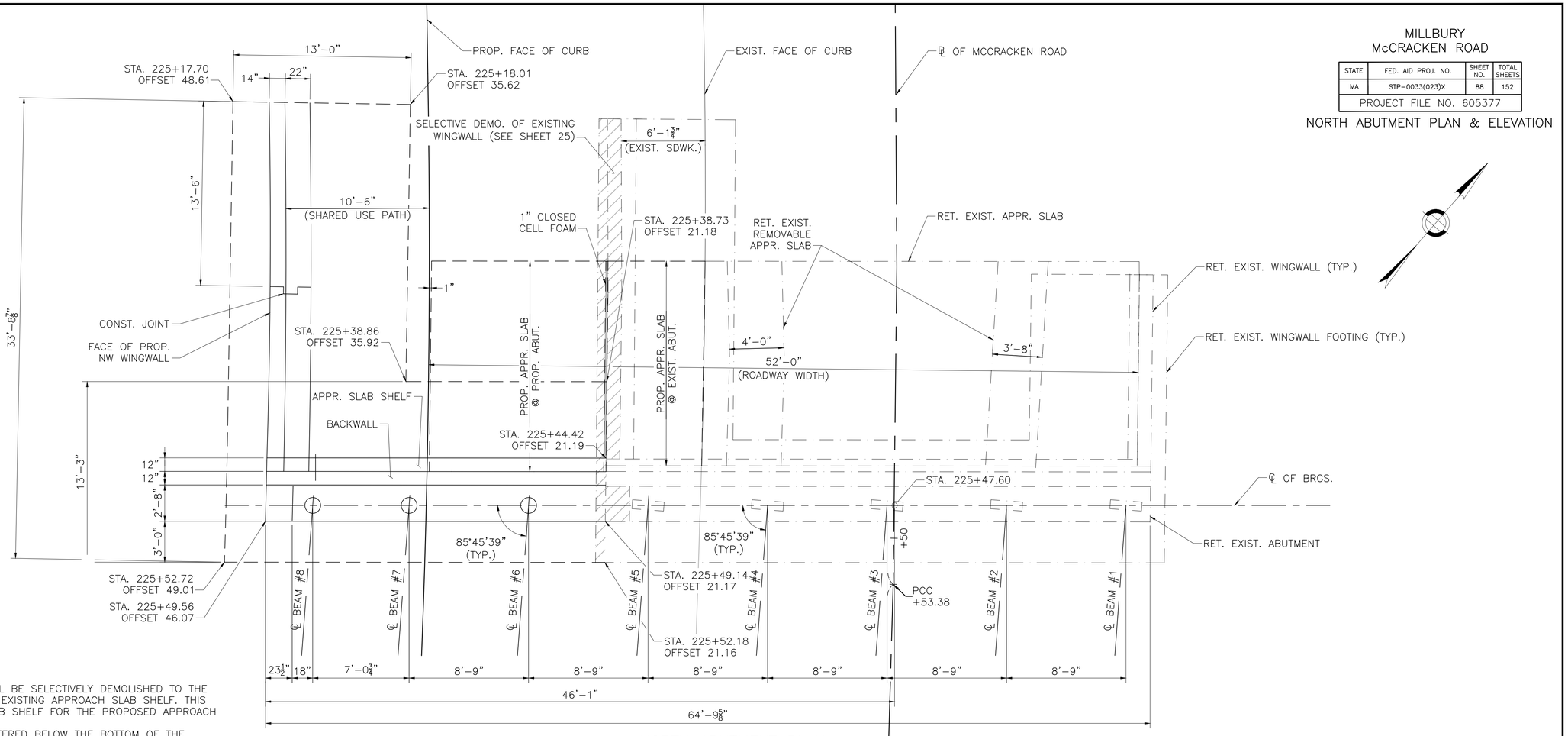
USE ONLY PRINTS OF LATEST DATE	

MILLBURY
McCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	88	152
PROJECT FILE NO. 605377			

NORTH ABUTMENT PLAN & ELEVATION

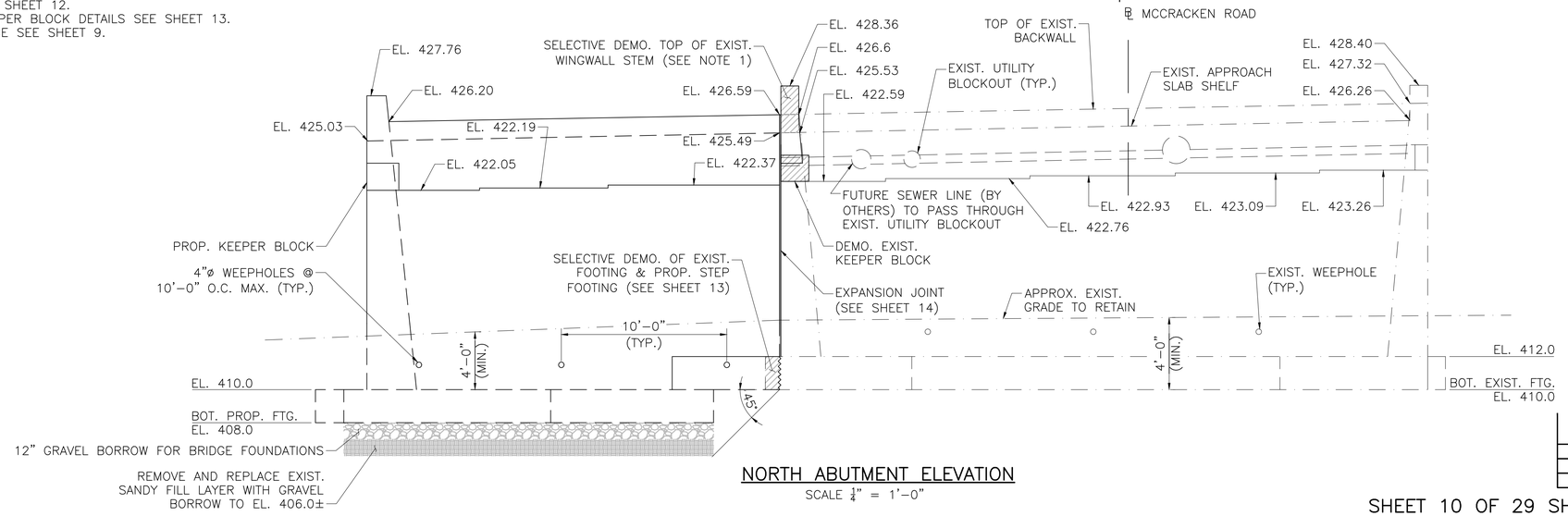


NORTH ABUTMENT PLAN

SCALE: ¼"=1'-0"

NOTES:

1. THE EXISTING WINGWALL STEM SHALL BE SELECTIVELY DEMOLISHED TO THE A DEPTH TO MATCH THE ADJACENT EXISTING APPROACH SLAB SHELF. THIS WILL SERVE AS THE APPROACH SLAB SHELF FOR THE PROPOSED APPROACH SLAB AT THE EXISTING ABUTMENT.
2. IF A SANDY FILL LAYER IS ENCOUNTERED BELOW THE BOTTOM OF THE GRAVEL BORROW FOR BRIDGE FOUNDATION, THE SAND SHALL BE REMOVED AND REPLACED WITH GRAVEL BORROW TO BOTTOM OF THE FILL LAYER.
3. FOR SOUTH ABUTMENT PLAN & ELEVATION, SEE SHEET 11.
4. FOR ABUTMENT DETAILS, SEE SHEET 12.
5. FOR UNDERPINNING AND KEEPER BLOCK DETAILS SEE SHEET 13.
6. FOR CONSTRUCTION SEQUENCE SEE SHEET 9.



NORTH ABUTMENT ELEVATION

SCALE ¼" = 1'-0"

DATE	DESCRIPTION
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MA	STP-0033(023)X	89	152
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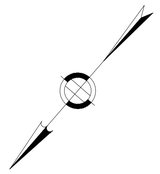
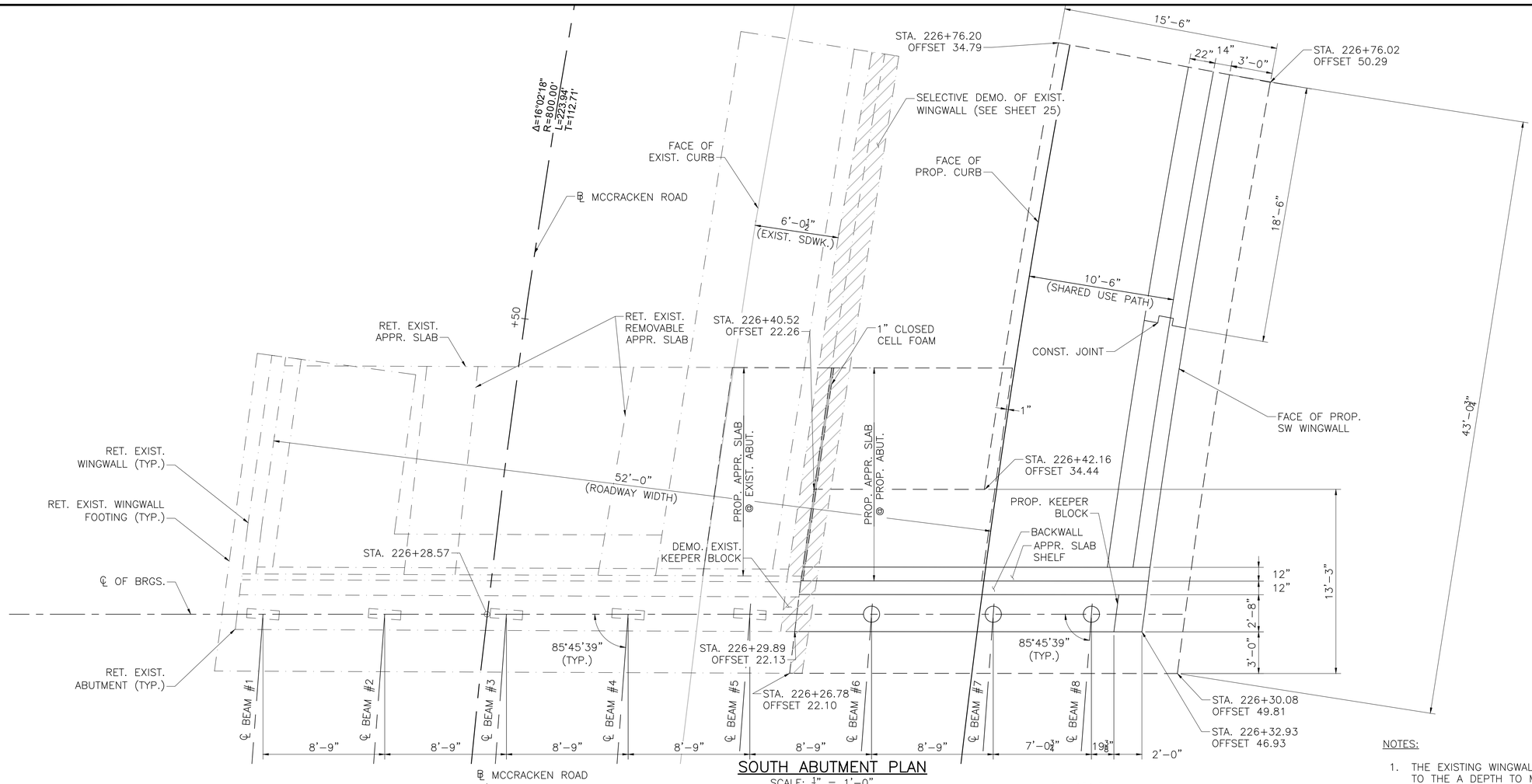
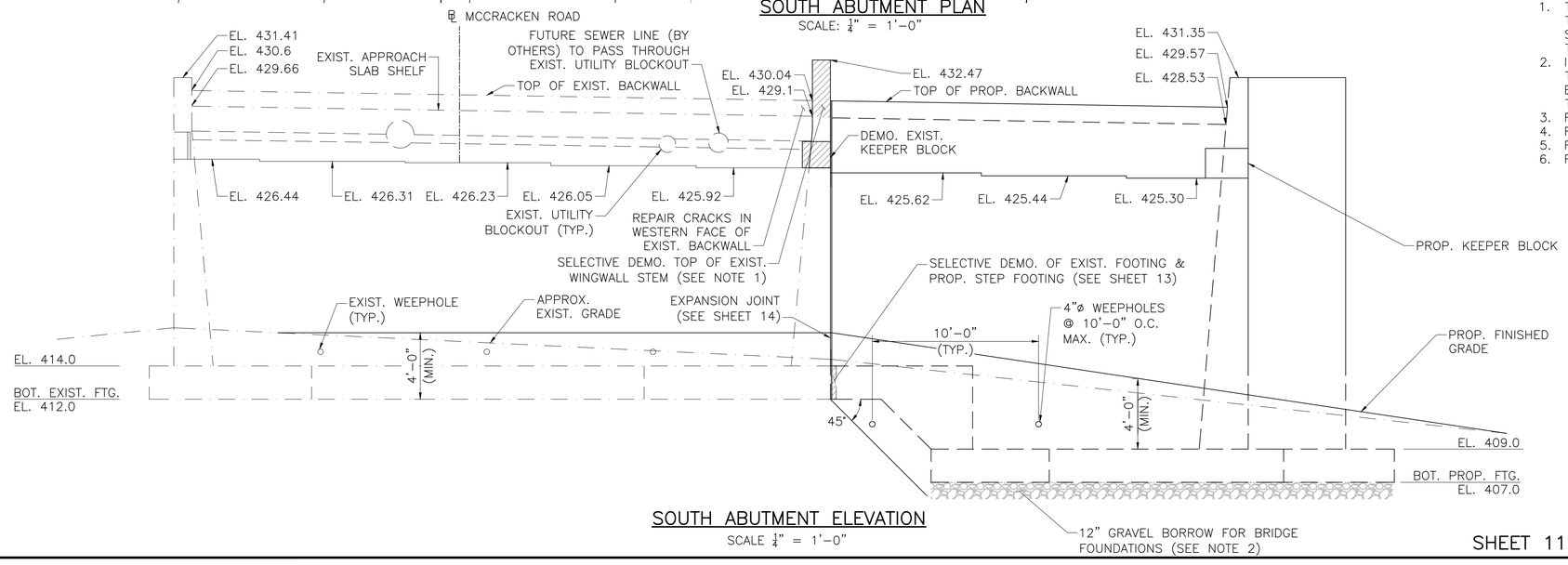
SOUTH ABUTMENT PLAN & ELEVATION





SOUTH ABUTMENT PLAN
SCALE: ¼" = 1'-0"



SOUTH ABUTMENT ELEVATION
SCALE ¼" = 1'-0"

NOTES:

1. THE EXISTING WINGWALL STEM SHALL BE SELECTIVELY DEMOLISHED TO THE A DEPTH TO MATCH THE ADJACENT EXISTING APPROACH SLAB SHELF. THIS WILL SERVE AS THE APPROACH SLAB SHELF FOR THE PROPOSED APPROACH SLAB AT THE EXISTING ABUTMENT.
2. IF A SANDY FILL LAYER IS ENCOUNTERED BELOW THE BOTTOM OF THE GRAVEL BORROW FOR BRIDGE FOUNDATION, THE SAND SHALL BE REMOVED AND REPLACED WITH GRAVEL BORROW TO BOTTOM OF THE FILL LAYER.
3. FOR NORTH ABUTMENT PLAN & ELEVATION, SEE SHEET 10.
4. FOR ABUTMENT DETAILS, SEE SHEET 12.
5. FOR STEPPED FOOTING AND KEEPER BLOCK DETAILS SEE SHEET 13.
6. FOR CONSTRUCTION SEQUENCE SEE SHEET 9.

DATE	DESCRIPTION
APRIL 16, 2022	ISSUED FOR CONSTRUCTION
USE ONLY PRINTS OF LATEST DATE	

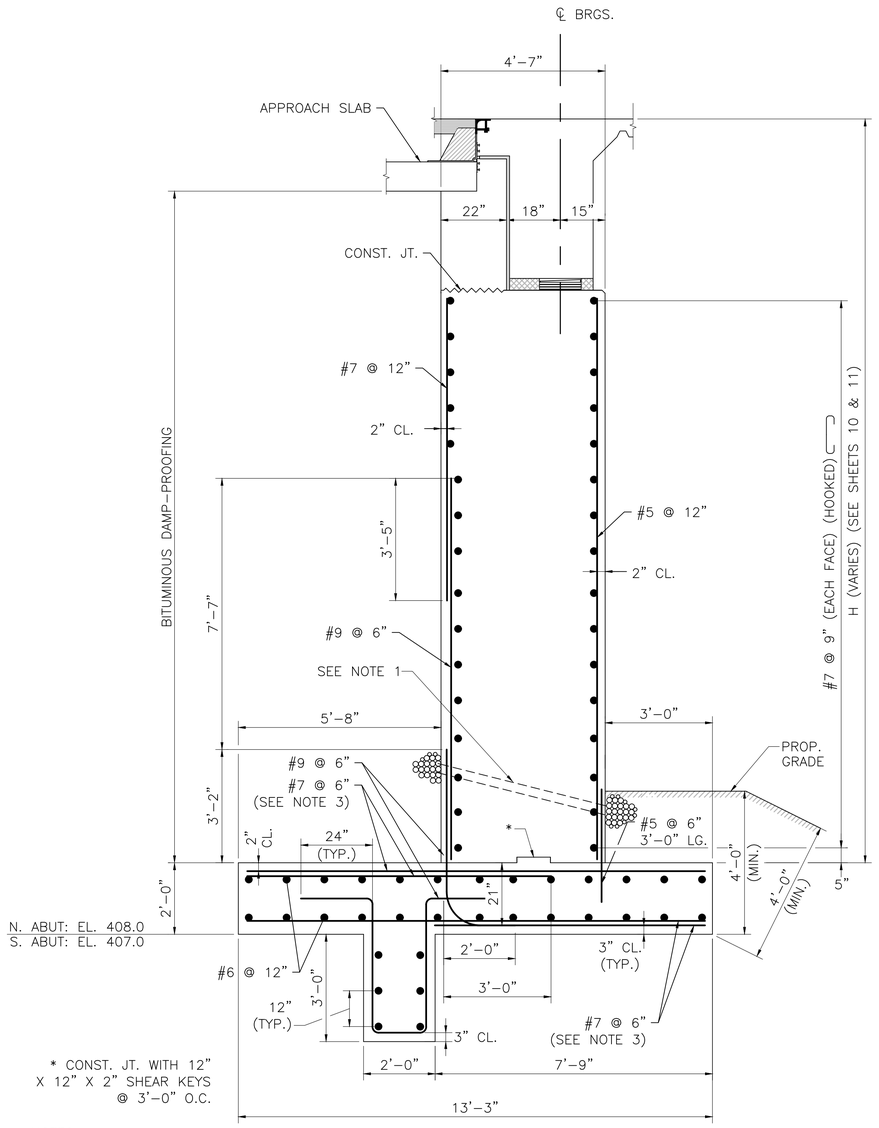
ISSUED FOR CONSTRUCTION (SF) APRIL 16, 2022

605377_BR6_SUBSTRUCTURE.DWG Plotted on 11-Apr-2022 8:54 AM

MILLBURY
McCRACKEN ROAD

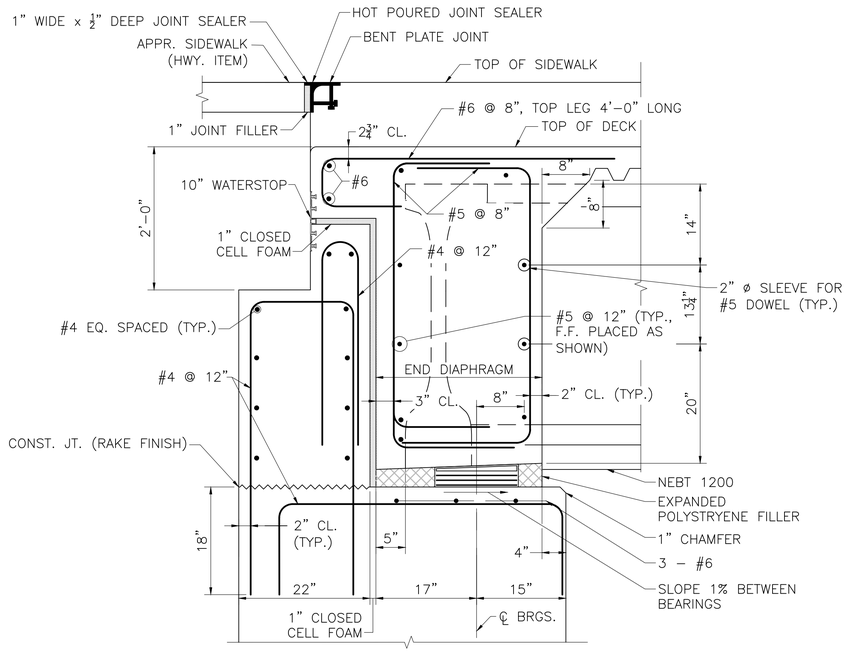
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	90	152
PROJECT FILE NO. 605377			

SUBSTRUCTURE DETAILS (1 OF 3)



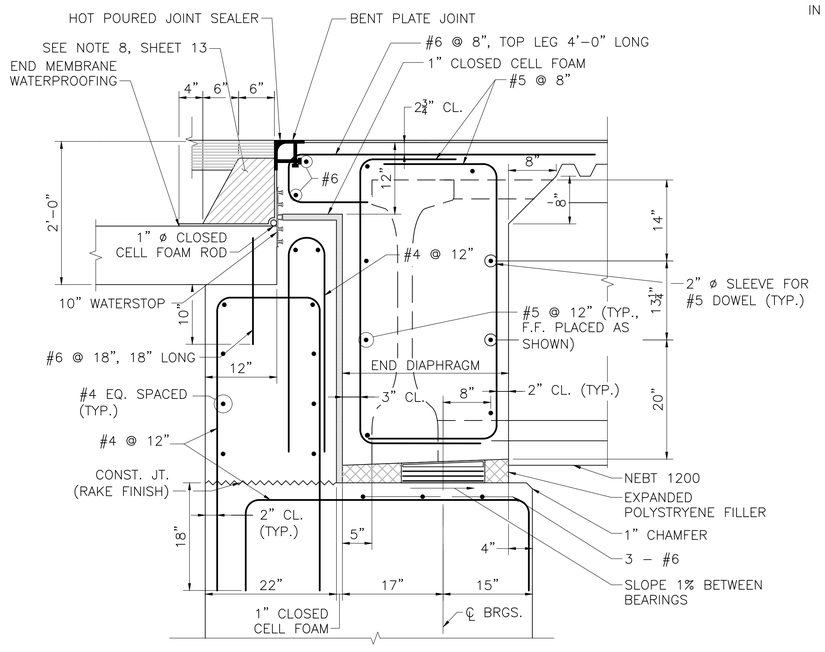
TYPICAL PROPOSED ABUTMENT SECTION

SCALE: ½" = 1'-0"



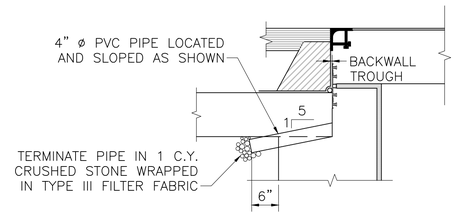
DETAILS AT ABUTMENT – SIDEWALK SECTION

SCALE: 1" = 1'-0"



DETAILS AT ABUTMENT – ROADWAY SECTION

SCALE: 1" = 1'-0"



TROUGH DRAIN DETAILS

SCALE: ¾" = 1'-0"

NOTES:

1. 4" ø WEEP HOLES 10'-0" O.C. (JUST ABOVE PROTECTIVE COURSE). PROVIDE 1 CUBIC YARD OF CRUSHED STONE AT EACH END OF WEEP HOLE.
2. ALL CONCRETE SHALL BE 4000 PSI, 1½ IN, 565 CEMENT CONCRETE EXCEPT THE BACKWALL, WHICH SHALL BE 4000 PSI, ¾ IN, 610 CEMENT CONCRETE.
3. EXTEND EVERY 3rd BAR FULL LENGTH AS SHOWN.
4. THE FACTORED BEARING PRESSURE = 5.7 KSF AS PER AASHTO STANDARD SPECIFICATIONS LOAD GROUP I. FACTORED BEARING RESISTANCE = 6.0 KSF. THE FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE AND A RESISTANCE FACTOR OF 0.45.

APRIL 16, 2022	ISSUED FOR CONSTRUCTION
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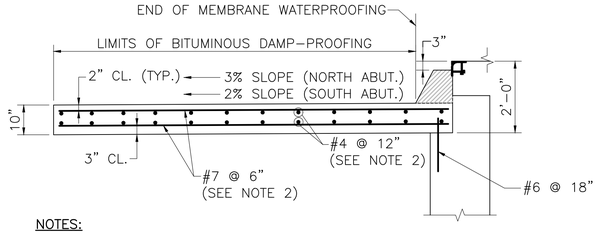
ISSUED FOR CONSTRUCTION (SF) APRIL 16, 2022

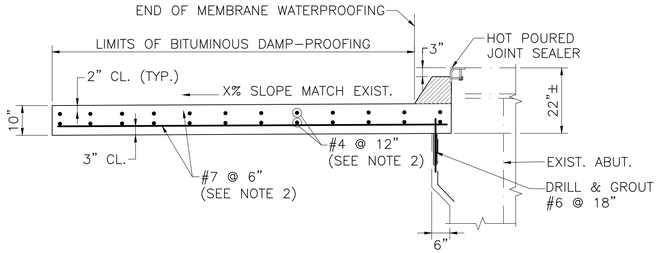


NOTES:

1. APPROACH SLAB TO BE 4000 PSI, 1½ IN, 565 CEMENT CONCRETE.
2. PLACE LONGITUDINAL REINFORCEMENT PERPENDICULAR TO ABUTMENT. PLACE TRANSVERSE REINFORCEMENT PARALLEL TO ABUTMENT.
3. THE CONTRACTOR SHALL FIELD VERIFY AND MATCH THE LAYOUT OF THE EXISTING APPROACH SLAB PRIOR TO THE PLACEMENT OF CONCRETE.

PROPOSED APPROACH SLAB DETAILS @ PROPOSED ABUTMENT

SCALE: ½" = 1'-0"



NOTES:

1. APPROACH SLAB TO BE 4000 PSI, 1½ IN, 565 CEMENT CONCRETE.
2. PLACE LONGITUDINAL REINFORCEMENT PERPENDICULAR TO ABUTMENT. PLACE TRANSVERSE REINFORCEMENT PARALLEL TO ABUTMENT.
3. THE PROPOSED APPROACH SLAB SHALL BE CONNECTED TO THE EXISTING THROUGH MEANS OF DRILLING AND DOWELING OF THE PROPOSED APPROACH SLAB REINFORCEMENT SHOWN ON THE PLANS.
4. THE CONTRACTOR SHALL FIELD VERIFY THE CONFIGURATION AND DIMENSIONS OF THE EXISTING APPROACH SLAB PRIOR TO CASTING NEW SLAB.

PROPOSED APPROACH SLAB DETAILS @ EXISTING ABUTMENT

SCALE: ½" = 1'-0"

NOTES:

1. ALL REINFORCEMENT SHOWN IN THESE DETAIL SHALL BE COATED, EXCEPT FOR THE APPROACH SLAB REINFORCEMENT.
2. ALL BACKWALL CONCRETE ABOVE THE CONSTRUCTION JOINT LOCATED AT THE BRIDGE SEAT SHALL BE 4000 PSI, ¾ IN, 610 CEMENT CONCRETE. THE CONSTRUCTION JOINT SHALL BE GIVEN A RAKE FINISH WITH A ¼" MINIMUM AMPLITUDE.
3. TOP OF BACKWALL SHALL BE TROWELED SMOOTH PARALLEL TO THE PROFILE GRADE.
4. BACKWALL AND KEEPER BLOCK CONCRETE MUST BE PLACED AND SUFFICIENTLY CURED PRIOR TO PLACING THE END DIAPHRAGM CONCRETE.
5. THE END DIAPHRAGM CONCRETE SHALL BE 4000 PSI, ¾ IN, 585 HP CEMENT CONCRETE AND SHALL BE PLACED MONOLITHICALLY WITH THE DECK.
6. PRIOR TO PLACING THE END DIAPHRAGM CONCRETE, CLOSED CELL FOAM OF THE SPECIFIED THICKNESSES SHALL BE ATTACHED WITH ADHESIVE TO ALL SURFACES OF THE BACKWALL AND KEEPER BLOCKS AS SHOWN ON THE PLANS. EXPANDED POLYSTYRENE SHALL BE PLACED UNDER THE BEAM BOTTOM FLANGE AND THE BOTTOM OF THE END DIAPHRAGM SHALL BE FORMED AS SPECIFIED. THE CONTRACTOR SHALL INSURE THAT ALL ABUTMENT CONCRETE IS PROPERLY LINED. END DIAPHRAGM CONCRETE MUST NOT COME IN DIRECT CONTACT WITH THE ABUTMENT CONCRETE.
7. DRAPE MEMBRANE WATERPROOFING OVER CLOSED CELL FOAM BACKER ROD.
8. PROTECTIVE COURSE TO BE SUPERPAVE BRIDGE PROTECTIVE COARSE (SPC-B-12.5), PLACED IN 2" LAYERS AND COMPACTED WITH A MECHANICAL HAND-GUIDED TAMPER WITHIN 12 HOURS AFTER PLACING MEMBRANE WATERPROOFING.
9. COVER THE BACKWALL TROUGH OPENING SECURELY TO KEEP DEBRIS OUT UNTIL READY TO INSTALL THE BENT PLATE JOINT.
10. FOR ABUTMENT ELEVATIONS SEE SHEETS 7 AND 8.
11. ALL DETAILS ARE SHOWN FOR THE NORTH ABUTMENT, THEY SHALL BE MIRRORED FOR THE SOUTH ABUTMENT.
12. FOR DETAIL OF THE EXISTING ABUTMENT, REFERENCE THE EXISTING BRIDGE PLANS.

MILLBURY
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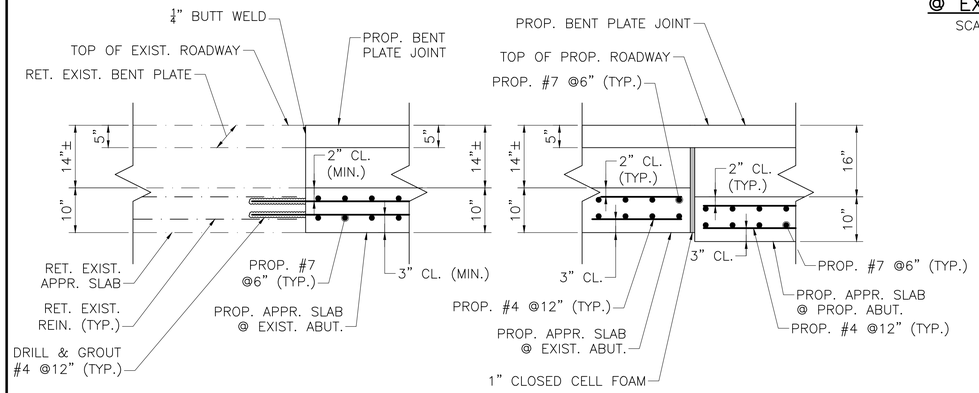
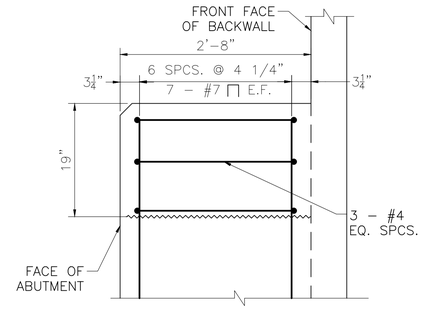
SUBSTRUCTURE DETAILS (2 OF 3)



APPROACH SLAB ELEVATION DETAIL

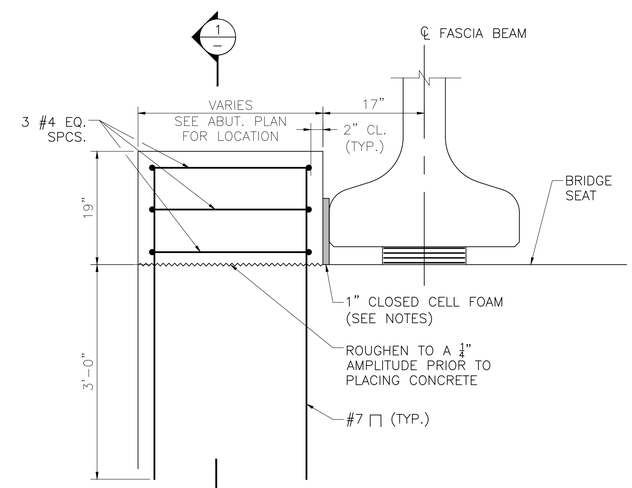
SCALE: ¾" = 1'-0"



NOTE:
DIMENSIONS NORMAL TO ℄ OF BEARINGS.

SECTION 1

SCALE: 1" = 1'-0"



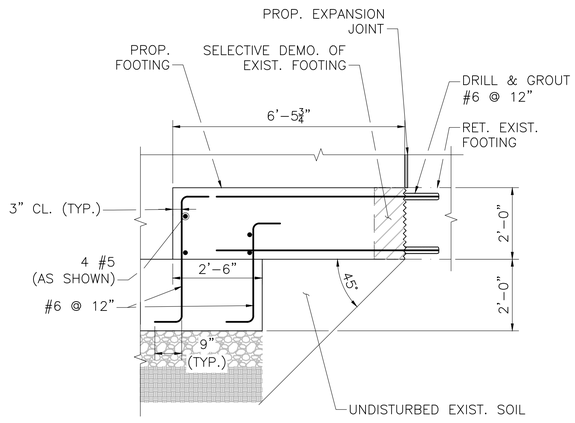
NOTES:

1. POUR ABUTMENT CONCRETE AND ATTACH THE CLOSED CELL FOAM TO THE SIDE OF THE PRECAST BEAM PRIOR TO PLACING CONCRETE FOR THE KEEPER BLOCK.
2. KEEPER BLOCK CONCRETE SHALL BE 4000 PSI, ¾" 610 CEMENT CONCRETE.

KEEPER BLOCK DETAIL

SCALE: 1" = 1'-0"

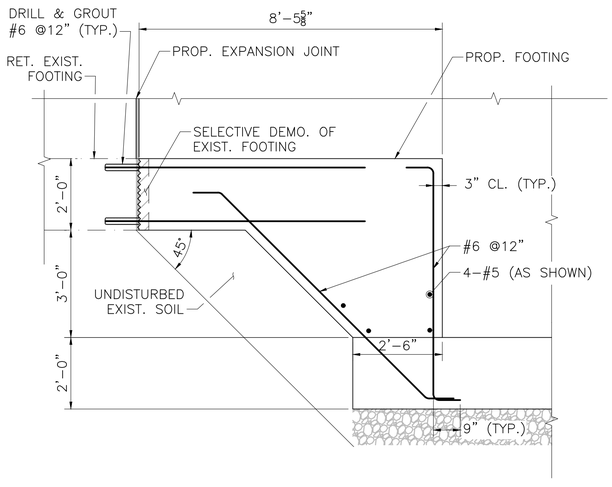
LOWER WALL HIGHER WALL



STEPPED-UP FOOTING DETAIL NORTH ABUTMENT

SCALE: ½" = 1'-0"

HIGHER WALL LOWER WALL



STEPPED-UP FOOTING DETAIL SOUTH ABUTMENT

SCALE: ½" = 1'-0"

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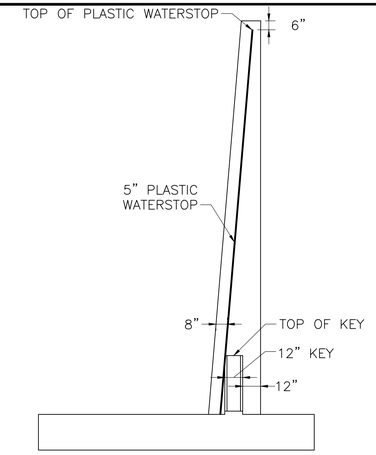
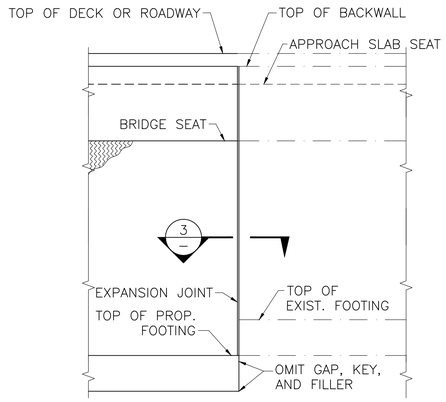
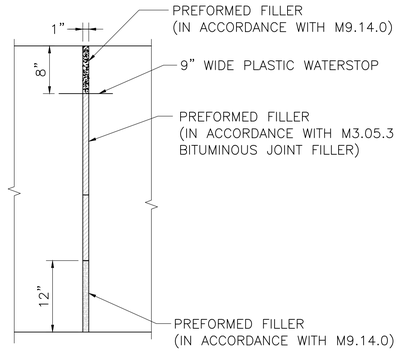


NOTE:
REINFORCEMENT SHALL BE CONTINUOUS THROUGH CONSTRUCTION JOINTS.

VERTICAL SECTION THROUGH CONSTRUCTION JOINT – WINGWALL
SCALE: $\frac{1}{4}$" = 1'–0"



ELEVATION OF ABUTMENT
SCALE: $\frac{1}{4}$" = 1'–0"



LIMITS OF PREFORMED FILLER
SCALE: 1" = 1'–0"

MILLBURY
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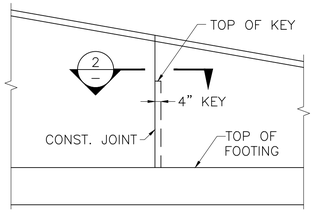
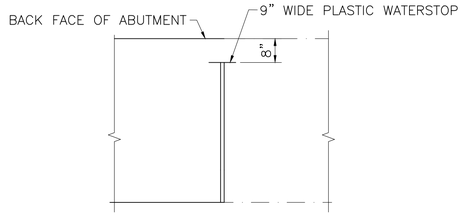
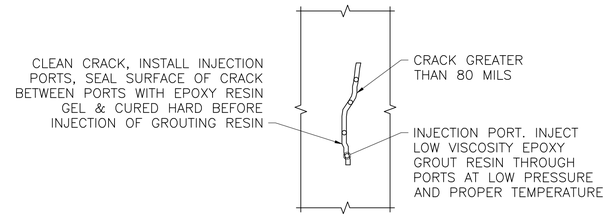
SUBSTRUCTURE DETAILS (3 OF 3)



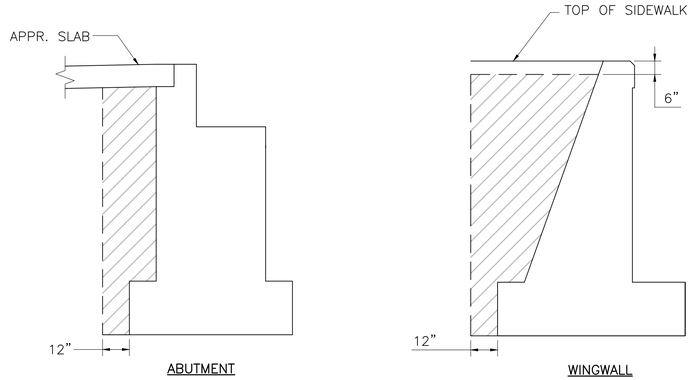
WINGWALL ELEVATION
SCALE: NOT TO SCALE



SECTION 3
SCALE: NOT TO SCALE

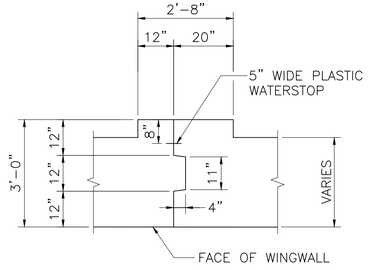


CONCRETE CRACK REPAIR
SCALE: N.T.S.

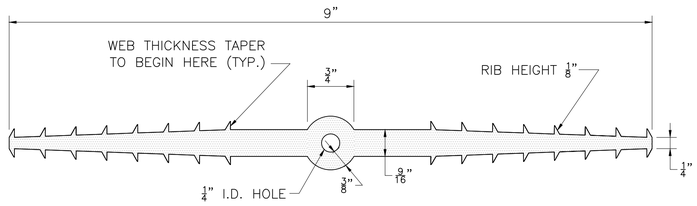


NOTE:
HATCHED AREA INDICATES LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.

