WESTFORD LITTLETON ROAD RECONSTRUCTION			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		1	38
PROJECT FILE NO. 604809			

TITLE AND INDEX

THE COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT

PLAN AND PROFILE OF

LITTLETON ROAD (ROUTE 110)
ROADWAY RECONSTRUCTION PROJECT

IN THE TOWN OF

WESTFORD
MIDDLESEX COUNTY

FEDERAL AID PROJECT NO.

THE 1988 MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES; THE SUPPLEMENTAL SPECIFICATIONS DATED JUNE 6, 2006; THE STANDARD SPECIAL PROVISIONS DATED AUGUST 8, 2008; THE 1977 CONSTRUCTION STANDARDS AND ALL SUPPLEMENTS; THE APRIL 2003 METRIC/ENGLISH SUPPLEMENTAL DRAWINGS; THE 2003 "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS; THE 1995 CONSTRUCTION AND TRAFFIC STANDARD DETAILS; THE 1968 "STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING"; AND THE LATEST EDITION OF AMERICAN STANDARD FOR NURSERY STOCK WILL GOVERN.

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET AND INDEX
2	LEGEND AND GENERAL NOTES
3-6	TYPICAL SECTIONS
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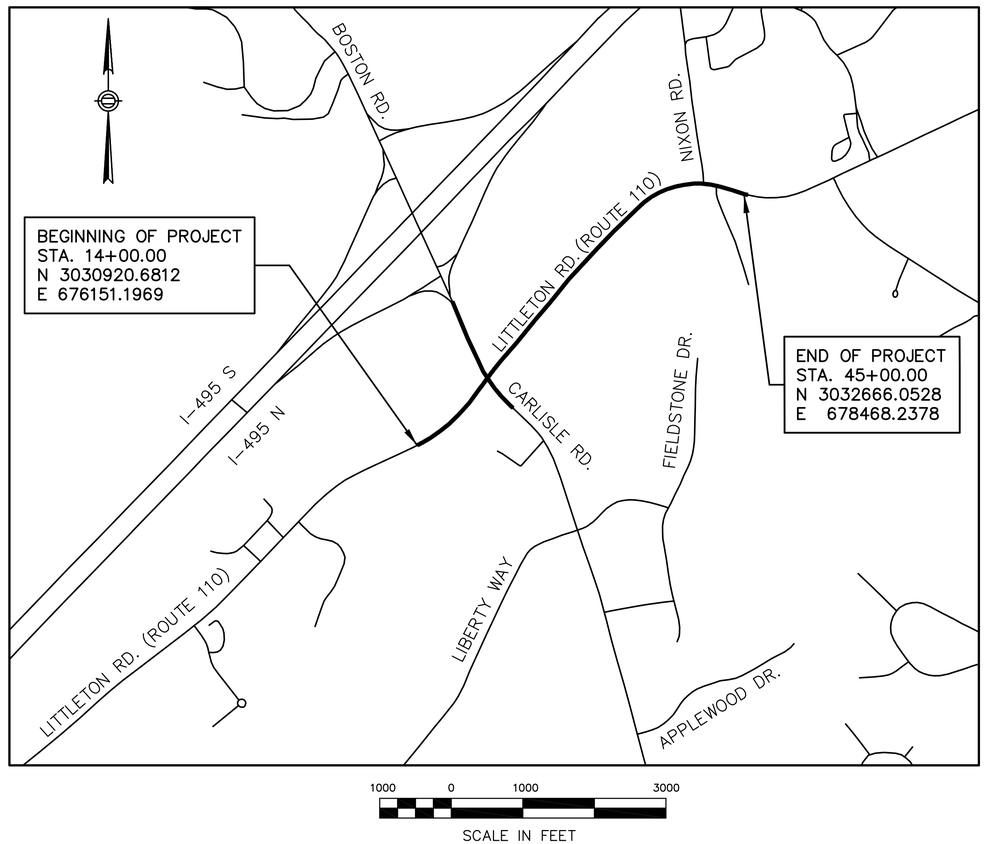
35	WHEELCHAIR RAMP AND DRIVEWAY DETAILS
36-38	CRITICAL CROSS SECTIONS
	REFERENCE PLANS - CORNERSTONE DEVELOPMENT



DESIGN DESIGNATION

DESIGN SPEED	40 MPH
ADT (2007)	19,400 VPD
ADT (2017)	31,300 VPD
K	9.2%
D	54% WB
T (PEAK HOUR)	0.3%
T (AVERAGE DAY)	2.6%
DHV	2905 VPH
DDHV	1705 VPH
FUNCTIONAL CLASSIFICATION:	URBAN ARTERIAL

CONVENTIONAL SIGNS

COUNTY, CITY, OR TOWN BOUNDARY

COUNTY, CITY, OR TOWN SIDE LINE

FENCE LINE

BASE LINE OR SURVEY LINE — 74 — N 57°-18"-41' E 59.57m

RIGHT OF WAY LINE

CULVERT

ELEVATIONS — PROPOSED SURFACE / EXISTING SURFACE — EXIST. 98.2 / 102.67 PROP. — 74

POLE

NOTE

LENGTH OF PROJECT = 3,100 FT = 0.59 MILE

25% SUBMISSION

JULY 2009

FAY, SPOFFORD & THORNDIKE, LLC
BOSTON, MA – BURLINGTON, MA

MASS HIGHWAY

MASSACHUSETTS HIGHWAY DEPARTMENT

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED

DIVISION ADMINISTRATOR — Date

APPROVED

MHD COMMISSIONER — Date

FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

LEGEND

EXISTING PLAN SYMBOLS

△	TRAVERSE STATION
□ SB/DH	STONE BOUND/DRILL HOLE
□ CB	CONCRETE BOUND
•	PK, REBAR, NAIL, SPIKE
□ H/T	HUB & TACK
EP/LP	ESCUTCHEON PIN/LEAD PLUG
"MHB"	MASSACHUSETTS HIGHWAY BOUND
FND	FOUND
W/	WITH
STA	STATION
N.T.S.	NOT TO SCALE
(TYP)	TYPICAL
(M)	MARKED
(R)	RECORD
(S)	SURVEY
	STATE HIGHWAY LAYOUT LINE
	STONE WALL
	WETLAND
	TREE LINE
	TREE (DIA & TYPE)
3"D	DECIDUOUS
10"E	EVERGREEN
CLF	CHAIN LINK FENCE
MP	METAL POST
MB	MAILBOX
	FENCE
	GUARD RAIL
RET WALL	RETAINING WALL
	CURBING(TYPE)
BIT CONC	BITUMINOUS CONCRETE
GRAN	GRANITE
SCC	SLOPED CONC CURB
SGC	SLOPED GRAN CURB
GC	GRAN CURB
CC	CONCRETE CURB
BCC	BITUMINOUS CONCRETE CURB
HCR	HANDICAP RAMP
DYL	DOUBLE YELLOW LINE
SYL	SINGLE YELLOW LINE
GP	GUARD POST
TSCC	TRAFFIC SIGNAL CONTROL CABINET
	TRAFFIC SIGNAL
	FLAGPOLE
	SIGN (TWO POSTS)
	SIGN
	PROPERTY LINE

EXISTING PLAN SYMBOLS (CONT'D)

MAP 17 LOT 8 N/F 187 LITTLETON ROAD, INC. BOOK 10667 PAGE 184	MAP & LOT OWNERS BOOK & PAGE
	UTILITY POLE/LIGHT POLE
	UTILITY POLE
	LIGHT POLE
FL	FLOOD LIGHT
OHW	OVERHEAD WIRE
	GUY WIRE
	GAS GATE
GM	GAS METER
	HYDRANT
HH	HANDHOLE
DPW	DEPARTMENT OF PUBLIC WORKS
WG	WATER GATE
IC HH	IRRIGATION CONTROL HANDHOLE
SH	SPRINKLER HEAD
SMH	SEWER MANHOLE
TMH	TELEPHONE MANHOLE
x—— WF #XX ——x	LIMIT OF BORDERING VEGETATED WETLANDS (#XX=FLAG NUMBER)
SIZE & TYPE OF MATERIAL / WATER MAIN	WATER MAIN
SIZE & TYPE OF MATERIAL / DRAIN PIPE	DRAINAGE PIPE (USE DOUBLE LINE UNDERGROUND UTILITIES FOR 600MM OR OVER)
NAME OF UTILITY / (TEL., ELEC., ETC.)	
DMH	DRAIN MANHOLE
CB	CATCH BASIN
CB/DI	CATCH BASIN/DROP INLET
R	RIM
I	INVERT
T'STONE	THROATSTONE
CIP	CAST IRON PIPE
RCP	REINFORCED CONCRETE PIPE
CMP	CORRUGATED METAL PIPE
CPP	CORRUGATED PLASTIC PIPE
VCP	VITRIFIED CLAY PIPE
PVC	POLYVINYL CHLORIDE
NPV	NO PIPE VISIBLE
ABAN	ABANDONED
TOB	TOP OF BELL
TOP	TOP OF PIPE
TOW	TOP OF WATER
FES	FLARED END SECTION
D	DRAIN LINE
S	SEWER LINE
W	WATER LINE
T	TELEPHONE LINE
CATV	CABLE TELEVISION LINE
G	GAS LINE

EXISTING PLAN SYMBOLS (CONT'D)

	MONITORING WELL
+ 384.9	SPOT ELEVATION
	INTERMEDIATE CONTOUR
344	INDEX CONTOUR
	RIPRAP
TP-1	TEST PIT LOCATION

PROPOSED PLAN SYMBOLS

LENGTH, SIZE & TYPE OF MATERIAL / DRAIN PIPE	PROPOSED DRAINAGE
LENGTH, SIZE & TYPE OF MATERIAL / WATER PIPE	PROPOSED WATER MAIN
LENGTH, TR. SIG. COND.	TRAFFIC SIGNAL CONDUIT
	MANHOLE–ADJUST TO FINISHED GRADE
MH	MANHOLE
CB	CATCH BASIN
CBCI	CATCH BASIN & CURB INLET (SQUARE FRAME)
GI	GUTTER INLET
	WATER GATE
	WATER GATE, ADJUST TO FINISHED GRADE
	CATCH BASIN, ADJUST TO FINISHED GRADE
	CATCH BASIN–ABANDON
	WHEELCHAIR RAMP
(ADJ)	ADJUST
(ABAN)	ABANDON
(CIT)	CHANGE IN TYPE (CB TO DMH)
F & C	FRAME & COVER
F & G	FRAME & GRATE
(REMODEL)	REMODEL
(R)	RECORD
(REM)	REMOVE
(CIT)	CHANGE IN TYPE
(RET)	RETAIN
(RELOC)	RELOCATE
	RELOCATED UTILITY POLE
1	WHEELCHAIR RAMP NUMBER
	STREET LIGHT

PROPOSED PAVEMENT MARKINGS

SL	STOP LINE, 12" WHITE LINE, 4' BEHIND CW
CW	CROSSWALK, 2–12" WHITE LINES, 10' O.C.
SWEL	SOLID WHITE EDGE LINE – 4"
SYEL	SOLID YELLOW EDGE LINE – 4" LINES
DYCL	DOUBLE YELLOW CENTER LINE, 2–4" LINES
BWLL	BROKEN WHITE LANE LINE – 4" LINES (10' LANE LINE, 30' SPACE)
SYCL	SOLID YELLOW CENTER LINE – 4" LINES
SWLL	SINGLE WHITE LANE LINE – 4" LINES
DWLL	DOUBLE WHITE LANE LINE – 2–4" LINES

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		2	38
PROJECT FILE NO. 604809			

LEGEND & GENERAL NOTES

GENERAL NOTES

1. BEFORE CONSTRUCTION, ALL UTILITIES, PUBLIC AND PRIVATE, MUST BE NOTIFIED (SEE MASSACHUSETTS GENERAL LAWS, CHAPTER 82 SECTION 40). CALL "DIG SAFE" 1–888–344–7233 OR WWW.DIGSAFE.COM.
2. GENERALLY, THE UTILITY LINES IN THE PUBLIC AND PRIVATE WAYS ARE SHOWN AND THE LATERAL CONNECTIONS SERVICING INDIVIDUAL USERS ARE NOT SHOWN.
3. UTILITY POLES, MAIL BOXES AND HYDRANTS THAT ARE TO BE RETAINED OR ADJUSTED SHALL BE REMOVED AND RESET IF FIELD CONDITIONS INDICATE THE CLEAR PATH OF TRAVEL ON THE SIDEWALK IS LESS THAN 3.0' IN WIDTH.
4. FENCES AND OTHER PRIVATE FEATURES WITHIN THE RIGHT–OF–WAY, ARE TO BE REMOVED AND STACKED WHEN THEY INTERFERE WITH THE PROPOSED CONSTRUCTION.
5. ALL TREES, SHRUBS & BRUSH NOT MARKED IN THE FIELD BY THE ENGINEER TO BE SAVED, SHALL BE REMOVED WITHIN THE LIMITS OF THE RIGHT–OF–WAY. TREES TO BE SAVED ARE TO BE PROTECTED.

1. THIS PLAN IS BASED ON THE CITED RECORD DESCRIPTIONS, ADDITIONAL REFERENCES (PRIMARILY, THE "TOWN SURVEY" OF 1999), OTHER SOURCES AS NOTED, AND AN ON–THE–GROUND, INSTRUMENT SURVEY MADE MAY–AUGUST, 2007.
2. COORDINATES, IN U.S. SURVEY FEET, ARE IN THE MASSACHUSETTS COORDINATE SYSTEM, MAINLAND ZONE, REFERENCED TO THE NORTH AMERICAN DATUM OF 1983, CORS ADJUSTMENT (NAD 83/CORS), AS DETERMINED BY SMC'S PROJECT NETWORK OF G.P.S. OBSERVATIONS AND TOTAL STATION TRAVERSING; THIS NETWORK IS BASED ON THE FOLLOWING NATIONAL GEODETIC SURVEY (NGS) AND PRIVATE CONTINUOUSLY OPERATING REFERENCE STATIONS (CORS):
   FMTS (FRAMINGHAM, MA) (NGS DATABASE ID DI0964)
   NMTS (NASHUA, NH),
   WMTS (WOBURN, MA) (NGS DATABASE ID AJ4072)
3. ELEVATIONS, IN U.S. SURVEY FEET, ARE REFERENCED TO THE SAME VERTICAL DATUM USED FOR THE REFERENCED "TOWN SURVEY," AS DETERMINED BY SMC'S PROJECT NETWORK OF TOTAL STATION TRAVERSING AND DIFFERENTIAL LEVELING; THIS NETWORK IS BASED ON THE FOLLOWING BENCH MARKS FROM SAID "TOWN SURVEY:"
   BM 94
   BM 517
   BM 518

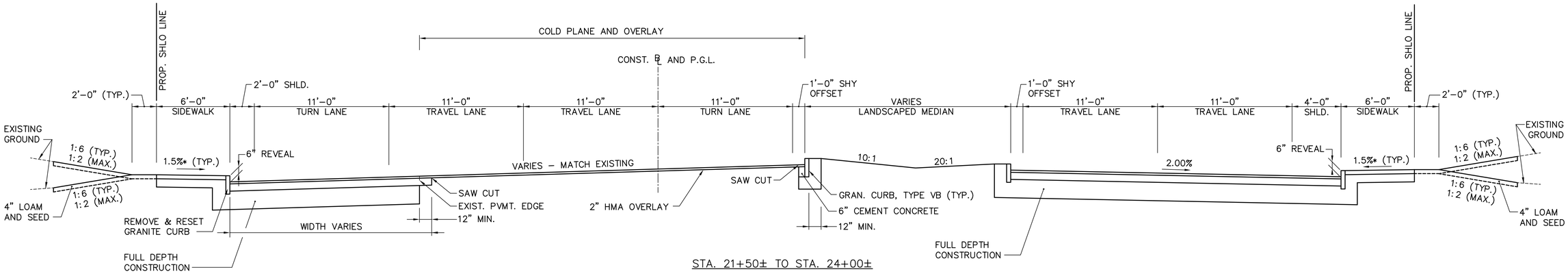
FS&T PROJECT NO.			
QW–023			
DES	JAS	CHK	JKH
DR	JPR	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

WESTFORD
LITTLETON ROAD RECONSTRUCTION

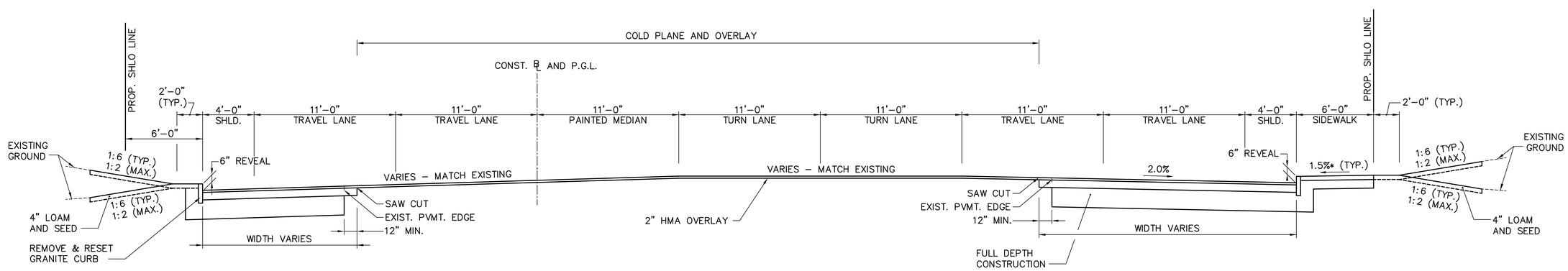
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		3	38
PROJECT FILE NO. 604809			

TYPICAL SECTIONS PART 1 OF 4



STA. 21+50± TO STA. 24+00±

TYPICAL SECTION – LITTLETON ROAD



STA. 16+75± TO STA. 20+15±

TYPICAL SECTION – LITTLETON ROAD

HOR. SCALE IN FEET
0 4 10 20

NOTES:

1. FOR PAVEMENT NOTES, SEE SHEET NO. 4.

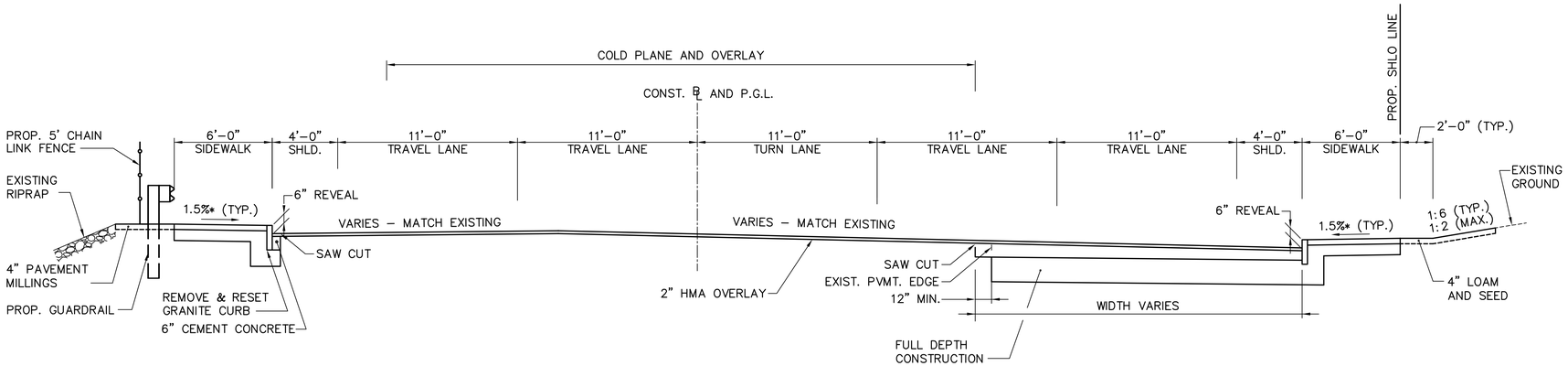
FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		4	38
PROJECT FILE NO. 604809			

TYPICAL SECTIONS
PART 2 OF 4



STA. 30+50± TO STA. 33+50±

TYPICAL SECTION – LITTLETON ROAD

PAVEMENT NOTES:

HOT MIX ASPHALT OVERLAY:

2" HMA SURFACE COURSE (MODIFIED TOP COURSE) OVER
1½" MILLING

BITUMEN–0.07 GAL./SY

FULL DEPTH PAVEMENT CONSTRUCTION:

2" HMA SURFACE COURSE (MODIFIED TOP COURSE) OVER
2" HMA INTERMEDIATE COURSE (DENSE BINDER COURSE) OVER
3½" HMA BASE COURSE (BASE COURSE) OVER
8" GRAVEL BORROW FOR SUB–BASE

BITUMEN–0.05 GAL./SY

CEMENT CONCRETE SIDEWALKS AND WHEELCHAIR RAMPS:

4" CEMENT CONCRETE OVER
8" GRAVEL BORROW (MIN.)

CEMENT CONCRETE DRIVEWAY APRONS:

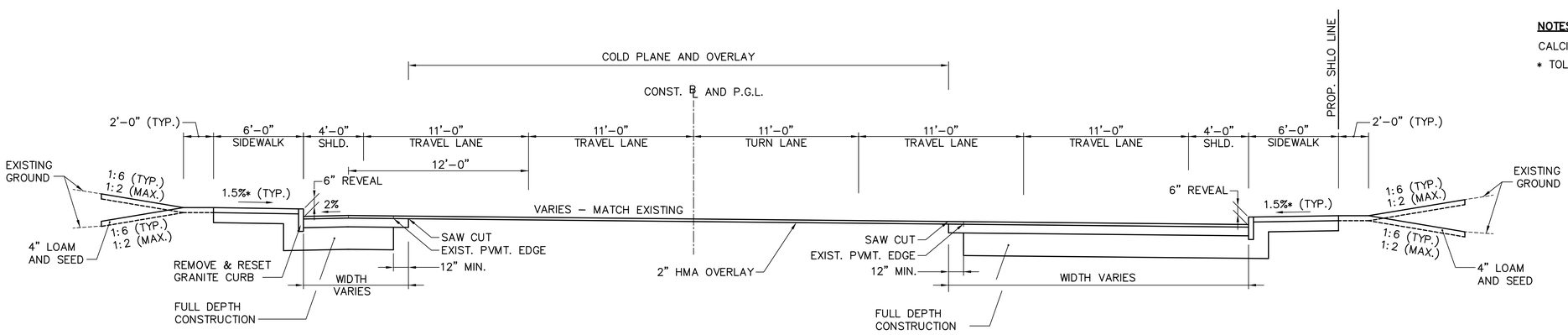
6" CEMENT CONCRETE OVER
8" DENSE GRADED CRUSHED STONE (MIN.)

