MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

PLAN AND PROFILE OF

KELLEY'S CORNER

IN THE TOWN OF

ACTON

MIDDLESEX COUNTY

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	1	145
PROJECT FILE NO.	608229		

TITLE SHEET & INDEX

16093_HD(CS).DWG Plotted on 25-Jan-2018 10:57 AM

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED JULY 1, 2015, THE OCTOBER 2017 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS, 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, WILL GOVERN.

25% DESIGN SUBMISSION

INDEX

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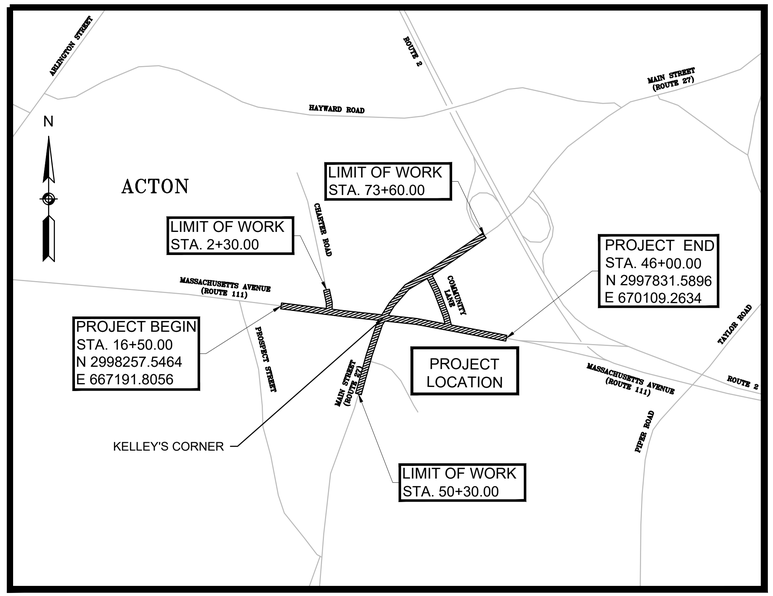

0 800 1600 2400 3200

SCALE: 1" = 800'

LENGTH OF PROJECT = 6,126 FEET = 1.160 MILES

DESIGN DESIGNATION	MASSASHUSETTS AVENUE (ROUTE111)	MAIN STREET (ROUTE 27)	COMMUNITY LANE
DESIGN SPEED	35 MPH	35 MPH	25 MPH
ADT (2016)	13,100	19,500	4,050
ADT (2018)	13,250	19,700	4,100
ADT (2038)	14,600	21,750	4,550
K	8.4%	7.8%	8.1%
D	53% EB	59% NB	55% NWB
T (PEAK HOUR)	2.0%	3.0%	1.0%
T (AVERAGE DAY)	3.0%	5.0%	1.0%
DHV	1,230	1,700	360
DDHV	650	1,000	200
FUNCTIONAL CLASSIFICATION	URBAN MINOR ARTERIAL	PRINCIPAL ARTERIAL	LOCAL ROAD

JANUARY 2018

GPI Greenman-Pedersen, Inc.
Engineering & Construction Services
181 Ballardvale Street, Suite 202, Wilmington, MA 01887
Tel: (978) 570-2999 Fax: (978) 658-3044
http://www.gpinet.com

DATE	DESCRIPTION	REV #

massDOT
Massachusetts Department of Transportation
Highway Division

RECOMMENDED FOR APPROVAL

CHIEF ENGINEER DATE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

APPROVED

HIGHWAY ADMINISTRATOR DATE

GENERAL SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
JB	JB	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
		CABLE MANHOLE
		DRAINAGE MANHOLE
		ELECTRIC MANHOLE
		GAS MANHOLE
		MISC MANHOLE
		SEWER MANHOLE
		TELEPHONE MANHOLE
		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
PM	PM	PARKING METER
		OVERHEAD CABLE/WIRE
		CURBING
99		CONTOURS (ON-THE-GROUND SURVEY DATA)
100 99		CONTOURS (PHOTOGRAMMETRIC DATA)
		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)
		BALANCED STONE WALL
		GUARD RAIL - STEEL POSTS
		GUARD RAIL - WOOD POSTS
x	x	CHAIN LINK OR METAL FENCE
		WOOD FENCE
		HAY BALES/SILT FENCE/COMPOST FILTER TUBES
		TREE LINE
		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
E		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

PAVEMENT MARKINGS SYMBOLS

EXISTING	PROPOSED	DESCRIPTION
		PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
	SL	STOP LINE (12" WHITE)
	CW	CROSSWALK (12" OR 24")
	SWL	SOLID WHITE LINE (6" OR 12")
	SYL	SOLID YELLOW LINE (6" OR 12")
	BWL *	BROKEN WHITE LINE (6")
	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")
	DBWL *	DOUBLE WHITE LINE (6")
	DBYL *	DOUBLE YELLOW LINE (6")

* BROKEN WHITE/YELLOW LINES TO BE 10' IN LENGTH WITH 30' GAP (TYP.)
** DOTTED WHITE/YELLOW LINES TO BE 2' IN LENGTH WITH 6' GAP (TYP.)
(NOTE: DWL SHOWN WITH GREEN PAVEMENT AT BICYCLE CROSSING TO BE 6" WIDE WITH 2' IN LENGTH AND 6' GAP)

GENERAL NOTES

1. TOPOGRAPHICAL INFORMATION WAS PROVIDED BY NITSCH ENGINEERING INC., SEPTEMBER 2016, (508-365-1030). VERTICAL DATUM IS BASED ON NGVD 1988. HORIZONTAL DATUM IS BASED ON MA MAINLAND NAD83.
2. THE LOCATIONS AND SIZES OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO LOCATE EXACTLY AND TO PRESERVE ANY AND ALL UNDERGROUND UTILITIES. CALL "DIG-SAFE" 1-888-DIGSAFE (344-7233) AT LEAST 72 HOURS BEFORE COMMENCING CONSTRUCTION.
3. WHERE AN EXISTING UNDERGROUND 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 MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES.
5. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
6. THE TERM "PROPOSED" (PROP.) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS, OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE & RESET" (R&R).
7. ALL EXISTING SIGNS WITHIN THE PROJECT LIMITS SHALL BE RETAINED UNLESS NOTED OTHERWISE.
8. ALL PROPOSED PAVEMENT MARKINGS SHALL BE THERMOPLASTIC.
9. ALL EXISTING STATE, COUNTY, CITY AND TOWN LOCATION LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND THEIR EXACT LOCATIONS ARE NOT GUARANTEED.
10. ALL TRANSVERSE JOINTS, AND ALL LONGITUDINAL JOINTS BETWEEN NEW SURFACE PAVEMENT AND EXISTING SURFACE PAVEMENT TO REMAIN SHALL BE COATED WITH A HOT POURED RUBBERIZED ASPHALT SEALER (ITEM 464.5).
11. ALL DISTURBED AREAS NOT DESIGNATED TO BE PAVED SHALL HAVE LOAM BORROW PLACED AND SEEDED. THE LOAM BORROW SHALL HAVE A MINIMUM DEPTH OF 4 INCHES AND SHALL BE PLACED FLUSH WITH THE TOP OF THE ADJACENT CURB, EDGING, BERM OR PAVEMENT SURFACE.
12. THE LIMIT OF WORK AREA SHALL BE THE STREET RIGHT OF WAY UNLESS SHOWN OTHERWISE.
13. PRIOR TO THE START OF ANY NEW UTILITY WORK, ALL ELEVATIONS OF EXISTING UTILITIES IN THOSE AREAS ARE TO BE VERIFIED. THE ENGINEER IS TO BE NOTIFIED IMMEDIATELY SHOULD ANY DISCREPANCIES OCCUR.
14. ALL CASTINGS SHALL BE SET FLUSH WITH FINISHED GRADE.
15. ALL PUBLICLY OWNED GATE BOXES, SERVICE BOXES, MANHOLE FRAMES AND COVERS SHALL BE ADJUSTED TO GRADE BY THE CONTRACTOR.
16. ALL NEW SIDEWALKS AND DRIVEWAY GRADES SHALL MATCH EXISTING GRADES AT BACK OF SIDEWALK LINE UNLESS SHOWN OTHERWISE ON THE PLANS AND CROSS-SECTIONS.
17. THE CONTRACTOR SHALL TAKE EVERY PRECAUTION TO PROTECT ALL EXISTING TREES AND ROOTS THAT ARE NOT DESIGNATED FOR REMOVAL.
18. CONTRACTOR TO CONTACT ENGINEER PRIOR TO INSTALLATION OF BOUNDS FOR FINAL LOCATIONS.
19. DRAINAGE ELEVATIONS ARE PROVIDED FOR DESIGN PURPOSES ONLY. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED DRAINAGE DESIGN. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER. ONLY AFTER THE CONTRACTOR VERIFIES ELEVATIONS FOR THE CONSTRUCTABILITY OF THE DRAINAGE SYSTEM SHALL ANY STRUCTURES BE ORDERED. ANY FIELD ADJUSTMENTS TO LINE & GRADE UP TO A DEPTH OF 5' SHALL BE INCLUDED IN THE COST OF THE PIPE. PIPE EXCAVATION GREATER THAN 5' WILL BE PAID UNDER CLASS B TRENCH EXCAVATION.

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	2	145
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LEGEND & ABBREVIATIONS

GENERAL ABBREVIATIONS

AADT	ANNUAL AVERAGE DAILY TRAFFIC	EXC	EXCAVATION	PVCC	POINT OF VERTICAL COMPOUND CURVATURE
ABAN	ABANDON	F&C	FRAME AND COVER	PVI	POINT OF VERTICAL INTERSECTION
ADJ	ADJUST	F&G	FRAME AND GRATE	PVRC	POINT OF VERTICAL REVERSE CURVATURE
APPROX.	APPROXIMATE	FDN.	FOUNDATION	PVT	POINT OF VERTICAL TANGENCY
A.C.	ASPHALT CONCRETE	FLDSTN	FIELDSTONE	PVMT	PAVEMENT
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE	GAR	GARAGE	PWW	PAVED WATER WAY
BIT.	BITUMINOUS	GD	GROUND	R	RADIUS OF CURVATURE
BC	BOTTOM OF CURB	GG	GAS GATE	R&D	REMOVE AND DISPOSE
BD.	BOUND	GI	GUTTER INLET	RCP	REINFORCED CONCRETE PIPE
BL	BASELINE	GIP	GALVANIZED IRON PIPE	RD	ROAD
BLDG	BUILDING	GRAN	GRANITE	RDWY	ROADWAY
BM	BENCHMARK	GRAV	GRAVEL	REM	REMOVE
BO	BY OTHERS	GRD	GUARD	RET	RETAIN
BOS	BOTTOM OF SLOPE	HDW	HEADWALL	RET WALL	RETAINING WALL
BR.	BRIDGE	HMA	HOT MIX ASPHALT	ROW	RIGHT OF WAY
CB	CATCH BASIN	HOR	HORIZONTAL	RR	RAILROAD
CBCI	CATCH BASIN WITH CURB INLET	HYD	HYDRANT	R&R	REMOVE AND RESET
CC	CEMENT CONCRETE	INV	INVERT	R&S	REMOVE AND STACK
CCM	CEMENT CONCRETE MASONRY	JCT	JUNCTION	RT	RIGHT
CEM	CEMENT	L	LENGTH OF CURVE	SB	STONE BOUND
CI	CURB INLET	LB	LEACH BASIN	SHLD	SHOULDER
CIP	CAST IRON PIPE	LP	LIGHT POLE	SMH	SEWER MANHOLE
CIT	CHANGE IN TYPE	LT	LEFT	ST	STREET
CLF	CHAIN LINK FENCE	MAX	MAXIMUM	STA	STATION
CL	CENTERLINE	MB	MAILBOX	SSD	STOPPING SIGHT DISTANCE
CMP	CORRUGATED METAL PIPE	MH	MANHOLE	SHLO	STATE HIGHWAY LAYOUT LINE
CSP	CORRUGATED STEEL PIPE	MHB	MASSACHUSETTS HIGHWAY BOUND	SW	SIDEWALK
CO.	COUNTY	MIN	MINIMUM	T	TANGENT DISTANCE OF CURVE/TRUCK %
CONC	CONCRETE	NIC	NOT IN CONTRACT	TAN	TANGENT
CONT	CONTINUOUS	NO.	NUMBER	TEMP	TEMPORARY
CONST	CONSTRUCTION	PC	POINT OF CURVATURE	TC	TOP OF CURB
CR GR	CROWN GRADE	PCC	POINT OF COMPOUND CURVATURE	TOS	TOP OF SLOPE
DHV	DESIGN HOURLY VOLUME	P.G.L.	PROFILE GRADE LINE	TYP	TYPICAL
DI	DROP INLET	PI	POINT OF INTERSECTION	UP	UTILITY POLE
DIA	DIAMETER	POC	POINT ON CURVE	VAR	VARIES
DIP	DUCTILE IRON PIPE	POT	POINT ON TANGENT	VERT	VERTICAL
DW	STEADY DON'T WALK - PORTLAND ORANGE	PRC	POINT OF REVERSE CURVATURE	VC	VERTICAL CURVE
DWY	DRIVEWAY	PROJ	PROJECT	WCR	WHEEL CHAIR RAMP
ELEV (or EL.)	ELEVATION	PROP	PROPOSED	WG	WATER GATE
EMB	EMBANKMENT	PSB	PLANTABLE SOIL BORROW	WIP	WROUGHT IRON PIPE
EOP	EDGE OF PAVEMENT	PT	POINT OF TANGENCY	WM	WATER METER/WATER MAIN
EXIST (or EX)	EXISTING	PVC	POINT OF VERTICAL CURVATURE	X-SECT	CROSS SECTION

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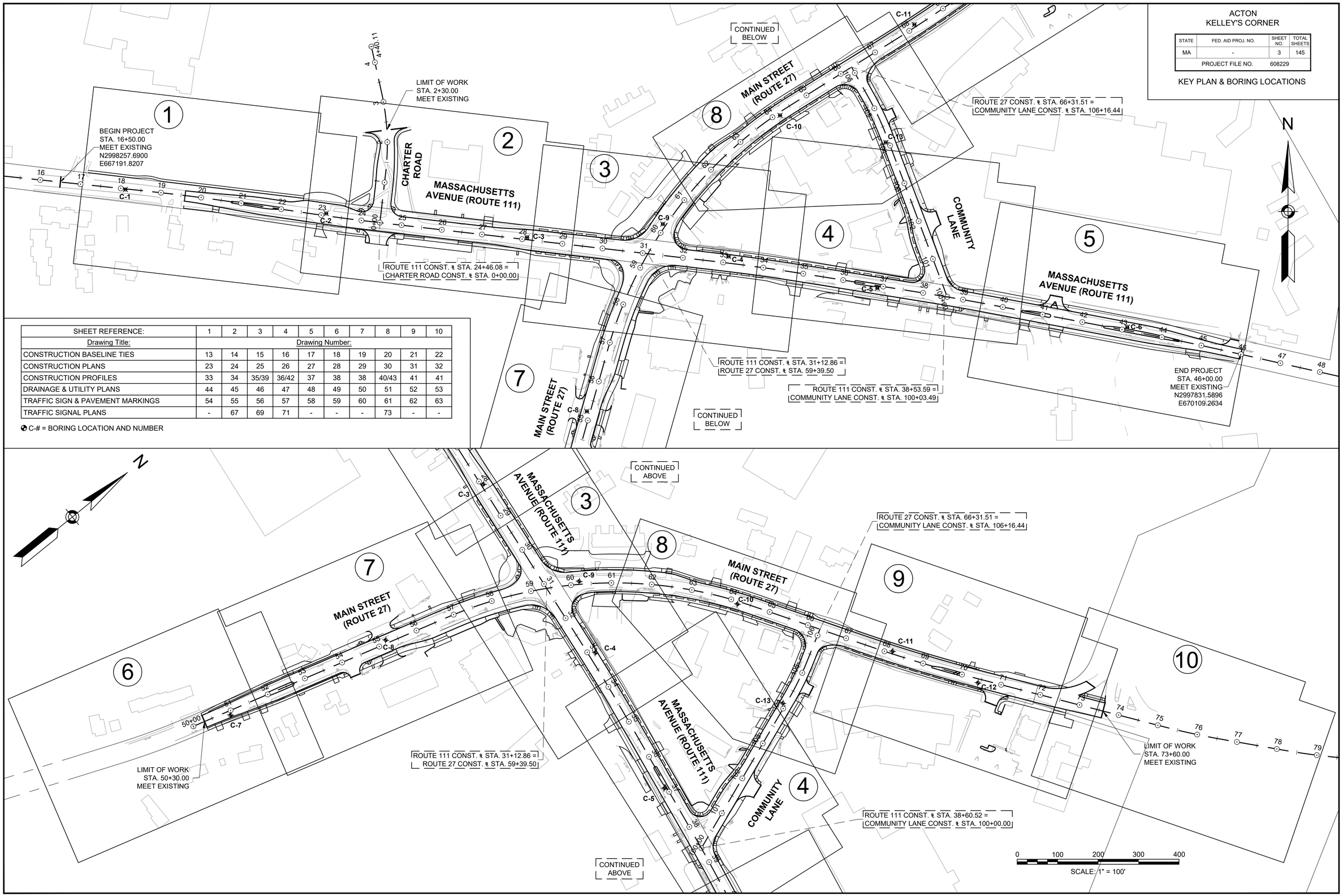
ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	3	145
PROJECT FILE NO.	608229		

KEY PLAN & BORING LOCATIONS



SHEET REFERENCE:	1	2	3	4	5	6	7	8	9	10
Drawing Title:	Drawing Number:									
CONSTRUCTION BASELINE TIES	13	14	15	16	17	18	19	20	21	22
CONSTRUCTION PLANS	23	24	25	26	27	28	29	30	31	32
CONSTRUCTION PROFILES	33	34	35/39	36/42	37	38	38	40/43	41	41
DRAINAGE & UTILITY PLANS	44	45	46	47	48	49	50	51	52	53
TRAFFIC SIGN & PAVEMENT MARKINGS	54	55	56	57	58	59	60	61	62	63
TRAFFIC SIGNAL PLANS	-	67	69	71	-	-	-	73	-	-

C-# = BORING LOCATION AND NUMBER

Plotted on 25-Jan-2018 10:57 AM
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BORING LOG

Boring C-1
Page 1 of 1

Project: **Proposed Kelly's Corner Infrastructure Improvements, Acton, MA**
Client: **Greenman-Pederson, Inc.** LGCI Project No.: 1637

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	12/8/2017
Drilling Foreman:	Tim Tucker	Date Completed:	12/8/2017
LGCI Engineer:	Andrew Jefferson	Location:	Route 111 (southern edge of roadway)
Ground Surface El:	N/A	Total Depth:	10.1"
Groundwater Depth:	N/E	Drill Rig Type:	Mobile Drill B-59 Truck Rig
		Drilling Method:	5" casing ID (drive and wash)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
									1	Asphalt	Cored 10.1" of asphalt Recovered 8.1" of asphalt About 2" of crushed stone at bottom of core hole
5ft											Bottom of boring at 10.1". Restored the ground surface with heated DOT-grade asphalt patch.
10ft											
15ft											
20ft											

Remarks:
1. Sample not obtained below asphalt because utilities were not cleared at the time of coring.

LGCI
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BORING LOG

Boring C-2
Page 1 of 1

Project: **Proposed Kelly's Corner Infrastructure Improvements, Acton, MA**
Client: **Greenman-Pederson, Inc.** LGCI Project No.: 1637

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	12/8/2017
Drilling Foreman:	Tim Tucker	Date Completed:	12/8/2017
LGCI Engineer:	Andrew Jefferson	Location:	Route 111 (northern edge of roadway)
Ground Surface El:	N/A	Total Depth:	5.4 feet
Groundwater Depth:	N/E	Drill Rig Type:	Mobile Drill B-59 Truck Rig
		Drilling Method:	5" casing ID (drive and wash)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
										Asphalt	Cored 14" of asphalt Recovered 13.7" of asphalt
	1.4-3.4	S1	11	12	8	6	24	11	1	Fill ~2.0'	S1 - Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, light brown, moist
	3.4-5.4	S2	5	4	7	10	24	2	2	Sand ~5.4'	S2 - Silty SAND (SM), fine to coarse, 15-20% fines, 30-35% fine gravel, light brown, wet
5ft											Bottom of boring at 5.4 feet. Backfilled borehole with sand and restored the ground surface with heated DOT-grade asphalt patch.
10ft											
15ft											
20ft											

Remarks:
1. About 3" of 1-1/2" crushed stone immediately under asphalt.
2. Transition from subbase/fill layer to subgrade estimated based on recovery in sample S1.

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BORING LOG

Boring C-3
Page 1 of 1

Project: **Proposed Kelly's Corner Infrastructure Improvements, Acton, MA**
Client: **Greenman-Pederson, Inc.** LGCI Project No.: 1637

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	12/8/2017
Drilling Foreman:	Tim Tucker	Date Completed:	12/8/2017
LGCI Engineer:	Andrew Jefferson	Location:	Route 111 (southern edge of roadway)
Ground Surface El:	N/A	Total Depth:	4.9 feet
Groundwater Depth:	N/E	Drill Rig Type:	Mobile Drill B-59 Truck Rig
		Drilling Method:	5" casing ID (drive and wash)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
										Asphalt	Cored 10" of asphalt Recovered 9.1" of asphalt
	0.9-2.9	S1	17	14	12	14	24	14	1	Fill ~2'	S1 - Well Graded SAND with Silt (SW-SM), fine to coarse, 5-10% fines, gray, moist
	2.9-4.9	S2	13	9	11	14	24	12		Sand ~4.9'	S2 - Silty SAND (SM), fine to medium, trace coarse, 15-20% fines, gray, wet
5ft											Bottom of boring at 4.9 feet. Backfilled borehole with sand and restored the ground surface with heated DOT-grade asphalt patch.
10ft											
15ft											
20ft											

Remarks:
1. Transition from subbase/fill layer to subgrade estimated based on recovery in sample S1.

ACTON
KELLEY'S CORNER

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MA	-	4	145
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BORING LOGS

LGCI
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BORING LOG

Boring C-4
Page 1 of 1

Project: **Proposed Kelly's Corner Infrastructure Improvements, Acton, MA**
Client: **Greenman-Pederson, Inc.** LGCI Project No.: 1637

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	12/8/2017
Drilling Foreman:	Tim Tucker	Date Completed:	12/8/2017
LGCI Engineer:	Andrew Jefferson	Location:	Route 111 (east of Rt. 27 intersection)
Ground Surface El:	N/A	Total Depth:	7"
Groundwater Depth:	N/E	Drill Rig Type:	Mobile Drill B-59 Truck Rig
		Drilling Method:	5" casing ID (drive and wash)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
									1	Asphalt	Cored 7" of asphalt
									2		Recovered 4.3" of asphalt
											Bottom of boring at 7". Restored the ground surface with heated DOT-grade asphalt patch.
5ft											
10ft											
15ft											
20ft											

Remarks:
1. Bottom of pavement core possibly broken by coring machine (see photograph).
2. SPT Sample not obtained below asphalt because utilities were not cleared at the time of coring. Obtained small grab sample by hand: Well Graded GRAVEL (GW), fine to coarse, angular, traces of asphalt, black, wet.

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BORING LOG

Boring C-5
Page 1 of 1

Project: **Proposed Kelly's Corner Infrastructure Improvements, Acton, MA**
Client: **Greenman-Pederson, Inc.** LGCI Project No.: 1637

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	12/8/2017
Drilling Foreman:	Tim Tucker	Date Completed:	12/8/2017
LGCI Engineer:	Andrew Jefferson	Location:	Route 111 (southern edge of roadway)
Ground Surface El:	N/A	Total Depth:	5 feet
Groundwater Depth:	N/E	Drill Rig Type:	Mobile Drill B-59 Truck Rig
		Drilling Method:	5" casing ID (drive and wash)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
										Asphalt	Cored 12" of asphalt
	1-3	S1	18	26	24	20	24	16		Fill ~2.0'	Recovered 11.5" of asphalt S1 - Well Graded SAND with Silt (SW), fine to coarse, 5-10% fines, gray, moist
	3-5	S2	16	12	8	8	24	14	1	Sand ~5'	S2 - Silty SAND (SM), fine to medium, trace coarse, 15-20% fines, gray, moist
5ft											Bottom of boring at 5 feet. Backfilled borehole with sand and restored the ground surface with heated DOT-grade asphalt patch.
10ft											
15ft											
20ft											

Remarks:
1. Transition from subbase/fill layer to subgrade estimated based on recovery in sample S1.

LGCI
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BORING LOG

Boring C-6
Page 1 of 1

Project: **Proposed Kelly's Corner Infrastructure Improvements, Acton, MA**
Client: **Greenman-Pederson, Inc.** LGCI Project No.: 1637

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	12/22/2017
Drilling Foreman:	Tim Tucker	Date Completed:	12/22/2017
LGCI Engineer:	Andrew Jefferson	Location:	Route 111 (northern edge of roadway)
Ground Surface El:	N/A	Total Depth:	4.9 feet
Groundwater Depth:	N/E	Drill Rig Type:	Mobile Drill B-59 Truck Rig
		Drilling Method:	5" casing ID (drive and wash)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
										Asphalt	Cored 10.5" of asphalt
	0.9-2.9	S1	9	9	5	8	24	12		Fill ~2'	Recovered 8.4" of asphalt S1 - Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 5-10% fines, trace of organic fines, 35-40% fine to coarse gravel, brown, moist
	2.9-4.9	S2	5	3	7	2	24	2		Sand ~4.9'	S2 - Similar to S1, 15-20% fines, gravel in tip
5ft											Bottom of boring 4.9 feet. Backfilled borehole with sand and restored the ground surface with heated DOT-grade asphalt patch.
10ft											
15ft											
20ft											

Remarks:
1. Transition from subbase/fill layer to subgrade estimated based on recovery in sample S1.

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BORING LOG

Boring C-7
Page 1 of 1

Project: **Proposed Kelly's Corner Infrastructure Improvements, Acton, MA**
Client: **Greenman-Pederson, Inc.** LGCI Project No.: 1637

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	12/22/2017
Drilling Foreman:	Tim Tucker	Date Completed:	12/22/2017
LGCI Engineer:	Andrew Jefferson	Location:	Route 27 (eastern edge of roadway)
Ground Surface El:	N/A	Total Depth:	5 feet
Groundwater Depth:	N/E	Drill Rig Type:	Mobile Drill B-59 Truck Rig
		Drilling Method:	5" casing ID (drive and wash)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
										Asphalt	Cored 12" of asphalt
	1-3	S1	20	17	17	12	24	12	1	Fill	Recovered 11.6" of asphalt S1 - Top 7": Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, ~30% fine to coarse gravel, light brown, moist Bot. 5": Similar to top 7", 35-40% fine to coarse gravel, trace of organic fines, brown
	3-5	S2	13	11	10	9	24	10		Sand ~5'	S2 - Silty SAND (SM), fine to coarse, 15-20% fines, 35-40% fine to coarse gravel, tan, moist
5ft											Bottom of boring at 5 feet. Backfilled borehole with sand and restored the ground surface with heated DOT-grade asphalt patch.
10ft											
15ft											
20ft											

Remarks:
1. Transition from subbase/fill layer to subgrade estimated based on recovery in sample S1.

LGCI
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BORING LOG

Boring C-8
Page 1 of 1

Project: **Proposed Kelly's Corner Infrastructure Improvements, Acton, MA**
Client: **Greenman-Pederson, Inc.** LGCI Project No.: 1637

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	12/22/2017
Drilling Foreman:	Tim Tucker	Date Completed:	12/22/2017
LGCI Engineer:	Andrew Jefferson	Location:	Route 27 (western edge of roadway)
Ground Surface El:	N/A	Total Depth:	10"
Groundwater Depth:	N/E	Drill Rig Type:	Mobile Drill B-59 Truck Rig
		Drilling Method:	5" casing ID (drive and wash)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
									1	Asphalt	Cored 10" of asphalt Recovered 9.4" of asphalt Well Graded SAND with Silt (SW-SM), fine to coarse, ~10% fines, trace coarse gravel, brown, moist
5ft											Bottom of boring at 10". Restored the ground surface with heated DOT-grade asphalt patch.
10ft											
15ft											
20ft											

Remarks:
1. SPT Sample not obtained below asphalt because utilities were not cleared at the time of coring. Obtained small grab sample by hand: Well Graded GRAVEL (GW), fine to coarse, angular, traces of asphalt, black, wet.

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BORING LOG

Boring C-9
Page 1 of 1

Project: **Proposed Kelly's Corner Infrastructure Improvements, Acton, MA**
Client: **Greenman-Pederson, Inc.** LGCI Project No.: 1637

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	12/22/2017
Drilling Foreman:	Tim Tucker	Date Completed:	12/22/2017
LGCI Engineer:	Andrew Jefferson	Location:	Route 27 (southern edge of roadway)
Ground Surface El:	N/A	Total Depth:	3 feet
Groundwater Depth:	N/E	Drill Rig Type:	Mobile Drill B-59 Truck Rig
		Drilling Method:	5" casing ID (drive and wash)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
										Asphalt	Cored 12" of asphalt
	1-3	S1	12	10	6	6	24	8	1	Fill	Recovered 10.4" of asphalt
									2	Sand ~3'	S1 - Silty SAND with Gravel (SM), fine to medium, trace coarse, 20-25% fines, 20-25% fine to coarse rounded gravel, gray, moist
5ft											Bottom of boring at 3 feet. Backfilled borehole with sand and restored the ground surface with heated DOT-grade asphalt patch.
10ft											
15ft											
20ft											

Remarks:
1. Transition from subbase/fill layer to subgrade estimated based on recovery in sample S1.
2. Driller encountered dense material at 3 feet. Drillers felt uncomfortable to continue (possible utility).

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	5	145
PROJECT FILE NO.	608229		

BORING LOGS

LGCI
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BORING LOG

Boring C-10
Page 1 of 1

Project: **Proposed Kelly's Corner Infrastructure Improvements, Acton, MA**
Client: **Greenman-Pederson, Inc.** LGCI Project No.: 1637

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	12/22/2017
Drilling Foreman:	Tim Tucker	Date Completed:	12/22/2017
LGCI Engineer:	Andrew Jefferson	Location:	Route 27 (northern edge of roadway)
Ground Surface El:	N/A	Total Depth:	8"
Groundwater Depth:	N/E	Drill Rig Type:	Mobile Drill B-59 Truck Rig
		Drilling Method:	5" casing ID (drive and wash)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
									1	Asphalt	Cored 8" of asphalt Recovered 7.3" of asphalt
5ft											Bottom of boring at 8". Restored the ground surface with heated DOT-grade asphalt patch.
10ft											
15ft											
20ft											

Remarks:
1. Sample not obtained below asphalt because utilities were not cleared at the time of coring.

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BORING LOG

Boring C-11
Page 1 of 1

Project: **Proposed Kelly's Corner Infrastructure Improvements, Acton, MA**
Client: **Greenman-Pederson, Inc.** LGCI Project No.: 1637

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	12/22/2017
Drilling Foreman:	Tim Tucker	Date Completed:	12/22/2017
LGCI Engineer:	Andrew Jefferson	Location:	Route 27 (northern edge of roadway)
Ground Surface El:	N/A	Total Depth:	4.8 feet
Groundwater Depth:	N/E	Drill Rig Type:	Mobile Drill B-59 Truck Rig
		Drilling Method:	5" casing ID (drive and wash)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
										Asphalt	Cored 9" of asphalt
	0.8-2.8	S1	26	18	12	11	24	13	1	Fill	Recovered 8" of asphalt S1 - Top 2": Silty SAND with Gravel (SM), fine to coarse, ~15% fines, 30-35% fine angular gravel, dark gray, moist Bot. 11": Well Graded SAND (SW), fine to coarse, 0-5% fines, ~15% fine to coarse gravel, brown, moist
	2.8-4.8	S2	16	15	19	20	24	8		Sand ~4.8'	S2 - Silty SAND with Gravel (SM), fine to coarse, 15-20% fines, 30-35% fine to coarse gravel, brown, moist
5ft											Bottom of boring at 4.8 feet. Backfilled borehole with sand and restored the ground surface with heated DOT-grade asphalt patch.
10ft											
15ft											
20ft											

Remarks:
1. Transition from subbase/fill layer to subgrade estimated based on recovery in sample S1.

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BORING LOG

Boring C-12
Page 1 of 1

Project: **Proposed Kelly's Corner Infrastructure Improvements, Acton, MA**
Client: **Greenman-Pederson, Inc.** LGCI Project No.: 1637

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	12/22/2017
Drilling Foreman:	Tim Tucker	Date Completed:	12/22/2017
LGCI Engineer:	Jibreel Mustafa	Location:	Route 27 (southern edge of roadway)
Ground Surface El:	N/A	Total Depth:	4.7 feet
Groundwater Depth:	N/E	Drill Rig Type:	Mobile Drill B-59 Truck Rig
		Drilling Method:	5" casing ID (drive and wash)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
									1	Asphalt	Cored 8" of asphalt
	0.7-2.7	S1	10	6	5	3	24	13	2	Fill	Recovered 4.4" of asphalt S1 - Top 7": Well Graded SAND with Silt and Gravel (SW-SM), fine to coarse, 10-15% fines, 30-35% fine to coarse gravel, gray, moist
	2.7-4.7	S2	4	6	7	13	24	8		Silt and Sand ~4.7'	Bot. 6": SILT with sand (ML), 35-40% fine sand, ~10% gravel, brown, moist S2 - Poorly Graded SAND with Silt and Gravel (SP-SM), fine to coarse, 20-25% fines, 25-30% fine to coarse gravel, brown, moist
5ft											Bottom of boring at 4.7 feet. Backfilled borehole with sand and restored the ground surface with heated DOT-grade asphalt patch.
10ft											
15ft											
20ft											

Remarks:
1. Bottom 3.6" of pavement core was lost during coring.
2. Transition from subbase/fill layer to subgrade estimated based on recovery in sample S1.

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BORING LOG

Boring C-13
Page 1 of 1

Project: **Proposed Kelly's Corner Infrastructure Improvements, Acton, MA**
Client: **Greenman-Pederson, Inc.** LGCI Project No.: 1637

Drilling Subcontractor:	Northern Drill Service, Inc.	Date Started:	12/22/2017
Drilling Foreman:	Tim Tucker	Date Completed:	12/22/2017
LGCI Engineer:	Jibreel Mustafa	Location:	Community Drive (southern edge)
Ground Surface El:	N/A	Total Depth:	4.5 feet
Groundwater Depth:	N/E	Drill Rig Type:	Mobile Drill B-59 Truck Rig
		Drilling Method:	5" casing ID (drive and wash)
Hammer Weight:	140 lbs	Split Spoon Diameter:	ID - 1.375", OD - 2"
Hammer Type:	Automatic	Rock Core Barrel Size:	NA
Drop:	30 inches		

Depth Scale	Sample Depth (ft)	Sample No	Blows per 6 inches 0-6	6-12	12-18	18-24	Pen (in)	Rec (in)	Remarks	Strata	Sample Description
	0.5-2.5	S1	8	7	6	7	24	9		Asphalt	Cored 6" of asphalt Recovered 5.7" of asphalt
	2.5-4.5	S2	6	5	5	4	24	6		Fill	S1 - Silty SAND (SM), fine to medium, 25-30% fines, tan, moist S2 - Silty SAND with Gravel (SM), fine to medium, 35-40% fines, 15-20% fine gravel, brown, moist
5ft										~4.6'	Bottom of boring at 4.5 feet. Backfilled borehole with sand and restored the ground surface with heated DOT-grade asphalt patch.
10ft											
15ft											
20ft											

Remarks:

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PAVEMENT NOTES

FULL DEPTH HMA CONSTRUCTION - MAIN STREET

SURFACE COURSE:	1 ¾" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5) OVER
INTERMEDIATE COURSE:	1 ¾" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC-12.5) OVER
BASE COURSE:	4 ½" SUPERPAVE BASE COURSE - 37.5 (SBC-37.5) OVER
SUBBASE:	4" DENSE GRADED CRUSHED STONE OVER 8" GRAVEL BORROW TYPE B

FULL DEPTH HMA CONSTRUCTION - MASSACHUSETTS AVENUE

SURFACE COURSE:	1 ¾" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5) OVER
INTERMEDIATE COURSE:	1 ¾" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC-12.5) OVER
BASE COURSE:	3 ½" SUPERPAVE BASE COURSE - 25.0 (SBC-25.0) OVER
SUBBASE:	4" DENSE GRADED CRUSHED STONE OVER 8" GRAVEL BORROW TYPE B

FULL DEPTH HMA CONSTRUCTION - COMMUNITY LANE

SURFACE COURSE:	1 ½" SUPERPAVE SURFACE COURSE - 9.5 (SSC-9.5) OVER
INTERMEDIATE COURSE:	1 ¾" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC-12.5) OVER
BASE COURSE:	3 ¼" SUPERPAVE BASE COURSE - 25.0 (SBC-25.0) OVER
SUBBASE:	4" DENSE GRADED CRUSHED STONE OVER 8" GRAVEL BORROW TYPE B

MICROMILLING & HMA OVERLAY - MAIN STREET & COMMUNITY LANE

SURFACE MILLING:	2" MAX PAVEMENT MICROMILLING TO BE USED ON THE EXISTING PAVEMENT SURFACE TO ACHIEVE DESIRED CROSS-SLOPE
SURFACE COURSE:	1 ¾" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5) OVER 1 ¾" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC-12.5)

MICROMILLING & HMA OVERLAY - MASSACHUSETTS AVENUE

SURFACE MILLING:	2" MAX PAVEMENT MICROMILLING TO BE USED ON THE EXISTING PAVEMENT SURFACE TO ACHIEVE DESIRED CROSS-SLOPE
SURFACE COURSE:	2" SUPERPAVE SURFACE COURSE - 9.5 (SSC-9.5) OVER

FULL DEPTH CONSTRUCTION <4 FEET - MAIN STREET & MASSACHUSETTS AVENUE

SURFACE COURSE:	1 ¾" SUPERPAVE SURFACE COURSE - 12.5 (SSC-12.5) OVER
INTERMEDIATE COURSE:	1 ¾" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC-12.5) OVER
SUBBASE:	6" HIGH EARLY STRENGTH CEMENT CONCRETE OVER 8" GRAVEL BORROW TYPE B

FULL DEPTH CONSTRUCTION <4 FEET - COMMUNITY LANE

SURFACE COURSE:	1 ½" SUPERPAVE SURFACE COURSE - 9.5 (SSC-9.5) OVER
INTERMEDIATE COURSE:	1 ¾" SUPERPAVE INTERMEDIATE COURSE 12.5 - (SIC-12.5) OVER
SUBBASE:	6" HIGH EARLY STRENGTH CEMENT CONCRETE OVER 8" GRAVEL BORROW TYPE B

CEMENT CONCRETE SIDEWALK, WHEELCHAIR RAMPS, AND WALKWAYS

SURFACE COURSE:	4" CEMENT CONCRETE (AIR ENTRAINED 4000 PSI, 3/4", 610) OVER
SUBBASE:	8" GRAVEL BORROW TYPE B

CEMENT CONCRETE SIDEWALK AT DRIVEWAYS

SURFACE COURSE:	6" CEMENT CONCRETE (AIR ENTRAINED 4000 PSI, 3/4", 610) OVER
SUBBASE:	8" GRAVEL BORROW TYPE B

HMA DRIVEWAYS

SURFACE COURSE:	1 ½" SUPERPAVE SURFACE COURSE - 9.5 (SSC-9.5) OVER
INTERMEDIATE COURSE:	2" SUPERPAVE INTERMEDIATE COURSE - 12.5 (SIC-12.5) OVER
SUBBASE:	8" GRAVEL BORROW TYPE B

HMA WALKWAYS

SURFACE COURSE:	1" SUPERPAVE SURFACE COURSE 9.5 (SSC-9.5) OVER
INTERMEDIATE COURSE:	1 ½" SUPERPAVE INTERMEDIATE COURSE 12.5 (SIC-12.5) OVER
SUBBASE:	8" GRAVEL BORROW TYPE B

BRICK SIDEWALK

SURFACE COURSE:	WIRE CUT BRICKS OVER MASTIC ADHESIVE OVER ¾" SAND ASPHALT SETTING BED OVER
INTERMEDIATE COURSE:	1 ½" HOT MIX ASPHALT (DENSE MIX) OVER
BASE COURSE:	2 ½" HOT MIX ASPHALT BINDER
SUBBASE:	6" GRAVEL BORROW

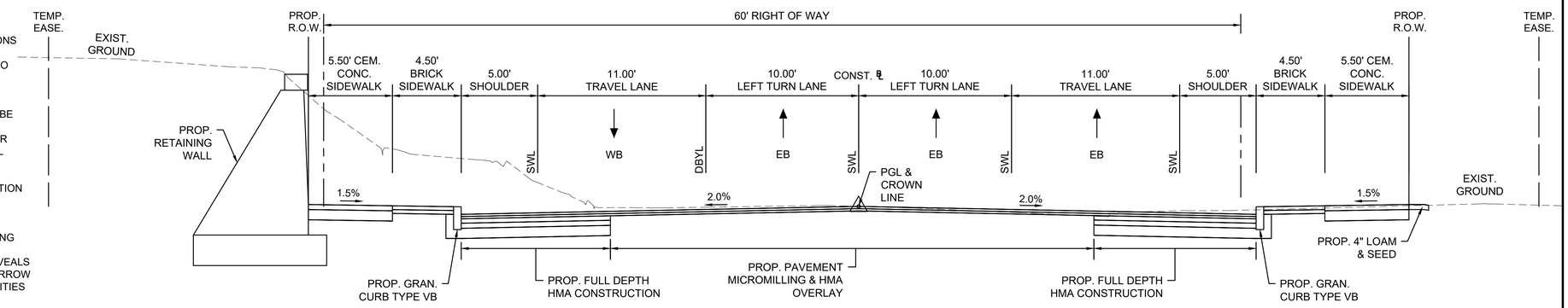
ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	7	145
PROJECT FILE NO.	608229		

TYPICAL SECTIONS

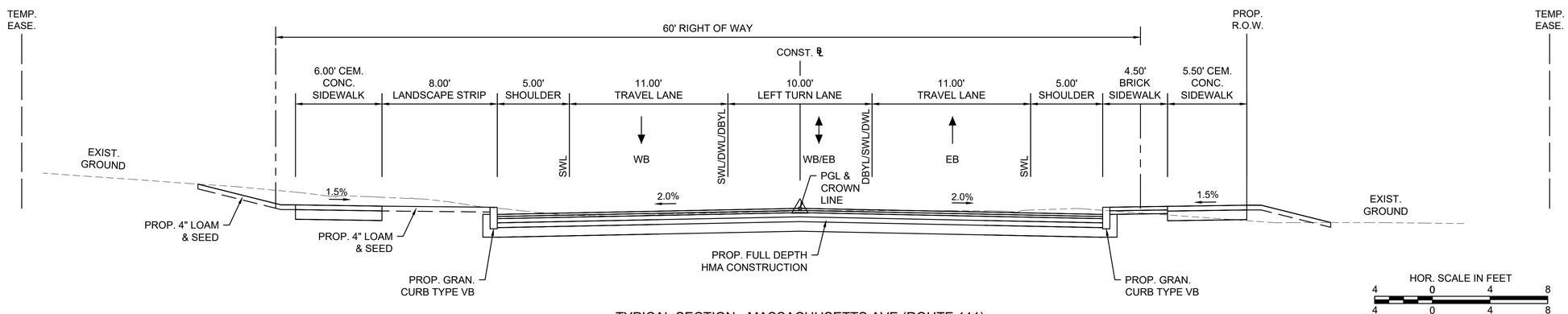
GENERAL NOTES

1. THE SECTIONS OF PROPOSED ROADWAY NOT COVERED IN THE RANGE OF STATIONS ASSOCIATED WITH THE TYPICAL SECTIONS ARE EITHER IN TRANSITION OR ARE LOCATED AT INTERSECTIONS AND THEREFORE HAVE NOT BEEN SHOWN. REFER TO CROSS SECTION SHEETS FOR MORE DETAILS.
2. ALL HMA SHALL BE IN ACCORDANCE WITH QUALITY ASSURANCE OF HMA AND SUPERPAVE SPECIFICATIONS. ASPHALT EMULSION FOR TACK COAT RS-1H SHALL BE APPLIED TO PAVEMENT LAYERS PRIOR TO PAVING FOR BONDED STRENGTH AND APPLIED AT A RATE OF 0.07 GAL/S.Y. FOR MILLED SURFACES AND 0.05 GAL/S.Y. FOR SMOOTH TIGHT PAVED SURFACES. HMA JOINT SEALANT SHALL BE APPLIED TO ALL COLD JOINTS IN THE SURFACE COURSE.
3. PAVEMENT MICROMILLING SHALL ACHIEVE A 2% CROSS SLOPE FOR NORMAL SECTION AND MAINTAIN EXISTING CROSS SLOPE FOR TRANSITIONS AND SUPERELEVATED SECTIONS AND/OR AS DIRECTED BY THE ENGINEER.
4. THE CONTRACTOR IS HEREBY NOTIFIED THAT IT IS ANTICIPATED THAT THE EXISTING SUBBASE MAY BE SUITABLE FOR RE-USE AS GRAVEL BORROW MATERIAL. THE EXISTING SUBBASE MATERIAL WILL BE TESTED BY MASSDOT. IF THE TESTING REVEALS THAT THE EXISTING SUBBASE MATERIAL IS SUITABLE FOR RE-USE AS GRAVEL BORROW FOR FULL DEPTH CONSTRUCTION AREAS, IT SHALL BE RETAINED AND THE QUANTITIES FOR EXCAVATION AND GRAVEL BORROW SHALL BE ADJUSTED ACCORDINGLY.
5. ALL SIDEWALKS SHALL HAVE A CROSS SLOPE OF 1.5% (0.015FT/FT). TOLERANCE FOR CONSTRUCTION SHALL BE ±0.50%. IN NO CASE SHALL THE SIDEWALK CROSS SLOPE EXCEED 2.0% (0.02 FT/FT). SIDEWALKS SHALL HAVE A MINIMUM CLEAR PATH OF 36" FREE OF OBSTRUCTION (UTILITY POLES, HYDRANTS, ETC.).