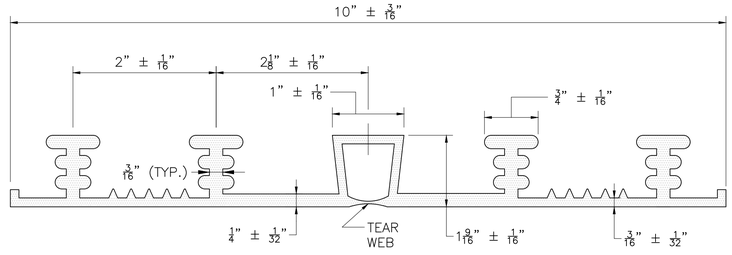
LIMITS OF GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES



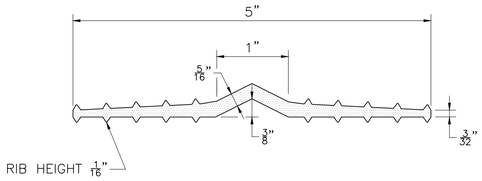
SECTION 2
SCALE: $\frac{1}{2}$" = 1'–0"



9" WATERSTOP
NOT TO SCALE



10" WATERSTOP
SCALE: NOT TO SCALE



5" WATERSTOP
SCALE: NOT TO SCALE

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SHEET 14 OF 29 SHEETS BRIDGE NO. M–22–058 (AJ0)

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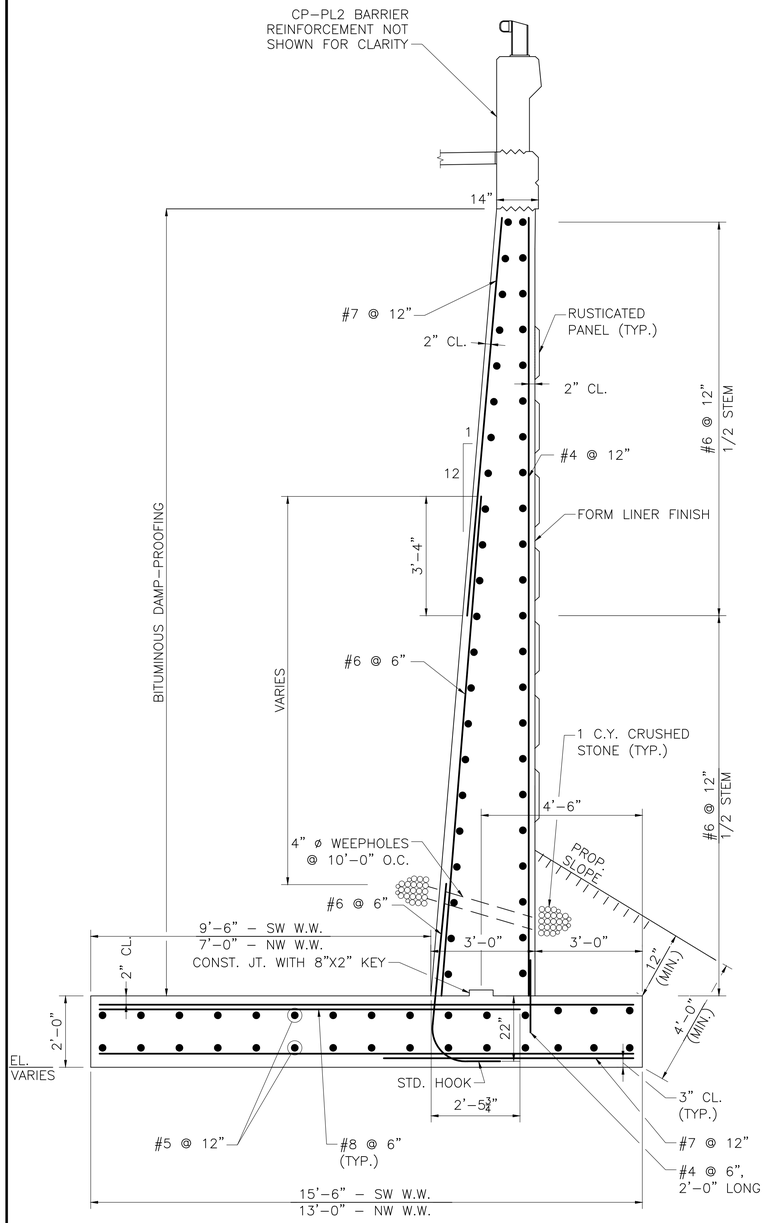
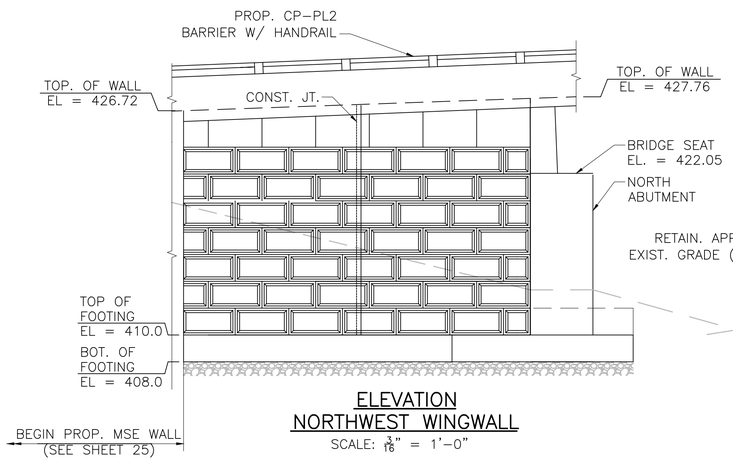
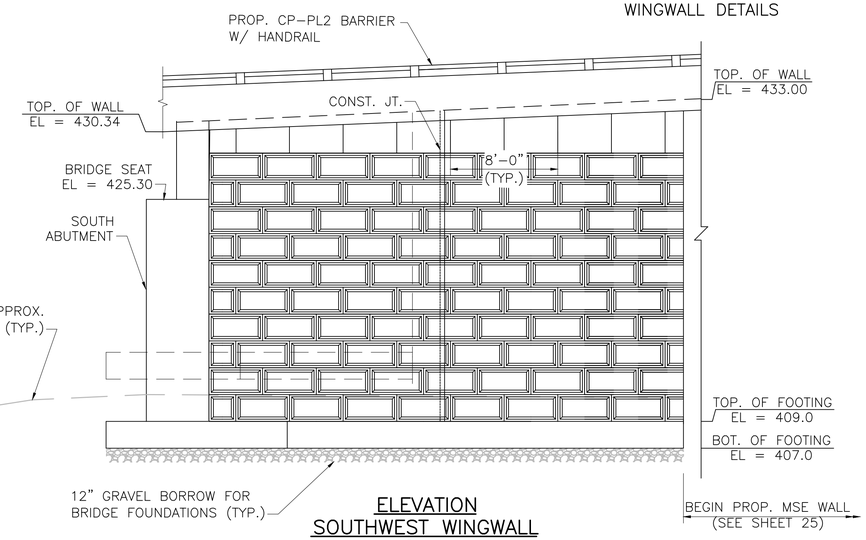
WINGWALL DETAILS



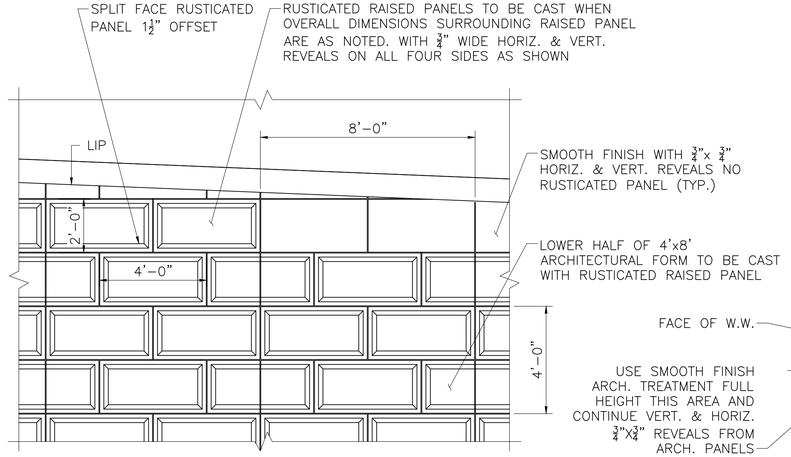
TYPICAL PROPOSED WINGWALL SECTION
SCALE: ½" = 1'-0"



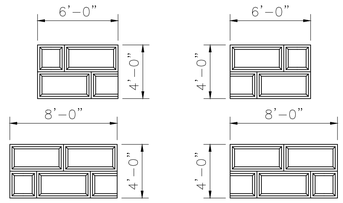
ELEVATION
NORTHWEST WINGWALL
SCALE: 3/16" = 1'-0"



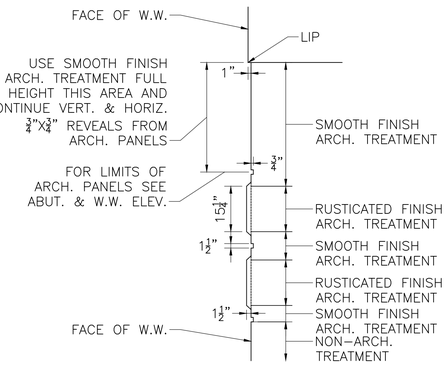
ELEVATION
SOUTHWEST WINGWALL
SCALE: 3/16" = 1'-0"



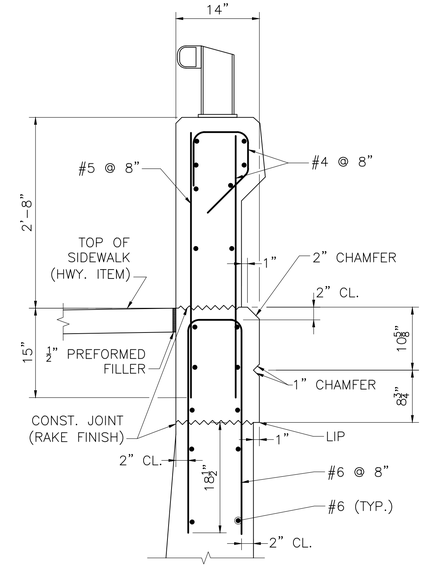
ARCHITECTURAL FINISH DETAIL
SCALE: NOT TO SCALE



END PANEL CONDITIONS DETAILS
SCALE: 3/16" = 1'-0"



TYPICAL SECTION AT WINGWALL
SCALE: NOT TO SCALE



NOTE:

SEE SECTION THRU CP-PL2 BARRIER AT SIDEWALK FOR DIMENSIONS AND REINFORCEMENT NOT SHOWN HERE.

TOP OF U-WINGWALL DETAIL AT SIDEWALK
SCALE: 1" = 1'-0"

NOTES:

1. 4" ø WEEP HOLES 10'-0" O.C. (JUST ABOVE PROTECTIVE COURSE). PROVIDE 1 CUBIC YARD OF CRUSHED STONE AT EACH END OF WEEP HOLE.
2. ALL CONCRETE SHALL BE 4000 PSI, 1½ IN, 565 CEMENT CONCRETE EXCEPT THE CP-PL2 BARRIER PARAPET, WHICH SHALL BE 5000 PSI, ¾ IN, 685 HP CEMENT CONCRETE.
3. EXTEND EVERY THIRD BAR FULL LENGTH AS SHOWN.
4. THE FACTORED BEARING PRESSURE = 3.385 KSF AS PER AASHTO STANDARD SPECIFICATION LOAD GROUP I. FACTORED BEARING RESISTANCE = 7.4 KSF. THE FACTORED BEARING RESISTANCE IS THE PRODUCT OF THE NOMINAL BEARING RESISTANCE AND RESISTANCE FACTOR OF 0.45.

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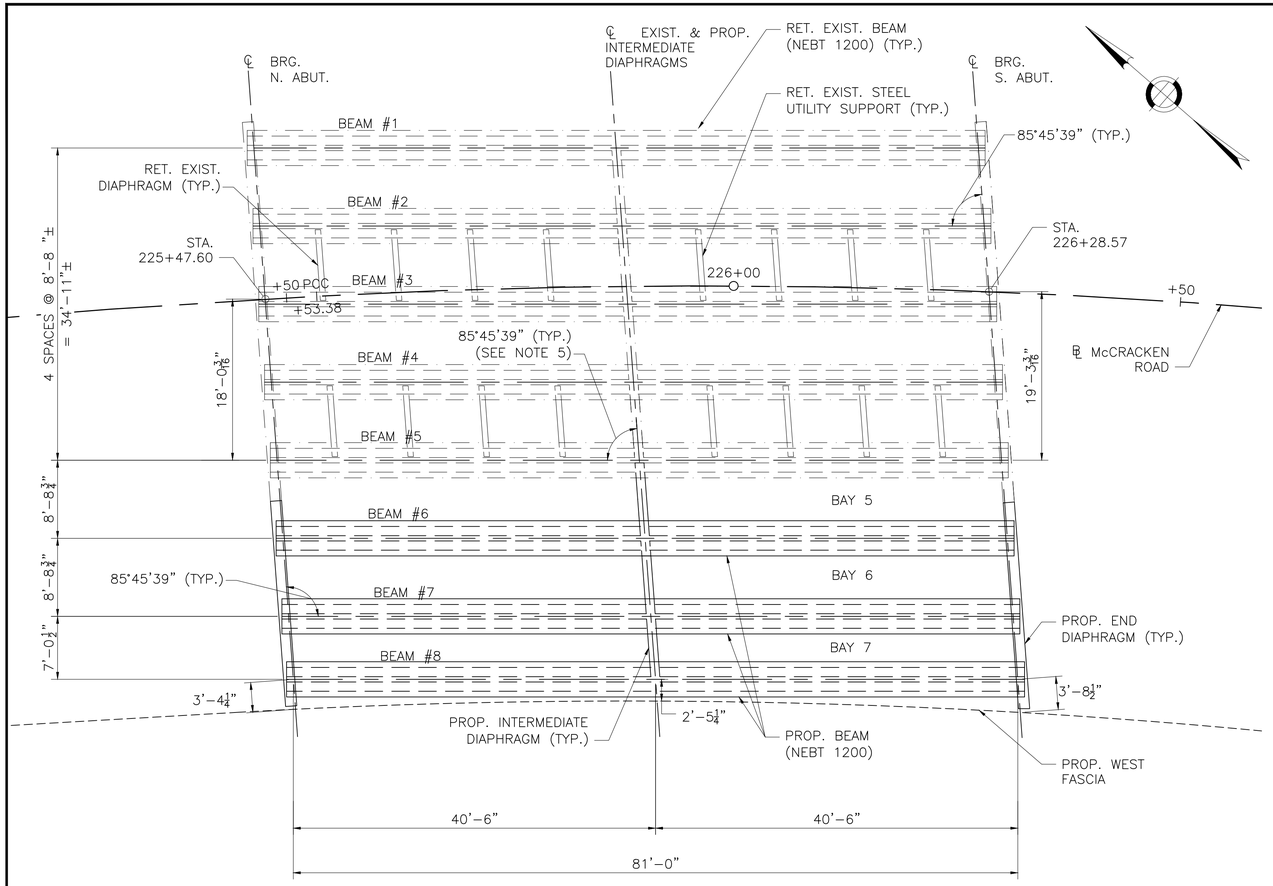
MILLBURY
McCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	94	152
PROJECT FILE NO. 605377			

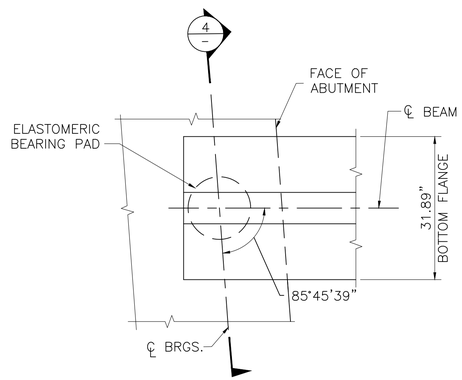
FRAMING PLAN & BEARING DETAILS



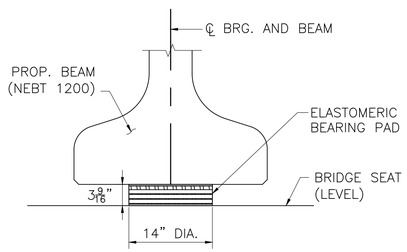
FRAMING PLAN
SCALE: 1/8" = 1'-0"

NOTES:

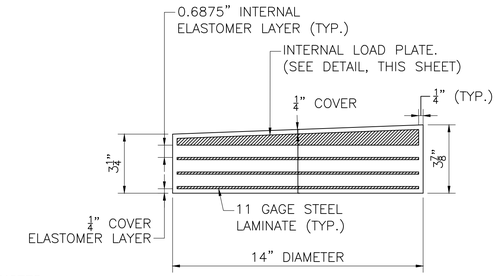
1. THE SPACING BETWEEN THE EXISTING STRINGERS IS DENOTED "±" AS THE STRINGERS HAVE ALREADY BEEN ERECTED. THE SPACING SPECIFIED ABOVE CORRESPONDS TO THE EXISTING BRIDGE PLANS.
2. REFER TO SHEETS 18 & 19 FOR END AND INTERMEDIATE DIAPHRAGM DETAILS.
3. REFER TO THE EXISTING BRIDGE PLANS FOR ADDITIONAL INFORMATION REGARDING THE EXISTING DIAPHRAGMS AND UTILITY SUPPORTS.
4. ALL DIMENSIONS SHOWN ARE SQUARE DIMENSIONS.
5. SKEW DIMENSION SHOWN IS TAKEN FROM THE CENTERLINE OF BEAM TO THE CENTERLINE OF DIAPHRAGM.



ELASTOMERIC BEARING PAD PLAN
SCALE: 3/4" = 1'-0"



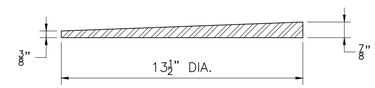
SECTION 4
SCALE: 1" = 1'-0"



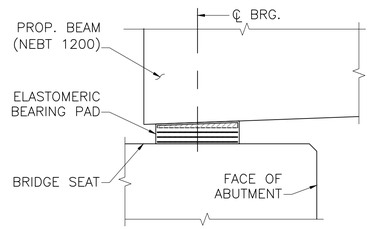
NOTES:

1. ELASTOMER SHALL HAVE A SHEAR MODULUS OF 0.160 KSI.
2. STEEL LAMINATES SHALL CONFORM TO ASTM A 1011 GRADE 36 OR HIGHER.
3. THE COMPRESSIVE DESIGN LOAD ON THE BEARING PAD IS 180.40 KIPS. THE COMPRESSIVE DESIGN STRESS IS THE RESULT OF DIVIDING THE COMPRESSIVE DESIGN LOAD BY THE AREA OF THE PAD AND IS EQUAL TO 1.17 KSI.
4. TAPERED INTERNAL LOAD PLATE SHALL CONFORM TO AASHTO M 270 GRADE 36.
5. ALL BEARINGS SHALL BE MARKED PRIOR TO SHIPPING. THE MARKS SHALL INCLUDE THE BEARING LOCATION ON THE BRIDGE, AND A 1/32" DEEP DIRECTION ARROW THAT POINTS UP-STATION. ALL MARKS SHALL BE PERMANENT AND BE VISIBLE AFTER BEARING IS INSTALLED.

ELASTOMERIC BEARING PAD
SCALE: 3" = 1'-0"



INTERNAL LOAD PLATE DETAIL
SCALE: 3" = 1'-0"



BEARING ELEVATION
SCALE: 1" = 1'-0"

APRIL 16, 2022	ISSUED FOR CONSTRUCTION
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ISSUED FOR CONSTRUCTION (SF) APRIL 16, 2022

605377_BR8_SUPERSTRUCTURE.DWG Plotted on 11-Apr-2022 8:55 AM

MILLBURY
McCRACKEN ROAD

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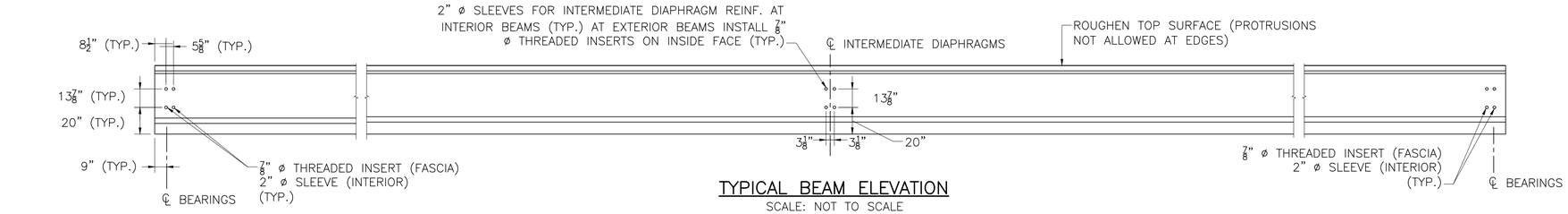
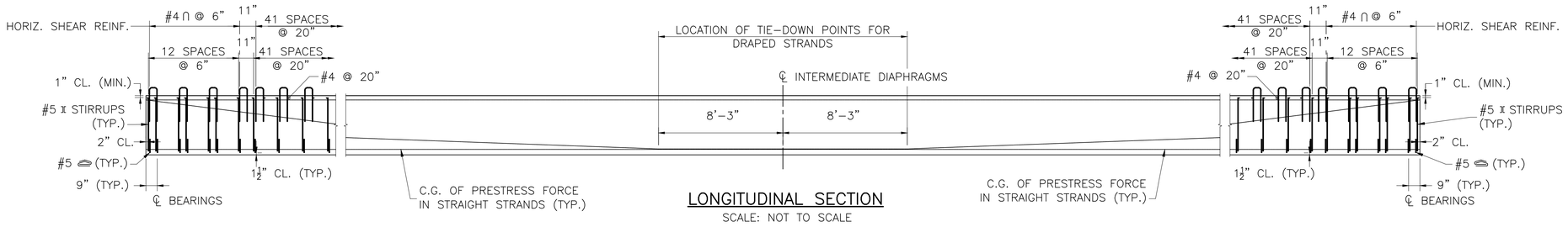
BEAM DETAILS



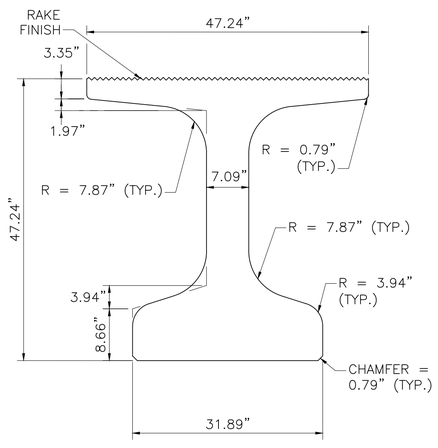
TYPICAL BEAM ELEVATION

SCALE: NOT TO SCALE



LONGITUDINAL SECTION

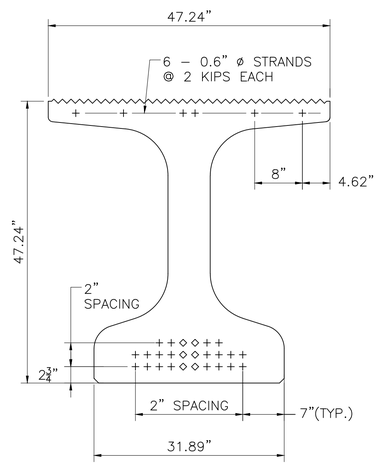
SCALE: NOT TO SCALE



NOTES:
STRANDS AND REINFORCEMENT NOT DRAWN FOR CLARITY.

TYPICAL BEAM SECTION

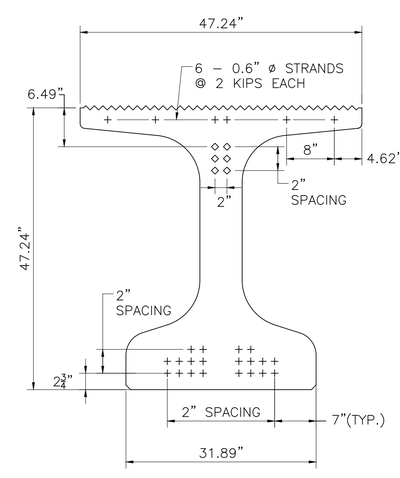
SCALE: 1" = 1'-0"



NOTES:
1. + DENOTES STRAIGHT STRANDS.
2. ◇ DENOTES DRAPED STRANDS.

TYPICAL STRAND LOCATION AT MIDSPAN

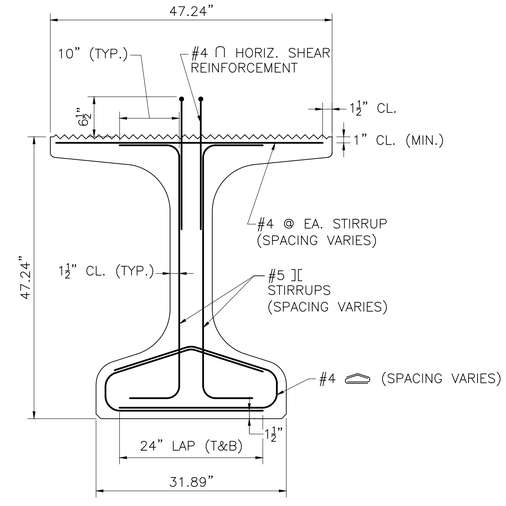
SCALE: 1" = 1'-0"



NOTES:
1. + DENOTES STRAIGHT STRANDS.
2. ◇ DENOTES DRAPED STRANDS.

TYPICAL STRAND LOCATION AT BEAM END

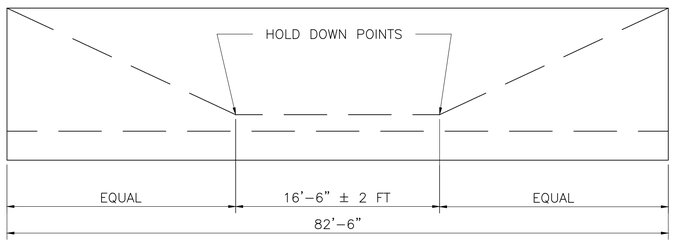
SCALE: 1" = 1'-0"



NOTES:
STRANDS NOT DRAWN FOR CLARITY.

TYPICAL BEAM REINFORCEMENT

SCALE: 1" = 1'-0"



HOLD DOWN POINTS FOR DRAPED STRANDS

SCALE: NOT TO SCALE

PRESTRESS NOTES:

1. ALL PRETENSIONING ELEMENTS SHALL BE 0.6" ø, UNCOATED, SEVEN-WIRE, LOW RELAXATION STEEL STRANDS AND SHALL CONFORM TO AASHTO M 203.
2. THE NOMINAL TENSILE STRENGTH OF THE PRETENSIONING STRANDS SHALL BE 270 KSI.
3. THE INITIAL TENSION PER 0.6" ø STRAND SHALL BE 44 KIPS, EXCEPT THE SIX STRANDS IN THE TOP FLANGE WHICH SHALL BE TENSIONED TO 2 KIPS.
4. THE MINIMUM 28 DAY COMPRESSIVE STRENGTH SHALL BE 6500 PSI.
5. NO PRESTRESS SHALL BE TRANSFERRED TO THE CONCRETE UNTIL IT HAS ATTAINED A COMPRESSIVE STRENGTH, AS SHOWN BY A CYLINDER TEST, OF AT LEAST 4500 PSI.
6. THE TOP OF ALL BEAMS SHALL BE GIVEN A RAKED FINISH (¼" AMPLITUDE) ACROSS THE WIDTH (PERPENDICULAR TO THE BEAM'S AXIS).
7. THE FABRICATOR IS FULLY RESPONSIBLE FOR THE DESIGN OF THE LIFTING DEVICES WHICH SHALL BE ADEQUATE FOR THE SAFETY FACTORS REQUIRED BY THE ERECTION PROCEDURE.

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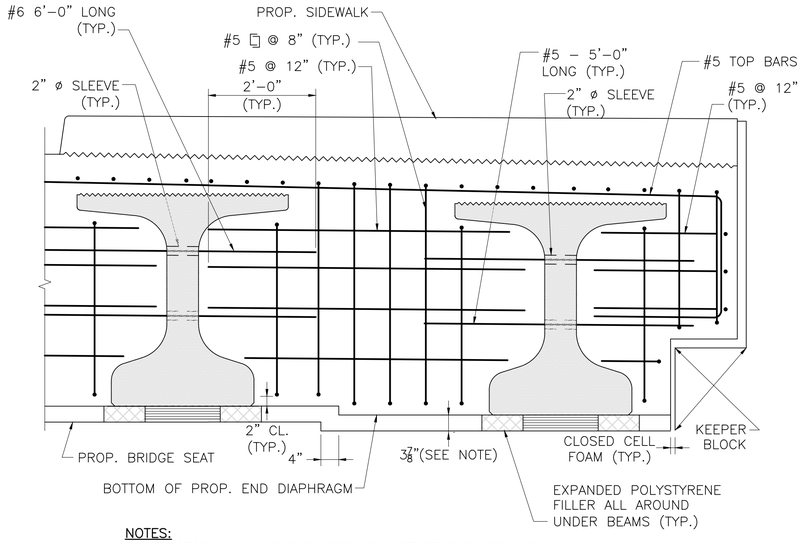
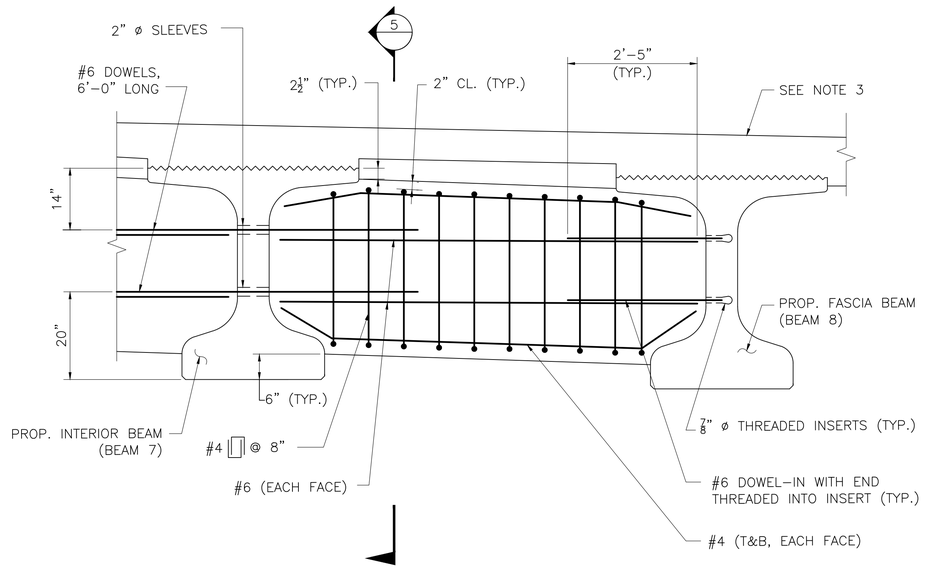
DIAPHRAGM DETAILS (1 OF 2)



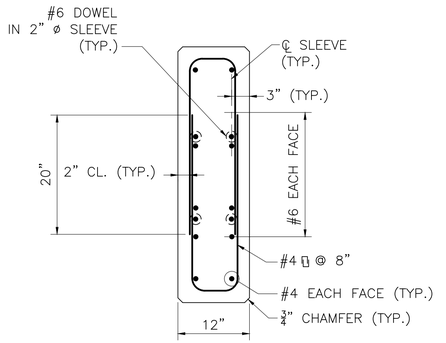
NOTES:
CONTRACTOR MAY USE EXPANDED POLYSTYRENE FILLER OR A REMOVABLE FORM TO FORM THE BOTTOM OF THE END DIAPHRAGM.

END DIAPHRAGM ELEVATION – BAY 7
SCALE: ¾" = 1'–0"

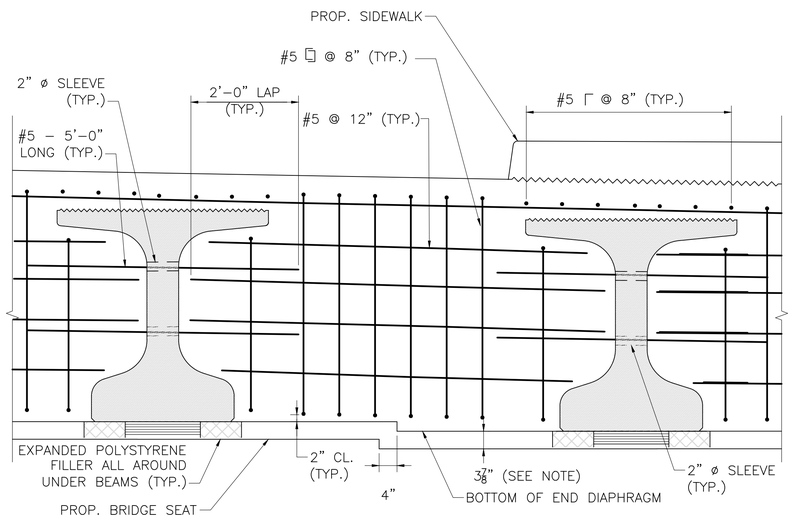


NOTES:
1. SLEEVES AND INSERTS SHALL BE ALIGNED WITH DIAPHRAGM SKEWS AS SHOWN ON THE FRAMING PLAN.
2. ⅞" ø THREADED INSERTS SHALL BE CAST INTO THE PRECAST BEAMS BY THE FABRICATOR AND SHALL PROVIDE A MINIMUM NOMINAL TENSILE RESISTANCE OF 21.0 KIPS AND A MINIMUM NOMINAL SHEAR RESISTANCE OF 21.0 KIPS IN 3000 PSI CONCRETE.
3. SIDEWALK AND SIDEWALK BARRIER NOT SHOWN FOR CLARITY.

INTERMEDIATE DIAPHRAGM – BAY 7
SCALE: ¾" = 1'–0"

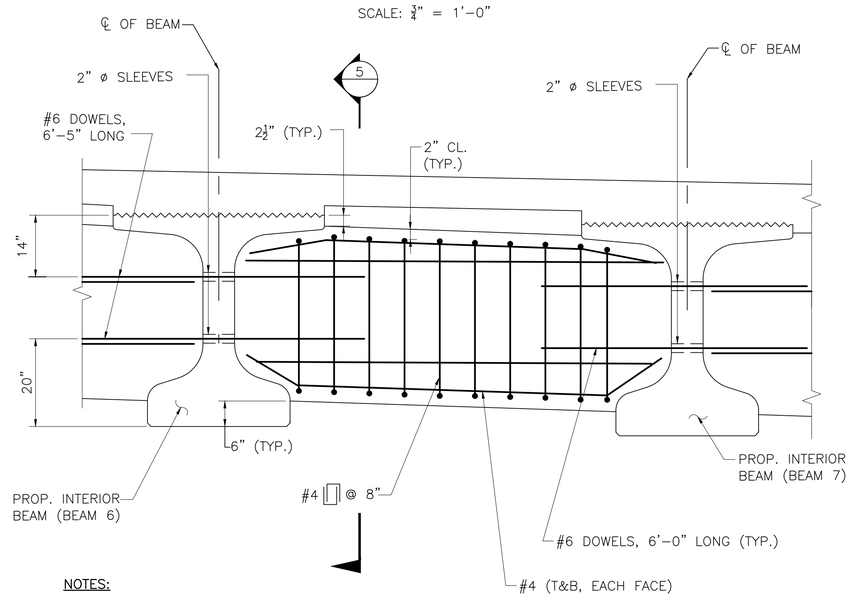


SECTION 5
SCALE: 1" = 1'–0"



NOTES:
CONTRACTOR MAY USE EXPANDED POLYSTYRENE FILLER OR A REMOVABLE FORM TO FORM THE BOTTOM OF THE END DIAPHRAGM.

END DIAPHRAGM ELEVATION BAY 6
SCALE: ¾" = 1'–0"



NOTES:
1. SLEEVES AND INSERTS SHALL BE ALIGNED WITH DIAPHRAGM SKEWS AS SHOWN ON THE FRAMING PLAN.
2. ⅞" ø THREADED INSERTS SHALL BE CAST INTO THE PRECAST BEAMS BY THE FABRICATOR AND SHALL PROVIDE A MINIMUM NOMINAL TENSILE RESISTANCE OF 21.0 KIPS AND A MINIMUM NOMINAL SHEAR RESISTANCE OF 21.0 KIPS IN 3000 PSI CONCRETE.
3. SIDEWALK AND SIDEWALK BARRIER NOT SHOWN FOR CLARITY.

INTERMEDIATE DIAPHRAGM DETAIL – BAY 6
SCALE: ¾" = 1'–0"

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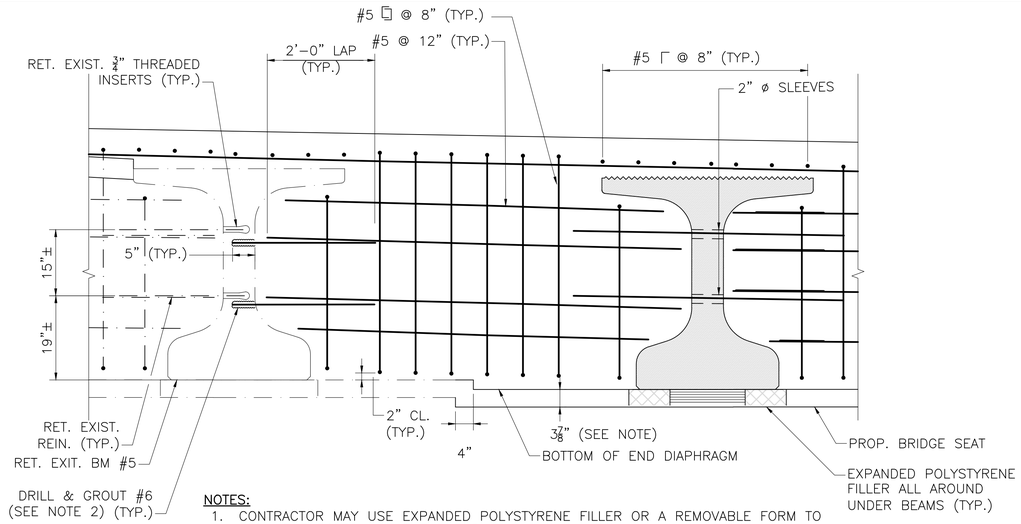
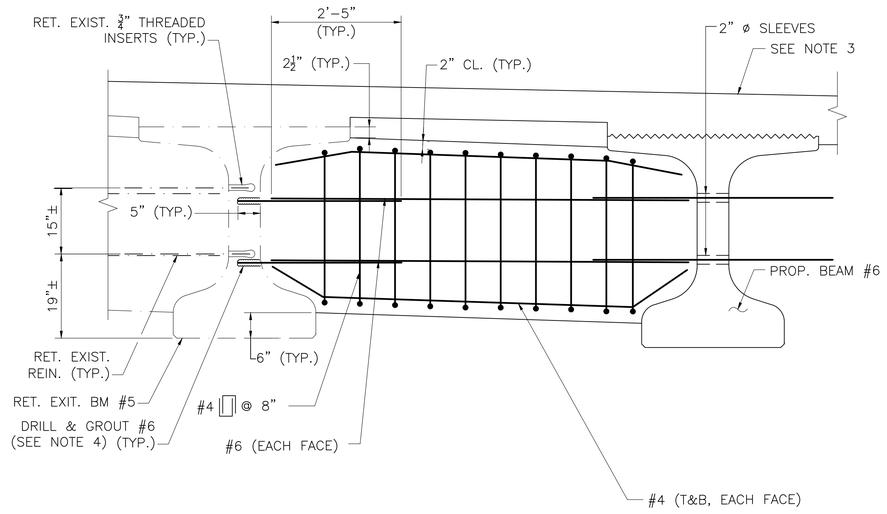


NOTES:

1. CONTRACTOR MAY USE EXPANDED POLYSTYRENE FILLER OR A REMOVABLE FORM TO FORM THE BOTTOM OF THE END DIAPHRAGM.
2. PRIOR TO DRILLING INTO THE EXISTING BEAM'S WEB, THE CONTRACTOR SHALL LOCATE ALL REINFORCING BARS AND PRESTRESSING TENDONS USING NON-DESTRUCTIVE MEANS. THE CONTRACTOR SHALL ADJUST THE LOCATION AS NEEDED. THE CONTRACTOR SHALL NOT DRILL THROUGH EXISTING STEEL REINFORCING, PRESTRESSING STRANDS, OR INSERTS CAST INTO PRECAST BEAMS WHEN INSTALLING THE DOWELS. FILL ANY HOLES WHERE OBSTRUCTIONS WERE ENCOUNTERED WITH CONSTRUCTION GROUT FROM MASSDOT QUALIFIED CONSTRUCTION MATERIALS LIST (QCML).

END DIAPHRAGM ELEVATION BAY 5

SCALE: ¾" = 1'-0"

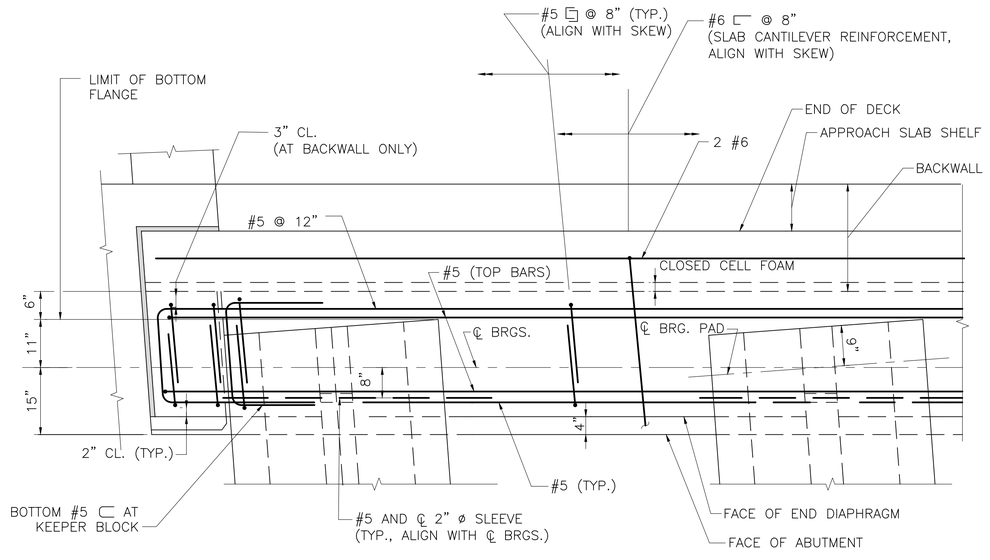


NOTES:

1. SLEEVES AND INSERTS SHALL BE ALIGNED WITH DIAPHRAGM SKEWS AS SHOWN ON THE FRAMING PLAN.
2. ⅞" ø THREADED INSERTS SHALL BE CAST INTO THE PRECAST BEAMS BY THE FABRICATOR AND SHALL PROVIDE A MINIMUM NOMINAL TENSILE RESISTANCE OF 21.0 KIPS AND A MINIMUM NOMINAL SHEAR RESISTANCE OF 21.0 KIPS IN 3000 PSI CONCRETE.
3. SIDEWALK AND SIDEWALK BARRIER NOT SHOWN FOR CLARITY.
4. PRIOR TO DRILLING INTO THE EXISTING BEAM'S WEB, THE CONTRACTOR SHALL LOCATE ALL REINFORCING BARS AND PRESTRESSING TENDONS USING NON-DESTRUCTIVE MEANS. THE CONTRACTOR SHALL ADJUST THE LOCATION AS NEEDED. THE CONTRACTOR SHALL NOT DRILL THROUGH EXISTING STEEL REINFORCING, PRESTRESSING STRANDS, OR INSERTS CAST INTO PRECAST BEAMS WHEN INSTALLING THE DOWELS. FILL ANY HOLES WHERE OBSTRUCTIONS WERE ENCOUNTERED WITH CONSTRUCTION GROUT FROM MASSDOT QUALIFIED CONSTRUCTION MATERIALS LIST (QCML).

INTERMEDIATE DIAPHRAGM – BAY 5

SCALE: ¾" = 1'-0"



END DIAPHRAGM PLAN

SCALE: ¾" = 1'-0"

MILLBURY
McCRACKEN ROAD

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DIAPHRAGM DETAILS (2 OF 2)

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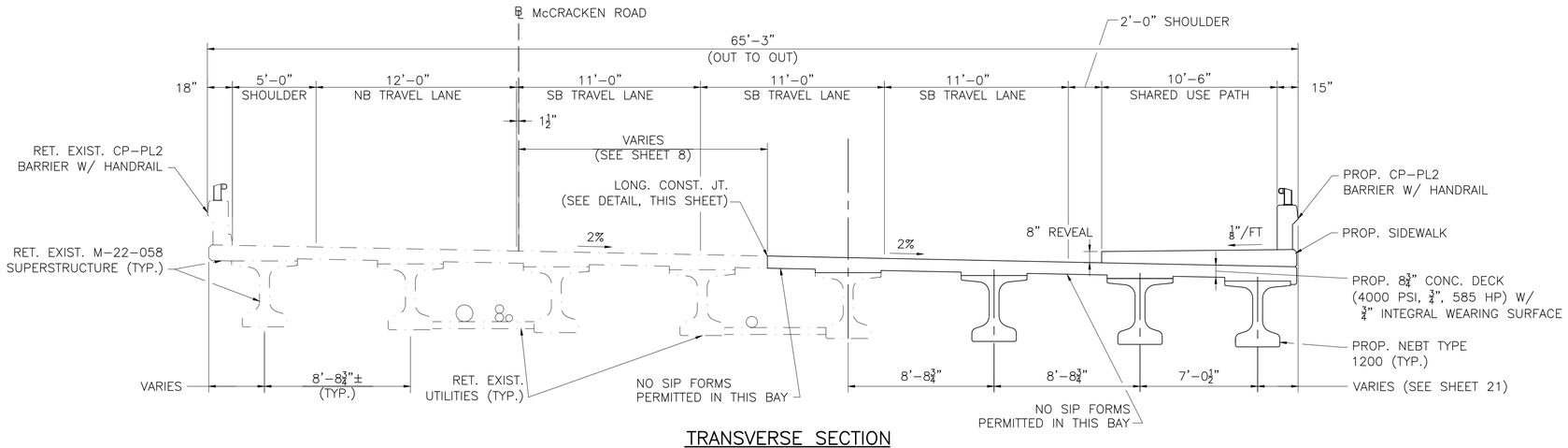
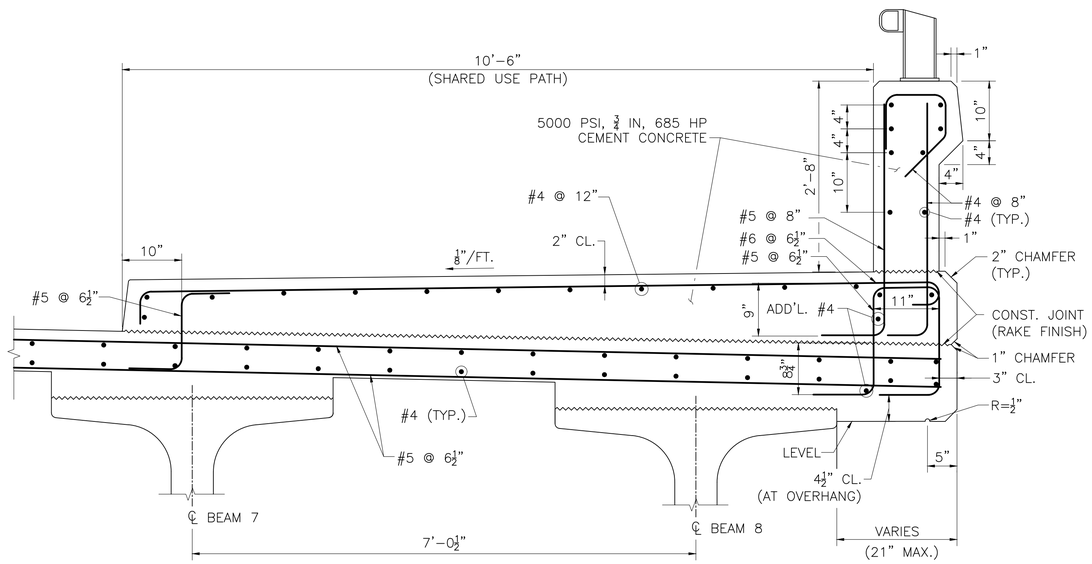
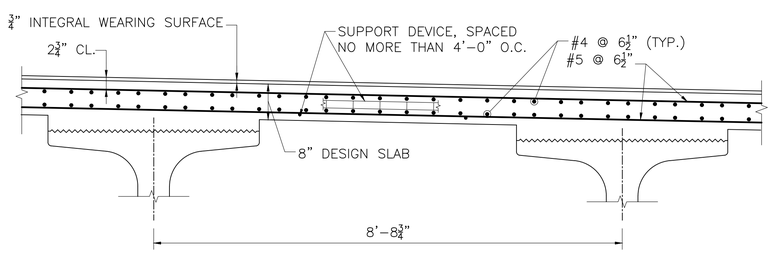
TRANSVERSE SECTION



TRANSVERSE SECTION
SCALE: ¼" = 1'-0"



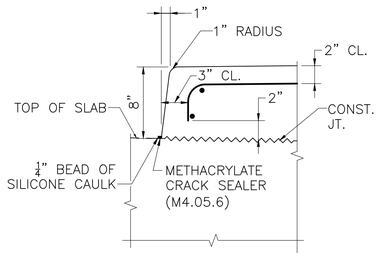
SECTION THRU SIDEWALK
SCALE: 1" = 1'-0"



NOTES:
1. ROADWAY DECK SLAB SHALL BE 4000 PSI, ¾ IN, 585 HP CEMENT CONCRETE.
2. LONGITUDINAL REINFORCEMENT SHALL BE PLACED PARALLEL TO THE ℄ OF CONSTRUCTION. TRANSVERSE (PRIMARY) REINFORCEMENT SHALL BE PLACED PERPENDICULAR TO THE ℄ OF CONSTRUCTION.
3. ALL REINFORCEMENT AND SUPPORT DEVICES SHALL BE COATED.
4. BRIDGE DECK SHALL BE GROOVED TRANSVERSELY USING MULTI-BLADED SELF-PROPELLED SAWCUTTING EQUIPMENT.