HOT MIX ASPHALT DRIVEWAYS AND APRONS

1.5" HMA SURFACE COURSE (TOP COURSE) OVER
3" HMA INTERMEDIATE COURSE (DENSE BINDER) OVER
8" DENSE GRADED CRUSHED STONE (MIN.)

NOTES:

CALCIUM CHLORIDE OR WATER FOR ROADWAY DUST CONTROL.
* TOLERANCE FOR CONSTRUCTION ±0.5% (TYP.)



STA. 27+00± TO STA. 30+00±
STA. 34+50± TO STA. 36+50±

TYPICAL SECTION – LITTLETON ROAD

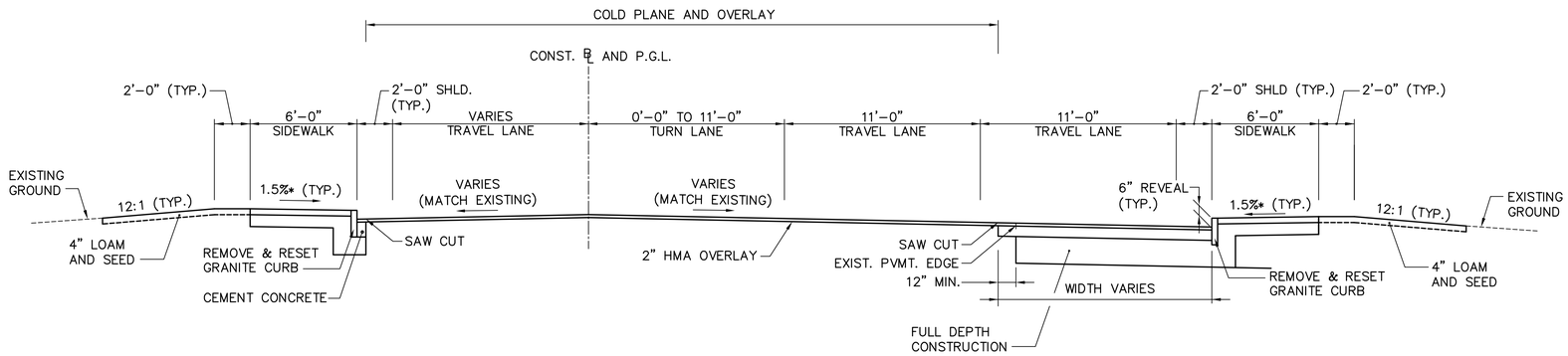
HOR. SCALE IN FEET
0 4 10 20

FS&T PROJECT NO.			
QW–023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH
ENGINEER IN CHARGE			

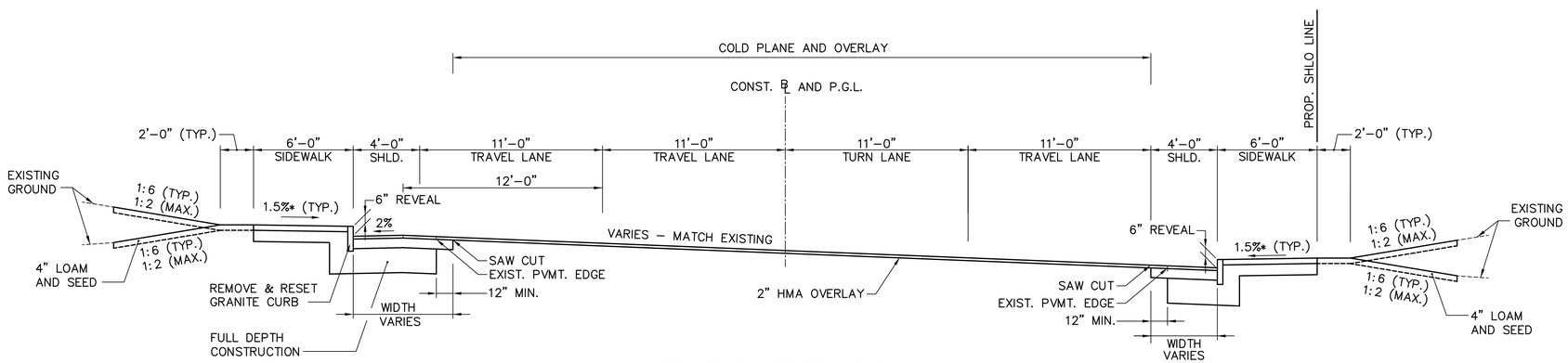
WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		5	38
PROJECT FILE NO. 604809			

TYPICAL SECTIONS
PART 3 OF 4



TYPICAL SECTION – CARLISLE ROAD



STA. 39+00± TO STA. 42+00±

TYPICAL SECTION – LITTLETON ROAD

HOR. SCALE IN FEET
0 4 10 20

NOTES:

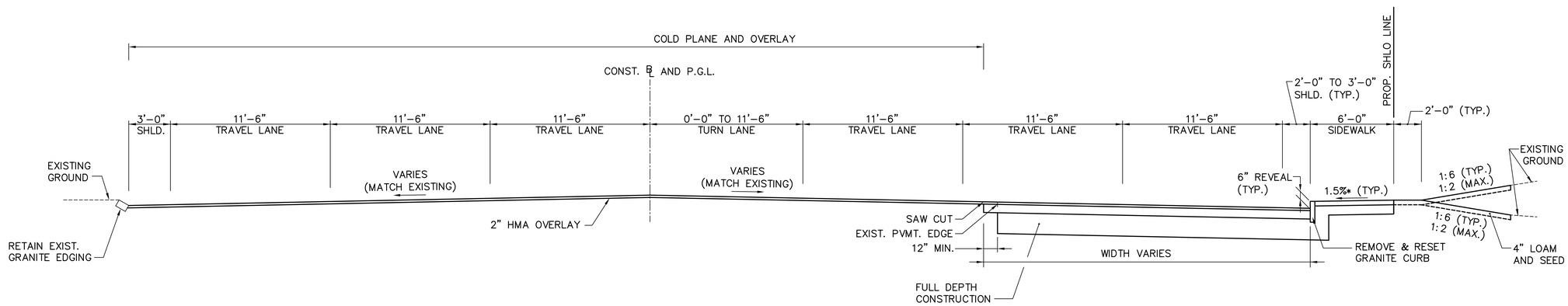
1. FOR PAVEMENT NOTES, SEE SHEET NO. 4.

FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH
ENGINEER IN CHARGE			

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		6	38
PROJECT FILE NO. 604809			

TYPICAL SECTIONS PART 4 OF 4



TYPICAL SECTION – BOSTON ROAD

HOR. SCALE IN FEET
0 4 10 20

NOTES:

1. FOR PAVEMENT NOTES, SEE SHEET NO. 4.

FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

HWY. GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

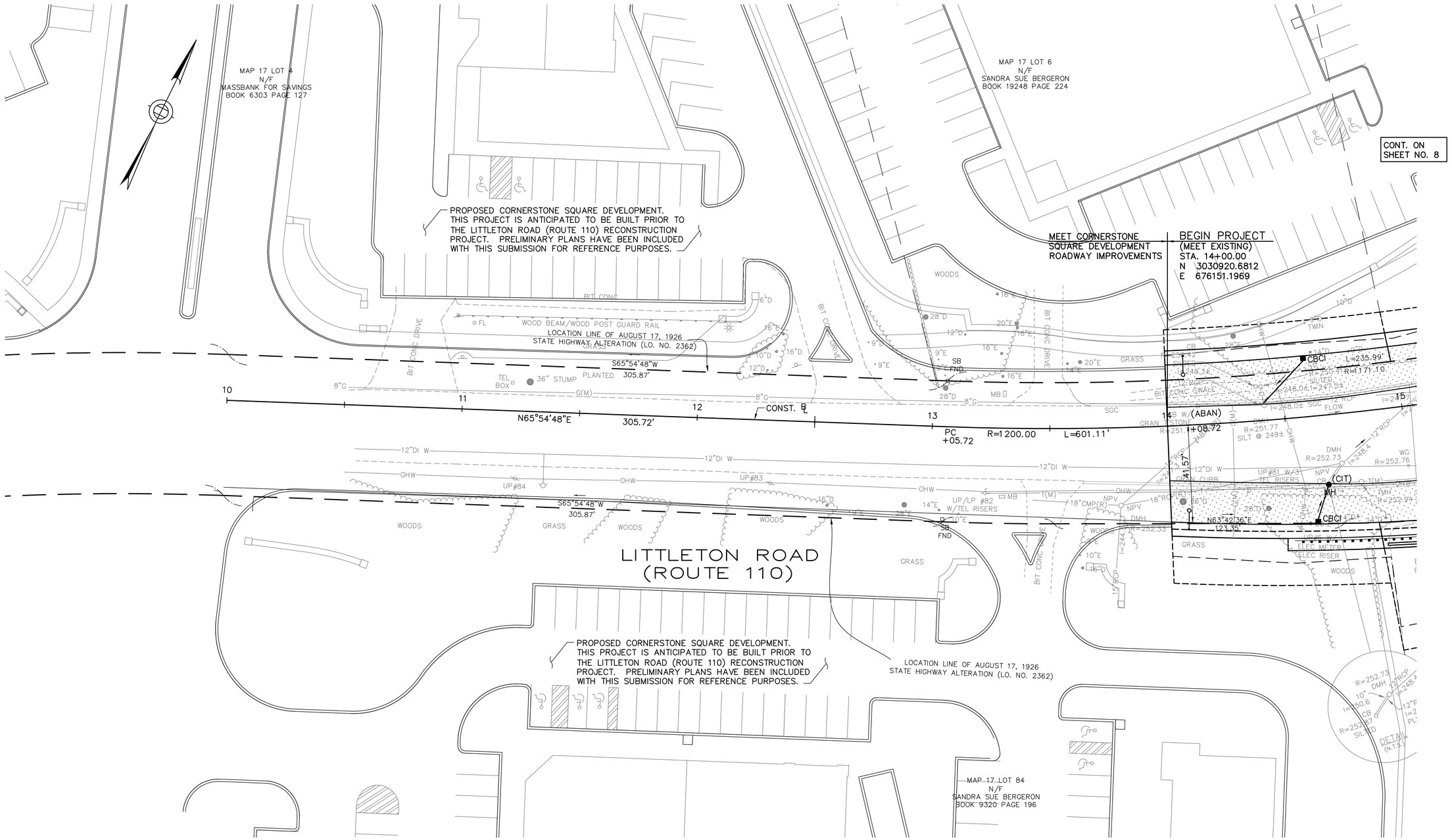
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE BELOW

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		7	38
PROJECT FILE NO. 604809			

CONSTRUCTION PLAN
PART 1 OF 10



HOR. SCALE IN FEET
0 20 50 100

NOTES:

1. FOR LEGEND AND GENERAL NOTES, SEE SHEET NO. 2.
2. FOR PROFILE, SEE SHEET NO. 17.

FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH
ENGINEER IN CHARGE			

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		8	38
PROJECT FILE NO. 604809			

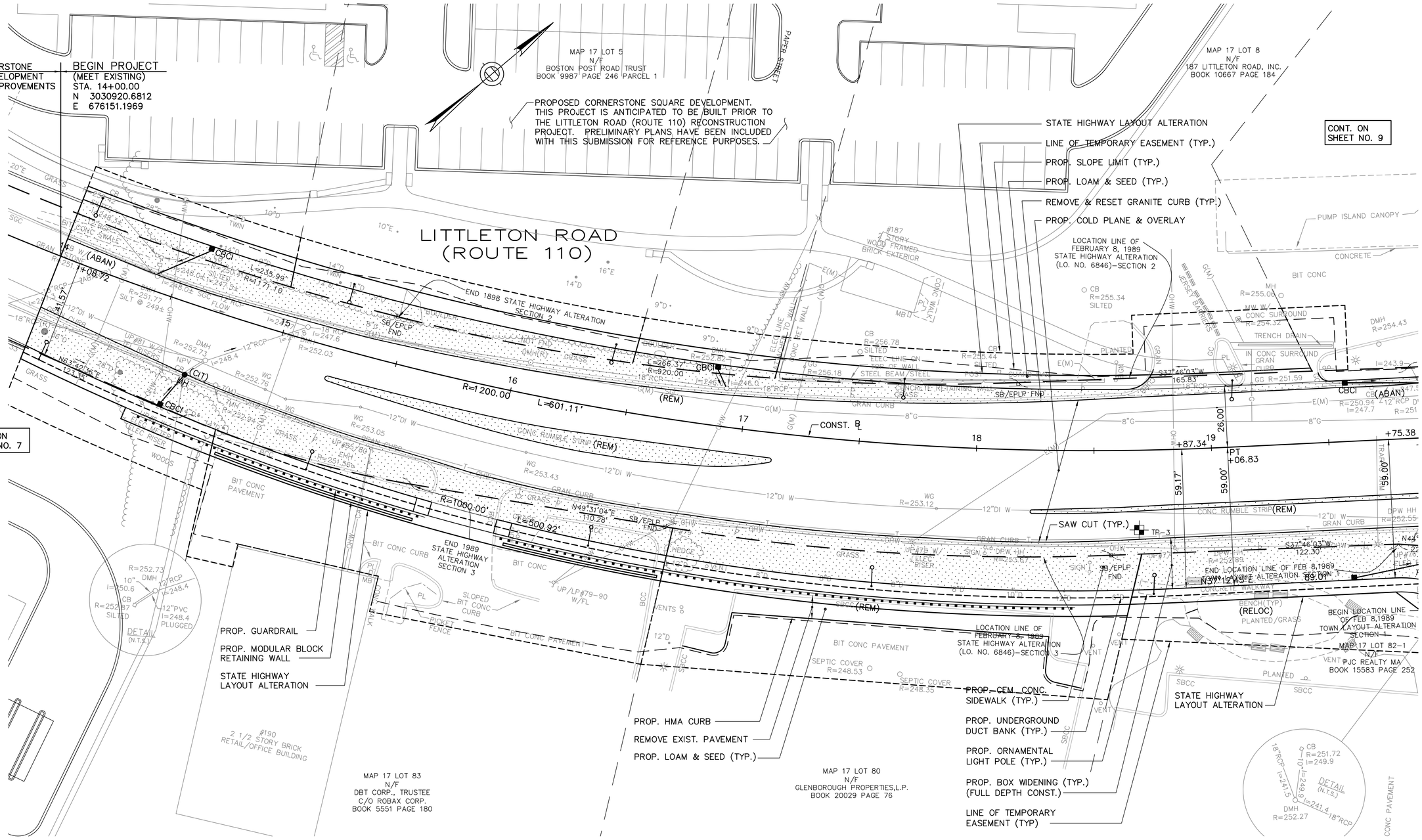
CONSTRUCTION PLAN
PART 2 OF 10

HWY. GUARD
SEE BELOW

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE BELOW



NOTES:

1. FOR LEGEND AND GENERAL NOTES, SEE SHEET NO. 2.
2. FOR PROFILE, SEE SHEET NO. 17.

FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

HWY. GUARD
NONE

TRAFFIC SIGNAL CONDUIT
SEE TRAFFIC SIGNAL PLAN

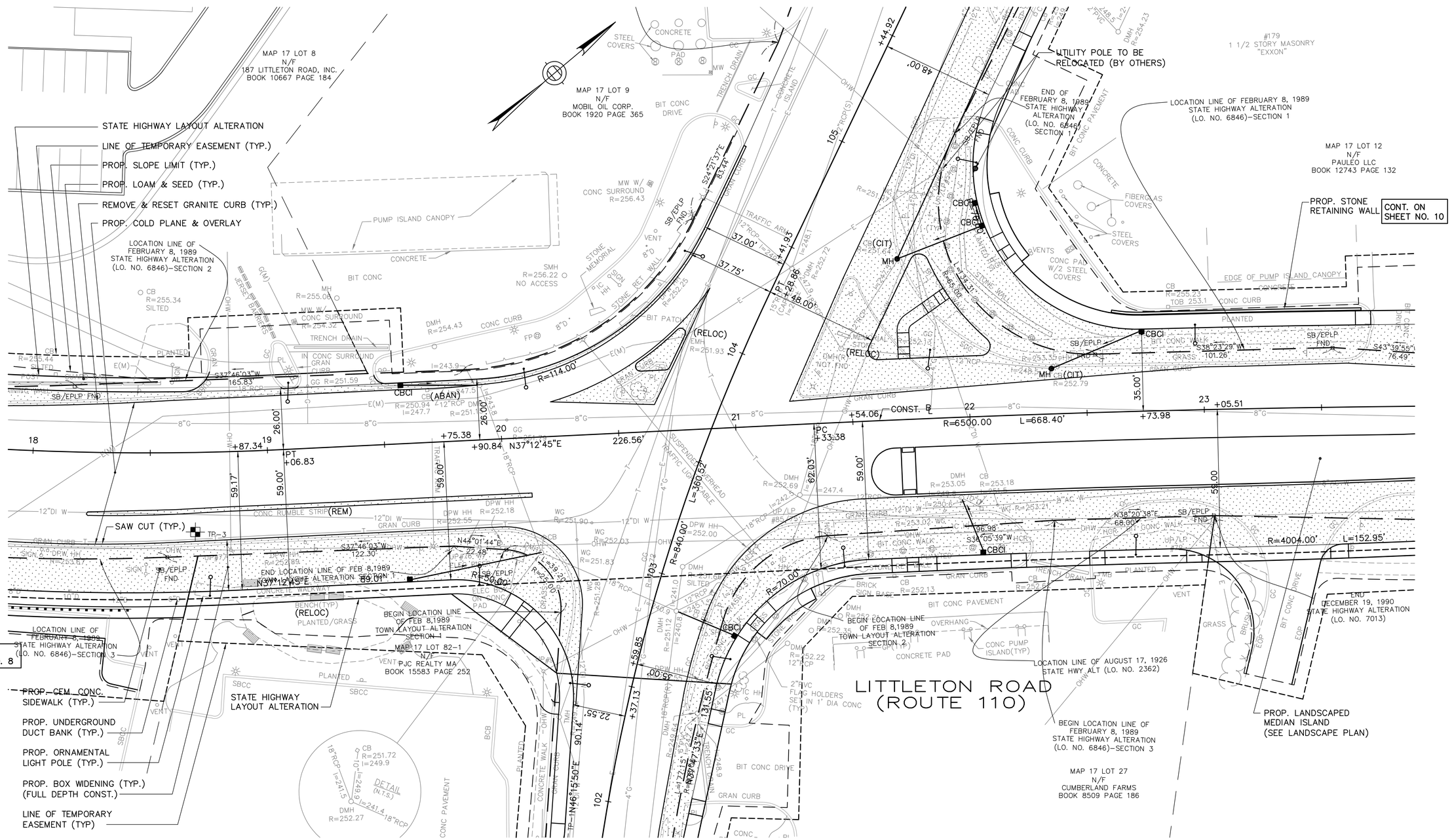
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE BELOW

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		9	38
PROJECT FILE NO. 604809			

CONSTRUCTION PLAN
PART 3 OF 10



HOR. SCALE IN FEET
0 20 50 100

NOTES:

1. FOR LEGEND AND GENERAL NOTES, SEE SHEET NO. 2.
2. FOR PROFILE, SEE SHEET NOS. 17–18 AND 21.

F&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

HWY. GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

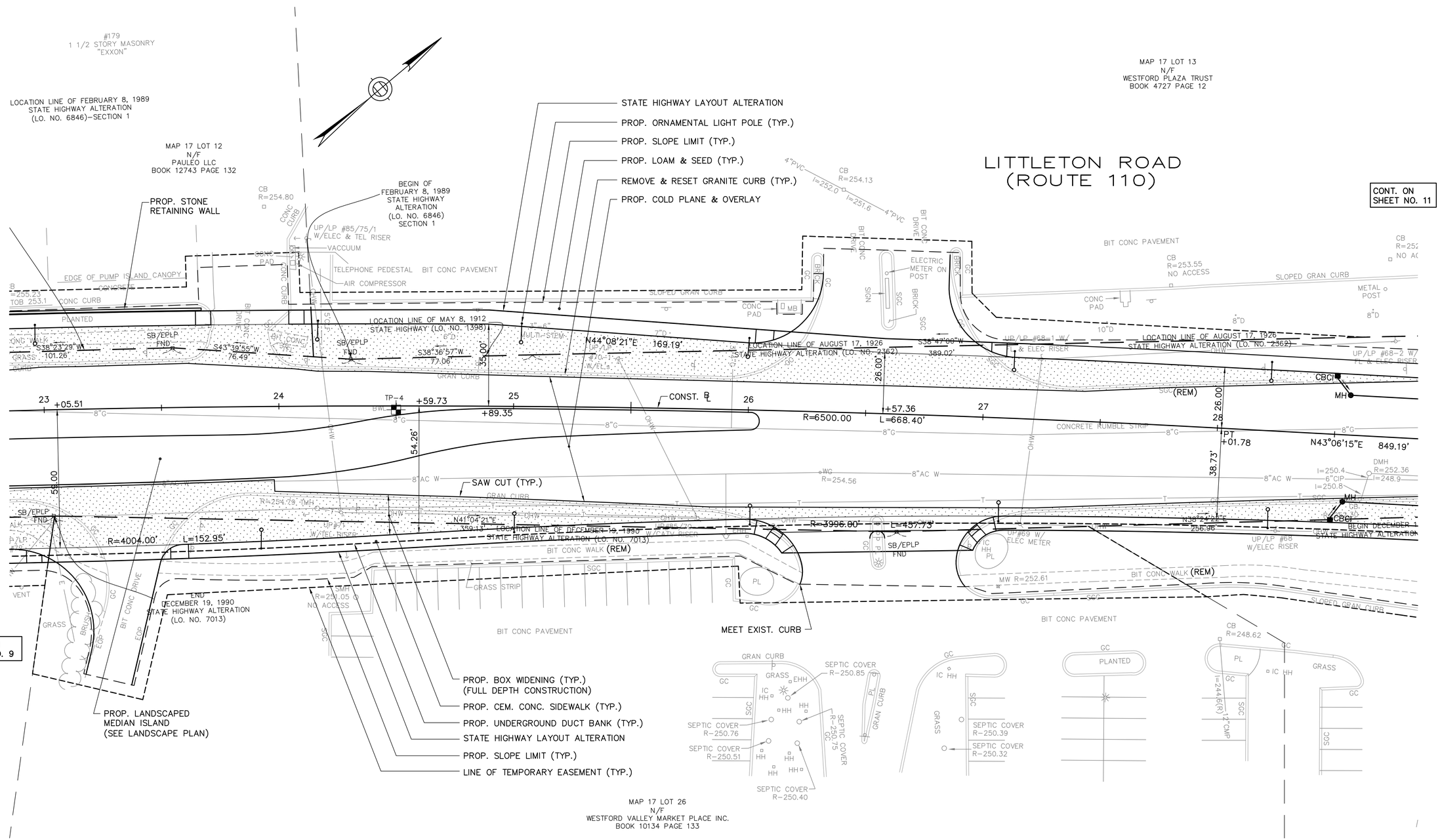
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE BELOW