TYPICAL SECTION - MASSACHUSETTS AVE (ROUTE 111)

STA. 28+40± - STA. 30+40±



TYPICAL SECTION - MASSACHUSETTS AVE (ROUTE 111)

STA. 25+00± - STA. 27+50±

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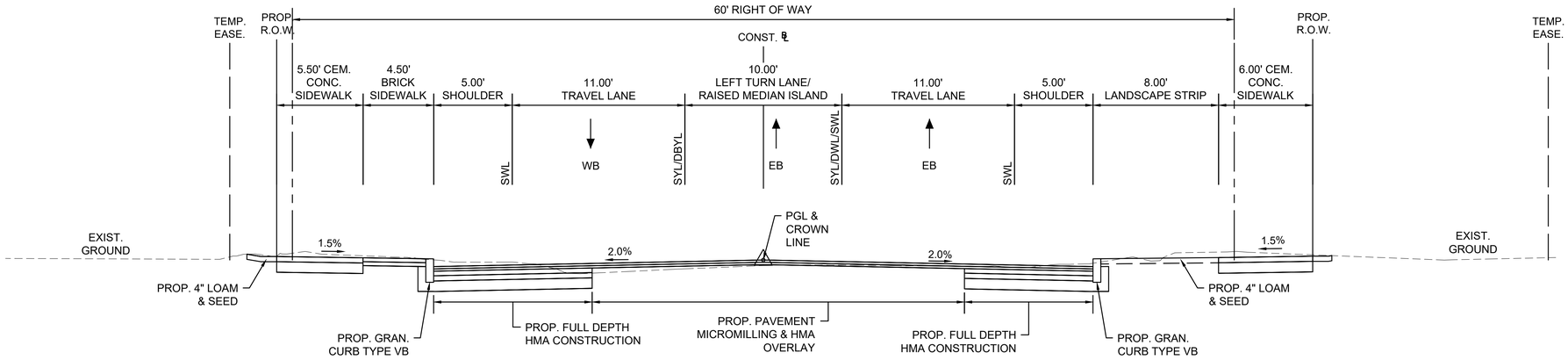
ACTON
KELLEY'S CORNER

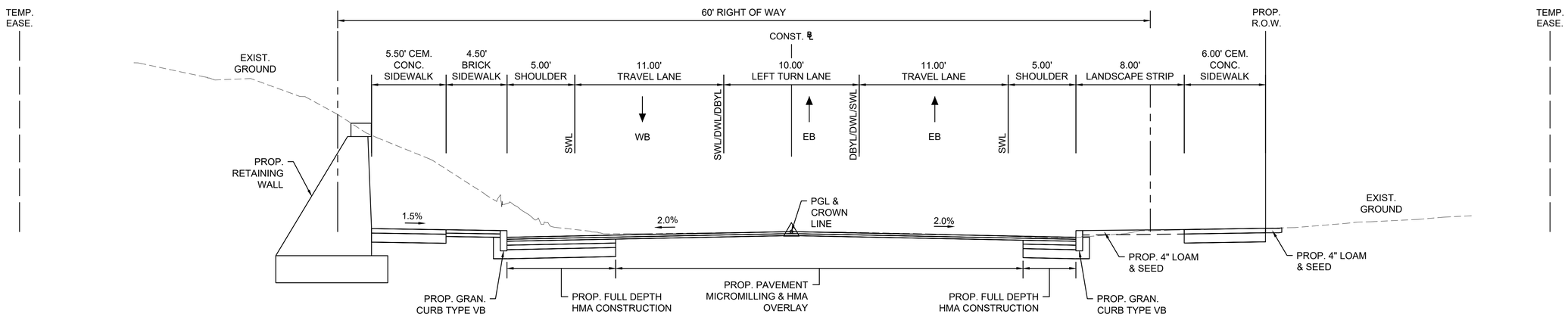
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	8	145
PROJECT FILE NO.	608229		

TYPICAL SECTIONS



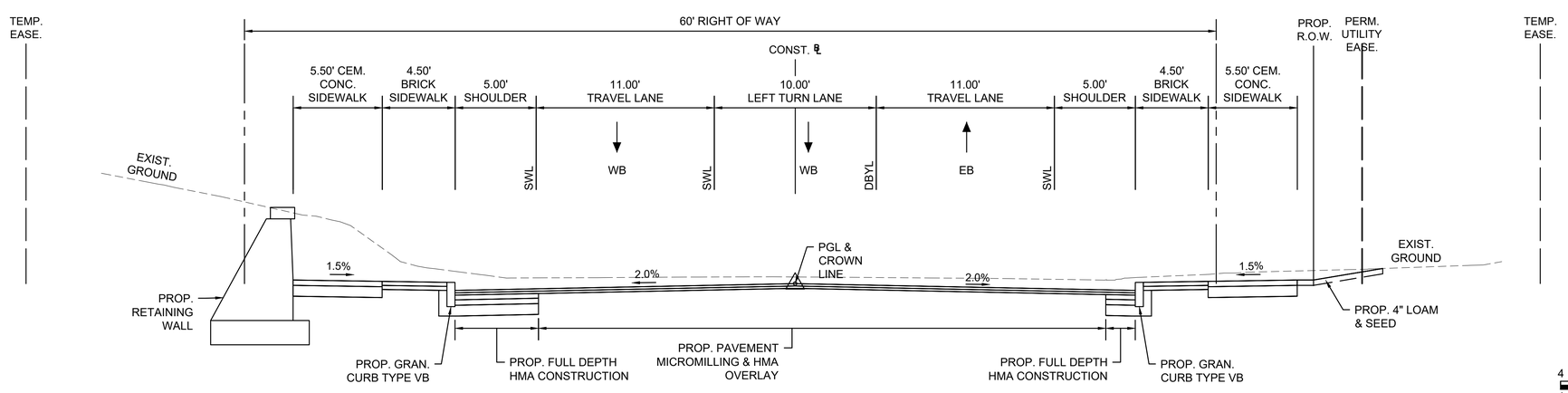
TYPICAL SECTION - MASSACHUSETTS AVE (ROUTE 111)

STA. 36+30± - STA. 37+75±



TYPICAL SECTION - MASSACHUSETTS AVE (ROUTE 111)

STA. 34+40± - STA. 35+75±



TYPICAL SECTION - MASSACHUSETTS AVE (ROUTE 111)

STA. 32+00± - STA. 34+40±

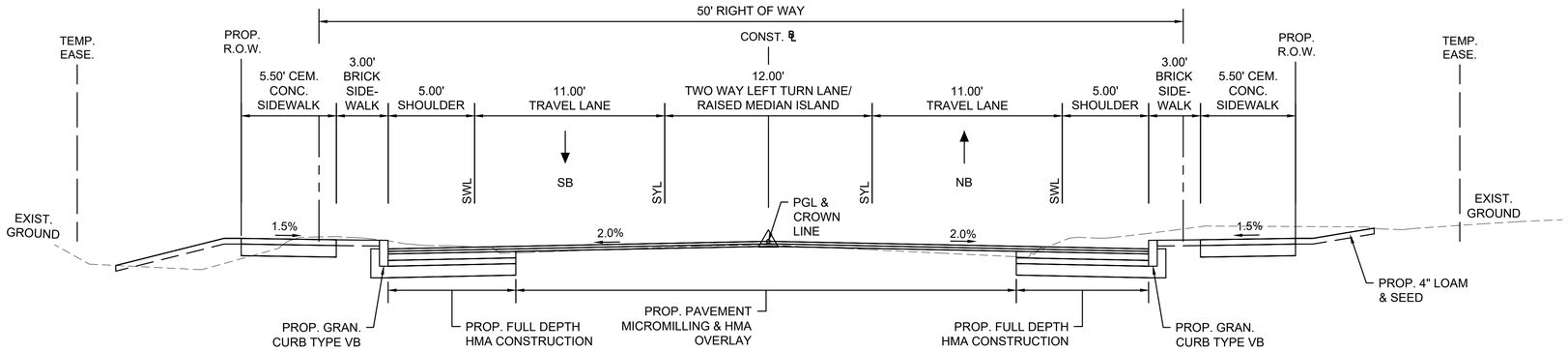
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

16093_HD(TYP).DWG Plotted on 25-Jan-2018 10:58 AM

ACTON
KELLEY'S CORNER

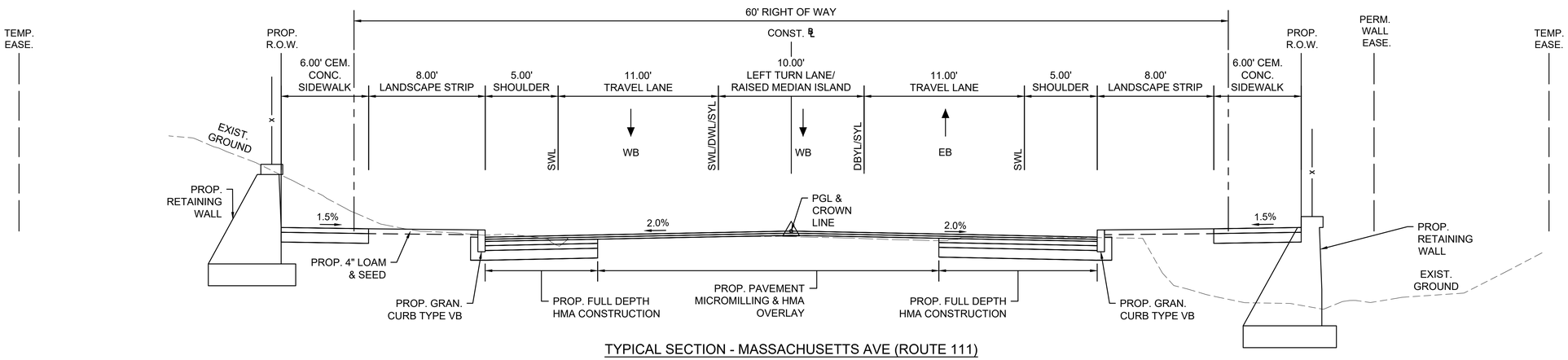
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	9	145
PROJECT FILE NO.	608229		

TYPICAL SECTIONS



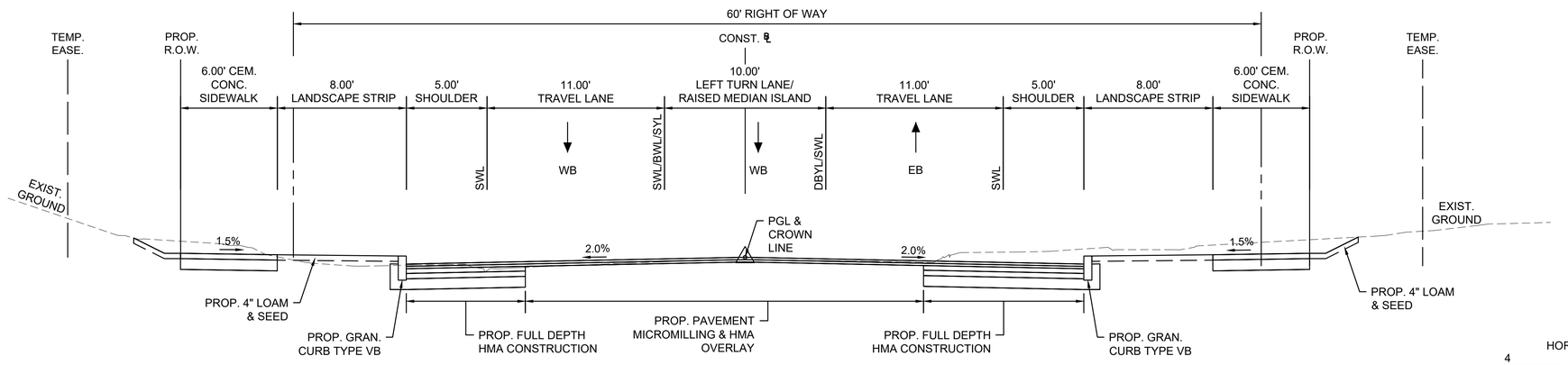
TYPICAL SECTION - MAIN STREET (ROUTE 27)

STA. 52+00± - STA. 54+00±



TYPICAL SECTION - MASSACHUSETTS AVE (ROUTE 111)

STA. 41+65± - STA. 43+50±



TYPICAL SECTION - MASSACHUSETTS AVE (ROUTE 111)

STA. 39+60± - STA. 41+25±

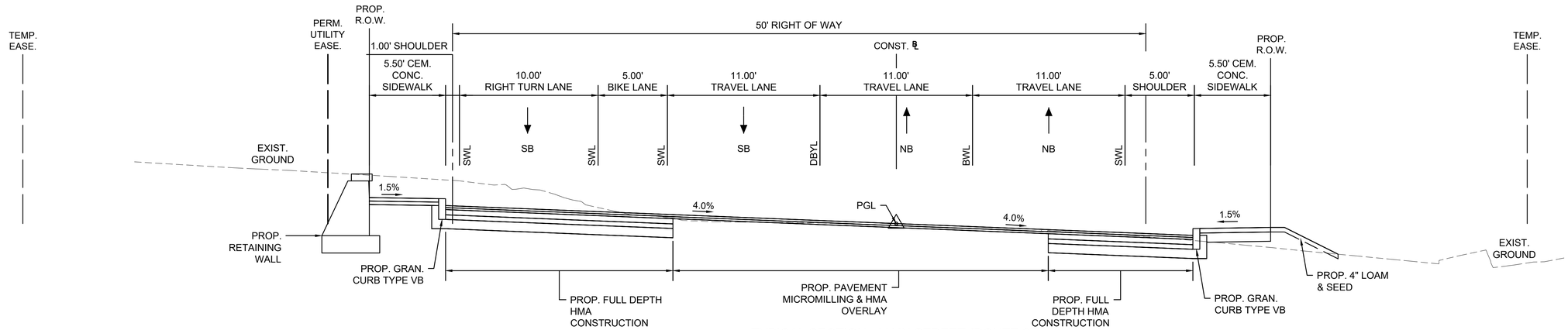
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

16093_HD(TYP).DWG Plotted on 25-Jan-2018 10:58 AM

ACTON
KELLEY'S CORNER

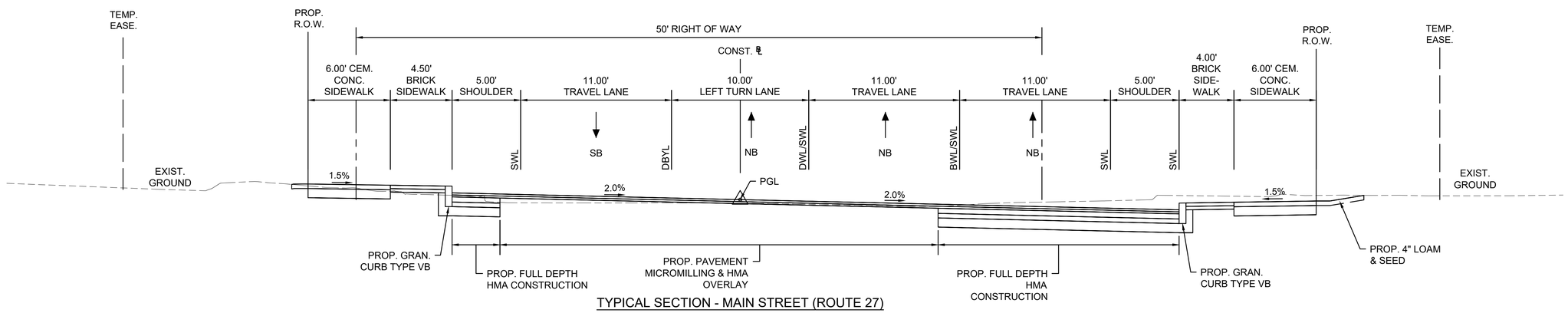
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	10	145
PROJECT FILE NO.	608229		

TYPICAL SECTIONS



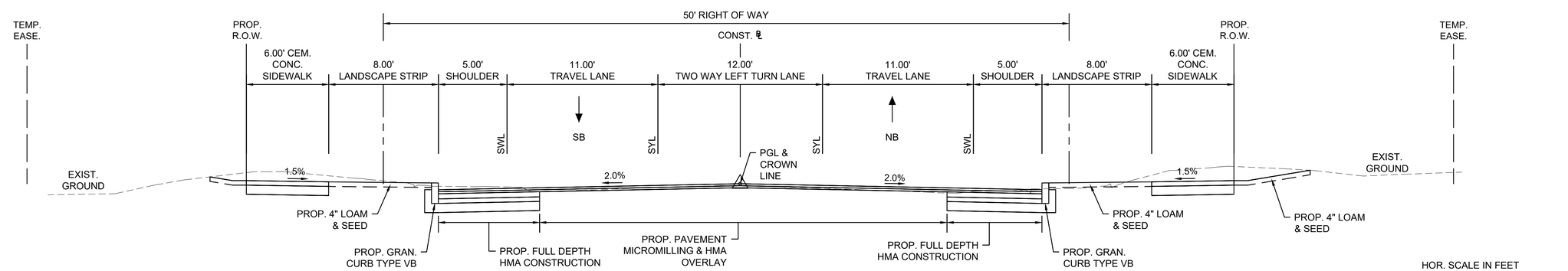
TYPICAL SECTION - MAIN STREET (ROUTE 27)

STA. 60+00± - STA. 61+75±



TYPICAL SECTION - MAIN STREET (ROUTE 27)

STA. 56+90± - STA. 59+00±



TYPICAL SECTION - MAIN STREET (ROUTE 27)

STA. 54+30± - STA. 55+50±

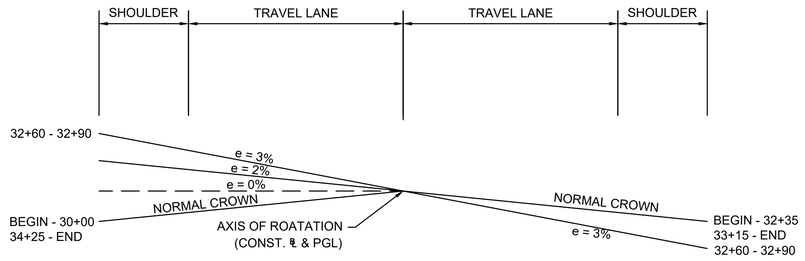
HOR. SCALE IN FEET
4 0 4 8
4 0 4 8
VER. SCALE IN FEET

16093_HD(TYP).DWG Plotted on 25-Jan-2018 10:58 AM

ACTON
KELLEY'S CORNER

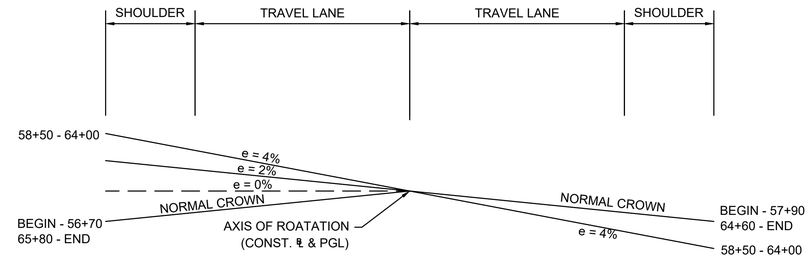
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	11	145
PROJECT FILE NO.	608229		

TYPICAL SECTIONS



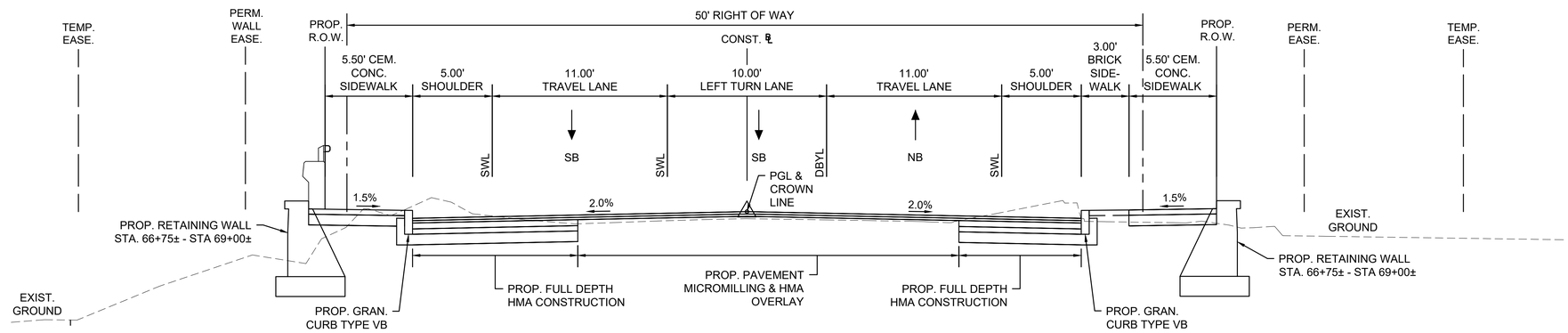
METHOD OF BANKING

MASSACHUSETTS AVENUE - CURVE 4
PC = 32+78.31
PT = 34+96.38
R = 5000'
BANK = 3%



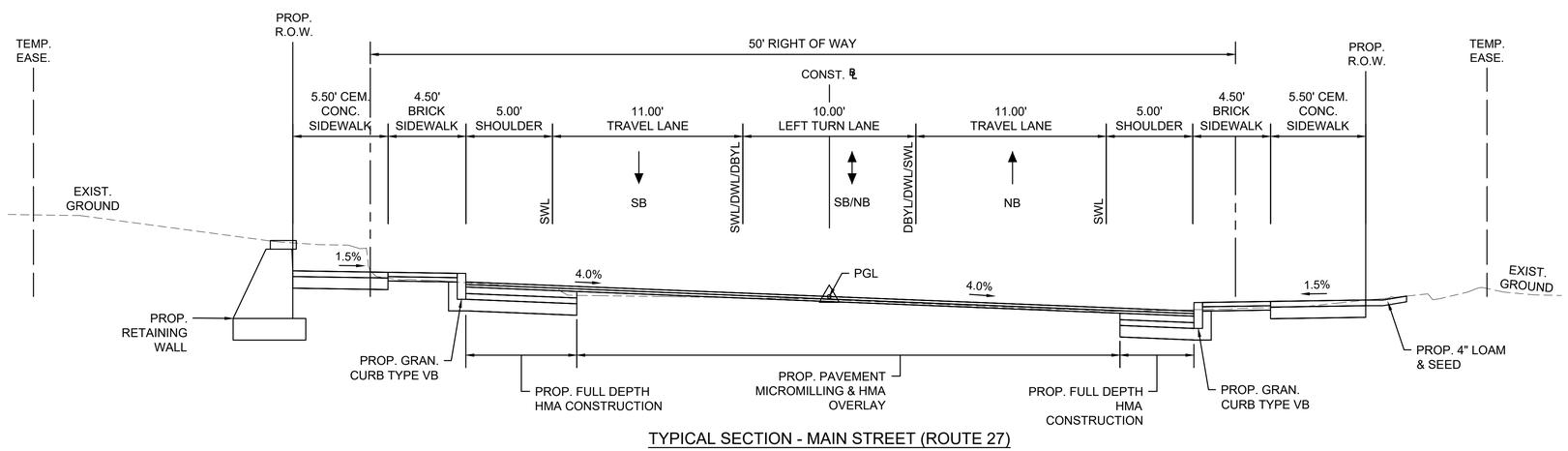
METHOD OF BANKING

MAIN STREET - CURVE 7
PC = 56+83.81
PT = 64+54.19
R = 1045'
BANK = 4%



TYPICAL SECTION - MAIN STREET (ROUTE 27)

STA. 66+75± - STA. 69+00±
STA. 71+10± - STA. 71+85±



TYPICAL SECTION - MAIN STREET (ROUTE 27)

STA. 63+75± - STA. 66+00±

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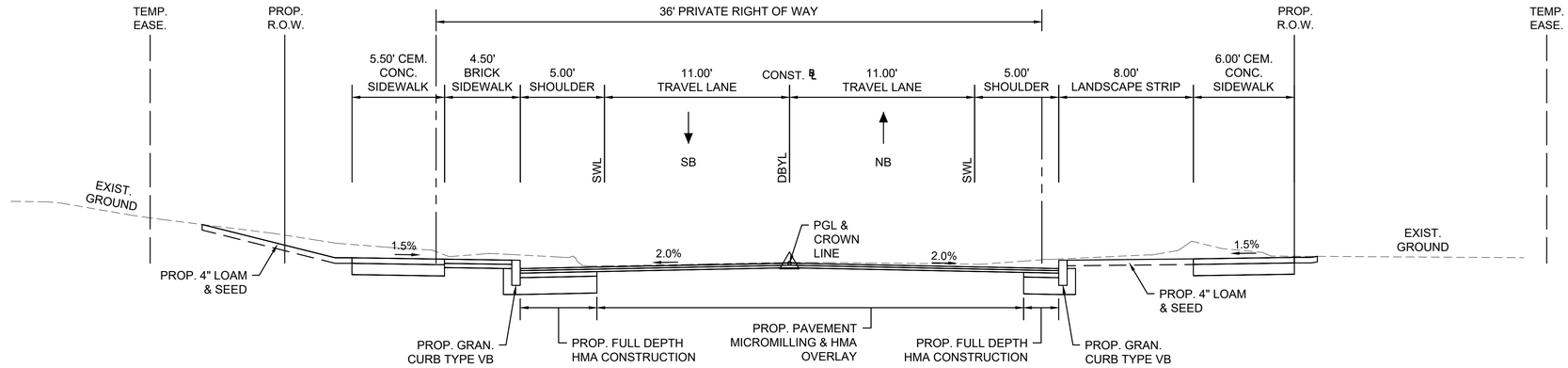
ACTON
KELLEY'S CORNER

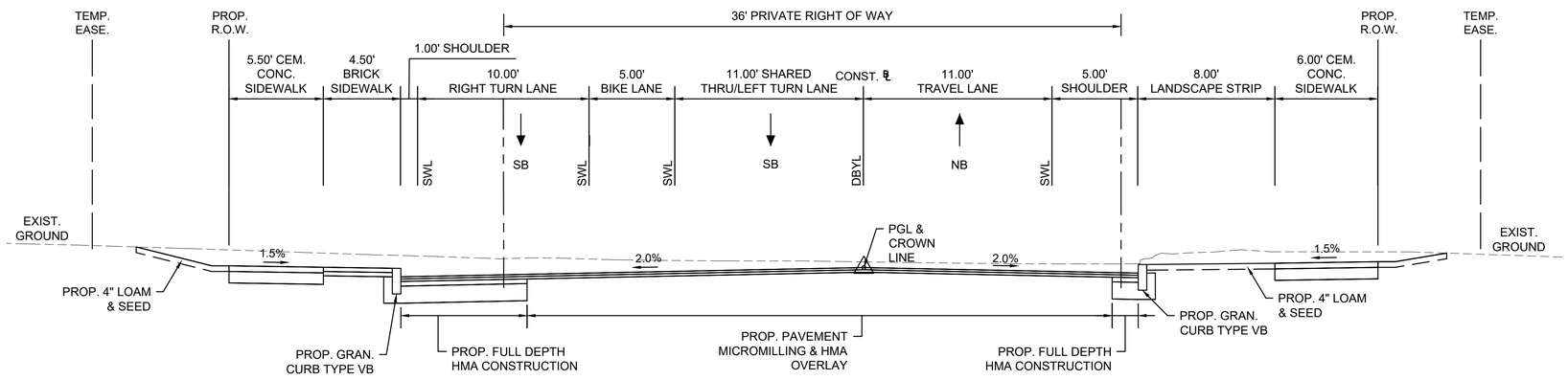
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	12	145
PROJECT FILE NO.	608229		

TYPICAL SECTIONS



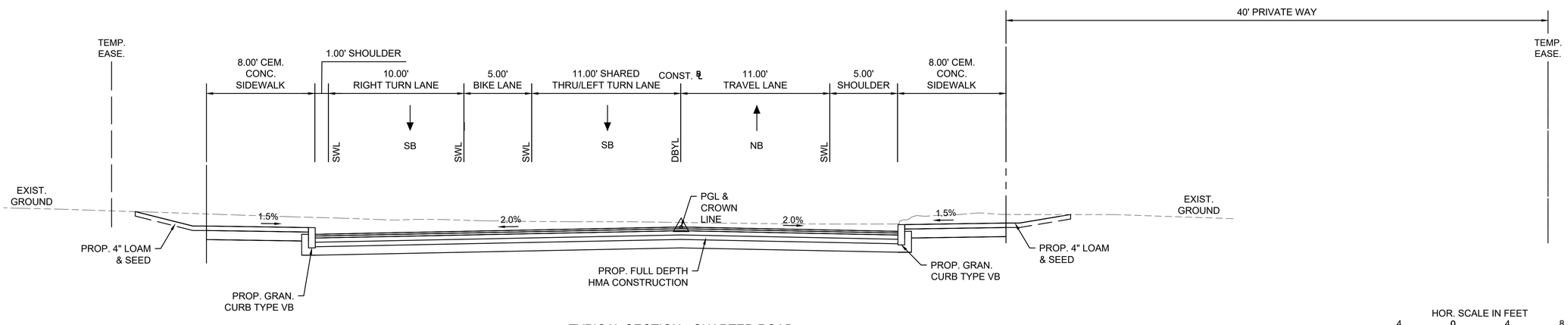
TYPICAL SECTION - COMMUNITY LANE

STA. 102+40± - STA. 104+50±



TYPICAL SECTION - COMMUNITY LANE

STA. 100+50± - STA. 101+50±



TYPICAL SECTION - CHARTER ROAD

STA. 00+50± - STA. 1+25±

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

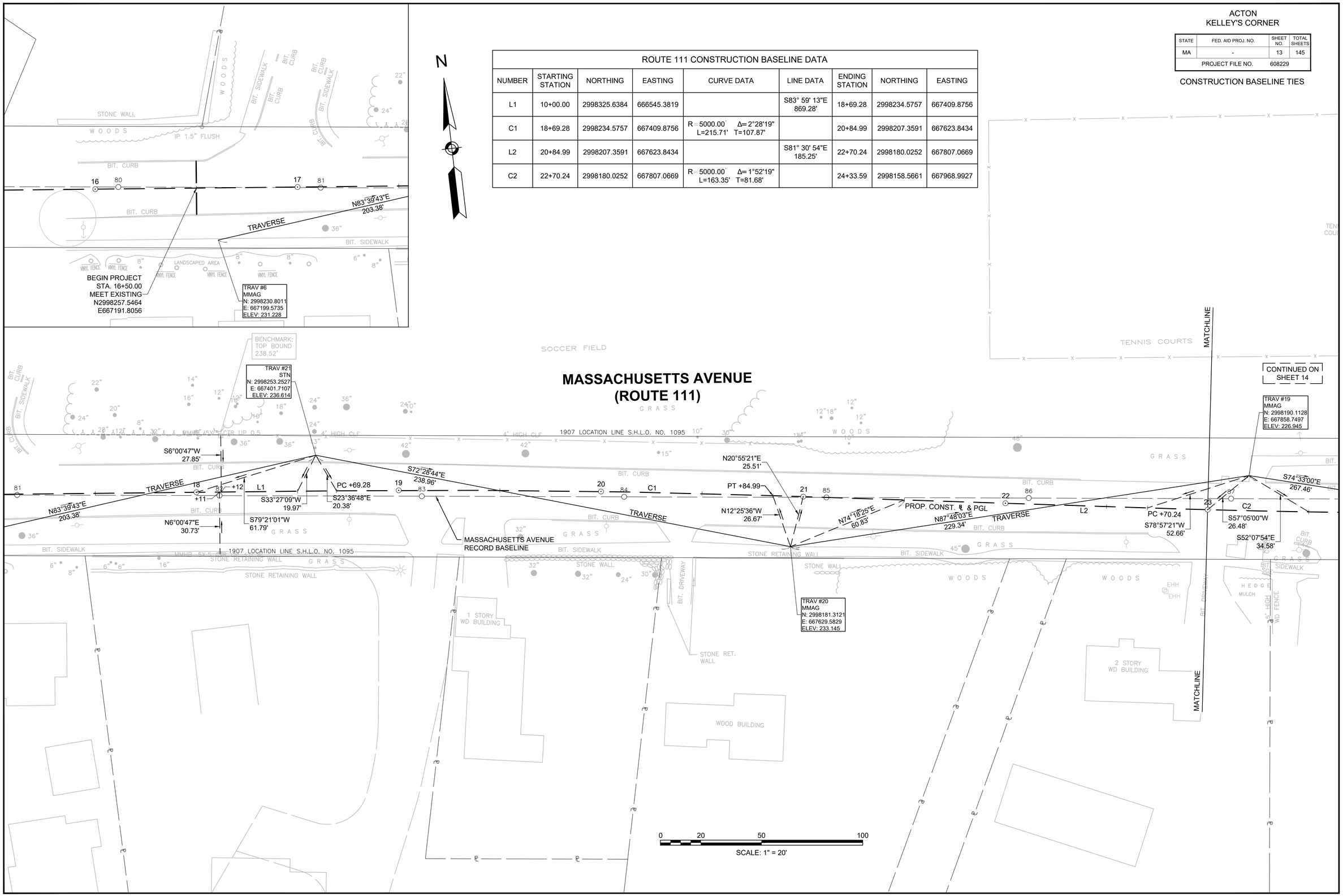
16093_HD(TYP).DWG Plotted on 25-Jan-2018 10:58 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	13	145
PROJECT FILE NO.	608229		

CONSTRUCTION BASELINE TIES

ROUTE 111 CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L1	10+00.00	2998325.6384	666545.3819		S83° 59' 13"E 869.28'	18+69.28	2998234.5757	667409.8756
C1	18+69.28	2998234.5757	667409.8756	R=5000.00' Δ=2°28'19" L=215.71' T=107.87'		20+84.99	2998207.3591	667623.8434
L2	20+84.99	2998207.3591	667623.8434		S81° 30' 54"E 185.25'	22+70.24	2998180.0252	667807.0669
C2	22+70.24	2998180.0252	667807.0669	R=5000.00' Δ=1°52'19" L=163.35' T=81.68'		24+33.59	2998158.5661	667968.9927



16093_HD(BLT).DWG Plotted on 25-Jan-2018 10:58 AM

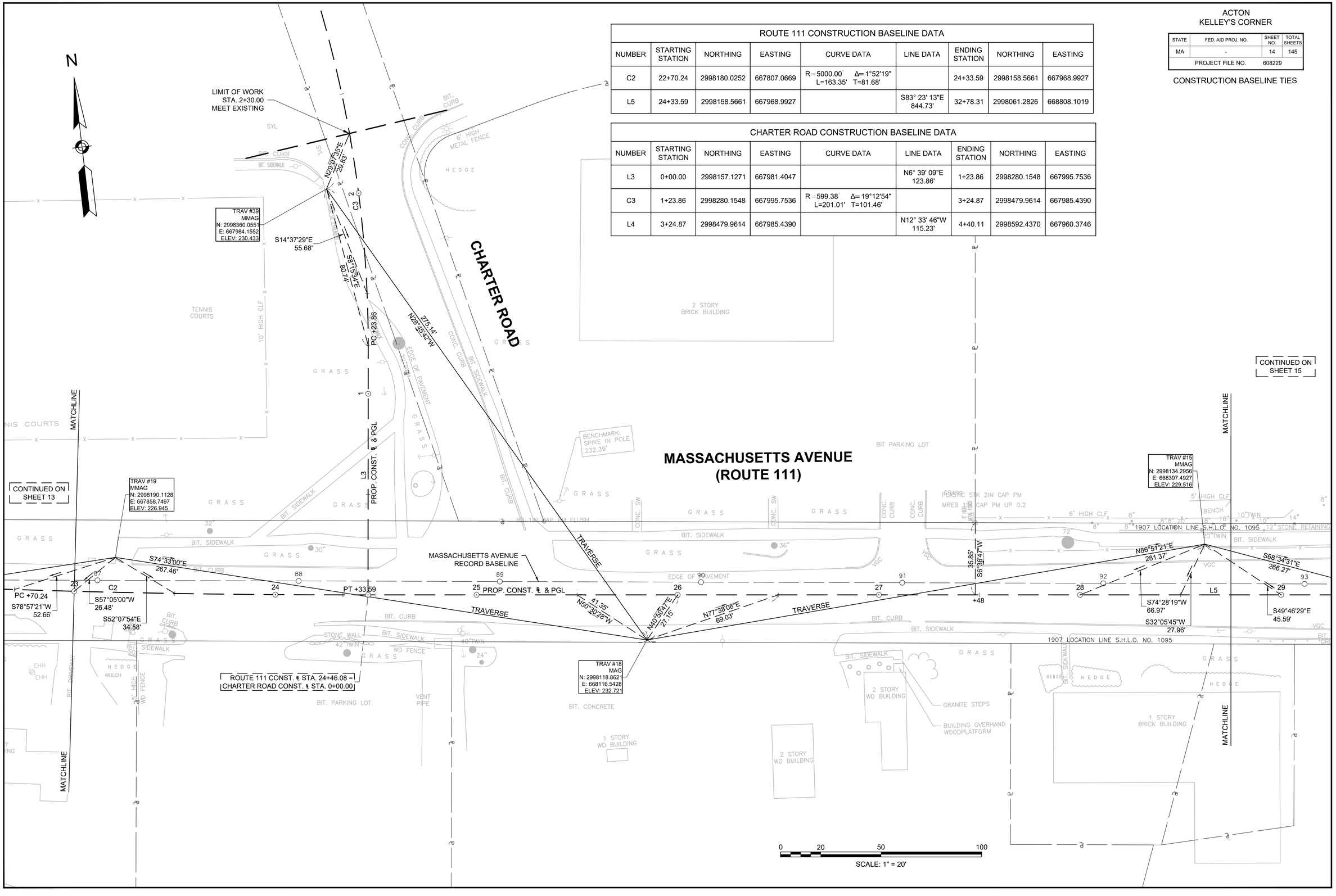
ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	14	145
PROJECT FILE NO.	608229		

CONSTRUCTION BASELINE TIES

ROUTE 111 CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C2	22+70.24	2998180.0252	667807.0669	R=5000.00' Δ=1°52'19" L=163.35' T=81.68'		24+33.59	2998158.5661	667968.9927
L5	24+33.59	2998158.5661	667968.9927		S83° 23' 13"E 844.73'	32+78.31	2998061.2826	668808.1019

CHARTER ROAD CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L3	0+00.00	2998157.1271	667981.4047		N6° 39' 09"E 123.86'	1+23.86	2998280.1548	667995.7536
C3	1+23.86	2998280.1548	667995.7536	R=599.38' Δ=19°12'54" L=201.01' T=101.46'		3+24.87	2998479.9614	667985.4390
L4	3+24.87	2998479.9614	667985.4390		N12° 33' 46"W 115.23'	4+40.11	2998592.4370	667960.3746

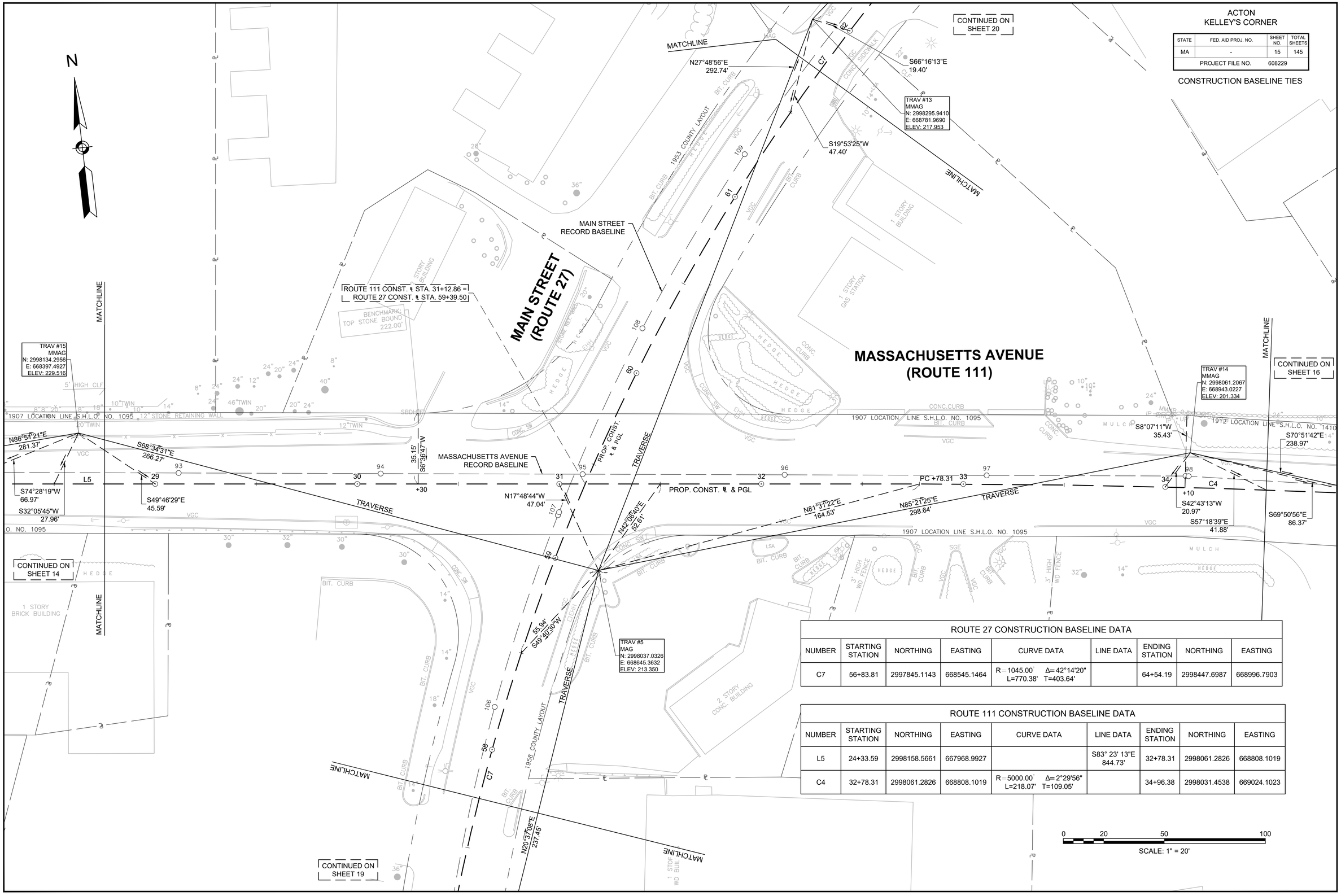


16083_HD(BLT).DWG Plotted on 25-Jan-2018 10:58 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	15	145
PROJECT FILE NO.	608229		

CONSTRUCTION BASELINE TIES



ROUTE 27 CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C7	56+83.81	2997845.1143	668545.1464	R=1045.00' Δ=42°14'20" L=770.38' T=403.64'		64+54.19	2998447.6987	668996.7903

ROUTE 111 CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L5	24+33.59	2998158.5661	667968.9927		S83° 23' 13"E 844.73'	32+78.31	2998061.2826	668808.1019
C4	32+78.31	2998061.2826	668808.1019	R=5000.00' Δ=2°29'56" L=218.07' T=109.05'		34+96.38	2998031.4538	669024.1023