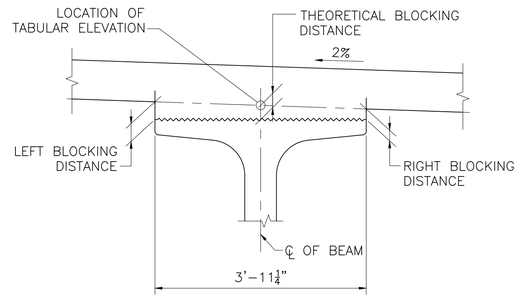
TYPICAL DECK REINFORCEMENT
SCALE: ¾" = 1'-0"

BEAM NO.	BLOCKING DISTANCE L	BLOCKING DISTANCE R
5	0.47"	-0.47"
6	0.47"	-0.47"
7	0.47"	-0.47"
8	0.47"	-0.47"



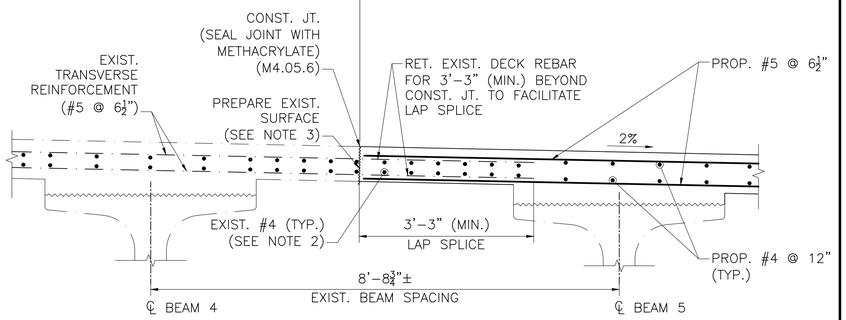
NOTES:
1. METHACRYLATE CRACK SEALER SHALL BE APPLIED AFTER SIDEWALK OR SAFETY CURB/BARRIER CURING PERIOD IS COMPLETE AND IN ACCORDANCE WITH REQUIREMENTS OF MANUFACTURER AND THE STANDARD SPECIFICATIONS.
2. BEFORE SEALING, THE CONCRETE AT THE INTERFACE OF DECK AND CURB SHALL BE SWEPT CLEAN AND BLOWN OFF USING OIL FREE COMPRESSED AIR IMMEDIATELY PRIOR TO APPLYING THE SEALER.
3. APPLY ¼" HIGH BEAD OF SILICONE CAULKING COMPOUND ABOUT ¼" FROM THE FACE OF CURB.
4. METHACRYLATE SHALL THEN BE POURED INTO THE ¼" WIDE GAP BETWEEN THE FACE OF CURB AND THE BEAD OF CAULK.
5. CURB AT SIDEWALK SHOWN. SAFETY CURB IS SIMILAR.

FACE OF CURB DETAILS
SCALE: 1½" = 1'-0"



NOTES:
1. THE RIGHT AND LEFT ORIENTATION IS TAKEN LOOKING UPSTATION ALONG THE BEAM.
2. RIGHT BLOCKING DISTANCE = THEORETICAL BLOCKING DISTANCE + "R"
   LEFT BLOCKING DISTANCE = THEORETICAL BLOCKING DISTANCE + "L"

HAUNCH DETAIL
SCALE: ¾"= 1'-0"



NOTES:
1. THE EXISTING TRANSVERSE REINFORCEMENT (#5 BARS @ 6½") MUST BE RETAINED TO FACILITATE A MINIMUM LAP SPLICE OF 3'-3" WITH THE PROPOSED TRANSVERSE REINFORCEMENT (#5 BARS @ 6½"). APPLY EPOXY COATING PAINT AS NEEDED TO ALL EXPOSED REINFORCING. EXISTING TRANSVERSE REINFORCING WHICH WILL NOT BE EMBEDDED AFTER THE DECK DEMOLITION MAY BE RE-USED.
2. THE EXISTING LONGITUDINAL REINFORCEMENT (#4 BARS) SHALL BE RETAINED TO THE GREATEST EXTENT PRACTICABLE. THE FIRST PROPOSED LONGITUDINAL BAR SHALL BE PLACED 12" BEYOND THE LAST RETAINED BAR.
3. THE SURFACE OF THE PREVIOUSLY CAST CONCRETE SHALL BE BLAST CLEANED, ROUGHENED, WETTED WITH CLEAN WATER AND THEN FLUSHED WITH A MORTAR COMPOSED OF EQUAL PARTS OF THE CEMENT AND SAND SPECIFIED FOR THE NEW CONCRETE DECK. FRESH CONCRETE SHALL BE PLACED BEFORE MORTAR HAS TAKEN SET.
4. IN LIEU OF THE MORTAR, AN EPOXY ADHESIVE SUITABLE FOR BONDING FRESH CONCRETE TO HARDENED CONCRETE FOR LOAD BEARING APPLICATIONS MAY BE USED. THE EPOXY ADHESIVE SHALL CONFORM TO AASHTO M 235 TYPE V AND SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

DETAIL AT LONGITUDINAL CONSTRUCTION JOINT
SCALE: ¾" = 1'-0"

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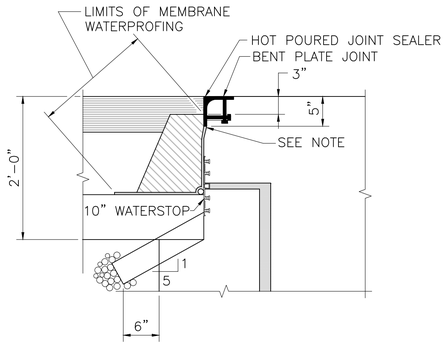
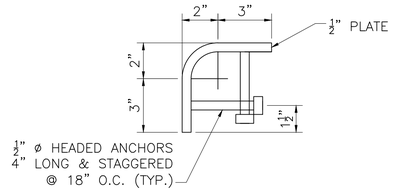
DECK DETAILS



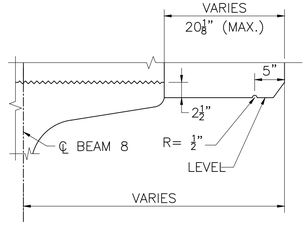
NOTE:
SEAL MEMBRANE TO BOTTOM OF BENT PLATE

DETAILS AT ABUTMENT FOR EXPOSED CONCRETE DECKS
SCALE: 1" = 1'-0"



NOTE:
PROPOSED BENT PLATE TO BE FIELD WELDED TO EXISTING BENT PLATE USING ¼" BUTT WELD. WELD TO BE GROUND SMOOTH TO THE SATISFACTION OF THE ENGINEER. AFTER WELD HAS BEEN GROUND SMOOTH, EXISTING JOINT SEALER BEHIND BENT PLATE TO BE REMOVED, AND HOT POURED JOINT SEALER TO BE INSTALLED FULL WIDTH. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO ITEM 992.1

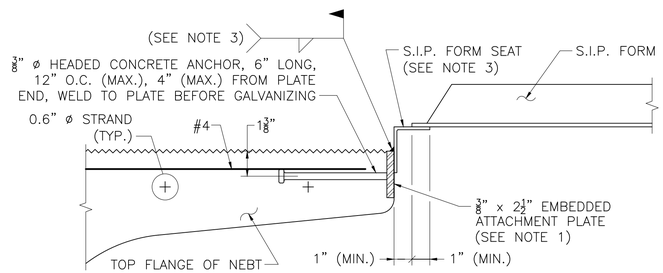
BENT PLATE DETAIL
SCALE: 3" = 1'-0"



SLAB OVERHANG AT FASCIA BEAM
SCALE: 1" = 1'-0"

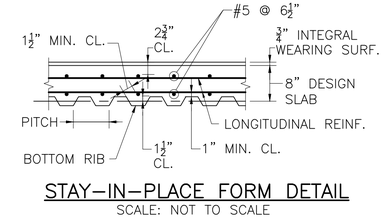
BEAM NO.	TOP OF FORM ELEVATIONS FOR DECK SLAB PRIOR TO PLACEMENT OF CONCRETE — INCREASING STATIONS →								
	℄ BRG.	1/8 PT.	1/4 PT.	3/8 PT.	1/2 PT.	5/8 PT.	3/4 PT.	7/8 PT.	℄ BRG.
6	426.76	426.89	427.60	427.99	428.38	428.78	429.18	429.57	429.99
7	426.59	426.71	427.42	427.81	428.21	428.60	429.00	429.39	429.81
8	426.45	426.58	427.29	427.68	428.08	428.47	428.87	429.25	429.67

NOTES:
AFTER THE BEAMS ARE ERECTED BUT BEFORE THE FORMS ARE BUILT, ELEVATIONS ON TOP OF THE FLANGE OF THE BEAMS ARE TO BE OBTAINED AT THE POINTS INDICATED IN THE TABLE. THE DIFFERENCE BETWEEN THE ELEVATIONS OBTAINED AND THOSE SHOWN IN THE TABLE GIVES THE ACTUAL BLOCKING DISTANCE FROM THE TOP OF BEAM TO THE BOTTOM OF THE SLAB AT CENTER LINE OF BEAM.



NOTES:
1. EMBEDDED ATTACHMENT PLATES SHALL BE HOT-DIP GALVANIZED AASHTO M 270 GRADE 36 STEEL. THE PLATES SHALL BE IN LENGTHS FROM 3' TO 13' WITH PIECES BUTTED TOGETHER WITHOUT END CONNECTIONS FOR FULL LENGTH OF BEAM. THE HEADED ANCHORS SHALL BE ATTACHED TO THE PLATES PRIOR TO GALVANIZING.
2. HEADED ANCHORS SHALL CONFORM TO M8.04.1 FOR MATERIAL REQUIREMENTS ONLY.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF THE S.I.P. FORM SEAT AND WELD.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING THE CONCRETE LAITANCE FROM THE ATTACHMENT PLATE BEFORE INSTALLING THE S.I.P. FORMS.

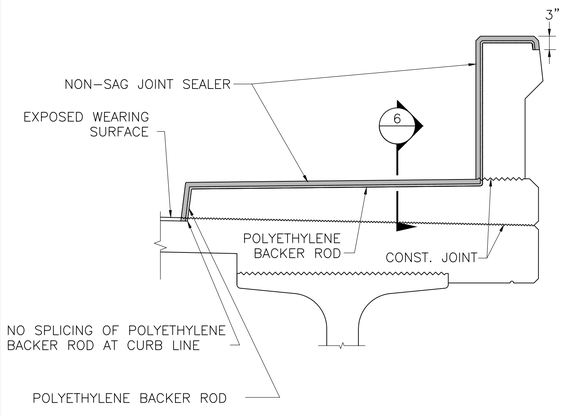
STAY-IN-PLACE FORM ATTACHMENT DETAIL
SCALE: 3" = 1'-0"



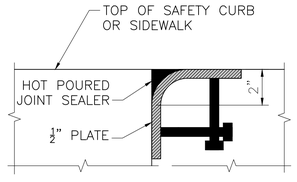
STAY-IN-PLACE FORM DETAIL
SCALE: NOT TO SCALE

NOTES:
1. FOR 2" S.I.P. FORM, SET BOTTOM OF FORM 1" BELOW ELEVATION GIVEN IN TABLE. FOR 3" S.I.P. FORM, SET BOTTOM OF FORM 1½" BELOW TABLE ELEVATIONS.
2. FORM ENDS SHALL BE CRIMPED CLOSED IN A TAPERED MANNER. SEPARATE END CLOSURE PIECES WILL NOT BE ALLOWED.
3. SUPPORT ANGLES SHALL BE PLACED IN THE "LEG DOWN" POSITION WHERE POSSIBLE. WHERE "LEG UP" POSITION IS NECESSARY, THE UPPER MOST PORTION OF THE ANGLE SHALL NOT PROJECT MORE THAN 1" ABOVE THE TOP FLANGE OR COVER PLATE. THE CONTRACTOR SHALL HAVE AN ASSORTMENT OF ANGLES OF VARIOUS SIZES AVAILABLE ON THE SITE TO CONFORM TO THIS REQUIREMENT.
4. ALL MAIN STEEL REINFORCEMENT IN THE LOWER MAT SHALL BE CENTERED OVER THE VALLEY OF THE S.I.P. FORM.
5. CONTRACTOR SHALL DESIGN AND DETAIL ALL ELEMENTS OF THE FORMING SYSTEM AND SHALL SUBMIT TO THE ENGINEER FOR APPROVAL.
6. IN CASES WHERE STANDARD 2" OR 3" DEEP S.I.P. FORMS DO NOT SATISFY DESIGN REQUIREMENTS AN ALTERNATIVE FORMING SYSTEM CONSISTING OF DEEPER S.I.P. FORMS OR REMOVABLE FORMS SHALL BE DESIGNED AND DETAILED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL. THE DESIGN THICKNESS OF THE SLAB SHALL NOT BE REDUCED.

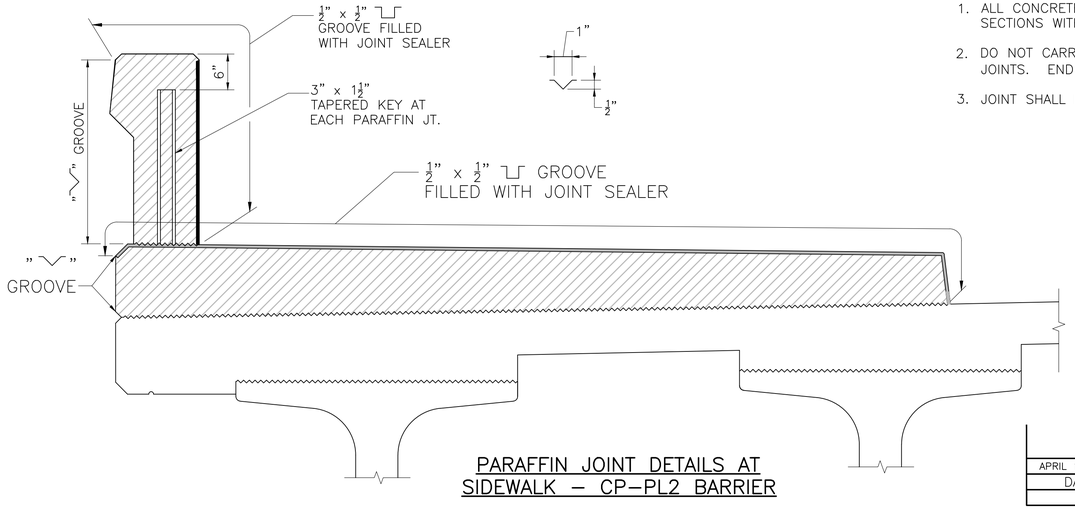
PARAFFIN JOINT NOTES:
1. ALL CONCRETE ABOVE SLAB SHALL BE POURED IN ALTERNATING SECTIONS WITH NOT LESS THAN 3 DAYS BETWEEN POURS.
2. DO NOT CARRY LONGITUDINAL BARS THROUGH THE PARAFFIN JOINTS. END THE REINFORCEMENT 2" CLEAR OF JOINT.
3. JOINT SHALL BE SQUARE TO FACE OF CURB.



JOINT DETAIL AT CP-PL2 BARRIER
SCALE: ¾" = 1'-0"



SECTION 6
SCALE: 3" = 1'-0"



PARAFFIN JOINT DETAILS AT SIDEWALK – CP-PL2 BARRIER
SCALE: 1"=1'-0"

DATE	DESCRIPTION
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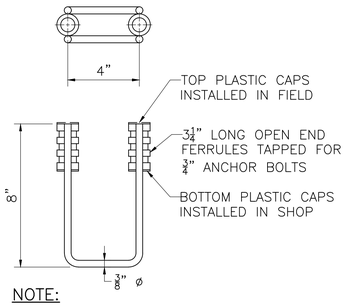
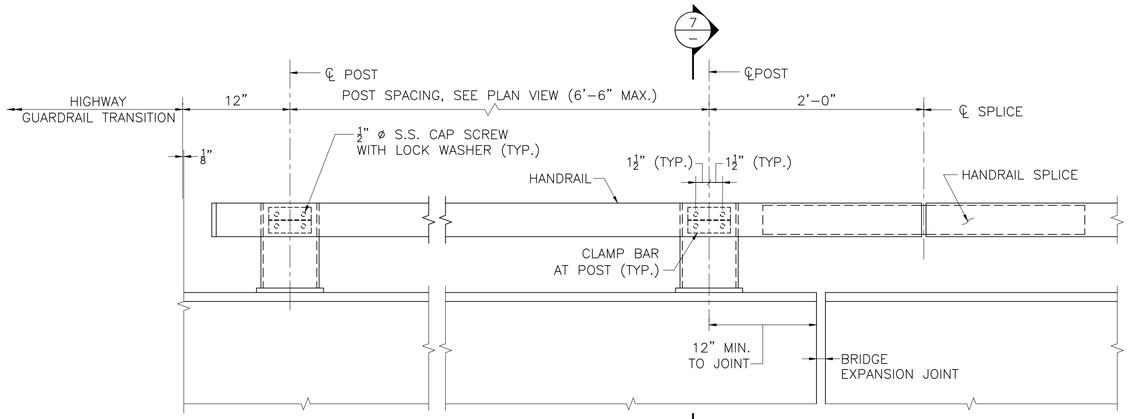
PROJECT FILE NO. 605377			

HAND RAIL DETAILS

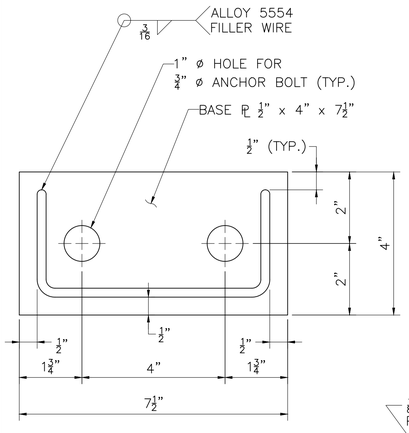


NOTE:
GALVANIZED OR ELECTROPLATE FINISH.

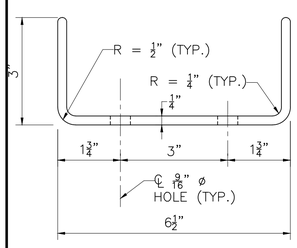
ANCHOR CAGE
SCALE: 3" = 1'-0"



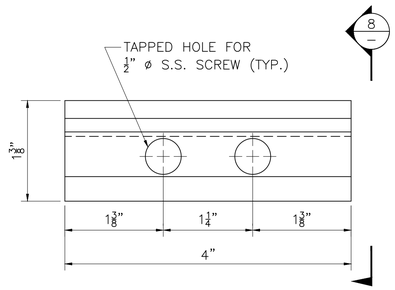
HANDRAIL ELEVATION
SCALE: 1 1/2" = 1'-0"



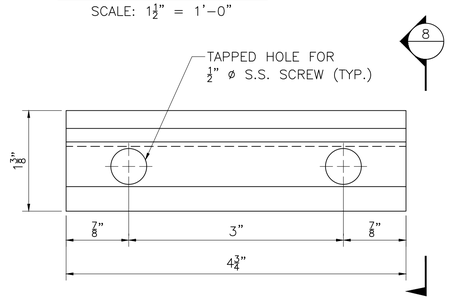
BASE PLATE DETAIL
SCALE: 6" = 1'-0"



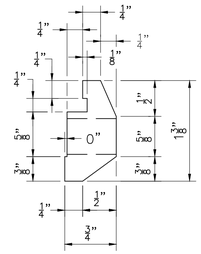
POST DETAIL
SCALE: 6" = 1'-0"



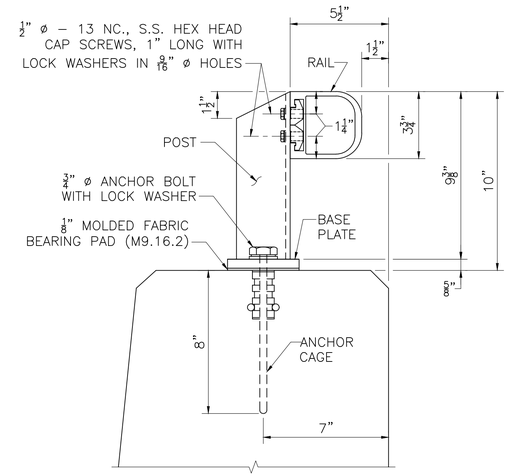
CLAMP BAR AT CONCRETE CLIP
FULL SIZE



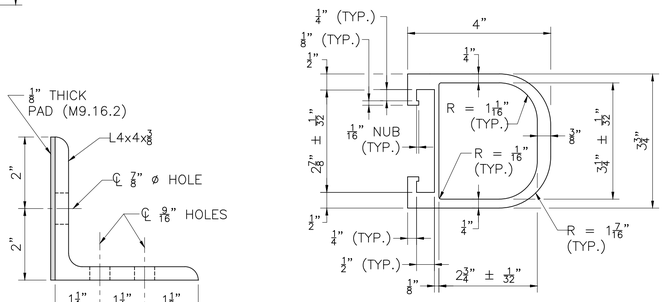
CLAMP BAR AT POST
FULL SIZE



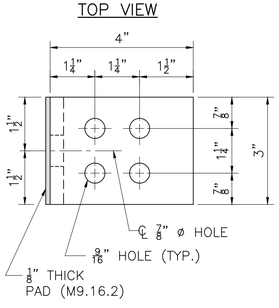
SECTION 8
FULL SIZE



SECTION 7
SCALE: 3" = 1'-0"

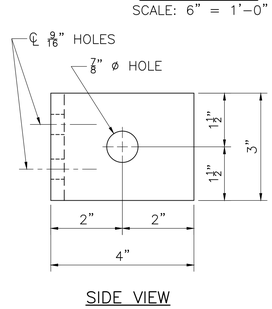


RAIL DETAIL
SCALE: 6" = 1'-0"



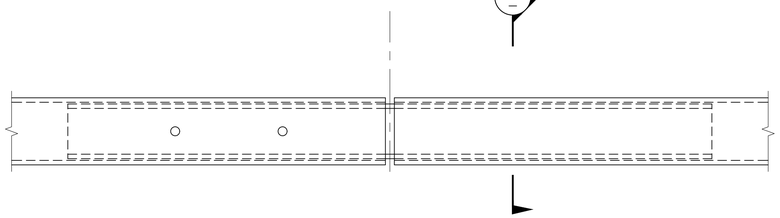
TOP VIEW

ELEVATION

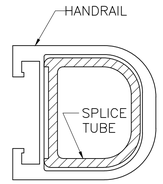


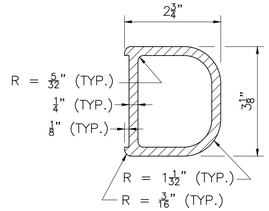
SIDE VIEW

CONCRETE CLIP
SCALE: 6" = 1'-0"



SECTION 9
SCALE: 6" = 1'-0"





SPLICE TUBE
SCALE: 6" = 1'-0"

FINISH:

POSTS, RAILS, BASE PLATES, CONCRETE CLIP AND SPLICE TUBE SHALL RECEIVE A PURPLE ANODIZED FINISH TO MATCH THE EXISTING HANDRAIL.

MATERIALS:

RAIL, POST AND BASE PLATE	ASTM B 221, ALLOY 6061-T6 (SEE NOTE 5)
CLAMP BAR, RAIL SPLICE AND CONC. CLIP	ASTM B 221, ALLOY 6061-T6
S.S. FASTENERS	ASTM A 193 GRADE B8 (TYPE 403)
ANCHOR BOLTS	AASHTO M 164 GALVANIZED (ROTATION CAPACITY TEST NOT REQUIRED)
ALUMINUM WASHERS	ASTM B 209 ALLOY ALCLAD 2024-T4

GENERAL NOTES:

1. RAILS SHALL BE CONTINUOUS OVER A MINIMUM OF FOUR POST, IF POSSIBLE.
2. RAILS SHALL HAVE A HANDRAIL SPLICE IN THE PANEL OVER A BRIDGE EXPANSION JOINT. 1/2" GAP SHALL BE INCREASE AS REQUIRED.
3. OTHER CONFIGURATIONS OF THE INTERNAL WALLS OF THE RAIL EXTRUSION MAY BE SUBMITTED FOR APPROVAL.
4. AT 45° MITRES, TRIM OFF 1/16" NUB ON VERTICAL RAIL SECTION AS NEEDED TO ALLOW BOTTOM HORIZONTAL CLAMP BAR TO PROPERLY ENGAGE THE HORIZONTAL RAIL.
5. THE CONTRACTOR MAY SUBSTITUTE MATERIALS FOR AN APPROVED EQUAL SUBJECT TO THE REVIEW AND APPROVAL OF THE ENGINEER.

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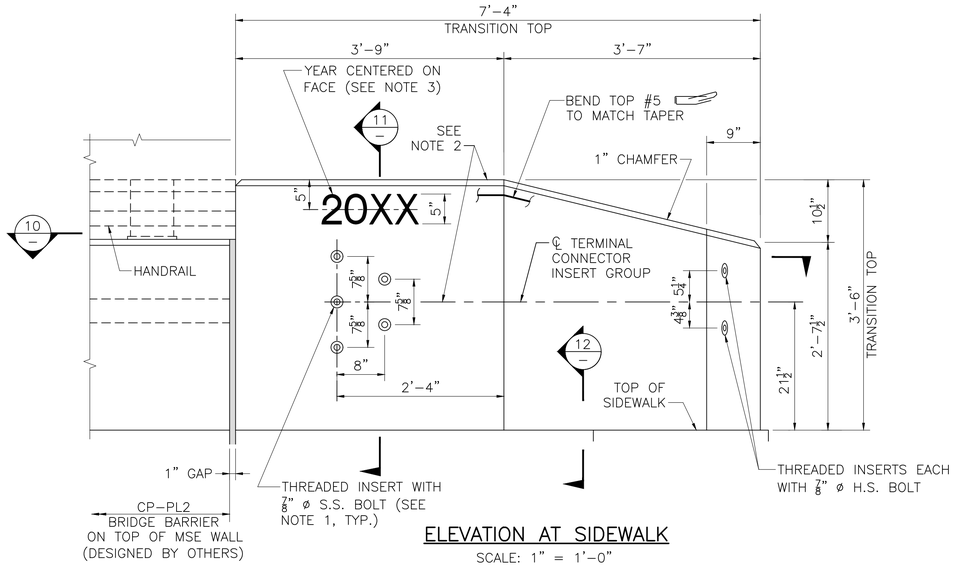
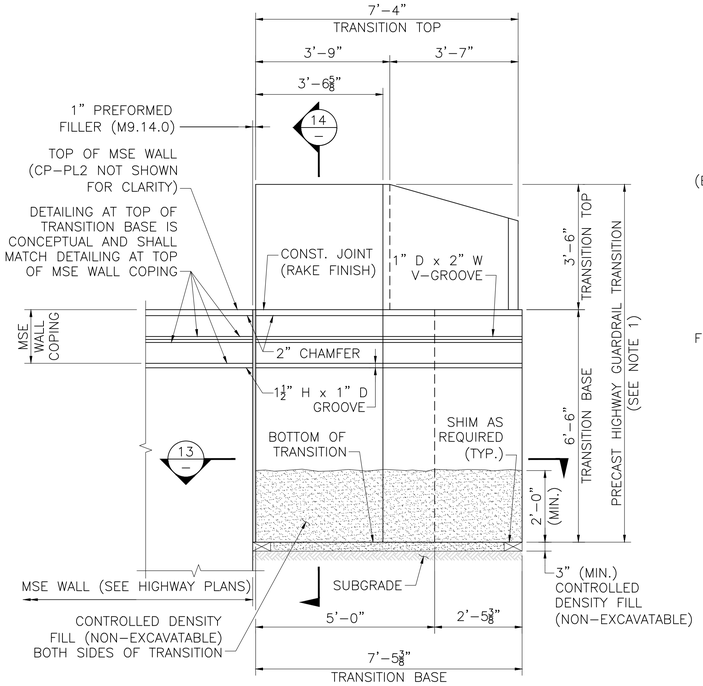


ELEVATION AT SIDEWALK

SCALE: 1" = 1'-0"

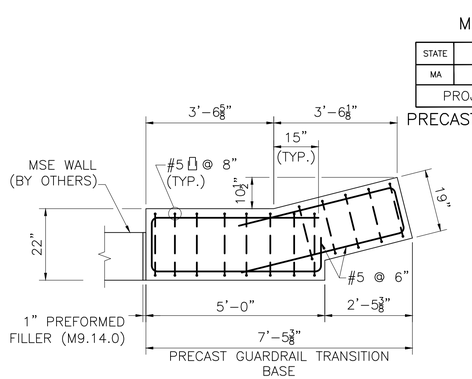


NOTES:

1. PRECAST GUARDRAIL TRANSITION SHALL BE 5000 PSI, ¾ IN, 685 HP CEMENT CONCRETE.
2. GRAVEL BORROW SHALL BE PLACED AND THOROUGHLY COMPACTED TO THE GRADE OF 3" (MIN.) BELOW THE INTENDED BOTTOM OF THE PRECAST GUARDRAIL TRANSITION BASE AND TO A HEIGHT OF 2'-0" (MIN.) ON ALL SIDES OF THE TRANSITION BASE TO FORM A TRENCH IN WHICH TO SET THE TRANSITION. WHERE NO GRAVEL BORROW IS REQUIRED BELOW THE BASE, IT SHALL BE PLACED ON UNDISTURBED SOIL.
3. CONTRACTOR SHALL SET THE PRECAST GUARDRAIL TRANSITION TO THE REQUIRED ELEVATION AND ALIGNMENT, AND BACKILL PRECAST GUARDRAIL TRANSITION WITH CONTROLLED DENSITY FILL (NON-EXCAVATABLE) TO THE ELEVATION SHOWN.

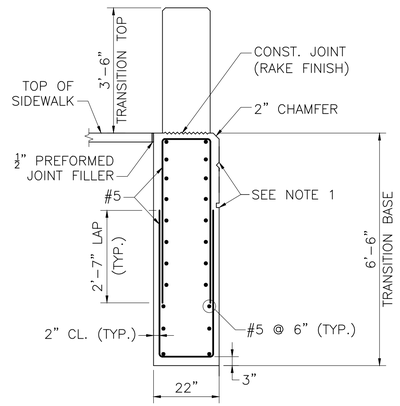
PRECAST GUARDRAIL TRANSITION ELEVATION AT U-WINGWALL

SCALE: ½" = 1'-0"



SECTION 13

SCALE: ½" = 1'-0"

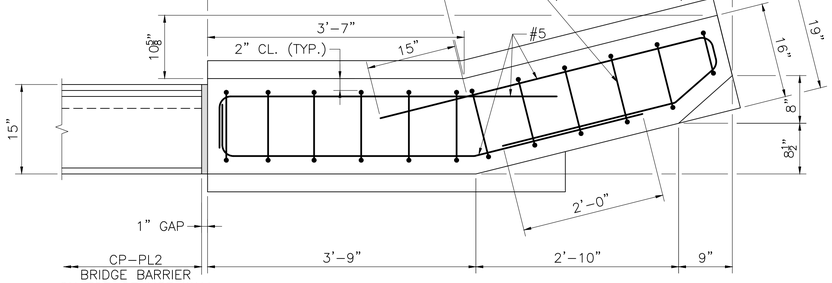


NOTES:

1. DETAILING AT TOP OF PRECAST TRANSITION BASE SHALL MATCH DETAILING AT MSE WALL COPING.
2. REINFORCEMENT OF THE TRANSITION TOP IS NOT SHOWN FOR CLARITY.

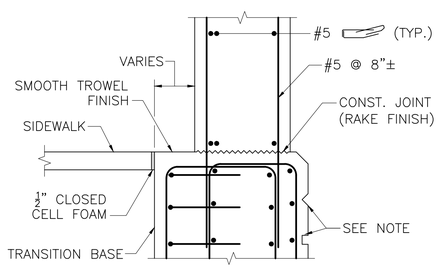
SECTION 14

SCALE: ½" = 1'-0"



SECTION 10

SCALE: 1" = 1'-0"

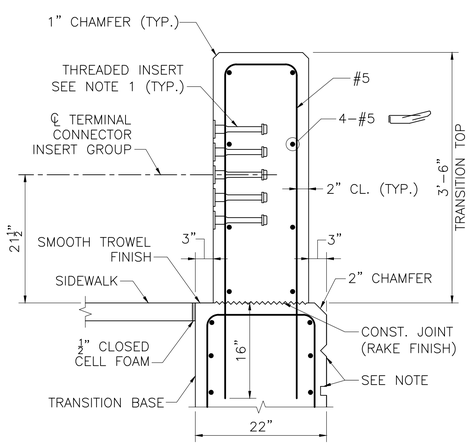


SECTION 12

SCALE: 1" = 1'-0"

NOTES:

1. DETAILING AT TOP OF PRECAST TRANSITION BASE SHALL MATCH DETAILING AT MSE WALL COPING.



SECTION 11

SCALE: 1" = 1'-0"

NOTES:

1. THREADED INSERTS SHALL BE PREQUALIFIED BY THE MANUFACTURER AS BEING CAPABLE OF DEVELOPING A NOMINAL SHEAR RESISTANCE OF 20 KIPS PER ⅞" ø S.S. BOLT. S.S. BOLTS SHALL BE ⅞" ø x 1½" LONG FULLY THREADED AISI TYPE 304N STAINLESS STEEL. INSERTS FOR ⅞" S.S. BOLTS SHALL BE GALVANIZED AND CAST INTO THE TRANSITION.
2. FOR AN APPROACH GRADE UP TO 3%, THE TRANSITION MAY BE CAST SQUARE AND SET PLUMB WITH THE MINIMUM EMBEDMENT DEPTH SHOWN. THE TERMINAL CONNECTOR INSERT GROUP SHALL BE SQUARE TO THE POST.

   FOR AN APPROACH GRADE IN EXCESS OF 3%, THE TRANSITION TOP AND THE TOP OF THE BRIDGE BARRIERS SHALL FOLLOW THE APPROACH GRADE. THE HEIGHT OF THE TRANSITION TOP SHALL VARY PROVIDED THAT THE MINIMUM DIMENSIONS SHOWN ON THE CONSTRUCTION DRAWINGS ARE MET. THE BOTTOM OF THE TRANSITION BASE SHALL BE SET LEVEL WITH THE MINIMUM EMBEDMENT DEPTH SHOWN. THE TERMINAL CONNECTOR INSERT GROUP SHALL BE SLOPED TO FOLLOW THE APPROACH GRADE.
3. USE LATEST CONTRACT COMPLETION YEAR IN EFFECT WHEN THE FIRST GUARDRAIL TRANSITION IS CAST. USE THIS YEAR FOR ALL GUARDRAIL TRANSITIONS.
4. ALL CONCRETE FOR THE PRECAST HIGHWAY GUARDRAIL TRANSITION SHALL BE 5000 PSI, ¾", 685 HP CEMENT CONCRETE.
5. LIFTING DEVICES (NOT SHOWN), INCLUDING THEIR NUMBER AND LOCATION, SHALL BE DESIGNED AND DETAILED BY THE PRECASTER. THEY SHALL BE GALVANIZED AND SHALL BE PLACED AND RECESSED IN POCKETS TO PROVIDE 1½" CLEAR COVER TO THE FACE OF THE TRANSITION CONCRETE. THESE DEVICES SHALL BE CLEARLY SHOWN ON THE SHOP DRAWINGS ALONG WITH ALL SUPPORTING CALCULATIONS AND/OR CATALOG CUTS. ONCE THE PRECAST TRANSITION IS SET IN PLACE, THE LIFTING DEVICE POCKETS SHALL BE FILLED WITH A NON-SHRINK GROUT THAT MATCHES THE COLOR OF THE TRANSITION CONCRETE WHEN CURED AND THE FILLED POCKETS SHALL BE RUBBED WITH A CORUNDUM STONE TO BLEND OUT THE JOINTS.

MILLBURY
McCRACKEN ROAD

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PRECAST HIGHWAY GUARDRAIL TRANSITIONS

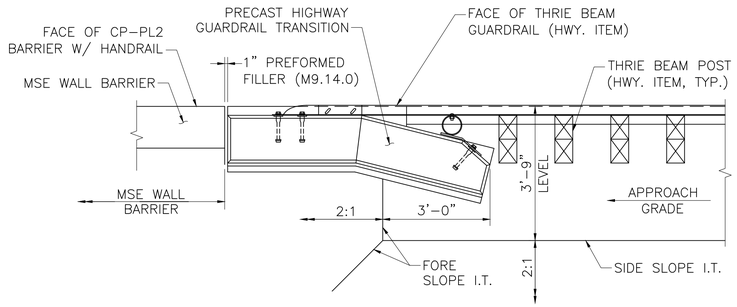
DATE	DESCRIPTION
APRIL 16, 2022	ISSUED FOR CONSTRUCTION
USE ONLY PRINTS OF LATEST DATE	

605377_BR10_GUARDRAIL TRANSITION.DWG Plotted on 11-Apr-2022 8:56 AM
ISSUED FOR CONSTRUCTION (SF) APRIL 16, 2022

MILLBURY
McCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	102	152
PROJECT FILE NO. 605377			

MISCELLANEOUS DETAILS



GRADING REQUIREMENTS
PLAN

SCALE: $\frac{1}{2}$" = 1'-0"

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MILLBURY
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MA	STP-0033(023)X	103	152
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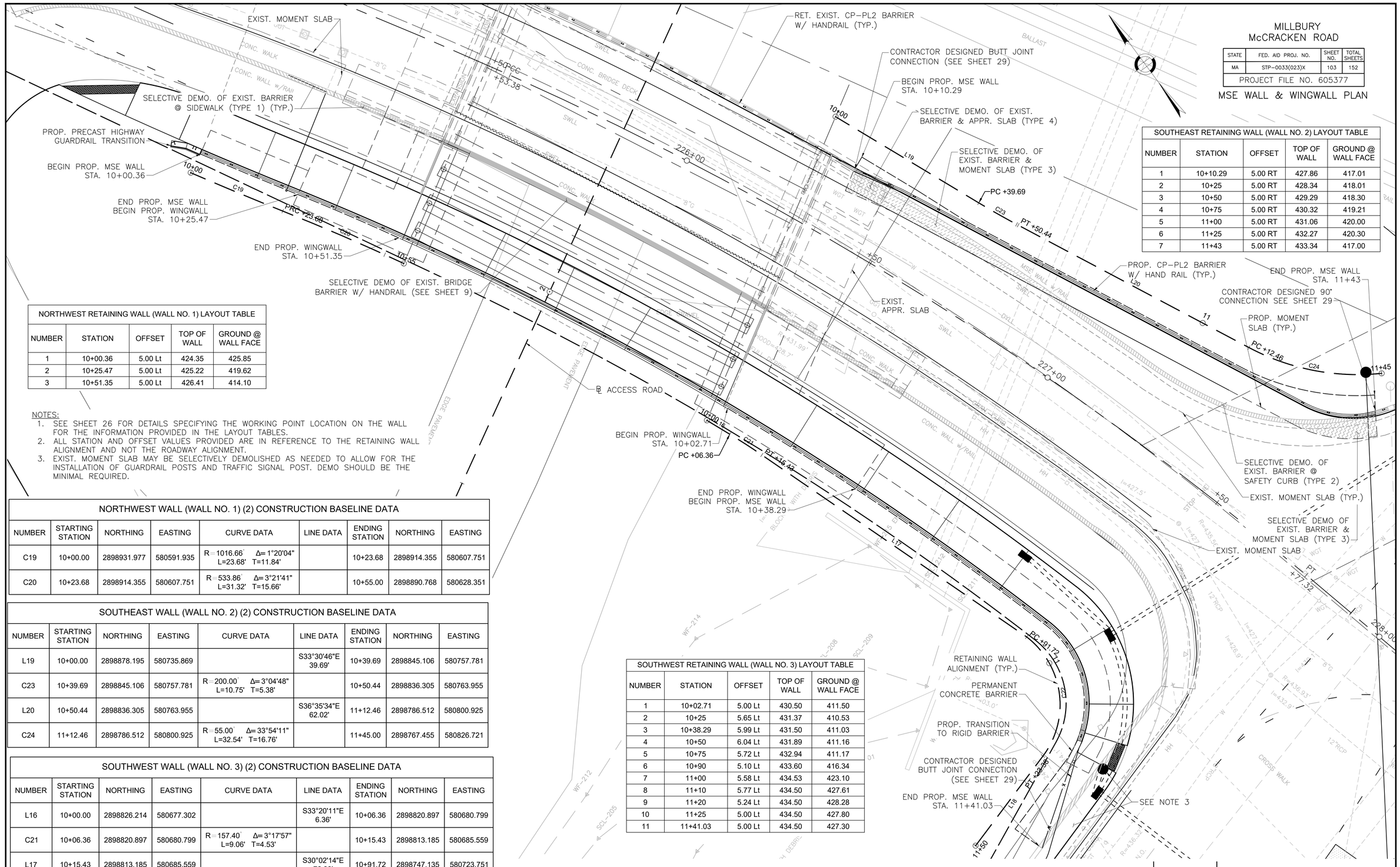
MSE WALL & WINGWALL PLAN



SOUTHEAST RETAINING WALL (WALL NO. 2) LAYOUT TABLE				
NUMBER	STATION	OFFSET	TOP OF WALL	GROUND @ WALL FACE
1	10+10.29	5.00 RT	427.86	417.01
2	10+25	5.00 RT	428.34	418.01
3	10+50	5.00 RT	429.29	418.30
4	10+75	5.00 RT	430.32	419.21
5	11+00	5.00 RT	431.06	420.00
6	11+25	5.00 RT	432.27	420.30
7	11+43	5.00 RT	433.34	417.00

NORTHWEST RETAINING WALL (WALL NO. 1) LAYOUT TABLE				
NUMBER	STATION	OFFSET	TOP OF WALL	GROUND @ WALL FACE
1	10+00.36	5.00 Lt	424.35	425.85
2	10+25.47	5.00 Lt	425.22	419.62
3	10+51.35	5.00 Lt	426.41	414.10

NOTES:
1. SEE SHEET 26 FOR DETAILS SPECIFYING THE WORKING POINT LOCATION ON THE WALL FOR THE INFORMATION PROVIDED IN THE LAYOUT TABLES.
2. ALL STATION AND OFFSET VALUES PROVIDED ARE IN REFERENCE TO THE RETAINING WALL ALIGNMENT AND NOT THE ROADWAY ALIGNMENT.
3. EXIST. MOMENT SLAB MAY BE SELECTIVELY DEMOLISHED AS NEEDED TO ALLOW FOR THE INSTALLATION OF GUARDRAIL POSTS AND TRAFFIC SIGNAL POST. DEMO SHOULD BE THE MINIMAL REQUIRED.

