MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

PLAN AND PROFILE OF

TRAPELO ROAD AND BELMONT STREET

IN THE TOWNS OF

BELMONT & WATERTOWN

MIDDLESEX COUNTY

FEDERAL AID PROJECT NO. XXX-XXXX

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	1	214
PROJ. FILE NO. 604688			

TITLE SHEET & INDEX

ALL WORK DONE UNDER THIS CONTRACT SHALL BE IN CONFORMANCE WITH THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988 AND THE ENGLISH SUPPLEMENTAL SPECIFICATIONS DATED FEBRUARY 25, 2010; THE STANDARD SPECIAL PROVISIONS, THE 2010 CONSTRUCTION STANDARDS DETAILS (ENGLISH EDITION); THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES WITH MASSACHUSETTS AMENDMENTS; THE 1995 CONSTRUCTION AND TRAFFIC STANDARD DETAILS; THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING; THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORT; THE LATEST EDITION OF AMERICAN STANDARD FOR NURSERY STOCK; THE PLANS AND SPECIAL PROVISIONS.

DESIGN DESIGNATION - TRAPELO ROAD (RTE. 60)

DESIGN SPEED	=	35 M.P.H.
ADT (2012)	=	30,055
ADT (2032)	=	32,550
K	=	7.9%
D	=	55%
T (PEAK HOUR)	=	5.6%
T (AVERAGE DAY)	=	4.7%
DHV	=	2,571
DDHV	=	1,414
FUNC. CLASS	=	URBAN PRINCIPAL ARTERIAL

DESIGN DESIGNATION - TRAPELO ROAD

DESIGN SPEED	=	35 M.P.H.
ADT (2012)	=	15,950
ADT (2032)	=	17,275
K	=	7.6%
D	=	62%
T (PEAK HOUR)	=	6.3%
T (AVERAGE DAY)	=	5.6%
DHV	=	1,313
DDHV	=	814
FUNC. CLASS	=	URBAN PRINCIPAL ARTERIAL

DESIGN DESIGNATION - BELMONT STREET

DESIGN SPEED	=	35 M.P.H.
ADT (2012)	=	23,700
ADT (2032)	=	25,670
K	=	7.1%
D	=	68%
T (PEAK HOUR)	=	5.3%
T (AVERAGE DAY)	=	5.4%
DHV	=	1,823
DDHV	=	1,239
FUNC. CLASS	=	URBAN PRINCIPAL ARTERIAL

DESIGN DESIGNATION - SIDE STREETS

DESIGN SPEED	=	30 M.P.H.
FUNC. CLASS	=	LOCAL

BEGIN PROJECT
STATION 17+40.00
N 2967460.7350
E 738144.8003

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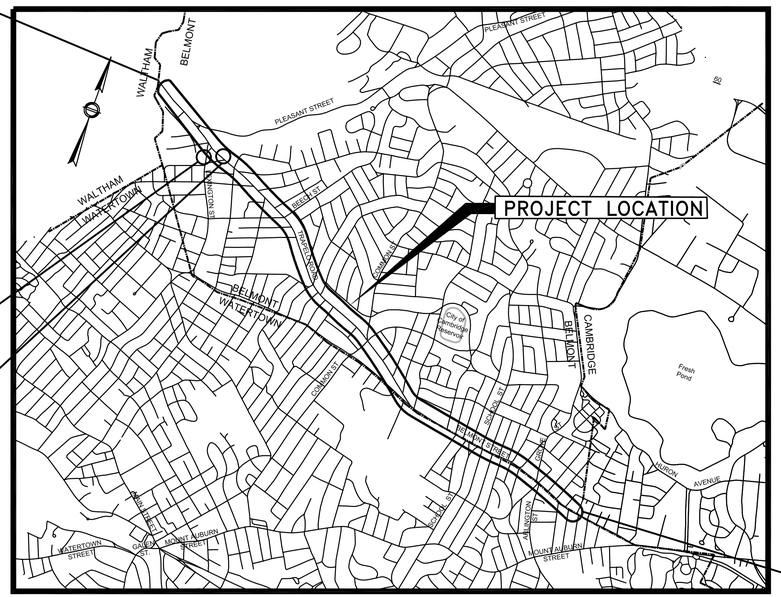
MHD BRIDGE B-7-6

MHD BRIDGE B-7-4



END PROJECT
STATION 147+30.18
N 2961926.5323
E 749560.5137

LOCATION MAP

1500 0 1500 3000

SCALE 1" = 1500'

LENGTH OF PROJECT = 12,990.18 FEET = 2.460 MILES

CONVENTIONAL SIGNS

COUNTY, CITY, OR TOWN BOUNDARY

COUNTY, CITY, OR TOWN SIDE LINE

FENCE LINE

BASE LINE OR SURVEY LINE — N57°-18'-41"E — 74 — 59.57

RIGHT OF WAY LINE

CULVERT

ELEVATIONS — PROPOSED SURFACE; EXIST. SURFACE; PRES. 222.40; PROP. 223.681; 74

UTILITY POLE

100% SUBMISSION
MARCH 1, 2012

SUBCONSULTANT:
BSC GROUP
15 ELKINS STREET
BOSTON, MASSACHUSETTS 02127
(617) 896-4300
www.bscgroup.com

RECOMMENDED FOR APPROVAL

CHIEF ENGINEER DATE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

APPROVED

DIVISION ADMINISTRATOR DATE

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	2	214
PROJ. FILE NO. 604688			

KEY PLAN & BORING LOCATIONS

BEGIN PROJECT
STA. 17+40.00
MEET EXISTING
N 2967460.7350
E 738144.8003

4+79.86

BEAVER BROOK

WAVERLEY OAKS ROAD (RTE 60)

TRAPELO ROAD (RTE 60)

MILL STREET

BELMONT / WALTHAM

AGASSIZ STREET

PLEASANT STREET (RTE 60)

MASSDOT BRIDGE # B-7-4
(NO WORK ON BRIDGE)

TRAPELO ROAD

MORAINE STREET

SHAW'S DRIVE

LEXINGTON STREET

CHURCH STREET

MASSDOT BRIDGE # B-7-6
(NO WORK ON BRIDGE)

THAYER ROAD

WHITE STREET

CONT. BELOW

CONT. ABOVE

WHITE STREET

WAVERLEY STREET

HAWTHORNE STREET

DAVIS ROAD

SYCAMORE STREET

MAPLE STREET

TRAPELO ROAD

BEECH STREET

HULL STREET

WALNUT STREET

TRAPELO ROAD

FLETT ROAD

SLADE STREET

BARTLETT AVENUE

CONT. ON SHEET # 3

LEGEND

- XX — CONSTRUCTION PLAN
- XX — PROFILE PLAN
- XX — GRADING & TIE PLAN
- XX — DRAINAGE AND UTILITY PLAN
- XX — PAVEMENT MARKING PLAN
- B-3 — EXISTING BORING LOCATION
- P-1 — EXISTING PROBE LOCATION

HOR. SCALE IN FEET
0 100 250 500

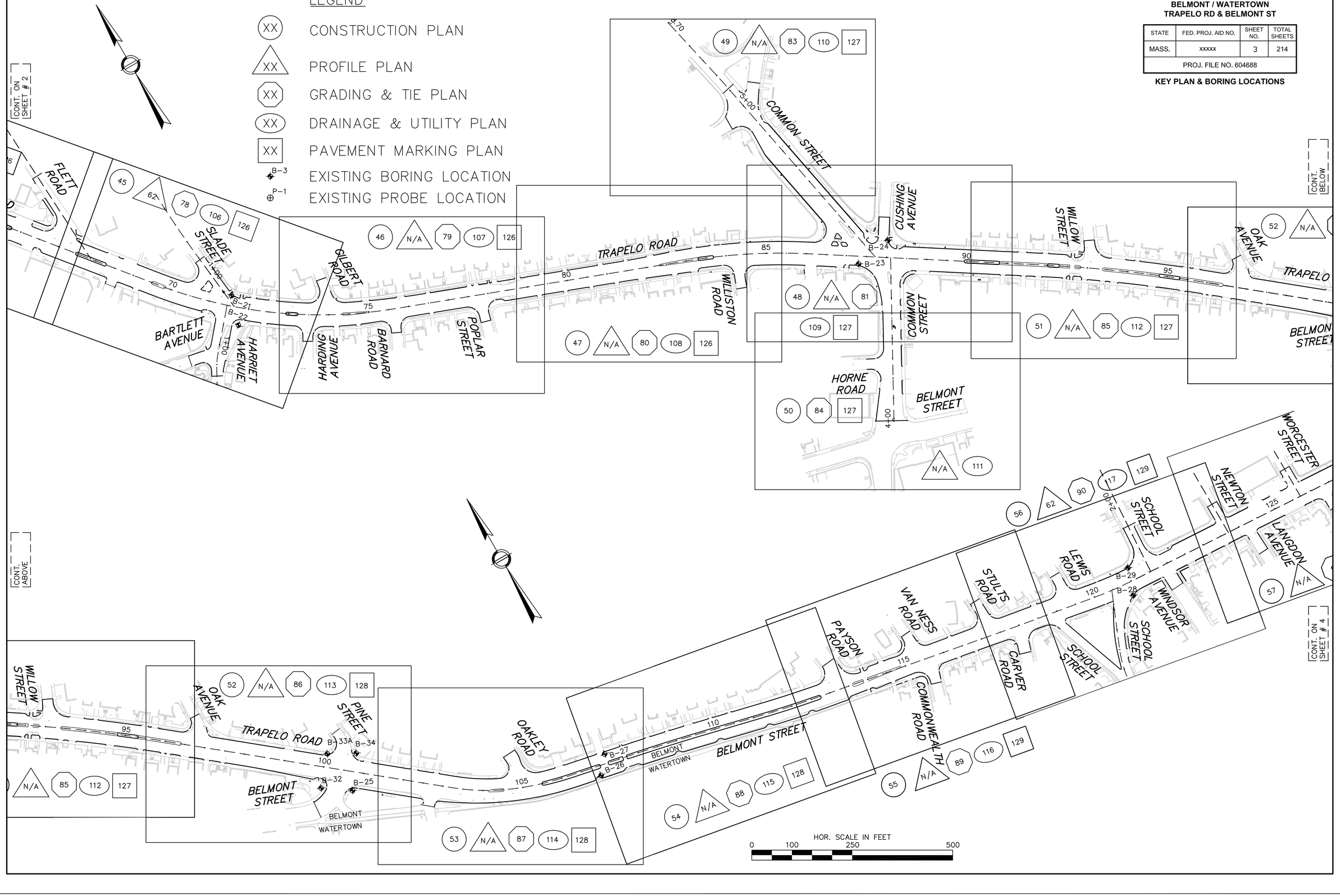
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	3	214
PROJ. FILE NO. 604688			

KEY PLAN & BORING LOCATIONS

LEGEND

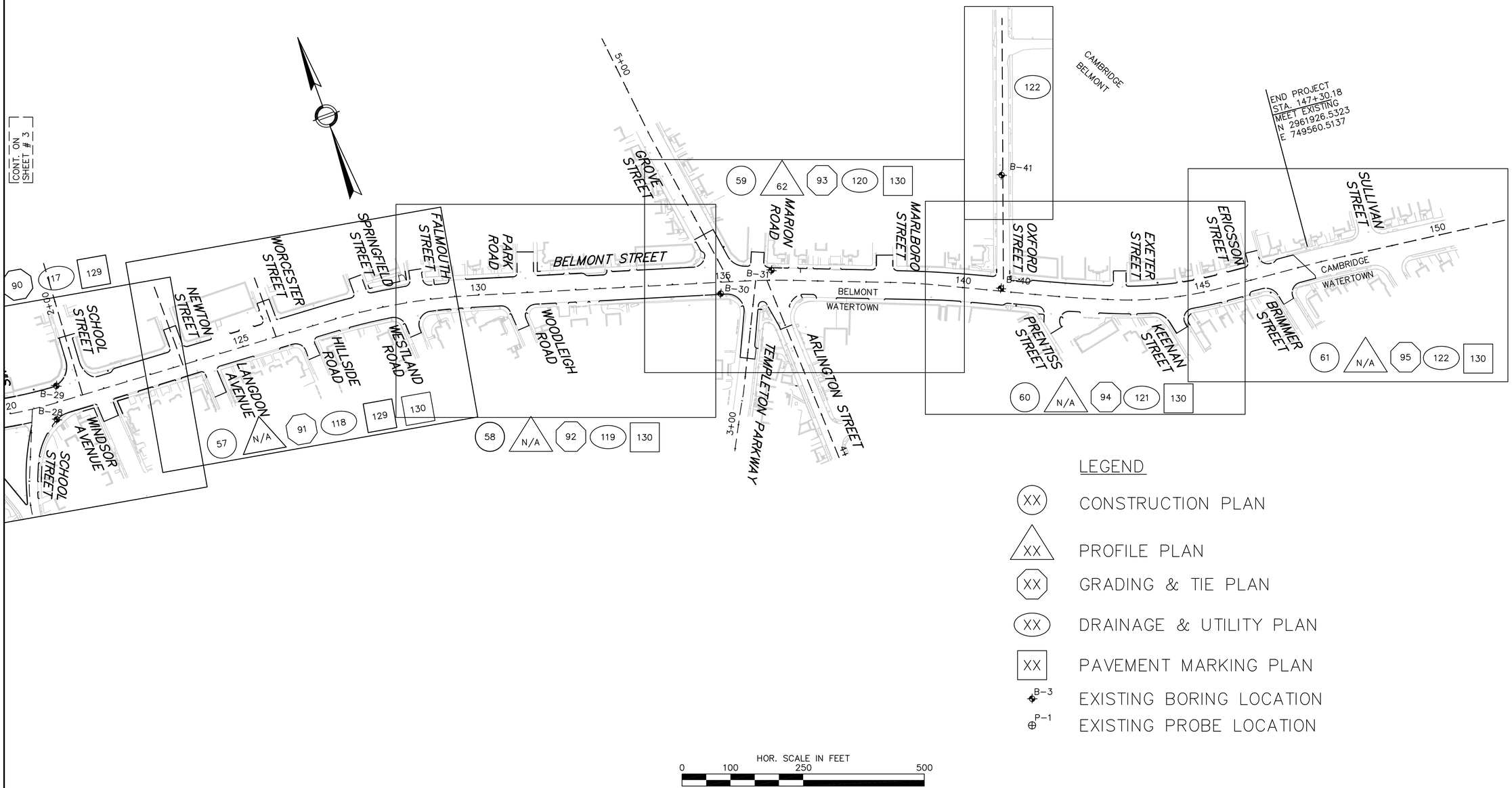
- XX — CONSTRUCTION PLAN
- XX — PROFILE PLAN
- XX — GRADING & TIE PLAN
- XX — DRAINAGE & UTILITY PLAN
- XX — PAVEMENT MARKING PLAN
- B-3 — EXISTING BORING LOCATION
- P-1 — EXISTING PROBE LOCATION



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	4	214
PROJ. FILE NO. 604688			

KEY PLAN & BORING LOCATIONS



LEGEND

- XX — CONSTRUCTION PLAN
- XX — PROFILE PLAN
- XX — GRADING & TIE PLAN
- XX — DRAINAGE & UTILITY PLAN
- XX — PAVEMENT MARKING PLAN
- B-3 — EXISTING BORING LOCATION
- P-1 — EXISTING PROBE LOCATION

HOR. SCALE IN FEET
0 100 250 500

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	5	214
PROJ. FILE NO. 604688			

BORING LOGS

BORING NOTES:

1. LOCATION OF BORINGS SHOWN ON THE PLAN THUS: ⊕ B–X

2. BORINGS TAKEN FOR THE PURPOSE OF DESIGN AND SHOW CONDITIONS AT BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE NATURE OF THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.

3. WATER LEVELS SHOWN ON THE BORING LOGS WERE OBSERVED AT THE TIME OF TAKING BORINGS AND DO NOT NECESSARILY SHOW THE TRUE GROUND WATER LEVEL.

4. FIGURES TO THE LEFT OF COLUMNS INDICATE DEPTH BELOW SURFACE AT BORING POINT.

5. FIGURES IN COLUMNS INDICATE NUMBER OF BLOWS PRODUCED BY A 30" FALL OF 140 POUND MASS HAMMER REQUIRED TO DRIVE 2" I.D. SPOON 6 INCHES.

6. BORING SAMPLE TAKEN 7/28/09 – 8/14/09.

7. BORING CONTRACTOR: NEW HAMPSHIRE BORING INC.

8. BORING SAMPLES MAY BE SEEN AT 1215 WEST CHESTNUT ST, BROCKTON, MA 02301

BORING #B–1
STA 19+00–46 LT
GROUND EL = 82.67

NEW HAMPSHIRE BORING, INC.
1215 West Chestnut Street Brockton, MA 02301

PROJECT
Trapelo Road
Belmont, Ma

REPORT OF BORING No. B-1
SHEET 1 OF 1
FILE No. 17141

DRILLER: Don Dunklee
HELPER: Scott Healey
INSPECTOR:

BORING LOCATION
GROUND SURFACE ELEVATION DATUM
DATE START 7/28/2009 DATE END 7-28-09

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.

CASING SIZE: HSA OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME
7/28/2009		14'	2 1/4	5 mins

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S-1	24/10	0-1	88-42	Concrete Thickness 4" dry, blackish, very dense fine SAND some coarse sand,		
			1-2	38-19	trace fine gravel		
5	S-2	24/8	5-6	6-5	moist, dense brown, loose fine SAND and SILT trace		
			6-7	5-7	coarse sand		
10	S-3	9/3	10-11	63-100/3"	dry, dense brown, very dense fine SAND some coarse		
			11-17		sand, trace fine gravel		
15	S-4	24/10	15-16	42-27	wet, gray, very dense fine SAND and SILT trace fine		
			16-17	31-39	gravel		
20					Bottom of Boring 17'		
25							
30							

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS: offsets from "A" locations
16' S.W.on roadway B-1 is on grass (no tar)

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-1

BORING #B–2
STA 18+45–33LT
GROUND EL = 84.1

NEW HAMPSHIRE BORING, INC.
1215 W. CHESTNUT ST., BROCKTON, MA 02301

PROJECT
Traffic Signal Improvements
Belmont, MA
BSC Group

REPORT OF BORING No. B-2
SHEET 1 OF 1
FILE No. 17141
CHKD. BY

Driller: Don Dunklee
Helper:
INSPECTOR:

BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 7/28/2009 DATE END 8/11/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.

CASING SIZE: 2.25" - 3" OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S1	24/8	0-2	1-2	No tar, on grass dry, brown, loose, fine SAND, some silt (organics)		
				3-3			
5	S2	24/6	4-6	8-17	dry, brown, very dense, fine SAND, some silt		
				50-92			
10	S3	24/3	9-11	10-18	wet, brown, very dense, fine GRAVEL, some coarse		
				39-41	sand, trace fine SAND		
15	S4	24/2	14-16	26-42	dry, gray, very dense, fine GRAVEL, trace fine sand		
				75-98			
20					Bottom of boring 16'		
25							
30							

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS: First attempt with 2.25" HSA
2' north of "A" mark
Second attempt with 3" casing
2.8' northwest of "A" mark

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-2

BORING #B–3
STA 17+61–34LT
GROUND EL = 81.2

NEW HAMPSHIRE BORING, INC.
1215 West Chestnut Street Brockton, MA 02301

PROJECT
Trapelo Rd
Belmont, MA

REPORT OF BORING No. B-3
SHEET 1 OF 1
FILE No. 17141

DRILLER: Don Dunklee
HELPER: Scott Healey
INSPECTOR:

BORING LOCATION
GROUND SURFACE ELEVATION DATUM
DATE START 7/28/2009 DATE END 7-28-09

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.

CASING SIZE: 3" OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME
7/28/2009		4.9'	5'	5 mins

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S-1	24/8	0-1	2-2	Concrete Thickness = 6 dry, black loose fine SAND some Silt, trace coarse		
			1-2	3-5	sand		
5	S-2	24/9	4-5	4-3	moist, dense brown, medium dense some coarse SAND		
			5-6	8-9	trace of fine gravel		
10	S-3	24/7	9-10	30-24	wet, dense brown, very dense fine SAND and fine		
			11-12	32-33	GRAVEL, trace coarse sand		
15	S-4	24/10	14-15	30-19	wet, dense brown, dense coarse SAND some fine		
			15-16	17-17	GRAVEL, trace fine sand		
20					Bottom Of Boring 16'		
25							
30							

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS:

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-3

BORING #B–4
STA 19+14–28RT
GROUND EL = 83.2

NEW HAMPSHIRE BORING, INC.
1215 West Chestnut Street Brockton, MA 02301

PROJECT
Trapelo RD
Belmont, MA

REPORT OF BORING No. B-4
SHEET 1 OF 1
FILE No. 17141

DRILLER: Don Dunklee
HELPER: Scott Healey
INSPECTOR:

BORING LOCATION
GROUND SURFACE ELEVATION DATUM
DATE START 7/29/2009 DATE END 7-29-09

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.

CASING SIZE: 3" OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME
7/29/2009		4 1/2	10'	5 mins

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S-1	24/14	0-1	44-28	dry, blackish, very dense fine, SAND some coarse sand		
			1-2	47-26	trace fine gravel		
5	S-2	24/12	4-5	22-35	wet, brown, very dense, fine SAND some coarse sand,		
			5-6	37-63	trace fine gravel		
10	S-3	24/10	9-10	18-28	wet, brown, very dense fine SAND		
			10-11	29-31			
15	S-4	11/5	14-15	46-100/3"	wet, brown, very dense, coarse SAND some fine		
			15-16		gravel, trace fine sand		
20					Bottom of Boring 16'		
25							
30							

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS: Offsets from "A" locations
5 1/2' N.G. of Hole

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-4

BORING #B–5
STA 24+19–26RT
GROUND EL = 90.6

NEW HAMPSHIRE BORING, INC.
1215 W. CHESTNUT ST., BROCKTON, MA 02301

PROJECT
Traffic Signal Improvements
Belmont, MA
BSC Group

REPORT OF BORING No. B-5
SHEET 1 OF 1
FILE No. 17141
CHKD. BY

Driller: Anthony Casaletto
Helper:
INSPECTOR:

BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/13/2009 DATE END 8/13/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.

CASING SIZE: 3" OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME
8/13/2009		8.5	10	

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S1	24/12	0-2	30-22	3" Asphalt dry, brown, dense, fine to medium SAND, trace fine		
				19-14	gravel		
5	S2	24/9	4-6	17-16	damp, brown, medium dense, fine to medium SAND,		
				12-15	some fine gravel and silt		
10	S3	24/4	9-11	16-29	wet, brown, medium dense, fine to medium SAND,		
				19-14	some fine gravel and silt		
15	S4	24/10	14-16	21-25	wet, brown, medium dense, SILT and CLAY, trace		
				26-27	fine gravel		
20					Bottom of boring 16'		
25							
30							

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS: Offsets from "A" locations
10' off of "A" location

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-5

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	6	214
PROJ. FILE NO. 604688			

BORING LOGS

BORING #B–6
STA 23+67–22LT
GROUND EL = 92.0

NEW HAMPSHIRE BORING, INC. — 1215 W. CHESTNUT ST., BROCKTON, MA 02301
PROJECT: Traffic Signal Improvements, Belmont, MA, BSC Group
REPORT OF BORING No. B-6 | SHEET 1 OF 1 | FILE No. 17141 | CHKD. BY

Driller: Don Dunklee
Helper:
INSPECTOR:
BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/11/2009 DATE END 8/11/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME
8/11/2009		6	10'	5 minutes

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S1	24/10	0-2	24-20	8" Asphalt		
				10-16	dry, brown, dense, fine SAND, some coarse sand		
5	S2	24/3	4-6	7-7	wet, brown, medium dense, fine SAND, some fine		
				7-7	gravel, trace coarse sand		
10	S3	24/5	9-11	9-7	wet, gray, medium dense, coarse SAND, some fine		
				10-14	sand, trace fine gravel		
15	S4	24/8	14-16	40-21	dry, gray, dense, coarse SAND, some fine sand,		
				20-20	trace fine gravel		
20					Bottom of boring 16'		

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFt
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS: Offsets from "A" locations 10' North of "A" mark.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TC OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-6

BORING #B–7
STA 29+76–19RT
GROUND EL = 81.1

NEW HAMPSHIRE BORING, INC. — 1215 West Chestnut Street Brockton, MA 02301
PROJECT: Trapelo Road, Belmont, MA
REPORT OF BORING No. B-7 | SHEET 1 OF 1 | FILE No. 17141

DRILLER: Don Dunklee
HELPER: Scott Healey
INSPECTOR:
BORING LOCATION
GROUND SURFACE ELEVATION DATUM
DATE START 7/29/2009 DATE END 7-29-2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME
7/29/2009		9'	10'	5 mins

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S-1	24/10	0-1	32-51	dry, brown, very dense fine SAND some fine gravel,		
			1-2	25-31	trace coarse sand		
5	S-2	24/11	4-5	18-24	wet, gray, very dense fine SAND and coarse sand		
			5-6	30-39			
10	S-3	21/9	9-10	28-30	wet, gray, very dense coarse SAND some fine sand,		
			10-11	95-100/3"	trace fine gravel		
15	S-4	0/0	14-15	100/0"	Refusal		
			15-16		rollerbit 14'-15'.		
20					Bottom of Boring 16'		

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFt
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS: on the Mark

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TC OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-7

BORING #B–8
STA 29+38–23LT
GROUND EL = 82.6

NEW HAMPSHIRE BORING, INC. — 1215 West Chestnut Street Brockton, MA 02301
PROJECT: Trapelo Road, Belmont, MA
REPORT OF BORING No. B-8 | SHEET 1 OF 1 | FILE No. 17141

DRILLER: Don Dunklee
HELPER: Scott Healey
INSPECTOR:
BORING LOCATION
GROUND SURFACE ELEVATION DATUM
DATE START 7/29/2009 DATE END 7-29-2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME
7/29/2009		0	0	0

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S-1	24/8	0-1	1-2	Concrete Thickness= 0		
			1-2	7-19	dry, medium dense brown, loose fine SAND some coarse sand		
5	S-2	24/7	4-5	22-27	wet, gray, very dense fine SAND some coarse sand,		
			5-6	33-31	trace of fine gravel		
10	S-3	16/5	9-10	26-39	wet, gray, very dense coarse SAND some fine gravel		
			10-11	100/3"	trace of fine sand		
15	S-4	13/4	14-15	17-35	wet, gray, very dense SAND		
			15-16	100/3"			
20					Bottom of Boring 16'		

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFt
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS: Offsets From "A" Locations 18" north of mark

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TC OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-8

BORING #B–9
STA 34+12–43RT
GROUND EL = 74.9

NEW HAMPSHIRE BORING, INC. — 1215 West Chestnut Street Brockton, MA 02301
PROJECT: Trapelo Road, Belmont, MA
REPORT OF BORING No. B-9 | SHEET 1 OF 1 | FILE No. 17141

DRILLER: Don Dunklee
HELPER: Scott Healey
INSPECTOR:
BORING LOCATION
GROUND SURFACE ELEVATION DATUM
DATE START 7/30/2009 DATE END 7/30/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME
7/30/2009		9	10'	

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S1	24/10	0-1	5-8	Concrete Thickness 6"		
			1-2	18-21	dry, gray, medium dense, medium to fine SAND and GRAVEL		
5	S2	24/12	4-5	12-11	dry, brown, medium dense, medium to fine SAND and		
			5-6	10-16	GRAVEL and silt		
10	S3	24/8	9-10	18-84	wet, brown, very dense, medium to fine SAND and		
			10-11	37-32	GRAVEL and some silt		
15	S4	24/10	14-15	17-18	wet, brown, fine to medium SAND and GRAVEL,		
			15-16	23-24	little silt		
20					Bottom of Boring 16'		

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFt
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS: Offsets from "A" locations 6" s/w of A mark

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TC OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-9

BORING #B–10
STA 0+64–11RT
GROUND EL = 74.4

NEW HAMPSHIRE BORING, INC. — 1215 W. CHESTNUT ST., BROCKTON, MA 02301
PROJECT: Traffic Signal Improvements, Belmont, MA, BSC Group
REPORT OF BORING No. B-10 | SHEET 1 OF 1 | FILE No. 17141 | CHKD. BY

Driller: Anthony Casaletto
Helper:
INSPECTOR:
BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/12/2009 DATE END 8/12/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME
8/12/2009		6	10'	5 minutes

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S1	24/10	0-2	26-22	5" Asphalt		
				13-9	dry, brown, dense, fine SAND, some coarse sand		
5	S2	24/6	4-6	8-10	dry, brown, medium dense, fine SAND, some silt,		
				15-30	trace coarse sand		
10	S3	21/6	9-11	59-82	wet, brown, very dense, fine SAND, some silt, trace		
				92-100/3"	coarse sand		
15	S4	24/12	14-16	31-32	dry, brown, very dense, fine SAND, trace fine gravel		
				23-18			
20					Bottom of boring 16'		

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFt
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS: Offsets from "A" locations 20' south of "A"

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TC OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-10

BORING #B–11
STA 35+50–44RT
GROUND EL = 74.7

NEW HAMPSHIRE BORING, INC. — 1215 West Chestnut Street Brockton, MA 02301
PROJECT: Trapelo Road, Belmont, MA
REPORT OF BORING No. B-11 | SHEET 1 OF 1 | FILE No. 17141

DRILLER: Don Dunklee
HELPER: Scott Healey
INSPECTOR:
BORING LOCATION
GROUND SURFACE ELEVATION DATUM
DATE START 7/30/2009 DATE END 7-30-09

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME
7/30/2009		0	0	

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S-1	24/12	0-1	8-8	Concrete Thickness = 3"		
			1-2	10-16	dry, brown, medium dense, fine SAND some coarse sand		
5	S2	24/9	4-5	10-14	wet, brown , medium dense, fine SAND and coarse		
			5-6	13-17	sand trace silt.		
10	S3	2/0	9-10	100/2"	No Recovery 6" coble (rollerbitted)		
			10-11				
15	S4	24/10	14-15	24-38	wet, olive, very dense, fine SAND some coarse sand		
			15-16	42-48	trace of silt		
20					Bottom of Boring 16'		

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFt
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS:

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TC OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-11

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	7	214
PROJ. FILE NO. 604688			

BORING LOGS

BORING #B-12
STA 35+11-34LT
GROUND EL = 74.1

NEW HAMPSHIRE BORING, INC.
1215 W. CHESTNUT ST., BROCKTON, MA 02301

PROJECT
Traffic Signal Improvements
Belmont, MA.
BSC Group

REPORT OF BORING No. B-12
SHEET 1 OF 1
FILE No. 17141
CHKD. BY

Driller: Anthony Casalletto
Helper:
INSPECTOR:

BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/12/2009 DATE END 8/12/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.

CASING SIZE: 3" OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME
8/12/2009		11.5'	10'	5 minutes

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S1	24/6	0-2	21-29	4" Asphalt		
				19-17	wet, brown, dense, fine SAND, some coarse sand, trace fine gravel		
5	S2	24/4	4-6	10-10			
				20-35	wet, brown, dense, fine SAND, trace silt and fine gravel		gray material 8'
10	S3	24/3	9-11	27-34	wet, gray, very dense, fine SAND, some coarse		
				28-41	sand, trace silt		
15	S4	24/9	14-16	33-39	wet, gray, very dense, fine SAND, some coarse sand,		
				57-21	trace fine gravel		
20					Bottom of boring 16'		

GRANULAR SOILS Blows/Ft Density: 0 - 4 V. LOOSE; 4-10 LOOSE; 10-30 M. DENSE; 30-50 DENSE; >50 V. DENSE

COHESIVE SOILS Blows/Ft Density: <2 V. SOFt; 2-4 SOFT; 4-8 M. STIFF; 8-15 STIFF; 15-30 V. STIFF; >30 HARD

REMARKS: Offsets from "A" locations
2.5' north of "A"

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-12

BORING #B-13
STA 34+30-24LT
GROUND EL = 73.8

NEW HAMPSHIRE BORING, INC.
1215 West Chestnut Street Brockton, MA 02301

PROJECT
Trapelo Road
Belmont, MA

REPORT OF BORING No. B-13
SHEET 1 OF 1
FILE No. 17141

DRILLER: Steve Bolduc
HELPER:
INSPECTOR:

BORING LOCATION
GROUND SURFACE ELEVATION DATUM
DATE START 8/3/2009 DATE END 8/3/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.

CASING SIZE: 3" OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME
8/3/2009	12:00	8.5	0	

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S-1	24/1	0-1	10-12	Concrete Thickness= 2"		
			1-2	17-27	wet, dense brown , medium dense fine GRAVEL trace fine sand		
5	S-2	24/8	4-5	12-25			
			5-6	38-32	wet, dense brown, very dense coarse SAND and fine sand trace fine gravel		
10	S-3	24/8	9-11	29-24			
				31-33	wet, brown, very dense coarse SAND and GRAVEL		
15	S-4	24/12	14-16	20-25			
				33-40	wet, brown, very dense, medium to coarse SAND and GRAVEL		
20					Bottom Of Boring 16'		

GRANULAR SOILS Blows/Ft Density: 0 - 4 V. LOOSE; 4-10 LOOSE; 10-30 M. DENSE; 30-50 DENSE; >50 V. DENSE

COHESIVE SOILS Blows/Ft Density: <2 V. SOFt; 2-4 SOFT; 4-8 M. STIFF; 8-15 STIFF; 15-30 V. STIFF; >30 HARD

REMARKS: Offsets From "A" Locations
11.5' west of Mast Arm Location

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-13

BORING #B-14
STA 33+26-24LT
GROUND EL = 75.5

NEW HAMPSHIRE BORING, INC.
1215 West Chestnut Street Brockton, MA 02301

PROJECT
Trapelo Road
Belmont, MA

REPORT OF BORING No. B-14
SHEET 1 OF 1
FILE No. 17141

DRILLER: Steve Bolduc
HELPER:
INSPECTOR:

BORING LOCATION
GROUND SURFACE ELEVATION DATUM
DATE START 8/3/2009 DATE END 8/3/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.

CASING SIZE: 3" OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME
8/3/2009	3:30	8'	10	Upon Completion

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S1	24/7	0-2	6-5	Concrete Thickness = 4"		
				8-18	dry, gray, medium dense, fine SAND and Gravel		
5	S2	24/3	4-6	8-7			
				7-9	dry, brown, medium dense, fine SAND gravel some silt		
10	S3	24/7	9-11	23-28			
				24-26	wet, brown, very dense, fine to medium SAND and GRAVEL		
15	S4	19/6	14-15.7	23-64			
				91-100/1"	wet, brown very dense, fine to medium SAND and GRAVEL		
20					Bottom of Boring 15.7'		

GRANULAR SOILS Blows/Ft Density: 0 - 4 V. LOOSE; 4-10 LOOSE; 10-30 M. DENSE; 30-50 DENSE; >50 V. DENSE

COHESIVE SOILS Blows/Ft Density: <2 V. SOFt; 2-4 SOFT; 4-8 M. STIFF; 8-15 STIFF; 15-30 V. STIFF; >30 HARD

REMARKS: Offsets from "A" Locations
Drilled on "A" Location

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-14

BORING #B-15
STA 3+91-20LT
GROUND EL = 70.5

NEW HAMPSHIRE BORING, INC.
1215 West Chestnut Street Brockton, MA 02301

PROJECT
Trapelo RD
Belmont, MA

REPORT OF BORING No. B-15
SHEET 1 OF 1
FILE No. 17141

DRILLER: Steve Bolduc
HELPER:
INSPECTOR:

BORING LOCATION
GROUND SURFACE ELEVATION DATUM
DATE START 8/3/2009 DATE END 8/3/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.

CASING SIZE: 3" OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME
8/3/2009	9:00	8'	10'	

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S1	24/11	0-2	15-9	wet, brown, medium dense, fine to coarse SAND and		
				4-7	GRAVEL, little silt		
5	S2	24/14	4-6	14-9			
				5-7	damp, brown, medium dense, fine SAND and SILT		
10	S3	24/10	9-11	25-35			
				22-20	dry, brown, very dense, fine SAND		
15	S4	10/5	14-14.10	32/100/4"	wet, gray, very dense GRAVEL some medium to fine		
					SAND		
20					Bottom of Boring 15'		

GRANULAR SOILS Blows/Ft Density: 0 - 4 V. LOOSE; 4-10 LOOSE; 10-30 M. DENSE; 30-50 DENSE; >50 V. DENSE

COHESIVE SOILS Blows/Ft Density: <2 V. SOFt; 2-4 SOFT; 4-8 M. STIFF; 8-15 STIFF; 15-30 V. STIFF; >30 HARD

REMARKS: Offsets From "A" Locations
6' N/W from Mast Arm Location

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-15

BORING #B-16
STA 3+78-15RT
GROUND EL = 70.2

NEW HAMPSHIRE BORING, INC.
1215 W. CHESTNUT ST., BROCKTON, MA 02301

PROJECT
Traffic Signal Improvements
Belmont, MA
BSC Group

REPORT OF BORING No. B-16
SHEET 1 OF 1
FILE No. 17141
CHKD. BY

Driller: Anthony Casalletto
Helper:
INSPECTOR:

BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/12/2009 DATE END 8/12/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.

CASING SIZE: 3" OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME
8/12/2009		6	10'	5 minutes

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S1	24/7	0-2	27-20	8" Asphalt		
				14-12	dry, brown, dense, fine SAND, some coarse sand, trace fine gravel		
5	S2	24/10	4-6	7-12			
				20-24	dry, brown, dense, fine SAND, some silt, trace coarse sand		
10	S3	5/3	9-9'5"	100/5"			
					wet, gray, very dense, fine GRAVEL		
15	S4	24/8	14-16	27-38			
				24-17	wet, gray, very dense, coarse SAND, some fine sand, trace fine gravel		
20					Bottom of boring 16'		

GRANULAR SOILS Blows/Ft Density: 0 - 4 V. LOOSE; 4-10 LOOSE; 10-30 M. DENSE; 30-50 DENSE; >50 V. DENSE

COHESIVE SOILS Blows/Ft Density: <2 V. SOFt; 2-4 SOFT; 4-8 M. STIFF; 8-15 STIFF; 15-30 V. STIFF; >30 HARD

REMARKS: Offsets from "A" locations
1' north of "A"

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-16

BORING #B-17
STA 40+11-27RT
GROUND EL = 69.3

NEW HAMPSHIRE BORING, INC.
1215 W. CHESTNUT ST., BROCKTON, MA 02301

PROJECT
Traffic Signal Improvements
Belmont, MA
BSC Group

REPORT OF BORING No. B-17
SHEET 1 OF 1
FILE No. 17141
CHKD. BY

Driller: Don Dunklee
Helper:
INSPECTOR:

BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/6/2009 DATE END 8/6/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.

CASING SIZE: 3" OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME
8/6/2009		7	10'	5 minutes

DEPTH (Ft)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S1	24/4	0-2	18-23	8" Asphalt		
				16-11	dry, brown, dense, fine SAND, some coarse sand, trace fine gravel		
5	S2	24/8	4-6	6-21			
				20-29	wet, brown, dense, fine SAND, some fine gravel, trace silt		sand and gravel
10	S3	24/14	9-11	35-55			
				39-35	wet, olive, very dense, fine SAND, some coarse sand, trace silt		
							sand and silt till
15	S4	24/12	14-16	32-22			
				17-23	wet, brown, dense, coarse SAND, some fine gravel, trace fine sand		sand and gravel till
20					Bottom of boring 16'		

GRANULAR SOILS Blows/Ft Density: 0 - 4 V. LOOSE; 4-10 LOOSE; 10-30 M. DENSE; 30-50 DENSE; >50 V. DENSE

COHESIVE SOILS Blows/Ft Density: <2 V. SOFt; 2-4 SOFT; 4-8 M. STIFF; 8-15 STIFF; 15-30 V. STIFF; >30 HARD

REMARKS: Offsets from "A" locations
7.5' East of "A" mark

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR I DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-17

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	8	214
PROJ. FILE NO. 604688			

BORING LOGS

BORING #B–18
STA 39+23–31LT
GROUND EL = 70.3

NEW HAMPSHIRE BORING, INC. 1215 W. CHESTNUT ST., BROCKTON, MA 02301 | PROJECT: Traffic Signal Improvements, Belmont, MA, BSC Group | REPORT OF BORING No. B-18, SHEET 1 OF 1, FILE No. 17141, CHKD. BY:

Driller: Don Dunklee
Helper:
INSPECTOR:
BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/6/2009 DATE END 8/6/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME
8/6/2009		7'	10'	5 minutes

DEPTH (FT)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft.)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S1	24/7	0-2	3-3	3" Asphalt		
				3-3	dry, brown, loose, fine SAND, some coarse sand, trace fine gravel		
5	S2	24/8	4-6	3-2	wet, reddish brown, loose, fine SAND, some silt, trace coarse sand		
				5-8			
10	S3	24/7	9-11	29-39	wet, gray, very dense, fine SAND, some coarse sand, trace fine gravel		sand and gravel till
				59-31			
15	S4	24/5	14-16	26-31	wet, gray, very dense, coarse SAND, some fine sand, trace fine gravel		
				35-30			
20					Bottom of boring 16'		
25							
30							

GRANULAR SOILS Blows/Ft Density: 0 - 4 V. LOOSE; 4-10 LOOSE; 10-30 M. DENSE; 30-50 DENSE; >50 V. DENSE
COHESIVE SOILS Blows/Ft Density: <2 V. SOFT; 2-4 SOFT; 4-8 M. STIFF; 8-15 STIFF; 15-30 V. STIFF; >30 HARD

REMARKS:

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-18

BORING #B–19
STA 55+89–30RT
GROUND EL = 73.1

NEW HAMPSHIRE BORING, INC. 1215 W. CHESTNUT ST., BROCKTON, MA 02301 | PROJECT: Traffic Signal Improvements, Belmont, MA, BSC Group | REPORT OF BORING No. B-19, SHEET 1 OF 1, FILE No. 17141, CHKD. BY:

Driller: Don Dunklee
Helper:
INSPECTOR:
BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/6/2009 DATE END 8/6/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME
8/6/2009		9'	10'	5 minutes

DEPTH (FT)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft.)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S1	24/6	0-2	6-5	8" Asphalt		
				8-7	dry, brown, medium dense, fine SAND, some coarse sand, trace fine gravel		
5	S2	24/10	4-6	10-12	wet, gray, medium dense, fine SAND, some coarse sand, trace fine gravel		sand and gravel
				15-12			
10	S3	24/5	9-11	13-20	wet, gray, dense, fine SAND and SILT, trace coarse sand		silty sand
				28-16			
15	S4	24/5	14-16	15-14	wet, brown, medium dense, fine SAND, some coarse sand, trace fine gravel		sand and gravel
				16-16			
20					Bottom of boring 16'		
25							
30							

GRANULAR SOILS Blows/Ft Density: 0 - 4 V. LOOSE; 4-10 LOOSE; 10-30 M. DENSE; 30-50 DENSE; >50 V. DENSE
COHESIVE SOILS Blows/Ft Density: <2 V. SOFT; 2-4 SOFT; 4-8 M. STIFF; 8-15 STIFF; 15-30 V. STIFF; >30 HARD

REMARKS: Offsets from "A" locations
7' Northwest of "A" mark

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-19

BORING #B–20
STA 55+67–34LT
GROUND EL = 74.0

NEW HAMPSHIRE BORING, INC. 1215 W. CHESTNUT ST., BROCKTON, MA 02301 | PROJECT: Traffic Signal Improvements, Belmont, MA, BSC Group | REPORT OF BORING No. B-20, SHEET 1 OF 1, FILE No. 17141, CHKD. BY:

Driller: Anthony Casalletto
Helper:
INSPECTOR:
BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/14/2009 DATE END 8/14/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME
8/14/2009		6	10	

DEPTH (FT)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft.)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S1	24/11	0-2	8-9	6" Concrete		
				11-7	dry, loose, fine to medium SAND, trace gravel		
5	S2	24/12	4-6	21-35	wet, dense, fine SAND, some fine to medium gravel, trace silt and clay		
				37-32			
10	S3	24/14	9-11	45-48	wet, dense, very fine SAND and SILT, trace gravel		
				52-49			
15	S4	24/12	14-16	49-52	wet, dense, very fine SAND and SILT, trace gravel		
				53-56			
20					Bottom of boring 16'		
25							
30							

GRANULAR SOILS Blows/Ft Density: 0 - 4 V. LOOSE; 4-10 LOOSE; 10-30 M. DENSE; 30-50 DENSE; >50 V. DENSE
COHESIVE SOILS Blows/Ft Density: <2 V. SOFT; 2-4 SOFT; 4-8 M. STIFF; 8-15 STIFF; 15-30 V. STIFF; >30 HARD

REMARKS: Offsets from "A" locations
14.5' northwest from "A"

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-20

BORING #B–21
STA 71+51–26LT
GROUND EL = 90.5

NEW HAMPSHIRE BORING, INC. 1215 W. CHESTNUT ST., BROCKTON, MA 02301 | PROJECT: Traffic Signal Improvements, Belmont, MA, BSC Group | REPORT OF BORING No. B-21, SHEET 1 OF 1, FILE No. 17141, CHKD. BY:

Driller: Don Dunklee
Helper:
INSPECTOR:
BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/7/2009 DATE END 8/7/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME
8/7/2009		8.5	10'	5 minutes

DEPTH (FT)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft.)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S1	24/6	0-2	16-10	3" Asphalt		
				5-3	dry, brown, dense, fine SAND, some coarse sand, trace silt		
5	S2	24/8	4-6	6-8	wet, brown, medium dense, fine SAND, some coarse sand, trace fine gravel		
				8-7			
10	S3	4/2	9-9'4"	100/2"	wet, brown, very dense, fine SAND and SILT, trace fine gravel		
15	S4	24/10	14-16	23-12	wet, brown, medium dense, fine SAND, some silt, trace coarse sand		
				12-11			
20					Bottom of boring 16'		
25							
30							

GRANULAR SOILS Blows/Ft Density: 0 - 4 V. LOOSE; 4-10 LOOSE; 10-30 M. DENSE; 30-50 DENSE; >50 V. DENSE
COHESIVE SOILS Blows/Ft Density: <2 V. SOFT; 2-4 SOFT; 4-8 M. STIFF; 8-15 STIFF; 15-30 V. STIFF; >30 HARD

REMARKS: Offsets from "A" locations
8' West of "A" mark

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-21

BORING #B–22
STA 71+82–43RT
GROUND EL = 91.9

NEW HAMPSHIRE BORING, INC. 1215 W. CHESTNUT ST., BROCKTON, MA 02301 | PROJECT: Traffic Signal Improvements, Belmont, MA, BSC Group | REPORT OF BORING No. B-22, SHEET 1 OF 1, FILE No. 17141, CHKD. BY:

Driller: Anthony Casalletto
Helper:
INSPECTOR:
BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/12/2009 DATE END 8/12/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME
8/12/2009		4'	15'	5 minutes

DEPTH (FT)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft.)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S1	24/11	0-2	8-7	8" Asphalt		
				6-7	dry, brown, medium dense, fine SAND, trace fine gravel and coarse sand		
5	S2	24/12	4-6	7-7	dry, brown, medium dense, fine SAND, some silt, trace coarse sand		
				8-9			
10	S3	24/14	9-11	50-45	wet, brown, very dense, CLAY and fine SAND, trace coarse sand		
				42-52			
15	S4	24/14	14-16	26-21	wet, olive, dense, CLAY, some fine sand		
				25-28			
20					Bottom of boring 16'		
25							
30							

GRANULAR SOILS Blows/Ft Density: 0 - 4 V. LOOSE; 4-10 LOOSE; 10-30 M. DENSE; 30-50 DENSE; >50 V. DENSE
COHESIVE SOILS Blows/Ft Density: <2 V. SOFT; 2-4 SOFT; 4-8 M. STIFF; 8-15 STIFF; 15-30 V. STIFF; >30 HARD

REMARKS:

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-22

BORING #B–23
STA 87+31–19RT
GROUND EL = 147.1

NEW HAMPSHIRE BORING, INC. 1215 W. CHESTNUT ST., BROCKTON, MA 02301 | PROJECT: Traffic Signal Improvements, Belmont, MA, BSC Group | REPORT OF BORING No. B-23, SHEET 1 OF 1, FILE No. 17141, CHKD. BY:

Driller: Don Dunklee
Helper:
INSPECTOR:
BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/7/2009 DATE END 8/7/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME
8/7/2009		2'	9'	5 minutes

DEPTH (FT)	SAMPLE NO.	SAMPLE PEN / REC	SAMPLE DEPTH (Ft.)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0	S1	24/5	0-2	28-42	8" Asphalt		
				64-21	dry, gray, very dense, fine SAND, some coarse sand, trace fine gravel		
5	S2	24/9	4-6	7-3	wet, brown, loose, fine SAND, some silt, trace coarse sand		
				7-13			
10	S3	24/14	9-11	12-19	wet, reddish brown, dense, fine SAND, some clay, trace coarse sand		
				18-19			
15	S4	24/16	14-16	22-31	wet, brown, very dense, fine SAND, some clay, trace fine gravel		
				22-25			
20					Bottom of boring 16'		
25							
30							

GRANULAR SOILS Blows/Ft Density: 0 - 4 V. LOOSE; 4-10 LOOSE; 10-30 M. DENSE; 30-50 DENSE; >50 V. DENSE
COHESIVE SOILS Blows/Ft Density: <2 V. SOFT; 2-4 SOFT; 4-8 M. STIFF; 8-15 STIFF; 15-30 V. STIFF; >30 HARD

REMARKS: Offsets from "A" locations
7' Northeast of "A" mark

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-23

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	9	214
PROJ. FILE NO. 604688			

BORING LOGS

BORING #B-24
STA 88+01-43LT
GROUND EL = 148.2

NEW HAMPSHIRE BORING, INC.
1215 W. CHESTNUT ST., BROCKTON, MA 02301

PROJECT: Traffic Signal Improvements, Belmont, MA, BSC Group
REPORT OF BORING No. B-24 | SHEET 1 OF 1 | FILE No. 17141 | CHKD. BY

Driller: Don Dunklee
Helper:
INSPECTOR:
BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/7/2009 DATE END 8/7/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME
8/7/2009		16'	10'	5 minutes

DEPTH (FT)	SAMPLE NO.	SAMPLE PEN/REC	SAMPLE DEPTH (FT)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0					5" Asphalt		
	S1	24/8	0-2	28-19	dry, brown, medium dense, fine SAND, some coarse		
				9-4	sand, trace fine gravel		
5	S2	24/1	4-6	5-10	wet, brown, medium dense, fine SAND, some fine		
				17-20	gravel, trace coarse sand		
10	S3	24/9	9-11	14-16	wet, brown, medium dense, fine SAND, some coarse		
				20-20	sand, trace silt		
15	S4	24/6	14-16	30-29	wet, brown, very dense, fine GRAVEL, some clay,		
				33-35	trace fine sand		
20					Bottom of boring 16'		
25							
30							

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS: Offsets from "A" locations
17' Northeast of "A" mark

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-24

BORING #B-25
100+79-74 RT
GROUND EL = 150.47

NEW HAMPSHIRE BORING, INC.
1215 W. CHESTNUT ST., BROCKTON, MA 02301

PROJECT: Traffic Signal Improvements, Belmont, MA, BSC Group
REPORT OF BORING No. B-25 | SHEET 1 OF 1 | FILE No. 17141 | CHKD. BY

Driller: Anthony Casaletto
Helper:
INSPECTOR:
BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/13/2009 DATE END 8/13/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME
8/13/2009		10	10	

DEPTH (FT)	SAMPLE NO.	SAMPLE PEN/REC	SAMPLE DEPTH (FT)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0					8" Asphalt		
	S1	24/12	0-2	3-5	dry, brown, loose, medium to coarse SAND, some		
				7-8	fine gravel		
5	S2	24/12	4-6	6-9	dry, brown, fine SAND, trace silt		
				9-12			
10	S3	24/12	9-11	39-53	wet, brown, dense, fine SAND and SILT, trace fine		
				59-40	gravel		
15	S4	24/16	14-16	18-20	wet, brown, dense, very fine SAND, some silt, trace		
				25-25	fine gravel		
20					Bottom of boring 16'		
25							
30							

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS: Offsets from "A" locations
moved 2' south of "A" because of a utility.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-25

BORING #B-26
STA 106+95-24RT
GROUND EL = 136.7

NEW HAMPSHIRE BORING, INC.
1215 W. CHESTNUT ST., BROCKTON, MA 02301

PROJECT: Traffic Signal Improvements, Belmont, MA, BSC Group
REPORT OF BORING No. B-26 | SHEET 1 OF 1 | FILE No. 17141 | CHKD. BY

Driller: Anthony Casaletto
Helper:
INSPECTOR:
BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/14/2009 DATE END 8/14/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME
8/14/2009		16.5'	10'	

DEPTH (FT)	SAMPLE NO.	SAMPLE PEN/REC	SAMPLE DEPTH (FT)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0					5" Asphalt		
	S1	24/18	0-2	29-25	medium dense, brown, SAND		
				20-14			
5	S2	24/4	4-6	21-15	dry, medium dense, SAND, trace gravel		
				11-13			
10	S3	24/12	9-11	29-25	wet, dense, brown medium SAND, some very fine		
				18-22	sand, trace gray silt and fine gravel		
15	S4	24/14	14-16	31-37	wet, dense, brown, fine SAND and SILT, trace gravel		
				33-39			
20					Bottom of boring 16'		
25							
30							

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS: Offsets from "A" locations
moved 6' from lot "B", 14' from "A"

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-26

BORING #B-27
STA 107+20-23LT
GROUND EL = 135.9

NEW HAMPSHIRE BORING, INC.
1215 W. CHESTNUT ST., BROCKTON, MA 02301

PROJECT: Traffic Signal Improvements, Belmont, MA, BSC Group
REPORT OF BORING No. B-27 | SHEET 1 OF 1 | FILE No. 17141 | CHKD. BY

Driller: Don Dunklee
Helper:
INSPECTOR:
BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/10/2009 DATE END 8/10/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME
8/10/2009		11.5'	10'	5 minutes

DEPTH (FT)	SAMPLE NO.	SAMPLE PEN/REC	SAMPLE DEPTH (FT)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0					3" Asphalt		
	S1	24/6	0-2	18-30	dry, brown, dense, fine SAND, some coarse sand		
				19-14			
5	S2	24/7	4-6	7-3	wet, brown, loose, fine SAND, some coarse sand,		
				4-4	trace silt		
10	S3	24/9	9-11	25-72	wet, brown, very dense, fine SAND, some clay,		
				65-92	trace fine gravel		
					Roller bit 14'-15', very dense		
15	S4	4/4	14-16	100/4"	wet, olive, very dense, fine SAND, some clay, trace		
					fine gravel		
20					Bottom of boring 16'		
25							
30							

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS: Offsets from "A" locations
12.5' Southeast from "A" mark

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-27

BORING #B-28
STA 120+89-33RT
GROUND EL = 84.5

NEW HAMPSHIRE BORING, INC.
1215 W. CHESTNUT ST., BROCKTON, MA 02301

PROJECT: Traffic Signal Improvements, Belmont, MA, BSC Group
REPORT OF BORING No. B-28 | SHEET 1 OF 1 | FILE No. 17141 | CHKD. BY

Driller: Don Dunklee
Helper:
INSPECTOR:
BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/10/2009 DATE END 8/10/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME
8/10/2009		4'	10'	5 minutes

DEPTH (FT)	SAMPLE NO.	SAMPLE PEN/REC	SAMPLE DEPTH (FT)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0					8" Asphalt		
	S1	24/10	0-2	16-8	dry, brown, medium dense, fine SAND, some coarse		
				8-14	sand, trace fine gravel		
5	S2	24/15	4-6	26-20	wet, brown, dense, fine SAND, trace coarse sand,		
				20-19	trace silt		
10	S3	24/10	9-11	29-56	wet, brown, very dense, fine SAND, some coarse		
				22-65	sand, trace silt		
15	S4	24/11	14-16	22-24	wet, brown, dense, fine SAND, some coarse sand,		
				21-29	trace silt		
20					Bottom of boring 16'		
25							
30							

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS: Offsets from "A" locations
26' West of "A" mark

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-28

BORING #B-29
STA 121+08-34LT
GROUND EL = 83.0

NEW HAMPSHIRE BORING, INC.
1215 W. CHESTNUT ST., BROCKTON, MA 02301

PROJECT: Traffic Signal Improvements, Belmont, MA, BSC Group
REPORT OF BORING No. B-29 | SHEET 1 OF 1 | FILE No. 17141 | CHKD. BY

Driller: Anthony Casaletto
Helper:
INSPECTOR:
BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/13/2009 DATE END 8/13/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS				
DATE	TIME	WATER	CASING	STABILIZATION TIME

DEPTH (FT)	SAMPLE NO.	SAMPLE PEN/REC	SAMPLE DEPTH (FT)	SAMPLE BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0					7" Asphalt		
	S1	24/18	0-2	12-21	dry, brown, medium to coarse SAND, trace fine		
				18-22	gravel		
5	S2	24/13	4-6	19-37	wet, gray, medium dense to dense, medium SAND,		
				38-25	trace silt and fine gravel		
10	S3	24/10	9-11	55-50	wet, brown, very dense, medium SAND, some coarse		
				53-51	gravel, trace silt and clay		
15	S4	24/14	14-16	55-56	wet, brown, dense, fine to medium SAND, trace silt		
				55-60	and fine gravel		
20					Bottom of boring 16'		
25							
30							

GRANULAR SOILS Blows/Ft Density		COHESIVE SOILS Blows/Ft Density	
0 - 4	V. LOOSE	<2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
>50	V. DENSE	15-30	V. STIFF
		>30	HARD

REMARKS: Offsets from "A" locations
7' southeast from "A"

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

BORING No B-29

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	10	214
PROJ. FILE NO. 604688			

BORING LOGS

BORING #B-30
STA 134+98-23RT
GROUND EL = 48.8

NEW HAMPSHIRE BORING, INC.
1215 W. CHESTNUT ST., BROCKTON, MA 02301

PROJECT: Traffic Signal Improvements, Belmont, MA, BSC Group

REPORT OF BORING No. B-30
SHEET 1 OF 1
FILE No. 17141
CHKD. BY

Driller: Anthony Casalletto
Helper:
INSPECTOR:

BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/14/2009 DATE END 8/14/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME
		NA		

DEPTH	ELEVATION	SAMPLE NO.	PEN / REC	DEPTH (FL)	BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0		S1	24/14	0-2	29-28	3" Asphalt dry, dense, brown, fine SAND, trace medium gravel,		
					14-17	trace silt		
5		S2	24/16	4-6	19-17	wet, medium dense, gray, brown, SAND and GRAVEL,		
					9-10	trace silt		
10		S3	24/10	9-11	75-66	wet, very dense, brown, gray, medium SAND and		
					46-52	GRAVEL, trace silt		
15		S4	24/12	14-16	71-88	wet, very dense, fine to coarse SAND and GRAVEL,		
					100/5"	trace silt		
20						Bottom of boring 16'		
25								
30								

GRANULAR SOILS (Blows/Ft Density): 0-4 V. LOOSE; 4-10 LOOSE; 10-30 M. DENSE; 30-50 DENSE; >50 V. DENSE
COHESIVE SOILS (Blows/Ft Density): <2 V. SOFT; 2-4 SOFT; 4-8 M. STIFF; 8-15 STIFF; 15-30 V. STIFF; >30 HARD

REMARKS: Offsets from "A" locations
Did "C" boring location. 14' Northeast from "A" locatior

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED. FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

BORING No B-30

BORING #B-31
STA 136+05-21LT
GROUND EL = 47.9

NEW HAMPSHIRE BORING, INC.
1215 W. CHESTNUT ST., BROCKTON, MA 02301

PROJECT: Traffic Signal Improvements, Belmont, MA, BSC Group

REPORT OF BORING No. B-31
SHEET 1 OF 1
FILE No. 17141
CHKD. BY

Driller: Anthony Casalletto
Helper:
INSPECTOR:

BORING LOCATION Trapelo Road
GROUND SURFACE ELEVATION DATUM
DATE START 8/14/2009 DATE END 8/14/2009

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 in.
CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 in.
CASING SIZE: 3" OTHER:

GROUNDWATER READINGS

DATE	TIME	WATER	CASING	STABILIZATION TIME

DEPTH	ELEVATION	SAMPLE NO.	PEN / REC	DEPTH (FL)	BLOWS/6"	SAMPLE DESCRIPTION	REMARKS	STRATUM DESCRIPTION
0		S1	24/18	0-2	22-21	3" Asphalt dry, dense, gray, brown, fine to coarse SAND and		
					23-30	GRAVEL		
5		S2	24/13	4-6	31-28	wet, dense, brown, fine SAND and GRAVEL, trace		
					26-14	silt		
10		S3	24/18	9-11	63-66	wet, very dense, gray, brown, fine SAND and		
					60-55	GRAVEL lll, trace silt		
15		S4	24/10	14-16	51-57	wet, very dense, brown, fine SAND and TILL, trace		
					62-48	silt		
20						Bottom of boring 16'		
25								
30								

GRANULAR SOILS (Blows/Ft Density): 0-4 V. LOOSE; 4-10 LOOSE; 10-30 M. DENSE; 30-50 DENSE; >50 V. DENSE
COHESIVE SOILS (Blows/Ft Density): <2 V. SOFT; 2-4 SOFT; 4-8 M. STIFF; 8-15 STIFF; 15-30 V. STIFF; >30 HARD

REMARKS:

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED. FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

BORING No B-31

BORING #B-32
STA 100+01-53RT
GROUND EL = 151.6

(603) 437-1610 **New Hampshire Boring, Inc.** **Fax: (603) 437-0034**
P.O. Box 165
Derry, NH 03038
E-Mail: nhb@nhboring

Boring # B-32 **Project**: BSC Group – Roadway Improvements **Project #** 95611
Project Address: Trapelo Road **City:** Belmont **State:** MA **Zip:**
Date Start: 9/27/10 9:00 am **Date End:** 9/27/10 11:00 am **Location:** See Plan

Auger: HSA Type: Hammer: | **Sampler:** S/S 140 lbs. | **Casing:** 2-1/4" ID Size: Fall: | **Sampler:** 1-3/8 in. I.D. 30 in.

GROUNDWATER OBSERVATION

Date: 09-27-10	Depth:	Casing:	Stabilization Period

DP	S.#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
-	S-1	0'-2'	24"	11"	2-3-6-9		Dry, loose, brown fine to coarse SAND, trace fine
-							to medium coarse gravel, trace inorganic silt.
-							
-							
5'0"	S-2	5'-7'	24"	18"	32-54-55-50		Dry, very dense, brown fine to coarse SAND and fine
-							to coarse GRAVEL, trace inorganic silt.
-							
-							
10'0"	S-3	10'-12'	24"	14"	18-28-22-20		Dry, very dense, brown fine to coarse SAND and
-							fine to coarse GRAVEL, trace inorganic silt
-							
-							
15'0"	S-4	15'-15'3"	3"	3"	120/3"		Dry, very dense, gray, coarse GRAVEL, possible
-							boulder. Advanced auger past boulder from 15'3"
-							To 16'.
-							Auger stopped at 19'6". Sent split spoon,
-	S-5	19'6'-19'6"	0"	0"	120/0"	19'6"	No penetration, No recovery.
20'0"							Bottom of Exploration – 19'6"
-							
-							
-							
-							
25'0"							
-							
-							
-							
30'0"							
-							

Drillers: R. Burke **Helper:** Pat Schofield **Inspector:**
Remarks: 2 ¼" Auger
S#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

BORING #B-33A
STA 100+02-45 LT
GROUND EL = 151.72

(603) 437-1610 **New Hampshire Boring, Inc.** **Fax: (603) 437-0034**
P.O. Box 165
Derry, NH 03038
E-Mail: nhb@nhboring

Boring # B-33A **Project**: BSC Group – Roadway Improvements **Project #** 95611
Project Address: Trapelo Road **City:** Belmont **State:** MA **Zip:**
Date Start: 9/25/10 9:30am **Date End:** 9/25/10 11:30 am **Location:** See Plan

Augers: HSA Type: Hammer: | **Sampler:** S/S 140 lbs. | **Casing:** 2-1/4" ID Size: Fall: | **Sampler:** 1-3/8 in. I.D. 30 in.

GROUNDWATER OBSERVATION

Date: 09-25-10	Depth: 14'	Casing:	Stabilization Period

DP	S.#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
						3"	Concrete
-	S-1	1' – 3'	24"	4"	2-3-6-9		Dry, medium dense, brown fine to coarse SAND and
-							coarse GRAVEL, trace inorganic silt
-							
-							
5'0"	S-2	5'-7'	24"	6"	21-29-27-30		Dry, very dense, brown fine to coarse SAND, trace
-							fine to medium gravel, trace inorganic silt.
-							
-							
-							
10'0"	S-3	10'-12'	24"	7"	17-27-27-29		Dry, very dense, brown, fine to coarse SAND and fine
-							to medium GRAVEL, trace inorganic silt
-							
-							
-							
15'0"	S-4	15'-15'6"	2"	2"	120/6"		Moist, very dense, gray, fine to coarse SAND and
-							fine to coarse GRAVEL, some inorganic silt
-							
-							
-	S-5	19'-19'	0"	0"	120/0"		No penetration, No recovery,
20'0"							Bottom of Exploration – 19'
-							
-							
-							
-							
25'0"							
-							
-							
-							
30'0"							
-							

Drillers: R. Burke **Helper:** Pat Schofield **Inspector:**
Remarks:
S#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

BORING #B-34
STA 100+74-47LT
GROUND EL = 151.1

(603) 437-1610 **New Hampshire Boring, Inc.** **Fax: (603) 437-0034**
P.O. Box 165
Derry, NH 03038
E-Mail: nhb@nhboring

Boring # B-34 **Project**: BSC Group – Roadway Improvements **Project #** 95611
Project Address: Trapelo Road **City:** Belmont **State:** MA **Zip:**
Date Start: 9/27/10 12:50 pm **Date End:** 9/27/10 2:45 pm **Location:** See Plan

Augers: HSA Type: Hammer: | **Sampler:** S/S 140 lbs. | **Casing:** 2-1/4" ID Size: Fall: | **Sampler:** 1-3/8 in. I.D. 30 in.

GROUNDWATER OBSERVATION

Date: 09-27-10	Depth: 13'	Casing:	Stabilization Period

DP	S.#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
						3"	Concrete
-	S-1	1' – 3'	24"	17"	5-4-5-6		Dry, loose, brown fine to coarse SAND and fine to
-							coarse GRAVEL, trace inorganic silt.
-							
-							
5'0"	S-2	5'-7'	24"	7"	3-4-3-3		Dry, loose, brown fine to coarse SAND and fine to
-							coarse GRAVEL, trace inorganic silt.
-							
-							
-						10'	
10'0"	S-3	10'-12'	24"	14"	22-26-20-21		Dry, dense, brown/gray coarse GRAVEL, trace
-							fine to medium sand.
-							
-							
-							
15'0"	S-4	15'-17'	24"	13"	18-15-13-10		Wet, medium dense, brown fine to coarse SAND,
-							trace fine to medium gravel, some inorganic silt.
-							
-							
-	S-5	19'6'-19'6"	0"	0"	120/0"	19'6"	No penetration, no recovery
20'0"							Bottom of Exploration – 19'6"
-							
-							
-							
-							
25'0"							
-							
-							
-							
30'0"							
-							

Drillers: R. Burne **Helper:** Pat Schofield **Inspector:**
Remarks: 2 1/4" auger
S#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

BORING #B-37
STA 16+95-20RT
GROUND EL = 80.4

(603) 437-1610 **New Hampshire Boring, Inc.** **Fax: (603) 437-0034**
P.O. Box 165
Derry, NH 03038
E-Mail: nhb@nhboring

Boring # B-37 **Project**: BSC Group – Roadway Improvements **Project #** 95611
Project Address: Trapelo Road **City:** Belmont **State:** MA **Zip:**
Date Start: 9/29/10 9:00 am **Date End:** 9/29/10 3:00 pm **Location:** See Plan

Auger: HSA Type: Hammer: | **Sampler:** S/S 140 lbs. | **Casing:** 4-1/4" ID Size: Fall: | **Sampler:** 1-3/8 in. I.D. 30 in.

GROUNDWATER OBSERVATION

Date:	Depth:	Casing:	Stabilization Period

DP	S.#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
						6"	Concrete
-	S-1	1' – 3'	24"	6.5"	25-27-14-6		Dry, dense, dark brown/black coarse to fine GRAVEL
-						3'	and fine to coarse SAND, trace inorganic silt.
-	S-2	3'-5'	24"	12"	20-15-15-13		Dry, med dense, dark brown, fine to coarse SAND
5'0"						5'	and fine to coarse GRAVEL, trace inorganic silt
-	S-3	5'-7'	24"	8.5"	43-24-19-14		Dry, dense, dark brown coarse to fine GRAVEL and
-							fine to coarse SAND, trace inorganic silt
-	S-4	7'-9'	24"	6"	24-25-7-10		Moist, medium dense, dark brown fine to coarse
10'0"							SAND, some fine to coarse gravel, trace inorganic
-	S-5	10'-12'	24"	12"	7-8-8-12		silt.
-	S-6	12'-14'	24"	4"	14-26-25-15		Wet, medium dense, coarse to fine GRAVEL, some
-							fine to coarse sand, trace inorganic silt.
15'0"	S-7	15'-17'	24"	8.5"	7-15-19-21		Wet, very dense, dark brown, coarse to fine SAND,
-							some fine to coarse sand, trace inorganic silt.
-							Wet, dense dark brown, coarse to fine SAND, some
-							coarse to fine gravel, trace inorganic silt.
20'0"	S-8	20'-22'	24"	0"	9-14-9-9		No recovery due to coarse GRAVEL
-							Second attempt with split spoon still no recovery
-							due to blow in. Advanced to 25'
-							
-							
25'0"	S-9	25'-27'	24"	11"	39-29-21-35		Wet, very dense, brown fine to coarse SAND, trace
-						26'	Fine to coarse gravel, trace inorganic silt.
-							Bottom of Exploration – 26'
-							
-							
-							
30'0"							
-							

Drillers: Roger Burne **Helper:** Patrick Schofield **Inspector:**
Remarks:
S#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

BORING #B-38
STA 17+49-35LT
GROUND EL = 81.3

(603) 437-1610 **New Hampshire Boring, Inc.** **Fax: (603) 437-0034**
P.O. Box 165
Derry, NH 03038
E-Mail: nhb@nhboring

Boring # B-38 **Project**: BSC Group – Roadway Improvements **Project #** 95611

Project Address: Trapelo Road **City:** Belmont **State:** MA **Zip:**

Date Start: 9/29/10 9:00 am **Date End:** 9/29/10 3:00 pm **Location:** See Plan

Casing: HSA	**Sampler:**	**Casing:** 4-1/4" ID	**Sampler:**
Type:	S/S	Size:	1-3/8 in. I.D.
Hammer:	140 lbs.	Fall:	30 in.

G R O U N D W A T E R O B S E R V A T I O N

Date: 09-29-10	**Depth:** 14'	**Casing:**	**Stabilization Period**

DP	S.#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
-						1"	Asphalt
-	S-1	1' – 3'	24"	3"	7-6-6-4		Dry, medium dense, dark brown fine to coarse SAND and fine to coarse GRAVEL, trace inorganic silt
-	S-2	3'-5'	24"	6.5"	3-5-12-7		Dry, medium dense,dark brown, fine to coarse SAND some coarse GRAVEL, trace inorganic silt
5'0"							
-	S-3	5'-7'	24"	9"	80-30-14-8		Dry, dense, gray, coarse to fine GRAVEL, some fine to coarse sand.
-	S-4	7'-9'	24"	6.5"	34-16-17-15		Moist, medium dense, brown fine to coarse SAND, some fine to coarse gravel, trace inorganic silt.
10'0"	S-5	10'-12'	24"	9"	50-32-22-26		Wet, very dense, dark brown fine to coarse SAND, some fine to coarse gravel, trace inorganic silt
-							
-							
-							
15'0"	S-6	15'-17'	24"	12"	16-10-14-14		Wet, medium dense, dark brown fine to coarse SAND, trace fine gravel, trace inorganic silt.
-							
-							
-							
20'0"	S-7	20'-22'	24"	10.5"	10-8-7-6		Wet, medium dense, dark brown fine to coarse SAND, some fine gravel, trace coarse gravel, trace Inorganic silt.
-							
-							
-							
25'0"	S-8	25'-27'	24"	6"	9-5-8-18		Wet, medium dense, dark brown fine to coarse SAND, some fine gravel, trace inorganic silt
-							
-	S-9	28'-29'9"		5"	40-52-70-100/3"		Wet, very dense, brown fine to coarse SAND, trace Inorganic silt
-						29'9"	
30'0"							Bottom of Exploration – 29'9"
-							

Drillers: Roger Burne **Helper:** Patrick Schofield **Inspector:**

Remarks:

S#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

BORING #B-40
STA 140+78-5LT
GROUND EL = 46.4

(603) 437-1610 **New Hampshire Boring, Inc.** **Fax: (603) 437-0034**
P.O. Box 165
Derry, NH 03038
E-Mail: nhb@nhboring

Boring # B-40 **Project**: BSC Group – Roadway Improvements **Project #** 95611

Project Address: Trapelo Road **City:** Belmont **State:** MA **Zip:**

Date Start: 9/28/10 1:35 pm **Date End:** 9/28/10 3:00 pm **Location:** See Plan

Augers: HSA	**Sampler:**	**Casing:** 2-1/4" ID	**Sampler:**
Type:	S/S	Size:	1-3/8 in. I.D.
Hammer:	140 lbs.	Fall:	30 in.

G R O U N D W A T E R O B S E R V A T I O N

Date:	**Depth:**	**Casing:**	**Stabilization Period**

DP	S.#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
-						4"	Asphalt
-	S-1	1'6" – 3'6"	24"	14"	7-6-6-4		Possible rails from railroad 0'-1' & cobblestones. Dry, medium dense, brown coarse GRAVEL and fine to coarse SAND, trace inorganic silt.
-							
-							
5'0"							
-	S-2	5'-7'	24"	14"	41-51-59-44		Dry, very dense, brown, fine to coarse SAND, some fine to coarse gravel, trace inorganic silt.
-							
-							
10'0"	S-3	10'-12'	24"	14"	13-13-16-16		Dry, very dense, brown, fine to coarse SAND, some fine to coarse gravel, trace inorganic silt.
-							
-							
-							
15'0"	S-4	15'-17'	24"	18"	19-23-20-19	15"	Dry, dense, brown fine to coarse GRAVEL, some Fine to coarse sand
-							
-	S-5	17'-19'	24"	18"	19-19-21-29		Dry, dense, brown fine to coarse GRAVEL, some Fine to coarse sand
-						19"	
20'0"							Bottom of Exploration – 19'
-							
-							
-							
25'0"							
-							
-							
-							
30'0"							
-							

Drillers: Roger Burne **Helper:** Patrick Schofield **Inspector:**

Remarks: 2 ¼" auger

S#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

BORING #B-41
STA 140+58-239LT
GROUND EL = 42.0

(603) 437-1610 **New Hampshire Boring, Inc.** **Fax: (603) 437-0034**
P.O. Box 165
Derry, NH 03038
E-Mail: nhb@nhboring

Boring # B-41 **Project**: BSC Group – Roadway Improvements **Project #** 95611

Project Address: Trapelo Road **City:** Belmont **State:** MA **Zip:**

Date Start: 9/25/10 12:00 pm **Date End:** 9/25/10 1:30 pm **Location:** See Plan

Casing: HSA	**Sampler:**	**Casing:** 4-1/4" ID	**Sampler:**
Type:	S/S	Size:	1-3/8 in. I.D.
Hammer:	140 lbs.	Fall:	30 in.

G R O U N D W A T E R O B S E R V A T I O N

Date:	**Depth:**	**Casing:**	**Stabilization Period**

DP	S.#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
-						4"	Asphalt
-	S-1	1'– 3'	24"	14"	7-7-9-11		Dry, medium dense, brown, fine to coarse SAND and fine to coarse GRAVEL
-							
-							
5'0"	S-2	5'-7'	24"	20"	14-14-13-14		Dry, medium dense, brown fine to coarse SAND and fine to coarse GRAVEL, trace inorganic silt.
-							
-							
-							
10'0"	S-3	10'-12'	24"	18"	17-20-13-19		Dry, dense, brown, fine to coarse SAND and fine to coarse GRAVEL, trace inorganic silt.
-							
-							
-							
15'0"	S-4	15'-17'	24"	18"	20-20-19-20		Dry, dense, brown, coarse GRAVEL and fine to coarse SAND, trace inorganic silt.
-							
-							
-	S-5	17'-19'	24"	18"	24-23-19-18		Dry, dense, brown, coarse GRAVEL and fine to coarse SAND, trace inorganic silt. No water.
-						19	
20'0"							Bottom of Exploration – 19'
-							
-							
-							
25'0"							
-							
-							
-							
30'0"							
-							

Drillers: Roger Burne **Helper:** Patrick Schofield **Inspector:**

Remarks:

S#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	11	214
PROJ. FILE NO. 604688			

BORING LOGS

PROBE	ADDRESS	ASPHALT	WATER	ACTUAL DEPTH	NOTES
P-1	TRAPELO ROAD	0	0	13'	FINE TO COARSE SAND AND FINE TO COARSE GRAVEL, SEEN FROM DRILL CUTTINGS, POSSIBLE BEDROCK.
P-2	TRAPELO ROAD	0	0	8'	FINE TO COARSE SAND, SOME GRAVEL, TRACE INORGANIC SILT.
P-3	TRAPELO ROAD	0	0	FIRST ATTEMPT 2.5'	SECOND ATTEMPT 3.5'. COARSE GRAVEL, SOME FINE TO COARSE SAND. BOTH ATTEMPTS WERE AUGER REFUSAL.
P-4	TRAPELO ROAD	0	0	2'	OUT CROP NEXT TO HOLE. AUGER REFUSAL.

LEGEND

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	12	214
PROJ. FILE NO. 604688			

LEGEND & GENERAL NOTES

UTILITIES

EXISTING	PROPOSED	DESCRIPTION
□	CB	CATCH BASIN (OR GUTTER INLET)
□	CBCI	CATCH BASIN WITH CURB INLET
□		CATCH BASIN TYPE 3
□		CATCH BASIN WITH OFFSET CONE
⊡	⊡	CATCH BASIN TO BE RETAINED
□	□ GI	GUTTER INLET
12" D	12" R.C.P.	DRAIN PIPE
Ⓓ	DMH	DRAINAGE MANHOLE
UGE	12" ELEC.	ELECTRIC DUCT
Ⓔ	EMH	ELECTRIC MANHOLE
GG	□ GG	GAS GATE
4" G	12" GAS	GAS MAIN
ⓂMBTA	MBTA	MBTA MANHOLE
OHW	OHW	OVERHEAD WIRES
		MBTA CATENARY WIRES
TW	TW	MBTA TROLLEY WIRES
15" S	12" P.V.C. SEWER	SEWER MAIN
Ⓢ	SMH	SEWER MANHOLE
8" SD	8" SD	SUBDRAIN
4-3" T	12" P.V.C. TELE.	TELEPHONE DUCT
Ⓣ	TMH	TELEPHONE MANHOLE
[	[	UTILITY PLUG
WG	○	WATER SERVICE BOX
WG	WG	WATER GATE
Ⓦ	WMH	WATER MANHOLE
8" W	12" DICL WATER	WATER MAIN

SURFACE DETAILS/TOPO

EXISTING	PROPOSED	DESCRIPTION
12 N00°00'00"E 57.59	74+00 N57° 18' 41"E 300.00'	BASE/SURVEY LINE
(NAME)		CITY, TOWN OR COUNTY BOUNDARY
		CURB (OR BERM) – TYPE NOTED
		EDGE OF ROAD
		LINE OF EASEMENT
		FENCE (SIZE AND TYPE NOTED)
		HIGHWAY GUARD (TYPE NOTED)
SB	SB	HIGHWAY/PROPERTY BOUND
P	P	PROPERTY LINE
S.H.L.O	R.O.W	STATE HIGHWAY LAYOUT LINE
TOWN L.O	R.O.W	TOWN HIGHWAY LAYOUT LINE
12"		TREE (ON CONSRTUCTION PLAN ONLY)
12"		TREE
		WHEEL CHAIR RAMP
		HEDGE
		SHRUBS

MISCELLANEOUS

EXISTING	PROPOSED	DESCRIPTION
B-#	B-#	BORING
F	F	FIRE ALARM BOX
		HYDRANT
M	M	MAILBOX – COMMERCIAL
M		MAILBOX – RESIDENTIAL
		STREET LIGHT
		WOODEN POLE
		MBTA CATENARY POLE
		UTILITY POLE WITH STREET LIGHT
		MBTA CATENARY POLE WITH LIGHT
BS	BS	BARBER SHOP POST
		SAWCUT
		ROOT PATHS
		SIDEWALK W/ SPECIAL SCORING PATTERN
		TOWN BOUNDARY LINE

TRAFFIC, PAVEMENT MARKINGS & SIGNING

EXISTING	PROPOSED	DESCRIPTION
	=======	CONDUIT
		CONTROL CABINET – GROUND MOUNTED
		CONTROL CABINET – POLE MOUNTED
ø1	ø1	CONTROLLER PHASE
	CW	CROSSWALK
		DIRECTION OF FLOW
EHH	■EHH	ELECTRIC HANDHOLE
		EMERGENCY CONFIRMATION BEACON
		FLASHING BEACON (ALPHA–NUMERIC DESIGNATION NOTED)
		INTERCONNECT CABLE
		VIDEO DETECTION AREA
		LIMIT OF VISIBILITY OF OPTICALLY PROGRAMMED SIGNAL HEAD
	30'	MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		OPTICAL EMERGENCY DETECTOR
OHW	OHW	OVERHEAD CABLE
		PAVEMENT ARROW AND LEGEND
		PEDESTRIAN PUSH BUTTON
		PEDESTRIAN SIGNAL HEAD (ALPHA–NUMERIC DESIGNATION NOTED)
PB		PULL BOX 12" X 12"
PB		PULL BOX 8" X 23", 12" X 24"
		RAISED PAVEMENT MARKER: TWO–WAY YELLOW
		RAISED PAVEMENT MARKER: ONE–WAY WHITE
		RAISED PAVEMENT MARKER: YELLOW/RED
		SIGN AND POST
R1–1	R1–1	SIGN LEGEND
		SIGNAL POST AND BASE
		VEHICULAR SIGNAL HEAD (ALPHA–NUMERIC DESIGNATION NOTED)
		VEHICULAR SIGNAL HEAD OPTICALLY PROGRAMMED (ALPHA–NUMERIC DESIGNATION NOTED)
	=X=X=	" X " DUCT (CONCRETE ENCASED)
		VIDEO CAMERA
		TOP OR BOTTOM OF SLOPE
		FULL DEPTH RECONSTRUCTION
	A89	AAB/ADA RAMP TYPE REFERENCE
		CHANGE IN PVM'T TYPE

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	13	214
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LEGEND & GENERAL NOTES

ABBREVIATIONS

R	CIRCULAR RED
Y	CIRCULAR AMBER
G	CIRCULAR GREEN
FR	FLASHING CIRCULAR RED
FY	FLASHING CIRCULAR AMBER
	45° ARROW RED
	45° ARROW AMBER
	45° ARROW GREEN
	135° ARROW RED
	135° ARROW AMBER
	135° ARROW GREEN
	LEFT ARROW RED
	LEFT ARROW AMBER
	LEFT ARROW GREEN
	RIGHT ARROW RED
	RIGHT ARROW AMBER
	RIGHT ARROW GREEN
	VERTICAL ARROW RED
	VERTICAL ARROW AMBER
	VERTICAL ARROW GREEN
	WALK – LUNAR WHITE
FD	FLASHING DON'T WALK – PORTLAND ORANGE
D	DON'T WALK – PORTLAND ORANGE

ABAN	ABANDON (BY CONTRACTOR)
(A)	ABANDONED (WAS RECENTLY ABANDONED BO)
ADJ	ADJUST
BO	BY OTHERS
BOC	BEGINNING OF CURB
BOS	BOTTOM OF SLOPE
CAT	CATENARY POLE
CIT	CHANGE IN TYPE
DIP	DUCTILE IRON PIPE
EOC	END OF CURB
FE	FLARED END
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
HMA	HOT MIX ASPHALT
MA	MAST ARM
MOUP	MOUNTED ON UTILITY POLE
MOP	MOUNTED ON POLE
MOLP	MOUNTED ON LIGHT POLE
MOTSP	MOUNTED ON TRAFFIC SIGNAL POLE
MOMA	MOUNTED ON MAST ARM
MOMAP	MOUNTED ON MAST ARM POST
NIC	NOT IN CONTRACT
PBS	PAINTED BOTH SIDES
PWW	PAVED WATERWAY
RCP	REINFORCED CONCRETE PIPE
REC	FROM RECORD PLANS
REMOD	REMODEL
RET	RETAIN
R,R&R	REMOVE, RELOCATE & RESET
R&D	REMOVE & DISCARD
R&R	REMOVE & RESET
R&S	REMOVE & STACK
R&T	REMOVE & TRANSPORT
SGE	SLOPED GRANITE EDGING
SHLD	SHOULDER
TOS	TOP OF SLOPE
TS	TRAFFIC SIGNAL
VGC	VERTICAL GRANITE CURB
WTX	EXISTING WAVERELY TRAIL SIGN OR KIOSK

BWLL	BROKEN WHITE LANE LINE, 4" (10' MARK – 30' SKIP)
BYCL	BROKEN YELLOW CENTER LINE, 4" (10' MARK – 30' SKIP)
CW	CROSSWALK (12" WHITE)
DWLL	DOTTED WHITE LANE LINE, 4" (2' MARK – 4' SKIP)
DYCL	DOUBLE YELLOW CENTER LINE, 4"
SL	STOP LINE, 12", 5' BEHIND CW OR AS NOTED
SWCHL	SOLID WHITE CHANNELIZATION LINE, 8"
SWEL	SOLID WHITE EDGE LINE, 6" UNLESS OTHERWISE NOTED
SWLL	SOLID WHITE LANE LINE, 4"
SYCHL	SOLID YELLOW CHANNELIZATION LINE, 8"
SYEL	SOLID YELLOW EDGE LINE, 4" (6" AT BICYCLE LANE)
WCL	WHITE CHEVRON LINE, 12" (SPACED 10' O.C. UNLESS OTHERWISE NOTED)
WTL	WHITE TRANSVERSE LINE, 12" (SPACED 10' O.C. UNLESS OTHERWISE NOTED)
YTL	YELLOW TRANSVERSE LINE, 12" (SPACED 10' O.C. UNLESS OTHERWISE NOTED)
R1–1	EXISTING SIGN
R1–1	PROPOSED SIGN

GENERAL NOTES

1. ALL NEW GRANITE CURB SHALL BE TYPE VB UNLESS OTHERWISE NOTED.
2. ALL GRANITE CURB SHALL BE SET TO HAVE A 6" REVEAL ABOVE FINAL PAVEMENT GRADES (UNLESS OTHERWISE NOTED).
3. ALL BASELINE TIES FOR CURB CORNERS AND RADII ARE TO THE P.C.'S OR P.T.'S, UNLESS OTHERWISE NOTED. WHERE PROPOSED CURB MEETS EXISTING CURB, BERM, ROADWAY, AND/OR DRIVEWAY PAVEMENT EDGES, MINOR FIELD ADJUSTMENTS TO EITHER THE DESIGNATED RADIUS OR THE DESIGNATED STATION OF THE P.C. OR P.T. FOR THE PROPOSED CURB OR BERM MAY BE REQUIRED. THESE ADJUSTMENTS SHALL BE MADE IN THE FIELD BY THE CONTRACTOR AS DIRECTED BY THE RESIDENT ENGINEER.
4. ALL EXISTING MUNICIPAL, MWRA, AND MBTA UTILITY CASTINGS THAT ARE TO REMAIN WITHIN AREAS TO BE REPAVED SHALL BE ADJUSTED TO LINE AND GRADE BY THE CONTRACTOR UNLESS OTHERWISE NOTED. ALL PRIVATE TELEPHONE, GAS, AND ELECTRICAL CASTINGS SHALL BE ADJUSTED BY OTHERS.
5. THE LOCATIONS OF EXISTING SUBSURFACE UTILITIES SHOWN ON THE PLANS WERE COMPILED FROM AVAILABLE RECORD DRAWINGS AND ARE NOT WARRANTED TO BE CORRECT. THE LOCATIONS ARE APPROXIMATE ONLY AND IN SOME CASES MAY BE INCOMPLETE. THE CONTRACTOR SHALL NOTIFY ALL AGENCIES REQUIRED AND VERIFY THE LOCATIONS OF ALL EXISTING SUBSURFACE UTILITIES PRIOR TO PERFORMING ANY WORK.
6. PRIOR TO THE INSTALLATION OF PROPOSED UTILITIES, THE CONTRACTOR SHALL EXCAVATE TEST PITS AT LOCATIONS OF UTILITY CROSSINGS TO VERIFY DEPTHS OF EXISTING PIPES, CONDUITS OR OTHER FACILITIES, AS DIRECTED BY ENGINEER.
7. THE CONTRACTOR SHALL ENSURE THAT ALL ROADWAY RUNOFF SHALL BE DIRECTED TO CATCH BASINS.
8. THE CONTRACTOR SHALL VERIFY ALL OUTLET GRADES OF DRAINAGE STRUCTURES PRIOR TO CONSTRUCTING THE DRAINAGE IMPROVEMENTS.
9. THE CONTRACTOR SHALL SAWCUT TO THE FULL PAVEMENT DEPTH AT BOUNDARIES BETWEEN FULL DEPTH CONSTRUCTION AND EXISTING PAVEMENT.
10. EXCEPT AS NOTED, ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC.
11. ALL WHEELCHAIR RAMPS SHALL BE CONSTRUCTED TO COMPLY WITH THE LATEST MASSDOT STANDARDS.
12. ALL AREAS OUTSIDE OF THE LIMIT OF WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S OWN EXPENSE.
13. ALL EXISTING TREES TO REMAIN SHALL BE PROTECTED FROM DAMAGE CAUSED BY CONTRACTORS OPERATIONS.
14. THE CONTRACTOR SHALL NOTIFY UTILITY COMPANY OF SCHEDULE OF REQUIRED POLE RELOCATIONS AS SOON AS THE NOTICE TO PROCEED IS RECEIVED.
15. BASE MAPPING PREPARED BY BSC GROUP, INC. BETWEEN FEBRUARY AND JUNE OF 2006 AND SUPPLEMENTED WITH SPOT SURVEYS AFTER THAT DATE. HORIZONTAL DATUM: MASS. STATE PLANE COORD. SYSTEM MAINLAND ZONE. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988(NAVD88)
16. THE TOWN OF BELMONT USES A PLOW WITH A 52" WIDE BLADE TO CLEAN SNOW FROM THE SIDEWALKS IN RESIDENTIAL AREAS IN BELMONT. WHEN CONSTRUCTION IS COMPLETE THERE MUST BE A 56" CLEAR WIDTH IN THE RESIDENTIAL SECTION OF TRAPELO ROAD AND BELMONT STREET(BELMONT SIDE ONLY) TO ALLOW FOR THIS TO CONTINUE. THE INSTALLATION OF UTILITY POLES, HYDRANTS, AND SIGN POLES MUST BE ACCOMPLISHED WITH THIS IN MIND. LOCATIONS IN BELMONT WHERE THE 56" CLEAR PATH DOES APPLY ARE: TRAPELO ROAD AND SIDE STREETS LEFT SIDE (17+77 TO 18+70, 20+78 TO 29+24, 41+20 TO 52+00, 58+00 TO 62+22, 69+00 TO 84+50, 90+00 TO 120+20, 127+75 TO 133+12, 135+88 TO 140+64, 142+50 TO 143+50, 144+50 TO 146+90), TRAPELO ROAD AND SIDE STREETS RIGHT SIDE (17+77 TO 38+00, 42+90 TO 51+55, 58+50 TO 65+24, 71+62 TO 84+14, 90+58 TO 104+00), MILL STREET RIGHT SIDE (0+00 TO 2+50), MILL STREET LEFT SIDE (0+00 TO 4+00), LEXINGTON STREET RIGHT SIDE (1+00 TO 2+85, 4+00 TO 4+60), LEXINGTON STREET LEFT SIDE (0+00 TO 5+50), CHURCH STREET RIGHT SIDE (0+50 TO 4+00). COMMON STREET BOTH SIDES (3+57 TO 5+10), HARRIET AVE BOTH SIDES (0+50 TO 1+78).
17. THE CONTRACTOR IS ADVISED OF THE EXISTENCE OF A FRAGILE MWRA 56" STEEL AQUEDUCT CLOSE TO THE SURFACE OF TRAPELO ROAD STATION 22+00 RT TO STATION 30+00 LT
18. THE CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO AVOID DISTURBING THE EXISTING STONE WALLS AT THE EDGE OF THE ROADWAY LAYOUT.
19. THE CONTRACTOR IS ADVISED THAT THERE ARE MBTA TROLLEY WIRES ABOUT 18' ABOVE THE TRAVEL LANES THROUGHOUT MOST OF THIS PROJECT AND THE CONTRACTOR MUST TAKE THIS INTO CONSIDERTATION WHEN PLANNING WORK.
20. THE CONTRACTOR MUST NOTIFY THE MBTA POWER DISPATCHER (617–222–5546) IF ANY MACHINERY OR DEBRIS HITS THE CATENARY SYSTEM, DC FEEDERS, WAYSIDE SWITCHES, CONTROLS, OR CATENARY POLES.
21. THE CATENARY SYSTEM AND DC FEEDERS MAY BE ALIVE DURING SOME PHASES OF CONSTRUCTION. THE CONTRACTOR MUST CONTACT THE MBTA POWER DISPATCHER AND OCC (TRACKLESS TROLLEY) FOR CONFIRMATION.
22. THE CONTRACTOR IS REQUIRED TO SUPPORT MBTA POLES IN PLACE DURING EXCAVATION FOR DRAINAGE LINES. THE MBTA POWER DEPT. WILL NEED TO REVIEW AND APPROVE THE PROPOSED SUPPORT METHOD PRIOR TO USE.
23. ANY DAMAGE TO EXISTING UTILITIES CAUSED BY CONTRACTOR'S WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR AT ITS OWN COST.
24. THE CONTRACTOR SHALL COORDINATE WITH THE UTILITY POLE OWNER AS NECESSARY BEFORE STARTING WORK WHICH COULD UNDERMINE POLES.
25. THE CONTRACTOR IS MADE AWARE THAT THERE ARE NUMEROUS UTILITY LINES AND SERVICES UNDERGROUND AND THE EXACT LOCATION EITHER HORIZONTALLY OR VERTICALLY IS NOT KNOWN. TEST PITS HAVE BEEN CALLED FOR ON THE PLANS WHERE IT APPEARS THAT THERE IS A GOOD POSSIBILITY THAT A CONFLICT WITH THE PROPOSED DRAINAGE SYSTEM MAY OCCUR. IT IS POSSIBLE CONFLICTS MAY OCCUR WHERE CROSSINGS ARE SHOWN AND NO TEST PITS ARE PROPOSED. BEFORE INSTALLING A PARTICULAR DRAINAGE SYSTEM THE CONTRACTOR SHALL SUBMIT A PROPOSED PLAN AND PROFILE OF THE PROPOSED SYSTEM SHOWING THE HORIZONTAL AND VERTICAL LOCATIONS OF THE EXISTING UTILITIES AND HOW THE CONTRACTOR PROPOSES TO AVOID THEM. THE CONTRACTOR SHALL ALSO SUBMIT A PLAN OF HIS PROPOSED TEST PITS FOR REVIEW. THE DEPARTMENT IS NOT RESPONSIBLE FOR THE RELAYING OF ANY DRAINAGE LINE THAT HAS BEEN INSTALLED AND THEN NEEDS TO BE RELAID BECAUSE THE CONTRACTOR'S PLAN IS NOT ACCURATE.
26. ANY DAMAGE TO THE MBTA CATENARY SYSTEM SHALL BE REPORTED TO JACK MARTIN OF MBTA POWER DEPT (617–222–3199) AS SOON AS IT OCCURS.
27. THE CONTRACTOR IS ADVISED THAT IN MANY SECTIONS OF THE CORRIDOR THERE EXISTS RAILROAD TRACKS SET IN CONCRETE (AND POSSIBLE COBBLE) AND WOOD TIES AT VARYING DEPTHS BELOW THE SURFACE AND HE SHALL ADJUST HIS MILLING ACCORDINGLY. IT IS REQUIRED THAT THE MILLING OPERATION WILL EXPOSE THE TRACKS AND ITS SURROUNDING SYSTEM (COBBLES/CONCRETE).
28. CONTACT NATIONAL GRID (508–424–7509) AT LEAST TWO DAYS PRIOR TO EXCAVATING WITHIN 200 FEET OF THEIR REGULATOR VAULT LOCATED AT STA. 104+50 RT. NATIONAL GRID HAS SPECIAL RESTRICTIONS AROUND THIS SENSITIVE FACILITY.
29. IF ANY OF THE GAS FACILITIES BECOME EXPOSED DURING CONSTRUCTION NATIONAL GRID MUST BE NOTIFIED BEFORE THE PIPE IS BACKFILLED.
30. IF ANY OF THE GAS LINES ARE DAMAGED OR THE COATING SCRATCHED THE CONTRACTOR SHALL CALL 800–233–5325 IMMEDIATELY AND THE GAS COMPANY WILL REPAIR THE DAMAGED PIPE.
31. CARE SHOULD BE USED WHEN SAWCUTTING OVER GAS SERVICES WHICH ARE USUALLY ON AVERAGE 18 INCHES DEEP.
32. IN SOME AREAS THE PLANS CALL FOR AN ABANDONED GAS LINE TO BE CUT AND CAPPED. BEFORE CUTTING THE LINE THE CONTRACTOR SHALL HAVE THE GAS COMPANY COME OUT AND CONFIRM THAT THE GAS LINE IS TRULY ABANDONED AND EMPTY OF GAS.
33. SOME EXISTING GAS LINES ARE LABELED AS ABANDONED ON THE PLANS. THESE LINES SHOULD NOT BE DISTRUBED WITHOUT VERIFICATION BY THE GAS COMPANY THAT THEY ARE TRULY ABANDONED.

BELMONT / WATERTOWN
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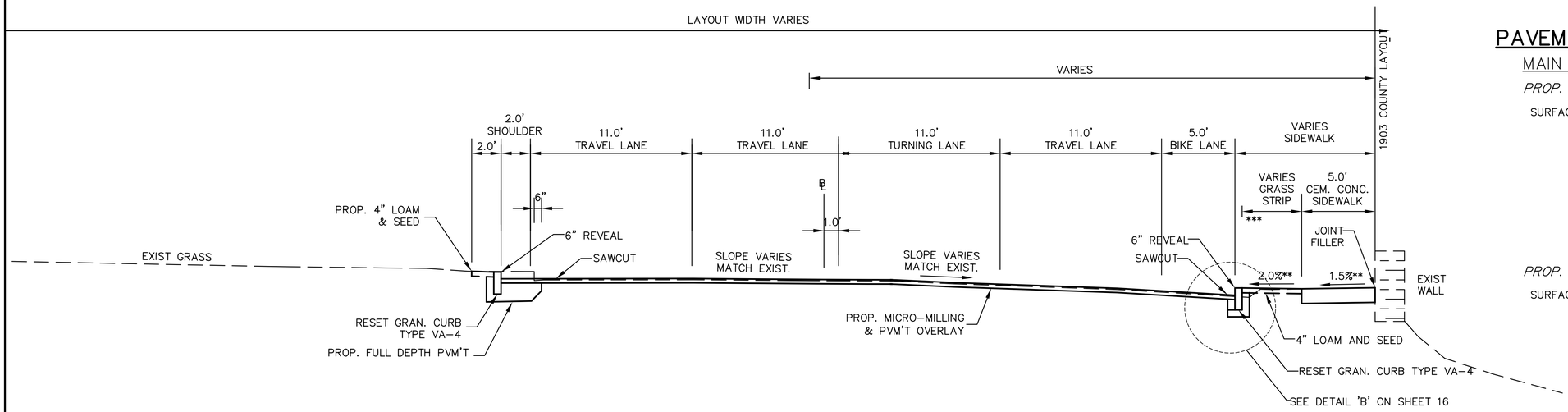
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	14	214
PROJ. FILE NO. 604688			

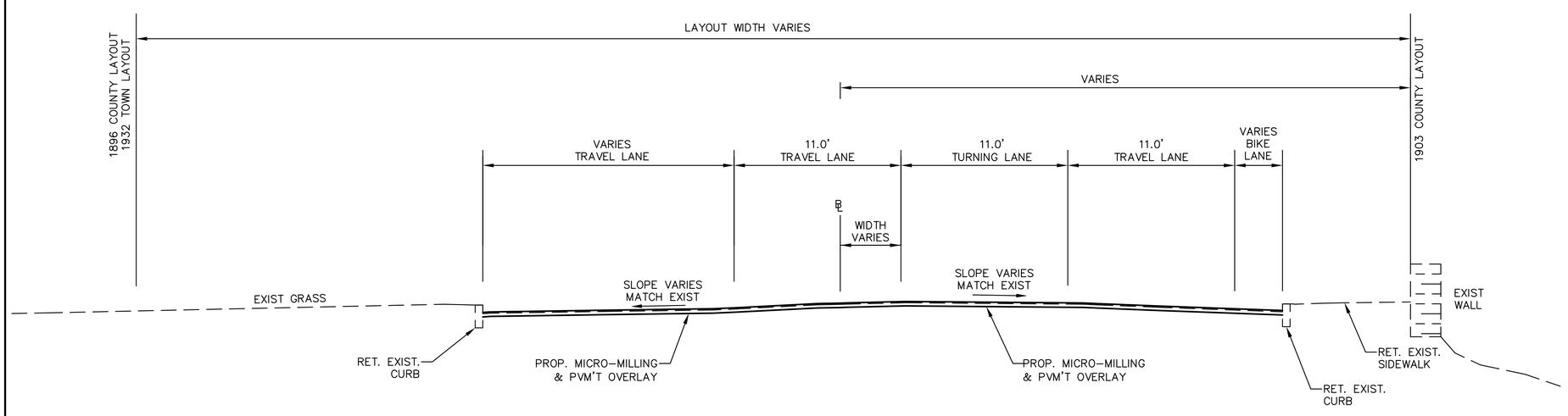
TYPICAL SECTIONS & PAVEMENT NOTES



TRAPELO ROAD (STA 18+00 TO 19+50)

SCALE: 1" = 4'

*** STA 18+00 TO 18+40. FOR STA 18+40 TO 19+50 SEE TYPICAL SECTION STA 19+50 TO 21+00



TRAPELO ROAD (STA 17+40 TO 18+00)

SCALE: 1" = 4'

*1.5% PREFERRED

**CONSTRUCTION TOLERANCE ±0.5%

PAVEMENT NOTES

MAIN LINE:

PROP. MICRO-MILLING & PVM'T OVERLAY

SURFACE: 3½" HOT MIX ASPHALT PLACED IN 2 LAYERS; 1½" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5), OVER BITUMEN FOR TACK COAT (RS-1) AT 0.05GAL/SY, OVER 2" SUPERPAVE INTERMEDIATE COURSE 12.5(SIC-12.5), OVER

BITUMEN FOR TACK COAT (RS-1) AT 0.07GAL/SY OVER EXISTING MILLED PAVEMENT, OVER

MICRO-MILLING TO A DEPTH OF 2¼" (AN ADDITIONAL 0" TO 1" VARIABLE DEPTH MICRO-MILLING ALONG THE CURB WHERE NOTED).

PROP. VARIABLE DEPTH MICRO-MILLING & PVM'T OVERLAY

SURFACE: 3½" TO 6" HOT MIX ASPHALT PLACED IN 2 OR 3 LAYERS; 1½" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5), OVER BITUMEN FOR TACK COAT (RS-1) AT 0.05GAL/SY, OVER 2" TO 3" SUPERPAVE INTERMEDIATE COURSE 12.5(SIC-12.5), OVER BITUMEN FOR TACK COAT (RS-1) AT 0.05GAL/SY, OVER 1½" SUPERPAVE LEVELING COURSE 9.5(SIC-9.5) IF REQUIRED, OVER

BITUMEN FOR TACK COAT (RS-1) AT 0.07GAL/SY OVER EXISTING MILLED PAVEMENT, OVER

MICRO-MILLING TO A DEPTH OF ½" TO 2¼" TO ESTABLISH CROSS SLOPE AS INDICATED ON THE PLANS.

PROP. FULL DEPTH PVM'T

SURFACE: 3½" HOT MIX ASPHALT PLACED IN 2 LAYERS; 1½" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5), OVER BITUMEN FOR TACK COAT (RS-1) AT 0.05GAL/SY, OVER 2" SUPERPAVE INTERMEDIATE COURSE 12.5(SIC-12.5), OVER BITUMEN FOR TACK COAT (RS-1) AT 0.05GAL/SY, OVER

BASE: 4½" SUPERPAVE BASE COURSE 37.5 (SBC-37.5), OVER

SUBBASE: EXIST. MATERIAL MEETING SPECIFICATIONS OR BE REPLACED WITH 4" DENSE GRADED CRUSHED STONE FOR SUBBASE OVER 8" GRAVEL.