16093_HD(BLT).DWG Plotted on 25-Jan-2018 10:58 AM

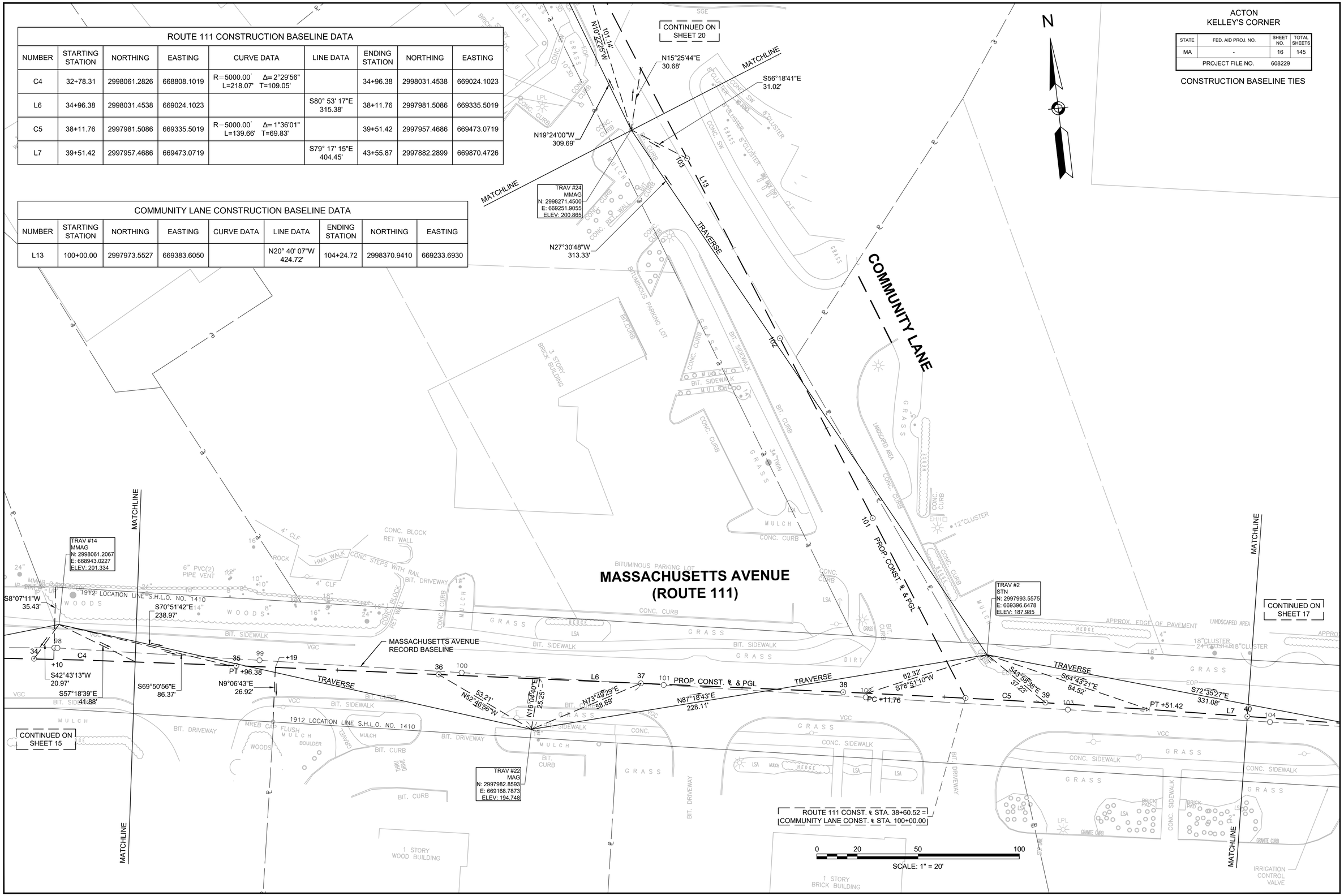
ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	16	145
PROJECT FILE NO.	608229		

CONSTRUCTION BASELINE TIES

ROUTE 111 CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C4	32+78.31	2998061.2826	668808.1019	R=5000.00' Δ=2°29'56" L=218.07' T=109.05'		34+96.38	2998031.4538	669024.1023
L6	34+96.38	2998031.4538	669024.1023		S80° 53' 17"E 315.38'	38+11.76	2997981.5086	669335.5019
C5	38+11.76	2997981.5086	669335.5019	R=5000.00' Δ=1°36'01" L=139.66' T=69.83'		39+51.42	2997957.4686	669473.0719
L7	39+51.42	2997957.4686	669473.0719		S79° 17' 15"E 404.45'	43+55.87	2997882.2899	669870.4726

COMMUNITY LANE CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L13	100+00.00	2997973.5527	669383.6050		N20° 40' 07"W 424.72'	104+24.72	2998370.9410	669233.6930



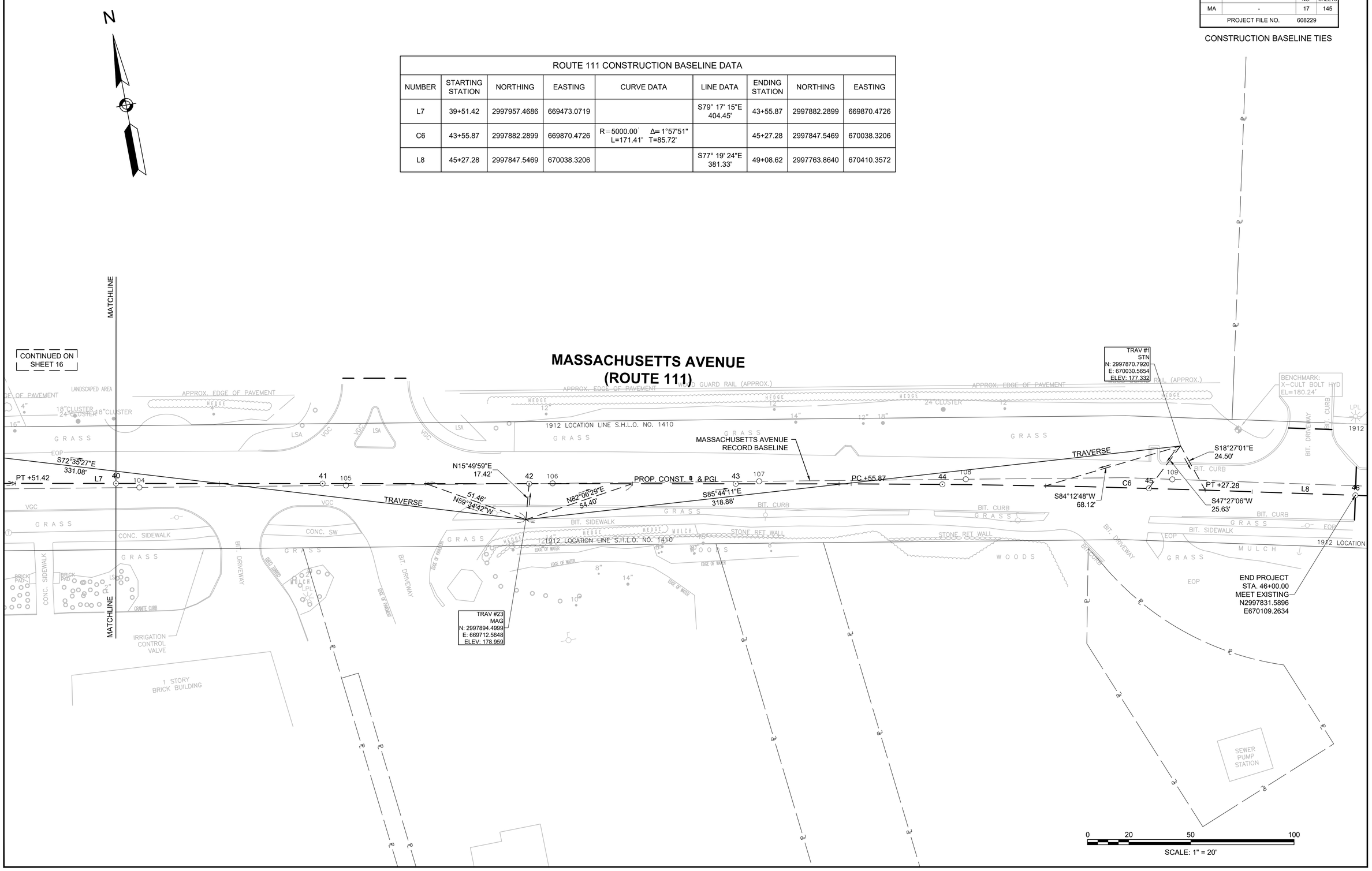
16093_HD(BLT).DWG Plotted on 25-Jan-2018 10:59 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	17	145
PROJECT FILE NO.	608229		

CONSTRUCTION BASELINE TIES

ROUTE 111 CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L7	39+51.42	2997957.4686	669473.0719		S79° 17' 15"E 404.45'	43+55.87	2997882.2899	669870.4726
C6	43+55.87	2997882.2899	669870.4726	R=5000.00' Δ=1°57'51" L=171.41' T=85.72'		45+27.28	2997847.5469	670038.3206
L8	45+27.28	2997847.5469	670038.3206		S77° 19' 24"E 381.33'	49+08.62	2997763.8640	670410.3572



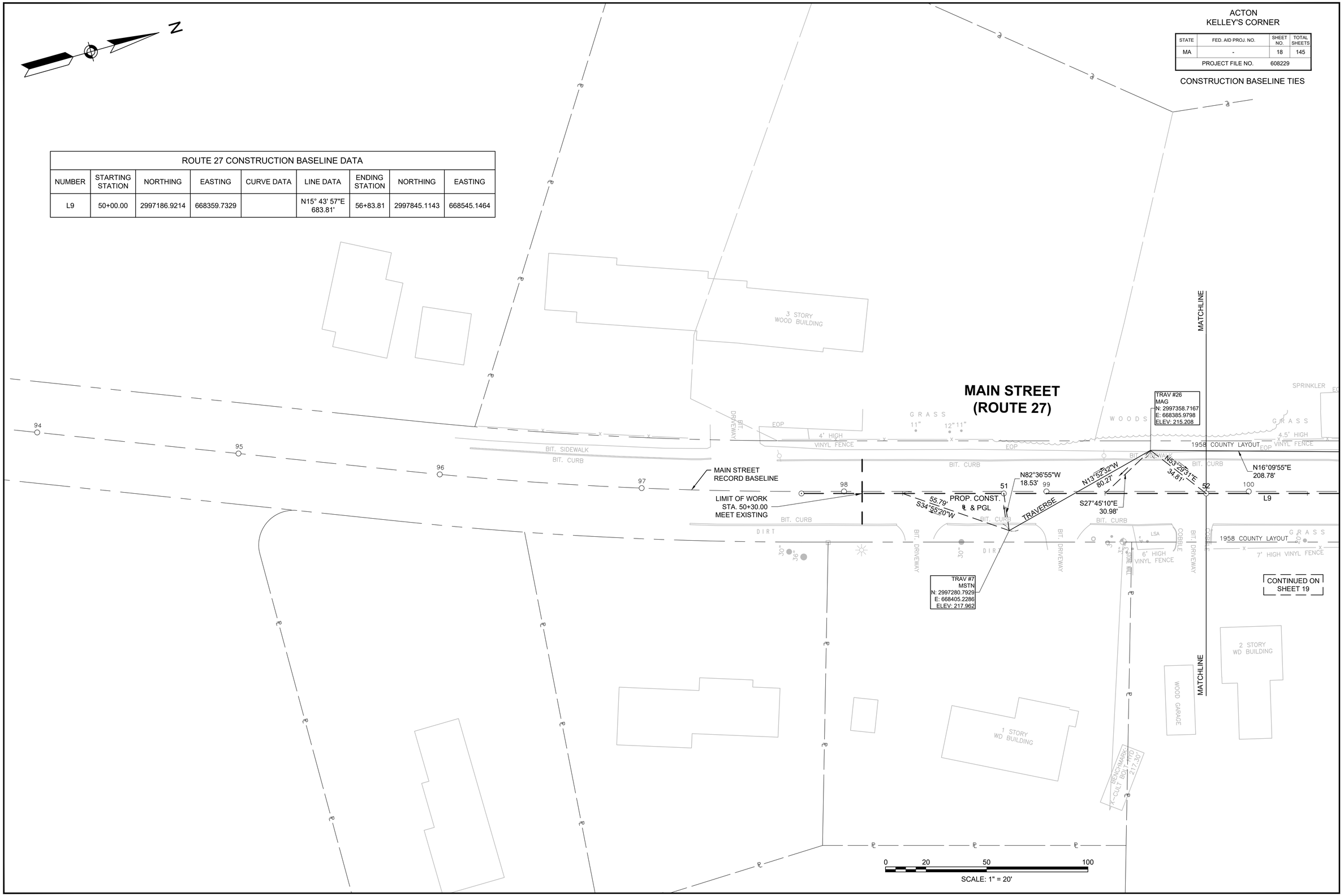
16093_HD(BLT).DWG Plotted on 25-Jan-2018 10:59 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	18	145
PROJECT FILE NO.	608229		

CONSTRUCTION BASELINE TIES

ROUTE 27 CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L9	50+00.00	2997186.9214	668359.7329		N15° 43' 57"E 683.81'	56+83.81	2997845.1143	668545.1464



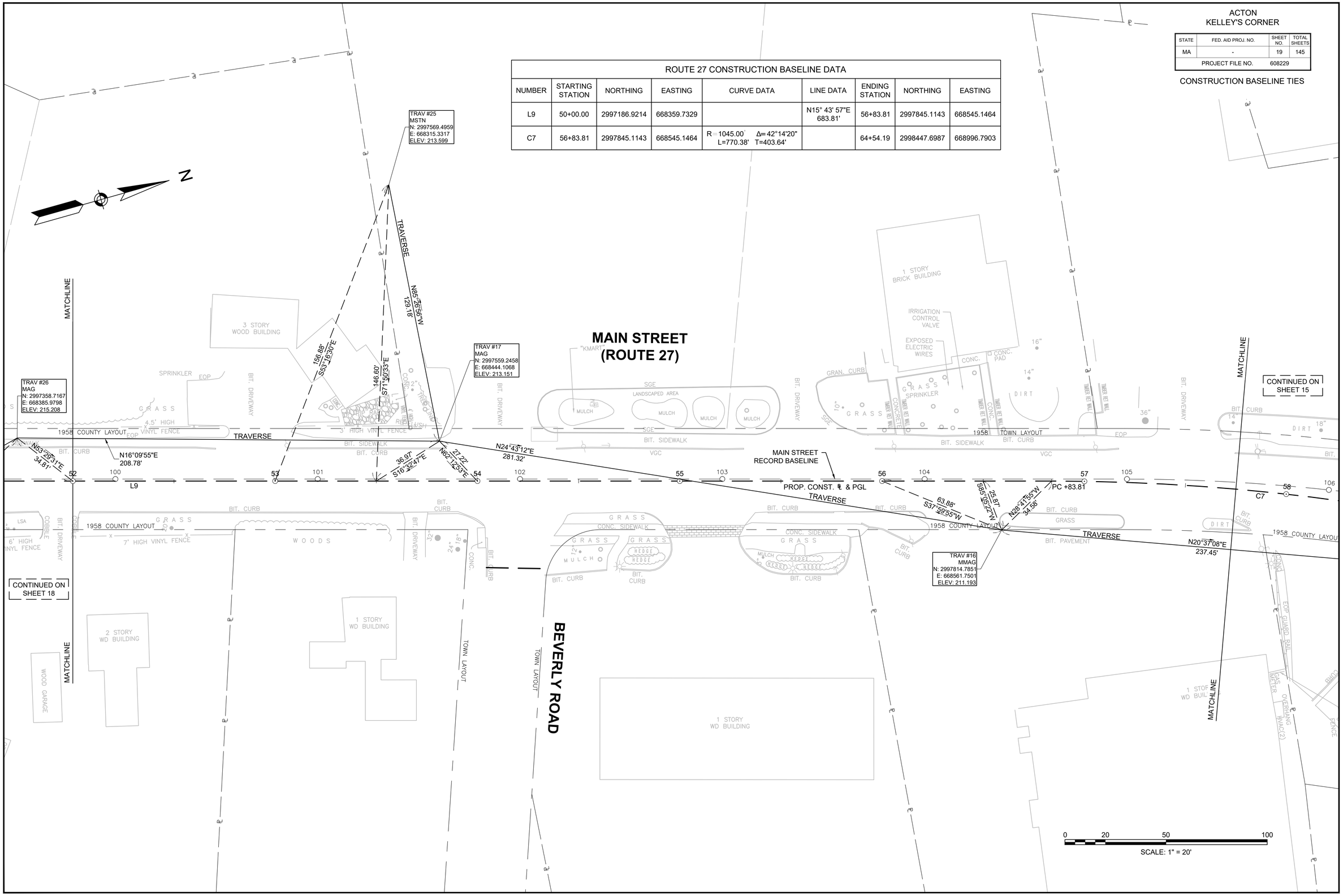
16083_HD(BLT).DWG Plotted on 25-Jan-2018 10:59 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	19	145
PROJECT FILE NO.	608229		

CONSTRUCTION BASELINE TIES

ROUTE 27 CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L9	50+00.00	2997186.9214	668359.7329		N15° 43' 57"E 683.81'	56+83.81	2997845.1143	668545.1464
C7	56+83.81	2997845.1143	668545.1464	R=1045.00' Δ=42°14'20" L=770.38' T=403.64'		64+54.19	2998447.6987	668996.7903



16093_HD(BLT).DWG Plotted on 25-Jan-2018 10:59 AM

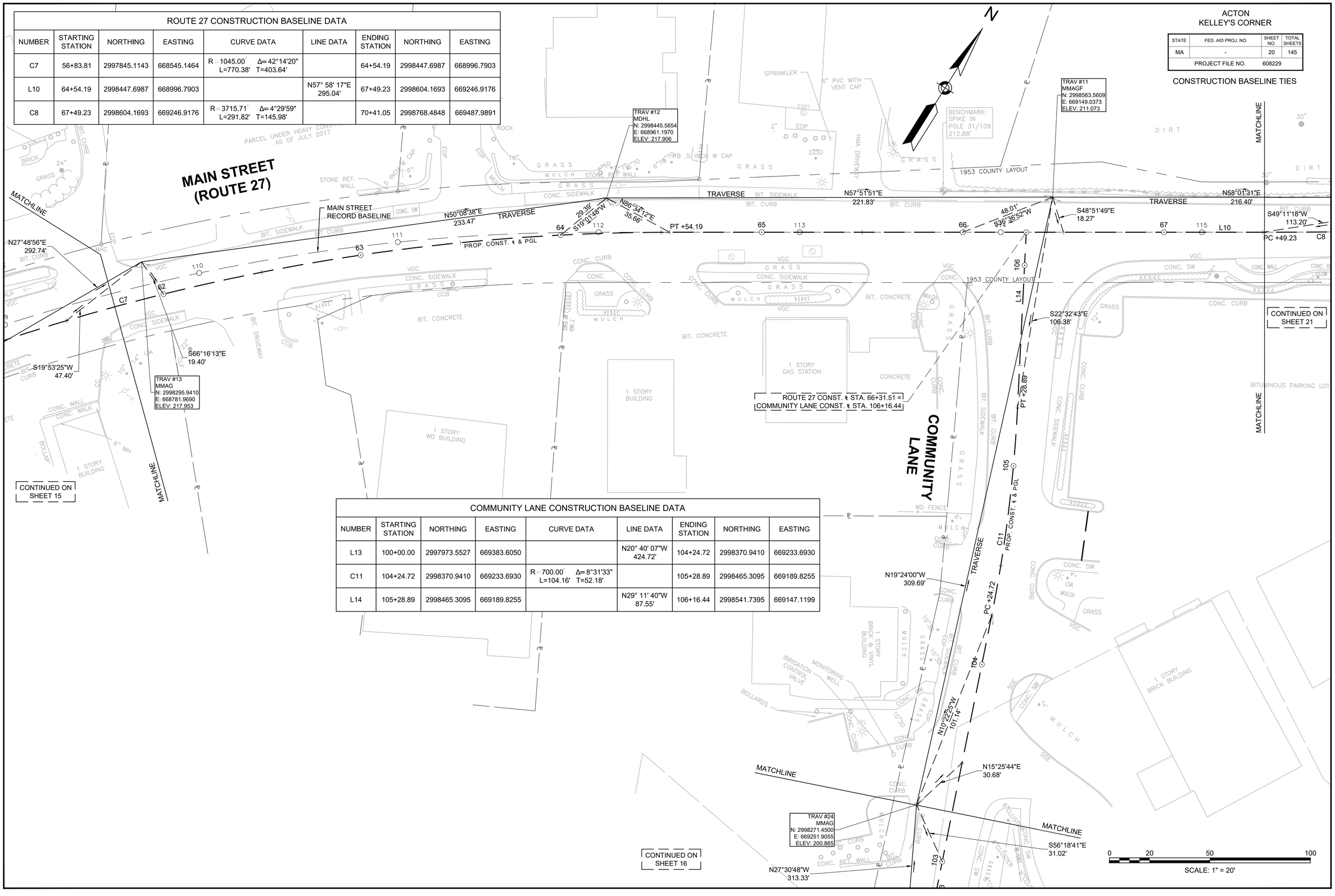
ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	20	145
PROJECT FILE NO.	608229		

CONSTRUCTION BASELINE TIES

ROUTE 27 CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
C7	56+83.81	2997845.1143	668545.1464	R=1045.00' Δ=42°14'20" L=770.38' T=403.64'		64+54.19	2998447.6987	668996.7903
L10	64+54.19	2998447.6987	668996.7903		N57° 58' 17"E 295.04'	67+49.23	2998604.1693	669246.9176
C8	67+49.23	2998604.1693	669246.9176	R=3715.71' Δ=4°29'59" L=291.82' T=145.98'		70+41.05	2998768.4848	669487.9891



COMMUNITY LANE CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L13	100+00.00	2997973.5527	669383.6050		N20° 40' 07"W 424.72'	104+24.72	2998370.9410	669233.6930
C11	104+24.72	2998370.9410	669233.6930	R=700.00' Δ=8°31'33" L=104.16' T=52.18'		105+28.89	2998465.3095	669189.8255
L14	105+28.89	2998465.3095	669189.8255		N29° 11' 40"W 87.55'	106+16.44	2998541.7395	669147.1199

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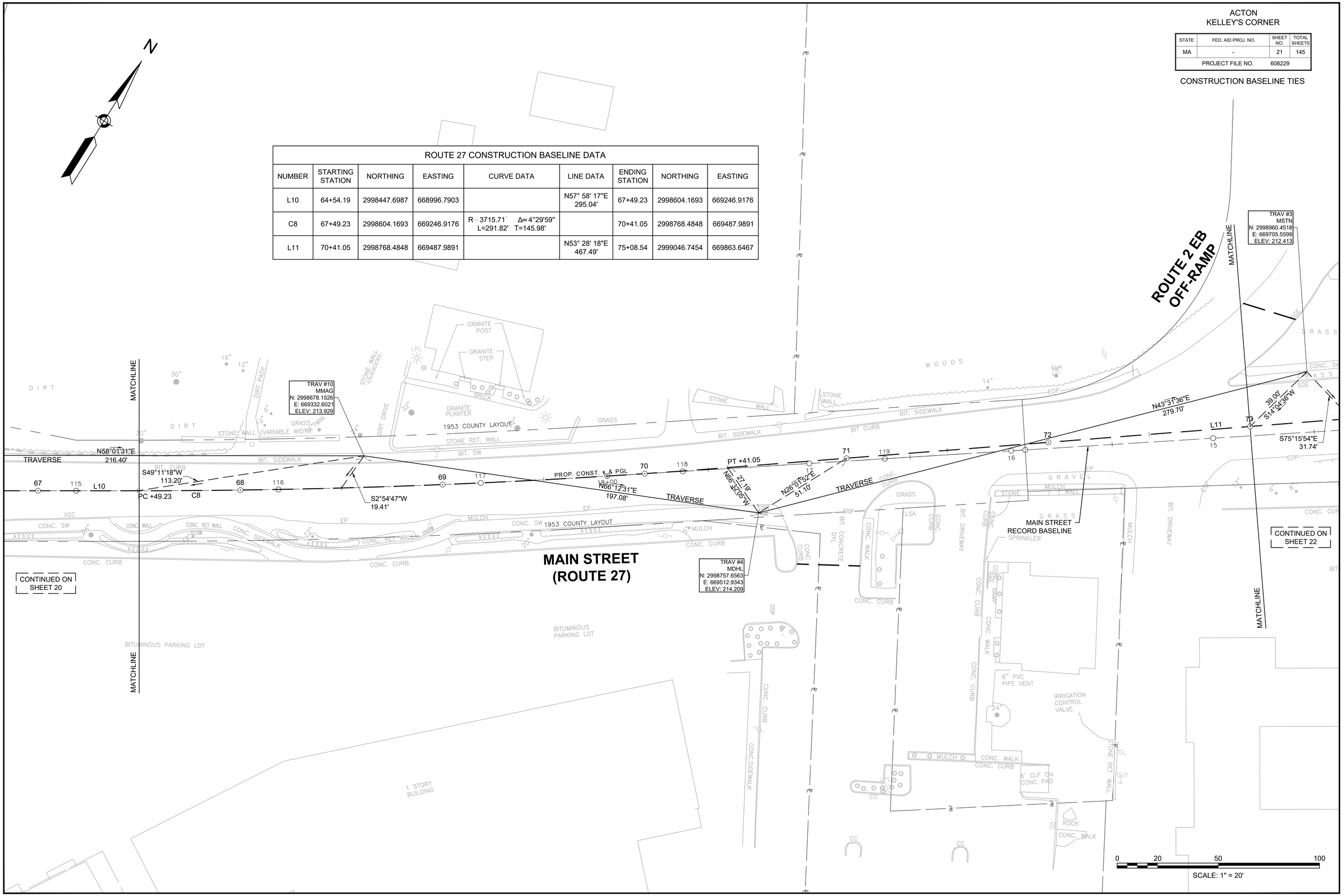
ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	21	145
PROJECT FILE NO.	608229		

CONSTRUCTION BASELINE TIES

ROUTE 27 CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L10	64+54.19	2998447.6987	668996.7903		N57° 58' 17"E 295.04'	67+49.23	2998604.1693	669246.9176
C8	67+49.23	2998604.1693	669246.9176	R=3715.71' Δ=4°29'59" L=291.82' T=145.98'		70+41.05	2998768.4848	669487.9891
L11	70+41.05	2998768.4848	669487.9891		N53° 28' 18"E 467.49'	75+08.54	2999046.7454	669863.6467



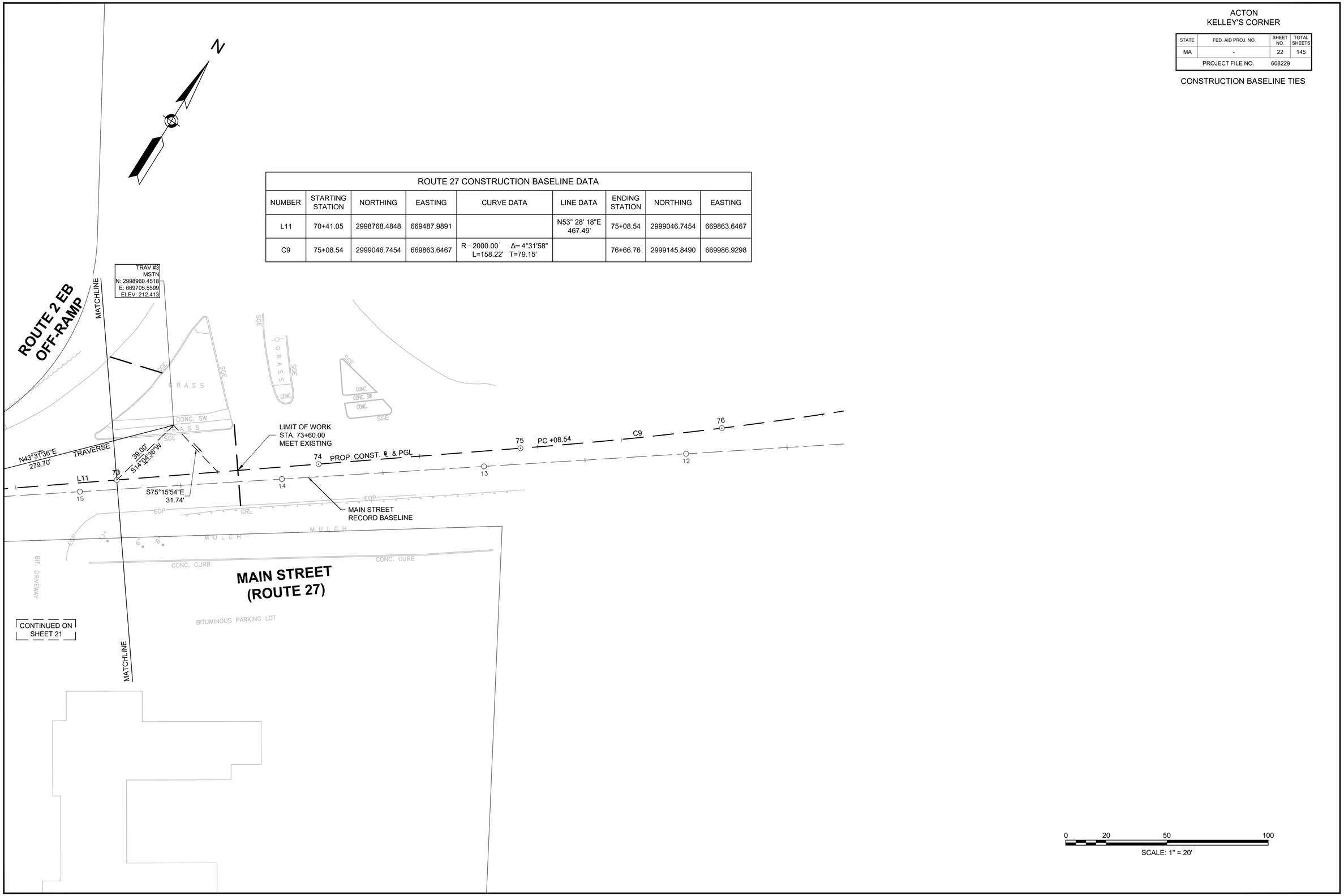
16093_HD(BLT).DWG Plotted on 25-Jan-2018 10:59 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	22	145
PROJECT FILE NO.	608229		

CONSTRUCTION BASELINE TIES

ROUTE 27 CONSTRUCTION BASELINE DATA								
NUMBER	STARTING STATION	NORTHING	EASTING	CURVE DATA	LINE DATA	ENDING STATION	NORTHING	EASTING
L11	70+41.05	2998768.4848	669487.9891		N53° 28' 18"E 467.49'	75+08.54	2999046.7454	669863.6467
C9	75+08.54	2999046.7454	669863.6467	R=2000.00' Δ=4°31'58" L=158.22' T=79.15'		76+66.76	2999145.8490	669986.9298



16083_HD(BLT).DWG Plotted on 25-Jan-2018 10:59 AM

HIGHWAY GUARD DETAILS
NONE

TRAFFIC SIGNAL CONDUIT
NONE

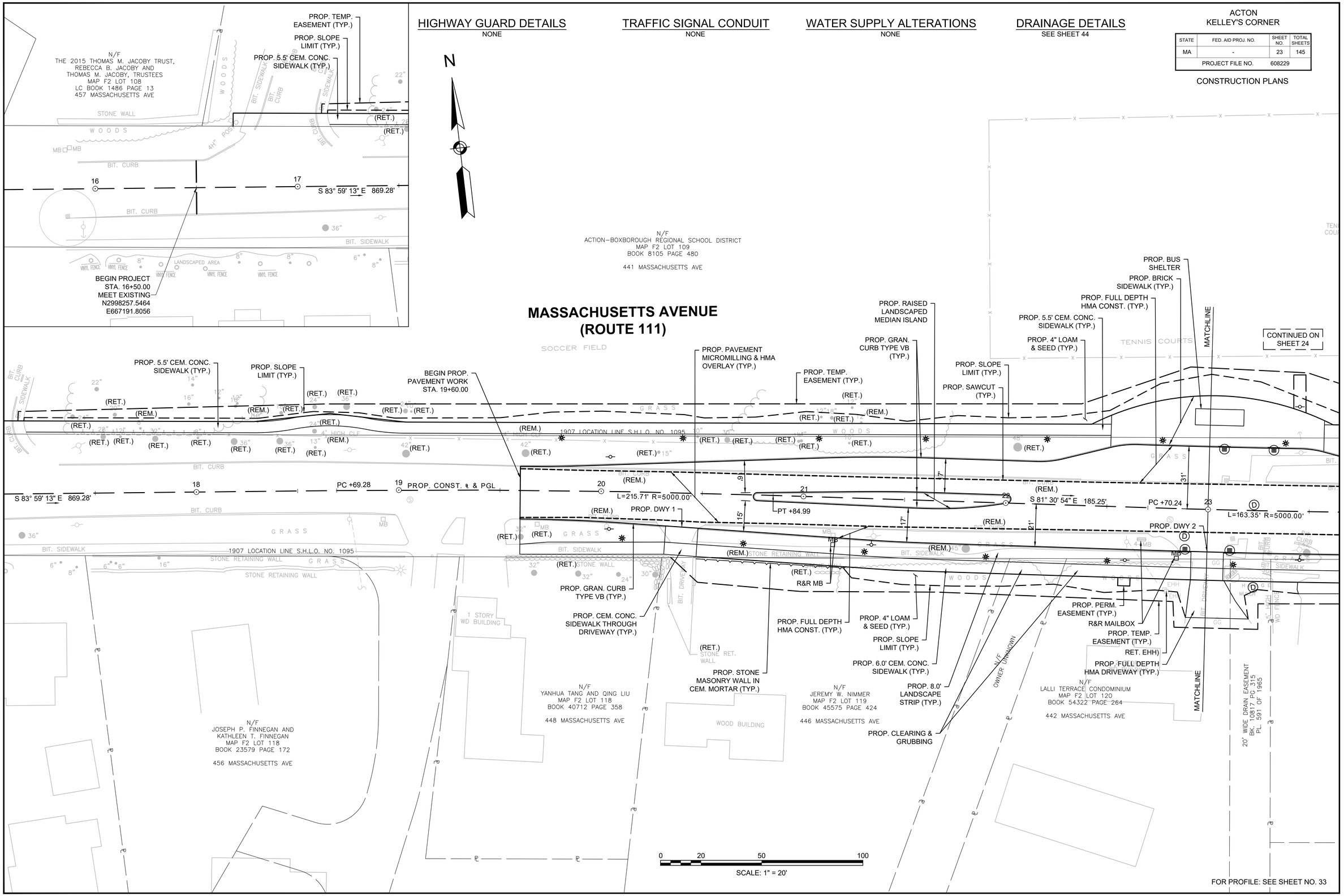
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE SHEET 44

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	23	145
PROJECT FILE NO.	608229		

CONSTRUCTION PLANS



FOR PROFILE: SEE SHEET NO. 33

16093_HD(CO).DWG Plotted on 25-Jan-2018 10:59 AM

HIGHWAY GUARD DETAILS
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET 67

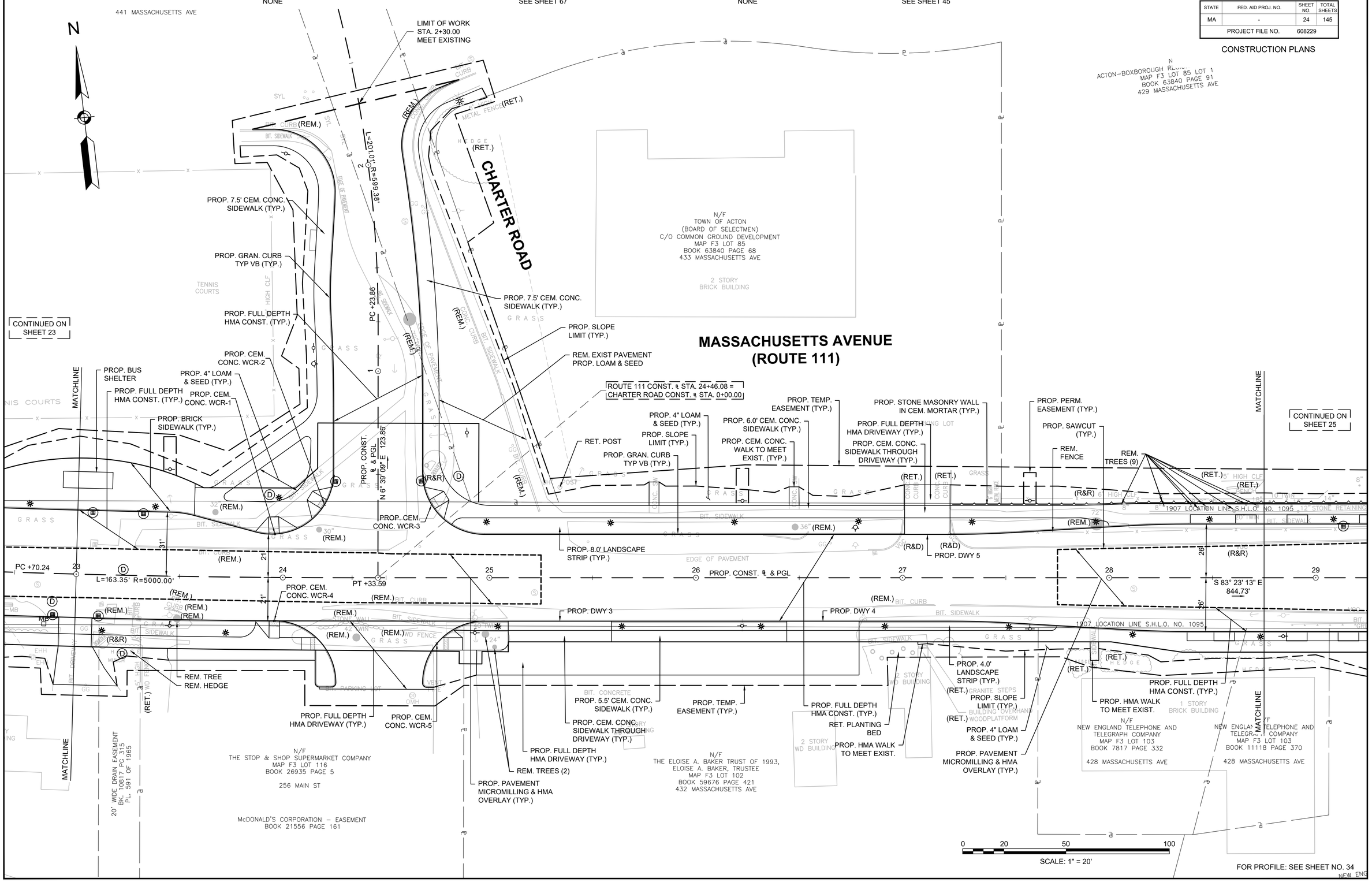
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE SHEET 45

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	24	145
PROJECT FILE NO.	608229		

CONSTRUCTION PLANS



16093_HD(CO).DWG Plotted on 25-Jan-2018 10:59 AM

HIGHWAY GUARD DETAILS
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET 69

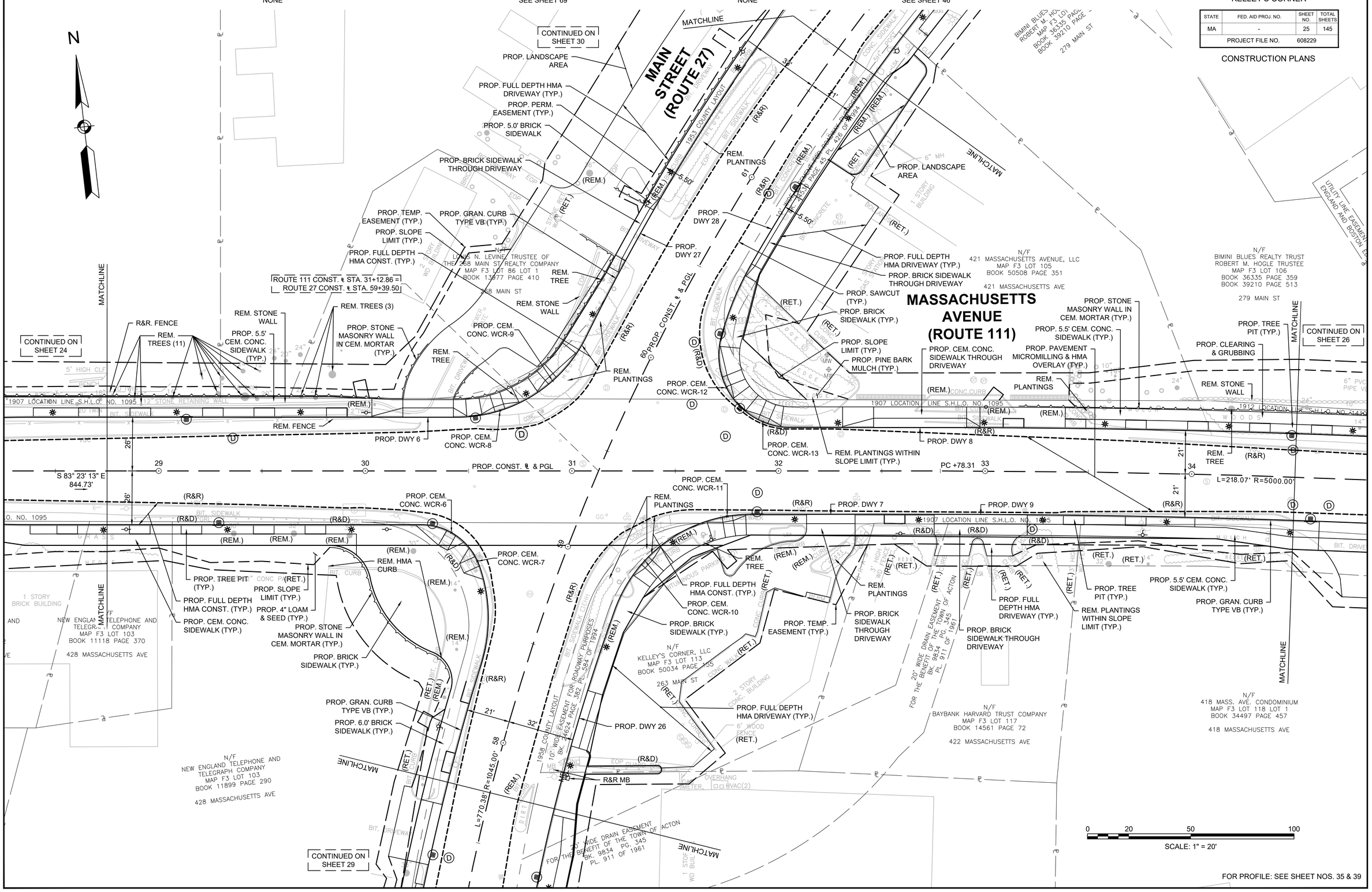
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE SHEET 46

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	25	145
PROJECT FILE NO.	608229		