NORTHWEST WALL (WALL NO. 1) (2) CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C19	10+00.00	2898931.977	580591.935	R=1016.66' Δ=1°20'04" L=23.68' T=11.84'		10+23.68	2898914.355	580607.751
C20	10+23.68	2898914.355	580607.751	R=533.86' Δ=3°21'41" L=31.32' T=15.66'		10+55.00	2898890.768	580628.351

SOUTHEAST WALL (WALL NO. 2) (2) CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L19	10+00.00	2898878.195	580735.869		S33°30'46"E 39.69'	10+39.69	2898845.106	580757.781
C23	10+39.69	2898845.106	580757.781	R=200.00' Δ=3°04'48" L=10.75' T=5.38'		10+50.44	2898836.305	580763.955
L20	10+50.44	2898836.305	580763.955		S36°35'34"E 62.02'	11+12.46	2898786.512	580800.925
C24	11+12.46	2898786.512	580800.925	R=55.00' Δ=33°54'11" L=32.54' T=16.76'		11+45.00	2898767.455	580826.721

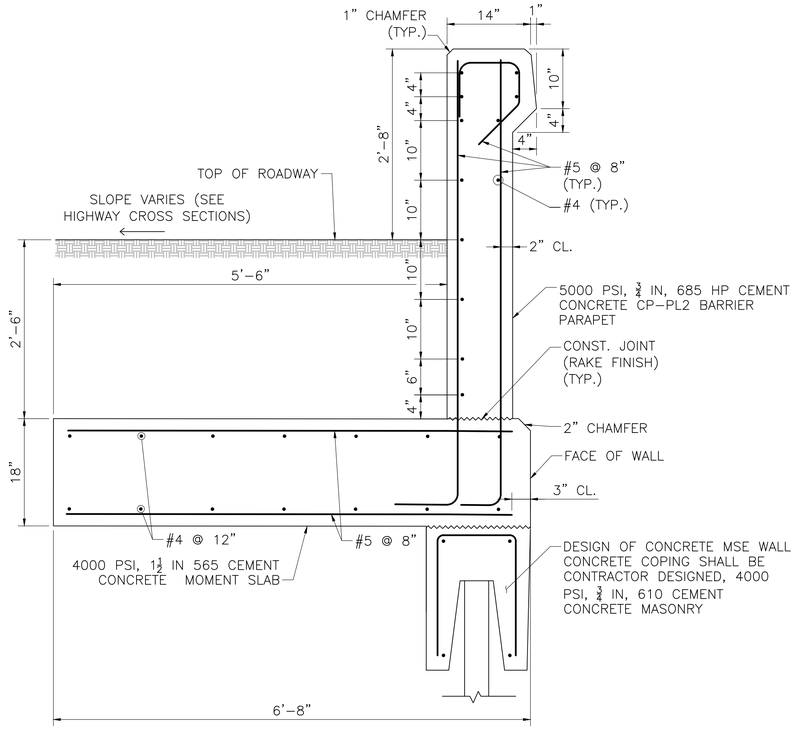
SOUTHWEST WALL (WALL NO. 3) (2) CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L16	10+00.00	2898826.214	580677.302		S33°20'11"E 6.36'	10+06.36	2898820.897	580680.799
C21	10+06.36	2898820.897	580680.799	R=157.40' Δ=3°17'57" L=9.06' T=4.53'		10+15.43	2898813.185	580685.559
L17	10+15.43	2898813.185	580685.559		S30°02'14"E 76.30'	10+91.72	2898747.135	580723.751
C22	10+91.72	2898747.135	580723.751	R=20.30' Δ=89°20'27" L=31.65' T=20.07'		11+23.38	2898719.942	580715.076
L18	11+23.38	2898719.942	580715.076		S62°21'46"W 26.62'	11+50.00	2898707.593	580691.492

SOUTHWEST RETAINING WALL (WALL NO. 3) LAYOUT TABLE				
NUMBER	STATION	OFFSET	TOP OF WALL	GROUND @ WALL FACE
1	10+02.71	5.00 Lt	430.50	411.50
2	10+25	5.65 Lt	431.37	410.53
3	10+38.29	5.99 Lt	431.50	411.03
4	10+50	6.04 Lt	431.89	411.16
5	10+75	5.72 Lt	432.94	411.17
6	10+90	5.10 Lt	433.60	416.34
7	11+00	5.58 Lt	434.53	423.10
8	11+10	5.77 Lt	434.50	427.61
9	11+20	5.24 Lt	434.50	428.28
10	11+25	5.00 Lt	434.50	427.80
11	11+41.03	5.00 Lt	434.50	427.30

DATE	DESCRIPTION
APRIL 16, 2022	ISSUED FOR CONSTRUCTION
USE ONLY PRINTS OF LATEST DATE	

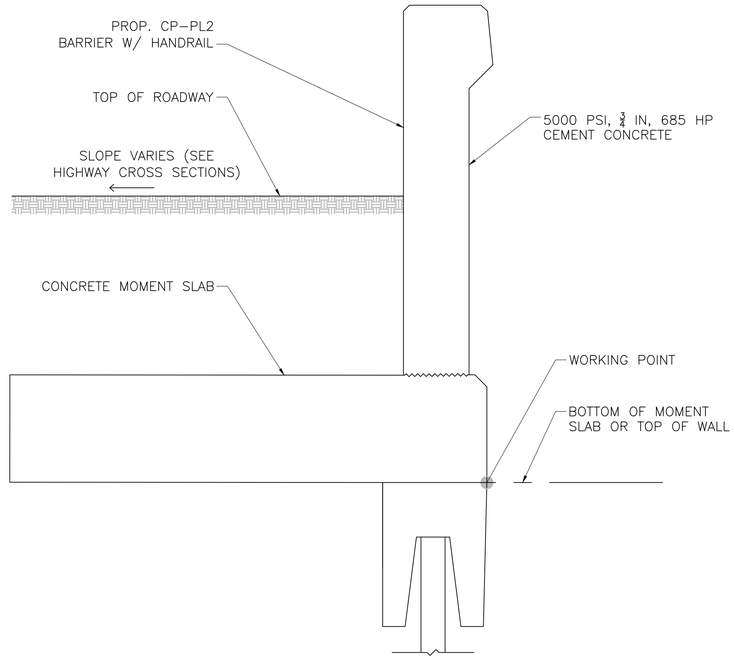
ISSUED FOR CONSTRUCTION (SF) APRIL 16, 2022

605377_BR11_MSE WALL PLAN.DWG Plotted on 11-Apr-2022 8:56 AM



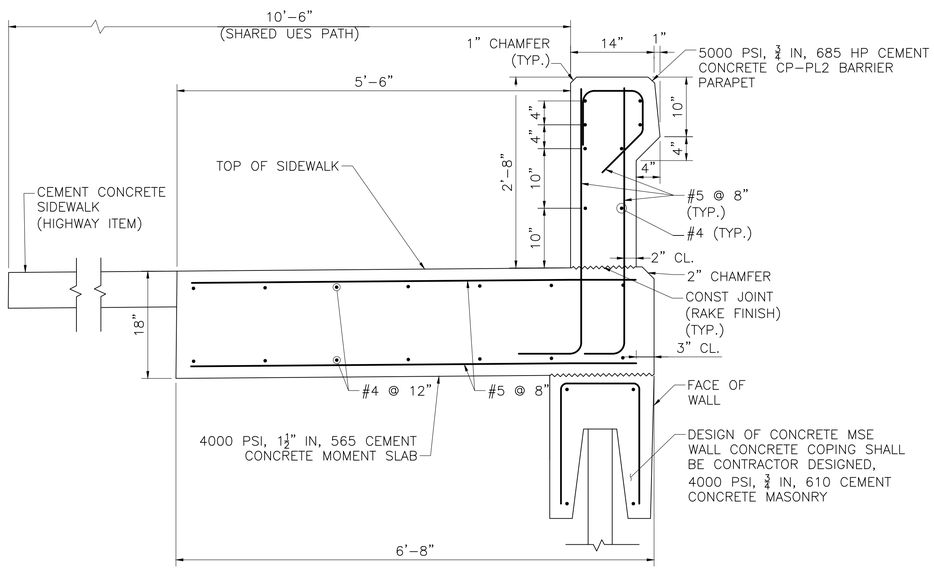
PROPOSED MOMENT SLAB TYPICAL SECTION @ MSE WALL W/O SHARED USE PATH

SCALE: 1" = 1'-0"



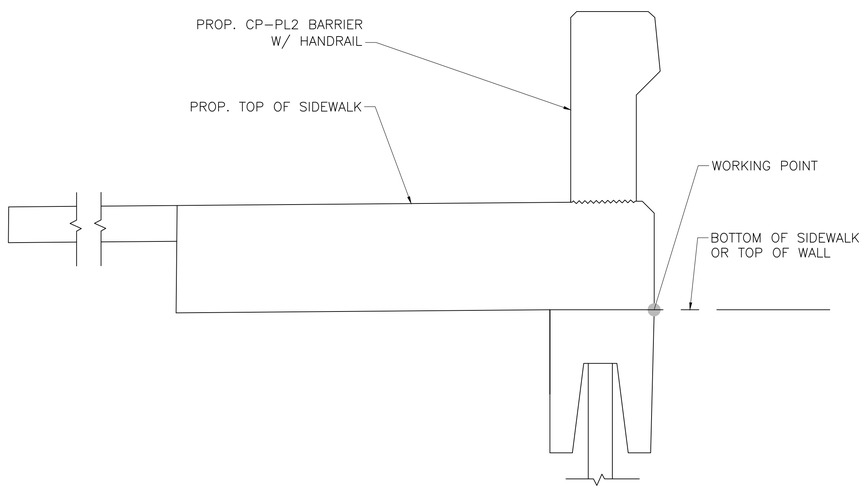
MSE WALL LAYOUT WORKING POINT DETAIL W/O SHARED USE PATH

SCALE: 1" = 1'-0"



PROPOSED MOMENT SLAB TYPICAL SECTION @ MSE WALL W/ SHARED USE PATH

SCALE: 1" = 1'-0"



MSE WALL LAYOUT WORKING POINT DETAIL W/ SHARED USE PATH

SCALE: 1" = 1'-0"

MILLBURY
McCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	104	152
PROJECT FILE NO. 605377			

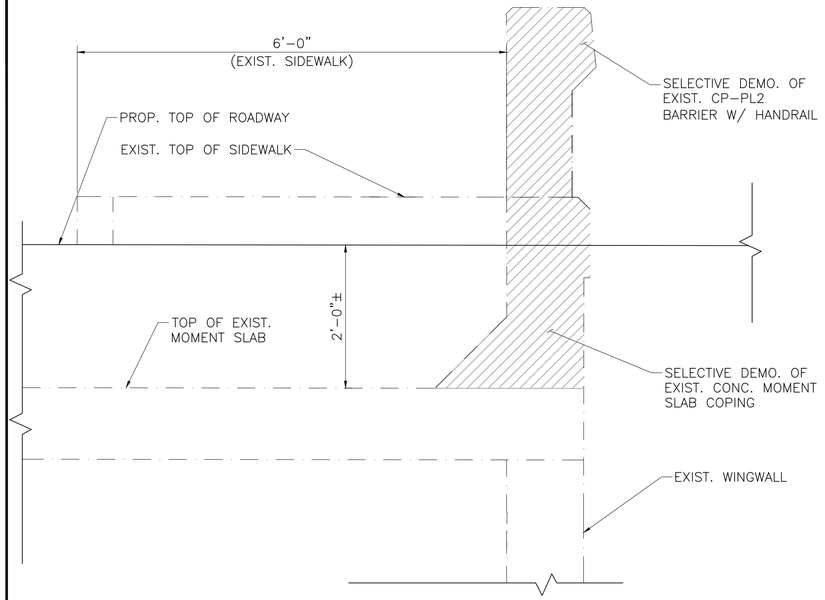
MSE WALL & MOMENT SLAB DETAILS

APRIL 16, 2022	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

MILLBURY
McCRACKEN ROAD

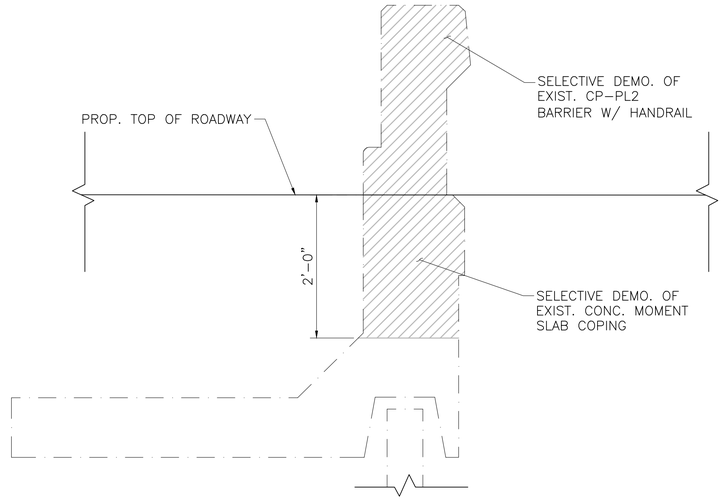
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	105	152
PROJECT FILE NO. 605377			

MSE WALL & WINGWALL
DEMOLITION DETAILS



SELECTIVE DEMOLITION OF EXISTING
BARRIER @ SIDEWALK (TYPE 1)

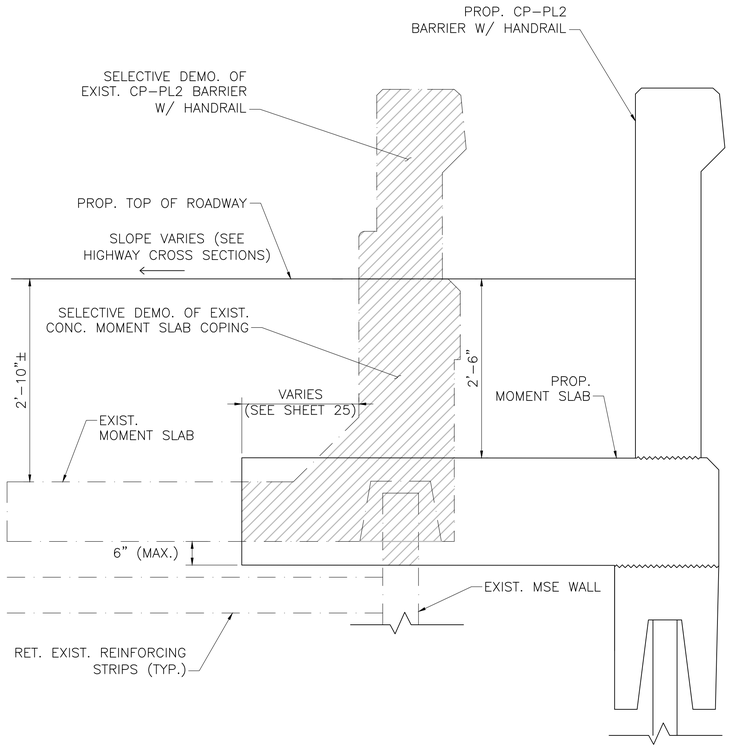
SCALE: 1" = 1'-0"



SELECTIVE DEMOLITION OF EXISTING
BARRIER @ SAFETY CURB (TYPE 2)

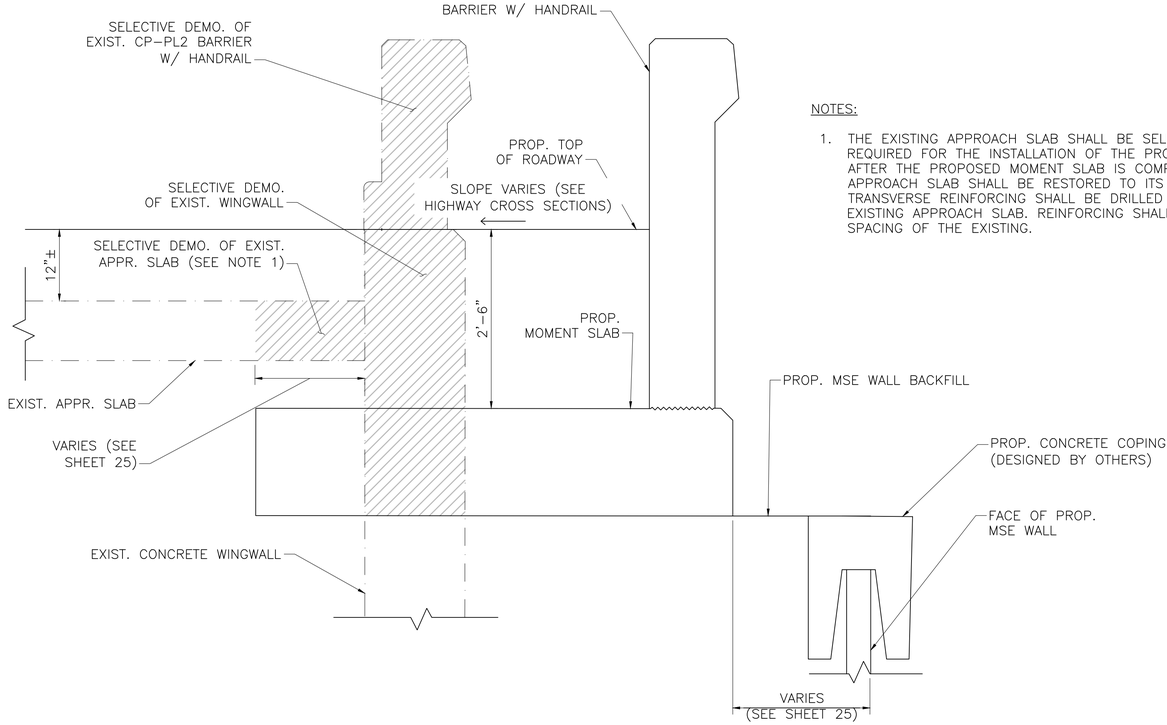
SCALE: 1" = 1'-0"

DEMOLITION LAYOUT TABLE			
DEMO. TYPE	START STATION	END STATION	OFFSET
1	224+39.12	225+44.47	RT
1	226+34.83	227+68.90	RT
2	226+87.13	227+61.51	LT
3	226+44.89	226+87.13	LT
4	226+35.41	226+44.89	LT



SELECTIVE DEMOLITION OF EXISTING
BARRIER & MOMENT SLAB (TYPE 3)

SCALE: 1" = 1'-0"



SELECTIVE DEMOLITION OF EXISTING
BARRIER & APPROACH SLAB (TYPE 4)

SCALE: 1" = 1'-0"

NOTES:

1. THE EXISTING APPROACH SLAB SHALL BE SELECTIVELY DEMOLISHED AS REQUIRED FOR THE INSTALLATION OF THE PROPOSED MOMENT SLAB. AFTER THE PROPOSED MOMENT SLAB IS COMPLETE, THE EXISTING APPROACH SLAB SHALL BE RESTORED TO ITS ORIGINAL LIMITS. NEW TRANSVERSE REINFORCING SHALL BE DRILLED AND GROUTED INTO THE EXISTING APPROACH SLAB. REINFORCING SHALL MATCH THE SIZE AND SPACING OF THE EXISTING.

APRIL 16, 2022	ISSUED FOR CONSTRUCTION
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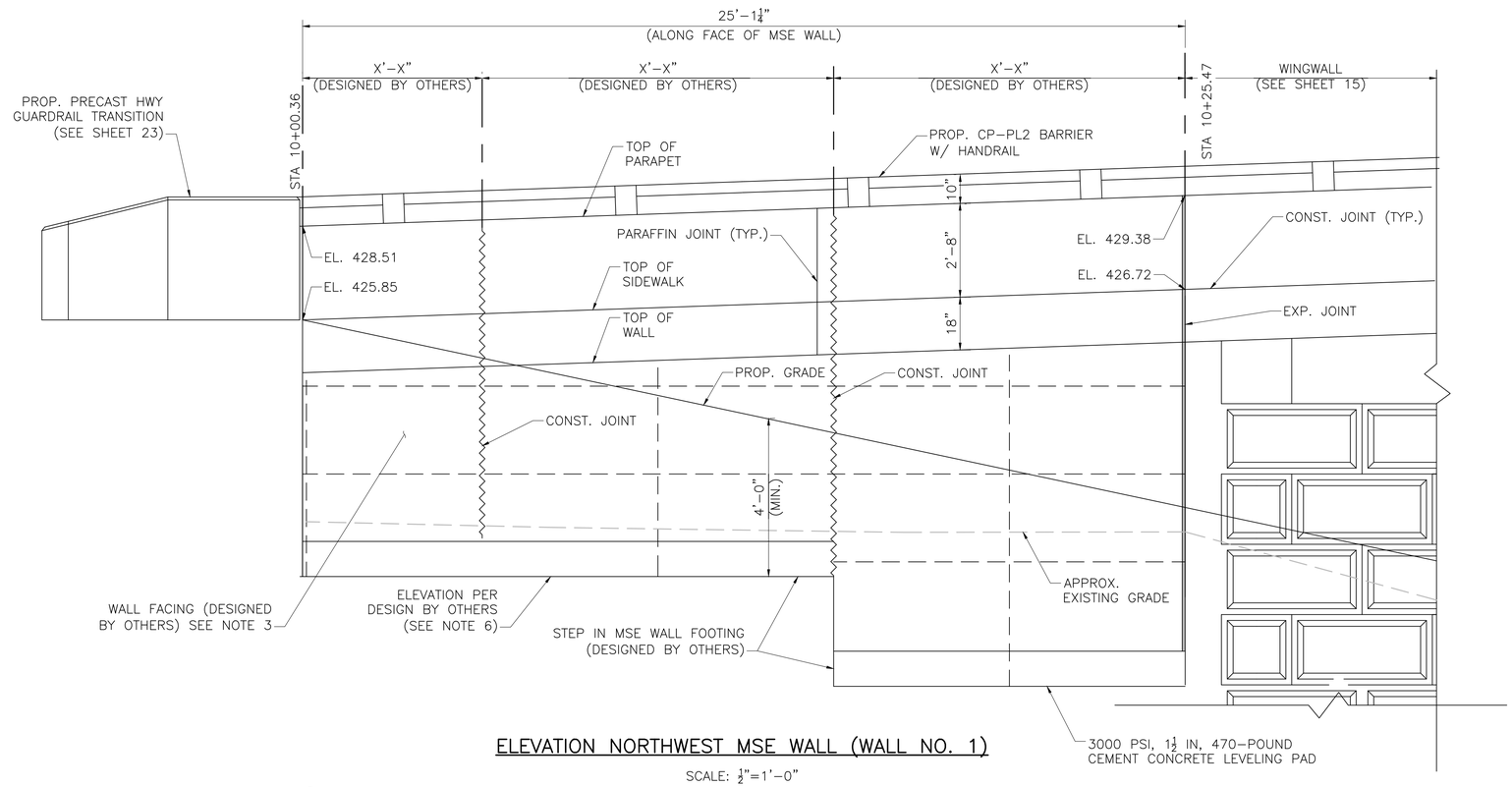
USE ONLY PRINTS OF LATEST DATE	

MILLBURY
McCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	106	152
PROJECT FILE NO. 605377			

MSE WALL ELEVATIONS (1 OF 2)

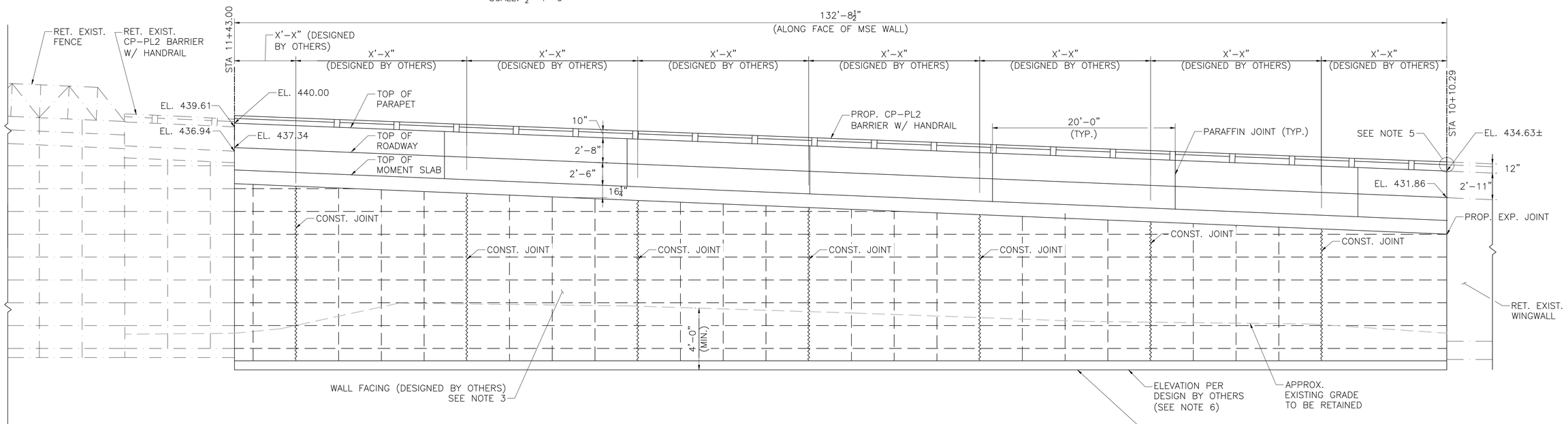


ELEVATION NORTHWEST MSE WALL (WALL NO. 1)

SCALE: ½"=1'-0"

NOTES:

1. WHERE THERE IS INADEQUATE SPACE BEHIND THE PROPOSED MSE WALLS FOR THE REINFORCED SOIL, THE PROPOSED WALL SHALL BE ANCHORED INTO EXISTING WALL FACE (SEE MSE WALL ATTACHMENT TO EXISTING WALL DETAIL ON SHEET 29). THIS DETAIL MAY BE USED FOR ANCHORING TO BOTH AN EXISTING MSE WALL AND CONCRETE WALL.
2. WHERE THERE IS DEBRIS OR EXISTING STRUCTURES OTHER THAN THE EXISTING CONCRETE WALL PREVENTING THE PLACEMENT OF REINFORCED SOIL, THE OBSTRUCTION MAY BE SELECTIVELY DEMOLISHED. ALL SELECTIVE DEMOLITION SHALL BE APPROVED BY THE ENGINEER BEFORE WORK COMMENCES. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE MSE WALLS.
3. THE WALL FACING PANELS SHOULD CONSIST OF RAISED RUSTICATED SURFACES AND SHOULD BE SELECTED TO BEST MATCH THE APPEARANCE AND TEXTURE OF THE EXISTING WALL PANELS.
4. EXCAVATION FOR THE CONCRETE LEVELING PAD SHALL EXTEND 12" BELOW THE PROPOSED FINISH GRADE ELEVATIONS AND BE BACKFILLED WITH GRAVEL BORROW FOR BACKFILLING STRUCTURES AND PIPES.
5. THE CONTRACTOR SHALL CONFIRM THE ELEVATION OF THE EXISTING HANDRAIL. THE PROPOSED BARRIER PARAPET ELEVATION SHALL BE VARIED AS NEEDED TO ENSURE THE PROPOSED HANDRAIL ELEVATION MATCHES THE EXISTING HANDRAIL.
6. THE BOTTOM OF THE FACING PANELS SHALL BE LOCATED A MINIMUM OF 4'-0" BELOW THE PROPOSED FINAL GRADE ELEVATION.



ELEVATION SOUTHEAST MSE WALL (WALL NO. 2)

SCALE: 3/16"=1'-0"

APRIL 16, 2022	ISSUED FOR CONSTRUCTION
DATE	DESCRIPTION
USE ONLY PRINTS OF LATEST DATE	

ISSUED FOR CONSTRUCTION (SF) APRIL 16, 2022

605377_BR12_MSE WALL ELEVATION.DWG Plotted on 11-Apr-2022 8:57 AM

NOTES:

1. WHERE THERE IS INADEQUATE SPACE BEHIND THE PROPOSED MSE WALLS FOR THE REINFORCED SOIL, THE PROPOSED WALL SHALL BE ANCHORED INTO EXISTING WALL FACE. THIS DETAIL MAY BE USED FOR ANCHORING TO BOTH EXISTING MSE WALLS (SOUTHEAST APPROACH) AND CONCRETE WALLS (NORTHWEST & SOUTHWEST APPROACHES).
2. THE STABILITY OF THE EXISTING WALL TO REMAIN, WHERE ALTERATIONS SUCH AS ANCHORING ARE REQUIRED, SHALL BE CONFIRMED BY THE CONTRACTOR AND INCLUDED IN THE DESIGN.
3. THE CONTRACTOR SHALL TAKE CARE AS NOT TO DAMAGE THE EXISTING CULVERT TO REMAIN.

MILLBURY
McCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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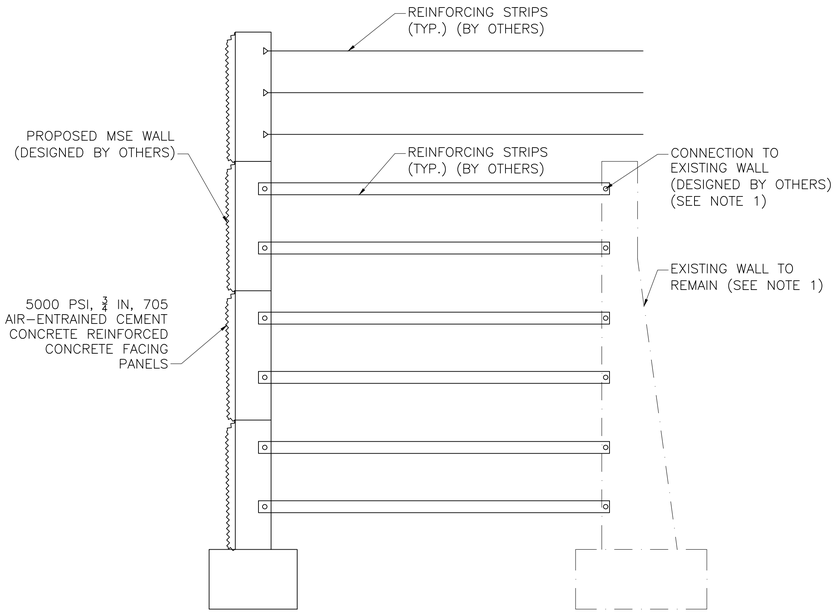
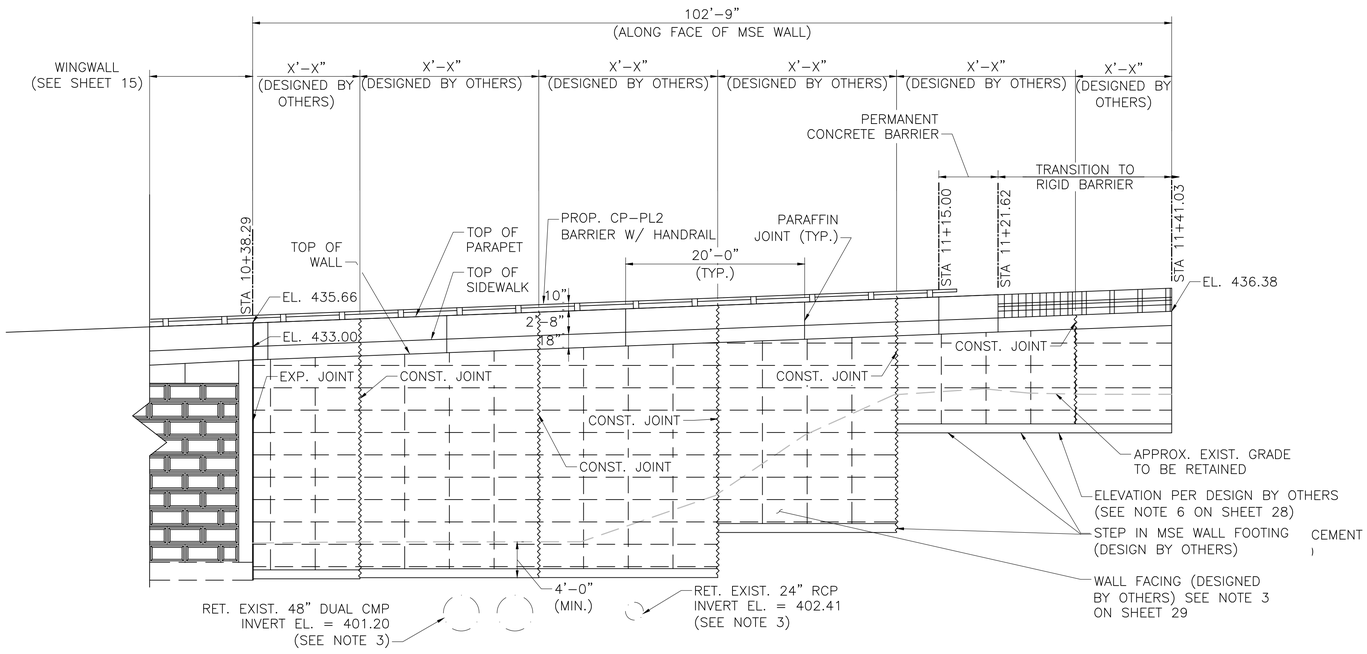
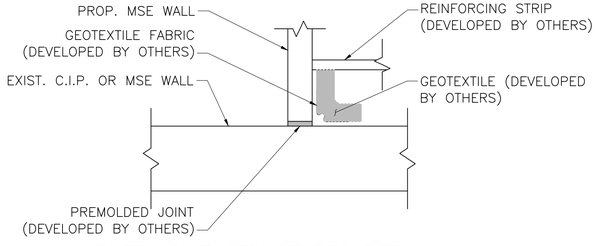
MSE WALL ELEVATIONS (2 OF 2)



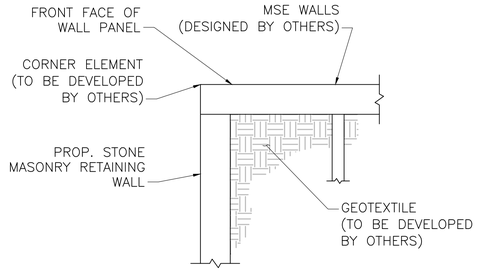
MSE WALL ATTACHMENT TO EXISTING WALL
SCALE: NTS



ELEVATION SOUTHWEST MSE WALL (WALL NO. 3) – STA. 226+76 TO 227+68
SCALE: ⅛"=1'-0"



BUTT JOINT STRUCTURES DETAIL
SCALE: NOT TO SCALE



MSE WALLS – 90° CORNER ELEMENT
DETAIL AT AUBIN PROPERTY
MAP 36, BLOCK 6, BOOK 13196, PAGE 390
SCALE: NOT TO SCALE

APRIL 16, 2022	ISSUED FOR CONSTRUCTION
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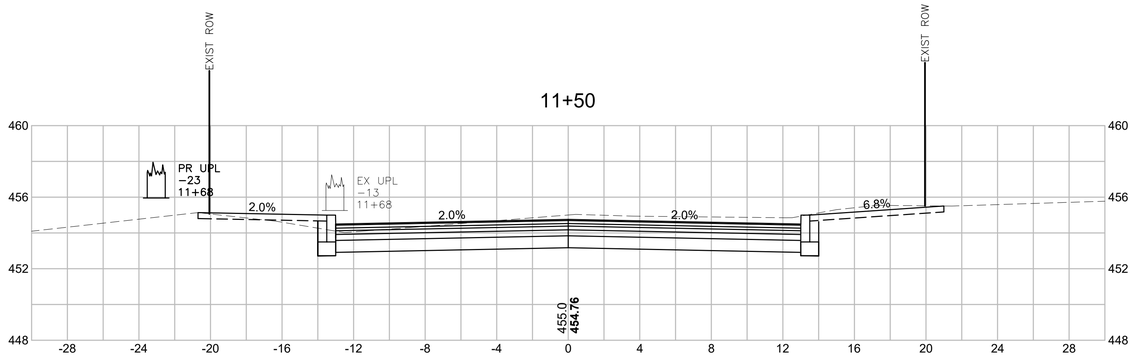
MILLBURY
MCCRACKEN ROAD

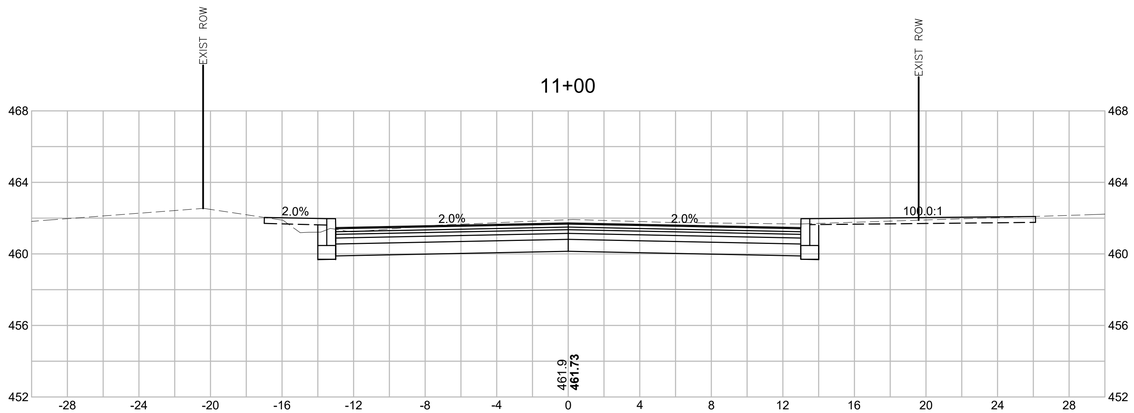
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	108	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
GREENWOOD STREET

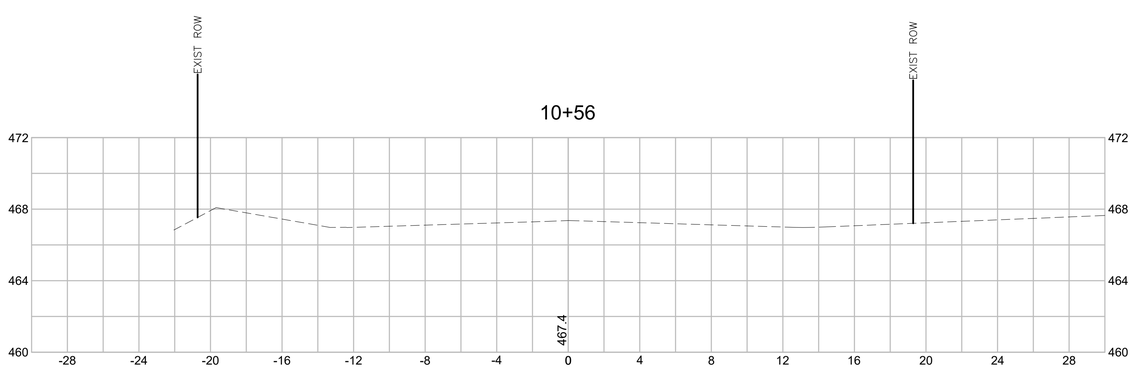
605377_HD(XSECT).DWG Plotted on 11-Apr-2022 5:31 PM



Material(s) at Station 11+50.00		
Material Name	Area	Volume
CUT	56.1	98.1
FILL	0.6	1.1



Material(s) at Station 11+00.00		
Material Name	Area	Volume
CUT	49.8	40.6
FILL	0.6	0.5



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

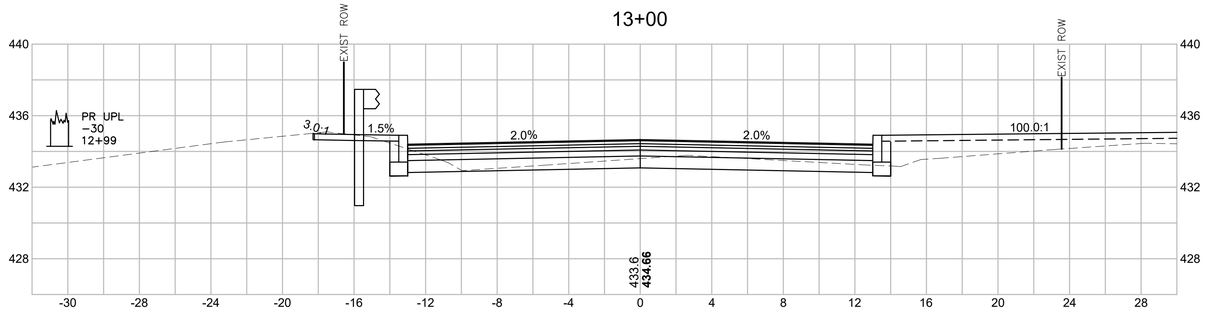
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	109	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
GREENWOOD STREET

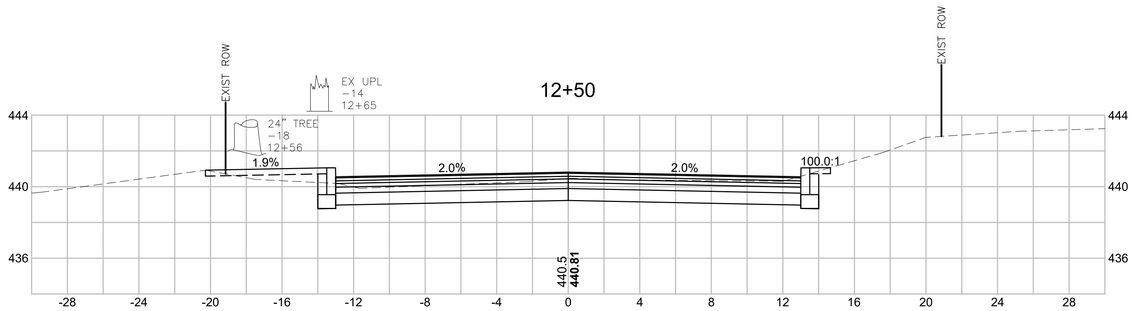
605377_HD\XSECT\.DWG Plotted on 11-Apr-2022 5:31 PM

13+00



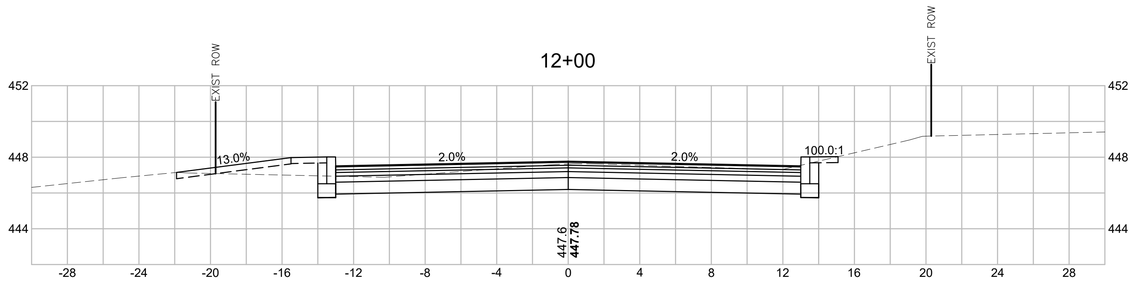
Material(s) at Station 13+00.00		
Material Name	Area	Volume
CUT	16.2	46.4
FILL	10.9	11.4

12+50



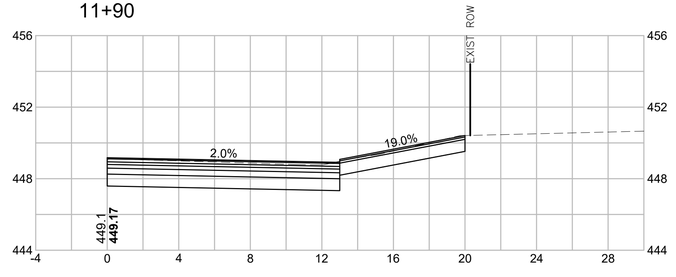
Material(s) at Station 12+50.00		
Material Name	Area	Volume
CUT	33.9	65.5
FILL	1.4	3.5

12+00



Material(s) at Station 12+00.00		
Material Name	Area	Volume
CUT	36.8	86.0
FILL	2.4	2.8

11+90



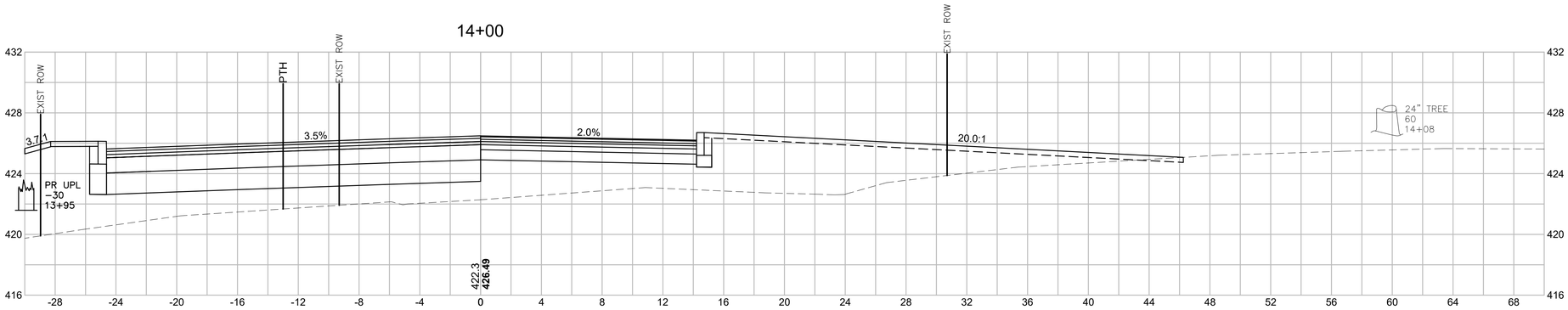
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	110	152
PROJECT FILE NO. 605377			