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		10	38
PROJECT FILE NO. 604809			

CONSTRUCTION PLAN
PART 4 OF 10



NOTES:

1. FOR LEGEND AND GENERAL NOTES, SEE SHEET NO. 2.
2. FOR PROFILE, SEE SHEET NO. 18.

FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

[Rubino_J] - August 05, 2009 - 11:29am - T:\QW-023 Westford\Drawings\QW-023_Const_Plans.dwg [10 - CONST4]

HWY. GUARD
SEE BELOW

TRAFFIC SIGNAL CONDUIT
SEE TRAFFIC SIGNAL PLAN

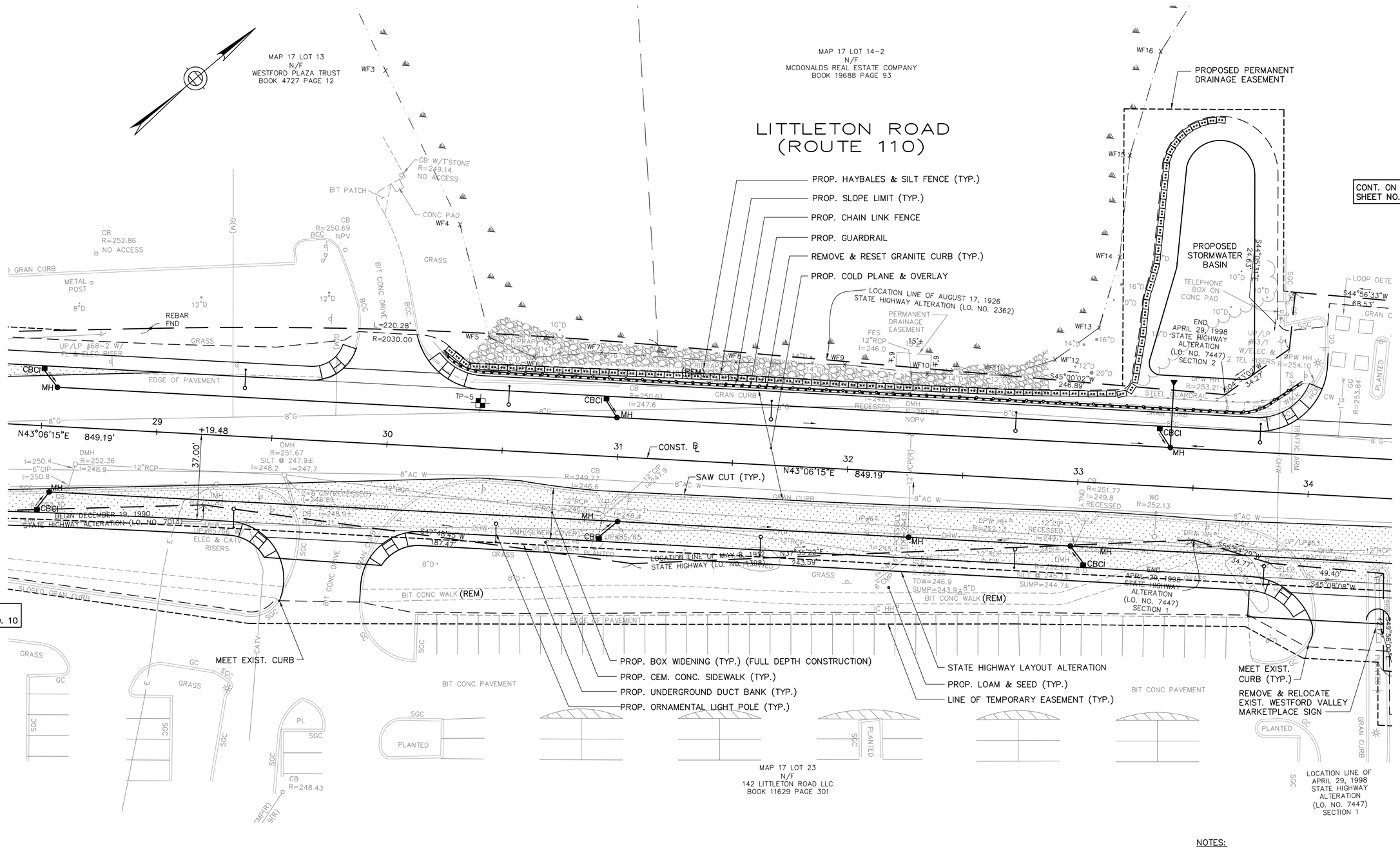
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE BELOW

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		11	38
PROJECT FILE NO. 604809			

CONSTRUCTION PLAN
PART 5 OF 10



NOTES:

1. FOR LEGEND AND GENERAL NOTES, SEE SHEET NO. 2.
2. FOR PROFILE, SEE SHEET NOS. 18–19.

FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

[Rubino_J] - August 05, 2009 - 11:29am - T:\QW-023 Westford\Drawings\QW-023_Const_Plans.dwg [11 - CONST5]

HWY. GUARD
NONE

TRAFFIC SIGNAL CONDUIT
SEE TRAFFIC SIGNAL PLAN

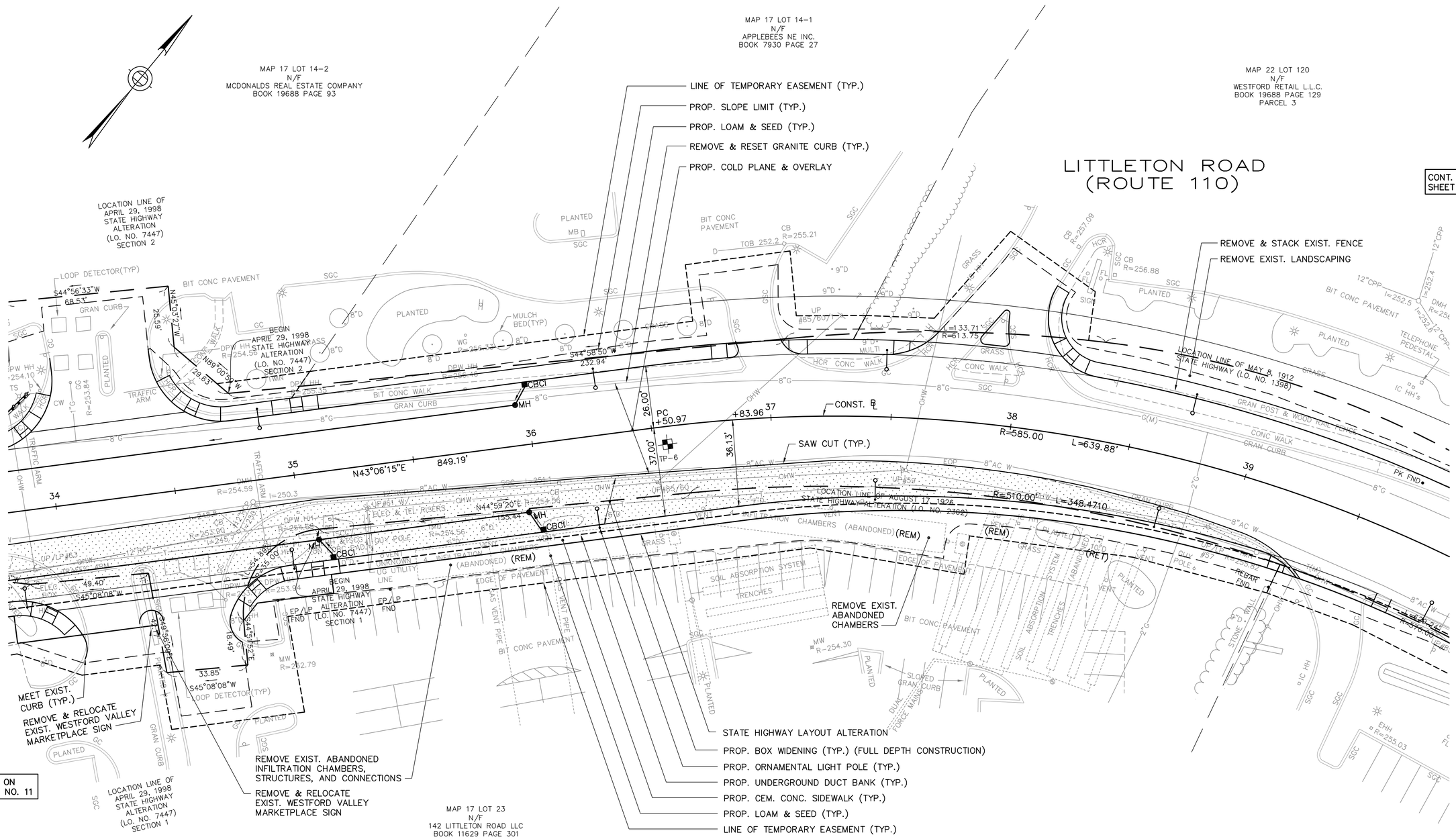
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE BELOW

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		12	38
PROJECT FILE NO. 604809			

CONSTRUCTION PLAN
PART 6 OF 10



NOTES:

1. FOR LEGEND AND GENERAL NOTES, SEE SHEET NO. 2.
2. FOR PROFILE, SEE SHEET NO. 19.

FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

[Rubino_J] - August 05, 2009 - 11:29am - T:\QW-023 Westford\Drawings\QW-023_Const_Plans.dwg [12 - CONST6]

HWY. GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

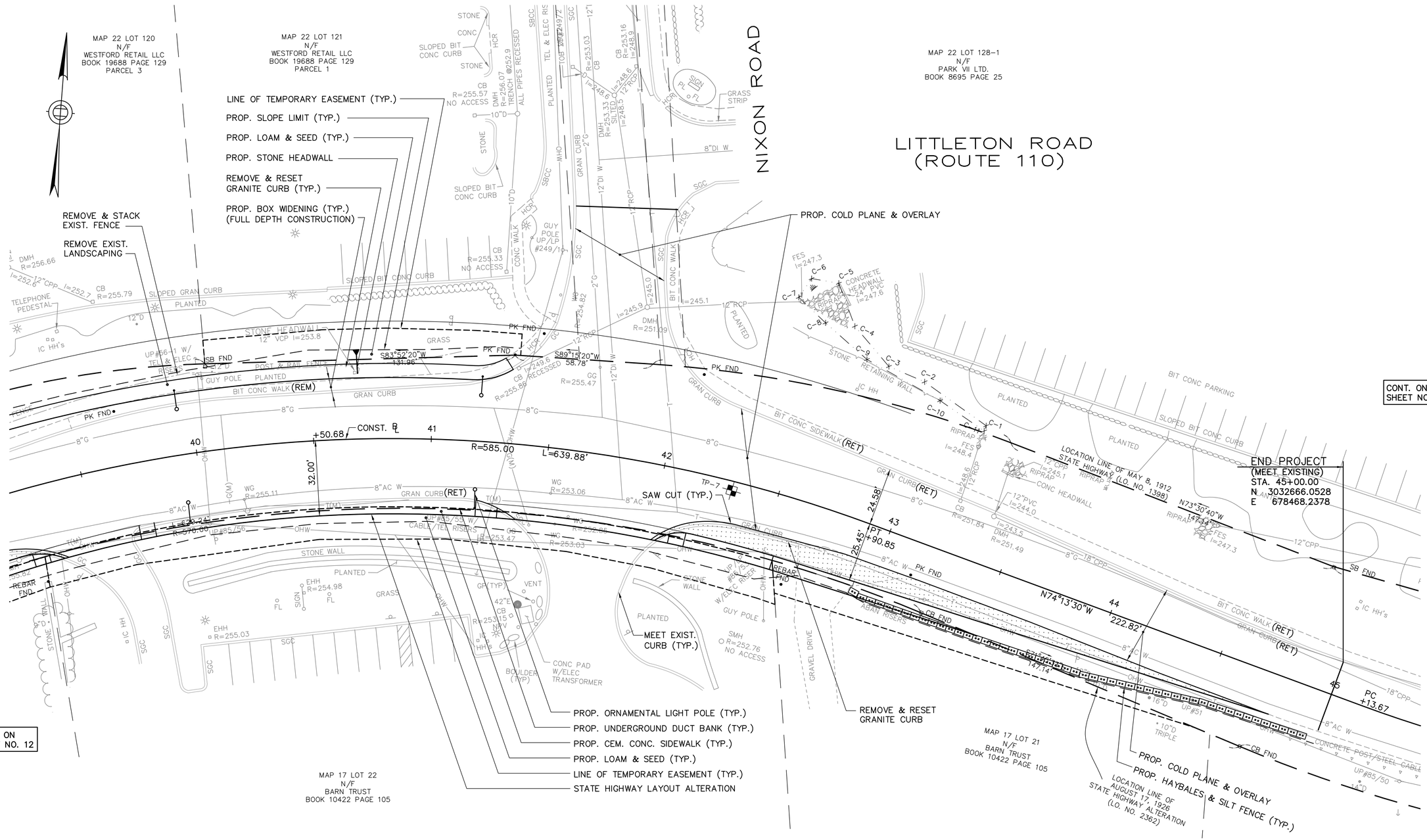
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE BELOW

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		13	38
PROJECT FILE NO. 604809			

CONSTRUCTION PLAN
PART 7 OF 10



NOTES:

1. FOR LEGEND AND GENERAL NOTES, SEE SHEET NO. 2.
2. FOR PROFILE, SEE SHEET NOS. 19-20.

FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

HWY. GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

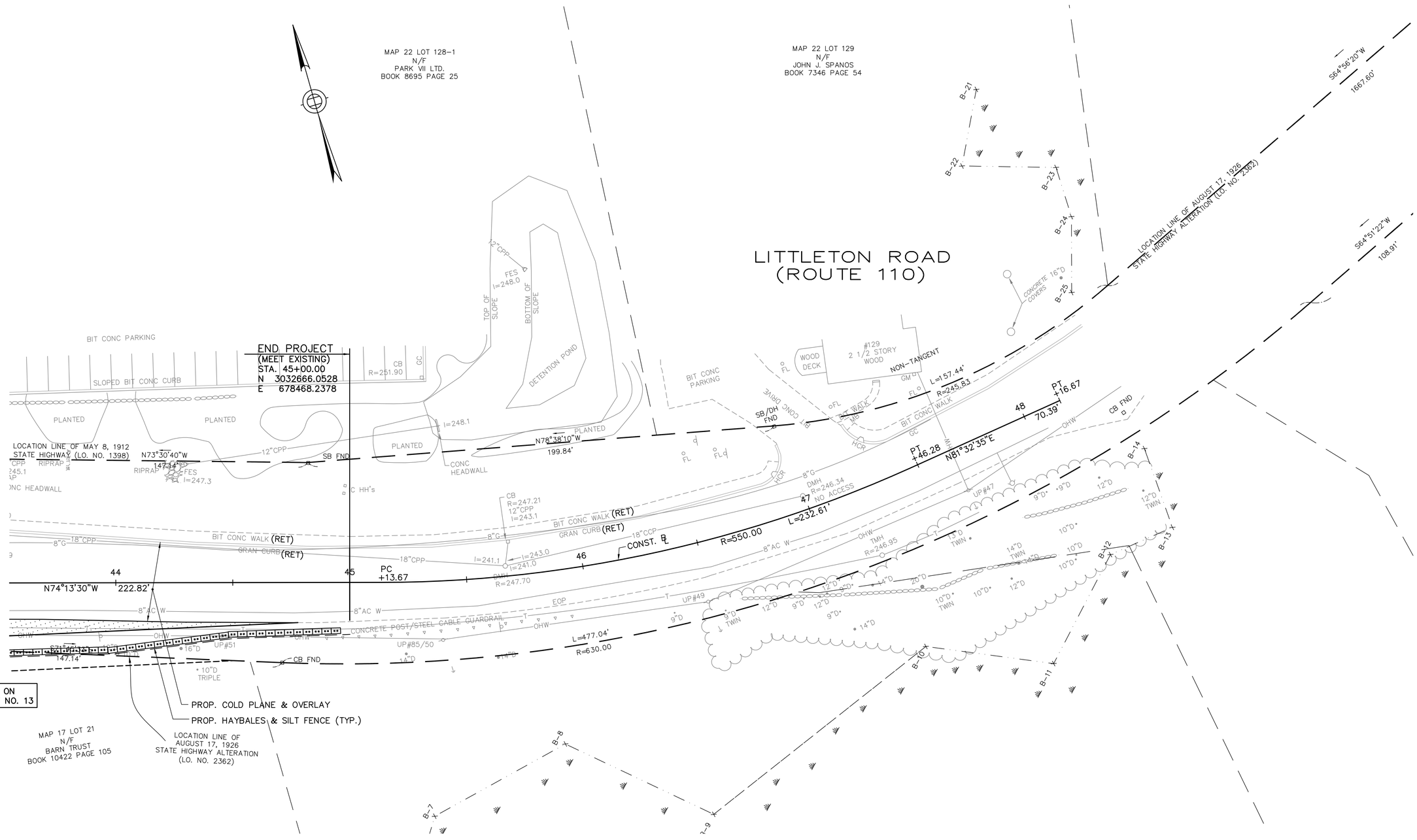
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE BELOW

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		14	38
PROJECT FILE NO. 604809			

CONSTRUCTION PLAN
PART 8 OF 10



NOTES:

1. FOR LEGEND AND GENERAL NOTES, SEE SHEET NO. 2.
2. FOR PROFILE, SEE SHEET NO. 20.

FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

HWY. GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

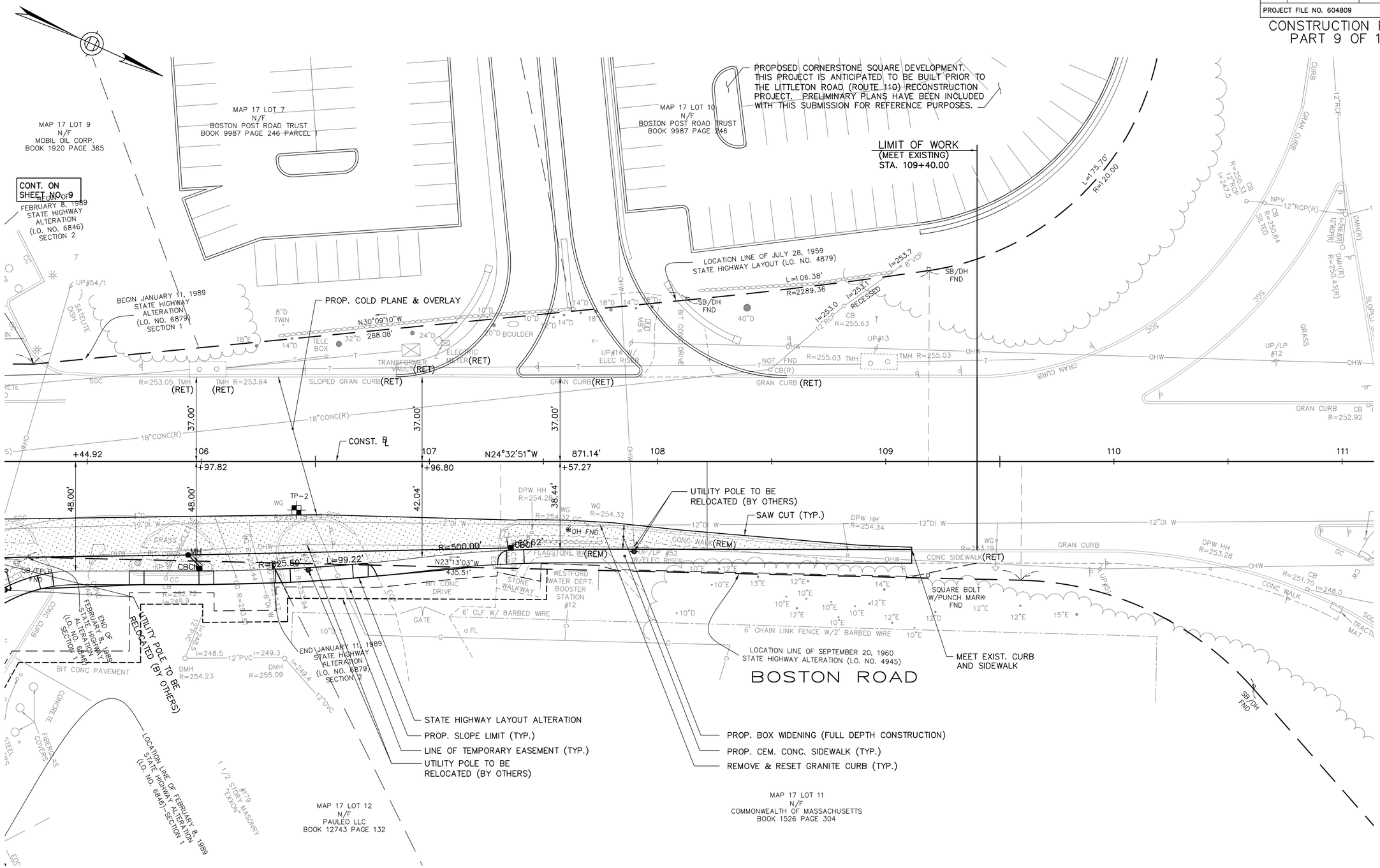
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE BELOW

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		15	38
PROJECT FILE NO. 604809			