CONSTRUCTION PLANS



FOR PROFILE: SEE SHEET NOS. 35 & 39

16093_HD(CO).DWG Plotted on 25-Jan-2018 11:00 AM

HIGHWAY GUARD DETAILS
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET 71

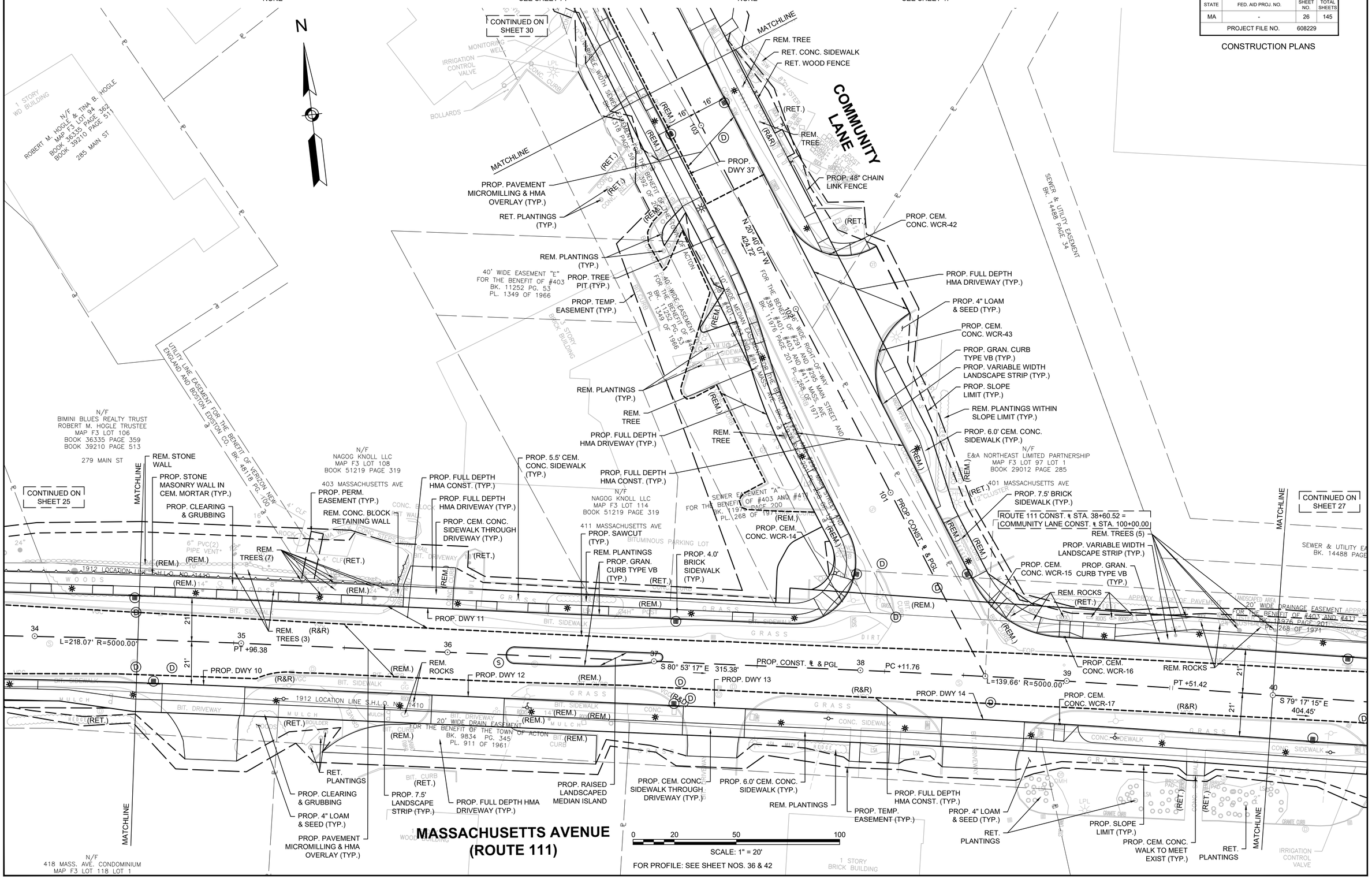
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE SHEET 47

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	26	145
PROJECT FILE NO.	608229		

CONSTRUCTION PLANS



16093_HD(CO).DWG Plotted on 25-Jan-2018 11:00 AM

HIGHWAY GUARD DETAILS
NONE

TRAFFIC SIGNAL CONDUIT
NONE

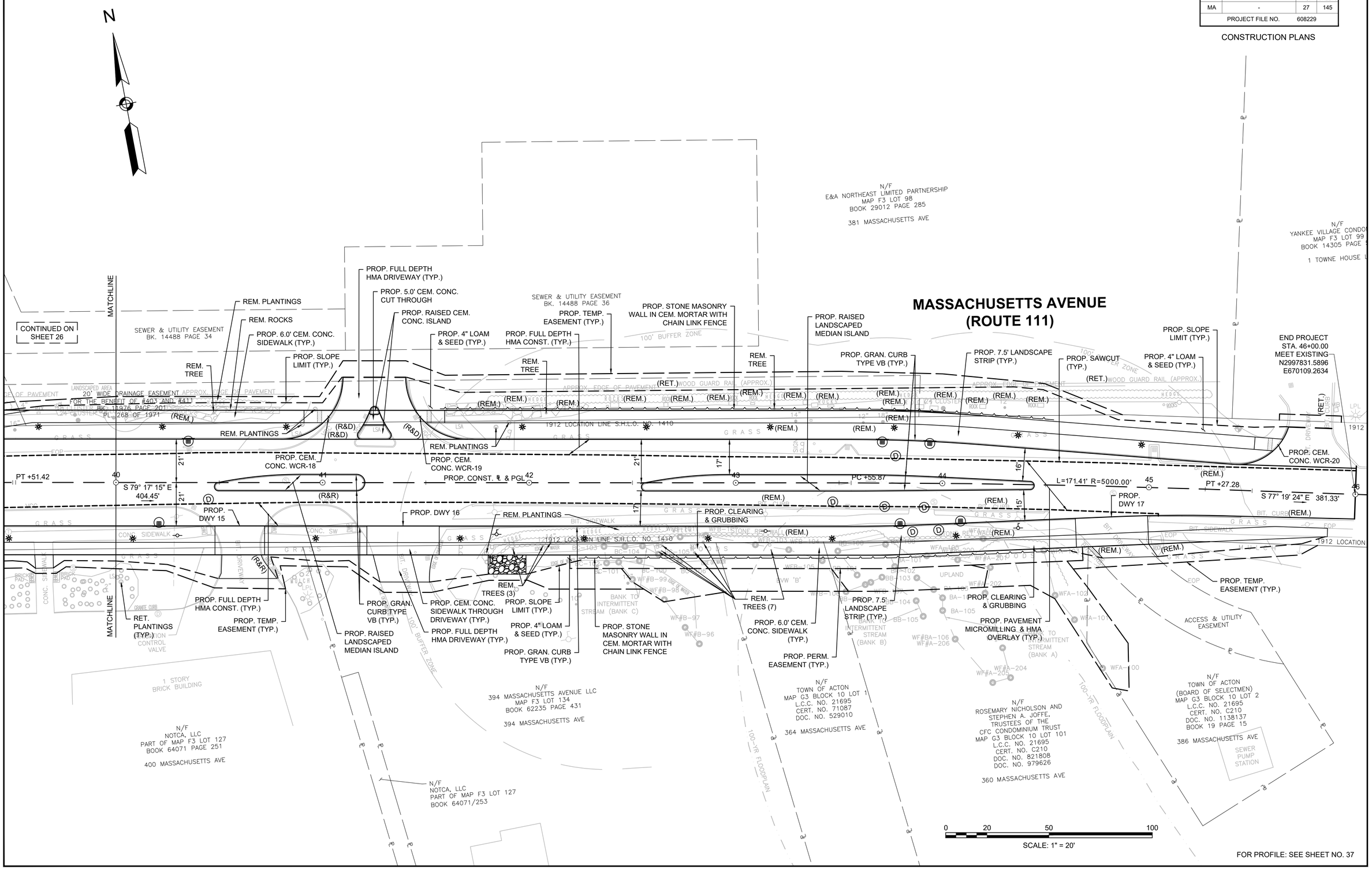
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE SHEET 48

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	27	145
PROJECT FILE NO.	608229		

CONSTRUCTION PLANS



FOR PROFILE: SEE SHEET NO. 37

16093_HD(CO).DWG Plotted on 25-Jan-2018 11:00 AM

HIGHWAY GUARD DETAILS
NONE

TRAFFIC SIGNAL CONDUIT
NONE

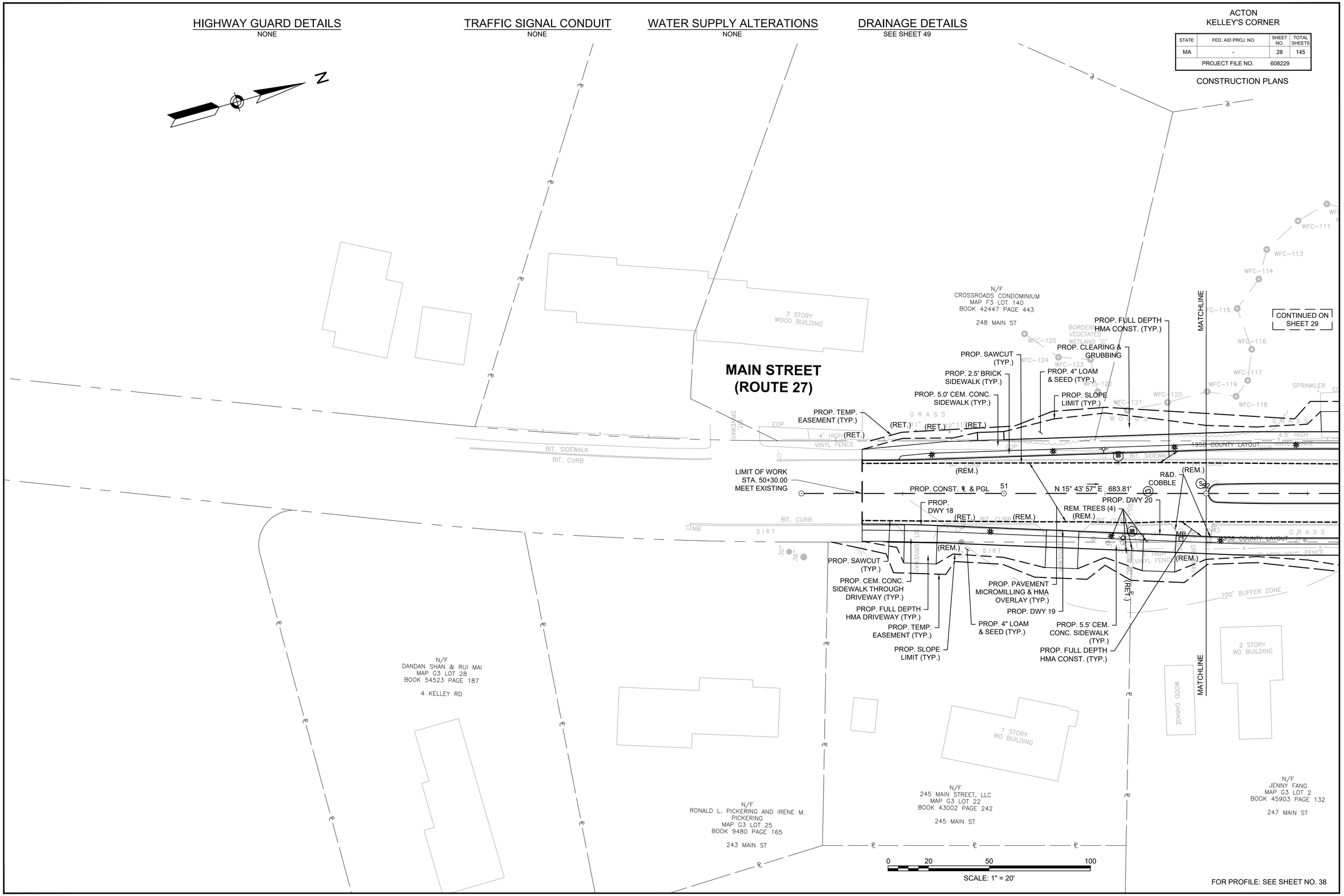
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE SHEET 49

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	28	145
PROJECT FILE NO.	608229		

CONSTRUCTION PLANS



FOR PROFILE: SEE SHEET NO. 38

16093_HD(CO).DWG Plotted on 25-Jan-2018 11:00 AM

HIGHWAY GUARD DETAILS
NONE

TRAFFIC SIGNAL CONDUIT
NONE

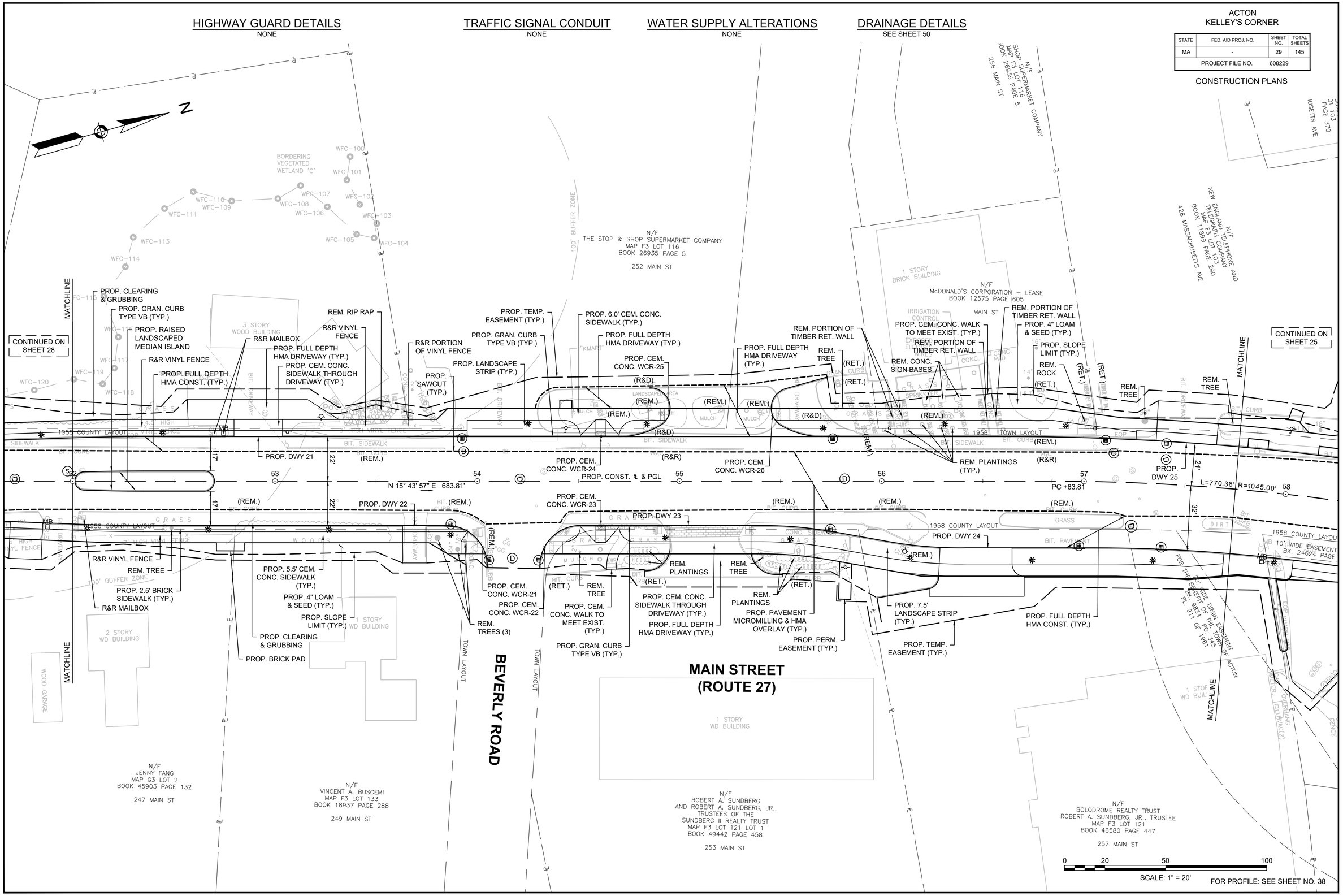
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE SHEET 50

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	29	145
PROJECT FILE NO.	608229		

CONSTRUCTION PLANS



FOR PROFILE: SEE SHEET NO. 38

16093_HD(CO).DWG Plotted on 25-Jan-2018 11:00 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	30	145
PROJECT FILE NO.	608229		

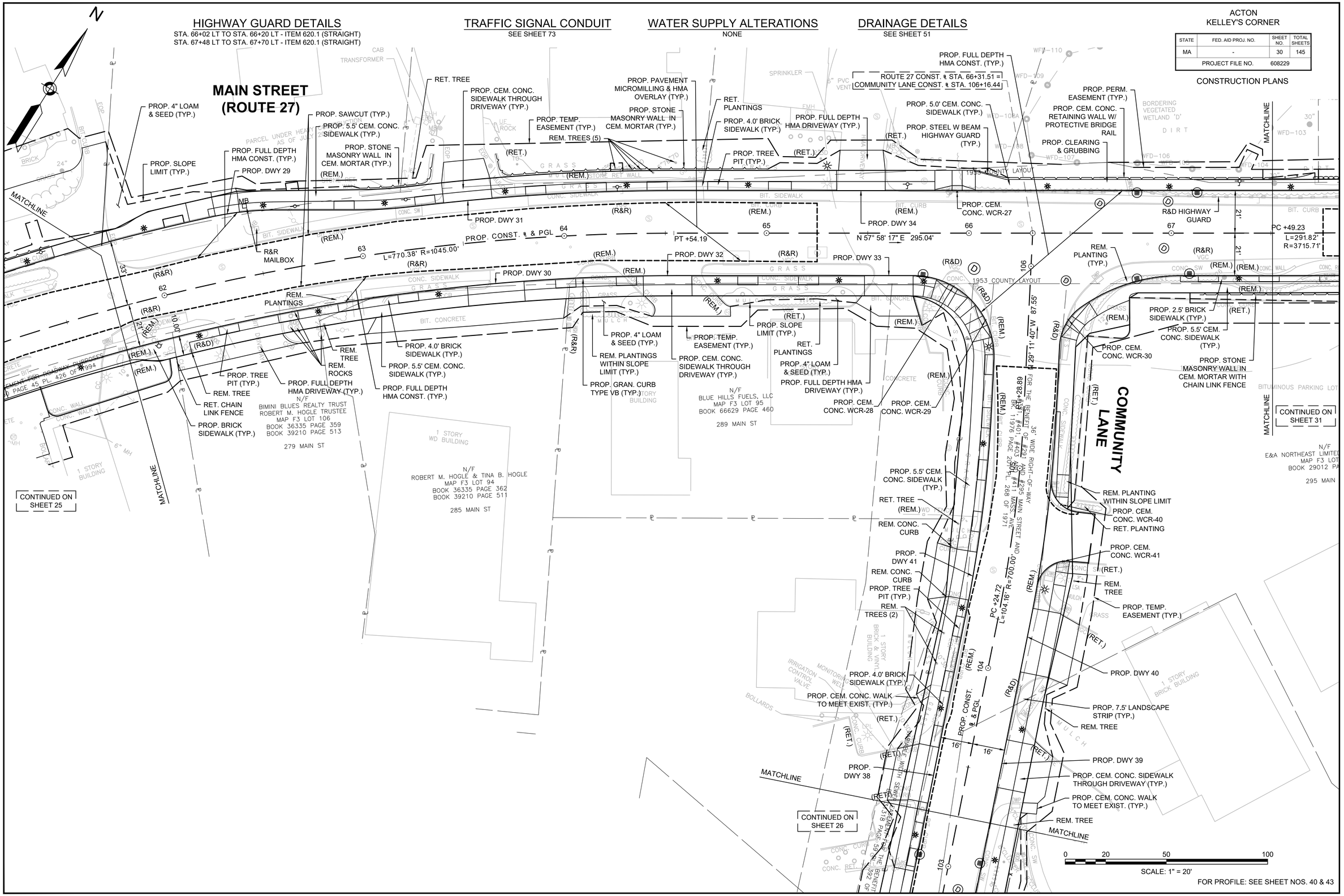
CONSTRUCTION PLANS

HIGHWAY GUARD DETAILS
STA. 66+02 LT TO STA. 66+20 LT - ITEM 620.1 (STRAIGHT)
STA. 67+48 LT TO STA. 67+70 LT - ITEM 620.1 (STRAIGHT)

TRAFFIC SIGNAL CONDUIT
SEE SHEET 73

WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE SHEET 51



FOR PROFILE: SEE SHEET NOS. 40 & 43

16093_HD(CO)DWG Plotted on 25-Jan-2018 11:00 AM

HIGHWAY GUARD DETAILS
STA. 67+48 LT TO STA. 67+70 LT - ITEM 620.1 (STRAIGHT)

TRAFFIC SIGNAL CONDUIT
NONE

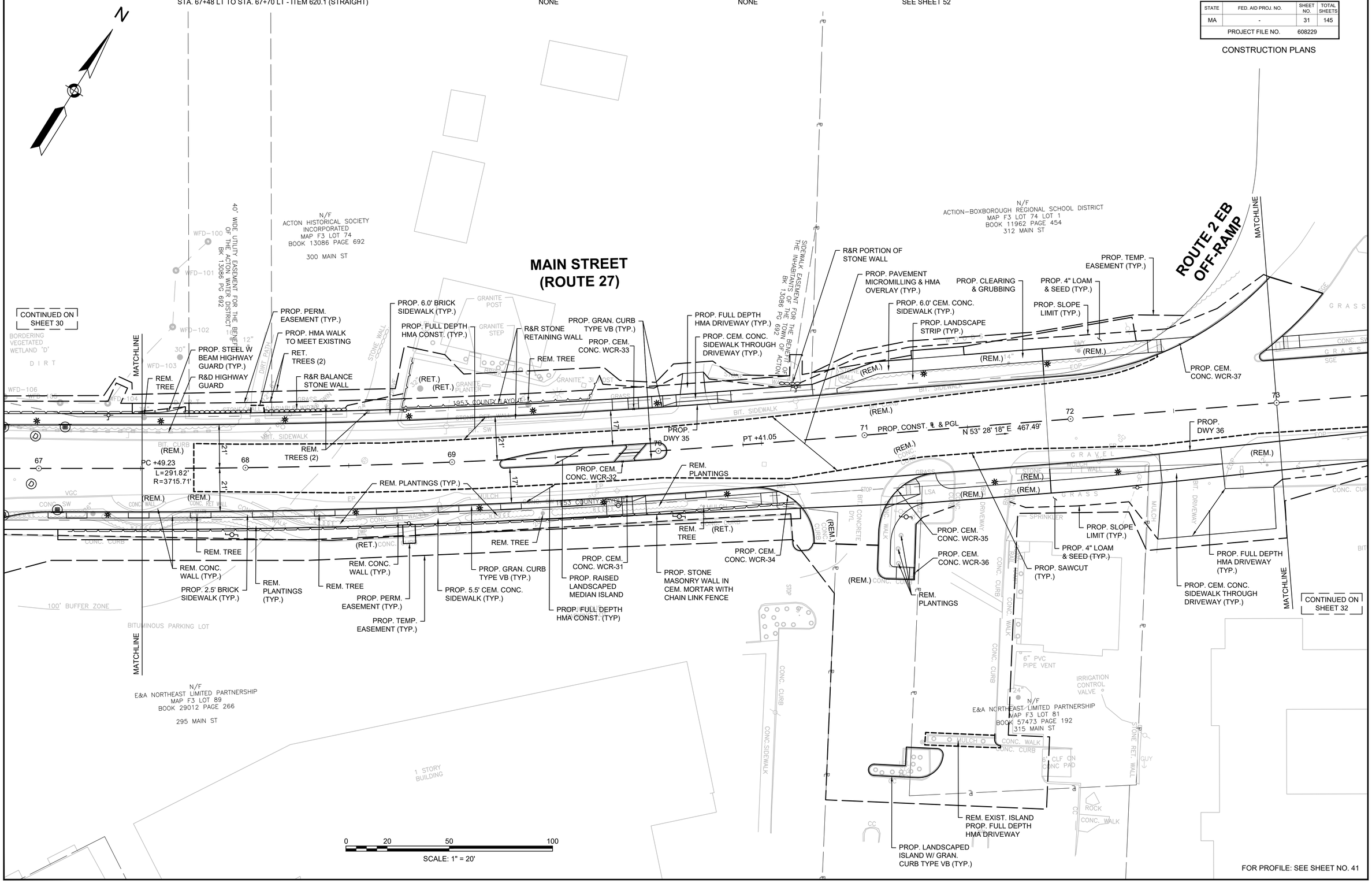
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE SHEET 52

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	31	145
PROJECT FILE NO.	608229		

CONSTRUCTION PLANS



FOR PROFILE: SEE SHEET NO. 41

16093_HD(CO).DWG Plotted on 25-Jan-2018 11:00 AM

HIGHWAY GUARD DETAILS
NONE

TRAFFIC SIGNAL CONDUIT
NONE

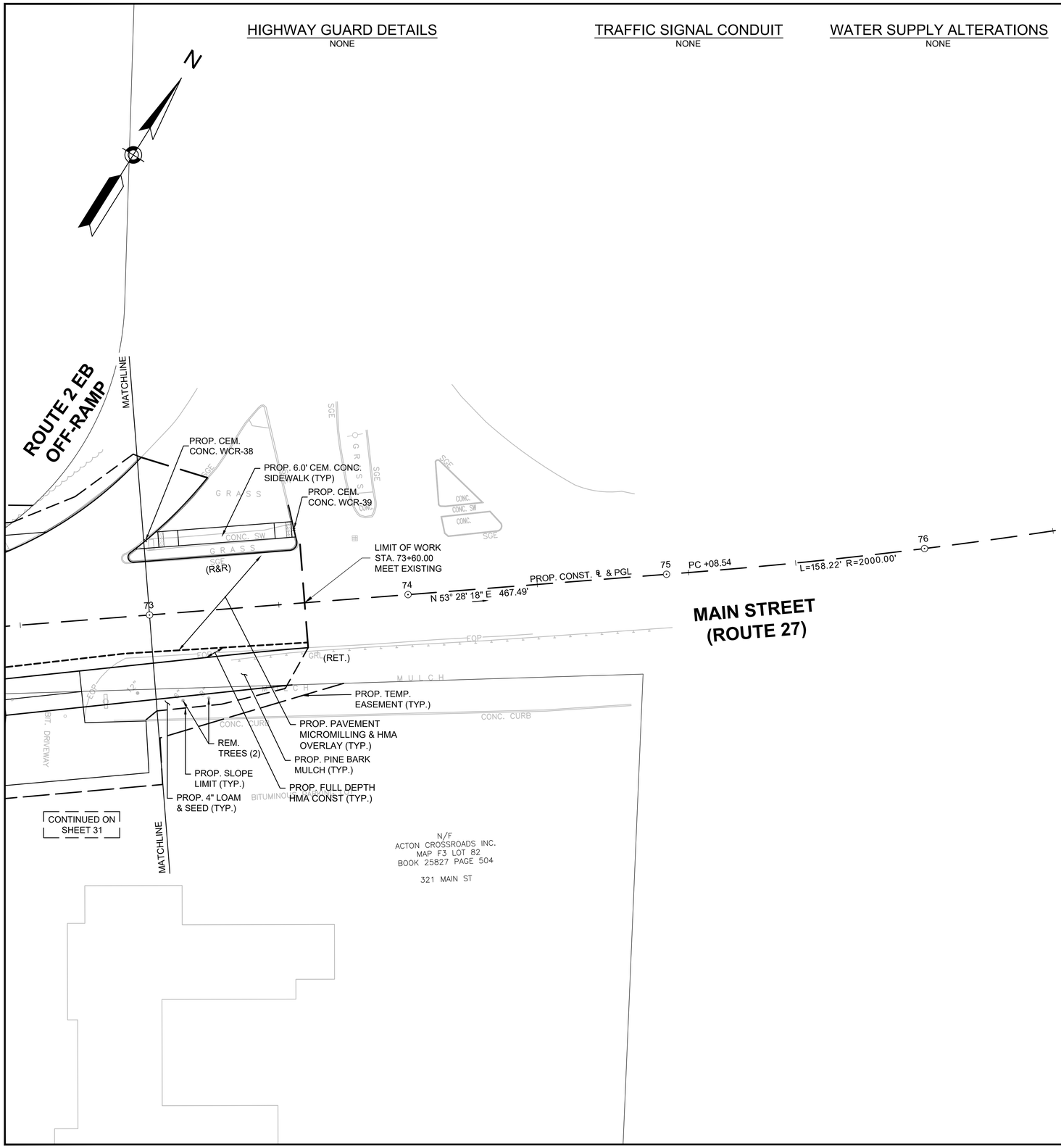
WATER SUPPLY ALTERATIONS
NONE

DRAINAGE DETAILS
SEE SHEET 53

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	32	145
PROJECT FILE NO.	608229		

CONSTRUCTION PLANS



0 20 50 100
SCALE: 1" = 20'

FOR PROFILE SEE SHEET 41

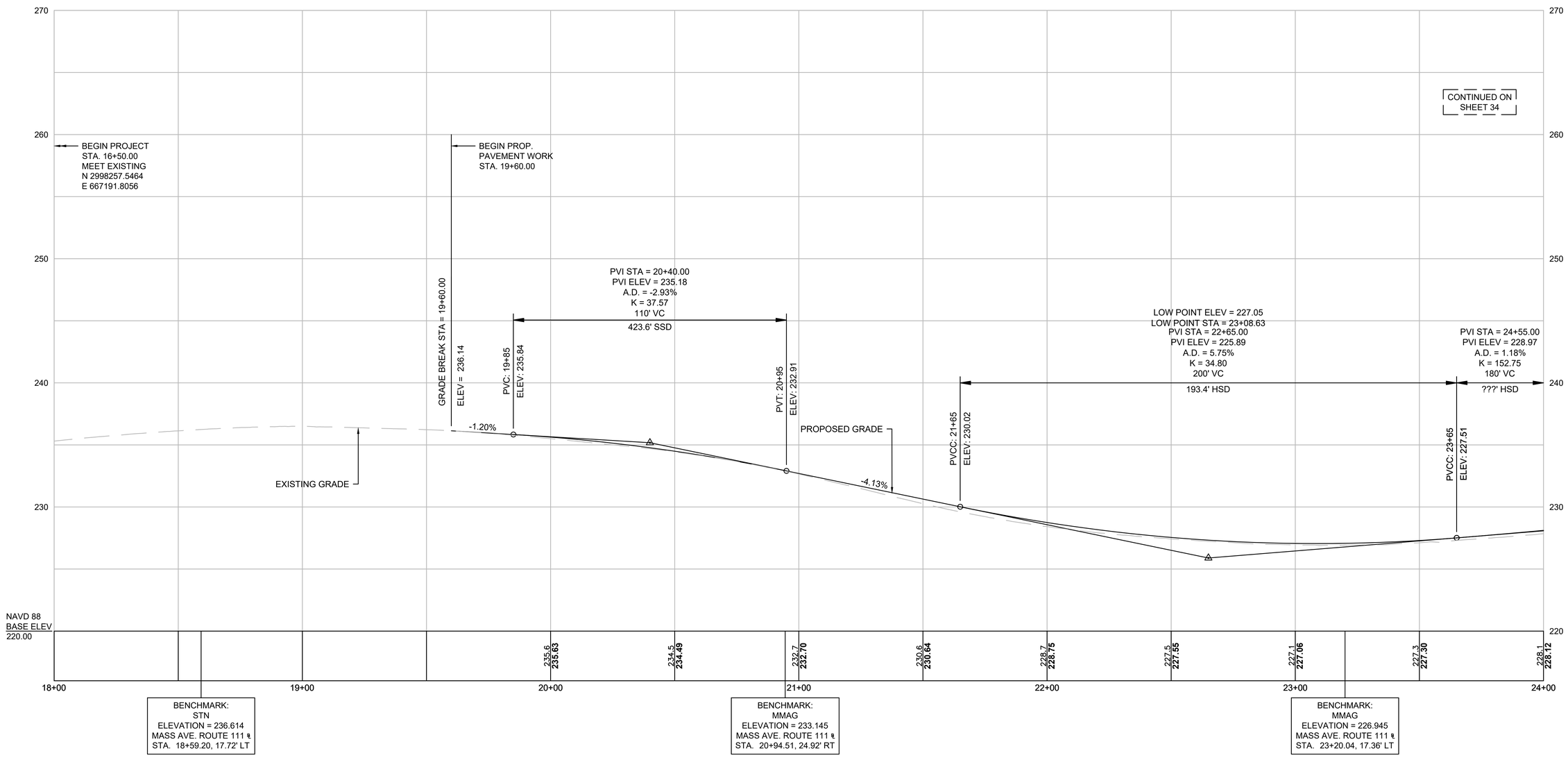
16093_HD(CO).DWG Plotted on 25-Jan-2018 11:00 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	33	145
PROJECT FILE NO.	608229		

CONSTRUCTION PROFILES

MASS AVE. (ROUTE 111)



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

FOR CONSTRUCTION PLAN SEE SHEET NO. 23

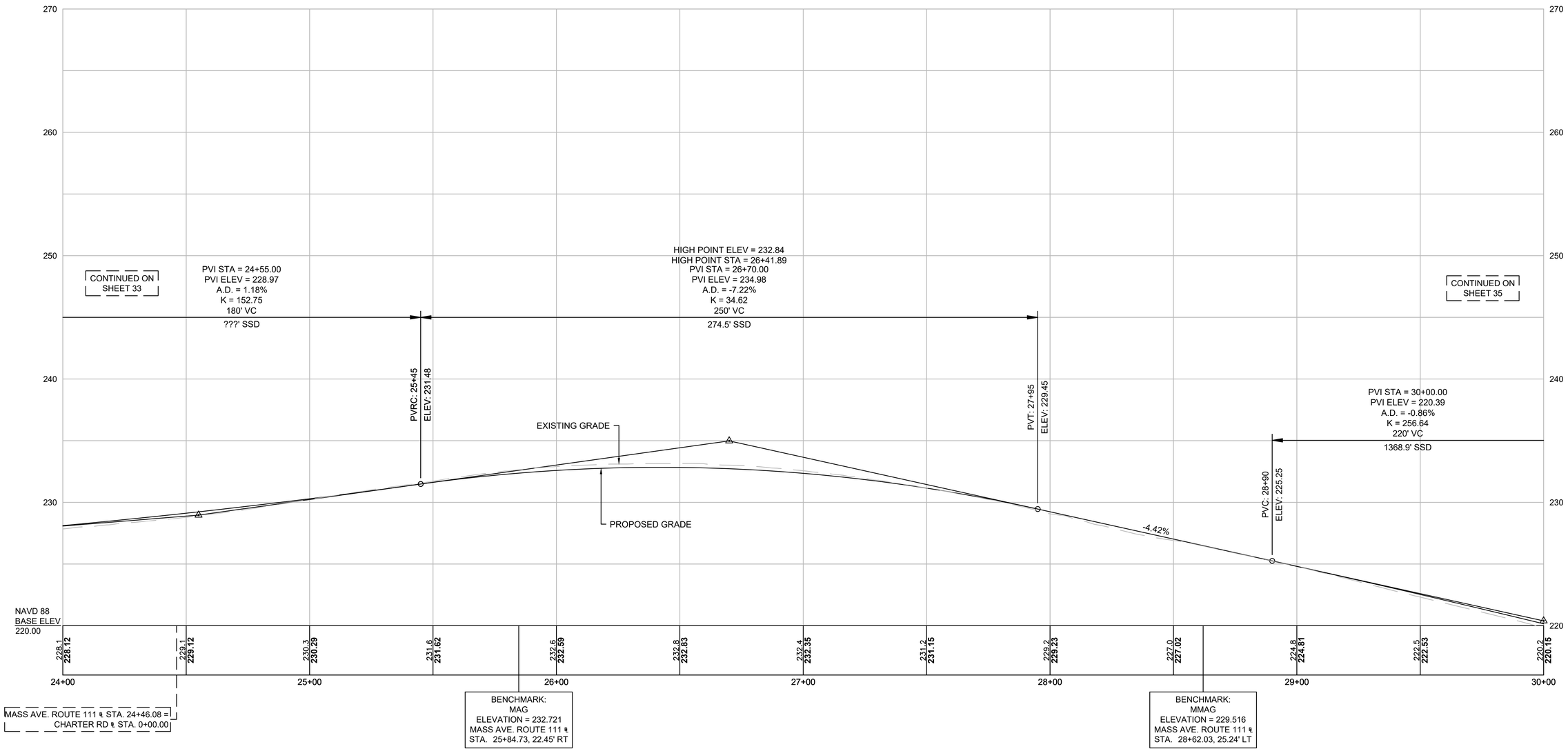
16093_HD(PR).DWG Plotted on 25-Jan-2018 11:00 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	34	145
PROJECT FILE NO.	608229		

CONSTRUCTION PROFILES

MASS AVE. (ROUTE 111)



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

FOR CONSTRUCTION PLAN SEE SHEET NO. 24

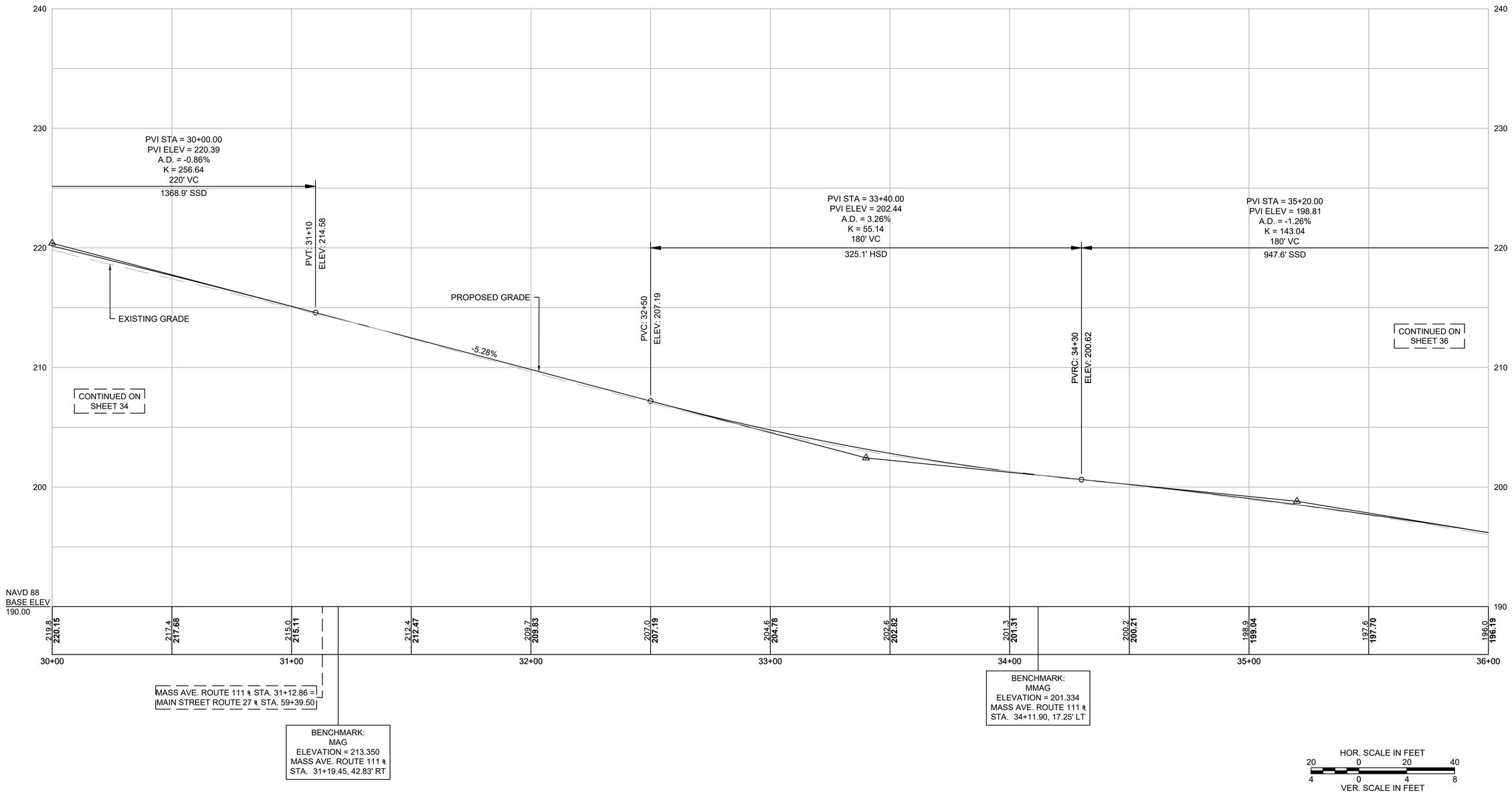
16093_HD(PR).DWG Plotted on 25-Jan-2018 11:00 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	35	145
PROJECT FILE NO.	608229		

CONSTRUCTION PROFILES

MASS AVE. (ROUTE 111)



FOR CONSTRUCTION PLAN SEE SHEET NO. 25

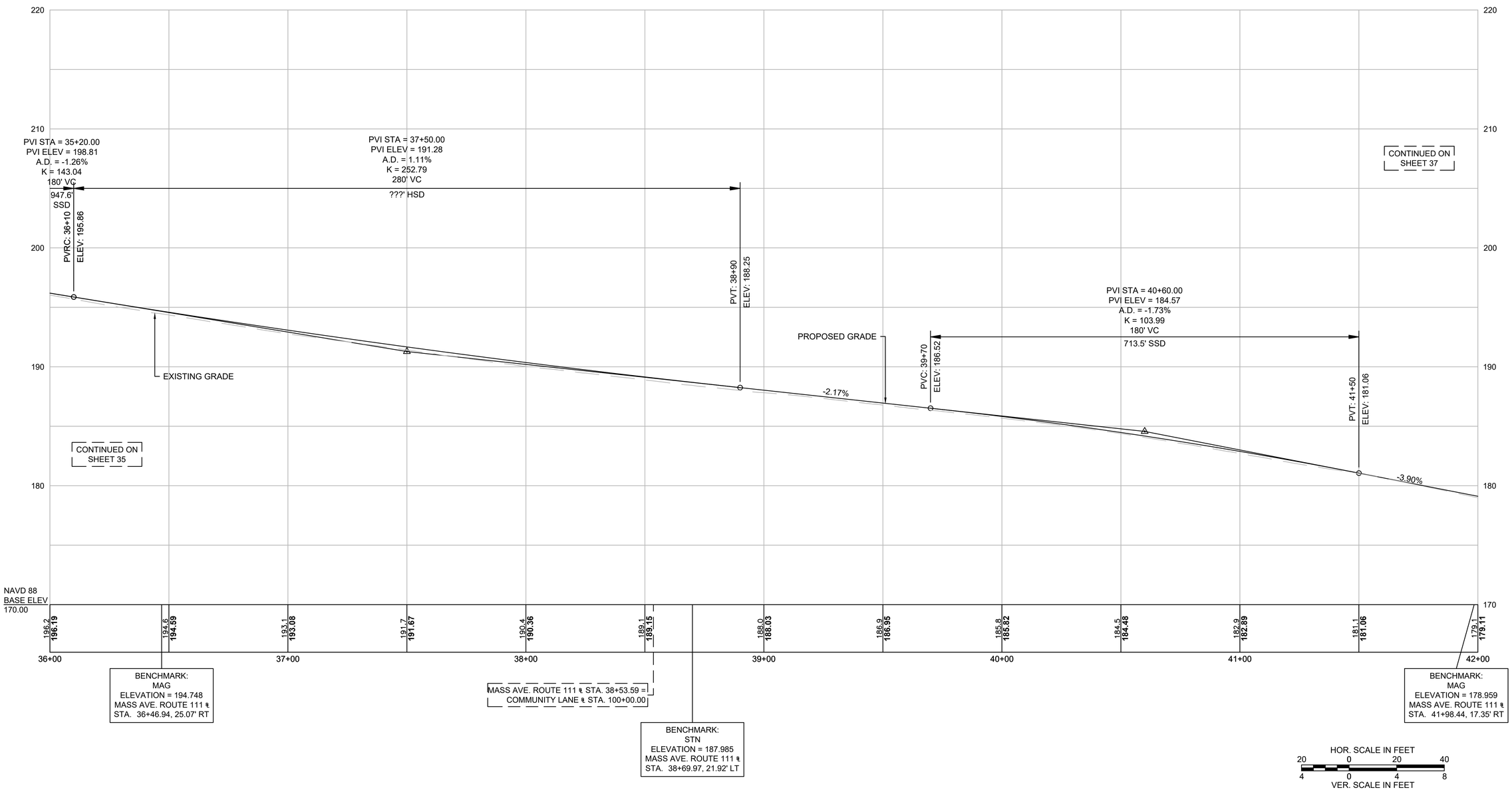
16093_HD(PR).DWG Plotted on 25-Jan-2018 11:00 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	36	145
PROJECT FILE NO.	608229		

CONSTRUCTION PROFILES

MASS AVE. (ROUTE 111)