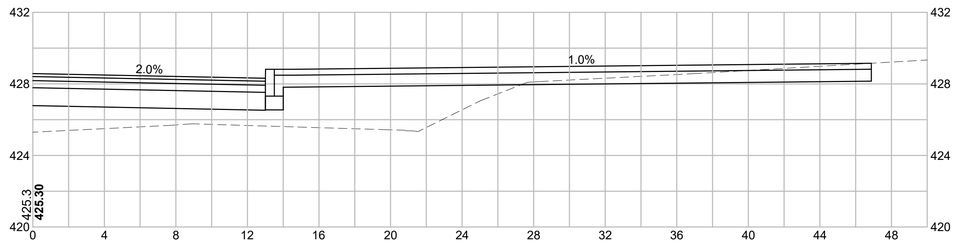
CROSS SECTIONS
GREENWOOD STREET

14+00

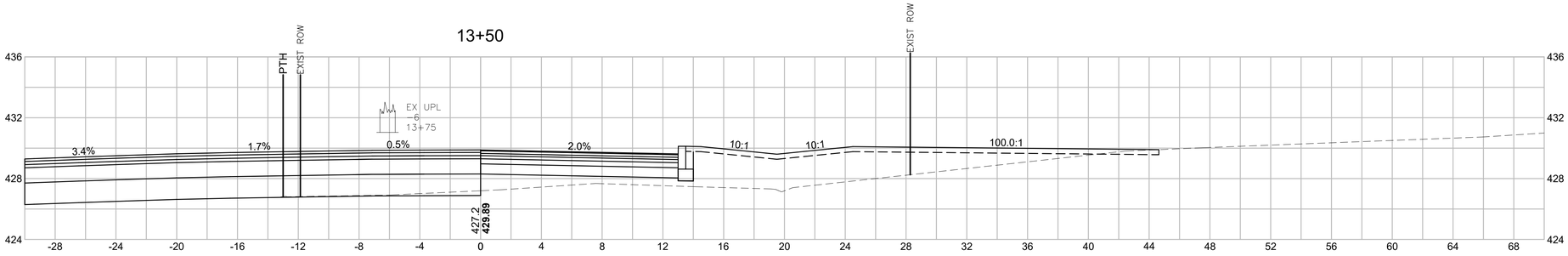


Material(s) at Station 14+00.00		
Material Name	Area	Volume
CUT	0.1	1.1
FILL	100.9	136.4

13+67

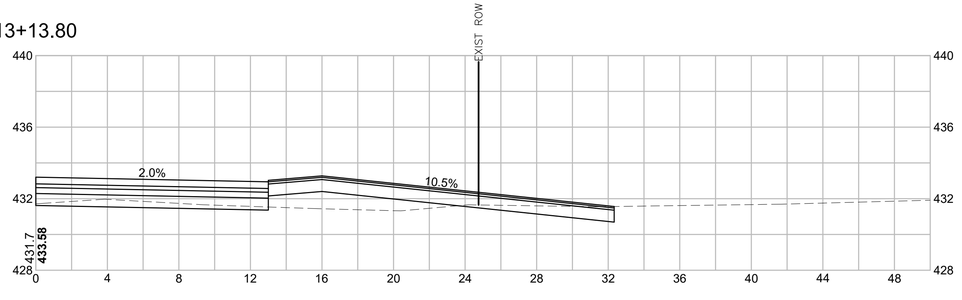


13+50



Material(s) at Station 13+50.00		
Material Name	Area	Volume
CUT	1.1	16.0
FILL	46.4	53.1

13+13.80



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

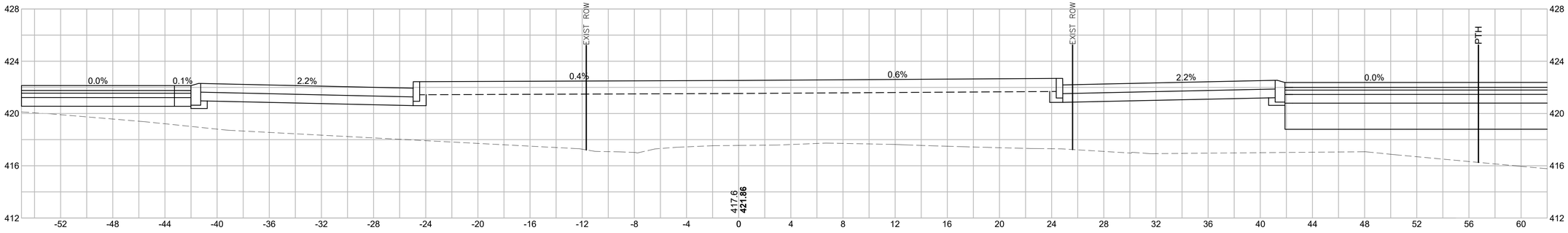
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	111	152
PROJECT FILE NO. 605377			

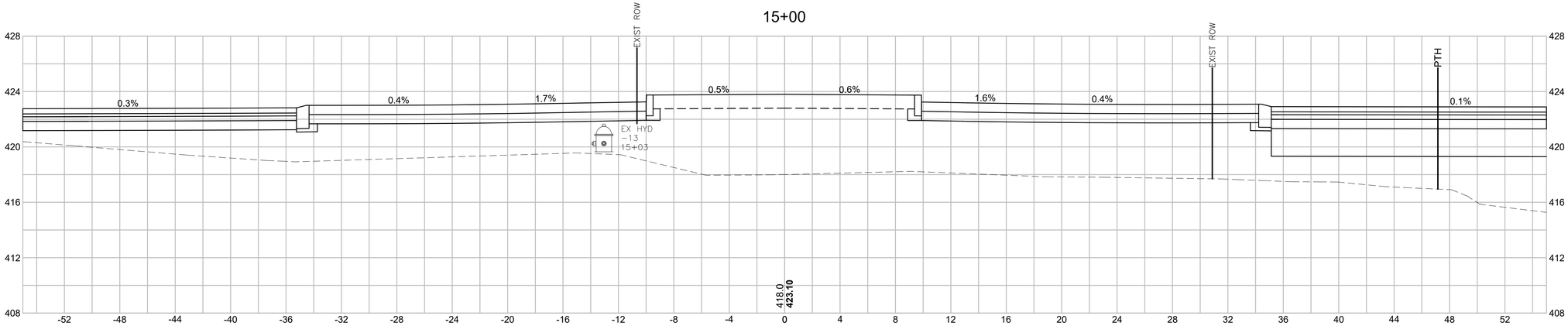
CROSS SECTIONS
GREENWOOD STREET

Material(s) at Station 15+25.00		
Material Name	Area	Volume
CUT	0.0	0.0
FILL	355.6	223.2

15+25

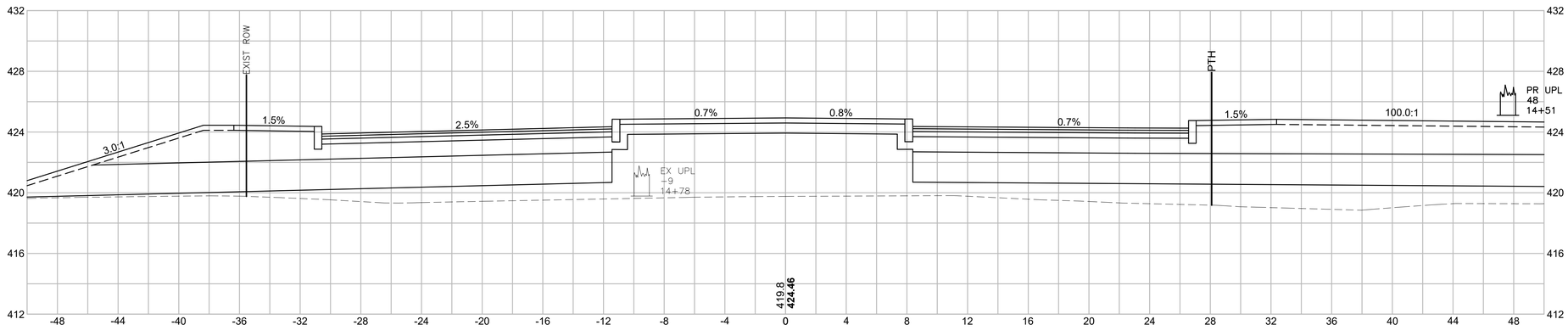


15+00



Material(s) at Station 15+00.00		
Material Name	Area	Volume
CUT	0.0	0.0
FILL	320.4	413.9

14+50



Material(s) at Station 14+50.00		
Material Name	Area	Volume
CUT	0.0	0.1
FILL	126.6	210.6

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	112	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
GREENWOOD STREET

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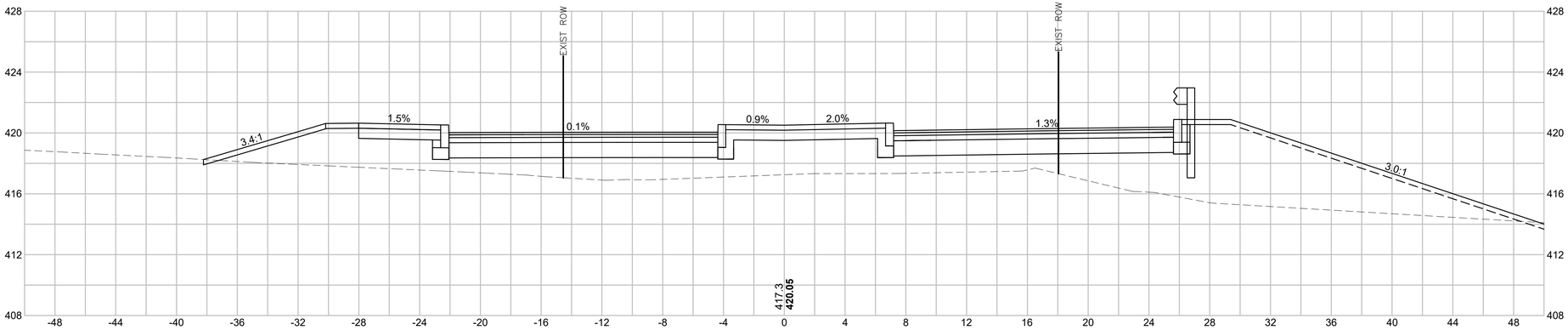
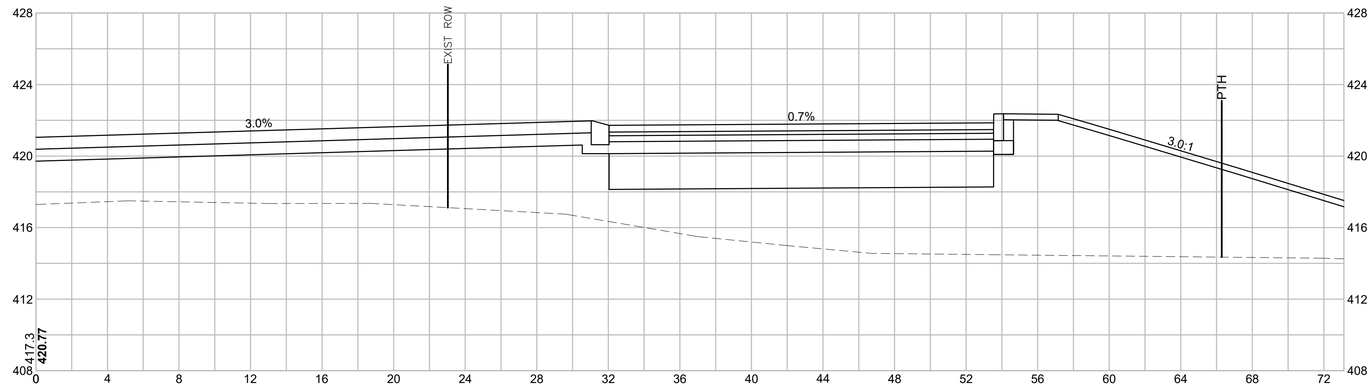
16+00



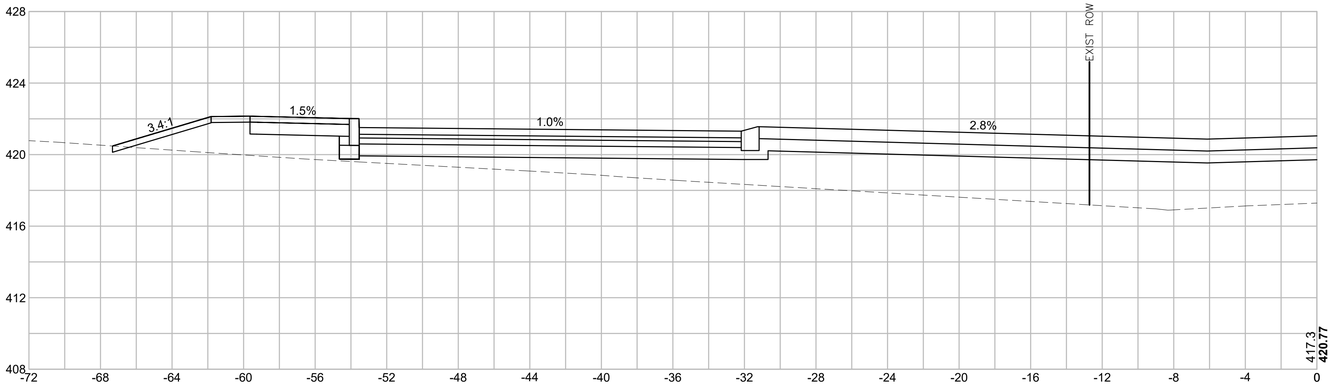
Material(s) at Station 16+00.00		
Material Name	Area	Volume
CUT	0.0	0.0
FILL	130.4	439.5

15+50



Material(s) at Station 15+50.00		
Material Name	Area	Volume
CUT	0.0	0.0
FILL	344.3	307.7

15+50



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

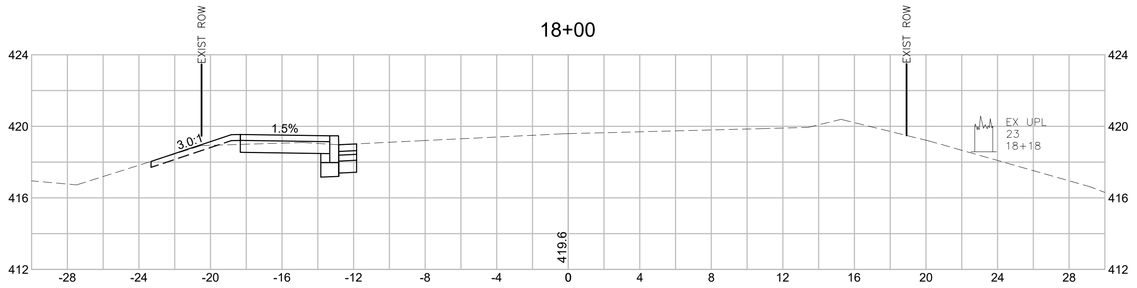
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	113	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
GREENWOOD STREET

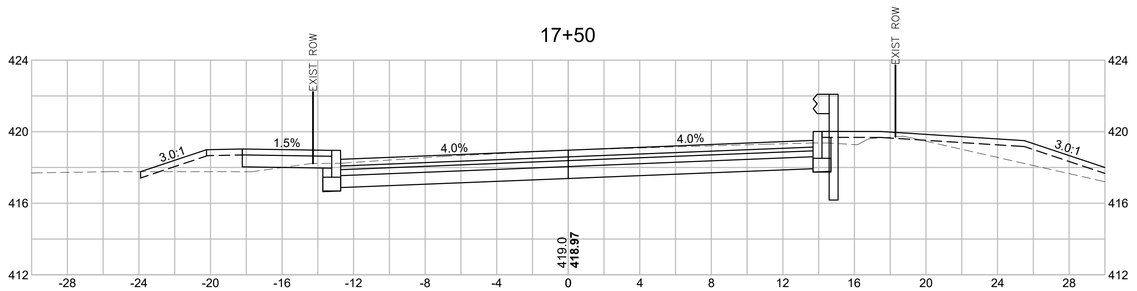
605377_HD\XSECT\.DWG Plotted on 11-Apr-2022 5:31 PM

18+00



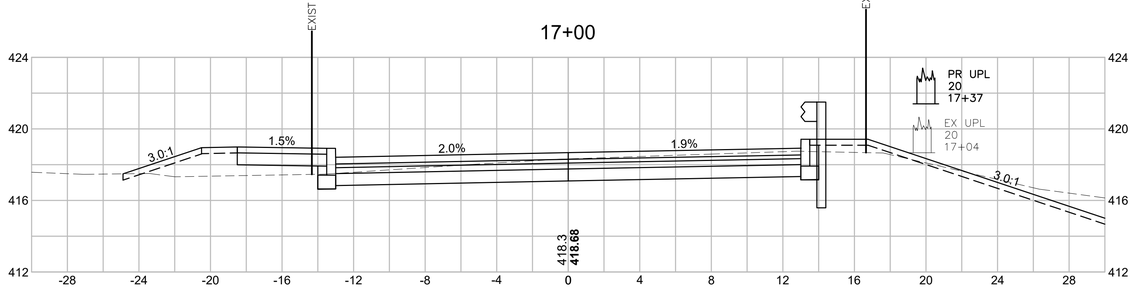
Material(s) at Station 18+00.00		
Material Name	Area	Volume
CUT	6.8	40.1
FILL	0.0	3.3

17+50



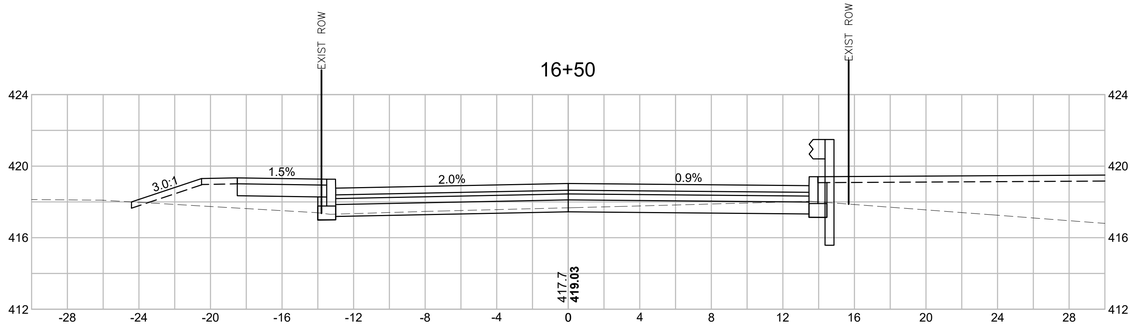
Material(s) at Station 17+50.00		
Material Name	Area	Volume
CUT	43.3	70.4
FILL	3.6	10.6

17+00



Material(s) at Station 17+00.00		
Material Name	Area	Volume
CUT	32.7	39.7
FILL	7.8	18.5

16+50



Material(s) at Station 16+50.00		
Material Name	Area	Volume
CUT	10.2	9.4
FILL	12.2	132.0

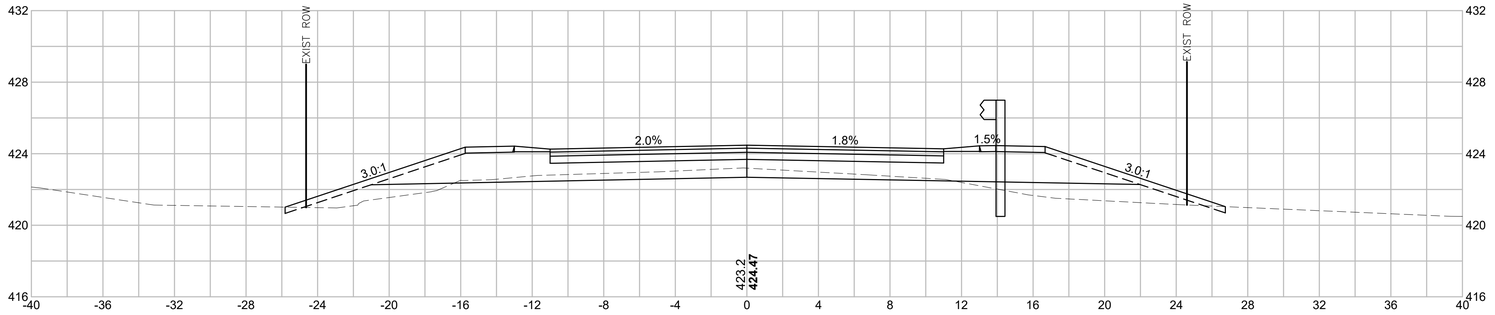
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	114	152
PROJECT FILE NO. 605377			

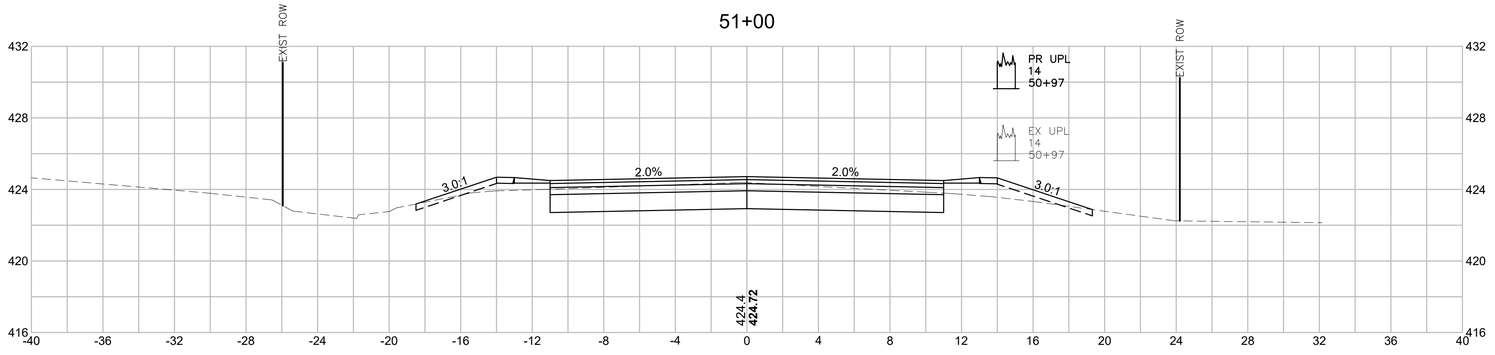
CROSS SECTIONS
MCCRACKEN ROAD

51+50



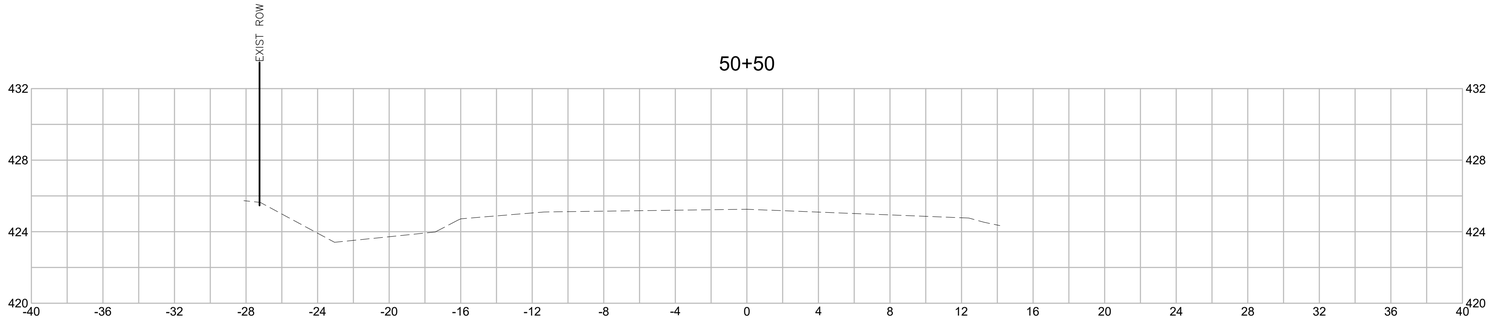
Material(s) at Station 51+50.00		
Material Name	Area	Volume
CUT	8.3	35.6
FILL	38.6	40.1

51+00



Material(s) at Station 51+00.00		
Material Name	Area	Volume
CUT	30.1	22.3
FILL	4.7	3.5

50+50



Material(s) at Station 50+50.00		
Material Name	Area	Volume
CUT	0.0	0.0
FILL	0.0	0.0

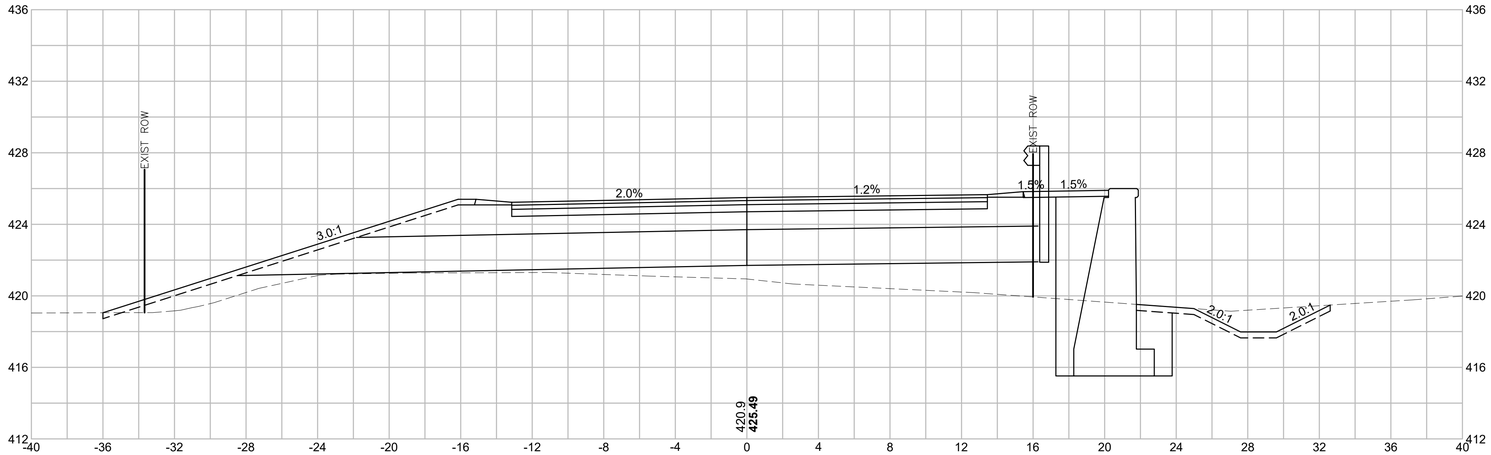
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	115	152
PROJECT FILE NO. 605377			

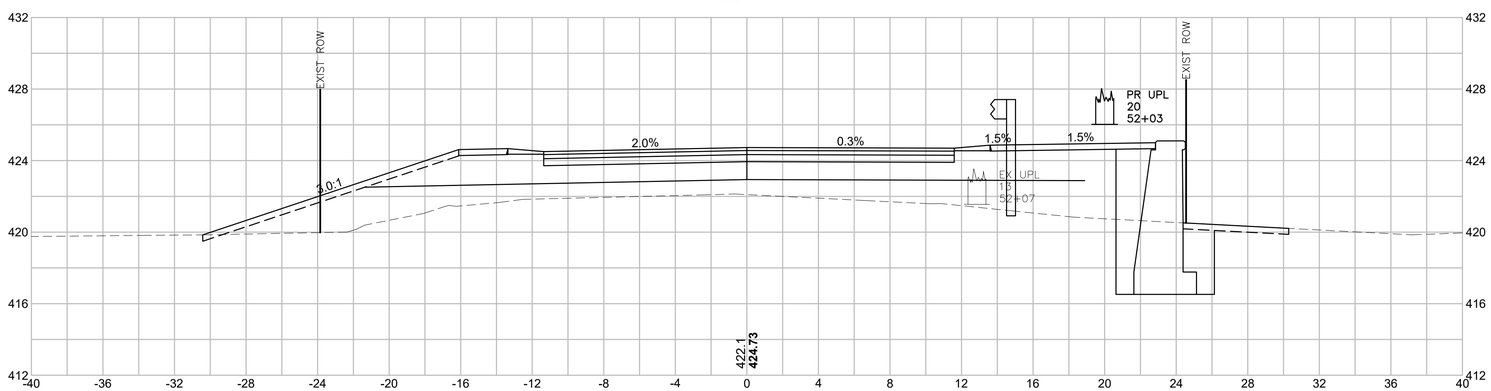
CROSS SECTIONS
MCCRACKEN ROAD

52+50



Material(s) at Station 52+50.00		
Material Name	Area	Volume
CUT	0.2	0.4
FILL	40.2	90.7

52+00



Material(s) at Station 52+00.00		
Material Name	Area	Volume
CUT	0.2	7.9
FILL	57.8	89.3

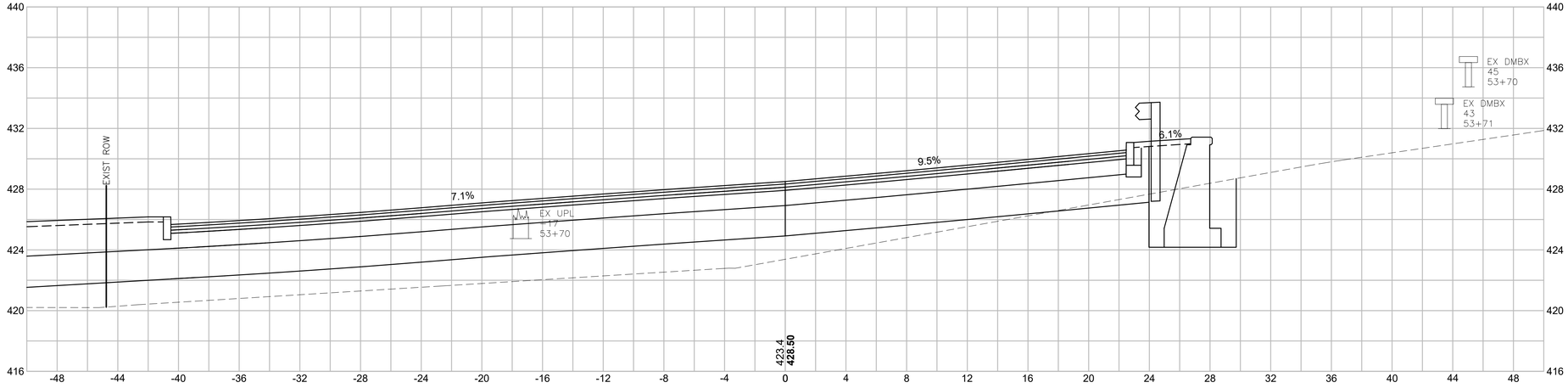
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	116	152
PROJECT FILE NO. 605377			

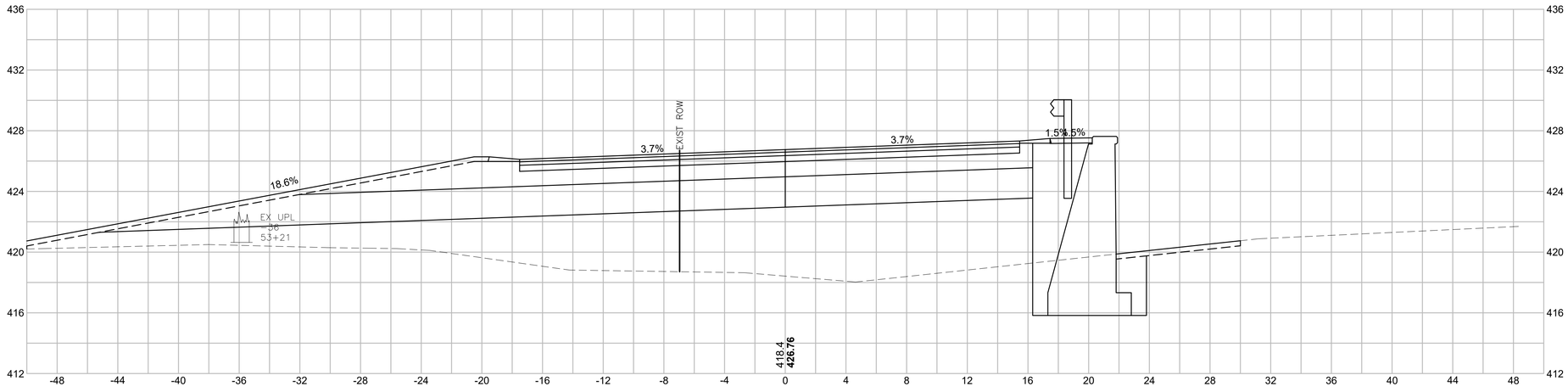
CROSS SECTIONS
MCCRACKEN ROAD

53+50



Material(s) at Station 53+50.00		
Material Name	Area	Volume
CUT	0.0	0.0
FILL	231.2	392.2

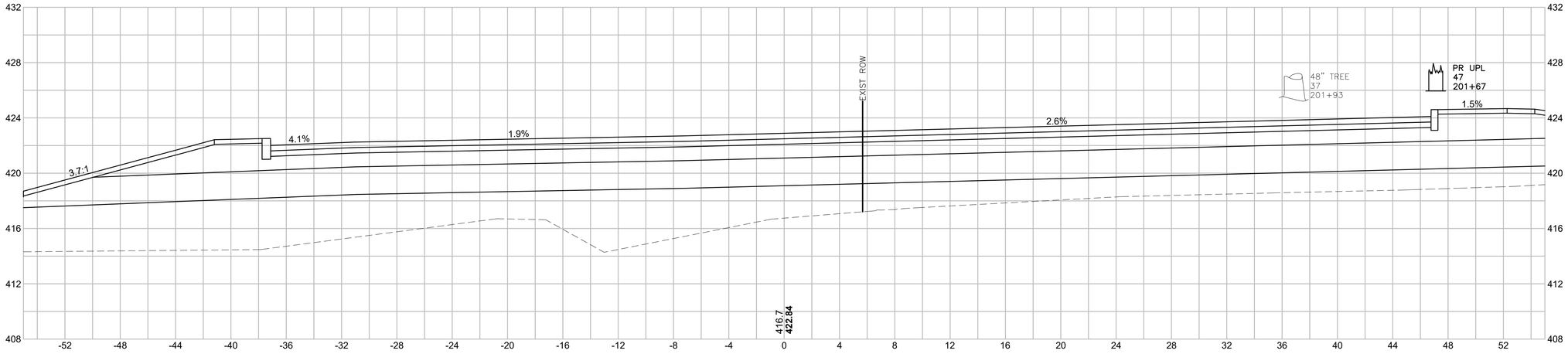
53+00



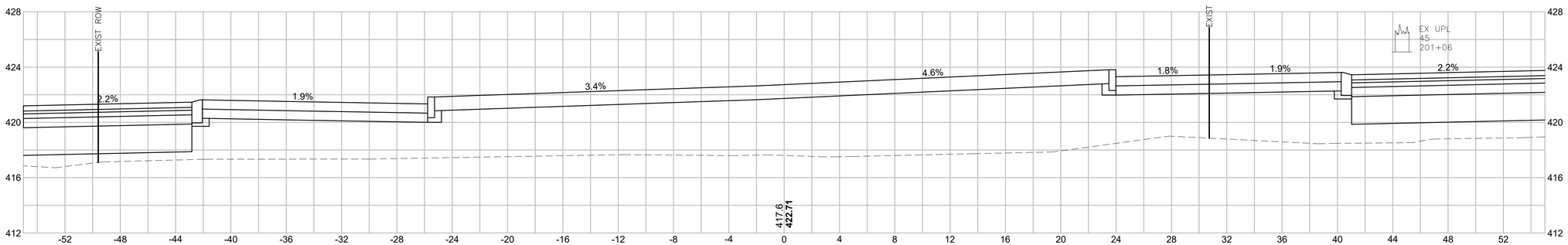
Material(s) at Station 53+00.00		
Material Name	Area	Volume
CUT	0.0	0.2
FILL	192.4	215.4

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

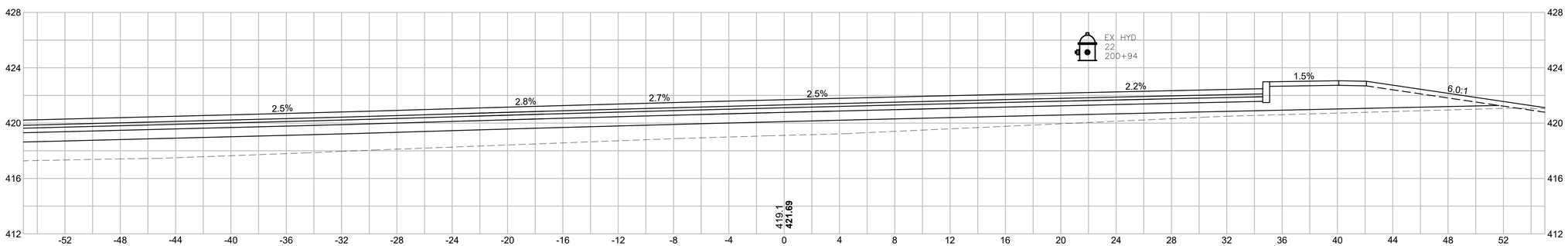
201+50



201+00



200+50



MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	117	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
ROUNDABOUT

Material(s) at Station 201+50.00		
Material Name	Area	Volume
CUT	0.0	-
FILL	291.4	-

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

605377_HD\XSECT\.DWG Plotted on 11-Apr-2022 5:31 PM

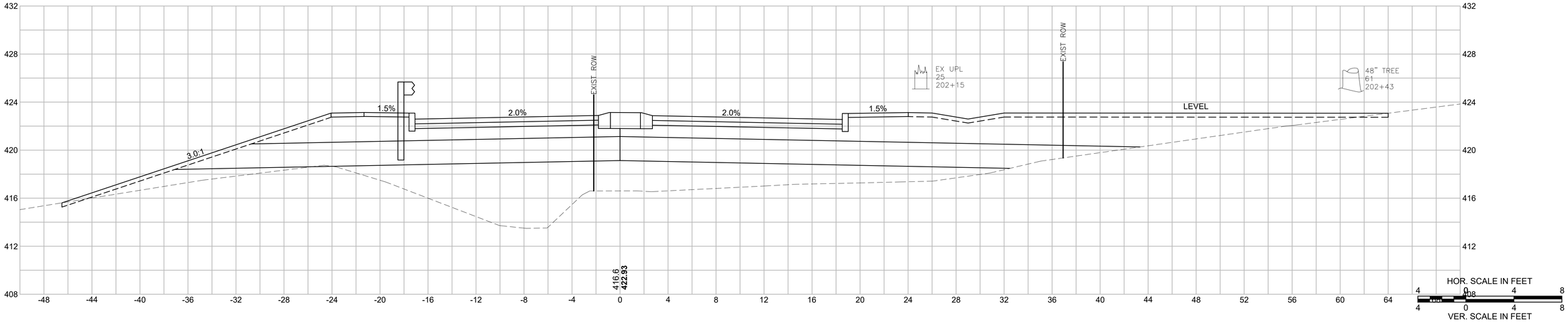
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	118	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MCCRACKEN ROAD

Material(s) at Station 202+00.00		
Material Name	Area	Volume
CUT	1.2	1.1
FILL	140.0	399.4

202+00

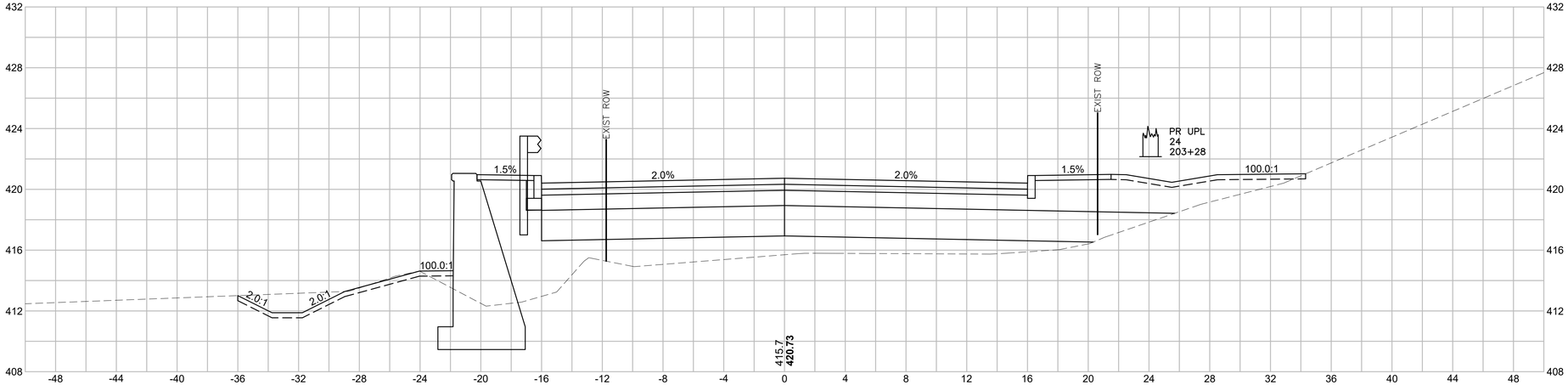


MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	119	152
PROJECT FILE NO. 605377			

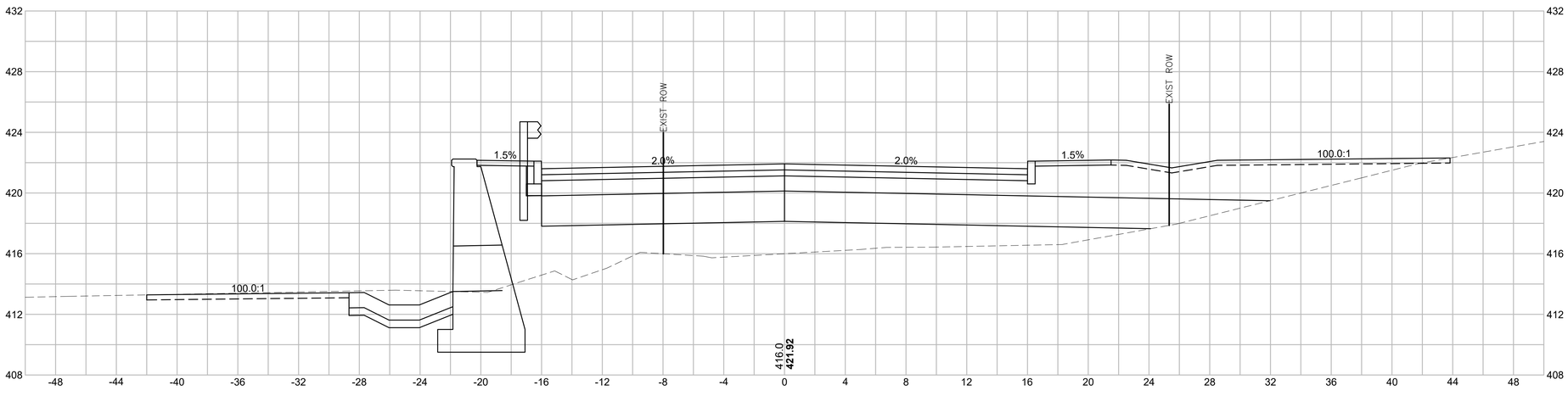
CROSS SECTIONS
MCCRACKEN ROAD

203+00



Material(s) at Station 203+00.00		
Material Name	Area	Volume
CUT	0.2	0.5
FILL	46.0	108.6

202+50



Material(s) at Station 202+50.00		
Material Name	Area	Volume
CUT	0.3	1.4
FILL	71.3	195.6

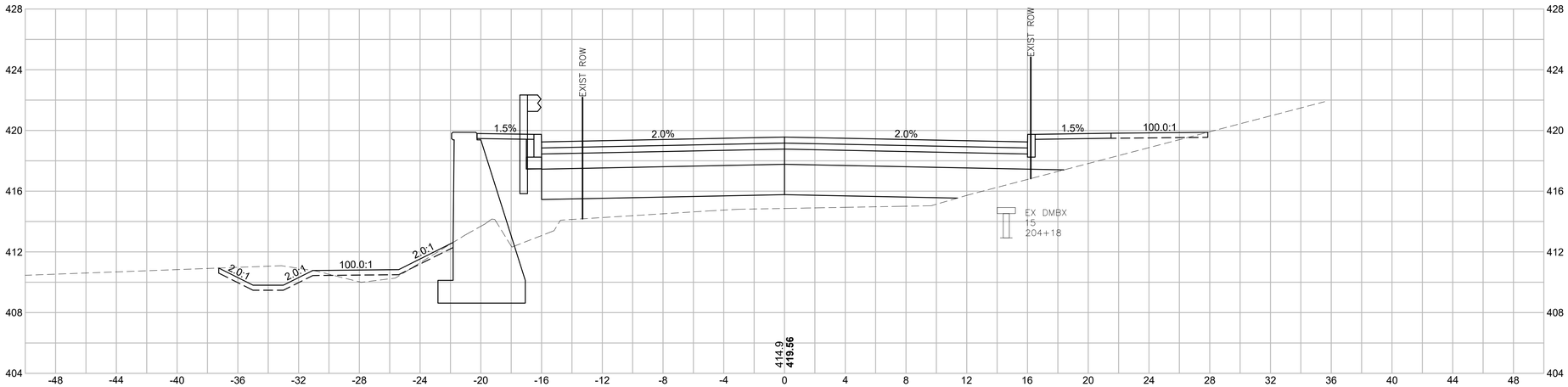
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	120	152
PROJECT FILE NO. 605377			