PROP. FULL DEPTH PVM'T < 4'

SURFACE: 3½" HOT MIX ASPHALT PLACED IN 2 LAYERS; 1½" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5), OVER BITUMEN FOR TACK COAT (RS-1) AT 0.05GAL/SY, OVER 2" SUPERPAVE INTERMEDIATE COURSE 12.5(SIC-12.5), OVER

BASE: 6" HIGH EARLY STRENGTH CEMENT CONCRETE BASE, OVER

SUBBASE: EXIST. MATERIAL MEETING SPECIFICATIONS OR BE REPLACED WITH 8" GRAVEL.

PROP. BRIDGE APPROACH TRANSITION

SURFACE: 3½" HOT MIX ASPHALT PLACED IN 2 LAYERS; 1½" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5), OVER BITUMEN FOR TACK COAT (RS-1) AT 0.05GAL/SY, OVER 2" SUPERPAVE INTERMEDIATE COURSE 12.5(SIC-12.5), OVER

BITUMEN FOR TACK COAT (RS-1) AT 0.07GAL/SY OVER EXISTING MILLED PAVEMENT, OVER

2¼" TO 3½" VARIABLE DEPTH MICRO-MILLING.

PROP. COLORED SCORED CEM. CONC. PVM'T (SD E 105.2.0)

SURFACE: 8" CEMENT CONCRETE AIR ENTRAINED 5000 PSI, ¾", 705 LB/CY, OVER

SUBBASE: 12" GRAVEL

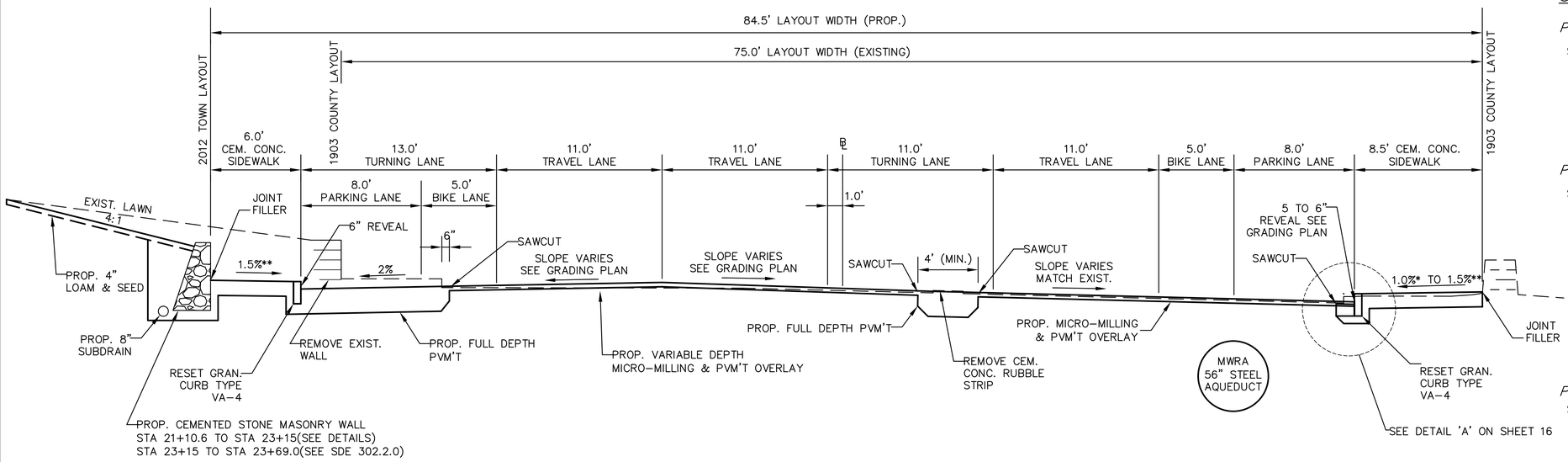
(NOTES CONTINUED ON NEXT SHEET)

NOTE: THIS NEW SUBBASE TO BE PLACED ONLY WHERE EXISTING SUBBASE MATERIAL FAILS TO MEET SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

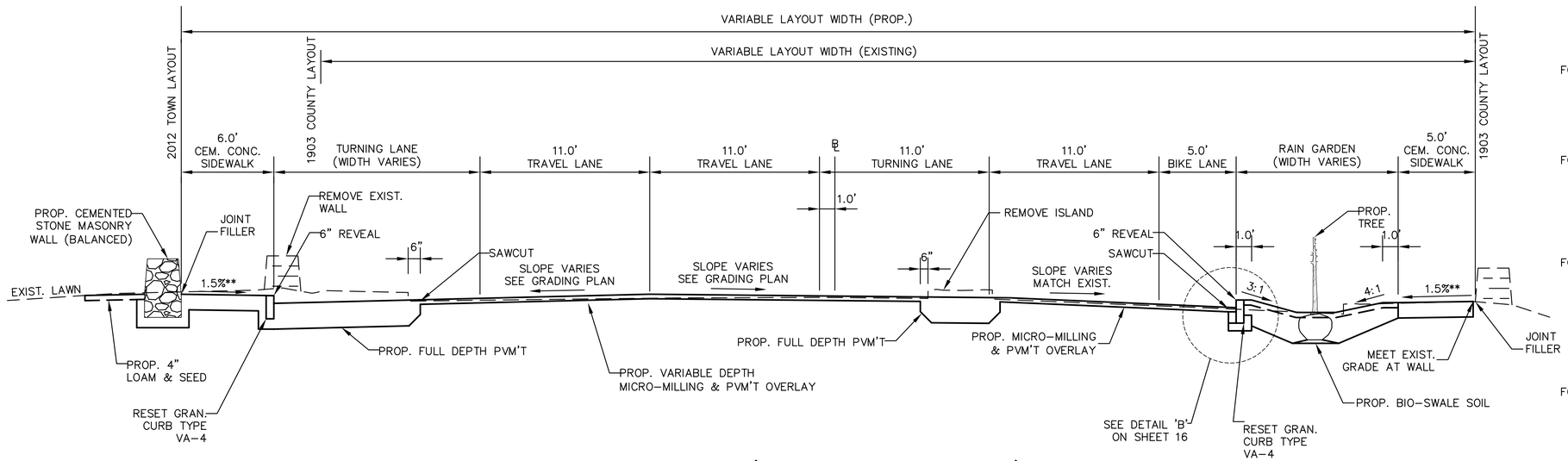
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	15	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



TRAPELO ROAD (STA 21+00 TO 24+00)

SCALE: 1" = 4'



TRAPELO ROAD (STA 19+50 TO 21+00)

SCALE: 1" = 4'

* 1.5% PREFERRED

** CONSTRUCTION TOLERANCE ±0.5%

PAVEMENT NOTES (CONT'D)

SIDE STREETS:

PROP. MICRO-MILLING & PVM'T OVERLAY

SURFACE: 1½" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5), OVER

BITUMEN FOR TACK COAT (RS-1) AT 0.07GAL/SY OVER EXISTING MILLED PAVEMENT, OVER

MICRO-MILLING TO A DEPTH OF ½", 1", OR 1½" AS NOTED ON THE PLANS.

PROP. VARIABLE DEPTH MICRO-MILLING & PVM'T OVERLAY

SURFACE: 1½" TO 4¾" HOT MIX ASPHALT PLACED IN 2 LAYERS; 1½" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5) OVER, BITUMEN FOR TACK COAT (RS-1) AT 0.05GAL/SY, OVER 2" TO 3" SUPERPAVE INTERMEDIATE COURSE 12.5(SIC-12.5), OVER

BITUMEN FOR TACK COAT (RS-1) AT 0.07GAL/SY OVER EXISTING MILLED PAVEMENT, OVER

1¼" SUPERPAVE LEVELING COURSE 9.5(SIC-9.5) IF REQUIRED, OVER

MICRO-MILLING TO A DEPTH OF ½" TO 2¼" TO ESTABLISH CROSS SLOPE AS INDICATED ON THE PLANS.

PROP. FULL DEPTH PVM'T

SURFACE: 3½" HOT MIX ASPHALT PLACED IN 2 LAYERS; 1½" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5) OVER BITUMEN FOR TACK COAT (RS-1) AT 0.05GAL/SY, OVER 2" SUPERPAVE INTERMEDIATE COURSE 12.5(SIC-12.5) OVER BITUMEN FOR TACK COAT (RS-1) AT 0.05GAL/SY, OVER

BASE: 4½" SUPERPAVE BASE COURSE 37.5 (SBC-37.5) OVER

SUBBASE: 4" DENSE GRADED CRUSHED STONE FOR SUBBASE OVER 8" GRAVEL.

PROP. CEM. CONC. SIDEWALK/WHEELCHAIR RAMP:

SURFACE: 4" CEMENT CONCRETE AIR INTRAINED 4000 PSI, ¾", 610, OVER

FOUNDATION: 8" GRAVEL.

PROP. SCORED CEM. CONC. SIDEWALK:

SURFACE: 4" CEMENT CONCRETE AIR INTRAINED 4000 PSI, ¾", 610, OVER

FOUNDATION: 8" GRAVEL.

PROP. CEM. CONC. SIDEWALK AT DRIVEWAY:

SURFACE: 6" CEMENT CONCRETE AIR INTRAINED 4000 PSI, ¾", 610, OVER

FOUNDATION: 8" GRAVEL.

PROP. HMA DRIVEWAY:

SURFACE: 3½" HOT MIX ASPHALT DRIVEWAY MATERIAL PLACED IN 2 LAYERS; 1½" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5), OVER 2" SUPERPAVE INTERMEDIATE COURSE 12.5(SIC-12.5).

FOUNDATION: 8" GRAVEL.

PROP. HMA SIDEWALK:

SURFACE: 2½" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5), OVER

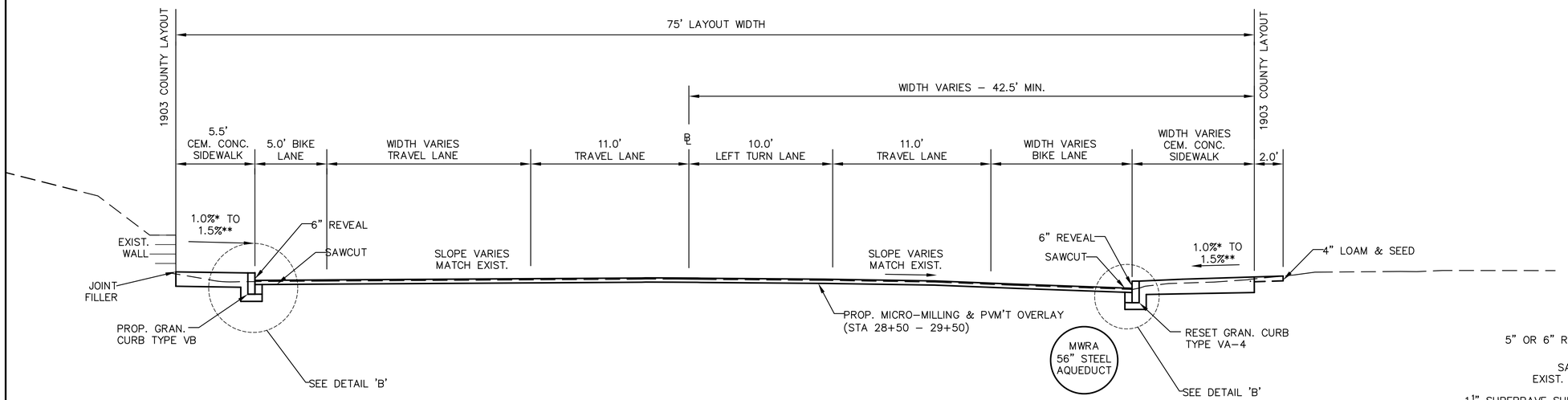
FOUNDATION: 8" GRAVEL.

NOTE: THIS NEW SUBBASE TO BE PLACED ONLY WHERE EXISTING SUBBASE MATERIAL FAILS TO MEET SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

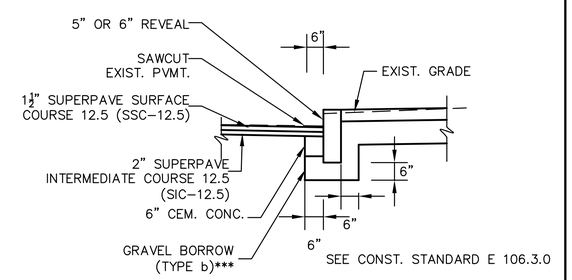
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	16	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



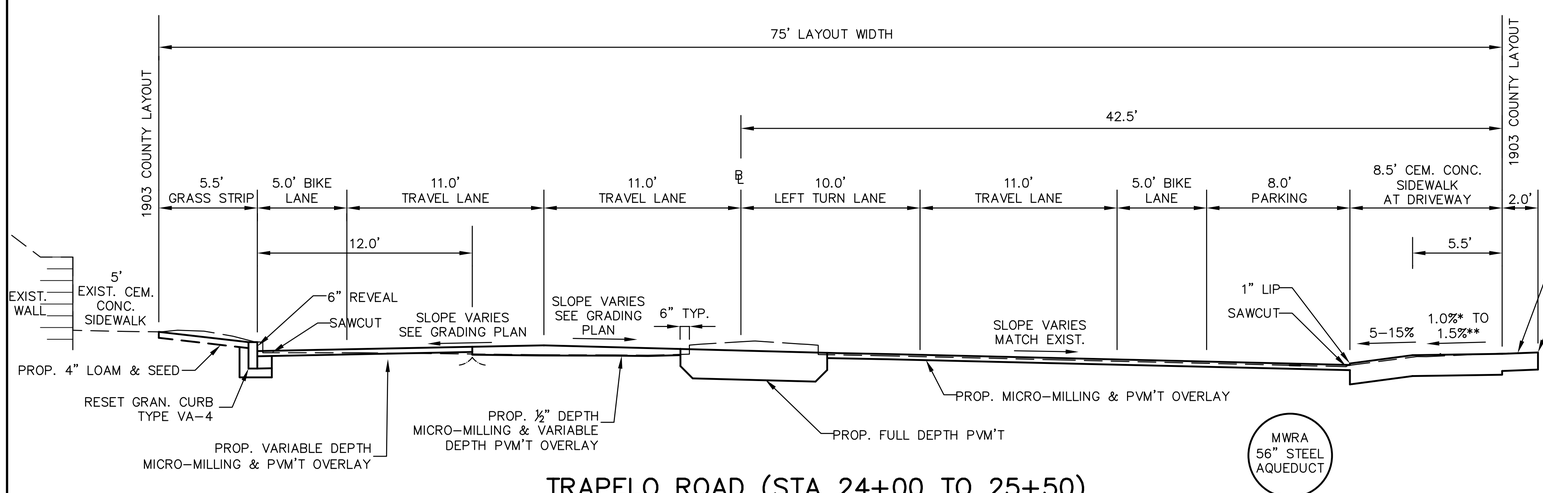
TRAPELO ROAD (STA 25+50 TO 29+50)

SCALE: 1" = 4'



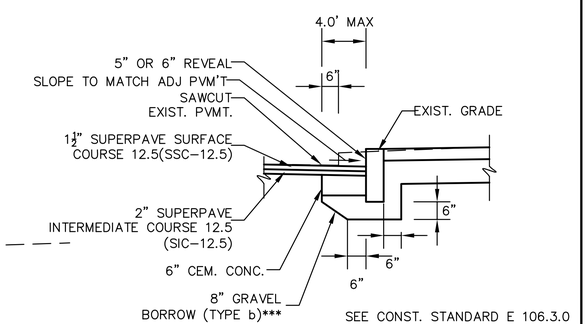
DETAIL B
RESET CURB

N.T.S.



TRAPELO ROAD (STA 24+00 TO 25+50)

SCALE: 1" = 4'



DETAIL A
FULL DEPTH PVM'T WIDENING < 4'

N.T.S.

* 1.5% PREFERRED

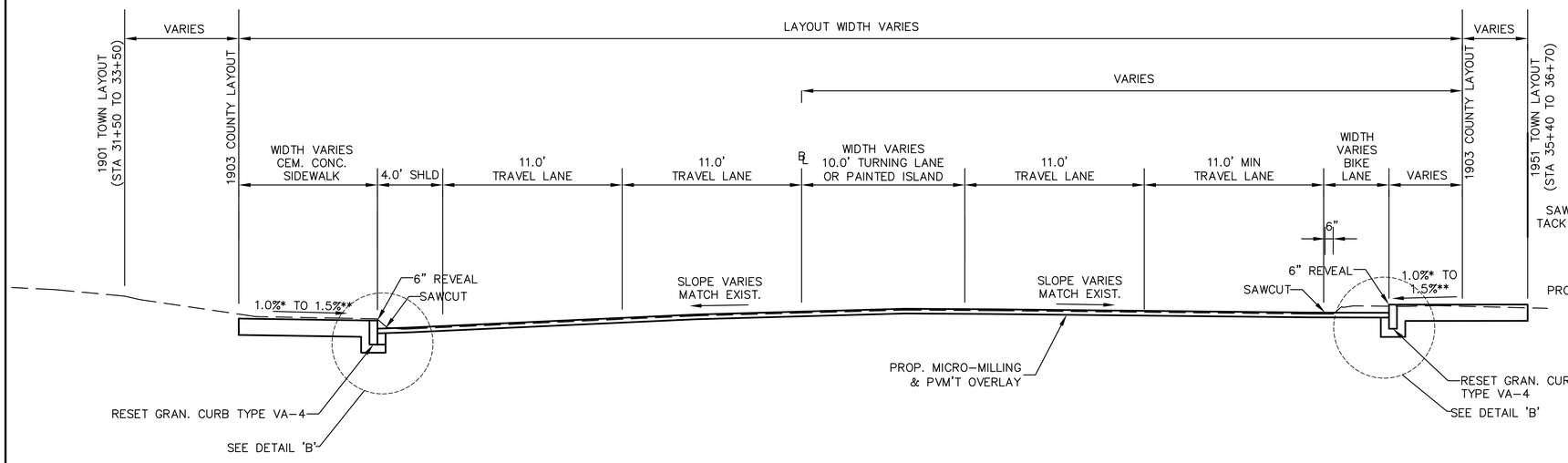
** CONSTRUCTION TOLERANCE ±0.5%

*** THIS NEW SUBBASE TO BE PLACED ONLY WHERE EXISTING SUBBASE MATERIAL FAILS TO MEET REQUIREMENTS OF M1.03.0 TYPE b AND AS DIRECTED BY THE ENGINEER.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

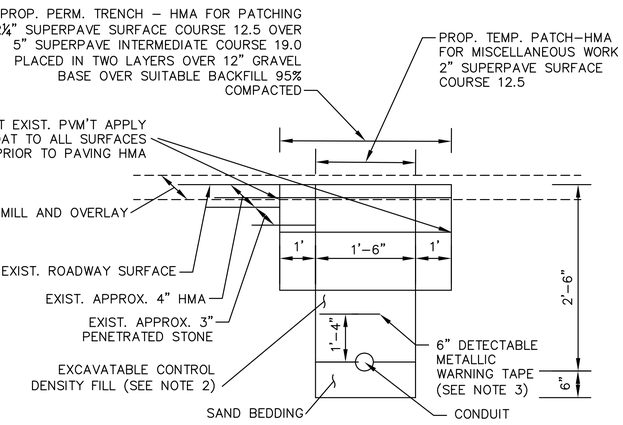
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	17	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



TRAPELO ROAD (STA 31+50 TO 36+25)

SCALE: 1" = 4'

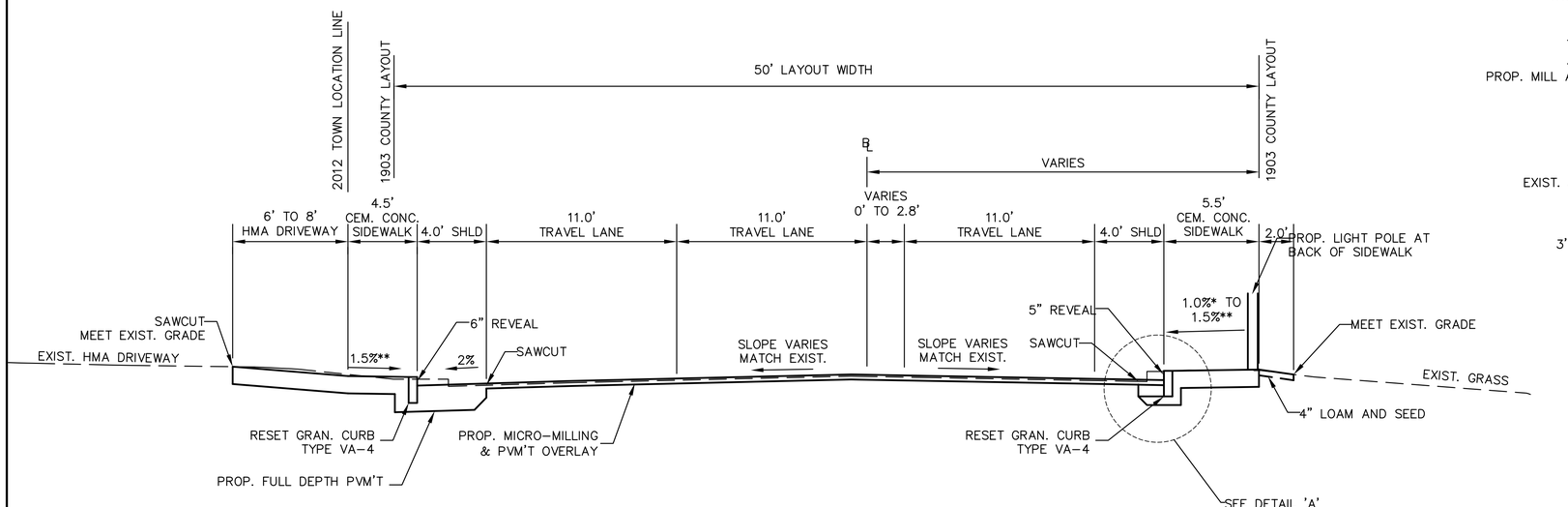


CONDUIT CROSSING ROADWAY

N.T.S.

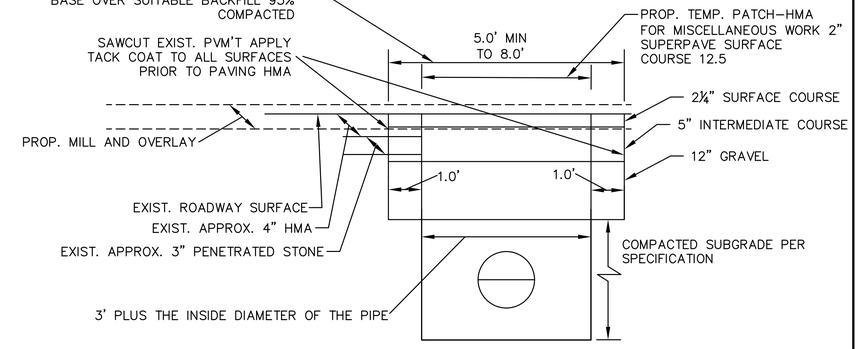
NOTES:

1. SCHEDULE 80 ELECTRICAL CONDUIT TYPE NM–PLASTIC (UL), WITH PULL ROPE, UNLESS OTHERWISE NOTED BY MASSDOT.
2. CONTROL DENSITY FILL SHALL MEET THE REQUIREMENTS OF SUBSECTION M4.08.0.
3. WARNING TAPE SHALL BE PER CURRENT APWA STANDARDS.



TRAPELO ROAD (STA 29+50 TO 31+50)

SCALE: 1" = 4'



TEMPORARY AND PERMANENT TRENCH PATCH DETAIL (PRIOR TO MILLING AND OVERLAY)

N.T.S.

* 1.5% PREFERRED

** CONSTRUCTION TOLERANCE ±0.5%

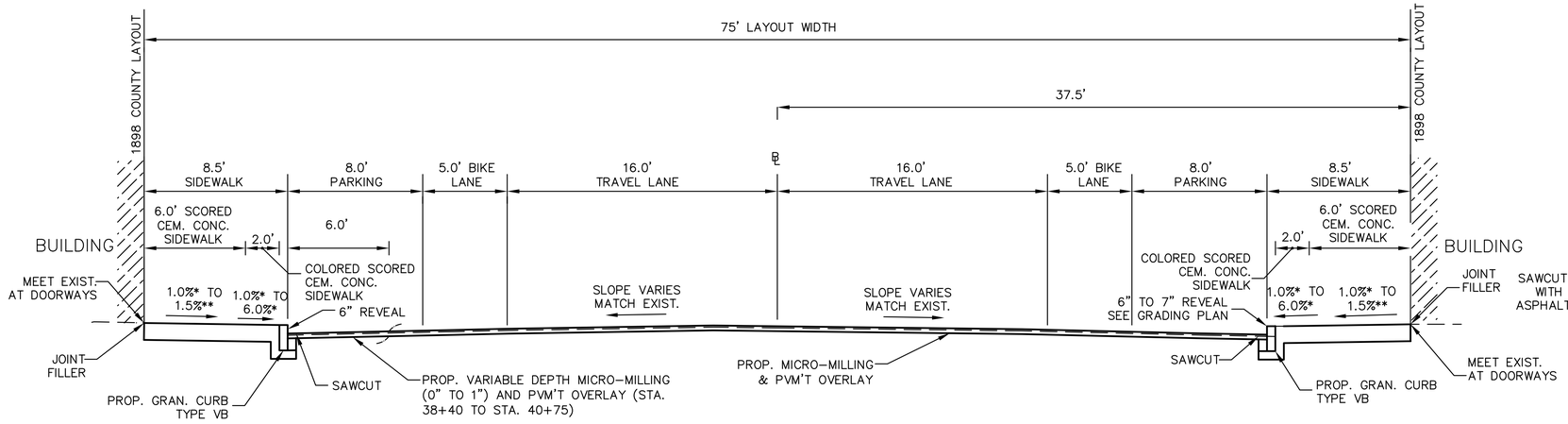
TRENCH PATCH NOTES:

1. TEMPORARY TRENCH AND HMA PATCH AS REQUIRED SHALL BE REPAIRED WITH PERMANENT PAVEMENT TRENCH PATCH 5' MIN WIDTH.
2. HMA SHALL BE SPREAD BY APPROVED SPREADING EQUIPMENT OR ACCEPTABLE HAND METHODS.
3. COMPACTION OF TRENCH PAVEMENT SHALL BE BY A MINIMUM OF A 3 TON VIBRATORY ROLLER.
4. THE 2" SUPERPAVE SURFACE COURSE 12.5 SHALL BE TEMPORARY PATCH DEPTH TO BE REMOVED TO BUILD PERMANENT PATCH OR TO BE MILLED OFF WITH PROP MILL AND OVERLAY.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

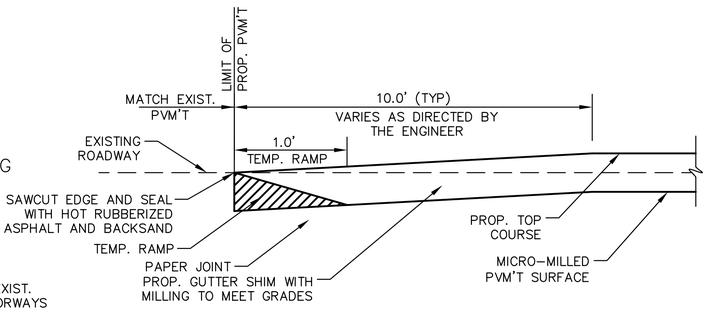
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	18	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



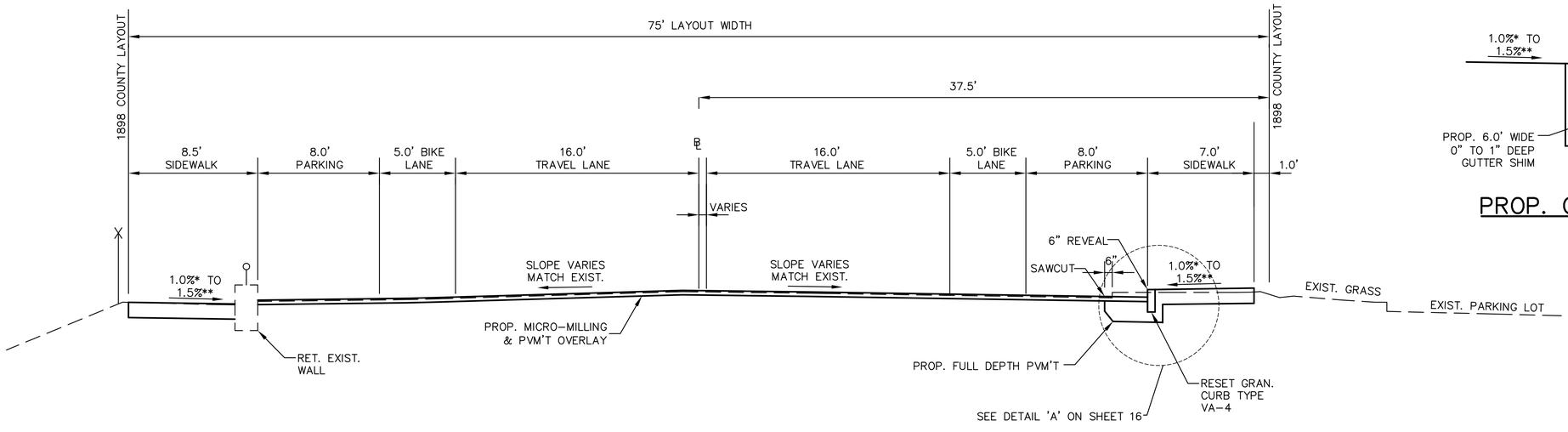
TRAPELO ROAD (STA 38+35 TO 43+00)

SCALE: 1" = 4'



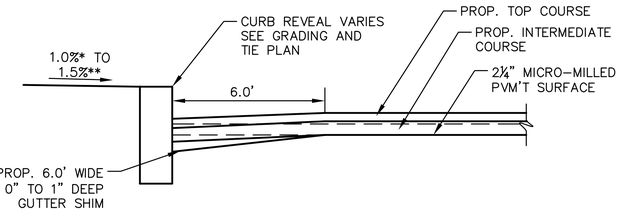
PVM'T TRANSITION FOR SIDE STREETS

N.T.S.



TRAPELO ROAD (STA 37+15 TO 38+35)

SCALE: 1" = 4'



PROP. GUTTER SHIM ON MAIN STREET

N.T.S.

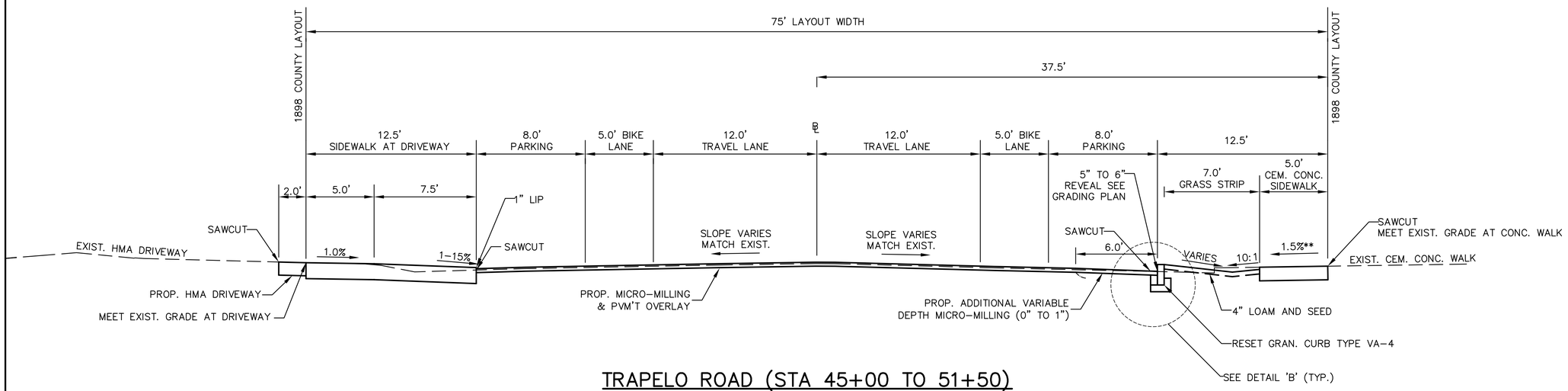
* 1.5% PREFERRED

** CONSTRUCTION TOLERANCE ±0.5%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

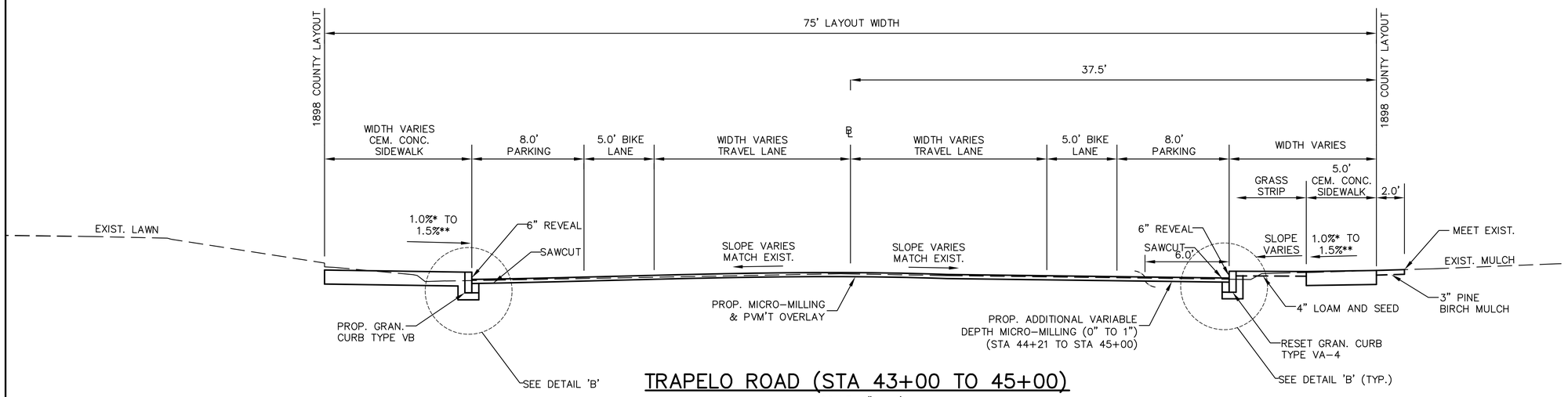
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	19	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



TRAPELO ROAD (STA 45+00 TO 51+50)

SCALE: 1" = 4'



TRAPELO ROAD (STA 43+00 TO 45+00)

SCALE: 1" = 4'

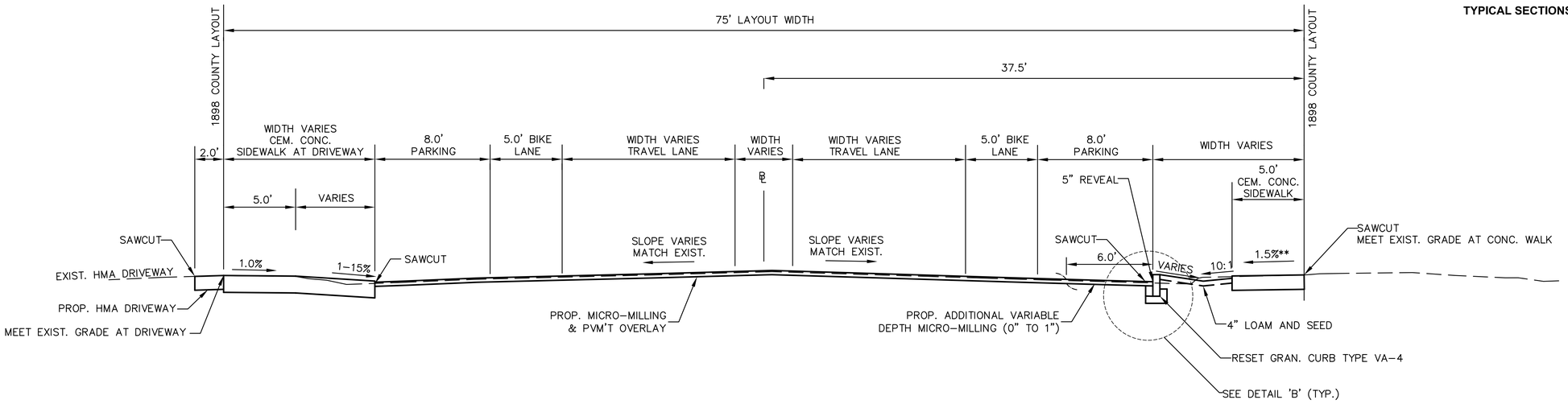
* 1.5% PREFERRED

** CONSTRUCTION TOLERANCE ±0.5%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

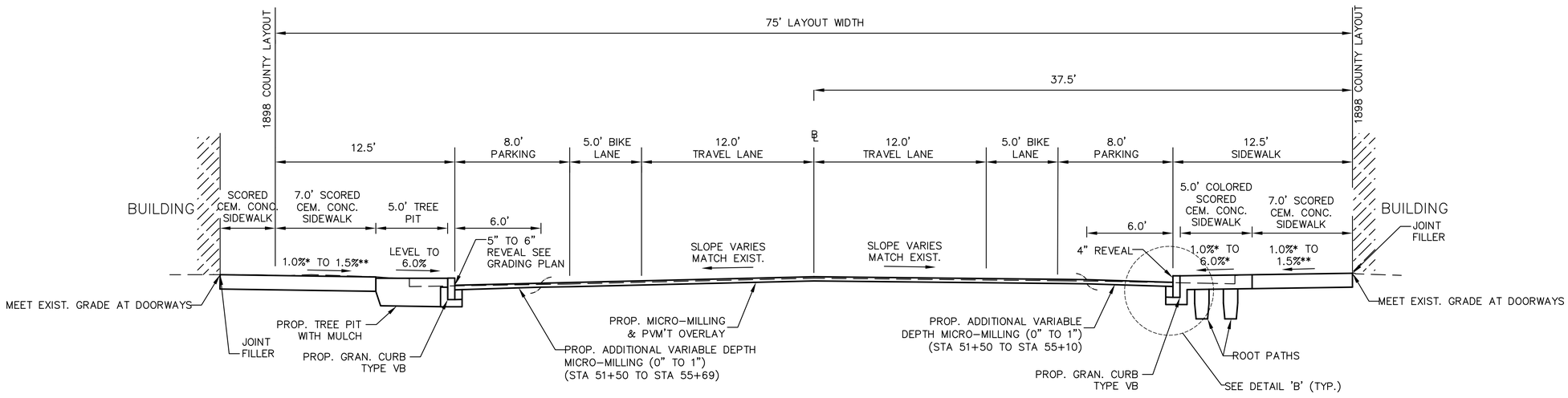
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	20	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



TRAPELO ROAD (STA 58+00 TO 61+05)

SCALE: 1" = 4'



TRAPELO ROAD (STA 51+50 TO 58+00)

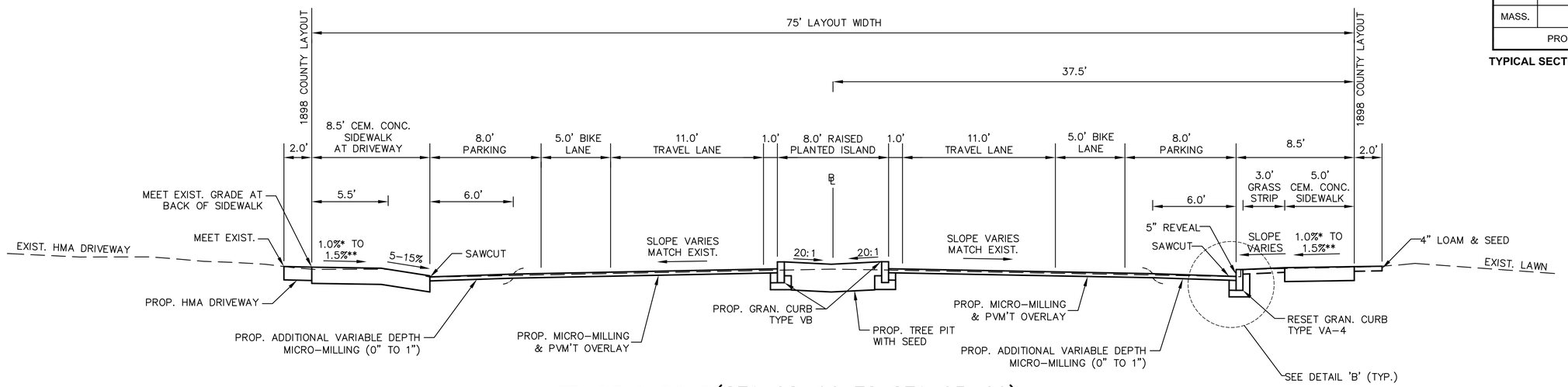
SCALE: 1" = 4'

*1.5% PREFERRED
**CONSTRUCTION TOLERANCE ±0.5%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

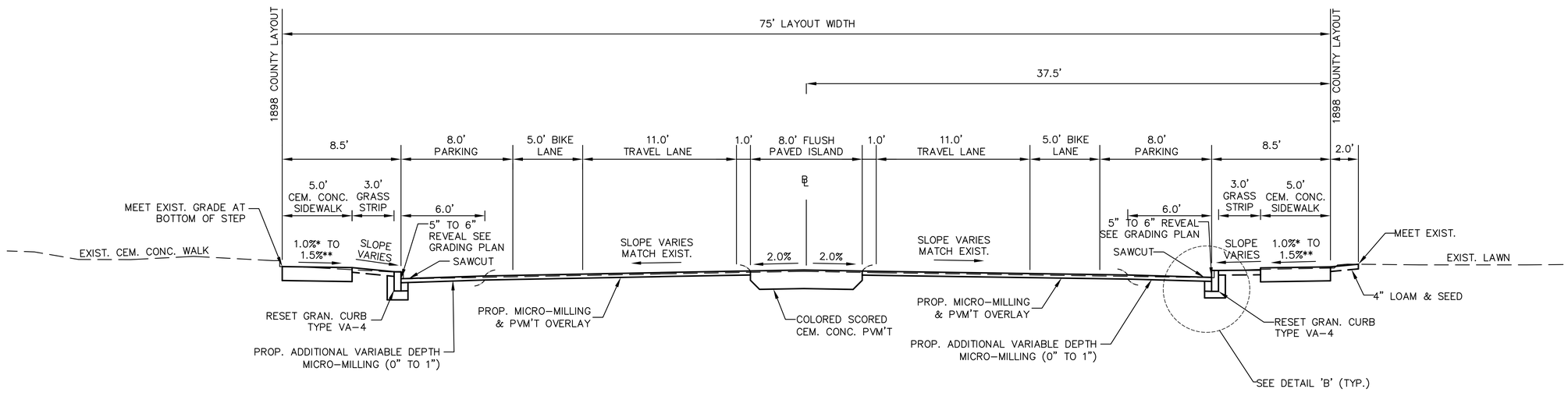
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	21	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



TRAPELO ROAD(STA 62+90 TO STA 63+60)
(STA 65+50 TO STA 65+75)
(STA 67+45 TO STA 68+30)
(STA 72+90 TO STA 73+25)

SCALE: 1" = 4'



TRAPELO ROAD(STA 61+05 TO STA 62+90)
(STA 64+10 TO STA 65+15)
(STA 69+50 TO STA 69+85)

SCALE: 1" = 4'

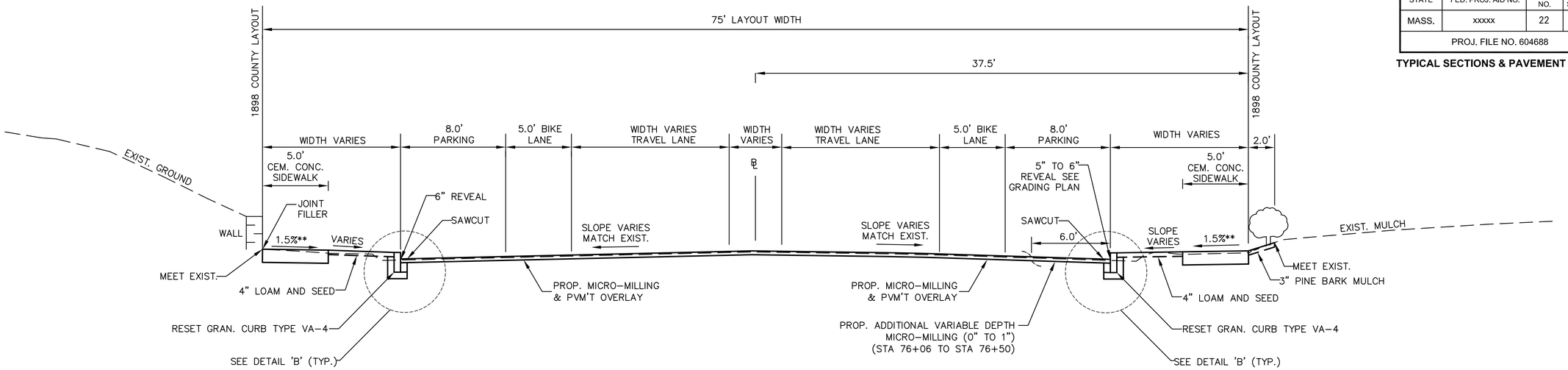
*1.5% PREFERRED

**CONSTRUCTION TOLERANCE ±0.5%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

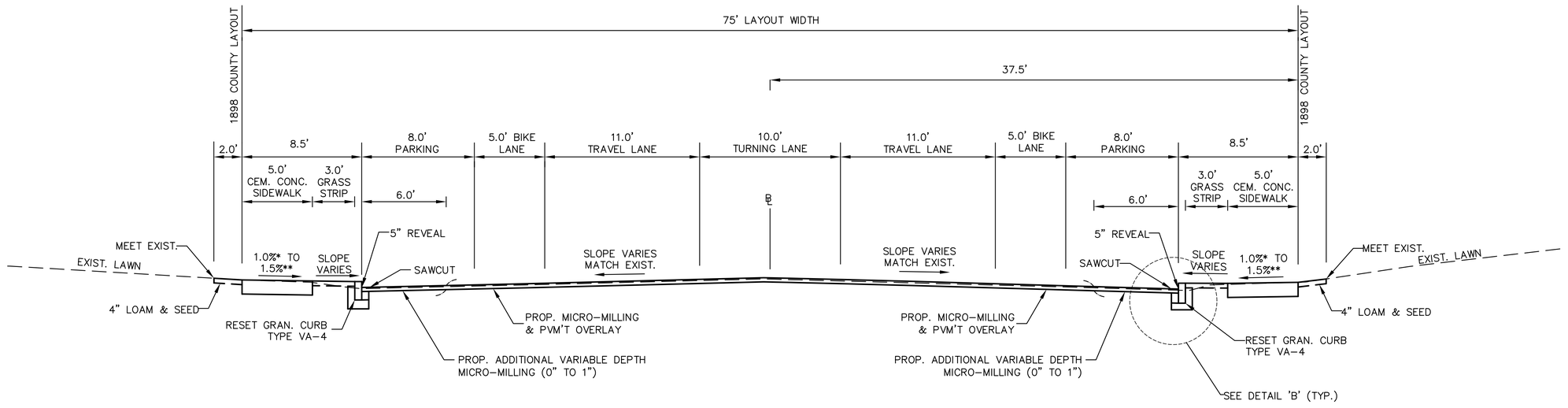
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	22	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



TRAPELO ROAD (STA 73+25 TO 76+50)

SCALE: 1" = 4'



TRAPELO ROAD(STA 63+60 TO STA 64+10)
(STA 65+15 TO STA 65+50)
(STA 65+75 TO STA 67+45)
(STA 68+30 TO STA 69+50)
(STA 69+85 TO STA 72+90)

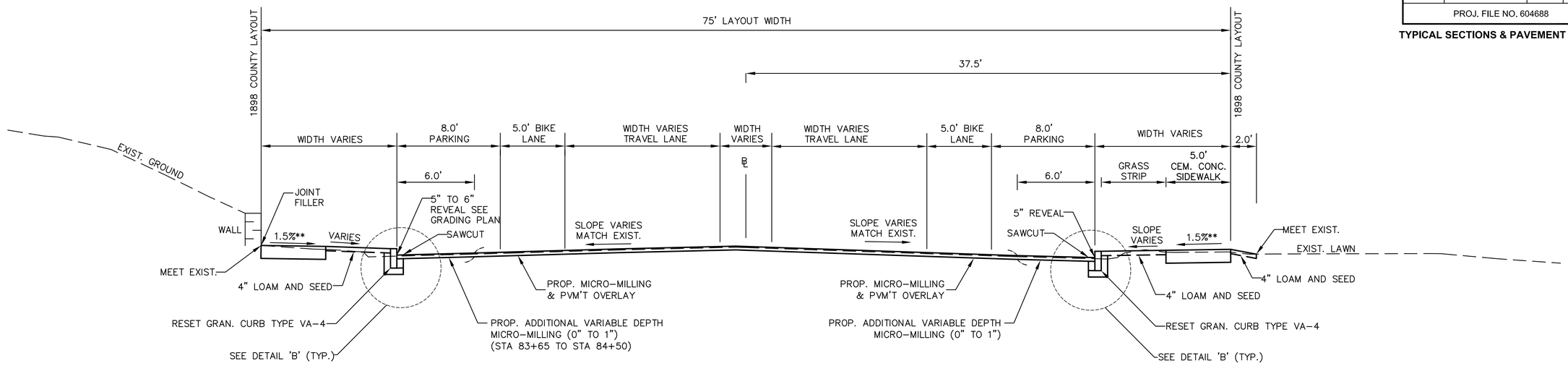
SCALE: 1" = 4'

*1.5% PREFERRED
** CONSTRUCTION TOLERANCE ±0.5%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

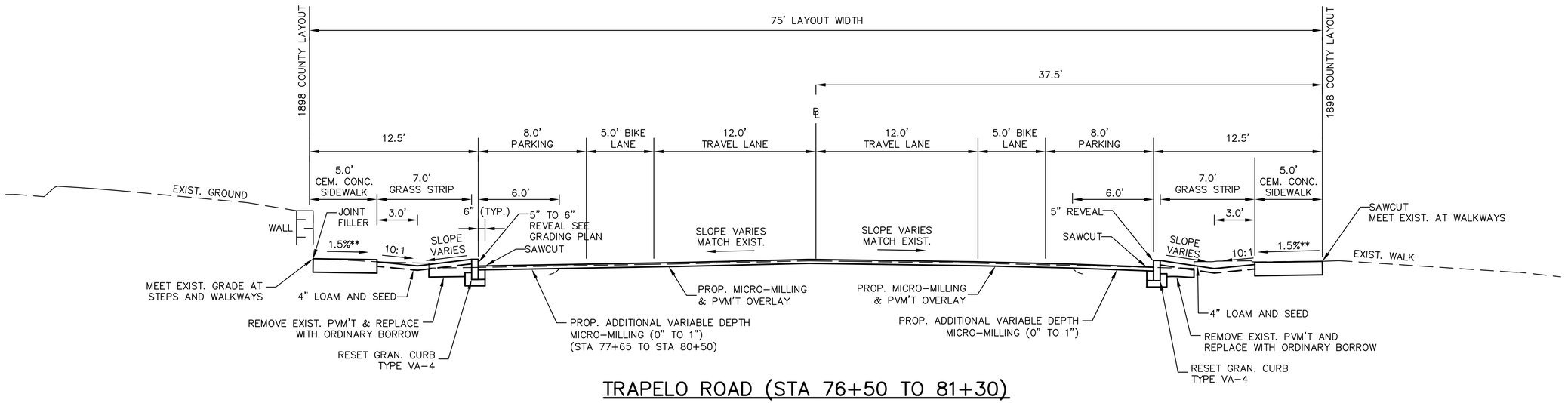
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	23	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



TRAPELO ROAD (STA 81+30 TO 84+50)

SCALE: 1" = 4'



TRAPELO ROAD (STA 76+50 TO 81+30)

SCALE: 1" = 4'

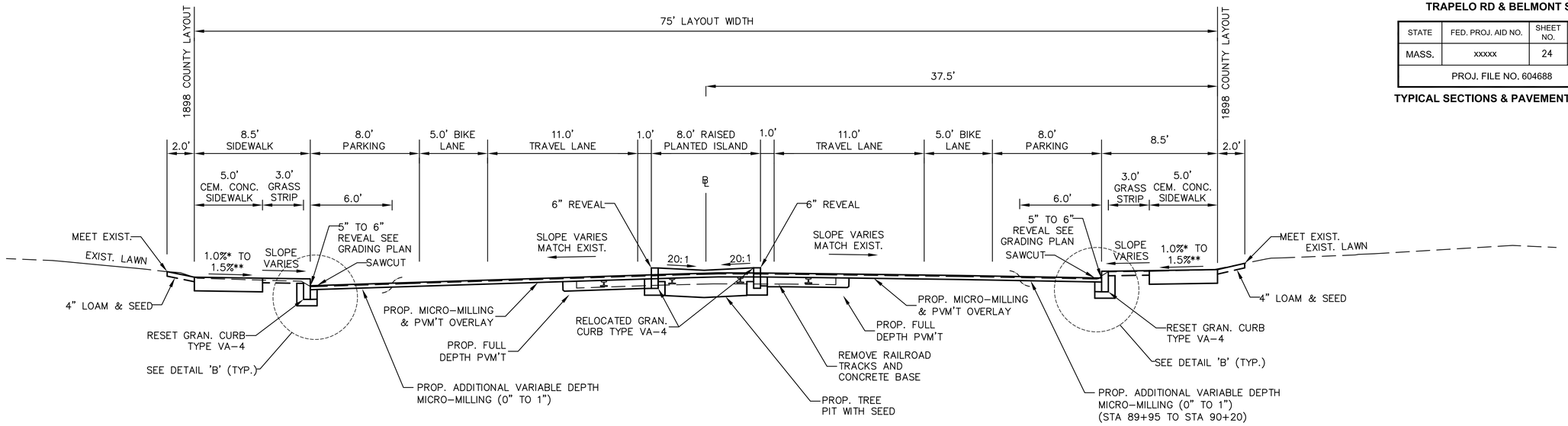
*1.5% PREFERRED

**CONSTRUCTION TOLERANCE ±0.5%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

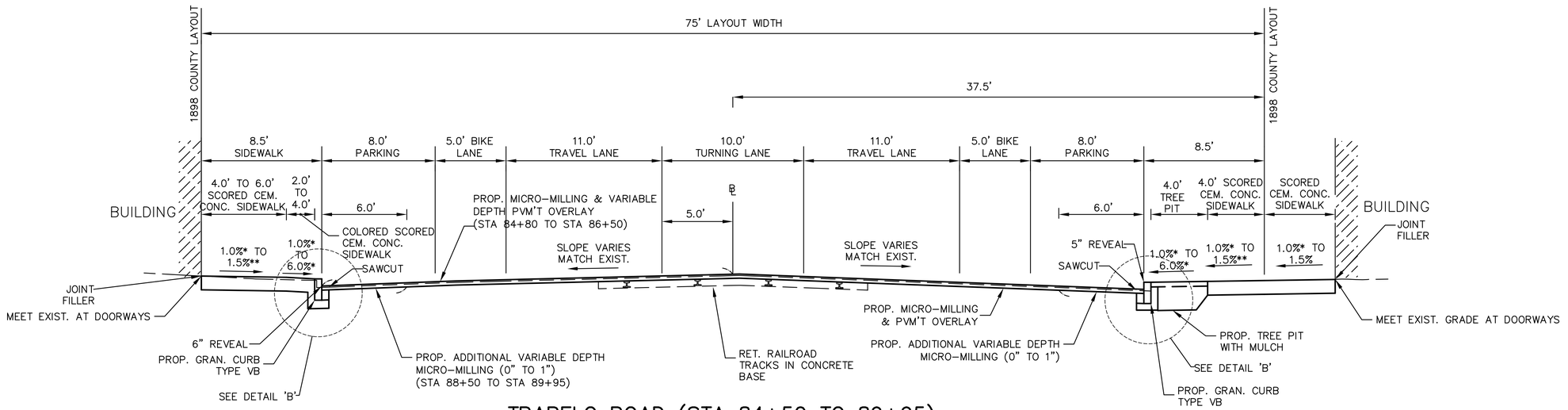
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	24	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



TRAPELO ROAD(STA 89+95 TO STA 90+80) (STA 92+00 TO STA 92+30) (STA 94+80 TO STA 95+30)

SCALE: 1" = 4'



TRAPELO ROAD (STA 84+50 TO 89+95)

SCALE: 1" = 4'

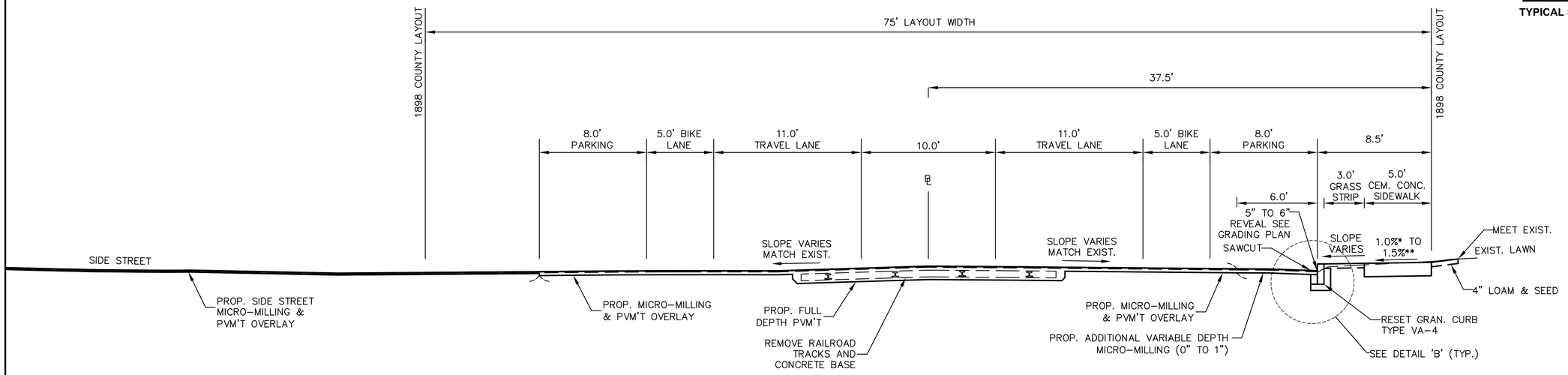
*1.5% PREFERRED

** CONSTRUCTION TOLERANCE ±0.5%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

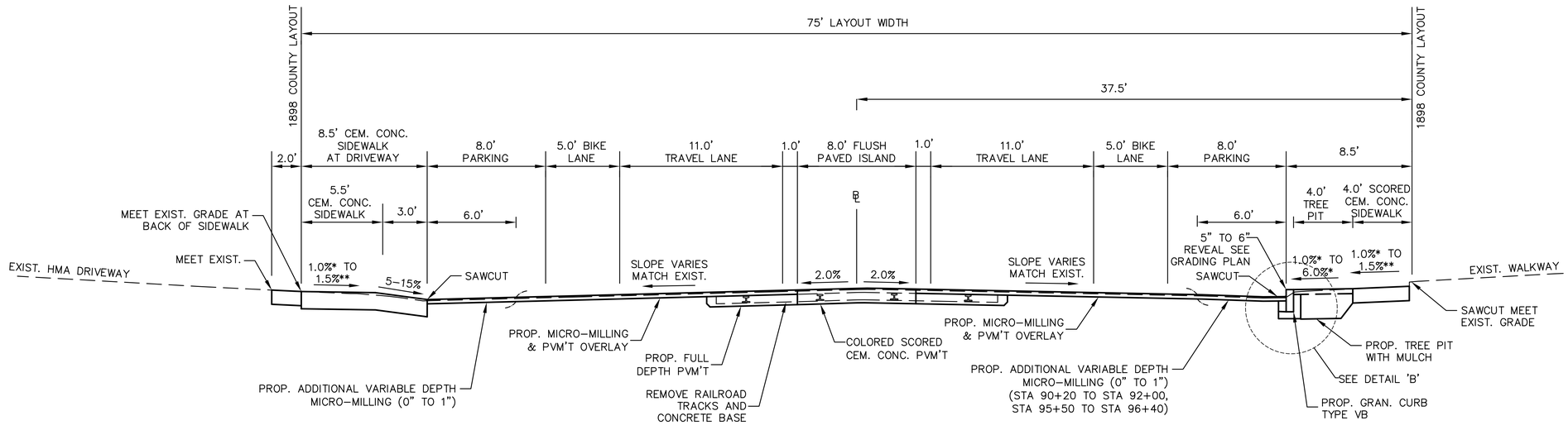
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	25	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



TRAPELO ROAD(STA 92+85 TO STA 93+40)
(STA 96+40 TO STA 98+00)

SCALE: 1" = 4'



TRAPELO ROAD(STA 90+80 TO STA 92+00)
(STA 92+30 TO STA 92+85)
(STA 93+40 TO STA 94+80)
(STA 95+30 TO STA 96+40)

SCALE: 1" = 4'

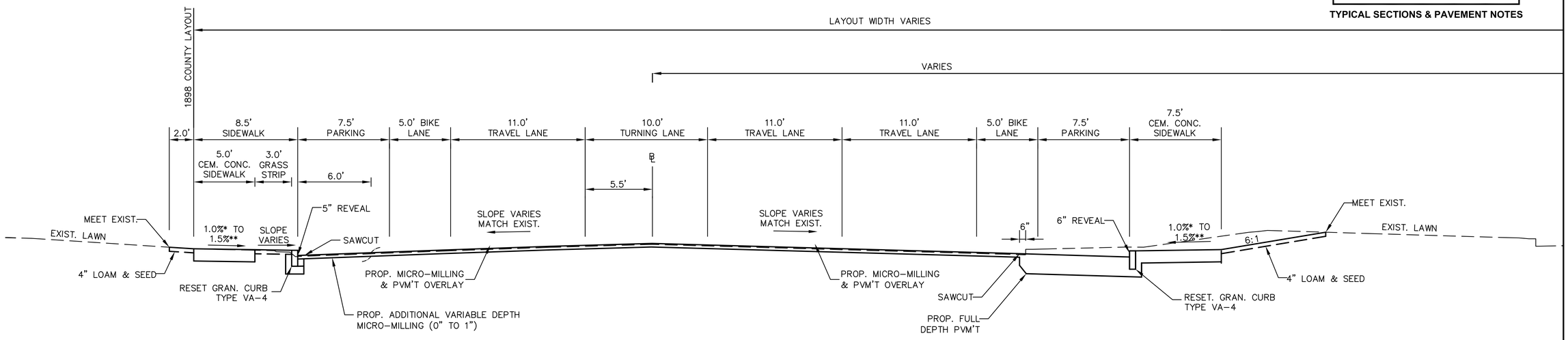
*1.5% PREFERRED

** CONSTRUCTION TOLERANCE ±0.5%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

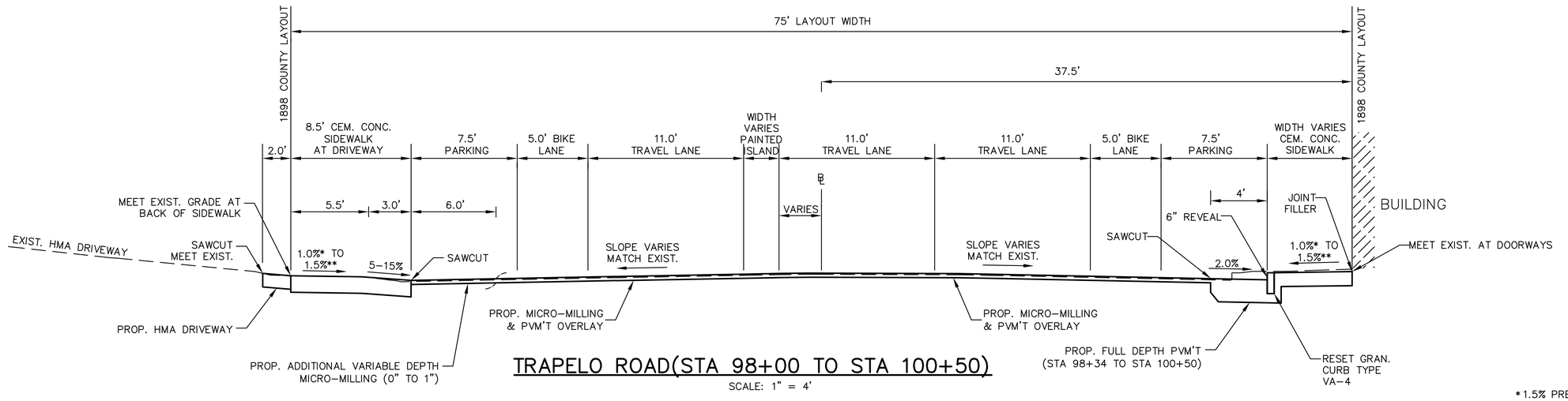
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	26	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



TRAPELO ROAD(STA 100+50 TO STA 102+50)

SCALE: 1" = 4'



TRAPELO ROAD(STA 98+00 TO STA 100+50)

SCALE: 1" = 4'

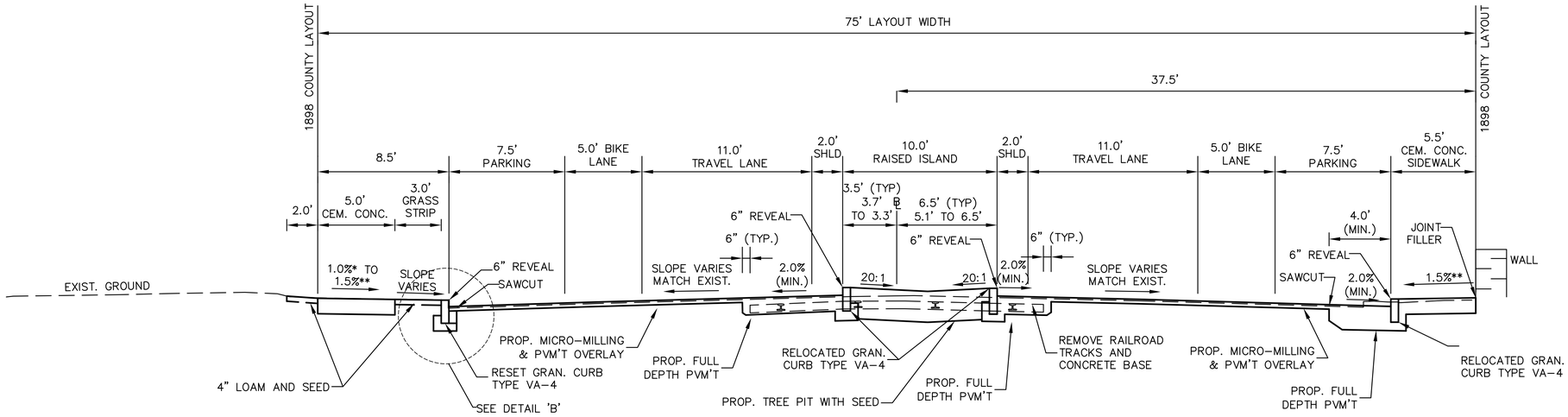
*1.5% PREFERRED

** CONSTRUCTION TOLERANCE ±0.5%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

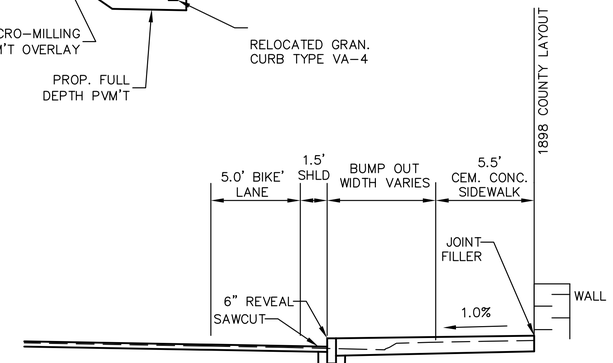
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	27	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



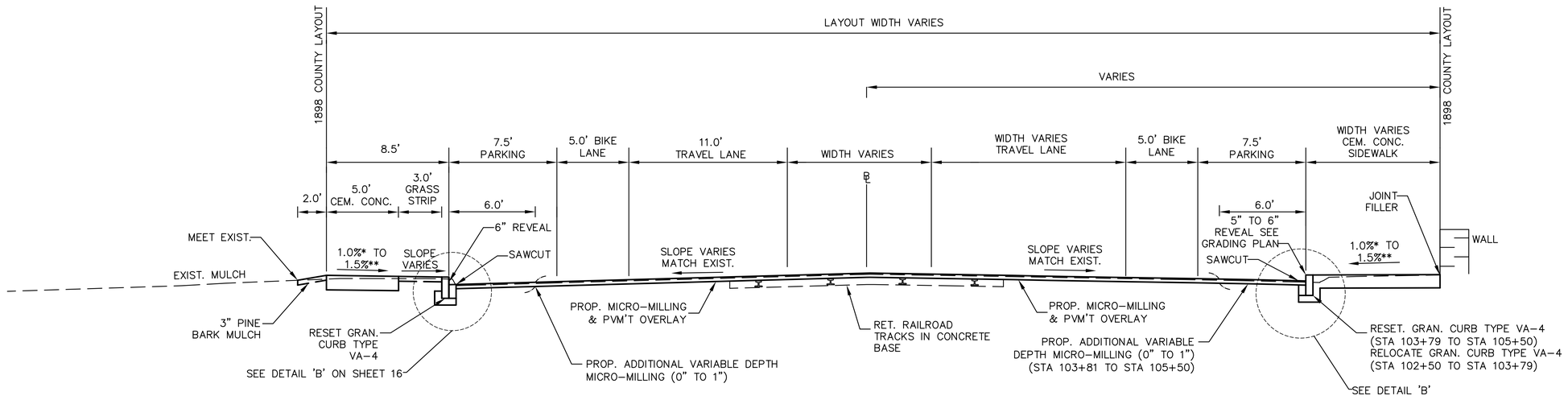
BELMONT STREET (STA 106+00 TO 112+75)

SCALE: 1" = 4'



BUMP OUTS

(STA 106+00 TO STA 112+75)



TRAPELO ROAD(STA 102+50 TO STA 105+50)

SCALE: 1" = 4'

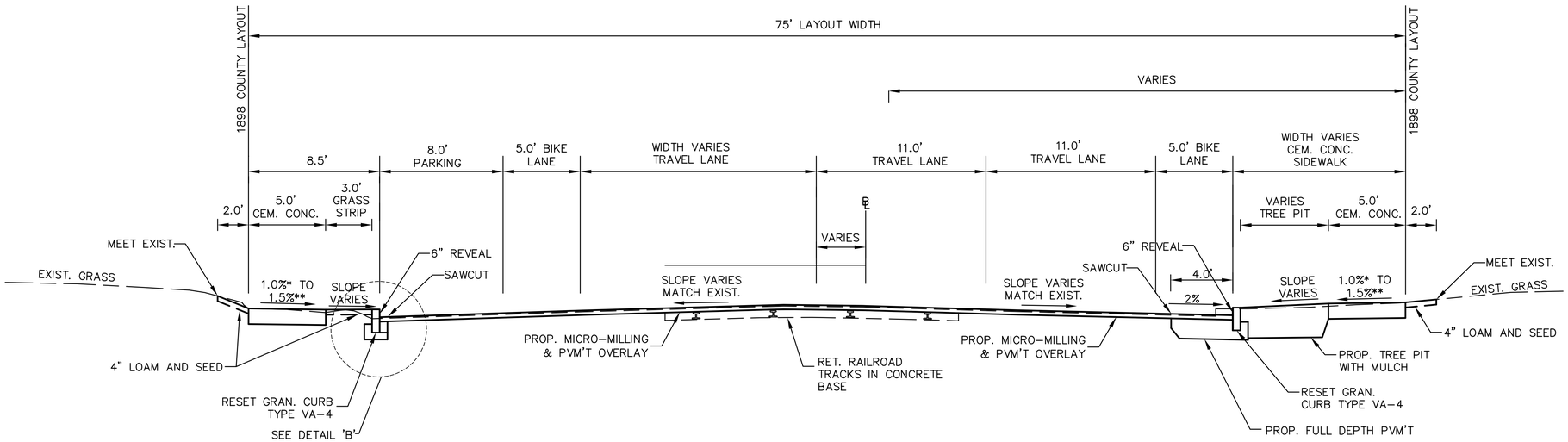
*1.5% PREFERRED

**CONSTRUCTION TOLERANCE ±0.5%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

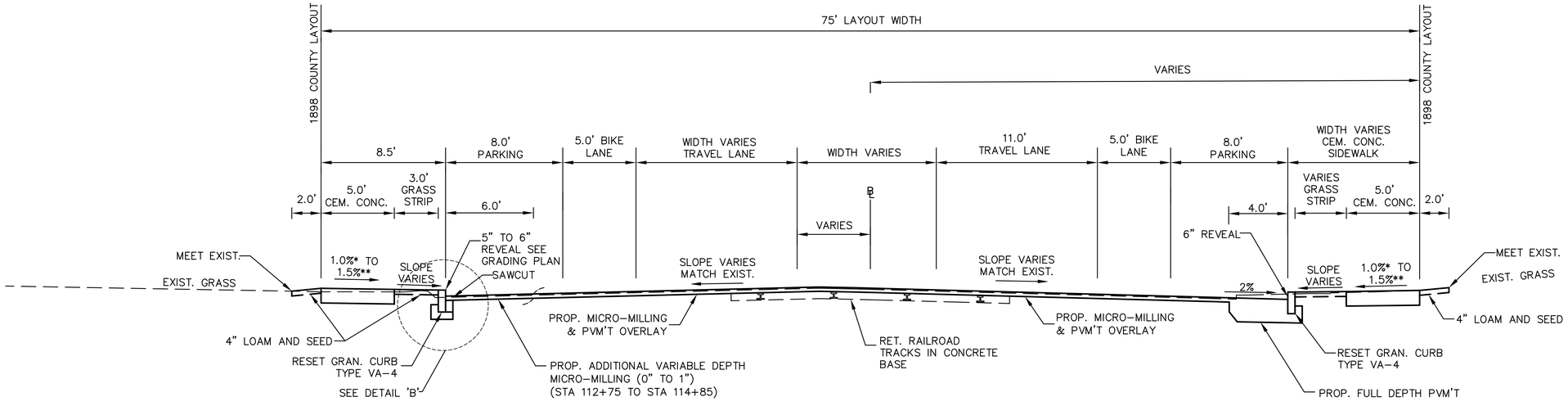
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	28	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



BELMONT STREET (STA 116+00 TO 118+00)

SCALE: 1" = 4'



BELMONT STEET (STA 112+75 TO 116+00)

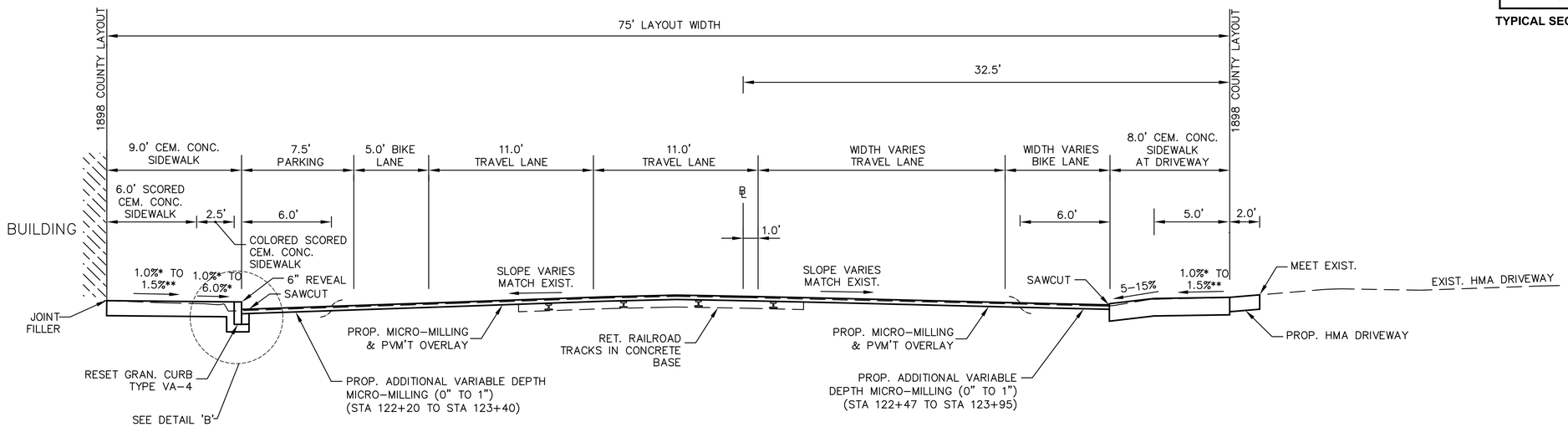
SCALE: 1" = 4'

*1.5% PREFERRED
**CONSTRUCTION TOLERANCE ±0.5%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

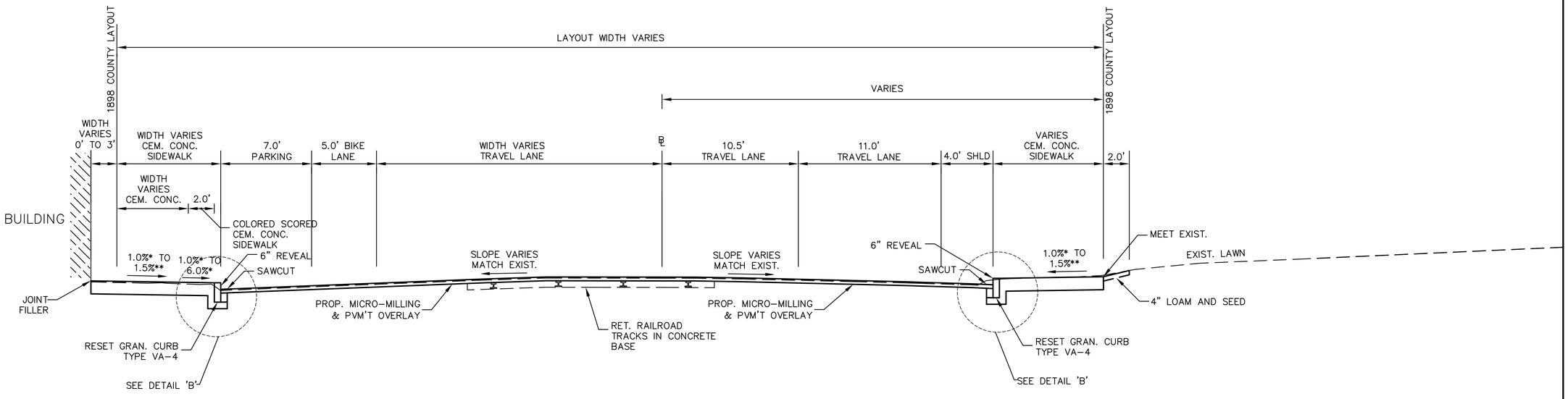
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	29	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



BELMONT STREET (STA 121+50 TO 124+50)

SCALE: 1" = 4'



BELMONT STREET (STA 118+00 TO 121+50)

SCALE: 1" = 4'

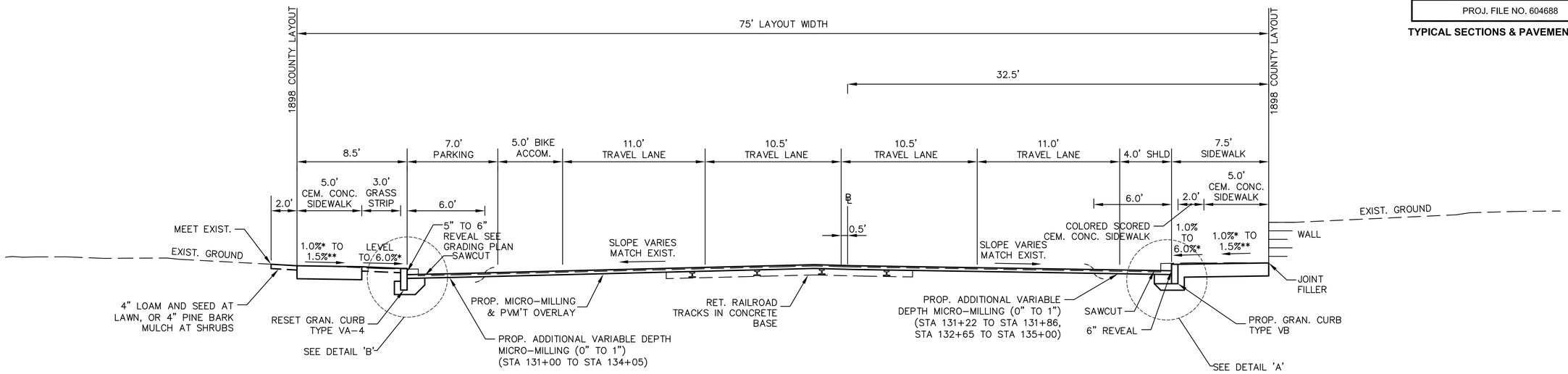
*1.5% PREFERRED

**CONSTRUCTION TOLERANCE ±0.5%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

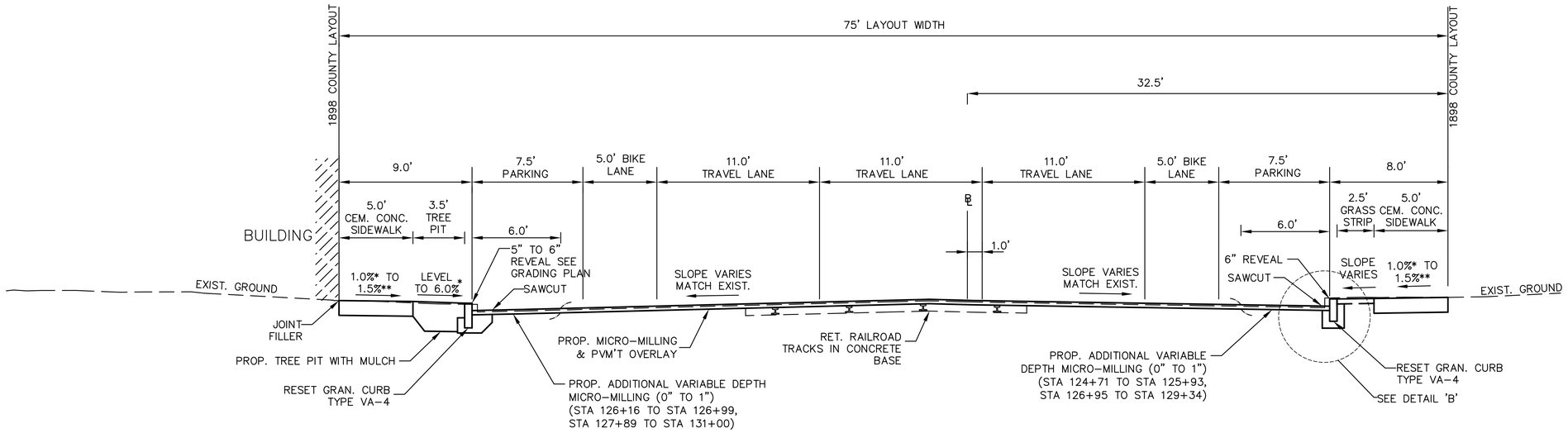
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	30	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



BELMONT STREET (STA 131+00 TO 135+00)

SCALE: 1" = 4'



BELMONT STREET (STA 124+50 TO 131+00)

SCALE: 1" = 4'

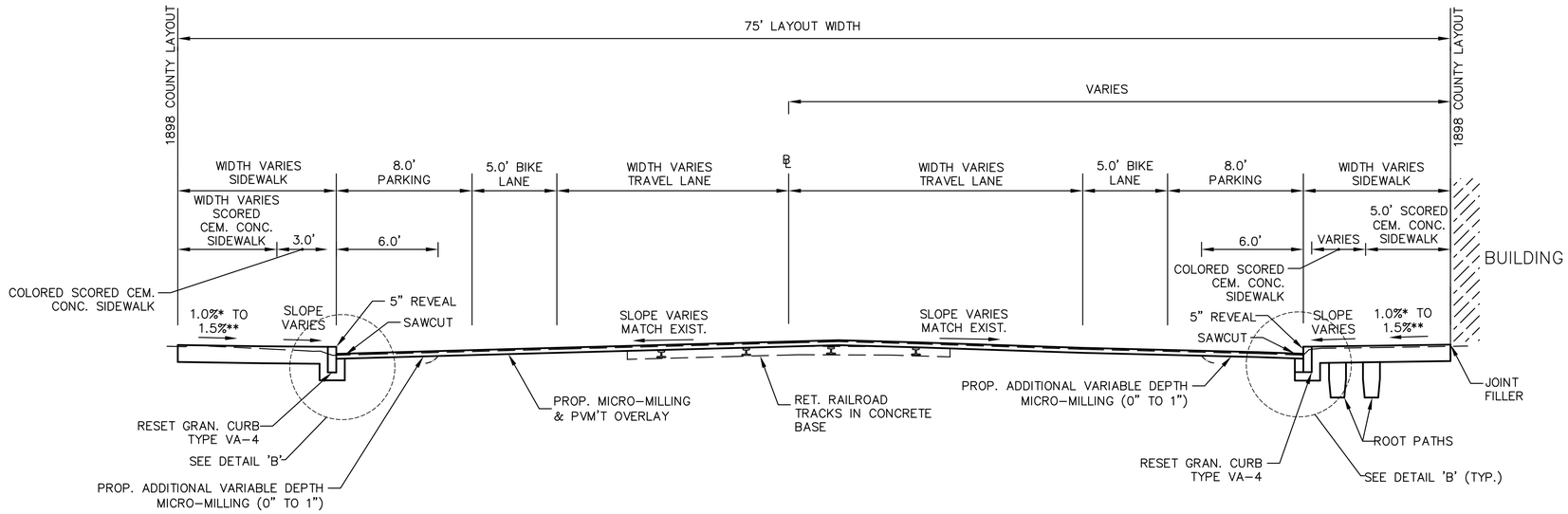
*1.5% PREFERRED

** CONSTRUCTION TOLERANCE ±0.5%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

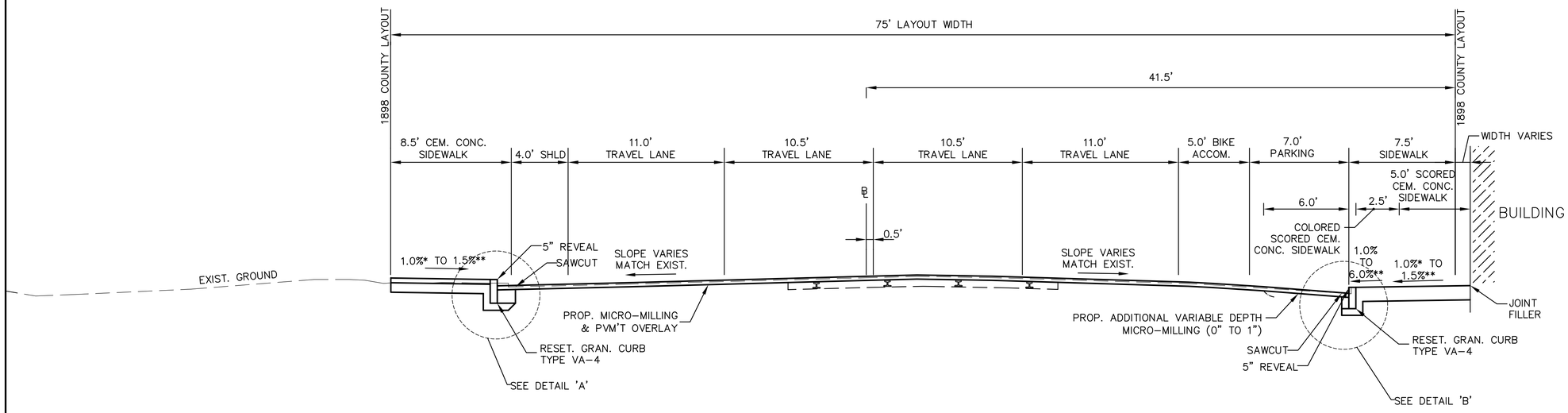
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	31	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



BELMONT STREET (STA 138+00 TO 141+00)

SCALE: 1" = 4'



BELMONT STREET (STA 135+00 TO 138+00)

SCALE: 1" = 4'

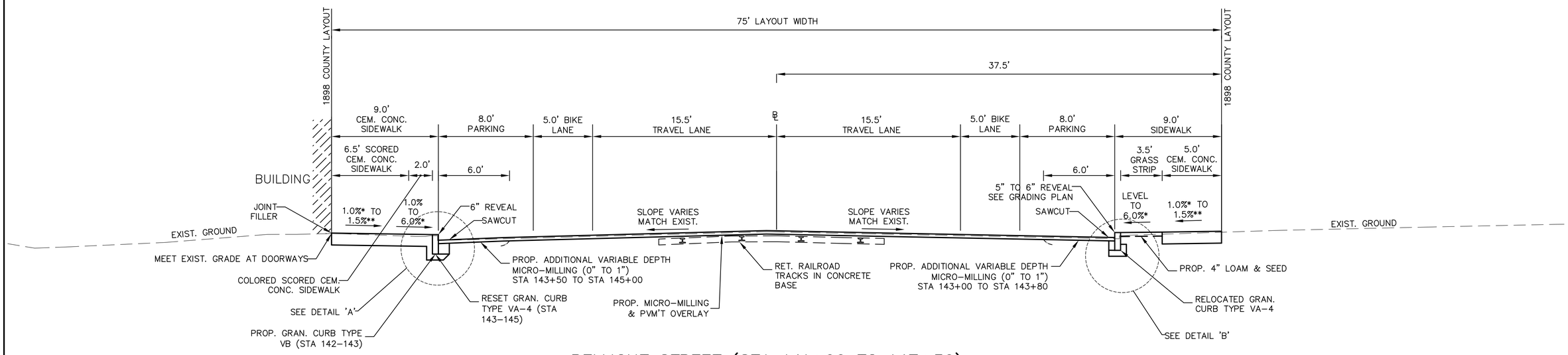
*1.5% PREFERRED

** CONSTRUCTION TOLERANCE ±0.5%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	32	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



BELMONT STREET (STA 141+00 TO 147+30)

SCALE: 1" = 4'

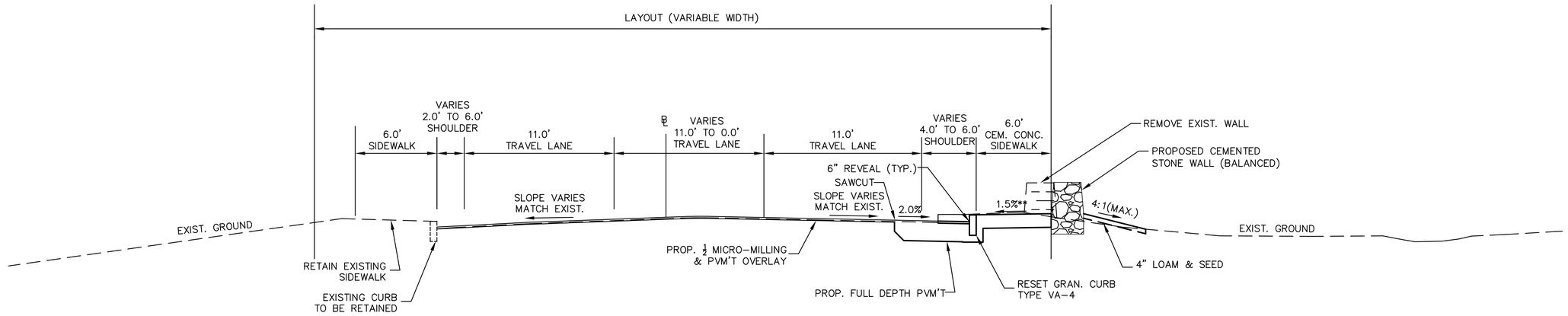
*1.5% PREFERRED

**CONSTRUCTION TOLERANCE ±0.5%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

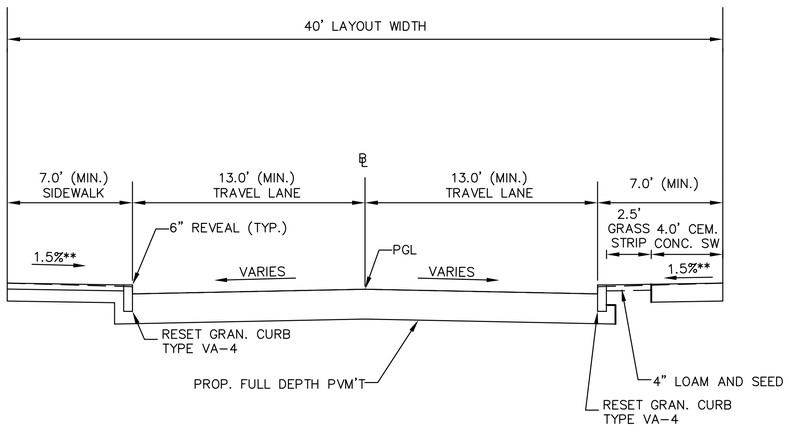
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	33	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



MILL STREET (STA 1+78 TO STA 3+70)

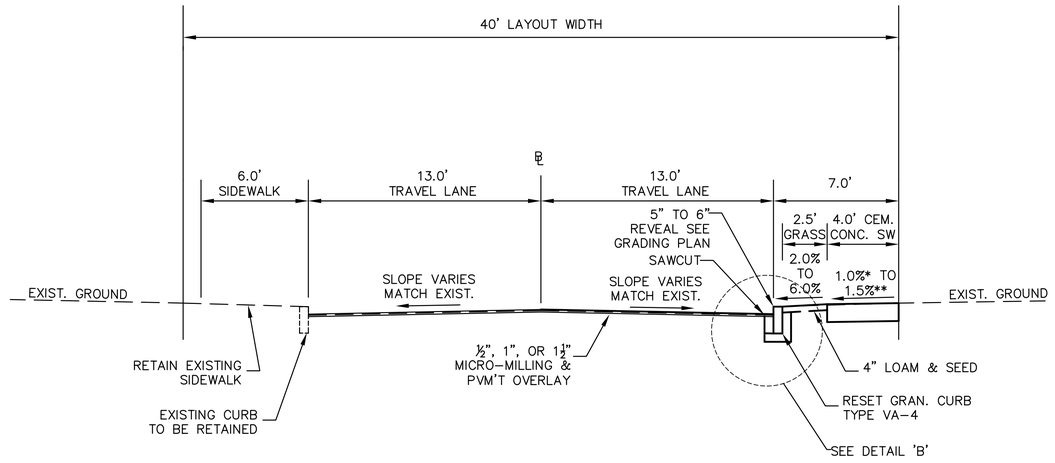
SCALE: 1" = 4'



SIDE STREET (FULL DEPTH RECONSTRUCTION)

SCALE: 1" = 4'

BEECH STREET (STA 0+25 TO STA 0+94)
HARRIET AVENUE (STA 0+30 TO STA 1+78)
SCHOOL STREET (STA 0+35 TO STA 1+25)
GROVE STREET (STA 0+36 TO STA 1+11)
WORCESTER STREET (STA 0+35 TO STA 0+79)
NEWTON STREET (STA 0+35 TO STA 0+80)



SIDE STREET (MICRO-MILLING AND OVERLAY)

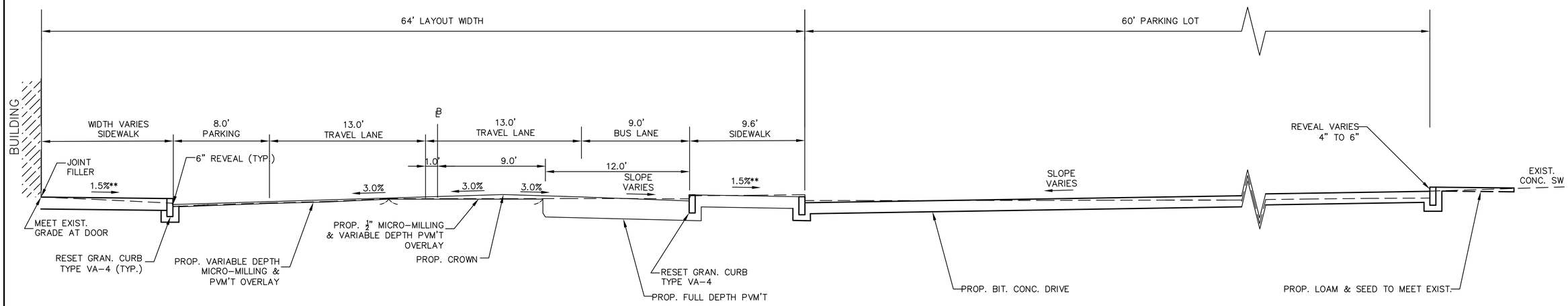
SCALE: 1" = 4'

*1.5% PREFERRED
**CONSTRUCTION TOLERANCE ±0.5%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	34	214
PROJ. FILE NO. 604688			

TYPICAL SECTIONS & PAVEMENT NOTES



CHURCH STREET (STA 1+23 TO STA 2+80)

SCALE: 1" = 4'

*1.5% PREFERRED
**CONSTRUCTION TOLERANCE ±0.5%

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET NO. 136 & 162

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 96

DRAINAGE DETAILS
SEE SHEET NO. 96

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	35	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

CONT'D BELOW

MILL STREET

100 FT BUFFER ZONE

PROP. WHEELCHAIR RAMP

PROP. FULL DEPTH PVM'T

PROP. ½" MICRO–MILLING & PVM'T OVERLAY

BEAVER BROOK RESERVATION

PROP HAYBALES w/SILT FENCE

PROP. GRANITE CURB FROM RESET

PROP. 16' – 5.5' CEM. CONC. SW (BO)

PROP. 4" LOAM & SEED

BEGIN PROP. 5.5' CEM. CONC. SW

HAND EXCAVATION AROUND ROOTS

HAND EX. AROUND ROOTS & PROP. TREE PROTECTION

PROP. WHEELCHAIR RAMP (TYP.)

PROP. 1½" TO 2" MICRO–MILLING & PVM'T OVERLAY

PROP. 1½" MICRO–MILLING & PVM'T OVERLAY

PROP. 1½" TO 2½" MICRO–MILLING & PVM'T OVERLAY

APPROX. LIMIT OF 100 YEAR FLOODPLAIN (FIRM MAP#25017C0414E) (BLSF)

BEAVER BROOK

WORK AREA WITHIN BLSF (375 SF)

BEGIN PROJECT
STA. 17+40.00
MEET EXISTING
N 2967460.7350
E 738144.8003

100 FT BUFFER ZONE

HOR. SCALE IN FEET
0 20 50 100

PROP. FULL DEPTH WIDENING

PROP. 2½" MICRO–MILLING & PVM'T OVERLAY

PROP. 4" LOAM & SEED

APPROX. LIMIT OF 100 YEAR FLOODPLAIN (EL=75')(BLSF)

BELMONT / WALTHAM

BEAVER BROOK

TRAPELO ROAD (RTE 60)

STA. 18+96.70 TRAPELO ROAD ℄ =
STA. 0+00.00 MILL STREET ℄
N=2967375.5977 E=738276.3501

PROP. 24" BIO–SWALE SOIL & SOD

PROP. GRAN. CURB TYPE VB

PROP. BOUND

PROP. 4" LOAM & SEED

PROP. HMA DRIVE

PROP. 4" LOAM & SEED

PROP. 6.0' CEM. CONC.SW

PROP. GRAN. CURB FROM RESET

PROP. CEMENTED STONE MASONRY WALL (BALANCED)

PROP. GRAN. CURB FROM RESET

PROP. TREE PROTECTION (TYP.)

HAND EX. ROOT ZONE (TYP.)

LINE OF TEMP. EASEMENT

PROP. UTILITY POLE (BO)(TYP)

PROP. CEM. CONC. WALK SURFACE

PROP. WHEELCHAIR RAMP

PROP. 4" LOAM & SEED

PROP. GRAN. CURB TYPE VB

PROP. SAW CUT & HMA DRIVE

PROP. 6.0' CEM. CONC. SW

PROP. TOWN LOCATION LINE

PROP. GRAN. CURB TYPE VB

PROP. 6' CEM. CONC. SW

PROP. 4" LOAM & SEED (TYP.)

HAND EX. AROUND ROOT ZONES

PROP. SAWCUT (TYP)

PROP. CHANGE IN PVM'T TYPE (TYP)

CONST. ℄

PROP. GRAN. CURB FROM RESET

PROP. TREE (TYP.)

PROP. 24" BIO–SWALE SOIL & SOD

PROP. 5.0' CEM. CONC. SW

INSTALL 12" WAVERLEY TRAIL MEDALLION(TYP)

INSTALL 3" WAVERLEY TRAIL MEDALLION (TYP)

100 FT BUFFER ZONE

BEAVER BROOK RESERVATION

CONT'D ABOVE

LIMIT OF 200 FT RIVERFRONT AREA

STA. 3+97.4
LIMIT OF WORK
MEET EXISTING

PROP. 6.5' GRAN. TRANS. STONE TYPE VB

PROP. FULL DEPTH PVM'T

PROP. VARIABLE DEPTH MICRO–MILLING & PVM'T OVERLAY

PROP. FULL DEPTH PAVEMENT

PROP. 2 ½" MICRO–MILLING & PVM'T OVERLAY

PROP. 4" LOAM & SEED

PROP. TREE PROTECTION (TYP.)

PROP. CEMENTED STONE MASONRY WALL (LOW) SEE DETAILS

REM. CONC. PAD

N/F BELMONT HOUSING AUTHORITY BOOK 12540, PAGE 586 MAP 59, LOT 11–A

CONT. ON SHEET 36

MATCH LINE

+10.60 BEGIN WALL

+84.88 END WALL

99.70'
S56°27'53"E

PC +75.48

PROP. 8.5' CEM. CONC. SW

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	36	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET NO. 138 & 162

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 97

DRAINAGE DETAILS
SEE SHEET NO. 97

OLMSTEAD DRIVE

TRAPELO ROAD (RTE 60)

AGASSIZ STREET

TRAPELO ROAD ℄
△ =8°29'00"
R=1305.82'
T=96.85'
L=193.34'

TRAPELO ROAD ℄
△ =3°31'10"
R=4085.11'
T=125.50'
L=250.93'

TRAPELO ROAD ℄
△ =5°45'22"
R=2999.50'
T=150.80'
L=301.34'

HOR. SCALE IN FEET
0 20 50 100

CONT. ON SHEET 35
CONT. ON SHEET 37

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	37	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET NO. 140 & 162

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 98

DRAINAGE DETAILS
SEE SHEET NO. 98

OLMSTEAD DRIVE

PLEASANT STREET (RTE 60)

TRAPELO ROAD (RTE 60)

TRAPELO ROAD

MORAINE STREET

PROP. HMA WALK SURFACE

PROP. SAWCUT & 7' HMA DRIVE (SEE DETAIL SHEET 98)

PROP. CEM. CONC. WALK SURFACE

PROP. TREE (TYP.)

PROP. VARIABLE DEPTH MICRO-MILLING & PVM'T OVERLAY

PROP. 1/2" MICRO-MILLING & VARIABLE DEPTH OVERLAY

PROP. FULL DEPTH PVM'T

PROP. VARIABLE DEPTH MICRO-MILLING & PVM'T OVERLAY

PROP. 2¼" MICRO-MILLING & PVM'T OVERLAY

PROP. GRAN. CURB TYPE VB

PROP. ½" TO 1½" MICRO-MILLING & PVM'T OVERLAY

PROP. CEM. CONC. SW

TRAPELO ROAD ℄
△ =5°01'32"
R=2700.50'
T=118.51'
L=236.86'

STA 14+27.41 LIMIT OF WORK MEET EXISTING

PROP. BOUNDS

PROP. 6' CEM. CONC. SW AT DRIVE

113.17'
N86°52'59"E

PC +99.76

R&R CURB

186.59'
N86°52'59"E

R&R GRAN. CURB

PROP. 1½" MICRO-MILLING & PVM'T OVERLAY

PROP. ½" TO 1½" MICRO-MILLING & PVM'T OVERLAY

PROP. WHEELCHAIR RAMP (TYP.)

PROP. BOUND

PROP. 6' FULL DEPTH PVM'T.

PROP. VARIABLE DEPTH OVERLAY

PROP. 2012 TOWN LOCATION LINE

SAWCUT-MEET EXIST. GRADE AT BACK OF SIDEWALK

PROP. FULL DEPTH PVM'T

PROP. 2¼" MICRO-MILLING & PVM'T OVERLAY

PROP. 8' FULL DEPTH PVM'T.

BEGIN SCORED CEM. CONC. SW

PROP. 6:1 SLOPE

PROP. 8.5' SCORED CEM. CONC. SIDEWALK (TYP.)

PROP. 4" LOAM & SEED AT LAWN

3" PINE BARK MULCH AT SHRUBS (TYP.)

INSTALL 3" WAVERLEY TRAIL MEDALLION (TYP)

PROP. GRAN. CURB TYPE VB

PROP. BOUND

PROP. SAWCUT (TYP)

PT +57.95
48.12'
S60°41'53"E
PC +06.07

PROP. SAWCUT & 2' HMA DRIVE

PROP. GRAN. CURB FROM RESET

PROP. 5.5' CEM. CONC. SW

PROP. 3" PINE BARK MULCH AT SHRUBS (TYP.)

PROP. 4" LOAM & SEED(TYP)

REM

MEET EXISTING GRADE AT WALK

MEET EXISTING GRADE AT DRIVE

PROP. 4" LOAM & SEED AT LAWN (TYP.)

PROP. SAWCUT & 2.0' HMA DRIVE (TYP.)

PROP. 4.0' CEM. CONC. WALK SURF. (TYP.)

R&R BRICK WALK (6')

LINE OF TEMP. EASEMENT (TYP.)