CONSTRUCTION PLAN
PART 9 OF 10



HOR. SCALE IN FEET
0 20 50 100

NOTES:

1. FOR LEGEND AND GENERAL NOTES, SEE SHEET NO. 2.
2. FOR PROFILE, SEE SHEET NOS. 21–22.

FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

HWY. GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

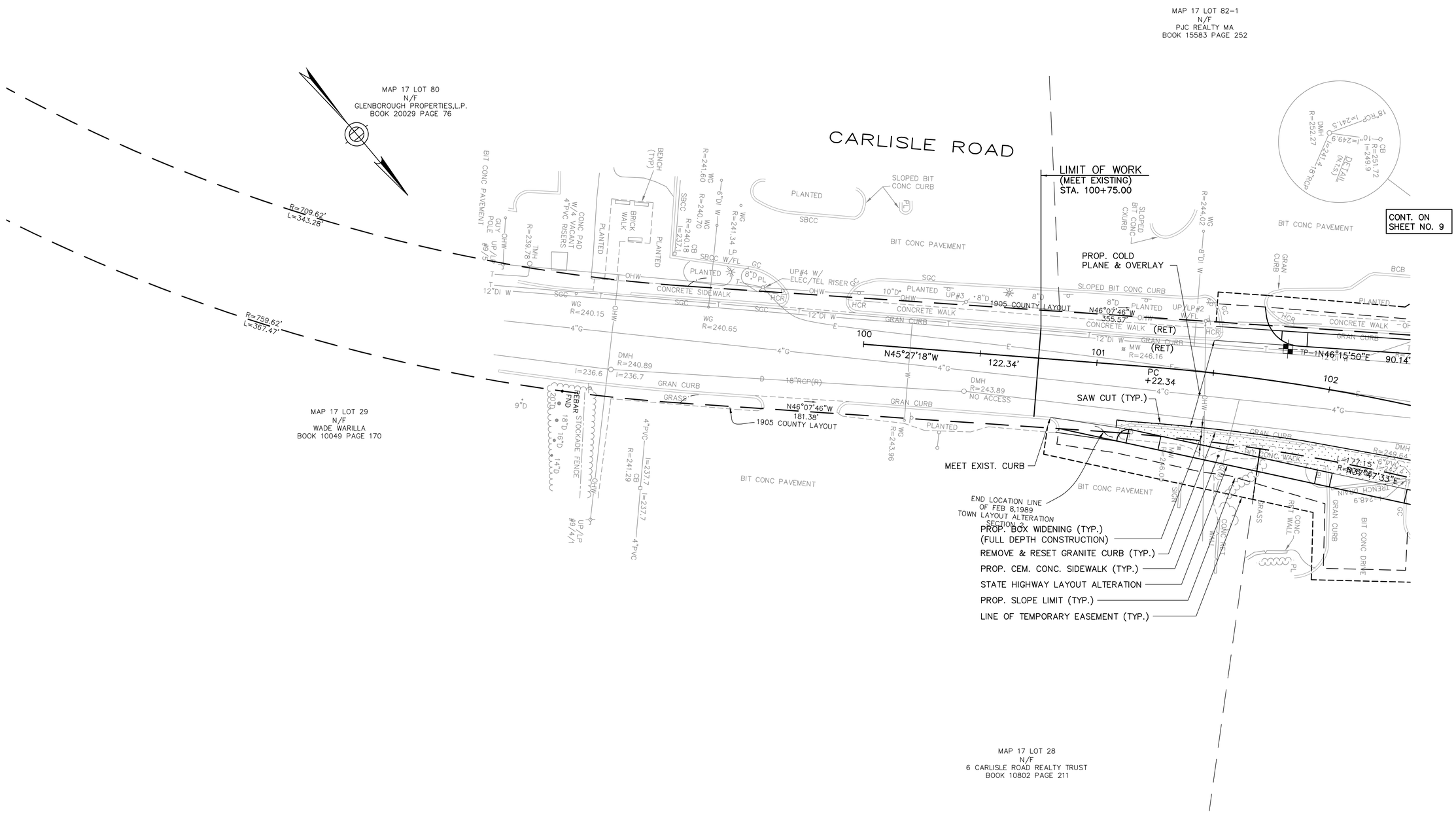
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE BELOW

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		16	38
PROJECT FILE NO. 604809			

CONSTRUCTION PLAN
PART 10 OF 10



HOR. SCALE IN FEET
0 20 50 100

NOTES:

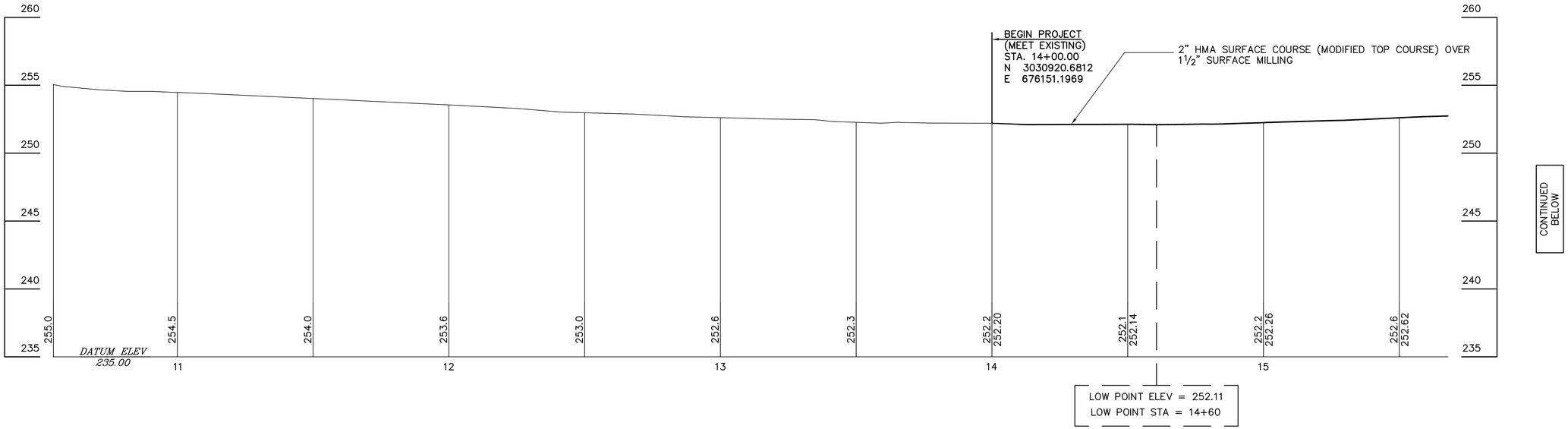
1. FOR LEGEND AND GENERAL NOTES, SEE SHEET NO. 2.
2. FOR PROFILE, SEE SHEET NO. 21.

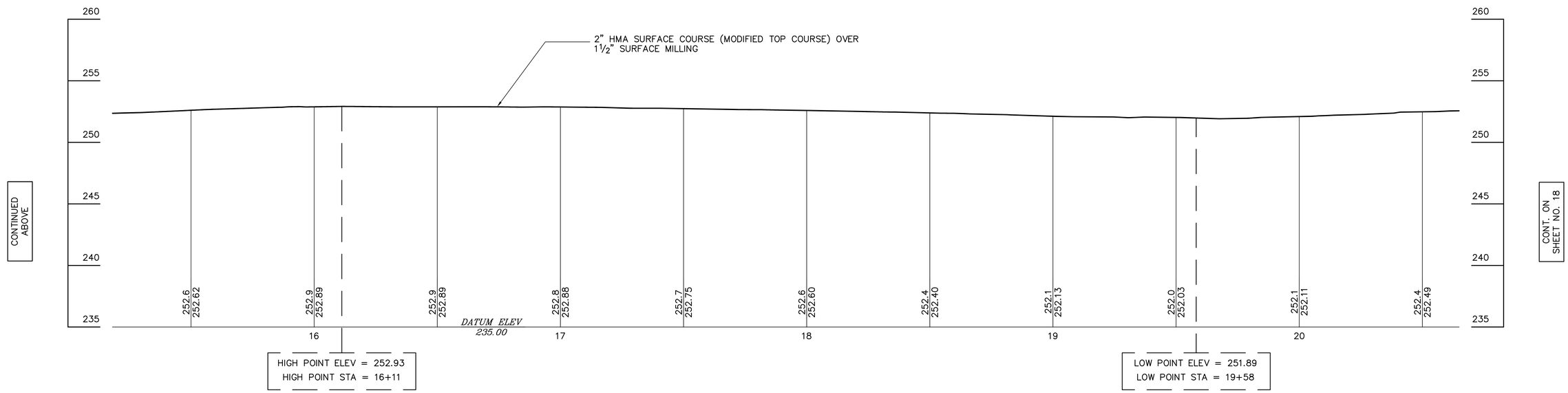
FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH
ENGINEER IN CHARGE			

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		17	38
PROJECT FILE NO. 604809			

PROFILE
LITTLETON ROAD
PART 1 OF 4





HOR. SCALE IN FEET
0 20 50 100
0 4 10 20
VERT. SCALE IN FEET

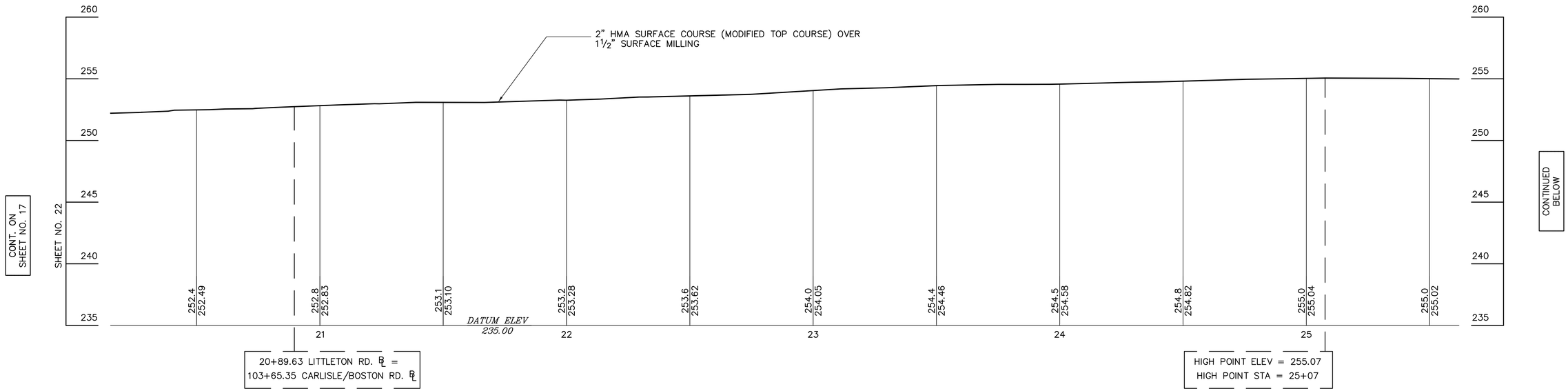
FOR PLAN SEE SHEET NOS. 7–9

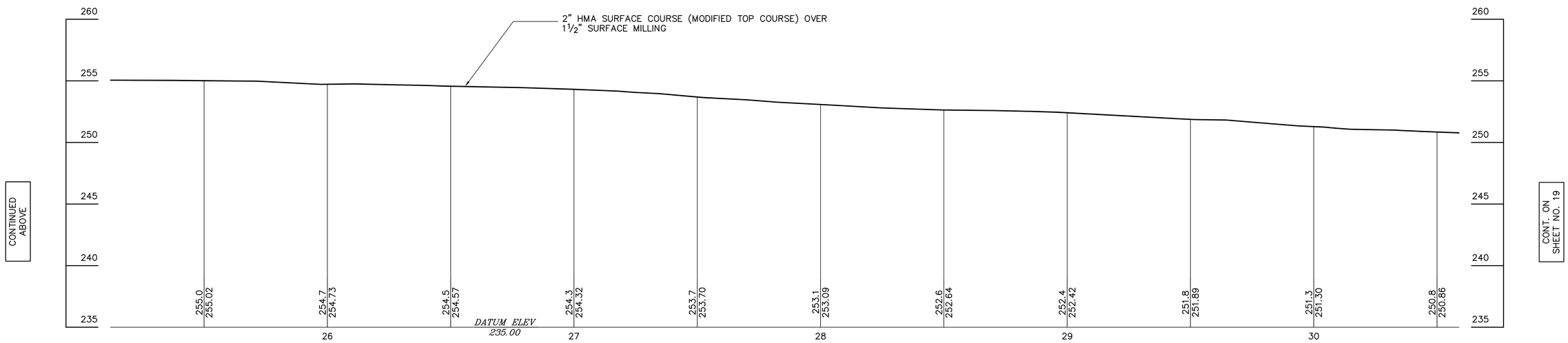
FS&T PROJECT NO.			
QW–023			
DES	JAS	CHK	JKH
DR	JPR	CHK	JKH
EST	JAS	CHK	JKH
ENGINEER IN CHARGE			

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		18	38
PROJECT FILE NO. 604809			

PROFILE
LITTLETON ROAD
PART 2 OF 4





HOR. SCALE IN FEET
0 20 50 100
0 4 10 20
VERT. SCALE IN FEET

FOR PLAN SEE SHEET NO. 9–11

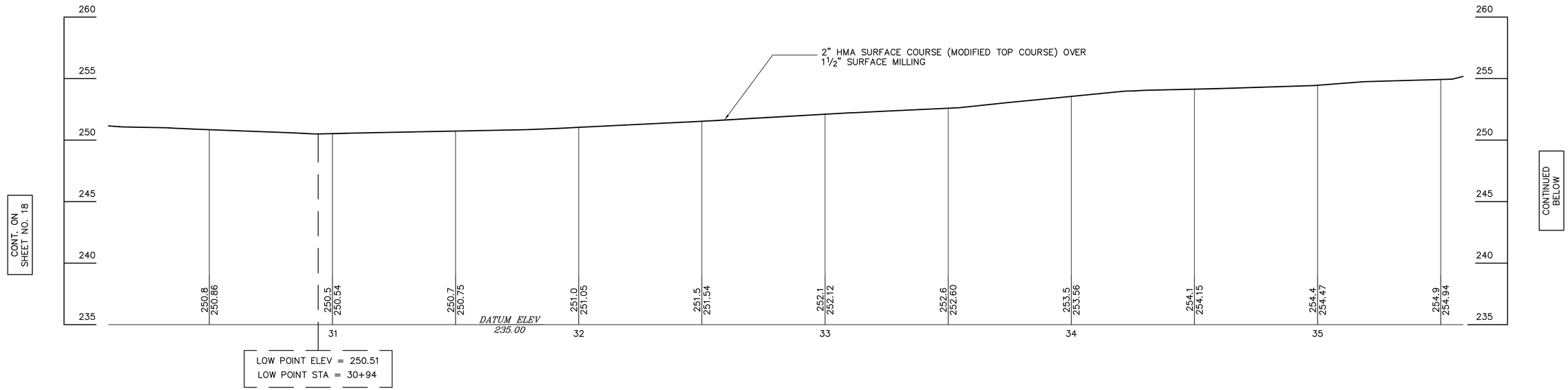
FS&T PROJECT NO.			
QW–023			
DES	JAS	CHK	JKH
DR	JPR	CHK	JKH
EST	JAS	CHK	JKH

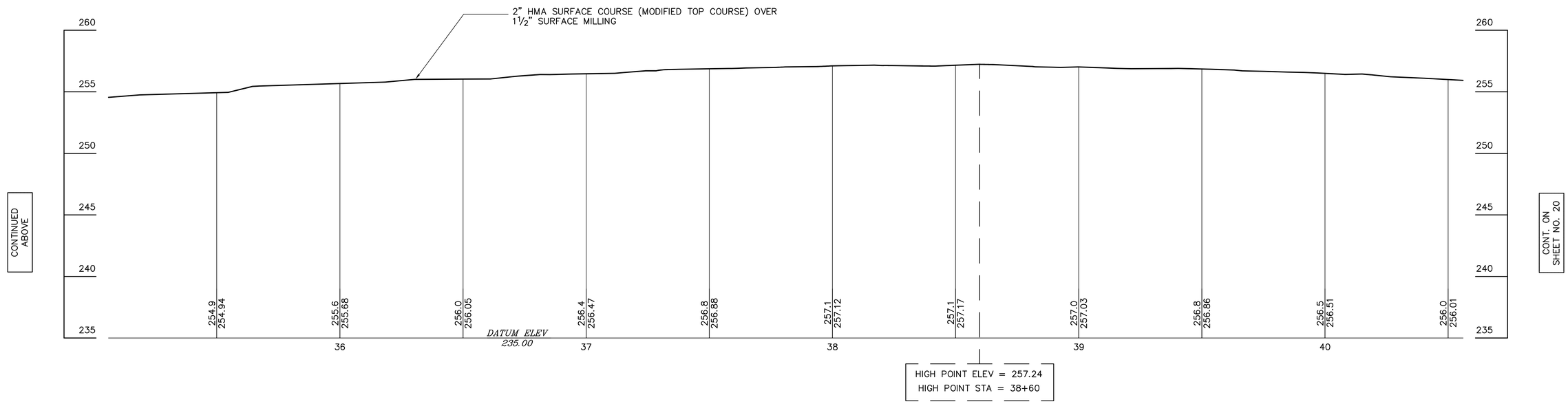
ENGINEER IN CHARGE

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		19	38
PROJECT FILE NO. 604809			

PROFILE
LITTLETON ROAD
PART 3 OF 4





HOR. SCALE IN FEET
0 20 50 100
0 4 10 20
VERT. SCALE IN FEET

FOR PLAN SEE SHEET NOS. 11–13

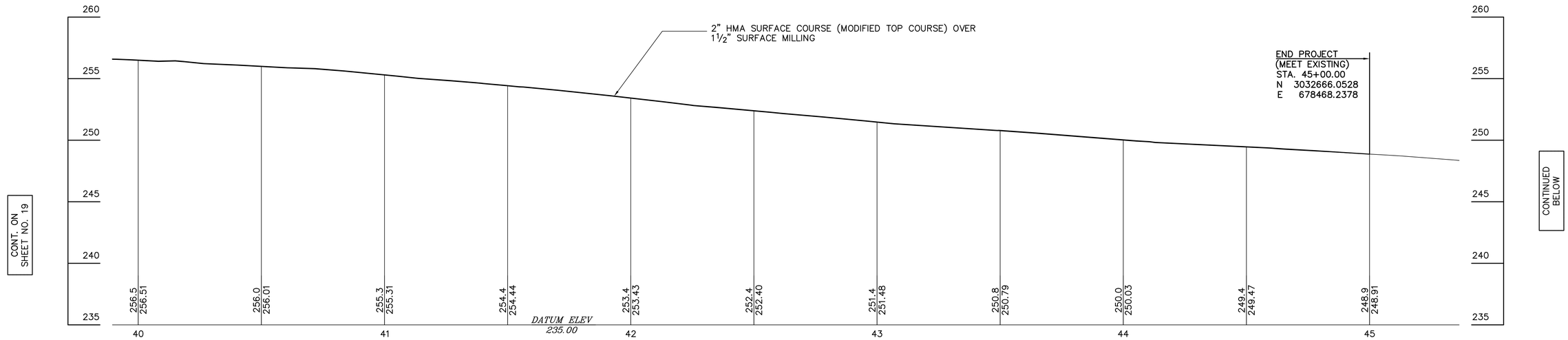
FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JPR	CHK	JKH
EST	JAS	CHK	JKH

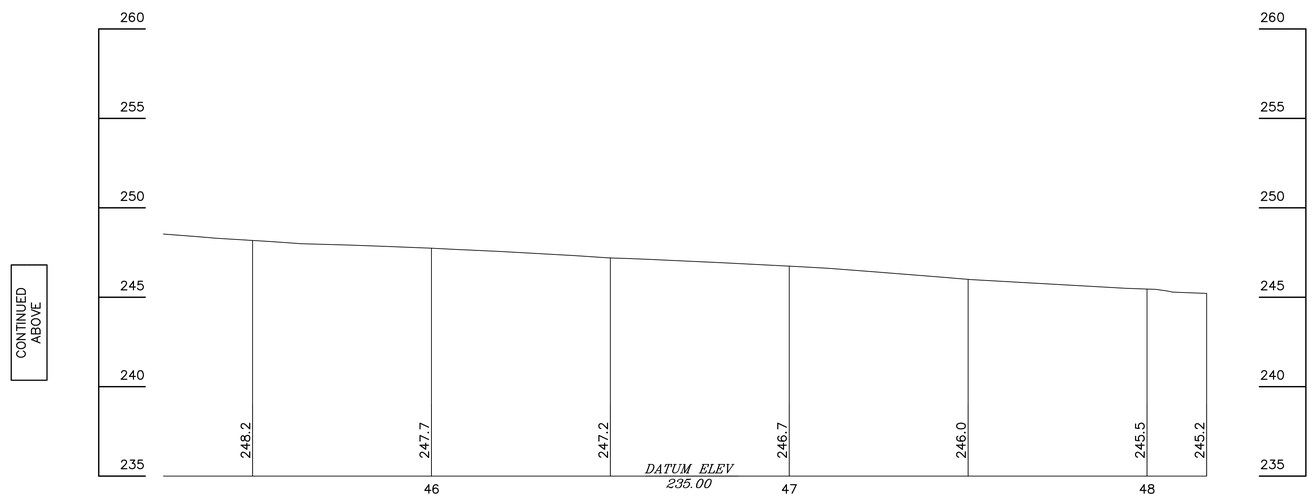
ENGINEER IN CHARGE

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		20	38
PROJECT FILE NO. 604809			