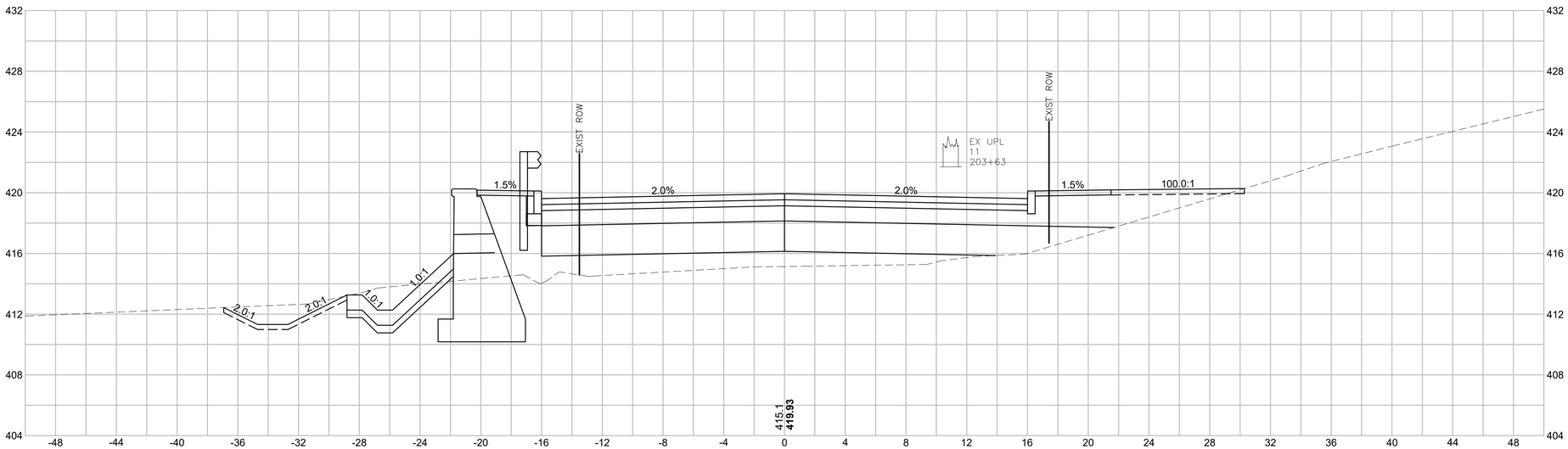
CROSS SECTIONS
MCCRACKEN ROAD

204+00



Material(s) at Station 204+00.00		
Material Name	Area	Volume
CUT	0.3	0.6
FILL	26.3	50.5

203+50



Material(s) at Station 203+50.00		
Material Name	Area	Volume
CUT	0.3	0.6
FILL	28.2	68.7

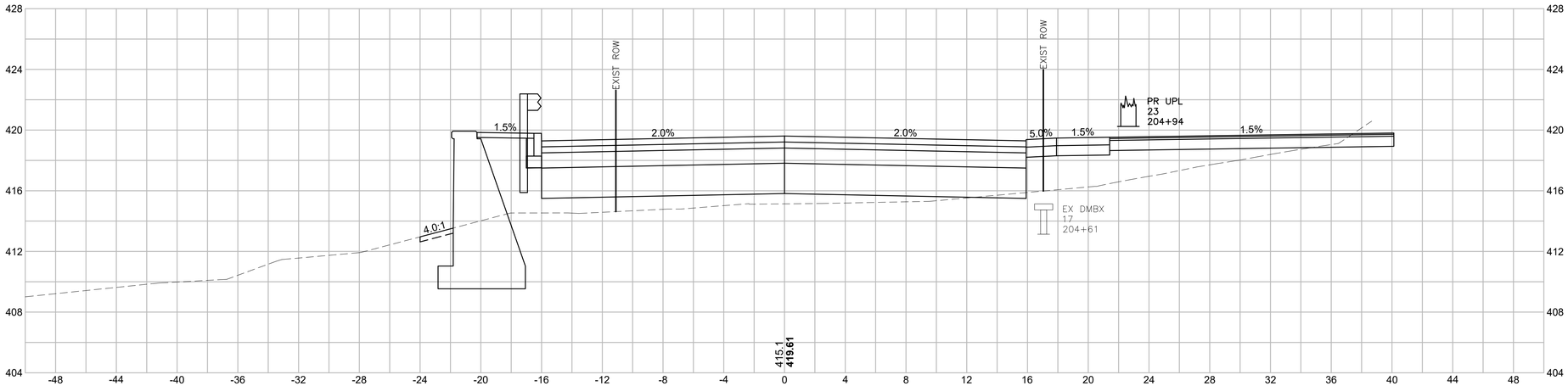
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	121	152
PROJECT FILE NO. 605377			

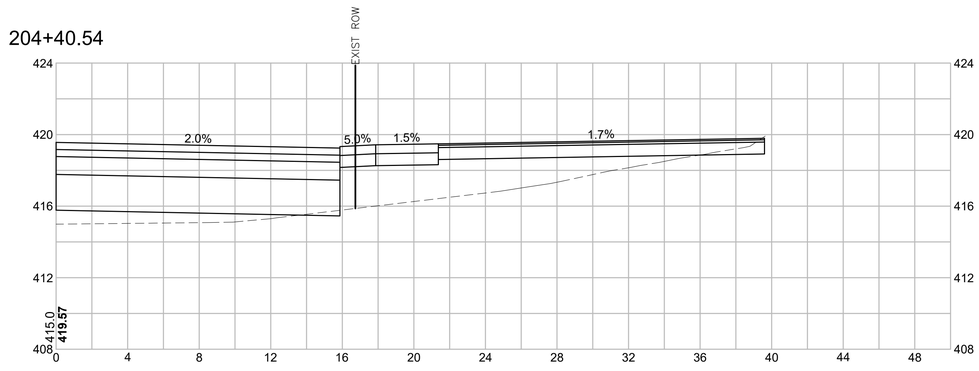
CROSS SECTIONS
MCCRACKEN ROAD

204+50



Material(s) at Station 204+50.00		
Material Name	Area	Volume
CUT	3.0	3.1
FILL	45.1	66.1

204+40.54



HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	122	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MCCRACKEN ROAD

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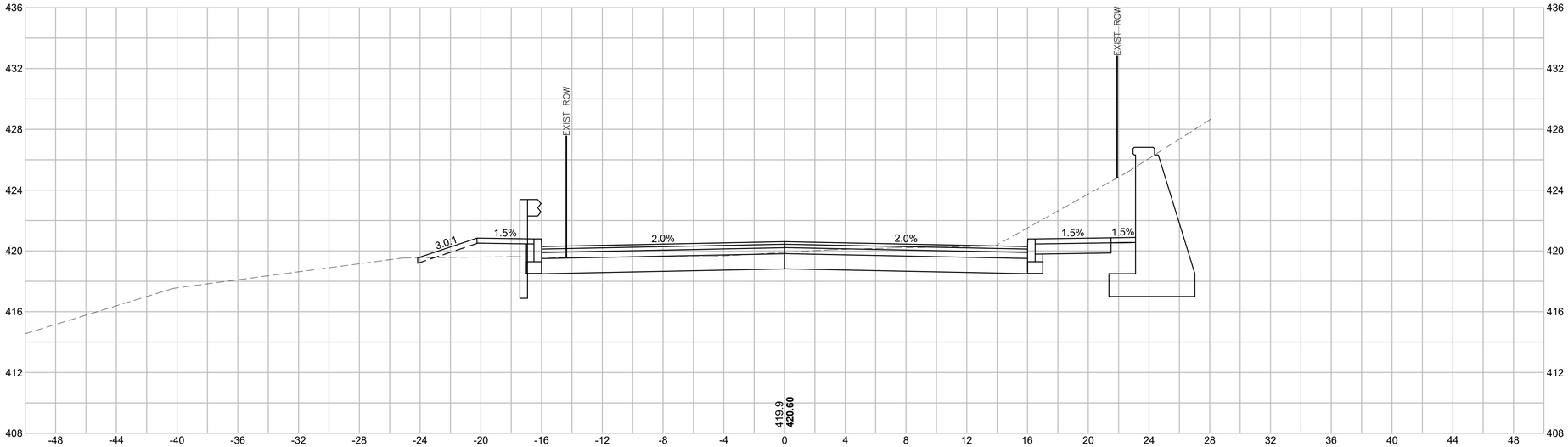
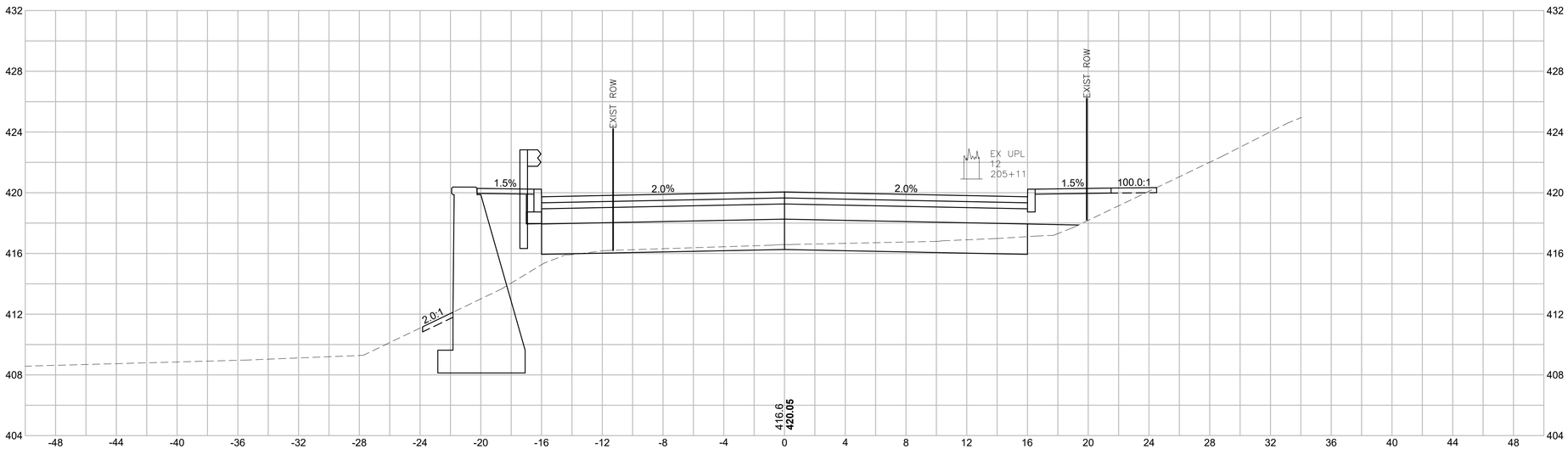
205+50



Material(s) at Station 205+50.00		
Material Name	Area	Volume
CUT	68.4	85.4
FILL	2.4	4.5

205+00



Material(s) at Station 205+00.00		
Material Name	Area	Volume
CUT	23.8	24.8
FILL	2.5	44.1

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	123	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MCCRACKEN ROAD

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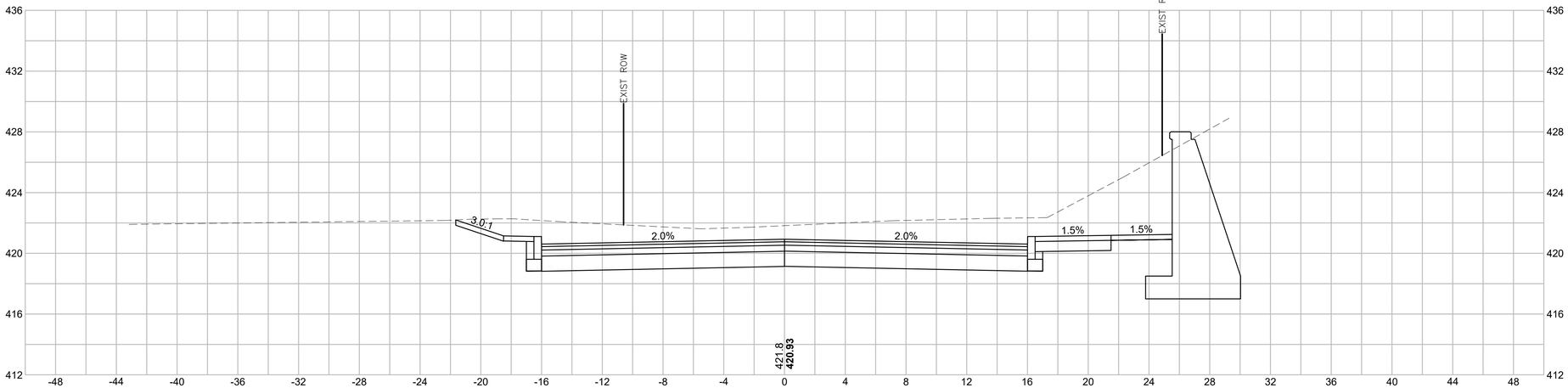
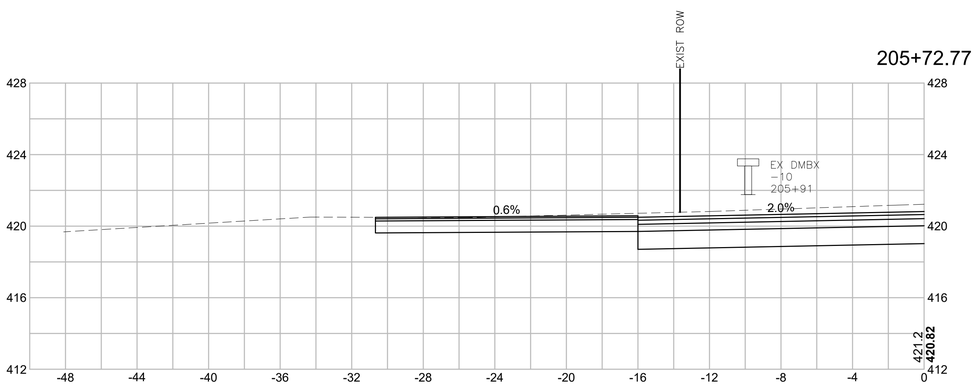
206+00



Material(s) at Station 206+00.00		
Material Name	Area	Volume
CUT	128.1	181.9
FILL	0.0	2.2

205+72.77



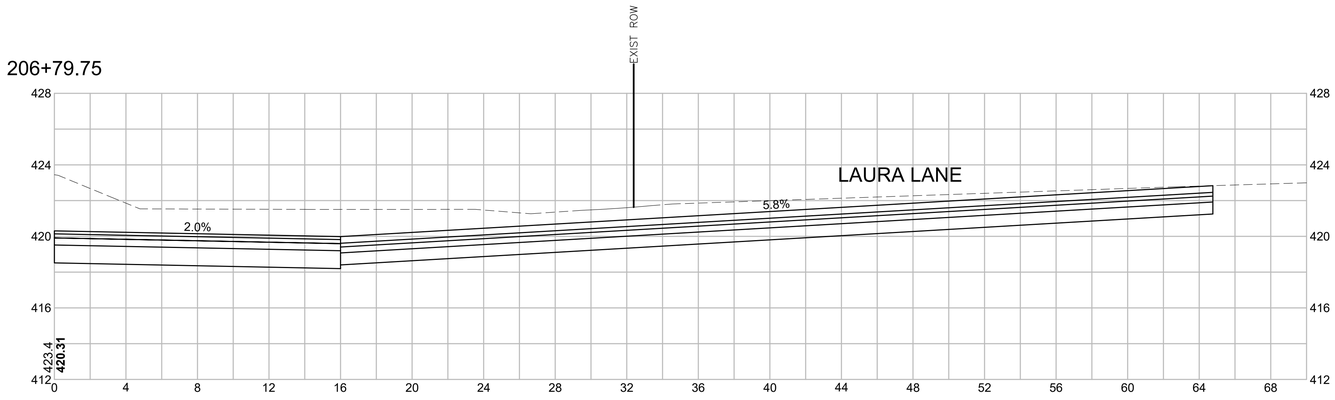
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

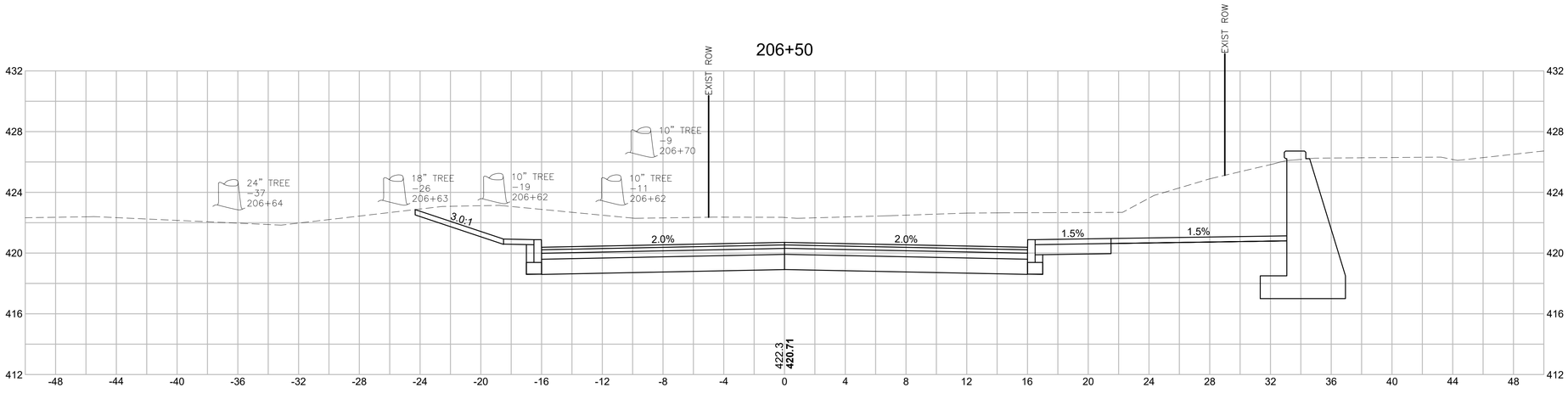
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	124	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MCCRACKEN ROAD

605377_HD(XSECT).DWG Plotted on 14-Jun-2022 4:48 PM





Material(s) at Station 206+50.00		
Material Name	Area	Volume
CUT	182.9	288.0
FILL	0.0	0.0

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	125	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MCCRACKEN ROAD

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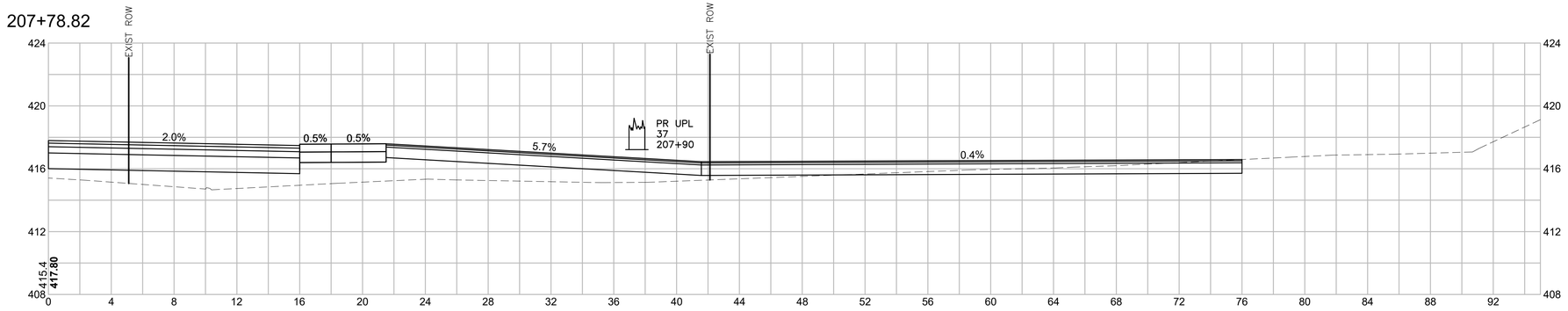
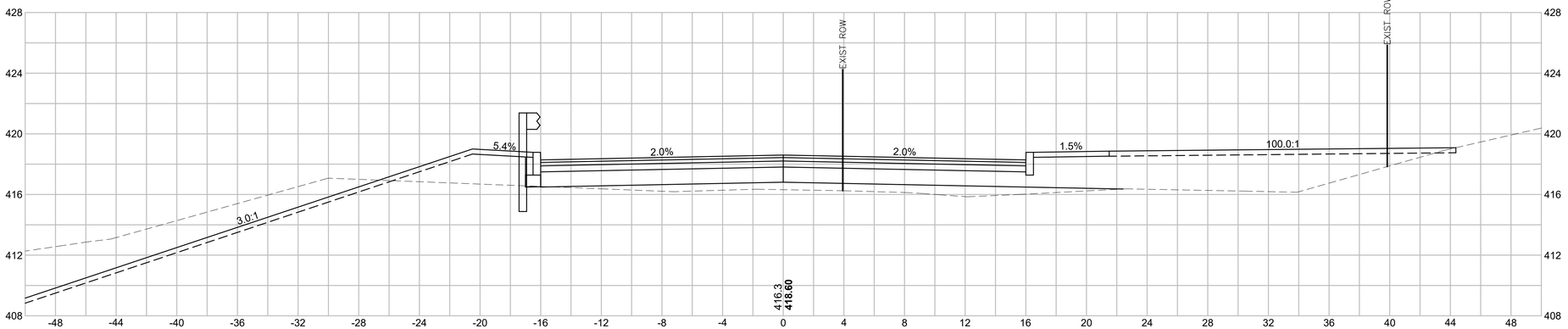
207+78.82

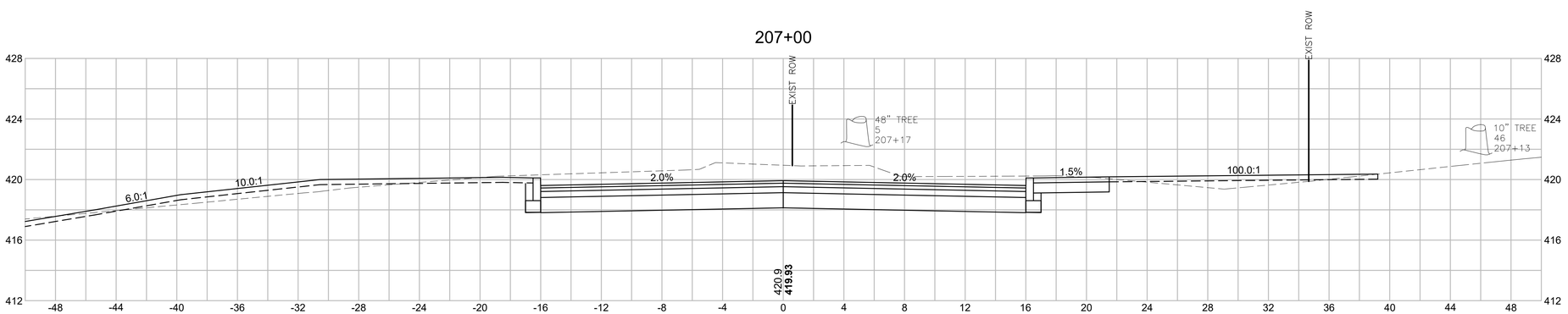


207+50



Material(s) at Station 207+50.00		
Material Name	Area	Volume
CUT	1.6	89.2
FILL	15.5	17.5

207+00



Material(s) at Station 207+00.00		
Material Name	Area	Volume
CUT	94.7	257.0
FILL	3.4	3.1

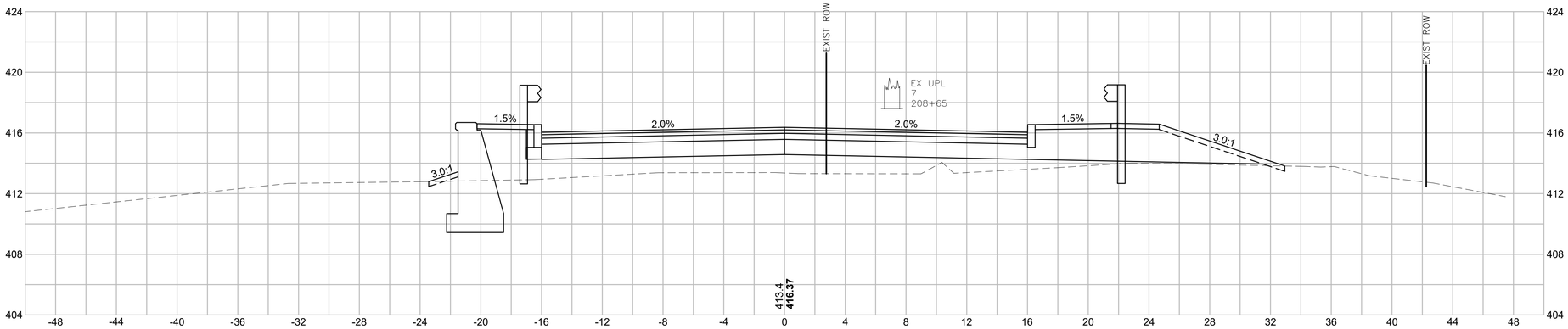
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	126	152
PROJECT FILE NO. 605377			

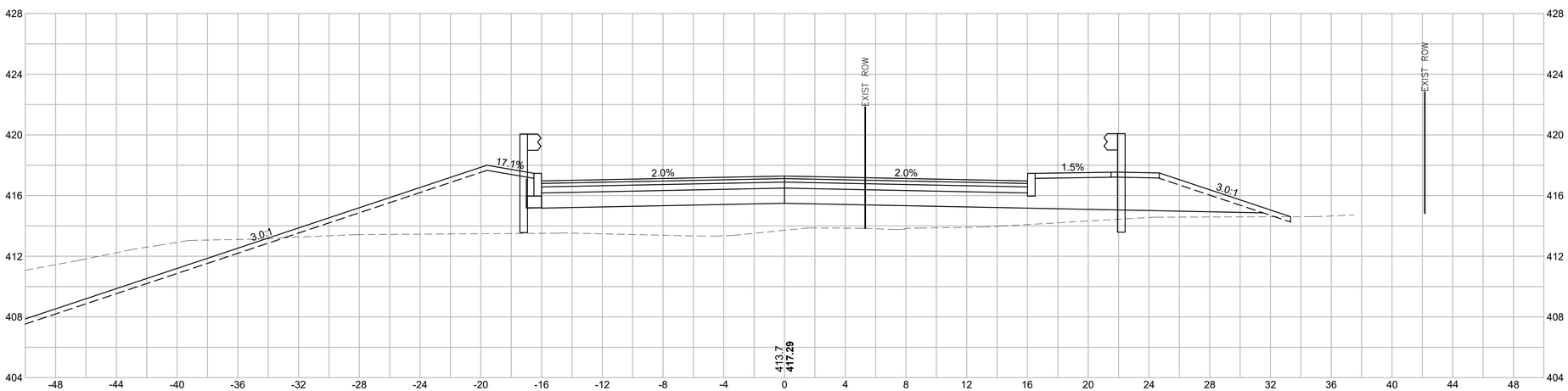
CROSS SECTIONS
MCCRACKEN ROAD

208+50



Material(s) at Station 208+50.00		
Material Name	Area	Volume
CUT	0.2	0.4
FILL	39.1	92.6

208+00



Material(s) at Station 208+00.00		
Material Name	Area	Volume
CUT	0.2	1.7
FILL	60.9	70.7

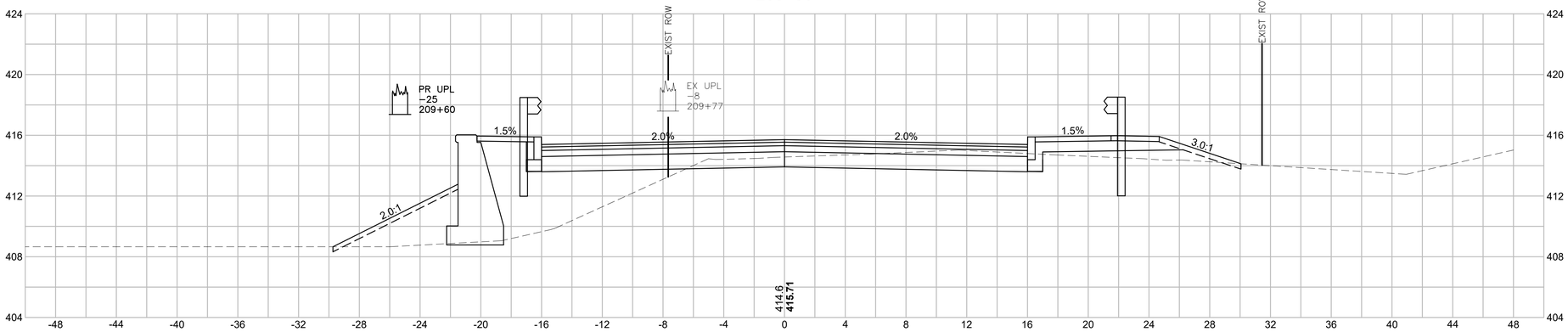
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	127	152
PROJECT FILE NO. 605377			

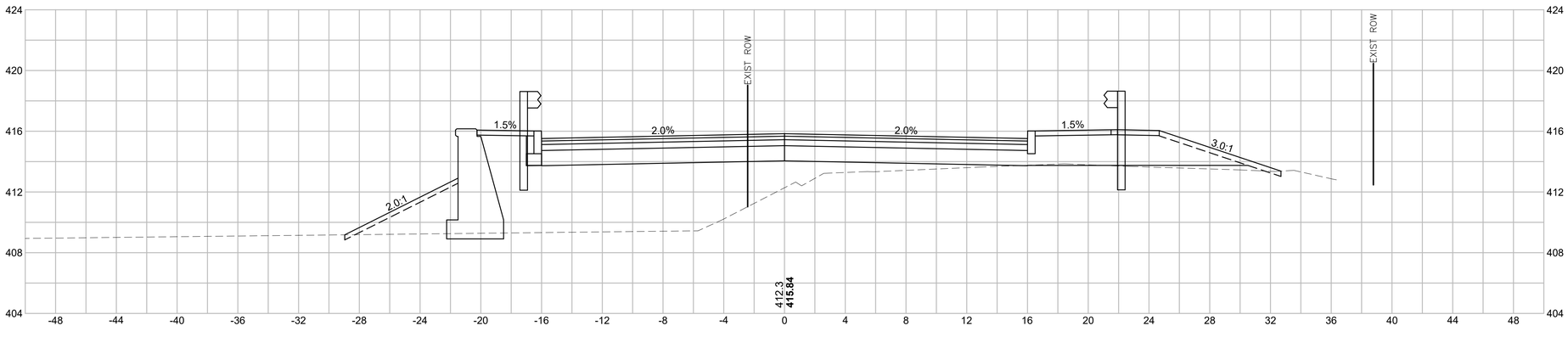
CROSS SECTIONS
MCCRACKEN ROAD

209+50



Material(s) at Station 209+50.00		
Material Name	Area	Volume
CUT	21.8	20.4
FILL	39.8	117.5

209+00



Material(s) at Station 209+00.00		
Material Name	Area	Volume
CUT	0.2	0.4
FILL	87.1	116.9

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	128	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MCCRACKEN ROAD

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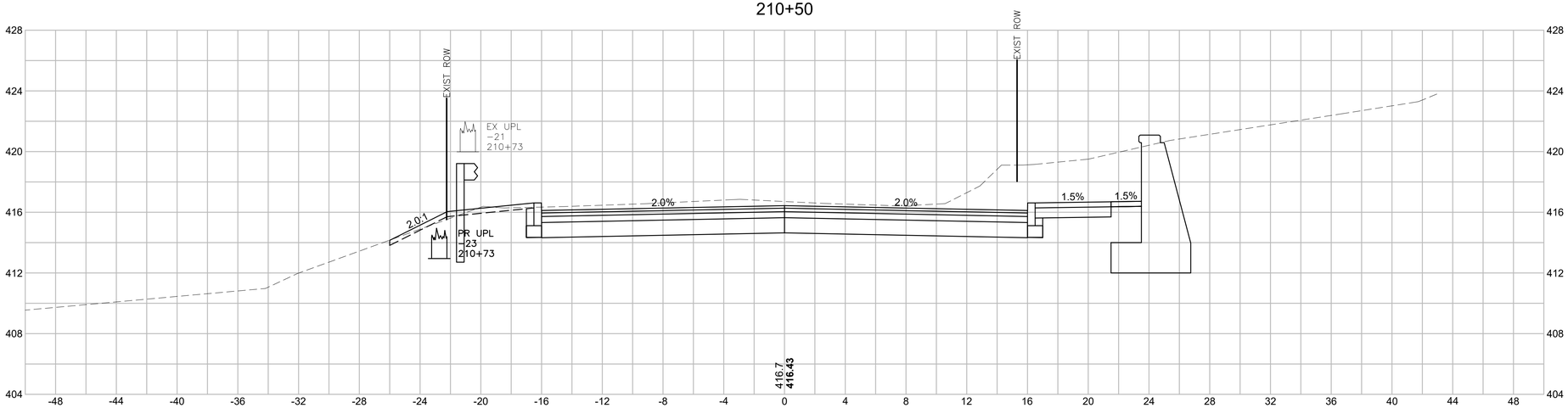
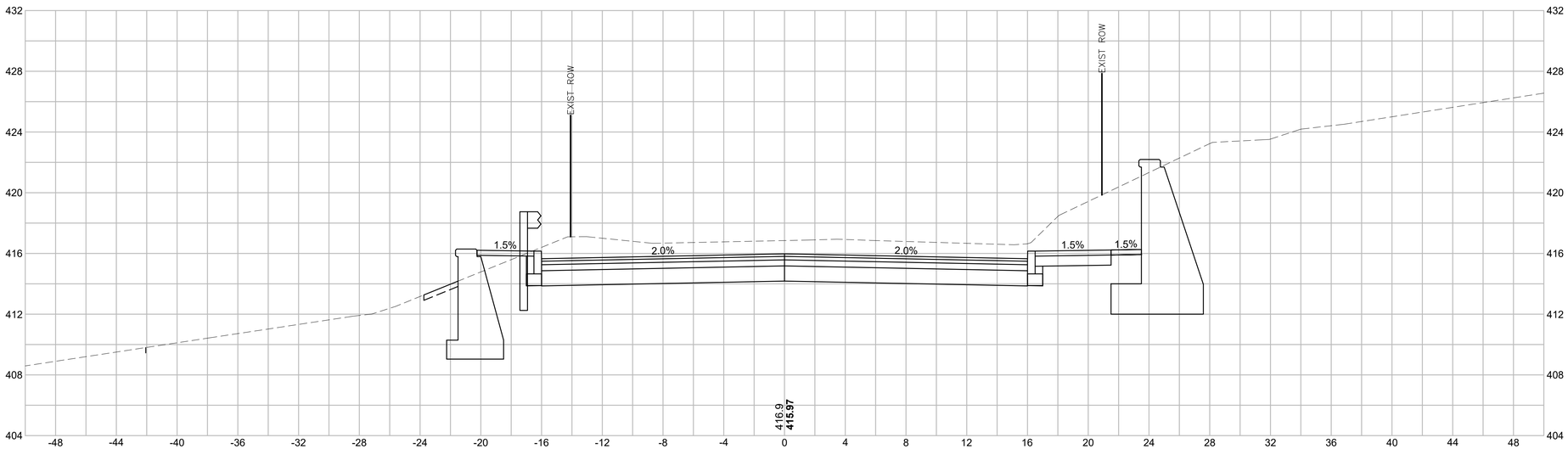
210+50



Material(s) at Station 210+50.00		
Material Name	Area	Volume
CUT	99.3	195.7
FILL	0.2	0.2

210+00



Material(s) at Station 210+00.00		
Material Name	Area	Volume
CUT	112.2	124.0
FILL	0.0	36.9

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

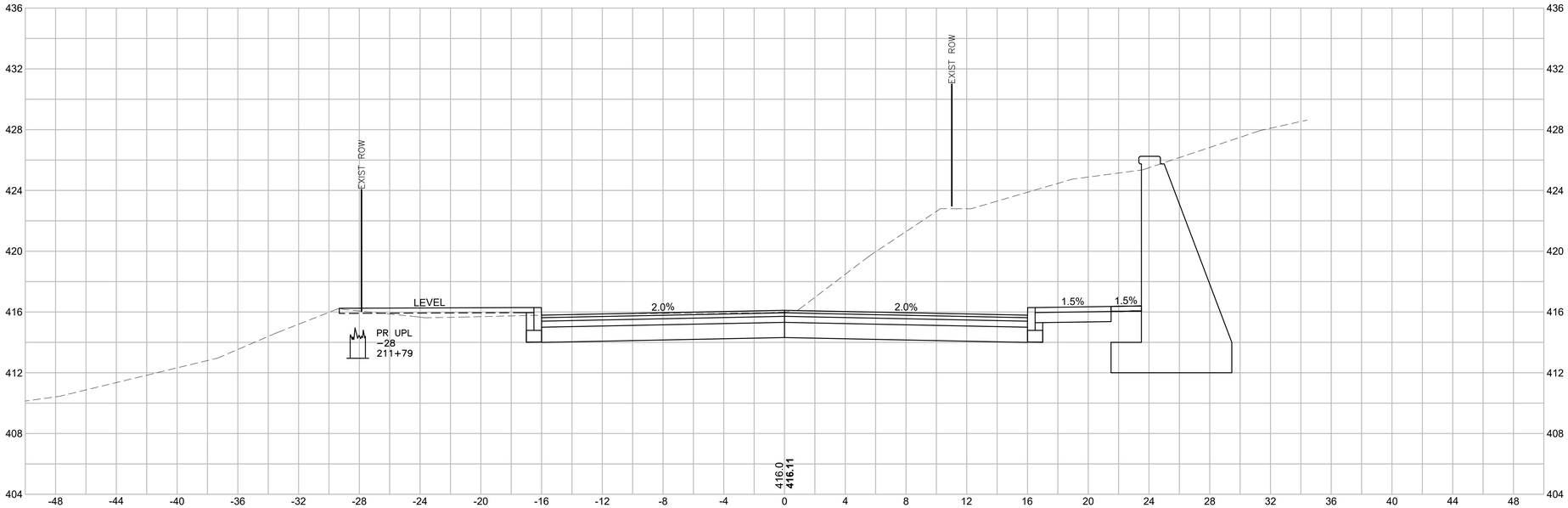
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	129	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MCCRACKEN ROAD

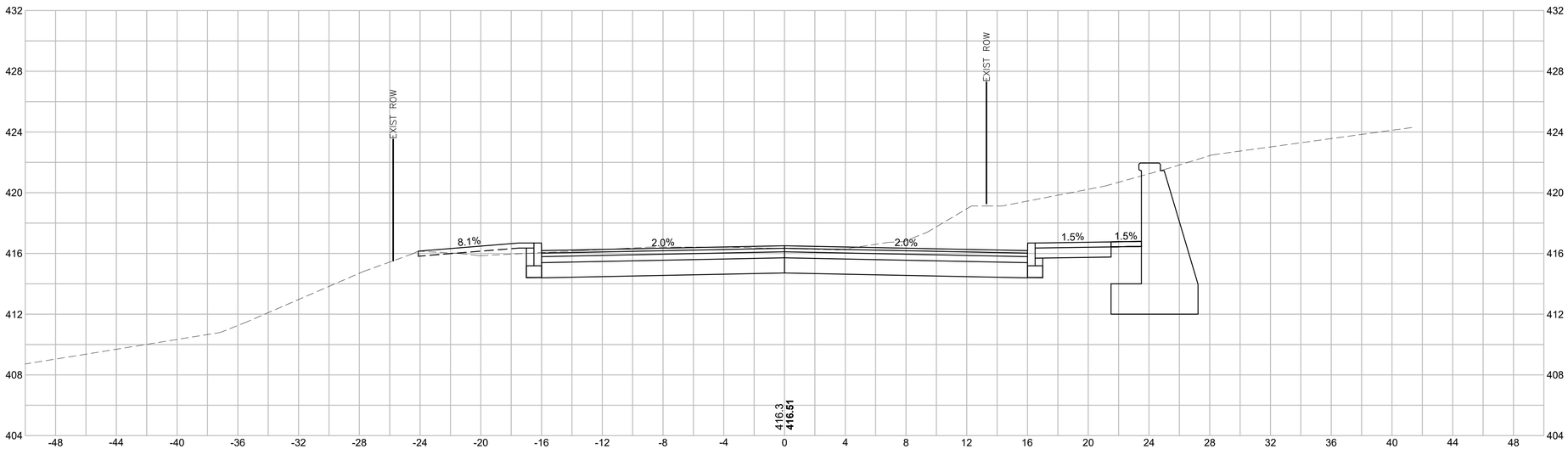
605377_HD(XSECT).DWG Plotted on 14-Jun-2022 4:48 PM

211+50



Material(s) at Station 211+50.00		
Material Name	Area	Volume
CUT	185.7	265.7
FILL	2.2	3.2

211+00



Material(s) at Station 211+00.00		
Material Name	Area	Volume
CUT	101.3	185.7
FILL	1.3	1.4

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

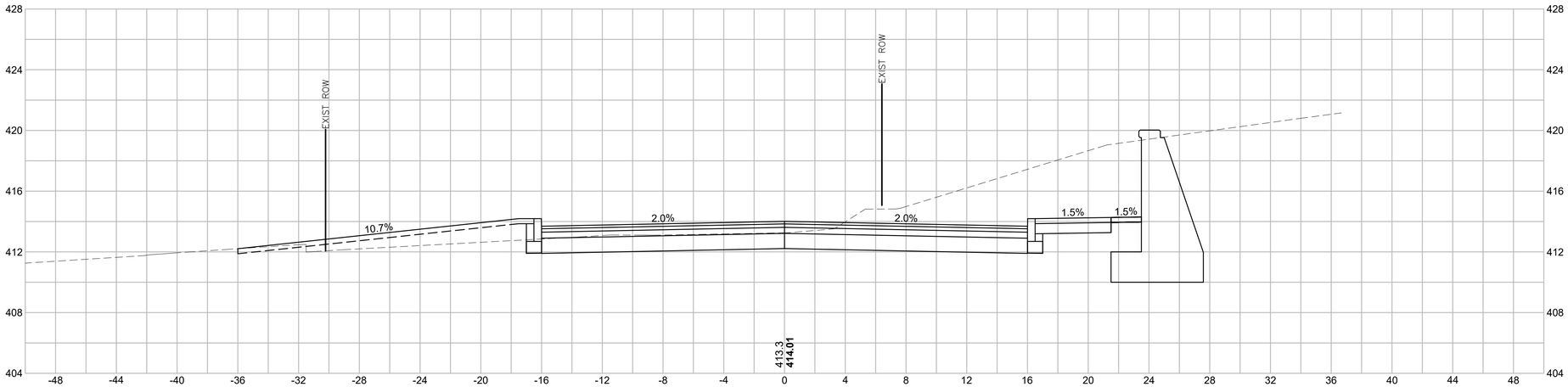
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	130	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MCCRACKEN ROAD

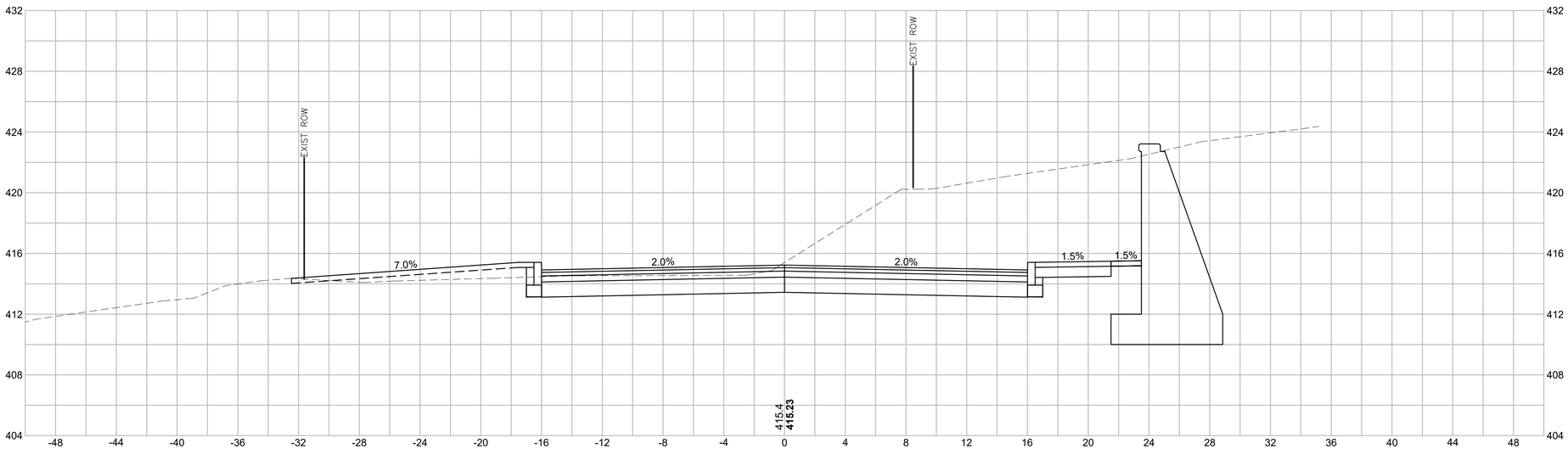
605377_HD\XSECT\.DWG Plotted on 14-Jun-2022 4:48 PM

212+50



Material(s) at Station 212+50.00		
Material Name	Area	Volume
CUT	96.1	236.3
FILL	10.6	14.7

212+00



Material(s) at Station 212+00.00		
Material Name	Area	Volume
CUT	159.1	319.3
FILL	5.3	6.9