FOR CONSTRUCTION PLAN SEE SHEET NO. 26

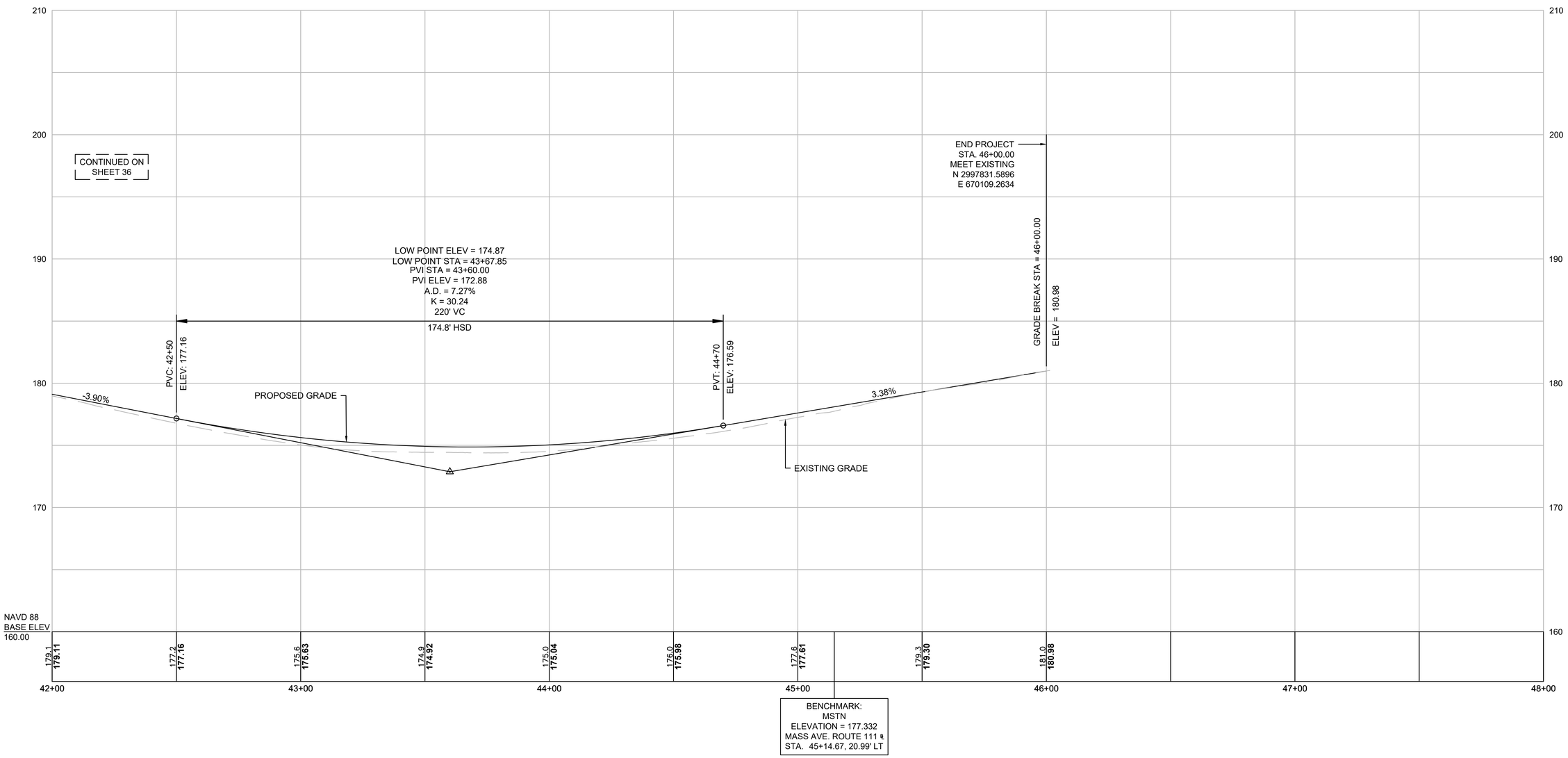
16093_HD(PR).DWG Plotted on 25-Jan-2018 11:01 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	37	145
PROJECT FILE NO.	608229		

CONSTRUCTION PROFILES

MASS AVE. (ROUTE 111)



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

FOR CONSTRUCTION PLAN SEE SHEET NO. 27

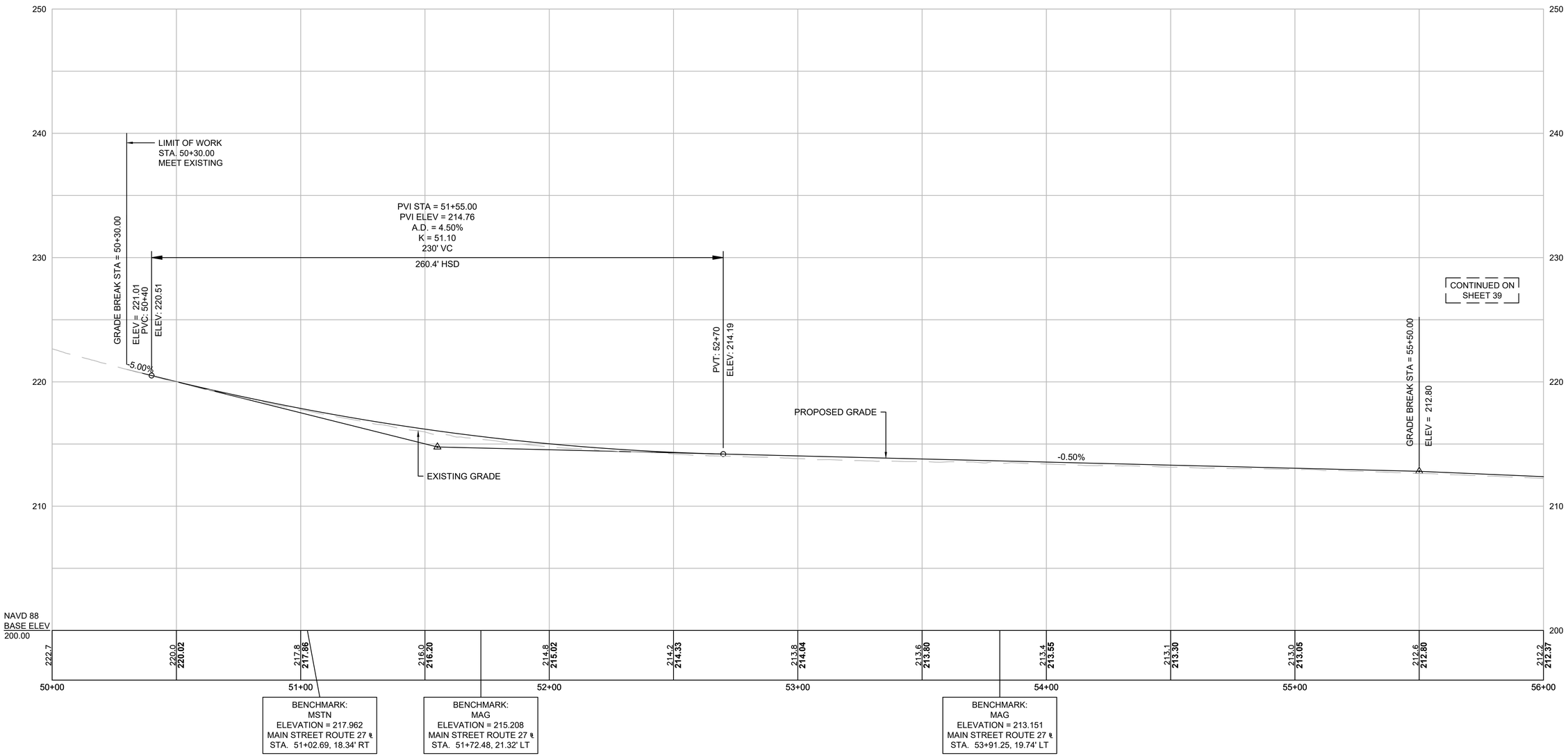
16093_HD(PR).DWG Plotted on 25-Jan-2018 11:01 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	38	145
PROJECT FILE NO.	608229		

CONSTRUCTION PROFILES

MAIN STREET (ROUTE 27)



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

FOR CONSTRUCTION PLAN SEE SHEET NOS. 28 & 29

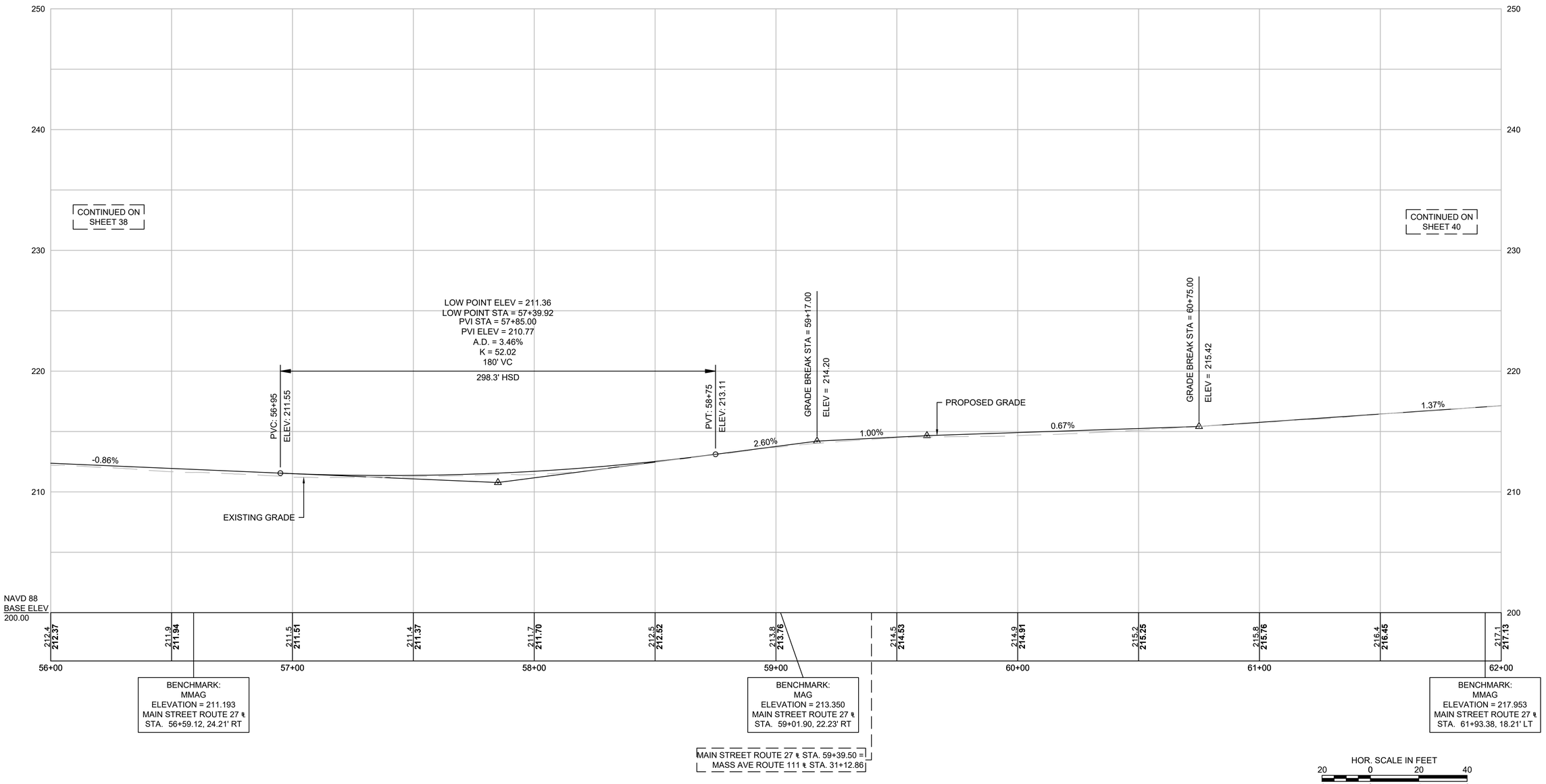
16093_HD(PR).DWG Plotted on 25-Jan-2018 11:01 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	39	145
PROJECT FILE NO.	608229		

CONSTRUCTION PROFILES

MAIN STREET (ROUTE 27)



FOR CONSTRUCTION PLAN SEE SHEET NO. 25

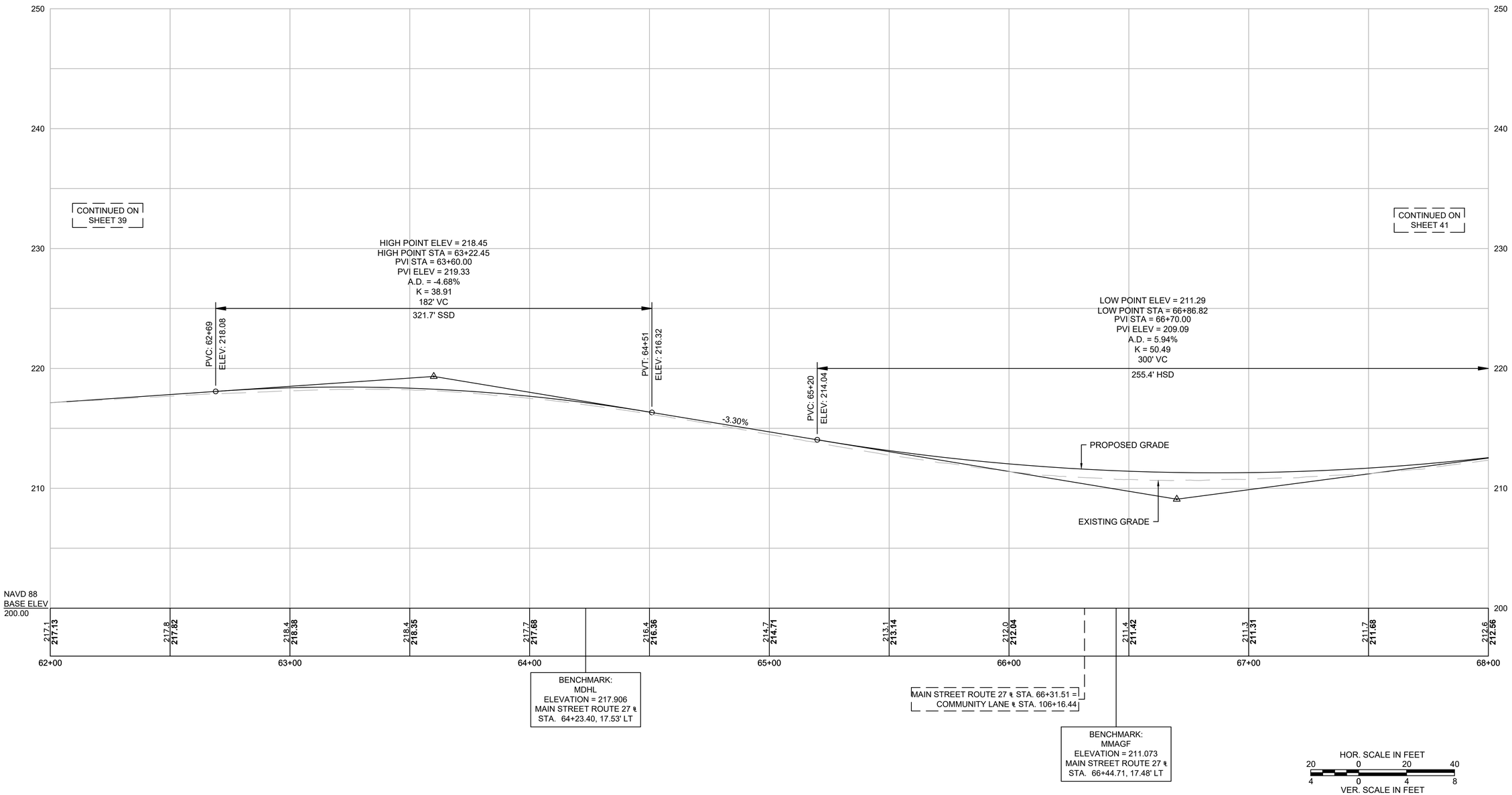
16093_HD(PR).DWG Plotted on 25-Jan-2018 11:01 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	40	145
PROJECT FILE NO.	608229		

CONSTRUCTION PROFILES

MAIN STREET (ROUTE 27)



FOR CONSTRUCTION PLAN SEE SHEET NO. 30

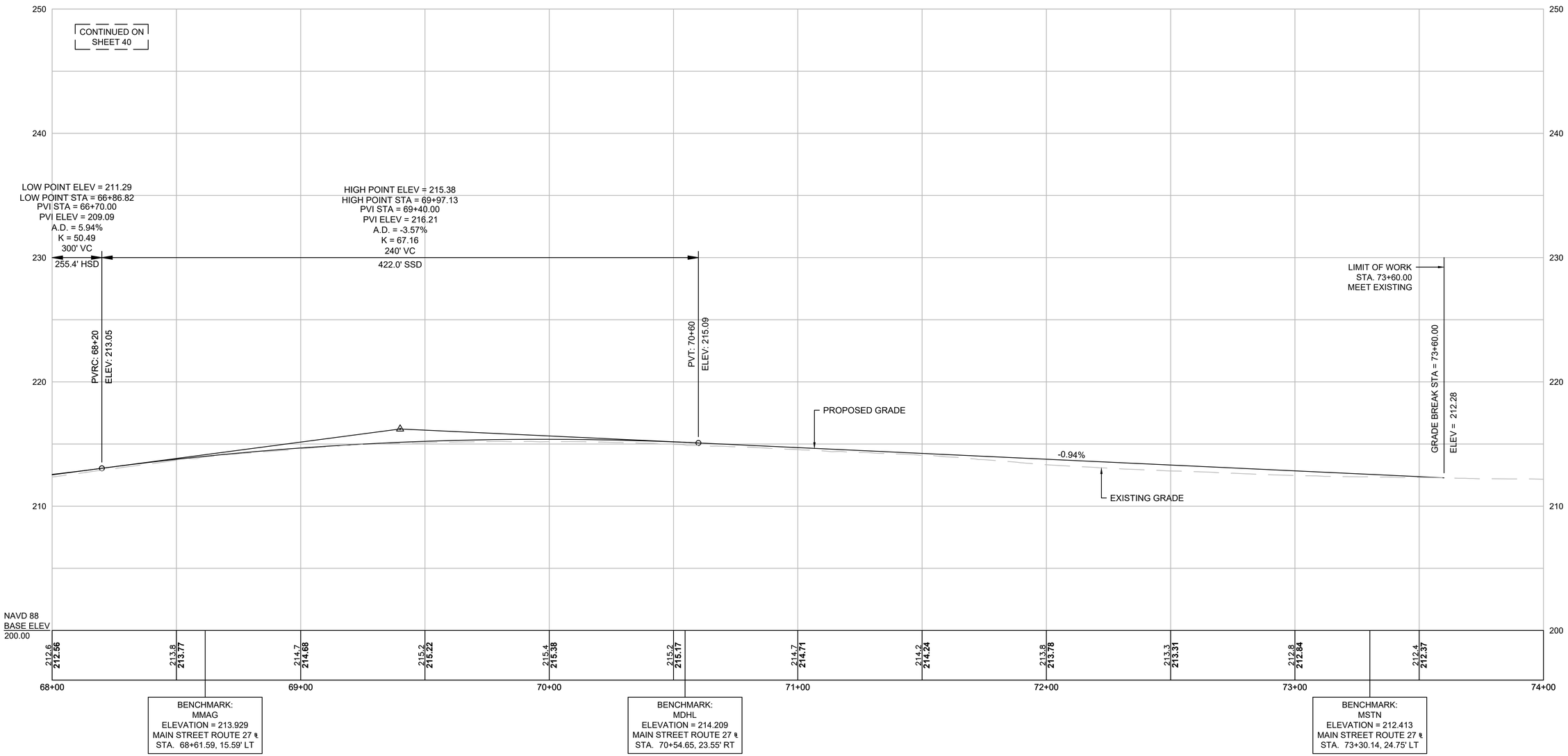
16093_HD(PR).DWG Plotted on 25-Jan-2018 11:01 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	41	145
PROJECT FILE NO.	608229		

CONSTRUCTION PROFILES

MAIN STREET (ROUTE 27)



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

FOR CONSTRUCTION PLAN SEE SHEET NOS. 31 & 32

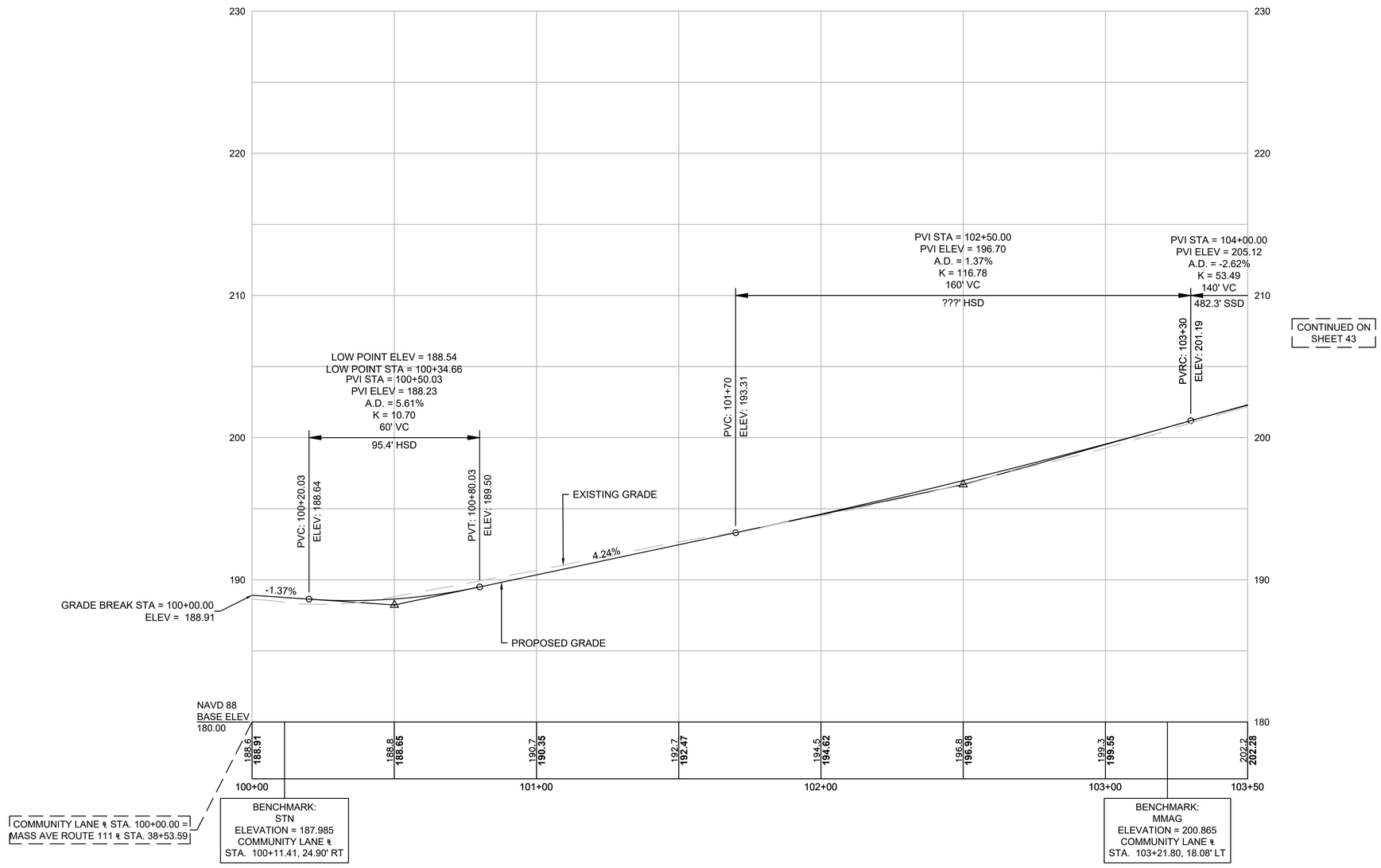
16093_HD(PR).DWG Plotted on 25-Jan-2018 11:01 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	42	145
PROJECT FILE NO.	608229		

CONSTRUCTION PROFILES

COMMUNITY LANE



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

FOR CONSTRUCTION PLAN SEE SHEET NO. 26

16093_HD(PR).DWG Plotted on 25-Jan-2018 11:01 AM

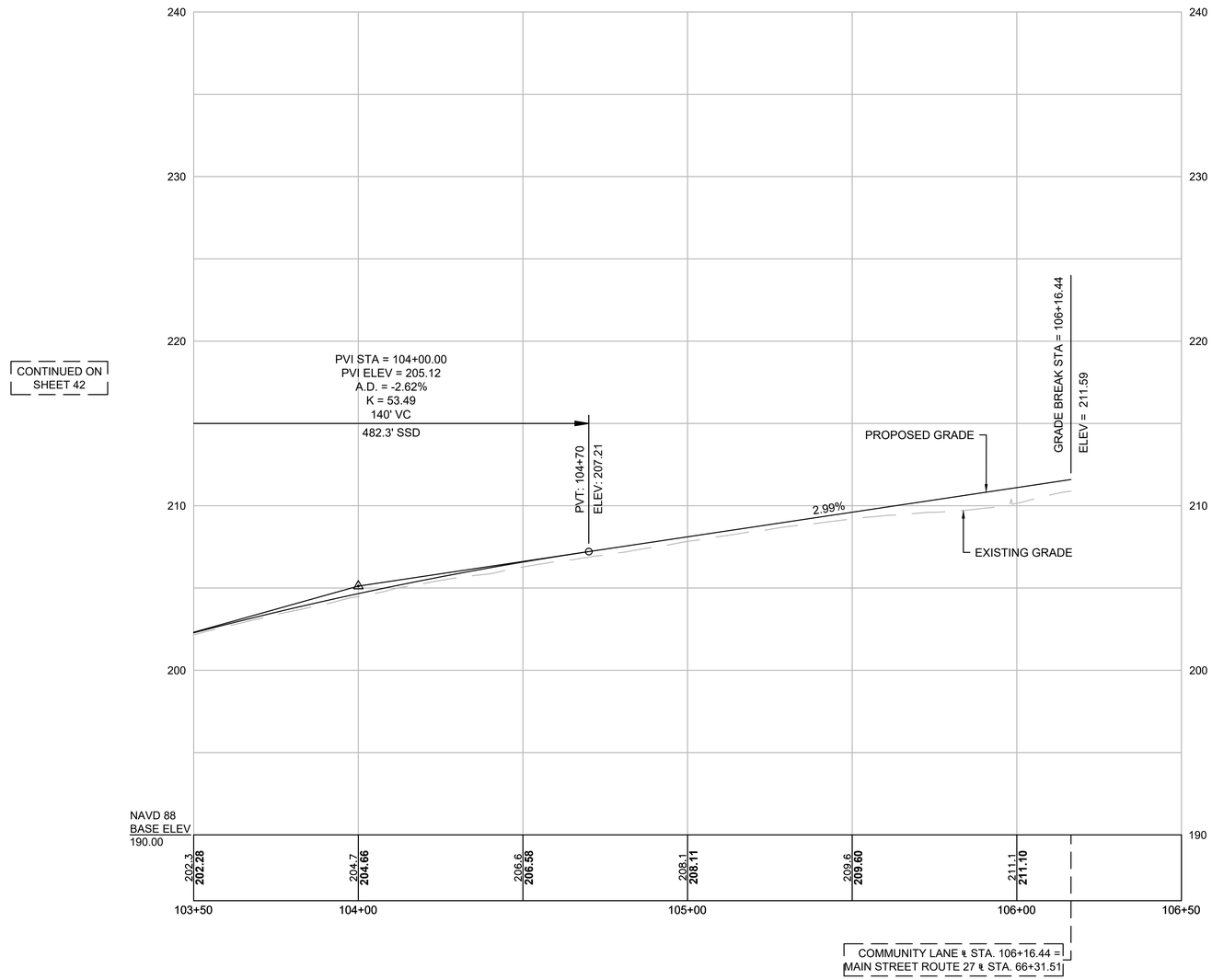
ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	43	145
PROJECT FILE NO.	608229		

CONSTRUCTION PROFILES

16093_HD(PR).DWG Plotted on 25-Jan-2018 11:01 AM

COMMUNITY LANE



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

FOR CONSTRUCTION PLAN SEE SHEET NO. 30

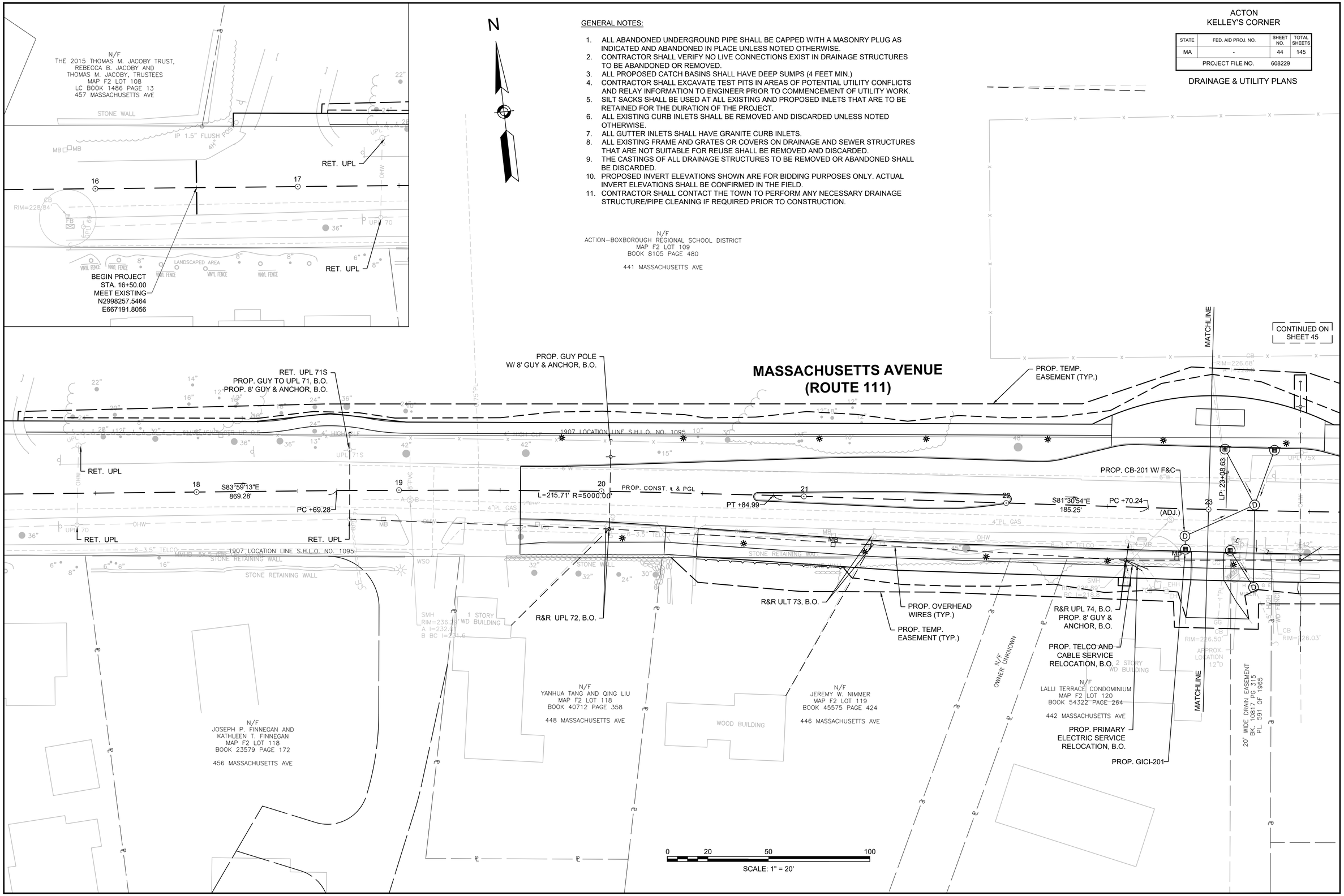
ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	44	145
PROJECT FILE NO.	608229		

DRAINAGE & UTILITY PLANS

GENERAL NOTES:

1. ALL ABANDONED UNDERGROUND PIPE SHALL BE CAPPED WITH A MASONRY PLUG AS INDICATED AND ABANDONED IN PLACE UNLESS NOTED OTHERWISE.
2. CONTRACTOR SHALL VERIFY NO LIVE CONNECTIONS EXIST IN DRAINAGE STRUCTURES TO BE ABANDONED OR REMOVED.
3. ALL PROPOSED CATCH BASINS SHALL HAVE DEEP SUMPS (4 FEET MIN.)
4. CONTRACTOR SHALL EXCAVATE TEST PITS IN AREAS OF POTENTIAL UTILITY CONFLICTS AND RELAY INFORMATION TO ENGINEER PRIOR TO COMMENCEMENT OF UTILITY WORK.
5. SILT SACKS SHALL BE USED AT ALL EXISTING AND PROPOSED INLETS THAT ARE TO BE RETAINED FOR THE DURATION OF THE PROJECT.
6. ALL EXISTING CURB INLETS SHALL BE REMOVED AND DISCARDED UNLESS NOTED OTHERWISE.
7. ALL GUTTER INLETS SHALL HAVE GRANITE CURB INLETS.
8. ALL EXISTING FRAME AND GRATES OR COVERS ON DRAINAGE AND SEWER STRUCTURES THAT ARE NOT SUITABLE FOR REUSE SHALL BE REMOVED AND DISCARDED.
9. THE CASTINGS OF ALL DRAINAGE STRUCTURES TO BE REMOVED OR ABANDONED SHALL BE DISCARDED.
10. PROPOSED INVERT ELEVATIONS SHOWN ARE FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS SHALL BE CONFIRMED IN THE FIELD.
11. CONTRACTOR SHALL CONTACT THE TOWN TO PERFORM ANY NECESSARY DRAINAGE STRUCTURE/PIPE CLEANING IF REQUIRED PRIOR TO CONSTRUCTION.

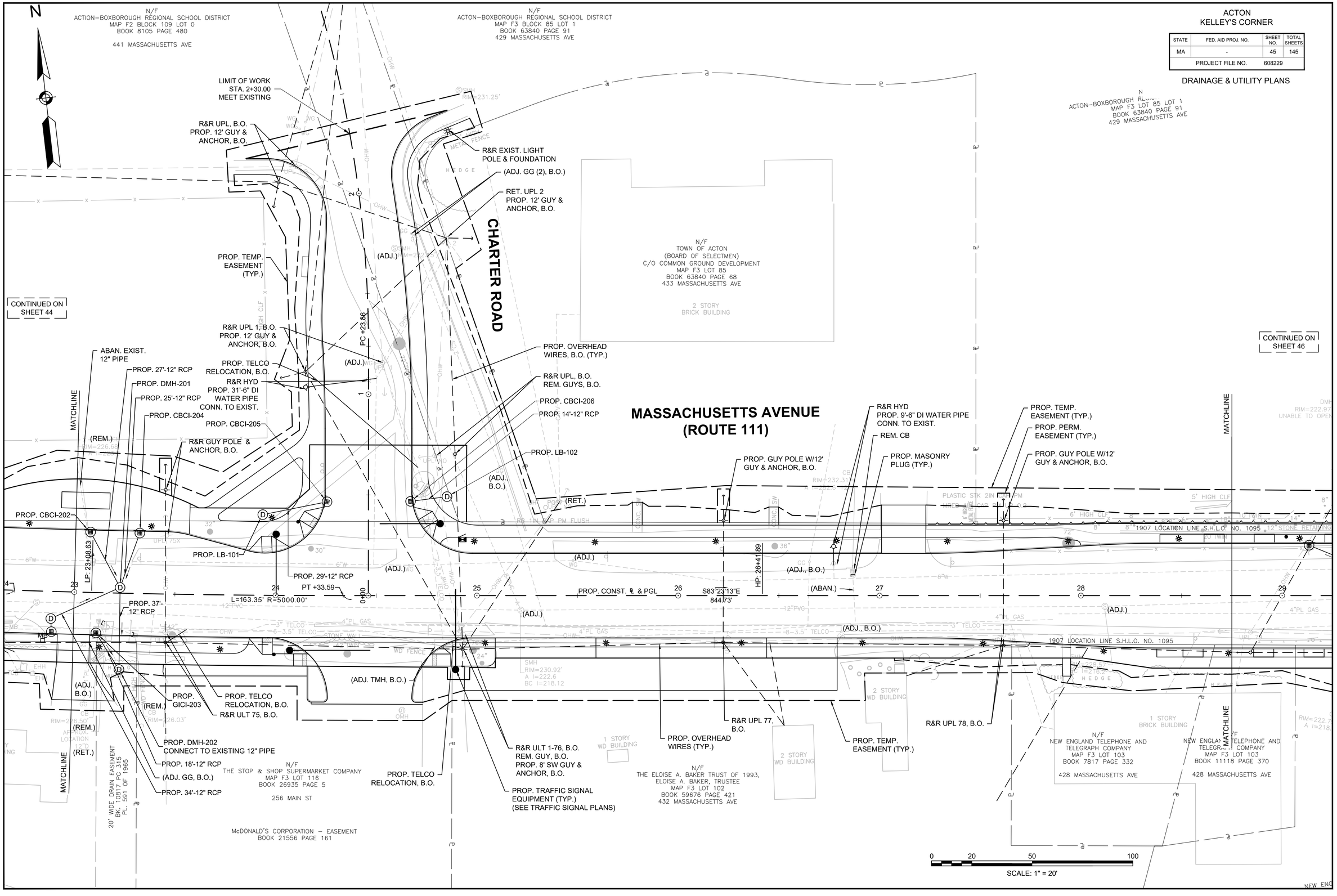


16093_HD(DU).DWG Plotted on 25-Jan-2018 11:01 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	45	145
PROJECT FILE NO.	608229		

DRAINAGE & UTILITY PLANS

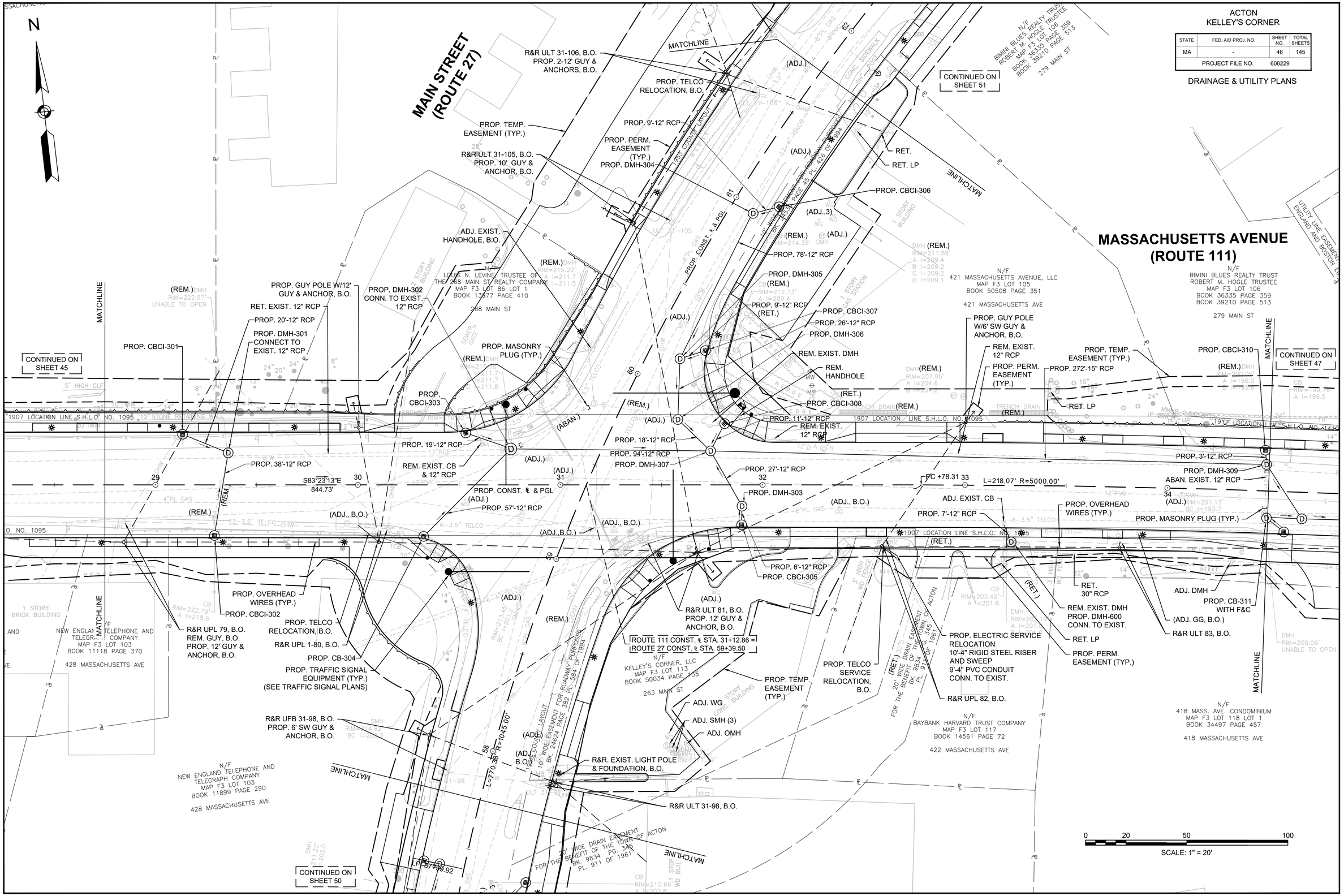


16093_HD(DU).DWG Plotted on 25-Jan-2018 11:02 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	46	145
PROJECT FILE NO.	608229		

DRAINAGE & UTILITY PLANS

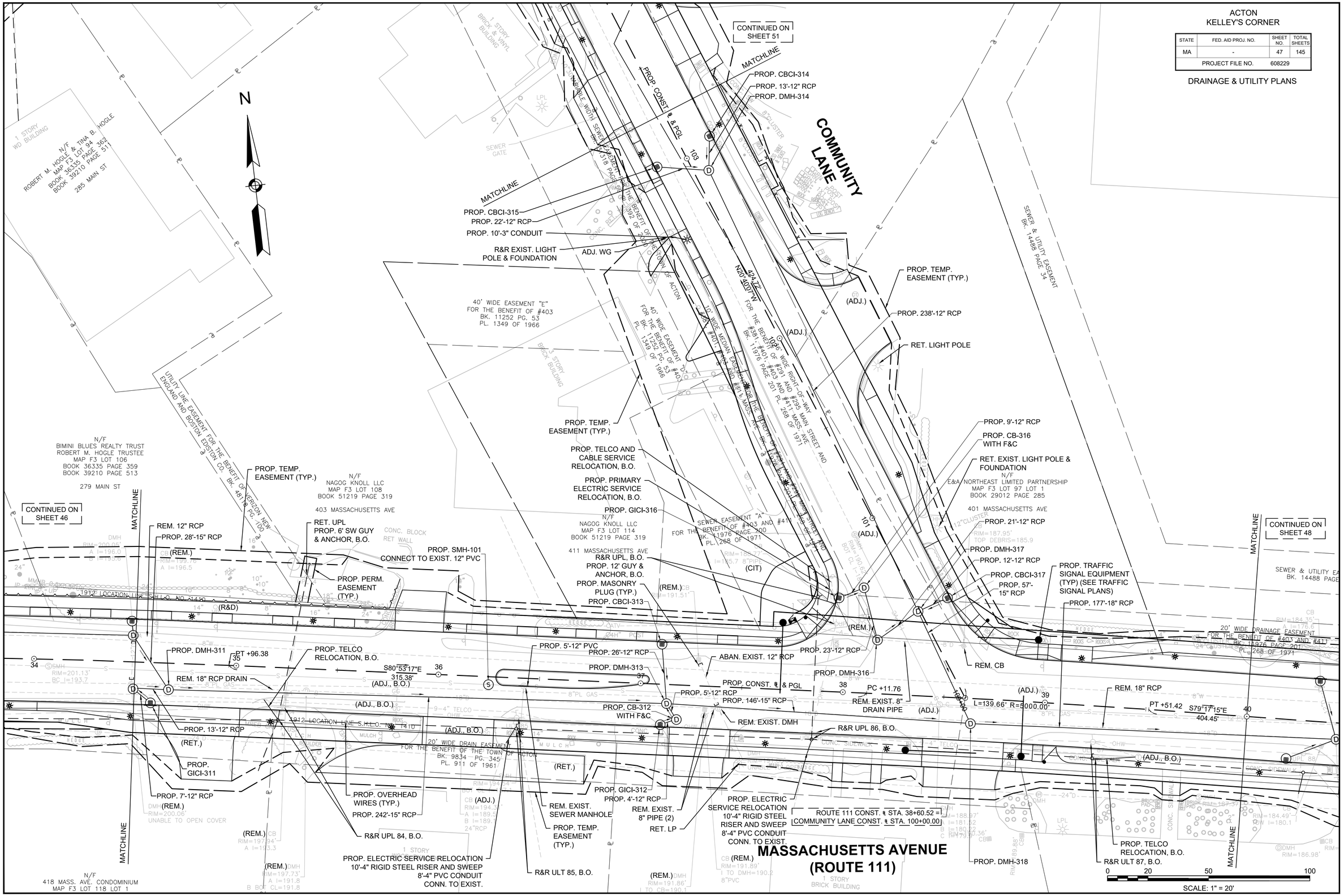


16093_HD(DU).DWG Plotted on 25-Jan-2018 11:02 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	47	145
PROJECT FILE NO.	608229		