PROFILE
LITTLETON ROAD
PART 4 OF 4





HOR. SCALE IN FEET
0 20 50 100
0 4 10 20
VERT. SCALE IN FEET

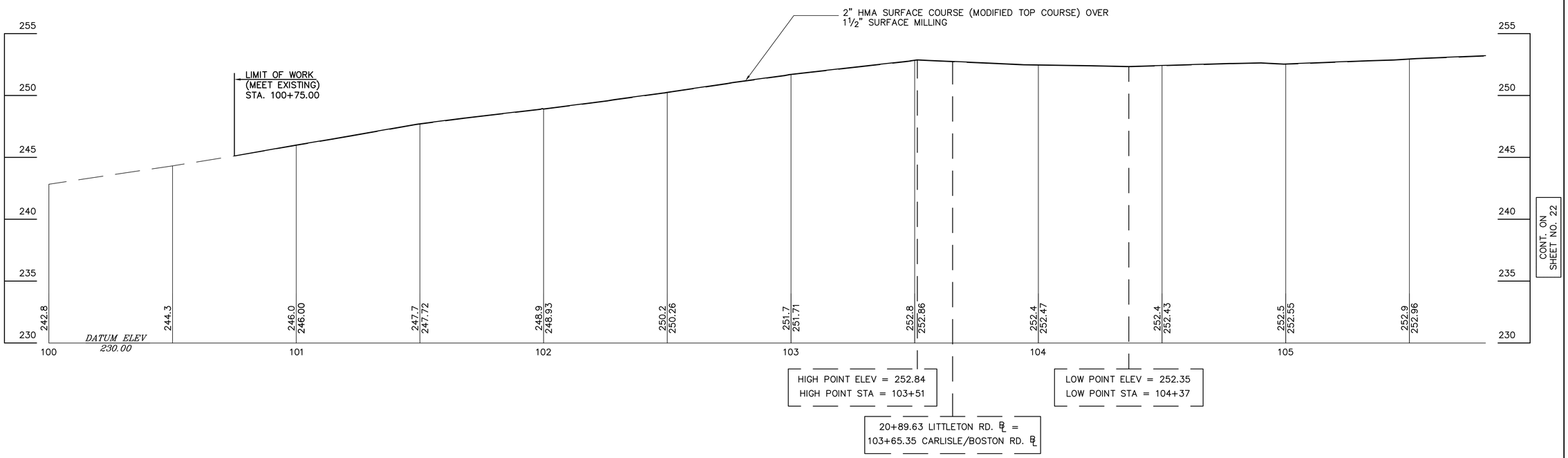
FOR PLAN SEE SHEET NOS. 13–14

FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JPR	CHK	JKH
EST	JAS	CHK	JKH
ENGINEER IN CHARGE			

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		21	38
PROJECT FILE NO. 604809			

PROFILE
CARLISLE/BOSTON ROAD
PART 1 OF 2



HOR. SCALE IN FEET
0 20 50 100
0 4 10 20
VERT. SCALE IN FEET

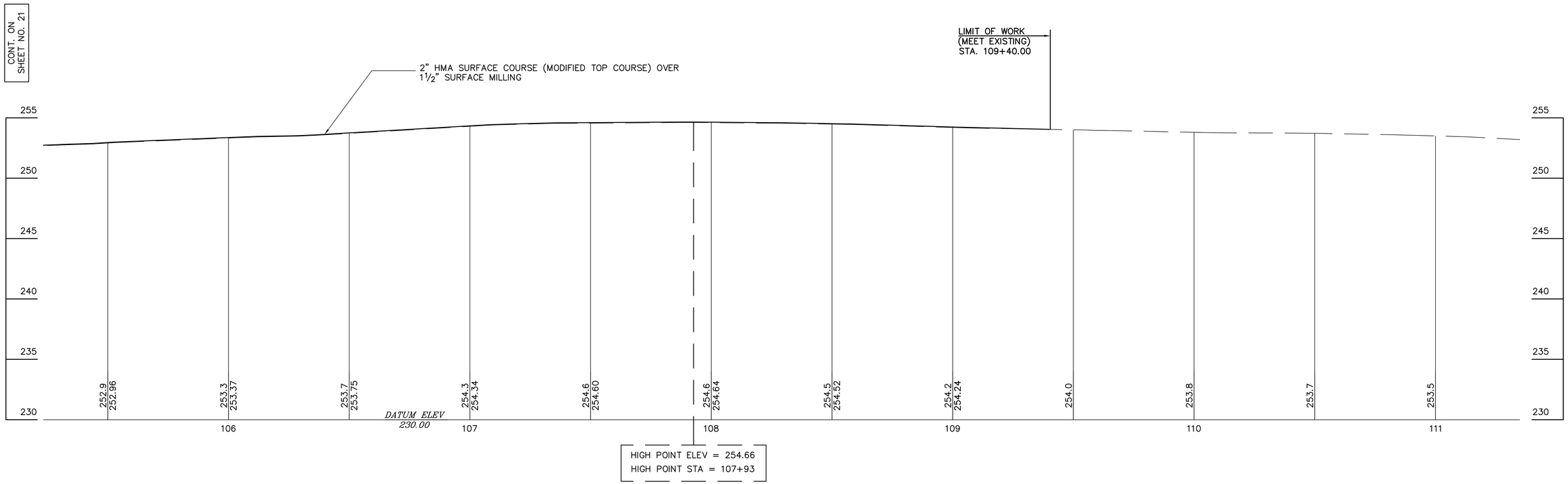
FOR PLAN SEE SHEET NOS. 9 AND 15–16.

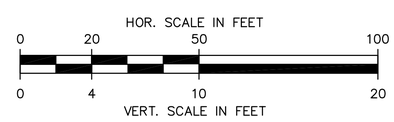
FS&T PROJECT NO.			
QW–023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH
ENGINEER IN CHARGE			

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		22	38
PROJECT FILE NO. 604809			

PROFILE
CARLISLE/BOSTON ROAD
PART 2 OF 2





FOR PLAN SEE SHEET NOS. 9 AND 15

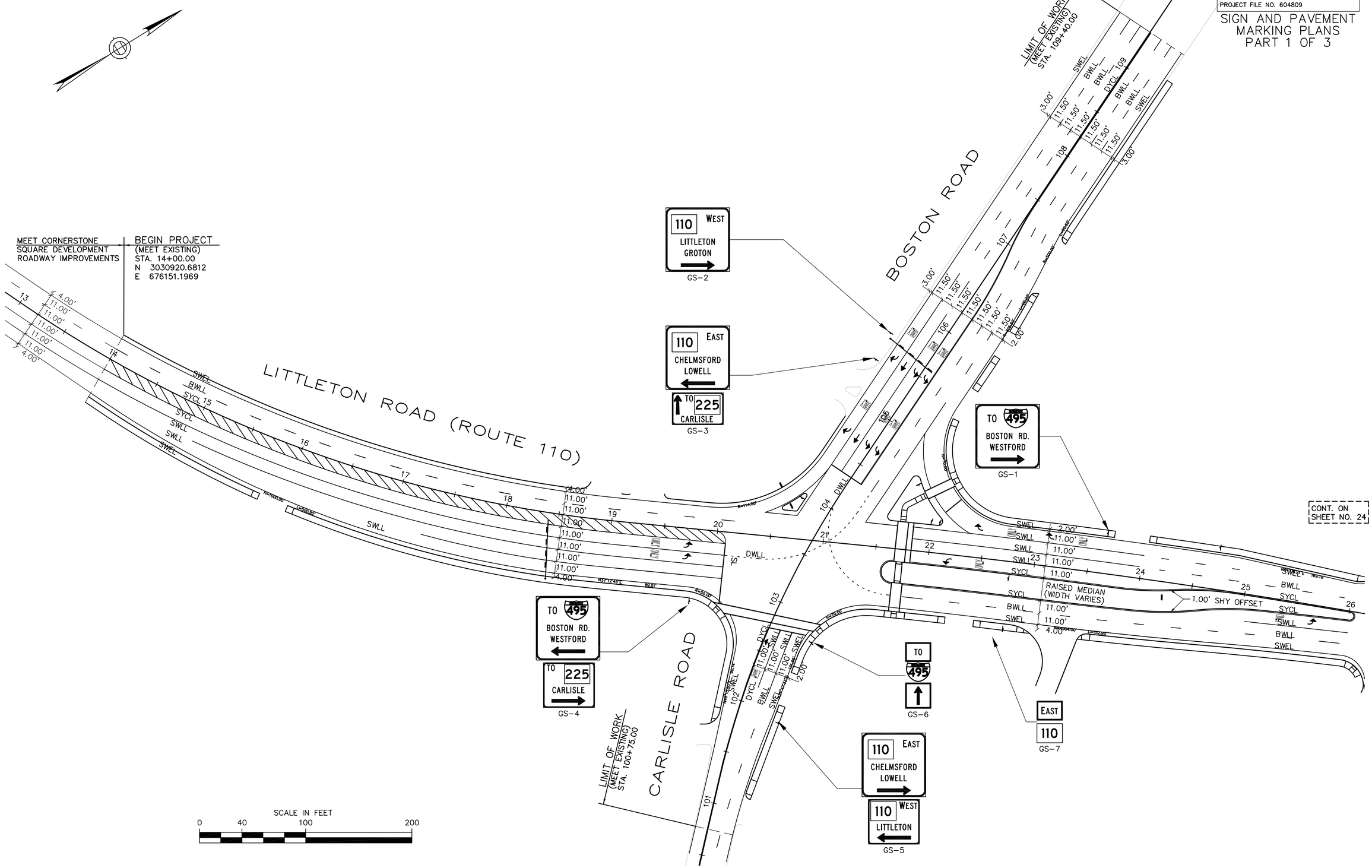
FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		23	38
PROJECT FILE NO. 604809			

SIGN AND PAVEMENT MARKING PLANS PART 1 OF 3



FS&T PROJECT NO.			
QW-023			
DES	ATC	CHK	JKH
DR	JPR	CHK	JKH
EST	ATC	CHK	JKH

ENGINEER IN CHARGE

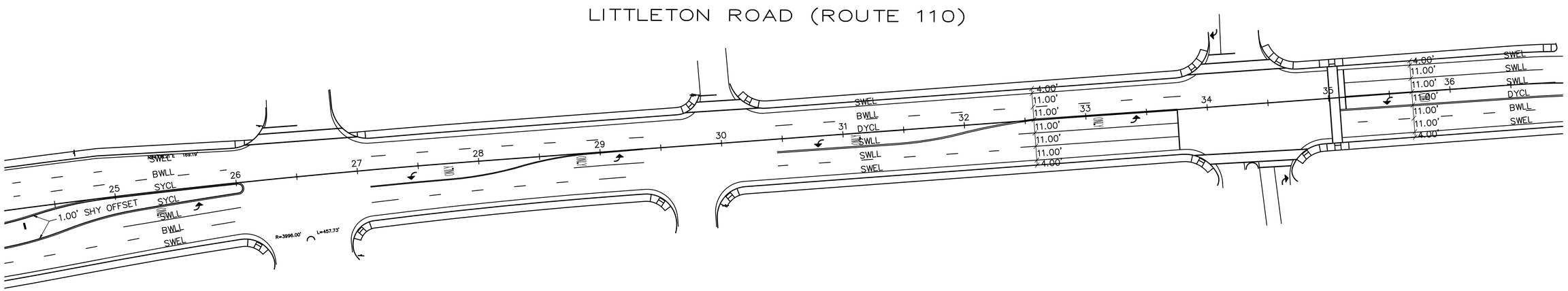
[Rubino_J] - August 05, 2009 - 11:30am - T:\QW-023 Westford\Drawings\QW-023_PMARK.dwg [23 - PMARK1]

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		24	38
PROJECT FILE NO. 604809			

SIGN AND PAVEMENT MARKING PLANS PART 2 OF 3

CONT. ON SHEET NO. 25



CONT. ON SHEET NO. 23

SCALE IN FEET
0 40 100 200

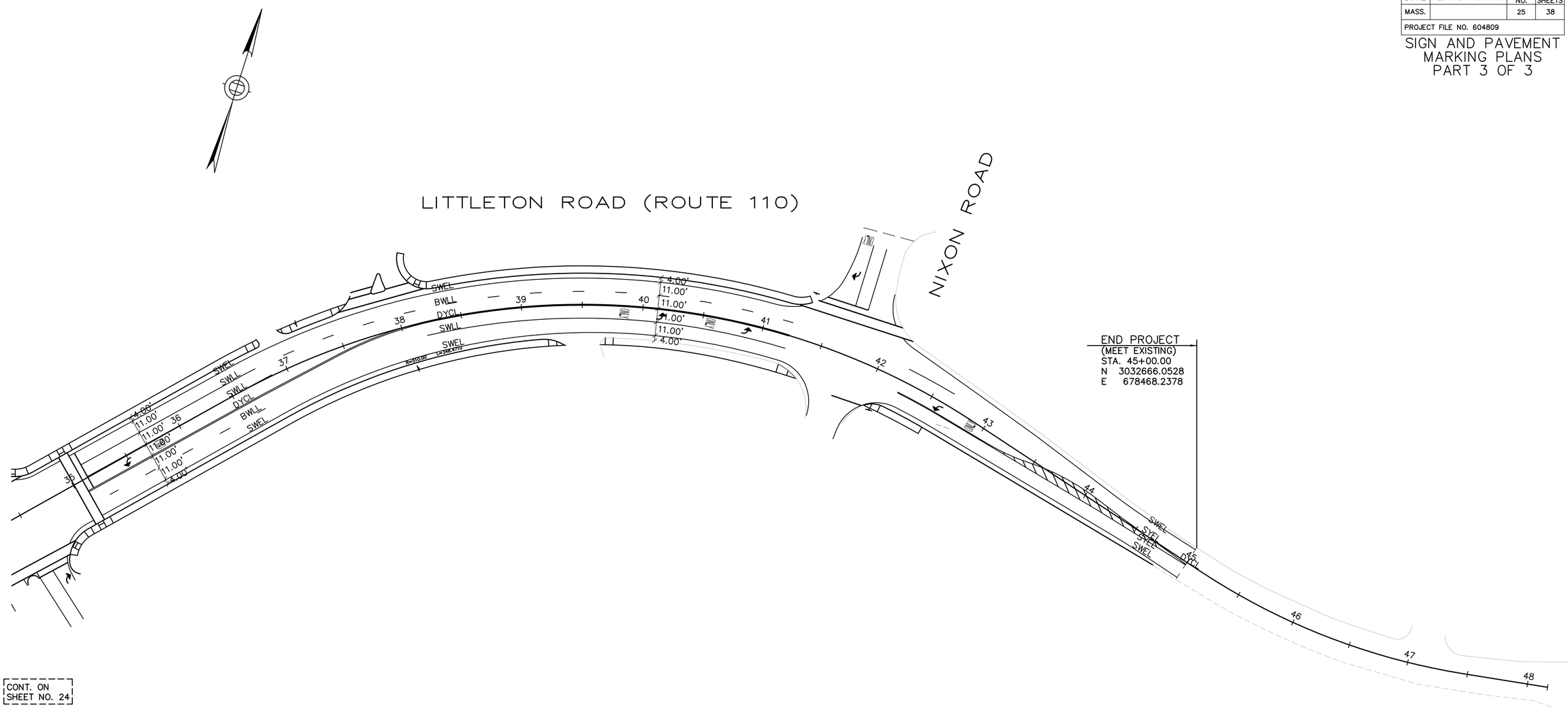
FS&T PROJECT NO.			
QW-023			
DES	ATC	CHK	JKH
DR	JPR	CHK	JKH
EST	ATC	CHK	JKH

ENGINEER IN CHARGE

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		25	38
PROJECT FILE NO. 604809			

SIGN AND PAVEMENT MARKING PLANS PART 3 OF 3



SCALE IN FEET
0 40 100 200

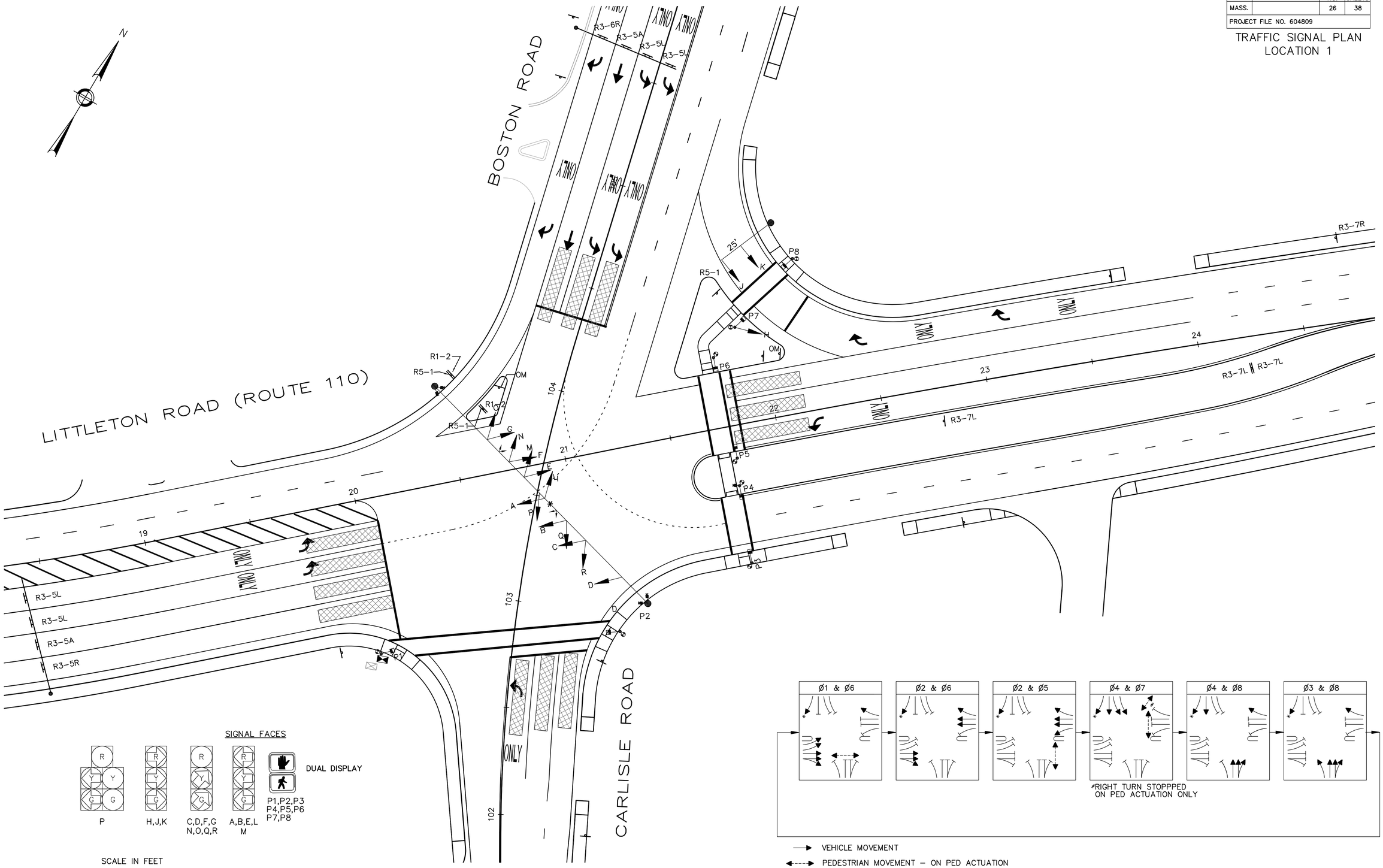
FS&T PROJECT NO.			
QW-023			
DES	ATC	CHK	JKH
DR	JPR	CHK	JKH
EST	ATC	CHK	JKH
ENGINEER IN CHARGE			

[Rubino_J] - August 05, 2009 - 11:30am - T:\QW-023 Westford\Drawings\QW-023_PMARK.dwg [25 - PMARK3]

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		26	38
PROJECT FILE NO. 604809			

TRAFFIC SIGNAL PLAN
LOCATION 1



FS&T PROJECT NO.			
QW-023			
DES	ATC	CHK	FAM
DR	ATC	CHK	FAM
EST	ATC	CHK	FAM

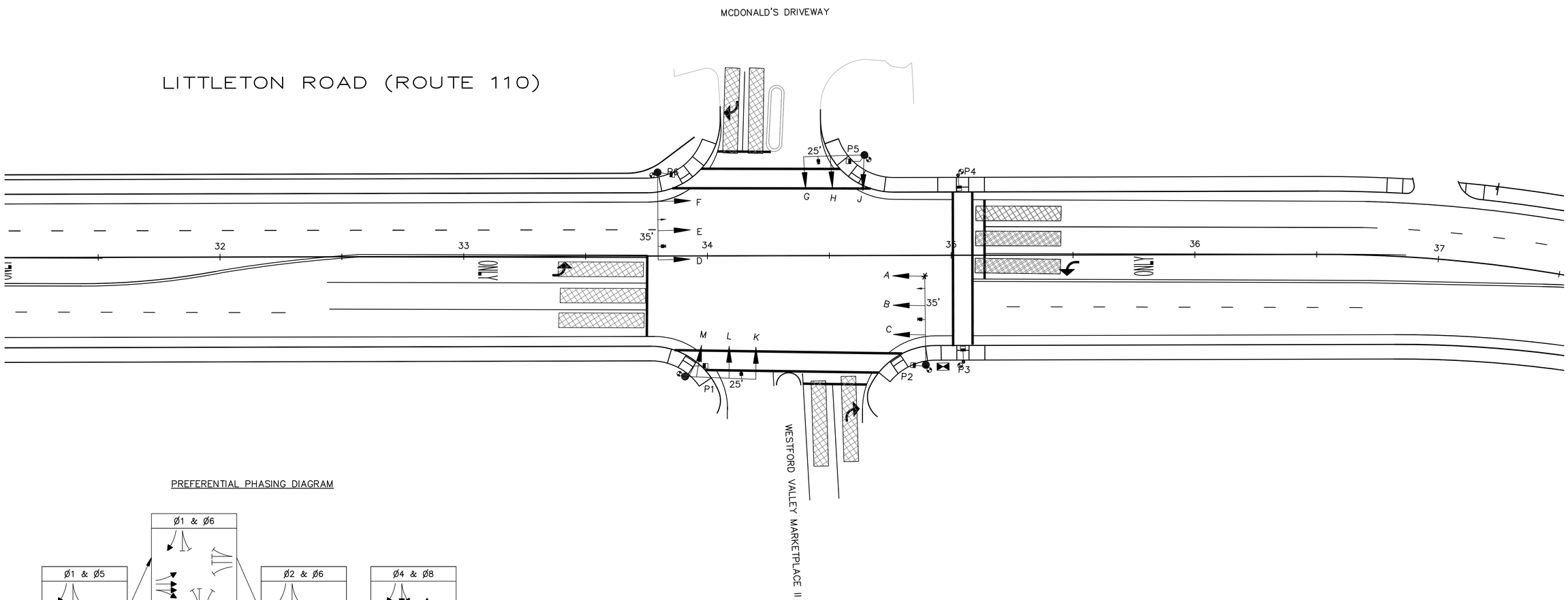
ENGINEER IN CHARGE

[Rubino_J] - August 05, 2009 - 11:30am - T:\QW-023 Westford\Drawings\QW-023_Signal.dwg [26 - Littleton Rd1-layout]