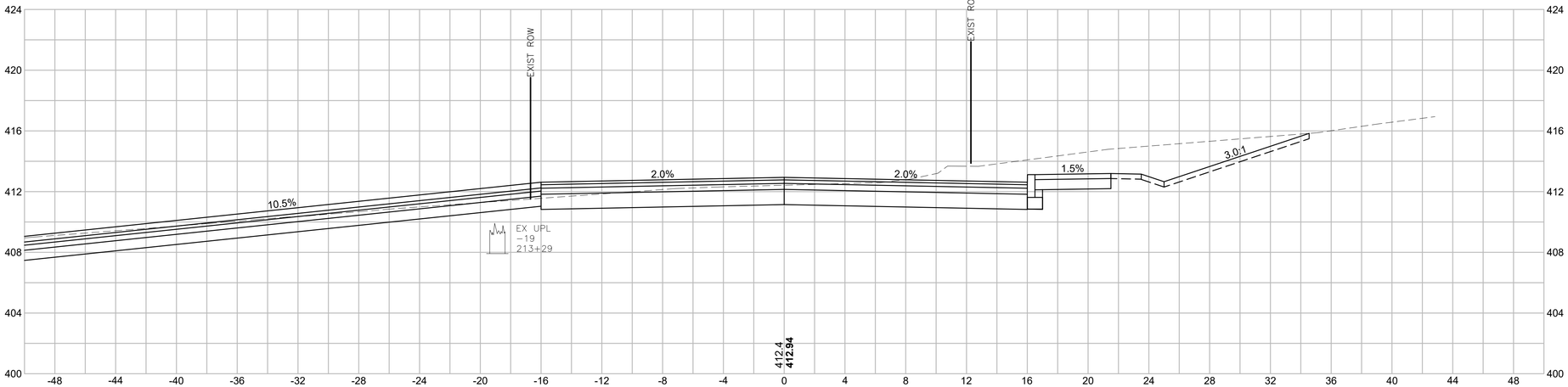
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	131	152
PROJECT FILE NO. 605377			

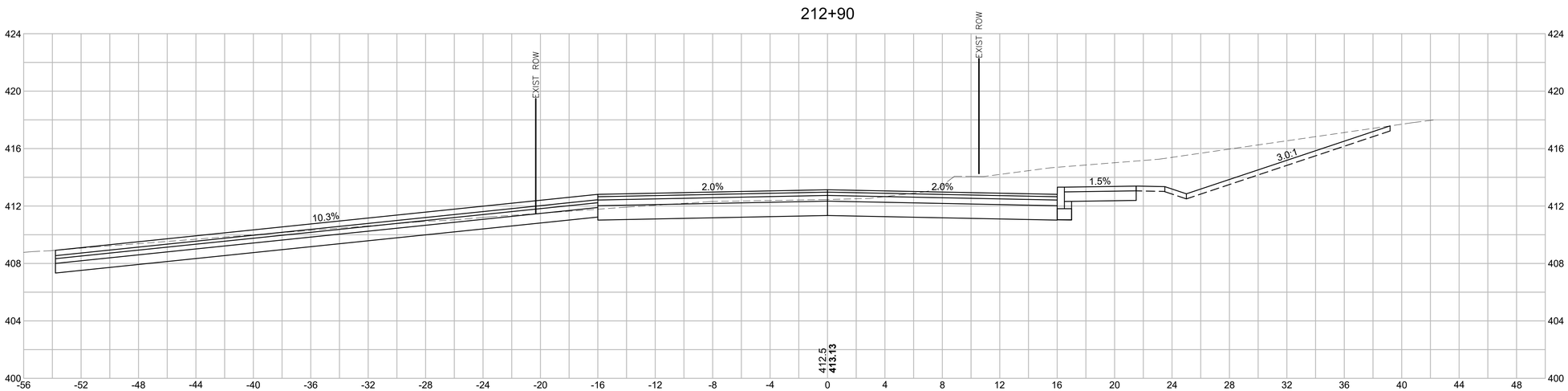
CROSS SECTIONS
MCCRACKEN ROAD

213+00



Material(s) at Station 213+00.00		
Material Name	Area	Volume
CUT	122.0	201.9
FILL	0.0	9.8

212+90



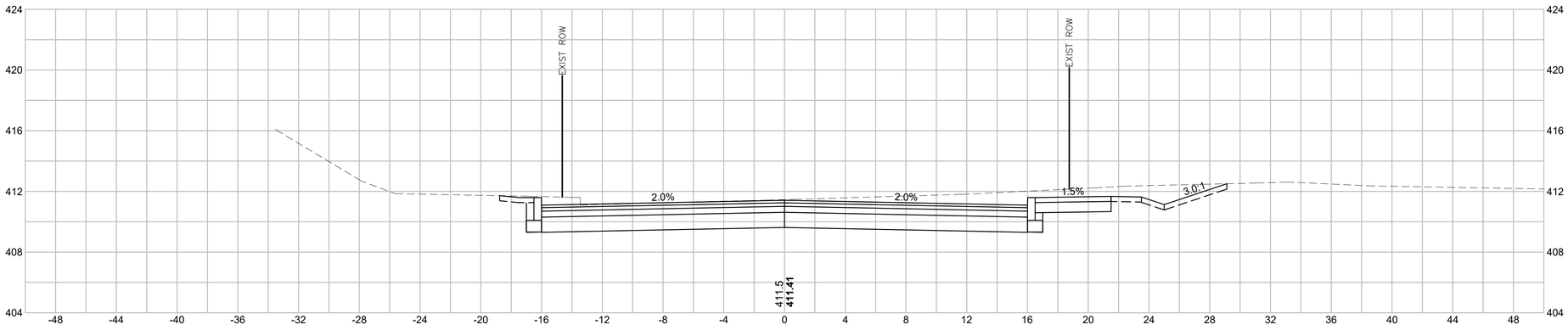
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	132	152
PROJECT FILE NO. 605377			

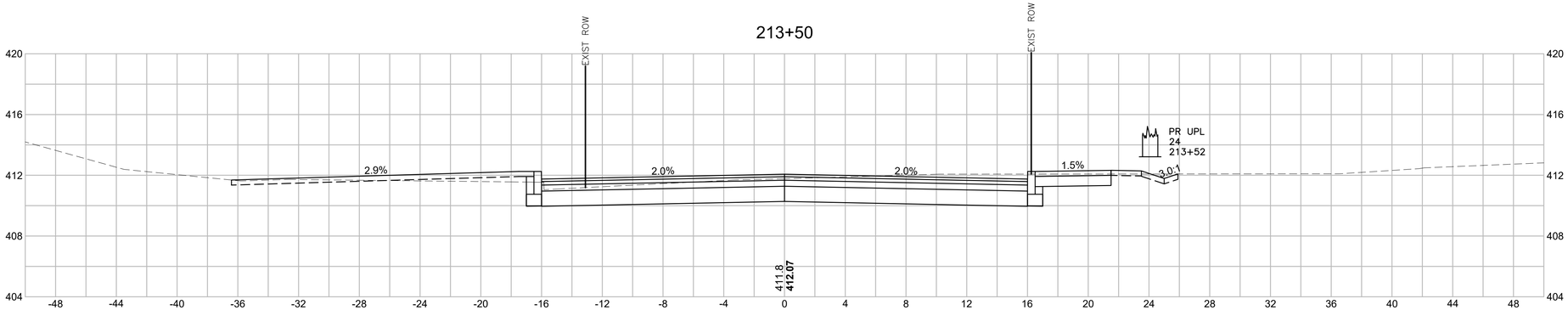
CROSS SECTIONS
MCCRACKEN ROAD

214+00



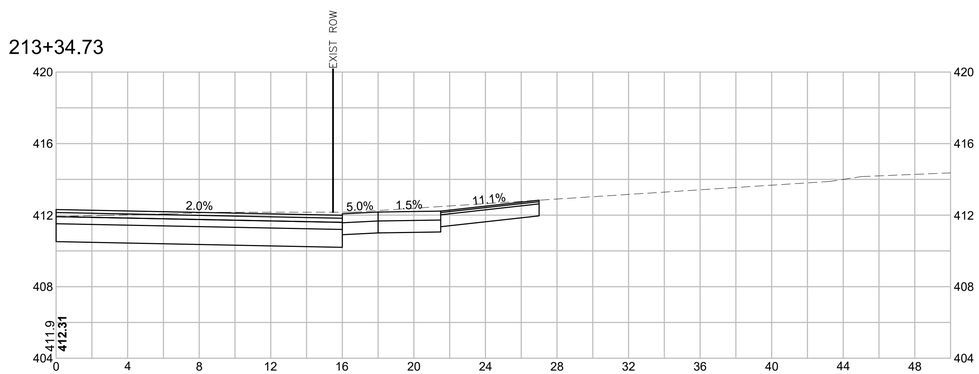
Material(s) at Station 214+		
Material Name	Area	Volume
CUT	86.8	137.1
FILL	0.0	1.7

213+50



Material(s) at Station 213+50.00		
Material Name	Area	Volume
CUT	61.3	169.7
FILL	1.8	1.7

213+34.73



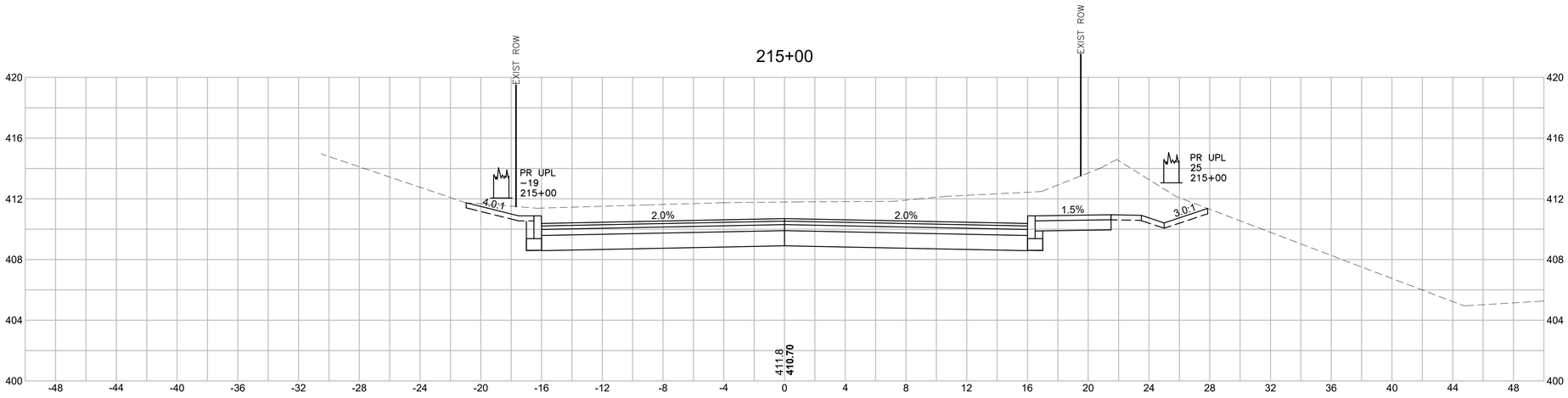
HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET
4 0 4 8

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	133	152
PROJECT FILE NO. 605377			

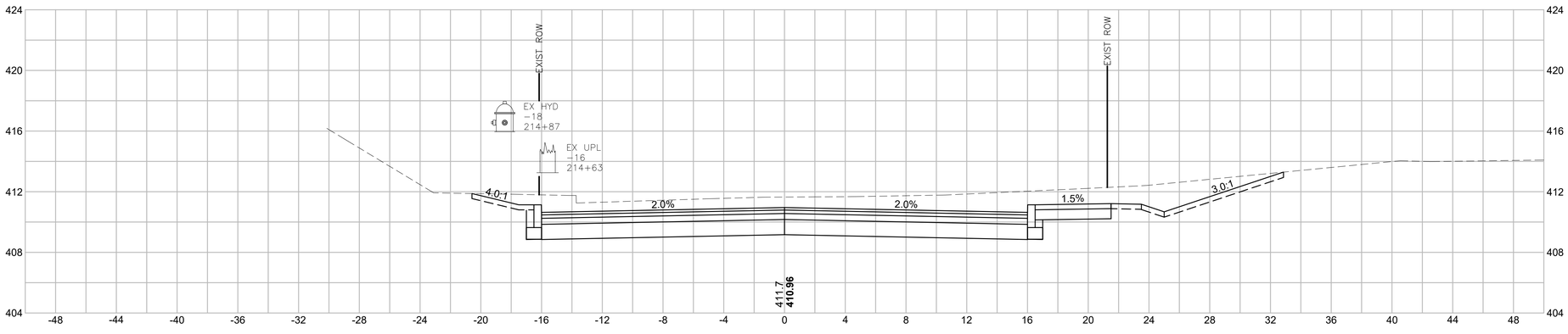
CROSS SECTIONS
MCCRACKEN ROAD

215+00



Material(s) at Station 215+00.00		
Material Name	Area	Volume
CUT	138.6	237.5
FILL	0.0	0.0

214+50



Material(s) at Station 214+50.00		
Material Name	Area	Volume
CUT	117.9	189.5
FILL	0.0	0.0

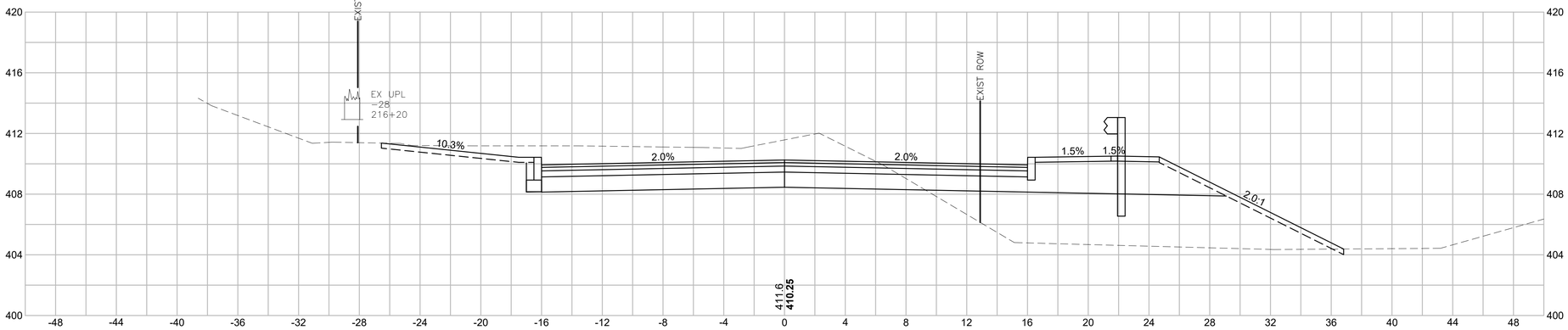
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	134	152
PROJECT FILE NO. 605377			

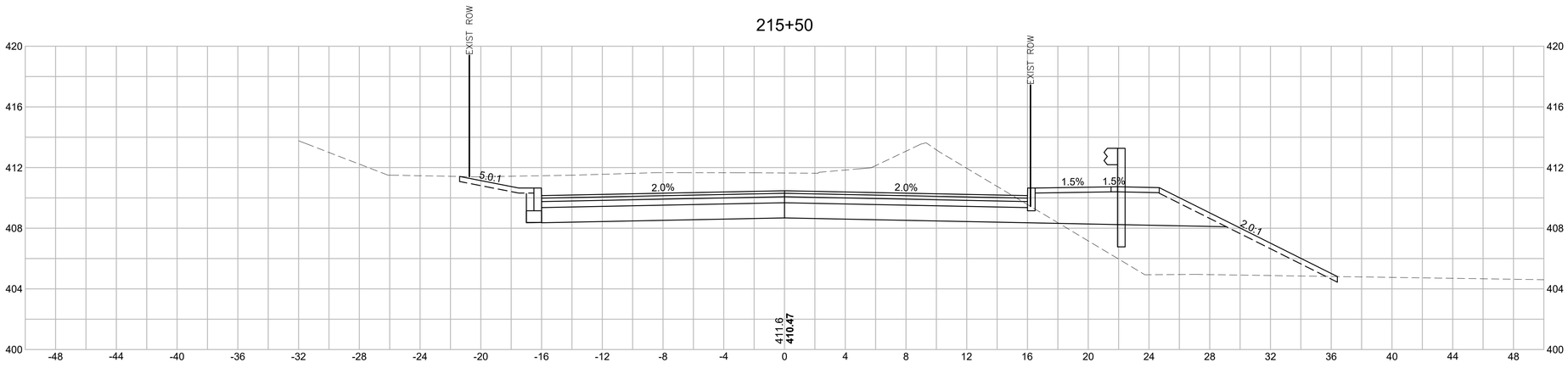
CROSS SECTIONS
MCCRACKEN ROAD

216+00



Material(s) at Station 216+00.00		
Material Name	Area	Volume
CUT	76.2	173.6
FILL	69.4	98.4

215+50



Material(s) at Station 215+50.00		
Material Name	Area	Volume
CUT	111.3	231.4
FILL	36.9	34.2

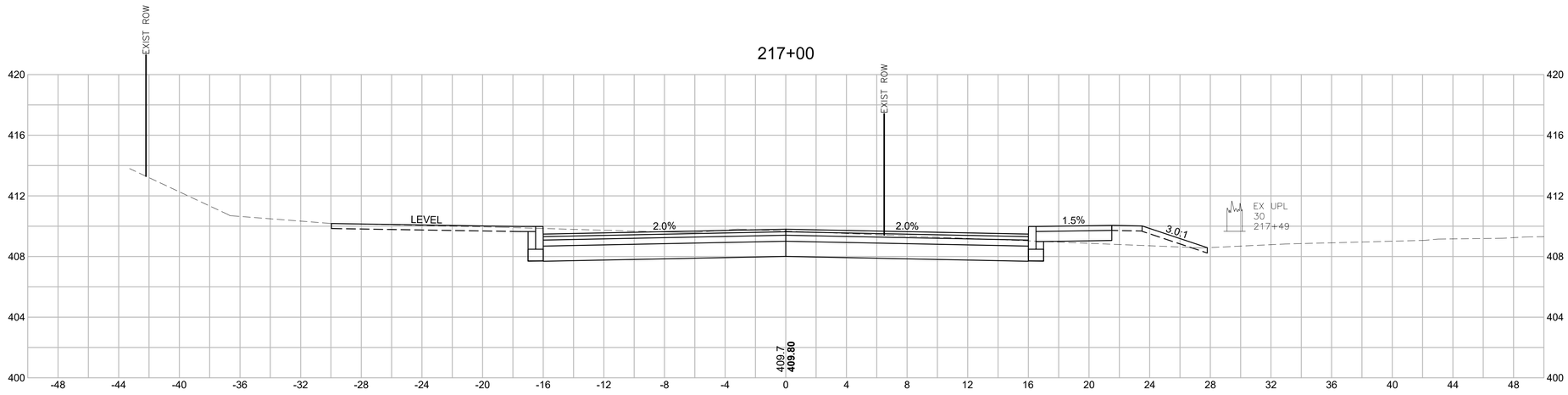
HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET
4 0 4 8

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	135	152
PROJECT FILE NO. 605377			

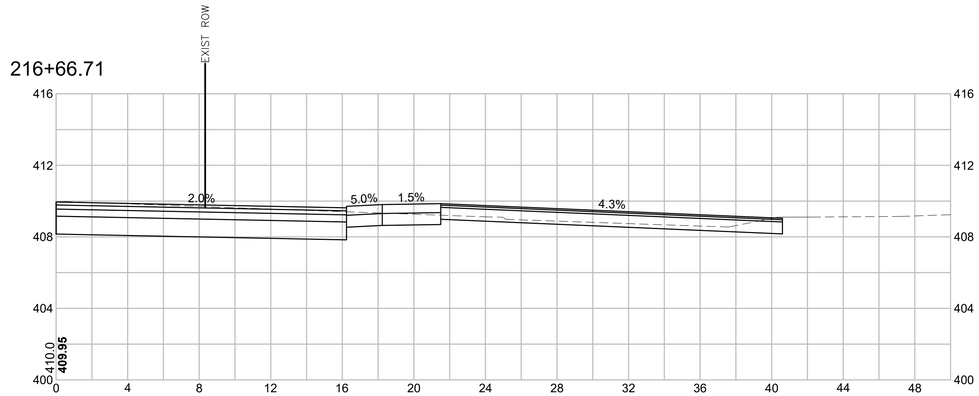
CROSS SECTIONS
MCCRACKEN ROAD

217+00

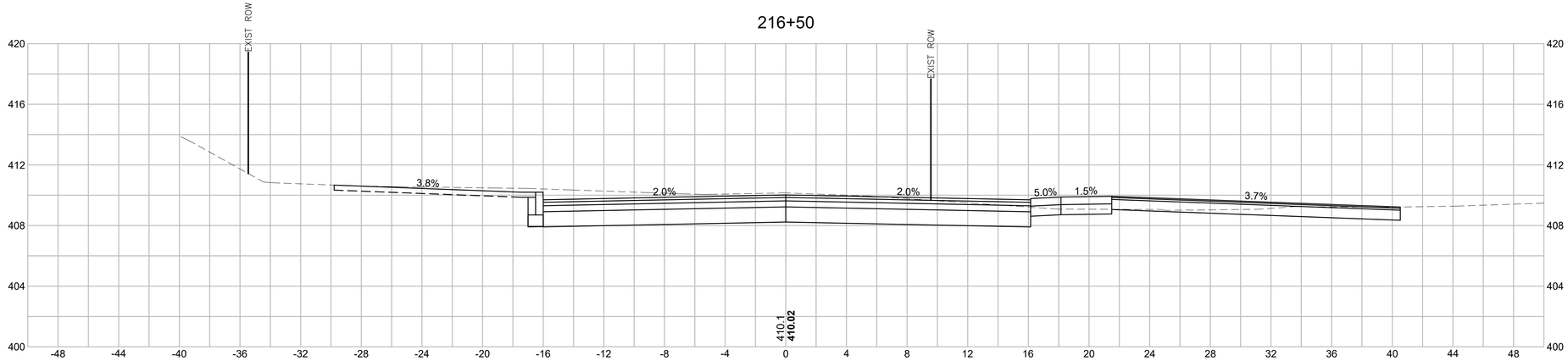


Material(s) at Station 217+00.00		
Material Name	Area	Volume
CUT	61.3	130.1
FILL	3.9	3.6

216+66.71



216+50



Material(s) at Station 216+50.00		
Material Name	Area	Volume
CUT	79.2	143.9
FILL	0.0	64.3

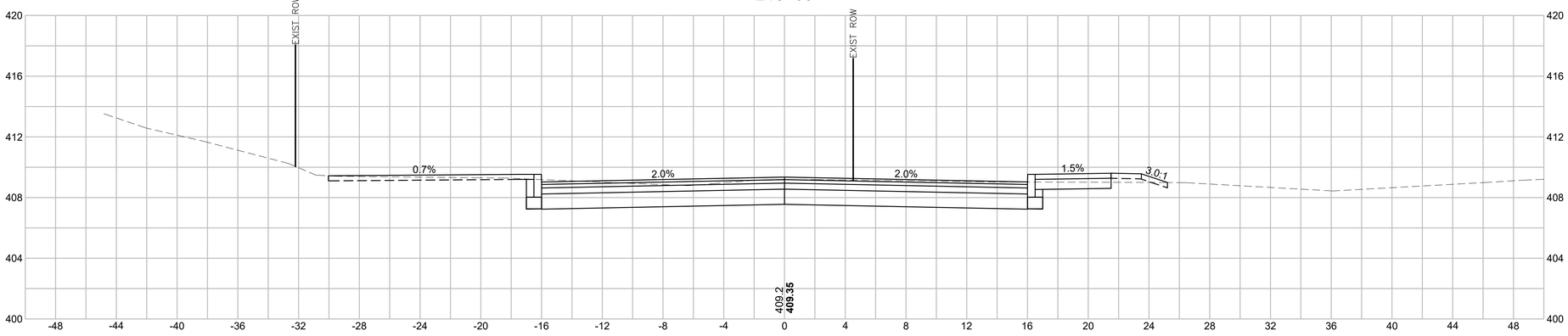
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	136	152
PROJECT FILE NO. 605377			

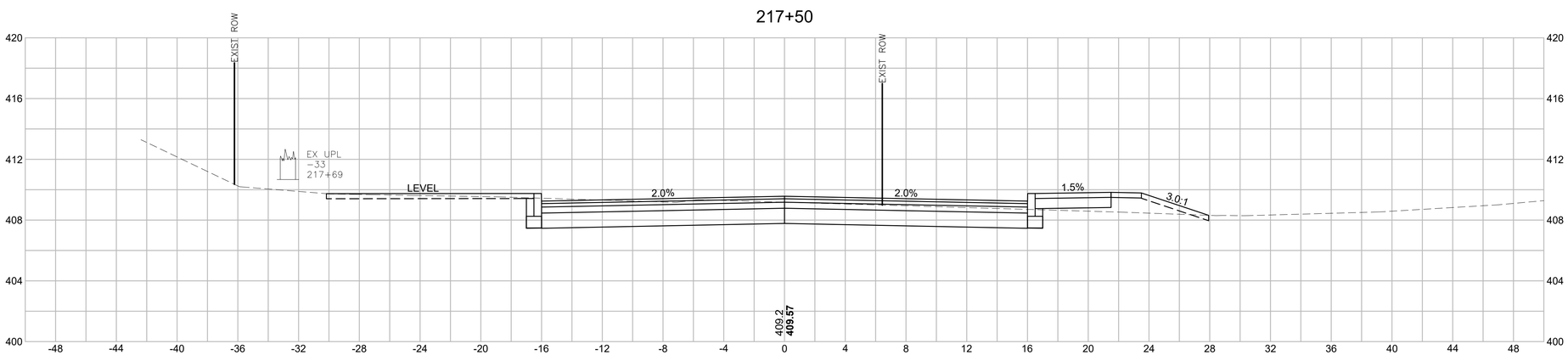
CROSS SECTIONS
MCCRACKEN ROAD

218+00



Material(s) at Station 218+00.00		
Material Name	Area	Volume
CUT	61.3	106.5
FILL	0.6	4.5

217+50



Material(s) at Station 217+50.00		
Material Name	Area	Volume
CUT	53.7	106.5
FILL	4.3	7.6

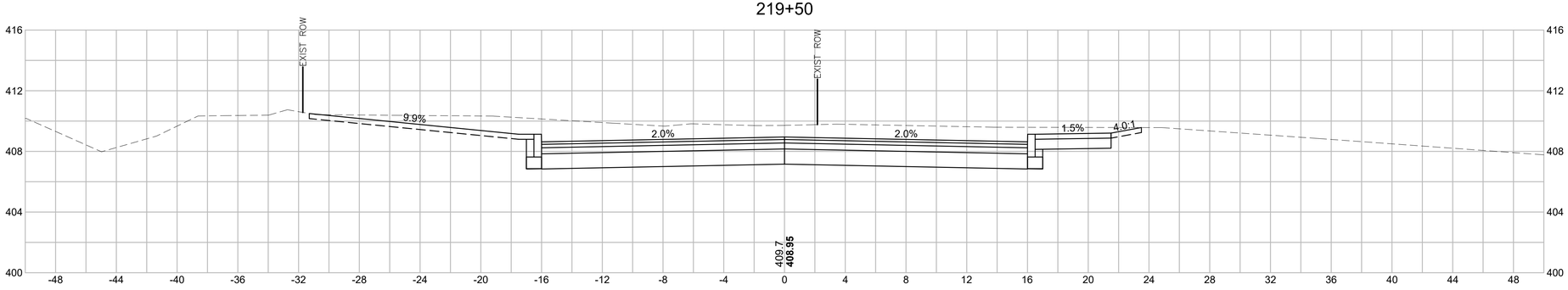
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	137	152
PROJECT FILE NO. 605377			

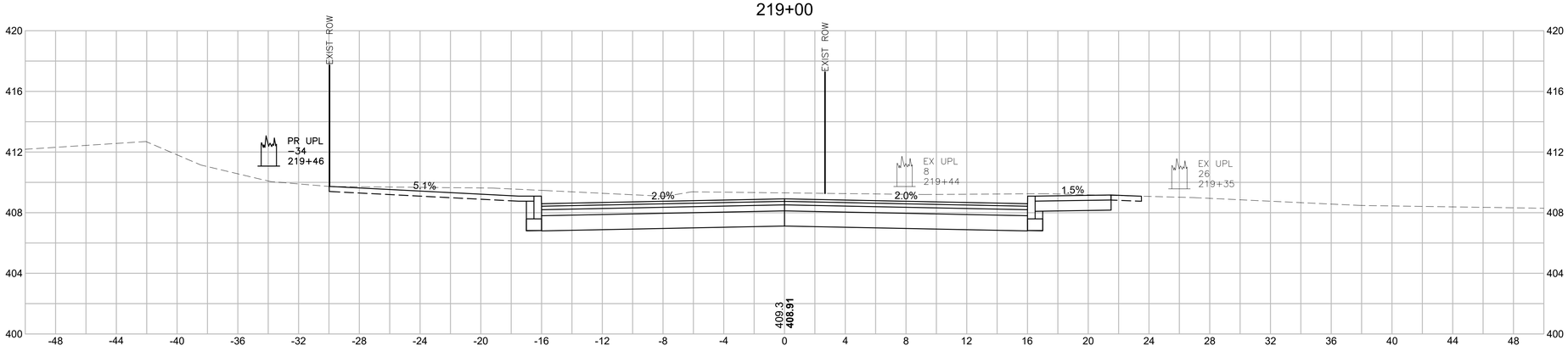
CROSS SECTIONS
MCCRACKEN ROAD

219+50



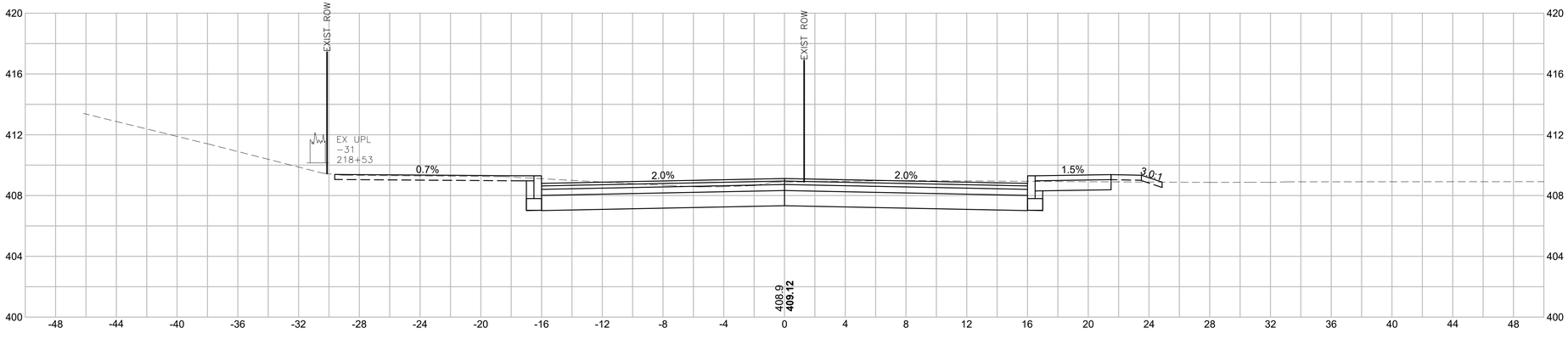
Material(s) at Station 219+50.00		
Material Name	Area	Volume
CUT	118.3	196.1
FILL	0.0	0.0

219+00



Material(s) at Station 219+00.00		
Material Name	Area	Volume
CUT	93.5	146.2
FILL	0.0	0.3

218+50



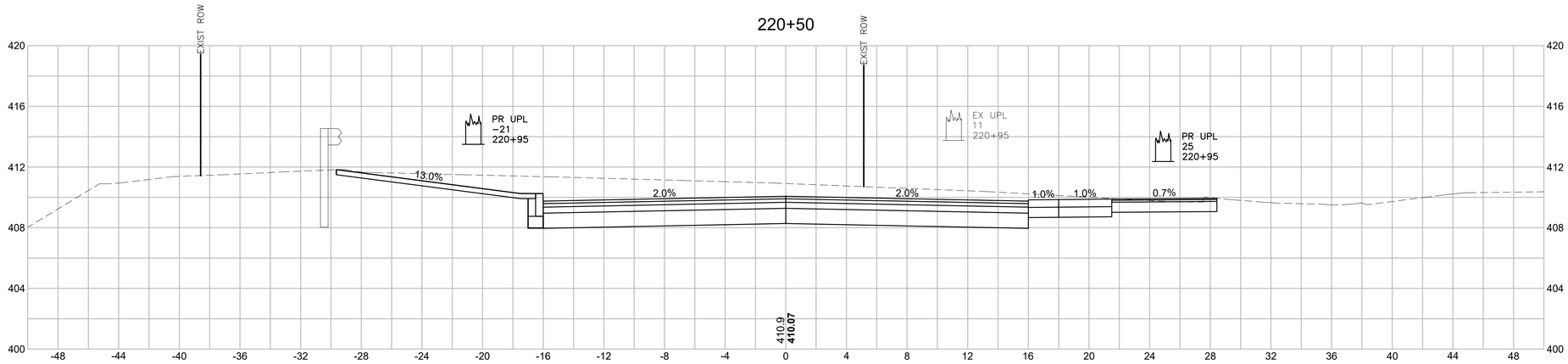
Material(s) at Station 218+50.00		
Material Name	Area	Volume
CUT	64.4	116.4
FILL	0.3	0.8

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

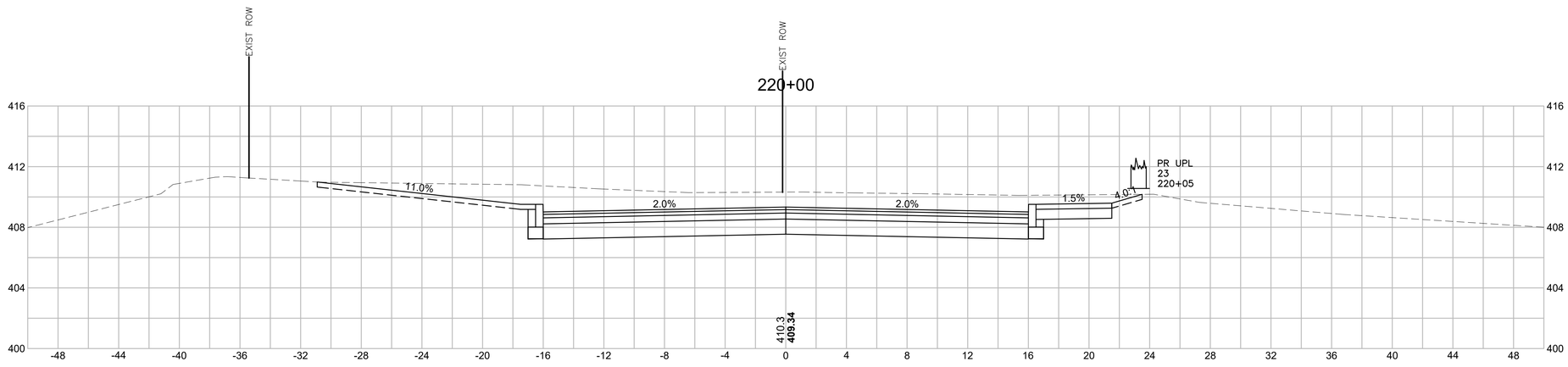
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	138	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MCCRACKEN ROAD



Material(s) at Station 220+50.00		
Material Name	Area	Volume
CUT	111.2	220.2
FILL	0.0	0.0



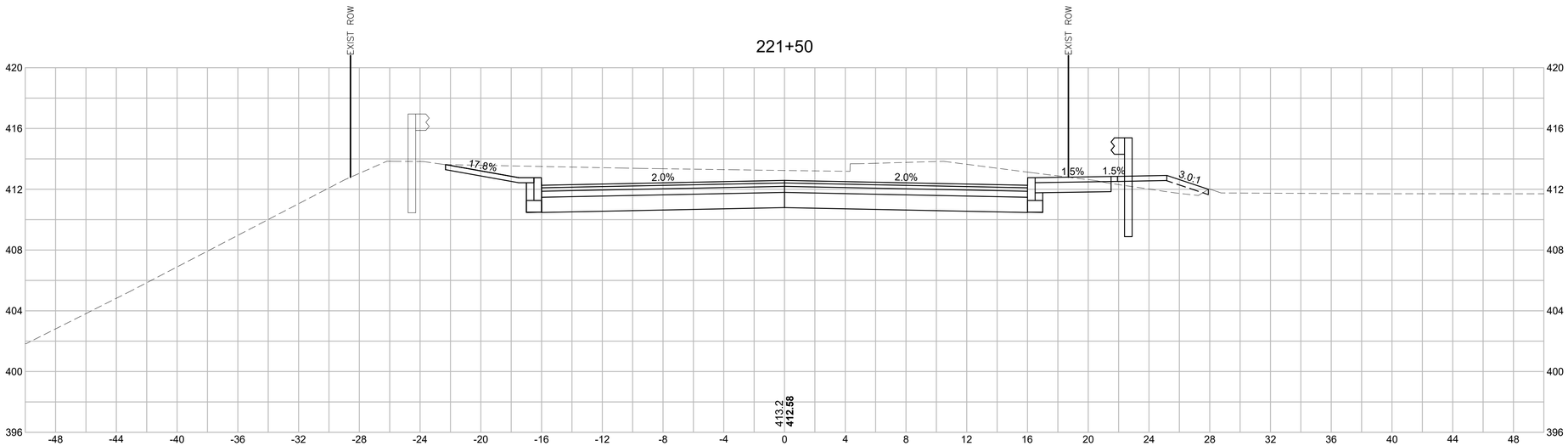
Material(s) at Station 220+00.00		
Material Name	Area	Volume
CUT	126.6	226.8
FILL	0.0	0.0

HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

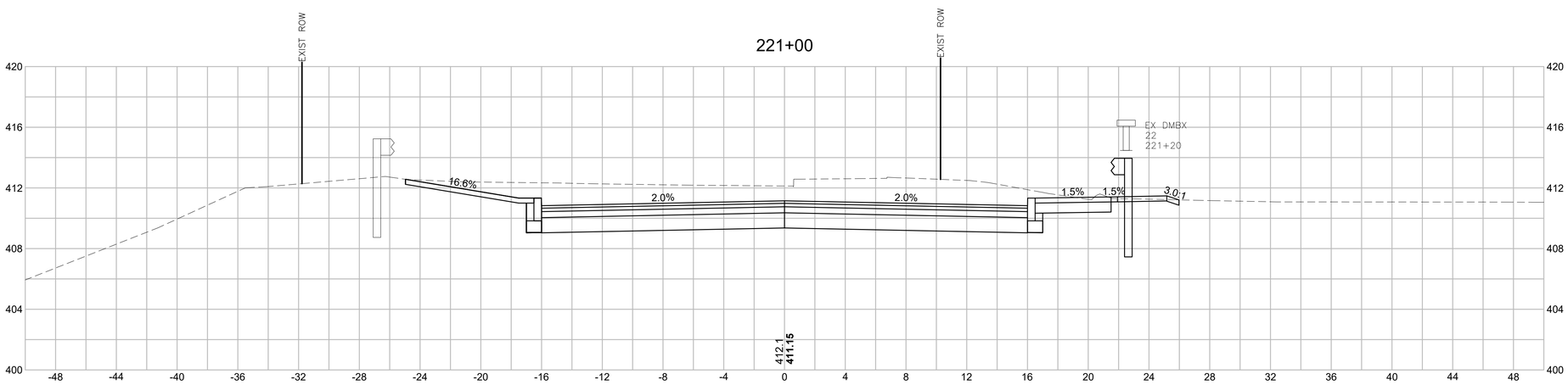
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	139	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MCCRACKEN ROAD



Material(s) at Station 221+50.00		
Material Name	Area	Volume
CUT	104.8	207.0
FILL	2.7	2.5



Material(s) at Station 221+00.00		
Material Name	Area	Volume
CUT	118.8	213.0
FILL	0.0	0.0

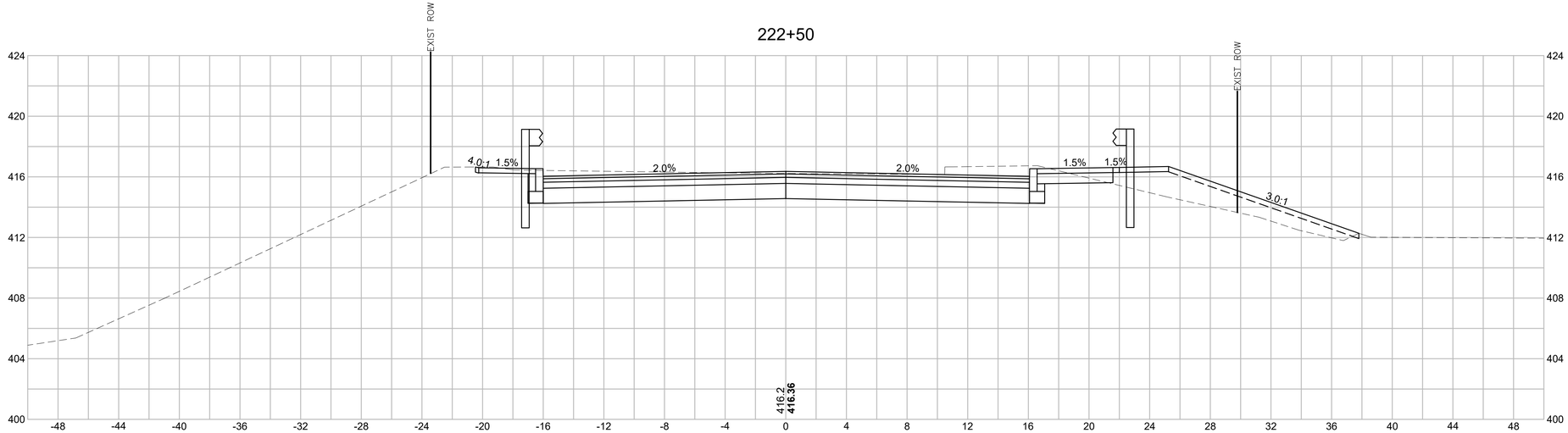
HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET
4 0 4 8

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	140	152
PROJECT FILE NO. 605377			

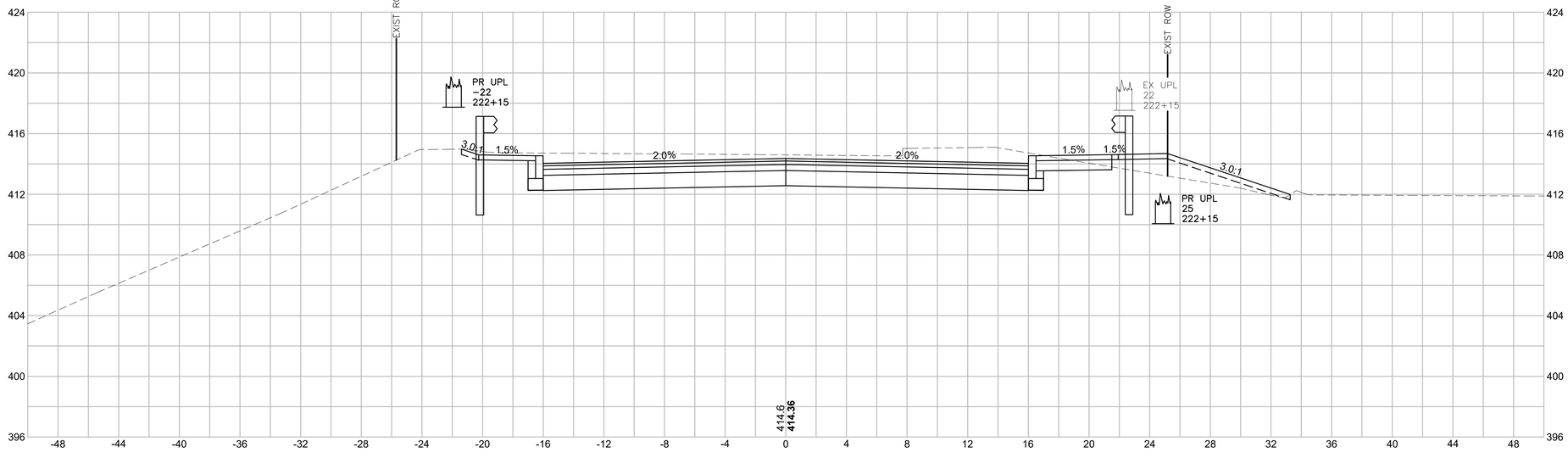
CROSS SECTIONS
MCCRACKEN ROAD

222+50



Material(s) at Station 222+50.00		
Material Name	Area	Volume
CUT	70.3	143.0
FILL	17.9	23.1

222+00



Material(s) at Station 222+00.00		
Material Name	Area	Volume
CUT	84.1	174.9
FILL	7.0	9.0