R&R BRICK WALK (4')

PROP. 2.0' LOAM & SEED AT LAWN (TYP.)

PROP. SAWCUT & 2.0' HMA DRIVE (TYP.)

PROP. 3" PINE BARK MULCH AT SHRUBS (TYP.)

PROP. SAWCUT & 2' HMA DRIVE (TYP.)

PROP. 4" LOAM & SEED AT LAWN (TYP.)

PROP. CEM. CONC. SW

PROP. SAWCUT & 2' HMA DRIVE

PROP. SAWCUT & 3.5' HMA WALK SURFACE

MEET EXISTING

PROP. SAWCUT & 6.5' CEM. CONC. WALK SURFACE*

PROP. 4" LOAM & SEED AT LAWN (TYP.)

PROP. 4' CEM. CON. SW

PROP. TREE PIT W/SEED

½" TO 1½" MICRO-MILLING & PVM'T OVERLAY

PROP. TREE PIT W/SEED

PROP. 4' CEM. CON. SW

LIMIT OF WORK MEET EXISTING

MATCH LINE

PT 26.37'
S49°17'53"E
+59.87
PC +86.

TRAPELO ROAD ℄
△ =5°45'22"
R=2999.50'
T=150.80'
L=301.34'

STA. 28+79.49 TRAPELO ROAD ℄ =
STA. 0+00.00 PLEASANT STREET ℄
N=2966881.6019 E=739124.6298

TRAPELO ROAD ℄
△ =11°24'00"
R=773.00'
T=77.16'
L=153.80'

CONT. ON SHEET 36

CONT. ON SHEET 38

HOR. SCALE IN FEET
0 20 50 100

N/F INHABITANTS OF THE TOWN OF BELMONT BOOK 45478, PAGE 283 MAP 59, LOT 9

N/F MARTHA JEAN EAKIN BOOK 25635, PAGE 421 MAP 33, LOT 55

N/F AJM BELMONT TRUST BOOK 53390, PAGE 213 MAP 33, LOT 54

N/F KATHLEEN P. & MICHELLE LYNN KENNEY BOOK 29, PAGE 196 MAP 33, LOT 53

N/F JEAN A. CHAPMAN & GEORGE M. MAHNKE BOOK 20901, PAGE 524 MAP 33, LOT 52

N/F CARL ATTARDO BOOK 52956, PAGE 303 MAP 33, LOT 51

N/F WAVERLY SQUARE TOWNHOUSE CONDOMINIUMS BOOK 52322, PAGE 264 MAP 33, LOT 50

N/F TOWNHOUSE CONDOMINIUMS BOOK 52322, PAGE 264 MAP 33, LOT 49

N/F 556 TRAPELO BOOK 41811, PAGE 266 MAP 33, LOT 48

N/F FRED PEARSON TRUST ETAL BOOK 20081, PAGE 596 MAP 32, LOT 4

N/F KEVIN G. TREANOR BOOK 51888, PAGE 162 MAP 33, LOT 44

N/F JINRONG ZHANG & SHENG GUODING BOOK 54546, PAGE 66 MAP 33, LOT 14

56" MWRA WESTON AQUEDUCT SUPPLY MAIN

48" MWRA WESTON AQUEDUCT SUPPLY MAIN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET NO. 142 & 162

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 99

DRAINAGE DETAILS
SEE SHEET NO. 99

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	38	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

TRAPELO ROAD ℄
Δ =17°57'51"
R=658.00'
T=104.01'
L=206.30'

STA. 34+87.32 TRAPELO ROAD ℄ =
STA. 0+00.00 LEXINGTON STREET ℄
N=2966544.9486 E=739629.4696

STA. 38+65.65 TRAPELO ROAD ℄ =
STA. 0+00.00 CHURCH STREET ℄
N=2966394.5463 E=739976.0919

TRAPELO ROAD ℄
Δ =2°28'09"
R=2000.00'
T=43.10'
L=86.19'

HOR. SCALE IN FEET
0 20 50 100

CONT. ON SHEET 37
CONT. ON SHEET CP-5
CONT. ON SHEET 40

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET NO. 144 & 162

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 100

DRAINAGE DETAILS
SEE SHEET NO. 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	39	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

LEXINGTON STREET
CHURCH STREET
THAYER ROAD
THAYER STREET
MBTA ROW
MATCH LINE
PROP. 4' CEM. CON. SW
PROP. STRUCTURAL SOIL
MEET EXISTING GRADE AT DOORWAY
PROP. VARIABLE DEPTH MICRO-MILLING & PVM'T OVERLAY
PROP. VARIABLE WIDTH CEM. CONC. SW
PROP. 4" LOAM & SEED (TYP.)
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE
PROP. TREE PIT WITH SEED
PROP. SAWCUT, MEET EXISTING GRADE AT WALK
PROP. SAWCUT & 2' HMA WALK SURFACE
PROP. 4" LOAM & SEED
PROP. SAWCUT & 2' HMA DRIVE
PROP. 1½" MICRO-MILLING & PVM'T OVERLAY
PROP. 10' CEM. CONC. SW
END PROP. CEM. CONC. SW
MHD BRIDGE # B-7-6 (NO WORK ON BRIDGE)
BEGIN PROP. 9' CEM. CONC. SW
PROP. 1½" MICRO-MILLING & PVM'T OVERLAY
PROP. 1/2" TO 1½" MICRO-MILLING & PVM'T OVERLAY
PROP. SAWCUT & 2' HMA DRIVE
PROP. 73' TIMBER EDGING
PROP. 3" PINE BARK MULCH
PROP. 8' CEM. CONC. SW
PROP. 2' COLORED SCORED CEM. CONC. SW
STA. 3+76.84 LEXINGTON STREET ℄ =
STA. 4+17.17 CHURCH STREET ℄
N=2966188.0878 E=739613.5887
R&R WOODEN RR TIES
PROP. GRAN. CURB TYPE VB
R&R CHAIN LINK FENCE
PROP. 4" LOAM & SEED
STA. 4+80.1 LIMIT OF WORK MEET EXISTING
PROP. TREE (TYP.)
R&S EXIST. TRASH BARREL
PROP. 4" LOAM & SEED
PROP. HMA DRIVE
CONT. ON SHEET 38
PROP. BENCH
PROP. GRAN CURB FROM RESET
R&R BUS SHELTER
PROP. TRASH BARREL
END SCORED CEM. CONC. SW
PROP. CEM. CONC. SW
PROP. VARIABLE DEPTH OVERLAY
PROP. 5.5' COLORED CEM. CONC. SW (TYP.)
PROP. ROOT PATHS (2 TYP.)
MEET EXISTING
PROP. GRAN. CURB TYPE VB
R&S EXIST. TRASH BARREL
PROP. TRASH BARREL
END PROP. SCORED CEM. CONC. SW
LINE OF TEMP. EASEMENT (TYP.)
PROP. CEM. CONC. WALK SURFACE
PROP. WHEELCHAIR RAMP (TYP.)
PROP. GRAN. CURB FROM RESET
PROP. 8' CEM. CONC. SW
PROP. VARIABLE DEPTH MICRO-MILLING & PVM'T OVERLAY
PROP. 1½" MICRO-MILLING & PVM'T OVERLAY
PROP. 5' SCORED CEM. CONC. SW
PROP. GRANITE CURB FROM RESET
PROP. VARIABLE DEPTH MICRO-MILLING & PVM'T OVERLAY
PROP. TREE PIT W/MULCH (TYP.)
MEET EXISTING GRADE AT DOORWAY (TYP.)
PROP. TREE PROTECTION (TYP.)
PROP. 5.5' COLORED SCORED CEM. CONC. SW
PROP. 5' SCORED CEM. CONC. SW
PROP. TRASH BARREL
PROP. 4.5' COLORED SCORED CEM. CONC. SW
PROP. ROOT PATHS (2 TYP.)
PROP. VARIABLE DEPTH MICRO-MILLING & PVM'T OVERLAY
PROP. FULL DEPTH PVM'T
PROP. 4' CEM. CONC. WALK SURFACE
PROP. 5.5' COLORED SCORED CEM. CONC. SW
PROP. FULL DEPTH PVM'T
PROP. 4' HMA DRIVE
PROP. TREE PIT W/MULCH (TYP.)
PROP. 3" PINE BARK MULCH

LEXINGTON STREET ℄
△ =16°11'00"
R=1381.73'
T=196.44'
L=390.27'

HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	40	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET NO. 146 & 162

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 101

DRAINAGE DETAILS
SEE SHEET NO. 101

WHITE STREET

TRAPELO ROAD

WAVERLEY STREET

THAYER STREET

PROP. VARIABLE DEPTH MICRO–MILLING & PVM'T OVERLAY

END PROP. COLORED SCORED CEM. CONC. SW

PROP. SAWCUT & 2' HMA DRIVE

PROP. 2' COLORED SCORED CEM. CONC. SW

PROP. SCORED CEM. CONC. SW

PROP. 3" PINE BARK MULCH

PROP. SAWCUT & HMA DRIVE

PROP. CEM. CONC. WALK SURFACE

PROP. GRAN. CURB TYPE VB

PROP. RESIN INLAY

PROP. BIKE RACK

PROP. BIKE RACK

INSTALL 12" WAVERLEY TRAIL MEDALLION (TYP)

MEET EXISTING GRADE AT DOORWAY (TYP.)

PROP. 2' COLORED CEM. CONC. SW (TYP.)

PROP. 6' SCORED CEM. CONC. SW

MATCH LINE

PROP. ½" MICRO–MILLING AND PVM'T OVERLAY

PROP. 6.5' GRAN. TRANS. STONE

PROP. 7' CEM. CONC. SW

LIMIT OF WORK MEET EXISTING

PROP. SAWCUT & 2' HMA WALK SURFACE

PROP. 2 ¼" MICRO–MILLING & PVM'T OVERLAY

PROP. 4" LOAM & SEED AT LAWN (TYP.)

PROP. 4" LOAM & SEED (TYP.)

PROP. 5' CEM. CONC. SW

PROP. SAWCUT & 2' HMA WALK SURFACE

PROP. 3" WAVERLEY TRAIL MEDALLION (TYP)

PROP. WHEELCHAIR RAMP (TYP.)

PROP. 2½" AND 0" TO 2" MICRO–MILLING & PVM'T OVERLAY

PROP. TRASH BARREL

PROP. TREE (TYP.)

PROP. ROOT PATHS (2)

PROP. 3' COLORED SCORED CEM. CONC. SW

PROP. 5' SCORED CEM. CONC. SW

LINE OF TEMP. EASEMENT (TYP.)

END PROP. SCORED CEM. CONC. SW

PROP. CEM. CONC. SW

LIMIT OF WORK MEET EXISTING

PROP. 4" LOAM & SEED

PROP. 1½" MICRO–MILLING & PVM'T OVERLAY

PROP. 4' CEM. CONC. WALK SURFACE

PROP. 3" PINE BARK MULCH AT SHRUBS (TYP.)

PROP. TREE PIT W/SEED

PROP. 4' CEM. CONC. SW

PROP. SAWCUT & 2' HMA DRIVE

PROP. TREE (TYP.)

PROP. 4" LOAM & SEED

PROP. 5' CEM. CONC. SW

PROP. SAWCUT & 2' HMA WALK SURFACE

PROP. 2 ¼" MICRO–MILLING & PVM'T OVERLAY

PROP. 4" LOAM & SEED AT LAWN (TYP.)

PROP. 4" LOAM & SEED (TYP.)

PROP. 5' CEM. CONC. SW

PROP. SAWCUT & 2' HMA WALK SURFACE

PROP. 3" PINE BARK MULCH

REM

R&R MB (BO)

PROP. TREE PIT W/SEED

PROP. GRAN. CURB TYPE VB

PROP. 3" WAVERLEY TRAIL MEDALLION (TYP)

PROP. GRAN. CURB FROM RESET

PROP. 5' CEM. CONC. SW

PROP. ½" TO 1½" MICRO–MILLING & PVM'T OVERLAY

BEGIN COLORED SCORED CEM. CONC. SW

PROP. ½" TO 1½" MICRO–MILLING AND PVM'T OVERLAY

PROP. TREE PIT W/SEED

PROP. 4' CEM. CONC. WALK SURFACE

END SCORED CEM. CONC. SW

PROP. TREE PIT W/MULCH (TYP.)

PROP. ROOT PATHS (2)

PROP. 4' COLORED SCORED CEM. CONC. SW

PROP. 4' SCORED CEM. CONC. SW

PROP. ADDITIONAL 0" TO 1" MICRO–MILLING AND PVM'T OVERLAY

PROP. 2 ¼" AND 0" TO 2" MICRO–MILLING & PVM'T OVERLAY

PROP. SAWCUT & 2' HMA DRIVE

R&R GRAN. CURB

PROP. 2 ¼" AND 0" TO 1" MICRO–MILLING & PVM'T OVERLAY

PROP. 2 1/4" MICRO–MILLING & PVM'T OVERLAY

PROP. CEM. CONC. SW

PROP. TREE PIT W/SEED

PROP. 4" LOAM & SEED

INSTALL 12" WAVERLEY TRAIL MEDALLION (TYP)

LIMIT OF WORK MEET EXISTING

PROP. TREE PIT W/SEED

TRIM HEDGES

PROP. 4" LOAM & SEED (TYP.)

PROP. SAWCUT & 2' HMA DRIVE

PROP. TREE PIT W/SEED (TYP.)

PROP. 5' CEM. CONC. SW

PROP. 3" PINE BARK MULCH AT SHRUBS

PROP. SAWCUT & 2' HMA DRIVE

MATCH LINE

1185.84'
S64°16'45"E

497.05'
S69°43'53"E

CONT. ON SHEET 41

CONT. ON SHEET 38

TRAPELO ROAD ℄
△ =2°28'09"
R=2000.00'
T=43.10'
L=86.19'

TRAPELO ROAD ℄
△ =5°27'08"
R=1211.63'
T=57.69'
L=115.30'

HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	41	214
PROJ. FILE NO. 604688			

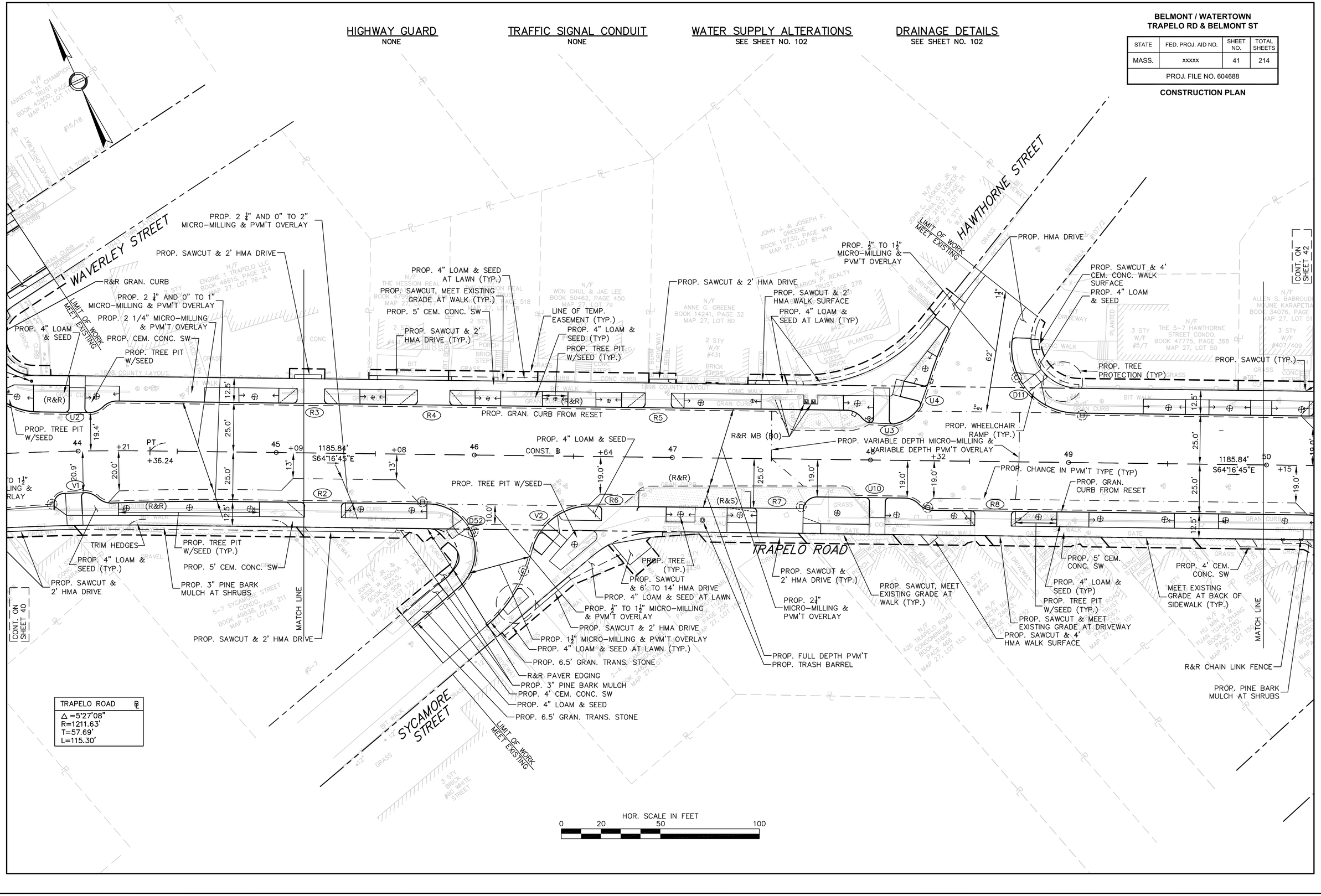
CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 102

DRAINAGE DETAILS
SEE SHEET NO. 102



HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

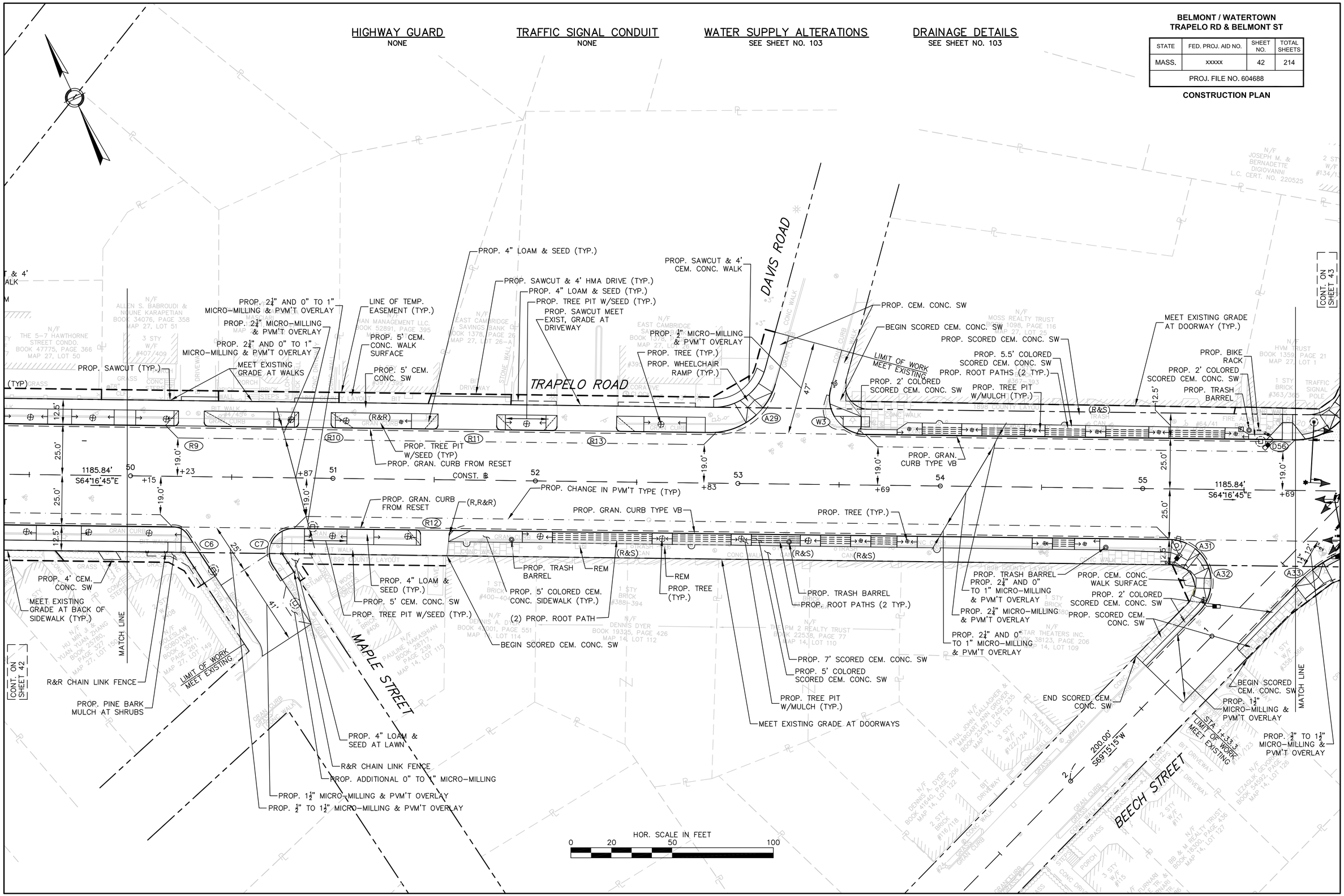
WATER SUPPLY ALTERATIONS
SEE SHEET NO. 103

DRAINAGE DETAILS
SEE SHEET NO. 103

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	42	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN



HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET NO. 148

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 104

DRAINAGE DETAILS
SEE SHEET NO. 104

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	43	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

STA. 56+09.67 TRAPELO ROAD ℄ =
STA. 0+00.00 BEECH STREET ℄
N=2965682.5466 E=741566.4532

STA. 56+03.98 TRAPELO ROAD ℄ =
STA. 0+00.00 BEECH STREET ℄
N=2965685.0171 E=741561.3247

TRAPELO ROAD ℄
△ =25°20'00"
R=956.62'
T=215.00'
L=422.97'

HOR. SCALE IN FEET
0 20 50 100

CONT. ON SHEET 42
CONT. ON SHEET 44
FOR PROFILE: SEE SHEET NO. 62

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	44	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 105

DRAINAGE DETAILS
SEE SHEET NO. 105

TRAPELO ROAD

FLETT ROAD

PEQUOSSETTE PARK

PROP. SAWCUT, MEET EXISTING GRADE AT WALK (TYP.)
PROP. 4" LOAM & SEED AT LAWN (TYP.)
PROP. 8' CEM. CONC. SW
PROP. GRAN. CURB FROM RESET
PROP. TREE PIT W/SEED (TYP.)
PROP. ROOT PATHS (3 TYP.)
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE
PROP. 5' CEM. CON. SW
LINE OF TEMP. EASEMENT (TYP.)
PROP. TREE (TYP.)
PROP. ROOT PATHS (3 TYP.)
PROP. 4" LOAM & SEED
PROP. COLORED SCORED CEM. CONC. PVMT
PROP. TREE PIT W/SEED (TYP.)
PROP. 4" LOAM & SEED
PROP. WHEELCHAIR RAMP (TYP.)
PROP. TREE PIT W/SEED (TYP.)
PROP. GRAN. CURB TYPE VB
RETAIN EXISTING SIDEWALK & CURB
PROP. SAWCUT & 4' HMA DRIVE
PROP. 2¼" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY
PROP. 2¼" MICRO-MILLING & PVM'T OVERLAY
PROP. COLORED SCORED CEM. CONC. PVM'T
PROP. 2¼" MICRO-MILLING & PVM'T OVERLAY
PROP. 2¼" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY
PROP. 2¼" MICRO-MILLING & PVM'T OVERLAY
R&R GRAN. CURB
PROP. 3" PINE BARK MULCH
R&R GRAN. CURB
PROP. SAWCUT, 2' HMA DRIVE (TYP.)
PROP. 8.5' CEM. CONC. SW
R&R MB(BO)
PROP. COLORED SCORED CEM. CONC. PVMT
PROP. WHEELCHAIR RAMP
PROP. ROOT PATHS (3 TYP.)
PROP. CHANGE IN PVM'T TYPE (TYP)
PROP. GRAN. CURB TYPE VB
PROP. TREE PIT W/SEED
PROP. TRASH BARREL
PROP. GRAN. CURB FROM RESET
CONST. ℄
PROP. TREE (TYP.)
PROP. TREE PIT W/SEED
PROP. ROOT PATHS (3 TYP.)
PROP. 4" LOAM & SEED (TYP.)
R&R GRAN. CURB (TYP.)
PROP. 2¼" AND 0" TO 2" MICRO-MILLING & PVM'T OVERLAY
PROP. SAWCUT & 4' HMA DRIVE (TYP.)
PROP. SAWCUT, 4' CEM. CONC. WALK SURFACE
R&R GRAN. CURB (TYP.)
PROP. STRUCTURAL SOIL
PROP. TREE PIT W/MULCH
PROP. SAWCUT & 4' HMA DRIVE
PROP. CEM. CONC. WALK SURFACE
PROP. GRAN. CURB TYPE VB
PROP. FULL DEPTH PVM'T
MEET EXISTING GRADE
PROP. TREE PROTECTION (TYP.)
PROP. CEM. CONC. WALK SURFACE
LIMIT OF WORK MEET EXISTING
REM
PROP. 67'-72" CLF
REM
REM
REM
PROP. HMA CURB
R&R SLIDING CHAIN LINK FENCE GATE ONTO NEW FENCE
PROP. SAWCUT & 7' HMA DRIVE
PROP. 12" LOAM & 3" PINE BARK MULCH
PROP. 4" LOAM & SEED
PROP. BIKE RACK
R&R GRAN. CURB
PROP. SAWCUT, MEET EXISTING GRADE AT WALK (TYP.)
PROP. 4" LOAM & SEED
PROP. HMA CURB
PROP. 6.5' GRAN. TRANS.STONE
PROP. GRAN. CURB TYPE VB
REM. 3 CURB STOPS
PROP. 6.5' GRAN. TRANS.STONE
STA. 3+53.71 LIMIT OF WORK MEET EXISTING
3+00
2+00
1+00
609.10'
N02°56'00"W
13.0'
7.0'
MATCH LINE
CONT. ON SHEET 45
CONT. ON SHEET 43
919.25'
S38°56'45"E
HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	45	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET NO. 150

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 106

DRAINAGE DETAILS
SEE SHEET NO. 106

STA. 67+86.96 TRAPELO ROAD ℄ =
STA. 0+00.00 FLETT ROAD ℄
N=2964839.6268 E=742372.8300

STA. 71+63.55 TRAPELO ROAD ℄ =
STA. 0+00.00 SLADE STREET ℄
N=2964558.5824 E=742622.5579

TRAPELO ROAD ℄
△ =30°21'30"
R=1127.30'
T=305.84'
L=597.30'

3+38.17
L=475.53'
R=2365.49'
SLADE STREET
PC +62.63
144.91'
N06°06'35"W
STA 1+44.9 LIMIT OF WORK MEET EXISTING
MATCH LINE
1+00
TRAPELO ROAD
GILBERT ROAD
MATCH LINE
CONT. ON SHEET 46
CONT. ON SHEET 44
919.25'
S38°56'45"E
CONST. ℄
PC +64.30
PC +20.82
R=200.00'
L=41.97'
PT +62.79
S28°37'23"W
174.24'
STA 1+78.7 LIMIT OF WORK MEET EXISTING
BARTLETT AVENUE
HARRIET AVENUE
HARRIET AVENUE ℄
△ =12°01'23"
R=200.00'
T=21.06'
L=41.97'
STA. 71+45.30 TRAPELO ROAD ℄ =
STA. 0+00.00 HARRIET AVENUE ℄
N=2964570.6500 E=742608.8655
HOR. SCALE IN FEET
0 20 50 100

PROP. SAWCUT & 15' HMA DRIVE
PROP. TREE PIT W/SEED
PROP. SAWCUT & 4' HMA DRIVE
PROP. 5' CEM. CONC. SIDEWALK
LINE OF TEMP. EASEMENT (TYP.)
PROP. SAWCUT & 2' HMA DRIVE
PROP. 2¼" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY
PROP. 2¼" MICRO-MILLING & PVM'T OVERLAY
PROP. 2¼" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY
PROP. TREE PROTECTION (TYP.)
PROP. 1" MICRO-MILLING & PVM'T OVERLAY
PROP. 8.5' CEM. CONC. SW (R&R)
PROP. GRAN. CURB FROM RESET
PROP. CHANGE IN PVM'T TYPE (TYP)
PROP. COLORED SCORED CEM. CONC. PVM'T
PROP. TREE PIT W/SEED
PROP. GRAN. CURB TYPE VB
CONST. ℄
PROP. GRAN. CURB FROM RESET
REM
R&R MB(BO)
PROP. TRASH BARREL
PROP. WHEELCHAIR RAMP (TYP.)
PROP. 5' CEM. CONC. SW
PROP. FULL DEPTH PVM'T
PROP. 4" LOAM & SEED
PROP. TREE PIT W/SEED
PROP. TREE (TYP.)
PROP. ROOT PATHS (3 TYP.)
PROP. TREE PIT W/MULCH (TYP.)
PROP. SCORED CEM. CONC. SW (TYP.)
PROP. 4' COLORED SCORED CEM. CONC. SW
BEGIN SCORED CEM. CONC. SW
PROP. 3" PINE BARK MULCH
PROP. HMA DRIVE
PROP. 2' COLORED CEM. CONC. SW (TYP.)
PROP. CEM. CONC. WALK SURFACE
PROP. FULL DEPTH PVM'T
PROP. 6' CEM. CONC. SW
MEET EXISTING GRADE AT DRIVE
PROP. SCORED CEM. CONC. WALK SURFACE AT DRIVEWAY
PROP. TREE PROTECTION (TYP.)
MEET EXISTING GRADE AT WALK
PROP. 4" LOAM & SEED (TYP.)
PROP. SAWCUT, 2' HMA DRIVE
PROP. 4' CEM. CONC. SW
MEET EXISTING AT WALK
PROP. TREE PIT W/SEED
PROP. WHEELCHAIR RAMP
MEET EXISTING GRADE AT WALK (TYP.)
PROP. SAWCUT, 2' HMA DRIVE
PROP. 5' CEM. CONC. SW
PROP. TREE PIT W/SEED
PROP. STRUCTURAL SOIL
PROP. TREE PIT W/SEED
PROP. TREE (TYP.)
PROP. STRUCTURAL SOIL
PROP. 6.5' GRAN. TRANS. STONE
PROP. 4" LOAM & SEED
PROP. 4' CEM. CONC. SW
PROP. 1" MICRO-MILLING & PVM'T OVERLAY
PROP. STRUCTURAL SOIL
PROP. GRAN. CURB TYPE VB
PROP. CEM. CONC WALK SURFACE
PROP. HAND EX. ROOT ZONE
PROP. SAWCUT & 4' HMA DRIVE
PROP. 5' CEM. CONC. SW
PROP. 4" LOAM & SEED
PROP. 3" PINE BARK MULCH
PROP. CEM. CONC. SW
PROP. TREE PIT W/SEED
MEET EXISTING GRADE AT WALK (TYP.)
PROP. BIKE RACK
INSTALL BUS SHELTER
PROP. 4" LOAM & SEED
PROP. TREE (TYP.)
PROP. 7.5' CEM CONC. SW
PROP. SAWCUT 2' TO 11' CEM. CONC. DRIVE
MEET EXISTING GRADE AT WALK
MEET EXISTING GRADE AT DOORWAY (TYP.)
PROP. 3" PINE BARK MULCH
PROP. 7' CEM. CONC. SW
PROP. 1" MICRO-MILLING & PVM'T OVERLAY

FOR PROFILE: SEE SHEET NO. 62

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 107

DRAINAGE DETAILS
SEE SHEET NO. 107

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	46	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

GILBERT ROAD
TRAPELO ROAD
HARDING AVENUE
BARNARD ROAD
POPLAR STREET
MATCH LINE
LIMIT OF WORK MEET EXISTING
PROP. TREE PIT W/SEED
PROP. TREE (TYP.)
PROP. STRUCTURAL SOIL
PROP. 6.5' GRAN. TRANS. STONE
PROP. 4" LOAM & SEED
PROP. 4' CEM. CONC. SW
PROP. ½" MICRO–MILLING & PVM'T OVERLAY
PROP. 4" LOAM & SEED
PROP. 4' CEM. CONC. SW
MEET EXISTING GRADE AT STEPS (TYP.)
PROP. COLORED SCORED CEM. CONC. PVM'T
PROP. HAND EX. ROOT ZONE (TYP.)
PROP. SAWCUT & 4' HMA DRIVE (TYP.)
PROP. 4" LOAM & SEED (TYP.)
PROP. 2¼" MICRO–MILLING & PVM'T OVERLAY
LINE OF TEMP. EASEMENT (TYP.)
PROP. TREE (TYP.)
PROP. GRAN. CURB FROM RESET
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE
PROP. 2¼" AND 0" TO 1" MICRO–MILLING & PVM'T OVERLAY
PROP. TREE PROTECTION (TYP.)
PROP. 5' CEM. CONC. SW
PROP. TREE PIT W/SEED (TYP.)
PROP. 4" LOAM & SEED AT LAWN (TYP.)
PROP. FULL DEPTH PVM'T
PROP. SAWCUT, MEET EXISTING AT WALK
PROP. SAWCUT & 4' HMA DRIVE
PROP. SAWCUT (TYP)
743.80'
S69°18'15"E
PROP. CHANGE IN PVM'T TYPE
PROP. FULL DEPTH PVM'T R&R MB(BO)
PROP. WHEELCHAIR RAMP (TYP.)
PROP. HAND EX. ROOT ZONE (TYP.)
PROP. STRUCTURAL SOIL
PROP. GRAN. CURB TYPE VB
PROP. CEM. CONC WALK SURFACE
PROP. ½" TO 1½" MICRO–MILLING & PVM'T OVERLAY
PROP. 3" PINE BARK MULCH
PROP. CEM. CONC. SW
PROP. TREE PIT W/SEED
PROP. 4" LOAM & SEED AT LAWN (TYP.)
MEET EXISTING GRADE AT STEPS (TYP.)
PROP. SAWCUT & 2' HMA DRIVE (TYP.)
PROP. 3" PINE BARK MULCH AT SHRUBS (TYP.)
PROP. 4' CEM. CONC. SW
PROP. 4" LOAM & SEED
PROP. ½" MICRO–MILLING & PVM'T OVERLAY
PROP. 6.5' GRAN. TRANS. STONE
PROP. 4" LOAM & SEED (TYP.)
PROP. LINE OF TEMP. EASEMENT (TYP.)
PROP. 4' CEM. CONC. SW
PROP. 4" LOAM & SEED
PROP. 5' CEM. CONC. SW
PROP. TREE PIT W/SEED (TYP.)
PROP. TREE (TYP.)
PROP. SAWCUT & MEET EXISTING AT WALK (TYP.)
PROP. TREE PROTECTION (TYP.)
PROP. ½" MICRO–MILLING & PVM'T OVERLAY
PROP. 4' CEM. CONC SW.
PROP. 4" LOAM & SEED
PROP. 6.5' GRAN. TRANS. STONE
PROP. 4' CEM. CONC. SW
PROP. 4" LOAM & SEED
PROP. SAWCUT & 4" CEM. CONC. WALK SURFACE
CONT. ON SHEET 45
CONT. ON SHEET 47
PT. +61.60
CONST. ℄
HOR. SCALE IN FEET
0 20 50 100

N/F DENNIS G. & RICHARD F. LOMBARDO BOOK 45777, PAGE 593 MAP 12, LOT 114
N/F HARRY K. KALOYAN REVOCABLE TRUST BOOK 54281, PAGE 540 MAP 12, LOT 120
N/F JARAM ADAM BELORIAN & ARAKSI KEOROGLIAN LC. CERT. NO. 207099 MAP 12, LOT 115
N/F WILLIAM H. O'CONNELL BOOK 30325, PAGE 291 MAP 12, LOT 116
N/F MARK T. WILGREN & PAMELA MORRIS BOOK 33265, PAGE 544 MAP 12, LOT 117
N/F KALOYAN S. & GAYLE M. TANEV BOOK 55226, PAGE 40 MAP 12, LOT 118
N/F GREGORY CUMMINGS BOOK 48806, PAGE 393 MAP 12, LOT 119
N/F TRAPELO ROAD REALTY TRUST BOOK 54281, PAGE 540 MAP 12, LOT 120
N/F ANTHANASIOS & VIRGINIA STAMATOPOULOS BOOK 47777, PAGE 121 MAP 12, LOT 121
N/F GIACOMO CHIACCHIERI BOOK 42776, PAGE 435 MAP 12, LOT 122
N/F DANIEL F. BOOK 12, LOT 123
N/F CARL & HEATHER P. TORTOLA BOOK 53572, PAGE 396 MAP 12, LOT 155
N/F DARA & SARA COLLEARY BOOK 48720, PAGE 82 MAP 12, LOT 154
N/F LIBERO L. & CARMELA ABRUZZESE BOOK 11868, PAGE 277 MAP 12, LOT 175
N/F NEWTON J. KUPELIAN BOOK 16300, PAGE 401 MAP 12, LOT 177
N/F ARTHUR E. & MARY H. CHUDA BOOK 51790, PAGE 382 MAP 13, LOT 12
N/F SHERIDIAN FAMILY TRUST BOOK 54281, PAGE 542 MAP 12, LOT 195
N/F JOHN J. STANTON JR. BOOK 14175, PAGE 502 MAP 12, LOT 221

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	47	214
PROJ. FILE NO. 604688			

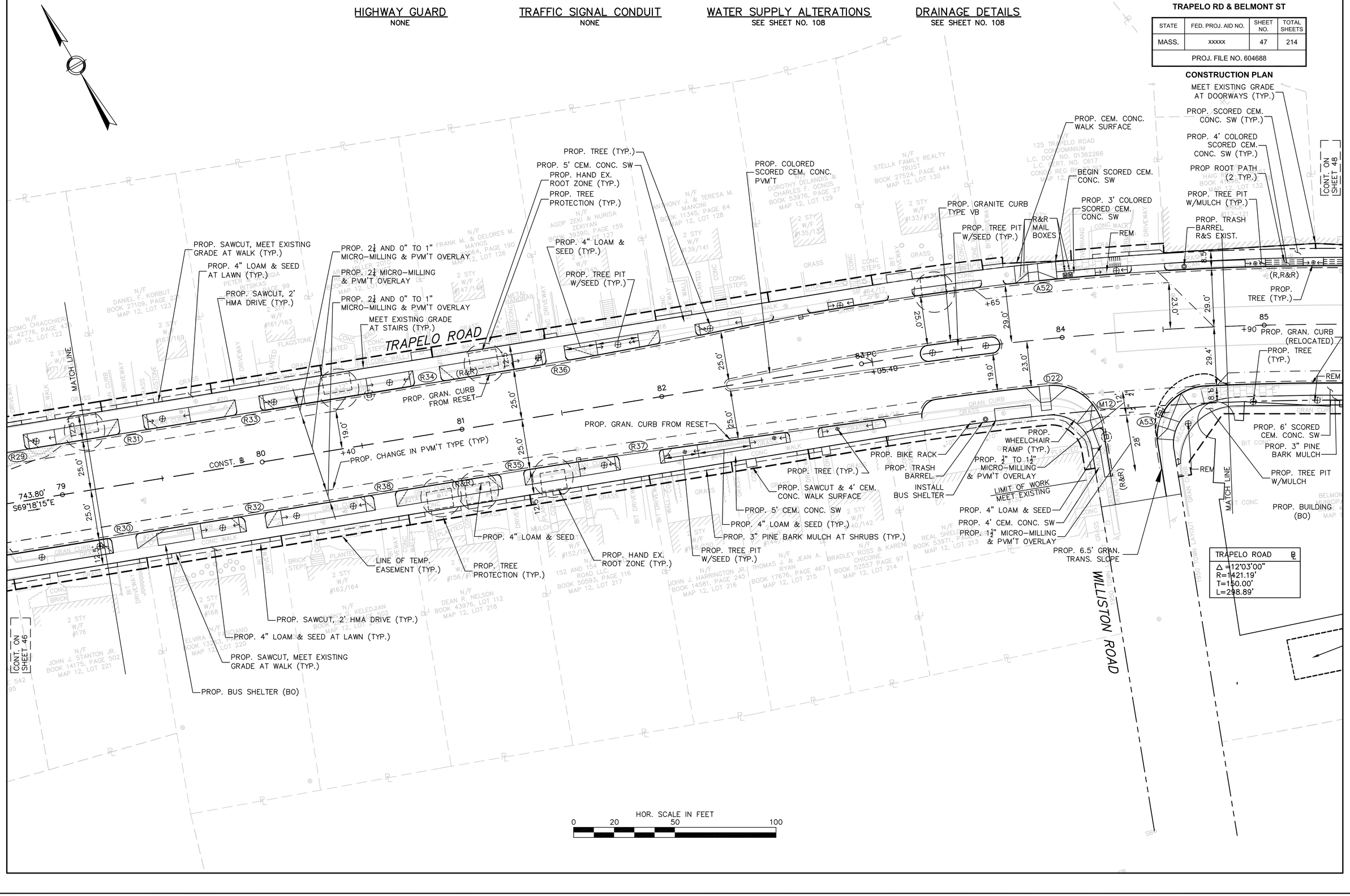
CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 108

DRAINAGE DETAILS
SEE SHEET NO. 108



HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET NO. 152

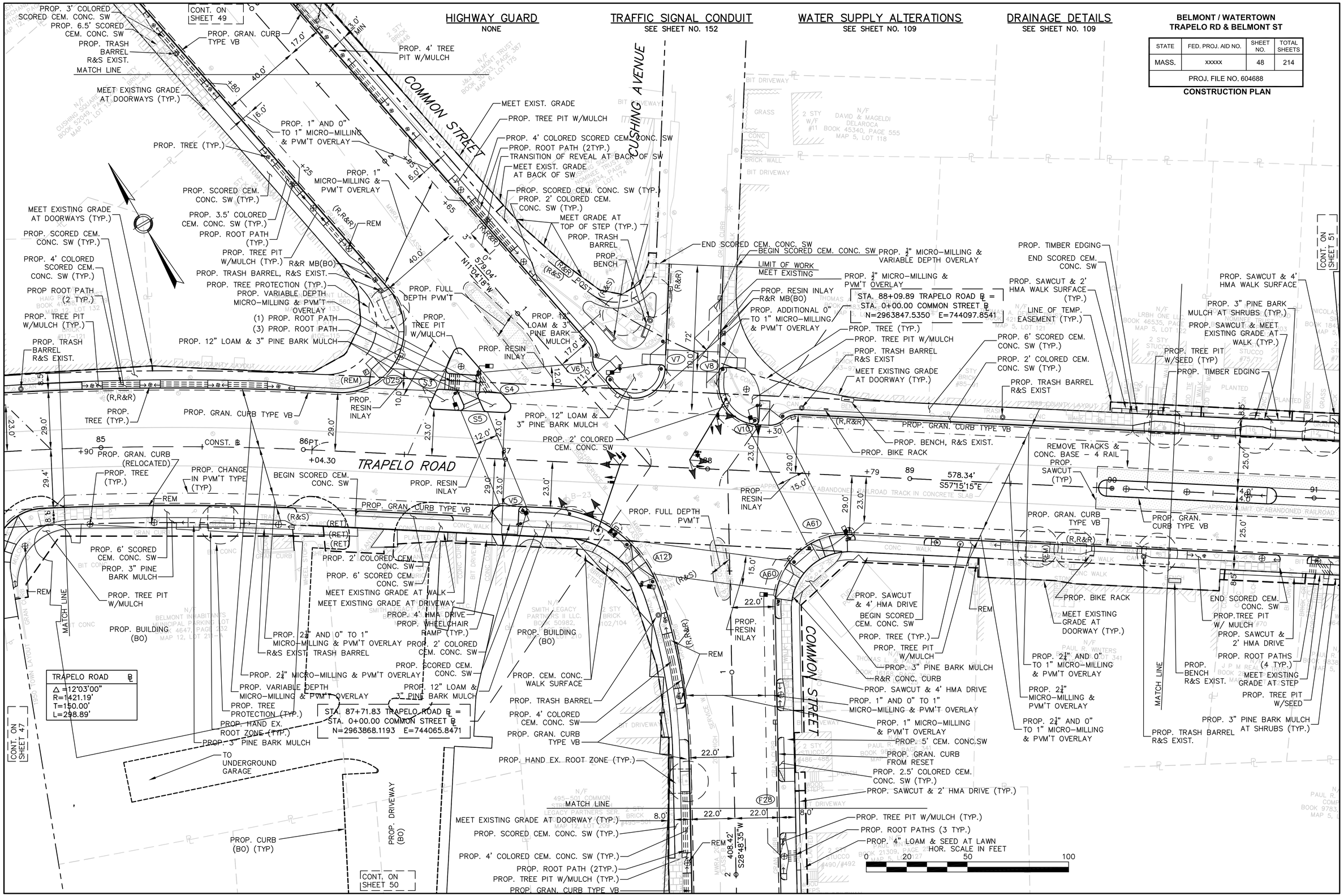
WATER SUPPLY ALTERATIONS
SEE SHEET NO. 109

DRAINAGE DETAILS
SEE SHEET NO. 109

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	48	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	49	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 110

DRAINAGE DETAILS
SEE SHEET NO. 110

HOR. SCALE IN FEET
0 20 50 100

PAYSON ROAD
PALFREY ROAD
COMMON STREET

199.66'
N12°37'18"W

579.04'
N11°04'18"W

PROP. 4" LOAM & SEED
PROP. WHEELCHAIR RAMP
PROP. TREE PROTECTION (TYP.)
LIMIT OF WORK MEET EXISTING
PROP. 4" LOAM & SEED (TYP.)
PROP. 1" MICRO-MILLING & PVM'T OVERLAY
PROP. GRAN. CURB FROM RESET
PROP. 4" LOAM & SEED AT LAWN (TYP.)
PROP. SAWCUT & 2' HMA DRIVE
PROP. WHEELCHAIR RAMP (TYP.)
END SCORED CEM. CONC. SW
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE
PROP. 2' COLORED CEM. CONC. SW (TYP.)
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE
PROP. 4' TREE PIT W/MULCH
PROP. SAWCUT & MEET EXISTING GRADE AT WALK
PROP. 8' SCORED CEM. CONC. SW (TYP.)
PROP. TRASH BARREL R&S EXIST.
PROP. ROOT PATH (2)
PROP. 4' COLORED SCORED CEM. CONC. SW
LINE OF TEMP. EASEMENT (TYP.)
PROP. TRASH BARREL R&S EXIST.
MEET EXISTING GRADE AT DOORWAY (TYP.)
PROP. GRAN. CURB TYPE VB
PROP. 4' TREE PIT W/MULCH
MATCH LINE
MEET EXISTING GRADE AT DOORWAYS (TYP.)
PROP. TREE (TYP.)
PROP. 1" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY
MEET EXIST. GRADE
PROP. TREE PIT W/MULCH
PROP. 4' COLORED SCORED CEM.
PROP. ROOT PATH (2TYP.)

PROP. GRAN. CURB FROM RESET
STA 5+56.4 LIMIT OF WORK MEET EXISTING
R&R MB(BO)
PROP. CEM. CONC. SW
PROP. 1" MICRO-MILLING & PVM'T OVERLAY
LIMIT OF WORK MEET EXISTING
END SCORED CEM. CONC. SW MEET EXISTING GRADE AT STEPS
PROP. 5.5' SCORED CEM. CONC. SW (TYP.)
PROP. 2' COLORED CEM. CONC. SW (TYP.)
PROP. 1" MICRO-MILLING & PVM'T OVERLAY
PROP. SAWCUT & MEET EXISTING GRADE AT WALK
PROP. 3' COLORED SCORED CEM. CONC. SW
PROP. 6.5' SCORED CEM. CONC. SW
PROP. TRASH BARREL R&S EXIST.

CONT. ON SHEET 48

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	50	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 111

DRAINAGE DETAILS
SEE SHEET NO. 111

TO UNDERGROUND GARAGE

CONT. ON SHEET 48

MATCH LINE

PROP. CURB (BO) (TYP)

PROP. DRIVE (BO)

MEET EXISTING GRADE AT DOORWAY (TYP.)

PROP. SCORED CEM. CONC. SW (TYP.)

PROP. 4' COLORED CEM. CONC. SW (TYP.)

PROP. ROOT PATH (2TYP.)

PROP. TREE PIT W/MULCH (TYP.)

PROP. GRAN. CURB TYPE VB

8.0'

22.0'

22.0'

8.0'

REM

408.42'

S28°48'35"W

2 Φ

3 Φ

LIMIT OF WORK MEET EXISTING

HORNE ROAD

A62

A63

PROP. 6.5" GRAN. TRANS. CURB

PROP. GRAN. CURB FROM RESET

PROP. DRIVEWAY (BO)

PROP. WHEELCHAIR RAMP (TYP.)

PROP. SAWCUT & 2' HMA DRIVE

PROP. 8' CEM. CONC. SW

PROP. STRUCTURAL SOIL

PROP. SAWCUT & 13' CEM. CONC. WALK SURFACE

PROP. BUILDING (BO)

2 STY BRICK #527

PROP. SAWCUT & 2' HMA DRIVE

COMMON STREET

PROP. GRAN. CURB FROM RESET

STA 4+06.0
LIMIT OF WORK
MEET EXISTING

PROP. TREE PIT W/MULCH (TYP.)

PROP. ROOT PATHS (3 TYP.)

PROP. 4" LOAM & SEED AT LAWN

PROP. SAWCUT & 2' HMA DRIVE

LINE OF TEMP. EASEMENT (TYP.)

PROP. 8' CEM. CONC. SW

PROP. SAWCUT & 2' HMA DRIVE

PROP. TREE (TYP.)

PROP. SAWCUT, PROP. CEM. CONC. SW AT DRIVE

PROP. STRUCTURAL SOIL

PROP. 1" MICRO-MILLING & PVM'T OVERLAY

BELMONT STREET

BELMONT

WATERTOWN

HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	51	214
PROJ. FILE NO. 604688			

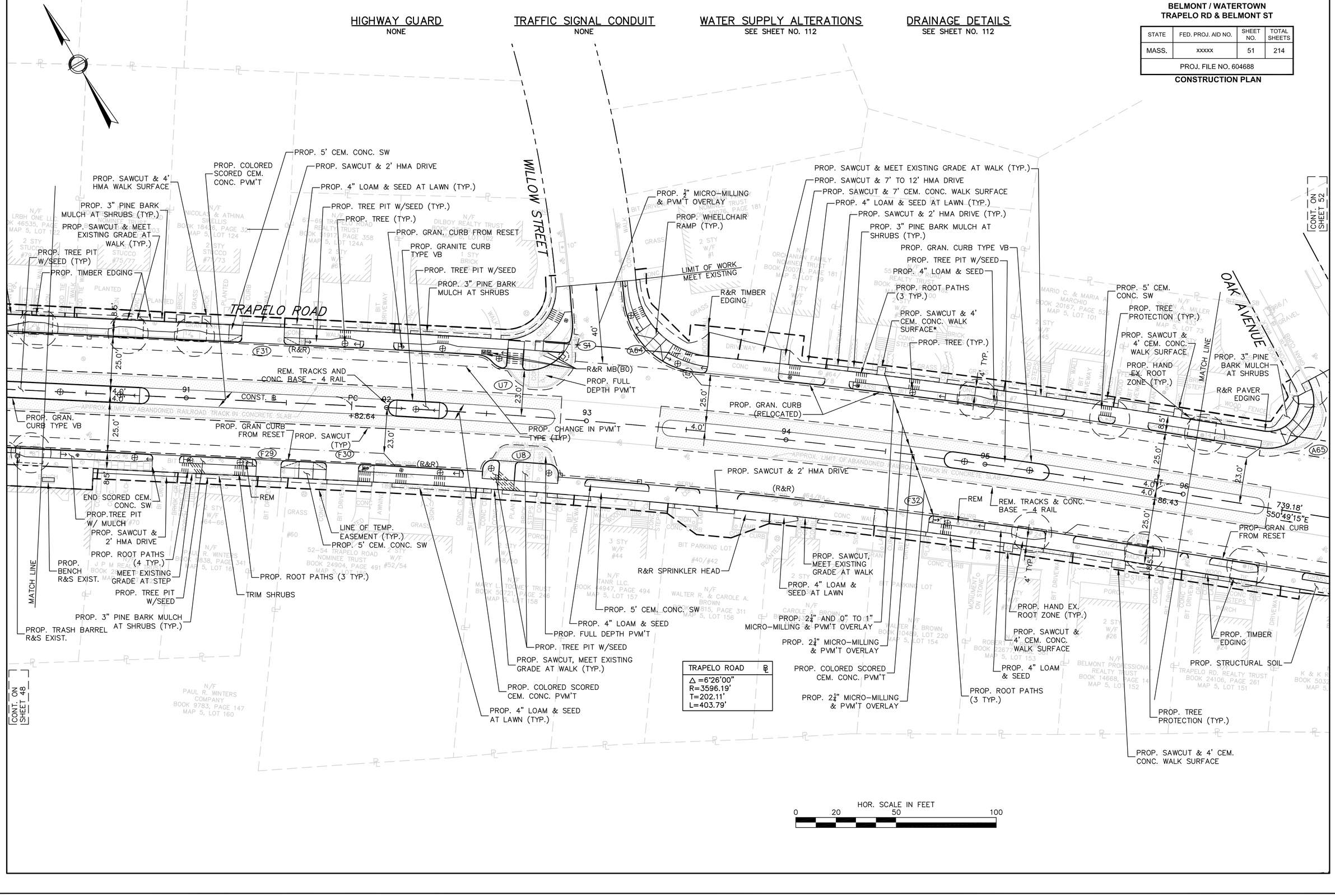
CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 112

DRAINAGE DETAILS
SEE SHEET NO. 112



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	52	214
PROJ. FILE NO. 604688			

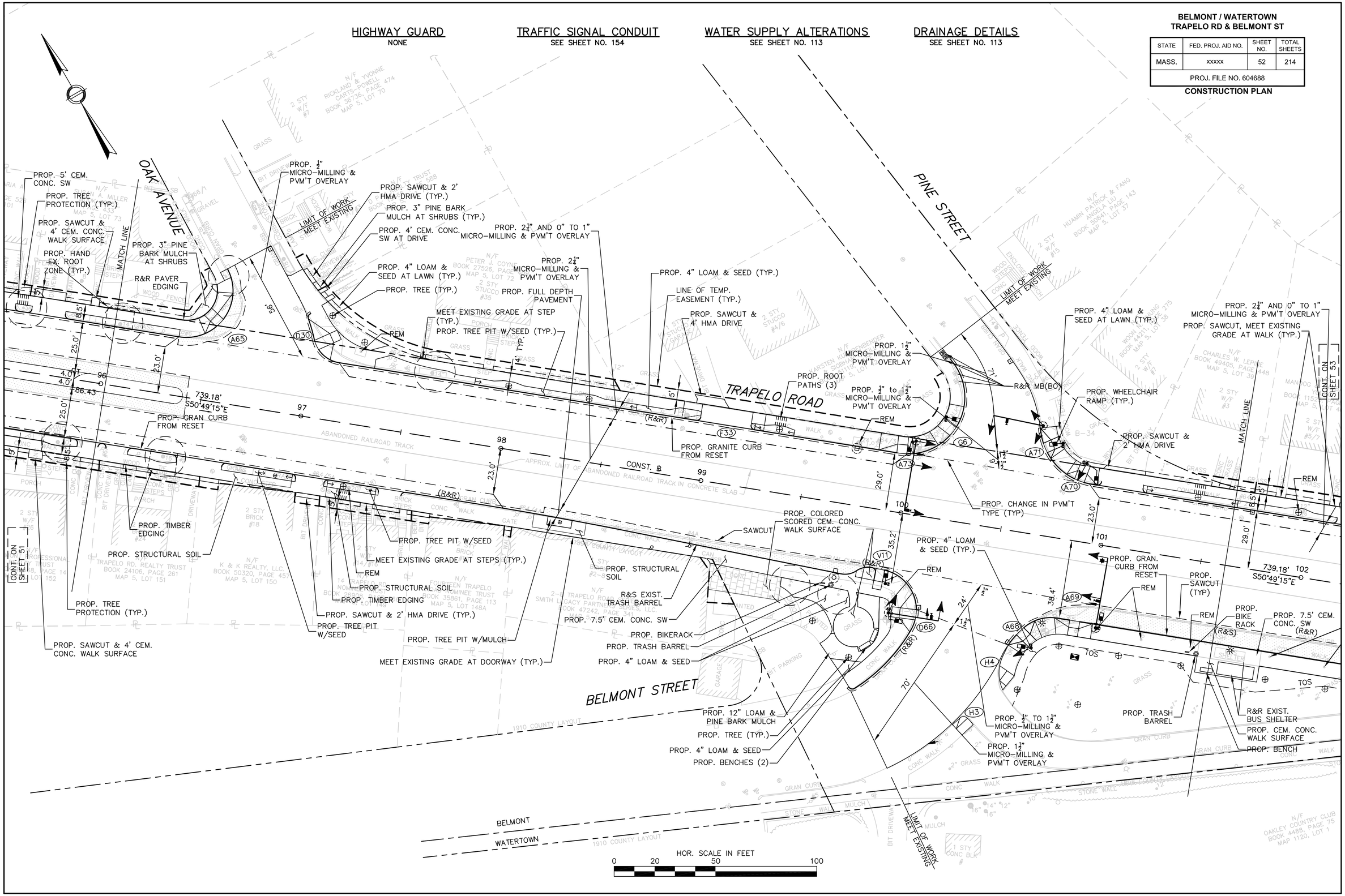
CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET NO. 154

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 113

DRAINAGE DETAILS
SEE SHEET NO. 113



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	53	214
PROJ. FILE NO. 604688			

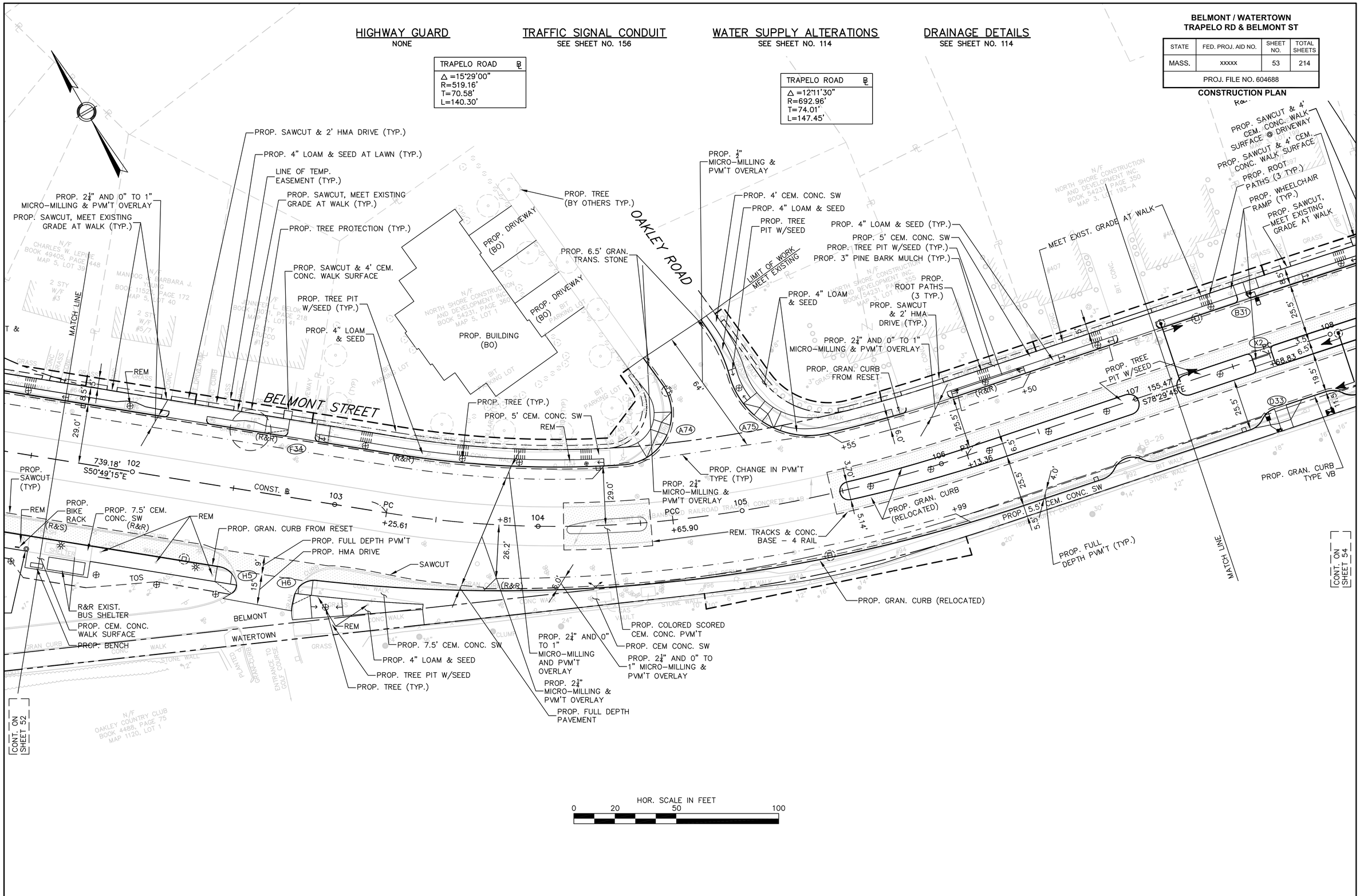
CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET NO. 156

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 114

DRAINAGE DETAILS
SEE SHEET NO. 114



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	54	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET NO. 156

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 115

DRAINAGE DETAILS
SEE SHEET NO. 115

TRAPELO ROAD ℄
△ =3°21'00"
R=2603.31'
T=76.13'
L=152.21'

TRAPELO ROAD ℄
△ =2°03'00"
R=5552.10'
T=99.34'
L=198.65'

PROP. 4" LOAM & SEED AT LAWN (TYP.)
PROP. 2¼" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY
PROP. 2¼" MICRO-MILLING & PVM'T OVERLAY
PROP. FULL DEPTH PVM'T
PROP. TREE PIT W/SEED
PROP. FULL DEPTH PVM'T
PROP. 2¼" MICRO-MILLING & PVM'T OVERLAY
PROP. FULL DEPTH PVM'T
PROP. SAWCUT & 2" HMA DRIVE
PROP. SAWCUT, MEET EXISTING GRADE AT WALK (TYP.)
PROP. SAWCUT & 2' HMA DRIVE
PROP. SAWCUT, MEET EXISTING GRADE AT DRIVE
PROP. TREE PIT W/SEED (TYP.)
R&R 4' FLAGSTONE WALK
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE @ DRIVEWAY
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE
PROP. ROOT PATHS (3 TYP.)
MEET EXIST. GRADE AT WALK
PROP. WHEELCHAIR RAMP (TYP.)
PROP. SAWCUT, MEET EXISTING GRADE AT WALK
PROP. TREE (TYP.)
PROP. 5' CEM. CONC. SW
PROP. TIMBER EDGING
PROP. 4" LOAM & SEED AT LAWN (TYP.)
PROP. SAWCUT , MEET EXISTING GRADE AT DRIVE
PROP. SAWCUT, MEET EXISTING GRADE AT WALK (TYP.)
LINE OF TEMP. EASEMENT (TYP.)
PROP. ½" MICRO-MILLING & PVM'T OVERLAY
PROP. TREE PIT W/SEED
LIMIT OF WORK MEET EXISTING
PROP. 4" LOAM & SEED (TYP)
PROP. 5' CEM. CONC. SW
PROP. GRAN. CURB FROM RESET
PROP. CHANGE IN PVM'T TYPE (TYP.)
PROP. SAWCUT (TYP) REM. TRACKS & CONC. BASE - 4 RAIL
PROP. TREE PIT W/SEED
107 155.47' S78°29'45"E
108
109 CONST. ℄
PT +67.48
110
161.70' S76°26'45"E
111
PC +29.18
112
PT +81.39
113 51.99' S79°47'45"E
REMOVE TRACKS & CONC. BASE - 4 RAIL
BELMONT
WATERTOWN
PROP. 5.5' CEM. CONC. SW
PROP. SAW CUT (TYP.)
PROP. GRAN. CURB (RELOCATED)
PROP. GRAN. CURB (RELOCATED)
(R&R)
PROP. GRAN. CURB FROM RESET
PROP. 5.5' CEM. CONC. SW
PROP. GRAN. CURB TYPE VB
PROP. GRAN. CURB TYPE VB (TYP)
PROP. FULL DEPTH PVM'T (TYP.)
PROP. GRAN. CURB (RELOCATED)
PROP. FULL DEPTH PVM'T
PROP. GRAN. CU FROM RESET
CONT. ON SHEET 55
CONT. ON SHEET 53
MATCH LINE
MATCH LINE
APPROX. LIMIT OF ABANDONED RAILROAD TRACK IN CONCRETE SLAB
25.5'
19.5'
11.5'
8.5'
6.5'
3.5'
45'
1"
½"

HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	55	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 116

DRAINAGE DETAILS
SEE SHEET NO. 116

TRAPELO ROAD
Δ =3°21'00"
R=2603.31'
T=76.13'
L=152.21'

TRAPELO ROAD
Δ =0°56'23"
R=5000.00'
T=41.01'
L=82.01'

PROP. 1" MICRO-MILLING & PVM'T OVERLAY
PROP. TREE PIT W/SEED
LIMIT OF WORK MEET EXISTING
PROP. SAWCUT (TYP)
REM. TRACKS & CONC. BASE – 4 RAIL
PROP. FULL DEPTH PVM'T
PROP. GRAN. CURB FROM RESET
PROP. 5.5' CEM. CONC. SW
CONT. ON SHEET 54
MATCH LINE
TRIM TREES OVER SIDEWALK
PROP. BIKERACK
PROP. GRAN. CURB TYPE VB
PROP. COLORED SCORED CEM. CONC. PVM'T
INSTALL BUS SHELTER
PROP. FULL DEPTH PVM'T
PROP. SAWCUT & 4' HMA DRIVE
PROP. 6.5' GRAN. TRANS. STONE
PROP. 2¼" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY
PROP. 4" LOAM & SEED (TYP)
PROP. TREE (TYP.)
PROP. 5' CEM. CONC. SW
HAND EX. ROOT ZONE(TYP)
PROP. WHEELCHAIR RAMP (TYP.)
PAYSON ROAD
BELMONT STREET
PROP. CHANGE IN PVM'T TYPE (TYP.)
APPROX. LIMIT OF ABANDONED RAILROAD TRACK IN CONCRETE SLAB
PROP. GRAN. CURB FROM RESET (TYP.)
HAND EX. ROOT ZONE(TYP)
PROP. SAWCUT (TYP)
PROP. 5' CEM. CONC. SW
PROP. SAWCUT & 4' HMA DRIVE
PROP. TREE PROTECTION (TYP.)
PROP. HAND EXC. ROOT ZONE
PROP. 4" LOAM & SEED (TYP.)
PROP. FULL DEPTH PVM'T
PROP. GRAN. CURB FROM RESET (TYP.)
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE (TYP.)
R&R PAVER EDGING (TYP.)
PROP. 4" LOAM & SEED AT LAWN
PROP. 2¼" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY
R&R QUARTER ROUND CURB
PROP. 4" LOAM & SEED AT LAWN
LIMIT OF WORK MEET EXISTING
VAN NESS ROAD
PROP. 6' CURB INLET
PROP. TREE PROTECTION (TYP.)
PROP. 4" LOAM & SEED AT LAWN (TYP.)
PROP. 6.5' GRAN. TRANS. STONE
PROP. SAWCUT, MEET EXISTING GRADE AT STEPS
PROP. HAND EX. ROOT ZONE
PROP. FULL DEPTH PVM'T
PROP. 4" LOAM & SEED AT LAWN (TYP.)
PROP. 4" LOAM & SEED (TYP)
PROP. 5' CEM. CONC. SW
PROP. TREE PIT W/SEED (TYP.)
PROP. SAWCUT & 2' HMA DRIVE
PROP. GRAN CURB (RELOCATED)
PROP. GRAN CURB FROM RESET (TYP.)
PROP. 6.5' GRAN. TRANS. STONE
PROP. 1" MICRO-MILLING & PVM'T OVERLAY
PROP. SAWCUT, MEET EXISTING GRADE AT WALK
PROP. TREE PIT W/SEED (TYP.)
PROP. 2¼" MICRO-MILLING & PVM'T OVERLAY
PROP. TREE (TYP.)
PROP. FULL DEPTH PVM'T
LINE OF TEMP. EASEMENT (TYP.)
PROP. SAWCUT & 2' HMA DRIVE (TYP.)
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE (TYP.)
PROP. TREE PROTECTION (TYP.)
BELMONT WATERTOWN
COMMONWEALTH ROAD
STUL TS ROAD
CARVER ROAD
CONT. ON SHEET 56
PROP. 2¼" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY
PROP. SAWCUT, MEET EXISTING GRADE AT WALK
PROP. 1" MICRO-MILLING & PVM'T OVERLAY
PROP. 5' CEM. CONC. SW
PROP. TREE PIT W/SEED (TYP.)
PROP. SAWCUT & 2' CEM. CONC. WALK
PROP. 4" LOAM & SEED (TYP.)
REM
R&R MB(BO)
PROP. 5' CEM. CONC. SW
PROP. FULL DEPTH PVM'T
PROP. SAWCUT & CEM. CONC. WALK SURFACE
PROP. 6.5' GRAN. TRANS. STONE
LIMIT OF WORK MEET EXISTING
PROP. 4" LOAM & SEED AT LAWN (TYP.)
PROP. 5' CEM. CONC. SW
PROP. 1" MICRO-MILLING & PVM'T OVERLAY
PROP. 4" LOAM & SEED (TYP.)
PROP. 5' CEM. CONC. SW
HOR. SCALE IN FEET
0 20 50 100

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET NO. 158

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 117

DRAINAGE DETAILS
SEE SHEET NO. 117

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	56	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

STULTS ROAD
LEWIS ROAD
BELMONT STREET
SCHOOL STREET
CARVER ROAD
WINDSOR AVENUE
MATCH LINE
CONT. ON SHEET 55
CONT. ON SHEET 57
LIMIT OF WORK MEET EXISTING
PROP. 2½" AND 0" TO 1" MICRO–MILLING & PVM'T OVERLAY
PROP. SAWCUT, MEET EXISTING GRADE AT WALK
PROP. ½" MICRO–MILLING & PVM'T OVERLAY
PROP. 5' CEM. CONC. SW
PROP. TREE PIT W/SEED (TYP.)
PROP. SAWCUT & 2' CEM. CONC. WALK
PROP. SAWCUT & 4' HMA DRIVE
PROP. 4" LOAM & SEED (TYP.)
TRAPELO ROAD ℄
△ =0°56'23"
R=5000.00'
T=41.01'
L=82.01'
STA. 120+46.52 TRAPELO ROAD ℄ = STA. 0+00.00 SCHOOL STREET ℄ N=2962548.1604 E=746976.4569
MEET EXISTING GRADE AT DOORWAY (TYP.)
BEGIN SCORED CEM. CONC. SW
PROP. 4" LOAM & SEED (TYP.)
PROP. TREE PIT W/SEED
PROP. TRASH BARREL R&S EXIST.
PROP. SCORED CEM. CONC. SW
TRAPELO ROAD ℄
△ =6°12'54"
R=1001.00'
T=54.34'
L=108.58'
PROP. FULL DEPTH CONSTRUCTION
PROP. WHEELCHAIR RAMP (TYP.)
END SCORED CEM. CONC. SW
PROP. 2' COLORED CEM. CONC. SW
PROP. GRAN CURB TYPE VB
PROP. GRAN CURB FROM RESET
PROP. 7' CEM. CONC. SW
PROP. SAW CUT & HMA DRIVE
PROP. 7' CEM. CONC. SW
PROP. ROOT PATH (1)
STA 1+25.4 LIMIT OF WORK MEET EXISTING
PROP. 2 1/4" AND 0" TO 1" MICRO–MILLING & PVM'T OVERLAY
PROP. 3' COLORED SCORED CEMC. CONC. SW
PROP. SCORED CEM. CONC. SW
PROP. 2 1/4" MICRO–MILLING & PVM'T OVERLAY
PROP. 2½" AND 0" TO 1" MICRO–MILLING & PVM'T OVERLAY
PROP. 2' COLORED SCORED CEM. CONC. SW
MEET EXISTING GRADE AT DOORWAY (TYP.)
BEGIN SCORED CEM. CONC. SW
R&R MB (BO)
PROP. TRASH BARREL, R&S EXIST
PROP. GRAN. CURB TYPE VB
PROP. FULL DEPTH PVM'T
PROP. 6' CEM. CONC. SW
PROP. GRAN CURB FROM RESET
R&R QUARTER ROUND CURB
MEET EXISTING GRADE AT STEPS
PROP. ½" MICRO–MILLING & PVM'T OVERLAY
LINE OF TEMP. EASEMENT (TYP.)
PROP. SAWCUT & 4' HMA DRIVE
PROP. 4" LOAM & SEED (TYP.)
PROP. 3" PINE BARK MULCH AT SHRUBS
STA. 121+54.17 TRAPELO ROAD ℄ = STA. 0+00.00 SCHOOL STREET ℄ N=2962540.2966 E=747083.8001
PROP. TREE PIT W/SEED (TYP.)
PROP. 4' CEM. CONC. SW
PROP. ½" MICRO–MILLING & PVM'T OVERLAY
PROP. TIMBER EDGING
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE
PROP. ROOT PATHS (3 TYP.)
PROP. SAWCUT & 4' HMA DRIVE (TYP.)
SCHOOL STREET ℄
△ =23°05'11"
R=275.00'
T=56.17'
L=110.81'
PROP. STRUCTURAL SOIL
PROP. ROOT PATHS (4)
PROP. 8" QUARTER ROUND CURB
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE AT DRIVEWAY
HAND EX. ROOT ZONE
PROP. 6.5' GRAN. TRANS. STONE
PROP. 4" LOAM & SEED (TYP.)
PROP. 3" PINE BARK MULCH AT SHRUBS
PROP. SAWCUT & 4' HMA DRIVE (TYP.)
PROP. 4" LOAM & SEED (TYP)
PROP. 5' CEM. CONC. SW
PROP. SAWCUT, MEET EXISTING GRADE AT WALK
PROP. 6.5' GRAN. TRANS. STONE
PROP. 1" MICRO–MILLING & PVM'T OVERLAY
PROP. GRAN. CURB FROM RESET
PROP. TREE PROTECTION (TYP.)
PROP. ½" TO 1½" MICRO–MILLING & PVM'T OVERLAY
PROP. CEM. CONC. SW
PROP. ½" MICRO–MILLING & PVM'T OVERLAY
PROP. 4" LOAM & SEED AT LAWN (TYP.)
PROP. 5' CEM. CONC. SW
PROP. 4" LOAM & SEED
PROP. VAR. WIDTH COLORED CEM. CONC. SW
PROP. 5' CEM. CONC. SW
PROP. FULL DEPTH PVM'T
PROP. GRAN. CURB. FROM RESET
PROP. .5' CONC. SW
PROP. FULL DEPTH PVM'T
PROP. GRAN. CURB TYPE VB
PROP. 3' COLORED SCORED CEM. CONC. SW
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE
PROP. 3" PINE BARK MULCH AT SHRUBS
PROP. SAWCUT & 4' HMA DRIVE (TYP.)
PROP. 4" LOAM & SEED (TYP)
PROP. 5' CEM. CONC. SW
PROP. SAWCUT, MEET EXISTING GRADE AT WALK
PC +44.24
PT +26.25
PC120 CONST. ℄ +96.20
PT +58.72
PC +47.92
+04.79
118
119
120
121
122
123
169.95' S80°29'51"E
293.32' N03°29'15"E
584.41' S86°42'45"E
61'
52'
34.0'
23.3'
9.2'
38'
19.9'
27.5'
33.5'
9.0'
6.5'
8.5'
9.5'
17.0'
REM
VARIES
TYP.
(TYP)
(R&R)
(REM)
HOR. SCALE IN FEET
0 20 50 100
FOR PROFILE: SEE SHEET NO. 62

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	57	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 118

DRAINAGE DETAILS
SEE SHEET NO. 118

CONT. ON SHEET 56

NEWTON STREET

WORCESTER STREET

SPRINGFIELD STREET

FALMOUTH STREET

BELMONT STREET

HILL-SIDE ROAD

LANGDON AVENUE

WESTLAND ROAD

STA. 123+70.32 TRAPELO ROAD ℄ =
STA. 0+00.00 NEWTON STREET ℄
N=2962527.9015 E=747299.5888

STA. 125+71.12 TRAPELO ROAD ℄ =
STA. 0+00.00 WORCESTER STREET ℄
N=2962516.3864 E=747500.0571

1+70.87

170.87'
N00°13'15"W

1+29.58

129.58'
N00°13'15"W

584.41'
S86°42'45"E

BEGIN SCORED CEM. CONC. SW

MEET EXISTING GRADE AT DOORWAY (TYP.)

PROP. FULL DEPTH PVM'T

PROP. 6.5' GRAN TRANS STONE

PROP. CEM. CONC. SW

PROP. 2' COLORED SCORED CEM. CONC. SW

PROP. 6.5' SCORED CEM. CONC. SW

PROP. SAWCUT & 4' HMA DRIVE

PROP. STRUCTURAL SOIL

PROP. 9' CEM. CONC. SW

LINE OF TEMP. EASEMENT (TYP.)

LIMIT OF WORK MEET EXISTING

PROP. 6.5' GRAN. TRANS. STONE

END SCORED CEM. CONC. SW

END PROP. SCORED CEM. CONC. SW

PROP. 4" LOAM & SEED (TYP.)

PROP. GRAN. CURB TYPE VB

PROP. TREE PIT W/MULCH (TYP.)

PROP. 6.5' SCORED CEM. CONC. SW (TYP.)

PROP. 2' COLORED CEM. CONC. SW (TYP.)

PROP. 5.5' SCORED CEM. CONC. SW

PROP. 3' COLORED SCORED CEM. CONC. SW (TYP.)

MEET EXISTING GRADE AT DOORWAY (TYP.)

BEGIN PROP. SCORED CEM. CONC. SW

R&R MB(BO)

PROP. GRAN. CURB TYPE VB

PROP. ROOT PATHS (2 TYP.)

PROP. 2¼" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY

PROP. ½" MICRO-MILLING & VARIABLE DEPTH PVM'T OVERLAY

PROP. 6.5' GRAN TRANS STONE

PROP. CEM. CONC. SW

END PROP. SCORED CEM. CONC. SW

PROP. CEM. CONC. WALK SURFACE

PROP. ½" MICRO-MILLING & PVM'T OVERLAY

PROP. CEM. CONC. SW

PROP. TREE (TYP.)

R&R QUARTER ROUND CURB (TYP.)

PROP. 5' CEM. CONC. SW

PROP. 3" PINE BARK MULCH

LIMIT OF WORK MEET EXISTING

PROP. TREE PIT W/SEED

PROP. GRAN. CURB FROM RESET

PROP. 6.5' GRAN. TRANS. STONE

PROP. ½" MICRO-MILLING & PVM'T OVERLAY

PROP. 5' GRAN. TRANS. STONE

PROP. HMA DRIVE

PROP. TIMBER EDGING

PROP. CEM. CONC. WALK SURFACE

LIMIT OF WORK MEET EXISTING

R&R MB(BO)

PROP. BIK

PROP. TREE PIT W/MULCH

PROP. CHANGE IN PVM'T TYPE (TYP.)

PROP. WHEELCHAIR RAMP (TYP.)

PROP. BOUND

R&R PAVERS AND METAL FENCE

PROP. 5.0' CEM. CONC. SW

PROP. 2012 TOWN LOCATION LINE

PROP. 4" LOAM & SEED (TYP.)

PROP. TREE PROTECTION

LIMIT OF WORK MEET EXISTING

PROP. FULL DEPTH PVM'T <4'

PROP. 2¼" MICRO-MILLING & PVM'T OVERLAY

PROP. SAWCUT & 4' TO 18' HMA DRIVE

PROP. 2¼" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY

PROP. 7' CEM. CONC. WALK SURFACE

PROP. 4" LOAM & SEED (TYP.)

PROP. 4" LOAM & SEED AT LAWN (TYP.)

PROP. 6.5' GRAN. TRANS. STONE

PROP. ½" MICRO-MILLING & PVM'T OVERLAY

PROP. 2012 TOWN LOCATION LINE

PROP. BOUND

PROP. 6.5' GRAN. TRANS. STONE

PROP. SAWCUT & 4' HMA DRIVE

PROP. 4" LOAM & SEED (TYP.)

PROP. ½" MICRO-MILLING & PVM'T OVERLAY

PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE

PROP. 3" PINE BARK MULCH AT SHRUBS

PROP. SAWCUT & 4' HMA DRIVE (TYP.)

PROP. 4" LOAM & SEED (TYP)

PROP. 5' CEM. CONC. SW

PROP. SAWCUT, MEET EXISTING GRADE AT WALK

PROP. SAWCUT & 2' HMA DRIVE (TYP.)

PROP. 4" LOAM & SEED AT LAWN (TYP.)

PROP. TREE PIT W/SEED (TYP.)

PROP. 3" PINE BARK MULCH AT SHRUBS

PROP. 5' CEM. CONC. SW

PROP. SAWCUT & 8' CEM. CONC. WALK SURFACE

R&R CHAIN LINK FENCE

PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE

PROP. SAWCUT, MEET EXISTING GRADE AT WALK (TYP.)

PROP. 2012 TOWN LOCATION LINE

PROP. 4" LOAM & SEED (TYP.)

PROP. 6.5' GRAN TRANS STONE

PROP. 1" MICRO-MILLING & PVM'T OVERLAY

PROP. 2" MICRO-MILLING & PVM'T OVERLAY

PROP. 4" LOAM & SEED (TYP.)

PROP. 2½" MICRO-MILLING & PVM'T OVERLAY

PROP. 2½" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY

PROP. 7' CEM. CONC. WALK SURFACE

PROP. 4" LOAM & SEED (TYP.)

PROP. 4" LOAM & SEED AT LAWN (TYP.)

PROP. 6.5' GRAN. TRANS. STONE

PROP. SAWCUT & 4' HMA DRIVE

PROP. 2012 TOWN LOCATION LINE

PROP. 6.5' GRAN. TRANS. STONE

MATCH LINE

MATCH LINE

APPROX. LIMIT OF ABANDONED RAILROAD TRACK IN CONCRETE SLAB

TRAPELO ROAD ℄
Δ =13°40'00"
R=1267.66'
T=151.91'
L=302.37'

CONT. ON SHEET 58

HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	58	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 119

DRAINAGE DETAILS
SEE SHEET NO. 119

CONT. ON SHEET 57

CONT. ON SHEET 59

FALMOUTH STREET

PROP. CEM. CONC. SW
PROP. 6.5' GRAN. TRANS. STONE
PROP. 1½" MICRO-MILLING & PVM'T OVERLAY
PROP. 5' GRAN. TRANS. STONE
PROP. HMA DRIVE
PROP. TIMBER EDGING
PROP. CEM. CONC. WALK SURFACE
LIMIT OF WORK MEET EXISTING
PROP. BIKERACK
R&R MB(BO)
PROP. TREE PIT W/MULCH
PROP. 2012 TOWN LOCATION LINE
PROP. 6.5' GRAN. TRANS. STONE
PROP. SAWCUT & 4' HMA DRIVE
PROP. 1½" MICRO-MILLING & PVM'T OVERLAY
PROP. BOUND
MATCH LINE
WESTLAND ROAD

TRAPELO ROAD
℄
Δ=13°40'00"
R=1267.66'
T=151.91'
L=302.37'

PROP. SAWCUT & 13' HMA DRIVE
PROP. 2¼" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY
PROP. SAWCUT & 13' CEM. CONC. WALK SURFACE
PROP. 4" LOAM & SEED AT LAWN (TYP.)
HAND EXC. ROOT ZONE
PROP. TREE PIT W/ SEED (TYP.)
PROP. 5' CEM. CONC. SW
PROP. 3" PINE BARK MULCH AT SHRUBS
PROP. SAWCUT, MEET EXISTING GRADE AT WALK (TYP.)
PROP. ½" MICRO-MILLING & PVM'T OVERLAY
PROP. 6.5' GRAN. TRANS. STONE
PROP. 4" LOAM & SEED
PROP. 4' CEM. CONC. SW
PROP. GRAN. CURB FROM RESET (TYP.)
PROP. CHANGE IN PVM'T TYPE (TYP)
PROP. GRAN. CURB TYPE VB
PROP. 5.0' CEM. CONC. SW
PROP. 4" LOAM & SEED (TYP.)
PROP. 6.5' GRAN. TRANS. STONE
MEET EXISTING GRADE AT STEPS (TYP.)
PROP. WHEELCHAIR RAMP (TYP.)
LIMIT OF WORK MEET EXISTING
R&R CHAIN LINK FENCE
R&R QUARTER ROUND CURB
R&R
PROP. FULL DEPTH PVM'T 4'
PROP. 4" LOAM & SEED (TYP.)
PROP. CEM. CONC. SW
PROP. 4" LOAM & SEED AT LAWN
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE AT DRIVEWAY
PROP. 4" LOAM & SEED (TYP.)
PROP. 6.5' GRAN. TRANS. STONE
PROP. ½" MICRO-MILLING & PVM'T OVERLAY
PROP. CEM. CONC. SW
PROP. 6.5' GRAN. TRANS. STONE
MEET EXISTING GRADE AT STEPS (TYP.)
PROP. 4" LOAM & SEED AT LAWN (TYP.)
PARK ROAD
WOODLEIGH ROAD
BELMONT STREET
GROVE STREET
PROP. TREE PIT W/MULCH
PROP. 2' COLORED SCORED CEM. CONC. SW
BEGIN SCORED CEM. CONC. SW
PROP. TREE PROTECTION (TYP.)
PROP. 4' HMA DRIVE
PROP. TREE PIT W/SEED
PROP. TREE (TYP.)
PROP. SAWCUT & 4' HMA DRIVE
R&R TIMBER EDGING
PROP. 5' CEM. CONC. SW
PROP. SAWCUT (TYP)
PROP. FULL DEPTH PVM'T
PROP. FULL DEPTH PVM'T
PROP. 2¼" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY
PROP. 2½" MICRO-MILLING & PVM'T OVERLAY
PROP. 2¼" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY
MEET EXISTING GRADE AT STEPS
PROP. TREE PROTECTION (TYP.)
PROP. HAND EXC. ROOT ZONE
LINE OF TEMP. EASEMENT (TYP.)
PROP. SAWCUT & 4' HMA DRIVE
PROP. 5.0' CEM. CONC. SW
PROP. GRAN. CURB TYPE VB
PROP. 4" LOAM & SEED (TYP.)
PROP. FULL DEPTH PVM'T
PROP. 5' SCORED CEM. CONC. SW
PROP. STRUCTURAL MEET EXISTING SOIL GRADE AT DOORWAY (TYP.)
PROP. GRAN. CURB TYPE VB
R&R MB(BO)
PROP. 2' COLORED CEM. CONC. SW
PROP. CEM. CONC. SW
PROP. 4" LOAM & SEED (TYP.)
PROP. GRAN. CURB TYPE VB
PROP. FULL DEPTH PVM'T
END SCORED CEM. CONC. SW
PROP. 2' COLORED SCORED CEM. CONC. SW
PROP. TREE PIT W/MULCH
PROP. 5' SCORED CEM. CONC. SW
PROP. STRUCTURAL MEET EXISTING SOIL GRADE AT DOORWAY (TYP.)
PROP. SCORED CEM. CONC. SW
PROP. TRASH BA
MATCH LINE

CONST. ℄
PT. 130
+91.56
545.77'
S73°02'45"E

STA. 135+18.09 TRAPELO ROAD ℄ =
STA. 0+00.00 GROVE STREET ℄
N=2962303.0696 E=748418.5394

0 20 50 100
HOR. SCALE IN FEET

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	59	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
SEE SHEET NO. 160

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 120

DRAINAGE DETAILS
SEE SHEET NO. 120

GROVE STREET
MARION ROAD
MARLBORO STREET
BELMONT STREET
TEMPLETON PARKWAY
ARLINGTON ST
MATCH LINE
APPROX. LIMIT OF ABANDONED RAILROAD TRACK IN CONCRETE SLAB
BELMONT
WATERTOWN

CONT. ON SHEET 58
CONT. ON SHEET 60

STA. 135+71.84 TRAPELO ROAD ℄ =
STA. 0+00.00 TEMPLETON PARKWAY ℄
N=2962287.0170 E=748469.8353

STA. 135+95.15 TRAPELO ROAD ℄ =
STA. 0+00.00 ARLINGTON STREET ℄
N=2962279.5351 E=748491.9176

STA. 135+18.09 TRAPELO ROAD ℄ =
STA. 0+00.00 GROVE STREET ℄
N=2962303.0696 E=748418.5394

TRAPELO ROAD ℄
Δ = 4°14'01"
R=1500.00'
T=55.44'
L=110.84'

TRAPELO ROAD ℄
Δ = 4°15'59"
R=1000.50'
T=37.27'
L=74.50'

545.77' S73°02'45"E
214.51' S68°48'44"E
227.43' S64°32'45"E

FOR PROFILE: SEE SHEET NO. 62

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	60	214
PROJ. FILE NO. 604688			

CONSTRUCTION PLAN

HIGHWAY GUARD
NONE

TRAFFIC SIGNAL CONDUIT
NONE

WATER SUPPLY ALTERATIONS
SEE SHEET NO. 121

DRAINAGE DETAILS
SEE SHEET NO. 121

TRAPELO ROAD
Δ =2°28'00"
R=2044.09'
T=44.01'
L=88.00'

TRAPELO ROAD
Δ =17°48'30"
R=753.97'
T=118.12'
L=234.34'

STA. 140+80.76 TRAPELO ROAD B =
STA. 0+00.00 OXFORD AVENUE B
N=2962091.1031 E=748942.7184

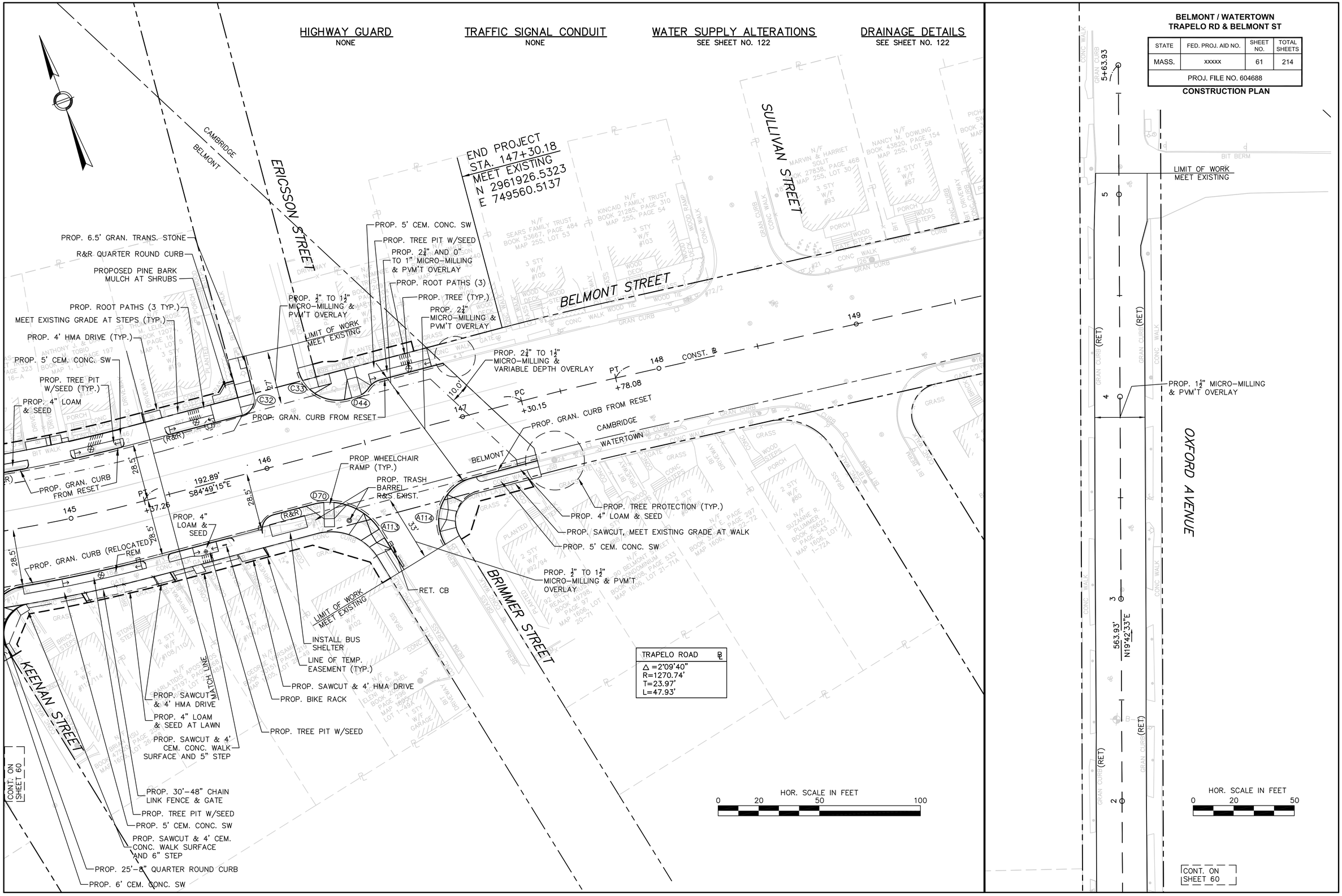
CONT. ON SHEET 61
CONT. ON SHEET 59

OXFORD AVENUE
EXETER STREET
BELMONT STREET
PRENTISS STREET
KEENAN STREET
BELMONT WATERTOWN

PROP. 3' COLORED SCORED CEM. CONC. SW
PROP. ROOT PATHS (2)
PROP. TREE PIT W/MULCH
MEET EXISTING GRADE AT DOORWAY (TYP.)
PROP. SCORED CEM. CONC. SW
MEET EXISTING GRADE AT DOORWAY
PROP. 1½" MICRO-MILLING & PVM'T OVERLAY
R&R CHAIN LINK FENCE
PROP. SAWCUT & MEET EXISTING GRADE AT WALK (TYP.)
PROP. GRAN. CURB TYPE VB
R&R
PROP. 6.5' SCORED CEM. CONC. SW (TYP.)
PROP. 2' COLORED CEM. CONC. SW (TYP.)
R&R MB(BO)
MEET EXISTING GRADE AT DOORWAY (TYP.)
PROP. ROOT PATHS (3)
PROP. TREE (TYP.)
PROP. TREE PIT (TYP.) W/ SEED
PROP. 2½" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY
PROP. GRAN. CURB TYPE VB (TYP.)
PROP. SAWCUT (TYP)
PROP. FULL DEPTH PVM'T <4'
INSTALL BUS SHELTER
CONST. Ⓑ
PROP. GRAN. CURB FROM RESET
PROP. CHANGE IN PVM'T TYPE (TYP)
PROP. BIKERACK
PROP. 2' COLORED SCORED CEM. CONC. SW (TYP.)
PROP. SCORED CEM. CONC. SW
PROP. 2' COLORED SCORED CEM. CONC. SW
PROP. WHEELCHAIR RAMP (TYP.)
END PROP. SCORED CEM. CONC. SW
PROP. HMA WALK SURFACE
PROP. ROOT PATH (2)
PROP. TREE PIT W/MULCH (TYP.)
PROP. CEM. CONC. SW
PROP. ½" TO 1½" MICRO-MILLING & PVM'T OVERLAY
LIMIT OF WORK MEET EXISTING
PROP. SAWCUT & 4' HMA DRIVE
PROP. STRUCTURAL SOIL
MATCH LINE
LINE OF TEMP. EASEMENT (TYP.)
PROP. SAWCUT & 4' HMA WALK SURFACE
PROP. 1" MICRO-MILLING & PVM'T OVERLAY
PROP. 6.5' GRAN. TRANS. STONE
PROP. 7' CEM. CONC. SW
PROP. PINE BARK MULCH AT SHRUBS
R&R CHAIN LINK FENCE
PROP. SAWCUT& 4' CEM. CONC. WALK SURFACE
PROP. 5' CEM. CONC. SW
PROP. 4" LOAM & SEED
PROP. 4" LOAM & SEED AT LAWN
PROP. HAND EX. ROOT ZONE
PROP. TREE PIT W/MULCH
PROP. TREE (TYP.)
PROP. 4" LOAM & SEED (TYP.)
PROP. CEM. CONC. WALK SURFACE (TYP.)
PROP. SAWCUT & 4' HMA DRIVE (TYP.)
END PROP. SCORED CEM. CONC. SW
PROP. 2' COLORED SCORED CEM. CONC. SW
PROP. CEM. CONC. SW
PROP. 6.5' GRAN. TRANS. STONE
PROP. 7' CEM. CONC. SW
PROP. TREE (TYP.)
PROP. 3.5' COLORED SCORED CEM. CONC. SW
LIMIT OF WORK MEET EXISTING
PROP. ROOT PATH (2)
PROP. TREE PIT W/MULCH (TYP.)
PROP. GRAN. CURB TYPE VB
PROP. TRASH BARREL
PROP. TREE PIT W/SEED
PROP. 4' HMA DRIVE
PROP. 5' CEM. CONC. SW
PROP. 4" LOAM & SEED
PROP. GRAN. CURB FROM RESET
PROP. 6.5' GRAN. TRANS. STONE
R&R QUARTER ROUND CURB
PROPOSED PINE BARK MULCH AT SHRUBS
PROP. ROOT PATHS (3 TYP.)
MEET EXISTING GRADE AT STEPS (TYP.)
PROP. TREE PIT W/SEED
PROP. 4" LOAM & SEED
PROP. GRAN. CURB (RELOCATED)
PROP. GRAN. CURB (RELOCATED) REM
R&R MB(BO)
PROP. TREE PIT W/SEED
PROP. 5' CEM. CONC. SW
PROP. 4" LOAM & SEED AT LAWN
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE AND 5" STEP
PROP. 30'-48" CHAIN LINK FENCE & GATE
PROP. TREE PIT W/SEED
PROP. 5' CEM. CONC. SW
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE AND 6" STEP
PROP. 25'-8" QUARTER ROUND CURB
PROP. 6' CEM. CONC. SW
PROP. 2¼" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY
PROP. 2¼" MICRO-MILLING & PVM'T OVERLAY
PROP. SAWCUT & 4' HMA DRIVE
PROP. HAND EX. ROOT ZONE
PROP. 2¾" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY
PROP. TREE PROTECTION
PROP. 6.5' GRAN. TRANS. STONE
PROP. ½" MICRO-MILLING & PVM'T OVERLAY
PROP. 6.5' GRAN. TRANS. STONE

PT. +37.18
227.43' S64°32'45"E
PC +64.62
PT. +52.62
50.30' S67°00'45"E
PC +02.92
PT. +37.26
192.89' S84°49'15"E

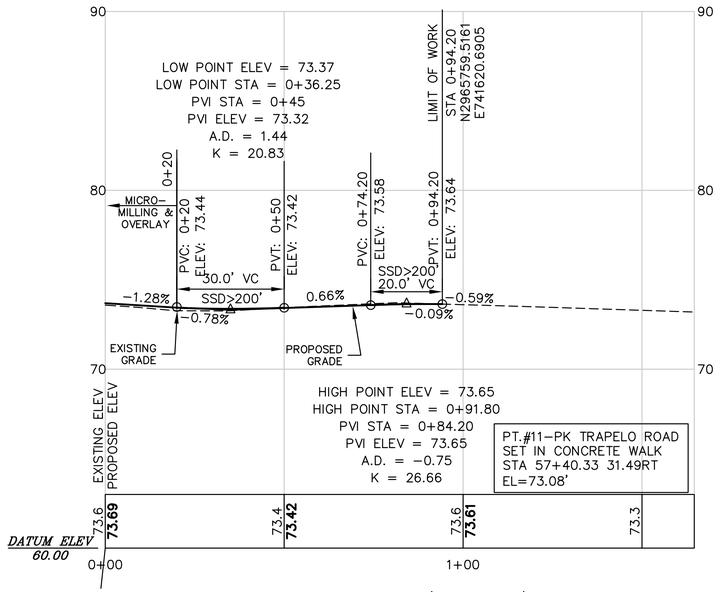
HOR. SCALE IN FEET
0 20 50 100


HIGHWAY GUARD
NONE
TRAFFIC SIGNAL CONDUIT
NONE
WATER SUPPLY ALTERATIONS
SEE SHEET NO. 122
DRAINAGE DETAILS
SEE SHEET NO. 122
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST
STATE | FED. PROJ. AID NO. | SHEET NO. | TOTAL SHEETS
MASS. | xxxxx | 61 | 214
PROJ. FILE NO. 604688
CONSTRUCTION PLAN
END PROJECT
STA. 147+30.18
MEET EXISTING
N 2961926.5323
E 749560.5137
ERICSSON STREET
BELMONT STREET
SULLIVAN STREET
BRIMMER STREET
KEENAN STREET
CAMBRIDGE
BELMONT
WATERTOWN
PROP. 6.5' GRAN. TRANS. STONE
R&R QUARTER ROUND CURB
PROPOSED PINE BARK MULCH AT SHRUBS
PROP. ROOT PATHS (3 TYP.)
MEET EXISTING GRADE AT STEPS (TYP.)
PROP. 4' HMA DRIVE (TYP.)
PROP. 5' CEM. CONC. SW
PROP. TREE PIT W/SEED (TYP.)
PROP. 4" LOAM & SEED
PROP. GRAN. CURB FROM RESET
PROP. GRAN. CURB (RELOCATED) REM
PROP. 5' CEM. CONC. SW
PROP. TREE PIT W/SEED
PROP. 2¼" AND 0" TO 1" MICRO-MILLING & PVM'T OVERLAY
PROP. ROOT PATHS (3)
PROP. TREE (TYP.)
PROP. 2¼" MICRO-MILLING & PVM'T OVERLAY
PROP. ½" TO 1½" MICRO-MILLING & PVM'T OVERLAY
LIMIT OF WORK MEET EXISTING
PROP. 2¼" TO 1½" MICRO-MILLING & VARIABLE DEPTH OVERLAY
PROP. GRAN. CURB FROM RESET
PROP WHEELCHAIR RAMP (TYP.)
PROP. TRASH BARREL R&S EXIST.
PROP. 4" LOAM & SEED
PROP. TREE PROTECTION (TYP.)
PROP. 4" LOAM & SEED
PROP. SAWCUT, MEET EXISTING GRADE AT WALK
PROP. 5' CEM. CONC. SW
PROP. ½" TO 1½" MICRO-MILLING & PVM'T OVERLAY
RET. CB
LIMIT OF WORK MEET EXISTING
INSTALL BUS SHELTER
LINE OF TEMP. EASEMENT (TYP.)
PROP. SAWCUT & 4' HMA DRIVE
PROP. BIKE RACK
PROP. TREE PIT W/SEED
PROP. SAWCUT & 4' HMA DRIVE
PROP. 4" LOAM & SEED AT LAWN
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE AND 5" STEP
PROP. 30'-48" CHAIN LINK FENCE & GATE
PROP. TREE PIT W/SEED
PROP. 5' CEM. CONC. SW
PROP. SAWCUT & 4' CEM. CONC. WALK SURFACE AND 6" STEP
PROP. 25'-8" QUARTER ROUND CURB
PROP. 6' CEM. CONC. SW
MATCH LINE
CONT. ON SHEET 60
TRAPELO ROAD
Δ =2°09'40"
R=1270.74'
T=23.97'
L=47.93'
HOR. SCALE IN FEET
0 20 50 100
OXFORD AVENUE
LIMIT OF WORK MEET EXISTING
PROP. 1½" MICRO-MILLING & PVM'T OVERLAY
563.93'
N19°42'33"E
HOR. SCALE IN FEET
0 20 50
CONT. ON SHEET 60

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	62	214
PROJ. FILE NO. 604688			

PROFILE SIDE STREETS

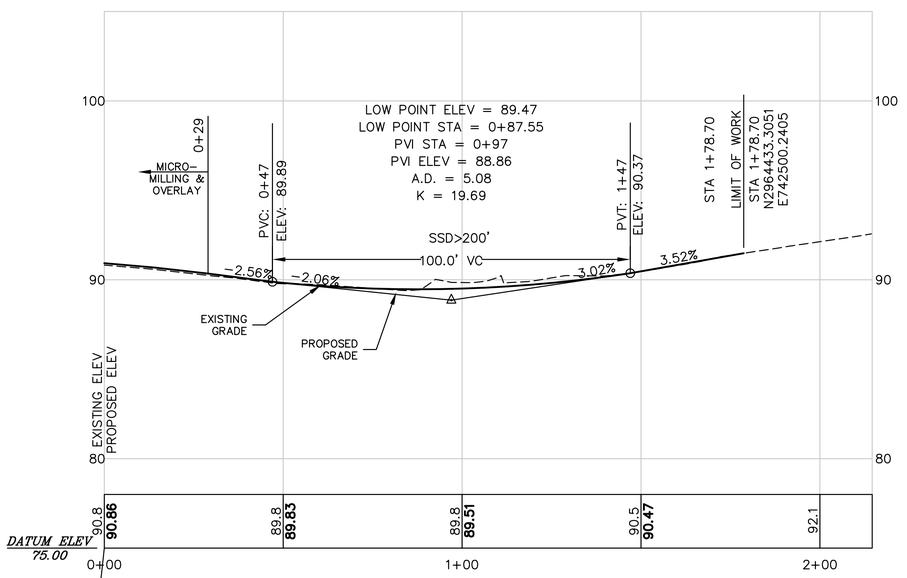


BEECH STREET (NORTH)

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'

STA. 56+09.67 TRAPELO ROAD ℄ =
STA. 0+00.00 BEECH STREET ℄

NOTE:
FOR CONSTRUCTION PLANS SEE
SHEET NO. 42



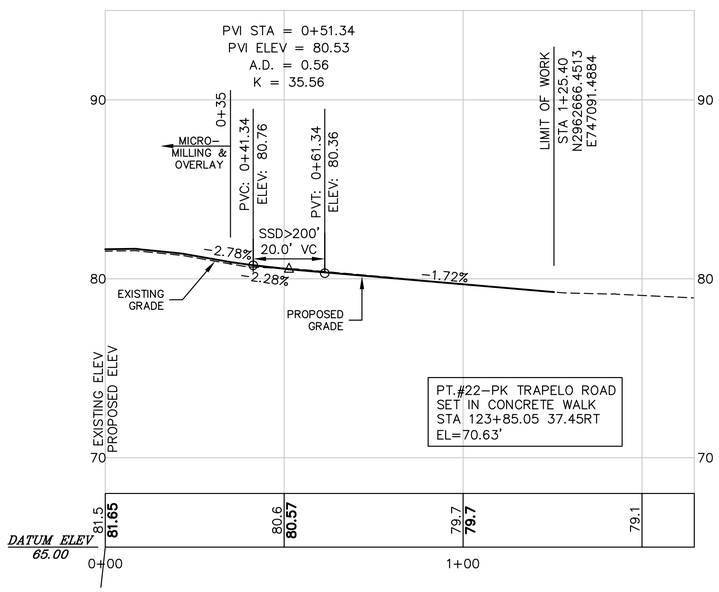
HARRIET AVENUE

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'

PT.#13-PK TRAPELO ROAD
SET IN CONCRETE WALK
STA 70+44.99 31.92LT
EL=87.34'

STA. 71+45.30 TRAPELO ROAD ℄ =
STA. 0+00.00 HARRIET AVENUE ℄

NOTE:
FOR CONSTRUCTION PLANS SEE
SHEET NO. 45

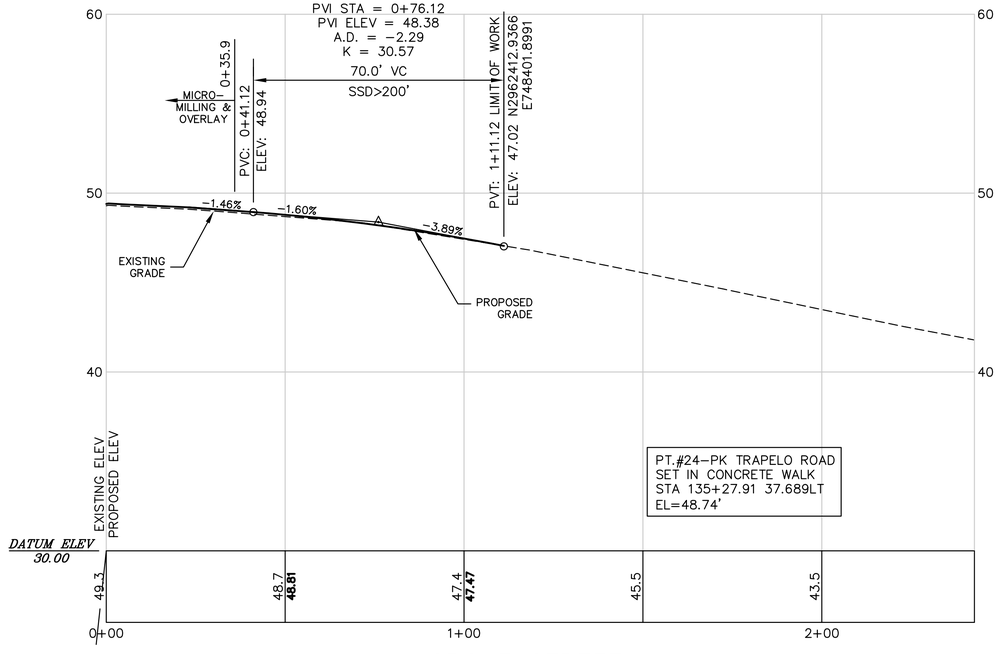


SCHOOL STREET (NORTH)

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'

STA. 121+54.17 TRAPELO ROAD ℄ =
STA. 0+00.00 SCHOOL STREET ℄

NOTE:
FOR CONSTRUCTION PLANS SEE
SHEET NO. 56



GROVE STREET

HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'

STA. 135+18.09 TRAPELO ROAD ℄ =
STA. 0+00.00 GROVE STREET ℄

NOTE:
FOR CONSTRUCTION PLANS SEE
SHEET NOS. 58-59

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

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	63	214
PROJ. FILE NO. 604688			

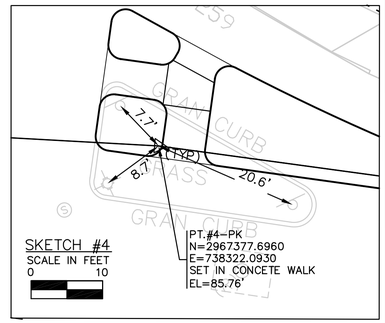
GRADING AND TIE PLAN

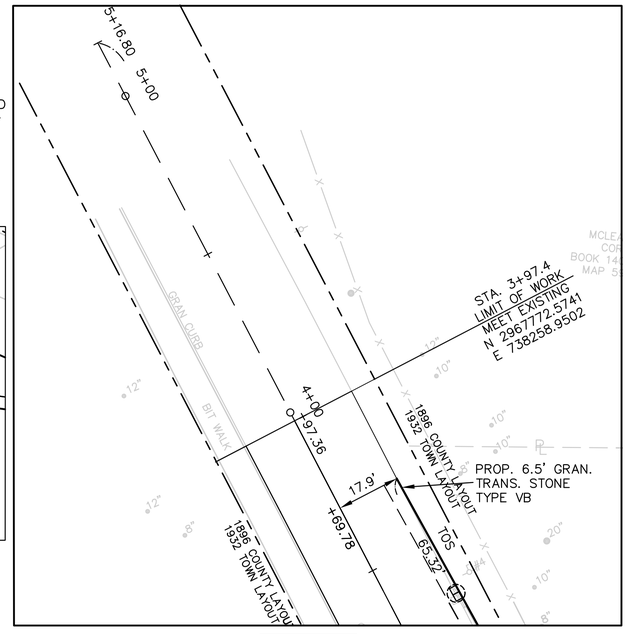
CONT'D BELOW

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C1	10.00	9.34	5.04	53°31'09"
C2	10.00	9.23	4.97	52°53'42"
C199	31.00	40.69	23.87	75°12'02"
C200	27.00	47.10	32.16	99°57'40"
C201	315.00	289.63	155.96	52°40'55"
C202	70.00	105.04	65.25	85°58'50"
C203	5.00	10.96	9.73	125°35'21"
C204	102.00	49.93	25.48	28°02'56"
C205	6.00	14.03	14.11	133°56'21"
C206	5.00	11.22	10.37	128°31'12"
C208	2.00	3.88	2.91	111°05'08"
C209	2.00	3.14	2.00	90°00'00"
C210	319.00	27.05	13.53	4°51'31"
C211	3.00	8.65	23.08	165°11'06"
C858	2.00	3.82	2.84	109°40'25"
C859	2.00	3.20	2.05	91°35'56"
C860	2.00	3.22	2.09	92°23'48"
C861	2.00	3.05	1.92	87°36'08"
C862	2.00	3.17	2.03	90°44'05"
C863	2.00	3.11	1.97	89°15'55"
C900	11.00	10.57	5.74	55°23'45"
C901	5.00	7.79	4.93	89°14'09"
C902	5.00	8.78	6.03	100°39'57"

NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.
2. PRIOR TO FINAL SETTINGS OF ROADSIDE CURBING CONTRACTOR SHALL CHECK THE RESULTING BACK OF SIDEWALK GRADES TO VERIFY THAT THE WORK OR LACK OF WORK ON THE ABUTTING PRIVATE PROPERTIES WILL BE CONSISTANT WITH WHAT IS SHOWN ON THE CONSTRUCTION PLANS.
3. PROP. CURB REVEAL SHALL TRANSITION AT A RATE NO GREATER THAN 1" REVEAL FOR EVERY 6 FEET OF CURB LENGTH.
4. ALL EXIST. AND PROPOSED DRIVEWAY CURB CORNERS ARE 2' RADIUS. IF ANY EXISTING 3' CURB CORNERS ARE FOUND, THEY SHOULD BE RELOCATED TO A DRIVEWAY WITH A WIDE PLANTING STRIP.