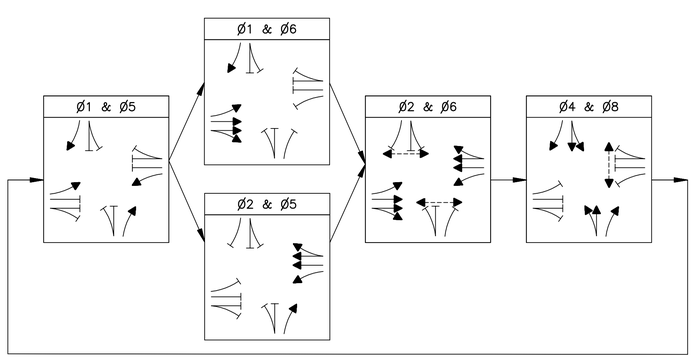
WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		27	38
PROJECT FILE NO. 604809			

TRAFFIC SIGNAL PLAN
LOCATION 2



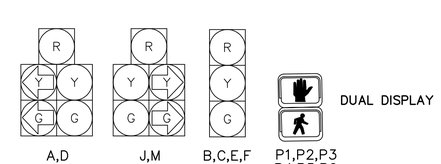
PREFERENTIAL PHASING DIAGRAM



VEHICLE MOVEMENT

PEDESTRIAN MOVEMENT – ON PED ACTUATION

SIGNAL FACES



SCALE IN FEET
0 20 50 100
1"=20'

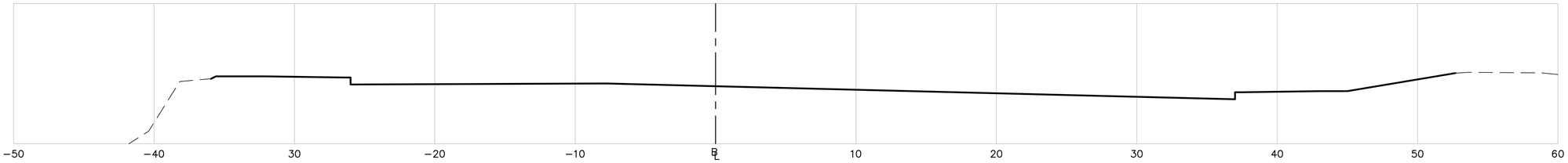
FS&T PROJECT NO.			
QW-023			
DES	ATC	CHK	FAM
DR	ATC	CHK	FAM
EST	ATC	CHK	FAM
ENGINEER IN CHARGE			

[Rubino_J] - August 05, 2009 - 11:30am - T:\QW-023 Westford\Drawings\QW-023_Signal.dwg [27 - Littleton Rd2-McDonalds]

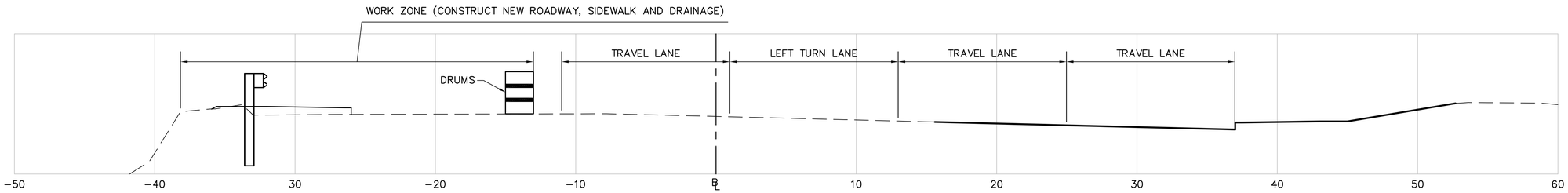
WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		28	38
PROJECT FILE NO. 604809			

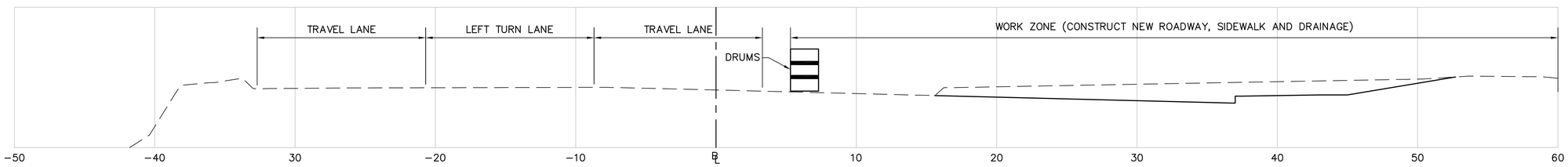
CONSTRUCTION PHASING



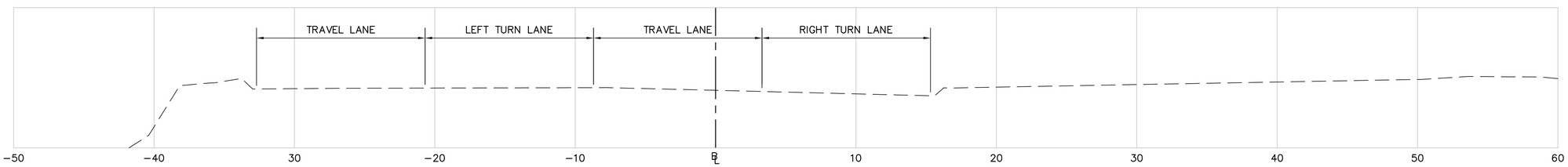
PHASE III (FINAL PAVING)



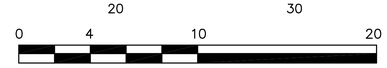
PHASE II



PHASE I



EXISTING CONDITION



PHASING NOTES

GENERAL

1. Contractor will perform work affecting the traveling public only between 9:00 AM and 3:00 PM. All lanes must be open to traffic outside of that window. Pavement shall be to the base course at a minimum to allow for traffic. All edges shall be sloped, with no sharp drop offs. All traffic control setups shall be emplaced and taken down within this work time window.
2. No work affecting the traveling public shall be done between the dates of 15 November and 15 January. All lanes must be open to traffic during this time.
3. During the work hour listed above the contractor will be allowed to restrict the traffic to 1 lane in each direction. Access to all intersecting streets and ramps as well as all drives shall be maintained.
4. Paving during the individual phases shall be to the binder level only. All final paving and permanent pavement markings shall be done in the final phase.

PHASE I

1. Contractor shall restrict traffic to three lanes and shall have the right most lane and shoulder for his work area.
2. Construct right edge of roadway and sidewalk from limit of work. Access to all intersecting streets and driveways shall be maintained at all times.

PHASE II

1. Contractor shall restrict traffic to four lanes and shall have the left most lane and shoulder for his work area.
2. Construct left edge of roadway and sidewalk from limit of work. Access to all intersecting streets and driveways shall be maintained at all times.

PHASE III

1. Contractor shall complete work using single lane closures and moving work zones. Traffic to be maintained to the maximum extent possible. One lane in each direction shall be maintained as a minimum at all times. Access to all intersecting streets and driveways shall be maintained at all times.
2. Construct final paving and pavement markings throughout the project.
3. Perform final cleanup of site.

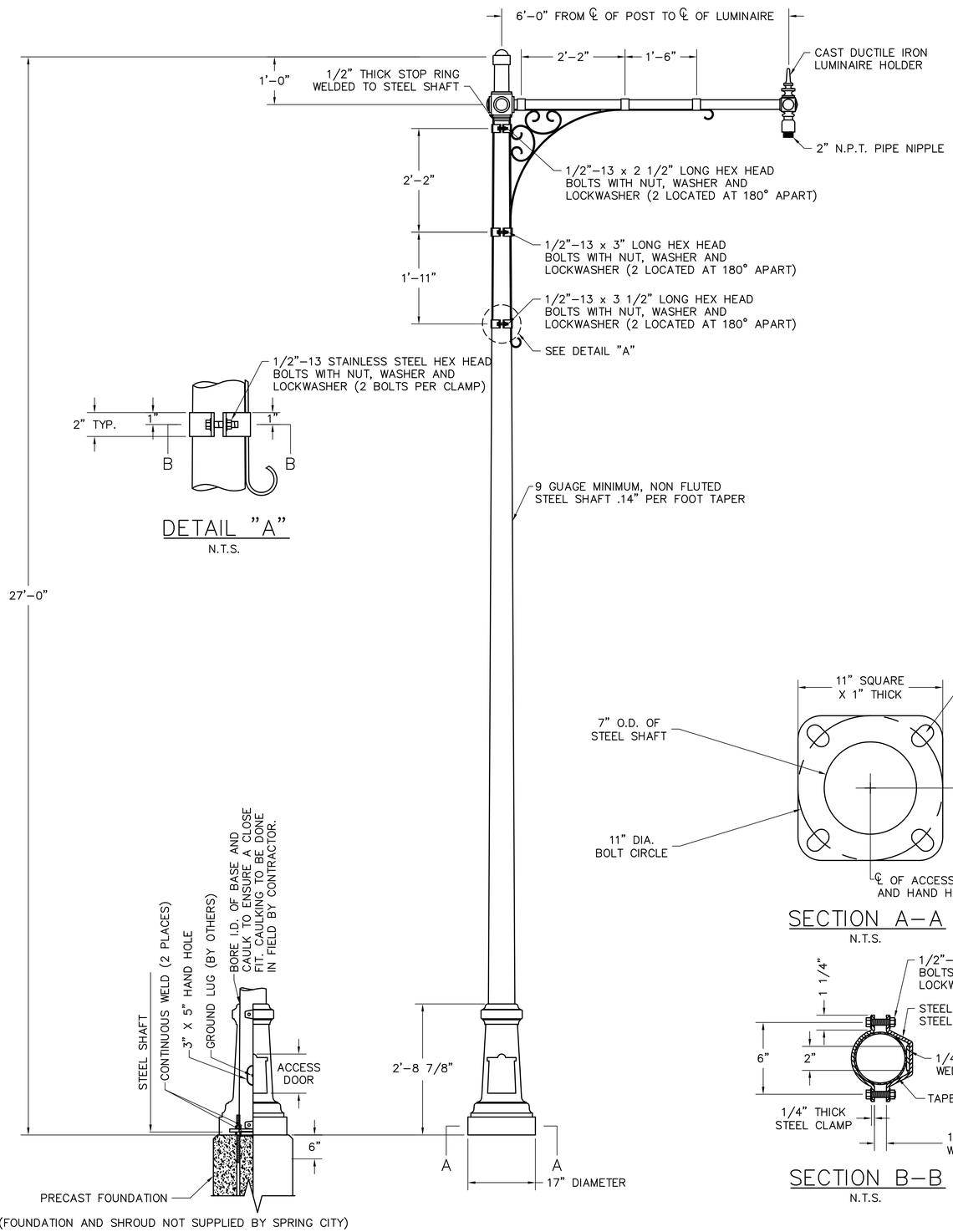
FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JPR	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		29	38
PROJECT FILE NO. 604809			

ELECTRICAL DETAILS PART 1 OF 3



DETAIL "A"
N.T.S.

CROSS ARM SPECIFICATIONS

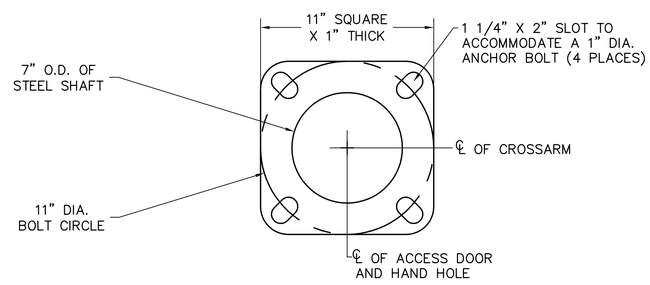
STYLE:	CAMBRIDGE SINGLE
WIDTH:	6'-0" FROM ℄ OF POST TO ℄ OF LUMINAIRE
MATERIAL:	CAST DUCTILE IRON WITH 2" STANDARD GALVANIZED STEEL PIPE AND GALVANIZED STEEL SCROLL WORK
FINISH:	PRIME PAINTED THEN FINISH PAINTED, SHERWIN WILLIAMS ACROLON – BOTTLE GREEN
CATALOG NO:	SPRING CITY DARCMB-1S-72-12-BG OR APPROVED EQUAL

LAMP POST SPECIFICATIONS

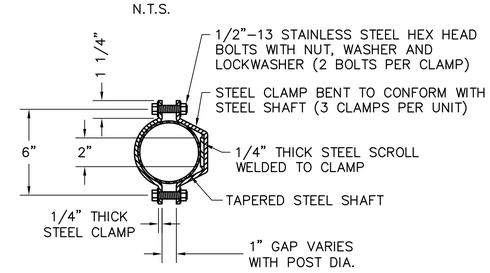
STYLE:	CAMBRIDGE STEEL
HEIGHT:	27'-0"
BASE:	17" DIAMETER
MATERIAL:	
SHAFT:	9 GAUGE MINIMUM, SMOOTH STEEL MONOTUBE CONSTRUCTION
BASE:	2 PIECE, (WRAP AROUND) HEAVY WALL CAST IRON PER A.S.T.M. A 48-83 CLASS 30
FINISH:	STEEL SHAFT SHALL BE HOT DIP GALVANIZED THEN ALL COMPONENTS SHALL PRIME PAINTED THEN FINISH PAINTED, SHERWIN WILLIAMS ACROLON – BOTTLE GREEN
ACCESS DOOR:	LOCATED IN BASE TO COINCIDE WITH HAND HOLE IN STEEL SHAFT SECURED WITH TAMPER PROOF HEX SOCKET SECURITY MACHINE SCREWS
GROUND STUD PROVISIONS:	1/4"-20 SQUARE NUT WELDED TO INSIDE WALL OF SHAFT OPPOSITE HAND HOLE FOR GROUND STUD (STUD BY OTHERS)
ANCHOR BOLTS:	(4) 1" X 30" + 4" HOOK (FULLY GALVANIZED WITH 2 GALVANIZED NUTS AND 2 GALVANIZED WASHERS PER BOLT)
BOLT PROJECTION:	5" REQUIRED
BASE CATALOG NO.:	SPRING CITY IWBCMB-17-BG OR APPROVED EQUAL
SHAFT CATALOG NO.:	SSHSM-G19-7-27-TNX/X-130/2NW-BG OR APPROVED EQUAL

LUMINAIRE SPECIFICATIONS

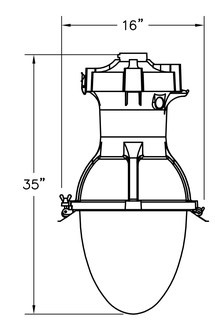
STYLE:	TEARDROP
OPTICS:	SAG GLASS CLEAR ASYMMETRIC, TYPE 3, IESNA CLASSIFICATION: CUTOFF
LAMP:	250W PULSE START METAL HALIDE, LAMP POSITION – BASE UP
CATALOG NO.:	KING LUMINAIRE K803-EGD-III-250(MOG)-PSMH, OR HOLOPHANE ES-250PSMH12B4 OR APPROVED EQUAL



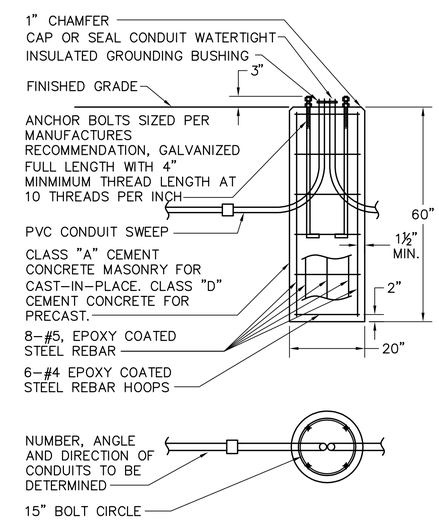
SECTION A-A
N.T.S.



SECTION B-B
N.T.S.



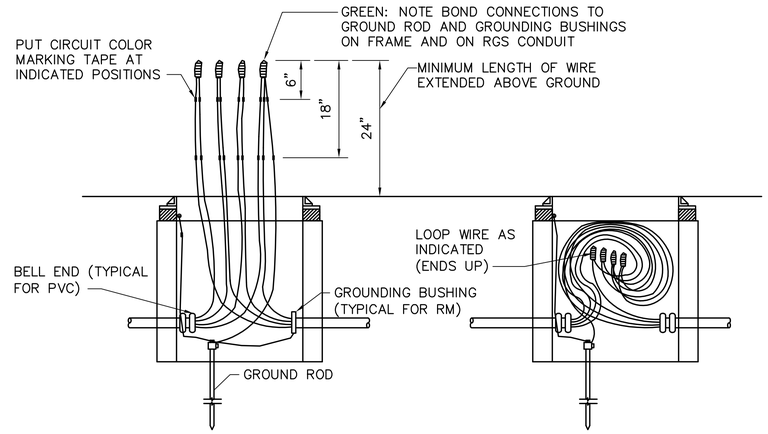
LIGHTING LUMINAIRE DETAIL
N.T.S.



POLE BASE DETAIL
NOT TO SCALE

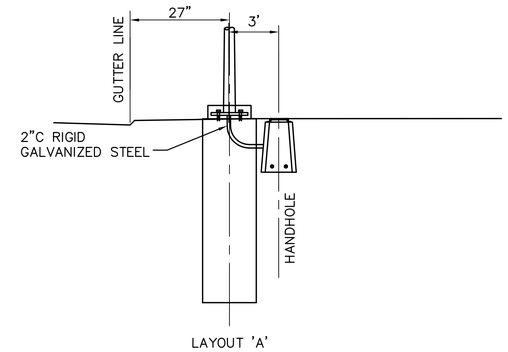
FS&T PROJECT NO.			
QW-023			
DES	DPH	CHK	JKH
DR	DPH	CHK	JKH
EST	DPH	CHK	JKH

ENGINEER IN CHARGE



HANDHOLE WIRING DETAIL

NOT TO SCALE



TYPICAL LIGHT POLE AND PULLBOX LAYOUT DETAILS

NOT TO SCALE

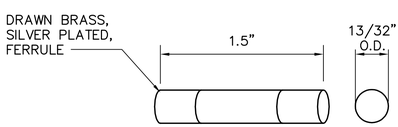
RATING: 600 VOLTS – 20 AMPS.	
FUSE SIZE: 1 1/2" x 13/32" O.D. – FERRULE 3/8"	
CONNECTOR SIZE: 8 1/2" x 7/8" O.D.	
CONNECTOR TYPE:	FUSE – QUICK DISCONNECT SET SCREW TYPE CONNECTION
CONNECTOR MATERIAL:	MOLDED PLASTIC BODY WITH RUBBER INSULATING BOOTS.
CONDUCTOR SIZE:	LINE AND LOAD #2 AWG THROUGH #12 AWG
REQUIRED FEATURES:	WATERTIGHT NO TAPING OR SEALANT REQUIRED

–FUSE HELD IN LOAD SIDE WHEN CONNECTOR IS DISCONNECTED.
–PROVIDE APPROVED FUSE HOLDER WITH "DUMMY" ROD BLANK FUSE FOR NEUTRALS

FUSE HELD IN LOAD SIDE WHEN CONNECTOR IS DISCONNECTED.