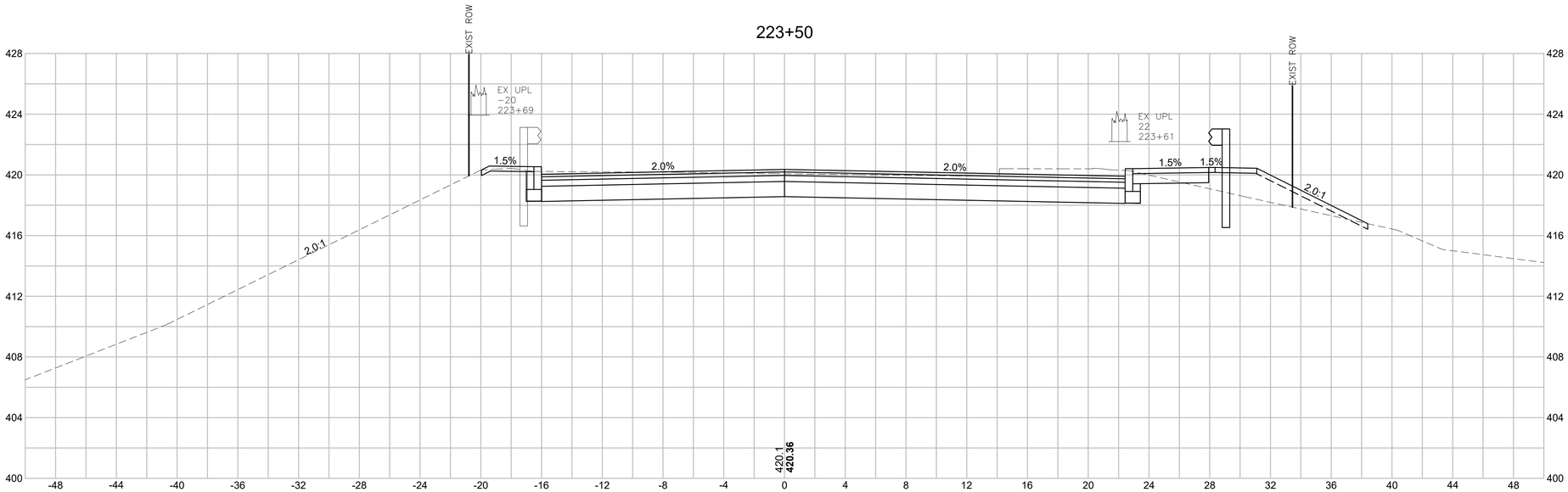
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	141	152
PROJECT FILE NO. 605377			

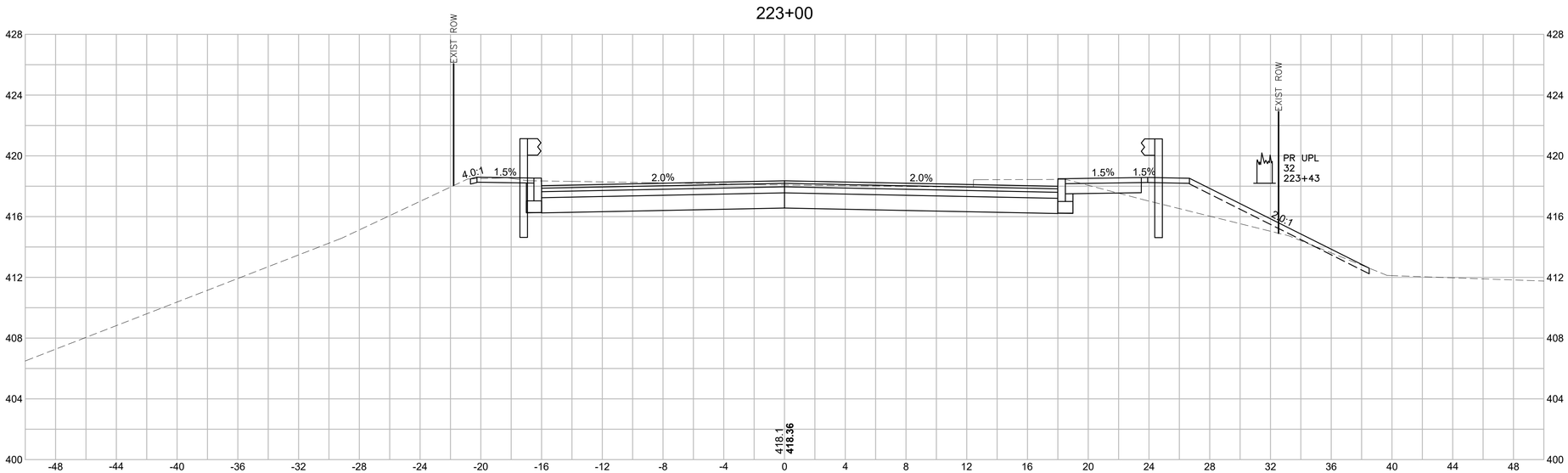
CROSS SECTIONS
MCCRACKEN ROAD

223+50



Material(s) at Station 223+50.00		
Material Name	Area	Volume
CUT	75.6	132.9
FILL	9.8	19.6

223+00



Material(s) at Station 223+00.00		
Material Name	Area	Volume
CUT	67.9	128.0
FILL	11.4	27.1

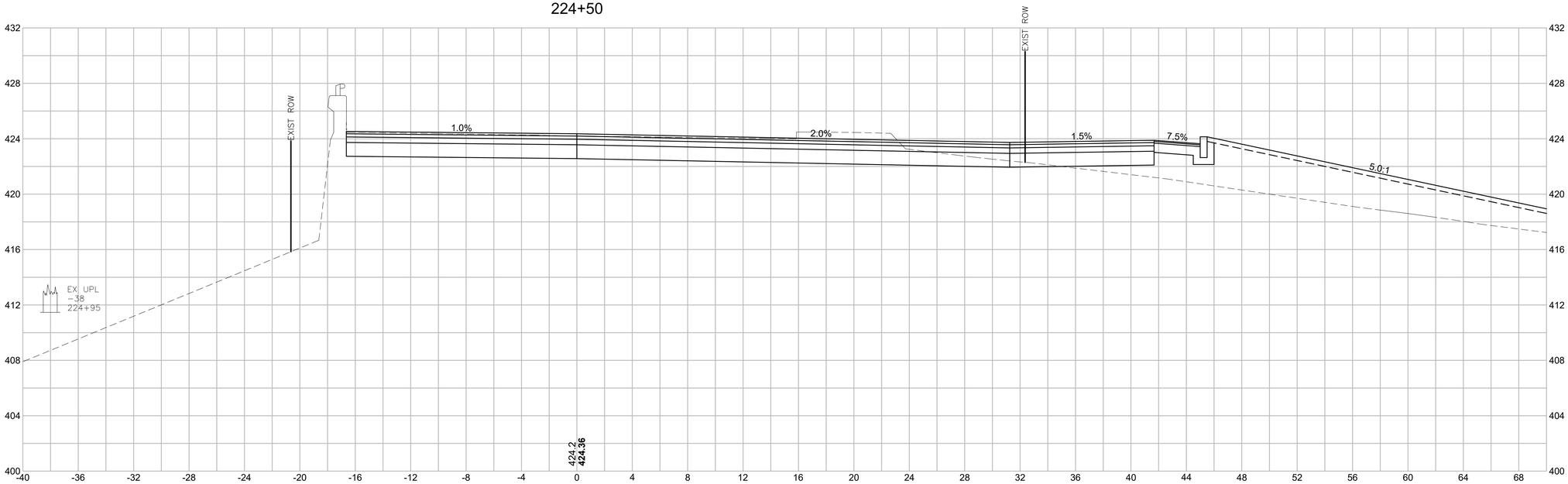
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	142	152
PROJECT FILE NO. 605377			

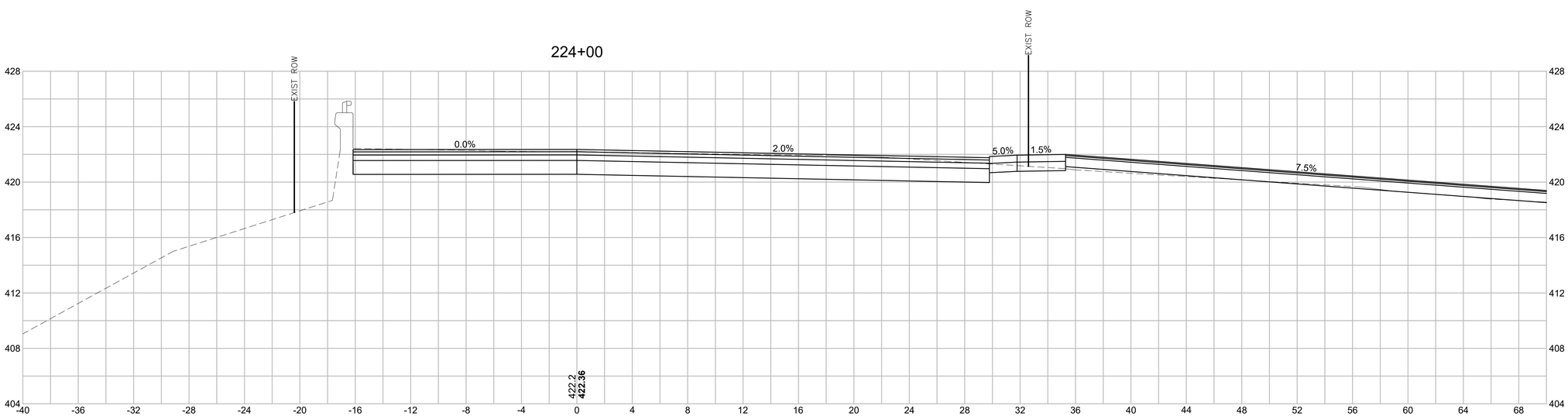
CROSS SECTIONS
MCCRACKEN ROAD

224+50



Material(s) at Station 224+50.00		
Material Name	Area	Volume
CUT	79.1	146.8
FILL	73.3	69.1

224+00



Material(s) at Station 224+00.00		
Material Name	Area	Volume
CUT	79.4	143.5
FILL	1.3	10.3

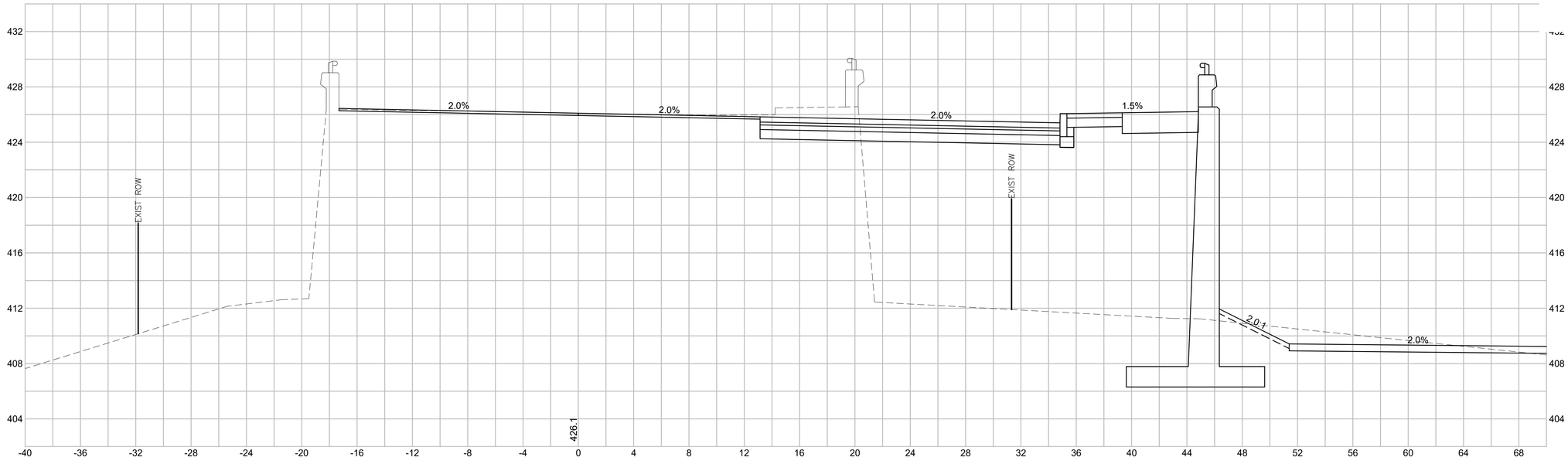
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	143	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MCCRACKEN ROAD

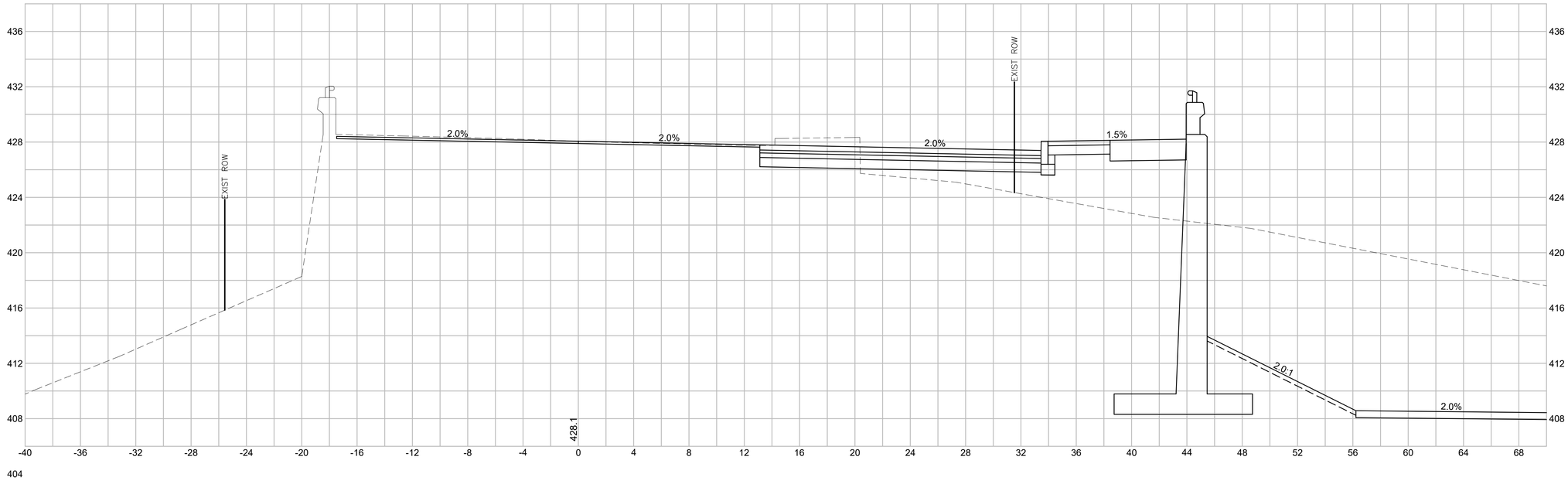
225+50



Material(s) at Station 225+50.00		
Material Name	Area	Volume
CUT	0.0	0.0
FILL	0.0	0.0

NOTES:
SEE SHEET 98 FOR BRIDGE CROSS SECTION
SEE SHEET 104 MOMENT SLAB SECTION

225+00



Material(s) at Station 225+00.00		
Material Name	Area	Volume
CUT	0.0	9.3
FILL	0.0	12.9

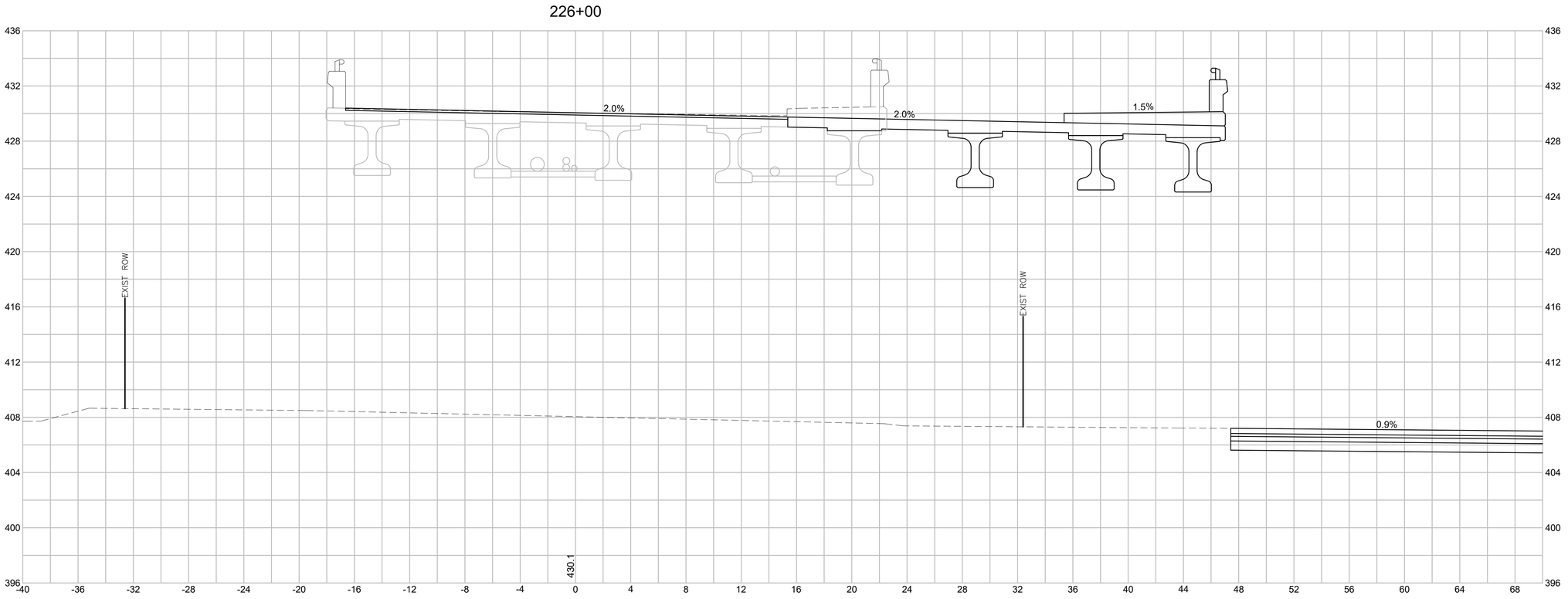
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	144	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MCCRACKEN ROAD

NOTES:
SEE SHEET 98 FOR BRIDGE CROSS SECTION
SEE SHEET 104 MOMENT SLAB SECTION



Material(s) at Station 226+00.00		
Material Name	Area	Volume
CUT	0.0	0.0
FILL	0.0	0.0

HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET
4 0 4 8

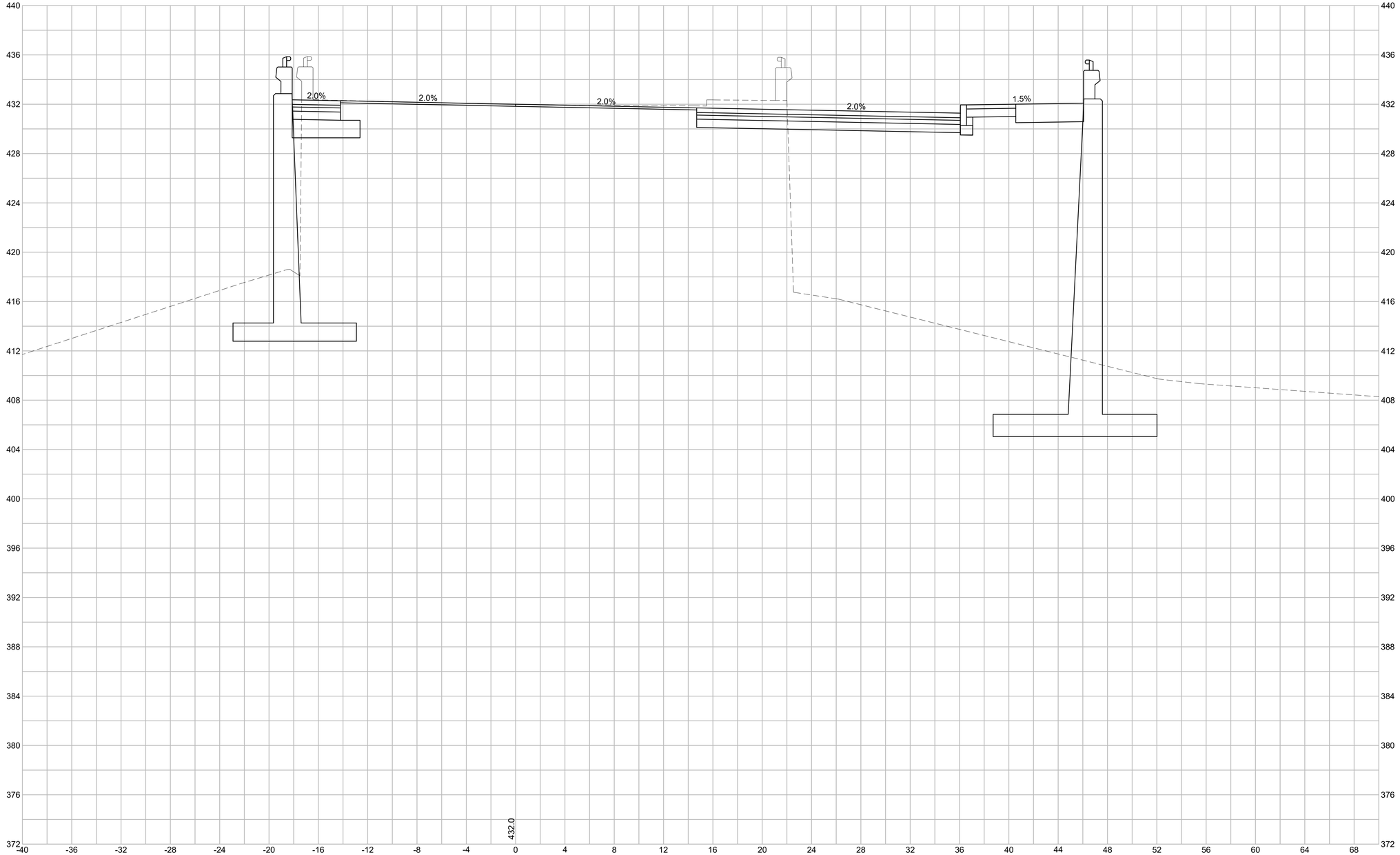
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	145	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MCCRACKEN ROAD

NOTES:
SEE SHEET 98 FOR BRIDGE CROSS SECTION
SEE SHEET 104 MOMENT SLAB SECTION

226+50



Material(s) at Station 226+50.00		
Material Name	Area	Volume
CUT	0.0	0.0
FILL	0.0	0.0

HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET
4 0 4 8

605377_HD\XSECT\.DWG Plotted on 11-Apr-2022 5:32 PM

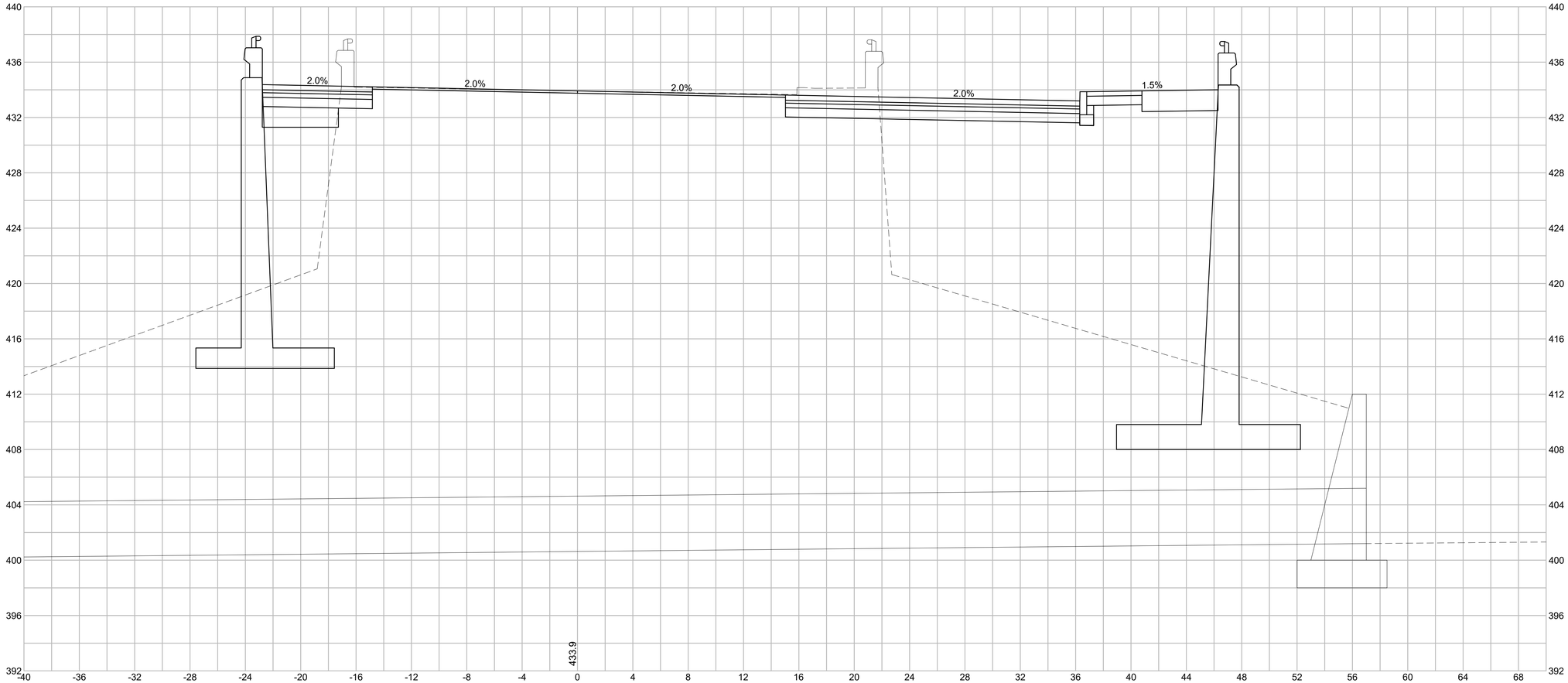
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	146	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MCCRACKEN ROAD

NOTES:
SEE SHEET 98 FOR BRIDGE CROSS SECTION
SEE SHEET 104 MOMENT SLAB SECTION

227+00



Material(s) at Station 227+00.00		
Material Name	Area	Volume
CUT	0.0	0.0
FILL	0.0	0.0

HOR. SCALE IN FEET
VER. SCALE IN FEET

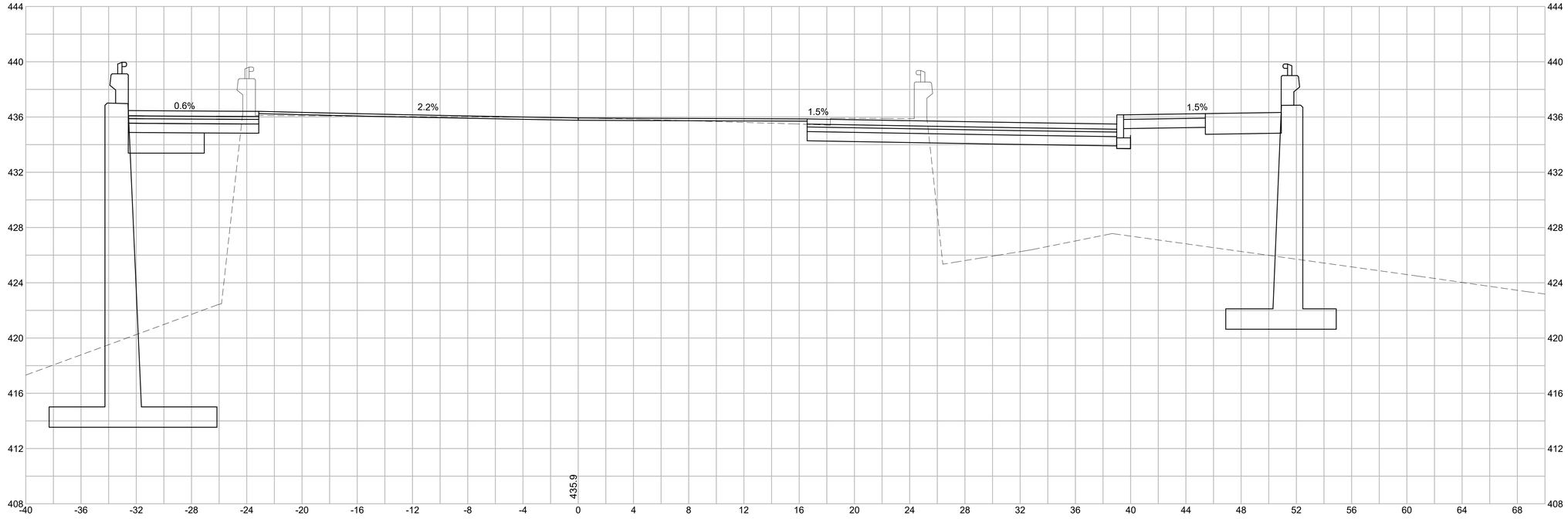
MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	147	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MCCRACKEN ROAD

NOTES:
SEE SHEET 98 FOR BRIDGE CROSS SECTION
SEE SHEET 104 MOMENT SLAB SECTION

227+50



Material(s) at Station 227+50.00		
Material Name	Area	Volume
CUT	0.0	0.0
FILL	0.0	0.0

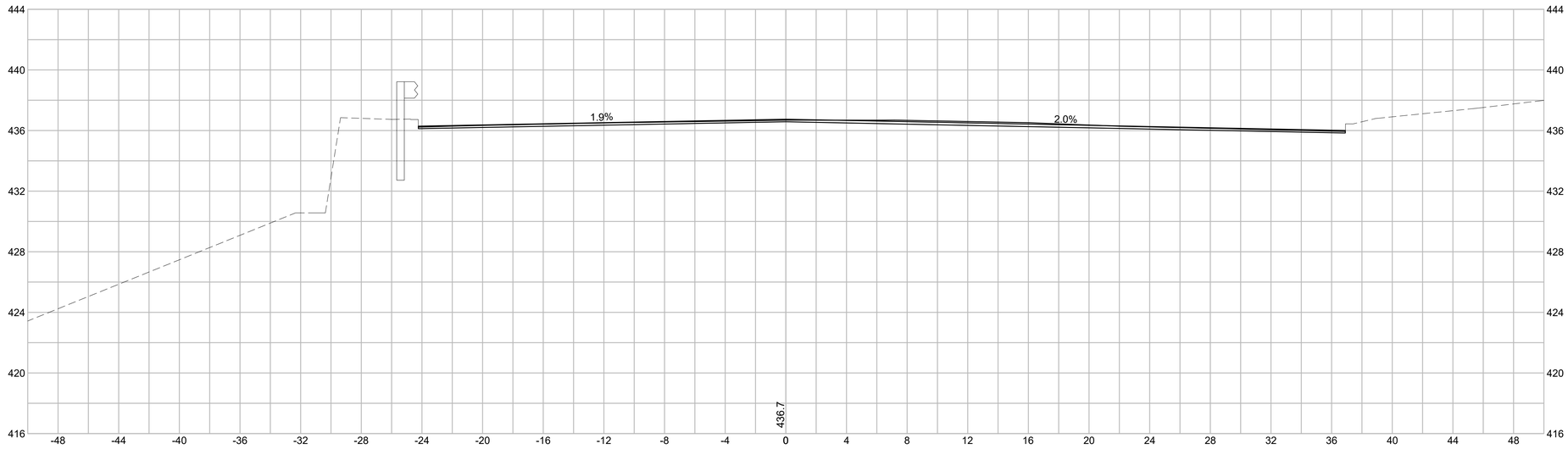
HOR. SCALE IN FEET
4 0 4 8
VER. SCALE IN FEET
4 0 4 8

MILLBURY
MCCRACKEN ROAD

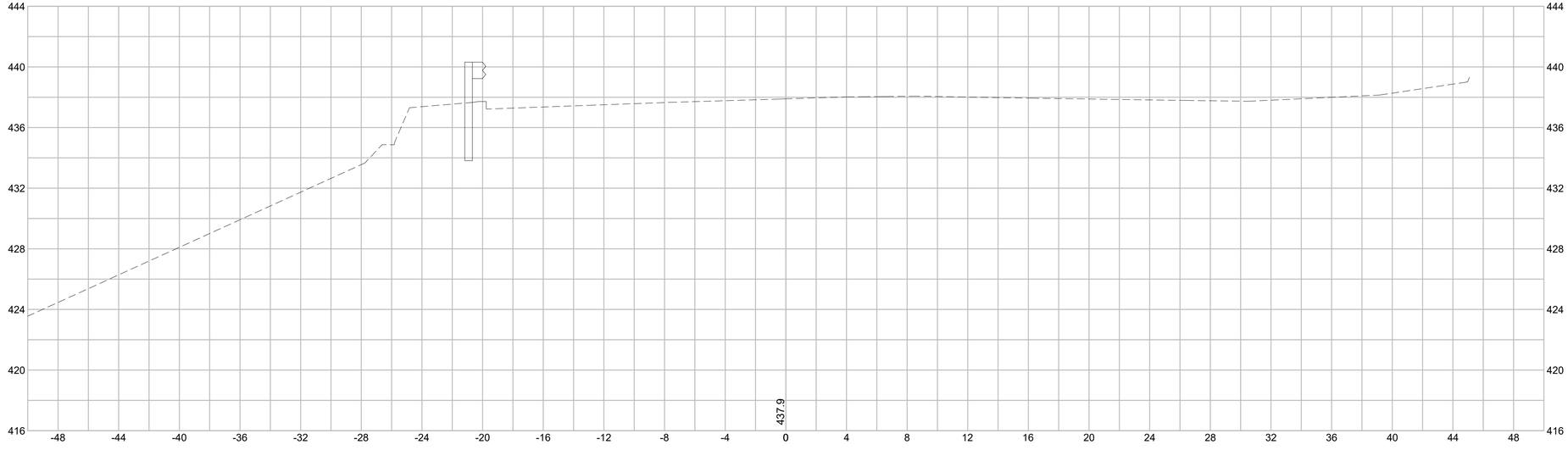
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	148	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MAIN STREET

500+50



500+00

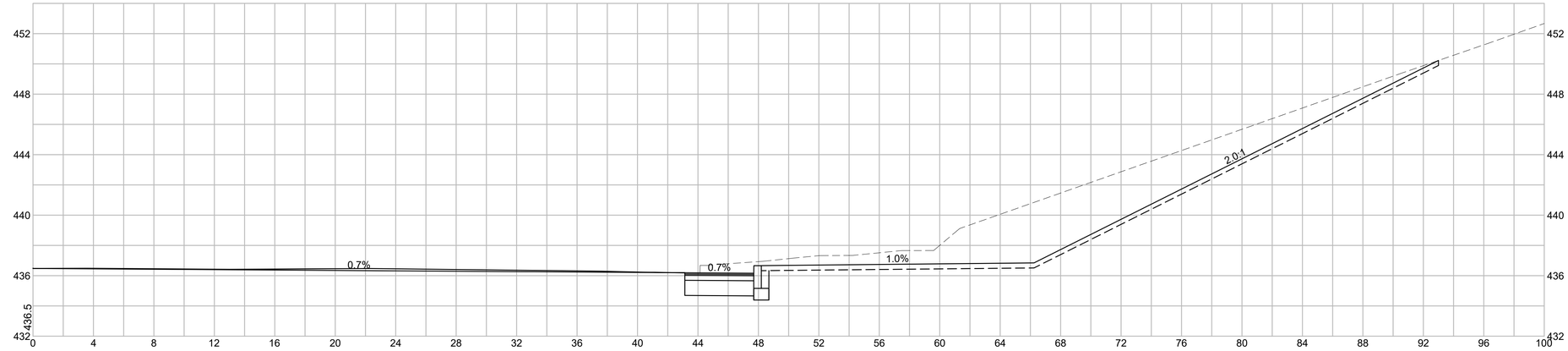


MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	149	152
PROJECT FILE NO. 605377			

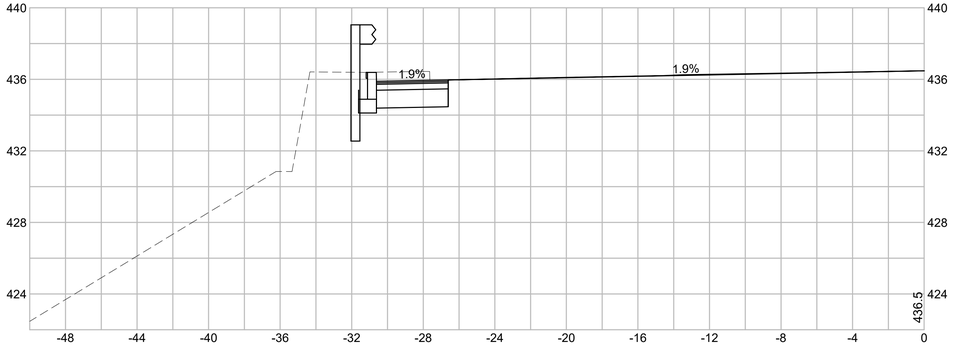
CROSS SECTIONS
MAIN STREET

501+50

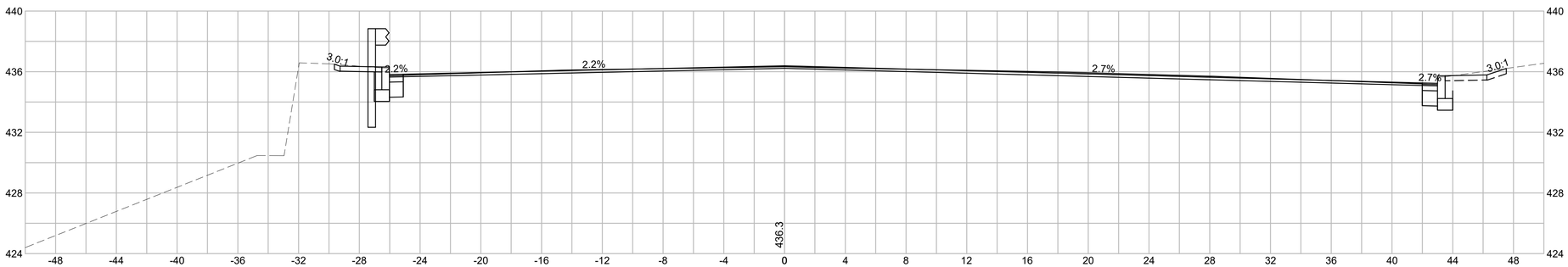


Material(s) at Station 501+50.00		
Material Name	Area	Volume
CUT	115.4	106.9
FILL	0.0	0.0

501+50



501+00

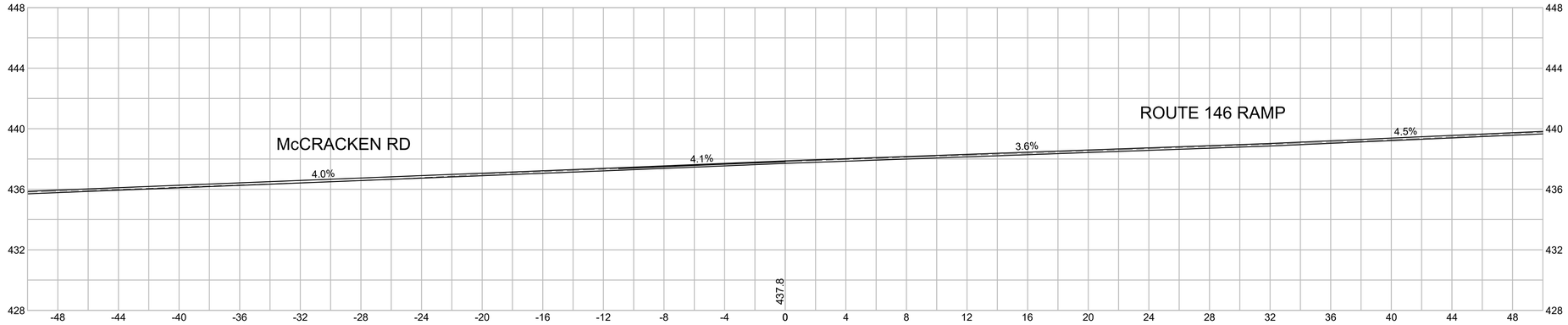


MILLBURY
MCCRACKEN ROAD

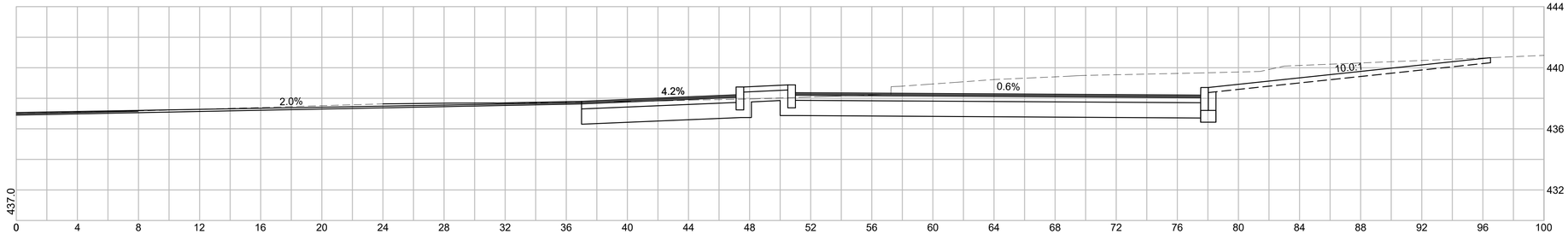
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	150	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MAIN STREET

502+50

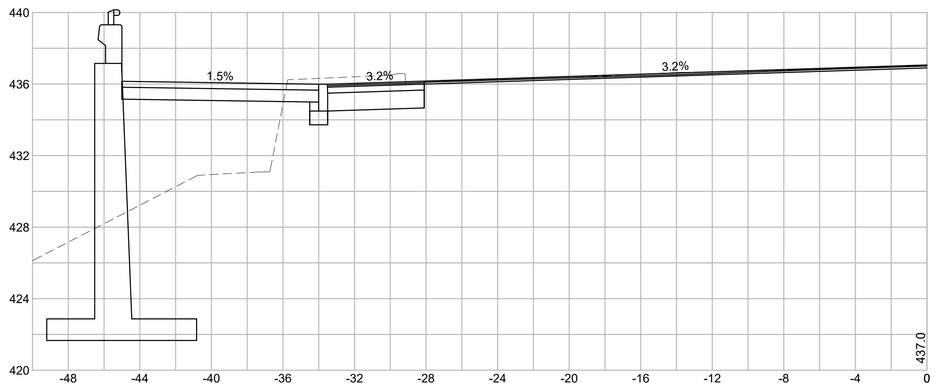


502+00



Material(s) at Station 502+00.00		
Material Name	Area	Volume
CUT	107.1	206.0
FILL	0.0	0.0

502+00

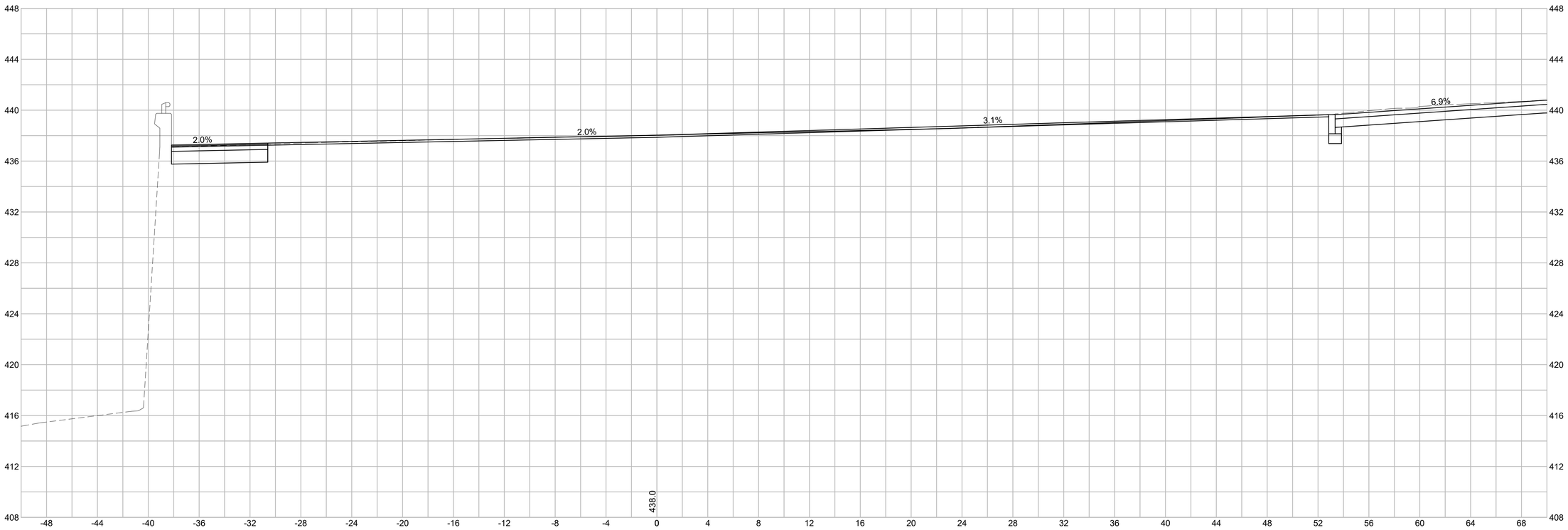


MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	151	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MAIN STREET

503+00



MILLBURY
MCCRACKEN ROAD

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	STP-0033(023)X	152	152
PROJECT FILE NO. 605377			

CROSS SECTIONS
MAIN STREET

503+25