ABBREVIATIONS:
REV = PROPOSED CURB REVEAL
XXX.XX(P) = PROPOSED ELEVATION AFTER MILLING AND STANDARD (3½" MAIN LINE, 1½" SIDE STREET) OVERLAY
XXX.XX(E) = EXISTING ELEVATION
XXX.XX = PROPOSED ELEVATION AFTER MILLING AND VARIABLE DEPTH OVERLAY
TC= TOP OF CURB
BC= BOTTOM OF CURB-GUTTER ELEVATION
LP= LOW POINT





CONT'D ABOVE

CONT. ON SHEET # 64

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	64	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

TRAPELO ROAD ℄
△ =8°29'00"
R=1305.82'
T=96.85'
L=193.34'

TRAPELO ROAD ℄
△ =3°31'10"
R=4085.11'
T=125.50'
L=250.93'

TRAPELO ROAD ℄
△ =5°45'22"
R=2999.50'
T=150.80'
L=301.34'

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C3	1339.82	198.38	99.37	8°29'00"
C4	4051.11	153.30	76.67	2°10'06"
C5	8.00	12.45	7.89	89°11'07"
C6	8.00	12.54	7.98	89°50'32"
C7	4051.11	112.56	56.28	1°35'31"
C212	1269.82	169.80	85.03	7°39'42"
C213	10.00	9.84	5.36	56°23'36"
C214	10.00	9.97	5.44	57°08'44"
C215	4087.11	306.57	153.36	4°17'52"
C849	10.00	5.02	2.56	28°44'15"
C850	10.00	5.10	2.61	29°12'35"
C857	2.00	3.13	1.98	89°32'34"

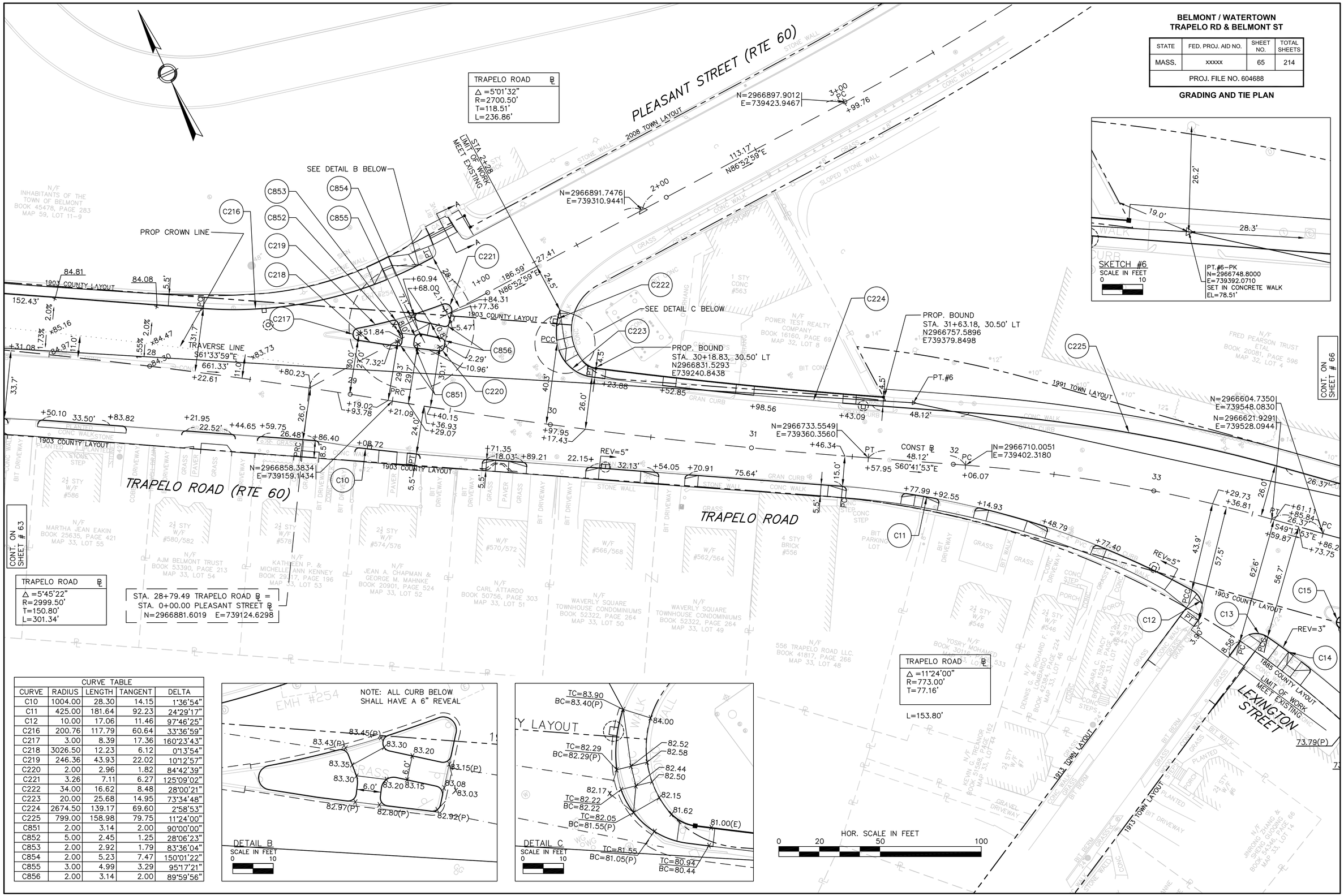
HOR. SCALE IN FEET
0 20 50 100

CONT. ON SHEET # 64
CONT. ON SHEET # 65

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	65	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN



CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C10	1004.00	28.30	14.15	1°36'54"
C11	425.00	181.64	92.23	24°29'17"
C12	10.00	17.06	11.46	97°46'25"
C216	200.76	117.79	60.64	33°36'59"
C217	3.00	8.39	17.36	160°23'43"
C218	3026.50	12.23	6.12	0°13'54"
C219	246.36	43.93	22.02	10°12'57"
C220	2.00	2.96	1.82	84°42'39"
C221	3.26	7.11	6.27	125°09'02"
C222	34.00	16.62	8.48	28°00'21"
C223	20.00	25.68	14.95	73°34'48"
C224	2674.50	139.17	69.60	2°58'53"
C225	799.00	158.98	79.75	11°24'00"
C851	2.00	3.14	2.00	90°00'00"
C852	5.00	2.45	1.25	28°06'23"
C853	2.00	2.92	1.79	83°36'04"
C854	2.00	5.23	7.47	150°01'22"
C855	3.00	4.99	3.29	95°17'21"
C856	2.00	3.14	2.00	89°59'56"

NOTES:
1. FOR GRADING OF CHURCH STREET AND MBTA PARKING LOT SEE NEXT SHEET.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	66	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

TRAPELO ROAD ℄
△ =17°57'51"
R=658.00'
T=104.01'
L=206.30'

TRAPELO ROAD ℄
△ =2°28'09"
R=2000.00'
T=43.10'
L=86.19'

STA. 34+87.32 TRAPELO ROAD ℄ =
STA. 0+00.00 LEXINGTON STREET ℄
N=2966544.9486 E=739629.4696

STA. 38+65.65 TRAPELO ROAD ℄ =
STA. 0+00.00 CHURCH STREET ℄
N=2966394.5463 E=739976.0919

STA: 1+28.25
N=2966432.4374
E=739567.9004

N=2966604.7350
E=739548.0830
N=2966621.9291
E=739528.0944
N=2966496.7105
E=739722.8538
N=2966409.0117
E=739936.9209
N=2966440.6032
E=739856.7344

TRAVERSE LINE
S52°37'02"E
545.30'

CONST ℄
497.05'
S69°43'53"E

CONST ℄
145.16'
S67°15'44"E

CONST ℄
524.75'
S77°35'44"E

CONST ℄
128.26'
S28°41'19"W

CONST ℄
275.32'
S10°35'27"E

CONST ℄
417.17'
S60°20'13"W

REVEAL TRANSITIONS 6" TO 8"

REVEAL TRANSITIONS 8" TO 6"

REVEAL TRANSITIONS 6" TO 4"

LIMIT OF WORK MEET EXISTING

1903 COUNTY LAYOUT
1898 COUNTY LAYOUT
1893 COUNTY LAYOUT
1885 COUNTY LAYOUT
1951 TOWN LAYOUT
1954 TOWN LAYOUT
1926 TOWN LAYOUT

TRAPELO ROAD
SHAW'S DRIVE
LEXINGTON STREET
CHURCH STREET

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C13	10.00	15.48	9.77	88°40'18"
C14	425.00	25.47	12.74	3°26'01"
C15	3.00	8.03	12.68	153°22'54"
C16	695.00	70.11	35.08	5°46'47"
C18	5.00	7.46	4.62	85°30'19"
C19	40.00	40.16	21.96	57°31'30"
C20	20.00	7.80	3.95	22°19'55"
C21	20.00	7.80	3.95	22°19'54"
C22	22.00	49.93	47.21	130°01'46"
C23	6.61	13.05	10.01	113°08'54"
C24	5.00	15.71	INFINITE	180°00'00"
C33	2.00	4.43	4.00	126°54'13"
C34	50.00	43.57	23.28	49°55'54"
C226	632.00	41.11	20.56	3°43'37"
C227	25.00	42.32	28.25	96°58'59"
C228	28.00	42.29	26.35	86°31'51"
C229	632.00	26.99	13.50	2°26'50"
C800	5.00	7.75	4.91	88°54'01"
C840	5.00	5.83	3.30	66°47'48"
C845	425.00	85.99	43.14	11°35'34"
C846	2.00	5.11	6.62	146°23'18"
C847	80.98	36.04	18.33	25°30'13"
C864	2.00	1.95	1.06	55°55'07"

CONT. ON SHEET # 65

CONT. ON SHEET # 67

CONT. ON SHEET # 70

HOR. SCALE IN FEET
0 20 50 100

SKETCH #7
SCALE IN FEET
0 10

PT.#7-PK
N=2966417.7300
E=739825.3620
SET IN CONCRETE WALK
EL=74.73'

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	67	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

TRAPELO ROAD

1898 COUNTY LAYOUT

1951 TOWN LAYOUT

1954 TOWN LAYOUT

1926 TOWN LAYOUT

CHURCH STREET

PROP. CROWN LINE

1+00

2+00

STA 00+60, 10.60' RT
71.50

STA 00+80, 19.00' RT
71.85

XSTA 00+90, 12.00' RT
71.55

N/F
ANTHONY J. & JEAN P.
OLIVERI
BOOK 48138, PAGE 191
MAP 28, LOT 133

N/F
COMMONWEALTH OF MASSACHUSETTS BAY
MDC PARKWAYS; AUTH. PAGE 113
BOOK 13117, PAGE 113
MAP 33, LOT 90

N/F
BELMONT INHABITANTS
MUNICIPAL PARKING LOT
CHURCH STREET
BOOK 7791, PAGE 242
MAP 33, LOT 90-B

N/F
ALEXANDER E. CORBETT III
BOOK 22662, PAGE 117
MAP 28, LOT 134

N/F
CHOBANIAN
NOMINEE TRUST
BOOK 37211, PAGE
562
MAP 28, LOT
136-A

N/F
CHURCH STREET REALTY
TRUST
BOOK 22237, PAGE 69
MAP 28, LOT 135

CONT. ON
SHEET # 68

SCALE IN FEET
0 5 10 20 30

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	68	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

NOTES:
1. FOR GRADING OF CHURCH AND LEXINGTON STREET SEE NEXT SHEET.

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C25	5.00	15.71	INFINITE	180°00'00"
C26				
C27	25.00	21.20	11.28	48°34'31"
C28	37.00	39.05	21.57	60°28'29"
C29	5.00	6.95	4.17	79°41'40"
C30	11.00	18.66	12.47	97°10'18"
C31	20.00	24.83	14.30	71°08'39"
C32	5.00	9.79	7.44	112°12'41"
C801	5.00	15.56	INFINITE	178°02'38"
C802	2.00	4.16	3.41	119°11'50"
C903	2.00	3.03	1.891	86°52'35"

STA. 3+76.84 LEXINGTON STREET ℄ =
STA. 4+17.17 CHURCH STREET ℄
N=2966188.0878 E=739613.5887

N=2966161.8062
E=739618.5029

N=2966106.4921
E=739630.0207

LEXINGTON STREET ℄
△ =16°11'00"
R=1381.73'
T=196.44'
L=390.27'

HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	69	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

CONT. ON SHEET # 67

1885 COUNTY LAYOUT

1926 TOWN LAYOUT

LEXINGTON STREET

THAYER ROAD

3+00

4+00

STA. 4+05.5
70.50

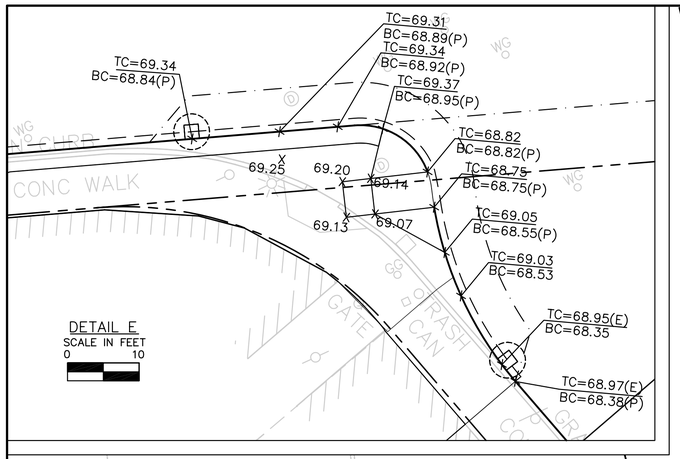
SCALE IN FEET
0 5 10 20 30

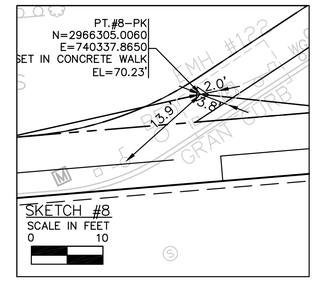
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	70	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C35	10.00	7.95	4.20	45°34'23"
C36	10.00	7.95	4.20	45°34'23"
C37	10.00	7.95	4.20	45°34'23"
C38	10.00	7.95	4.20	45°34'23"
C39	10.00	15.41	9.71	88°17'58"
C40	28.00	38.56	23.04	78°54'22"
C41	5.00	7.66	4.81	87°45'04"
C42	10.00	6.75	3.51	38°40'29"
C43	10.00	7.89	4.17	45°13'48"
C44	1186.00	60.91	30.46	2°56'32"
C230	10.00	7.95	4.20	45°34'23"
C231	10.00	7.95	4.20	45°34'23"
C232	10.00	7.95	4.20	45°34'23"
C233	10.00	7.95	4.20	45°34'23"
C234	10.00	17.32	11.76	99°15'00"
C235	25.00	34.64	20.75	79°23'36"
C236	20.00	30.06	18.69	86°07'39"
C237	60.00	60.19	32.90	57°28'47"
C238	32.00	81.49	104.34	145°54'00"
C239	10.00	7.95	4.20	45°34'23"
C240	10.00	7.95	4.20	45°34'23"
C803	50.00	29.79	15.35	34°08'22"
C865	2.00	3.14	2.00	90°00'00"
C866	2.00	3.40	2.28	97°29'01"





CONT. ON SHEET # 71

CONT. ON SHEET # 66

TRAPELO ROAD
△ =2°28'09"
R=2000.00'
T=43.10'
L=86.19'

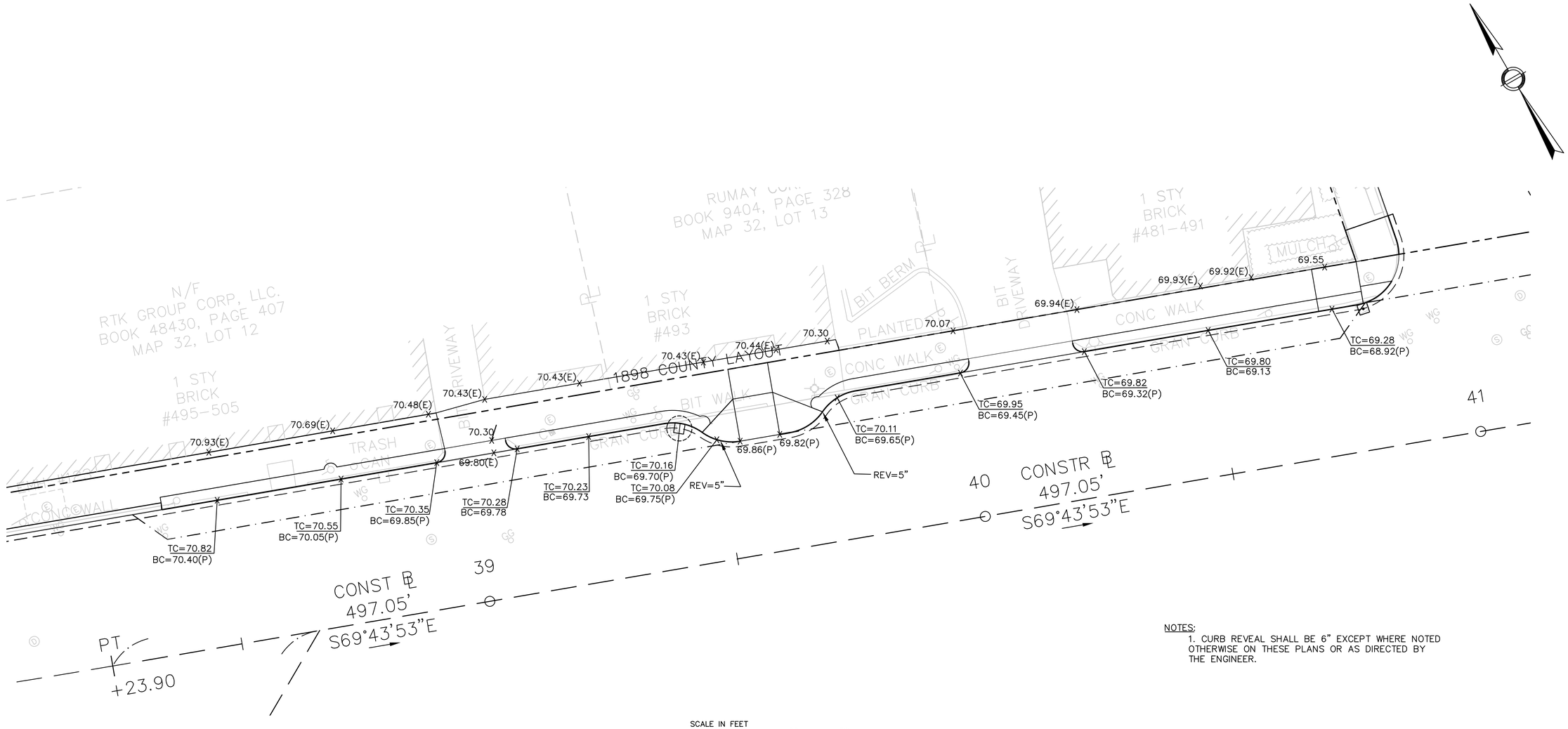
HOR. SCALE IN FEET
0 20 50 100

DETAIL D
SCALE IN FEET
0 10

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	71	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN



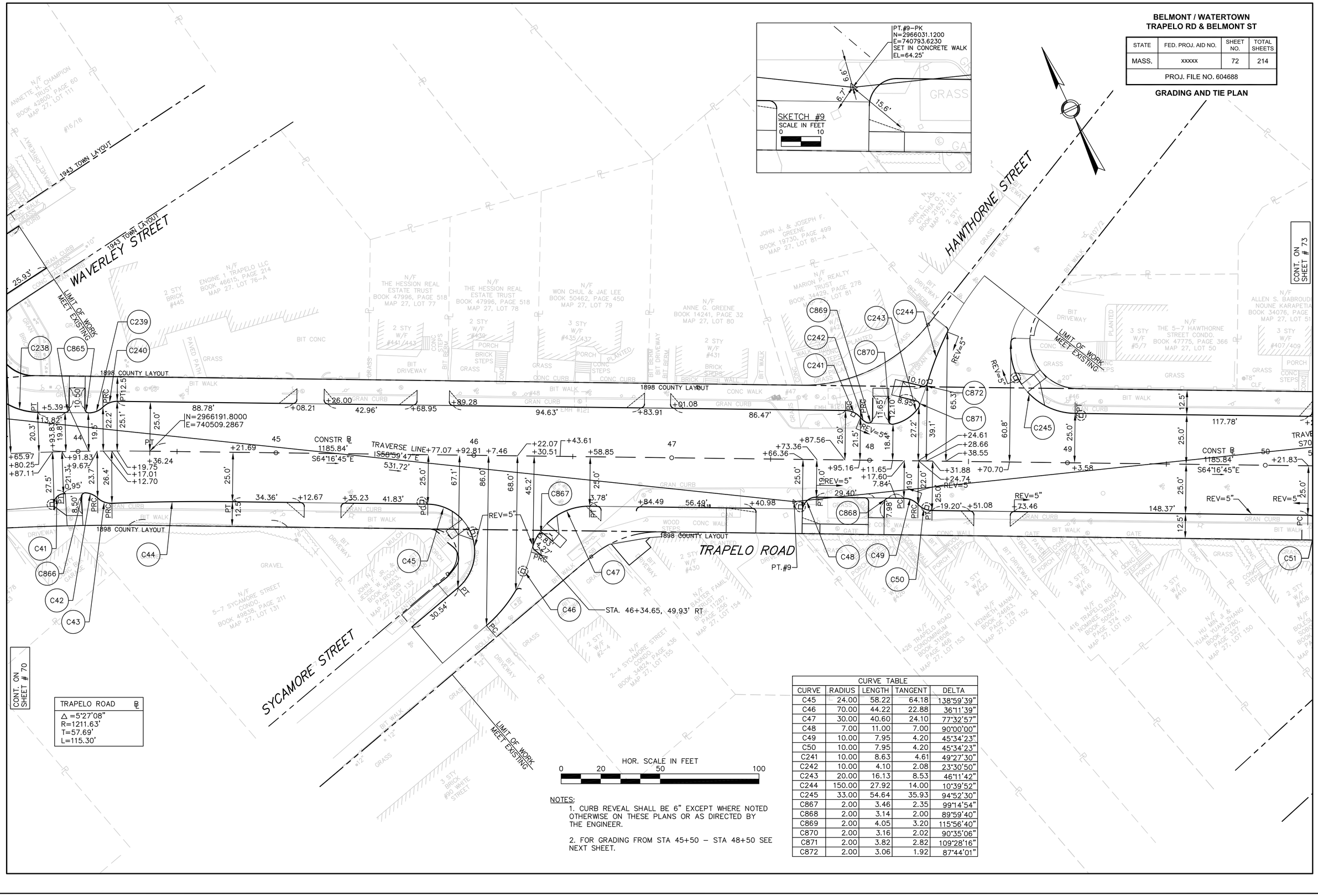
NOTES:

1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	72	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN



CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C45	24.00	58.22	64.18	138°59'39"
C46	70.00	44.22	22.88	36°11'39"
C47	30.00	40.60	24.10	77°32'57"
C48	7.00	11.00	7.00	90°00'00"
C49	10.00	7.95	4.20	45°34'23"
C50	10.00	7.95	4.20	45°34'23"
C241	10.00	8.63	4.61	49°27'30"
C242	10.00	4.10	2.08	23°30'50"
C243	20.00	16.13	8.53	46°11'42"
C244	150.00	27.92	14.00	10°39'52"
C245	33.00	54.64	35.93	94°52'30"
C867	2.00	3.46	2.35	99°14'54"
C868	2.00	3.14	2.00	89°59'40"
C869	2.00	4.05	3.20	115°56'40"
C870	2.00	3.16	2.02	90°35'06"
C871	2.00	3.82	2.82	109°28'16"
C872	2.00	3.06	1.92	87°44'01"

NOTES:

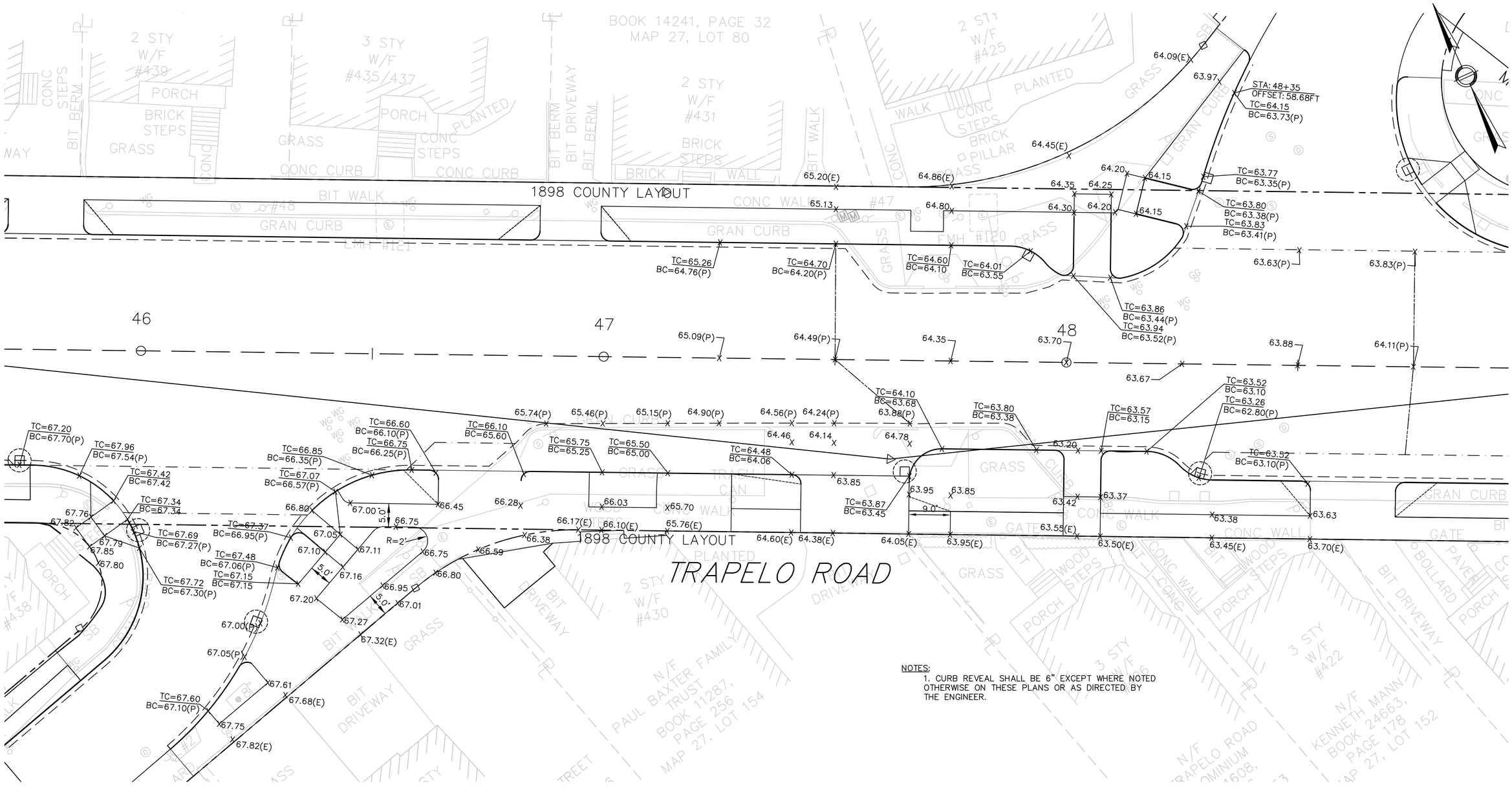
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

2. FOR GRADING FROM STA 45+50 – STA 48+50 SEE NEXT SHEET.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	73	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN



SCALE IN FEET
0 5 10 20 30

NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	74	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C51	8.00	7.79	4.24	55°47'01"
C52	12.00	25.98	22.58	124°02'00"
C53	21.00	48.94	48.92	133°32'00"
C246	33.00	43.25	25.36	75°05'15"
C247	18.00	33.12	23.64	105°25'11"

SKETCH #10
SCALE IN FEET
0 10

PT.#10-PK
N=2965851.0730
E=741316.4360
SET IN CONCRETE WALK
EL=74.56'

TRAPELO ROAD
DAVIS ROAD
MAPLE STREET
BEECH STREET

1898 COUNTY LAYOUT

TRAVERSE LINE
S70°59'50"E

CONST ℄
1185.84'
S64°16'45"E

CONST ℄
200.00'
S69°15'15"W

LIMIT OF WORK
MEET EXISTING

PT.#10

STA 1+33.3'

N=2965637.7917
E=741436.6480

CONT. ON SHEET # 75

CONT. ON SHEET # 72

HOR. SCALE IN FEET
0 20 50 100

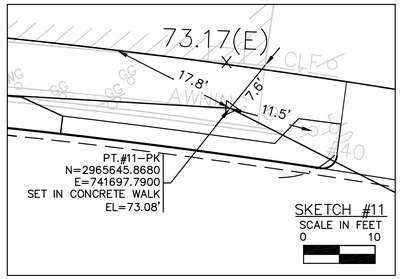
NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

NOTES:

1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

2. FOR GRADING OF BEECH STREET INTERSECTION SEE NEXT SHEET.

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C54	65.00	53.46	28.35	47°07'23"
C55	892.00	185.92	93.30	11°56'33"
C56	10.00	21.17	17.78	121°17'52"
C57	20.00	17.50	9.35	50°07'29"
C58	892.00	144.50	72.41	9°16'54"
C59	9.00	16.99	12.42	108°08'51"
C60	15.00	18.81	10.87	71°51'00"
C248	30.00	42.18	25.42	80°33'01"
C249	30.00	50.86	33.99	97°08'36"
C250	981.62	209.70	105.25	12°14'24"
C251	1208.00	227.42	114.05	10°47'12"
804	2.00	6.18	INFINITE	177°03'54"
805	918.00	33.13	16.56	2°04'03"
806	1182.00	64.07	32.04	3°06'21"
807	3.65	11.49	INFINITE	180°00'00"
808	4.00	12.56	INFINITE	180°00'00"



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

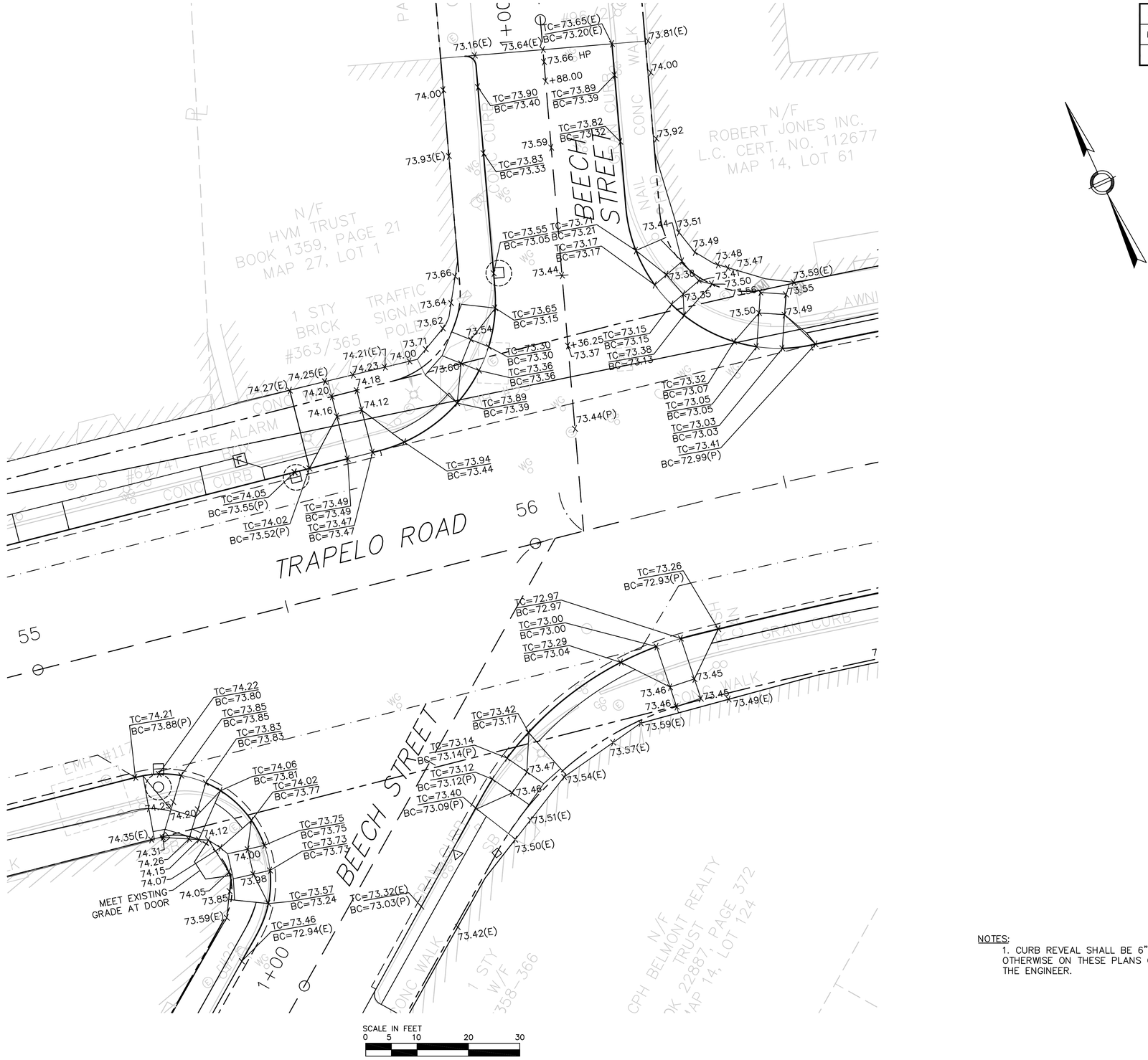
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	75	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	76	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN



NOTES:

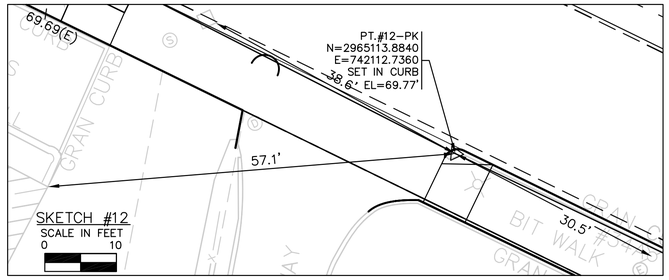
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	77	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C61	4.00	12.57	INFINITE	180°00'00"
C62	10.00	7.95	4.20	45°34'23"
C63	4.00	12.57	INFINITE	180°00'00"
C64	10.00	13.69	8.17	78°27'47"
C65	4.00	12.57	INFINITE	180°00'00"
C66	4.00	12.57	INFINITE	180°00'00"
C67	5.00	7.85	5.00	90°00'00"
C68	5.00	4.64	2.50	53°07'48"
C69	10.00	9.27	5.00	53°07'48"
C252				
C253				
C254	10.00	7.95	4.20	45°34'23"
C255	10.00	7.95	4.20	45°34'23"
C256	10.00	13.69	8.17	78°27'47"
C257	5.00	7.85	5.00	90°00'00"
C258	28.00	70.37	86.14	143°59'15"
C809	4.00	12.56	INFINITE	180°00'00"
C810	4.00	12.56	INFINITE	180°00'02"
C894	10.00	7.95	4.20	45°34'23"



CONT. ON SHEET # 75

CONT. ON SHEET # 78

TRAPELO ROAD

FLETT ROAD

1898 COUNTY LAYOUT

CONST ℄

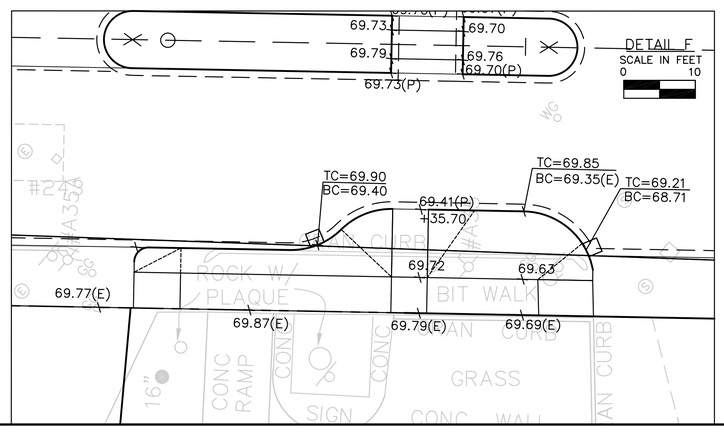
TRAVERSE LINE S37°57'15"E 674.68'

S38°56'45"F 919.25'

LIMIT OF WORK MEET EXISTING

SEE DETAIL F

PT.#12



HOR. SCALE IN FEET
0 20 50 100

NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	78	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C70	4.00	12.57	INFINITE	180°00'00"
C71	4.00	12.57	INFINITE	180°00'00"
C72	5.00	7.85	5.00	89°59'59"
C73	5.00	7.85	5.00	89°59'59"
C74	1156.30	121.20	60.66	6°00'20"
C75	10.00	8.00	4.23	45°55'44"
C76	10.00	7.89	4.16	45°13'09"
C77	1150.30	7.65	3.83	0°22'52"
C78	23.00	34.80	21.71	86°41'18"
C79	15.00	13.80	7.43	52°42'24"
C80	20.00	37.50	27.24	107°25'02"
C81	20.00	31.22	19.80	89°25'41"
C82	1000.00	35.09	17.55	2°00'37"
C83	1156.30	97.98	49.02	4°51'18"
C84	3.50	11.00	INFINITE	180°00'00"
C85	3.50	10.96	INFINITE	179°26'27"
C86	23.00	34.56	21.48	86°05'11"
C259	60.00	31.65	16.20	30°13'29"
C260	12.00	13.93	7.87	66°30'49"
C261	1098.30	59.53	29.77	3°06'20"
C262	28.00	70.38	86.24	144°01'37"
C263	3.00	6.07	4.80	116°00'52"
C264	54.00	23.01	11.68	24°24'58"
C265	2.00	4.43	4.00	126°49'25"
C266	1105.30	19.46	9.73	1°00'31"
C267	2.00	2.72	1.62	77°59'19"
C268	3.00	3.28	1.82	62°34'54"
C269	40.00	30.37	15.96	43°30'19"
C270	10.00	8.02	4.24	45°56'45"
C271	10.00	7.89	4.16	45°12'09"
C272	1098.30	150.51	75.37	7°51'06"
C366	1130.80	23.84	11.92	1°12'28"
C367	1123.80	23.61	11.80	1°12'13"
C369	1104.31	5.00	2.50	0°15'34"
C811	4.00	12.56	INFINITE	180°00'00"
C812	1123.00	17.68	8.84	0°54'07"
C813	1131.30	17.80	8.90	0°54'07"
C814	4.00	12.56	INFINITE	180°00'00"

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C873	2.00	2.86	1.74	82°03'45"
C875	2.00	2.97	1.83	84°58'39"
C876	2.00	3.33	2.20	95°23'16"
C877	2.00	4.05	3.21	116°07'30"

SKETCH #13
SCALE IN FEET 0 10
PT.#13-PK
N=2964582.2450
E=742549.8200
IN CONCRETE WALK
EL=87.34'
PILASTER
2.9'
17.9'
26.2'

TRAPELO ROAD ℄
△ =30°21'30"
R=1127.30'
T=305.84'
L=597.30'

STA. 71+63.55 TRAPELO ROAD ℄ =
STA. 0+00.00 SLADE STREET ℄
N=2964558.5824 E=742622.5579

STA. 71+45.30 TRAPELO ROAD ℄ =
STA. 0+00.00 HARRIET AVENUE ℄
N=2964570.6500 E=742608.8655

HARRIET AVENUE ℄
△ =12°01'23"
R=200.00'
T=21.06'
L=41.97'

DETAIL G
SCALE IN FEET 0 10

HOR. SCALE IN FEET
0 20 50 100

NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

CONT. ON SHEET # 77
CONT. ON SHEET # 79

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	79	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

TRAPELO ROAD
℄
Δ =30°21'30"
R=1127.30'
T=305.84'
L=597.30'

PT.#14-PK
N=2964229.9030
E=743230.4950
SET IN CONCRETE WALK
EL=125.53'

SKETCH #14
SCALE IN FEET
0 10

DETAIL H
SCALE IN FEET
0 10

GILBERT ROAD
1920 TOWN LAYOUT
LIMIT OF WORK MEET EXISTING
1898 COUNTY LAYOUT
TRAPELO ROAD
HARDING AVENUE
BARNARD ROAD
POPLAR S
SEE DETAIL H
SEE DETAIL I
CONT. ON SHEET # 78
CONT. ON SHEET # 80

TRAVERSE LINE
N=2964355.7518
E=742962.6546
S62°37'56"E
766.46'

CURVE TABLE

CURVE	RADIUS	LENGTH	TANGENT	DELTA
C87	26.00	40.99	26.15	90°20'03"
C88	823.75	128.44	64.35	8°56'01"
C89	25.00	41.23	27.04	94°29'37"
C90	25.00	37.56	23.35	86°05'00"
C91	30.00	44.94	27.89	85°49'44"
C92	25.00	41.89	27.77	96°00'16"
C93	10.00	7.95	4.20	45°34'23"
C94	10.00	7.95	4.20	45°34'23"
C273	28.00	55.05	42.02	112°38'27"
C274	35.00	46.01	27.01	75°19'06"
C275	1098.30	11.48	5.74	0°35'56"
C276	1985.00	188.62	94.38	5°26'40"
C815	3.11	10.35	INFINITE	190°09'53"
C816	1682.00	62.32	31.16	2°07'22"
C817	798.00	62.60	31.31	4°29'40"
C818	1.5	4.60	INFINITE	175°52'41"
C878	2.00	3.14	2.00	89°52'53"

HOR. SCALE IN FEET
0 20 50 100

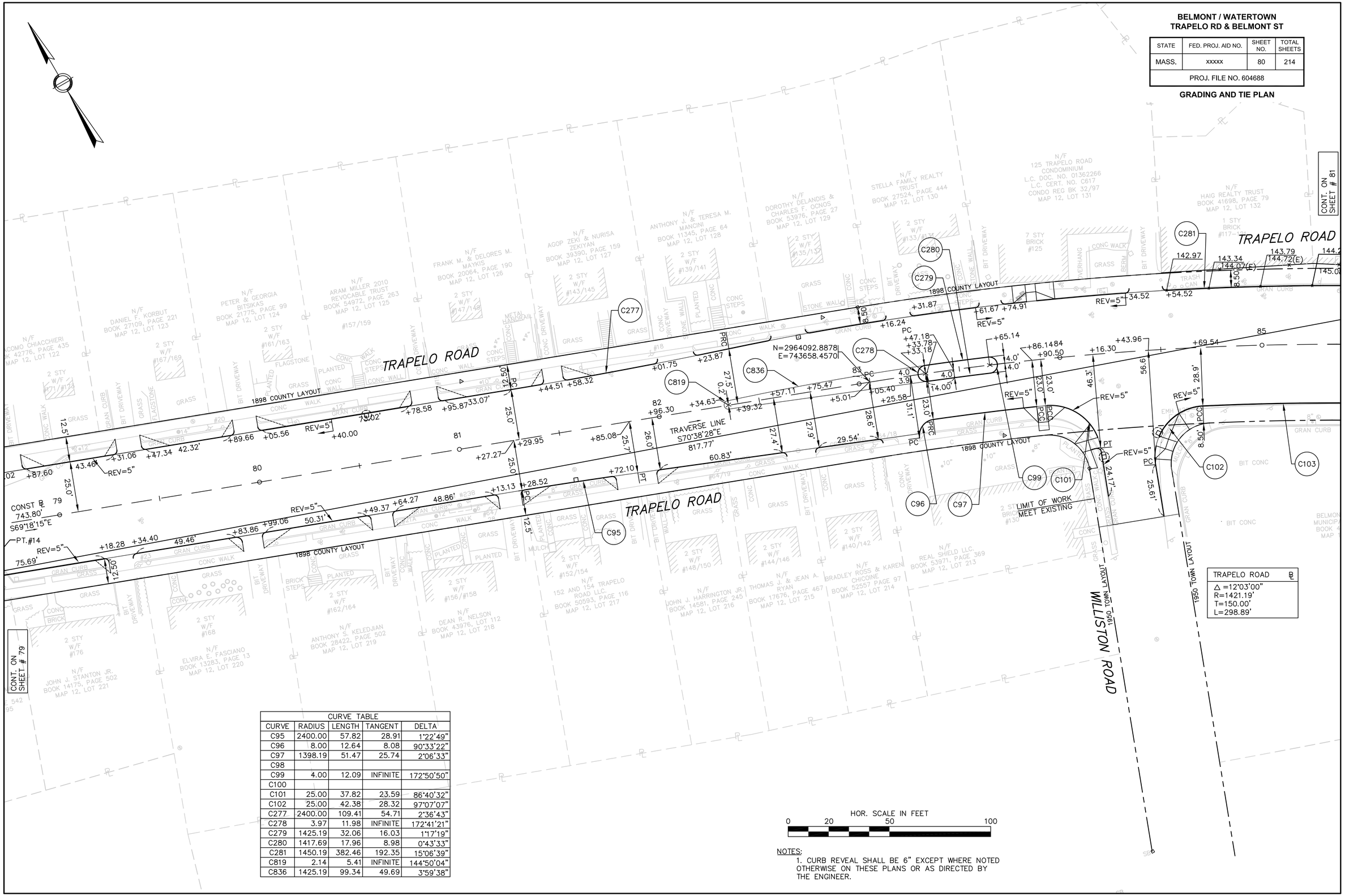
NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

DETAIL I
SCALE IN FEET
0 10

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	80	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN



CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C95	2400.00	57.82	28.91	1°22'49"
C96	8.00	12.64	8.08	90°33'22"
C97	1398.19	51.47	25.74	2°06'33"
C98				
C99	4.00	12.09	INFINITE	172°50'50"
C100				
C101	25.00	37.82	23.59	86°40'32"
C102	25.00	42.38	28.32	97°07'07"
C277	2400.00	109.41	54.71	2°36'43"
C278	3.97	11.98	INFINITE	172°41'21"
C279	1425.19	32.06	16.03	1°17'19"
C280	1417.69	17.96	8.98	0°43'33"
C281	1450.19	382.46	192.35	15°06'39"
C819	2.14	5.41	INFINITE	144°50'04"
C836	1425.19	99.34	49.69	3°59'38"

HOR. SCALE IN FEET
0 20 50 100

NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	81	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C26	22.46	16.82	8.83	42°53'52"
C103	1392.19	126.20	63.14	5°11'37"
C104	5.00	7.84	4.99	89°51'02"
C105	60.00	71.64	40.78	68°24'28"
C106	274.33	84.54	42.61	17°39'22"
C109	35.00	58.44	38.65	95°40'22"
C110	4.00	12.57	INFINITE	180°00'00"
C111	4.00	12.57	INFINITE	180°00'00"
C282	31.00	72.65	73.51	134°15'59"
C283	2.00	3.88	2.92	111°11'54"
C284	3.00	7.01	7.04	133°49'03"
C285	3.00	6.02	4.71	114°59'03"
C292	10.00	7.95	4.20	45°34'23"
C293	10.00	7.95	4.20	45°34'23"
C294	15.00	35.77	37.72	136°37'55"
C295	20.00	31.25	19.84	89°32'45"
C296	10.00	7.95	4.20	45°34'23"
C297	10.00	7.95	4.20	45°34'23"
C879	2.00	3.14	2.00	90°00'00"

NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.
2. FOR GRADING OF CUSHING AVENUE AND INTERSECTION WITH COMMON STREET SEE NEXT SHEET

STA. 88+09.89 TRAPELO ROAD ℄ =
STA. 0+00.00 COMMON STREET ℄
N=2963847.5350 E=744097.8541

CONT. ON SHEET # 83

CONT. ON SHEET # 85

CONT. ON SHEET # 80

CONT. ON SHEET # 84

TRAPELO ROAD ℄
△ =12°03'00"
R=1421.19'
T=150.00'
L=298.89'

STA. 87+71.83 TRAPELO ROAD ℄ =
STA. 0+00.00 COMMON STREET ℄
N=2963868.1193 E=744065.8471

HOR. SCALE IN FEET
0 20 50 100

DETAIL J
SCALE IN FEET
0 10

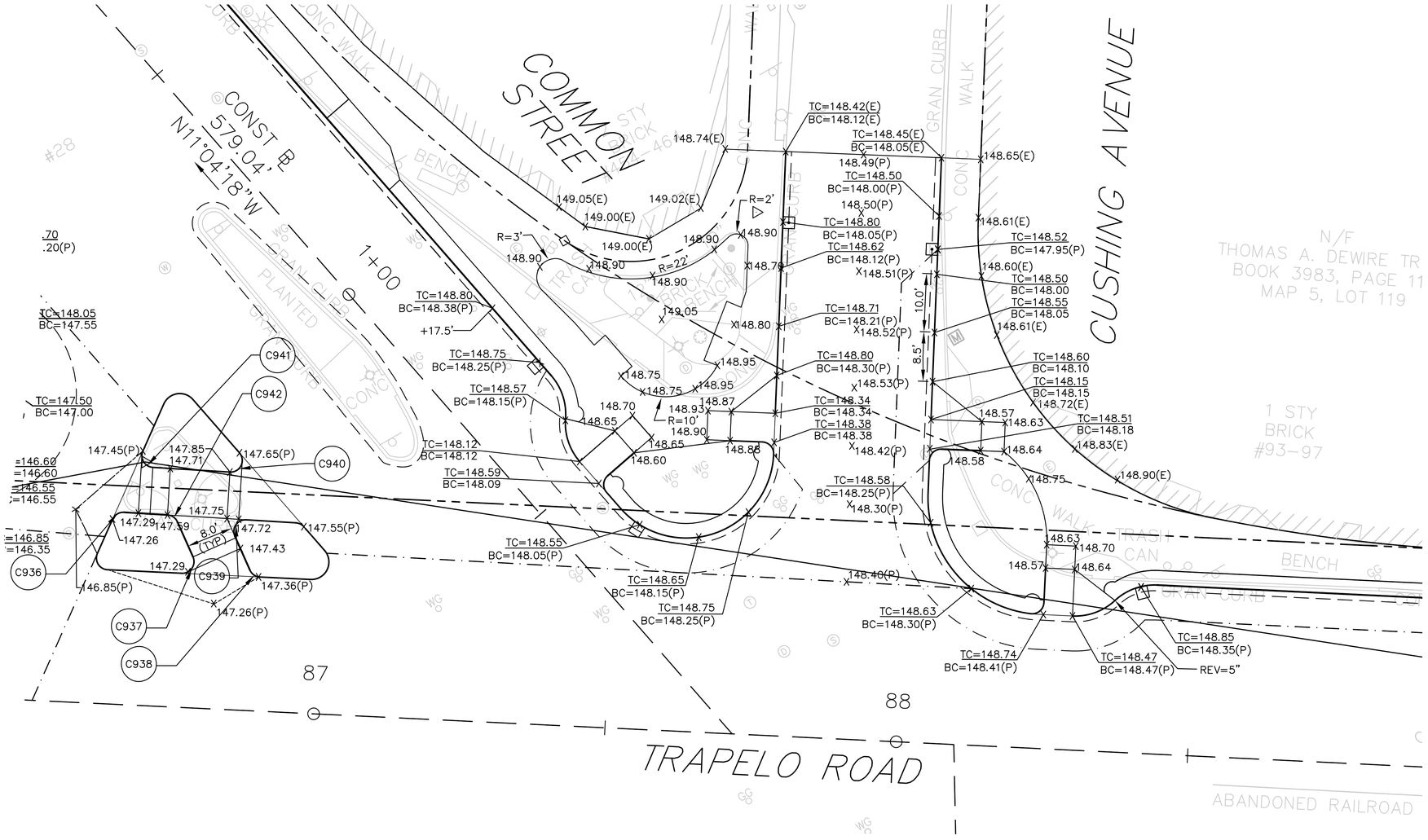
SKETCH #15
SCALE IN FEET
0 10
PT.#15-PK
N=2963958.8240
E=744002.0290
SET IN CONCRETE WALK
EL=147.32'

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C936	2.00	2.43	1.39	69°34'19"
C937	2.00	4.10	3.30	117°30'18"
C938	2.00	2.32	1.31	66°30'32"
C939	2.00	4.10	3.30	117°28'19"
C940	2.00	4.70	4.78	154°35'13"
C941	2.00	3.85	2.88	110°25'47"
C942	2.00	2.18	1.21	62°31'41"

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	82	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN



NOTES:

1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	83	214
PROJ. FILE NO. 604688			

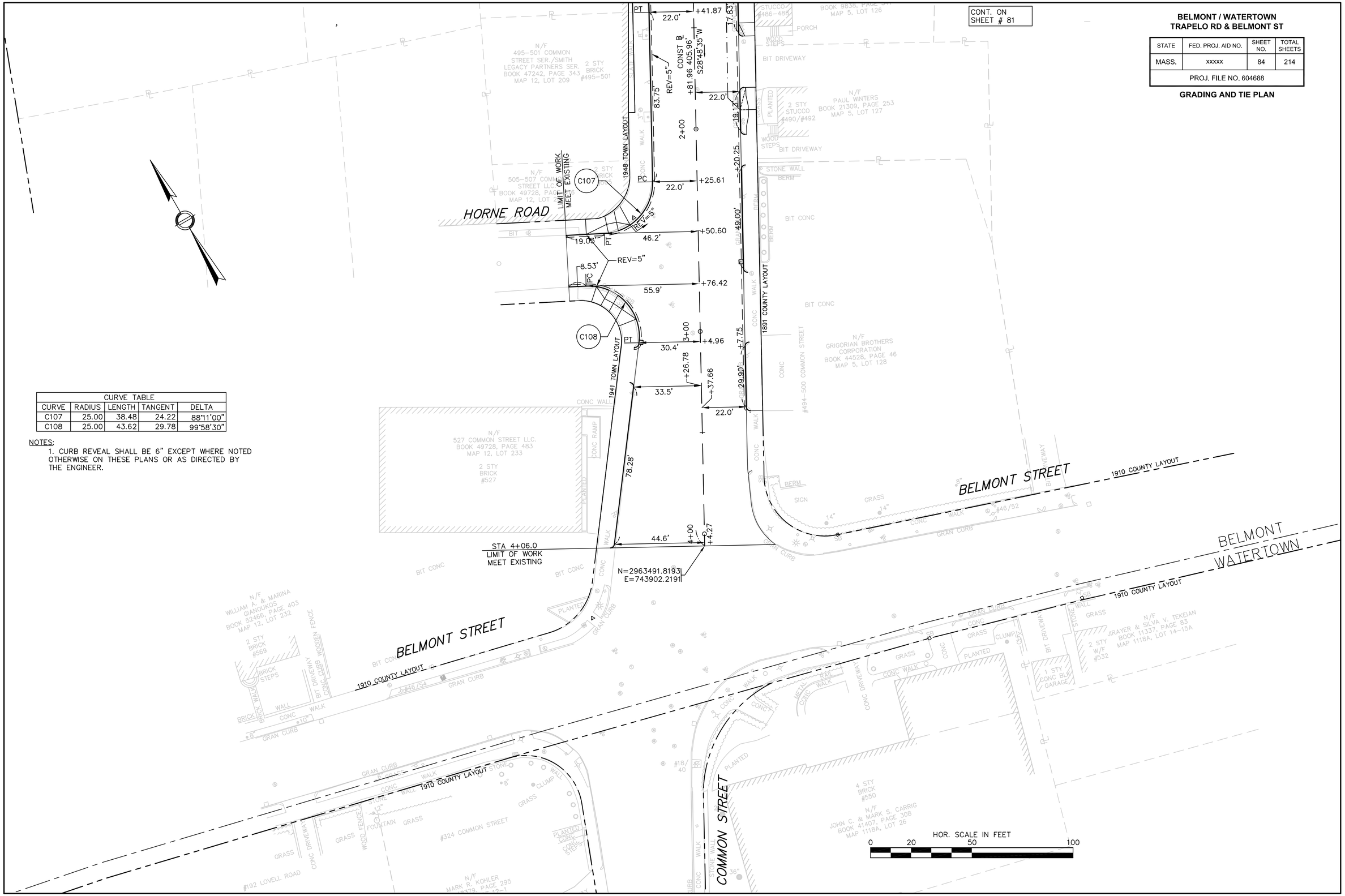
GRADING AND TIE PLAN

NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

HOR. SCALE IN FEET
0 20 50 100

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C286	34.00	53.56	34.15	90°15'00"
C287	56.00	62.20	34.75	63°38'22"
C288	656.58	50.43	25.23	4°24'01"
C289	70.00	54.49	28.71	44°36'08"
C290	10.00	6.75	3.51	38°41'15"
C291	10.00	7.00	3.65	40°06'18"

PAYSON ROAD
PALFREY ROAD
COMMON STREET
1891 COUNTY LAYOUT
1925 TOWN LAYOUT
CONST. @ N12°37'18"W 199.66'
N=2964436.3836
E=743954.6499
LIMIT OF WORK MEET EXISTING
STA 5+56.4 LIMIT OF WORK MEET EXISTING N 2964414.1155 E 743959.0072
N11°04'18"W 579.04'
PCC
PRC
PC
PT
REV 5%
2 STY STUCCO #15/17 — STEPHEN J. & CATHERINE N/F DAHILL BOOK 21913, PAGE 417 MAP 6, LOT 181
2 STY STUCCO #9/11 — 9-11 PAYSON ROAD N/F CONDOMINIUM BOOK 48003, PAGE 227 MAP 6, LOT 180
3 STY W/F #1/3 — 3 PAYSON ROAD N/F NOMINEE TRUST BOOK 27850, PAGE 265 MAP 6, LOT 179
2 STY W/F #430 — JANICE W. KNIGHT N/F BOOK 13789, PAGE 18 MAP 6, LOT 178
1 STY BRICK #432-444 — J G TELLIER REALTY TRUST N/F BOOK 13786, PAGE 158 MAP 6, LOT 176
2 STY BRICK #448 — J&J BELMONT TRUST N/F BOOK 30703, PAGE 387 MAP 6, LOT 175
1 STY BRICK #441-449 — CUSHING SQUARE LLC. N/F BOOK 52949, PAGE 269 MAP 12, LOT 134
1 STY BRICK #439 — ZAREH & LORI ORCHANIAN BOOK 41058, PAGE 204 MAP 12A, LOT 135
DANIEL & BARBARA M. SHEA N/F BOOK 9643, PAGE 149 MAP 12, LOT 136
BELMONT MEMORIAL CHURCH N/F MAP 16, LOT 1
THE BOOK 31 MAP 6
BENCH ON CONC PAD
BRICK DRIVEWAY
CONC DRIVEWAY
BERM
GRASS
GRAN CURB
BRICK WALK
CONC WALK
CONC STEPS
HAND RAIL
STONE WALL
METAL
SIGN
PLANTED
+78.70
7+00
6+00
4+00
3+00
2+00
+79.04
+56.35
+38.44
+5.21
+10.91
+79.87
+68.82
+72.13
+36.83
+31.72
+5.75
+29.51
+23.13
+71.49
+84.08
+39.00
56.4'
31.2'
53.3'
27.1'
61.61'
40.0'
220.27'
356.46'
46.2'
12.4'
14.7'
17.0'
8.0'
10.0'
6.00'
2.60'
R 21.5'
CONT. ON SHEET # 81



CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C107	25.00	38.48	24.22	88°11'00"
C108	25.00	43.62	29.78	99°58'30"

NOTES:

1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

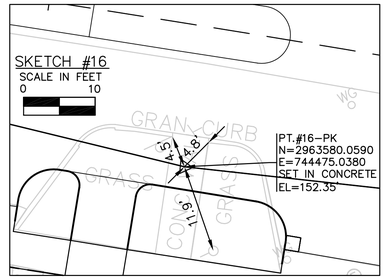
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	84	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	85	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN



CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C112	4.00	12.57	INFINITE	180°00'00"
C113	3592.19	21.34	10.67	0°20'25"
C114	3600.19	21.40	10.70	0°20'26"
C115	4.00	12.56	INFINITE	180°00'00"
C116	5.00	7.86	5.01	90°04'49"
C117	3573.19	27.87	13.93	0°26'49"
C118	5.00	7.86	5.01	90°04'49"
C119	3567.19	295.95	148.06	4°45'13"
C298	3625.19	61.78	30.89	0°58'35"
C299	10.00	7.97	4.21	45°40'46"
C300	10.00	5.72	2.94	32°47'17"
C301	22.00	37.23	24.85	96°57'19"
C302	40.00	55.09	32.92	78°54'51"
C303	3625.19	236.37	118.23	3°44'09"
C370	4.00	12.57	INFINITE	180°00'00"
C371	3592.19	44.66	22.33	0°42'45"
C372	3600.19	44.76	22.38	0°42'45"
C373	4.00	12.57	INFINITE	180°00'00"
C848	3567.2	66.77	33.39	01°04'21"
C880	2.00	3.14	2.00	90°00'00"
C881	2.00	3.56	2.48	102°08'54"
C882	2.00	3.20	2.06	91°46'12"
C883	2.00	4.68	4.73	134°08'28"
C884	2.00	2.64	1.55	75°43'19"
C904	4.00	12.56	3305.07	179°51'41"
C905	3600.19	13.08	6.54	00°12'29"

TRAPELO ROAD	℄
△ =6°26'00"	
R=3596.19'	
T=202.11'	
L=403.79'	

HOR. SCALE IN FEET
0 20 50 100

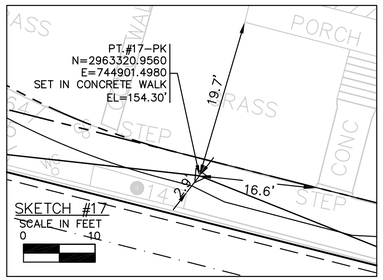
NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	86	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C120	2000.00	74.86	37.44	2°08'41"
C121	20.00	37.57	27.35	107°39'13"
C122	45.00	12.13	6.10	15°26'53"
C123	20.00	17.12	9.12	49°02'26"
C304	23.00	51.12	46.49	127°20'58"
C305	75.00	21.13	10.64	16°08'39"
C306	15.00	18.01	10.27	68°47'52"
C307	28.00	70.17	84.20	143°05'51"
C308	30.00	39.17	72.00	136°07'21"
C822	4.00	12.57	INFINITE	180°00'00"
C835	84.50	40.37	20.58	27°22'32"
C906	10.00	7.95	4.20	45°34'25"
C907	10.00	8.12	4.30	46°29'33"
C908	2.00	3.14	2.00	90°0'0"



CONT. ON SHEET # 87

CONT. ON SHEET # 85

NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	87	214
PROJ. FILE NO. 604688			

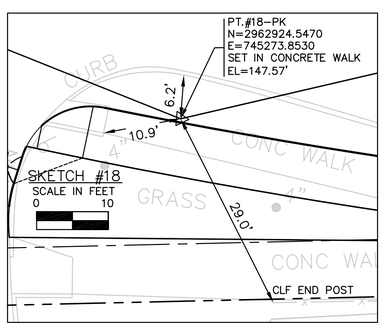
GRADING AND TIE PLAN

TRAPELO ROAD ℄
△ =15°29'00"
R=519.16'
T=70.58'
L=140.30'

TRAPELO ROAD ℄
△ =12°11'30"
R=692.96'
T=74.01'
L=147.45'

BELMONT STREET
OAKLEY ROAD
BELMONT
WATERTOWN
TRAVERSE LINE
S43°12'28"E
543.86'
CONST ℄
739.18'
S50°49'15"E
LIMIT OF WORK
MEET EXISTING
1898 COUNTY LAYOUT
REV=5"
PT.#18
PT.#19
N=2962941.9291
E=745311.0189
N=2962824.4773
E=745570.6405
N=2962793.4705
E=745727.9871
S78°05'07"E
506.49'
CONT. ON SHEET # 86
CONT. ON SHEET # 88

N/F CHARLES W. LEPINE BOOK 49405, PAGE 448 MAP 5, LOT 39 — 2 STY W/F #3
N/F MANOOG & BARBARA J. YOUNG BOOK 11523, PAGE 172 MAP 5, LOT 40 — 2 STY W/F #5/7
N/F JENNIFER L. BELOK BOOK 18071, PAGE 218 MAP 5, LOT 41 — 2 STY STUCCO #1/3
N/F NORTH SHORE CONSTRUCTION AND DEVELOPMENT INC. BOOK 54231, PAGE 360 MAP 5, LOT 1
N/F NORTH SHORE CONSTRUCTION AND DEVELOPMENT INC. BOOK 54231, PAGE 355 MAP 3, LOT 198
N/F NORTH SHORE CONSTRUCTION AND DEVELOPMENT INC. BOOK 54231, PAGE 350 MAP 3, LOT 193-A
N/F JEAN A. CONNERS BOOK 19455, PAGE 72 MAP 3, LOT 199 — 2 STY W/F #395/397
N/F OAKLEY COUNTRY CLUB BOOK 4488, PAGE 75 MAP 1120, LOT 1



HOR. SCALE IN FEET
0 20 50 100

NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C124	10.00	11.86	6.74	67°58'35"
C125	5.00	6.36	3.69	72°50'09"
C126	15.00	3.21	1.61	12°16'06"
C127	10.00	14.63	8.98	83°49'22"
C128	805.00	349.86	177.74	24°54'04"
C129	2.00	5.76	15.28	165°05'07"
C130	522.50	33.87	16.94	3°42'53"
C131	3.41	10.72	INFINITE	180°00'00"
C132	4.42	13.98	INFINITE	181°14'13
C133	779.50	78.98	39.52	5°48'19"
C134	689.21	62.36	31.20	5°11'02"
C135	10.00	7.95	4.20	45°34'23"
C136	10.00	15.91	10.20	91°08'46"
C309	490.16	111.57	56.03	13°02'30"
C310	98.00	21.01	10.54	12°16'57"
C311	516.16	13.24	6.62	1°28'13"
C312	25.00	53.13	44.88	121°45'38"
C313	75.00	26.24	13.25	20°02'41"
C314	40.00	61.16	38.36	87°35'53"
C315	663.96	38.46	19.23	3°19'07"
C909	10.00	7.95	4.20	45°34'24"

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	88	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

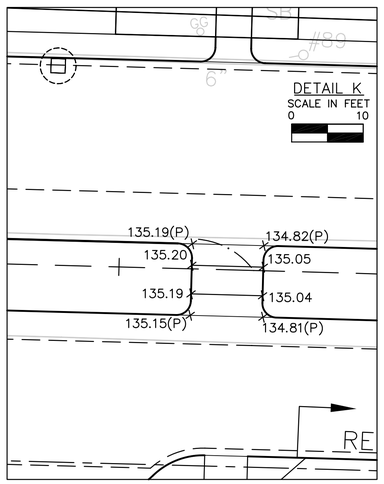
TRAPELO ROAD ℄
△ =3°21'00"
R=2603.31'
T=76.13'
L=152.21'

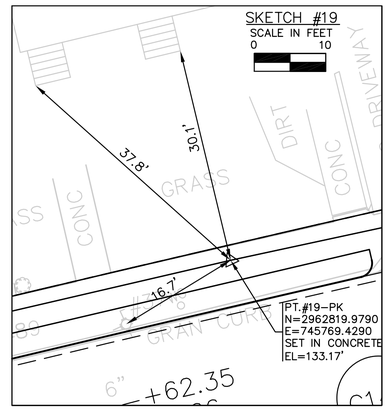
CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C914	10.00	7.95	4.20	45°34'23"
C915	10.00	15.91	10.20	91°08'46"
C916	10.00	7.95	4.20	45°34'24"
C917	5520.10	56.76	28.38	0°35'21"
C918	10.00	7.20	3.77	41°16'50"
C919	10.00	15.91	10.20	91°08'46"
C920	10.00	7.95	4.20	45°34'24"
C921	10.00	7.95	4.20	45°34'24"
C922	10.00	15.91	10.20	91°08'46"
C923	10.00	7.24	3.79	41°28'01"

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C136	10.00	15.91	10.20	91°08'46"
C137	2.00	3.14	2.00	90°00'00"
C138	2.00	3.14	2.00	90°00'00"
C139	10.00	7.94	4.19	45°28'21"
C140	10.00	7.95	4.20	45°32'41"
C141	5193.35	77.02	38.51	0°50'59"
C142	5555.60	195.50	97.76	2°00'58"
C143	5545.60	195.08	97.55	2°00'56"
C144	2599.81	112.21	56.11	2°28'22"
C145	2609.81	142.18	71.11	3°07'17"
C146	2635.31	82.82	41.41	1°48'02"
C147	4.92	15.11	144.65	176°06'24"
C316	5.00	15.71	INFINITE	180°00'00"
C317	5.00	15.71	INFINITE	180°00'00"
C318	5581.10	199.69	99.85	2°03'00"
C319	2574.31	111.11	55.56	2°28'22"
C320	30.00	56.33	40.98	107°34'48"
C842	2.00	3.14	2.00	90°00'00"
C843	2.00	3.14	2.00	90°00'00"
C885	2.00	3.14	2.00	90°00'00"
C909	10.00	7.95	4.20	45°34'24"
C910	5526.10	20.80	10.40	0°12'57"
C912	10.00	7.97	4.21	45°39'56"
C913	10.00	8.21	4.35	47°00'40"

TRAPELO ROAD ℄
△ =2°03'00"
R=5552.10'
T=99.34'
L=198.65'

HOR. SCALE IN FEET
0 20 50 100





NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

CONT. ON SHEET # 87
CONT. ON SHEET # 89

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	89	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

TRAPELO ROAD
△ =3°21'00"
R=2603.31'
T=76.13'
L=152.21'

TRAPELO ROAD
△ =0°56'23"
R=5000.00'
T=41.01'
L=82.01'

PAYSON ROAD
VAN NESS ROAD
BELMONT STREET
STULTS ROAD
COMMONWEALTH ROAD
CARVER ROAD
BELMONT
WATERTOWN

1898 COUNTY LAYOUT
1925 TOWN LAYOUT
1917 TOWN LAYOUT

LIMIT OF WORK MEET EXISTING

TRAVERSE LINE S73°06'28"E 557.69'

N=2962671.9424 E=746274.1950
N=2962681.1535 E=746223.0232
N=2962583.2741 E=746759.0227
N=2962597.4756 E=746678.2543

COSNT ℄ 410.86' S79°33'28"E

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C148	10.00	8.19	4.34	46°54'52"
C149	10.00	8.03	4.25	46°0'39"
C150	1230.80	39.89	19.95	1°51'25"
C151	10.00	7.93	4.18	45°25'04"
C152	10.00	7.98	4.22	45°43'43"
C153	2635.81	3.24	1.62	0°04'14"
C154	4976.00	95.28	47.64	1°05'50"
C155	30.00	50.22	33.26	95°54'14"
C156	20.00	28.27	17.07	80°58'26"
C157	4973.00	166.55	58.28	1°20'34"
C158	20.00	33.58	22.29	96°12'42"
C159	28.00	40.68	24.88	84°14'21"
C321	40.00	51.87	30.30	74°17'32"
C322	10.00	8.23	4.37	47°09'51"
C323	10.00	8.35	4.44	47°51'57"
C324	28.00	51.02	36.10	104°23'33"
C325	26.00	34.35	20.20	75°41'59"
C326	27.00	48.36	33.72	102°37'03"
C327	26.00	35.43	21.10	78°05'11"
C837	5.05	15.83	INFINITE	179°33'28"
C838	5001.00	68.72	34.36	0°47'14"
C839	2.00	6.19	INFINITE	177°26'18"
C886	2.00	3.14	2.00	90°00'00"
C889	2.00	3.44	2.29	97°40'28"

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C924	10.00	7.95	4.20	45°34'23"
C925	10.00	15.91	10.20	91°08'46"
C926	10.00	7.95	4.20	45°34'23"
C927	2635.31	46.91	23.45	1°01'11"
C928	2629.84	9.91	4.96	0°12'57"
C929	2.00	3.66	2.58	104°12'33"
C930	2.00	3.41	2.30	98°08'36"
C936	2610.81	17.98	9.00	0°23'41"
C937	2610.81	23.06	11.53	0°30'22"

SKETCH #20
SCALE IN FEET 0 10

PT.#20-PK
N=2962713.8010
E=746234.8150
SET IN CONCRETE WALK
EL=113.18'

PT.#21
N=2962583.2741
E=746759.0227

HOR. SCALE IN FEET
0 20 50 100

NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

CONT. ON SHEET # 88
CONT. ON SHEET # 90

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	90	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

STA. 120+46.52 TRAPELO ROAD ℄ =
STA. 0+00.00 SCHOOL STREET ℄
N=2962548.1604 E=746976.4569

TRAPELO ROAD ℄
△ =0°56'23"
R=5000.00'
T=41.01'
L=82.01'

TRAPELO ROAD ℄
△ =6°12'54"
R=1001.00'
T=54.34'
L=108.58'

STA. 121+54.17 TRAPELO ROAD ℄ =
STA. 0+00.00 SCHOOL STREET ℄
N=2962540.2966 E=747083.8001

SCHOOL STREET ℄
△ =23°05'11"
R=275.00'
T=56.17'
L=110.81'

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C160	35.00	36.50	20.10	59°44'50"
C161	8.00	16.78	13.90	120°09'04"
C162	1021.71	57.81	28.91	3°14'31"
C163	650.00	40.64	20.33	3°34'57"
C164	430.00	94.60	47.49	12°36'16"
C165	2.0	4.03	3.17	115°52'24"
C166	2.00	5.04	6.21	144°17'06"
C167	258.00	34.42	17.23	7°38'34"
C168	150.00	85.03	43.69	32°28'38"
C169	50.00	26.78	13.72	30°41'01"
C170	2.50	3.63	2.22	83°09'34"
C171	6.00	9.85	6.44	94°03'48"
C328	26.00	45.52	31.15	100°18'13"
C329	25.00	34.43	20.58	78°55'05"
C330	966.00	70.26	35.15	4°10'02"
C331	45.00	71.13	45.44	90°33'38"
C332	50.00	37.05	19.42	42°27'20"
C823	10.00	7.95	4.20	45°34'24"
C824	10.00	7.95	4.20	45°34'23"
C887	10.00	7.95	4.20	45°34'23"

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C931	966.00	34.48	17.24	2°02'42"
C932	20.00	16.67	8.85	47°44'40"

HOR. SCALE IN FEET
0 20 50 100

NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

SKETCH #21
SCALE IN FEET
0 10

PT.#21–PK
N=2962551.7520
E=746768.4430
SET IN CONCRETE WA
EL=96.60'

CONT. ON SHEET # 89
CONT. ON SHEET # 91

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	91	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

STA. 123+70.32 TRAPELO ROAD ℄ =
STA. 0+00.00 NEWTON STREET ℄
N=2962527.9015 E=747299.5888

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C172	8.00	11.67	7.15	83°36'38"
C173	8.00	13.49	8.98	96°38'00"
C174	22.00	33.45	20.92	87°07'12"
C175	10.00	17.14	11.55	98°13'37"
C176	1243.16	121.33	60.71	5°35'31"
C177	27.00	37.11	22.16	78°44'41"
C333	8.00	13.07	8.52	93°37'04"
C334	10.00	15.08	9.40	86°25'36"
C335	8.00	13.05	8.50	93°27'18"
C336	2.00	3.01	1.87	86°14'23"
C337	1301.16	53.47	26.73	2°21'16"
C338	8.00	13.35	8.82	95°36'04"
C339	10.00	14.35	8.72	82°12'32"
C340	1301.66	70.28	35.15	3°05'36"
C341	12.00	18.65	11.80	89°03'22"
C890	2.00	3.52	2.41	100°29'43"

CONT. ON SHEET # 90

CONT. ON SHEET # 92

N=2962645.9633
E=747499.5577

1+70.87

170.87'
N00°13'15"W

N=2962645.9633
E=747499.5577

STA. 125+71.12 TRAPELO ROAD ℄ =
STA. 0+00.00 WORCESTER STREET ℄
N=2962516.3864 E=747500.0571

1+29.58

1 CONST ℄
129.58'
N00°13'15"W

NEWTON STREET

WORCESTER STREET

SPRINGFIELD STREET

FALMOUTH STREET

BELMONT STREET

LANGDON AVENUE

HILLSIDE ROAD

WESTLAND ROAD

BELMONT WATERTOWN

1898 COUNTY LAYOUT

99.38' TRAVERSE LINE
S83°52'42"E
561.84'
N=2962509.6152
E=747617.9390

CONST ℄
584.41'
S86°42'45"E

LIMIT OF WORK MEET EXISTING

SEE DETAIL L

SEE DETAIL M

SEE DETAIL N

PT.#22

PROP. BOUND
STA. 126+99.48, 32.50' RT
N2962482.3129
E747526.5187

PROP. BOUND
STA. 128+98.37, 32.50' RT
N2962448.7836
E747817.6703

N/F 1-275 BELMONT STREET LLC. CERT. 240882 MAP 2, LOT 141

N/F G & M LIMITED PARTNERSHIP L.C. CERT. 207470 MAP 2, LOT 112

N/F G & M LIMITED PARTNERSHIP L.C. CERT. 208487 MAP 2, LOT 140

N/F P&S REALTY TRUST L.C. CERT. 780608 MAP 2, LOT 87

N/F LRBH TWO LLC BOOK 46535, PAGE 210 MAP 2, LOT 61

N/F JOAN O. MURPHY & CLAIRE TAYLOR BOOK 25766, PAGE 477 MAP 2, LOT 59

N/F PATRICIA M. TAVITIAN & MARY F. CUNNINGHAM BOOK 37590, PAGE 421 MAP 1141, LOT 12

N/F BRIAN SROKA BOOK 51379, PAGE 177 MAP 1141, LOT 1

TRS. JACQUE EDWARD ORCHANIAN/ORCHANIAN FAMILY NOMINEE TRUST BOOK 30076, PAGE 181 MAP 1142, LOT 14

DETAIL L
SCALE IN FEET 0 10

DETAIL M
SCALE IN FEET 0 10

DETAIL N
SCALE IN FEET 0 10

HOR. SCALE IN FEET
0 20 50 100

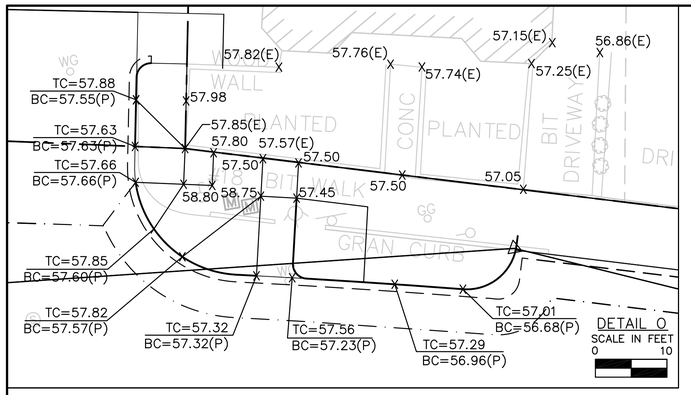
NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

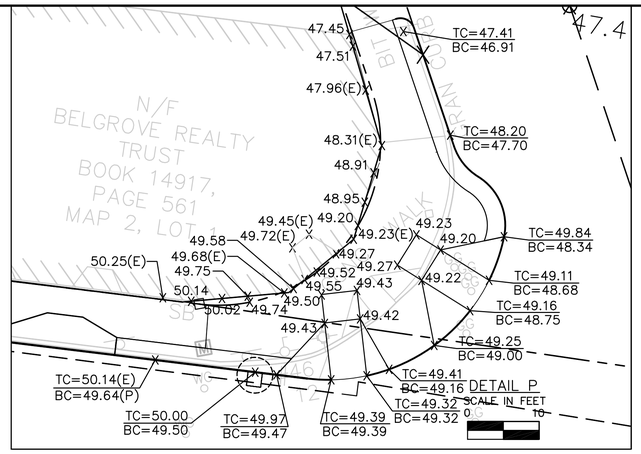
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

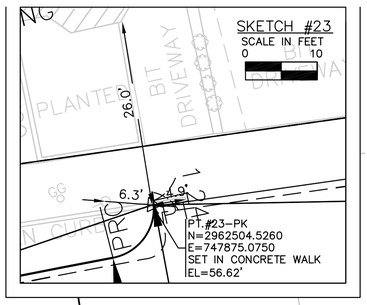
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	92	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C178	27.00	50.06	35.98	106°13'46"
C179	1243.16	93.62	46.83	04°18'53"
C180	20.00	23.69	13.46	67°52'05"
C181	22.00	42.73	32.18	111°17'03"
C342	15.00	23.11	14.56	88°16'38"
C343	1296.66	2.81	1.40	0°07'27"
C344	1296.66	21.93	10.96	0°58'08"
C345	10.00	8.01	4.23	45°53'19"
C346	1302.66	54.95	27.48	2°25'01"
C347	10.00	15.29	9.60	87°36'25"
C348	2.50	4.05	2.65	92°42'55"
C827	10.00	7.95	4.20	45°34'24"
C828	10.00	7.95	4.20	45°34'23"
C830	8.00	12.66	8.10	90°39'07"
C887	2.00	3.14	2.00	90°00'00"
C891	2.00	3.11	1.96	88°57'06"
C892	2.00	3.58	2.50	102°38'34"
C933	10.00	7.95	4.20	45°34'23"
C934	7.00	10.79	6.79	88°16'40"







CONT. ON SHEET # 91

FALMOUTH STREET

PARK ROAD

BELMONT STREET

GROVE STREET

WESTLAND ROAD

WOODLEIGH ROAD

BELMONT WATERTOWN

LIMIT OF WORK MEET EXISTING

SEE DETAIL O

PT.#23

PROP. BOUND 32.50' RT
STA. 128+98.37
N2962448.7836
E747817.6703

TRAPELO ROAD PI
Δ =13°40'00"
R=1267.66'
T=151.91'
L=302.37'

TRAVERSE LINE
S66°04'46"E
592.79'

1898 COUNTY LAYOUT

CONST PI
N08°36'45"W
220.62

CONST PI
545.77'
S73°02'45"E

STA 2+20.7
LIMIT OF WORK
MEET EXISTING

STA. 135+18.09 TRAPELO ROAD PI =
STA. 0+00.00 GROVE STREET PI
N=2962303.0696 E=748418.5394

CONT. ON SHEET # 93

NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	93	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

SKETCH #24
SCALE IN FEET 0 10

PT.#24–PK
N=2962264.1670
E=748416.9480
SET IN CONCRETE
EL=48.74'

DETAIL Q
SCALE IN FEET 0 10

NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

STA. 135+71.84 TRAPELO ROAD ℄ =
STA. 0+00.00 TEMPLETON PARKWAY ℄
N=2962287.0170 E=748469.8353

STA. 135+95.15 TRAPELO ROAD ℄ =
STA. 0+00.00 ARLINGTON STREET ℄
N=2962279.5351 E=748491.9176

STA. 135+18.09 TRAPELO ROAD ℄ =
STA. 0+00.00 GROVE STREET ℄
N=2962303.0696 E=748418.5394

TRAPELO ROAD ℄
△ =4°14'01"
R=1500.00'
T=55.44'
L=110.84'

TRAPELO ROAD ℄
△ =4°15'59"
R=1000.50'
T=37.27'
L=74.50'

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C182	35.00	59.91	40.32	98°04'35"
C186	40.00	26.01	13.48	37°15'28"
C187	25.00	14.84	7.64	34°0'03"
C188	1000.00	56.30	28.16	3°13'33"
C349	25.00	37.27	23.07	85°24'28"
C350	40.00	41.64	22.93	59°39'00"
C351	7.00	10.84	6.85	88°45'25"
C352	12.00	19.22	12.37	91°45'20"
C353	10.00	15.94	10.23	91°18'02"
C354	10.00	15.45	9.75	88°32'54"
C355	2476.30	182.41	91.25	4°13'14"
C368	8.00	12.40	7.84	88°48'44"
C827	10.00	7.95	4.20	45°34'24"
C828	10.00	7.95	4.20	45°34'23"
C829	8.00	9.74	5.58	69°46'46"
C830	8.00	12.66	8.10	90°39'07"
C887	2.00	3.14	2.00	89°59'07"

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C183	6.00	8.45	5.10	80°40'41"
C184	9.00	22.84	28.90	145°23'59"
C185	600.00	35.10	17.55	3°21'05"
C842	25.00	24.33	13.23	55°46'11"

HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	94	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN

TRAPELO ROAD
△ =2°28'00"
R=2044.09'
T=44.01'
L=88.00'

TRAPELO ROAD
△ =17°48'30"
R=753.97'
T=118.12'
L=234.34'

STA. 140+80.76 TRAPELO ROAD B =
STA. 0+00.00 OXFORD AVENUE B
N=2962091.1031 E=748942.7184

OXFORD STREET
EXETER STREET
ERICSSON STREET
BELMONT STREET
PRENTISS STREET
KEENAN STREET
BELMONT WATERTOWN
1898 COUNTY LAYOUT
1889 TOWN LAYOUT

N=2962154.2334
E=748810.0900

N=2962056.4849
E=749015.4467

N=2962020.3848
E=749095.6949

N=2962000.7411
E=749142.0006

N=2961943.9467
E=749368.3875

TRAVERSE LINE
S58°20'49"E
315.47'

CONST ℄
50.30'
S67°00'45"E

CONST ℄
192.89'
S84°49'15"E

LIMIT OF WORK
MEET EXISTING

SEE DETAIL R

PT.#25

PT.#26

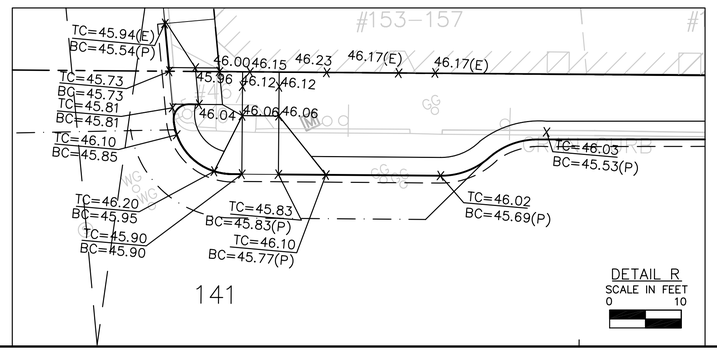
CONT. ON SHEET # 93

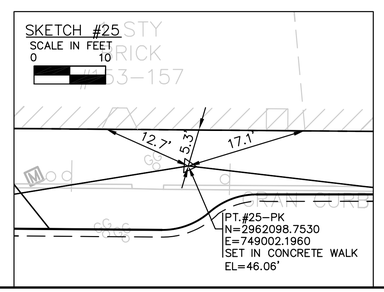
CONT. ON SHEET # 95

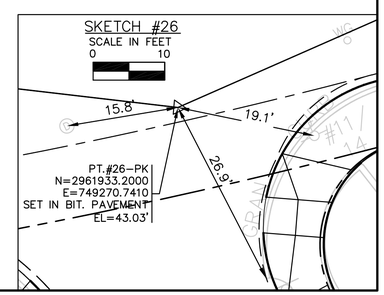
HOR. SCALE IN FEET
0 20 50 100

CURVE TABLE				
CURVE	RADIUS	LENGTH	TANGENT	DELTA
C189	15.00	19.21	11.18	73°22'59"
C191	20.00	44.15	39.67	126°29'35"
C193	782.47	90.14	546.12	6°36'01"
C194	40.00	43.31	24.05	62°02'01"
C195	21.00	40.99	31.03	111°49'28"
C196	782.47	69.22	34.63	5°04'07"
C356	8.00	13.57	9.07	97°10'50"
C357	8.00	11.77	7.24	84°19'40"
C359	8.00	13.44	8.92	96°14'13"
C360	4.00	6.29	4.01	90°09'38"
C361	725.47	187.98	94.52	14°50'45"
C831	10.00	7.28	3.81	41°41'41"
C832	10.00	7.19	3.76	41°13'26"
C833	10.00	7.23	3.78	41°24'36"
C834	10.00	7.23	3.78	41°24'35"
C888	2.00	3.43	2.31	98°08'57"
C893	2.00	3.62	2.54	103°34'59"
C935	2015.00	70.20	35.10	1°59'46"

NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.



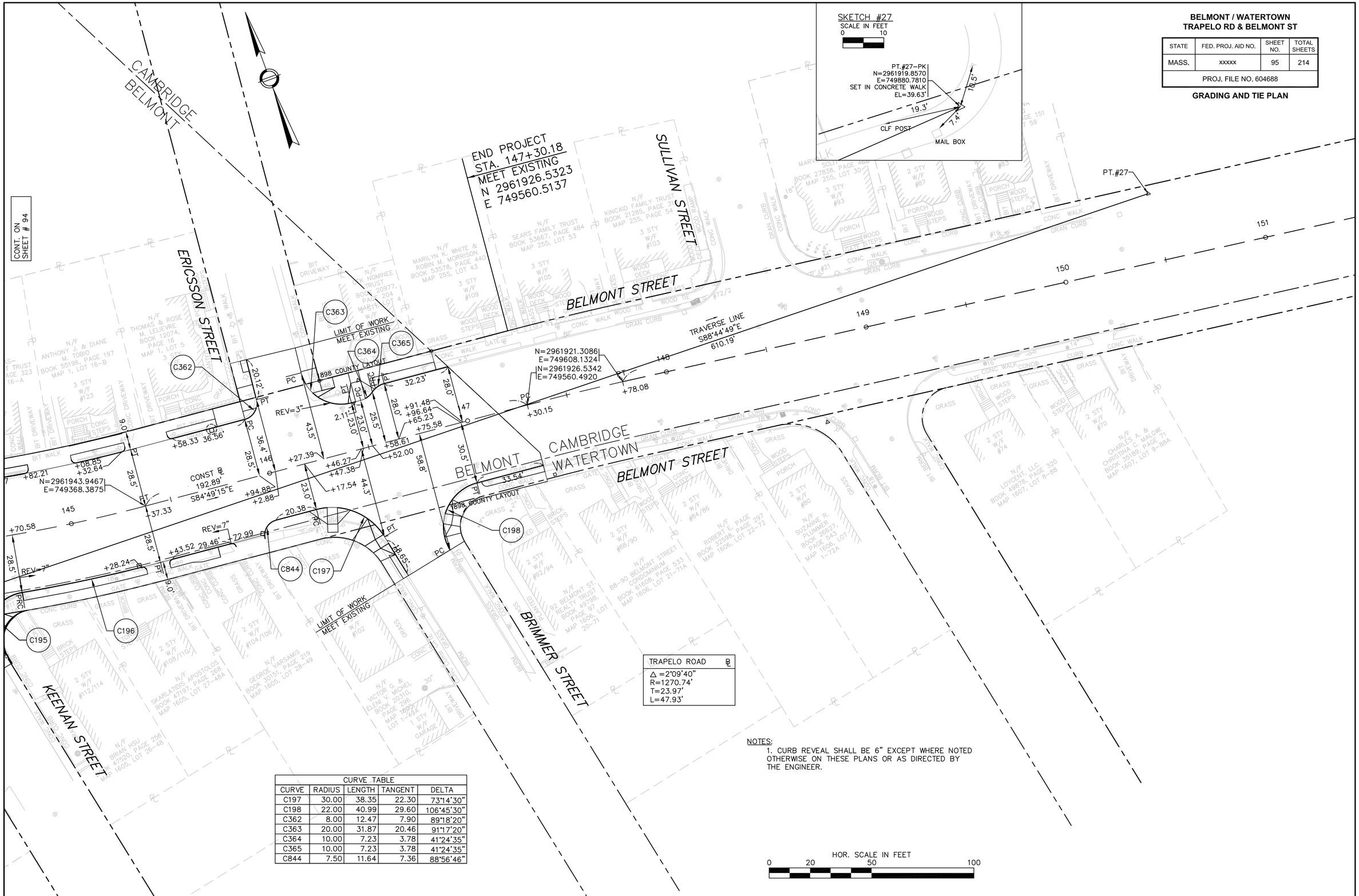




BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	95	214
PROJ. FILE NO. 604688			

GRADING AND TIE PLAN



NOTES:
1. CURB REVEAL SHALL BE 6" EXCEPT WHERE NOTED OTHERWISE ON THESE PLANS OR AS DIRECTED BY THE ENGINEER.

CURVE TABLE

CURVE	RADIUS	LENGTH	TANGENT	DELTA
C197	30.00	38.35	22.30	73°14'30"
C198	22.00	40.99	29.60	106°45'30"
C362	8.00	12.47	7.90	89°18'20"
C363	20.00	31.87	20.46	91°17'20"
C364	10.00	7.23	3.78	41°24'35"
C365	10.00	7.23	3.78	41°24'35"
C844	7.50	11.64	7.36	88°56'46"

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	96	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN

BEAVER BROOK RESERVATION

MILL STREET

CONT'D BELOW

100 FT BUFFER ZONE

13'-12" RCP
RET
+33.6 RT CBCI TYPE 2
R=92.34
I=88.84
REM

ADJ

INHABITANTS OF THE TOWN OF BELMONT
BOOK 45478, LOT 283
MAP 59, LOT 11-9

PLANTED BERM

SPEED BUMP

BIT PARKING LOT

BIT BERM

RET

ADJ

WALK

RECORD

EXIST. SWALE

+42.7 RT CBCI TYPE 3
R=84.40
I=80.90

25'-12" RCP

+14.3-34.6' RT DMH
R=85.00
I1=78.55
I2=80.50
I3=78.65
I4=78.55
I5=80.30

10'-18" RCP
REM

+16.2 RT DI
TYPE BF

SEE NOTE 2

ABAN

+9.2 RT CBCI
R=84.05
I=80.55

35'-12" RCP
21'-12" RCP
+65.8 RT DI TYPE CF
R=81.80
I=79.90

31'-18" RCP
PROP PLUG (TYP)

13=78.40

1'-12" RCP

+69.6 RT CBCI TYPE 3
R=84.30
I=80.80

+76.6-53.4' RT DMH
R=85.10
I1=79.75
I2=79.85
I3=80.65

R&R BO

ADJ BO

LIMIT OF 200 FT RIVERFRONT AREA

4'-12" RCP
+3.9 LT CBCI
R=82.28
I=78.78

112'-12" RCP

SEE NOTE 3

BEGIN PROJECT
STA. 17+40.00
MEET EXISTING
N 2967460.7350
E 738144.8003

WALTHAM

BELMONT

TRAPELO ROAD (RTE 60)

ABANDONED 6" WATER

12'-10" DI

+55.6-31.2'± RT DI TYPE CF
R=82.00
I=78.50

12" FLARED END
I=82.90

12" FLARED END
I=83.30

+56.3 RT CBCI TYPE 4
R=84.20

PROP SWALE (TYP)

+77.6 RT CBCI TYPE 4
R=86.35

100 FT BUFFER ZONE

PROP 4-6" COND & CABLE

+38.8 LT GICI
R=88.60
I=86.90

PROP-SPLICE BOX ON 6" CONCRETE PAD

RET HYD

212'-8" SUBDRAIN

10'-10" DI

CIT

SEE NOTE 1
SEE NOTE 2
REM

CONT. ON SHEET # 97

N/F BELMONT HOUSING AUTHORITY
BOOK 12540, PAGE 586
MAP 59, LOT 11-A

N/F COMMONWEALTH OF MASSACHUSETTS
BEAVER BROOK RESERVATION
MAP 60, LOT 1

LIMIT OF WETLANDS

HOR. SCALE IN FEET
0 20 50 100

NOTES:

1. PROP TEST PIT. RELOCATE ELECTRIC DUCT BANK BO IF NECESSARY.

2. PROP TEST PIT. RELOCATE TELEPHONE DUCT BANK BO IF NECESSARY.

3. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.

4. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

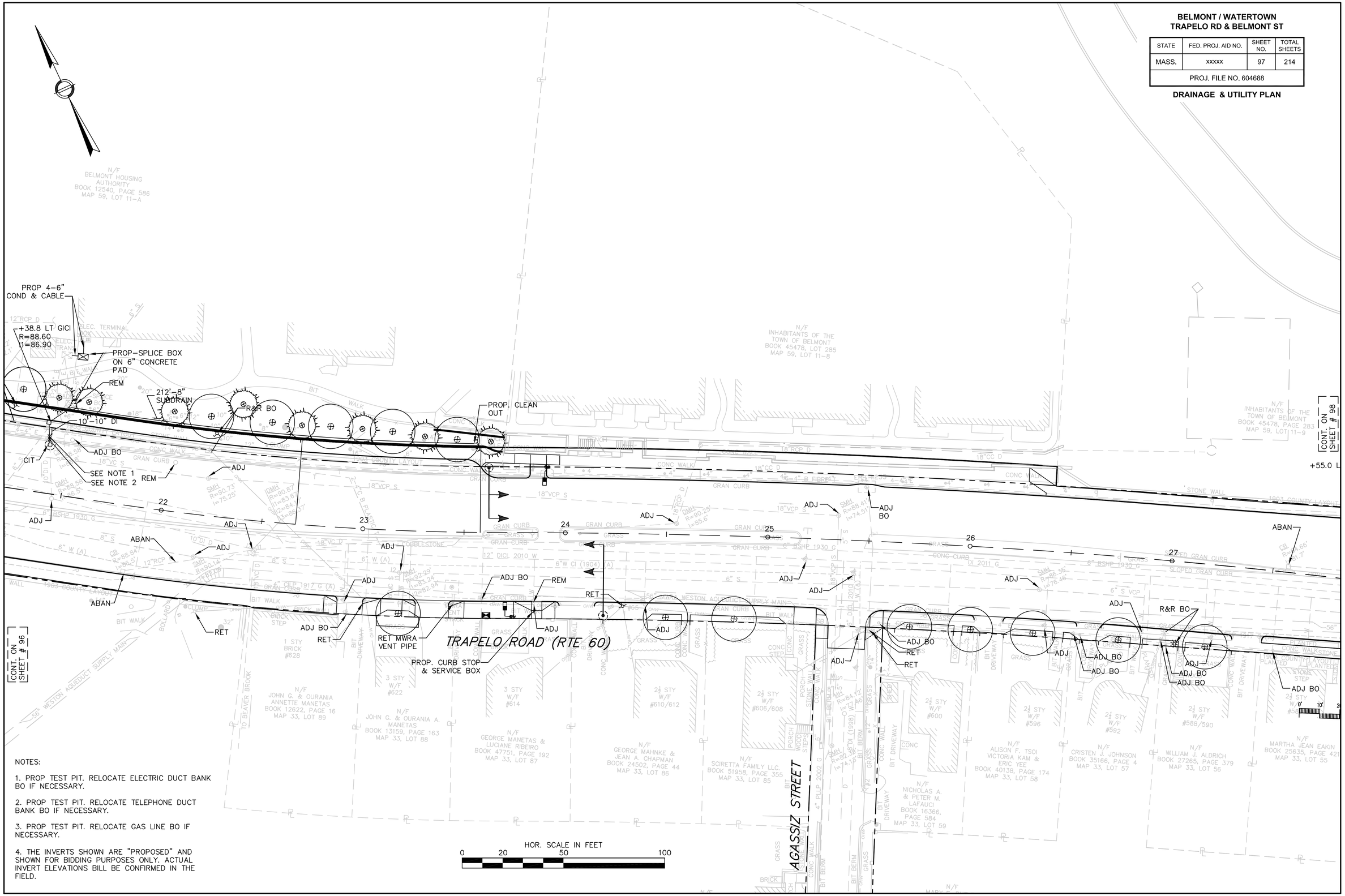
BEAVER BROOK RESERVATION

MILL STREET
100 FT BUFFER ZONE
CONT'D ABOVE
13'-12" RCP
RET
+33.6 RT CBCI TYPE 2
R=92.34
I=88.84
REM
LIMIT OF 200 FT RIVERFRONT AREA

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	97	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN



NOTES:

1. PROP TEST PIT. RELOCATE ELECTRIC DUCT BANK BO IF NECESSARY.

2. PROP TEST PIT. RELOCATE TELEPHONE DUCT BANK BO IF NECESSARY.

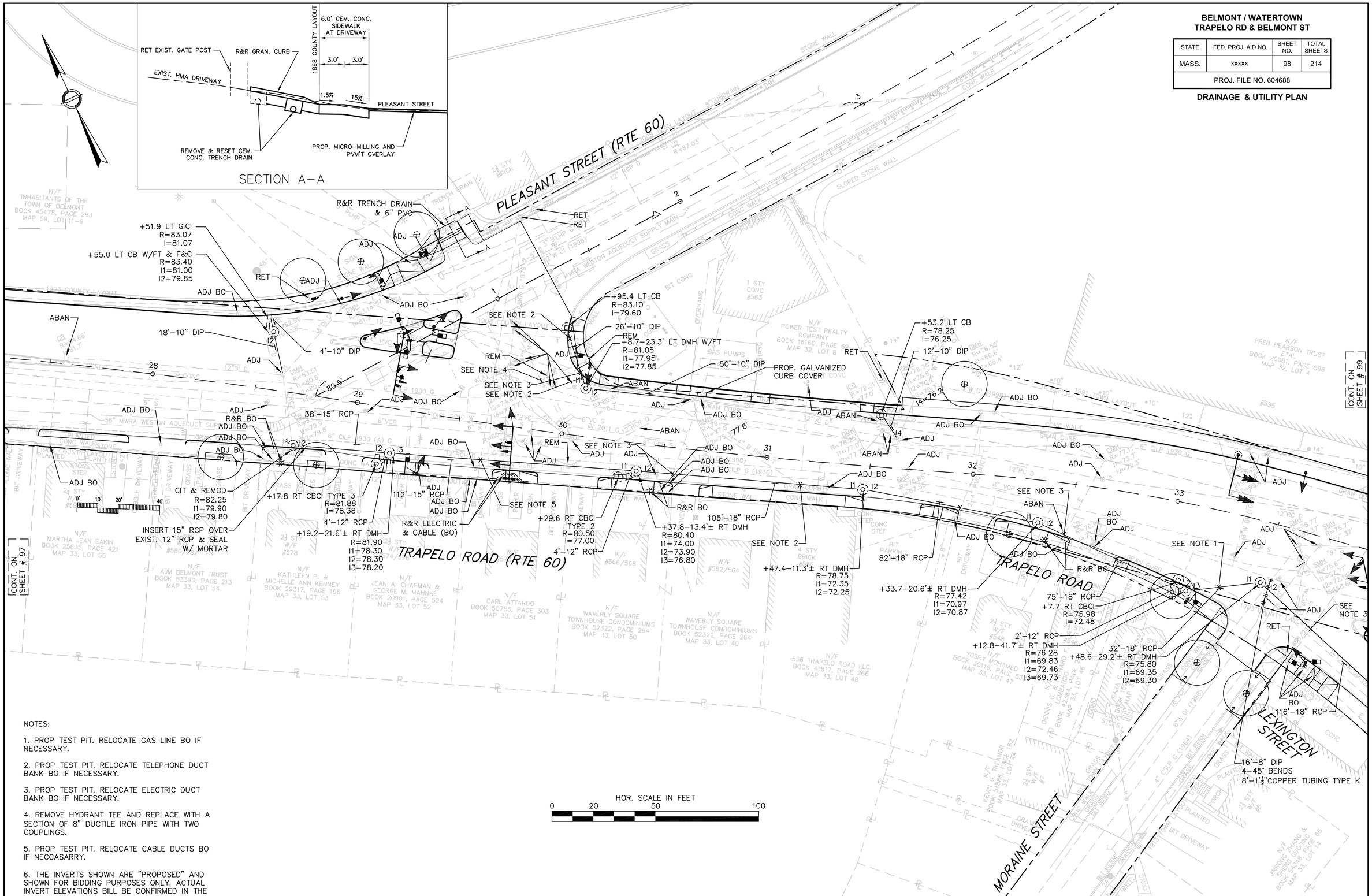
3. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.

4. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	98	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN



NOTES:

1. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.

2. PROP TEST PIT. RELOCATE TELEPHONE DUCT BANK BO IF NECESSARY.

3. PROP TEST PIT. RELOCATE ELECTRIC DUCT BANK BO IF NECESSARY.

4. REMOVE HYDRANT TEE AND REPLACE WITH A SECTION OF 8" DUCTILE IRON PIPE WITH TWO COUPLINGS.

5. PROP TEST PIT. RELOCATE CABLE DUCTS BO IF NECCASARRY.

6. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	99	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN

SHAW'S DRIVE
TRAPELO ROAD
LEXINGTON STREET
CHURCH STREET
MBTA ROW
ABANDONED 6" GAS
PROP. 20' MAST ARM (FDN #10) 34+75.4, 41.77' RT
PROP. 8.0' TRAFFIC SIGNAL POST 34+67.3, 54.09' RT
+60.4 RT CBCI R=74.30 I=70.70 R&R METER CHAMBER
+99.0–61.0'± RT DMH R=71.75 I1=66.1± I2=66.1± I3=67.45
+54.16–1.0'± RT DMH R=74.70 I1=62.88 I2=62.86 I3=66.20
+82.8–49.3'± RT DMH R=74.04 I1=67.64 I2=67.54 I3=68.20
+43.2 LT CB R=69.70 I=66.20
+45.8'–9.3'± LT DMH R=69.70 I1=65.2± I2=65.15 I3=65.1± I4=65.15
+42.4 RT CBCI R=69.90 I=66.40
+32.9 RT CBCI R=71.20 I=67.70
+34.6'–11.0'± RT DMH W/FT R=71.46 I1=67.55 I2=68.50 I3=67.55 I4=67.60
+5.3 RT CBCI R=71.10 I=67.60
16'–10" DICL 4–45° BENDS
16'–8" DICL 4–45° BENDS
16'–8" DIP 4–45° BENDS
8'–1½"COPPER TUBING TYPE K
69'–18" RCP
133'–18" RCP
133'–21" RCP
33'–12" RCP
14'–12" RCP
116'–18" RCP
90'–18" RCP
2'–12" RCP
6'–12" RCP
3'–12" RCP
13'–12" RCP
47'–10" DIP
PROP 18'–10" DICL PROP (4) 45° BENDS
PROP. PLUGS
SEE NOTE 1
SEE NOTE 2
SEE NOTES 1, 3
SEE NOTE 3
PROP. MBTA CAT POLE
PROP. 8" TRAFFIC SIGNAL POST
PROP. 6" TRAFFIC SIGNAL POST
PROP. 4" TRAFFIC SIGNAL POST
PROP. 2" TRAFFIC SIGNAL POST
PROP. 1" TRAFFIC SIGNAL POST
PROP. 3" TRAFFIC SIGNAL POST
PROP. 5" TRAFFIC SIGNAL POST
PROP. 7" TRAFFIC SIGNAL POST
PROP. 9" TRAFFIC SIGNAL POST
PROP. 10" TRAFFIC SIGNAL POST
PROP. 11" TRAFFIC SIGNAL POST
PROP. 12" TRAFFIC SIGNAL POST
PROP. 13" TRAFFIC SIGNAL POST
PROP. 14" TRAFFIC SIGNAL POST
PROP. 15" TRAFFIC SIGNAL POST
PROP. 16" TRAFFIC SIGNAL POST
PROP.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	100	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN

CONT. ON SHEET # 99

PROP. 8.0' TRAFFIC SIGNAL POST
34+67.3, 54.09' RT

+32.9 RT CBCI
R=71.20
I=67.70
ABAN
6'-12" RCP

+74.9 LT CBCI
R=70.60
I=67.75

+34.6'-11.0'± RT DMH W/FT
R=71.46
I1=67.55
I2=68.50
I3=67.55
I4=67.60

47'-10" DIP

+38.5 LT CBCI
R=69.77
I=66.27

+93.3 RT CB
R=70.37
I1=66.60
I2=66.10

24'-12" RCP

+10.2 RT CB
R=70.22
I=66.72

64'-12" RCP

28'-12" RCP

13'-12" RCP

PROP. MBTA CAT POLE

CHURCH STREET

THAYER ROAD

THAYER STREET

NOTES:

1. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	101	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN

WHITE STREET

TRAPELO ROAD

WAVERLEY STREET

THAYER STREET

WHITE STREET

CONT. ON SHEET #102

CONT. ON SHEET #99

+43.2 LT CB
R=69.70
I=66.20

+45.8'-9.3'± LT DMH
R=69.70
I1=65.2±
I2=65.15
I3=65.1±
I4=65.15

+83.6'-11.2'± LT DMH
R=69.42
I1=65.02
I2=64.27
I3=64.27

14'-2x12" DIP(SIDE BY SIDE)
OR 14'-15" DIP

29'-21" RCP

SEE NOTE 1

ABANDONED 10" WATER
SEE NOTES 3,4

14'-12" RCP

PROP. PLUGS

SEE NOTE 1

SEE NOTE 2

133'-21" RCP

33'-12" RCP

SEE NOTES 1, 3

65.16'

SEE NOTE 1

UNKNOWN ABANDONED

+42.4 RT CBCI
R=69.90
I=66.40

+07.3 RT CBCI
R=68.84 12'-12" RCP
I=65.34

R&S

PROP. MBTA CAT POLE

R&S LT POLE BO
R&R LUMINAIRE TO CAT POLE BO

ABAN

+47.9 RT CBCI
R=68.35
I=64.85

3'-12" DIP

+55.1'-67.8'± RT DMH
R=68.48
I1=63.40
I2=63.40
I3=64.80

63.0'

REMOD

ABANDONED 6" GAS

REM BO

ABANDONED 6" WATER

ABANDONED 6" GAS

189'-12" RCP

+86.1 RT CB
R=69.70
I=66.20

NOTES:

1. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.

2. PROP TEST PIT. RELOCATE TELEPHONE DUCT BANK BO IF NECESSARY.

3. PROP TEST PIT. RELOCATE ELECTRICAL DUCT BANK BO IF NECESSARY.

4. PROP TEST PIT. RELOCATE WATER LINE IF NECESSARY.

5. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	102	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN

WAVERLEY STREET

HAWTHORNE STREET

TRAPELO ROAD

SYCAMORE STREET

CONT. ON SHEET # 103

CONT. ON SHEET # 101

+81.1–20.0 RT DMH
R=67.80
I1=64.10
I2=61.78
I3=64.10

+74.1 RT CBCI
R=67.70
I=64.20

+33.8–22.9 RT DMH
R=67.70
I1=61.30
I2=61.20
I3=63.05
I4=63.65

+59.7–35.4'± RT DMH
R=66.65
I1=60.90
I2=55.2±

+41.7–67.3'± LT DMH W/FLAT TOP
R=64.00
I1=60.3±
I2=60.3±

19'–18" RCP
20'–12" RCP

+29.1 LT CB TYPE 3
R=63.35
I1=59.85
I2=59.95

ABANDONED 6" WATER

36'–10" DIP
R&R HYD

+91.9 LT GICI
R=63.55
I=61.05

ABAN

SEE NOTE 2

REMOD

PROP PLUGS (TYP.)

ABANDONED 4" GAS
ABANDONED 6" GAS

ABANDONED 8" WATER

+75.7 LT CB
R=63.60
I=60.10

14'–12" RCP

+06.6 LT CBCI
R=64.55
I=61.05

CIT

PROP. PLUGS

REM BO

PROP 14'–6" DICL

PROP (2) 45° BENDS

SEE NOTE 1

3'–12" RCP

4'–12"RCP

PROP. PLUG (TYP.)

5'–12" RCP

SEE NOTE 3

204'–12" RCP

189'–12" RCP

48'–12" RCP

3'–12" RCP

+99.0–39'± RT CB
R=67.27
I=63.77

33'–12" RCP

24'–12" RCP

32'–12" RCP

SEE NOTE 1

+26.5 RT CB
R=67.00
I=63.50

+86.1 RT CB
R=69.70
I=66.20

+58.0–28.3 RT DMH
R=64.20
I1=58.75
I2=62.5±
I3=59.90

+66.4 RT CB
R=63.45
I=59.95

73'–12"RCP

+28.9 RT CBCI
R=62.80
I=59.30

+35.4–28.5 RT DMH
R=63.40
I1=59.25
I2=58.38
I3=58.28

9'–12" RCP

+46.9–21.8 RT DMH
R=62.73
I1=58.23
I2=56.33
I3=58.23

PROP. MBTA POLE PROTECTION

ADJ
ADJ BO
RET
ABAN
REM
CIT

HOR. SCALE IN FEET
0 20 50 100

NOTES:

1. PROP TEST PIT. RELOCATE ELECTRICAL DUCT BANK BO IF NECESSARY.

2. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.

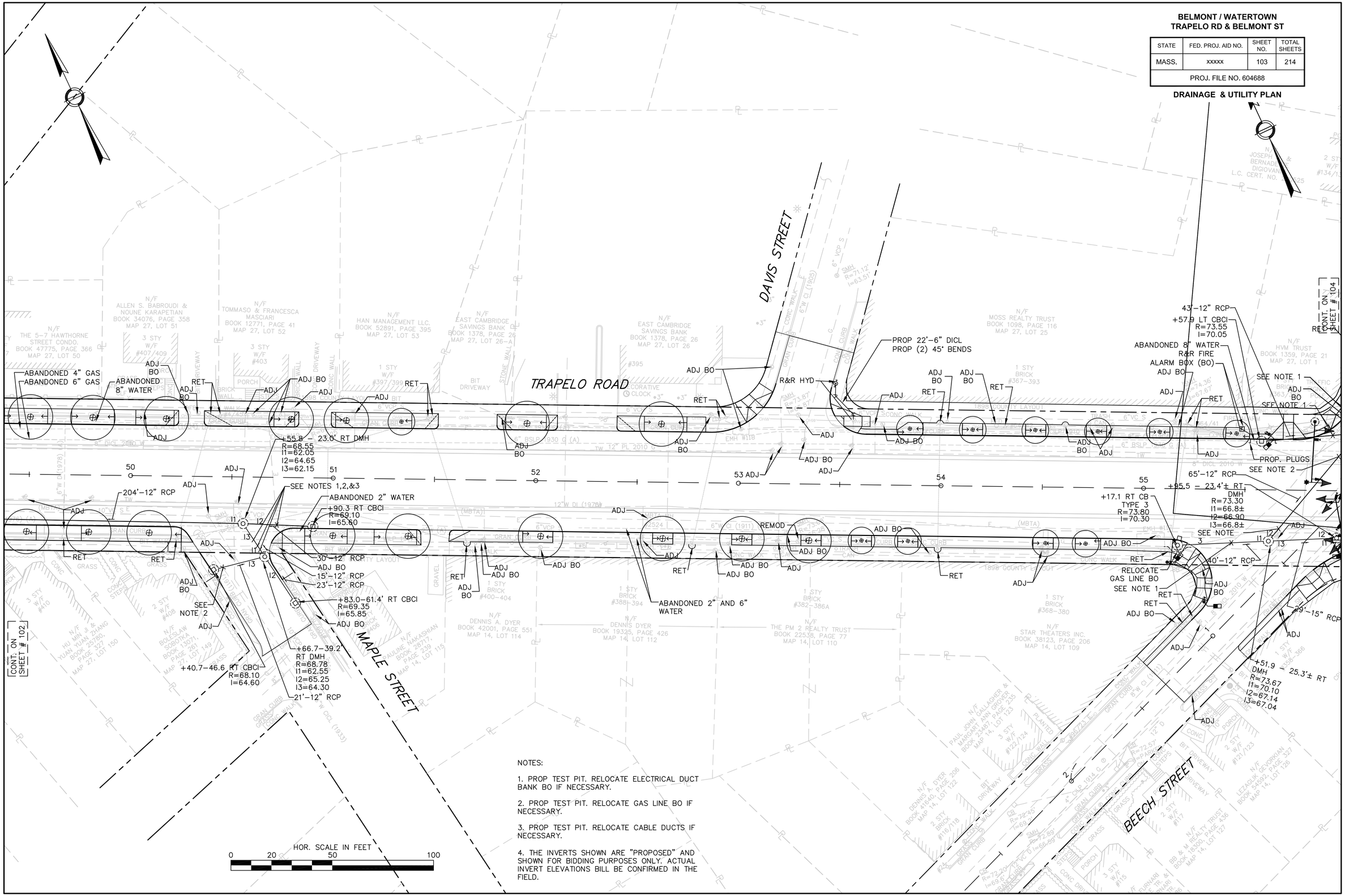
3. PROP TEST PIT. RELOCATE MBTA DUCTS IF NECESSARY.

4. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	103	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN



NOTES:

1. PROP TEST PIT. RELOCATE ELECTRICAL DUCT BANK BO IF NECESSARY.

2. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.

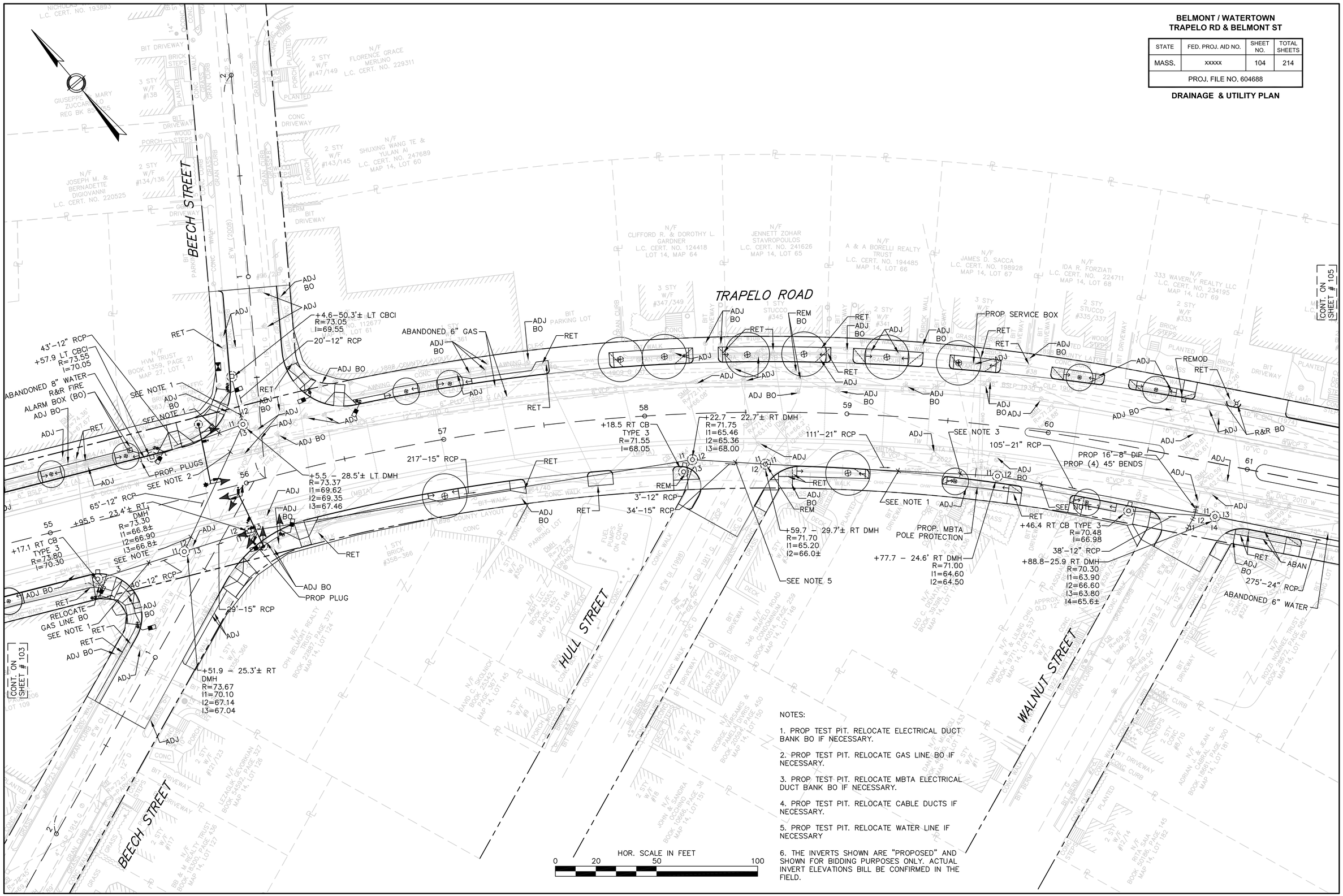
3. PROP TEST PIT. RELOCATE CABLE DUCTS IF NECESSARY.

4. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	104	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN



NOTES:

1. PROP TEST PIT. RELOCATE ELECTRICAL DUCT BANK BO IF NECESSARY.

2. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.

3. PROP TEST PIT. RELOCATE MBTA ELECTRICAL DUCT BANK BO IF NECESSARY.

4. PROP TEST PIT. RELOCATE CABLE DUCTS IF NECESSARY.

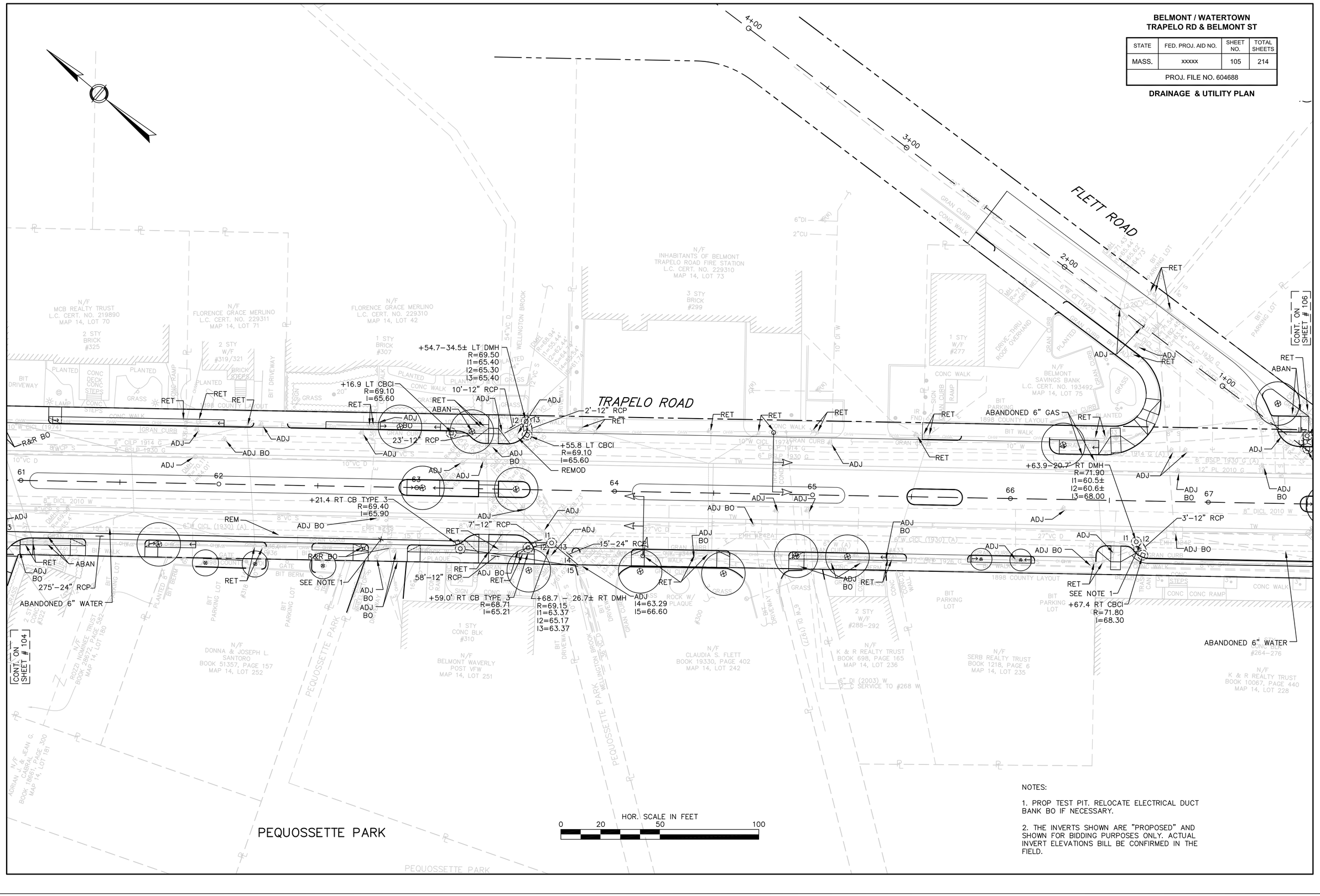
5. PROP TEST PIT. RELOCATE WATER LINE IF NECESSARY

6. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	105	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN



NOTES:

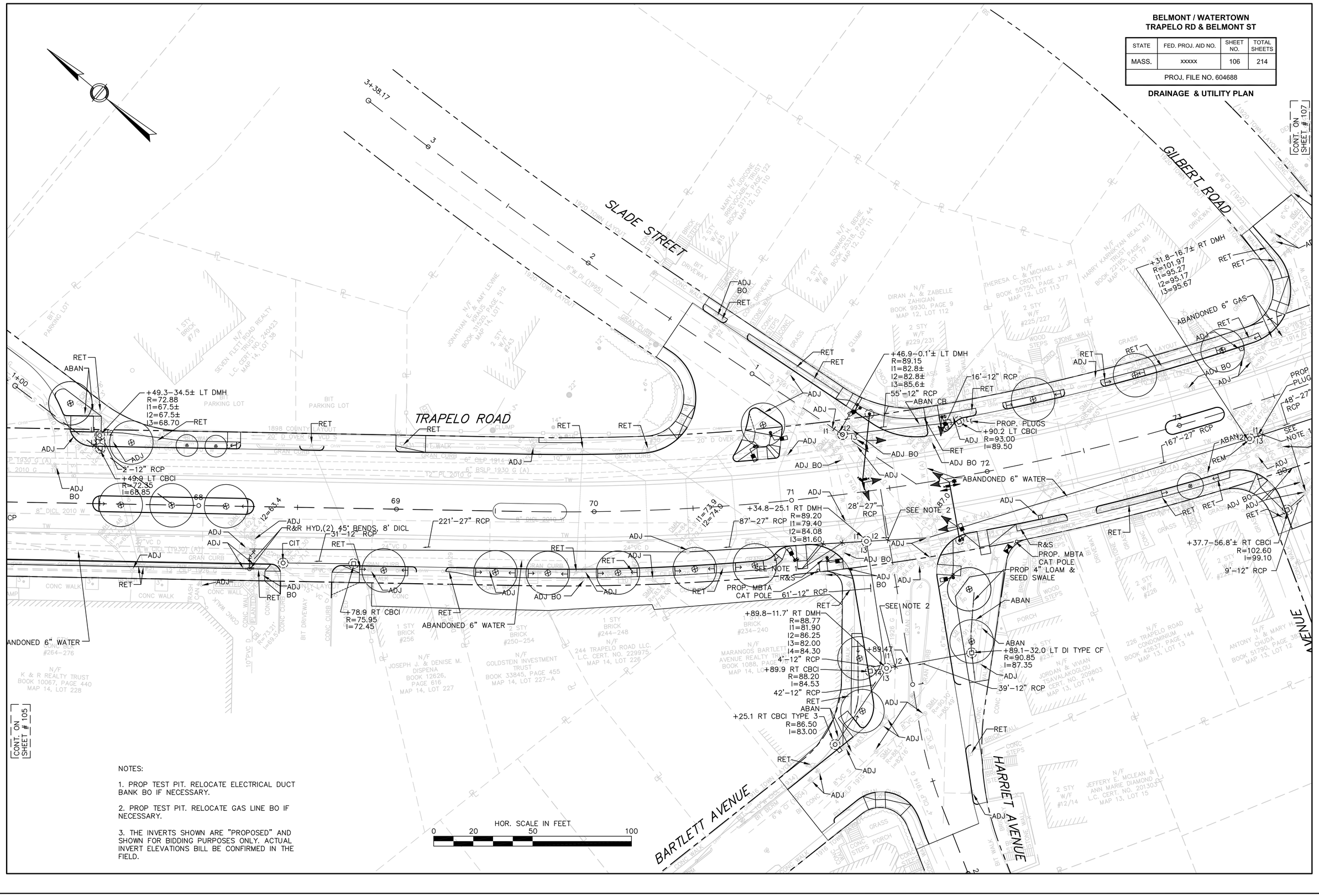
1. PROP TEST PIT. RELOCATE ELECTRICAL DUCT BANK BO IF NECESSARY.

2. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	106	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN



NOTES:

1. PROP TEST PIT. RELOCATE ELECTRICAL DUCT BANK BO IF NECESSARY.

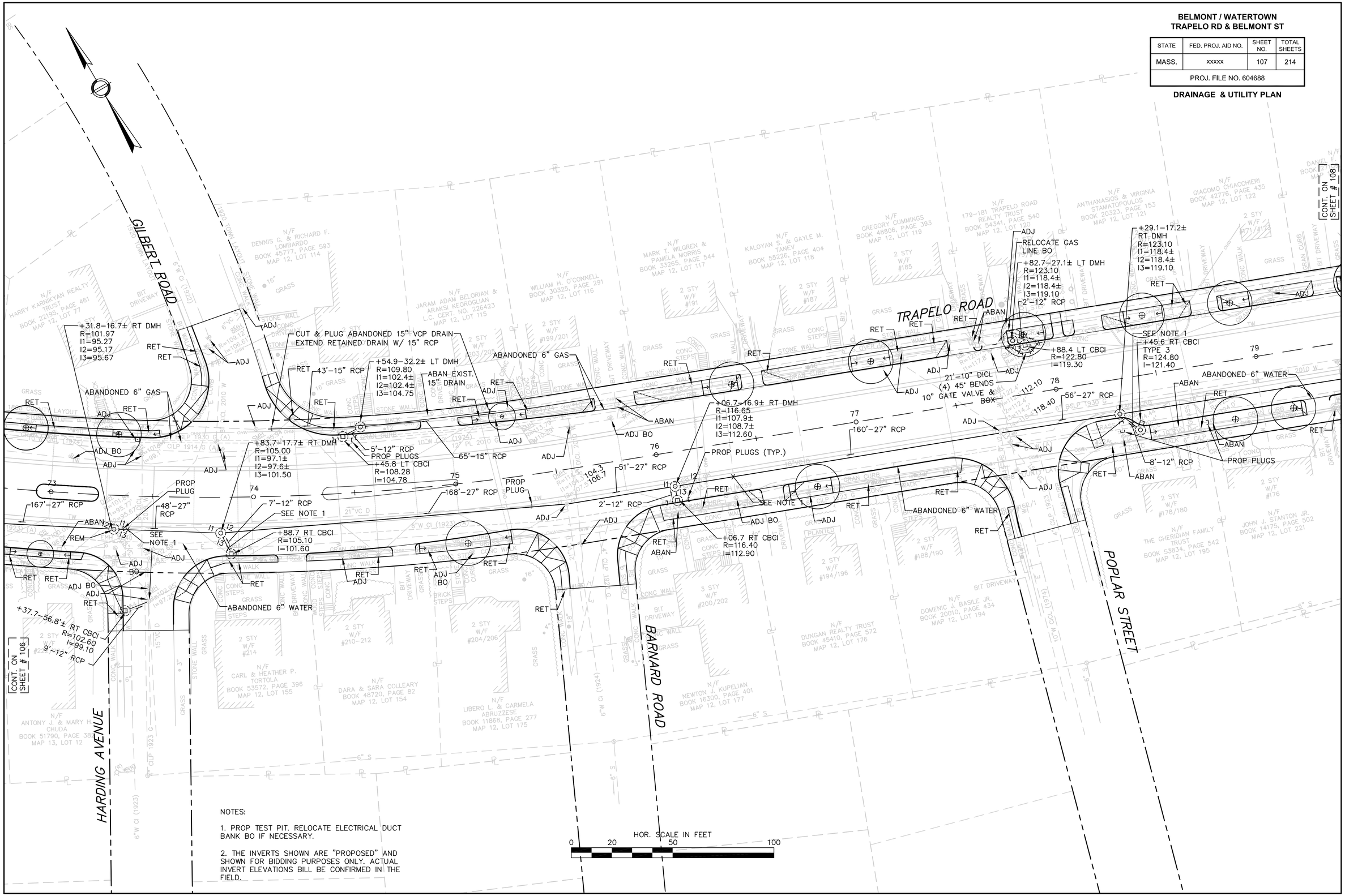
2. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.

3. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	107	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN



NOTES:

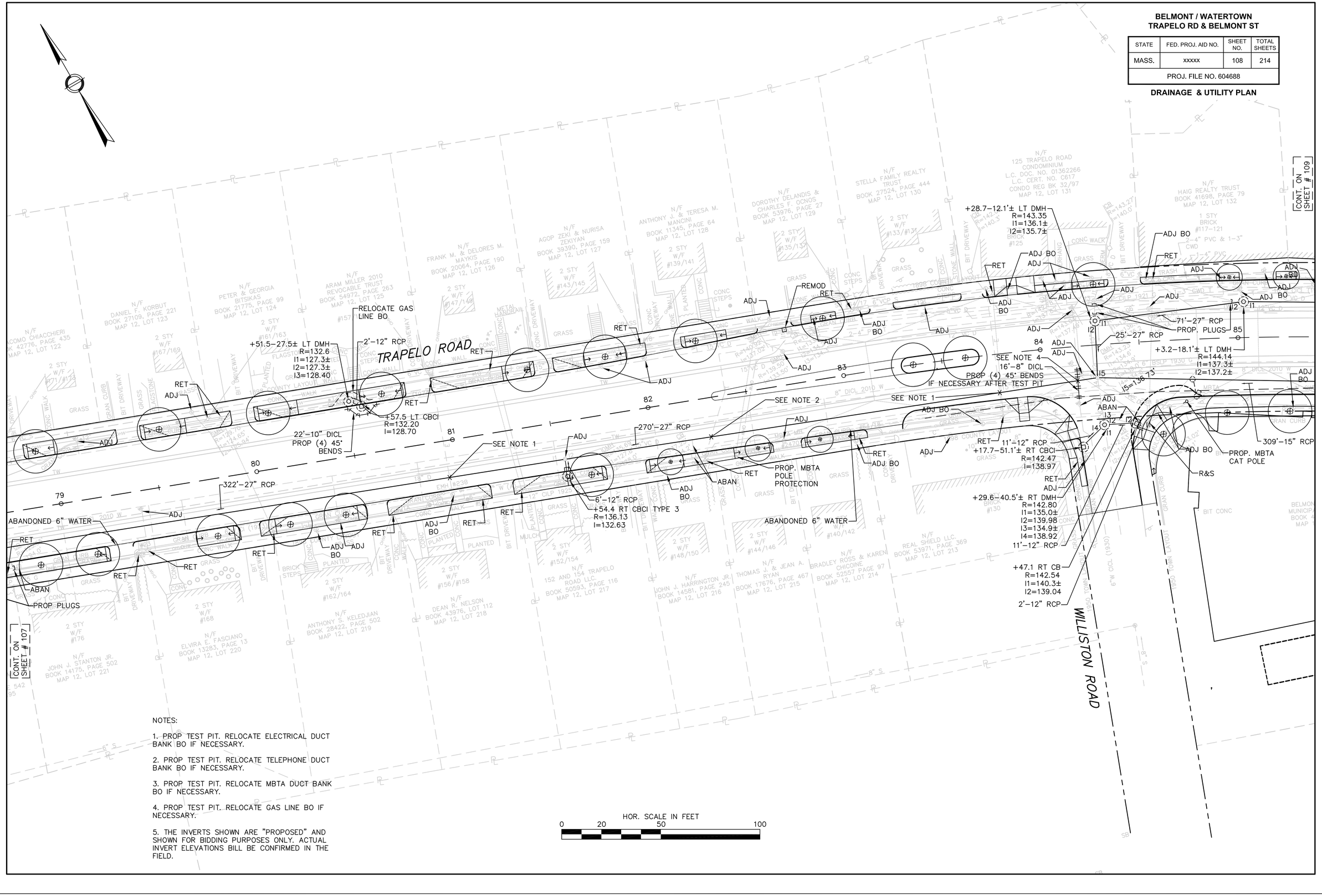
1. PROP TEST PIT. RELOCATE ELECTRICAL DUCT BANK BO IF NECESSARY.

2. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	108	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN



NOTES:

1. PROP TEST PIT. RELOCATE ELECTRICAL DUCT BANK BO IF NECESSARY.

2. PROP TEST PIT. RELOCATE TELEPHONE DUCT BANK BO IF NECESSARY.

3. PROP TEST PIT. RELOCATE MBTA DUCT BANK BO IF NECESSARY.

4. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.

5. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

HOR. SCALE IN FEET
0 20 50 100

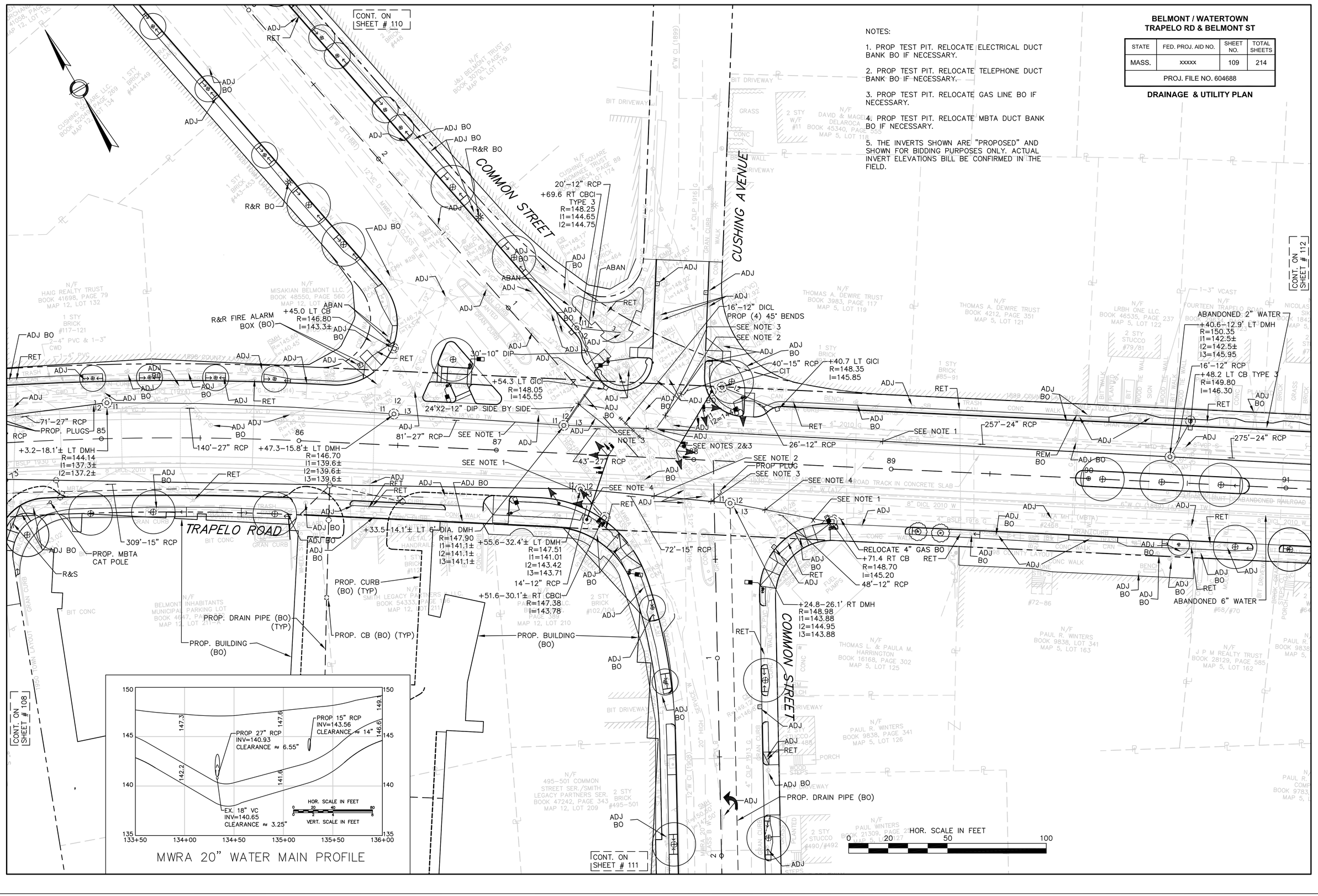
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	109	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN

NOTES:

1. PROP TEST PIT. RELOCATE ELECTRICAL DUCT BANK BO IF NECESSARY.
2. PROP TEST PIT. RELOCATE TELEPHONE DUCT BANK BO IF NECESSARY.
3. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.
4. PROP TEST PIT. RELOCATE MBTA DUCT BANK BO IF NECESSARY.
5. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	110	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN

NOTES:

1. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

HOR. SCALE IN FEET
0 20 50 100

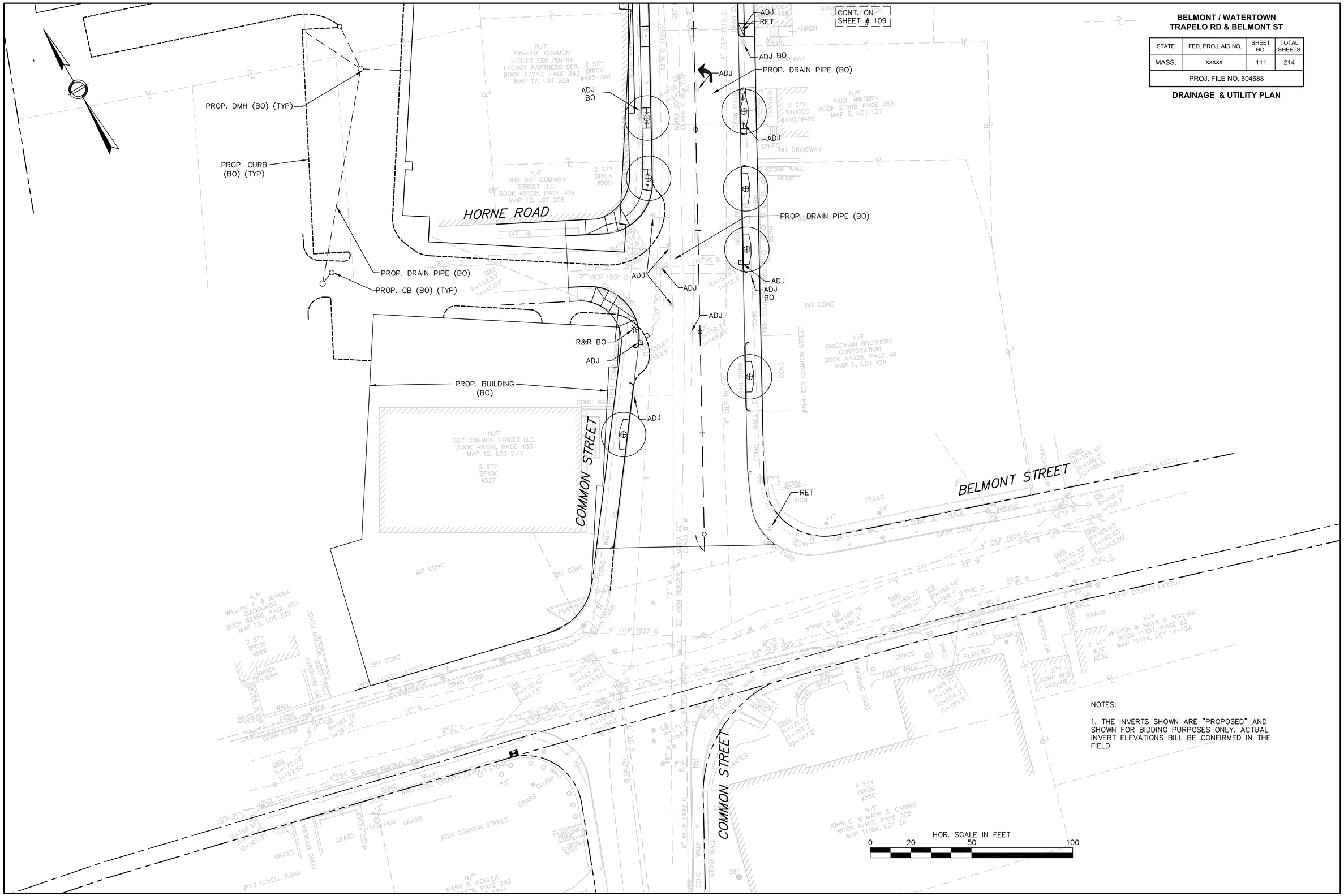
PAYSON ROAD
COMMON STREET
PALFREY ROAD

CONT. ON SHEET # 109

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	111	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN



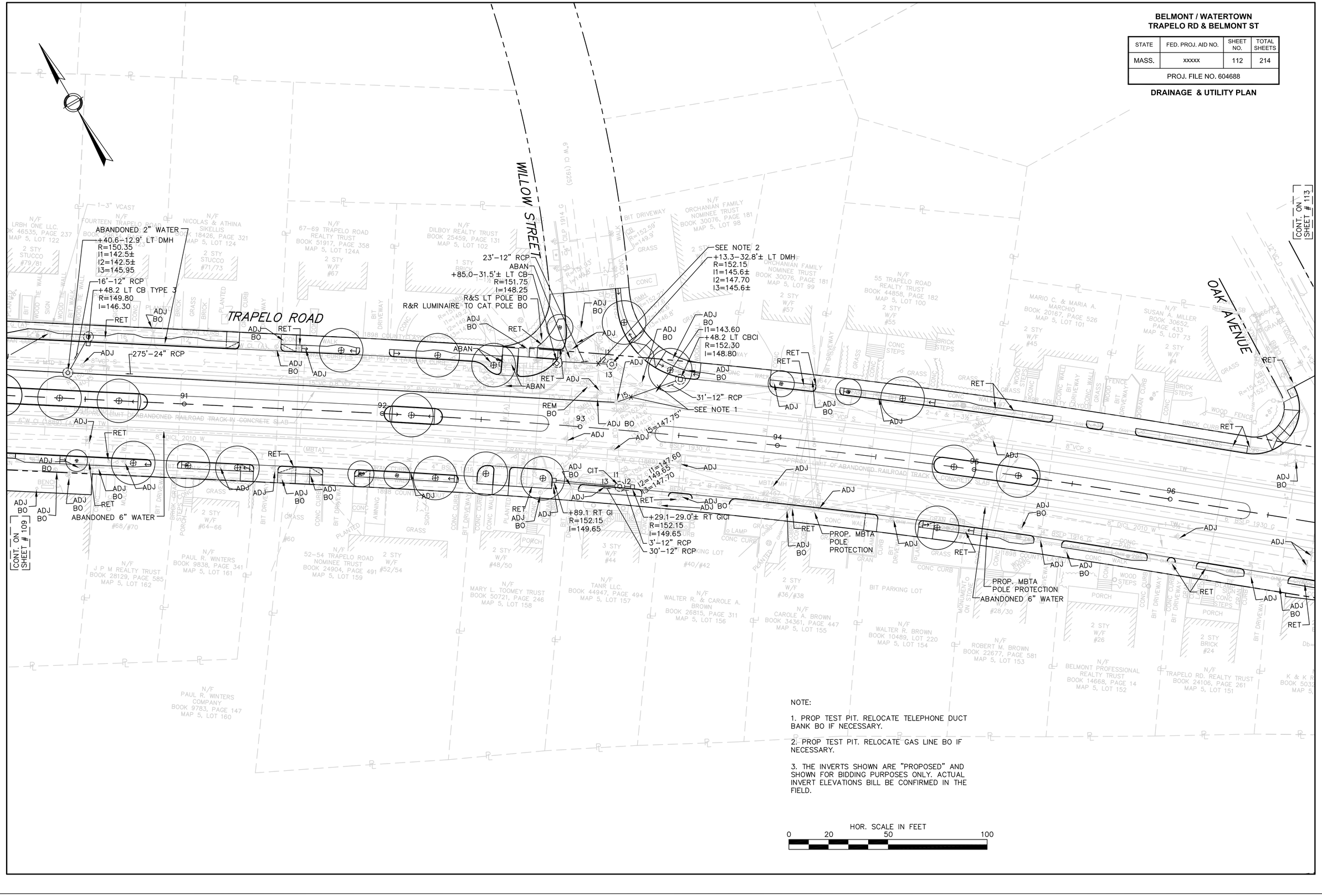
NOTES:

1. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	112	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN



NOTE:

1. PROP TEST PIT. RELOCATE TELEPHONE DUCT BANK BO IF NECESSARY.

2. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.

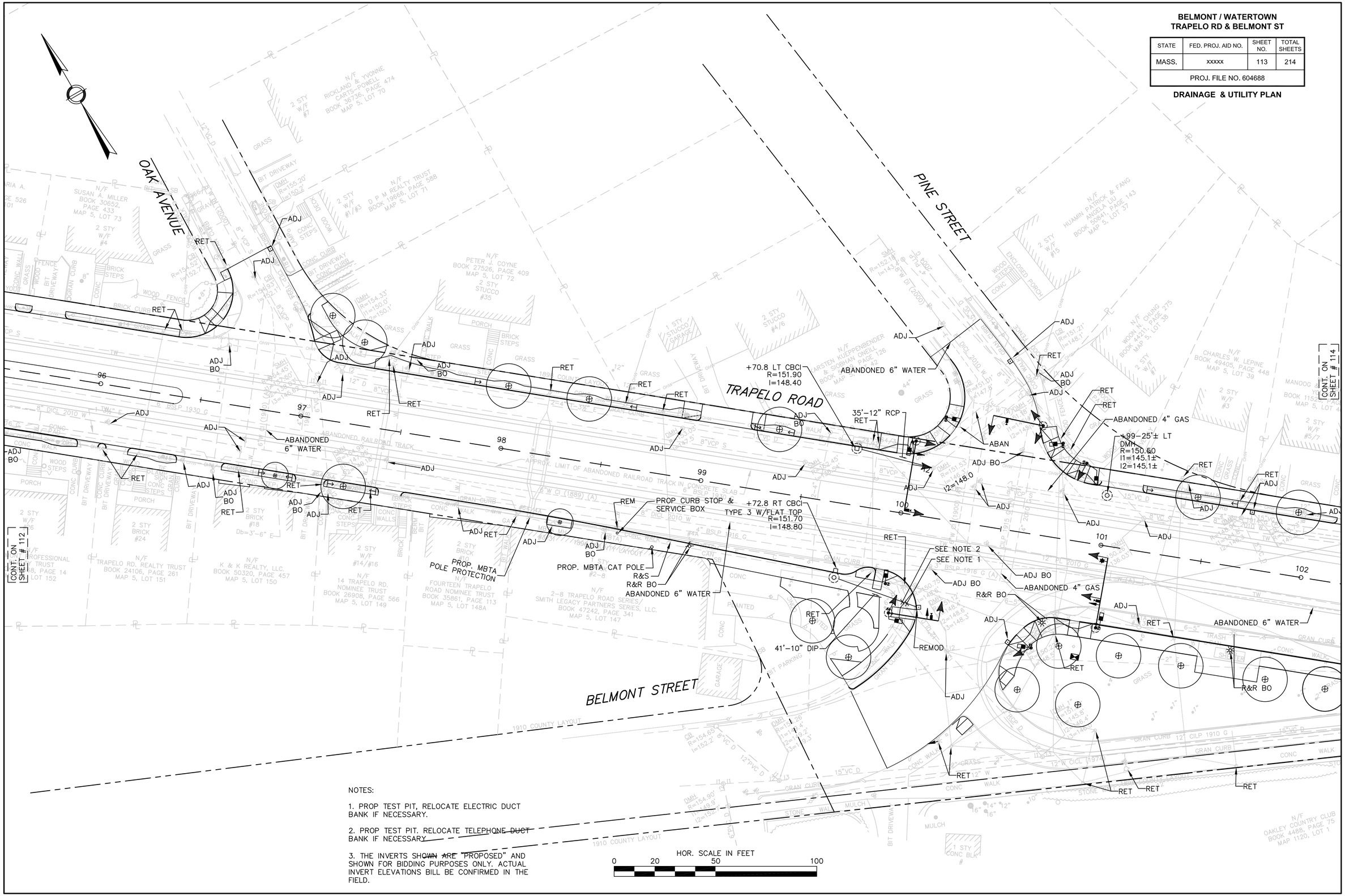
3. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	113	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN



NOTES:

1. PROP TEST PIT, RELOCATE ELECTRIC DUCT BANK IF NECESSARY.

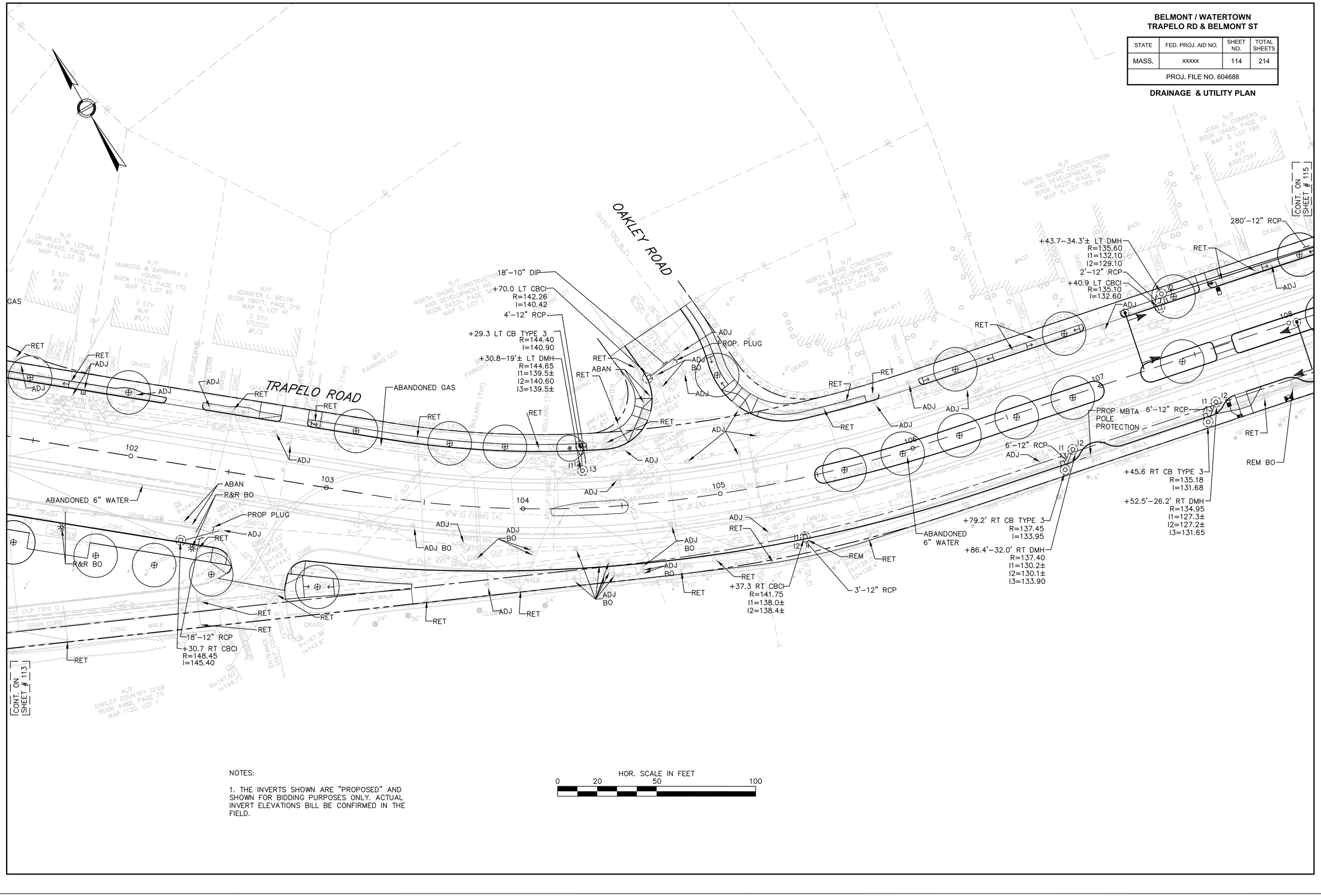
2. PROP TEST PIT. RELOCATE TELEPHONE DUCT BANK IF NECESSARY.

3. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	114	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN



NOTES:

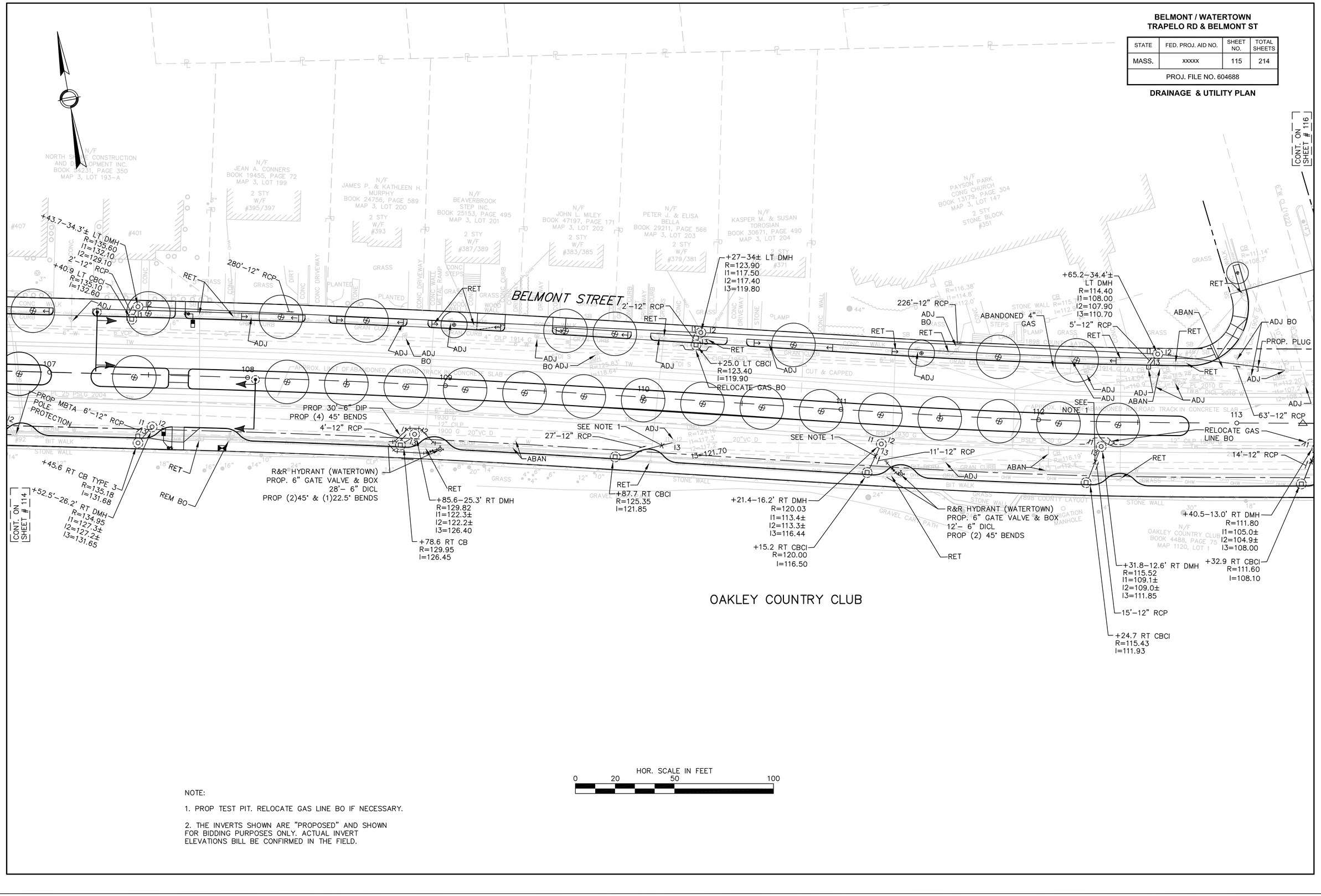
1. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	115	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN



NOTE:

1. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.

2. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	116	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN

PAYSON ROAD
BELMONT STREET
VAN NESS ROAD
STULTS ROAD
COMMONWEALTH ROAD
CARVER ROAD

+65.2–34.4'± LT DMH
R=114.40
I1=108.00
I2=107.90
I3=110.70
5'–12" RCP
RET
ABAN
ADJ BO
PROP. PLUG
ADJ
SEE NOTE 1
RELOCATE GAS LINE BO
63'–12" RCP
14'–12" RCP
+40.5–13.0' RT DMH
R=111.80
I1=105.0±
I2=104.9±
I3=108.00
+32.9 RT CBCI
R=111.60
I=108.10
+31.8–12.6' RT DMH
R=115.52
I1=109.1±
I2=109.0±
I3=111.85
15'–12" RCP
+24.7 RT CBCI
R=115.43
I=111.93
CONT. ON SHEET # 115

+16.1–62.0'± LT CBCI
R=106.30
I=102.80
49'–12" RCP
+85.8–34.6± LT CB WITH FRAME AND COVER
R=107.28
I1=102.85
I2=102.75
3'–12" RCP
+85.9 LT GICI
R=106.71
I=103.21
32'–12" RCP
+46.0–52.4' LT CBCI
R=105.60
I=102.10
14'–12" RCP
+39.6–33.8' LT DMH
R=105.45
I1=101.60
I2=99.50
I3=102.30
I4=102.00
2'–12" RCP
+41.7–27.9' LT DMH
R=105.45
I1=99.3±
I2=99.40
I3=99.3±

+3.9–87.5'± LT CBCI
R=100.70
I=97.20
+28.2–53± LT DMH
R=99.60
I1=93.10
I2=95.90
I3=96.00
37'–12" RCP
5'–12" RCP
+37.5–56.6'± LT CBCI
R=99.50
I=96.00
24'–12" RCP
+44.9–29.0' LT DMH
R=98.95
I1=93.9±
I2=92.90
I3=92.45
ABANDONED 6" WATER
184'–15" RCP
RELOCATE GAS LINE BO
41'–12" RCP
+56.4 RT CBCI
R=98.50
I=95.00
I4=93.8
R&R BO
+77.1 RT CBCI
R=94.31
I=90.81
+01.7–20.4' RT DMH
R=97.12
I1=93.8±
I2=93.9±
I3=94.75
CONT. ON SHEET # 117

HOR. SCALE IN FEET
0 20 50 100

NOTE:

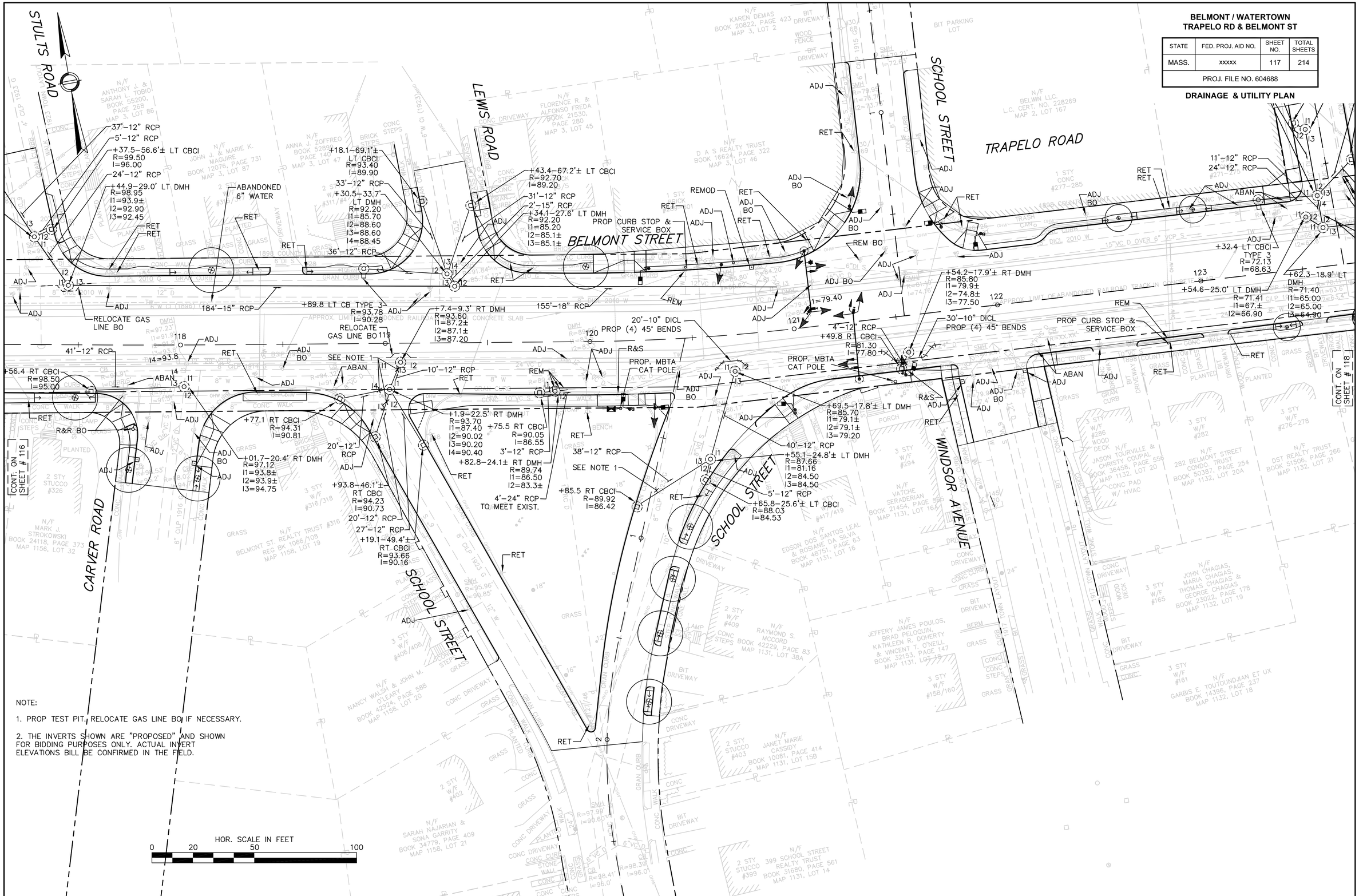
1. PROP TEST PIT, RELOCATE GAS LINE BO IF NECESSARY.

2. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	117	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN



NOTE:

1. PROP TEST PIT, RELOCATE GAS LINE BO IF NECESSARY.

2. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	118	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN

NEWTON STREET
WORCESTER STREET
SPRINGFIELD STREET
FALMOUTH STREET
BELMONT STREET
LANGDON AVENUE
HILLSIDE ROAD
WESTLAND ROAD

+72.2–13.0'± LT CBCI
R=71.20
I=67.70
+68.2–6.9'± LT DMH
I1=67.8±
I2=67.65
I3=65.29
20'–12" RCP
+49.7–13.6'± RT CBCI
R=70.50
I=67.00
2'–12" RCP
28'–12" RCP
+61.3–34.8' LT DMH
R=70.94
I1=68.51
I2=65.15
I3=65.40
I4=65.05
11'–12" RCP
24'–12" RCP
+32.4 LT CBCI
TYPE 3
R=72.13
I=68.63
+54.6–25.0' LT DMH
R=71.41
I1=67.±
I2=66.90
+62.3–18.9' LT DMH
R=71.40
I1=65.00
I2=65.00
I3=64.90
+66.7–13.2'± LT CBCI
R=65.75
I=62.25
+34.9–3.3'± LT DMH
R=65.40
I1=61.65
I2=59.57
I3=61.65
I4=61.65
+56.2–13.2'± RT CBCI
R=65.30
I=61.80
12'–8" DICL PROP (1)
60° BENDS
PROP CURB STOP & SERVICE BOX
R&R HYD
RET
21'–12" RCP
28'–12" RCP
SEE NOTE 1
+44.2 LT CB TYPE 3
R=65.86
I=62.36
199'–21" RCP
17'–12" RCP
12'–12" RCP
PROP PLUGS
+65.8–17.6' LT DMH
R=65.88
I1=59.48
I2=59.48
I3=59.38
+32.4–20'± RT DMH
R=68.85
I1=62.3±
I2=62.3±
I3=65.25
20'–12" RCP
+36.0–44.5'± RT CBCI
R=69.50
I=66.00
+76.2 RT CBCI
R=65.15
I=61.65
3'–12" RCP
+83.2–20.0' RT DMH
R=65.15
I1=59.05
I2=58.95
I3=61.50
R&S F&G
PROP F&G
+72.6–56.6'± LT CBCI
R=61.10
I=57.60
26'–12" RCP
+47.0–62.5'± LT CBCI
R=61.25
I=57.75
25'–12" RCP
9'–12" RCP
+38.5 LT CBCI
R=61.30
I=57.80
REM
ABAN
184'–21" RCP
PROP PLUGS
10'–12" RCP
113'–24" RCP
28'–12" RCP
+58.9–25± LT DMH
R=61.40
I1=55.00
I2=55.00
I3=54.90
+54.3–32.1'± LT DMH
R=61.20
I1=57.50
I2=55.05
I3=57.65
I4=57.63
+19.4 RT CBCI
R=59.40
I=55.90
7'–12" RCP
11'–12" RCP
+49.4 LT CB TYPE 3
R=58.56
I=55.06
24'–12" RCP
+70.2–17.7' LT DMH
R=58.62
I1=52.22
I2=54.90
I3=52.12
14'–6" DICL
PROP (2)
45° BENDS
221'–24" RCP
+68.0–53.2'± RT CBCI
R=58.55
I=55.05
SEE NOTE 1
+56.7–47± RT DMH
R=58.90
I1=54.0±
I2=54.60
I3=54.1±
I4=55.00
ADJ
ADJ BO
ABAN
SEE NOTE 1
ENCLOSED PORCH
CONC CURB
CONC DRIVEWAY
GRASS
PLANTED
WOOD STEPS
WOOD RAMP
BIT RAMP
BIT DRIVEWAY
CONC STEPS
CONC WALK
GRANITE CURB
BRICK WALL
FENCE
SIGN
N/F G & M LIMITED PARTNERSHIP LC. CERT. 207470 MAP 2, LOT 112
N/F P&S REALTY TRUST LC. CERT. 780608 MAP 2, LOT 67
N/F LRBH TWO LLC BOOK 46535, PAGE 210 MAP 2, LOT 61
N/F JOAN O. MURPHY & CLAIRE TAYLOR BOOK 46535, PAGE 207 MAP 2, LOT 59
N/F 275 BELMONT STREET CONDO. TRUST BOOK 50387, PAGE 254 MAP 1132, LOT 20A
N/F DST REALTY TRUST BOOK 51506, PAGE 266 MAP 1132, LOT 21
N/F GLENN F. & HILDA CAMPBELL BOOK 24261, PAGE 294 MAP 1132, LOT 21A
N/F MOHAMMAD J. ABDOLMOHAMMADI BOOK 54919, PAGE 301 MAP 1133, LOT 20
N/F RICHARD & MARY R. NASH BOOK 31809, PAGE 102 MAP 1133, LOT 21
N/F REEM BECKERLY BOOK 49070, PAGE 265 MAP 1133, LOT 22
N/F AL ABBASPOUR & KAREN PICHETTE BOOK 26954, PAGE 383 MAP 1133, LOT 23
N/F PATRICIA M. TAVITIAN & MARY F. CUNNINGHAM BOOK 37590, PAGE 421 MAP 1141, LOT 12
N/F BRIAN SROKA BOOK 51379, PAGE 177 MAP 1141, LOT 1
N/F 9 WESTLAND ROAD CONDOMINIUM BOOK 37181, PAGE 531 MAP 1141, LOT 2
N/F TRS. JACQUE EDWARD ORCHANIAN/ORCHANIAN FAMILY NOMINEE TRUST BOOK 30076, PAGE 181 MAP 1142, LOT 14
N/F JOHN CHAGIAS, MARIA CHAGIAS, THOMAS CHAGIAS & GEORGE CHAGIAS BOOK 23022, PAGE 178 MAP 1132, LOT 19
N/F BIS E. TOUTOUNDJIAN ET UX BOOK 14396, PAGE 237 LOT 18
CONT. ON SHEET # 117
CONT. ON SHEET # 119

HOR. SCALE IN FEET
0 20 50 100

NOTE:

1. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.

2. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	119	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN

CONT. ON SHEET # 118

CONT. ON SHEET # 120

FALMOUTH STREET

PARK ROAD

GROVE STREET

BELMONT STREET

WESTLAND ROAD

WOODLEIGH ROAD

N/F JOAN O. MURPHY & CLAIRE TAYLOR BOOK 2005, PAGE 59 MAP 2, LOT 59

N/F THE FALMONT CONDOMINIUM BOOK 47650, PAGE 2 MAP 2, LOT 28

N/F CHARLES A. SIMMONS JR. BOOK 33260, PAGE 2 MAP 2, LOT 28

N/F MILDRED C. MERCURIO BOOK 8233, PAGE 568 MAP 2, LOT 6

N/F JOSEPHINE BRUNO BOOK 55541, PAGE 549 MAP 2, LOT 5

N/F GHOLAMALI & NILA J. SHAHANAGHI BOOK 25794, PAGE 378 MAP 2, LOT 4

N/F PAUL & MONIKA NALEPA BOOK 27113, PAGE 97 MAP 2, LOT 3

N/F MANUEL A. & BERTHA G. BELTRAN BOOK 26914, PAGE 195 MAP 2, LOT 2

N/F TOWN OF BELMONT BOOK 7743, PAGE 346 MAP 2, LOT 27

#203A

N/F DEBORAH THEODORE & STEFFEN PIERCE BOOK 41188, PAGE 507 MAP 2, LOT 23

N/F CAROLYN N. NAJARIAN BOOK 26013, PAGE 543 MAP 2, LOT 24

N/F THE MARKUSSEN FAMILY TRUST BOOK 55625, PAGE 595 MAP 2, LOT 25

N/F BRYAN J. CORR BOOK 29235, PAGE 184 MAP 2, LOT 22

N/F BELGROVE REALTY TRUST BOOK 71917, PAGE 111 MAP 2, LOT 1

N/F FRANCOIS N. AYER BOOK 13433, PAGE 170 MAP 1143, LOT 5

N/F CELIA E. MANCUSO BOOK 19694, PAGE 249 MAP 1143, LOT 6

N/F COOLIDGE ESTATE CONDOMINIUM BOOK 14768, PAGE 373 MAP 1143, LOT 8

TRS. JACQUE EDWARD ORCHANIAN/ORCHANIAN FAMILY NOMINEE TRUST BOOK 30076, PAGE 181 MAP 1142, LOT 14

TRS. JOHN J. & LOUISE SILVESTRO BOOK 46278, PAGE 132 MAP 1142, LOT 1

N/F ROSE A. HARRINGTON BOOK 46956, PAGE 40 MAP 1142, LOT 2

MEET EXISTING PIPE AT I=48.2±

+49.4 LT CB TYPE 3 R=58.56 I=55.06

24'-12" RCP

+70.2-17.7' LT DMH R=58.62 I1=52.22 I2=54.90 I3=52.12

R&R HYD

14'-6" DICL PROP (2) 45° BENDS

221'-24" RCP

7'-12" RCP

+68.0-53.2'± RT CBCI R=58.55 I=55.05

SEE NOTE 1 +56.7-47± RT DMH R=58.90 I1=54.0± I2=54.60 I3=54.1± I4=55.00

11'-12" RCP

45'-12" RCP

+68.2 LT CBCI R=54.28 I=50.78

ABAN

26'-12" RCP

118'-24" RCP

+94.5-17.1' LT DMH R=54.79 I1=48.39 I2=48.54 I3=48.29 I4=50.50 R&R BO

SEE NOTE 1

9'-12" RCP

+17.5 LT CBCI R=52.80 I=49.30

+17.5-18.3' LT DMH R=53.18 I1=46.78 I2=49.00 I3=46.68

REMOD

PROP. MBTA CAT POLE

RELOCATE GAS BO

+37.5 LT CBCI R=49.50 I=46.00

SEE NOTE 1 262'-24" RCP

+84.4-15.7' ± LT DMH R=49.65 3'-12 I1=43.15 I2=45.45 I3=43.05

+98.4 RT CBCI TYPE 3 R=48.88 I=45.38

ADJ BO

REM

R&S

RET

ADJ

ADJ BO

HOR. SCALE IN FEET

0 20 50 100

NOTE:

1. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.

2. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	120	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN

GROVE STREET
MARION ROAD
MARLBORO STREET
BELMONT STREET
TEMPLETON PARKWAY
ARLINGTON STREET

N/F BELGROVE REALTY TRUST BOOK 11917, PAGE 191, MAP 2, LOT 1
N/F MANUEL A. & BERTHA G. BELTRAN BOOK 26914, PAGE 195 MAP 2, LOT 2
N/F BELMONT CATHOLIC CHARITIES TRUST INC. BOOK 27053, PAGE 369 MAP 1, LOT 116
N/F PETER J. MARINELLI BOOK 14982, PAGE 252 MAP 1, LOT 115
N/F J A R REALTY TRUST BOOK 11943, PAGE 507 MAP 1, LOT 105
N/F JANE M. BARRELL REVOCABLE TRUST BOOK 52105, PAGE 214 MAP 1, LOT 102
N/F 179 BELMONT STREET CONDOMINIUM BOOK 17068, PAGE 210 MAP 1, LOT 103
N/F STANLEY D. GARFIELD BOOK 13552, PAGE 116 MAP 1, LOT 104
N/F THE HARRY KARNIK REALTY TRUST II BOOK 22195, PAGE 452 MAP 1, LOT 65
N/F BELMONT–MARLBORO TRUST BOOK 14744, PAGE 37 MAP 1, LOTS 61/62
N/F JOHN M. & AGAVNI HARUTUNIAN BOOK 21690, PAGE 141 MAP 1, LOT 63
N/F THE MERCURIO REVOCABLE TRUST BOOK 27753, PAGE MAP 1, LOT 64
N/F FIRST BELMONT ST SHALOM INTERN BAPTIST CHURCH BOOK 4541, PAGE 476 MAP 1144, LOT 1A
N/F HARRY REALTY TRUST BOOK 31274, PAGE 174 MAP 1601, LOT 2A–0
N/F THE HARRY KARNIK REALTY TRUST BOOK 22254, PAGE 179 MAP 1601, LOT 2B–0
N/F FOREIGN LIMITED LIABILITY CO. BOOK 47598, PAGE 457 MAP 1601, LOT 5–1
N/F VINCENT J. SAPOCHETTI C. CERT. 224488 LOT 43–1

+37.5 LT CBCI R=49.50 I=46.00
45'–12" RCP
SEE NOTE 1
262'–24" RCP
+84.4–15.7' ± LT DMH R=49.65 I1=43.15 I2=45.45 I3=43.05
3'–12" RCP
+4.3–21.9' ± RT DMH R=48.89 I1=41.9± I2=41.9± I3=43.35
+98.4 RT CBCI TYPE 3 R=48.88 I=45.38
PROP. MBTA CAT POLE
2'–12" RCP
+5.6 RT CBCI R=47.35 I=44.15
I3=43.90
45'–12" RCP
+37.5 LT CBCI R=47.70 I=44.20
PROP CURB STOP & SERVICE BOX
322'–24" RCP
+98.4 LT CBCI R=46.75 I=43.25
32'–12" RCP
+32.3–8.6' LT DMH R=47.23 I1=39.80 I2=43.05 I3=38.90
241'–24" RCP
R&R HYDRANT (WATERTOWN)
PLUG EXIST HYD.
PROP. 6" GATE VALVE & BOX
11'– 6" DICL
1–22.5° BEND
+93.8 RT CB TYPE 3 R=45.85 I=42.35
10'–12" RCP

[CONT. ON SHEET # 119]
[CONT. ON SHEET # 121]
CONT. ON SHEET DU–26

NOTE:

1. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.

2. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	121	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN

NOTE:

1. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.

2. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

CONT. ON SHEET DU-28

238'-24" RCP

OXFORD AVENUE

EXETER STREET

BELMONT STREET

PRENTISS STREET

KEENAN STREET

CONT. ON SHEET # 120

CONT. ON SHEET # 122

241'-24" RCP

+49.6 LT CBCI
R=45.80
I=42.30

28'-12" RCP

+73.9-12.3' LT DMH
R=46.30
I1=35.40
I2=35.50
I3=36.50
I4=41.90

+93.8 RT CB TYPE 3
R=45.85
I=42.35

10'-12" RCP

ABAN

+85.4 RT CBCI TYPE 3
R=45.90
I=43.40

+95.1-25.3' RT DMH
R=46.40
I1=41.8±
I2=41.8±
I3=43.30

5'-12" RCP

RELOCATE GAS BO

SEE NOTE 1

193'-12" RCP

PROP CURB STOP & SERVICE BOX

+84.9 LT CB TYPE 3
R=44.25
I=40.75

15'-12" RCP

+75.7-13.1' LT DMH
R=44.75
I1=36.20
I2=40.55
I3=36.30

24'-12" RCP

+73.1-54± RT CBCI
R=45.55
I=42.05

50'-12" RCP

+30.5-12.5' LT DMH
R=44.30
I1=36.60
I2=36.70

REMOD

114'-12" RCP

+51.4-12.6' LT DMH
R=43.20
I1=37.20
I2=37.30

115'-12" RCP

+72.3-12.5' LT DMH
R=41.90
I1=37.98
I2=37.88

+78.0 LT CBCI
R=41.40
I=38.04

12'-12" RCP

REMOD
R&S F&G
PROP F&G

HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	122	214
PROJ. FILE NO. 604688			

DRAINAGE & UTILITY PLAN

CONT. ON SHEET # 121

NOTE:

1. PROP TEST PIT. RELOCATE GAS LINE BO IF NECESSARY.

2. THE INVERTS SHOWN ARE "PROPOSED" AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS BILL BE CONFIRMED IN THE FIELD.

END PROJECT
STA. 147+30.18
MEET EXISTING
N 2961926.5323
E 749560.5137

ERICSSON STREET

BELMONT STREET

BRIMMER STREET

KEENAN STREET

+78.0 LT CBCI
R=41.40
I=38.04

12'–12" RCP

+72.3–12.5' LT DMH
R=41.90
I1=37.98
I2=37.88

SEE NOTE 1

115'–12" RCP

REMOD
R&S F&G
PROP F&G

RET

ADJ

BO

+97.2–25.5' LT DMH
R=42.30
I1=38.1±
I2=38.1±
I3=39.10

4'–12" RCP

+90.2 RT CBCI
R=41.80
I=39.30

HOR. SCALE IN FEET
0 20 50 100

+3.2–4.1'± LT SPECIAL DMH
R=31.51
I1=26.00
I2=21.62

RELOCATE GAS BO

243'–24" RCP

OXFORD CIRCLE

OXFORD AVENUE

I1=18.68 (FROM RECORD PLAN)
I2=18.68 (FROM RECORD PLAN)

+56.0–4.5' LT DMH
R=41.45
I1=33.00
I2=31.60

RELOCATE GAS BO

238'–24" RCP

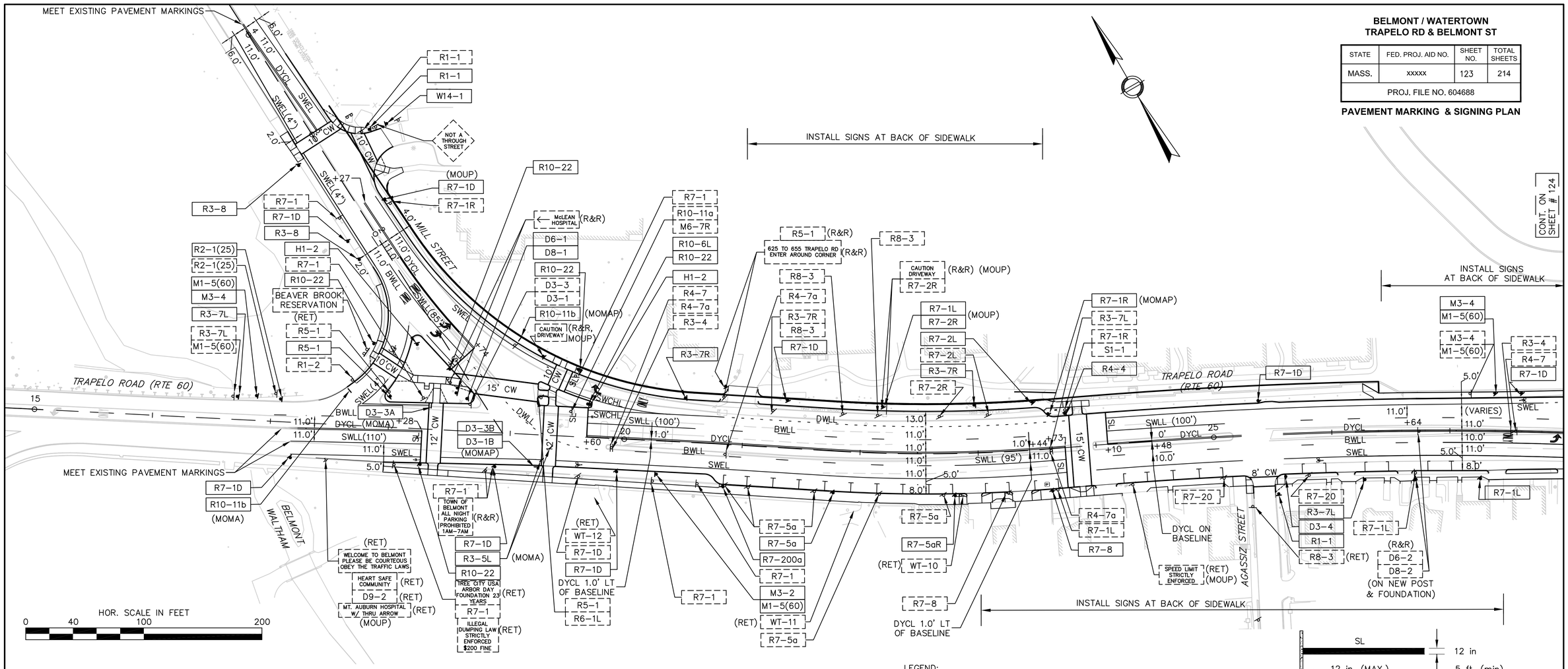
HOR. SCALE IN FEET
0 20 50

CONT. ON SHEET DU–27

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	123	214
PROJ. FILE NO. 604688			

PAVEMENT MARKING & SIGNING PLAN



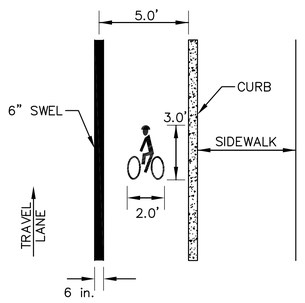
NOTES:

1. ALL EXISTING SIGNS ARE TO BE REMOVED AND STACKED UNLESS NOTED OTHERWISE.

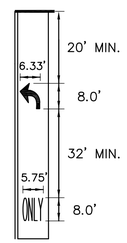
2. ALL CROSSWALKS SHALL CONFORM TO DETAIL SHOWN THIS ON SHEET UNLESS OTHERWISE NOTED.

LEGEND:

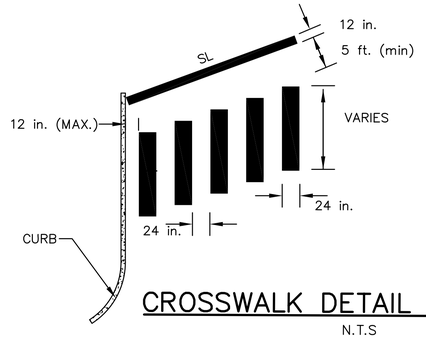
R1–1	EXISTING SIGN
R1–1	PROPOSED SIGN
(R&R)	REMOVE AND RESET
(RET)	RETAIN
(REM)	REMOVE
(MOUP)	MOUNTED ON UTILITY POLE
(MOP)	MOUNTED ON POLE
(MOLP)	MOUNTED ON LIGHT POLE
(MOTSP)	MOUNTED ON TRAFFIC SIGNAL POST
(MOMA)	MOUNTED ON MAST ARM
(MOMAP)	MOUNTED ON MAST ARM POST
WT–X	EXIST. WAVERLEY TRAIL SIGN OR KIOSK



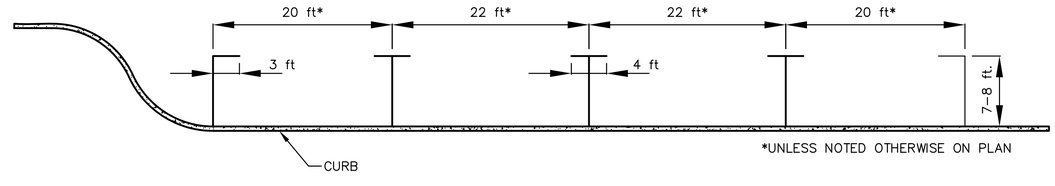
BICYCLE LANE DETAIL
N.T.S



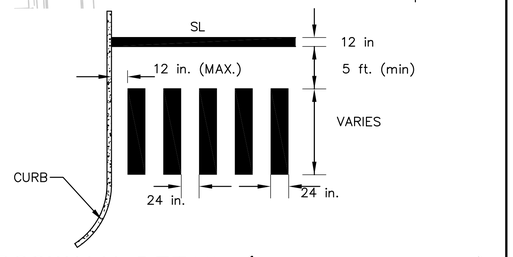
ARROW AND ONLY DETAIL
N.T.S



CROSSWALK DETAIL (ANGULAR)
N.T.S



TYPICAL PARKING STALL LAYOUT
N.T.S

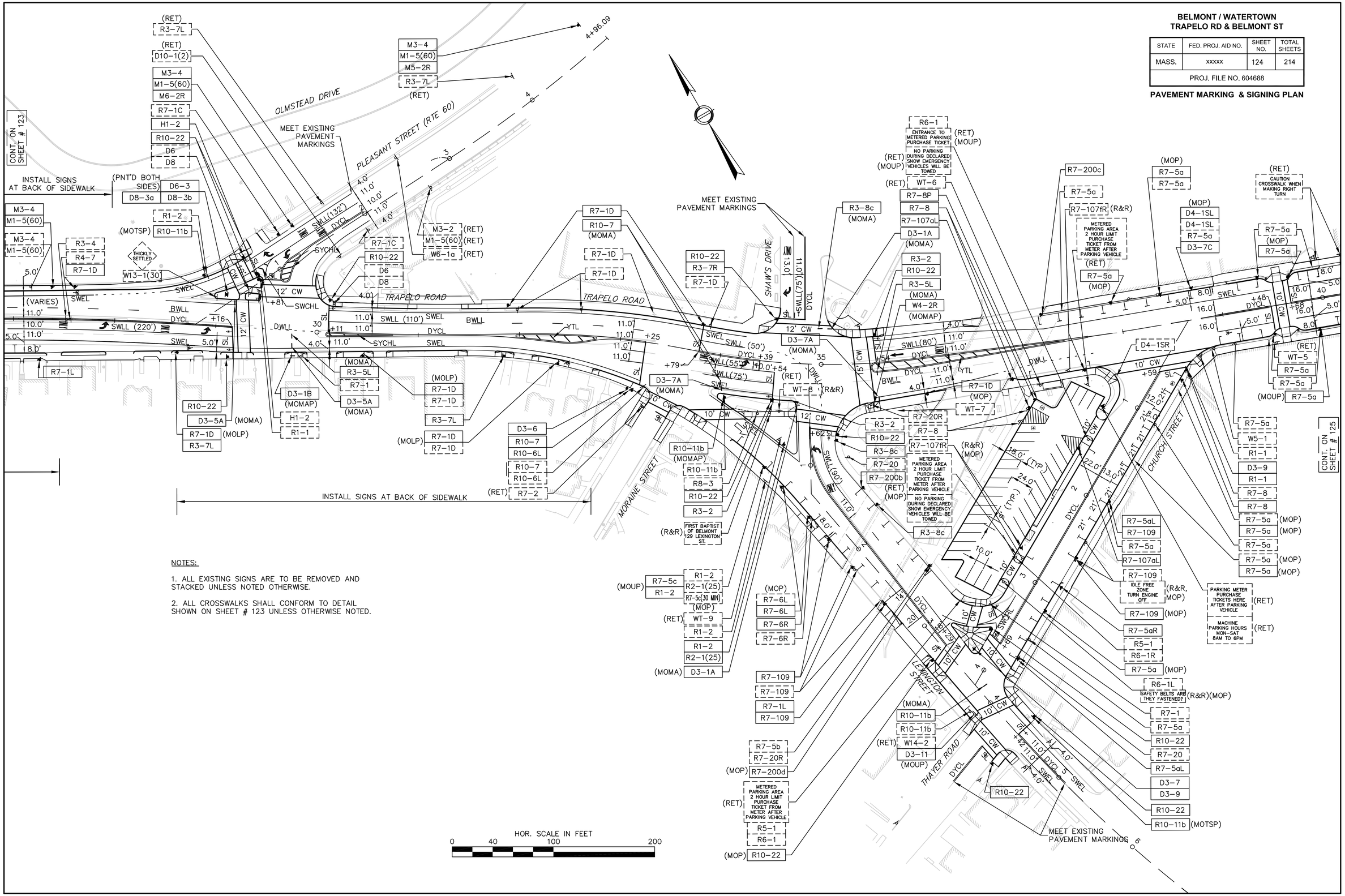


CROSSWALK DETAIL (PERPENDICULAR)
N.T.S

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	124	214
PROJ. FILE NO. 604688			

PAVEMENT MARKING & SIGNING PLAN



NOTES:

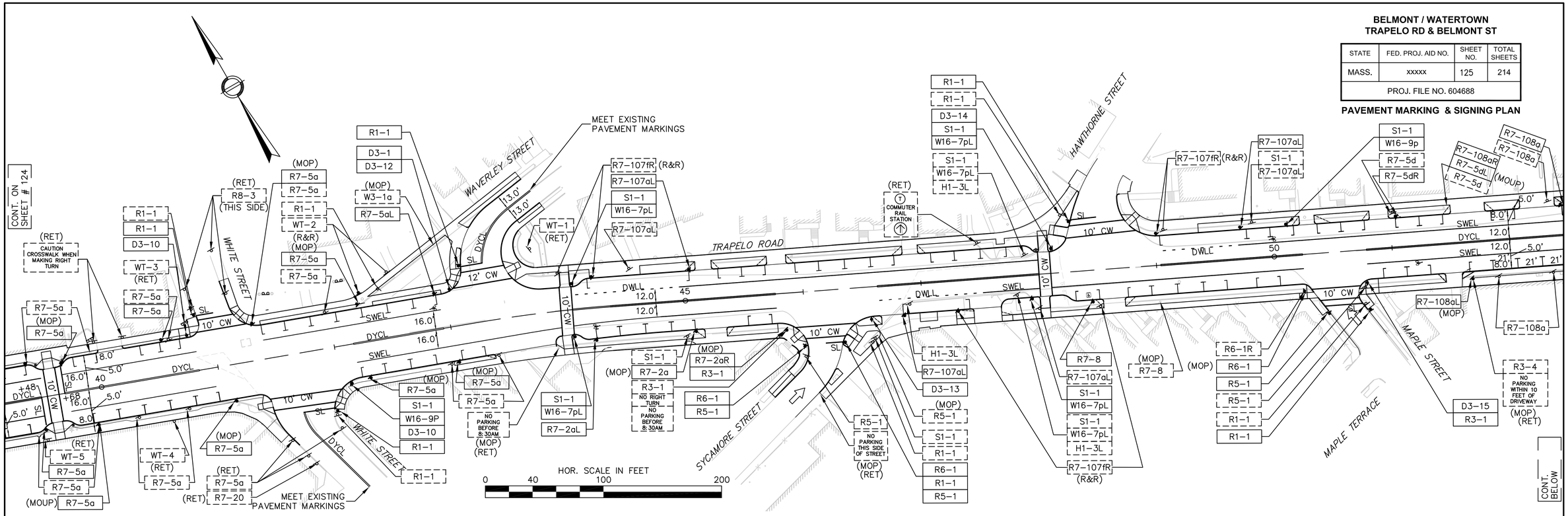
1. ALL EXISTING SIGNS ARE TO BE REMOVED AND STACKED UNLESS NOTED OTHERWISE.

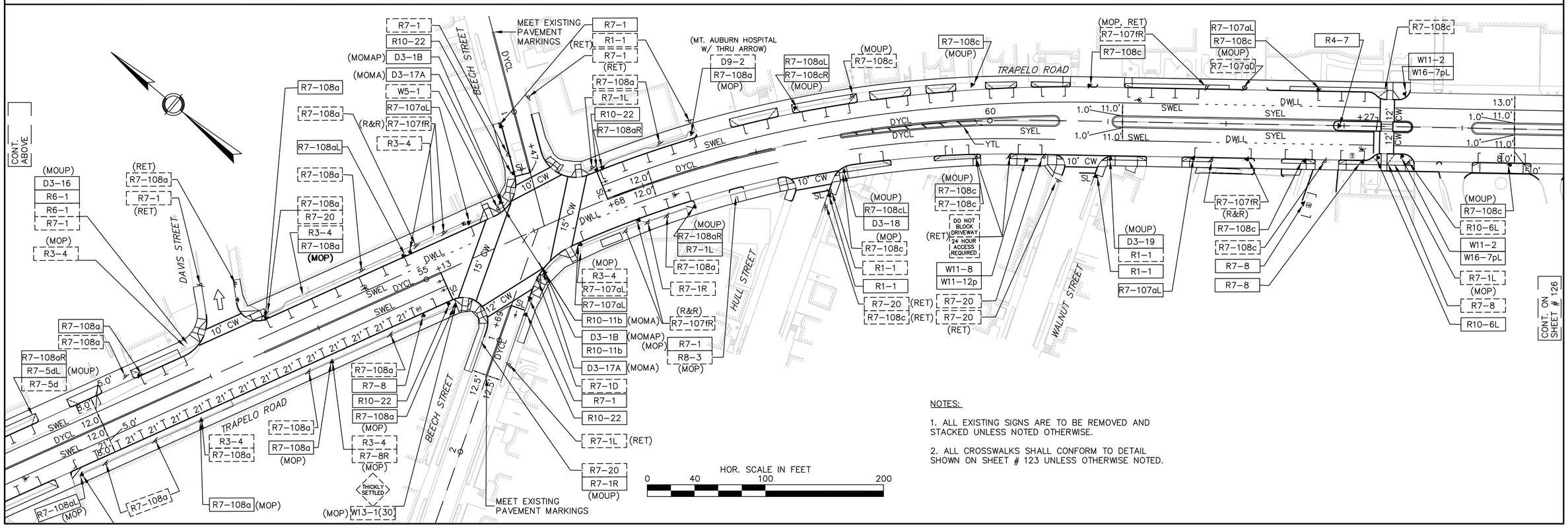
2. ALL CROSSWALKS SHALL CONFORM TO DETAIL SHOWN ON SHEET # 123 UNLESS OTHERWISE NOTED.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	125	214
PROJ. FILE NO. 604688			

PAVEMENT MARKING & SIGNING PLAN





NOTES:

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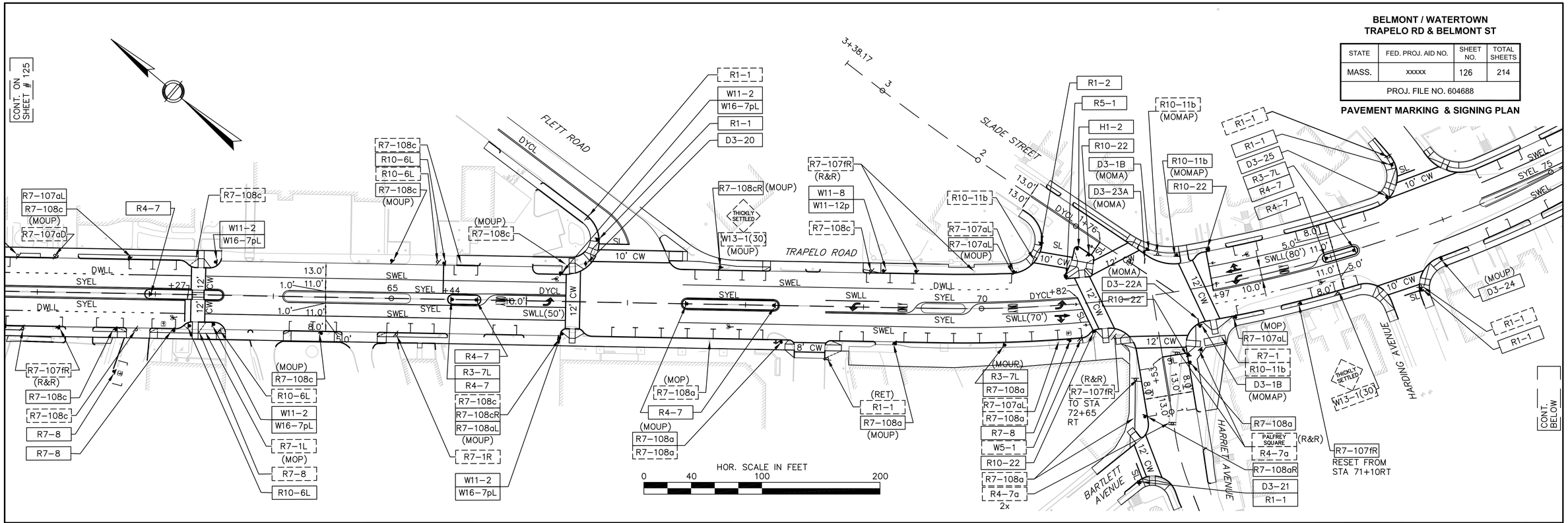
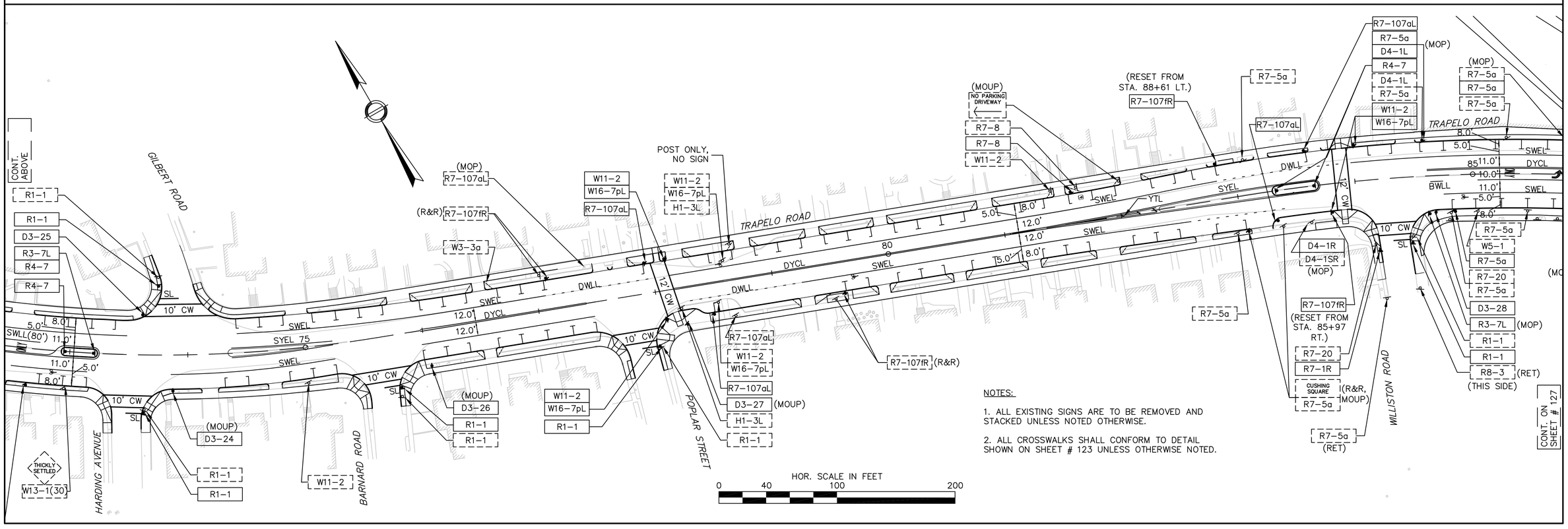
2. ALL CROSSWALKS SHALL CONFORM TO DETAIL SHOWN ON SHEET # 123 UNLESS OTHERWISE NOTED.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	126	214
PROJ. FILE NO. 604688			

PAVEMENT MARKING & SIGNING PLAN





NOTES:

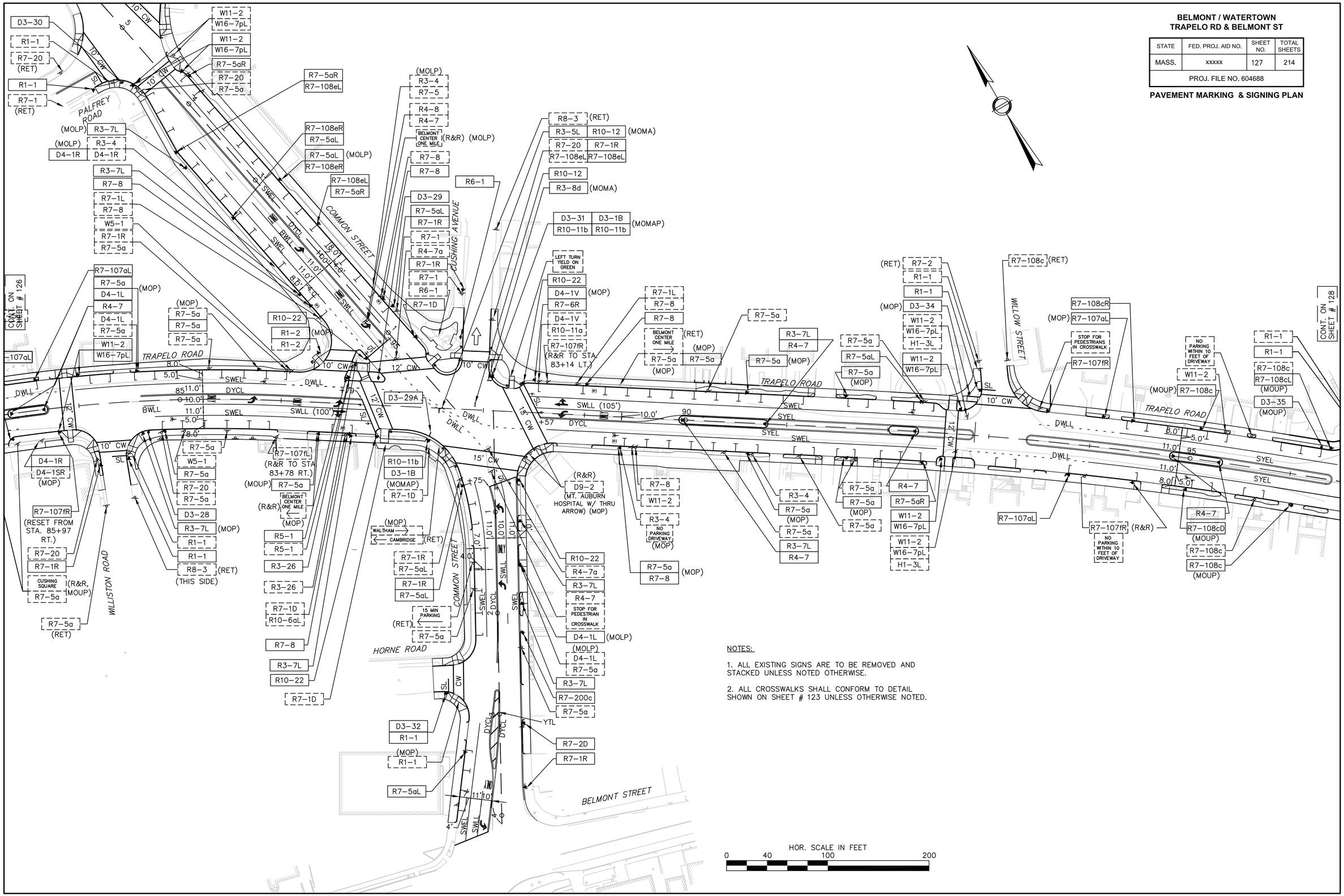
1. ALL EXISTING SIGNS ARE TO BE REMOVED AND STACKED UNLESS NOTED OTHERWISE.