STRAIGHT THRU CONNECTOR

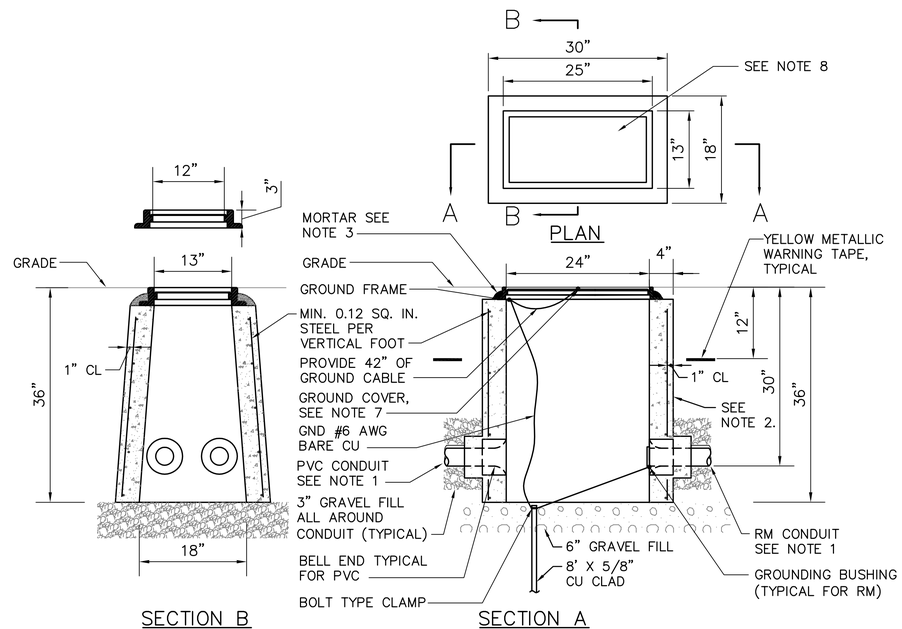
NOT TO SCALE



SIZE: MIDGET
TYPE: CURRENT LIMITING FUSE
VOLTAGE RATING: 277/480 VOLTS
USE: PROTECTION OF AREA LIGHTING EQUIPMENT

FUSES

NOT TO SCALE



HANDHOLE – 24" x 13" x 36"

NOT TO SCALE

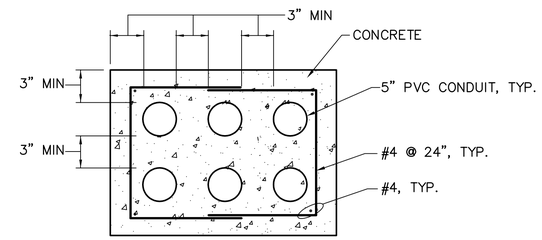
ELECTRIC HANDHOLE GENERAL NOTES:

1. ALL CONDUIT ENTERING PULLBOXES AND HANDHOLES SHALL EXTEND INTO THE PULLBOX/HANDHOLE CAVITY BY AT LEAST 2".
2. ALL PULLBOXES AND HANDHOLES SHALL BE PRECAST CONCRETE REINFORCED WITH STEEL, AND SHALL BE FREE OF CRACKS OR OTHER DEFECTS. CONCRETE FOR PRECAST CONCRETE PULLBOXES/HANDHOLES SHALL BE 5000 PSI, 3/8", 660 CEMENT CONCRETE MASONRY. REINFORCING BARS SHALL CONFORM TO AASHTO DESIGNATION M31 (ASTM DESIGNATION A 615) GRADE 60. AND SHALL BE EPOXY COATED.
3. CAST IRON FRAME SHALL BE MORTARED TO THE SURFACE OF THE PRECAST PULLBOX AND HANDHOLE.
4. ALL CONDUIT INSTALLED IN PULLBOXES AND HANDHOLES SHALL BE INSTALLED IN KNOCKOUTS PROVIDED IN THE BOX AND NO EXCESS KNOCKOUTS SHALL BE MADE. THE KNOCKOUTS ARE DESIGNED TO BE MADE PRIOR TO BACKFILLING AROUND THE PULLBOXES AND HANDHOLES. AFTER THE CONDUIT HAS BEEN INSTALLED IN THE PULLBOX/HANDHOLE, THE OPEN SPACE BETWEEN THE BOX AND THE CONDUIT WILL BE SEALED WITH CLASS B CEMENT CONCRETE MASONRY. ANY CONDUIT INSTALLED IN SUCH A MANNER AS TO BLOCK COMPLETE ACCESS TO ANY OTHER CONDUIT SHALL BE REMOVED AND RESET.
5. FOR THE EXACT NUMBER, SIZE, AND ORIENTATION OF THE CONDUITS ENTERING THE PULLBOX/HANDHOLE, SEE PLAN SHEETS.
6. CAST IRON PULLBOX/HANDHOLE COVERS AND FRAMES SHALL BE PRODUCED BY THE SAME MANUFACTURER AND IN ACCORDANCE WITH MASSACHUSETTS HIGHWAY DEPARTMENT SPECIFICATIONS.
7. METAL PULLBOX/HANDHOLE COVER AND FRAME ARE TO BE BONDED (GROUNDED). DRILL AND TAP FRAME FOR MECHANICAL GROUND LUG CONNECTION. INSTALL A POST TOP SERVIT GROUNDING CONNECTOR SUITABLE TO ACCOMMODATE ONE BARE #6 CONDUCTOR. EXTEND #6 GROUND CONDUCTOR THROUGH FRAME LUG TO BOND COVER. PROVIDE 42" OF SLACK FROM FRAME LUG TO BOND COVER. EXOTHERMICALLY WELD GROUND CONDUCTOR TO COVER.
8. FUNCTION DESIGNATION ON THE PULLBOX/HANDHOLE SHALL BE LABELED AS FOLLOWS PER NEC ARTICLE 314.30D:

   "LIGHTING" FOR LIGHTING CONDUIT
9. THE METHOD FOR GROUNDING ELECTRIC HANDHOLES SHOWN HEREIN, SHALL ALSO BE APPLIED AT EXISTING HANDHOLES.

PAVEMENT NOTES:

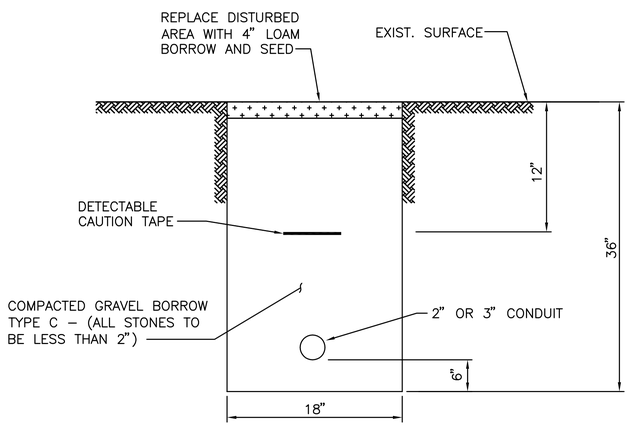
1. FOR TRENCH CUTS WITHIN PAVED SURFACES, (MAINLINE AND LOCAL ROADS) WHERE SUCH TRENCH CUTS HAVE A DEPTH OF 4' OR LESS, CONTROLLED DENSITY FILL (CDF) FOR BACKFILL IS MANDATORY. CONTROLLED DENSITY FILL TYPE 2E, (FLOWABLE–EXCAVATABLE)SHALL MEET THE REQUIREMENTS OF SECTION M4.08.0.



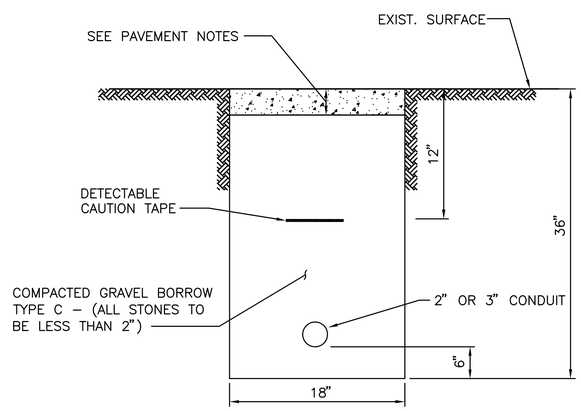
SIX–WAY DUCT

CONDUIT CONCRETE ENCASEMENT
NOT TO SCALE

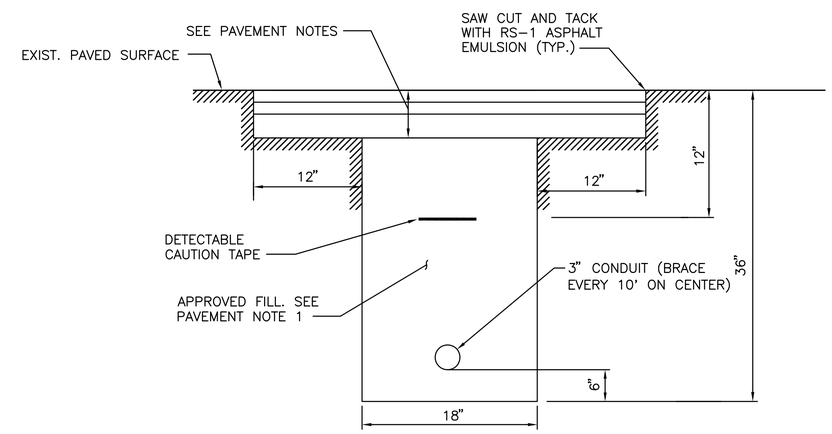
NOTES:
1. CONCRETE SHALL BE CLASS A CEMENT.
2. ALL DUCTS IN CONCRETE ENVELOPES TO BE 30" UNDER ALL PAVED SURFACES.
3. DIMENSIONS SHOWN FOR 6–WAY DUCT APPLY AS APPLICABLE TO OTHER SIZE DUCTS.



CONDUIT UNDER GRASSED AREAS



CONDUIT UNDER SIDEWALK



CONDUIT CROSSING ROADWAY

TYPICAL TRENCH DETAILS FOR CONDUIT
NOT TO SCALE

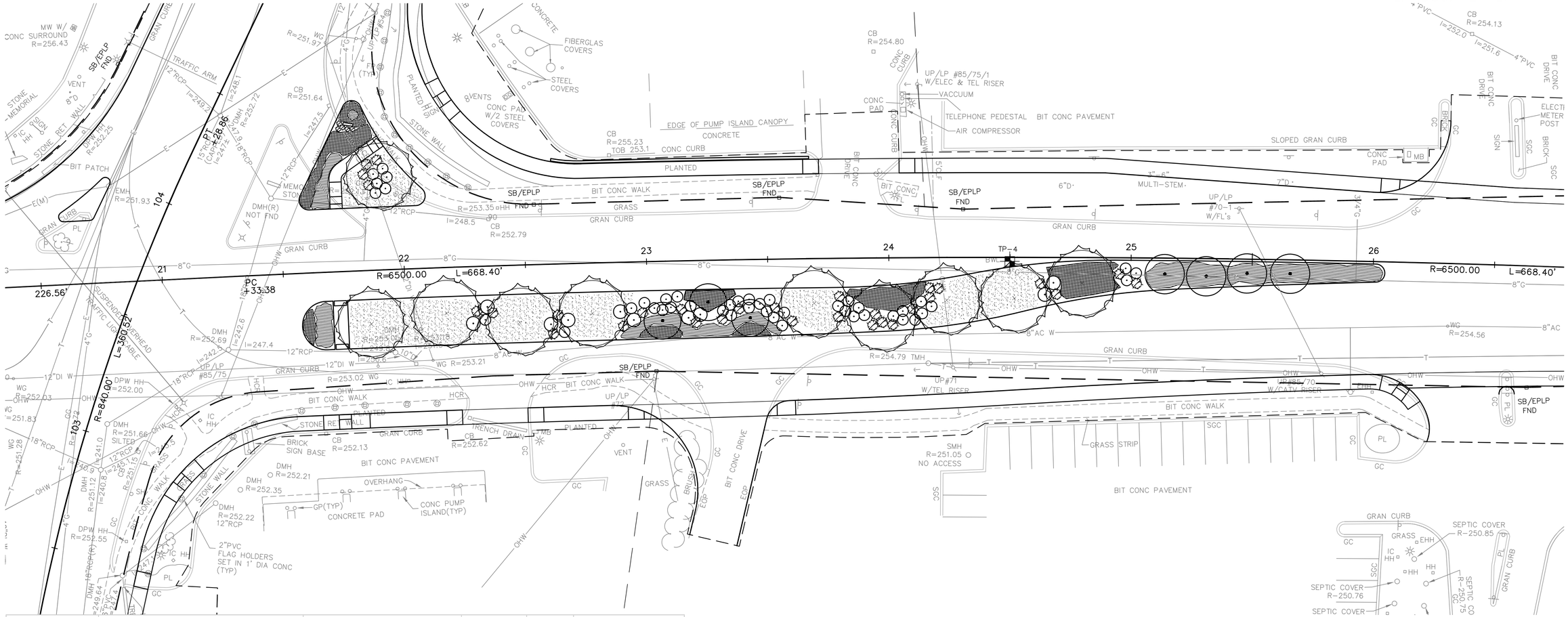
FS&T PROJECT NO.			
QW–023			
DES	DPH	CHK	JKH
DR	DPH	CHK	JKH
EST	DPH	CHK	JKH

ENGINEER IN CHARGE

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		32	38
PROJECT FILE NO. 604809			

LANDSCAPE PLAN



Tree Schedule

ABV	QTY	BOTANICAL NAME	COMMON NAME	SIZE	COND	REMARKS
					B&B=Balled and Burlap	
Street Trees						
GT		Gleditsia triancanthos ' Halka'	Halka Honey Locust	3.5"-4" Cal.	B&B	
PXA		Platanus x Acerfolia	London Planetree	3.5"-4" Cal.	B&B	
PCC		Pyrus calleryana 'Chanticleer'	Upright Callery Pear	3.5"-4" Cal.	B&B	
UP		Ulmus parvifolia 'Athena'	Athenea Lacebark Elm	3.5"-4" Cal.	B&B	
Ornamental Trees						
BN		Betula Nigra "Heritage'	Heritage River Birch	2.5"-3" Cal.	B&B	Multi-Stem
C		Carpinus Caroliniana	American Hornbeam	2.5"-3" Cal.	B&B	
HV		Hamamelis Virginiana	Witchhazel	5' - 6' Ht.	B&B	
PO		Prunus incisa 'Okame'	Okame Cherry	2"-2.5" Cal.	B&B	Multi-Stem

PLANTING NOTES:

PROPOSED SHURB PLANTING COULD CONTAIN THE FOLLOWING PLANTS: CRANBERRYBUSH VIBURNUM, INKBERRY HOLLY, LOW GROW SUMAC, SPICE BUSH, BAY BERRY, ROSA VIRGINIANA, CLETHERA, BLUE CHIP JUNIPER, AND LOW-BUSH BLUE BERRY.

PROPOSED PERENNIAL PLANTING AND GROUND COVER COULD CONTAIN THE FOLLOWING PLANTS: DAFFODILS, DAY LILYS, BLANKET FLOWER, LAVENDER, COMMON THYME, AND SPREADING LIRIOPE.

STREET TREE

GROUND COVER/ PERENNIALS

ORNAMENTAL TREE

LAWN

DECIDUOUS SHRUB

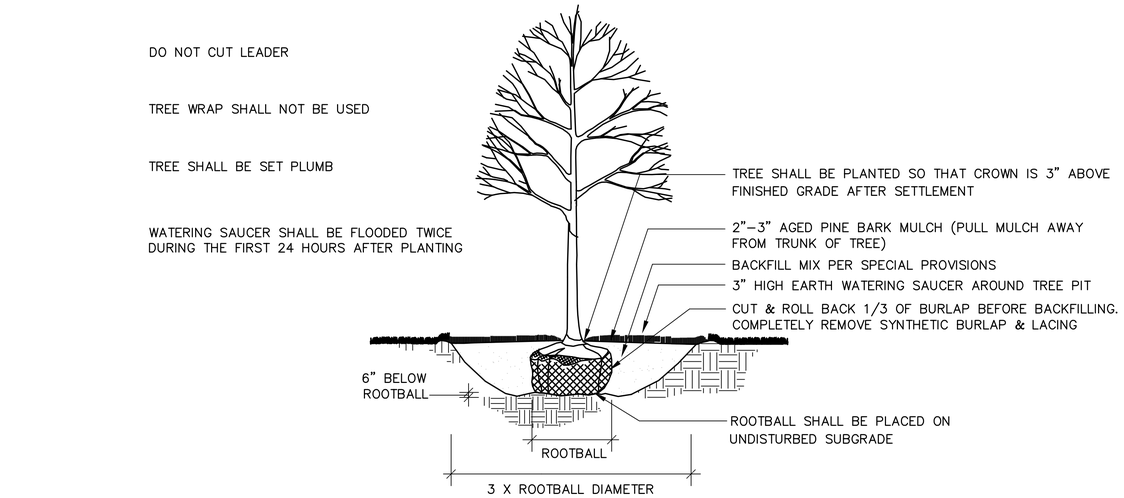
EVERGREEN SHURB

FS&T PROJECT NO.			
QW-023			
DES	JSL	CHK	CMS
DR	JSL	CHK	CMS
EST	JSL	CHK	CMS
ENGINEER IN CHARGE			

WESTFORD
LITTLETON ROAD RECONSTRUCTION

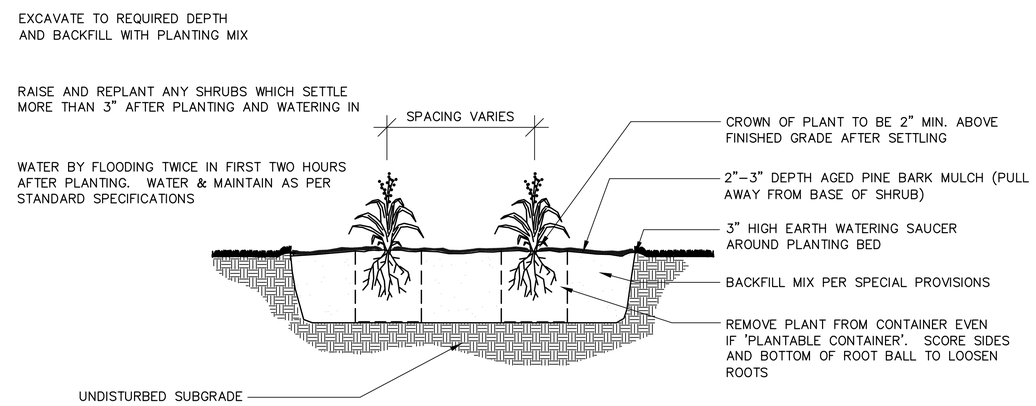
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		33	38
PROJECT FILE NO. 604809			

LANDSCAPE DETAILS



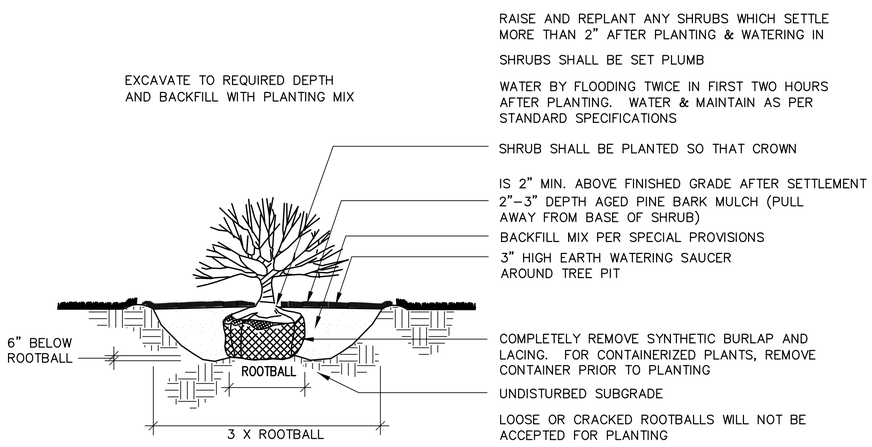
DECIDUOUS TREE PLANTING

NOT TO SCALE



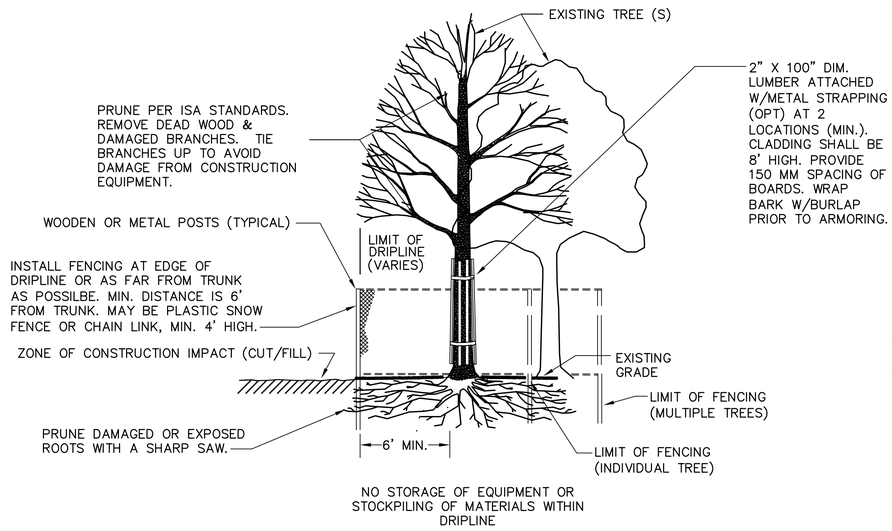
PERENNIAL PLANTING

NOT TO SCALE



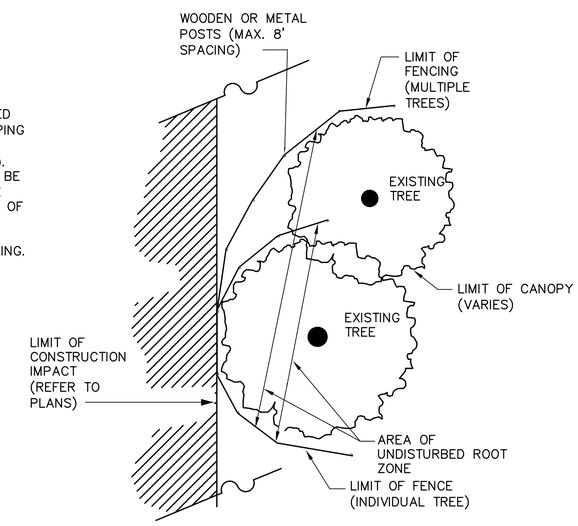
SHRUB PLANTING

NOT TO SCALE



TREE PROTECTION–EXISTING TREE(S)

NOT TO SCALE



PLAN VIEW

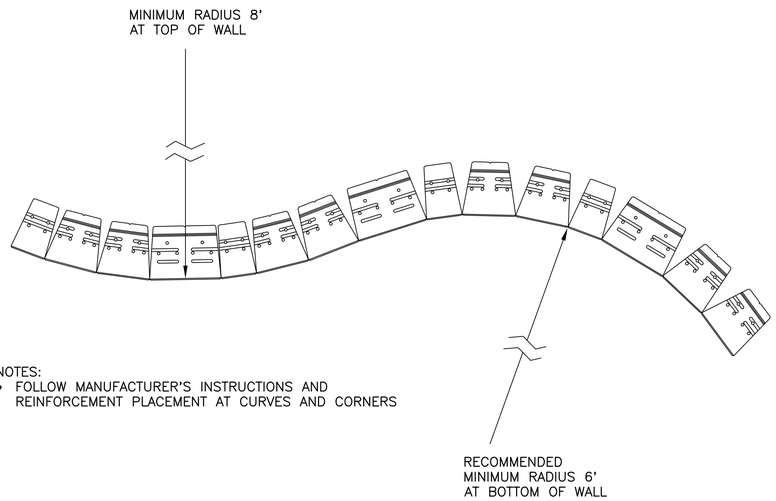
FS&T PROJECT NO.			
QW–023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

WESTFORD
LITTLETON ROAD RECONSTRUCTION

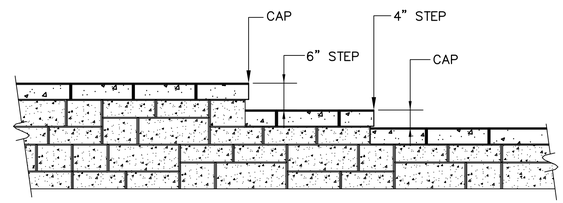
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		34	38
PROJECT FILE NO. 604809			