DRAINAGE & UTILITY PLANS

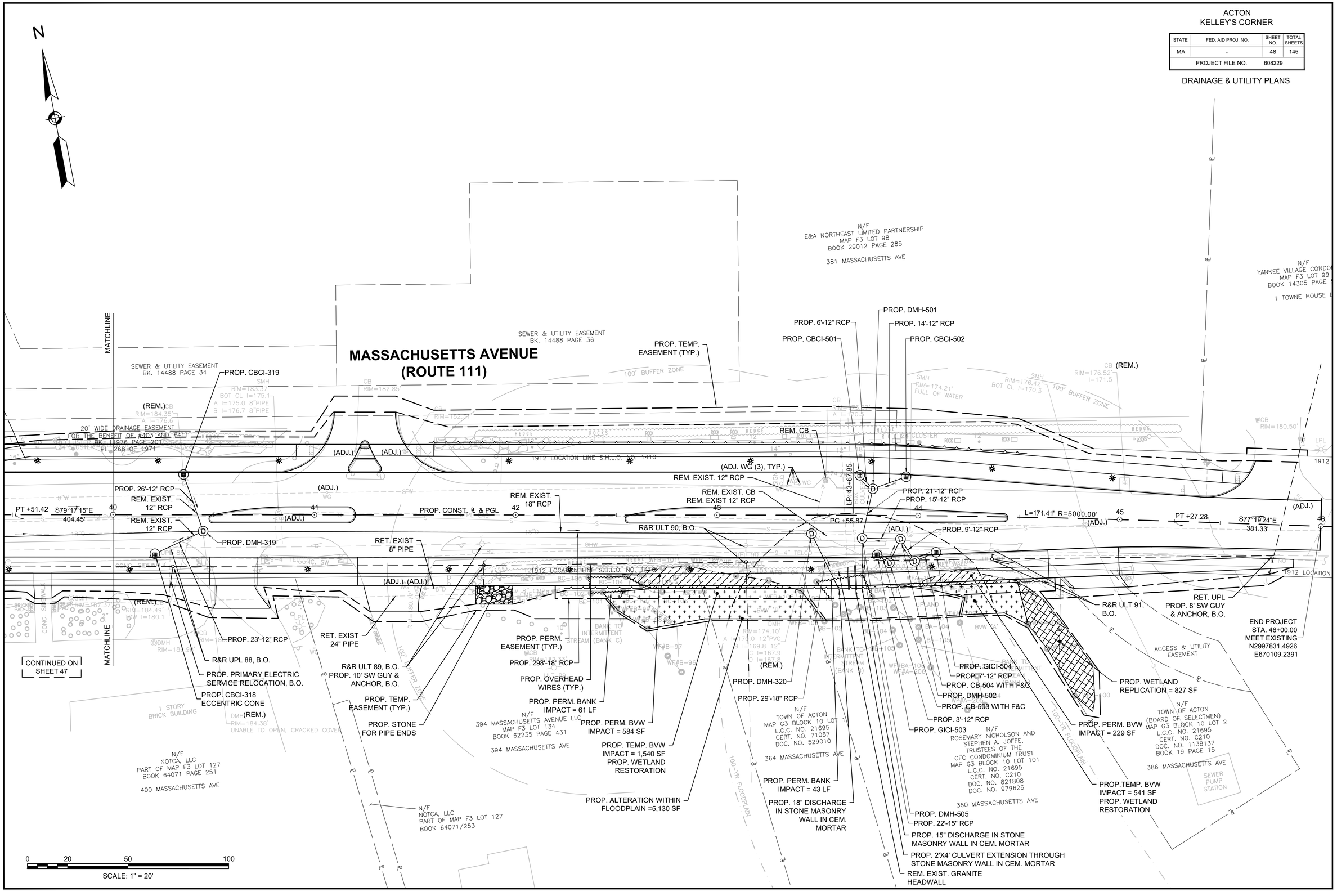


16093_HD(DU).DWG Plotted on 25-Jan-2018 11:02 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	48	145
PROJECT FILE NO.	608229		

DRAINAGE & UTILITY PLANS

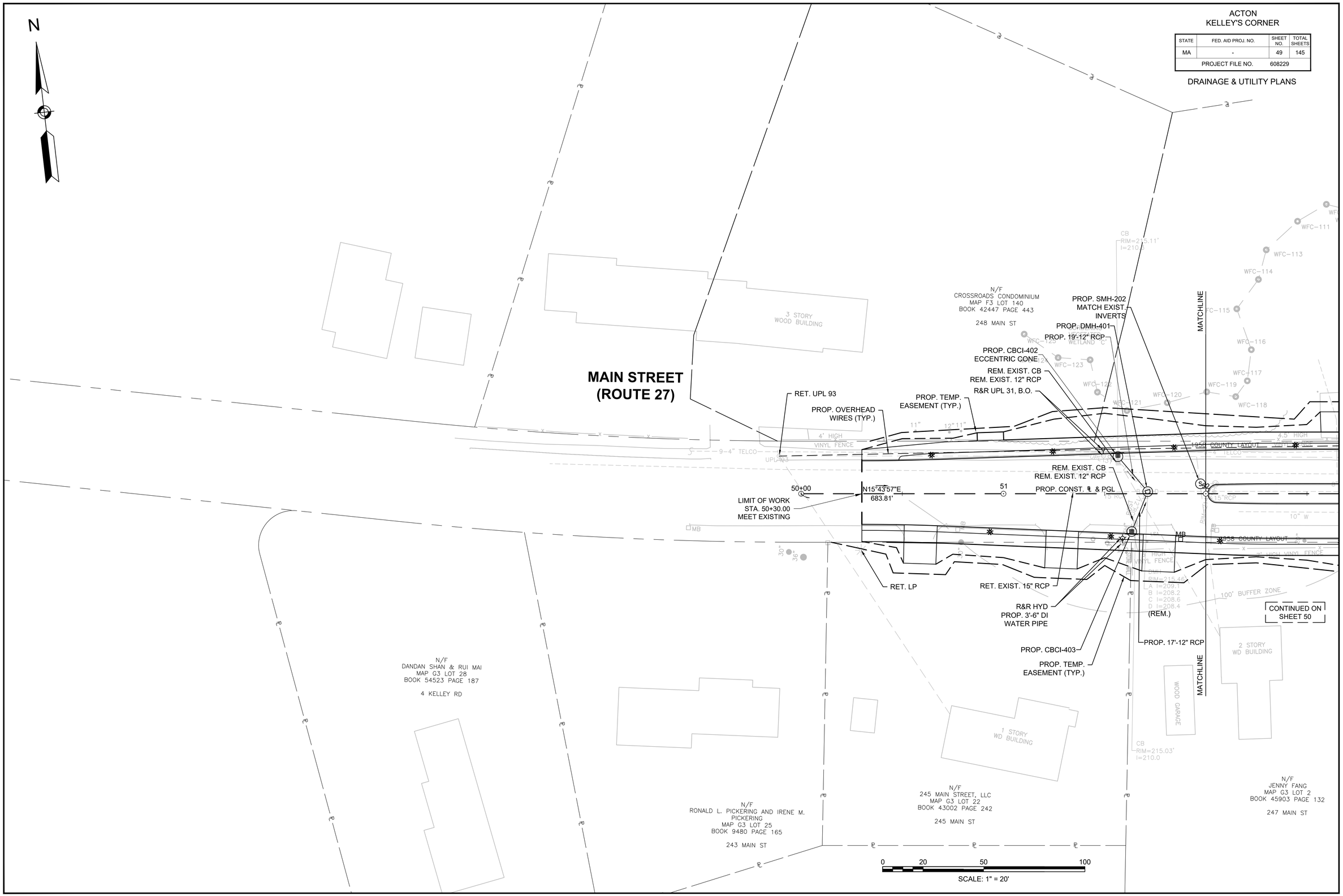


16093_HD(DU).DWG Plotted on 25-Jan-2018 11:02 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	49	145
PROJECT FILE NO.	608229		

DRAINAGE & UTILITY PLANS

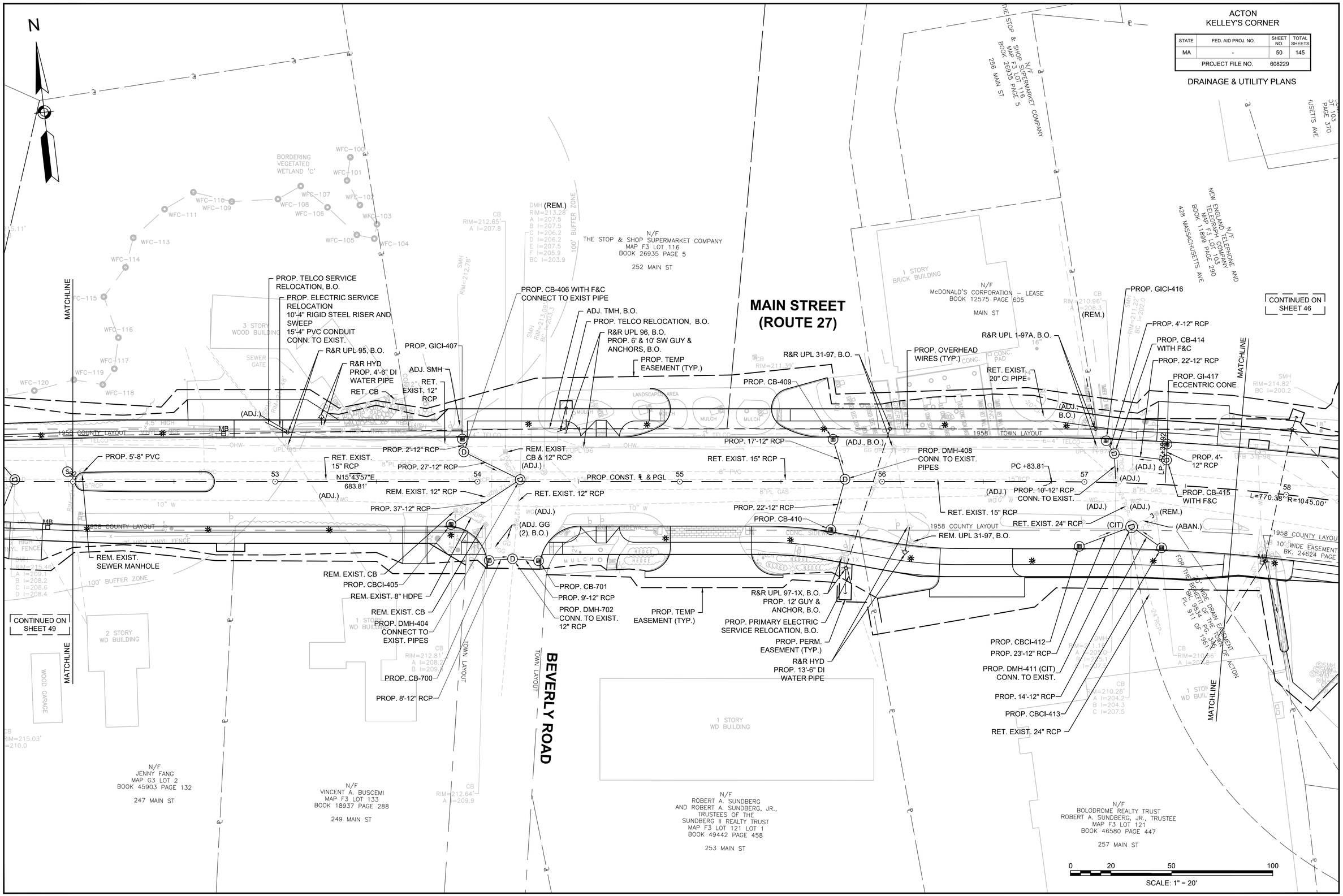


16093_HD(DU).DWG Plotted on 25-Jan-2018 11:02 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	50	145
PROJECT FILE NO.	608229		

DRAINAGE & UTILITY PLANS

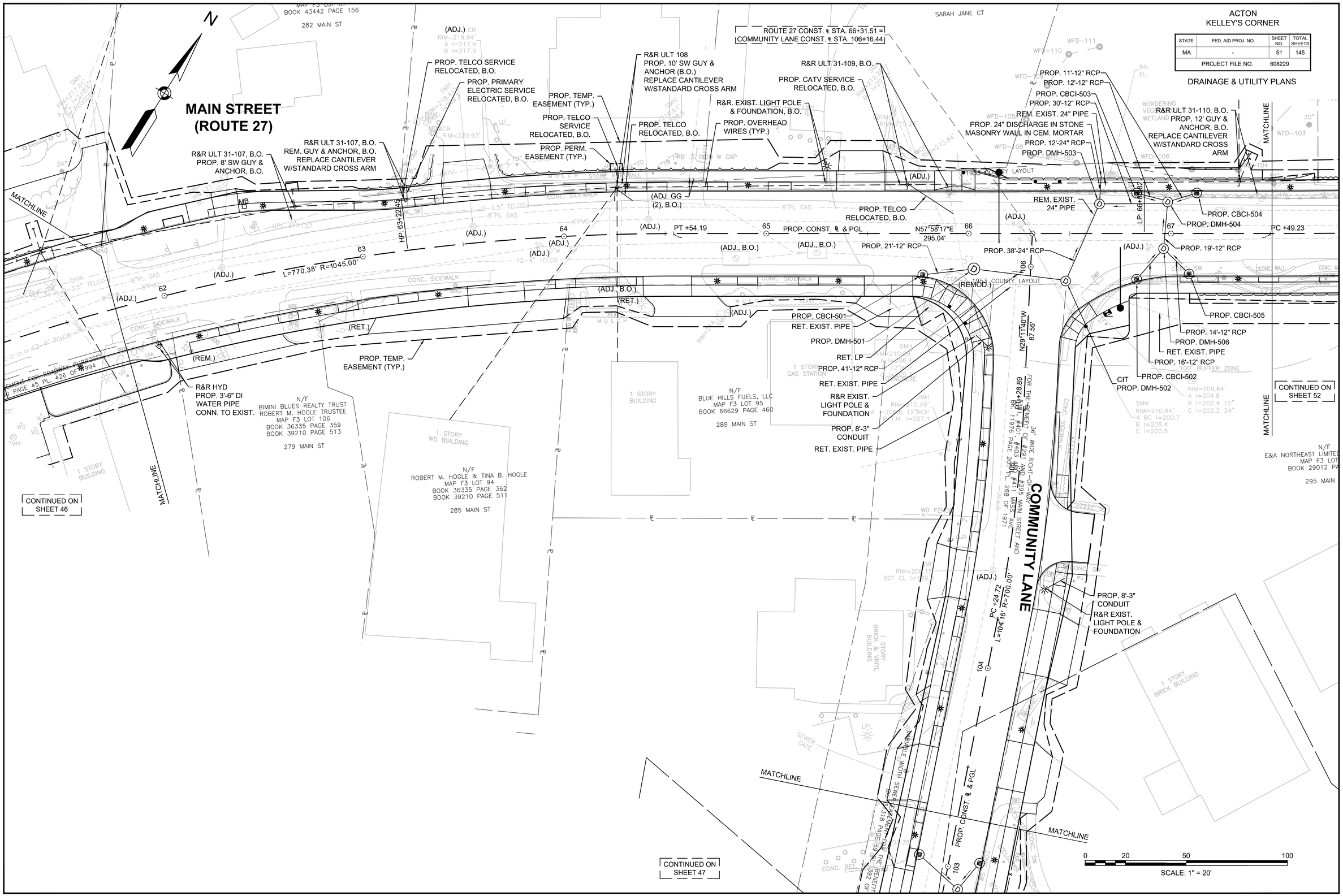


16093_HD(DU).DWG Plotted on 25-Jan-2018 11:02 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	51	145
PROJECT FILE NO.	608229		

DRAINAGE & UTILITY PLANS

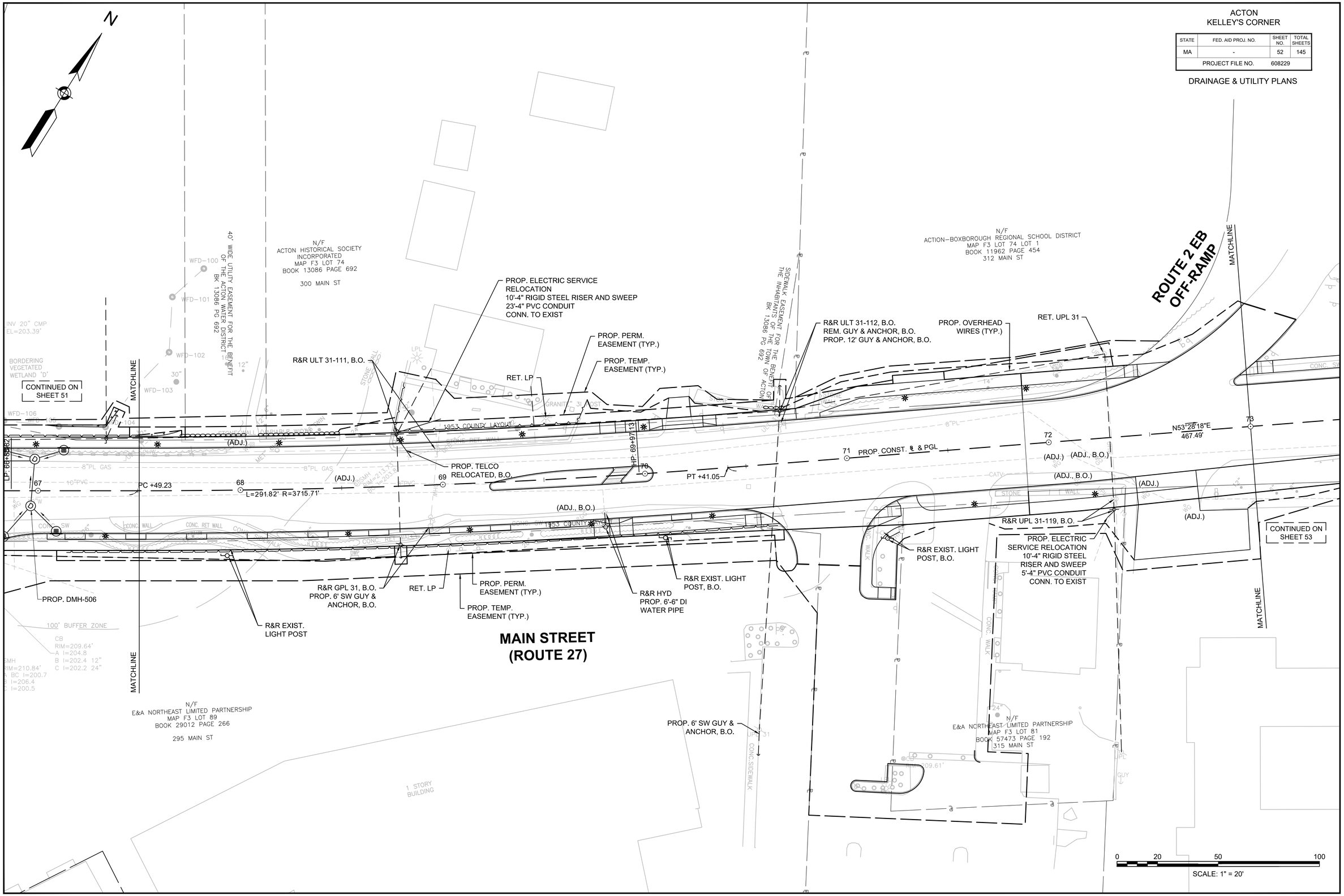


16093_HD(DU).DWG Plotted on 25-Jan-2018 11:02 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	52	145
PROJECT FILE NO.	608229		

DRAINAGE & UTILITY PLANS

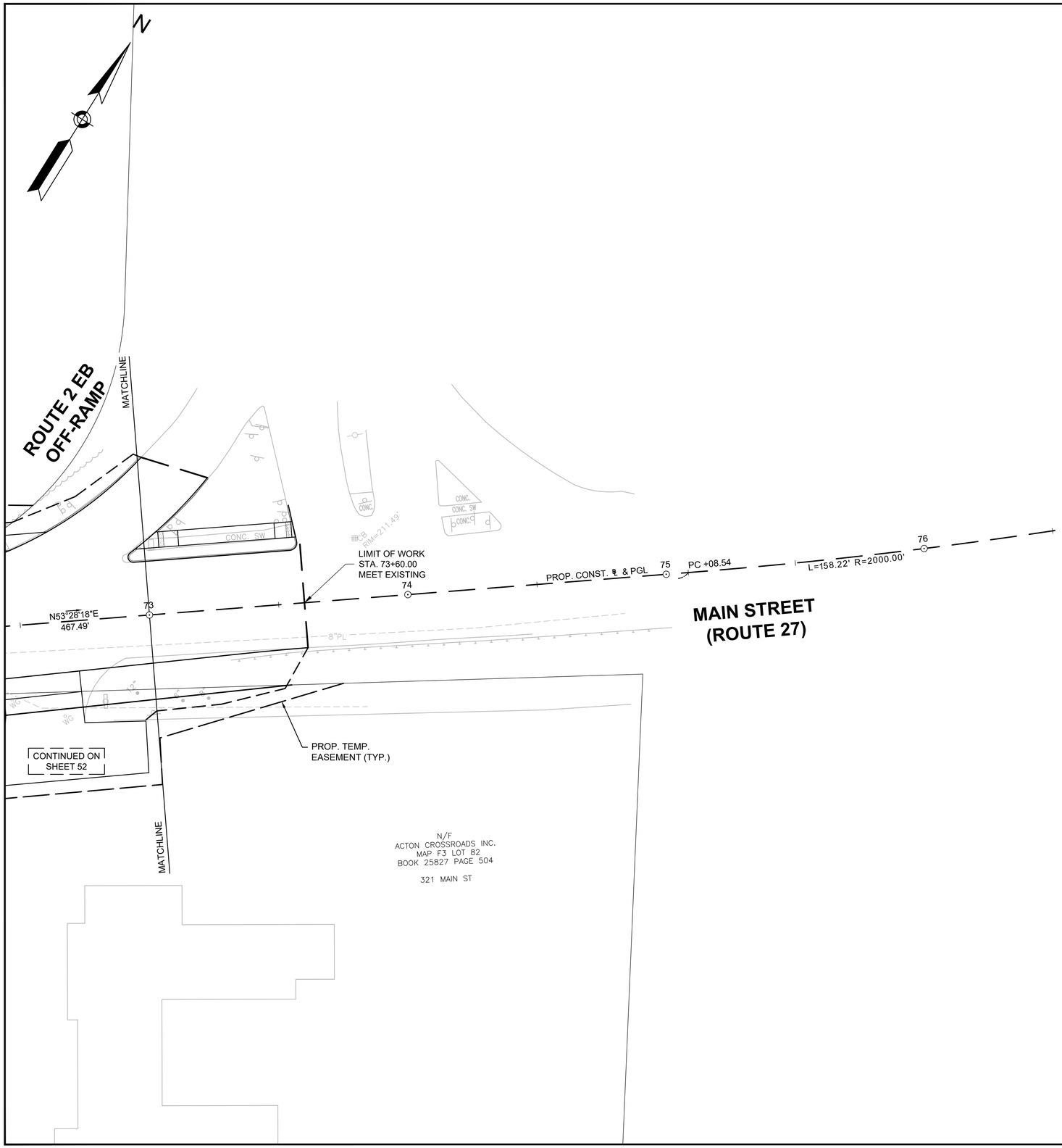


16093_HD(DU).DWG Plotted on 25-Jan-2018 11:02 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	53	145
PROJECT FILE NO.	608229		

DRAINAGE & UTILITY PLANS



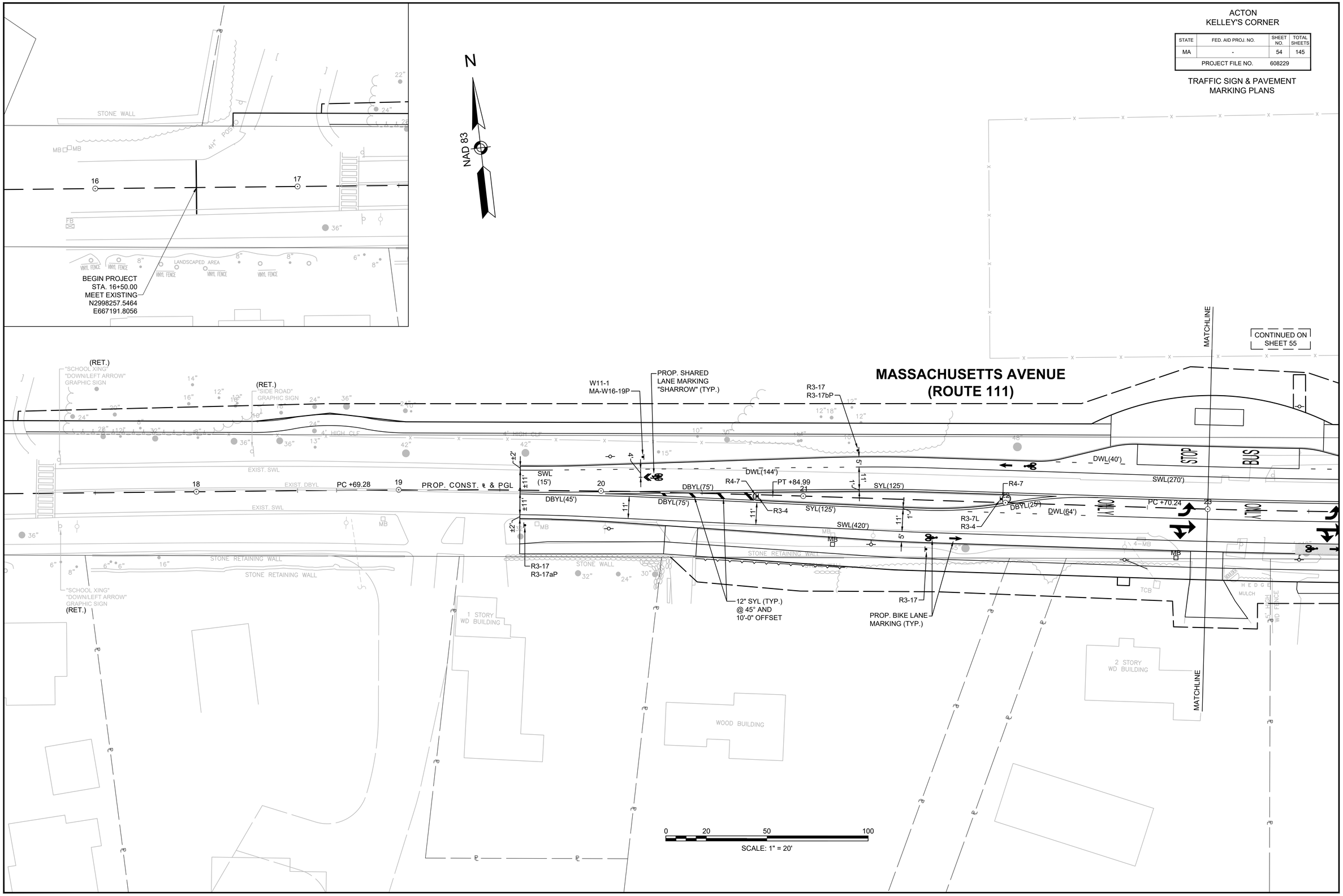
0 20 50 100
SCALE: 1" = 20'

16093_HD(DU).DWG Plotted on 25-Jan-2018 11:02 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	54	145
PROJECT FILE NO.	608229		

TRAFFIC SIGN & PAVEMENT MARKING PLANS

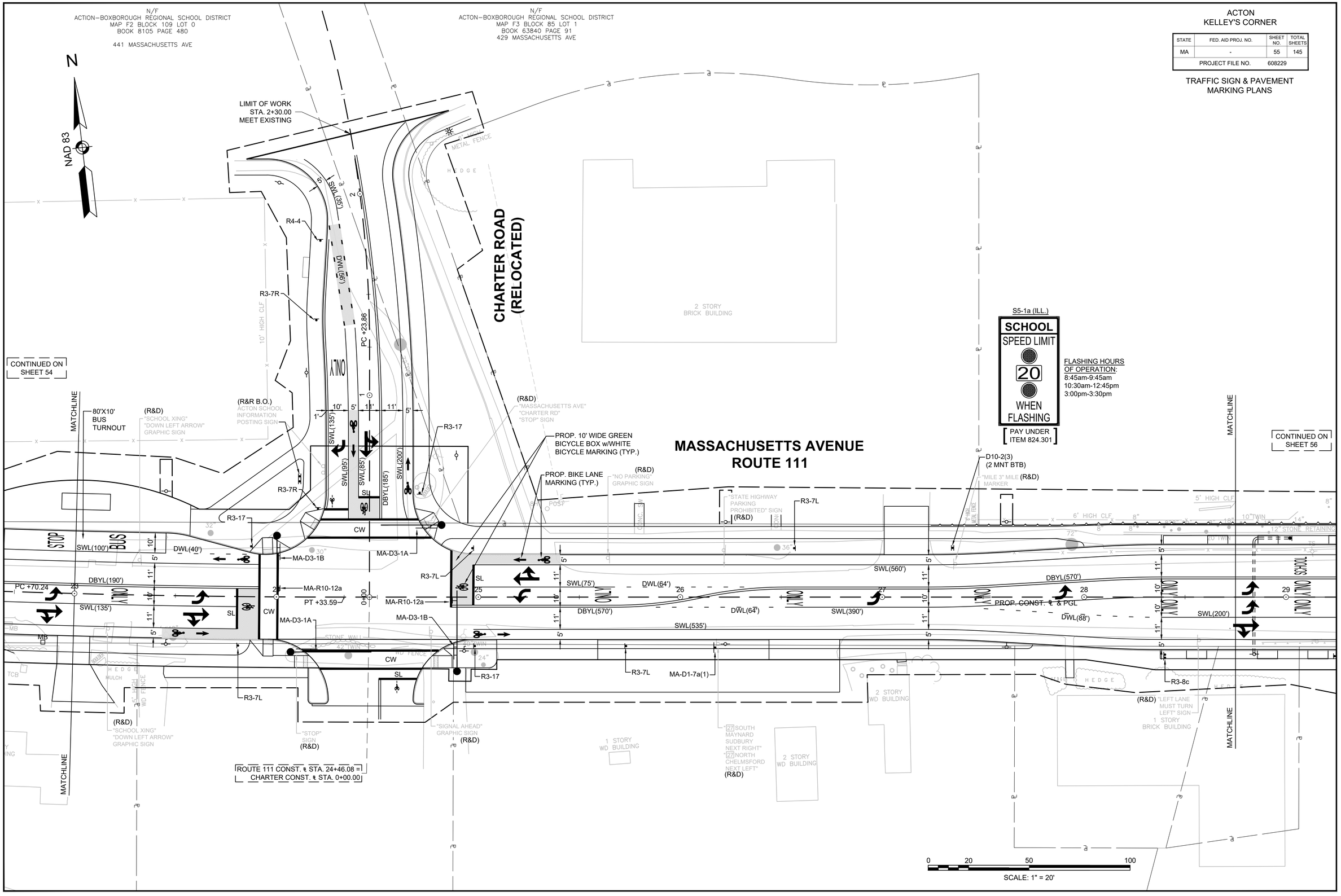


16093_HD(PM&S).DWG Plotted on 25-Jan-2018 11:03 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	55	145
PROJECT FILE NO.	608229		

TRAFFIC SIGN & PAVEMENT MARKING PLANS

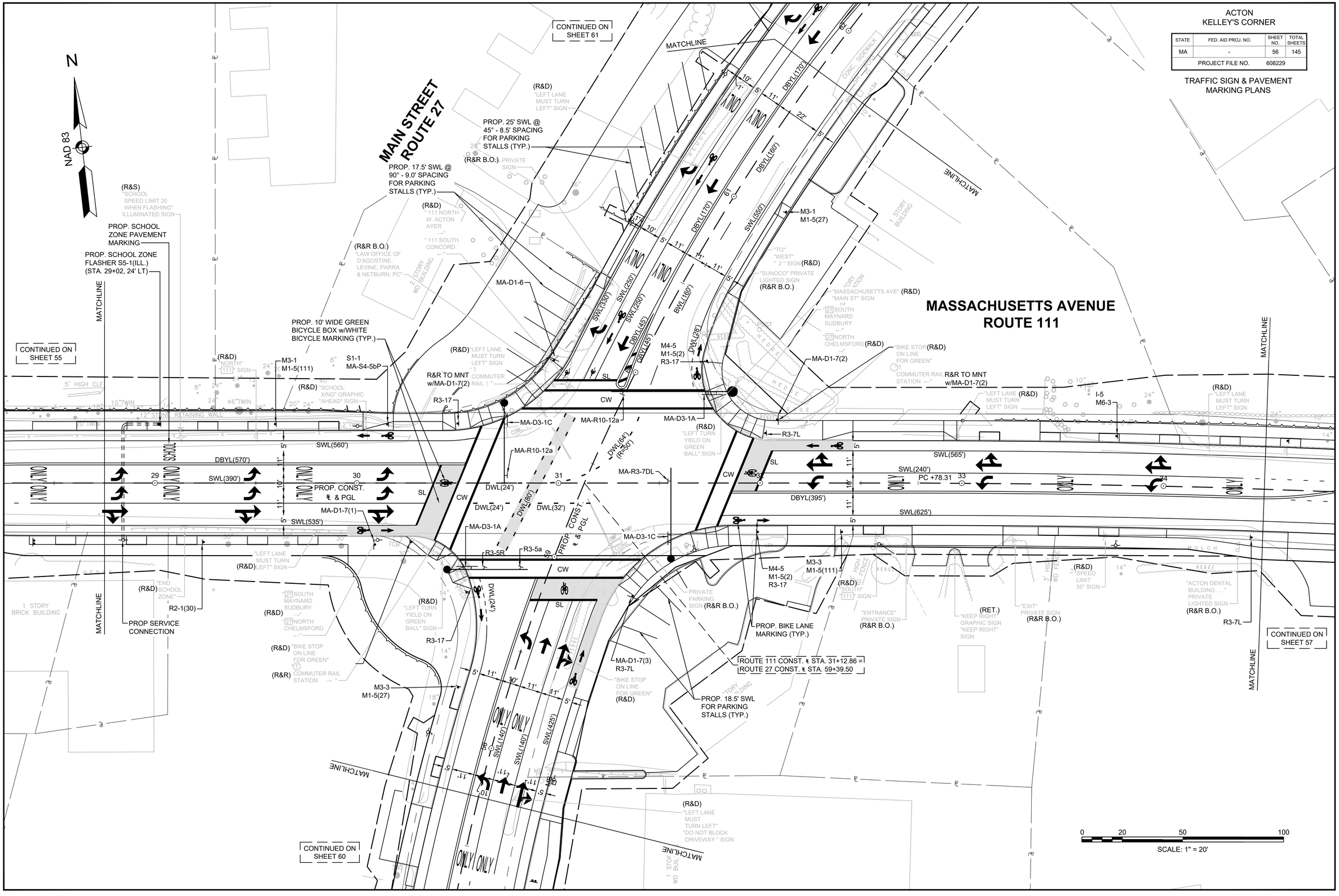


16093_HD(PM&S).DWG Plotted on 25-Jan-2018 11:03 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	56	145
PROJECT FILE NO.	608229		

TRAFFIC SIGN & PAVEMENT MARKING PLANS

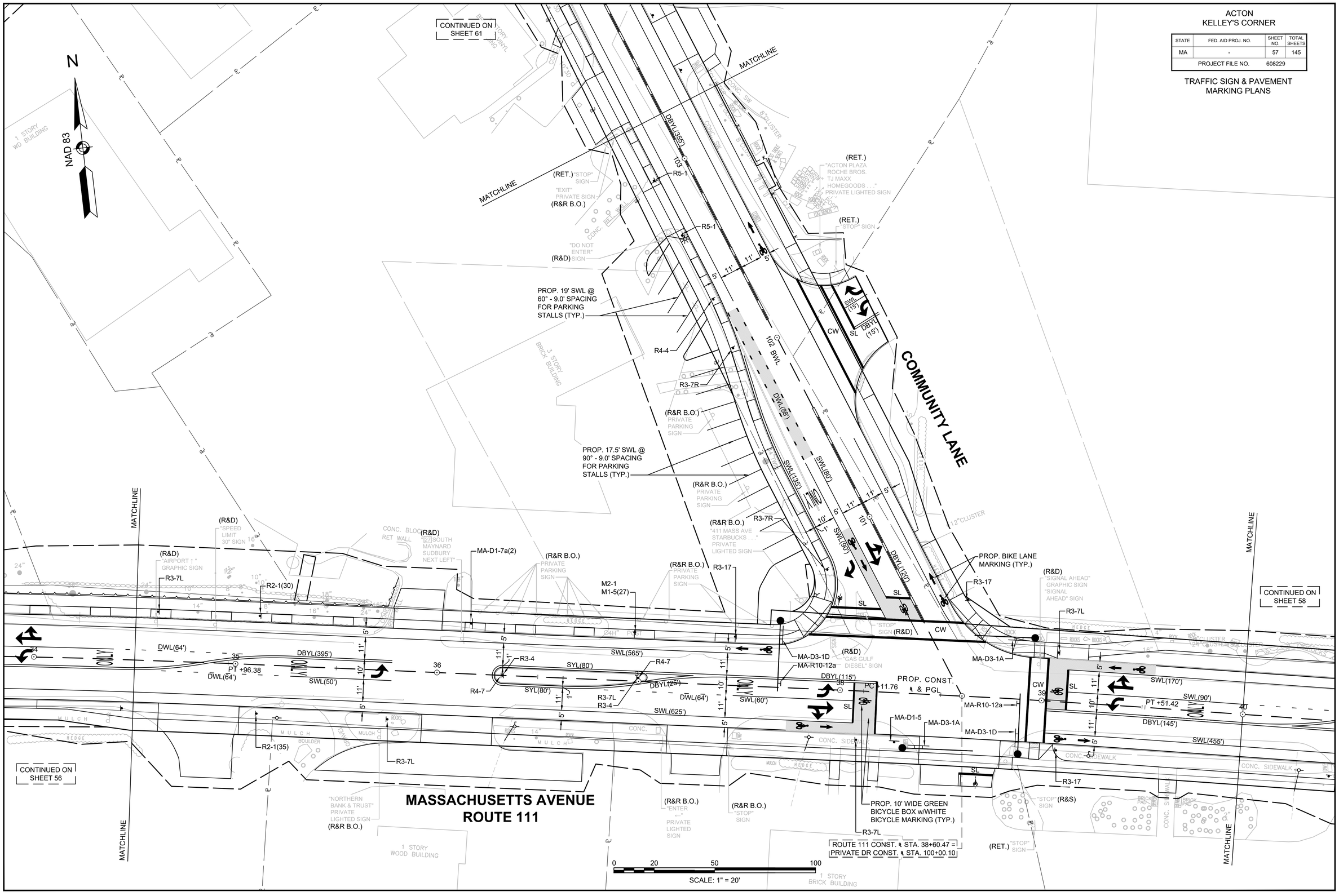


16093_HD(PM&S).DWG Plotted on 25-Jan-2018 11:03 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	57	145
PROJECT FILE NO.	608229		

TRAFFIC SIGN & PAVEMENT MARKING PLANS

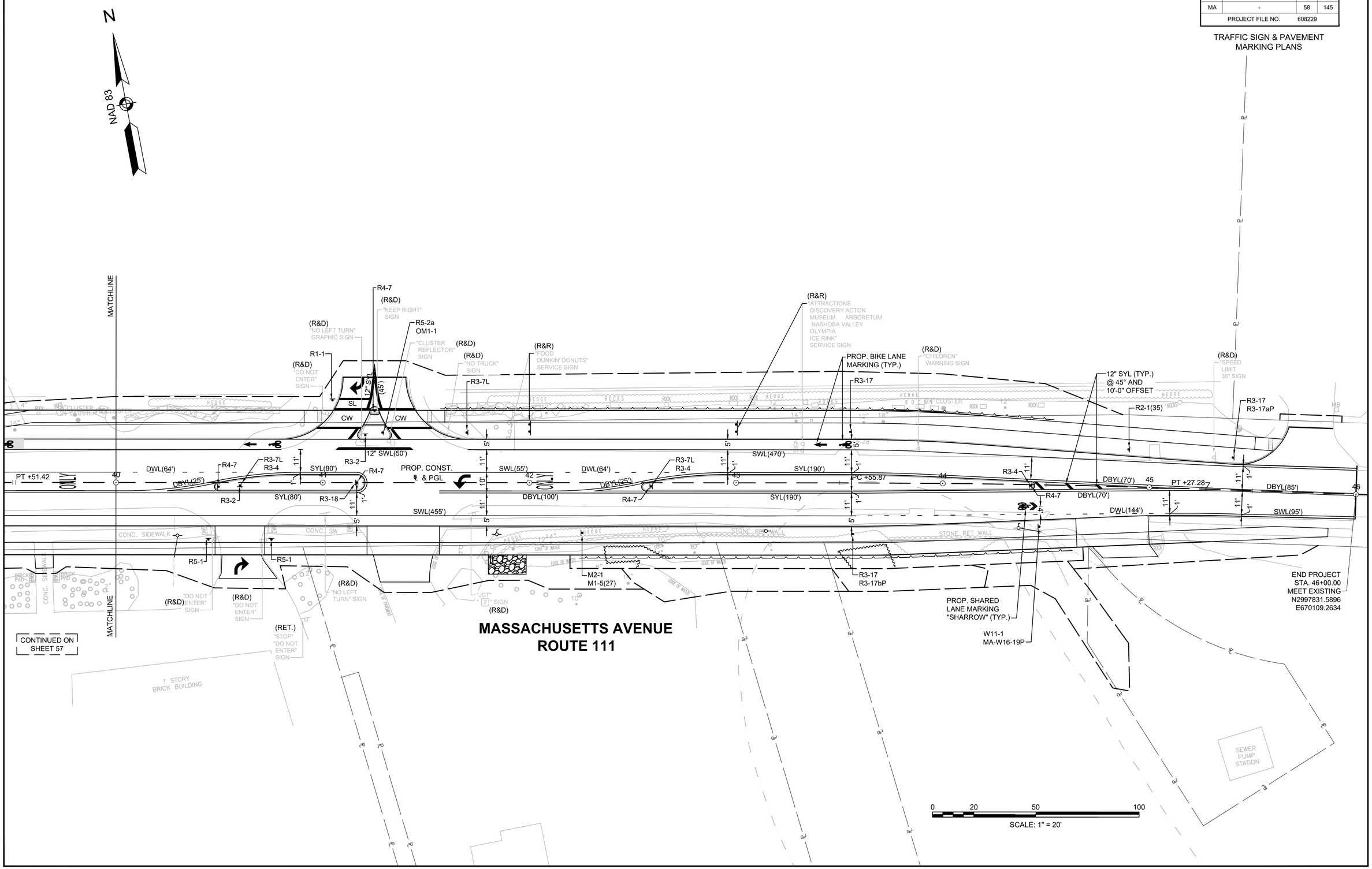


16093_HD(PM&S).DWG Plotted on 25-Jan-2018 11:03 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	58	145
PROJECT FILE NO.	608229		

TRAFFIC SIGN & PAVEMENT MARKING PLANS



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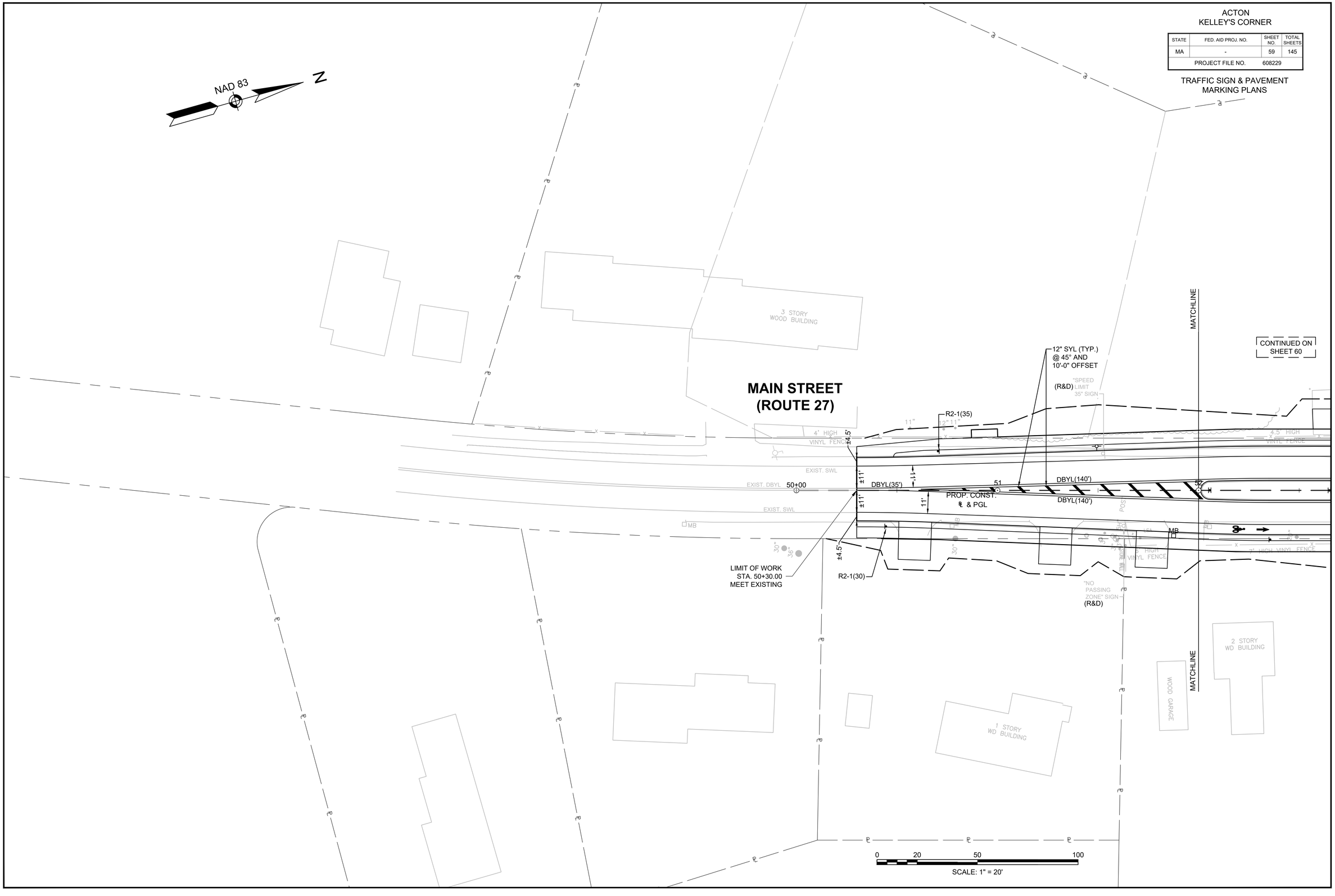
ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	59	145
PROJECT FILE NO.	608229		