2. ALL CROSSWALKS SHALL CONFORM TO DETAIL SHOWN ON SHEET # 123 UNLESS OTHERWISE NOTED.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	127	214
PROJ. FILE NO. 604688			

PAVEMENT MARKING & SIGNING PLAN



NOTES:

1. ALL EXISTING SIGNS ARE TO BE REMOVED AND STACKED UNLESS NOTED OTHERWISE.

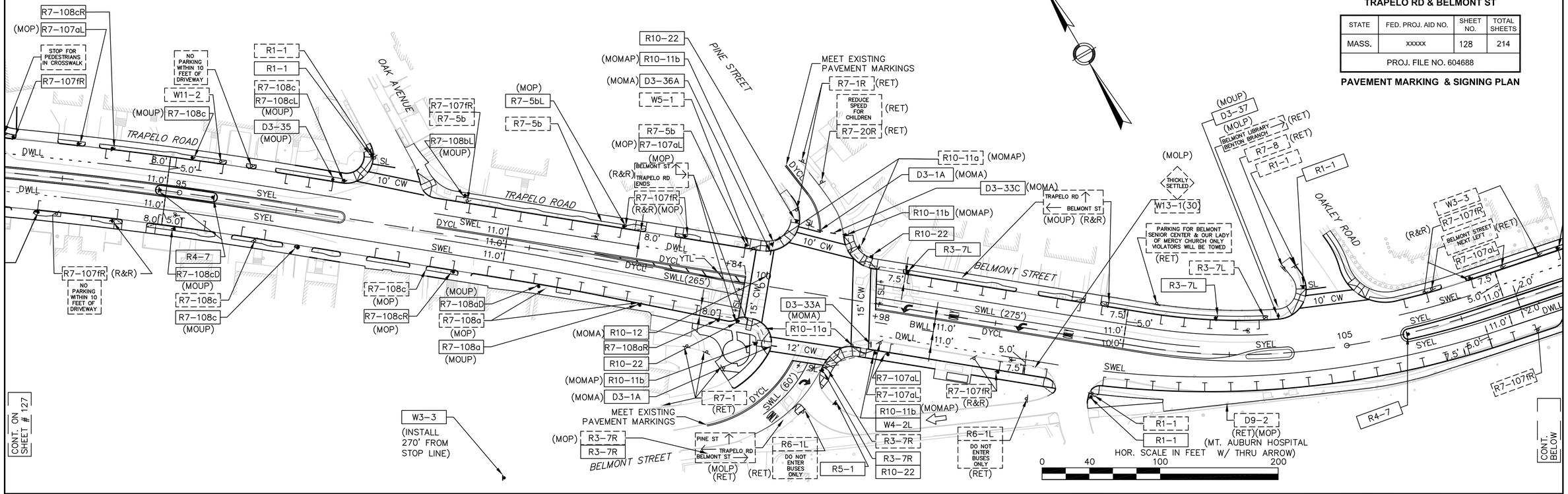
2. ALL CROSSWALKS SHALL CONFORM TO DETAIL SHOWN ON SHEET # 123 UNLESS OTHERWISE NOTED.

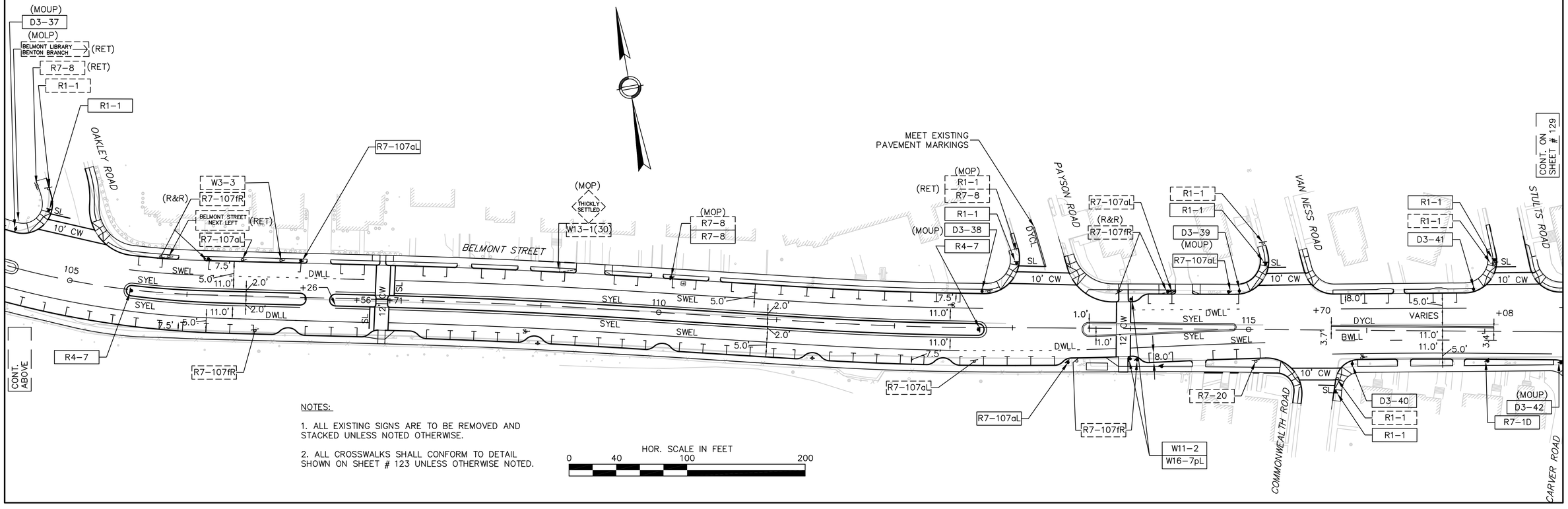
HOR. SCALE IN FEET
0 40 100 200

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	128	214
PROJ. FILE NO. 604688			

PAVEMENT MARKING & SIGNING PLAN

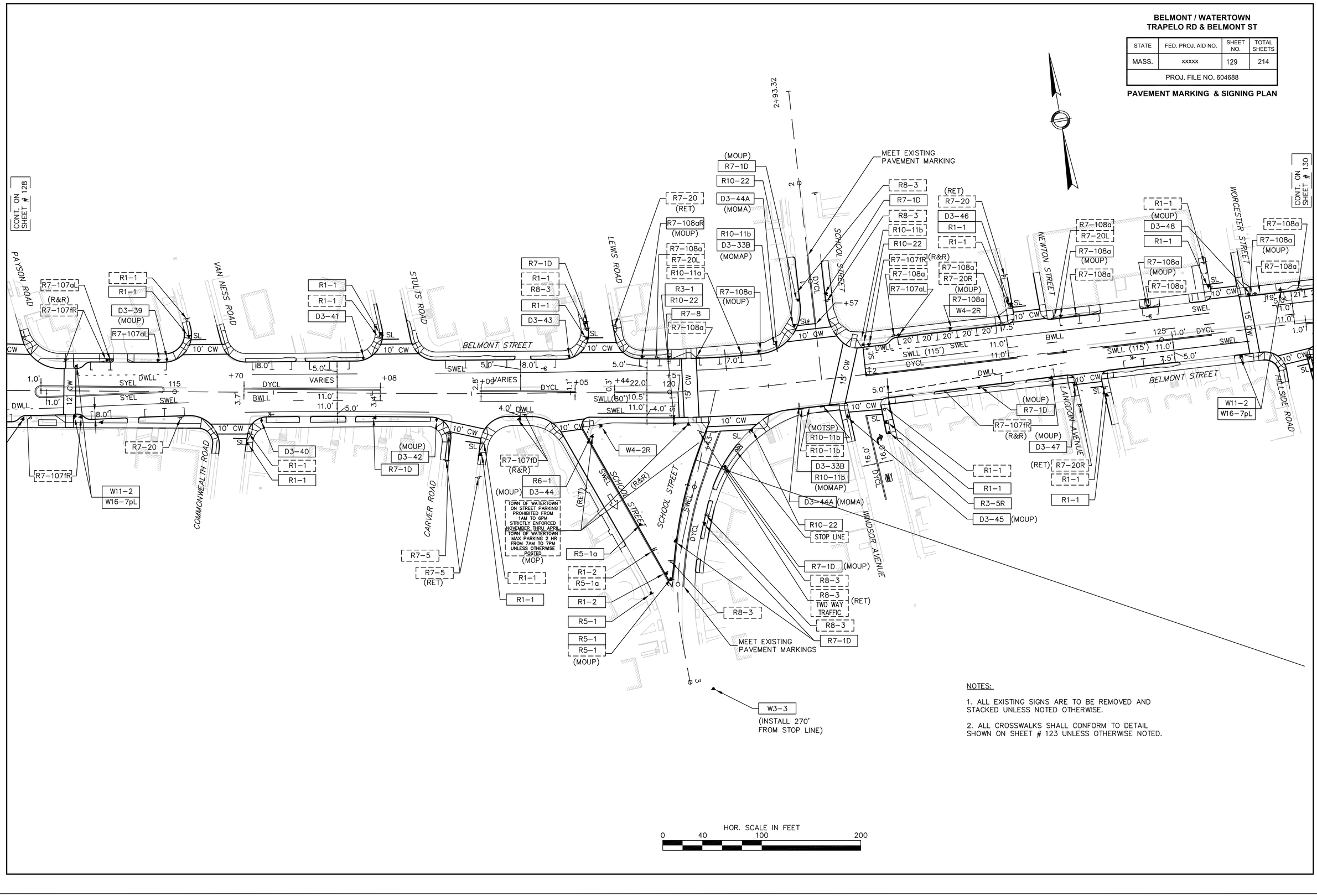




BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	129	214
PROJ. FILE NO. 604688			

PAVEMENT MARKING & SIGNING PLAN



NOTES:

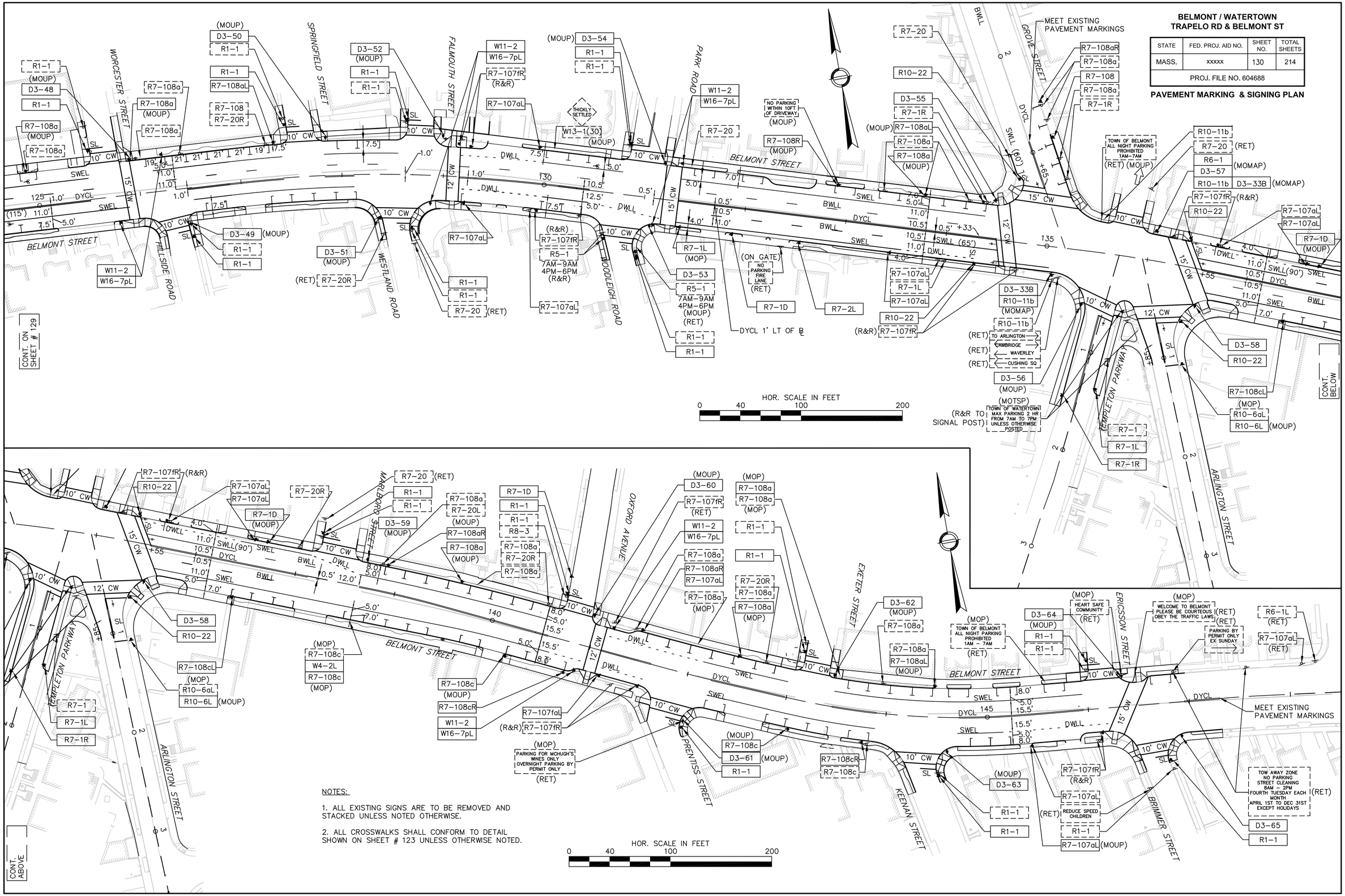
1. ALL EXISTING SIGNS ARE TO BE REMOVED AND STACKED UNLESS NOTED OTHERWISE.

2. ALL CROSSWALKS SHALL CONFORM TO DETAIL SHOWN ON SHEET # 123 UNLESS OTHERWISE NOTED.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	130	214
PROJ. FILE NO. 604688			

PAVEMENT MARKING & SIGNING PLAN



NOTES:

1. ALL EXISTING SIGNS ARE TO BE REMOVED AND STACKED UNLESS NOTED OTHERWISE.

2. ALL CROSSWALKS SHALL CONFORM TO DETAIL SHOWN ON SHEET # 123 UNLESS OTHERWISE NOTED.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	131	214
PROJ. FILE NO. 604688			

SIGN SUMMARY SHEET

TRAFFIC SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN WIDTH (in)	SIZE OF SIGN HEIGHT (in)	TEXT	TEXT DIMENSIONS (in) LETTER HEIGHT	TEXT DIMENSIONS (in) VERTICAL SPACING	TEXT DIMENSIONS (in) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACKGROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA (S.F.)
M1–5 (60)	30	24	60	SEE MASSDOT STANDARDS			5	SEE MASSDOT STANDARDS			P–5 (1)	6.25	31.25
M3–2	24	12		SEE 2009 M.U.T.C.D.			1	SEE 2009 M.U.T.C.D.			P–5 (1)	2.00	2.00
M3–4	24	12					4				P–5 (3)	2.00	8.00
M5–2R	21	15					1				P–5 (0)	2.18	2.18
M6–2R	21	15					1				P–5 (0)	2.18	2.18
R1–1	30	30	STOP				47				P–5 (43)	5.19	243.80
R1–2	36	36	YIELD				5				P–5 (3)	4.50	22.50
R2–1(25)	24	30	SPEED LIMIT 25				2				P–5 (1)	5.00	10.00
R3–1	24	24					4				P–5 (0)	4.00	16.00
R3–2	24	24					1				P–5 (0)	4.00	4.00
R3–5L	30	36	ONLY				3				P–5 (0)	7.50	22.50
R3–5R	30	36	ONLY				1				P–5 (1)	7.50	7.50
R3–7L	30	30	LEFT LANE MUST TURN LEFT				17				P–5 (12)	6.25	106.25
R3–7R	30	30	RIGHT LANE MUST TURN RIGHT				5				P–5 (3)	6.25	31.25
R3–8	30	30	ONLY				2				P–5 (2)	7.50	15.0
R3–8c	36	30	ONLY				1				P–5 (2)	7.50	7.50
R3–26	24	30	RIGHT TURN ONLY	SEE MASSDOT STANDARDS			1	SEE MASSDOT STANDARDS			P–5 (1)	5.00	5.00
R4–4	36	30	BEGIN RIGHT TURN LANE YIELD TO BIKES	SEE 2009 M.U.T.C.D.			1	SEE 2009 M.U.T.C.D.			P–5 (1)	7.50	7.50
R4–7	24	30					16				P–5 (14)	3.00	48.00
R5–1	30	30	DO NOT ENTER				9				P–5 (8)	6.25	56.25

TRAFFIC SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN WIDTH (in)	SIZE OF SIGN HEIGHT (in)	TEXT	TEXT DIMENSIONS (in) LETTER HEIGHT	TEXT DIMENSIONS (in) VERTICAL SPACING	TEXT DIMENSIONS (in) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACKGROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA (S.F.)
R5–1a	36	24	WRONG WAY	SEE 2009 M.U.T.C.D.			1	SEE 2009 M.U.T.C.D.			P–5 (1)	3.75	3.75
R6–1 PBS	36	12	ONE WAY				7				P–5 (4)	3.00	21.00
R3–8d	36	30	ONLY				1				P–5 (0)	7.50	7.50
R7–1	12	18	NO PARKING ANY TIME				3					1.50	4.5(
R7–1L	12	18	NO PARKING ANY TIME				6						
R7–1R	12	18	NO PARKING ANY TIME				10						
R7–1D	12	18	NO PARKING ANY TIME				25						
R7–2a	12	18	NO PARKING BEFORE 8:30 AM				1						
R7–2aL	12	18	NO PARKING BEFORE 8:30 AM				1						
R7–2aR	12	18	NO PARKING BEFORE 8:30 AM				1						
R7–2D	12	18	NO PARKING 4:00 PM TO 6:00 PM				1						
R7–2L	12	18	NO PARKING 4:00 PM TO 6:00 PM				1						
R7–2R	12	18	NO PARKING 4:00 PM TO 6:00 PM				1						
R7–5a	12	18	ONE HOUR PARKING				25						
R7–5aL	12	18	ONE HOUR PARKING				8						
R7–5aR	12	18	ONE HOUR PARKING				5						
R7–5bL	12	18	TWO HOUR PARKING				1						
R7–5c	12	18	30 MINUTE PARKING				1				(0)		
R7–5dL	12	18	15 MIN PARKING				1				P–5 (0)	1.50	1.50
R7–5dR	12	18	15 MIN PARKING				1				P–5 (1)	1.50	1.50

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MASS.	xxxxx	132	214
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SIGN SUMMARY SHEET

TRAFFIC SIGN SUMMARY

IDENTIFI-CATION NUMBER	SIZE OF SIGN WIDTH (in)	SIZE OF SIGN HEIGHT (in)	TEXT	TEXT DIMENSIONS (in) LETTER HEIGHT	TEXT DIMENSIONS (in) VERTICAL SPACING	TEXT DIMENSIONS (in) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK-GROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA (S.F.)
R7-6L	12	18	NO PARKING LOADING ZONE ←	SEE 2009 M.U.T.C.D.			1	SEE 2009 M.U.T.C.D.			P-5 (1)	1.50	1.50
R7-6R	12	18	NO PARKING LOADING ZONE →				2				P-5 (1)	1.50	3.00
R7-8	12	18	RESERVED PARKING				15				P-5 (14)	1.50	22.50
R7-107aL	12	30					30				P-5 (23)	2.50	75.00
R7-107fR	12	30					(1) PROVIDED BY MBTA				P-5 (1)	--	--
R7-108a	12	18	1 HR PARKING 8:00 AM TO 6:00 PM MON-SAT				21				P-5 (4)	1.50	31.50
R7-108aD	12	18	1 HR PARKING 8:00 AM TO 6:00 PM MON-SAT →				1				P-5 (0)	1.50	1.50
R7-108aL	12	18	1 HR PARKING 8:00 AM TO 6:00 PM MON-SAT ←				7				P-5 (2)	1.50	10.50
R7-108aR	12	18	1 HR PARKING 8:00 AM TO 6:00 PM MON-SAT →				9				P-5 (5)	1.50	13.50
R7-108bL	12	18	2 HR PARKING 8:00 AM TO 6:00 PM MON-SAT ←				1				P-5 (0)	1.50	1.50
R7-108c	12	18	2 HR PARKING 8:00 AM TO 6:00 PM EXCEPT SUNDAYS & HOLIDAYS				12				P-5 (2)	1.50	18.0
R7-108cL	12	18	2 HR PARKING 8:00 AM TO 6:00 PM EXCEPT SUNDAYS & HOLIDAYS ←				3				P-5 (1)	1.50	4.50
R7-108cR	12	18	2 HR PARKING 8:00 AM TO 6:00 PM EXCEPT SUNDAYS & HOLIDAYS →				7				P-5 (3)	1.50	10.50
R7-108cD	12	18	2 HR PARKING 8:00 AM TO 6:00 PM EXCEPT SUNDAYS & HOLIDAYS ↔				1				P-5 (0)	1.50	1.50
R7-108eL	12	18	15 MIN PARKING 9:00 AM TO 6:00 PM MONDAY - SAT ←				3				P-5 (1)	1.50	4.50
R7-108eR	12	18	15 MIN PARKING 9:00 AM TO 6:00 PM MONDAY - SAT →				2				P-5 (1)	1.50	3.00
R7-108R	12	18	2 HR PARKING X:XX AM TO X:XX PM →				1				P-5 (0)	1.50	1.50
R7-2L	12	18	NO PARKING 7-9 AM 4-6 PM MON-FRI ←				1				P-5 (1)	3.00	3.00
R7-109	12	18	NO PARKING TAXI STAND				5				P-5 (2)	1.50	7.50

TRAFFIC SIGN SUMMARY

IDENTIFI-CATION NUMBER	SIZE OF SIGN WIDTH (in)	SIZE OF SIGN HEIGHT (in)	TEXT	TEXT DIMENSIONS (in) LETTER HEIGHT	TEXT DIMENSIONS (in) VERTICAL SPACING	TEXT DIMENSIONS (in) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK-GROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA (S.F.)
R7-200a	24	18	ONE HOUR PARKING ← | NO PARKING ANY TIME →	SEE 2009 M.U.T.C.D.			1	SEE 2009 M.U.T.C.D.			P-5 (1)	3.00	3.00
R7-200b	24	18	NO PARKING ANY TIME ← | TWO HOUR PARKING →				1				P-5 (0)	3.00	3.00
R7-200c	24	18	NO PARKING ANY TIME ← | ONE HOUR PARKING →				2				P-5 (2)	3.00	6.00
R7-200d	24	18	TWO HOUR PARKING ← | NO PARKING ANY TIME →				1				P-5 (0)	3.00	3.00
R10-6L	24	36	STOP HERE ON RED ↙				5				P-5 (2)	6.00	30.00
R10-7	24	30	DO NOT BLOCK INTERSECTION				3				P-5 (1)	5.00	15.00
R10-11b	36	36	NO TURN ON RED				20				P-5 (8)	4.00	80.00
R10-12	30	36	LEFT TURN YIELD ON GREEN				3				P-5 (0)	5.00	15.00
R10-22	12	18	TO REQUEST GREEN WAIT ON				42				P-5 (41)	1.50	63.00
S1-1	36	36					6				P-5 (4)	6.25	37.50
W3-3	30	30					2				P-5 (2)	6.75	40.50
W4-2L	36	36					3				P-5 (1)	6.25	18.75
W4-2R	36	36					2				P-5 (1)	6.25	12.50
W11-2	30	30					22				P-5 (22)	6.25	137.50
W11-8	30	30					2				P-5 (2)	6.25	12.50
W11-12P	36	30	EMERGENCY SIGNAL AHEAD				2				P-5 (0)	7.50	15.00
W14-1	24	24	DEAD END				1				P-5 (1)	2.00	2.00
W16-7pL	24	12	↙				26				P-5 (0)	2.00	52.00
W16-9p	24	12	AHEAD				2				P-5 (0)	2.00	4.00

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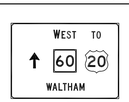
SIGN SUMMARY SHEET

TRAFFIC SIGN SUMMARY

IDENTIFI–CATION NUMBER	SIZE OF SIGN WIDTH (in)	SIZE OF SIGN HEIGHT (in)	TEXT	TEXT DIMENSIONS (in) LETTER HEIGHT	TEXT DIMENSIONS (in) VERTICAL SPACING	TEXT DIMENSIONS (in) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK–GROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA (S.F.)
D4–1L	30	24		SEE 2009 M.U.T.C.D.			2	SEE 2009 M.U.T.C.D.			P–5 (0)	5.00	10.00
D4–1R	30	24					1				P–5 (0)	5.00	5.00
D4–1SL	30	24					1				P–5 (0)	5.00	5.00
D4–1SR	30	24					1				P–5 (0)	5.00	5.00
D4–1V	30	24					1				P–5 (0)	5.00	5.00
D6–1	60	60		7C/6C 6C 6C 6C	4.5 4.5 4.5 4.5 6	18x18	1	GREEN	WHITE	WHITE	5in NOM. STEEL PIPE 4.89 lb/ft 11 ft (1)	25.00	25.00
D8–1	48	30		6C	6 6	18x18 8x18 @ 90°	1	GREEN	WHITE	WHITE	MOUNTED WITH D6–1	10.00	10.00
D6–3 (PBS)	60	60		7C/6C 6C 6C	6 4 4 6	18x18 36x8 @ 0°	1	GREEN	WHITE	WHITE	5in NOM. STEEL PIPE 4.89 lb/ft 11 ft (1)	25.00	25.00
D8–3a	60	42		6C 6C	11 8 11	8x18 @ 90°	1	GREEN	WHITE	WHITE	MOUNTED WITH D6–3	17.50	17.50
D8–3b	60	42		7C/6C 6C	2.5 3 3 2.5	18X18 36x8 @ 90°	1	GREEN	WHITE	WHITE	MOUNTED WITH D6–3	17.50	17.50
H1–2	24	24		SEE MASSDOT STANDARDS			4	SEE MASSDOT STANDARDS			P–5 (4)	––	EACH

TRAFFIC SIGN SUMMARY

IDENTIFI–CATION NUMBER	SIZE OF SIGN WIDTH (in)	SIZE OF SIGN HEIGHT (in)	TEXT	TEXT DIMENSIONS (in) LETTER HEIGHT	TEXT DIMENSIONS (in) VERTICAL SPACING	TEXT DIMENSIONS (in) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK–GROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA (S.F.)

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	134	214
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SIGN SUMMARY SHEET

TRAFFIC SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (in)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA (S.F.)
	WIDTH (in)	HEIGHT (in)		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER			
D3-1 (PBS)	VARIES	12	Trapelo Rd	SEE 2009 M.U.T.C.D.			1	SEE 2009 M.U.T.C.D.			P-5 (1)	--	EACH
D3-4 (PBS)	VARIES	12	Agassiz St				1				P-5 (1)	--	EACH
D3-6 (PBS)	VARIES	12	Moraine St				1				P-5 (0)	--	EACH
D3-7 (PBS)	VARIES	12	Lexington St				1				P-5 (1)	--	EACH
D3-9 (PBS)	VARIES	12	Church St				2				P-5 (1)	--	EACH
D3-10 (PBS)	VARIES	12	White St				2				P-5 (1)	--	EACH
D3-11 (PBS)	VARIES	12	Thayer Rd				1				P-5 (0)	--	EACH
D3-12 (PBS)	VARIES	12	Waverley St				1				P-5 (0)	--	EACH
D3-13 (PBS)	VARIES	12	Sycamore St				1				P-5 (1)	--	EACH
D3-14 (PBS)	VARIES	12	Hawthorne St				1				P-5 (1)	--	EACH
D3-15 (PBS)	VARIES	12	Maple St				1				P-5 (1)	--	EACH
D3-16 (PBS)	VARIES	12	Davis Rd				1				P-5 (0)	--	EACH
D3-18 (PBS)	VARIES	12	Hull St				1				P-5 (0)	--	EACH
D3-19 (PBS)	VARIES	12	Walnut St				1				P-5 (0)	--	EACH
D3-20 (PBS)	VARIES	12	Flett Rd				1				P-5 (1)	--	EACH
D3-21 (PBS)	VARIES	12	Bartlett Ave				1				P-5 (1)	--	EACH
D3-23 (PBS)	VARIES	12	Slade St				1				P-5 (0)	--	EACH
D3-24 (PBS)	VARIES	12	Harding Ave				1				P-5 (0)	--	EACH
D3-25 (PBS)	VARIES	12	Gilbert Rd				1				P-5 (1)	--	EACH
D3-26 (PBS)	VARIES	12	Barnard Rd				1				P-5 (0)	--	EACH

TRAFFIC SIGN SUMMARY

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (in)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA (S.F.)
	WIDTH (in)	HEIGHT (in)		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER			
D3-27 (PBS)	VARIES	12	Poplar St	SEE 2009 M.U.T.C.D.			1	SEE 2009 M.U.T.C.D.			P-5 (0)	--	EACH
D3-28 (PBS)	VARIES	12	Williston Rd				1				P-5 (1)	--	EACH
D3-29 (PBS)	VARIES	12	Common St				1				P-5 (1)	--	EACH
D3-30 (PBS)	VARIES	12	Palfrey Rd				1				P-5 (0)	--	EACH
D3-31 (PBS)	VARIES	12	Cushing Ave				1				P-5 (0)	--	EACH
D3-32 (PBS)	VARIES	12	Horne Rd				1				P-5 (1)	--	EACH
D3-34 (PBS)	VARIES	12	Willow St				1				P-5 (0)	--	EACH
D3-35 (PBS)	VARIES	12	Oak St				1				P-5 (0)	--	EACH
D3-37 (PBS)	VARIES	12	Oakley Rd				1				P-5 (0)	--	EACH
D3-38 (PBS)	VARIES	12	Payson Rd				1				P-5 (0)	--	EACH
D3-39 (PBS)	VARIES	12	Van Ness Rd				1				P-5 (0)	--	EACH
D3-40 (PBS)	VARIES	12	Commonwealth Rd				1				P-5 (1)	--	EACH
D3-41 (PBS)	VARIES	12	Stults Rd				1				P-5 (1)	--	EACH
D3-42 (PBS)	VARIES	12	Carver Rd				1				P-5 (0)	--	EACH
D3-43 (PBS)	VARIES	12	Lewis Rd				1				P-5 (1)	--	EACH
D3-44 (PBS)	VARIES	12	School St				1				P-5 (1)	--	EACH
D3-45 (PBS)	VARIES	12	Windsor Ave				1				P-5 (0)	--	EACH
D3-46 (PBS)	VARIES	12	Newton St				1				P-5 (1)	--	EACH
D3-47 (PBS)	VARIES	12	Langdon Ave				1				P-5 (0)	--	EACH
D3-48 (PBS)	VARIES	12	Worcester St				1				P-5 (0)	--	EACH

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MASS.	xxxxx	135	214
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SIGN SUMMARY SHEET

TRAFFIC SIGN SUMMARY

IDENTIFI–CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (in)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA (S.F.)
	WIDTH (in)	HEIGHT (in)		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK–GROUND	LEGEND	BORDER			
D3–49 (PBS)	VARIES	12	Hillside Rd	SEE 2009 M.U.T.C.D.			1	SEE 2009 M.U.T.C.D.			P–5 (0)	––	EACH
D3–50 (PBS)	VARIES	12	Springfield St				1				P–5 (0)	––	EACH
D3–51 (PBS)	VARIES	12	Westland Rd				1				P–5 (0)	––	EACH
D3–52 (PBS)	VARIES	12	Falmouth St				1				P–5 (0)	––	EACH
D3–53 (PBS)	VARIES	12	Woodleigh Rd				1				P–5 (1)	––	EACH
D3–54 (PBS)	VARIES	12	Park Rd				1				P–5 (0)	––	EACH
D3–55 (PBS)	VARIES	12	Grove St				1				P–5 (0)	––	EACH
D3–56 (PBS)	VARIES	12	Templeton Pkwy				1				P–5 (0)	––	EACH
D3–57 (PBS)	VARIES	12	Marion Rd				1				P–5 (0)	––	EACH
D3–58 (PBS)	VARIES	12	Arlington St				1				P–5 (0)	––	EACH
D3–59 (PBS)	VARIES	12	Marlbobo St				1				P–5 (0)	––	EACH
D3–60 (PBS)	VARIES	12	Oxford Ave				1				P–5 (0)	––	EACH
D3–61 (PBS)	VARIES	12	Prentiss St				1				P–5 (0)	––	EACH
D3–62 (PBS)	VARIES	12	Exeter St				1				P–5 (0)	––	EACH
D3–63 (PBS)	VARIES	12	Keenan St				1				P–5 (0)	––	EACH
D3–64 (PBS)	VARIES	12	Ericsson St				1				P–5 (0)	––	EACH
D3–65 (PBS)	VARIES	12	Brimmer St				1				P–5 (0)	––	EACH

TRAFFIC SIGN SUMMARY

IDENTIFI–CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (in)			NUMBER OF SIGNS REQUIRED	COLOR			POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	AREA (S.F.)
	WIDTH (in)	HEIGHT (in)		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK–GROUND	LEGEND	BORDER			
D3–1A (PBS)	VARIES	24	Trapelo Rd	SEE 2009 M.U.T.C.D.			4	SEE 2009 M.U.T.C.D.			P–5 (0)	––	EACH
D3–3A (PBS)	VARIES	24	Mill St				1				P–5 (0)	––	EACH
D3–5A (PBS)	VARIES	24	Pleasant St				2				P–5 (0)	––	EACH
D3–7A (PBS)	VARIES	24	Lexington St				2				P–5 (0)	––	EACH
D3–17A (PBS)	VARIES	24	Beech St				2				P–5 (0)	––	EACH
D3–22A (PBS)	VARIES	24	Harriet Ave				1				P–5 (0)	––	EACH
D3–29A (PBS)	VARIES	24	Common St				1				P–5 (0)	––	EACH
D3–33A (PBS)	VARIES	24	Belmont St				1				P–5 (0)	––	EACH
D3–44A (PBS)	VARIES	24	School St				2				PC (0)	––	EACH
D3–1B (POS)	VARIES	24	Trapelo Rd				8				P–5 (0)	––	EACH
D3–3B (POS)	VARIES	24	Mill St				1				P–5 (0)	––	EACH
D3–33B (POS)	VARIES	24	Belmont St				4				P–5	––	EACH
D3–7C (POS)	VARIES	24	← Lexington St				1				P–5 (0)	––	EACH
D3–33C (PBS)	VARIES	24	Belmont St →				1				P–5 (0)	––	EACH

NOTES:
1. REMOVE AND STACK ALL EXISTING TRAFFIC SIGNAL EQUIPMENT.

2. REMOVE ALL PULL BOXES AND ABANDON EXISTING TRAFFIC SIGNAL CONDUIT SYSTEM.

3. MINIMUM 36" CLEARANCE EXCLUDING THE CURB WIDTH IS REQUIRED ON ALL SIDEWALKS.

4. VIDEO DETECTION AREAS ARE SHOWN ON THE PLANS GRAPHICALLY AND SHOULD BE ADJUSTED IN THE FIELD FOR PROPER DETECTION.

5. REFER TO SHEET NO. 137 FOR TRAFFIC SEQUENCE PLAN.

6. REFER TO SHEET NOS. 164 TO 168 FOR MAST ARM FOUNDATION DETAILS.

7. REFER TO SHEET NO. 123 FOR COMPLETE PAVEMENT MARKING AND SIGNING PLAN.

8. REFER TO SHEET NO.162 FOR TRAFFIC SIGNAL INTERCONNECT PLAN AND SIGNAL INTERCONNECT MAJOR ITEMS LIST. PULL BOXES EXCLUSIVE TO THE INTERCONNECT ARE SHOWN ON THE TRAFFIC SIGNAL INTERCONNECT ITEM LIST.

9. PUSH BUTTONS SHALL BE LOCATED NO MORE THAN 10" HORIZONTALLY FROM A LEVEL SURFACE (≤1.5%).

10. TWO TEMPORARY TRAFFIC SIGNALS WILL BE REQUIRED.

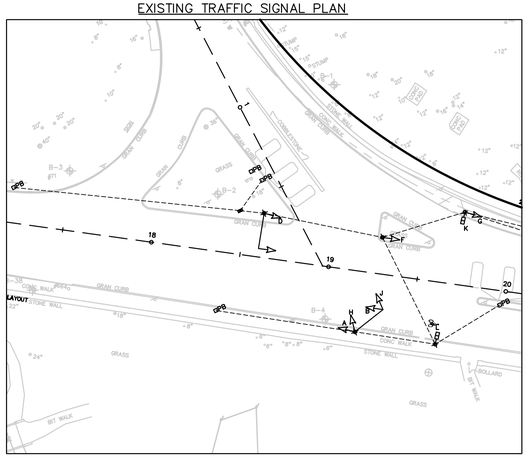
MAJOR ITEMS REQUIRED

QTY	ITEM 816.01
1	TRAFFIC SIGNAL CONTROLLER (TS-2, TYPE 1) W/ 8DW BASE MOUNTED CABINET
1	20' MAST ARM (STEEL), INCLUDE BASE & FOUNDATION
1	25' MAST ARM (STEEL), INCLUDE BASE & FOUNDATION W/(1) R10-11b
1	35' MAST ARM (STEEL), INCL. BASE & FNDN W/ (1) D3
1	30' MAST ARM (STEEL), INCL. BASE & FNDN W/ (2) R3-5L
1	10' TRAFFIC SIGNAL POST, BASE & FOUNDATION
9	8' TRAFFIC SIGNAL POST, BASE & FOUNDATION
6	1-WAY, 3-SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
1	1-WAY, 5-SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
1	2-WAY, 3-SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
1	2-WAY, 3/5-SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
11	5" LOUVERED BACKPLATES
10	PEDESTRIAN SIGNAL HEAD W/ EGG-CRATE VISOR (L.E.D. W/ COUNTDOWN)
10	ACCESSIBLE PEDESTRIAN PUSH BUTTON ASSEMBLY W/ SIGN
6	12" x 12" PULL BOXES*
1	12" x 24" PULL BOXES*
5	VIDEO DETECTION CAMERAS
5	VIDEO CAMERA MAST ARM MOUNTING BRACKET
3	VIDEO DETECTION PROCESSOR – TWO CHANNEL
3	OPTICAL PRE-EMPTION DETECTORS SINGLE CHANNEL
1	EMERGENCY VEHICLE PRE-EMPTION CONFIRMATION STROBE LIGHT (WHITE)
1	OPTICAL PHASE SELECTOR FOUR CHANNEL
1	SERVICE CONNECTION (OVERHEAD)

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

* TO BE PAID UNDER ITS RESPECTIVE PAY ITEM.

EXISTING TRAFFIC SIGNAL PLAN



HOR. SCALE IN FEET
0 40 100 200

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	136	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 1

TRAPELO ROAD AT MILL STREET

SEQUENCE AND TIMING CHART

				PHASE 1			PHASE 2			PHASE 3			PHASE 4			PHASE 5			PHASE 6			PHASE 7			PHASE 8			PHASE 9			EMERGENCY FLASH OPERATION
				SEQUENCE																											
STREET	DIR.	FACE	Ø/OL	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	
TRAPELO RD	EB	A	2				G	Y	R				R	R	R	R	R	R	R	R	R							R	R	R	FY
TRAPELO RD	EB	B	2/5				G	Y	R				R	R	R	G	Y	R	R	R	R							R	R	R	FY
TRAPELO RD	WB	C,D	6				R	R	R				R	R	R	R	R	R	G	Y	R							R	R	R	FY
TRAPELO RD	WB	E	6/4				R	R	R				R	R	R	R	R	R	G	Y	R							R	R	R	FY
TRAPELO RD	WB	F,G	6/4				R	R	R				G	Y	R	R	R	R	G	Y	R							R	R	R	FY
MILL ST	SB	H,J	4				R	R	R				R	R	R	R	R	R	R	R	R							R	R	R	FR
MILL ST	SB	K,L	4/5				R	R	R				G	Y	R	G	Y	R	R	R	R							R	R	R	FR
PEDESTRIAN		P1–P2	4										•																F/		OFF
PEDESTRIAN		P3–P4	6																•										F/		OFF
PEDESTRIAN		P5–P6	5													•													F/		OFF
PEDESTRIAN		P7–P8	9																										F/		OFF
PEDESTRIAN		P9–P10	6																•										F/		OFF
				TIMING IN SECONDS																											
MINIMUM GREEN							10						8			4			10												
VEHICLE INTERVAL							2						2			2			2												
MAXIMUM GREEN I (FREE)							45						31			15			31												
MAXIMUM GREEN II (COORD)							49						29			14			30												
YELLOW CLEAR								4						4			4			3											
ALL RED CLEAR									2						2			2			2										4
WALK INTERVAL													7			7			7									7			
PED CLEARANCE													12	4		3	3		18	2									14		
PED BUFFER															2		1	2		1	2										4
DETECTOR							NON–LOCK						NON–LOCK			NON–LOCK			NON–LOCK									LOCK			
RECALL MODE							SOFT						OFF			OFF			SOFT									OFF			
				COORDINATION TIMING (SECONDS)																											
CYCLE		OFFSET		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
DIAL	SEC.	%	SEC.																												
AM	90	39	35				49	4	2				29	4	2	14	4	2	30	3	2										
AM W/Ø9 PED	90	39	35				31	4	2				22	4	2	8	4	2	20	3	2							7	14	4	
PM	90	42	38				49	4	2				29	4	2	14	4	2	30	3	2										
PM W/Ø9 PED	90	42	38				30	4	2				23	4	2	10	4	2	15	3	2							7	14	4	

SEQUENCE NOTES:

1. ANY PHASE NOT CALLED WILL BE SKIPPED. SIGNAL IDENTIFICATION WILL NOT CHANGE IF THE ASSIGNED RIGHT OF WAY DOES NOT CHANGE DURING THE NEXT PHASE CALLED.
2. • NORMALLY DON'T WALK, UPON PEDESTRIAN PUSH BUTTON ACTIVATION, WALK/FLASHING DON'T WALK (COUNTDOWN).
3. COUNTDOWN PHASE OF PEDESTRAIN SIGNALS SHALL NOT OCCUR DURING THE WALK PERIOD.
4. THE RIGHT–OF–WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON–CONFLICTING PHASES.
5. Ø/OL = PHASE IN DISPLAY / OVERLAPPING PHASE.
6. DIAL 1 (AM) = 06:30 – 09:00, M–F
   DIAL 2 (PM) = 15:00 – 18:00, M–F
   FREE = ALL OTHER TIMES
7. OFFSETS REFERENCED TO THE BEGINNING OF GREEN, PHASE 2+6.
8. PHASE 9 TO BE CALLED ONLY BY P7–P8 PUSH BUTTON ACTIVATION.
9. PHASE 9 SHALL ONLY BE ACTIVATED BY P1, P2, P7 AND P8.

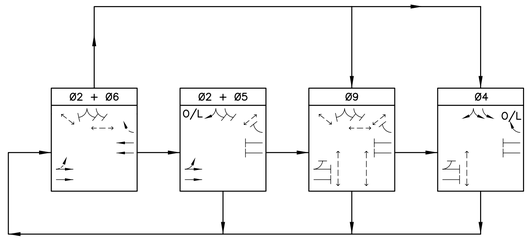
EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY

DETECTOR AND PRIORITY	PRE–EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø2 + Ø5
D2	2		Ø6
D3	3		Ø4

EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY NOTES:

1. EMERGENCY VEHICLE PRE–EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
2. IN RESPONSE TO A PRE–EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2, D3) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE–EMPTION PHASE #1 (OR #2, #3) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE–EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE–EMPTION PHASE CLEARANCE (4 SECONDS: YELLOW AND 2 SECONDS: ALL RED) AND SERVICE EMERGENCY VEHICLE PRE–EMPTION PHASE #2 (OR #1) IF NECESSARY, THEN TIME PHASE PRE–EMPTION CLEARANCE AND RESUME NORMAL SIGNAL OPERATION. EMERGENCY VEHICLE PRE–EMPTION PHASE #3 SHALL BE SIMILARLY SERVED.
3. MINIMUM GREEN, NORMAL VEHICLE CLEARANCE, SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE–EMPTION DEMAND.
4. PREEMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE–EMPTION GREEN IS ON.

PREFERENTIAL PHASING SEQUENCE



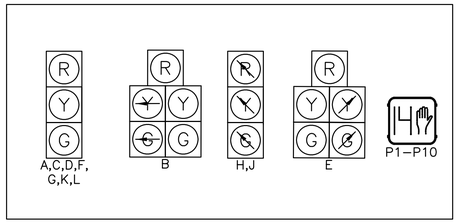
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	137	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 1

TRAPELO ROAD AT MILL STREET

SIGNAL DISPLAY



SIGNAL DISPLAY NOTES:

1. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED W/ LED MODULES (12–INCH LENS)
2. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED AND EQUIPPED WITH ±5" LOUVERED BACKPLATES.
3. ALL PEDESTRIAN SIGNAL HEADS SHALL HAVE PEDESTRIAN COUNTDOWN TIMER AND EGG–CRATE VISOR.

DETECTOR OPERATION

DETECTOR NUMBER	NUMBER OF SECTION/SIZE	PROCESSOR NUMBER	CHANNEL NUMBER	Ø CALLED	Ø EXTENSION	OPERATION	DELAY (SECONDS)	EXTENSION (SECONDS)
V1	9'x50'	1	1	2	2	PRESENCE	0	0
V2	9'x50'	1	1	2/5	2/5	PRESENCE	0	0
V3	3'x10'	1	1	2	2	PRESENCE	0	0
V4	1 – 9'x50' 1 – 9'x12'	1	2	6	6	PRESENCE	0	0
V5	1 – 9'x50' 1 – 9'x12'	1	2	6	6	PRESENCE	0	0
V6	12'x40'	2	1	6	6	PRESENCE	0	0
V7	9'x50'	2	2	4	4	PRESENCE	0	0
V8	9'x50'	2	2	4	4	PRESENCE	0	0
V9	3'x8'	2	2	4	4	PRESENCE	0	0
V10	12'x25'	3	1	4	4	PRESENCE	0	0

DETECTOR OPERATION NOTES:

1. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED AT THE DETECTOR.
2. DETECTOR OPERATION SHOULD BE BI–DIRECTIONAL.

NOTES:
1. REMOVE AND STACK ALL EXISTING TRAFFIC SIGNAL EQUIPMENT.

2. REMOVE ALL PULL BOXES AND ABANDON EXISTING TRAFFIC SIGNAL CONDUIT SYSTEM.

3. MINIMUM 36" CLEARANCE EXCLUDING THE CURB WIDTH IS REQUIRED ON ALL SIDEWALKS.

4. REFER TO SHEET NO. 139 FOR TRAFFIC SEQUENCE PLAN.

5. REFER TO SHEET NOS. 164 TO 168 FOR MAST ARM FOUNDATION DETAILS.

6. REFER TO SHEET NO. 123 FOR COMPLETE PAVEMENT MARKING AND SIGNING PLAN.

7. REFER TO SHEET NO. 162 FOR TRAFFIC SIGNAL INTERCONNECT PLAN AND SIGNAL INTERCONNECT MAJOR ITEMS LIST. PULL BOXES EXCLUSIVE TO THE INTERCONNECT ARE SHOWN ON THE TRAFFIC SIGNAL INTERCONNECT ITEM LIST.

8. AN 8M PERMIT IS REQUIRED FOR WORK WITHIN 15' OF MWRA FACILITIES INCLUDING THE 54" WESTON AQUEDUCT.

9. PUSH BUTTONS SHALL BE LOCATED NO MORE THAN 10" HORIZONTALLY FROM A LEVEL SURFACE (≤1.5%).

10. ONE TEMPORARY TRAFFIC SIGNALS WILLL BE REQUIRED.

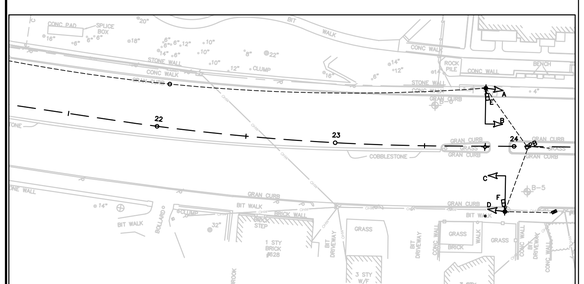
MAJOR ITEMS REQUIRED

QTY	ITEM 816.02
1	TRAFFIC SIGNAL CONTROLLER (TS-2, TYPE 1) W/ 8DW BASE MOUNTED CABINET AND FOUNDATION PAD
1	25' MAST ARM (STEEL), INCLUDE BASE & FOUNDATION
1	35' MAST ARM (STEEL), INCLUDE BASE & FOUNDATION
2	8' TRAFFIC SIGNAL POST, BASE & FOUNDATION
4	1-WAY, 3-SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
4	±5" LOUVERED BACKPLATES
2	PEDESTRIAN SIGNAL HEAD W/ EGG-CRATE VISOR (L.E.D. W/ COUNTDOWN)
2	ACCESSIBLE PEDESTRIAN PUSH BUTTON ASSEMBLY W/ SIGN
1	12" x 12" PULL BOX*
1	SERVICE CONNECTION (OVERHEAD)

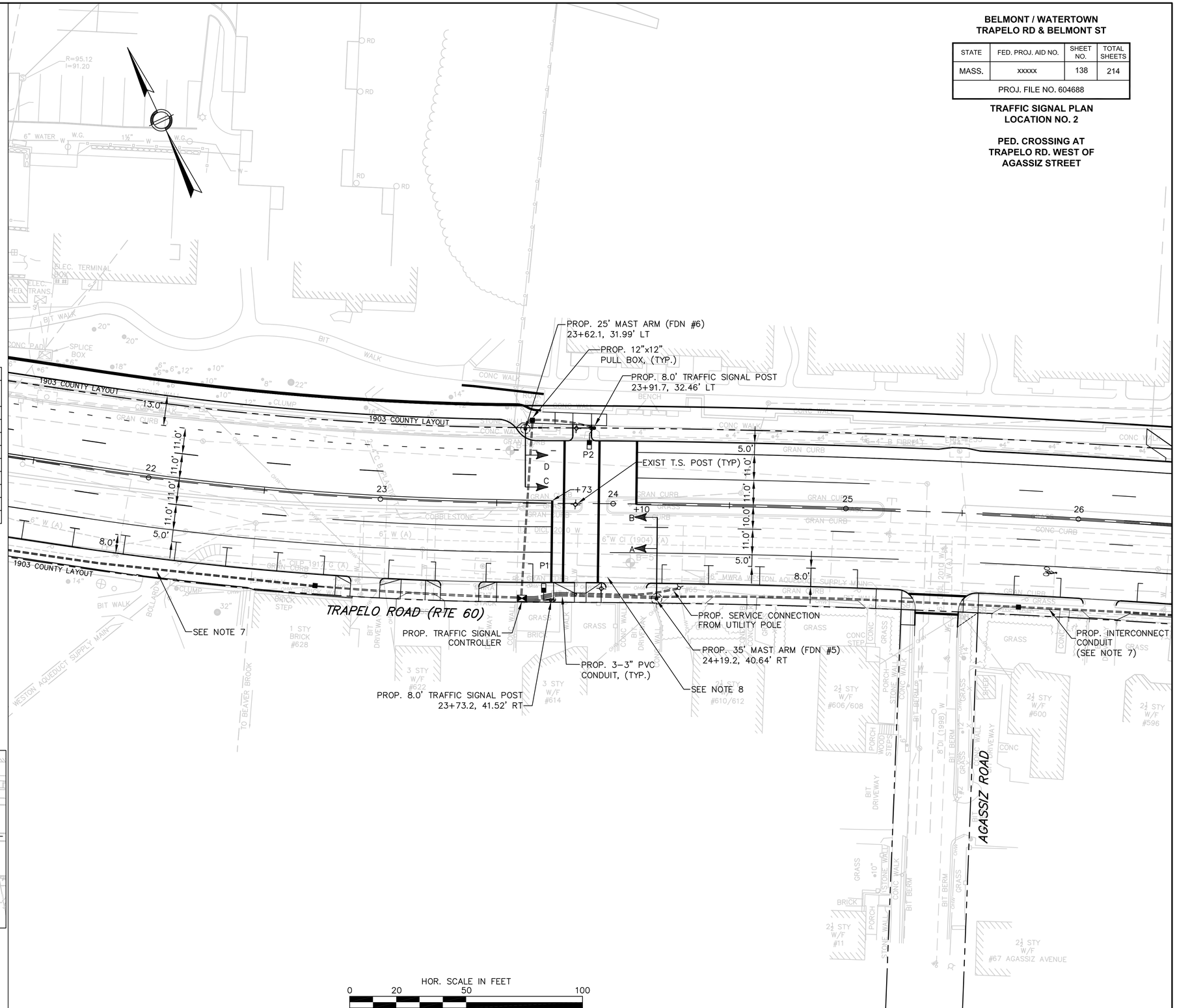
PLUS ALL NECESSARY DUCT, CABLE, FOUNDATIONS, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC SIGNAL.

* TO BE PAID UNDER ITS RESPECTIVE PAY ITEM.

EXISTING TRAFFIC SIGNAL PLAN



HOR. SCALE IN FEET
0 40 100 200



HOR. SCALE IN FEET
0 20 50 100

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	138	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 2

PED. CROSSING AT TRAPELO RD. WEST OF AGASSIZ STREET

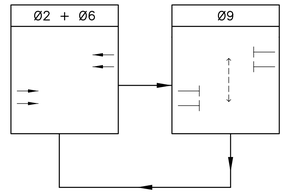
SEQUENCE AND TIMING CHART

				PHASE 1			PHASE 2			PHASE 3			PHASE 4			PHASE 5			PHASE 6			PHASE 7			PHASE 8			PHASE 9			EMERGENCY FLASH OPERATION
				SEQUENCE																											
STREET	DIR.	FACE	Ø/OL	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	
TRAPELO RD	EB	A,B	2				G	Y	R										R	R	R										FY
TRAPELO RD	WB	C,D	6				R	R	R										G	Y	R										FY
PEDESTRIAN		P1–P2	9																									F/			OFF
				TIMING IN SECONDS																											
MINIMUM GREEN							20												20												
VEHICLE INTERVAL																															
MAXIMUM GREEN I (FREE)							37												37												
MAXIMUM GREEN II (COORD)							57												57												
YELLOW CLEAR								4												4											
ALL RED CLEAR									1												1										4
WALK INTERVAL																												7			
PED CLEARANCE																													17		
PED BUFFER																															4
DETECTOR							NON–LOCK												NON–LOCK									LOCK			
RECALL MODE							SOFT												SOFT									OFF			
				COORDINATION TIMING (SECONDS)																											
CYCLE		OFFSET		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
DIAL	SEC.	%	SEC.																												
AM	90	83	75				57	4	1										57	4	1							7	17	4	
PM	90	37	33				57	4	1										57	4	1							7	17	4	

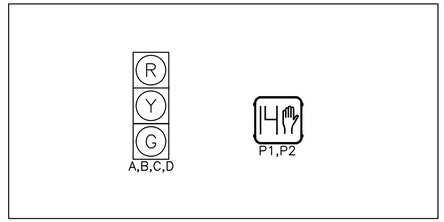
SEQUENCE NOTES:

1. ANY PHASE NOT CALLED WILL BE SKIPPED. SIGNAL IDENTIFICATION WILL NOT CHANGE IF THE ASSIGNED RIGHT OF WAY DOES NOT CHANGE DURING THE NEXT PHASE CALLED.
2. THE RIGHT–OF–WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON–CONFLICTING PHASES.
3. Ø/OL = PHASE IN DISPLAY / OVERLAPPING PHASE.
4. DIAL 1 (AM) = 06:30 – 09:00, M–F
   DIAL 2 (PM) = 15:00 – 18:30, M–F
   FREE = ALL OTHER TIMES
5. OFFSETS REFERENCED TO THE BEGINNING OF GREEN, PHASES 2+6.
6. COUNTDOWN PHASE OF PEDESTRIAN SIGNALS SHALL NOT OCCUR DURING THE WALK PERIOD.

PREFERENTIAL PHASING SEQUENCE



SIGNAL DISPLAY



SIGNAL DISPLAY NOTES:

1. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED W/ LED MODULES (12–INCH LENS)
2. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED AND EQUIPPED WITH ±5" LOUVERED BACKPLATES.
3. ALL PEDESTRIAN SIGNAL HEADS SHALL HAVE PEDESTRIAN COUNTDOWN TIMER AND EGG–CRATE VISOR.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	139	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 2

PED. CROSSING AT TRAPELO
ROAD WEST OF AGASSIZ STREET

NOTES:
1. MINIMUM 36" CLEARANCE EXCLUDING THE CURB WIDTH IS REQUIRED ON ALL SIDEWALKS.

2. VIDEO DETECTION AREAS ARE SHOWN ON THE PLANS GRAPHICALLY AND SHOULD BE ADJUSTED IN THE FIELD FOR PROPER DETECTION.

3. REFER TO SHEET NO. 141 FOR TRAFFIC SEQUENCE PLAN.

4. REFER TO SHEET NOS. 164 TO 168 FOR MAST ARM FOUNDATION DETAILS.

5. REFER TO SHEET NO. 124 FOR COMPLETE PAVEMENT MARKING AND SIGNING PLAN

6. REFER TO SHEET NO. 162 FOR TRAFFIC SIGNAL INTERCONNECT PLAN AND SIGNAL INTERCONNECT MAJOR ITEMS LIST. PULL BOXES EXCLUSIVE TO THE INTERCONNECT ARE SHOWN ON THE TRAFFIC SIGNAL INTERCONNECT ITEM LIST.

7. AN 8M PERMIT IS REQUIRED FOR WORK WITHIN 15' OF MWRA FACILITIES INCLUDING THE 56" WESTON AQUEDUCT.

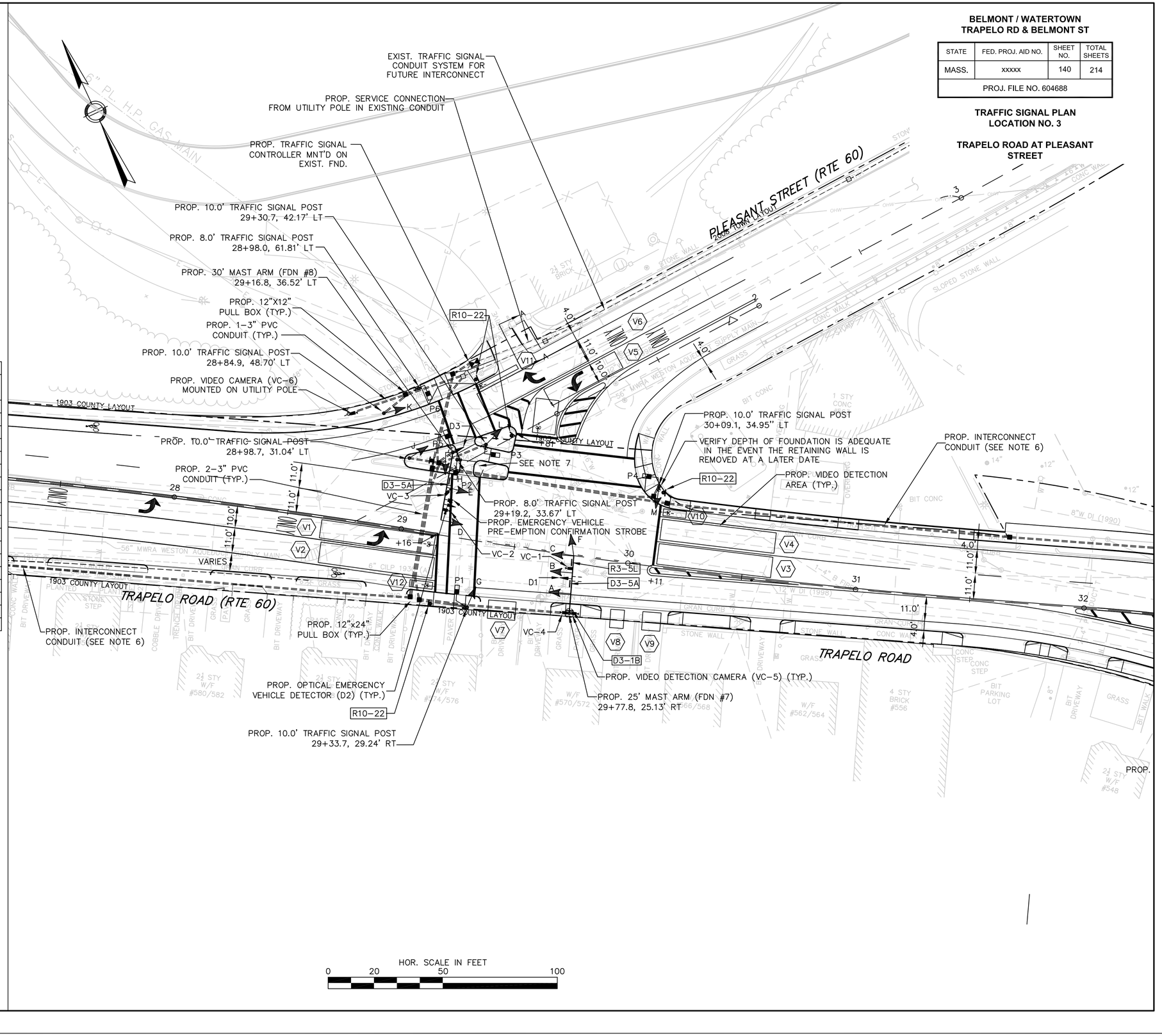
8. PUSH BUTTONS SHALL BE LOCATED NO MORE THAN 10" HORIZONTALLY FROM A LEVEL SURFACE (≤1.5%).

MAJOR ITEMS REQUIRED

QTY	ITEM 815.3
1	TRAFFIC SIGNAL CONTROLLER (TS-2, TYPE 1) W/8DW BASE MOUNTED CABINET MOUNTED ON EXISTING CEMENT CONCRETE PAD
1	25' MAST ARM (STEEL), INCL. BASE & FNDN W/ (1) R3-5L & (1) D3
1	30' MAST ARM (STEEL), INCL. BASE & FNDN W/ (1) D3
5	10' TRAFFIC SIGNAL POST, BASE & FOUNDATION
2	8' TRAFFIC SIGNAL POST, BASE & FOUNDATION
9	1-WAY, 3-SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
1	2-WAY, 3/5-SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
1	1-WAY, 5-SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
12	5" LOUVERED BACKPLATES
6	PEDESTRIAN SIGNAL HEAD W/ EGG-CRATE VISOR (L.E.D. W/ COUNTDOWN)
6	ACCESSIBLE PEDESTRIAN PUSH BUTTON ASSEMBLY W/ SIGN
5	12" x 12" PULL BOXES*
6	VIDEO DETECTION CAMERAS
6	VIDEO CAMERA MAST ARM MOUNTING BRACKET
3	VIDEO DETECTION PROCESSOR – TWO CHANNEL
3	OPTICAL PRE-EMPTION DETECTORS SINGLE CHANNEL
1	EMERGENCY VEHICLE PRE-EMPTION CONFIRMATION STROBE LIGHT (WHITE)
1	OPTICAL PHASE SELECTOR FOUR CHANNEL
1	SERVICE CONNECTION (OVERHEAD)

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

* TO BE PAID UNDER ITS RESPECTIVE PAY ITEM.



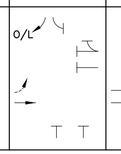
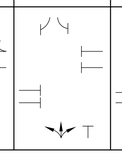
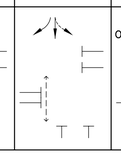
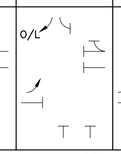
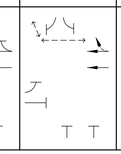
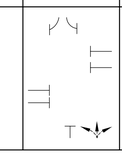
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	140	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 3

TRAPELO ROAD AT PLEASANT STREET

SEQUENCE AND TIMING CHART

				PHASE 1			PHASE 2			PHASE 3			PHASE 4			PHASE 5			PHASE 6			PHASE 7			PHASE 8			PHASE 9			EMERGENCY FLASH OPERATION
																															
				SEQUENCE																											
STREET	DIR.	FACE	Ø/OL	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	
TRAPELO RD	EB	A,B	2				G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R				R	R	R				FY
TRAPELO RD	EB	C	5				G	Y	R	R	R	R	R	R	R	G	Y	R	R	R	R				R	R	R				FY
TRAPELO RD	WB	D,E	6				R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R				R	R	R				FY
PLEASANT ST	SB	F,G	4				R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R				R	R	R				FR
PLEASANT ST	SB	J,K	4				R	R	R	R	R	R	G	ⓐ	ⓐ	G	Y	R	R	R	R				R	R	R				FR
PLEASANT ST	SB	L	4																												
DRIVEWAY 1	NB	M	8				R	R	R	R	R	R	R	R	R	R	R	R	R	R	R				G	Y	R				FR
DRIVEWAY 2	NB	H	3				R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R				R	R	R				FR
PEDESTRIAN		P1–P2	4				✋	✋	✋	✋	✋	✋	•	✋	✋	✋	✋	✋	•	✋	✋				✋	✋	✋				OFF
PEDESTRIAN		P3–P4	6				✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	•	✋	✋				✋	✋	✋				OFF
PEDESTRIAN		P5–P6	6				✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	•	✋	✋				✋	✋	✋				OFF
				TIMING IN SECONDS																											
MINIMUM GREEN							12			4			6			4			12						6						
VEHICLE INTERVAL							2			0			2			2			2						0						
MAXIMUM GREEN I (FREE)							48			4			22			15			30						6						
MAXIMUM GREEN II (COORD)							58			4			22			18			36						6						
YELLOW CLEAR								4			3			3			3			4						3					
ALL RED CLEAR									2			1			3			0			2						1				
WALK INTERVAL													7						7												
PED CLEARANCE													12	3					12	3											
PED BUFFER															3					1	2										
DETECTOR							NON–LOCK			NON–LOCK			NON–LOCK			NON–LOCK			NON–LOCK						NON–LOCK						
RECALL MODE							SOFT			OFF			OFF			SOFT			SOFT						OFF						
				COORDINATION TIMING (SECONDS)																											
CYCLE		OFFSET		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
DIAL	SEC.	%	SEC.																												
AM	90	83	75				56	4	2	4	3	1	22	3	3	18	3	0	35	4	2				6	3	1				
AM W/PED	90	83	75				56	4	2	4	3	1	22	3	3	18	3	0	35	4	2				6	3	1				
PM	90	85	77				58	4	2	4	3	1	20	3	3	19	3	0	36	4	2				6	3	1				
PM W/PED	90	86	77				56	4	2	4	3	1	22	3	3	18	3	0	35	4	2				6	3	1				

ⓐ ⓐ – G TO G, G IF FOLLOWED BY Ø5
G TO Y, R IF FOLLOWED BY Ø6

SEQUENCE NOTES:

1. ANY PHASE NOT CALLED WILL BE SKIPPED. SIGNAL IDENTIFICATION WILL NOT CHANGE IF THE ASSIGNED RIGHT OF WAY DOES NOT CHANGE DURING THE NEXT PHASE CALLED.
2. • NORMALLY DON'T WALK, UPON PEDESTRIAN PUSH BUTTON ACTIVATION, WALK/FLASHING DON'T WALK (COUNTDOWN).
3. THE RIGHT–OF–WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON–CONFLICTING PHASES.
4. Ø/OL = PHASE IN DISPLAY / OVERLAPPING PHASE.
5. DIAL 1 (AM) = 06:30 – 09:00, M–F
   DIAL 2 (PM) = 15:00 – 18:00, M–F
   FREE = ALL OTHER TIMES
6. OFFSETS REFERENCED TO THE BEGINNING OF GREEN, PHASE 2.
7. * TIME FOR PHASE 3 WHEN ACTUATED, TO BE TAKEN FROM PHASES 2+6.
8. COUNTDOWN PHASE OF PEDESTRIAN SIGNALS SHALL NOT OCCUR DURING THE WALK PERIOD.

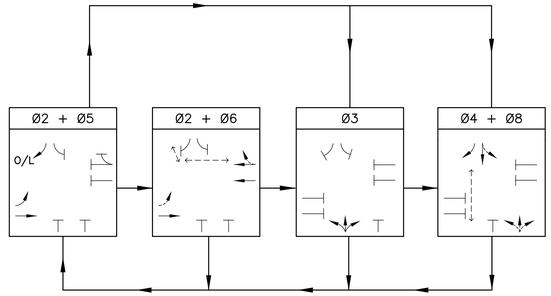
EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY

DETECTOR AND PRIORITY	PRE–EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø2+Ø5
D2	2		Ø6
D3	3		Ø4

EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY NOTES:

1. EMERGENCY VEHICLE PRE–EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
2. IN RESPONSE TO A PRE–EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2, D3) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE–EMPTION PHASE #1 (OR #2, #3) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE–EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE–EMPTION PHASE CLEARANCE (4 SECONDS: YELLOW AND 2 SECONDS: ALL RED) AND SERVICE EMERGENCY VEHICLE PRE–EMPTION PHASE #2 (OR #1) IF NECESSARY, THEN TIME PHASE PRE–EMPTION CLEARANCE AND RESUME NORMAL SIGNAL OPERATION. EMERGENCY VEHICLE PRE–EMPTION PHASE #3 SHALL BE SIMILARLY SERVED.
3. MINIMUM GREEN, NORMAL VEHICLE CLEARANCE, SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE–EMPTION DEMAND.
4. PREEMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE–EMPTION GREEN IS ON.

PREFERENTIAL PHASING SEQUENCE



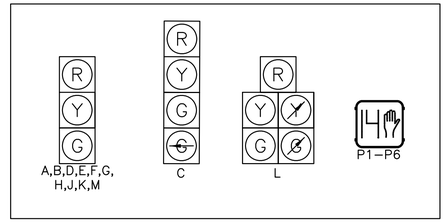
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	141	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 3

TRAPELO ROAD AT
PLEASANT STREET

SIGNAL DISPLAY



SIGNAL DISPLAY NOTES:

1. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED W/ LED MODULES (12–INCH LENS)
2. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED AND EQUIPPED WITH ±5" LOUVERED BACKPLATES.
3. ALL PEDESTRIAN SIGNAL HEADS SHALL HAVE PEDESTRIAN COUNTDOWN TIMER AND EGG–CRATE VISOR.

DETECTOR OPERATION

DETECTOR NUMBER	NUMBER OF SECTION/SIZE	PROCESSOR NUMBER	CHANNEL NUMBER	Ø CALLED	Ø EXTENSION	OPERATION	DELAY (SECONDS)	EXTENSION (SECONDS)
V1	8'x50'	1	1	5	5	PRESENCE	0	0
V2	9'x50'	1	1	2	2	PRESENCE	0	0
V3	9'x50'	1	2	6	6	PRESENCE	0	0
V4	9'x50'	1	2	6	6	PRESENCE	0	0
V5	1–10'x15' 1–8'x35'	2	1	4	4	PRESENCE	0	0
V6	10'x50'	2	2	4	4	PRESENCE	0	0
V7	8'x12'	3	1	3	3	PRESENCE	10	0
V8	6'x8'	3	2	8	8	PRESENCE	10	0
V9	8'x8'	3	2	8	8	PRESENCE	10	0
V10	3'x30'	1	2	6	6	PRESENCE	0	0
V11	2'x20'	2	2	4	4	PRESENCE	0	0
V12	4'x30'	1	1	2	2	PRESENCE	0	0

DETECTOR OPERATION NOTES:

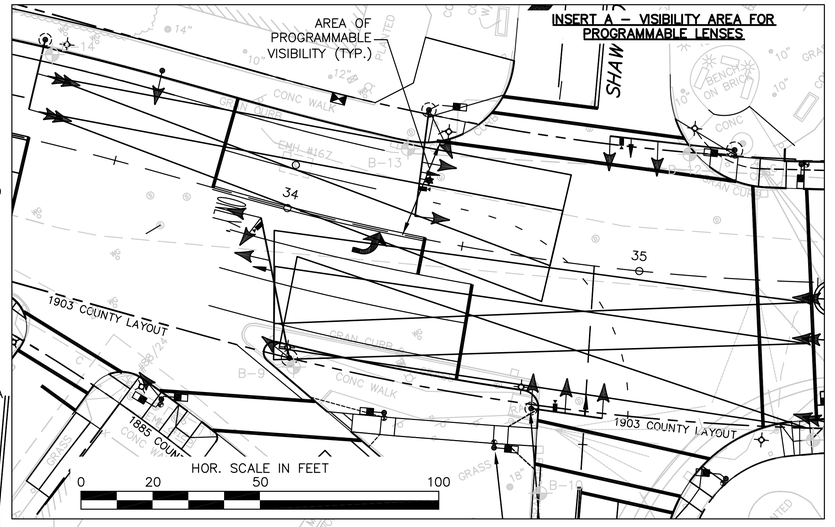
1. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED AT THE DETECTOR.

MAJOR ITEMS REQUIRED

QTY	ITEM 816.04
1	MASTER CONTROLLER
1	TRAFFIC SIGNAL CONTROLLER (TS-2, TYPE 1) W/ 8DW BASE MOUNTED CABINET AND FOUNDATION PAD
2	20' MAST ARM (STEEL), INCL. BASE & FNDN W/ (1) D3
1	25' MAST ARM (STEEL), INCLUDE BASE & FOUNDATION
1	35' MAST ARM (STEEL), INCL. BASE & FNDN W/ (1) D3 & (1) R3-8C
1	35' MAST ARM TYPE B (STEEL), INCL. BASE & FNDN W/ (1) R3-5L & (1) D3
1	35' MAST ARM (STEEL), INCL. BASE & FNDN W/ (2) R10-7 & (1) D3
2	10' TRAFFIC SIGNAL POST, BASE & FOUNDATION
5	8' TRAFFIC SIGNAL POST, BASE & FOUNDATION
13	1-WAY, 3-SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
2	1-WAY, 4-SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
2	1-WAY, 5-SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
1	2-WAY, 3-SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
18	±5" LOUVERED BACKPLATES
10	PEDESTRIAN SIGNAL HEAD W/ EGG-CRATE VISOR (L.E.D. W/ COUNTDOWN)
10	ACCESSIBLE PEDESTRIAN PUSH BUTTON ASSEMBLY W/ SIGN
5	12" x 12" PULL BOXES*
1	12" x 24" PULL BOXES*
5	VIDEO DETECTION CAMERAS
5	VIDEO CAMERA MAST ARM MOUNTING BRACKET
3	VIDEO DETECTION PROCESSOR – TWO CHANNEL

NOTES:

1. ALL PROPOSED SIGNAL HEADS MUST BE AT LEAST 10 FEET FROM THE POWERED MBTA TROLLEY WIRES AND 5 FEET FROM THEIR SUPPORT CABLES. (SEE TYPE B MAST ARM DETAIL, SHEET NO. 146)
2. REMOVE AND STACK ALL EXISTING TRAFFIC SIGNAL EQUIPMENT.
3. REMOVE ALL PULL BOXES AND ABANDON EXISTING TRAFFIC SIGNAL CONDUIT SYSTEM, UNLESS OTHERWISE NOTED.
4. MINIMUM 36" CLEARANCE EXCLUDING THE CURB WIDTH IS REQUIRED ON ALL SIDEWALKS.
5. VIDEO DETECTION AREAS ARE SHOWN ON THE PLANS GRAPHICALLY AND SHOULD BE ADJUSTED IN THE FIELD.
6. REFER TO SHEET NO. 143 FOR TRAFFIC SEQUENCE PLAN.
7. REFER TO SHEET NOS. 164 TO 168 FOR MAST ARM FOUNDATION DETAILS.
8. REFER TO SHEET NO. 124 FOR COMPLETE PAVEMENT MARKING AND SIGNING PLAN.
9. REFER TO SHEET NO. 162 FOR TRAFFIC SIGNAL INTERCONNECT PLAN AND SIGNAL INTERCONNECT MAJOR ITEMS LIST. PULL BOXES EXCLUSIVE TO THE INTERCONNECT ARE SHOWN ON THE TRAFFIC SIGNAL INTERCONNECT ITEM LIST.
10. PUSH BUTTONS SHALL BE LOCATED NO MORE THAN 10" HORIZONTALLY FROM A LEVEL SURFACE (≤1.5%).
11. ONE TEMPORARY TRAFFIC SIGNAL WILL BE REQUIRED.

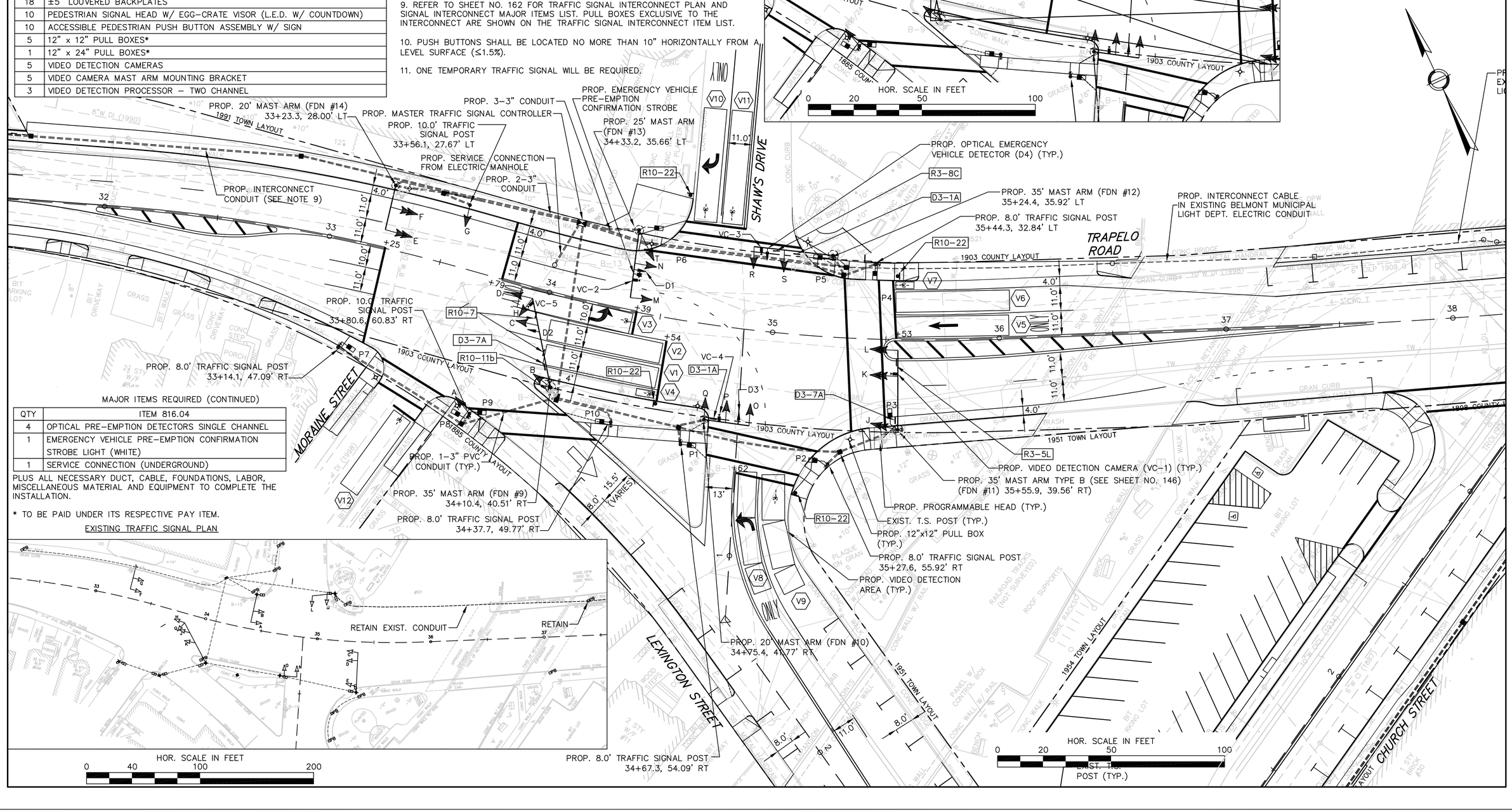


BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	142	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 4

TRAPELO ROAD AT
LEXINGTON STREET



MAJOR ITEMS REQUIRED (CONTINUED)

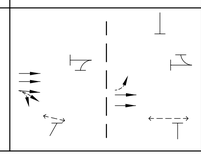
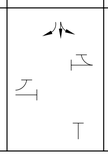
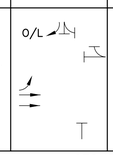
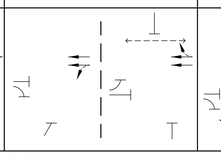
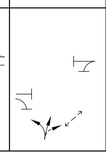
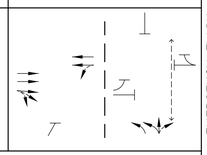
QTY	ITEM 816.04
4	OPTICAL PRE-EMPTION DETECTORS SINGLE CHANNEL
1	EMERGENCY VEHICLE PRE-EMPTION CONFIRMATION STROBE LIGHT (WHITE)
1	SERVICE CONNECTION (UNDERGROUND)

PLUS ALL NECESSARY DUCT, CABLE, FOUNDATIONS, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION.

* TO BE PAID UNDER ITS RESPECTIVE PAY ITEM.

EXISTING TRAFFIC SIGNAL PLAN

SEQUENCE AND TIMING CHART

				PHASE 1			PHASE 2			PHASE 4			PHASE 5			PHASE 6			PHASE 7			PHASE 8			EMERGENCY FLASH OPERATION
																									
				SEQUENCE																					
STREET	DIR.	FACE	Ø/OL	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	
TRAPELO RD	EB	A,B,C,D	2,8	R	R	R	G	Y	R	R	R	R	R	R	R	G	Y	R	R	R	R	G	G	G	FY
TRAPELO RD	EB	J,K	2,5	R	R	R	G	G	G	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	FY
TRAPELO RD	EB	L	2,5	R	R	R	G	G	G	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	FY
TRAPELO RD	WB	M	6	R	R	R	R	R	R	R	R	R	R	R	R	↟	Y	R	R	R	R	R	R	R	FY
TRAPELO RD	WB	N	6	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	FY
TRAPELO RD	WB	E	1,6,8	G	Y	R	R	R	R	R	R	R	R	R	R	G	G	G	R	R	R	G	G	G	FY
TRAPELO RD	WB	F	1,6,8	G	Y	R	R	R	R	R	R	R	R	R	R	G	G	G	R	R	R	G	G	G	FY
MORAINE ST	NB	G,H	7	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	R	R	R	FR
LEXINGTON ST	NB	R,T	8	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	FR
LEXINGTON ST	NB	S	8	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	G	Y	R	FR
SHAW'S DR	SB	Q	4/5	R	R	R	R	R	R	↛	Y	R	↛	ⓐ	ⓐ	R	R	R	R	R	R	R	R	R	FR
SHAW'S DR	SB	O,P	4	R	R	R	R	R	R	G	Y	R	R	R	R	R	R	R	R	R	R	R	R	R	FR
PEDESTRIAN		P1–P2, P5–P8	2+6	✋	✋	✋	•	✋	✋	✋	✋	✋	✋	✋	✋	•	✋	✋	✋	✋	✋	✋	✋	✋	OFF
PEDESTRIAN		P3–P4	8	✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	•	✋	✋	OFF
PEDESTRIAN		P9–P10	5/7	ⓑ	ⓑ	ⓑ	✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	✋	ⓑ	✋	✋	✋	✋	✋	OFF
				TIMING IN SECONDS																					
MINIMUM GREEN				4			12			6			4			12			6			12			
VEHICLE INTERVAL							2			2						2			2			2			
MAXIMUM GREEN I (FREE)				4			25			15			4			25			15			25			
MAXIMUM GREEN II (COORD)				4			30			10			4			30			10			26			
YELLOW CLEAR					4			4			3			4			4			3			3		
ALL RED CLEAR						1			2			3			1			2			3			3	
WALK INTERVAL				7ⓑ			7									7			ⓑ			7			
PED CLEARANCE					12ⓑ		11	3								13	3			12ⓑ		16	3		
PED BUFFER								1	2								1	2		3				3	
DETECTOR				NON–LOCK			NON–LOCK			NON–LOCK			NON–LOCK			NON–LOCK			NON–LOCK			NON–LOCK			
RECALL MODE				OFF			SOFT			OFF			OFF			SOFT			OFF			OFF			
				COORDINATION TIMING (SECONDS)																					
CYCLE		OFFSET		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
DIAL	SEC.	%	SEC.																						
AM	90	0	0	4	4	1	30	4	2	8	3	3	4	4	1	30	4	2	8	3	3	25	3	3	
PM	90	0	0	4	4	1	27	4	2	10	3	3	4	4	1	27	4	2	10	3	3	26	3	3	

ⓐ ⓐ – ↛ TO ↛, ↛ IF FOLLOWED BY Ø4
↛ TO Y, R IF FOLLOWED BY Ø8 OR Ø6

ⓑ NORMAL DON'T WALK. UPON PUSH BUTTON ACTIVATION, WALK SHALL BEGIN IN Ø1 FOR 7 SECONDS. "FLASHING DON'T WALK" SHALL BEGIN IN Ø1 AND CONTINUE INTO Ø7 FOR A TOTAL OF 12 SECONDS.

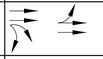
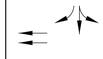
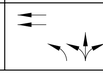
SEQUENCE NOTES:

1. ANY PHASE NOT CALLED WILL BE SKIPPED. SIGNAL IDENTIFICATION WILL NOT CHANGE IF THE ASSIGNED RIGHT OF WAY DOES NOT CHANGE DURING THE NEXT PHASE CALLED.
2. • NORMALLY DON'T WALK, UPON PEDESTRIAN PUSH BUTTON ACTIVATION, WALK/FLASHING DON'T WALK (COUNTDOWN).
3. THE RIGHT–OF–WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON–CONFLICTING PHASES.
4. Ø/OL = PHASE IN DISPLAY / OVERLAPPING PHASE.
5. DIAL 1 (AM) = 06:30 – 09:00, M–F, DIAL 2 (PM) = 15:00 – 18:00, M–F
   FREE = ALL OTHER TIMES
6. OFFSETS REFERENCED TO THE BEGINNING OF GREEN, PHASES 2+6.
7. COUNTDOWN PHASE OF PEDESTRIAN SIGNALS SHALL NOT OCCUR DURING THE WALK PERIOD.

EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY NOTES:

1. EMERGENCY VEHICLE PRE–EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
2. IN RESPONSE TO A PRE–EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2, D3, D4) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE–EMPTION PHASE #1 (OR #2, #3, #4) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE–EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE–EMPTION PHASE CLEARANCE (4 SECONDS: YELLOW AND 2 SECONDS: ALL RED) AND SERVICE EMERGENCY VEHICLE PRE–EMPTION PHASE #2 (OR #1) IF NECESSARY, THEN TIME PHASE PRE–EMPTION CLEARANCE AND RESUME NORMAL SIGNAL OPERATION. EMERGENCY VEHICLE PRE–EMPTION PHASE #3 AND #4 SHALL BE SIMILARLY SERVED.
3. MINIMUM GREEN, NORMAL VEHICLE CLEARANCE, SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE–EMPTION DEMAND.
4. PREEMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE–EMPTION GREEN IS ON.

EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY

DETECTOR AND PRIORITY	PRE–EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø6
D2	2		Ø2
D3	3		Ø1 & Ø4
D4	4		Ø8

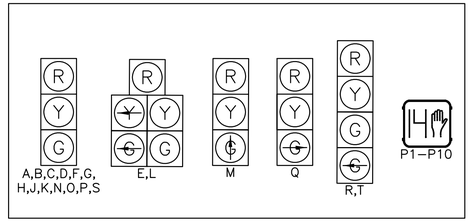
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	143	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 4

TRAPELO ROAD AT
LEXINGTON STREET

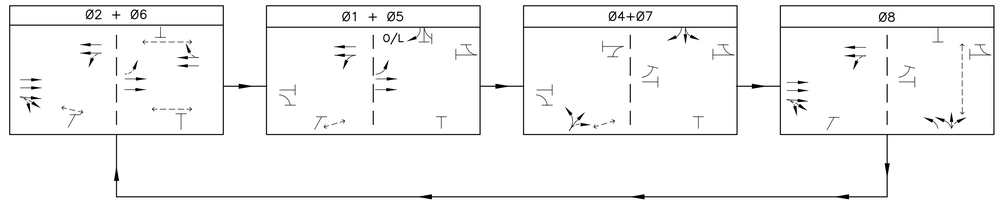
SIGNAL DISPLAY



SIGNAL DISPLAY NOTES:

1. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED W/ LED MODULES (12–INCH LENS)
2. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED AND EQUIPPED WITH ±5" LOUVERED BACKPLATES.
3. ALL PEDESTRIAN SIGNAL HEADS SHALL HAVE PEDESTRIAN COUNTDOWN TIMER AND EGG–CRATE VISOR.
4. L,K,J,E,F ARE PROGRAMMABLE HEADS.

PREFERENTIAL PHASING SEQUENCE



DETECTOR OPERATION

DETECTOR NUMBER	NUMBER OF SECTION/SIZE	PROCESSOR NUMBER	CHANNEL NUMBER	Ø CALLED	Ø EXTENSION	OPERATION	DELAY (SECONDS)	EXTENSION (SECONDS)
V1	9'x50'	1	1	2	2	PRESENCE	0	0
V2	9'x50'	1	1	2	2	PRESENCE	0	0
V3	8'x50'	1	1	5	5	PRESENCE	0	0
V4	3'x8'	1	1	2	2	PRESENCE	0	0
V5	9'x50'	1	2	6	6	PRESENCE	0	0
V6	9'x50'	1	2	6	6	PRESENCE	0	0
V7	3'x8'	1	2	6	6	PRESENCE	0	0
V8	2–8'x20' 1–8'x12'	2	1	8	8	PRESENCE	0	0
V9	2–10'x20' 1–10'x10'	2	1	8	8	PRESENCE	0	0
V10	10'x50'	2	2	4	4	PRESENCE	0	0
V11	9'x50'	2	2	4	4	PRESENCE	0	0
V12	9'x40'	3	1	7	7	PRESENCE	0	0

DETECTOR OPERATION NOTES:

1. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED AT THE DETECTOR.

NOTES:
1. REMOVE AND STACK ALL EXISTING TRAFFIC SIGNAL EQUIPMENT.

2. REMOVE ALL PULL BOXES AND ABANDON EXISTING TRAFFIC SIGNAL CONDUIT SYSTEM.

3. MINIMUM 36" CLEARANCE EXCLUDING THE CURB WIDTH IS REQUIRED ON ALL SIDEWALKS.

4. VIDEO DETECTION AREAS ARE SHOWN ON THE PLANS GRAPHICALLY AND SHOULD BE ADJUSTED IN THE FIELD.

5. REFER TO SHEET NO. 145 FOR TRAFFIC SEQUENCE PLAN.

6. REFER TO SHEET NOS. 164 TO 168 FOR MAST ARM FOUNDATION DETAILS.

7. REFER TO SHEET NO. 124 FOR COMPLETE PAVEMENT MARKING AND SIGNING PLAN.

8. REFER TO SHEET NO. 162 FOR TRAFFIC SIGNAL INTERCONNECT PLAN AND SIGNAL INTERCONNECT MAJOR ITEMS LIST. PULL BOXES EXCLUSIVE TO THE INTERCONNECT ARE SHOWN ON THE TRAFFIC SIGNAL INTERCONNECT ITEM LIST.

9. PUSH BUTTONS SHALL BE LOCATED NO MORE THAN 10" HORIZONTALLY FROM A LEVEL SURFACE (≤1.5%).

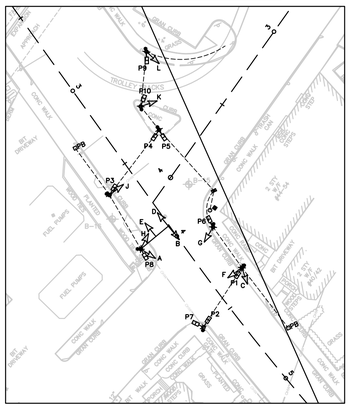
MAJOR ITEMS REQUIRED

QTY	ITEM 816.05
1	TRAFFIC SIGNAL CONTROLLER (TS-2, TYPE 1) W/ 8DW BASE MOUNTED CABINET AND FOUNDATION PAD
1	30' MAST ARM (STEEL), INCL. BASE & FNDN W/ (1) R10-11b
5	10' TRAFFIC SIGNAL POST, BASE & FOUNDATION
7	8' TRAFFIC SIGNAL POST, BASE & FOUNDATION
6	1-WAY, 3-SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
1	2-WAY, 3-SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
1	3-WAY, 3-SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
10	5" LOUVERED BACKPLATES
10	PEDESTRIAN SIGNAL HEAD W/ EGG-CRATE VISOR (L.E.D. W/ COUNTDOWN)
10	ACCESSIBLE PEDESTRIAN PUSH BUTTON ASSEMBLY W/ SIGN
2	12" x 24" PULL BOXES*
2	12" x 12" PULL BOXES*
4	VIDEO DETECTION CAMERAS
4	VIDEO CAMERA MAST ARM MOUNTING BRACKET
2	VIDEO DETECTION PROCESSOR - TWO CHANNELS
4	OPTICAL PRE-EMPTION DETECTORS SINGLE CHANNEL
1	EMERGENCY VEHICLE PRE-EMPTION CONFIRMATION STROBE LIGHT (WHITE)
1	OPTICAL PHASE SELECTOR FOUR CHANNEL
1	SERVICE CONNECTION (UNDERGROUND)

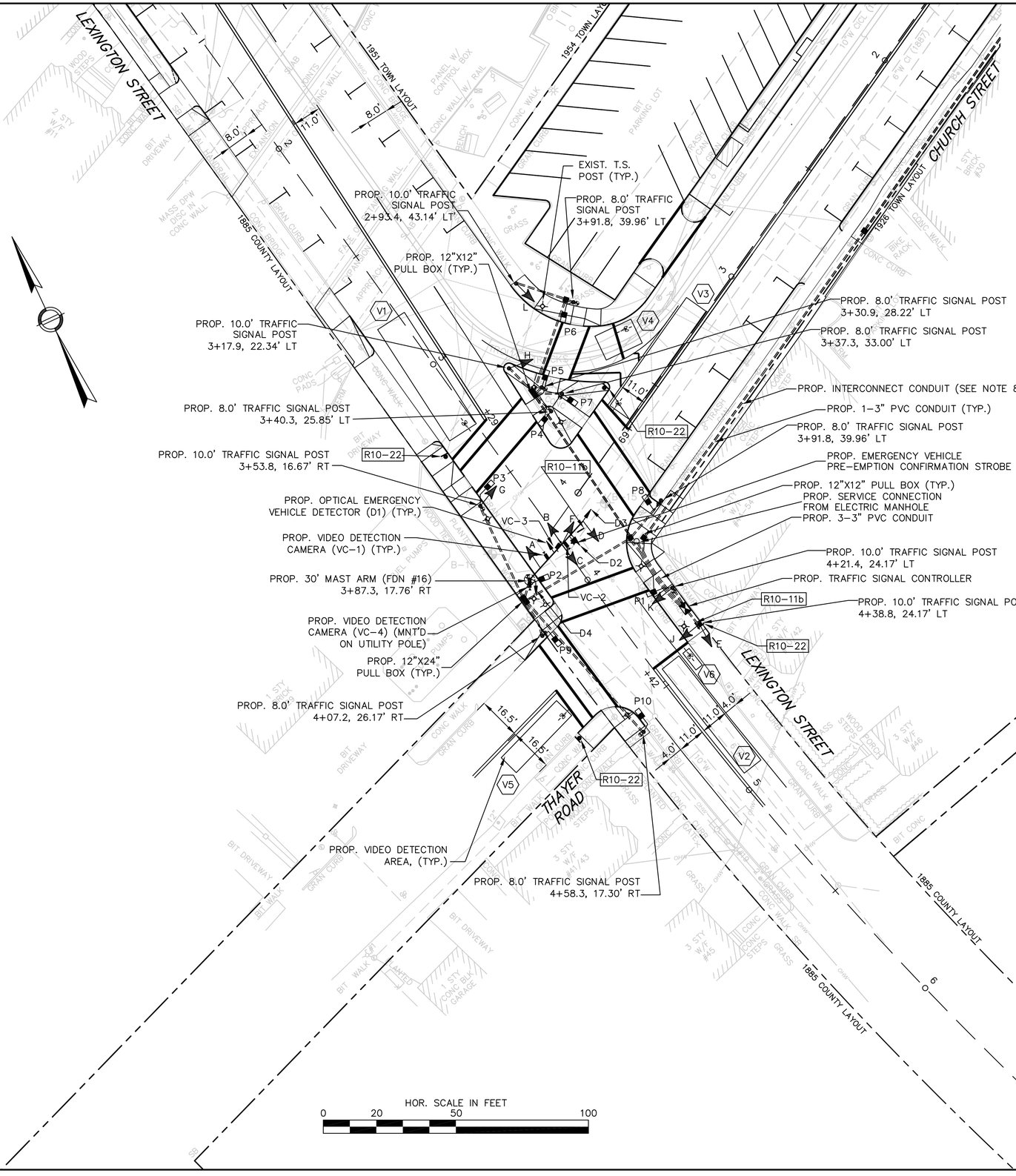
PLUS ALL NECESSARY DUCT, CABLE, FOUNDATIONS, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION.

* TO BE PAID UNDER ITS RESPECTIVE PAY ITEM.

EXISTING TRAFFIC SIGNAL PLAN



HOR. SCALE IN FEET
0 40 100 200



HOR. SCALE IN FEET
0 20 50 100

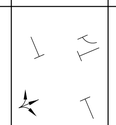
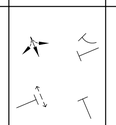
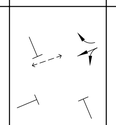
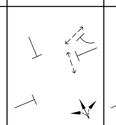
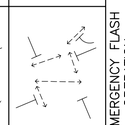
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	144	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 5

LEXINGTON ST. AT
THAYER ROAD /
CHURCH STREET

SEQUENCE AND TIMING CHART

				PHASE 1			PHASE 2			PHASE 3			PHASE 4			PHASE 5			PHASE 6			PHASE 7			PHASE 8			PHASE 9			EMERGENCY FLASH OPERATION
																															
				SEQUENCE																											
STREET	DIR.	FACE	Ø/OL	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	
LEXINGTON ST	SB	A,B	4				R	R	R				G	Y	R				R	R	R				R	R	R	R	R	R	FY
LEXINGTON ST	NB	C,D,E	8				R	R	R				R	R	R				R	R	R				G	Y	R	R	R	R	FY
CHURCH ST	WB	F,G	6				R	R	R				R	R	R				G	Y	R				R	R	R	R	R	R	FR
CHURCH ST	WB	H,L	6				R	R	R				R	R	R				⊘	Y	R				R	R	R	R	R	R	FR
THAYER RD	EB	J,K	2				G	Y	R				R	R	R				R	R	R				R	R	R	R	R	R	FR
PEDESTRIAN		P1–P2	9				✋	✋	✋				✋	✋	✋				✋	✋	✋				✋	✋	🚶	F/✋	✋	OFF	
PEDESTRIAN		P3–P4	6				✋	✋	✋				✋	✋	✋				•	✋	✋				✋	✋	🚶	F/✋	✋	OFF	
PEDESTRIAN		P5–P6	8				✋	✋	✋				✋	✋	✋				✋	✋	✋				•	✋	🚶	F/✋	✋	OFF	
PEDESTRIAN		P7–P8	8				✋	✋	✋				✋	✋	✋				✋	✋	✋				•	✋	🚶	F/✋	✋	OFF	
PEDESTRIAN		P9–P10	4				✋	✋	✋				•	✋	✋				✋	✋	✋				🚶	F/✋	✋	🚶	F/✋	✋	OFF	
				TIMING IN SECONDS																											
MINIMUM GREEN							6						10						6						10						
VEHICLE INTERVAL							2						2						2						2						
MAXIMUM GREEN I (FREE)							10						30						22						30						
MAXIMUM GREEN II (COORD)							10						40						22						40						
YELLOW CLEAR								3						4						4						4					
ALL RED CLEAR									3						3						3						3			2	
WALK INTERVAL													7						7						7			7			
PED CLEARANCE													7.5	4					7.5	4					7.5	4			10		
PED BUFFER															3						3						3			4	
DETECTOR							NON–LOCK						NON–LOCK						NON–LOCK						NON–LOCK			LOCK			
RECALL MODE							OFF						SOFT						OFF						SOFT			OFF			
				COORDINATION TIMING (SECONDS)																											
CYCLE		OFFSET		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
DIAL	SEC.	%	SEC.																												
AM	90	50	45				10	3	3				40	4	3				20	4	3				40	4	3				
AM W/EX PED	90	50	45				10	3	3				23	4	3				16	4	3				23	4	3	7	12	2	
PM	90	51	46				10	3	3				38	4	3				22	4	3				38	4	3				
PM W/ EX PED	90	51	46				10	3	3				23	4	3				16	3	3				23	4	3	7	12	2	

SEQUENCE NOTES:

1. ANY PHASE NOT CALLED WILL BE SKIPPED. SIGNAL IDENTIFICATION WILL NOT CHANGE IF THE ASSIGNED RIGHT OF WAY DOES NOT CHANGE DURING THE NEXT PHASE CALLED.
2. • NORMALLY DON'T WALK, UPON PEDESTRIAN PUSH BUTTON ACTIVATION, WALK/FLASHING DON'T WALK (COUNTDOWN).
3. PHASE 9 ONLY BY P1–P2 PUSH BUTTON ACTIVATION.
4. THE RIGHT–OF–WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON–CONFLICTING PHASES.
5. Ø/OL = PHASE IN DISPLAY / OVERLAPPING PHASE.
6. DIAL 1 (AM) = 06:30 – 09:00, M–F
   DIAL 2 (PM) = 15:00 – 18:00, M–F
   FREE = ALL OTHER TIMES
7. OFFSETS REFERENCED TO THE BEGINNING OF GREEN, PHASES 4+8 LEXINGTON NB & SB.
8. PHASE 9 SHALL ONLY BE ACTIVATED BY P1, P2, P3 AND P4.
9. COUNTDOWN PHASE OF PEDESTRIAN SIGNALS SHALL NOT OCCUR DURING THE WALK PERIOD.