CONSTRUCTION DETAILS

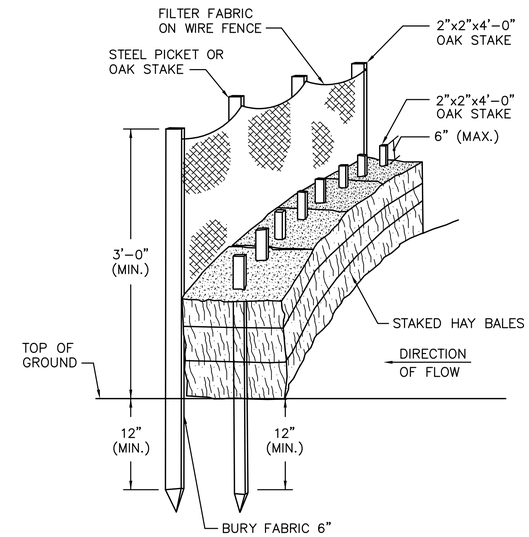


NOTES:
- FOLLOW MANUFACTURER'S INSTRUCTIONS AND REINFORCEMENT PLACEMENT AT CURVES AND CORNERS

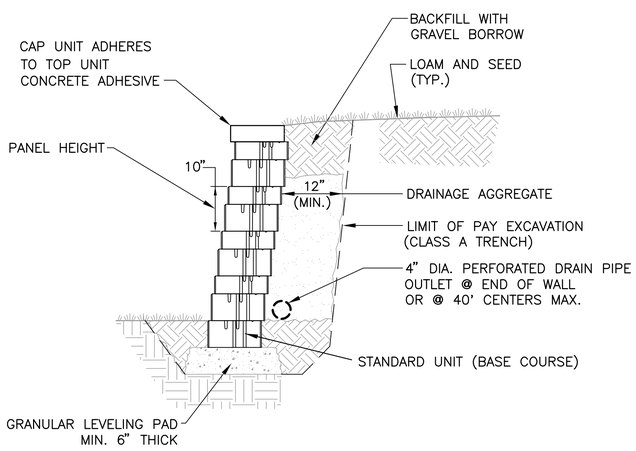
CURVE DETAIL–PLAN
NOT TO SCALE



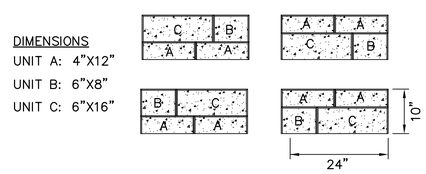
CAPPING DETAIL–PROFILE
STEP AT TOP OF WALL
NOT TO SCALE



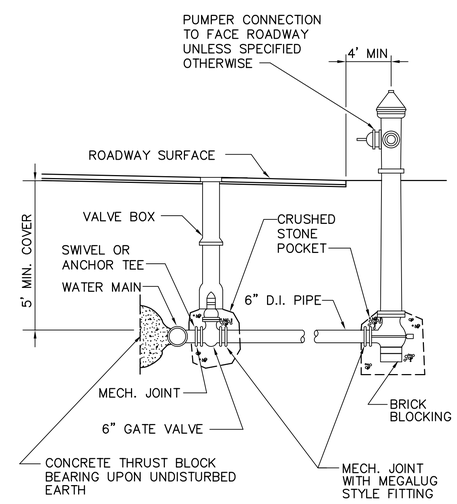
HAY BALE AND SILT FENCE
NOT TO SCALE



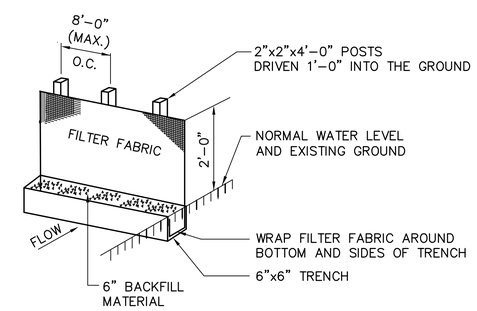
TYPICAL SECTION
NOT TO SCALE



PANEL CONFIGURATIONS
NOT TO SCALE



FIRE HYDRANT CONNECTION
NOT TO SCALE



EROSION CONTROL FENCING DETAIL
NOT TO SCALE

UNREINFORCED MODULAR BLOCK RETAINING WALL

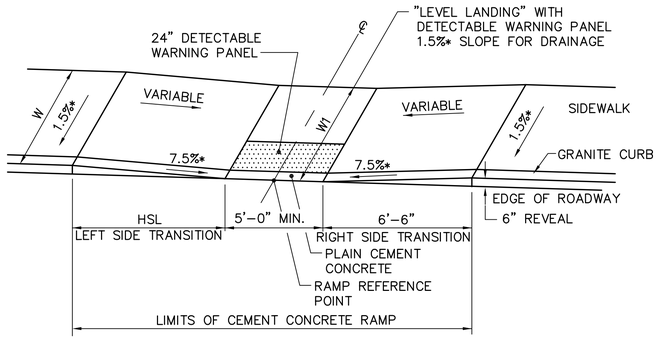
FS&T PROJECT NO.			
QW–023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

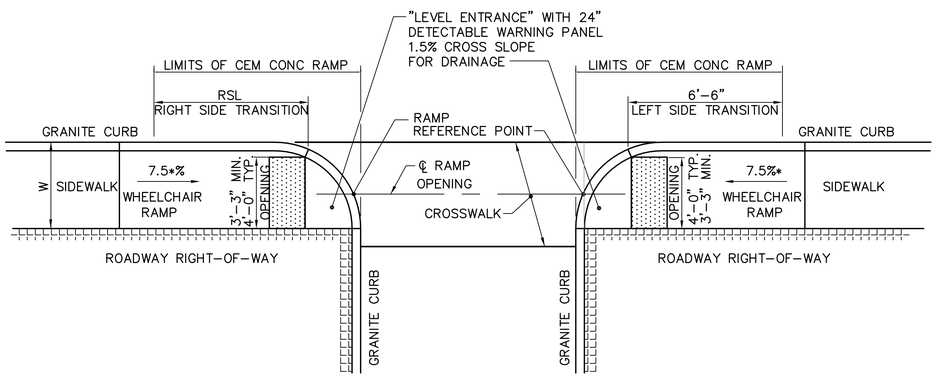
WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		35	38
PROJECT FILE NO. 604809			

WHEELCHAIR RAMP AND DRIVEWAY DETAILS



WHEELCHAIR RAMP – TYPE A
NOT TO SCALE



WHEELCHAIR RAMP – TYPE B
NOT TO SCALE

WHEELCHAIR RAMPS

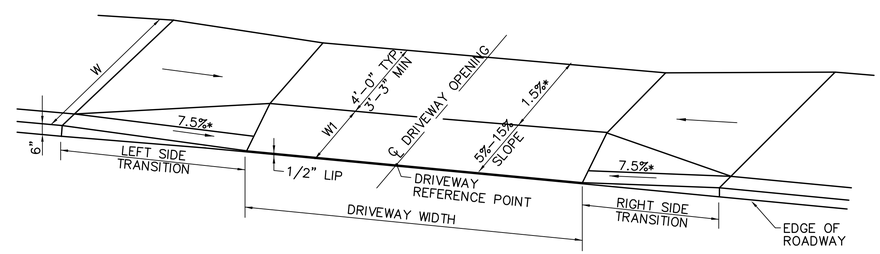
WCR #	TYPE	RAMP REFERENCE POINT			LENGTH OF PRIMARY RAMP (W1)	WIDTH OF SIDEWALK (W)	WIDTH OF RAMP	DEPTH OF LEVEL LANDING	ROADWAY GUTTER SLOPE	TRANSITION LENGTH	
		BASELINE	STATION	OFFSET						LEFT SIDE	RIGHT SIDE
1	A OR B	LITTLETON	00+00.00	00.00' RT	0.00'	0.00'	0.00'	0.00'	0.00%	0.00'	0.00'
2	A OR B	LITTLETON	00+00.00	00.00' RT	0.00'	0.00'	0.00'	0.00'	0.00%	0.00'	0.00'
3	A OR B	LITTLETON	00+00.00	00.00' RT	0.00'	0.00'	0.00'	0.00'	0.00%	0.00'	0.00'
4	A OR B	LITTLETON	00+00.00	00.00' RT	0.00'	0.00'	0.00'	0.00'	0.00%	0.00'	0.00'
5	A OR B	LITTLETON	00+00.00	00.00' RT	0.00'	0.00'	0.00'	0.00'	0.00%	0.00'	0.00'

NOTES:

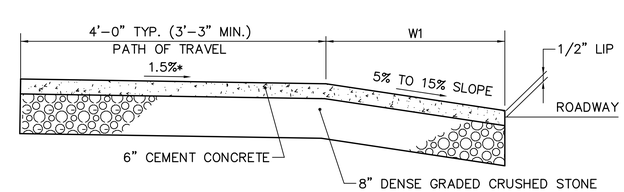
1. WHEELCHAIR RAMPS AND DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH MHD STANDARD DRAWINGS NUMBERED 107.1.0, 107.2.0, 107.2.1R, 107.6.0, 107.6.4, 107.6.5R, 107.8.0 AND 107.9.0.

2. DETECTABLE WARNING PANELS ARE REQUIRED ON ALL PROPOSED WHEELCHAIR RAMPS AND ARE TO BE INSTALLED IN ACCORDANCE WITH CONSTRUCTION STANDARD M/E 107.6.5R (DECEMBER 2004).

* TOLERANCE FOR CONSTRUCTION ±0.5% (TYP.)



CONCRETE SIDEWALK AT DRIVEWAY DETAIL
NOT TO SCALE



CONCRETE DRIVEWAY SECTION
NOT TO SCALE

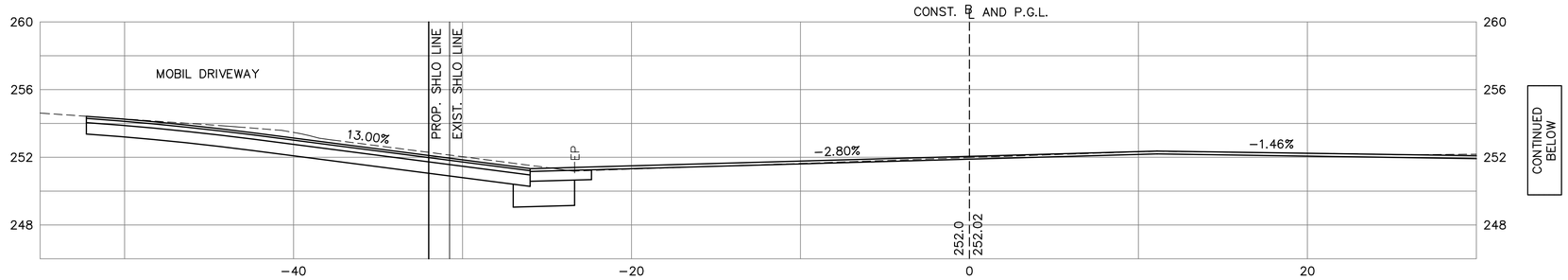
FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JPR	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

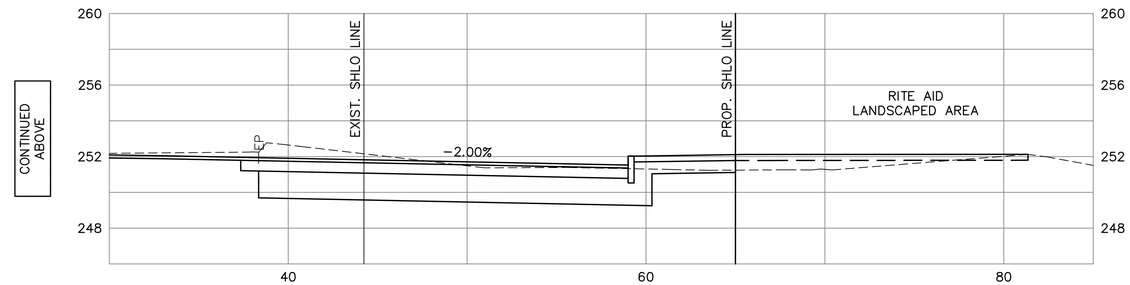
WESTFORD
LITTLETON ROAD RECONSTRUCTION

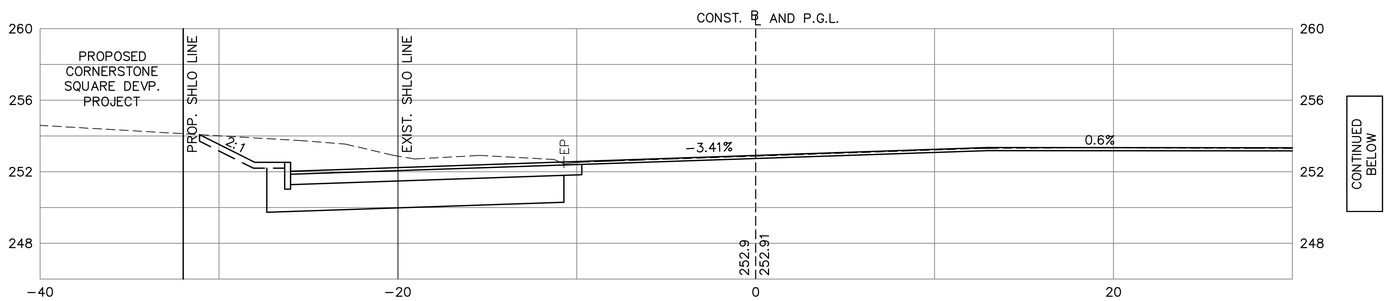
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		36	38
PROJECT FILE NO. 604809			

CRITICAL CROSS SECTIONS PART 1 OF 3



19+32





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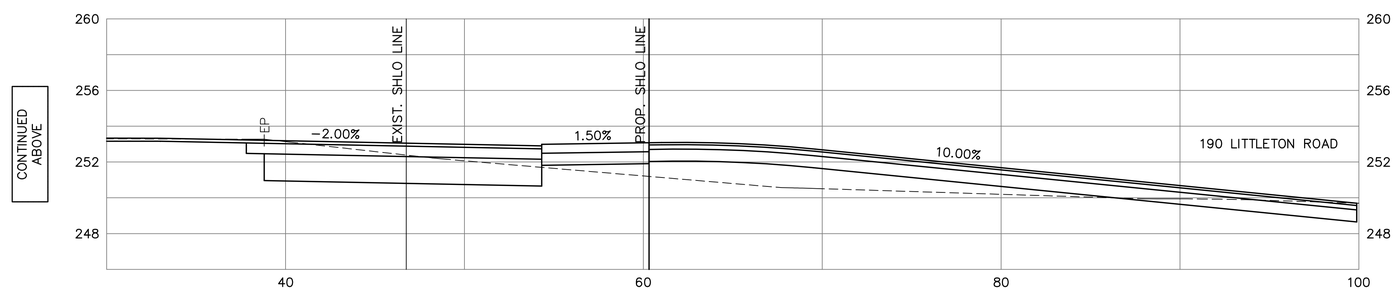


HOR. SCALE IN FEET
0 4 10 20

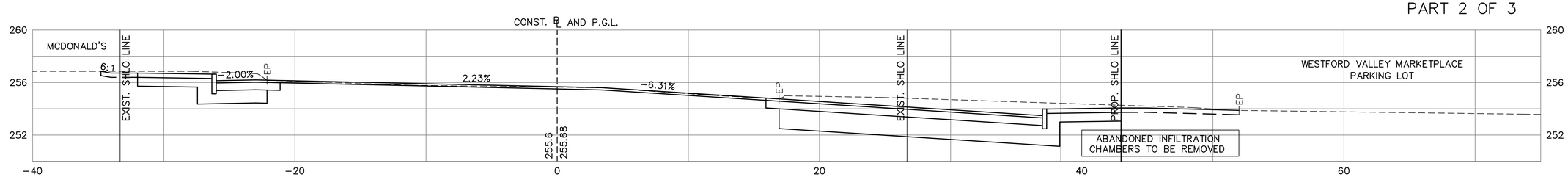
FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		37	38
PROJECT FILE NO. 604809			

CRITICAL CROSS SECTIONS PART 2 OF 3



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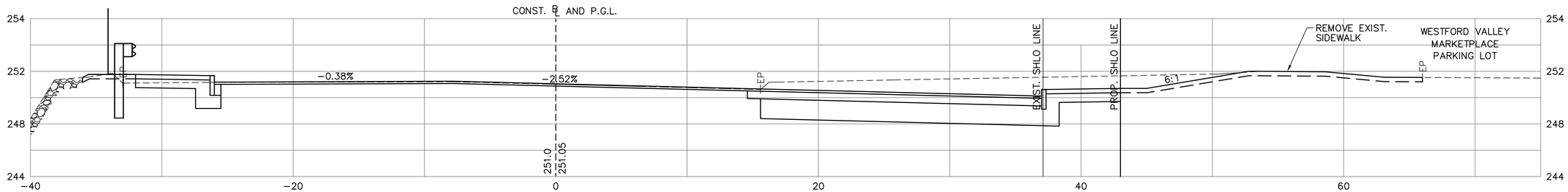
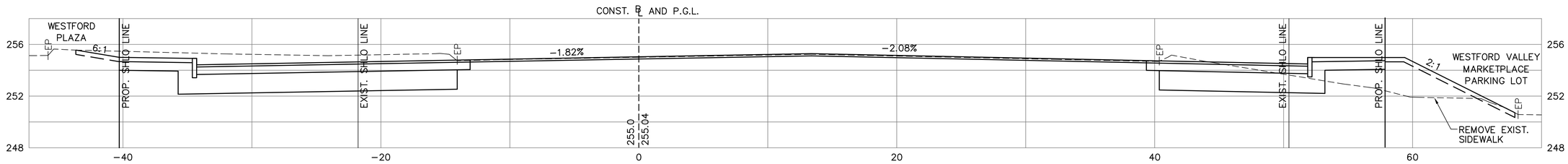
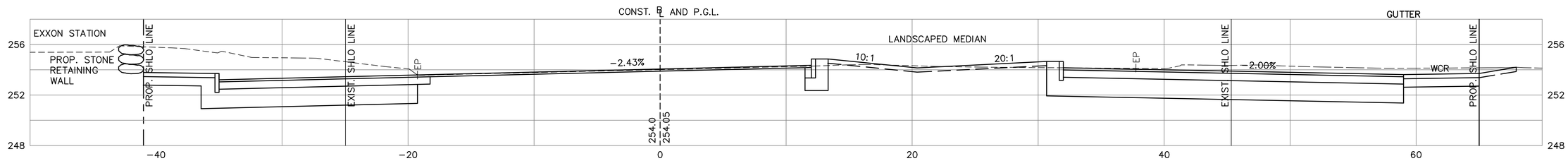


32+00



25+00



23+00

HOR. SCALE IN FEET
0 4 10 20

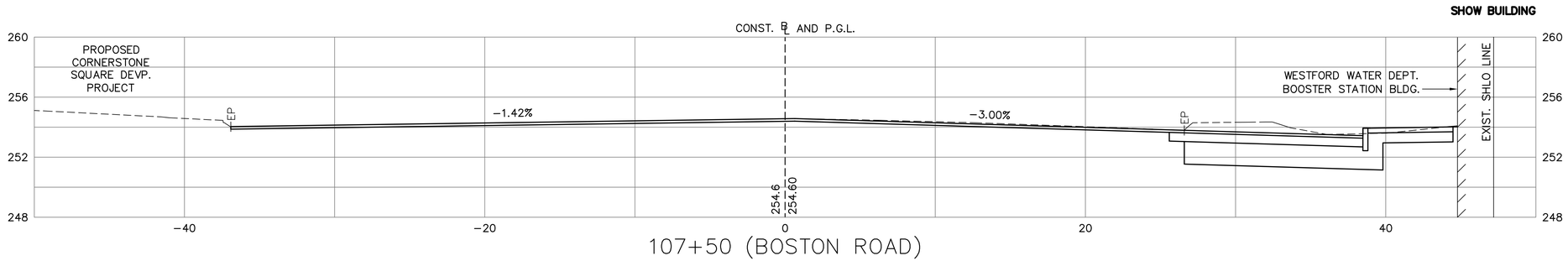
FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE

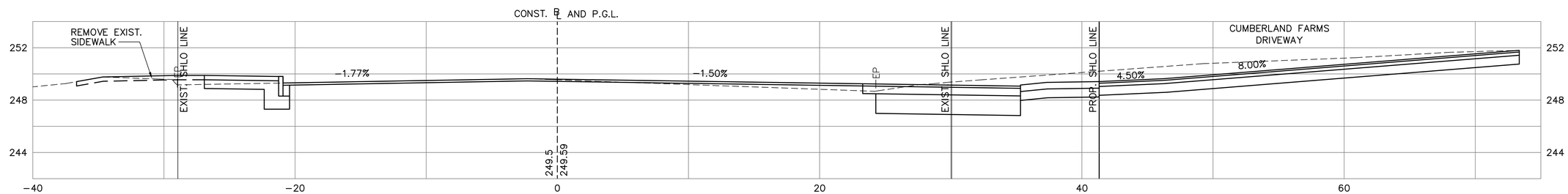
WESTFORD
LITTLETON ROAD RECONSTRUCTION

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.		38	38
PROJECT FILE NO. 604809			

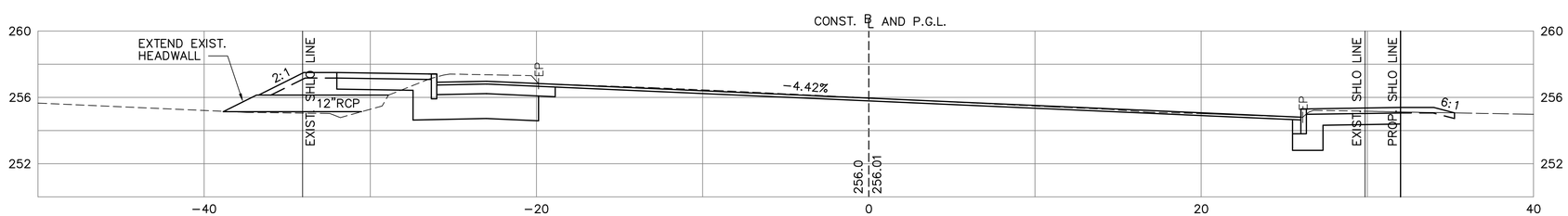
CRITICAL CROSS SECTIONS PART 3 OF 3



107+50 (BOSTON ROAD)



102+26 (CARLISLE ROAD)



40+50

HOR. SCALE IN FEET
0 4 10 20

FS&T PROJECT NO.			
QW-023			
DES	JAS	CHK	JKH
DR	JAS	CHK	JKH
EST	JAS	CHK	JKH

ENGINEER IN CHARGE