TRAFFIC SIGN & PAVEMENT MARKING PLANS



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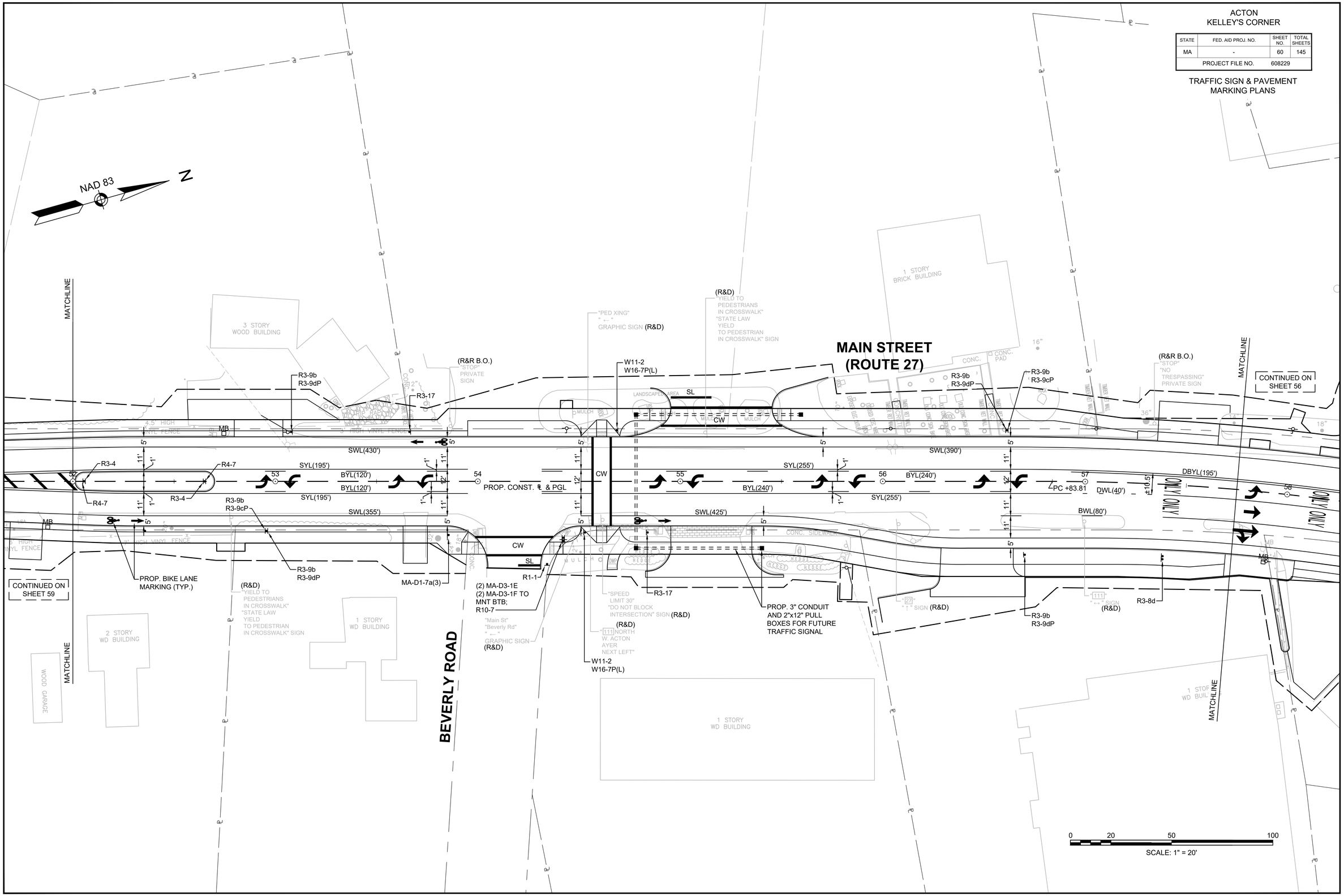
ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	60	145
PROJECT FILE NO.	608229		

TRAFFIC SIGN & PAVEMENT MARKING PLANS



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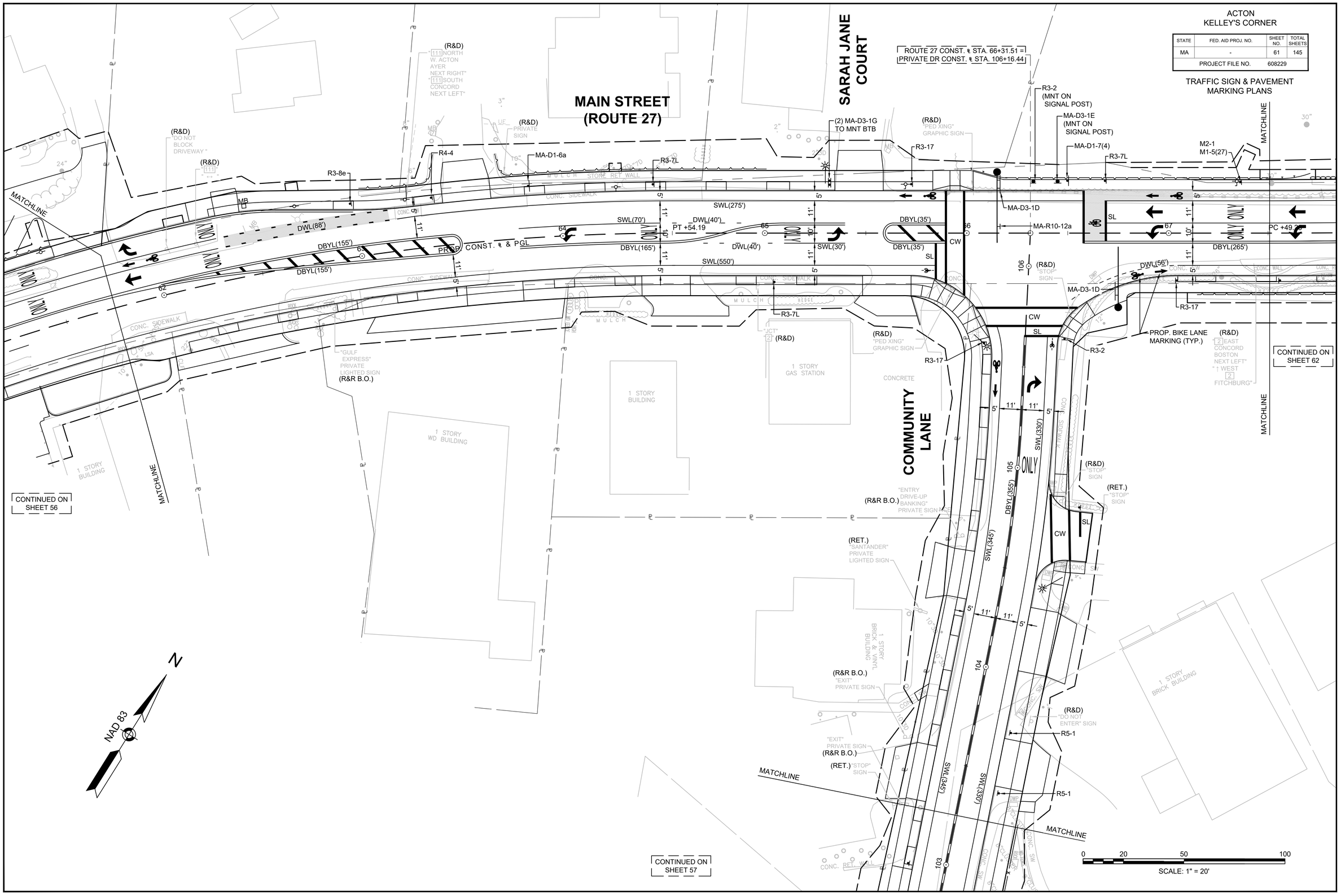
ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	61	145
PROJECT FILE NO.	608229		

TRAFFIC SIGN & PAVEMENT MARKING PLANS



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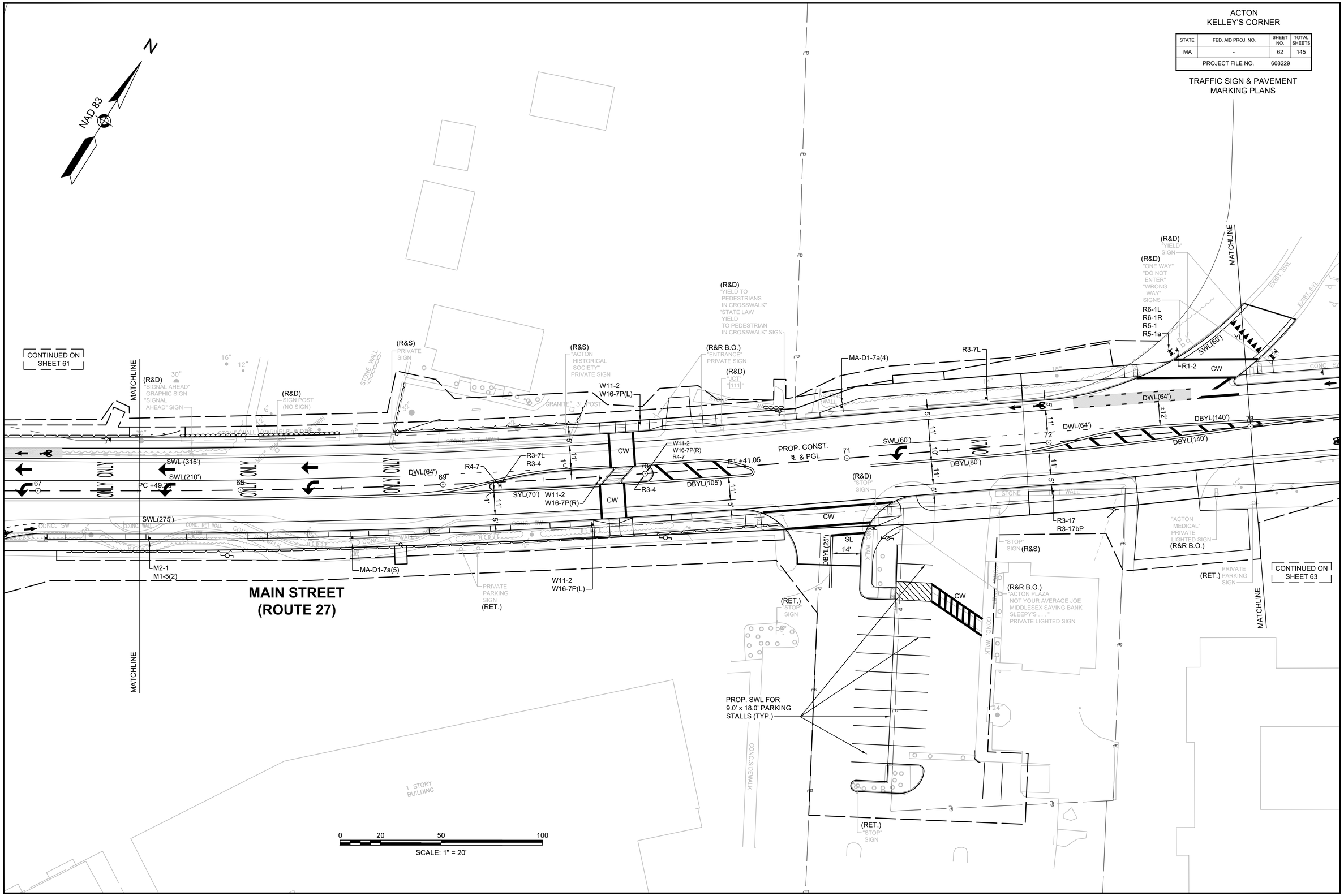
ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	62	145
PROJECT FILE NO.	608229		

TRAFFIC SIGN & PAVEMENT MARKING PLANS



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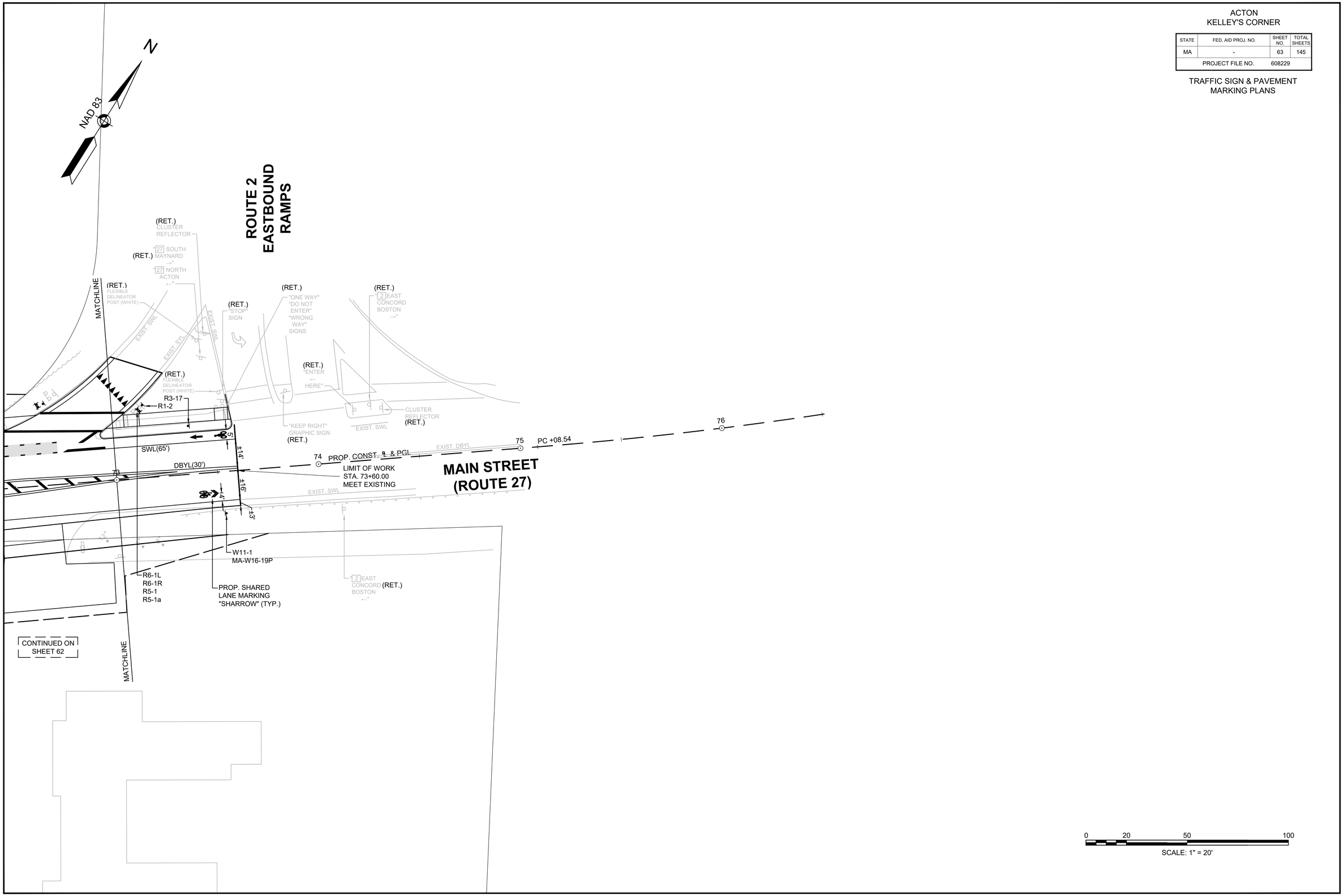
ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	63	145
PROJECT FILE NO.	608229		

TRAFFIC SIGN & PAVEMENT
MARKING PLANS



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NOTES:

1. ALL WARNING, REGULATORY AND ROUTE MARKERS SHALL BE FABRICATED WITH HIGH INTENSITY ENCAPSULATED LENS REFLECTIVE SHEETING (SEE SECTION M9.30.0) TYPE III OR IV.
2. ALL SIGNS NOTED AS "(R&R)" SHALL BE MOUNTED ON NEW P5 POSTS OR AS OTHERWISE INDICATED.
3. ALL P5 POSTS SHALL BE TELESCOPIC SQUARE TYPE POSTS.
4. QUANTITIES OF SIGNS AND POSTS SHOWN ON THIS SHEET MAY DIFFER FROM THE TRAFFIC SIGN & PAVEMENT MARKING PLANS. WHERE DIFFERENCES OCCUR, THE TRAFFIC SIGN & PAVEMENT MARKING PLANS SHALL PREVAIL.

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	64	145
PROJECT FILE NO.	608229		

TRAFFIC SIGN SUMMARY SHEET

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)		NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA IN SQUARE FEET	AREA IN SQUARE FEET
	WIDTH (INCHES)	HEIGHT (INCHES)		LETTER HEIGHT	VERTICAL SPACING		BACK-GROUND	LEGEND	BORDER			
R1-1	30	30	STOP	MUTCD STANDARD	MUTCD STANDARD	2	RED	WHITE	WHITE	P5 (2 REQ'D)	6.25	12.50
R1-2	30	30	YIELD	MUTCD STANDARD	MUTCD STANDARD	2	RED	WHITE	WHITE	P5 (2 REQ'D)	6.25	12.50
R2-1(30)	24	30	SPEED LIMIT 30	MUTCD STANDARD	MUTCD STANDARD	3	WHITE	BLACK	BLACK	P5 (3 REQ'D)	5.00	15.00
R2-1(35)	24	30	SPEED LIMIT 35	MUTCD STANDARD	MUTCD STANDARD	3	WHITE	BLACK	BLACK	P5 (3 REQ'D)	5.00	15.00
R3-2	24	24		MUTCD STANDARD	MUTCD STANDARD	4	WHITE	BLACK/ RED	BLACK	P5 (3 REQ'D); 1 MNT ON SIGNAL POST	4.00	16.00
R3-4	24	24		MUTCD STANDARD	MUTCD STANDARD	11	WHITE	BLACK/ RED	BLACK	8 MNT w/ R4-7; 2 MNT w/ R4-7c; 1 MNT w/ R3-2;	4.00	44.00
R3-5a	30	36	ONLY	MUTCD STANDARD	MUTCD STANDARD	1	WHITE	BLACK	BLACK	MNT ON M.A.	7.50	7.50
R3-5R	30	36	ONLY	MUTCD STANDARD	MUTCD STANDARD	1	WHITE	BLACK	BLACK	MNT ON M.A.	7.50	7.50
MA-R3-7DL	30	30	ONLY ONLY	MASSDOT STANDARD	MASSDOT STANDARD	1	WHITE	BLACK	BLACK	MNT ON M.A.	6.25	6.25
R3-7L	30	30	LEFT LANE MUST TURN LEFT	MUTCD STANDARD	MUTCD STANDARD	21	WHITE	BLACK	BLACK	P5 (15 REQ'D); 4 w/ R4-7; 1 w/ R3-2; 1 w/MA-D1-7(3)	6.25	131.25
R3-7R	30	30	RIGHT LANE MUST TURN RIGHT	MUTCD STANDARD	MUTCD STANDARD	4	WHITE	BLACK	BLACK	P5 (4 REQ'D)	6.25	25.00
R3-8c	48	30	ONLY ONLY	MUTCD STANDARD	MUTCD STANDARD	1	WHITE	BLACK	BLACK	2 - P5 (1 REQ'D)	10.00	10.00
R3-8d	48	30	ONLY ONLY	MUTCD STANDARD	MUTCD STANDARD	1	WHITE	BLACK	BLACK	2 - P5 (1 REQ'D)	10.00	10.00
R3-8e	30	30	ONLY ONLY	MUTCD STANDARD	MUTCD STANDARD	1	WHITE	BLACK	BLACK	P5 (1 REQ'D)	6.25	6.25
R3-9b	24	36	CENTER LANE ONLY	MUTCD STANDARD	MUTCD STANDARD	6	WHITE	BLACK	BLACK	P5 (5 REQ'D)	6.00	36.00
R3-9cP	30	12	BEGIN	MUTCD STANDARD	MUTCD STANDARD	2	WHITE	BLACK	BLACK	2 MNT w/ R3-9b	2.50	5.00
R3-9dP	30	12	END	MUTCD STANDARD	MUTCD STANDARD	4	WHITE	BLACK	BLACK	3 MNT w/ R3-9b	2.50	10.00
R4-4	36	30	BEGIN RIGHT TURN LANE YIELD TO BIKES	MUTCD STANDARD	MUTCD STANDARD	3	WHITE	BLACK	BLACK	P5 (3 REQ'D)	7.50	22.50

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)		NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA IN SQUARE FEET	AREA IN SQUARE FEET
	WIDTH (INCHES)	HEIGHT (INCHES)		LETTER HEIGHT	VERTICAL SPACING		BACK-GROUND	LEGEND	BORDER			
R10-7	24	30	DO NOT BLOCK INTERSECTION	MUTCD STANDARD	MUTCD STANDARD	1	WHITE	BLACK	BLACK	1 MNT w/ D3-1E	5.00	5.00
R3-17	24	18	BIKE LANE	MUTCD STANDARD	MUTCD STANDARD	23	BLACK & WHITE	BLACK TEXT WHITE SYMBOL	BLACK	P5 (23 REQ'D); 2 MNT w/ M4-5	3.00	69.00
R3-17aP	24	8	AHEAD	MUTCD STANDARD	MUTCD STANDARD	2	WHITE	BLACK	BLACK	2 MNT w/ R3-17	1.33	2.67
R3-17bP	24	8	ENDS	MUTCD STANDARD	MUTCD STANDARD	3	WHITE	BLACK	BLACK	1 MNT w/ R3-17	1.33	4.00
R3-18	24	24		MUTCD STANDARD	MUTCD STANDARD	1	WHITE	BLACK/ RED	BLACK	1 MNT w/ R4-7	4.00	4.00
R4-7	24	30		MUTCD STANDARD	MUTCD STANDARD	13	WHITE	BLACK	BLACK	P5 (12 REQ'D); 1 MNT w/ W11-2	5.00	65.00
R5-1	30	30	DO NOT ENTER	MUTCD STANDARD	MUTCD STANDARD	8	WHITE	WHITE	RED	P5 (6 REQ'D); 2 MNT w/ R6-1L	6.25	50.00
R5-1a	36	24	WRONG WAY	MUTCD STANDARD	MUTCD STANDARD	2	WHITE	WHITE	RED	2 MNT w/ R6-1L	6.00	12.00
R5-2a	24	24	NO TRUCKS	MUTCD STANDARD	MUTCD STANDARD	1	WHITE	BLACK	BLACK	P5 (1 REQ'D)	4.00	4.00
R6-1L	36	12	ONEWAY	MUTCD STANDARD	MUTCD STANDARD	2	WHITE	BLACK	BLACK	P5 (2 REQ'D)	3.00	6.00
R6-1R	36	12	ONEWAY	MUTCD STANDARD	MUTCD STANDARD	2	WHITE	BLACK	BLACK	2 MNT w/ R6-1L	3.00	6.00
MA-R10-12a	30	36	LEFT TURN YIELD ON FLASHING	MASSDOT STANDARD	MASSDOT STANDARD	7	WHITE	BLACK TEXT & CIRCLE; YELLOW ARROW	BLACK	9 MNT ON MA	7.50	52.50
M1-5(2)	24	24	2	MUTCD STANDARD	MUTCD STANDARD	3	WHITE	BLACK	BLACK	2 MNT w/ M4-5; 1 MNT w/ M2-1	4.00	12.00
M1-5(27)	24	24	27	MUTCD STANDARD	MUTCD STANDARD	5	WHITE	BLACK	BLACK	3 MNT w/ M2-1; 1 MNT w/ M3-1; 1 MNT w/ M3-3	4.00	20.00
M1-5(111)	30	24	111	MUTCD STANDARD	MUTCD STANDARD	2	WHITE	BLACK	BLACK	1 MNT w/ M3-1; 1 MNT w/ M3-3	5.00	10.00
M2-1	12	6	JCT	MUTCD STANDARD	MUTCD STANDARD	4	GREEN	WHITE	WHITE	P5 (4 REQ'D)	0.50	2.00
M3-1	24	12	NORTH	MUTCD STANDARD	MUTCD STANDARD	2	GREEN	WHITE	WHITE	P5 (2 REQ'D)	2.00	4.00
M3-3	24	12	SOUTH	MUTCD STANDARD	MUTCD STANDARD	2	GREEN	WHITE	WHITE	P5 (2 REQ'D)	2.00	4.00

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ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	65	145
PROJECT FILE NO.	608229		

TRAFFIC SIGN SUMMARY SHEET

IDENTIFI-CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)		NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA IN SQUARE FEET	AREA IN SQUARE FEET
	WIDTH (INCHES)	HEIGHT (INCHES)		LETTER HEIGHT	VERTICAL SPACING		BACK-GROUND	LEGEND	BORDER			
M4-5	24	12	TO	MUTCD STANDARD	MUTCD STANDARD	2	WHITE	BLACK	BLACK	P5 (2 REQ'D)	2.00	4.00
M6-3	12	6		MUTCD STANDARD	MUTCD STANDARD	1	GREEN	WHITE	WHITE	P5 (2 REQ'D)	0.50	0.50
I-5	12	12		MUTCD STANDARD	MUTCD STANDARD	1	GREEN	WHITE	WHITE	P5 (2 REQ'D)	1.00	1.00
OM1-1	18	18		MUTCD STANDARD	MUTCD STANDARD	1	YELLOW	YELLOW REFLEC-TIVE	YELLOW REFLEC-TIVE	1 MNT w/ R5-2a	2.25	2.25
S1-1	36	36		MUTCD STANDARD	MUTCD STANDARD	1	YELLOW	BLACK	BLACK	P5 (1 REQ'D)	9.00	9.00
MA-S4-5bP	24	24	SCHOOL ZONE AHEAD	MASSDOT STANDARD	MASSDOT STANDARD	1	FLUORES-CENT YELLOW GREEN	BLACK	BLACK	MNT w/ S1-1	4.00	4.00
S5-1a(ILL.)	24	48	SCHOOL SPEED LIMIT 20 WHEN FLASHING	MASSDOT STANDARD	MASSDOT STANDARD	1	YELLOW/ WHITE	BLACK	BLACK	PAY UNDER ITEM 824.301 - SCHOOL ZONE FLASHER	-	-
W11-1	30	30		MUTCD STANDARD	MUTCD STANDARD	3	YELLOW	BLACK SYMBOL	BLACK	P5 (3 REQ'D)	6.25	18.75
W11-2	30	30		MUTCD STANDARD	MUTCD STANDARD	6	YELLOW	BLACK	BLACK	P5 (6 REQ'D)	6.25	37.50
W16-7P(L)	24	12		MUTCD STANDARD	MUTCD STANDARD	4	YELLOW	BLACK	BLACK	4 MNT w/ W11-2	2.00	8.00
W16-7P(R)	24	12		MUTCD STANDARD	MUTCD STANDARD	2	YELLOW	BLACK	BLACK	2 MNT w/ W11-2	2.00	4.00
MA-W16-19p	24	12	ON ROADWAY	MUTCD STANDARD	MUTCD STANDARD	3	YELLOW	BLACK	BLACK	MNT w/ W11-1	2.00	6.00
MA-D3-1A	126	24	Massachusetts Ave (INCL. 12" TOWN SEAL)	12"D/8"D 8"D	6" 6"	6	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	MNT ON MAST ARM	PAY UNDER ITEM 874.	PAY UNDER ITEM 874.
MA-D3-1B	96	24	Charter Rd (INCL. 12" TOWN SEAL)	12"D/8"D 8"D	6" 6"	2	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	MNT ON MAST ARM	PAY UNDER ITEM 874.	PAY UNDER ITEM 874.
MA-D3-1C	78	24	Main St (INCL. 12" TOWN SEAL)	12"D/8"D 8"D	6" 6"	2	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	MNT ON MAST ARM	PAY UNDER ITEM 874.	PAY UNDER ITEM 874.
MA-D3-1D	108	24	Community Ln (INCL. 12" TOWN SEAL)	12"D/8"D 8"D	6" 6"	4	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	MNT ON MAST ARM	PAY UNDER ITEM 874.	PAY UNDER ITEM 874.
MA-D3-1E	42	12	Main St (INCL. 6" TOWN SEAL)	6"D/4"D 4"D	3" 3"	3	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	2 MNT BTB w/ D3-1F; 1 MNT ON SIGNAL POST	PAY UNDER ITEM 874.	PAY UNDER ITEM 874.

IDENTIFI-CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)		NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA IN SQUARE FEET	AREA IN SQUARE FEET
	WIDTH (INCHES)	HEIGHT (INCHES)		LETTER HEIGHT	VERTICAL SPACING		BACK-GROUND	LEGEND	BORDER			
MA-D3-1F	48	12	Beverly Rd (INCL. 6" TOWN SEAL)	6"D/4"D 4"D	3" 3"	2	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	2 MNT BTB ON 2-P5	PAY UNDER ITEM 874.	PAY UNDER ITEM 874.
MA-D3-1G	54	12	Sarah Jane Ct (INCL. 6" TOWN SEAL)	6"D/4"D 4"D	3" 3"	2	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	2 MNT BTB ON 2-P5	PAY UNDER ITEM 874.	PAY UNDER ITEM 874.
MA-D1-7a(1)	60	108	BORDER: 1" WIDE, 3" RAD. 27 SOUTH Maynard Sudbury NEXT RIGHT / 27 NORTH Chelmsford NEXT LEFT	18"x18"/9"D/7"C/6"C 8"C 8"C 6"C 18"x18"/9"D/7"C/6"C 8"C 6"C	3" 4" 4" 4" 3" 3" 4" 4" 4"	1	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	PAY UNDER ITEM 841.1	45.00	45.00
MA-D1-7(1)	60	108	BORDER: 1" WIDE, 3" RAD. 27 SOUTH Maynard Sudbury → / 27 NORTH Chelmsford ←	18"x18"/9"D/7"C/6"C 8"C 8"C 18"x8" ARROW 18"x18"/9"D/7"C/6"C 8"C 18"x8" ARROW	3" 3" 4" 3" 3" 3" 4" 3" 3"	1	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	PAY UNDER ITEM 841.1	45.00	45.00
MA-D1-7a(2)	60	108	BORDER: 1" WIDE, 3" RAD. 27 SOUTH Maynard Sudbury NEXT LEFT / 27 NORTH Chelmsford NEXT RIGHT	18"x18"/9"D/7"C/6"C 8"C 8"C 6"C 18"x18"/9"D/7"C/6"C 8"C 6"C	3" 4" 4" 4" 3" 3" 4" 4" 4"	1	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	PAY UNDER ITEM 841.1	45.00	45.00
MA-D1-7(2)	60	108	BORDER: 1" WIDE, 3" RAD. 27 SOUTH Maynard Sudbury ← / 27 NORTH Chelmsford →	18"x18"/9"D/7"C/6"C 8"C 8"C 18"x8" ARROW 18"x18"/9"D/7"C/6"C 8"C 18"x8" ARROW	3" 3" 4" 3" 3" 3" 4" 3" 3"	1	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	PAY UNDER ITEM 841.1	45.00	45.00
MA-D1-7a(3)	60	108	BORDER: 1" WIDE, 3" RAD. 111 NORTH Boxboro Harvard NEXT LEFT / 111 SOUTH Concord NEXT RIGHT	24"x18"/9"D/7"C/6"C 8"C 8"C 6"C 24"x18"/9"D/7"C/6"C 8"C 6"C	3" 4" 4" 4" 3" 3" 4" 4" 4"	1	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	2 MNT ON MA	45.00	45.00
MA-D1-7(3)	60	108	BORDER: 1" WIDE, 3" RAD. 111 NORTH Boxboro Harvard ← / 111 SOUTH Concord →	24"x18"/9"D/7"C/6"C 8"C 8"C 18"x8" ARROW 24"x18"/9"D/7"C/6"C 8"C 18"x8" ARROW	3" 3" 4" 3" 3" 3" 4" 3" 3"	1	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	2 MNT ON MA	45.00	45.00

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ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	66	145
PROJECT FILE NO.	608229		

TRAFFIC SIGN SUMMARY SHEET

IDENTIFI-CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (INCHES)		NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA IN SQUARE FEET	AREA IN SQUARE FEET
	WIDTH (INCHES)	HEIGHT (INCHES)		LETTER HEIGHT	VERTICAL SPACING		BACK-GROUND	LEGEND	BORDER			
MA-D1-6a	60	66	BORDER: 1" WIDE, 3" RAD. 111 NORTH Boxboro Harvard NEXT RIGHT	24"x18"/9"D/7"C/6"C 8"C 8"C 6"C	4" 4" 4" 4" 8"	1	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	PAY UNDER ITEM 841.2	27.50	27.50
MA-D1-6	60	66	BORDER: 1" WIDE, 3" RAD. 111 NORTH Boxboro Harvard →	24"x18"/9"D/7"C/6"C 8"C 8"C 18"x8" ARROW	4" 4" 4" 4" 6"	1	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	PAY UNDER ITEM 841.2	27.50	27.50
MA-D1-5	60	54	BORDER: 1" WIDE, 3" RAD. 111 SOUTH Concord ←	24"x18"/9"D/7"C/6"C 8"C 18"x8" ARROW	4" 4" 4" 6"	1	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	PAY UNDER ITEM 841.2	22.50	22.50
MA-D1-7a(4)	60	102	BORDER: 1" WIDE, 3" RAD. 111 NORTH ↑ Boxboro Harvard 111 SOUTH Concord NEXT LEFT	24"x18"/9"D/7"C/6"C 8"x18" ARROW 8"C 8"C 24"x18"/9"D/7"C/6"C 8"C 6"C	3" 4" 4" 4" 6" 4" 4" 4"	1	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	PAY UNDER ITEM 841.1	42.50	42.50
MA-D1-7(4)	60	102	BORDER: 1" WIDE, 3" RAD. 111 NORTH ↑ Boxboro Harvard 111 SOUTH Concord ←	24"x18"/9"D/7"C/6"C 8"x18" ARROW 8"C 8"C 24"x18"/9"D/7"C/6"C 8"C 18"x8" ARROW	3" 4" 4" 4" 6" 4" 3" 3"	1	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	PAY UNDER ITEM 841.1	42.50	42.50
MA-D1-7a(5)	60	108	BORDER: 1" WIDE, 3" RAD. 2 EAST Concord Boston NEXT LEFT WEST 2 ↑ Fitchburgh	18"x18"/9"D/7"C/6"C 8"C 8"C 6"C 8"x18" ARROW 7"C/6"C 18"x18"/9"D 8"C	3" 4" 4" 4" 3" 3" 3" 3" 5"	1	GREEN H/I	SILVER/ WHITE H/I	SILVER/ WHITE H/I	PAY UNDER ITEM 841.1	45.00	45.00

NOTES:

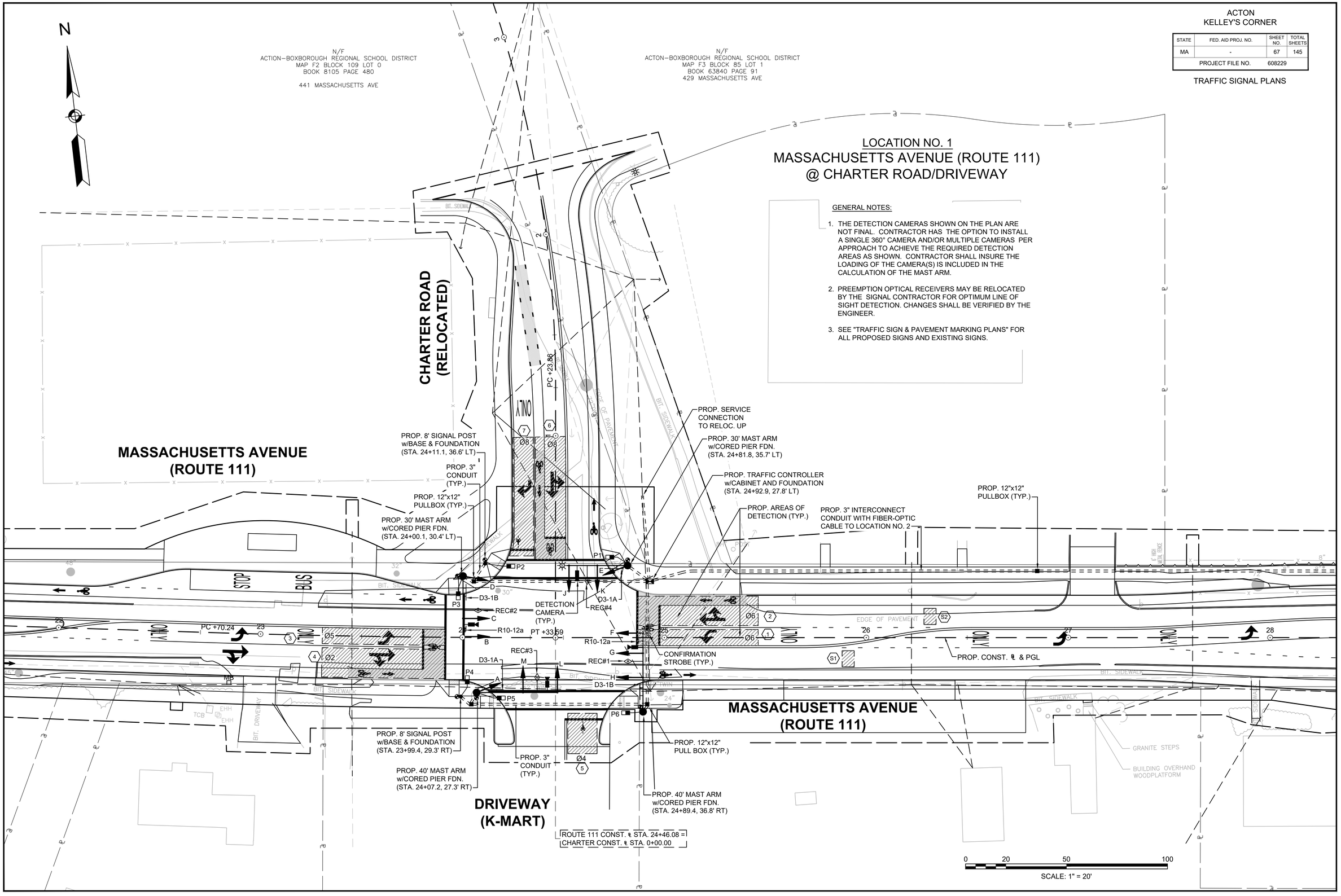
1. ALL WARNING, REGULATORY AND ROUTE MARKERS SHALL BE FABRICATED WITH HIGH INTENSITY ENCAPSULATED LENS REFLECTIVE SHEETING (SEE SECTION M9.30.0) TYPE III OR IV.
2. ALL SIGNS NOTED AS "(R&R)" SHALL BE MOUNTED ON NEW P5 POSTS OR AS OTHERWISE INDICATED.
3. ALL P5 POSTS SHALL BE TELESCOPIC SQUARE TYPE POSTS.
4. QUANTITIES OF SIGNS AND POSTS SHOWN ON THIS SHEET MAY DIFFER FROM THE TRAFFIC SIGN & PAVEMENT MARKING PLANS. WHERE DIFFERENCES OCCUR, THE TRAFFIC SIGN & PAVEMENT MARKING PLANS SHALL PREVAIL.

16093_HD(PM&S).DWG Plotted on 25-Jan-2018 11:04 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	67	145
PROJECT FILE NO.	608229		

TRAFFIC SIGNAL PLANS



16093_HD(TS).DWG Plotted on 25-Jan-2018 11:04 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	68	145
PROJECT FILE NO.	608229		

TRAFFIC SIGNAL PLANS

16093_HD(TS).DWG Plotted on 25-Jan-2018 11:04 AM

LOCATION NO. 1
MASSACHUSETTS AVENUE (ROUTE 111)
@ CHARTER ROAD/DRIVEWAY

EMERGENCY VEHICLE PREEMPTION

WB	EB	SB	NB
PREEMPT#3	PREEMPT#4	PREEMPT#5	PREEMPT#6
REC#1	REC#2	REC#3	REC#4

EMERGENCY VEHICLE PREEMPTION OPERATION

1. EMERGENCY VEHICLE PREEMPTION SIGNAL SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS (RECEIVERS) LOCATED AT THE INTERSECTION.
2. PREEMPTION SIGNALS SHALL BE SERVICED ON A FIRST COME FIRST SERVED BASIS. IN CASE WHERE TWO OR MORE CALLS ARE COMING IN AT THE SAME TIME, PREEMPTION SHALL BE PRIORITIZED WITH PREEMPT #3 (ROUTE 111 WB) FIRST, THEN FOLLOW BY PREEMPT #4 (ROUTE 111 EB), PREEMPT #5 (CHARTER ROAD SB) AND PREEMPT#6 (DRIVEWAY) LAST.
3. IN RESPONSE TO A PREEMPTION SIGNAL RECEIVED BY OPTICAL DETECTOR REC#1 (OR REC#2, REC#3, REC#4), THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PREEMPTION SIGNAL #1 (OR #2, #3, #4) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PREEMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME THE RELEVANT CLEARANCE INTERVALS AND SERVICE THE SUBSEQUENT EMERGENCY VEHICLE PREEMPTION SIGNAL IF NECESSARY. NORMAL SIGNAL OPERATION SHALL RESUME PROVIDED THAT ALL PREEMPTION SIGNALS HAVE CEASED.
4. NORMAL VEHICLE CLEARANCES SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PREEMPTION DEMAND.
5. PREEMPTION STROBE SHALL BE ILLUMINATED ONLY WHEN THE PREEMPTION PHASE IS ON GREEN.

DETECTION DATA

DETECTION ZONE NO.	LOCATION	Ø CALLED	Ø EXT.	MODE A=PULSE B=PRES.	DELAY TIME	EXT. TIME
1	ROUTE 111 WB LEFT	6	6	B	-	-
2	ROUTE 111 WB THRU/RIGHT	6	6	B	-	-
3	ROUTE 111 EB LEFT	5	5 & 2	B	-	-
4	ROUTE 111 EB THRU/RIGHT	2	2	B	-	-
5	DRIVEWAY NB ALL MOVEMENTS	4	4	B	-	-
6	CHARTER ROAD SB LEFT/THRU	8	8	B	-	-
7	CHARTER ROAD SB RIGHT	8	8	B	6 SEC	-
S1	SYSTEM (EB-E OF CHARTER RD)	-	-	A	-	-
S2	SYSTEM (WB-E OF CHARTER RD)	-	-	A	-	-

TRAFFIC CONTROLLER DATA

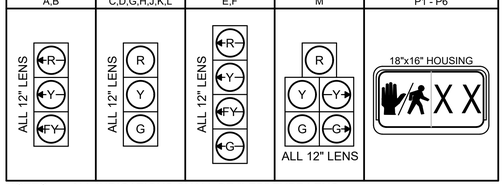
PARAMETER	SELECTION
PHASE ASSIGNMENTS	STD. NEMA
OVERLAPS	STD. NEMA
RINGS	DUAL
DUAL ENTRY	ON (Ø2 & Ø6) (Ø4 & Ø8)
SIMULTANEOUS GAP OUT DISABLED	YES (Ø2 & Ø6) (Ø4 & Ø8)
MINIMUM YELLOW IN SECONDS	3
MAX II BY INTERNAL CLOCK	YES
NIGHT TIME FLASH BY INTERNAL CLOCK	NOT USED
TYPE OF INTERCONNECT TO MASTER	FIBER-OPTIC CABLE
REMOTE MUTCD FLASH BY MASTER	YES (NOT USE)

MASSACHUSETTS AVENUE (ROUTE 111) @ CHARTER ROAD
COORDINATION DATA
(ALL ENTRIES IN SECONDS)

	PLAN 1 M-F: 0630-1000		PLAN 2 M-F: 1500-1900		PLAN 3 SAT: 0930-1800 SUN: 1100-1700	
CYCLE	90		90		90	
OFFSET	27		14		7	
	w/O Ø9	w/Ø9	w/O Ø9	w/Ø9	w/O Ø9	w/Ø9
SPLIT TIME Ø1	-	-	-	-	-	-
SPLIT TIME Ø2	68	49	66	49	71	50
SPLIT TIME Ø3	-	-	-	-	-	-
SPLIT TIME Ø4	22	16	24	16	19	15
SPLIT TIME Ø5	12	12	12	12	12	12
SPLIT TIME Ø6	56	37	54	37	59	38
SPLIT TIME Ø7	-	-	-	-	-	-
SPLIT TIME Ø8	22	16	24	16	19	15
SPLIT TIME Ø9		25		25		25

1. OFFSET IS REFERENCE TO THE END OF COORDINATED (Ø6) PHASE.
2. Ø2 & Ø6 "CALL NOT ACTUATED" DURING COORDINATION.
3. PLAN FORCE OFF SHALL BE IN EFFECT.
4. SPLIT TIMES EQUAL TO GREEN PLUS CLEARANCES.
5. MAX2 TERMINATION SHALL BE IN EFFECT DURING COORDINATION.
6. YIELD MODE COORDINATION SHALL BE IN EFFECT.
7. OFFSET SEEK METHOD SHALL BE SHORTWAY.