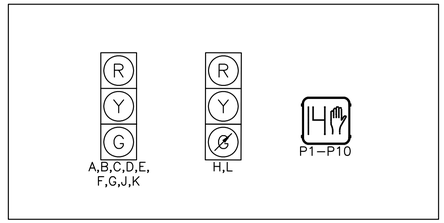
EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY NOTES:

1. EMERGENCY VEHICLE PRE–EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
2. IN RESPONSE TO A PRE–EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2, D3, D4) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE–EMPTION PHASE #1 (OR #2, #3, #4) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE–EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE–EMPTION PHASE CLEARANCE (4 SECONDS: YELLOW AND 2 SECONDS: ALL RED) AND SERVICE EMERGENCY VEHICLE PRE–EMPTION PHASE #2 (OR #1) IF NECESSARY, THEN TIME PHASE PRE–EMPTION CLEARANCE AND RESUME NORMAL SIGNAL OPERATION. EMERGENCY VEHICLE PRE–EMPTION PHASE #3 AND #4 SHALL BE SIMILARLY SERVED.
3. MINIMUM GREEN, NORMAL VEHICLE CLEARANCE, SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE–EMPTION DEMAND.
4. PREEMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE–EMPTION GREEN IS ON.

EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY

DETECTOR AND PRIORITY	PRE–EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø4
D2	2		Ø8
D3	3		Ø6
D4	4		Ø2

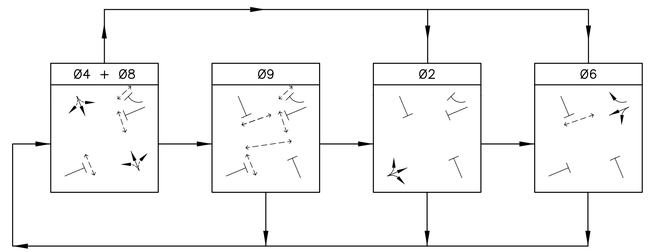
SIGNAL DISPLAY



SIGNAL DISPLAY NOTES:

1. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED W/ LED MODULES (12–INCH LENS)
2. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED AND EQUIPPED WITH ±5" LOUVERED BACKPLATES.
3. ALL PEDESTRIAN SIGNAL HEADS SHALL HAVE PEDESTRIAN COUNTDOWN TIMER AND EGG–CRATE VISOR.

PREFERENTIAL PHASING SEQUENCE



DETECTOR OPERATION

DETECTOR NUMBER	NUMBER OF SECTION/SIZE	PROCESSOR NUMBER	CHANNEL NUMBER	Ø CALLED	Ø EXTENSION	OPERATION	DELAY (SECONDS)	EXTENSION (SECONDS)
V1	12'x50'	1	1	4	4	PRESENCE	0	0
V2	8'x50'	1	2	8	8	PRESENCE	0	0
V3	9'x50'	2	1	6	6	PRESENCE	0	0
V4	10'x15'	2	1	6	6	PRESENCE	0	0
V5	8'x30'	2	2	2	2	PRESENCE	0	0
V6	3'x8'	2	2	8	8	PRESENCE	0	0

DETECTOR OPERATION NOTES:

1. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED AT THE DETECTOR.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	145	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 5

TRAPELO ROAD AT
THAYER ROAD / CHURCH STREET

NOTES:
1. ALL PROPOSED SIGNAL HEADS MUST BE AT LEAST 10 FEET FROM THE POWERED MBTA TROLLEY WIRES AND 5 FEET FROM THEIR SUPPORT CABLES. (SEE TYPE B MAST ARM DETAIL, THIS SHEET TSP–11)

2. REMOVE AND STACK ALL EXISTING TRAFFIC CONTROL EQUIPMENT.

3. REMOVE ALL PULL BOXES AND ABANDON EXISTING TRAFFIC SIGNAL CONDUIT SYSTEM, EXCEPT AS NOTED BELOW.

4. MINIMUM 36" CLEARANCE EXCLUDING THE CURB WIDTH IS REQUIRED ON ALL SIDEWALKS.

5. REFER TO SHEET NO. 147 FOR TRAFFIC SEQUENCE PLAN.

6. REFER TO SHEET NOS. 164 TO 168 FOR MAST ARM FOUNDATION.

7. REFER TO SHEET NO. 124 FOR COMPLETE PAVEMENT MARKING AND SIGNING PLAN

8. REFER TO SHEET NO. 162 FOR TRAFFIC SIGNAL INTERCONNECT PLAN AND SIGNAL INTERCONNECT MAJOR ITEMS LIST. PULL BOXES EXCLUSIVE TO THE INTERCONNECT ARE SHOWN ON THE TRAFFIC SIGNAL INTERCONNECT ITEM LIST.

9. PUSH BUTTONS SHALL BE LOCATED NO MORE THAN 10" HORIZONTALLY FROM A LEVEL SURFACE (≤1.5%).

MAJOR ITEMS REQUIRED (TRAFFIC SIGNAL EQUIPMENT)

QTY	ITEM 816.06
1	TRAFFIC SIGNAL CONTROLLER (TS–2, TYPE 1) W/ 8DW BASE MOUNTED CABINET AND FOUNDATION PAD
1	25' MAST ARM TYPE B (STEEL), INCLUDE BASE & FOUNDATION
1	30' MAST ARM TYPE B (STEEL), INCLUDE BASE & FOUNDATION
2	8' TRAFFIC SIGNAL POST, BASE & FOUNDATION
4	1–WAY, 3–SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
4	±5" LOUVERED BACKPLATES
2	PEDESTRIAN SIGNAL HEAD W/ EGG–CRATE VISOR (L.E.D. W/ COUNTDOWN)
2	ACCESSIBLE PEDESTRIAN PUSH BUTTON ASSEMBLY W/SIGN
1	12" x 12" PULL BOXES*
1	SERVICE CONNECTION (UNDERGROUND)

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

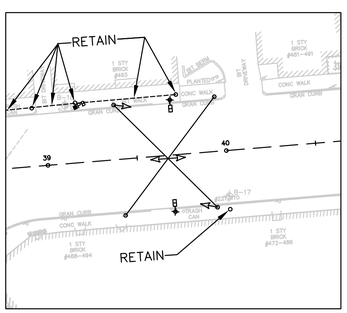
* TO BE PAID UNDER ITS RESPECTIVE PAY ITEM.

MAJOR ITEMS REQUIRED (ILLUMINATED BOLLARD SYSTEM)

QTY	ITEM 707.821
4	BOLLARDS
1	TIME CLOCK (MOUNTED IN TRAFFIC SIGNAL CABINET)

PLUS ALL NECESSARY DUCT, CABLE, FOUNDATIONS, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION.

EXISTING TRAFFIC SIGNAL PLAN



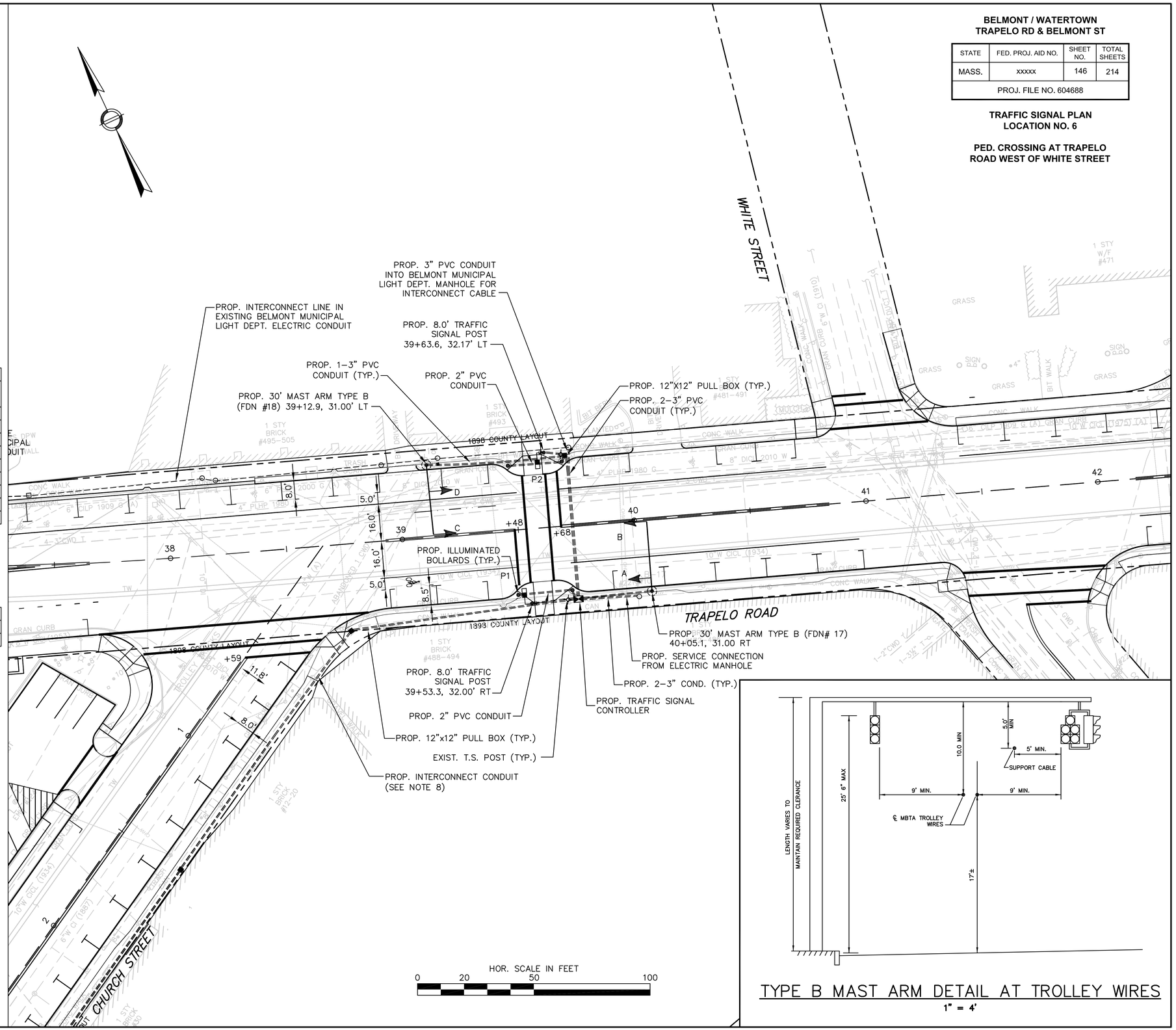
HOR. SCALE IN FEET
0 40 100 200

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	146	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 6

PED. CROSSING AT TRAPELO ROAD WEST OF WHITE STREET



HOR. SCALE IN FEET
0 20 50 100

TYPE B MAST ARM DETAIL AT TROLLEY WIRES
1" = 4'

SEQUENCE AND TIMING CHART

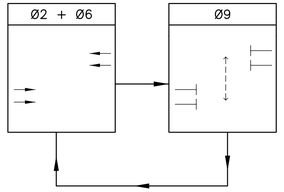
				PHASE 1			PHASE 2			PHASE 3			PHASE 4			PHASE 5			PHASE 6			PHASE 7			PHASE 8			PHASE 9			EMERGENCY FLASH OPERATION
				SEQUENCE																											
STREET	DIR.	FACE	Ø/OL	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	
TRAPELO RD	EB	A,B	2				G	Y	R										R	R	R							R	R	R	FY
TRAPELO RD	WB	C,D	6				R	R	R										G	Y	R							R	R	R	FY
PEDESTRIAN		P1–P2	9																									F/			OFF
				TIMING IN SECONDS																											
MINIMUM GREEN							20												20												
VEHICLE INTERVAL																															
MAXIMUM GREEN I							32												32												
MAXIMUM GREEN II							32												32												
YELLOW CLEAR								4												4											
ALL RED CLEAR									1												1										
WALK INTERVAL																												7			
PED CLEARANCE																													12		
PED BUFFER																														4	
DETECTOR							NON–LOCK												NON–LOCK									LOCK			
RECALL MODE				SOFT															SOFT									OFF			

CYCLE		OFFSET		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
DIAL	SEC.	%	SEC.																											
AM	60						32	4.0	1.0										32	4.0	1.0							7	12	4
PM	60						32	4.0	1.0										32	4.0	1.0							7	12	4

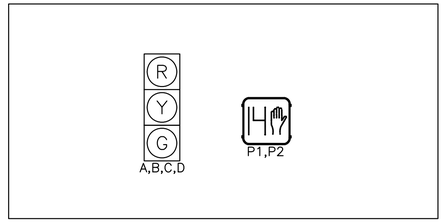
SEQUENCE NOTES:

1. ANY PHASE NOT CALLED WILL BE SKIPPED. SIGNAL IDENTIFICATION WILL NOT CHANGE IF THE ASSIGNED RIGHT OF WAY DOES NOT CHANGE DURING THE NEXT PHASE CALLED.
2. THE RIGHT–OF–WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON–CONFLICTING PHASES.
3. Ø/OL = PHASE IN DISPLAY / OVERLAPPING PHASE.
4. DIAL 1 (AM) = 06:30 – 09:00, M–F
   DIAL 2 (PM) = 15:00 – 18:00, M–F
   FREE = ALL OTHER TIMES
5. COUNTDOWN PHASE OF PEDESTRIAN SIGNALS SHALL NOT OCCUR DURING THE WALK PERIOD.

PREFERENTIAL PHASING SEQUENCE



SIGNAL DISPLAY



SIGNAL DISPLAY NOTES:

1. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED W/ LED MODULES (12–INCH LENS)
2. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED AND EQUIPPED WITH ±5" LOUVERED BACKPLATES.
3. ALL PEDESTRIAN SIGNAL HEADS SHALL HAVE PEDESTRIAN COUNTDOWN TIMER AND EGG–CRATE VISOR.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	147	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 6

PED CROSSING AT TRAPELO ROAD
WEST OF WHITE STREET

NOTES:
1. ALL PROPOSED SIGNAL HEADS MUST BE AT LEAST 10 FEET FROM THE POWERED MBTA TROLLEY WIRES AND 5 FEET FROM THEIR SUPPORT CABLES. (SEE TYPE B MAST ARM DETAIL, SHEET TSP–11)

2. REMOVE AND STACK ALL EXISTING TRAFFIC SIGNAL EQUIPMENT.

3. REMOVE ALL PULL BOXES AND ABANDON EXISTING TRAFFIC SIGNAL CONDUIT SYSTEM.

4. MINIMUM 36" CLEARANCE EXCLUDING THE CURB WIDTH IS REQUIRED ON ALL SIDEWALKS.

5. VIDEO DETECTION AREAS ARE SHOWN ON THE PLANS GRAPHICALLY AND SHOULD BE ADJUSTED IN THE FIELD FOR PROPER DETECTION.

6. REFER TO SHEET NO. 149 FOR TRAFFIC SEQUENCE PLAN.

7. REFER TO SHEET NOS. 164 TO 168 FOR MAST ARM FOUNDATION.

8. REFER TO SHEET NO. 125 FOR COMPLETE PAVEMENT MARKING AND SIGNING PLAN.

9. PUSH BUTTONS SHALL BE LOCATED NO MORE THAN 10" HORIZONTALLY FROM A LEVEL SURFACE (≤1.5%).

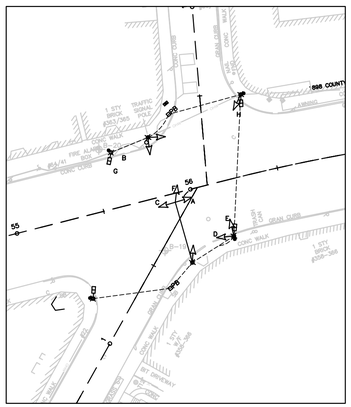
MAJOR ITEMS REQUIRED

QTY	ITEM 816.07
1	TRAFFIC SIGNAL CONTROLLER (TS–2, TYPE 1) W/ 8DW BASE MOUNTED CABINET AND FOUNDATION PAD
1	30' MAST ARM TYPE B (STEEL), INCL. BASE & FNDN W/ (1) D3 & (2) R10–11b
1	30' MAST ARM TYPE B (STEEL), INCL. BASE & FNDN W/ (1) D3 & (1) R10–11b
7	8' TRAFFIC SIGNAL POST, BASE & FOUNDATION
4	1–WAY, 3–SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
2	2–WAY, 3–SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
8	±5" LOUVERED BACKPLATES
8	PEDESTRIAN SIGNAL HEAD W/ EGG–CRATE VISOR (L.E.D. W/ COUNTDOWN)
8	ACCESSIBLE PEDESTRIAN PUSH BUTTON ASSEMBLY W/SIGN
4	12" x 12" PULL BOXES*
1	12" x 24" PULL BOXES*
4	VIDEO DETECTION CAMERAS
4	VIDEO CAMERA MAST ARM MOUNTING BRACKET
2	VIDEO DETECTION PROCESSOR – TWO CHANNELS
4	OPTICAL PRE–EMPTION DETECTORS SINGLE CHANNEL
1	EMERGENCY VEHICLE PRE–EMPTION CONFIRMATION STROBE LIGHT (WHITE)
1	OPTICAL PHASE SELECTOR FOUR CHANNEL
1	SERVICE CONNECTION (UNDERGROUND)

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

* TO BE PAID UNDER ITS RESPECTIVE PAY ITEM.

EXISTING TRAFFIC SIGNAL PLAN



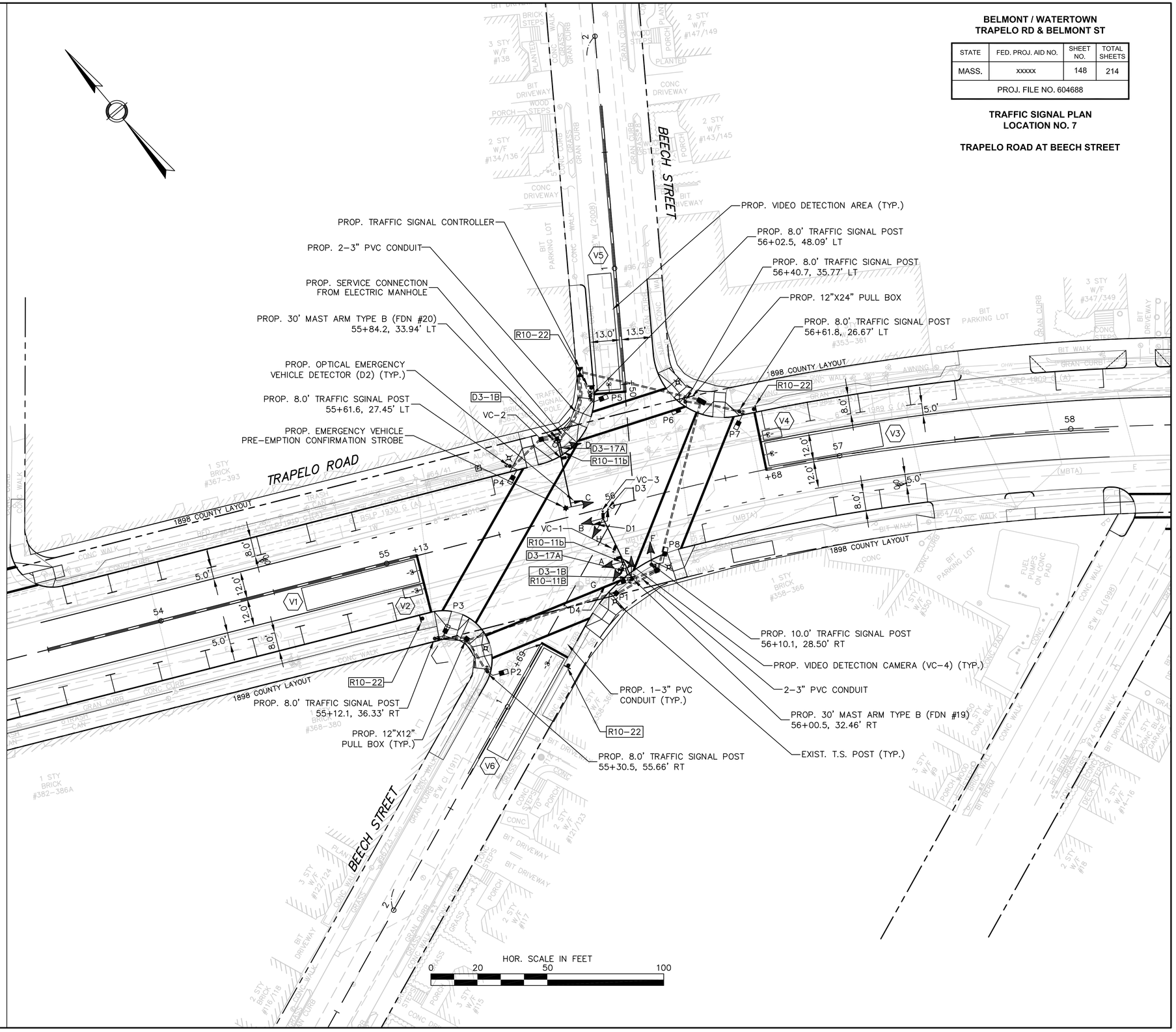
HOR. SCALE IN FEET
0 40 100 200

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	148	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 7

TRAPELO ROAD AT BEECH STREET



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	149	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 7

TRAPELO ROAD AT
BEECH STREET

SEQUENCE AND TIMING CHART

				PHASE 1			PHASE 2			PHASE 3			PHASE 4			PHASE 5			PHASE 6			PHASE 7			PHASE 8			PHASE 9			EMERGENCY FLASH OPERATION
				SEQUENCE																											
STREET	DIR.	FACE	Ø/OL	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	
TRAPELO RD	EB	A,B	2				G	Y	R				R	R	R				R	R	R				R	R	R	R	R	R	FY
TRAPELO RD	WB	C,D	6				R	R	R				R	R	R				G	Y	R				R	R	R	R	R	R	FR
BEECH ST	NB	G,H	8				R	R	R				R	R	R				R	R	R				G	Y	R	R	R	R	FR
BEECH ST	SB	E,F	4				R	R	R				G	Y	R				R	R	R				R	R	R	R	R	R	FR
PEDESTRIAN		P1–P2	2				•																					F/			OFF
PEDESTRIAN		P5–P6	6																•									F/			OFF
PEDESTRIAN		P3–P4, P7–P8	9																									F/			OFF
				TIMING IN SECONDS																											
MINIMUM GREEN							12						6						12						6						
VEHICLE INTERVAL							2						2						2						2						
MAXIMUM GREEN I (ALL OTHER TIMES)							38						18						38						18						
MAXIMUM GREEN II (AM,PM)							43						18						43						18						
YELLOW CLEAR								4						3						4						3					
ALL RED CLEAR									3						4						3						4				
WALK INTERVAL							7												7									7			
PED CLEARANCE							11.5	4											11.5	4									21		
PED BUFFER									3												3										4
DETECTOR							NON–LOCK						NON–LOCK						NON–LOCK						NON–LOCK			LOCK			
RECALL MODE							SOFT						OFF						SOFT						OFF			OFF			

CYCLE				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
DIAL	SEC.																													
AM	70						38	4	3				18	3	4				38	4	3				18	3	4			
AM W/ EX PED	100						41	4	3				13	3	4				41	4	3				13	3	4	7	21	4
PM	70						38	4	3				18	3	4				38	4	3				18	3	4			
PM W/ EX PED	90						33	4	3				11	3	4				33	4	3				11	3	4	7	21	4

SEQUENCE NOTES:

1. ANY PHASE NOT CALLED WILL BE SKIPPED. SIGNAL IDENTIFICATION WILL NOT CHANGE IF THE ASSIGNED RIGHT OF WAY DOES NOT CHANGE DURING THE NEXT PHASE CALLED.
2. • NORMALLY DON'T WALK, UPON PEDESTRIAN PUSH BUTTON ACTIVATION, WALK/FLASHING DON'T WALK (COUNTDOWN).
3. THE RIGHT–OF–WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON–CONFLICTING PHASES.
4. Ø/OL = PHASE IN DISPLAY / OVERLAPPING PHASE.
5. DIAL 1 (AM) = 06:30 – 09:00, M–F
   DIAL 2 (PM) = 15:00 – 18:00, M–F
   MAX1 = ALL OTHER TIMES
6. PHASE 9 SHALL ONLY NE ACTIVATED BY P3, P4, P7 AND P8.
7. COUNTDOWN PHASE OF PEDESTRIAN SIGNALS SHALL NOT OCCUR DURING THE WALK PERIOD.

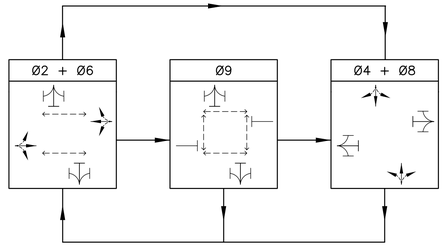
EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY NOTES:

1. EMERGENCY VEHICLE PRE–EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
2. IN RESPONSE TO A PRE–EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2, D3, D4) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE–EMPTION PHASE #1 (OR #2, #3, #4) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE–EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE–EMPTION PHASE CLEARANCE (4 SECONDS: YELLOW AND 2 SECONDS: ALL RED) AND SERVICE EMERGENCY VEHICLE PRE–EMPTION PHASE #2 (OR #1) IF NECESSARY, THEN TIME PHASE PRE–EMPTION CLEARANCE AND RESUME NORMAL SIGNAL OPERATION. EMERGENCY VEHICLE PRE–EMPTION PHASE #3 AND #4 SHALL BE SIMILARLY SERVED.
3. MINIMUM GREEN, NORMAL VEHICLE CLEARANCE, SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE–EMPTION DEMAND.
4. PREEMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE–EMPTION GREEN IS ON.

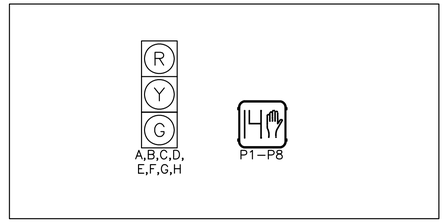
EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY

DETECTOR AND PRIORITY	PRE–EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø2
D2	2		Ø6
D3	3		Ø4
D4	4		Ø8

PREFERENTIAL PHASING SEQUENCE



SIGNAL DISPLAY



SIGNAL DISPLAY NOTES:

1. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED W/ LED MODULES (12–INCH LENS)
2. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED AND EQUIPPED WITH ±5" LOUVERED BACKPLATES.
3. ALL PEDESTRIAN SIGNAL HEADS SHALL HAVE PEDESTRIAN COUNTDOWN TIMER AND EGG–CRATE VISOR.

DETECTOR OPERATION

DETECTOR NUMBER	NUMBER OF SECTION/SIZE	PROCESSOR NUMBER	CHANNEL NUMBER	Ø CALLED	Ø EXTENSION	OPERATION	DELAY (SECONDS)	EXTENSION (SECONDS)
V1	10'x50'	1	1	2	2	PRESENCE	0	0
V2	4'x8'	1	1	2	2	PRESENCE	0	0
V3	10'x50'	1	2	6	6	PRESENCE	0	0
V4	4'x8'	1	2	6	6	PRESENCE	0	0
V5	10'x50'	2	1	4	4	PRESENCE	0	0
V6	10'x50'	2	2	8	8	PRESENCE	0	0

DETECTOR OPERATION NOTES:

1. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED AT THE DETECTOR.

NOTES:
1. ALL PROPOSED SIGNAL HEADS MUST BE AT LEAST 10 FEET FROM THE POWERED MBTA TROLLEY WIRES AND 5 FEET FROM THEIR SUPPORT CABLES. (SEE TYPE B MAST ARM DETAIL, SHEET TSP–11)

2. REMOVE AND STACK ALL EXISTING TRAFFIC SIGNAL EQUIPMENT.

3. REMOVE ALL PULL BOXES AND ABANDON EXISTING TRAFFIC SIGNAL CONDUIT SYSTEM.

4. MINIMUM 36" CLEARANCE EXCLUDING THE CURB WIDTH IS REQUIRED ON ALL SIDEWALKS.

5. VIDEO DETECTION AREAS ARE SHOWN ON THE PLANS GRAPHICALLY AND SHOULD BE ADJUSTED IN THE FIELD FOR PROPER DETECTION.

6. REFER TO SHEET NO. 151 FOR TRAFFIC SEQUENCE PLAN.

7. REFER TO SHEET NOS. 164 TO 168 FOR MAST ARM FOUNDATION.

8. REFER TO SHEET NO. 126 FOR COMPLETE PAVEMENT MARKING AND SIGNING PLAN.

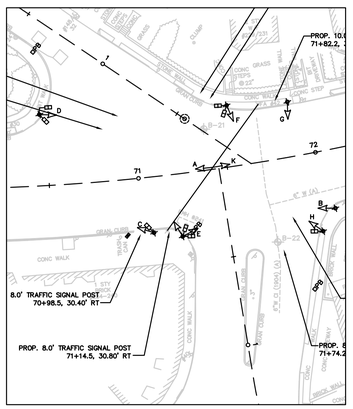
9. PUSH BUTTONS SHALL BE LOCATED NO MORE THAN 10" HORIZONTALLY FROM A LEVEL SURFACE (≤1.5%).

MAJOR ITEMS REQUIRED

QTY	ITEM 816.08
1	TRAFFIC SIGNAL CONTROLLER (TS–2, TYPE 1) W/8DW BASE MOUNTED CABINET AND FOUNDATION PAD
1	30' MAST ARM TYPE B (STEEL), INCL. BASE & FNDN W/ (1) D3
1	35' MAST ARM TYPE B (STEEL), INCL. BASE & FNDN W/ (1) D3
5	8' TRAFFIC SIGNAL POST, BASE & FOUNDATION
1	10' TRAFFIC SIGNAL POST, BASE & FOUNDATION
3	1–WAY, 3–SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
3	2–WAY, 3–SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
8	±5" LOUVERED BACKPLATES
8	PEDESTRIAN SIGNAL HEAD W/ EGG–CRATE VISOR (L.E.D. W/ COUNTDOWN)
8	ACCESSIBLE PEDESTRIAN PUSH BUTTON ASSEMBLY W/SIGN
2	12" x 12" PULL BOXES
2	12" x 24" PULL BOXES
4	VIDEO DETECTION CAMERAS
4	VIDEO CAMERA MAST ARM MOUNTING BRACKET
2	VIDEO DETECTION PROCESSOR – TWO CHANNELS
4	OPTICAL PRE–EMPTION DETECTORS SINGLE CHANNEL
1	EMERGENCY VEHICLE PRE–EMPTION CONFIRMATION STROBE LIGHT (WHITE)
1	OPTICAL PHASE SELECTOR FOUR CHANNEL
1	SERVICE CONNECTION (UNDERGROUND)

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

EXISTING TRAFFIC SIGNAL PLAN

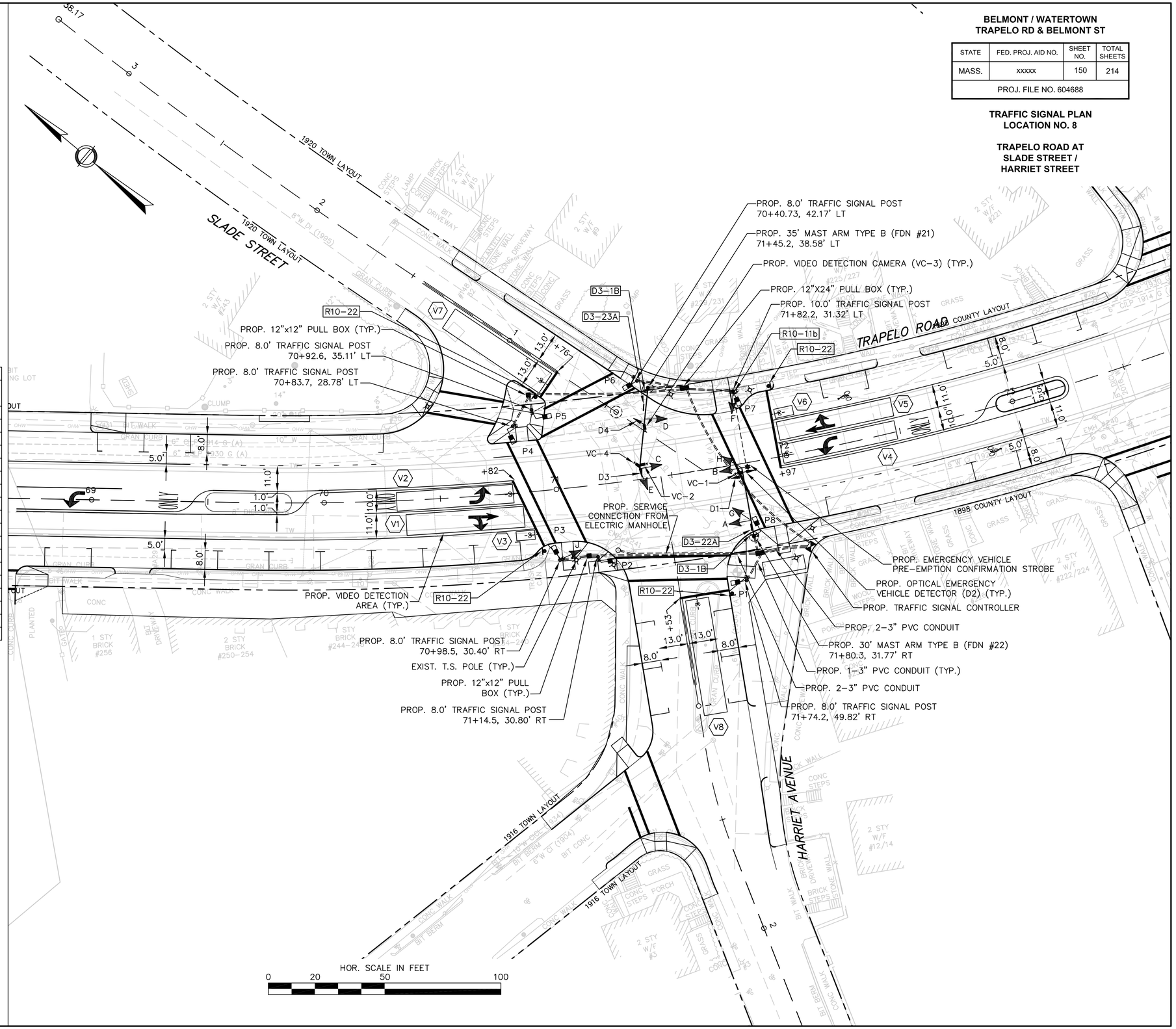


BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	150	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 8

TRAPELO ROAD AT SLADE STREET / HARRIET STREET



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	151	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 8

TRAPELO ROAD AT SLADE
STREET/ HARRIET STREET

SEQUENCE AND TIMING CHART

* YIELD CONTROL

				PHASE 1			PHASE 2			PHASE 3			PHASE 4			PHASE 5			PHASE 6			PHASE 7			PHASE 8			PHASE 9			EMERGENCY FLASH OPERATION
				SEQUENCE																											
STREET	DIR.	FACE	Ø/OL	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	
TRAPELO RD	EB	A,B	2				G	Y	R				R	R	R				R	R	R				R	R	R	R	R	R	FY
TRAPELO RD	WB	C,D,J	6				R	R	R				R	R	R				G	Y	R				R	R	R	R	R	R	FY
HARRIET AVE	NB	E,F	8				R	R	R				R	R	R				R	R	R				G	Y	R	R	R	R	FR
SLADE ST	SB	G,H	4				R	R	R				G	Y	R				R	R	R				R	R	R	R	R	R	FR
PEDESTRIAN		P1–P2	2				•																					F/			OFF
PEDESTRIAN		P5–P6	6																•									F/			OFF
PEDESTRIAN		P3–P4, P7–P8	9																									F/			OFF
				TIMING IN SECONDS																											
MINIMUM GREEN							12						6						12						6						
VEHICLE INTERVAL							2						2						2						2						
MAXIMUM GREEN I (ALL OTHER TIMES)							40						15						40						15						
MAXIMUM GREEN II (AM,PM)							43						19						43						19						
YELLOW CLEAR								4						3						4						3					
ALL RED CLEAR									3						3						3						3				
WALK INTERVAL							7												7										7		
PED CLEARANCE							11	4																						15	
PED BUFFER									3												3										4
DETECTOR							NON–LOCK						NON–LOCK						NON–LOCK						NON–LOCK			LOCK			
RECALL MODE							SOFT						OFF						SOFT						OFF			OFF			

CYCLE		OFFSET		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
DIAL	SEC.	%	SEC.																											
AM	70						43	4	3				14	3	3				43	4	3				14	3	3			
AM W/PED	90						37	4	3				14	3	3				37	4	3				14	3	3	7	15	4
PM	70						38	4	3				19	3	3				38	4	3				19	3	3			
PM W/PED	90						37	4	3				14	3	3				37	4	3				14	3	3	7	15	4

SEQUENCE NOTES:

1. ANY PHASE NOT CALLED WILL BE SKIPPED. SIGNAL IDENTIFICATION WILL NOT CHANGE IF THE ASSIGNED RIGHT OF WAY DOES NOT CHANGE DURING THE NEXT PHASE CALLED.
2. • NORMALLY DON'T WALK, UPON PEDESTRIAN PUSH BUTTON ACTIVATION, WALK/FLASHING DON'T WALK (COUNTDOWN).
3. THE RIGHT–OF–WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON–CONFLICTING PHASES.
4. Ø/OL = PHASE IN DISPLAY / OVERLAPPING PHASE.
5. DIAL 1 (AM) = 06:30 – 09:00, M–F
   DIAL 2 (PM) = 15:00 – 18:00, M–F
   MAX1 = ALL OTHER TIMES
6. PHASE 9 SHALL ONLY BE ACTIVATED BY P3, P4, P7 AND P8.
7. COUNTDOWN PHASE OF PEDESTRIAN SIGNALS SHALL NOT OCCUR DURING THE WALK PERIOD.

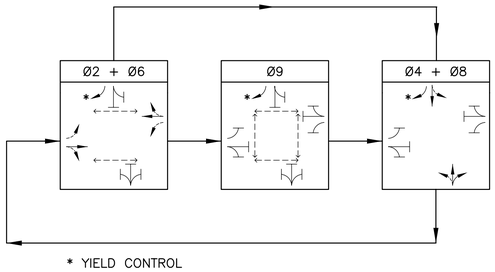
EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY NOTES:

1. EMERGENCY VEHICLE PRE–EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
2. IN RESPONSE TO A PRE–EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2, D3, D4) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE–EMPTION PHASE #1 (OR #2, #3, #4) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE–EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE–EMPTION PHASE CLEARANCE (4 SECONDS: YELLOW AND 2 SECONDS: ALL RED) AND SERVICE EMERGENCY VEHICLE PRE–EMPTION PHASE #2 (OR #1) IF NECESSARY, THEN TIME PHASE PRE–EMPTION CLEARANCE AND RESUME NORMAL SIGNAL OPERATION. EMERGENCY VEHICLE PRE–EMPTION PHASE #3 AND #4 SHALL BE SIMILARLY SERVED.
3. MINIMUM GREEN, NORMAL VEHICLE CLEARANCE, SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE–EMPTION DEMAND.
4. PREEMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE–EMPTION GREEN IS ON.

EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY

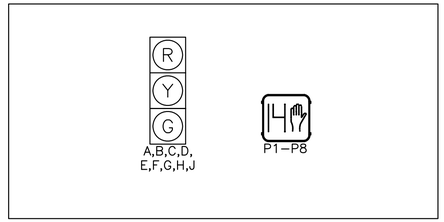
DETECTOR AND PRIORITY	PRE–EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø2
D2	2		Ø6
D3	3		Ø8
D4	4		Ø4

PREFERENTIAL PHASING SEQUENCE



* YIELD CONTROL

SIGNAL DISPLAY



SIGNAL DISPLAY NOTES:

1. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED W/ LED MODULES (12–INCH LENS)
2. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED AND EQUIPPED WITH ±5" LOUVERED BACKPLATES.
3. ALL PEDESTRIAN SIGNAL HEADS SHALL HAVE PEDESTRIAN COUNTDOWN TIMER AND EGG–CRATE VISOR.

DETECTOR OPERATION

DETECTOR NUMBER	NUMBER OF SECTION/SIZE	PROCESSOR NUMBER	CHANNEL NUMBER	Ø CALLED	Ø EXTENSION	OPERATION	DELAY (SECONDS)	EXTENSION (SECONDS)
V1	9'x50'	1	1	2	2	PRESENCE	0	0
V2	8'x50'	1	1	2	2	PRESENCE	0	0
V3	4'x8'	1	1	2	2	PRESENCE	0	0
V4	8'x50'	1	2	6	6	PRESENCE	0	0
V5	9'x50'	1	2	6	6	PRESENCE	0	0
V6	4'x8'	1	2	6	6	PRESENCE	0	0
V7	10'x50'	2	1	4	4	PRESENCE	0	0
V8	10'x50'	2	2	8	8	PRESENCE	0	0

DETECTOR OPERATION NOTES:

1. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED AT THE DETECTOR.

NOTES:
1. ALL PROPOSED SIGNAL HEADS MUST BE AT LEAST 10 FEET FROM THE POWERED MBTA TROLLEY WIRES AND 5 FEET FROM THEIR SUPPORT CABLES. (SEE TYPE B MAST ARM DETAIL, SHEET TSP–11)

2. REMOVE AND STACK ALL EXISTING TRAFFIC SIGNAL EQUIPMENT.

3. REMOVE ALL PULL BOXES AND ABANDON EXISTING TRAFFIC SIGNAL CONDUIT SYSTEM.

4. MINIMUM 36" CLEARANCE EXCLUDING CURB WIDTH IS REQUIRED ON ALL SIDEWALKS.

5. VIDEO DETECTION AREAS ARE SHOWN ON THE PLANS GRAPHICALLY AND SHOULD BE ADJUSTED IN THE FIELD FOR PROPER DETECTION.

6. REFER TO SHEET NO. 153 FOR TRAFFIC SEQUENCE PLAN.

7. REFER TO SHEET NOS. 164 TO 168 FOR MAST ARM FOUNDATION.

8. REFER TO SHEET NO. 127 FOR COMPLETE PAVEMENT MARKING AND SIGNING PLAN.

9. PUSH BUTTONS SHALL BE LOCATED NO MORE THAN 10" HORIZONTALLY FROM A LEVEL SURFACE (≤1.5%).

10. FOUR TEMPORARY TRAFFIC SIGNALS WILL BE REQUIRED.

MAJOR ITEMS REQUIRED (TRAFFIC SIGNAL EQUIPMENT)

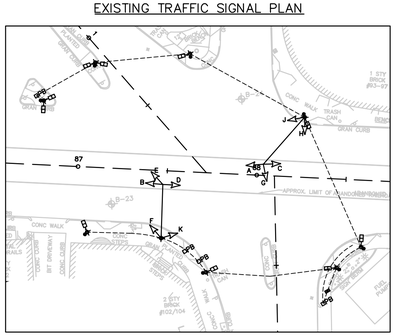
QTY	ITEM 816.09
1	TRAFFIC SIGNAL CONTROLLER (TS–2, TYPE 1) W/ 8DW BASE MOUNTED CABINET AND FOUNDATION PAD
1	35' MAST ARM TYPE B (STEEL), INCL. BASE & FNDN W/ (1) R3–8d & (1) R10–12
1	35' MAST ARM TYPE B (STEEL), INCL. BASE & FNDN W/ (1) R3–5L, (1) R10–12 & (1) D3
7	8' TRAFFIC SIGNAL POST, BASE & FOUNDATION
2	10' TRAFFIC SIGNAL POST, BASE & FOUNDATION
2	1–WAY, 3–SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
2	2–WAY, 3–SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
2	2–WAY, 3/5–SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
10	±5" LOUVERED BACKPLATES
8	PEDESTRIAN SIGNAL HEAD W/ EGG–CRATE VISOR (L.E.D. W/ COUNTDOWN)
8	ACCESSIBLE PEDESTRIAN PUSH BUTTON ASSEMBLY W/SIGN
1	12" x 12" PULL BOXES
4	12" x 24" PULL BOXES
4	VIDEO DETECTION CAMERAS
4	VIDEO CAMERA MAST ARM MOUNTING BRACKET
2	VIDEO DETECTION PROCESSOR – TWO CHANNELS
4	OPTICAL PRE–EMPTION DETECTORS SINGLE CHANNEL
1	EMERGENCY VEHICLE PRE–EMPTION CONFIRMATION STROBE LIGHT (WHITE)
1	OPTICAL PHASE SELECTOR FOUR CHANNEL
1	SERVICE CONNECTION (UNDERGROUND)

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

MAJOR ITEMS REQUIRED (ILLUMINATED BOLLARD SYSTEM)

QTY	ITEM 707.822
13	BOLLARDS
1	TIME CLOCK (MOUNTED IN TRAFFIC SIGNAL CABINET)

EXISTING TRAFFIC SIGNAL PLAN



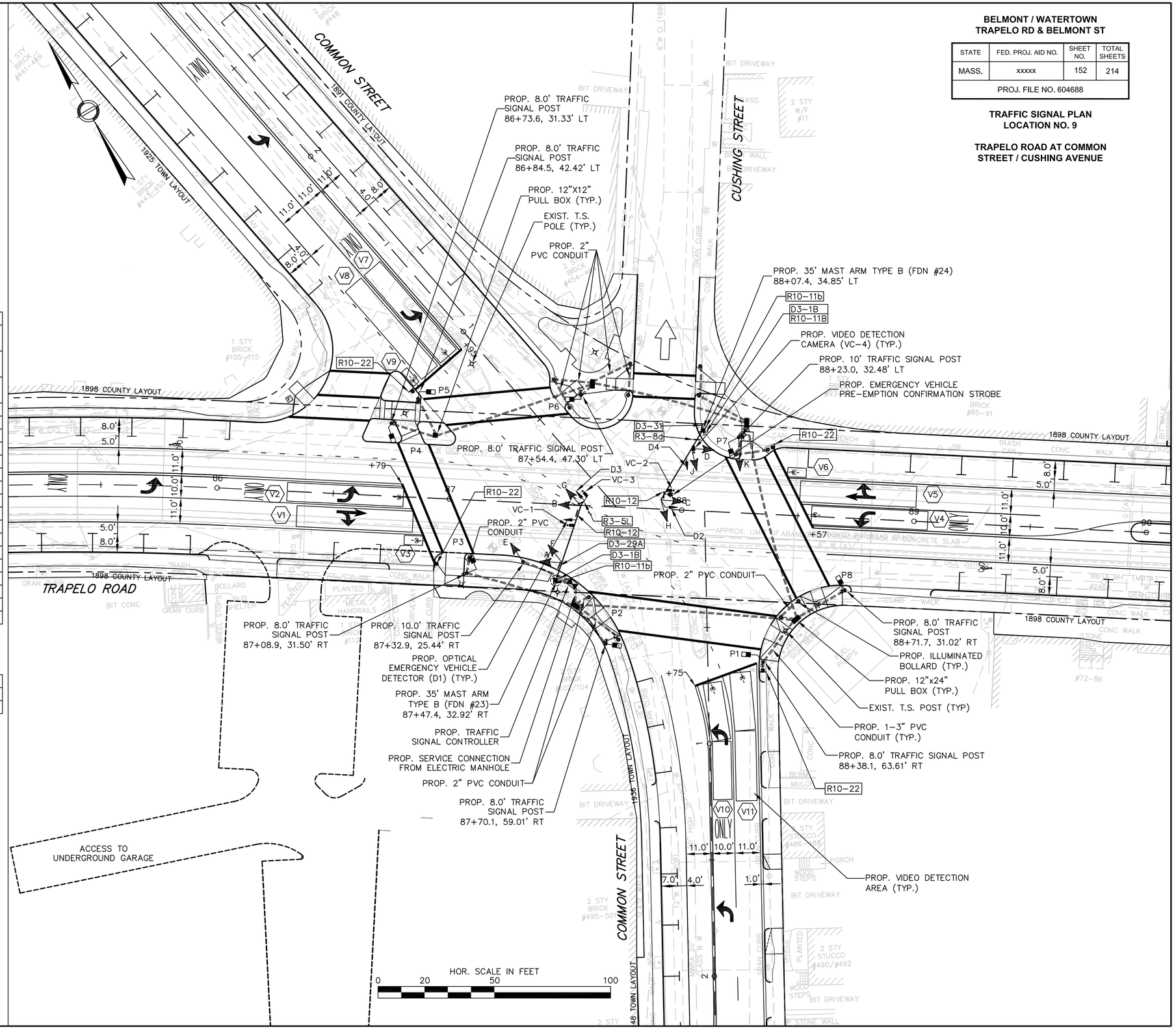
HOR. SCALE IN FEET
0 40 100 200

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	152	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 9

TRAPELO ROAD AT COMMON STREET / CUSHING AVENUE



SEQUENCE AND TIMING CHART

* YIELD CONTROL

				PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 6	PHASE 7	PHASE 8	PHASE 9	EMERGENCY FLASH OPERATION
				SEQUENCE									
STREET	DIR.	FACE	Ø/OL	R/W CL1 CL2	R/W CL1 CL2	R/W CL1 CL2	R/W CL1 CL2	R/W CL1 CL2	R/W CL1 CL2	R/W CL1 CL2	R/W CL1 CL2	R/W CL1 CL2	
TRAPELO RD	EB	B	5	R R R	G Y R	R R R	R R R	R R R	R R R	R R R	R R R		FY
TRAPELO RD	EB	A	2	R R R	G Y R	R R R	R R R	R R R	G Y R	R R R	R R R		FY
TRAPELO RD	WB	C	1	R R R	R R R	R R R	R R R	R R R	R R R	R R R	R R R		FY
TRAPELO RD	WB	D	6	R R R	R R R	R R R	R R R	R R R	G Y R	R R R	R R R		FY
COMMON ST	NB	H	3	~~R R R~~	~~R R R~~	~~G Y R~~	~~R R R~~	~~R R R~~	~~R R R~~	~~R R R~~	~~R R R~~		~~FR~~
COMMON ST	NB	J,K	8	R R R	R R R	R R R	R R R	R R R	R R R	R R R	G Y R		FR
COMMON ST	SB	G	7	~~R R R~~	~~R R R~~	~~R R R~~	~~R R R~~	~~R R R~~	~~R R R~~	~~G Y R~~	~~R R R~~		~~FR~~
COMMON ST	SB	E,F	4	R R R	R R R	R R R	G Y R	R R R	R R R	R R R	R R R		FR
PEDESTRIAN		P1–P2, P5–P6		•	•				•				OFF
PEDESTRIAN		P3–P4, P7–P8		•			•				•		OFF
				TIMING IN SECONDS									
MINIMUM GREEN				3	12	6	12	3	12	6	12		
VEHICLE INTERVAL				2	2	2	2	2	2	2	2		
MAXIMUM GREEN I (ALL OTHER TIMES)				8	40	12	25	8		12	25		
MAXIMUM GREEN II (AM,PM)				8	49	15	27	8	49	15	27		
YELLOW CLEAR				3	4	4	4	3	4	4	4		
ALL RED CLEAR				0	3	3	3	0	3	3	3		
WALK INTERVAL					7		7		7		7		
PED CLEARANCE					16 4		14.5 4		16 4		14.5 4		
PED BUFFER					3		3		3		3		
DETECTOR				NON–LOCK	NON–LOCK	NON–LOCK	NON–LOCK	NON–LOCK	NON–LOCK	NON–LOCK	NON–LOCK		
RECALL MODE				OFF	SOFT	OFF	OFF	OFF	SOFT	OFF	OFF		
CYCLE				1 2 3	4 5 6	7 8 9	10 11 12	13 14 15	16 17 18	19 20 21	22 23 24	25 26 27	
DIAL	SEC.												
AM	120			5 3 0	49 4 3	15 4 3	27 4 3	5 3 0	49 4 3	15 4 3	27 4 3		
PM	120			8 3 0	49 4 3	14 4 3	25 4 3	8 3 0	49 4 3	14 4 3	25 4 3		

SEQUF

1.

2. •

3.

CTING PHASES.

4. Ø/OL = PHASE IN DISPLAY / OVERLAPPING PHASE.

5. DIAL 1 (AM) = 06:30 – 09:00, M–F
   DIAL 2 (PM) = 15:00 – 18:00, M–F
   MAX1 = ALL OTHER TIMES

6. COUNTDOWN PHASE OF PEDESTRIAN SIGNALS SHALL NOT OCCUR DURING THE WALK PERIOD.

EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY NOTES:

1. EMERGENCY VEHICLE PRE–EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.

2. IN RESPONSE TO A PRE–EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2, D3, D4) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE–EMPTION PHASE #1 (OR #2, #3, #4) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE–EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE–EMPTION PHASE CLEARANCE (4 SECONDS: YELLOW AND 2 SECONDS: ALL RED) AND SERVICE EMERGENCY VEHICLE PRE–EMPTION PHASE #2 (OR #1) IF NECESSARY, THEN TIME PHASE PRE–EMPTION CLEARANCE AND RESUME NORMAL SIGNAL OPERATION. EMERGENCY VEHICLE PRE–EMPTION PHASE #3 AND #4 SHALL BE SIMILARLY SERVED.

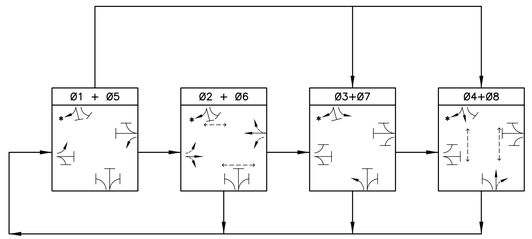
3. MINIMUM GREEN, NORMAL VEHICLE CLEARANCE, SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE–EMPTION DEMAND.

4. PREEMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE–EMPTION GREEN IS ON.

EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY

DETECTOR AND PRIORITY	PRE–EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø2+Ø5
D2	2		Ø1+Ø6
D3	3		Ø4+Ø7
D4	4		Ø3+Ø8

PREFERENTIAL PHASING SEQUENCE



* YIELD CONTROL

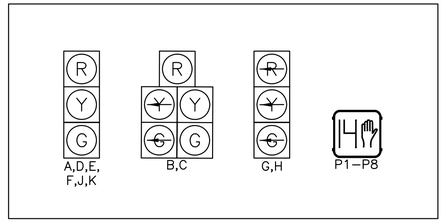
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	153	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 9

TRAPELO ROAD AT COMMON STREET / CUSHING AVENUE

SIGNAL DISPLAY



SIGNAL DISPLAY NOTES:

1. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED W/ LED MODULES (12–INCH LENS)
2. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED AND EQUIPPED WITH ±5" LOUVERED BACKPLATES.
3. ALL PEDESTRIAN SIGNAL HEADS SHALL HAVE PEDESTRIAN COUNTDOWN TIMER AND EGG–CRATE VISOR.

DETECTOR OPERATION

DETECTOR NUMBER	NUMBER OF SECTION/SIZE	PROCESSOR NUMBER	CHANNEL NUMBER	Ø CALLED	Ø EXTENSION	OPERATION	DELAY (SECONDS)	EXTENSION (SECONDS)
V1	9'x50'	1	1	2	2	PRESENCE	0	0
V2	8'x50'	1	1	5	5	PRESENCE	0	0
V3	4'x8'	1	1	2	2	PRESENCE	0	0
V4	8'x50'	1	2	1	1	PRESENCE	0	0
V5	9'x50'	1	2	6	6	PRESENCE	0	0
V6	4'x8'	1	2	6	6	PRESENCE	0	0
V7	9'x50'	2	1	7	7	PRESENCE	0	0
V8	9'x50'	2	1	4	4	PRESENCE	0	0
V9	3'x8'	2	1	4	4	PRESENCE	0	0
V10	2–8'x25'	2	2	3	3	PRESENCE	0	0
V11	1–9'x25' 1–9'x30'	2	2	8	8	PRESENCE	0	0

DETECTOR OPERATION NOTES:

1. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED AT THE DETECTOR.

NOTES:
1. ALL PROPOSED SIGNAL HEADS MUST BE AT LEAST 10 FEET FROM THE POWERED MBTA TROLLEY WIRES AND 5 FEET FROM THEIR SUPPORT CABLES. (SEE TYPE B MAST ARM DETAIL, SHEET TSP–11)

2. REMOVE AND STACK ALL EXISTING TRAFFIC CONTROL EQUIPMENT.

3. PROTECT EXISTING TRAFFIC SIGNAL CONDUIT SYSTEM, EXCEPT AS NOTED BELOW.

4. MINIMUM 36" CLEARANCE EXCLUDING CURB WIDTH IS REQUIRED ON ALL SIDEWALKS.

5. VIDEO DETECTION AREAS ARE SHOWN ON THE PLANS GRAPHICALLY AND SHOULD BE ADJUSTED IN THE FIELD FOR PROPER DETECTION.

6. REFER TO SHEET NO. 155 FOR TRAFFIC SEQUENCE PLAN.

7. REFER TO SHEET NOS. 164 TO 168 FOR MAST ARM FOUNDATION.

8. REFER TO SHEET NO. 128 FOR COMPLETE PAVEMENT MARKING AND SIGNING PLAN.

9. PUSH BUTTONS SHALL BE LOCATED NO MORE THAN 10" HORIZONTALLY FROM A LEVEL SURFACE (≤1.5%).

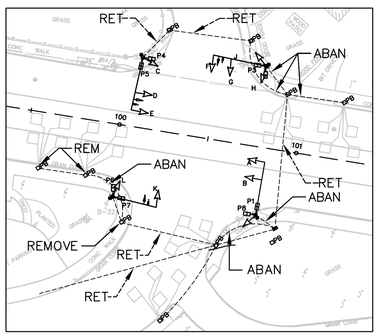
MAJOR ITEMS REQUIRED

QTY	ITEM 816.10
1	TRAFFIC SIGNAL CONTROLLER (TS–2, TYPE 1) W/ 8DW BASE MOUNTED CABINET AND CEMENT CONCRETE PAD
1	25' MAST ARM (STEEL), MNT'D ON EXIST. FNDN W/ (1) D3
1	25' MAST ARM (STEEL), MNT'D ON EXIST. FNDN W/ (2) D3
1	35' MAST ARM TYPE B (STEEL), MNT'D ON EXIST. FNDN W/ (1) D3 & (1) R10–12
1	35' MAST ARM TYPE B (STEEL), INCL. BASE & FNDN W/ (1) D3
2	10' TRAFFIC SIGNAL POST, BASE & FOUNDATION
3	8' TRAFFIC SIGNAL POST, BASE & FOUNDATION
9	1–WAY, 3–SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
3	1–WAY, 5–SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
12	5" LOUVERED BACKPLATES
8	PEDESTRIAN SIGNAL HEAD W/ EGG–CRATE VISOR (L.E.D. W/ COUNTDOWN)
8	ACCESSIBLE PEDESTRIAN PUSH BUTTON ASSEMBLY W/SIGN
2	12"x12" PULL BOXES*
4	VIDEO DETECTION CAMERAS
4	VIDEO CAMERA MAST ARM MOUNTING BRACKET
2	VIDEO DETECTION PROCESSOR – TWO CHANNELS
4	OPTICAL PRE–EMPTION DETECTORS SINGLE CHANNEL
1	EMERGENCY VEHICLE PRE–EMPTION CONFIRMATION STROBE LIGHT (WHITE)
1	OPTICAL PHASE SELECTOR FOUR CHANNEL
1	SERVICE CONNECTION (UNDERGROUND)

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

* TO BE PAID UNDER ITS RESPECTIVE PAY ITEM.

EXISTING TRAFFIC SIGNAL PLAN



HOR. SCALE IN FEET
0 40 100 200

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	154	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 10

TRAPELO ROAD AT BELMONT STREET / PINE STREET

PINE STREET
TRAPELO ROAD
BELMONT STREET
1898 COUNTY LAYOUT
1910 COUNTY LAYOUT
BELMONT
WATERTOWN
PROP. 8.0' TRAFFIC SIGNAL POST 100+14.7, 50.30' LT
CUT & EXTEND CONDUIT
PROP. 35' MAST ARM TYPE B (FDN #33A) 100+01.8, 36.26' LT
PROP. VIDEO DETECTION CAMERA (VC–4) (TYP.)
PROP. 25' MAST ARM (FDN #34) 100+62.5, 53.68' LT
PROP. 2–3" PVC CONDUIT (TYP.)
PROP. 10.0' TRAFFIC SIGNAL POST 100+86.7, 38.82' LT
PROP. 12"X12" PULL BOX
CUT & EXTEND CONDUIT
PROP. VIDEO DETECTION AREA (TYP.)
PROP. EMERGENCY VEHICLE PRE–EMPTION CONFIRMATION STROBE
PROP. 8.0' TRAFFIC SIGNAL POST 100+73.6, 46.72' LT
PROP. 8.0' TRAFFIC SIGNAL POST 99+98.0, 35.67' RT
EXIST. T.S. POST (TYP.)
PROP. 25' MAST ARM (FDN #32) 100+01.8, 49.75' RT
PROP. 12"X12" PULL BOX
EXIST. CONDUIT SYSTEM TO BE RETAINED
VARIES
PROP. 35' MAST ARM TYPE B (FDN # 25) 101+03.9, 40.71' RT
PROP. 3" PVC CONDUIT (TYP.)
CUT & EXTEND CONDUIT
PROP. TRAFFIC SIGNAL CONTROLLER W/ CEMENT CONCRETE PAD
PROP. 3–3" PVC CONDUIT
PROP. 10.0' TRAFFIC SIGNAL POST 100+74.0, 55.55" RT
CUT & EXTEND CONDUIT
PROP. SERVICE CONNECTION FROM ELECTRIC MANHOLE
PROP. 3" PVC CONDUIT
PROP. OPTICAL EMERGENCY VEHICLE DETECTOR (D4, TYP.) MOUNTED ON LIGHT POLE

HOR. SCALE IN FEET
0 20 50 100

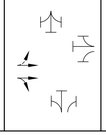
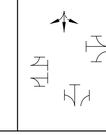
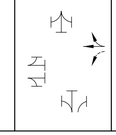
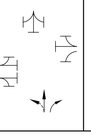
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	155	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 10

TRAPELO ROAD AT BELMONT
STREET / PINE STREET

SEQUENCE AND TIMING CHART

				PHASE 1			PHASE 2			PHASE 3			PHASE 4			PHASE 5			PHASE 6			PHASE 7			PHASE 8			PHASE 9			EMERGENCY FLASH OPERATION
																															
				SEQUENCE																											
STREET	DIR.	FACE	Ø/OL	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	
TRAPELO RD	EB	A,B	2	R	R	R	G	Y	R				R	R	R				R	R	R				R	R	R	R	R	R	FY
TRAPELO RD	WB	C	1	~~G~~	~~G~~	R	R	R	R				R	R	R				G	Y	R				R	R	R	R	R	R	FY
TRAPELO RD	WB	D,E	6	G	Y	R	R	R	R				R	R	R				G	Y	R				R	R	R	R	R	R	FR
BELMONT ST	NB	F,G,H	8	R	R	R	R	R	R				R	R	R				R	R	R				G	Y	R	R	R	R	FR
BELMONT ST	NB	J	8	~~R~~	~~R~~	R	R	R	R				R	R	R				R	R	R				G	Y	R	R	R	R	FR
PINE ST	SB	K,L,M	4	R	R	R	R	R	R				G	Y	R				R	R	R				R	R	R	R	R	R	FR
PEDESTRIAN		P1–P8	9																									F/			OFF
				TIMING IN SECONDS																											
MINIMUM GREEN				12			12						3						12						3						
VEHICLE INTERVAL				2			2						2						2						2						
MAXIMUM GREEN I (ALL OTHER TIMES)				25			30						9						58						9						
MAXIMUM GREEN II (AM,PM)				27			28						9						58						9						
YELLOW CLEAR					3			4						3						4						3					
ALL RED CLEAR						0			3						3						3						3				
WALK INTERVAL																												7			
PED CLEARANCE																													19		
PED BUFFER																														4	
DETECTOR				NON–LOCK			NON–LOCK						NON–LOCK						NON–LOCK						NON–LOCK			LOCK			
RECALL MODE				OFF			OFF						OFF						OFF						OFF			OFF			

CYCLE		OFFSET		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
DIAL	SEC.	%	SEC.																											
AM	80			27	3.0	0	28	4.0	3.0				9	3.0	3.0				58	4.0	3.0				9	3.0	3.0			
AM W/PED	90			19	3.0	0	19	4.0	3.0				6	3.0	3.0				41	4.0	3.0				6	3.0	3.0	7	19	4
PM	80			27	3.0	0	28	4.0	3.0				9	3.0	3.0				58	4.0	3.0				9	3.0	3.0			
PM W/PED	100			26	3.0	0	21	4.0	3.0				7	3.0	3.0				50	4.0	3.0				7	3.0	3.0	7	19	4

SEQUENCE NOTES:

1. ANY PHASE NOT CALLED WILL BE SKIPPED. SIGNAL IDENTIFICATION WILL NOT CHANGE IF THE ASSIGNED RIGHT OF WAY DOES NOT CHANGE DURING THE NEXT PHASE CALLED.
2. THE RIGHT–OF–WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON–CONFLICTING PHASES.
3. Ø/OL = PHASE IN DISPLAY / OVERLAPPING PHASE.
4. DIAL 1 (AM) = 06:30 – 09:00, M–F
   DIAL 2 (PM) = 15:00 – 18:00, M–F
   MAX1 = ALL OTHER TIMES
5. COUNTDOWN PHASE OF PEDESTRIAN SIGNALS SHALL NOT OCCUR DURING THE WALK PERIOD.

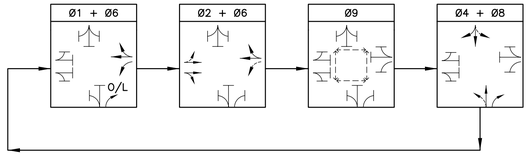
EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY NOTES:

1. EMERGENCY VEHICLE PRE–EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
2. IN RESPONSE TO A PRE–EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2, D3, D4) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE–EMPTION PHASE #1 (OR #2, #3, #4) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE–EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE–EMPTION PHASE CLEARANCE (4 SECONDS: YELLOW AND 2 SECONDS: ALL RED) AND SERVICE EMERGENCY VEHICLE PRE–EMPTION PHASE #2 (OR #1) IF NECESSARY, THEN TIME PHASE PRE–EMPTION CLEARANCE AND RESUME NORMAL SIGNAL OPERATION. EMERGENCY VEHICLE PRE–EMPTION PHASE #3 AND #4 SHALL BE SIMILARLY SERVED.
3. MINIMUM GREEN, NORMAL VEHICLE CLEARANCE, SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE–EMPTION DEMAND.
4. PREEMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE–EMPTION GREEN IS ON.

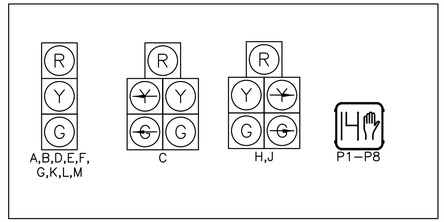
EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY

DETECTOR AND PRIORITY	PRE–EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø2
D2	2		Ø1 + Ø6
D3	3		Ø4
D4	4		Ø8

PREFERENTIAL PHASING SEQUENCE



SIGNAL DISPLAY



SIGNAL DISPLAY NOTES:

1. EXISTING PED. HEADS TO BE RETROFITTED WITH GRAPHIC SYMBOL AS SHOWN, IN COMFORMANCE WITH MUTCD STANDARDS.
2. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED AND EQUIPPED WITH ±5" LOUVERED BACKPLATES.
3. ALL PEDESTRIAN SIGNAL HEADS SHALL HAVE PEDESTRIAN COUNTDOWN TIMER AND EGG–CRATE VISOR.

DETECTOR OPERATION

DETECTOR NUMBER	NUMBER OF SECTION/SIZE	PROCESSOR NUMBER	CHANNEL NUMBER	Ø CALLED	Ø EXTENSION	OPERATION	DELAY (SECONDS)	EXTENSION (SECONDS)
V1	9'x50'	1	1	2	2	PRESENCE	0	0
V2	9'x50'	1	1	2	2	PRESENCE	0	0
V3	3'x8'	1	1	2	2	PRESENCE	0	0
V4	8'x50'	1	2	1	1	PRESENCE	0	0
V5	9'x50'	1	2	6	6	PRESENCE	0	0
V6	4'x8'	1	2	6	6	PRESENCE	0	0
V7	2–9'x25'	2	1	8	8	PRESENCE	0	0
V8	2–9'x25'	2	1	8	8	PRESENCE	0	0
V9	1–8'x14' 1–6'x12' 1–8'x8'	2	2	4	4	PRESENCE	0	0

DETECTOR OPERATION NOTES:

1. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED AT THE DETECTOR.

NOTES:
1. ALL PROPOSED SIGNAL HEADS MUST BE AT LEAST 10 FEET FROM THE POWERED MBTA TROLLEY WIRES AND 5 FEET FROM THEIR SUPPORT CABLES. (SEE TYPE B MAST ARM DETAIL, SHEET TSP–11)

2. REMOVE AND STACK ALL EXISTING TRAFFIC SIGNAL EQUIPMENT.

3. MINIMUM 36" CLEARANCE EXCLUDING CURB WIDTH IS REQUIRED ON ALL SIDEWALKS.

4. REFER TO SHEET NO. 157 FOR TRAFFIC SEQUENCE PLAN.

5. REFER TO SHEET NOS. 164 TO 168 FOR MAST ARM FOUNDATION.

6. REFER TO SHEET NO. 129 FOR COMPLETE PAVEMENT MARKING AND SIGNING PLAN.

7. PUSH BUTTONS SHALL BE LOCATED NO MORE THAN 10" HORIZONTALLY FROM A LEVEL SURFACE (≤1.5%).

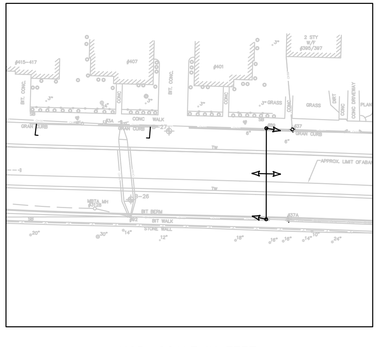
MAJOR ITEMS REQUIRED

QTY	ITEM 816.11
1	TRAFFIC SIGNAL CONTROLLER (TS–2, TYPE 1) W/ 8DW BASE MOUNTED CABINET AND FOUNDATION PAD
1	25' MAST ARM TYPE B (STEEL), INCLUDE BASE & FOUNDATION
1	30' MAST ARM TYPE B (STEEL), INCLUDE BASE & FOUNDATION
2	8' TRAFFIC SIGNAL POST, BASE & FOUNDATION
4	1–WAY, 3–SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
4	±5" LOUVERED BACKPLATES
2	PEDESTRIAN SIGNAL HEAD W/ EGG–CRATE VISOR (L.E.D. W/ COUNTDOWN)
2	ACCESSIBLE PEDESTRIAN PUSH BUTTON ASSEMBLY W/SIGN
2	12" x 12" PULL BOXES*
1	SERVICE CONNECTION (OVERHEAD)

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

* TO BE PAID UNDER ITS RESPECTIVE PAY ITEM.

EXISTING TRAFFIC SIGNAL PLAN



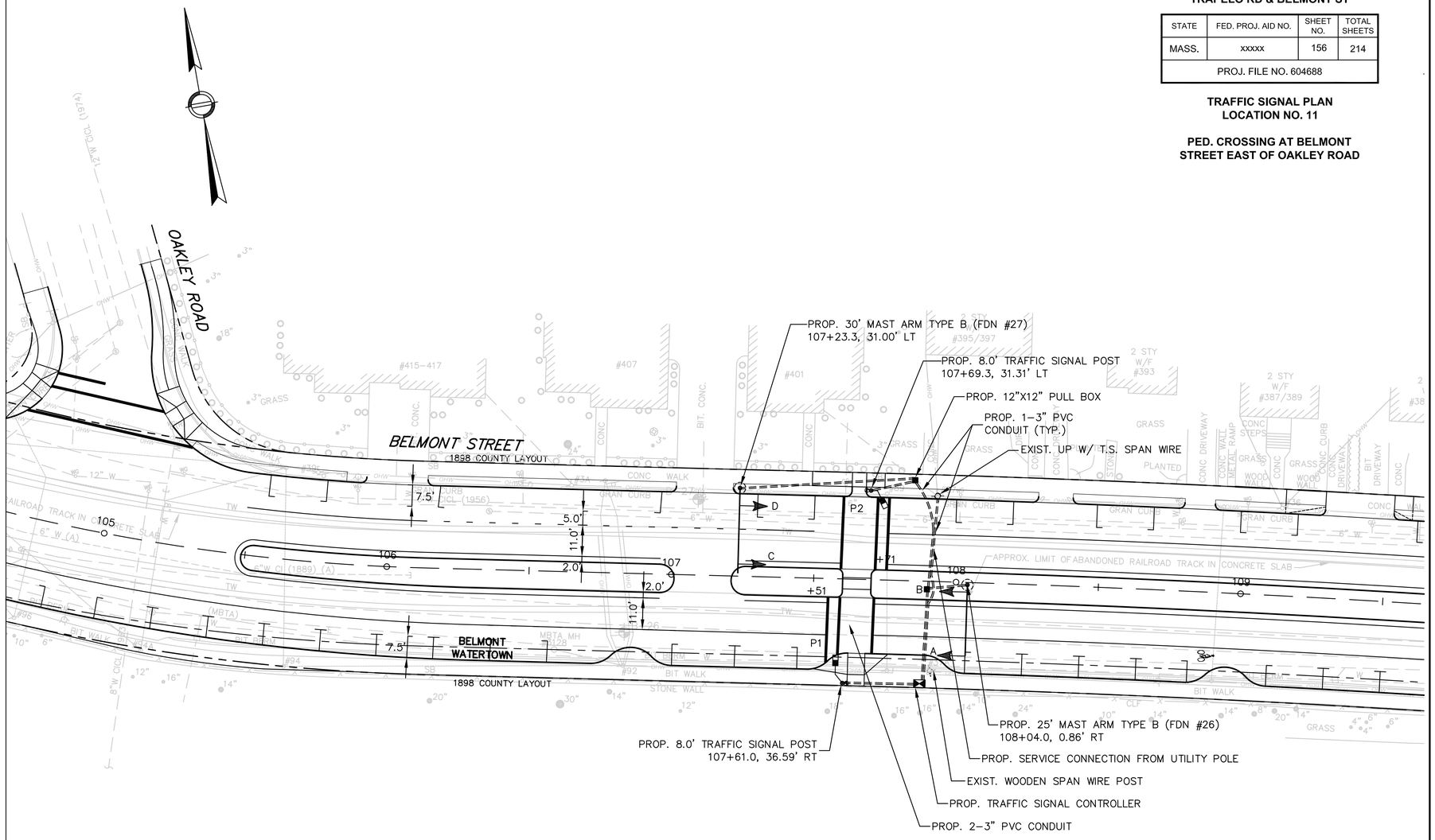
HOR. SCALE IN FEET
0 40 100 200

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	156	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 11

PED. CROSSING AT BELMONT STREET EAST OF OAKLEY ROAD



HOR. SCALE IN FEET
0 20 50 100

SEQUENCE AND TIMING CHART

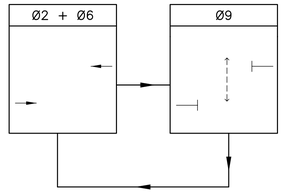
				PHASE 1			PHASE 2			PHASE 3			PHASE 4			PHASE 5			PHASE 6			PHASE 7			PHASE 8			PHASE 9			EMERGENCY FLASH OPERATION
				SEQUENCE																											
STREET	DIR.	FACE	Ø/OL	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	
BELMONT ST	EB	A,B	2				G	Y	R										R	R	R							R	R	R	FY
BELMONT ST	WB	C,D	6				R	R	R										G	Y	R							R	R	R	FY
PEDESTRIAN		P1–P2	9																									F/			OFF
				TIMING IN SECONDS																											
MINIMUM GREEN							20												20												
VEHICLE INTERVAL							2												2												
MAXIMUM GREEN I (ALL OTHER TIMES)							41												41												
MAXIMUM GREEN II (AM & PM)							41												41												
YELLOW CLEAR								4												4											
ALL RED CLEAR									1												1										
WALK INTERVAL																												7			
PED CLEARANCE																													15		
PED BUFFER																														4	
DETECTOR							NON–LOCK												NON–LOCK									LOCK			
RECALL MODE							SOFT												SOFT									OFF			

CYCLE		OFFSET		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
DIAL	SEC.	%	SEC.																											
AM	70						39	4	1										39	4	1							7	15	4
PM	70						39	4	1										39	4	1							7	15	4

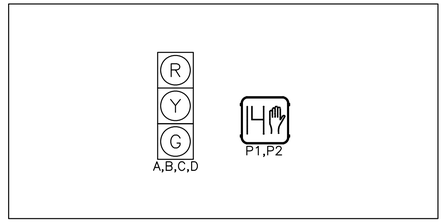
SEQUENCE NOTES:

1. ANY PHASE NOT CALLED WILL BE SKIPPED. SIGNAL IDENTIFICATION WILL NOT CHANGE IF THE ASSIGNED RIGHT OF WAY DOES NOT CHANGE DURING THE NEXT PHASE CALLED.
2. THE RIGHT–OF–WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON–CONFLICTING PHASES.
3. Ø/OL = PHASE IN DISPLAY / OVERLAPPING PHASE.
4. DIAL 1 (AM) = 06:30 – 09:00, M–F
   DIAL 2 (PM) = 15:00 – 18:00, M–F
   MAX1 = ALL OTHER TIMES
5. COUNTDOWN PHASE OF PEDESTRIAN SIGNALS SHALL NOT OCCUR DURING THE WALK PERIOD.

PREFERENTIAL PHASING SEQUENCE



SIGNAL DISPLAY



SIGNAL DISPLAY NOTES:

1. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED W/ LED MODULES (12–INCH LENS)
2. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED AND EQUIPPED WITH ±5" LOUVERED BACKPLATES.
3. ALL PEDESTRIAN SIGNAL HEADS SHALL HAVE PEDESTRIAN COUNTDOWN TIMER AND EGG–CRATE VISOR.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	157	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 11

PED CROSSING AT BELMONT
STREET EAST OF OAKLEY ROAD

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	158	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 12

BELMONT STREET AT SCHOOL STREET

NOTES:
1. ALL PROPOSED SIGNAL HEADS MUST BE AT LEAST 10 FEET FROM THE POWERED MBTA TROLLEY WIRES AND 5 FEET FROM THEIR SUPPORT CABLES. (SEE TYPE B MAST ARM DETAIL, SHEET TSP–11)

2. REMOVE AND STACK ALL EXISTING TRAFFIC SIGNAL EQUIPMENT.

3. REMOVE ALL PULL BOXES AND ABANDON EXISTING TRAFFIC SIGNAL CONDUIT SYSTEM.

4. MINIMUM 36" CLEARANCE EXCLUDING CURB WIDTH IS REQUIRED ON ALL SIDEWALKS.

5. VIDEO DETECTION AREAS ARE SHOWN ON THE PLANS GRAPHICALLY AND SHOULD BE ADJUSTED IN THE FIELD FOR PROPER DETECTION.

6. REFER TO SHEET NO. 159 FOR TRAFFIC SEQUENCE PLAN.

7. REFER TO SHEET NOS. 164 TO 168 FOR MAST ARM FOUNDATION.

8. REFER TO SHEET NO. 129 FOR COMPLETE PAVEMENT MARKING AND SIGNING PLAN.

9. PUSH BUTTONS SHALL BE LOCATED NO MORE THAN 10" HORIZONTALLY FROM A LEVEL SURFACE (≤1.5%).

10. THREE TEMPORARY TRAFFIC SIGNALS WILL BE REQUIRED.

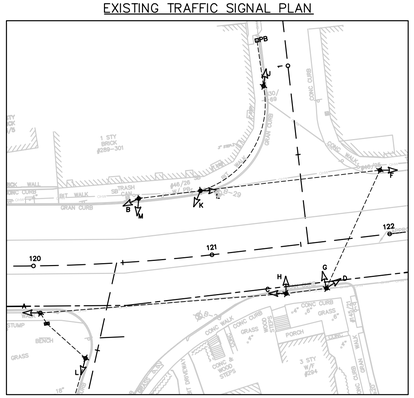
MAJOR ITEMS REQUIRED

QTY	ITEM 816.12
1	TRAFFIC SIGNAL CONTROLLER (TS–2, TYPE 1) W/ 8DW BASE MOUNTED CABINET AND FOUNDATION PAD
2	30' MAST ARM TYPE B (STEEL), INCL. BASE & FNDN
4	10' TRAFFIC SIGNAL POST, BASE & FOUNDATION
5	8' TRAFFIC SIGNAL POST, BASE & FOUNDATION
7	1–WAY, 3–SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
2	2–WAY, 3–SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
11	±5" LOUVERED BACKPLATES
8	PEDESTRIAN SIGNAL HEAD W/ EGG–CRATE VISOR (L.E.D. W/ COUNTDOWN)
8	ACCESSIBLE PEDESTRIAN PUSH BUTTON ASSEMBLY W/SIGN
5	12" x 12" PULL BOXES*
1	12" x 24" PULL BOXES*
4	VIDEO DETECTION CAMERAS
4	VIDEO CAMERA MAST ARM MOUNTING BRACKET
2	VIDEO DETECTION PROCESSOR – TWO CHANNELS (2–CHANNEL, 4–CHANNEL)
4	OPTICAL PRE–EMPTION DETECTORS SINGLE CHANNEL
1	EMERGENCY VEHICLE PRE–EMPTION CONFIRMATION STROBE LIGHT (WHITE)
1	OPTICAL PHASE SELECTOR FOUR CHANNEL
1	SERVICE CONNECTION (OVERHEAD)

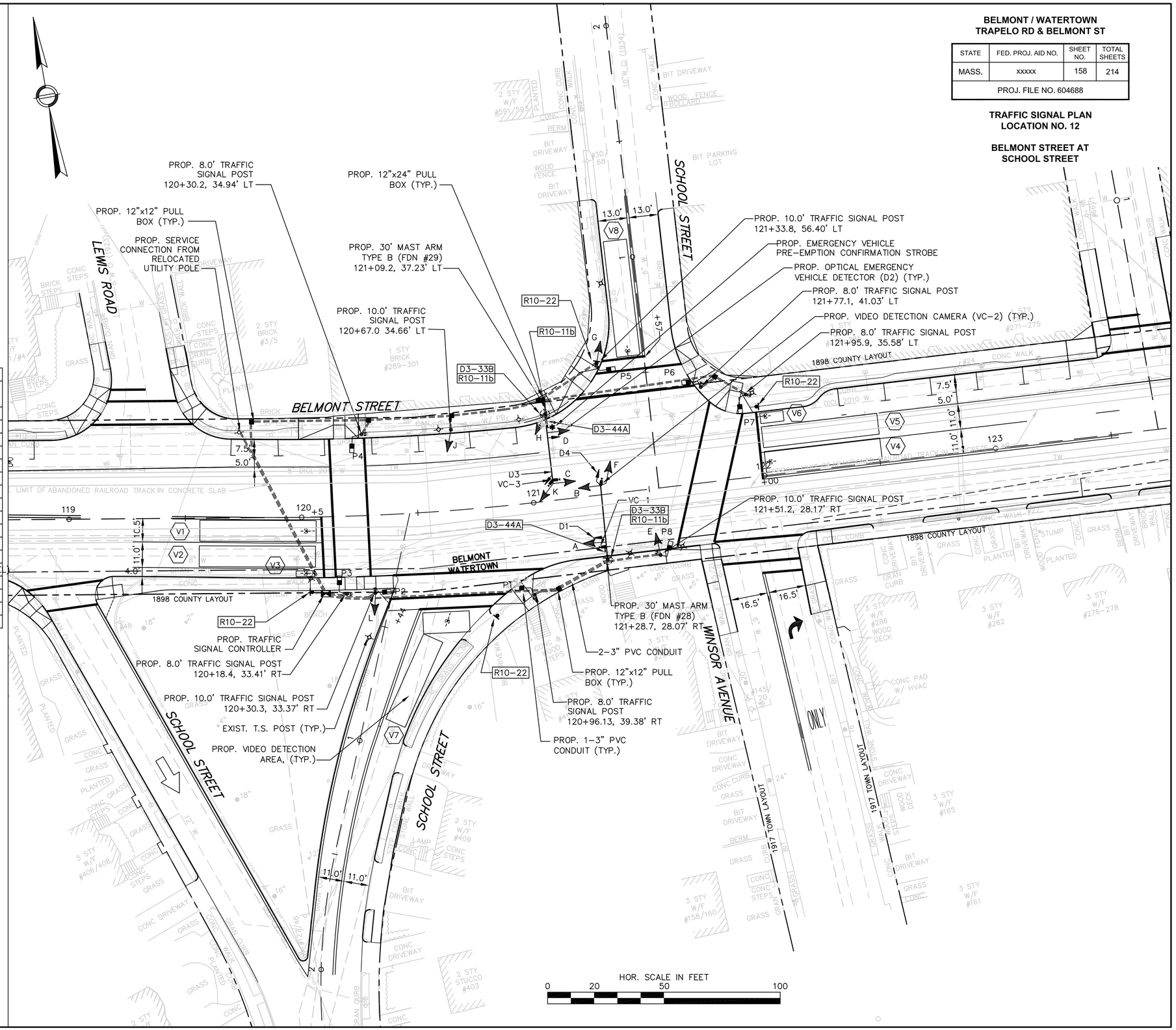
PLUS ALL NECESSARY DUCT, CABLE, FOUNDATIONS, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC SIGNAL.

* TO BE PAID UNDER ITS RESPECTIVE PAY ITEM.

EXISTING TRAFFIC SIGNAL PLAN



HOR. SCALE IN FEET
0 40 100 200



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	159	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 12

BELMONT STREET AT SCHOOL STREET

SEQUENCE AND TIMING CHART

				PHASE 1			PHASE 2			PHASE 3			PHASE 4			PHASE 5			PHASE 6			PHASE 7			PHASE 8			PHASE 9			EMERGENCY FLASH OPERATION
				SEQUENCE																											
STREET	DIR.	FACE	Ø/OL	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	R/W	CL1	CL2	
BELMONT ST	EB	A,B	2				G	Y	R				R	R	R				R	R	R				R	R	R	R	R	R	FY
BELMONT ST	WB	C,D	6				R	R	R				R	R	R				G	Y	R				R	R	R	R	R	R	FY
SCHOOL ST	NB	H,J,K,L	8				R	R	R				R	R	R				R	R	R				G	Y	R	R	R	R	FR
SCHOOL ST	SB	E,F,G	4				R	R	R				G	Y	R				R	R	R				R	R	R	R	R	R	FR
PEDESTRIAN		P1–P2	2				•																					F/		OFF
PEDESTRIAN		P5–P6	6																•									F/		OFF
PEDESTRIAN		P3–P4, P7–P8	9																									F/		OFF
				TIMING IN SECONDS																											
MINIMUM GREEN							12						6						12						6						
VEHICLE INTERVAL							2						2						2						2						
MAXIMUM GREEN I (ALL OTHER TIMES)							40						35						40						35						
MAXIMUM GREEN II (AM, PM)							40						35						40						35						
YELLOW CLEAR								4						3						4						3					
ALL RED CLEAR									4						4						4						4				
WALK INTERVAL							7												7										7		
PED CLEARANCE							16	4											16	4										15	
PED BUFFER									4												4										4
DETECTOR							NON–LOCK						NON–LOCK						NON–LOCK						NON–LOCK			LOCK			
RECALL MODE							SOFT						OFF						SOFT						OFF			OFF			
CYCLE				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27		
DIAL	SEC.																														
AM	100						42	4	4				33	3	4				42	4	4				33	3	4					
AM W/PED	100						31	4	4				28	3	4				31	4	4				28	3	4	7	15	4		
PM	90						40	4	4				35	3	4				40	4	4				35	3	4					
PM W/PED	100						30	4	4				29	3	4				30	4	4				29	3	4	7	15	4		

SEQUENCE NOTES:

1. ANY PHASE NOT CALLED WILL BE SKIPPED. SIGNAL IDENTIFICATION WILL NOT CHANGE IF THE ASSIGNED RIGHT OF WAY DOES NOT CHANGE DURING THE NEXT PHASE CALLED.
2. • NORMALLY DON'T WALK, UPON PEDESTRIAN PUSH BUTTON ACTIVATION, WALK/FLASHING DON'T WALK (COUNTDOWN).
3. THE RIGHT–OF–WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON–CONFLICTING PHASES.
4. Ø/OL = PHASE IN DISPLAY / OVERLAPPING PHASE.
5. DIAL 1 (AM) = 06:30 – 09:00, M–F
   DIAL 2 (PM) = 15:00 – 18:00, M–F
   MAX1 = ALL OTHER TIMES
6. Ø9 SHOULD ONLY BE CALLED BY P3–4 OR P7–8
7. PHASE 9 SHALL ONLY BE ACTIVATED BY P3, P4, P7 AND P8.
8. COUNTDOWN PHASE OF PEDESTRIAN SIGNALS SHALL NOT OCCUR DURING THE WALK PERIOD.

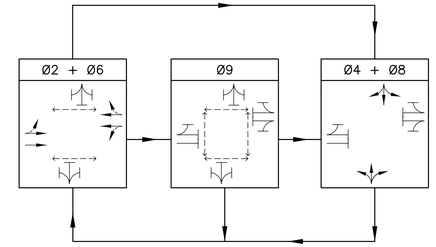
EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY NOTES:

1. EMERGENCY VEHICLE PRE–EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
2. IN RESPONSE TO A PRE–EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2, D3, D4) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE–EMPTION PHASE #1 (OR #2, #3, #4) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE–EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE–EMPTION PHASE CLEARANCE (4 SECONDS: YELLOW AND 2 SECONDS: ALL RED) AND SERVICE EMERGENCY VEHICLE PRE–EMPTION PHASE #2 (OR #1) IF NECESSARY, THEN TIME PHASE PRE–EMPTION CLEARANCE AND RESUME NORMAL SIGNAL OPERATION. EMERGENCY VEHICLE PRE–EMPTION PHASE #3 AND #4 SHALL BE SIMILARLY SERVED.
3. MINIMUM GREEN, NORMAL VEHICLE CLEARANCE, SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE–EMPTION DEMAND.
4. PREEMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE–EMPTION GREEN IS ON.

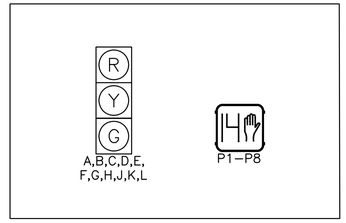
EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY

DETECTOR AND PRIORITY	PRE–EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø2
D2	2		Ø6
D3	3		Ø8
D4	4		Ø4

PREFERENTIAL PHASING SEQUENCE



SIGNAL DISPLAY



SIGNAL DISPLAY NOTES:

1. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED W/ LED MODULES (12–INCH LENS)
2. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED AND EQUIPPED WITH ±5" LOUVERED BACKPLATES.
3. ALL PEDESTRIAN SIGNAL HEADS SHALL HAVE PEDESTRIAN COUNTDOWN TIMER AND EGG–CRATE VISOR.

DETECTOR OPERATION

DETECTOR NUMBER	NUMBER OF SECTION/SIZE	PROCESSOR NUMBER	CHANNEL NUMBER	Ø CALLED	Ø EXTENSION	OPERATION	DELAY (SECONDS)	EXTENSION (SECONDS)
V1	9'x50'	1	1	2	2	PRESENCE	0	0
V2	9'x50'	1	1	2	2	PRESENCE	0	0
V3	4'x8'	1	1	2	2	PRESENCE	0	0
V4	9'x50'	1	2	6	6	PRESENCE	0	0
V5	9'x50'	1	2	6	6	PRESENCE	0	0
V6	6'x10'	1	2	6	6	PRESENCE	0	0
V7	1–9'x20' 1–9'x40'	2	1	8	8	PRESENCE	0	0
V8	10'x50'	2	2	4	4	PRESENCE	0	0

DETECTOR OPERATION NOTES:

1. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED AT THE DETECTOR.

NOTES:
1. ALL PROPOSED SIGNAL HEADS MUST BE AT LEAST 10 FEET FROM THE POWERED MBTA TROLLEY WIRES AND 5 FEET FROM THEIR SUPPORT CABLES. (SEE TYPE B MAST ARM DETAIL, SHEET TSP–11)

2. REMOVE AND STACK ALL EXISTING TRAFFIC SIGNAL EQUIPMENT.

3. REMOVE ALL PULL BOXES AND ABANDON EXISTING TRAFFIC SIGNAL CONDUIT SYSTEM.

4. MINIMUM 36" CLEARANCE EXCLUDING CURB WIDTH IS REQUIRED ON ALL SIDEWALKS.

5. VIDEO DETECTION AREAS ARE SHOWN ON THE PLANS GRAPHICALLY AND SHOULD BE ADJUSTED IN THE FIELD FOR PROPER DETECTION.

6. REFER TO SHEET NO. 161 FOR TRAFFIC SEQUENCE PLAN.

7. REFER TO SHEET NOS. 164 TO 168 FOR MAST ARM FOUNDATION.

8. REFER TO SHEET NO. 130 FOR COMPLETE PAVEMENT MARKING AND SIGNING PLAN.

9. PUSH BUTTONS SHALL BE LOCATED NO MORE THAN 10" HORIZONTALLY FROM A LEVEL SURFACE (≤1.5%).

10. THREE TEMPORARY TRAFFIC SIGNALS WILL BE REQUIRED.

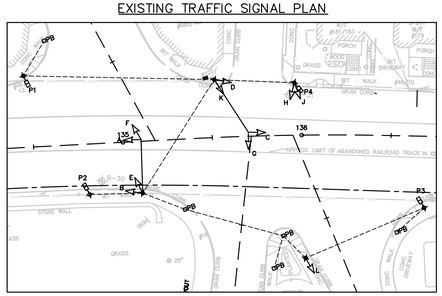
MAJOR ITEMS REQUIRED

QTY	ITEM 816.13
1	TRAFFIC SIGNAL CONTROLLER (TS–2, TYPE 1) W/ 8DW BASE MOUNTED CABINET AND FOUNDATION PAD
1	30' MAST ARM TYPE B (STEEL), INCL. BASE & FNDN
1	35' MAST ARM TYPE B (STEEL), INCL. BASE & FNDN
9	8' TRAFFIC SIGNAL POST, BASE & FOUNDATION
3	1–WAY, 3–SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
4	2–WAY, 3–SECTION SIGNAL HEAD, 12" L.E.D. LENS (W/VISORS)
11	±5" LOUVERED BACKPLATES
10	PEDESTRIAN SIGNAL HEAD W/ EGG–CRATE VISOR (L.E.D. W/ COUNTDOWN)
9	ACCESSIBLE PEDESTRIAN PUSH BUTTON ASSEMBLY W/SIGN
4	12" x 12" PULL BOXES*
1	12" x 24" PULL BOXES*
5	VIDEO DETECTION CAMERAS
5	VIDEO CAMERA MAST ARM MOUNTING BRACKET
2	VIDEO DETECTION PROCESSOR – TWO CHANNELS (2–CHANNEL, 4–CHANNEL)
5	OPTICAL PRE–EMPTION DETECTORS SINGLE CHANNEL
1	EMERGENCY VEHICLE PRE–EMPTION CONFIRMATION STROBE LIGHT (WHITE)
1	OPTICAL PHASE SELECTOR FOUR CHANNEL
1	OPTICAL PHASE SELECTOR TWO CHANNEL
1	SERVICE CONNECTION (OVERHEAD)

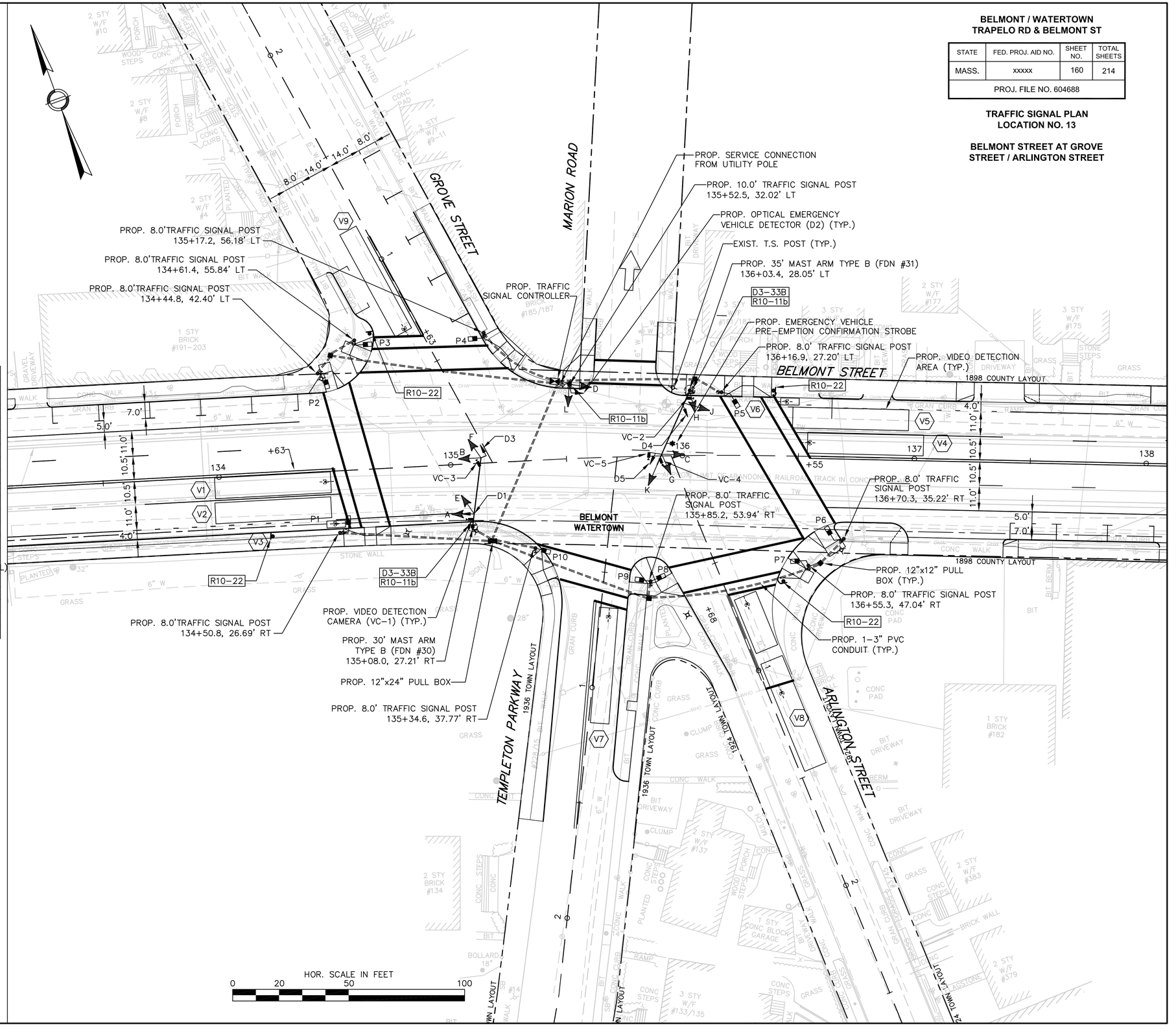
PLUS ALL NECESSARY DUCT, CABLE, FOUNDATIONS, LABOR, MISCELLANEOUS MATERIAL AND EQUIPMENT TO COMPLETE THE INSTALLATION AND PROVIDE AN OPERATING TRAFFIC SIGNAL.

* TO BE PAID UNDER ITS RESPECTIVE PAY ITEM.

EXISTING TRAFFIC SIGNAL PLAN



HOR. SCALE IN FEET
0 40 100 200



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	160	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 13

BELMONT STREET AT GROVE STREET / ARLINGTON STREET

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	161	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL PLAN
LOCATION NO. 13

BELMONT STREET AT GROVE STREET / ARLINGTON STREET

SEQUENCE AND TIMING CHART

				PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 6	PHASE 7	PHASE 8	PHASE 9	EMERGENCY FLASH OPERATION
								SEQUENCE					
STREET	DIR.	FACE	Ø/OL	R/W CL1 CL2	R/W CL1 CL2	R/W CL1 CL2	R/W CL1 CL2	R/W CL1 CL2	R/W CL1 CL2	R/W CL1 CL2	R/W CL1 CL2	R/W CL1 CL2	
BELMONT ST	EB	A,B	2		G Y R	R R R	R R R		R R R		R R R		FY
BELMONT ST	WB	C,D,J	6		R R R	R R R	R R R		G Y R		R R R		FY
GROVE ST	SB	E,F	4		R R R	R R R	G Y R		R R R		R R R		FR
ARLINGTON ST	NB	G,H	3		R R R	G Y R	R R R		R R R		R R R		FR
TEMPLETON PKWY	NB	K,L	8		R R R	R R R	R R R		R R R		G Y R		FR
PEDESTRIAN		P1–P2			✋ ✋ ✋	✋ ✋ ✋	• ✋ ✋		✋ ✋ ✋		✋ ✋ ✋		OFF
PEDESTRIAN		P3–P4			✋ ✋ ✋	✋ ✋ ✋	✋ ✋ ✋		• ✋ ✋		✋ ✋ ✋		OFF
PEDESTRIAN		P5–P6			✋ ✋ ✋	• ✋ ✋	✋ ✋ ✋		✋ ✋ ✋		✋ ✋ ✋		OFF
PEDESTRIAN		P7–P8			• ✋ ✋	✋ ✋ ✋	✋ ✋ ✋		✋ ✋ ✋		✋ ✋ ✋		OFF
								TIMING IN SECONDS					
MINIMUM GREEN					12	6	6		12		6		
VEHICLE INTERVAL					2	2	2		2		2		
MAXIMUM GREEN I (ALL OTHER TIMES)					30	24	25		30		25		
MAXIMUM GREEN II (AM & PM)					35	27	31		35		31		
YELLOW CLEAR					4	3	3		4		3		
ALL RED CLEAR					4	4	4		4		4		
WALK INTERVAL					7	7	7		7				
PED CLEARANCE					12 4	17 3	14 3		16 4		3		
PED BUFFER					4	4	4		4		4		
DETECTOR					NON–LOCK	NON–LOCK	NON–LOCK		NON–LOCK		NON–LOCK		
RECALL MODE					SOFT	OFF	OFF		SOFT		OFF		

CYCLE			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
DIAL	SEC.																												
AM	100					35	4	4	12	3	4	31	3	4				35	4	4				31	3	4			
AM W/PED	100					28	4	4	23	3	4	27	3	4				28	4	4				27	3	4			
PM	100					33	4	4	26	3	4	19	3	4				33	4	4				19	3	4			
PM W/PED	100					31	4	4	26	3	4	21	3	4				31	4	4				21	3	4			

SEQUENCE NOTES:

1. ANY PHASE NOT CALLED WILL BE SKIPPED. SIGNAL IDENTIFICATION WILL NOT CHANGE IF THE ASSIGNED RIGHT OF WAY DOES NOT CHANGE DURING THE NEXT PHASE CALLED.
2. • NORMALLY DON'T WALK, UPON PEDESTRIAN PUSH BUTTON ACTIVATION, WALK/FLASHING DON'T WALK (COUNTDOWN).
3. THE RIGHT–OF–WAY MAY BE ASSIGNED TO ANY PHASE OR ANY COMBINATION OF NON–CONFLICTING PHASES.
4. Ø/OL = PHASE IN DISPLAY / OVERLAPPING PHASE.
5. DIAL 1 (AM) = 06:30 – 09:00, M–F
   DIAL 2 (PM) = 15:00 – 18:00, M–F
   MAX1 = ALL OTHER TIMES
6. COUNTDOWN PHASE OF PEDESTRIAN SIGNALS SHALL NOT OCCUR DURING THE WALK PERIOD.