PROPOSED SIGNALS



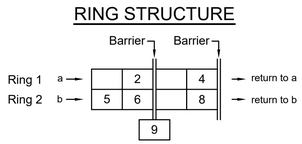
NOTES:
1. ALL INDICATIONS SHALL BE "LED" TYPE LENS IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
2. ALL OVERHEAD SIGNALS SHALL BE RIGIDLY MOUNTED. ALL SIGNAL HEADS SHALL BE EQUIPPED WITH CUT TUNNEL VISORS AND 5" SOLID BACKPLATES.
3. ALL VEHICLE SIGNAL HEAD BACKPLATES SHALL INCLUDE 3" YELLOW RETRO-REFLECTIVE BORDER IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
4. ALL PEDESTRIAN DISPLAY SHALL BE "FULL" DISPLAYS. NO OUTLINE SYMBOL SHALL BE PERMITTED.

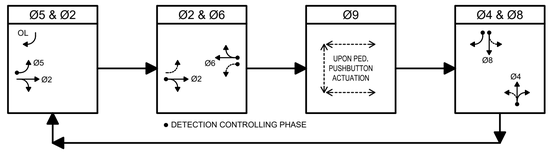
MAJOR ITEMS REQUIRED

QUANTITY	DESCRIPTION
1	ADVANCE TRAFFIC CONTROLLER (ATC) AND NEMA TS2 CABINET WITH FOUNDATION
1	FIBER OPTIC PATCH PANEL
1	ENVIRONMENTAL HARDENED ETHERNET SWITCH (FOR INTERCONNECT)
1	SERVICE CONNECTION (OVERHEAD FROM RELOC. UTILITY POLE)
2	40' MAST ARM ASSEMBLY, BASE & FDN.
2	30' MAST ARM ASSEMBLY, BASE & FDN.
2	8' SIGNAL POST, BASE & FDN.
9	SIGNAL HEAD, 3 SECTION
2	SIGNAL HEAD, 4 SECTION
1	SIGNAL HEAD, 5 SECTION (DOG HOUSE)
6	PEDESTRIAN HOUSING GRAPHIC LED WITH COUNTDOWN TIMER
6	AUDIBLE & VIBRO-TACTILE PEDESTRIAN PUSH BUTTON (APS TYPE) INTEGRATED R10-3e SIGN & SADDLE w/LED CONFIRMATION LIGHT
1	DETECTION SYSTEM WITH CAMERA(S), AND PROCESSORS THAT IS CAPABLE OF STOP LINE PRESENT DETECTION, HIGH SPEED DILEMMA ZONE DETECTION AND BICYCLE DETECTION AS SHOWN ON THE PLAN
4	PULL BOX 12"x12" - SD2.031 (PAY SEPARATELY UNDER ITEM 811.31)
4	UNIDIRECTIONAL SINGLE CHANNEL OPTICAL DETECTOR (RECEIVER)
2	PREEMPTION 2-CHANNEL PHASE SELECTOR
2	PREEMPTION CONFIRMATION STROBE (CLEAR)

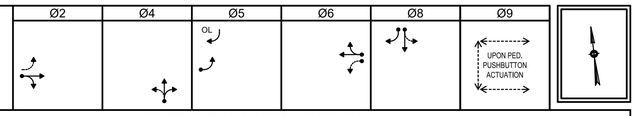
PLUS ALL MISCELLANEOUS EQUIPMENT AND MATERIAL NECESSARY TO PROVIDE A COMPLETE OPERATING TRAFFIC CONTROL SIGNAL.

RING STRUCTURE





FULLY-ACTUATED ☑ ISOLATED ☐
SEMI-ACTUATED ☐ COORDINATED ☑
PRE-TIMED ☐ WIRE ☑ TBCU ☐



SEQUENCE AND TIMING

STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	FLASH OPER.
MASSACHUSETTS AVE (ROUTE 111)	WB	A,B	RL	RL	RL	RL	RL	RL	RL	RL	RL	FYL	YL	RL	RL	RL	RL	RL	RL	RL	FYL
MASSACHUSETTS AVE (ROUTE 111)	WB	C,D	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	FY
MASSACHUSETTS AVE (ROUTE 111)	EB	E,F	FYL	YL	RL	RL	RL	RL	GL	YL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	FYL
MASSACHUSETTS AVE (ROUTE 111)	EB	G,H	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
DRIVEWAY	NB	J,K	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
CHARTER ROAD	SB	L	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	FR
CHARTER ROAD	SB	M	R	R	R	R	R	R	R/GR	R/YR	R	R	R	R	G	Y	R	R	R	R	FR
PEDESTRIAN	ALL	P1-P6	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	OUT

TIMING IN SECONDS

MINIMUM INITIAL			6			6			6			6			6						EMERGENCY
PASSAGE			2			2			2			2			2						
MAXIMUM 1 (FREE OPERATION)			50			30			10			50			30						
MAXIMUM 2 (COORDINATED OPERATION)			-			-			-			-			-						
CHANGE				4.0	2.0		3.0	2.0		4.0	2.0		4.0	2.0		3.0	2.0				
PEDESTRIAN																		7	16	2	
RECALL			MIN			OFF			OFF			MIN			OFF			OFF			
MEMORY			NON-LOCKING			NON-LOCKING			NON-LOCKING			NON-LOCKING			NON-LOCKING			LOCKING			

ACTON
KELLEY'S CORNER

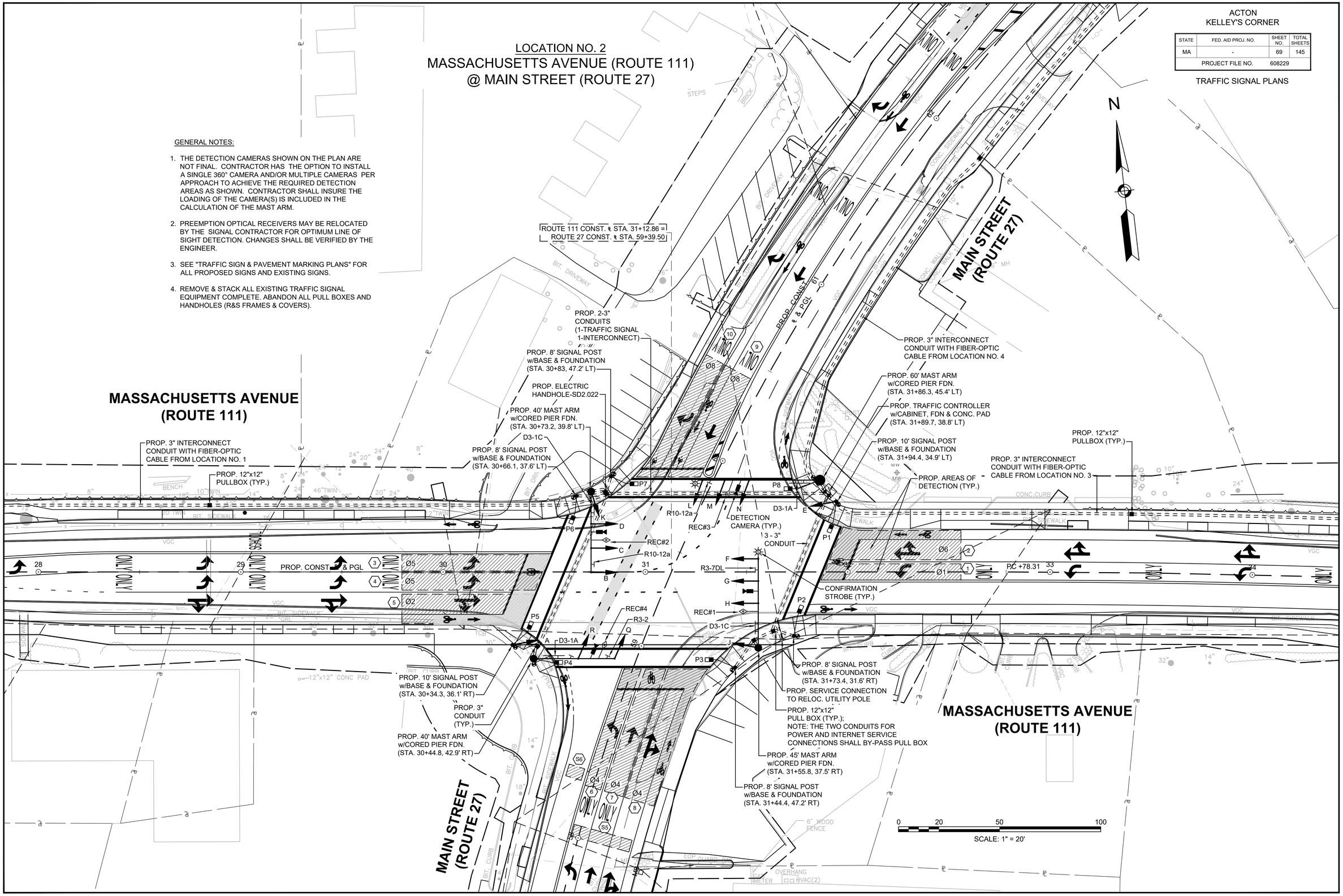
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	69	145
PROJECT FILE NO.	608229		

TRAFFIC SIGNAL PLANS

LOCATION NO. 2
MASSACHUSETTS AVENUE (ROUTE 111)
@ MAIN STREET (ROUTE 27)

GENERAL NOTES:

1. THE DETECTION CAMERAS SHOWN ON THE PLAN ARE NOT FINAL. CONTRACTOR HAS THE OPTION TO INSTALL A SINGLE 360° CAMERA AND/OR MULTIPLE CAMERAS PER APPROACH TO ACHIEVE THE REQUIRED DETECTION AREAS AS SHOWN. CONTRACTOR SHALL INSURE THE LOADING OF THE CAMERA(S) IS INCLUDED IN THE CALCULATION OF THE MAST ARM.
2. PREEMPTION OPTICAL RECEIVERS MAY BE RELOCATED BY THE SIGNAL CONTRACTOR FOR OPTIMUM LINE OF SIGHT DETECTION. CHANGES SHALL BE VERIFIED BY THE ENGINEER.
3. SEE "TRAFFIC SIGN & PAVEMENT MARKING PLANS" FOR ALL PROPOSED SIGNS AND EXISTING SIGNS.
4. REMOVE & STACK ALL EXISTING TRAFFIC SIGNAL EQUIPMENT COMPLETE. ABANDON ALL PULL BOXES AND HANDHOLES (R&S FRAMES & COVERS).



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ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	70	145
PROJECT FILE NO.	608229		

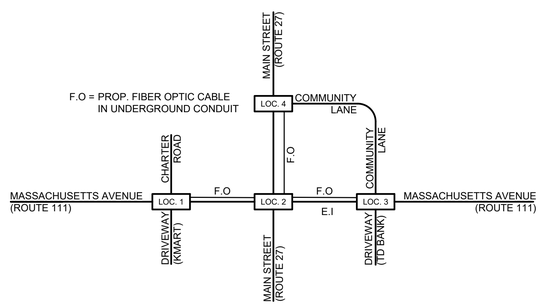
TRAFFIC SIGNAL PLANS

LOCATION NO. 2
MASSACHUSETTS AVENUE (ROUTE 111)
@ MAIN STREET (ROUTE 27)

MASSACHUSETTS AVENUE (ROUTE 111) @ MAIN STREET (ROUTE 27)
COORDINATION DATA
(ALL ENTRIES IN SECONDS)

	PLAN 1 M-F: 0630-1000		PLAN 2 M-F: 1500-1900		PLAN 3 SAT: 0930-1800 SUN: 1100-1700	
CYCLE	90		90		90	
OFFSET	0		0		0	
	w/O Ø9	w/Ø9	w/O Ø9	w/Ø9	w/O Ø9	w/Ø9
SPLIT TIME Ø1	14	13	18	14	20	14
SPLIT TIME Ø2	35	23	35	24	35	24
SPLIT TIME Ø3	-	-	-	-	-	-
SPLIT TIME Ø4	41	24	37	22	35	22
SPLIT TIME Ø5	21	15	18	14	19	14
SPLIT TIME Ø6	28	21	35	24	36	24
SPLIT TIME Ø7	-	-	-	-	-	-
SPLIT TIME Ø8	41	24	37	22	35	22
SPLIT TIME Ø9		30		30		30

1. OFFSET IS REFERENCE TO THE END OF COORDINATED (Ø6) PHASE.
2. Ø2 & Ø6 "CALL NOT ACTUATED" DURING COORDINATION.
3. PLAN FORCE OFF SHALL BE IN EFFECT.
4. SPLIT TIMES EQUAL TO GREEN PLUS CLEARANCES.
5. MAX2 TERMINATION SHALL BE IN EFFECT DURING COORDINATION.
6. YIELD MODE COORDINATION SHALL BE IN EFFECT.
7. OFFSET SEEK METHOD SHALL BE SHORTWAY.



SCHEMATIC OF INTERCONNECT SYSTEM

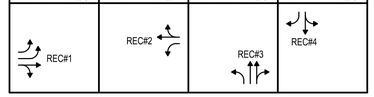
MASTER PROGRAM
SUB SYSTEM#1
MASSACHUSETTS AVENUE (ROUTE 111)
AND MAIN STREET (ROUTE 27)
DAILY & WEEKLY PROGRAM

	MONDAY - FRIDAY	SATURDAY	SUNDAY
PLAN 1 90" CYCLE	0630 - 1000	-	-
PLAN 2 90" CYCLE	1500 - 1900		
PLAN 3 90" CYCLE		0930 - 1800	1100 - 1700
FREE OPERATION	0000 - 0700 1000 - 1500 1900 - 2400	0000 - 0930 1800 - 2400	0000 - 1100 1700 - 2400
FLASH OPERATION	-	-	-

LOCATION NO. 1: MASSACHUSETTS AVENUE (ROUTE 111) @ CHARTER ROAD----------LOCAL
LOCATION NO. 2: MASSACHUSETTS AVENUE (ROUTE 111) @ MAIN STREET (ROUTE 27)----------MASTER
LOCATION NO. 3: MASSACHUSETTS AVENUE (ROUTE 111) @ COMMUNITY LANE----------LOCAL
LOCATION NO. 4: MAIN STREET (ROUTE 27) @ COMMUNITY LANE----------LOCAL

EMERGENCY VEHICLE PREEMPTION

WB	EB	NB	SB
PREEMPT#3	PREEMPT#4	PREEMPT#5	PREEMPT#6



EMERGENCY VEHICLE PREEMPTION OPERATION

1. EMERGENCY VEHICLE PREEMPTION SIGNAL SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS (RECEIVERS) LOCATED AT THE INTERSECTION.
2. PREEMPTION SIGNALS SHALL BE SERVICED ON A FIRST COME FIRST SERVED BASIS. IN CASE WHERE TWO OR MORE CALLS ARE COMING IN AT THE SAME TIME, PREEMPTION SHALL BE PRIORITIZED WITH PREEMPT #3 (ROUTE 111 WB) FIRST, THEN FOLLOW BY PREEMPT #4 (ROUTE 111 EB), PREEMPT #5 (ROUTE 27 NB) AND PREEMPT#6 (ROUTE 27 SB) LAST.
3. IN RESPONSE TO A PREEMPTION SIGNAL RECEIVED BY OPTICAL DETECTOR REC#1 (OR REC#2, REC#3, REC#4), THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PREEMPTION SIGNAL #1 (OR #2, #3, #4) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PREEMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME THE RELEVANT CLEARANCE INTERVALS AND SERVICE THE SUBSEQUENT EMERGENCY VEHICLE PREEMPTION SIGNAL IF NECESSARY. NORMAL SIGNAL OPERATION SHALL RESUME PROVIDED THAT ALL PREEMPTION SIGNALS HAVE CEASED.
4. NORMAL VEHICLE CLEARANCES SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PREEMPTION DEMAND.
5. PREEMPTION STROBE SHALL BE ILLUMINATED ONLY WHEN THE PREEMPTION PHASE IS ON GREEN.

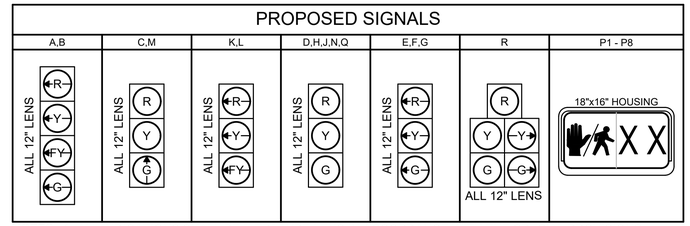
TRAFFIC CONTROLLER DATA

PARAMETER	SELECTION
PHASE ASSIGNMENTS	STD. NEMA
OVERLAPS	STD. NEMA
RINGS	DUAL
DUAL ENTRY	ON (Ø2 & Ø6) (Ø4 & Ø8)
SIMULTANEOUS GAP OUT DISABLED	YES (Ø2 & Ø6) (Ø4 & Ø8)
MINIMUM YELLOW IN SECONDS	3
MAX II BY INTERNAL CLOCK	YES
NIGHT TIME FLASH BY INTERNAL CLOCK	NOT USED
TYPE OF INTERCONNECT TO MASTER	MASTER LOCATION
REMOTE MUTCD FLASH BY MASTER	YES (NOT USE)

DETECTION DATA

DETECTION ZONE NO.	LOCATION	Ø CALLED	Ø EXT.	MODE A=PULSE B=PRES.	DELAY TIME	EXT. TIME
1	ROUTE 111 WB LEFT	1	1 & 6	B	-	-
2	ROUTE 111 WB THRU/RIGHT	6	6	B	-	-
3	ROUTE 111 EB LEFT	5	5	B	-	-
4	ROUTE 111 EB LEFT	5	5	B	-	-
5	ROUTE 111 EB THRU/RIGHT	2	2	B	-	-
6	ROUTE 27 NB LEFT	4	4	B	-	-
7	ROUTE 27 NB THRU	4	4	B	-	-
8	ROUTE 27 NB THRU/RIGHT	4	4	B	-	-
9	ROUTE 27 SB THRU	8	8	B	-	-
10	ROUTE 27 NB RIGHT	8	8 & 5	B	6 SEC	-

PROPOSED SIGNALS



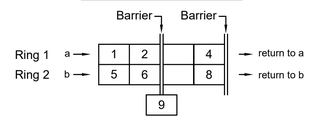
NOTES:
1. ALL INDICATIONS SHALL BE "LED" TYPE LENS IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
2. ALL OVERHEAD SIGNALS SHALL BE RIGIDLY MOUNTED. ALL SIGNAL HEADS SHALL BE EQUIPPED WITH CUT TUNNEL VISORS AND 5" SOLID BACKPLATES.
3. ALL VEHICLE SIGNAL HEAD BACKPLATES SHALL INCLUDE 3" YELLOW RETRO-REFLECTIVE BORDER IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
4. ALL PEDESTRIAN DISPLAY SHALL BE "FULL" DISPLAYS. NO OUTLINE SYMBOL SHALL BE PERMITTED.

MAJOR ITEMS REQUIRED

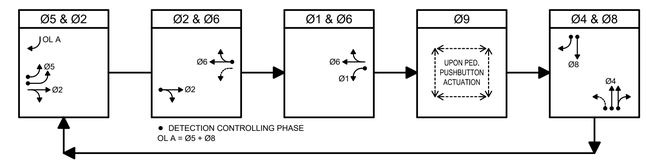
QUANTITY	DESCRIPTION
1	ADVANCE TRAFFIC CONTROLLER (ATC) AND NEMA TS2 CABINET WITH FOUNDATION AND CONC. PAD
1	ON-STREET MASTER CONTROLLER (TO LOCATE IN THE SAME CABINET)
1	FIBER OPTIC PATCH PANEL
1	ENVIRONMENTAL HARDENED ETHERNET SWITCH (FOR INTERCONNECT)
1	SERVICE CONNECTION (OVERHEAD FROM RELOC. UTILITY POLE)
1	CABLE SERVICE CONNECTION FOR HIGH SPEED INTERNET ACCESS INCLUDING CABLE MODEM AND ETHERNET BROADBAND ROUTER
1	60' MAST ARM ASSEMBLY, BASE & FDN.
1	45' MAST ARM ASSEMBLY, BASE & FDN.
2	40' MAST ARM ASSEMBLY, BASE & FDN.
2	10' SIGNAL POST, BASE & FDN.
4	8' SIGNAL POST, BASE & FDN.
12	SIGNAL HEAD, 3 SECTION
2	SIGNAL HEAD, 4 SECTION
1	SIGNAL HEAD, 5 SECTION (DOG HOUSE)
8	PEDESTRIAN HOUSING GRAPHIC LED WITH COUNTDOWN TIMER
8	AUDIBLE & VIBRO-TACTILE PEDESTRIAN PUSH BUTTON (APS TYPE) INTEGRATED R10-3e SIGN & SADDLE w/LED CONFIRMATION LIGHT
1	DETECTION SYSTEM WITH CAMERA(S), AND PROCESSORS THAT IS CAPABLE OF STOP LINE PRESENT DETECTION, HIGH SPEED DILEMMA ZONE DETECTION AND BICYCLE DETECTION AS SHOWN ON THE PLAN
6	PULL BOX 12"x12" - SD2.031 (PAY SEPARATELY UNDER ITEM 811.31)
1	ELECTRIC HANDHOLE - SD2.022 (PAY SEPARATELY UNDER ITEM 811.22)
4	UNIDIRECTIONAL SINGLE CHANNEL OPTICAL DETECTOR (RECEIVER)
2	PREEMPTION 2-CHANNEL PHASE SELECTOR
2	PREEMPTION CONFIRMATION STROBE (CLEAR)

PLUS ALL MISCELLANEOUS EQUIPMENT AND MATERIAL NECESSARY TO PROVIDE A COMPLETE OPERATING TRAFFIC CONTROL SIGNAL.

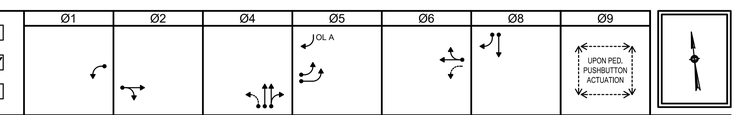
RING STRUCTURE



PREFERENTIAL PHASE SEQUENCE



FULLY-ACTUATED ☑ ISOLATED ☐
SEMI-ACTUATED ☐ COORDINATED ☑
PRE-TIMED ☐ WIRE ☑ TBCU ☐



SEQUENCE AND TIMING

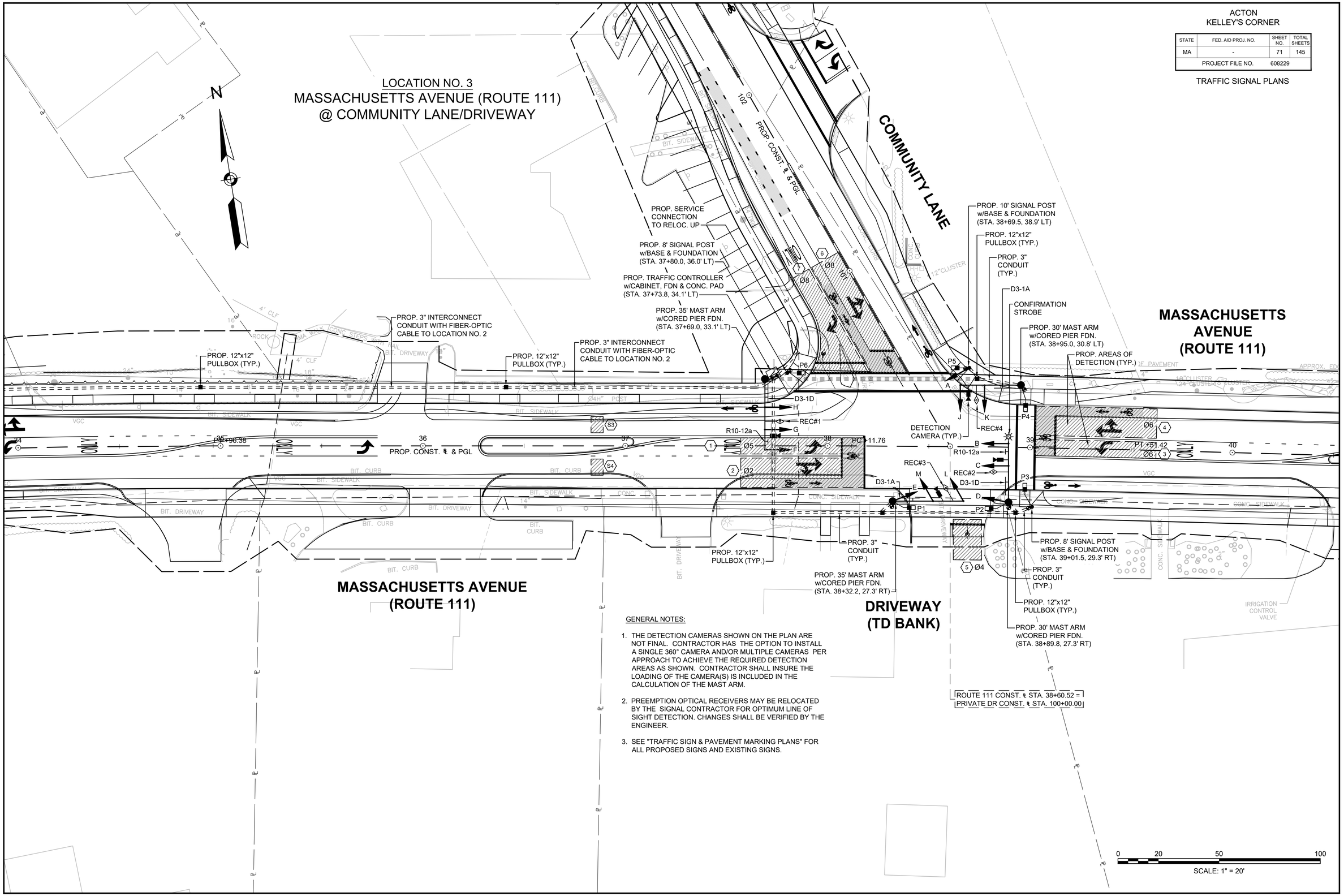
STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	FLASH OPER.
MASSACHUSETTS AVE (ROUTE 111)	WB	A,B	GL	YL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	FYL	YL	RL	RL	RL	RL	RL	RL	RL	FYL
MASSACHUSETTS AVE (ROUTE 111)	WB	C	R	R	R	R	R	R	R	R	R	R	R	R	GV	Y	R	R	R	R	R	R	R	FY
MASSACHUSETTS AVE (ROUTE 111)	WB	D	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	FY
MASSACHUSETTS AVE (ROUTE 111)	EB	E,F,G	RL	RL	RL	RL	RL	RL	RL	RL	RL	GL	YL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	FYL
MASSACHUSETTS AVE (ROUTE 111)	EB	H,J	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
MAIN STREET (ROUTE 27)	NB	K,L	RL	RL	RL	RL	RL	RL	FYL	YL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	RL	FRL
MAIN STREET (ROUTE 27)	NB	M	R	R	R	R	R	R	GV	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
MAIN STREET (ROUTE 27)	NB	N	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
MAIN STREET (ROUTE 27)	SB	Q	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	FR
MAIN STREET (ROUTE 27)	SB	R	R	R	R	R	R	R	R	R	R	R/GR	R/YR	R	R	R	R	G	Y	R	R	R	R	FR
PEDESTRIAN	ALL	P1-P8	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	OUT
TIMING IN SECONDS																								
MINIMUM INITIAL			6			6			6			6			6			6						EMERGENCY
PASSAGE			2			2			2			2			2			2						
MAXIMUM 1 (FREE OPERATION)			50			50			50			30			50			30						
MAXIMUM 2 (COORDINATED OPERATION)			-			-			-			-			-			-						
CHANGE				4.0	2.5		4.0	2.5		3.5	2.0		4.0	2.5		4.0	2.5		3.5	2.0				
PEDESTRIAN																					7	21	2	
RECALL			OFF			MIN			OFF			OFF			MIN			OFF			OFF			
MEMORY			NON-LOCKING			NON-LOCKING			NON-LOCKING			NON-LOCKING			NON-LOCKING			NON-LOCKING			LOCKING			

16093_HD(TS).DWG Plotted on 25-Jan-2018 11:04 AM

ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	71	145
PROJECT FILE NO.	608229		

TRAFFIC SIGNAL PLANS



GENERAL NOTES:

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2. PREEMPTION OPTICAL RECEIVERS MAY BE RELOCATED BY THE SIGNAL CONTRACTOR FOR OPTIMUM LINE OF SIGHT DETECTION. CHANGES SHALL BE VERIFIED BY THE ENGINEER.
3. SEE "TRAFFIC SIGN & PAVEMENT MARKING PLANS" FOR ALL PROPOSED SIGNS AND EXISTING SIGNS.

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ACTON
KELLEY'S CORNER

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MA	-	72	145
PROJECT FILE NO.	608229		

TRAFFIC SIGNAL PLANS

LOCATION NO. 3
MASSACHUSETTS AVENUE (ROUTE 111)
@ COMMUNITY LANE/DRIVEWAY

DETECTION DATA

DETECTION ZONE NO.	LOCATION	Ø CALLED	Ø EXT.	MODE A=PULSE B=PRES.	DELAY TIME	EXT. TIME
1	ROUTE 111 EB LEFT	5	5	B	-	-
2	ROUTE 111 EB THRU/RIGHT	2	2	B	-	-
3	ROUTE 111 WB LEFT	6	6	B	-	-
4	ROUTE 111 WB THRU/RIGHT	6	6	B	-	-
5	DRIVEWAY NB ALL MOVEMENTS	4	4	B	-	-
6	COMMUNITY LANE SB LEFT/THRU	8	8	B	-	-
7	COMMUNITY LANE SB RIGHT	8	8	B	6 SEC	-
S3	SYSTEM (WB-W OF COMM. LANE)	-	-	A	-	-
S4	SYSTEM (EB-W OF COMM. LANE)	-	-	A	-	-

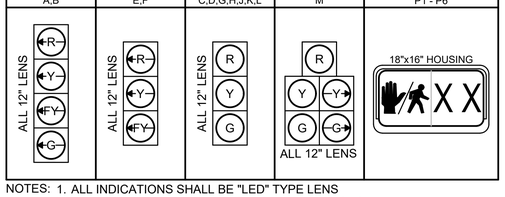
EMERGENCY VEHICLE PREEMPTION

WB	EB	SB	NB
PREEMPT#3	PREEMPT#4	PREEMPT#5	PREEMPT#6
REC#1	REC#2	REC#3	REC#4

EMERGENCY VEHICLE PREEMPTION OPERATION

1. EMERGENCY VEHICLE PREEMPTION SIGNAL SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS (RECEIVERS) LOCATED AT THE INTERSECTION.
2. PREEMPTION SIGNALS SHALL BE SERVICED ON A FIRST COME FIRST SERVED BASIS. IN CASE WHERE TWO OR MORE CALLS ARE COMING IN AT THE SAME TIME, PREEMPTION SHALL BE PRIORITIZED WITH PREEMPT #3 (ROUTE 111 WB) FIRST, THEN FOLLOW BY PREEMPT #4 (ROUTE 111 EB), PREEMPT #5 (COMMUNITY LANE SB) AND PREEMPT#6 (DRIVEWAY) LAST.
3. IN RESPONSE TO A PREEMPTION SIGNAL RECEIVED BY OPTICAL DETECTOR REC#1 (OR REC#2, REC#3, REC#4), THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PREEMPTION SIGNAL #1 (OR #2, #3, #4) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PREEMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME THE RELEVANT CLEARANCE INTERVALS AND SERVICE THE SUBSEQUENT EMERGENCY VEHICLE PREEMPTION SIGNAL IF NECESSARY. NORMAL SIGNAL OPERATION SHALL RESUME PROVIDED THAT ALL PREEMPTION SIGNALS HAVE CEASED.
4. NORMAL VEHICLE CLEARANCES SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PREEMPTION DEMAND.
5. PREEMPTION STROBE SHALL BE ILLUMINATED ONLY WHEN THE PREEMPTION PHASE IS ON GREEN.

PROPOSED SIGNALS



NOTES:
1. ALL INDICATIONS SHALL BE "LED" TYPE LENS IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
2. ALL OVERHEAD SIGNALS SHALL BE RIGIDLY MOUNTED. ALL SIGNAL HEADS SHALL BE EQUIPPED WITH CUT TUNNEL VISORS AND 5" SOLID BACKPLATES.
3. ALL VEHICLE SIGNAL HEAD BACKPLATES SHALL INCLUDE 3" YELLOW RETRO-REFLECTIVE BORDER IN ACCORDANCE WITH THE SPECIAL PROVISIONS.
4. ALL PEDESTRIAN DISPLAY SHALL BE "FULL" DISPLAYS. NO OUTLINE SYMBOL SHALL BE PERMITTED.

MAJOR ITEMS REQUIRED

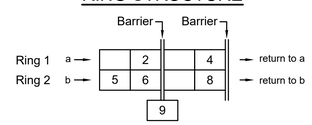
QUANTITY	DESCRIPTION
1	ADVANCE TRAFFIC CONTROLLER (ATC) AND NEMA TS2 CABINET WITH FOUNDATION AND CONC. PAD
1	FIBER OPTIC PATCH PANEL
1	ENVIRONMENTAL HARDENED ETHERNET SWITCH (FOR INTERCONNECT)
1	SERVICE CONNECTION (OVERHEAD FROM RELOC. UTILITY POLE)
2	35' MAST ARM ASSEMBLY, BASE & FDN.
2	30' MAST ARM ASSEMBLY, BASE & FDN.
2	8' SIGNAL POST, BASE & FDN.
1	10' SIGNAL POST, BASE & FDN.
9	SIGNAL HEAD, 3 SECTION
2	SIGNAL HEAD, 4 SECTION
1	SIGNAL HEAD, 5 SECTION (DOG HOUSE)
6	PEDESTRIAN HOUSING GRAPHIC LED WITH COUNTDOWN TIMER
6	AUDIBLE & VIBRO-TACTILE PEDESTRIAN PUSH BUTTON (APS TYPE) INTEGRATED R10-3e SIGN & SADDLE w/LED CONFIRMATION LIGHT
1	DETECTION SYSTEM WITH CAMERA(S), AND PROCESSORS THAT IS CAPABLE OF STOP LINE PRESENT DETECTION, HIGH SPEED DILEMMA ZONE DETECTION AND BICYCLE DETECTION AS SHOWN ON THE PLAN
6	PULL BOX 12"x12" - SD2.031 (PAY SEPARATELY UNDER ITEM 811.31)
4	UNIDIRECTIONAL SINGLE CHANNEL OPTICAL DETECTOR (RECEIVER)
2	PREEMPTION 2-CHANNEL PHASE SELECTOR
1	PREEMPTION CONFIRMATION STROBE (CLEAR)

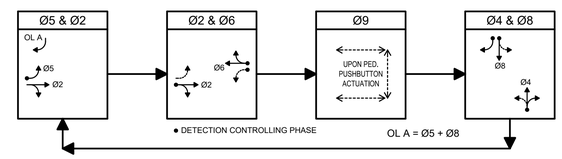
PLUS ALL MISCELLANEOUS EQUIPMENT AND MATERIAL NECESSARY TO PROVIDE A COMPLETE OPERATING TRAFFIC CONTROL SIGNAL.

TRAFFIC CONTROLLER DATA

PARAMETER	SELECTION
PHASE ASSIGNMENTS	STD. NEMA
OVERLAPS	STD. NEMA
RINGS	DUAL
DUAL ENTRY	ON (Ø2 & Ø6) (Ø4 & Ø8)
SIMULTANEOUS GAP OUT DISABLED	YES (Ø2 & Ø6) (Ø4 & Ø8)
MINIMUM YELLOW IN SECONDS	3
MAX II BY INTERNAL CLOCK	YES
NIGHT TIME FLASH BY INTERNAL CLOCK	NOT USED
TYPE OF INTERCONNECT TO MASTER	FIBER-OPTIC CABLE
REMOTE MUTCD FLASH BY MASTER	YES

RING STRUCTURE



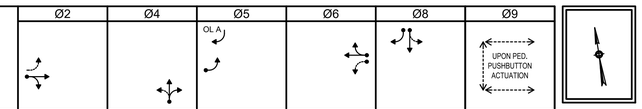


MASSACHUSETTS AVENUE (ROUTE 111) @ COMMUNITY LANE COORDINATION DATA (ALL ENTRIES IN SECONDS)

	PLAN 1 M-F: 0630-1000		PLAN 2 M-F: 1500-1900		PLAN 3 SAT: 0930-1800 SUN: 1100-1700	
CYCLE	90		90		90	
OFFSET	2		87		86	
	w/O Ø9	w/Ø9	w/O Ø9	w/Ø9	w/O Ø9	w/Ø9
SPLIT TIME Ø1	-	-	-	-	-	-
SPLIT TIME Ø2	68	47	65	38	70	47
SPLIT TIME Ø3	-	-	-	-	-	-
SPLIT TIME Ø4	22	15	25	24	20	15
SPLIT TIME Ø5	15	12	14	12	16	12
SPLIT TIME Ø6	53	35	51	26	54	35
SPLIT TIME Ø7	-	-	-	-	-	-
SPLIT TIME Ø8	22	15	25	24	20	15
SPLIT TIME Ø9		28		28		28

1. OFFSET IS REFERENCE TO THE END OF COORDINATED (Ø6) PHASE.
2. Ø2 & Ø6 "CALL NOT ACTUATED" DURING COORDINATION.
3. PLAN FORCE OFF SHALL BE IN EFFECT.
4. SPLIT TIMES EQUAL TO GREEN PLUS CLEARANCES.
5. MAX2 TERMINATION SHALL BE IN EFFECT DURING COORDINATION.
6. YIELD MODE COORDINATION SHALL BE IN EFFECT.
7. OFFSET SEEK METHOD SHALL BE SHORTWAY.

FULLY-ACTUATED	☑	ISOLATED	☐
SEMI-ACTUATED	☐	COORDINATED	☑
PRE-TIMED	☐	WIRE ☑	TBCU ☐



SEQUENCE AND TIMING

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MASSACHUSETTS AVE (ROUTE 111)	EB	C,D	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	FY
MASSACHUSETTS AVE (ROUTE 111)	WB	E,F	RL	RL	RL	RL	RL	RL	RL	RL	RL	FYL	YL	RL	RL	RL	RL	RL	RL	RL	FYL
MASSACHUSETTS AVE (ROUTE 111)	WB	G,H	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	FY
DRIVEWAY	NB	J,K	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
COMMUNITY LANE	SB	L	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	FR
COMMUNITY LANE	SB	M	R	R	R	R	R	R	R/GR	R/YR	R	R	R	R	G	Y	R	R	R	R	FR
PEDESTRIAN	ALL	P1-P6	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	OUT
TIMING IN SECONDS																					
MINIMUM INITIAL			6			6			6			6			6						EMERGENCY
PASSAGE			2			2			2			2			2						
MAXIMUM 1			50			30			10			50			30						
MAXIMUM 2			-			-			-			-			-						
CHANGE				4.5	1.5		3.5	1.5		4.5	1.5		4.5	1.5		3.5	1.5				
PEDESTRIAN																		7	19	2	
RECALL			MIN			OFF			OFF			MAX			OFF			OFF			
MEMORY			NON-LOCKING			NON-LOCKING			NON-LOCKING			NON-LOCKING			NON-LOCKING			LOCKING			

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ACTON
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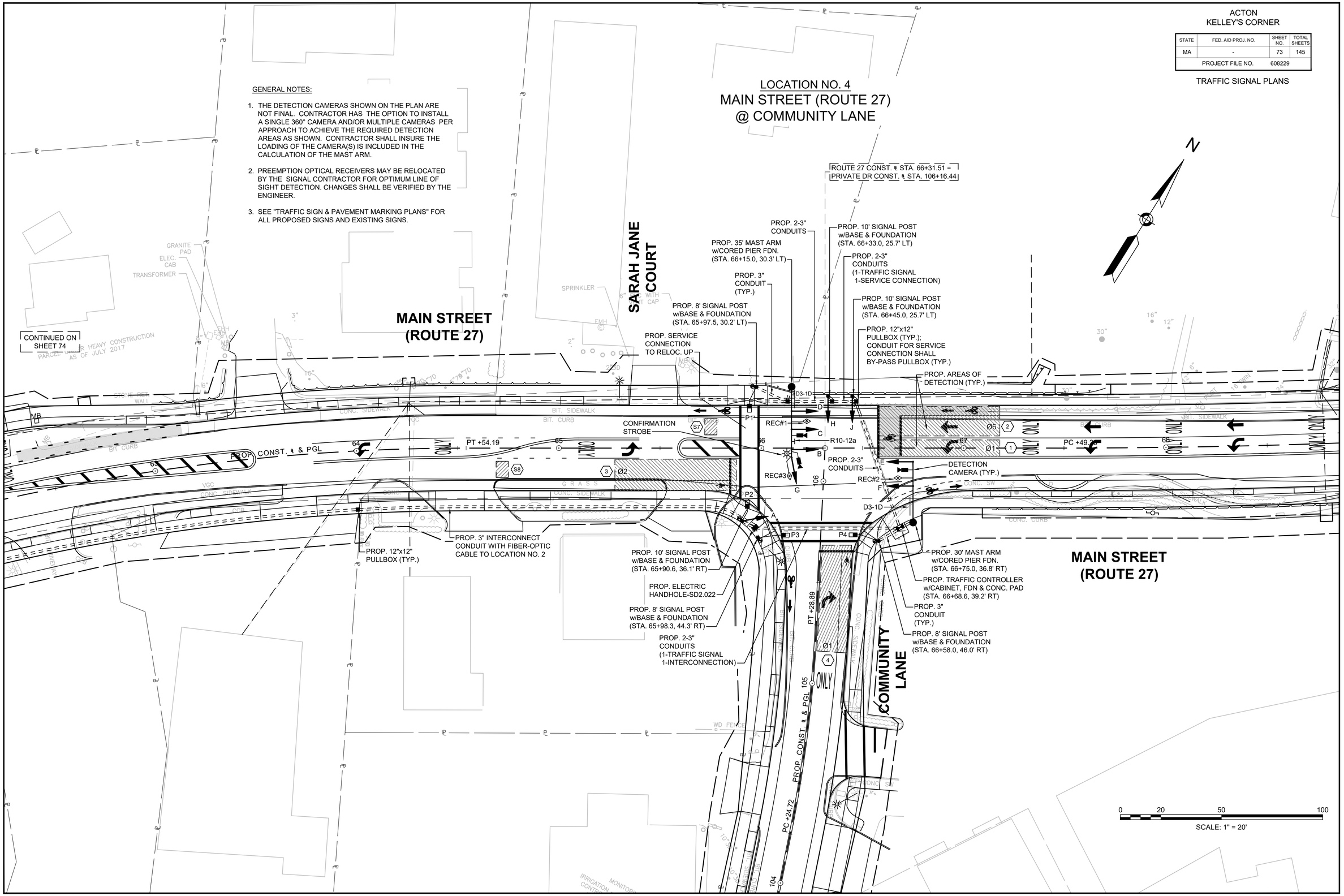

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