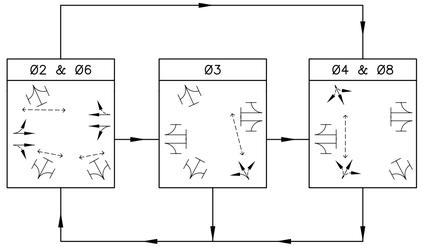
EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY NOTES:

1. EMERGENCY VEHICLE PRE–EMPTION SIGNALS SHALL BE OPTICALLY TRANSMITTED BY OPTICAL EMITTERS MOUNTED IN EMERGENCY VEHICLES AND RECEIVED BY OPTICAL DETECTORS LOCATED AT EACH INTERSECTION.
2. IN RESPONSE TO A PRE–EMPTION SIGNAL RECEIVED AT AN INTERSECTION BY OPTICAL DETECTOR D1 (OR D2, D3, D4, D5) THE CONTROLLER SHALL HOLD OR ADVANCE TO AND HOLD IN EMERGENCY VEHICLE PRE–EMPTION PHASE #1 (OR #2, #3, #4) GREEN FOR A MINIMUM OF TEN (10) SECONDS OR UNTIL PRE–EMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME PRE–EMPTION PHASE CLEARANCE (4 SECONDS: YELLOW AND 2 SECONDS: ALL RED) AND SERVICE EMERGENCY VEHICLE PRE–EMPTION PHASE #2 (OR #1) IF NECESSARY, THEN TIME PHASE PRE–EMPTION CLEARANCE AND RESUME NORMAL SIGNAL OPERATION. EMERGENCY VEHICLE PRE–EMPTION PHASE #3, #4 AND #5 SHALL BE SIMILARLY SERVED.
3. MINIMUM GREEN, NORMAL VEHICLE CLEARANCE, SHALL BE PROVIDED ON PHASES THAT ARE TO BE TERMINATED BY PRE–EMPTION DEMAND.
4. PREEMPTION STROBE SHALL BE ILLUMINATED WHENEVER ANY EMERGENCY VEHICLE PRE–EMPTION GREEN IS ON.

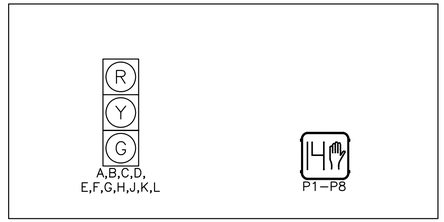
EMERGENCY VEHICLE PRE–EMPTION PHASING AND PRIORITY

DETECTOR AND PRIORITY	PRE–EMPT PHASE ASSIGNMENT	MOVEMENT	VEHICLE PHASE ASSIGNMENT
D1	1		Ø2
D2	2		Ø6
D3	3		Ø4
D4	4		Ø3
D5	5		Ø8

PREFERENTIAL PHASING SEQUENCE



SIGNAL DISPLAY



SIGNAL DISPLAY NOTES:

1. ALL SIGNAL DISPLAYS SHALL BE EQUIPPED W/ LED MODULES (12–INCH LENS)
2. ALL SIGNAL HEADS SHALL BE RIGID MOUNTED AND EQUIPPED WITH ±5" LOUVERED BACKPLATES.
3. ALL PEDESTRIAN SIGNAL HEADS SHALL HAVE PEDESTRIAN COUNTDOWN TIMER AND EGG–CRATE VISOR.

DETECTOR OPERATION

DETECTOR NUMBER	NUMBER OF SECTION/SIZE	PROCESSOR NUMBER	CHANNEL NUMBER	Ø CALLED	Ø EXTENSION	OPERATION	DELAY (SECONDS)	EXTENSION (SECONDS)
V1	9'x50'	1	1	2	2	PRESENCE	0	0
V2	9'x50'	1	1	2	2	PRESENCE	0	0
V3	3'x8'	1	1	2	2	PRESENCE	0	0
V4	9'x50'	1	2	6	6	PRESENCE	0	0
V5	9'x50'	1	2	6	6	PRESENCE	0	0
V6	3'x8'	1	2	6	6	PRESENCE	0	0
V7	8'x50'	2	1	8	8	PRESENCE	0	0
V8	10'X25' 10'x50'	2	1	3	3	PRESENCE	0	0
V9	8'x50'	2	2	4	4	PRESENCE	0	0

DETECTOR OPERATION NOTES:

1. DELAY TIME SHALL BE EFFECTIVE ONLY DURING THE RED PORTION OF THE PHASE THAT IS CALLED AT THE DETECTOR.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	162	214
PROJ. FILE NO. 604688			

INTERCONNECT PLAN

PROP. LOCATION 1 CONTROLLER CABINET

PROP. 35' MAST ARM (FDN #2) 18+34.8, 37.33' LT

PROP. 8.0' TRAFFIC SIGNAL POST 18+49.1, 62.24' LT

PROP. 20' MAST ARM (FDN #1) MILL ST 0+58.4, 52.25' RT

PROP. 8' TRAFFIC SIGNAL POST 17+80.9, 57.94' LT

PROP. 25' MAST ARM (FDN# 3) 17+57.9, 38.01' LT

PROP. 8.0' TRAFFIC SIGNAL POST 19+27.7, 39.16' LT

PROP. 8.0' TRAFFIC SIGNAL POST 19+49.2, 62.24' LT

PROP. 8.0' TRAFFIC SIGNAL POST 19+41.9, 36.32' LT

PROP. 10.0' TRAFFIC SIGNAL POST 19+68.6, 27.95' LT

PROP. 8.0' TRAFFIC SIGNAL POST 18+16.5, 38.00' LT

PROP. LOCATION 2 CONTROLLER CABINET

PROP. 25' MAST ARM (FDN #6) 23+62.1, 31.99' LT

PROP. 8.0' TRAFFIC SIGNAL POST 23+91.7, 32.46' LT

PROP. 8.0' TRAFFIC SIGNAL POST 19+33.1, 26.93' LT

PROP. 8.0' TRAFFIC SIGNAL POST 18+34.3, 32.67' RT

PROP. 30' MAST ARM (FDN #4) 19+27.2, 28.12' RT

PROP. 8.0' TRAFFIC SIGNAL POST 19.31.7, 33.82' RT

STUB PROP. INTERCONNECT CABLE / CONDUIT FOR FUTURE EXTENSION (TYP.)

PROP. 12"X12" PULL BOX (TYP.)

PROP. 8.0' TRAFFIC SIGNAL POST 23+73.2, 41.52' RT

PROP. 35' MAST ARM (FDN #5) 24+19.2, 40.64' RT

CONTINUED BELOW

PROP. LOCATION 3 CONTROLLER CABINET

PROP. 10.0' TRAFFIC SIGNAL POST 28+84.9, 48.70' LT

PROP. 10.0' TRAFFIC SIGNAL POST 28+98.7, 31.04' LT

PROP. 10.0' TRAFFIC SIGNAL POST 30+09.1, 34.95' LT

PROP. 12"X12" PULL BOX (TYP.)

PROP. 8.0' TRAFFIC SIGNAL POST 29+19.2, 33.67' LT

PROP. 20' MAST ARM (FDN #14) 33+23.3, 28.00' LT

PROP. 10.0' TRAFFIC SIGNAL POST 33+56.1, 27.67' LT

PROP. LOCATION 4 MASTER CONTROLLER CABINET

PROP. 25' MAST ARM (FDN #13) 34+33.2, 35.66' LT

PROP. INTERCONNECT CABLE IN EXISTING BELMONT MUNICIPAL LIGHT DEPT. ELECTRIC CONDUIT

PROP. 8.0' TRAFFIC SIGNAL POST 39+63.6, 32.17' LT

PROP. 30' MAST ARM TYPE B (FDN #18) 39+12.9, 31.00' LT

PROP. 35' MAST ARM (FDN #12) 35+24.4, 35.92' LT

PROP. 8.0' TRAFFIC SIGNAL POST 35+44.3, 32.84' LT

PROP. 25' MAST ARM (FDN #7) 29+77.6, 25.13' RT

PROP. 10.0' TRAFFIC SIGNAL POST 29+33.7, 29.24' RT

PROP. INTERCONNECT CABLE (TYP.) IN PROP. 3" PVC CONDUIT

PROP. 10.0' TRAFFIC SIGNAL POST 33+80.6, 60.83' RT

PROP. 8.0' TRAFFIC SIGNAL POST 33+14.1, 47.09' RT

PROP. 35' MAST ARM TYPE B (SEE SHEET NO. 146) (FDN #11) 35+55.9, 39.56' RT)

PROP. 8.0' TRAFFIC SIGNAL POST 39+53.3, 32.00' RT

PROP. 35' MAST ARM (FDN #9) 34+10.4, 40.51' RT

PROP. 8.0' TRAFFIC SIGNAL POST 34+37.7, 49.77' RT

PROP. 8.0' TRAFFIC SIGNAL POST 35+27.6, 55.92' RT

PROP. LOCATION 6 CONTROLLER CABINET

PROP. 20' MAST ARM (FDN #10) 34+05.4, 41.77' RT

PROP. 12"X12" PULL BOX (TYP.)

PROP. 8.0' TRAFFIC SIGNAL POST 34+67.3, 54.09' RT

PROP. 10.0' TRAFFIC SIGNAL POST 2+93.4, 43.14' LT

PROP. 8.0' TRAFFIC SIGNAL POST 3+91.8, 39.96' LT

PROP. INTERCONNECT CABLE (TYP.) IN PROP. 3" PVC CONDUIT

PROP. 8.0' TRAFFIC SIGNAL POST 3+30.9, 28.22' LT

PROP. 8.0' TRAFFIC SIGNAL POST 3+37.3, 33.00' LT

PROP. 10.0' TRAFFIC SIGNAL POST 3+17.9, 22.34' LT

PROP. LOCATION 5 CONTROLLER CABINET

PROP. 8.0' TRAFFIC SIGNAL POST 3+40.3, 25.85' LT

PROP. 8.0' TRAFFIC SIGNAL POST 3+91.8, 39.96' LT

PROP. 10.0' TRAFFIC SIGNAL POST 3+53.8, 16.67' RT

PROP. 10.0' TRAFFIC SIGNAL POST 4+21.4, 24.17' LT

PROP. 30' MAST ARM (FDN #16) 3+87.3, 17.76' RT

PROP. 10.0' TRAFFIC SIGNAL POST 4+38.8, 24.17' LT

CONTINUED ABOVE

HOR. SCALE IN FEET

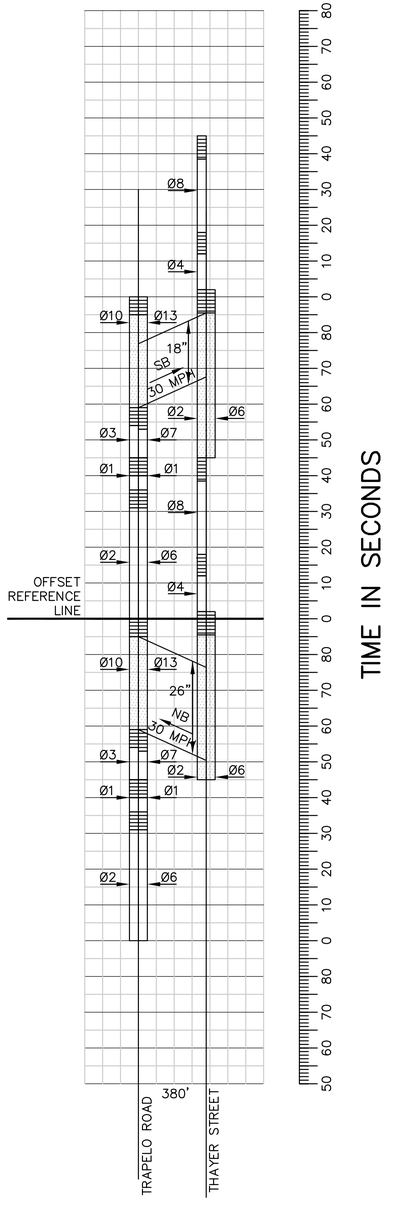
0 40 100 200

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

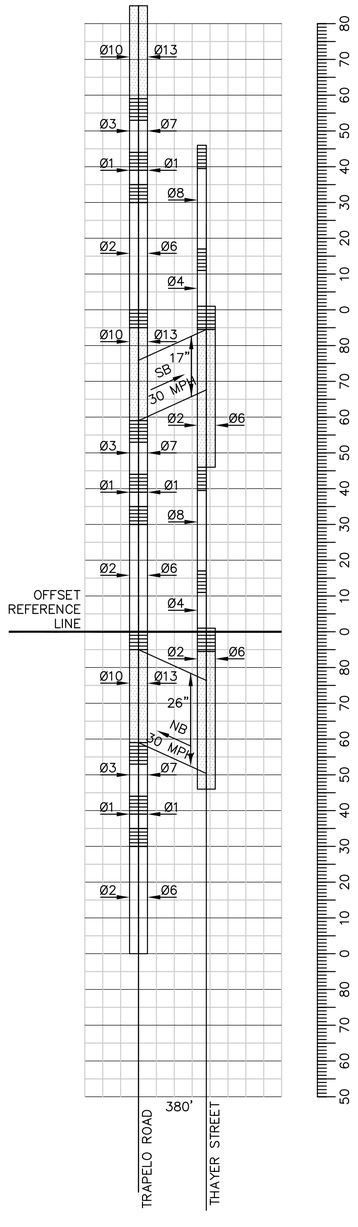
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	163	214
PROJ. FILE NO. 604688			

TIME SPACE DIAGRAM

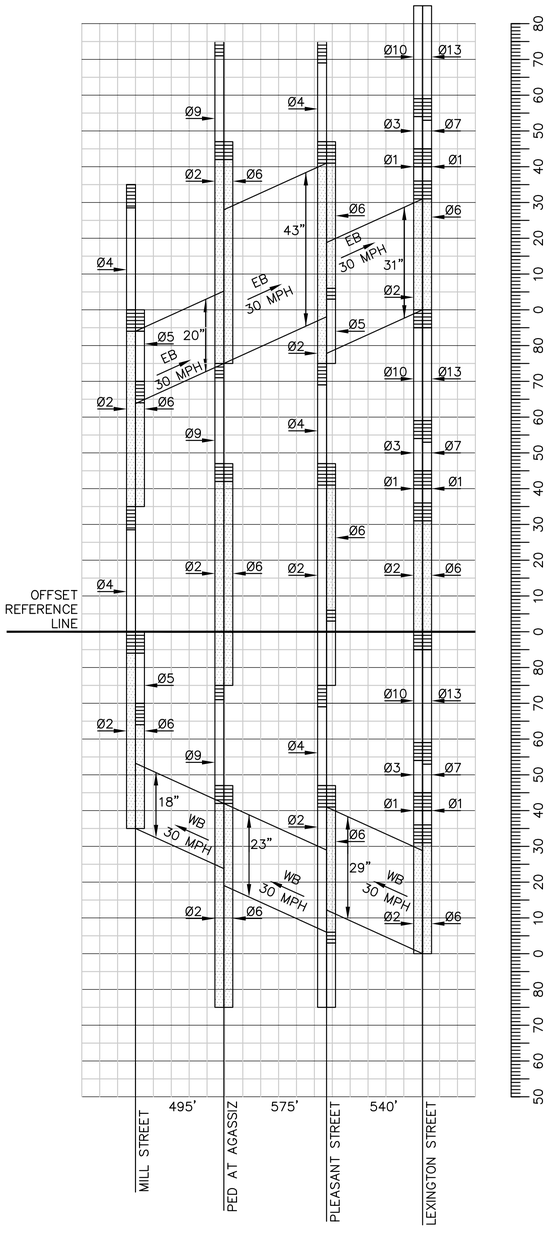
LEXINGTON STREET
90 SECOND CYCLE (AM)



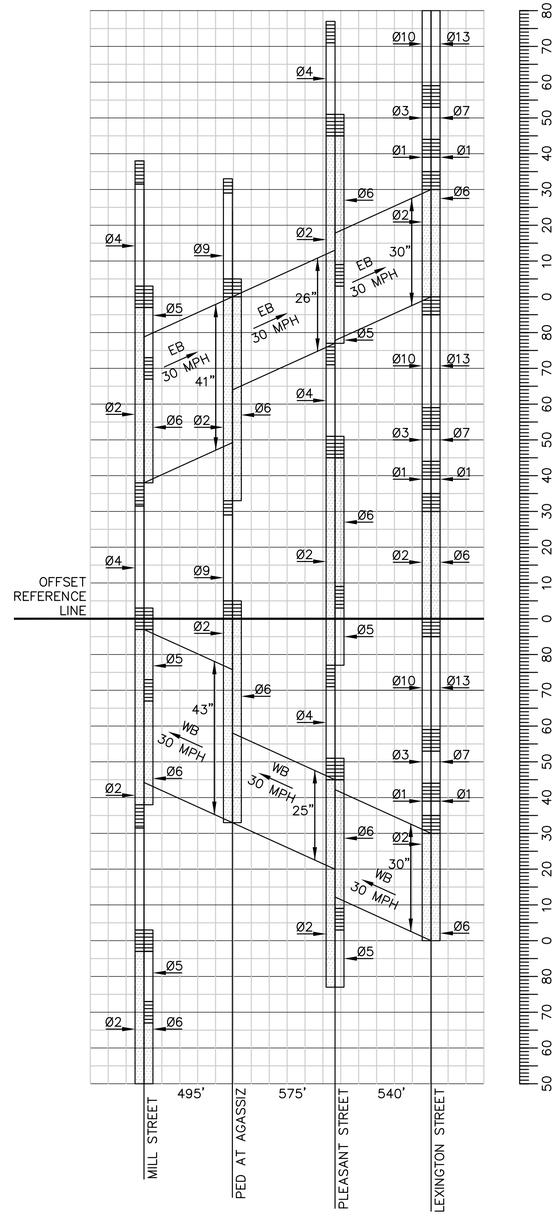
LEXINGTON STREET
90 SECOND CYCLE (PM)



TRAPELO ROAD
90 SECOND CYCLE (AM)



TRAPELO ROAD
90 SECOND CYCLE (PM)



LEXINGTON STREET

LEXINGTON STREET

TRAPELO ROAD

TRAPELO ROAD

SCALE IN FEET
0 400 800 1600

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	164	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL DETAILS

INDEX

SHEET NO.	DESCRIPTION
1	Title Sheet
2	Light, Medium & Short Span Load Diagrams
3	Heavy Load Diagrams
4	Details
5	Cored Pier Foundations

THE MASSACHUSETTS DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION 1988 STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, THE ENGLISH EDITION OF SUPPLEMENTAL SPECIFICATIONS DATED JUNE 6, 2006, THE AMENDMENTS TO THE STANDARD AND SUPPLEMENTAL SPECIFICATIONS, THE 1977 CONSTRUCTION STANDARDS, THE ENGLISH EDITION OF SUPPLEMENTAL DRAWINGS DATED APRIL 2003, THE 2001 "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS" WITH LATEST REVISIONS, THE 2003 "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" WITH LATEST REVISIONS, THE 1990 "STANDARD DRAWINGS FOR SIGNS AND SUPPORTS," AND THE 2004 EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, WILL GOVERN.

MAST ARM & FOUNDATION

Details Standard Drawings

NOTES

1. For these standard drawings the Design Wind Speed for all Mast Arm Structures shall be **130 MPH**.

2. For these standard drawings the Design Wind Speed for mast arm foundations located in the following counties: Plymouth, Bristol, Barnstable, Dukes, and Nantucket counties in District 5 and Berkshire county in District 1 shall be **130 MPH**. The design wind speed for mast arm foundations for the remainder of the state shall be **110 MPH.**

3. For these standard drawings the mast arm structure design life shall be 25 years.

4. For these standard drawings the Fatigue Category no. 2 was used and truck induced gusts were excluded in the design.

5. These standard drawings do not apply for mast arm structures at intersections with an ADT greater than 40,000 vehicles and a truck percentage of greater than 10%. The responsibility for the design of mast structures and foundations will rest with the design engineer. The structure design life will be 50 years and the fatigue category shall be no. 1. The design wind speed criteria shall be as shown in Notes Nos. 1 & 2. The design will be submitted to MassDOT for review and comment.

6. For strain pole, dual mast arm designs, or mast arms longer than 45 feet, notes 1, 2, 3 and 4 will apply, if ADT (>40,000 vehicles) and truck percentage (10%) criterion is met, note 5 design criteria (50 year design life, fatigue category no. 1, wind design speed notes 1 and 2) will apply. The responsibility for the design of these structures and foundations will rest with the design engineer. The design will be submitted to MassDOT for review and comment.

NO.	REVISION	DATE

Moving Massachusetts Forward. massDOT Highway

MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISON

RECOMMENDED FOR APPROVAL

Neil E. Boudreau — 2/11/11
TRAFFIC ENGINEER — DATE

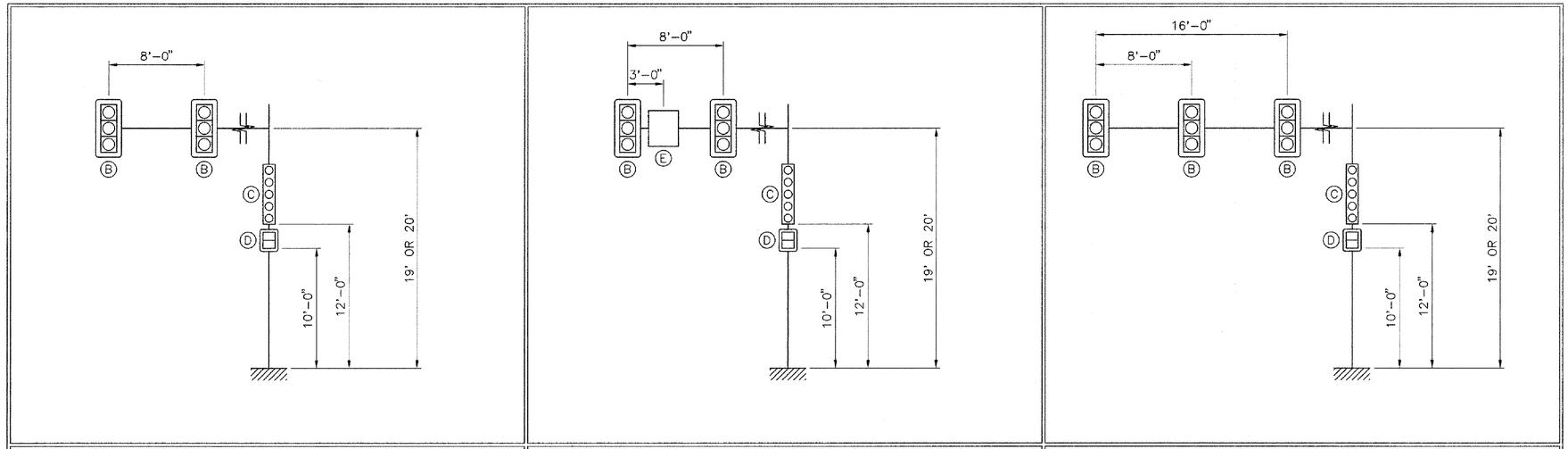
Frank W. Ramsey P.E. — 2/17/11
BRIDGE ENGINEER — DATE

Frank A. Tramuta — 2/24/2011
CHIEF ENGINEER — DATE

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

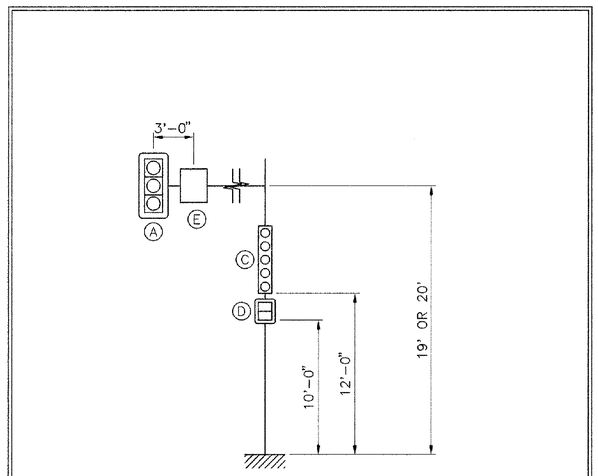
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	165	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL DETAILS



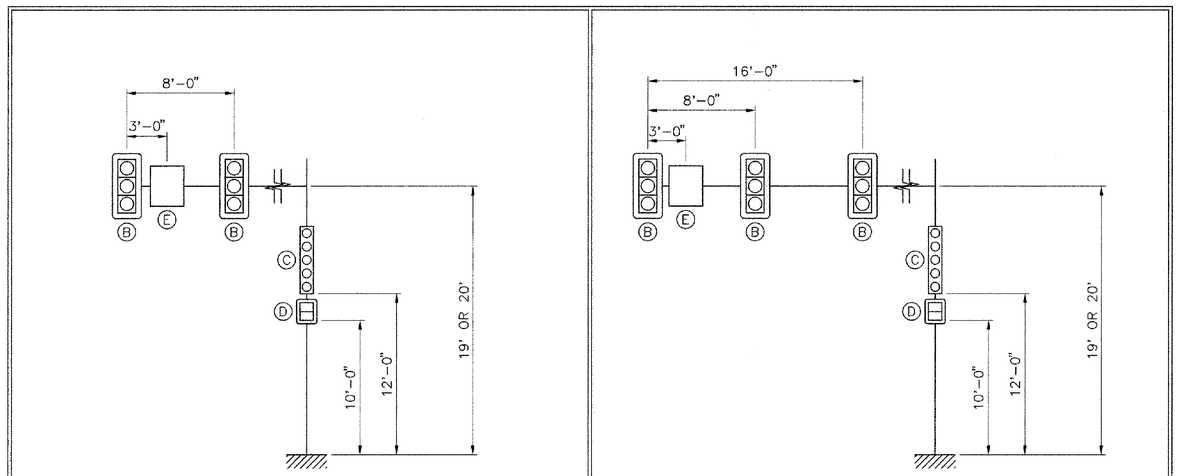
20', 25', 40' & 45' SPANS | 30' SPAN | 35' SPAN

LOAD DEFINITIONS – LIGHT LOADS



15' SPAN

SHORT SPAN LOADING



20' & 25' SPANS | 30', 35', 40' & 45' SPANS

LOAD DEFINITIONS – MEDIUM LOADS

DEVICE	DESCRIPTION	PROJ. AREA (FT^2)	WEIGHT (LBS)
A	3 SECTION, 3 WAY SIGNAL	13.50	202
B	3 SECTION, 1 WAY SIGNAL	8.67	74
C	5 SECTION, 1 WAY SIGNAL	13.33	110
D	DUAL PEDESTRIAN SIGNAL	8.00	80
E	30" X 36" REGULATORY SIGN	7.50	23
NOTE: ALL SIGNALS HAVE 5.0" BACKPLATES			

MONTH_DD,_YYYY | ISSUED FOR CONSTRUCTION

Moving Massachusetts Forward
massDOT Highway

STANDARD DRAWINGS

TYPE II MAST ARMS
LIGHT, MEDIUM & SHORT SPAN
LOAD DIAGRAMS

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

Frank A. Tramontozzi 2/24/2011
CHIEF ENGINEER

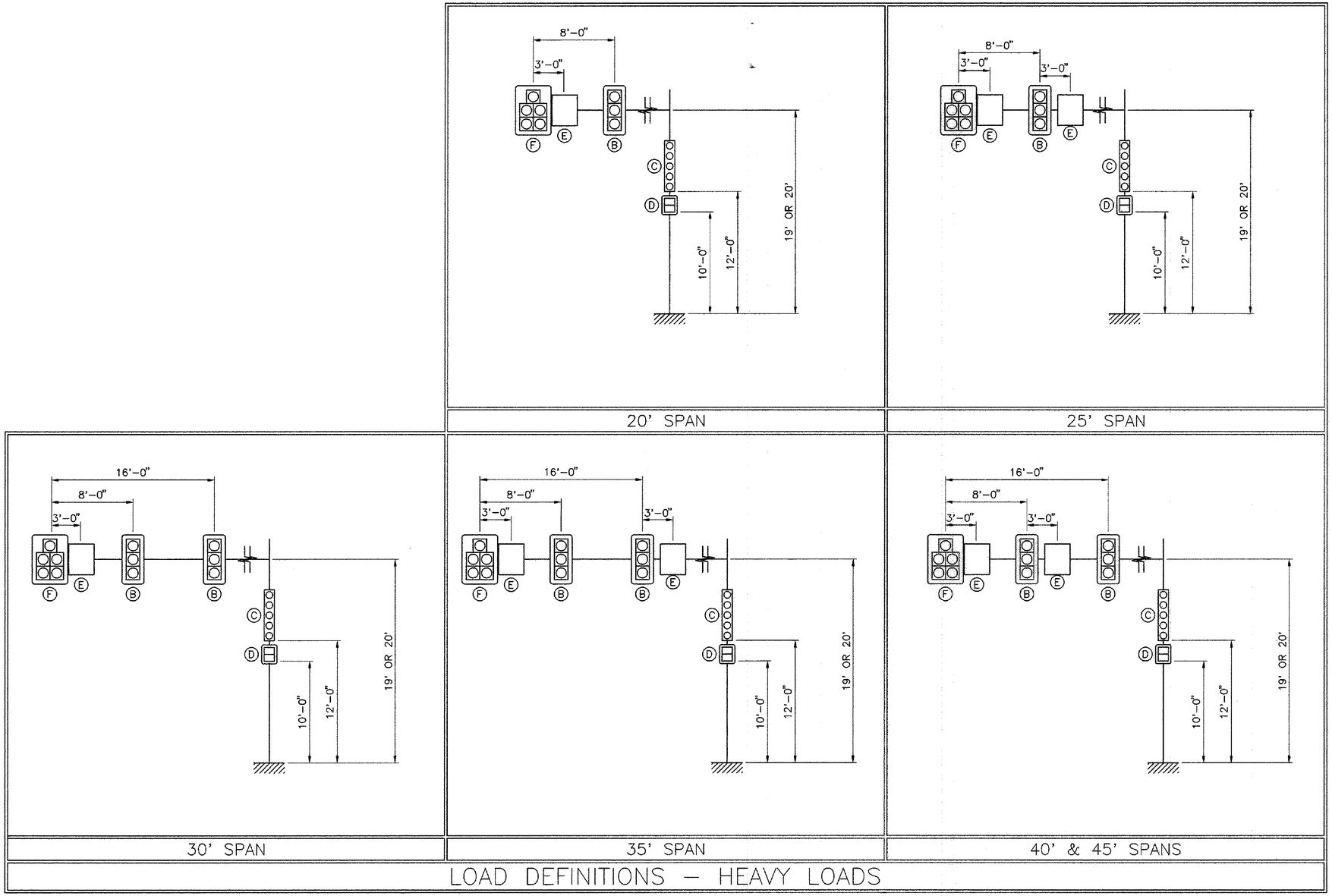
BRIDGE ENGINEER

Neal E. Boudreau
TRAFFIC ENGINEER

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	166	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL DETAILS



DEVICE	DESCRIPTION	PROJ. AREA (FT~2)	WEIGHT (LBS)
Ⓐ	3 SECTION, 3 WAY SIGNAL	18.29	202
Ⓑ	3 SECTION, 1 WAY SIGNAL	8.67	74
Ⓒ	5 SECTION, 1 WAY SIGNAL	13.33	110
Ⓓ	DUAL PEDESTRIAN SIGNAL	8.00	80
Ⓔ	30" X 36" REGULATORY SIGN	7.50	23
Ⓕ	5 SECTION, 2 WAY SIGNAL	21.95	215

NOTE: ALL SIGNALS HAVE 5.0" BACKPLATES

MONTH_DD,_YYYY	ISSUED FOR CONSTRUCTION

Moving Massachusetts Forward
massDOT Highway

STANDARD DRAWINGS

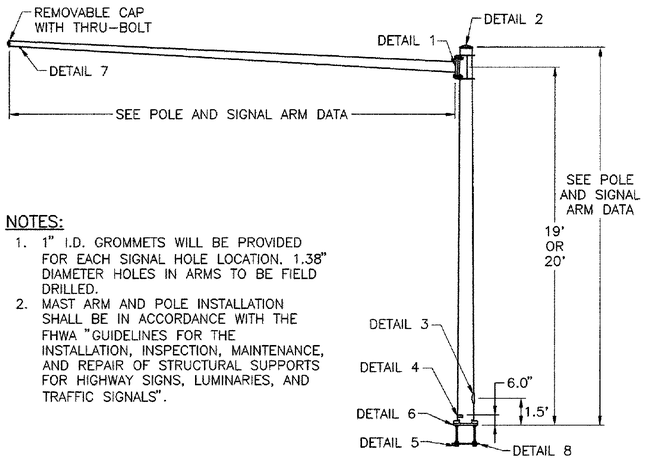
TYPE II MAST ARMS
HEAVY LOAD DIAGRAMS

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

2/24/2011
CHIEF ENGINEER

BRIDGE ENGINEER

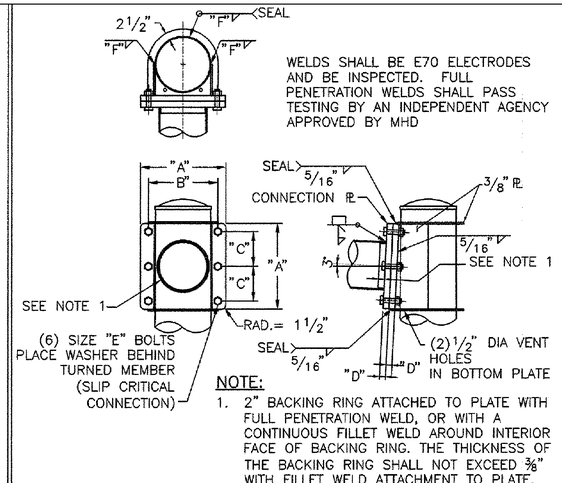
TRAFFIC ENGINEER



NOTES:

1. 1" I.D. GROMMETS WILL BE PROVIDED FOR EACH SIGNAL HOLE LOCATION. 1.38" DIAMETER HOLES IN ARMS TO BE FIELD DRILLED.
2. MAST ARM AND POLE INSTALLATION SHALL BE IN ACCORDANCE WITH THE FHWA "GUIDELINES FOR THE INSTALLATION, INSPECTION, MAINTENANCE, AND REPAIR OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES, AND TRAFFIC SIGNALS".

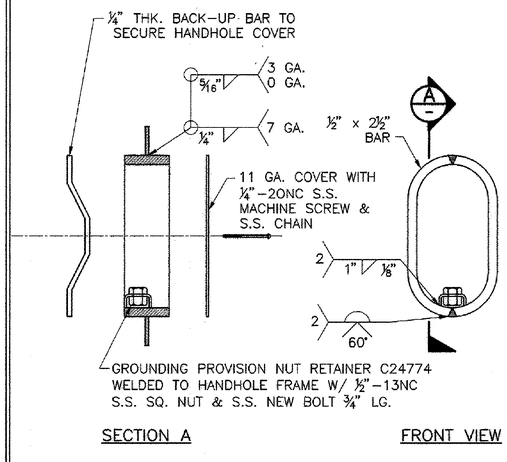
MAST ARM ELEVATION



NOTE:

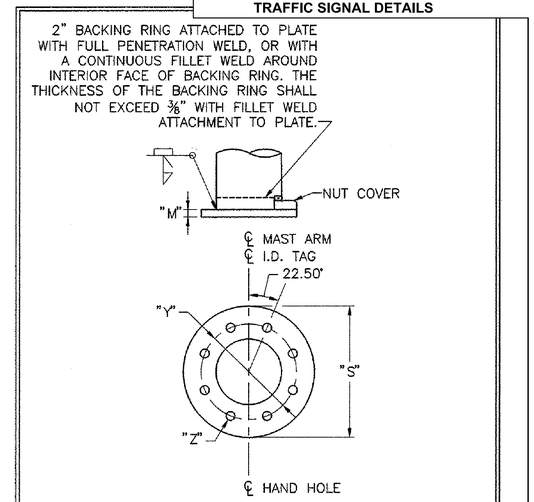
1. 2" BACKING RING ATTACHED TO PLATE WITH FULL PENETRATION WELD, OR WITH A CONTINUOUS FILLET WELD AROUND INTERIOR FACE OF BACKING RING. THE THICKNESS OF THE BACKING RING SHALL NOT EXCEED 3/8" WITH FILLET WELD ATTACHMENT TO PLATE.

DETAIL 1 | SIGNAL ARM ATTACHMENT



SECTION A FRONT VIEW

DETAIL 3 | 4"x8" HANDHOLE

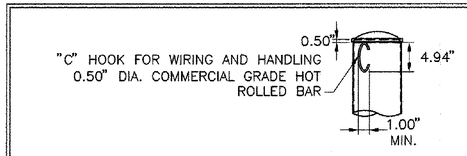


DETAIL 6 | POLE BASE

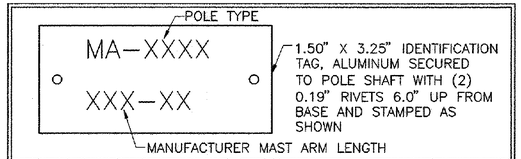
MATERIAL DATA

COMPONENT	DESIGNATION	YIELD (KSI)	COMPONENT	DESIGNATION	YIELD (KSI)
POLE TUBE	ASTM A595 GR. A	55	ARM TUBE	ASTM A595 GR. A	55
POLE BASE PLATE	AASHTO M270	50	ARM CONNECTION PLATE	AASHTO M270	50
ANCHOR BOLTS	AASHTO M314	55	ARM CONNECTING BOLTS	AASHTO M164 **	
GALVANIZING	AASHTO M111 OR M232				

** BOLTS WHICH ACCUMULATE RUST OR DIRT SHALL BE DISCARDED.



DETAIL 2 | POLE TOP



DETAIL 4 | I.D. TAG

POLE AND SIGNAL ARM DATA – LIGHT LOADS

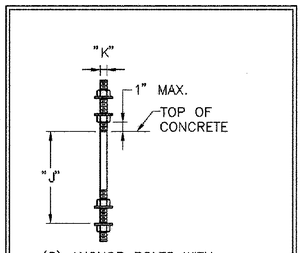
LOCATIONS	SIGNAL ARM TUBE SPAN (FT)	FIXED END DIA. (IN)	FREE END DIA. (IN)	WALL THK.	POLE TUBE BASE DIA. (IN)	TOP DIA. (IN)	LENGTH (FT)	WALL THK.	POLE BASE PLATE CIRCLE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "M" (IN)	HOLE "Z" (IN)	ANCHOR BOLT DIA. "K" (IN)	EMBED. LENGTH "J" (IN)	SIGNAL ARM ATTACHMENT DATA "A" (IN)	"B" (IN)	"C" (IN)	"D" (IN)	"E" (IN)	"F" (IN)
	15.00	9.00	6.90	7 GA.	12.00	9.06	21.00	7 GA.	29.50	24.00	1.50	1.813	1.50	36.00	19.00	15.00	7.50	1.00	1.00	0.188
	20.00	9.00	6.20	7 GA.	12.00	9.06	21.00	7 GA.	29.50	24.00	1.50	1.813	1.50	36.00	19.00	15.00	7.50	1.00	1.00	0.188
	25.00	10.00	6.50	7 GA.	13.00	10.06	21.00	7 GA.	29.50	24.00	1.50	1.813	1.50	36.00	20.00	16.00	8.00	1.00	1.00	0.188
	30.00	12.50	8.30	3 GA.	15.50	12.56	21.00	3 GA.	29.50	24.00	1.50	1.813	1.50	36.00	23.50	19.00	9.50	1.25	1.25	0.250
	35.00	13.00	8.10	3 GA.	16.00	13.06	21.00	3 GA.	29.50	24.00	1.50	1.813	1.50	36.00	24.50	20.00	10.00	1.25	1.25	0.250
	40.00	13.00	7.40	3 GA.	16.00	13.06	21.00	3 GA.	29.50	24.00	1.50	1.813	1.50	36.00	24.50	20.00	10.00	1.25	1.25	0.250
	45.00	13.50	7.20	3 GA.	16.50	13.56	21.00	3 GA.	29.50	24.00	1.50	1.813	1.50	36.00	27.50	22.00	11.00	1.50	1.50	0.313

POLE AND SIGNAL ARM DATA – MEDIUM LOADS

LOCATIONS	SIGNAL ARM TUBE SPAN (FT)	FIXED END DIA. (IN)	FREE END DIA. (IN)	WALL THK.	POLE TUBE BASE DIA. (IN)	TOP DIA. (IN)	LENGTH (FT)	WALL THK.	POLE BASE PLATE CIRCLE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "M" (IN)	HOLE "Z" (IN)	ANCHOR BOLT DIA. "K" (IN)	EMBED. LENGTH "J" (IN)	SIGNAL ARM ATTACHMENT DATA "A" (IN)	"B" (IN)	"C" (IN)	"D" (IN)	"E" (IN)	"F" (IN)
	15.00	9.00	6.90	7 GA.	12.00	9.06	21.00	7 GA.	29.50	24.00	1.50	1.813	1.50	36.00	19.00	15.00	7.50	1.00	1.00	0.188
	20.00	10.00	7.20	3 GA.	13.00	10.06	21.00	3 GA.	29.50	24.00	1.50	1.813	1.50	36.00	20.00	16.00	8.00	1.00	1.00	0.250
	25.00	11.00	7.50	3 GA.	14.00	11.06	21.00	3 GA.	29.50	24.00	1.50	1.813	1.50	36.00	23.50	19.00	9.50	1.25	1.25	0.250
	30.00	13.00	8.80	3 GA.	16.00	13.06	21.00	3 GA.	29.50	24.00	1.50	1.813	1.50	36.00	23.50	19.00	9.50	1.25	1.25	0.250
	35.00	14.00	9.10	3 GA.	17.00	14.06	21.00	3 GA.	29.50	24.00	1.50	1.813	1.50	36.00	27.50	22.00	11.00	1.50	1.50	0.250
	40.00	15.00	9.40	3 GA.	18.00	15.06	21.00	3 GA.	29.50	24.00	1.50	1.813	1.50	36.00	27.50	22.00	11.00	1.50	1.50	0.250
	45.00	16.00	9.70	0 GA.	19.00	16.06	21.00	0 GA.	29.50	24.00	1.50	1.813	1.50	36.00	29.50	24.00	12.00	1.75	1.50	0.313

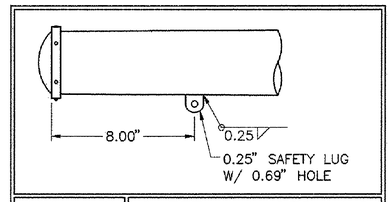
POLE AND SIGNAL ARM DATA – HEAVY LOADS

LOCATIONS	SIGNAL ARM TUBE SPAN (FT)	FIXED END DIA. (IN)	FREE END DIA. (IN)	WALL THK.	POLE TUBE BASE DIA. (IN)	TOP DIA. (IN)	LENGTH (FT)	WALL THK.	POLE BASE PLATE CIRCLE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "M" (IN)	HOLE "Z" (IN)	ANCHOR BOLT DIA. "K" (IN)	EMBED. LENGTH "J" (IN)	SIGNAL ARM ATTACHMENT DATA "A" (IN)	"B" (IN)	"C" (IN)	"D" (IN)	"E" (IN)	"F" (IN)
	15.00	9.00	6.90	7 GA.	12.00	9.06	21.00	7 GA.	29.50	24.00	1.50	1.813	1.50	36.00	19.00	15.00	7.50	1.00	1.00	0.188
	20.00	12.50	9.70	3 GA.	15.50	12.56	21.00	3 GA.	29.50	24.00	1.50	1.813	1.50	36.00	24.00	19.00	9.50	1.25	1.25	0.250
	25.00	14.00	10.50	3 GA.	17.00	14.06	21.00	3 GA.	29.50	24.00	1.50	1.813	1.50	36.00	27.50	22.00	11.00	1.50	1.50	0.250
	30.00	15.50	11.30	3 GA.	18.50	15.56	21.00	3 GA.	29.50	24.00	1.50	1.813	1.50	36.00	27.50	22.00	11.00	1.50	1.50	0.250
	35.00	16.50	11.60	0 GA.	19.50	16.56	21.00	0 GA.	34.50	28.00	1.75	2.063	1.75	36.00	29.50	24.00	12.00	1.75	1.50	0.313
	40.00	17.50	11.90	0 GA.	20.50	17.56	21.00	0 GA.	34.50	28.00	1.75	2.063	1.75	36.00	29.50	24.00	12.00	1.75	1.50	0.313
	45.00	18.50	12.20	0 GA.	21.50	18.56	21.00	0 GA.	34.50	28.00	1.75	2.063	1.75	36.00	31.50	26.00	13.00	2.00	1.50	0.313

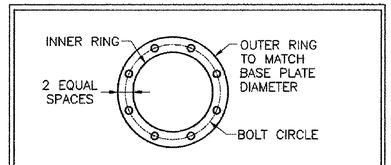


(8) ANCHOR BOLTS WITH (4) HEX NUTS, (4) FLAT WASHERS, AND (1) LOCK-WASHER PER BOLT.

DETAIL 5 | ANCHOR BOLT



DETAIL 7 | SAFETY HANGER LUG



DETAIL 8 | ANCHOR PLATE

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	167	214
PROJ. FILE NO. 604688			

TRAFFIC SIGNAL DETAILS

MONTH_DD,_YYYY | ISSUED FOR CONSTRUCTION

Moving Massachusetts Forward. massDOT Highway

STANDARD DRAWINGS

TYPE II MAST ARMS DETAILS

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

Frank A. Tramontozzi 2/24/2011
CHIEF ENGINEER

BRIDGE ENGINEER

Neil E. Boudreau
TRAFFIC ENGINEER

PIER FOUNDATIONS FOR 110 MPH WIND SPEED ZONE

LIGHT LOADING CONDITIONS

SOIL TYPE	15' & 20' MAST ARMS			25' & 30' MAST ARMS			35' & 40' MAST ARMS			45' MAST ARMS		
	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS
DRY SAND	3'-6"	6'-0"	18-#8	3'-6"	8'-0"	18-#8	3'-6"	8'-0"	18-#8	3'-6"	9'-0"	18-#8
WET SAND	3'-6"	7'-0"	18-#8	3'-6"	9'-0"	18-#8	3'-6"	9'-0"	18-#8	3'-6"	9'-0"	18-#8
CLAY (MEDIUM STIFF)	3'-6"	11'-0"	18-#8	3'-6"	12'-0"	18-#8	3'-6"	12'-0"	18-#8	3'-6"	12'-0"	18-#8
ALLUVIAL	3'-6"	8'-0"	18-#8	3'-6"	10'-0"	18-#8	3'-6"	10'-0"	18-#8	3'-6"	11'-0"	18-#8

MEDIUM LOADING CONDITIONS

SOIL TYPE	15' & 20' MAST ARMS			25' & 30' MAST ARMS			35' & 40' MAST ARMS			45' MAST ARMS		
	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS
DRY SAND	3'-6"	7'-0"	18-#8	3'-6"	9-0"	18-#8	4'-0"	9-0"	18-#9	4'-6"	8'-0"	18-#10
WET SAND	3'-6"	8'-0"	18-#8	3'-6"	9'-0"	18-#8	4'-0"	10'-0"	18-#9	4'-6"	9'-0"	18-#10
CLAY (MEDIUM STIFF)	3'-6"	11'-0"	18-#8	3'-6"	12'-0"	18-#8	4'-0"	13'-0"	18-#9	4'-6"	14'-0"	18-#10
ALLUVIAL	3'-6"	9'-0"	18-#8	3'-6"	10'-0"	18-#8	4'-0"	11'-0"	18-#9	4'-6"	10'-0"	18-#10

HEAVY LOADING CONDITIONS

SOIL TYPE	15' & 20' MAST ARMS			25' & 30' MAST ARMS			35' & 40' MAST ARMS			45' MAST ARMS		
	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS
DRY SAND	3'-6"	8'-0"	18-#8	4'-0"	9'-0"	18-#9	4'-6"	10'-0"	18-#10	5'-0"	9'-0"	23-#10
WET SAND	3'-6"	8'-0"	18-#8	4'-0"	10'-0"	18-#9	4'-6"	11'-0"	18-#10	5'-0"	10'-0"	23-#10
CLAY (MEDIUM STIFF)	3'-6"	12'-0"	18-#8	4'-0"	14'-0"	18-#9	4'-6"	15'-0"	18-#10	5'-0"	16'-0"	23-#10
ALLUVIAL	3'-6"	10'-0"	18-#8	4'-0"	11'-0"	18-#9	4'-6"	12'-0"	18-#10	5'-0"	12'-0"	23-#10

PIER FOUNDATIONS FOR 130 MPH WIND SPEED ZONE

LIGHT LOADING CONDITIONS

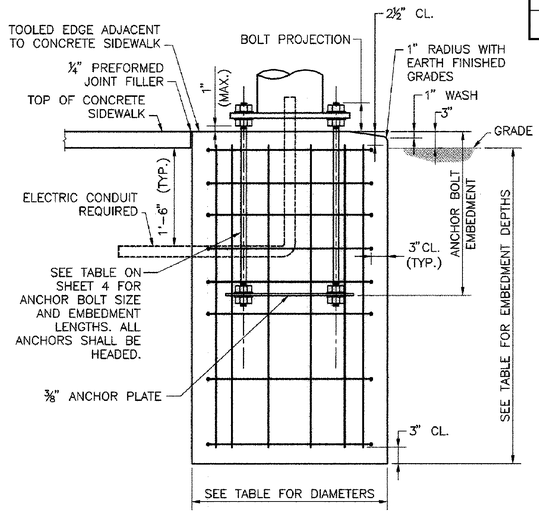
SOIL TYPE	15' & 20' MAST ARMS			25' & 30' MAST ARMS			35' & 40' MAST ARMS			45' MAST ARMS		
	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS
DRY SAND	3'-6"	7'-0"	18-#8	3'-6"	9'-0"	18-#8	3'-6"	10'-0"	18-#8	3'-6"	10'-0"	18-#8
WET SAND	3'-6"	8'-0"	18-#8	3'-6"	10'-0"	18-#8	3'-6"	11'-0"	18-#8	3'-6"	11'-0"	18-#8
CLAY (MEDIUM STIFF)	3'-6"	12'-0"	18-#8	3'-6"	13'-0"	18-#8	3'-6"	13'-0"	18-#8	3'-6"	13'-0"	18-#8
ALLUVIAL	3'-6"	9'-0"	18-#8	3'-6"	12'-0"	18-#8	3'-6"	12'-0"	18-#8	3'-6"	13'-0"	18-#8

MEDIUM LOADING CONDITIONS

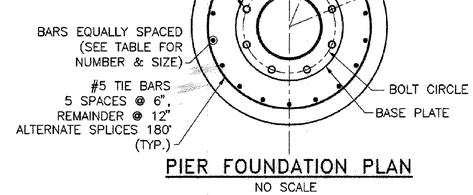
SOIL TYPE	15' & 20' MAST ARMS			25' & 30' MAST ARMS			35' & 40' MAST ARMS			45' MAST ARMS		
	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS
DRY SAND	3'-6"	8'-0"	18-#8	3'-6"	10'-0"	18-#8	4'-0"	11'-0"	18-#9	4'-6"	10'-0"	18-#10
WET SAND	3'-6"	8'-0"	18-#8	3'-6"	11'-0"	18-#8	4'-0"	12'-0"	18-#9	4'-6"	11'-0"	18-#10
CLAY (MEDIUM STIFF)	3'-6"	12'-0"	18-#8	3'-6"	14'-0"	18-#8	4'-0"	15'-0"	18-#9	4'-6"	15'-0"	18-#10
ALLUVIAL	3'-6"	10'-0"	18-#8	3'-6"	13'-0"	18-#8	4'-0"	13'-0"	18-#9	4'-6"	12'-0"	18-#10

HEAVY LOADING CONDITIONS

SOIL TYPE	15' & 20' MAST ARMS			25' & 30' MAST ARMS			35' & 40' MAST ARMS			45' MAST ARMS		
	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS
DRY SAND	3'-6"	9'-0"	18-#8	4'-0"	11'-0"	18-#9	4'-6"	12'-0"	18-#10	5'-0"	11'-0"	23-#10
WET SAND	3'-6"	10'-0"	18-#8	4'-0"	12'-0"	18-#9	4'-6"	13'-0"	18-#10	5'-0"	12'-0"	23-#10
CLAY (MEDIUM STIFF)	3'-6"	14'-0"	18-#8	4'-0"	15'-0"	18-#9	4'-6"	16'-0"	18-#10	5'-0"	17'-0"	23-#10
ALLUVIAL	3'-6"	11'-0"	18-#8	4'-0"	13'-0"	18-#9	4'-6"	15'-0"	18-#10	5'-0"	14'-0"	23-#10



PIER FOUNDATION DETAIL
NO SCALE



PIER FOUNDATION PLAN
NO SCALE

NOTES:

1. FOUNDATIONS SHALL BE 4000 PSI, 1½", 565 CEMENT CONCRETE.
2. REINFORCEMENT SHALL BE ASTM A615 GRADE 60.
3. ANCHOR BOLTS SHALL BE SET BY TEMPLATE.
4. PROVIDE FOR ELECTRICAL CONDUIT.
5. EXCAVATION SHALL BE BY THE AUGER METHOD TO THE NEAT LINES OF THE OUTSIDE DIMENSION OF THE FOUNDATIONS WITHOUT DISTURBING THE SOIL AROUND AND BELOW THE PROPOSED FOUNDATION BOTTOM. ALTERNATE METHODS OF EXCAVATION MAY BE SUBMITTED TO MASSHIGHWAY FOR APPROVAL IF THEY MEET THE REQUIREMENTS LISTED IN NOTES 6, 7, AND 8.
6. THE EARTH WALLS OF THE FOUNDATION SHALL BE ADEQUATELY AND SECURELY PROTECTED AT ALL TIMES AGAINST CAVE-INS, DISPLACEMENT OF THE SURROUNDING EARTH AND FOR THE EXCLUSION OF GROUND WATER. THIS MAY BE DONE BY THE USE OF STEEL CYLINDER LINERS OR CASINGS THAT ARE APPROVED BY MASSHIGHWAY. IF LINERS ARE USED THEY MAY BE RECLAIMED PROVIDED THAT THEY ARE WITHDRAWN AS THE CONCRETE IS BEING PLACED, MAINTAINING A SUFFICIENT HEAD OF CONCRETE WITHIN THE LINER TO PREVENT REDUCTION IN THE FOUNDATION DIAMETER AND TO PREVENT EXTRANEOUS MATERIAL FROM FALLING IN FROM THE SIDES AND MIXING WITH THE CONCRETE.
7. IF THE SOIL IS DISTURBED OR REMOVED BEYOND THE NEAT LINES OF THE OUTSIDE DIMENSION OF THE FOUNDATION, IT SHALL BE REPLACED WITH CONCRETE. ANY ADDITIONAL COST FOR THE CONCRETE SHALL BE PAID FOR BY THE CONTRACTOR.
8. SPECIAL CARE SHOULD BE GIVEN TO AREAS WHERE WET SOIL IS ENCOUNTERED, TO INSURE THAT THE PREAUGERED HOLE DOES NOT COLLAPSE. THIS MAY REQUIRE THE USE OF STEEL CYLINDER LINERS OR CASINGS TO HOLD THE SOIL IN PLACE UNTIL READY FOR CONCRETE PLACEMENT. THE STEEL CYLINDERS OR CASINGS SHALL BE WITHDRAWN AS THE FOUNDATION CONCRETE IS PLACED.
9. DETERMINATION OF EXISTING SOIL CONDITIONS SHALL BE MADE BY THE DESIGN ENGINEER.
10. IF LEDGE OR POOR SOIL IS ENCOUNTERED (i.e. ONE WHICH DOES NOT APPLY TO THE DESIGN TABLES SHOWN ON THIS SHEET), AN ALTERNATIVE DESIGN SHALL BE PROVIDED BY THE DESIGN ENGINEER. DECISIONS MADE IN NOTES 8 AND 9 SHALL BE SUBMITTED TO MASSHIGHWAY FOR APPROVAL. IF UTILITIES OR OTHER UNDERGROUND OBSTRUCTIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL BACKFILL THE AREA TO ITS ORIGINAL CONDITION UNTIL AN ALTERNATE DESIGN HAS BEEN PROVIDED BY THE ENGINEER.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	168	214
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TRAFFIC SIGNAL DETAILS

MONTH_DD,_YYYY	ISSUED FOR CONSTRUCTION

massDOT Highway

STANDARD DRAWINGS

TYPE II MAST ARMS
CORED PIER FOUNDATIONS

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

Frank A. Tramontozzi Jr. 3/24/2011
CHIEF ENGINEER
BRIDGE ENGINEER
TRAFFIC ENGINEER

NOTES:

1. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS.
2. ALL SIGN LEGENDS, BORDERS AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
3. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
4. TEMPORARY CONSTRUCTION SIGNING, BARRICADES AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
5. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, AND REFLECTORIZED PLASTIC DRUMS WITH LIGHTING DEVICES MOUNTED ON THEM, MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, "RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES."
6. CONTRACTORS SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT AND SIMILAR OPERATIONS.
7. THE FIRST THREE PLASTIC DRUMS OF A TAPER MAY BE MOUNTED WITH TYPE A LIGHTS. (INCIDENTAL TO ITEM 859)
8. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
9. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
10. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
11. MINIMUM LANE WIDTH IS TO BE 11 FEET (3.3m) UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
12. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.

LEGEND:

- REFLECTORIZED PLASTIC DRUM
- WORK ZONE
- WORK VEHICLE
- POLICE DETAIL
- DIRECTION OF TRAFFIC
- MOVEABLE IMPACT ATTENUATOR
- TYPE III BARRICADE
- IMPACT ATTENUATOR
- TRAFFIC OR PEDESTRIAN SIGNAL
- CHANGEABLE MESSAGE SIGN
- MEDIAN BARRIER
- SIGN
- FLASHING ARROW PANEL
- MEDIAN BARRIER WITH WARNING LIGHTS

THE IDEAL CAPACITY OF A MAJOR HIGHWAY IS GENERALLY CONSIDERED TO BE 1900 PASSENGER CARS PER HOUR PER LANE (PCPHPL). IN WORK ZONES ON A MULTI-LANE DIVIDED HIGHWAY, THE FOLLOWING VOLUME GUIDELINES HAVE BEEN SUGGESTED:

MEASURED AVERAGE WORK ZONE CAPACITIES

Number of Lanes		Number of Studies	Average Capacity	
NORMAL (existing)	OPEN (to traffic)		VPH	VPHPL
3	1	7	1,170	1,170
2	1	8	1,340	1,340
5	2	8	2,740	1,370
4	2	4	2,960	1,480
3	2	9	2,980	1,490
4	3	4	4,560	1,520

Source: Dudek, C. Notes on Work Zone Capacity and Level of Service. Texas Transportation Institute, Texas A&M University, College Station, Texas (1984)

OBTAINING HOURLY TRAFFIC COUNTS FOR A PARTICULAR ROADWAY (WITH A MINIMUM OF A 48-HOUR AUTOMATIC TRAFFIC RECORDER (ATR) COUNT) WILL HELP TO DETERMINE AT WHAT TIMES OF THE DAY OR NIGHT A CERTAIN NUMBER OF LANES MAY BE CLOSED.

massDOT Highway	Standard Details and Drawings for the Development of Traffic Management Plans	FIGURE Gen-1 GENERAL GUIDELINES NOT TO SCALE

SUGGESTED WORK ZONE WARNING SIGN SPACING

Road Type	Distance Between Signs**		
	A	B	C
LOCAL OR LOW VOLUME ROADWAYS*	350 (100)	350 (100)	350 (100)
MOST OTHER ROADWAYS*	500 (150)	500 (150)	500 (150)
FREEWAYS AND EXPRESSWAYS*	1,000 (300)	1,500 (450)	2,640 (800)

* SPEED CATEGORY TO BE DETERMINED BY HIGHWAY AGENCY

** DISTANCES ARE SHOWN IN FEET (METERS). THE COLUMN HEADINGS A, B, AND C ARE THE DIMENSIONS SHOWN IN THE DETAIL/ TYPICAL SETUP FIGURES. THE A DIMENSION IS THE DISTANCE FROM THE TRANSITION OR POINT OF RESTRICTION TO THE FIRST SIGN. THE B DIMENSION IS THE DISTANCE BETWEEN THE FIRST AND SECOND SIGNS. THE C DIMENSION IS THE DISTANCE BETWEEN THE SECOND AND THIRD SIGNS. (THE "THIRD" SIGN IS THE FIRST ONE TYPICALLY ENCOUNTERED BY A DRIVER APPROACHING A TEMPORARY TRAFFIC CONTROL (TTC) ZONE.)

THE "THIRD" SIGN ABOVE IS TYPICALLY REFERRED TO AS AN "ADVANCE WARNING" SIGN ON THE TMP SETUPS. IT IS THE ONE WHICH MAY OFTEN HAVE THE "STANDARD RED OR RED-ORANGE FLAGS (16 in. X 16 in.)" MOUNTED ON IT. THESE ADVANCE WARNING SIGNS ARE LOCATED AT THE PROJECT LIMITS ON ALL APPROACHES (i.e. THE W20-1 SERIES (ROAD WORK XX FT) SIGNS), AND USUALLY REMAIN FOR THE DURATION OF THE PROJECT. ADDITIONAL SIGNS (i.e. "RIGHT LANE CLOSED 1 MILE" AND "LEFT LANE CLOSED 1 MILE") HAVE BEEN SHOWN IN SOME FIGURES AS EXAMPLES OF REINFORCEMENT SIGN PLACEMENT, BUT ARE USED ONLY IN RARE OCCASIONS.

THE FIRST AND SECOND WARNING SIGNS ABOVE ARE REFERRED TO AS THE OPERATIONAL (DAY-TO-DAY) WORK ZONE SIGNS AND MAY BE MOVED DEPENDING ON WHERE THE SPECIFIC ROADWAY WORK FOR THAT DAY IS LOCATED.

R2-10a SIGNS SHALL BE PLACED BETWEEN THE SECOND AND THIRD SIGNS.

R2-10a AND W20-1 SERIES SIGNS ARE TO BE INCLUDED ON ALL DETAILS/TYPICAL SETUPS.

Based on: Table 6C-1 2003 MUTCD

STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED

SPEED* (km/h)	DISTANCE (m)
30	35
40	50
50	65
60	85
70	105
80	130
90	160
100	185
110	220
120	250

SPEED* (mph)	DISTANCE (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820

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

THESE VALUES MAY BE USED TO DETERMINE THE LENGTH OF LONGITUDINAL BUFFER SPACES.

THE DISTANCES IN THE ABOVE CHART REPRESENT THE MINIMAL VALUES FOR BUFFER SPACING.

Source: Table 6C-2 2003 MUTCD

massDOT Highway	Standard Details and Drawings for the Development of Traffic Management Plans	FIGURE Gen-2 NOTES ON WORK ZONE DISTANCES NOT TO SCALE

CONVENTIONAL ROADWAY– A STREET OR HIGHWAY OTHER THAN A LOW-VOLUME ROAD, EXPRESSWAY, OR FREEWAY.

EXPRESSWAY– A DIVIDED HIGHWAY WITH PARTIAL CONTROL OF ACCESS.

FREEWAY– A DIVIDED HIGHWAY WITH FULL CONTROL OF ACCESS.

LOW-VOLUME ROAD– A FACILITY LYING OUTSIDE OF BUILT-UP AREAS OF CITIES, TOWNS, AND COMMUNITIES, AND IT SHALL HAVE A TRAFFIC VOLUME OF LESS THAN 400 AADT. IT SHALL NOT BE A FREEWAY, EXPRESSWAY, INTERCHANGE RAMP, FREEWAY SERVICE ROAD, OR A ROAD ON A DESIGNATED STATE HIGHWAY SYSTEM.

Source: 2003 MUTCD

TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES

Type of Taper	Taper Length (L)*
MERGING TAPER	AT LEAST L
SHIFTING TAPER	AT LEAST 0.5L
SHOULDER TAPER	AT LEAST 0.33L
ONE-LANE, TWO-WAY TRAFFIC TAPER	100 FT (30 m) MAXIMUM
DOWNSTREAM TAPER	100 FT (30 m) PER LANE

Source: Table 6C-3 2003 MUTCD

FORMULAS FOR DETERMINING TAPER LENGTHS

Speed Limit (S)	Taper Length (L) Feet
40 MPH OR LESS	L= WS²/60
45 MPH OR MORE	L= WS

Speed Limit (S)	Taper Length (L) Meters
60 KM/H OR LESS	L= WS²/155
70 KM/H OR MORE	L= WS/1.6

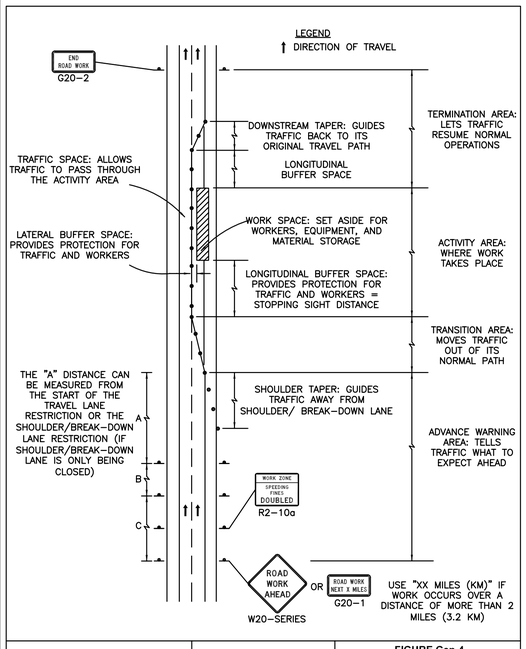
WHERE: L = TAPER LENGTH IN FEET (METERS)

W = WIDTH OF OFFSET IN FEET (METERS)

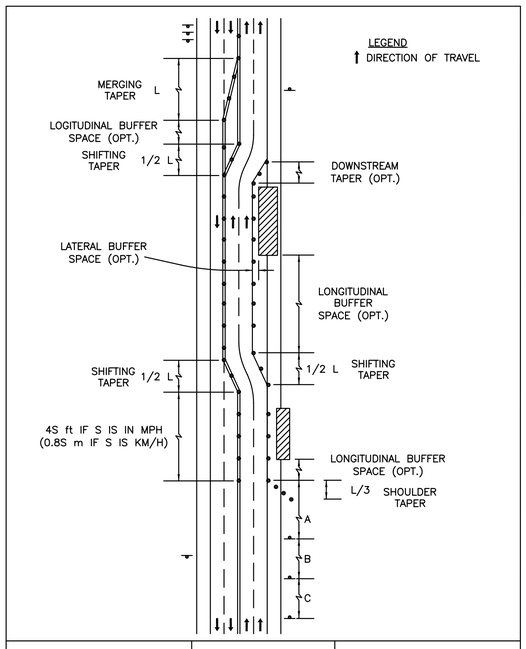
S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH (KM/H)

Source: Table 6C-4 2003 MUTCD

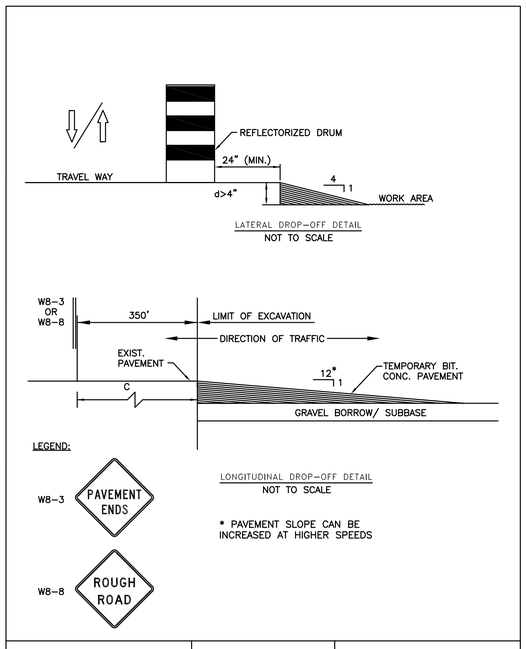
massDOT Highway	Standard Details and Drawings for the Development of Traffic Management Plans	FIGURE Gen-3 NOTES ON WORK ZONE DISTANCES NOT TO SCALE



massDOT Highway	Standard Details and Drawings for the Development of Traffic Management Plans	FIGURE Gen-4 COMPONENT PARTS OF A TEMPORARY TRAFFIC CONTROL (TTC) ZONE NOT TO SCALE



massDOT Highway	Standard Details and Drawings for the Development of Traffic Management Plans	FIGURE Gen-5 TYPES OF TAPERS AND BUFFER SPACES NOT TO SCALE



massDOT Highway	Standard Details and Drawings for the Development of Traffic Management Plans	FIGURE Gen-6 LATERAL AND LONGITUDINAL DROP-OFF DETAILS NOT TO SCALE

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MASS.	XXXXX	169	214
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TRAFFIC MANAGEMENT PLAN

TRAFFIC MANAGEMENT NOTES

GENERAL:

1. ALL TEMPORARY CONSTRUCTION SIGNING, DRUMS, BARRICADES AND OTHER WORKZONE TRAFFIC CONTROL DEVICES SHALL BE FURNISHED AND INSTALLED IN CONFORMANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" – 2009 EDITION (M.U.T.C.D.), REVISION 1 (DATED JULY 21, 2004); THE MASSDOT STANDARD SPECIFICATIONS; THE MASSDOT "STANDARD DETAILS AND DRAWINGS FOR THE DEVELOPMENT OF TRAFFIC MANAGEMENT PLANS", DATED JULY 2005, AND THE LATEST REVISIONS; AND THE FOLLOWING:
2. MAINTAIN CONTINUOUS ACCESS & EGRESS TO ON-AND-OFF RAMPS, ALL STREETS AND DRIVES.
3. UNLESS WRITTEN PERMISSION FROM MASSDOT IS OBTAINED, THE TRAVELWAY CAN ONLY BE OCCUPIED BETWEEN THE HOURS OF 08:30AM AND 03:30PM (MONDAY THROUGH FRIDAY FROM SEPTEMBER THRU JUNE*). APPROVAL FROM MASSDOT'S AND BELMONT'S REPRESENTATIVES ARE REQUIRED FOR ANY CHANGES TO THESE HOURS.
   *DURING JULY AND AUGUST THESE HOURS ARE EXPANDED TO 08:00AM AND 04:30PM.
4. WARNING SIGNS SHALL HAVE AN ORANGE BACKGROUND, AND REGULATORY SIGNS SHALL BE BLACK TEXT ON A WHITE BACKGROUND.
5. AT ALL TIMES MAINTAIN TRAFFIC SIGNAL CONTROLS AND STREET LIGHTING IN AN OPERATING CONDITION.
6. AT ALL TIMES, MAINTAIN AN ADA-ACCESSIBLE WALKING PATH.
7. MAINTAIN CONTINUOUS ACCESS AND EGRESS TO ALL BUSSINESSES DURING THEIR HOURS OF OPERATION.

CONSTRUCTION SIGNING:

1. FINAL LOCATION OF SIGNS, DRUMS, AND OTHER TRAFFIC CONTROL DEVICES SHALL BE DETERMINED IN THE FIELD BY MASSDOT'S REPRESENTATIVE.
2. ADVISORY SPEED PLATES (W13-1(XX)) SHALL BE USED IF APPROPRIATE AND AS DIRECTED. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE MASSDOT'S REPRESENTATIVE.
3. NON-ESSENTIAL TEMPORARY CONSTRUCTION TRAFFIC CONTROL DEVICES SHALL BE COVERED OR REMOVED FROM THE HIGHWAY WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
4. COVER OR REMOVE ALL EXISTING REGULATORY AND WARNING SIGNS THAT CONFLICT WITH THE INTENT OF THIS TRAFFIC MANAGEMENT PLAN OR ARE NOT REPRESENTATIVE OF ACTUAL WORK CONDITIONS, ESPECIALLY W5-1, W20-4, W20-5, W20-8, AND W2-5a PANELS. SIGNS SHALL REMAIN COVERED WHILE THIS TRAFFIC MANAGEMENT PLAN IS IN EFFECT.
5. SEVEN DAYS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL PLACE TWO PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) ON THE PROJECT SITE.

TRAFFIC OPERATIONS:

1. TRAFFIC MANAGEMENT
   a. AT ALL TIMES MAINTAIN A MINIMUM OF ONE-WAY ALTERNATING TRAFFIC ON ALL STREETS.
   b. AT ALL TIMES MAINTAIN ONE OPEN SIDEWALK ON EITHER SIDE OF ALL STREETS.
   c. AT ALL TIMES MAINTAIN ALL EXISTING TURNING MOVEMENTS AT INTERSECTIONS.
   d. AT ALL TIMES MAINTAIN A MINIMUM OF TWO 11-FOOT TRAVEL LANES ON TRAPELO ROAD, BELMONT STREET, ARLINGTON STREET, COMMON STREET, GROVE STREET, LEXINGTON STREET, MILL STREET, AND PLEASANT STREET AS DIRECTED BY THE ENGINEER.
   e. AT ALL TIMES MAINTAIN A MINIMUM OF ONE 10-FOOT TRAVEL LANE ON ALL SIDE STREETS AS DIRECTED BY THE ENGINEER.
2. BUS STOPS
   a. ADJACENT BUS STOPS IN THE SAME DIRECTION MAY NOT BE CLOSED AT THE SAME TIME. (SEE SPECIFICATIONS)

MISCELLANEOUS:

1. THE WORKSITE SHALL BE ADEQUATELY PROTECTED (DURING BOTH WORKING AND NON-WORKING HOURS) TO ENSURE SAFETY OF VEHICULAR AND PEDESTRIAN TRAFFIC.
2. PEDESTRIAN ACTIVITY SHALL BE CONTROLLED BY THE POLICE OFFICER(S), FLAGMEN, AND CONSTRUCTION OFFICIALS ON DUTY.

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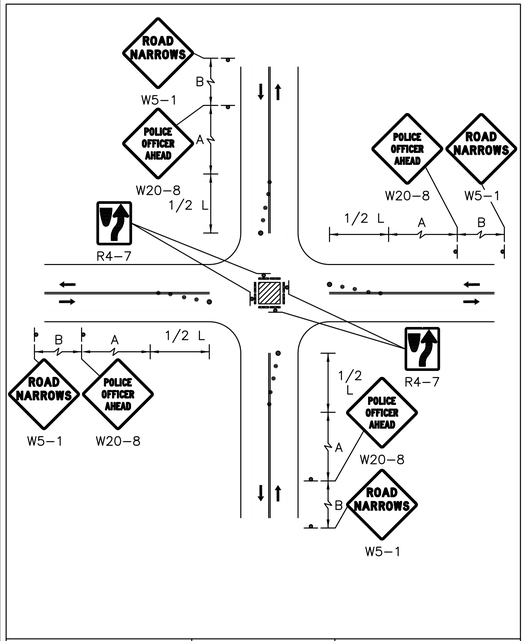
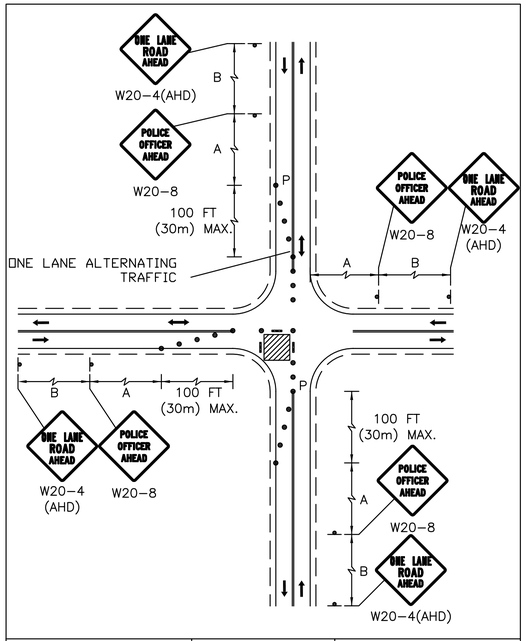
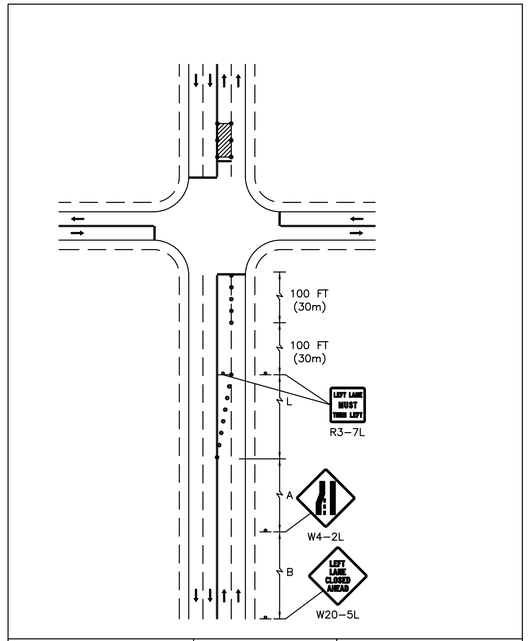
TRAFFIC MANAGEMENT PLAN



massDOT Highway | Standard Details and Drawings for the Development of Traffic Management Plans | **FIGURE Int-1** SINGLE LANE APPROACH CENTER CLOSURE NOT TO SCALE



massDOT Highway | Standard Details and Drawings for the Development of Traffic Management Plans | **FIGURE Int-2** SINGLE LANE APPROACH ONE QUADRANT CLOSURE NOT TO SCALE



massDOT Highway | Standard Details and Drawings for the Development of Traffic Management Plans | **FIGURE Int-3** DOUBLE LANE APPROACH FAR SIDE CLOSURE INSIDE LANE NOT TO SCALE

GENERAL CONSTRUCTION STAGES*

1. CONSTRUCTION SEGMENTS

   THE PROJECT SHALL BE BROKEN UP IN AT LEAST FIVE APPROXIMATELY EQUAL LONG SEGMENTS. ANY PARTICULAR PHASE OF WORK ON THE SUBSEQUENT SEGMENT SHALL NOT BEGIN UNTIL THAT PHASE OF WORK ON THE PREVIOUS SEGMENT HAS BEEN COMPLETED.

2. UTILITY WORK

   CONSTRUCT ALL PROPOSED UTILITIES AND ADJUST, ABANDON, REMOVE, OR REMOVE AND RESET, ALL EXISTING UTILITIES, AS SHOWN ON THE PLANS.

3. ROADWAY MICRO–MILLING AND OVERLAY

   A. BEFORE THE MILLING CAN PROCEED, ALL CASTINGS SHALL BE ADJUSTED TO A GRADE BELOW THE FINISHED MILLED SURFACE THAT IS DEEP ENOUGH SO THAT THE CASTING IS NOT DAMAGED BY THE MILLING MACHINE. BUT NOT SO DEEP THAT IT ENDS UP BEING MORE THAN ONE INCH BELOW THE FINISHED MILLED SURFACE.

   B. MICRO–MILL ROADWAY, ONE HALF AT A TIME, THE LENGTH OF WHICH WILL BE DETERMINED BY THE CONTRACTOR'S ABILITY TO MILL AND MAKE THE ENTIRE WIDTH OF ROADWAY SUITABLE FOR TRAFFIC BY THE END OF THE DAY.

      a. DURING THE FIRST HALF OF THE DAY, MICRO–MILL ONE HALF OF THE ROADWAY AND MAKE THE AREA SUITABLE FOR TRAFFIC, (WHILE MAINTAINING TRAFFIC IN EACH DIRECTION), BYPASSING THE WORK ZONE AS DIRECTED BY POLICE OFFICER(S), FLAGMEN, AND CONSTRUCTION OFFICIALS.

      b. DURING THE SECOND HALF OF THE DAY, SWITCH TRAFFIC TO THE PREVIOUSLY MICRO–MILLED PORTION OF ROADWAY AND REPEAT THE SEQUENCE ON THE REMAINING HALF OF ROADWAY.

4. INTERMEDIATE COURSE

   PLACE THE INTERMEDIATE COURSE FOR THE ENTIRE LENGTH OF THE SEGMENT AND BRING ALL CASTINGS UP TO THE INTERMEDIATE GRADE.

5. CURB WORK

   INSTALL ALL PROPOSED CURBING; REMOVE AND RESET EXISTING CURBING.

6. SIDEWALKS AND ISLANDS

   CONSTRUCT SIDEWALKS AND TRAFFIC ISLANDS.

7. TRAFFIC CONTROL

   INSTALL ALL TRAFFIC SIGNAL EQUIPMENT AND SIGNING.

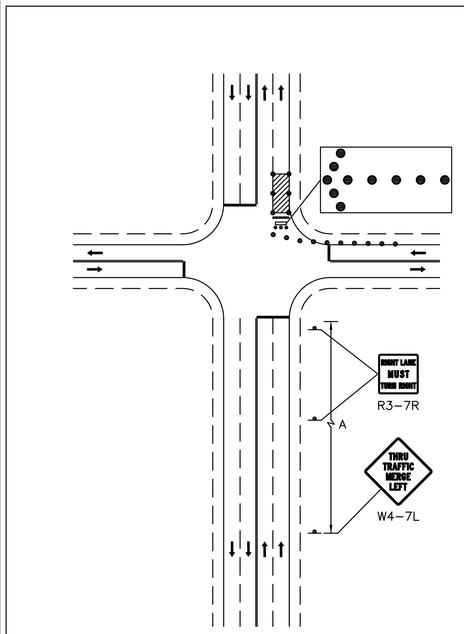
8. TOP COURSE AND BINDER COURSE

   RAISE THE UTILITY CASTING TO THE FINISHED SURFACE GRADE AND PLACE TOP COURSE FOR THE ENTIRE LENGTH OF THE PROJECT.

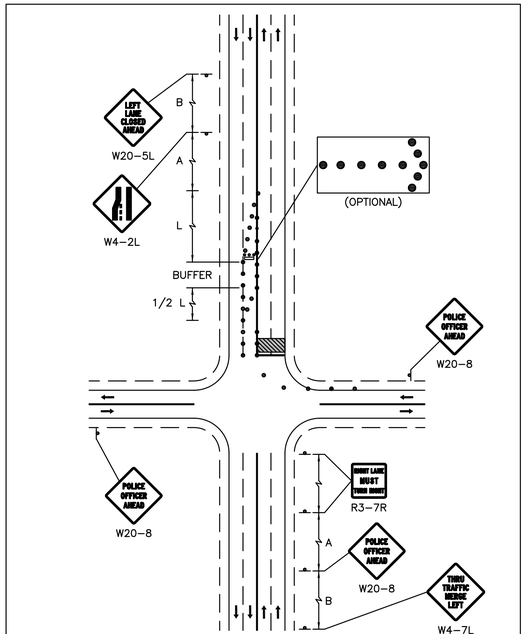
9. PAVEMENT MARKINGS

   INSTALL PAVEMENT MARKINGS.

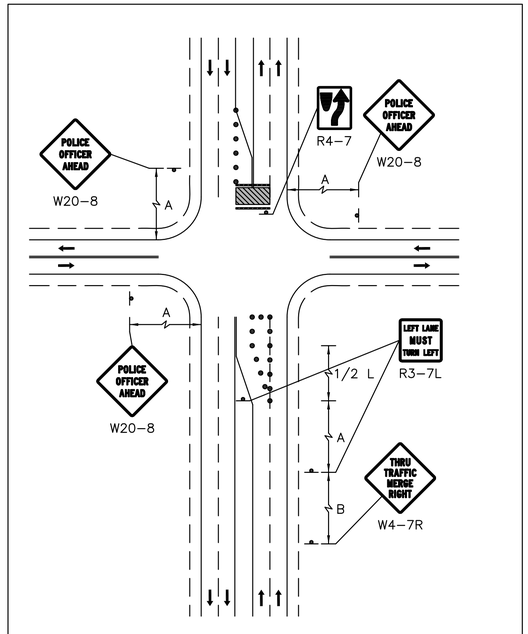
* SEE SUBSECTION 8.03 OF THE SPECIAL PROVISIONS FOR SPECIFIC GUIDELINES.



massDOT Highway | Standard Details and Drawings for the Development of Traffic Management Plans | **FIGURE Int-4** DOUBLE LANE APPROACH FAR SIDE CLOSURE RIGHT LANE NOT TO SCALE



massDOT Highway | Standard Details and Drawings for the Development of Traffic Management Plans | **FIGURE Int-5** DOUBLE LANE APPROACH HALF ROAD CLOSURE NOT TO SCALE



massDOT Highway | Standard Details and Drawings for the Development of Traffic Management Plans | **FIGURE Int-6** MULTI-LANE APPROACH MULTIPLE LANE CLOSURE NOT TO SCALE

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MASS.	xxxxx	171	214
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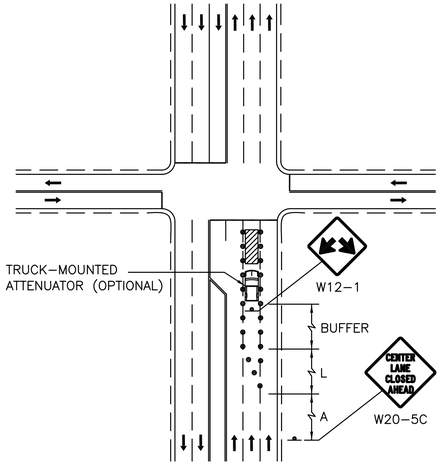
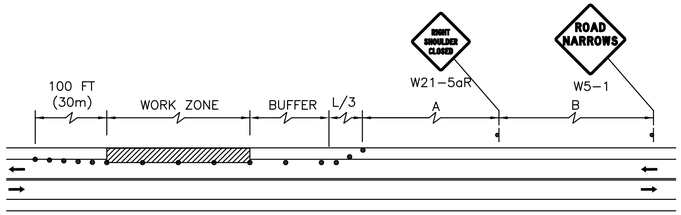
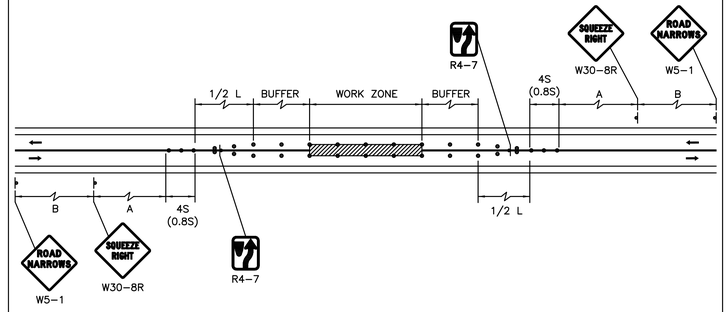
TRAFFIC MANAGEMENT PLAN



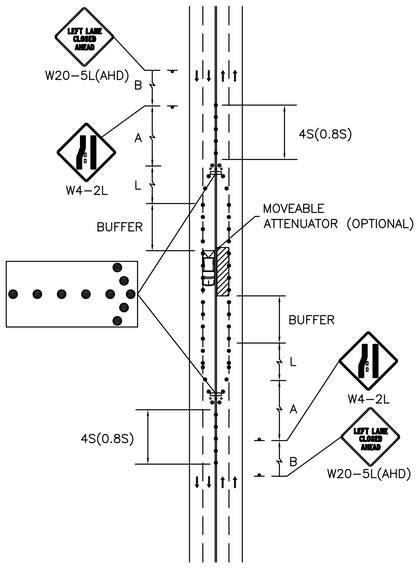
massDOT Highway | Standard Details and Drawings for the Development of Traffic Management Plans | **FIGURE Int-7** MULTI-LANE APPROACH NEAR SIDE CLOSURE NOT TO SCALE



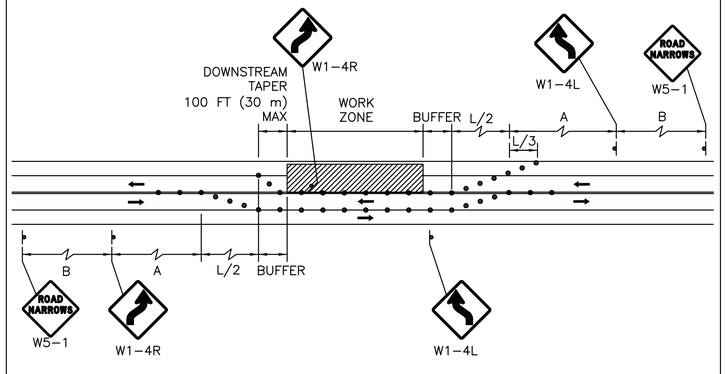
massDOT Highway | Standard Details and Drawings for the Development of Traffic Management Plans | **FIGURE TLR-1** TWO LANE ROAD SHOULDER CLOSED NOT TO SCALE



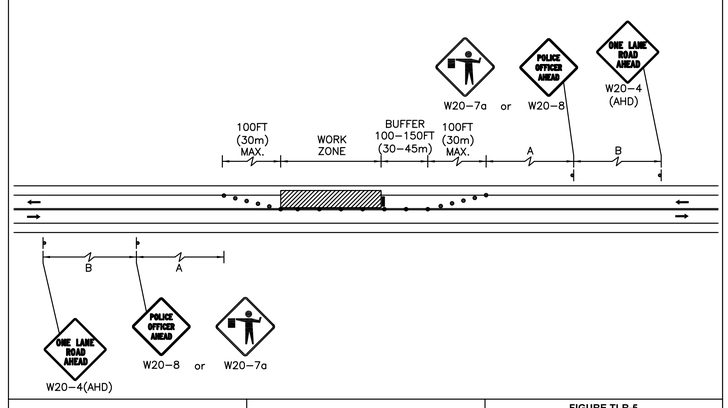
massDOT Highway | Standard Details and Drawings for the Development of Traffic Management Plans | **FIGURE TLR-3** TWO LANE ROAD CENTER OF ROAD CLOSURE NOT TO SCALE



massDOT Highway | Standard Details and Drawings for the Development of Traffic Management Plans | **FIGURE MLR-1** MULTIPLE LANE ROAD INTERIOR LANE CLOSURE NOT TO SCALE



massDOT Highway | Standard Details and Drawings for the Development of Traffic Management Plans | **FIGURE TLR-2** TWO LANE ROAD SHOULDER AND TRAVEL LANE CLOSED NOT TO SCALE



massDOT Highway | Standard Details and Drawings for the Development of Traffic Management Plans | **FIGURE TLR-5** TWO LANE ROAD ONE LANE ALTERNATING TRAFFIC WITH POLICE DETAIL NOT TO SCALE

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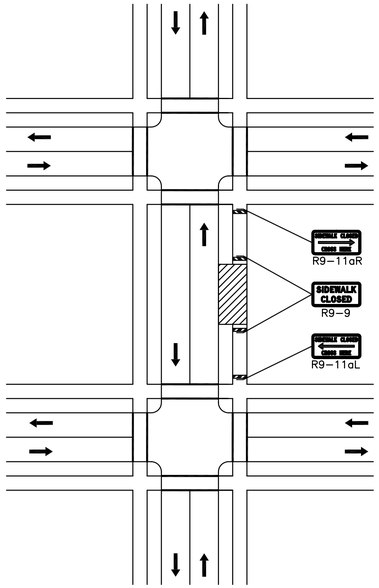
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	172	214
PROJ. FILE NO. 604688			

TRAFFIC MANAGEMENT PLAN

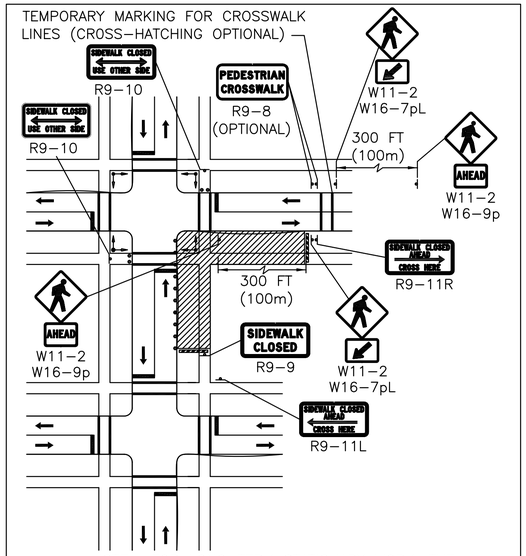


Standard Details and Drawings for the Development of Traffic Management Plans

FIGURE Ped-1

SIDEWALK CLOSED WITH DETOUR

NOT TO SCALE

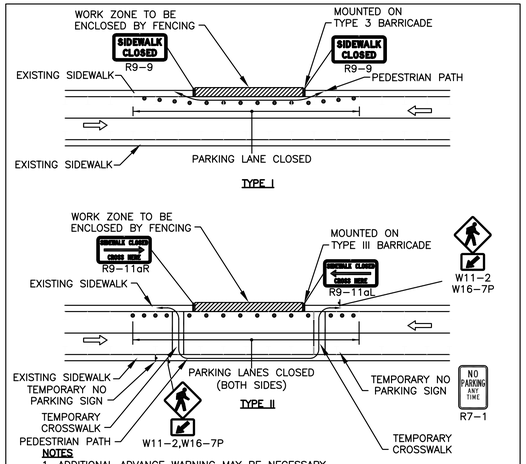


Standard Details and Drawings for the Development of Traffic Management Plans

FIGURE Ped-2

PEDESTRIAN DETOUR

NOT TO SCALE



NOTES

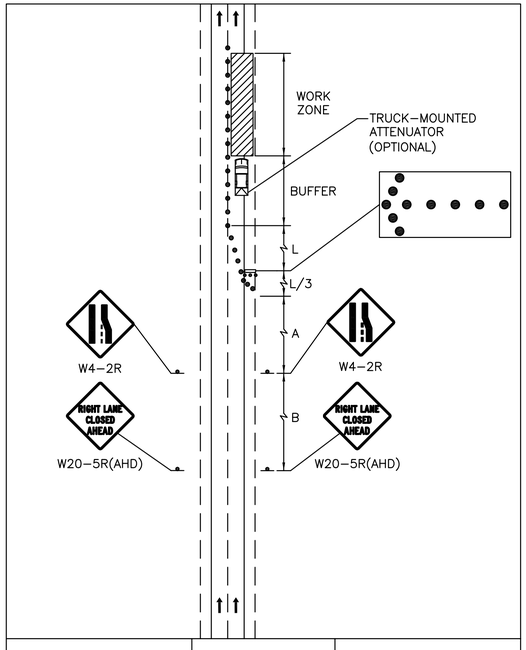
1. ADDITIONAL ADVANCE WARNING MAY BE NECESSARY.
2. CONTROLS ONLY FOR PEDESTRIAN TRAFFIC ARE SHOWN. VEHICULAR TRAFFIC SHOULD BE HANDLED AS SHOWN ELSEWHERE.
3. STREET LIGHTING SHOULD BE CONSIDERED WHEN LOCATING CONTROL DEVICES.
4. IF THE WORK ZONE DOES NOT PERMIT PEDESTRIANS TO TRAVEL ADJACENT TO IT AS SHOWN IN PEDESTRIAN BYPASS TYPE I, TEMPORARY CROSSWALKS WITH APPROPRIATE SIGNS SHOULD BE INSTALLED TO CROSS PEDESTRIANS TO THE OPPOSITE SIDE OF THE STREET AS SHOWN IN PEDESTRIAN BYPASS TYPE II, AND AS DIRECTED BY THE ENGINEER.
5. BYPASS IS TO BE USED IN CONJUNCTION WITH THE PROPOSED LANE CLOSURE DETAILS AND DURING CONSTRUCTION STAGING, AS DIRECTED BY THE ENGINEER.
6. ATT ALL TIMES MAINTAIN A PEDESTRIAN PATH THAT CONFORMS TO ALL RELEVANT ADA AND AAB STANDARDS.

Standard Details and Drawings for the Development of Traffic Management Plans

FIGURE Ped-3

PEDESTRIAN BYPASS

NOT TO SCALE



Standard Details and Drawings for the Development of Traffic Management Plans

FIGURE Div-2

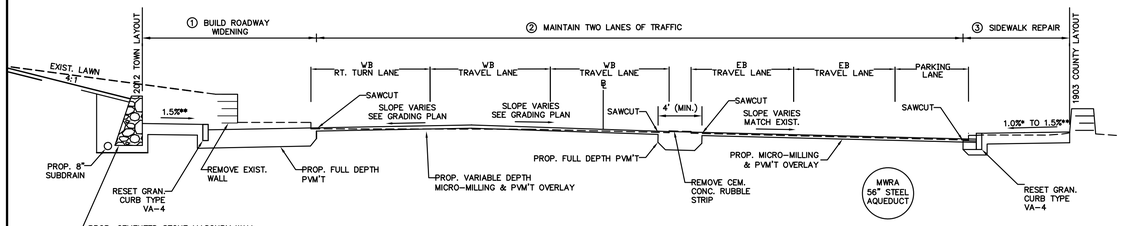
DIVIDED HIGHWAY/ LANE CLOSURE (SHORT TERM)

NOT TO SCALE

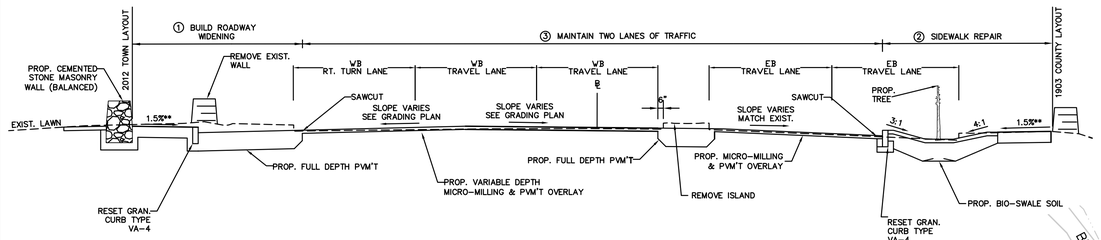
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	XXXXX	173	214
PROJ. FILE NO. 604688			

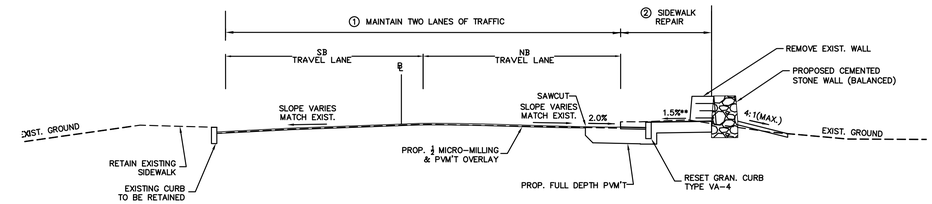
TRAFFIC MANAGEMENT PLAN



TRAPELO ROAD (STA 21+00 TO 24+00)
N.T.S.



TRAPELO ROAD (STA 19+50 TO 21+00)
N.T.S.



MILL STREET (STA 1+78 TO STA 3+70)
N.T.S.

NOTES:

1. ROADWAY CONSTRUCTION ON TRAPELO ROAD, FROM STA. 17+40 TO STA. 36+00, SHALL ONLY BE DONE DURING THE SUMMER MONTHS OF JULY AND AUGUST.

2. REFER TO "STANDARD DETAILS AND DRAWINGS FOR THE DEVELOPMENT OF TRAFFIC MANAGEMENT PLANS" FOR:

a. GEN	– FIGURE GEN–1 THRU 6	(GENERAL)
b. INT	– FIGURE INT–1 THRU 7	(INTERSECTION)
c. TLR	– FIGURE TLR–1,2,3 AND 5	(TWO LANE ROADS)
d. DIV	– FIGURE DIV–2	(DIVIDED HIGHWAY)
e. PEDS	– FIGURE PED–1 THRU 3	(PEDESTRIANS)

HOR. SCALE IN FEET
0 60 150 300

TRAPELO ROAD (STA 24+00 TO 25+50)
N.T.S.

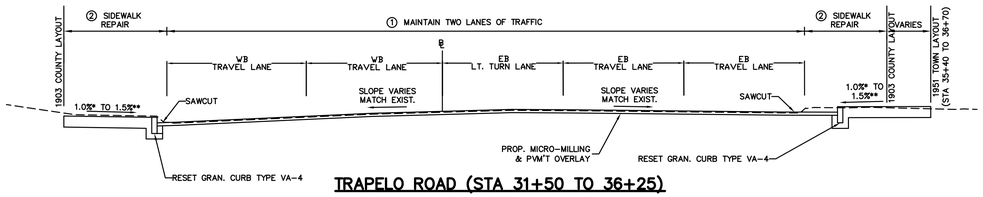
LEGEND:

Ⓧ: NUMBER OF SEQUENCE IN ORDER OF CONSTRUCTION

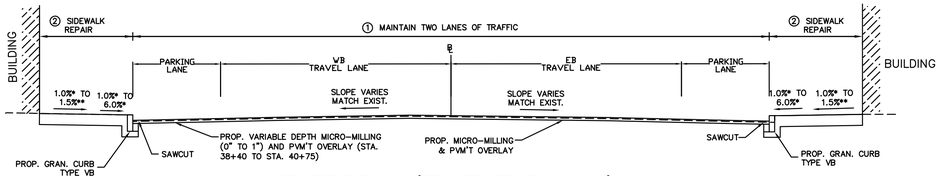
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	XXXXX	174	214
PROJ. FILE NO. 604688			

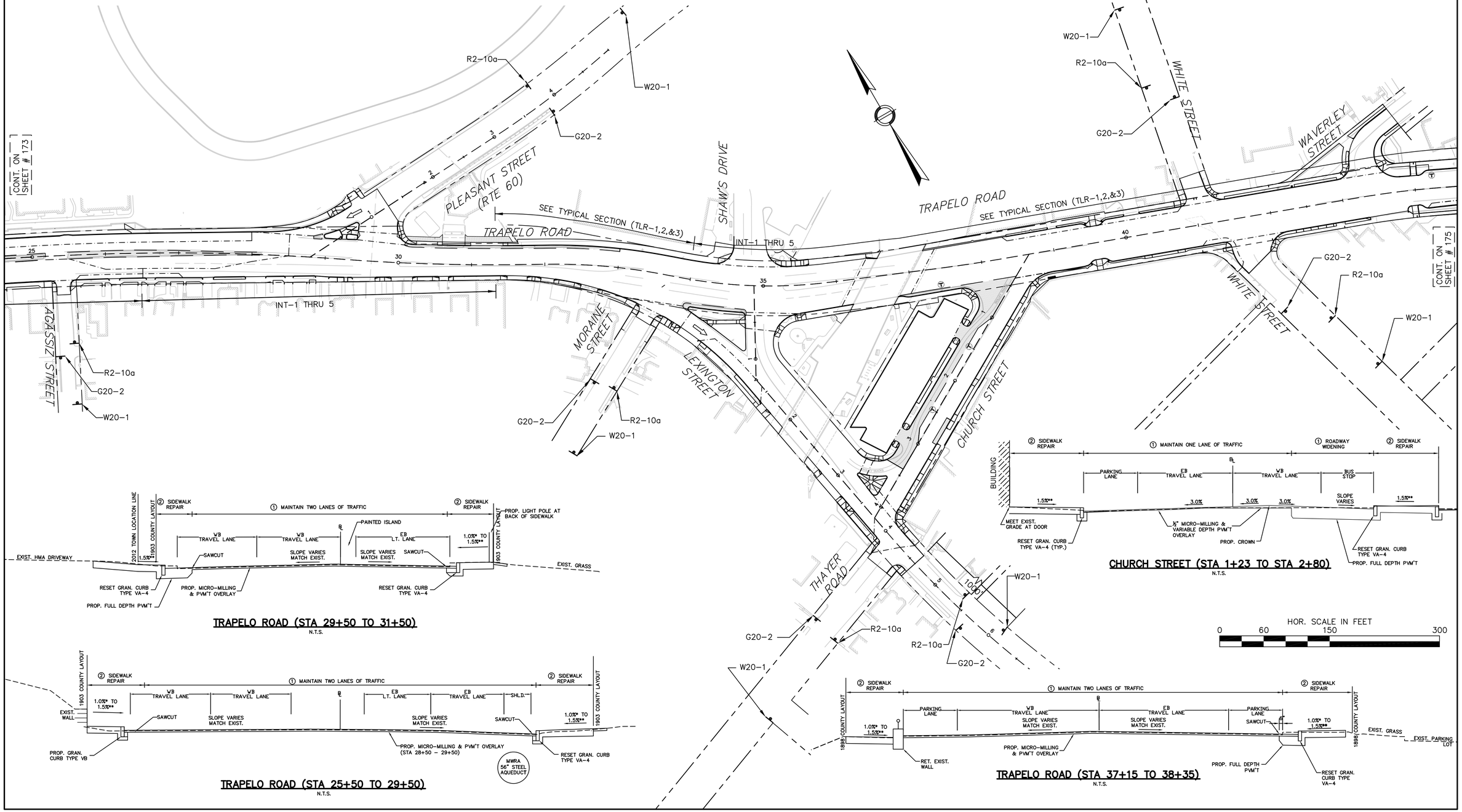
TRAFFIC MANAGEMENT PLAN



TRAPELO ROAD (STA 31+50 TO 36+25)
N.T.S.



TRAPELO ROAD (STA 38+35 TO 43+00)
N.T.S.



TRAPELO ROAD (STA 29+50 TO 31+50)
N.T.S.

TRAPELO ROAD (STA 25+50 TO 29+50)
N.T.S.

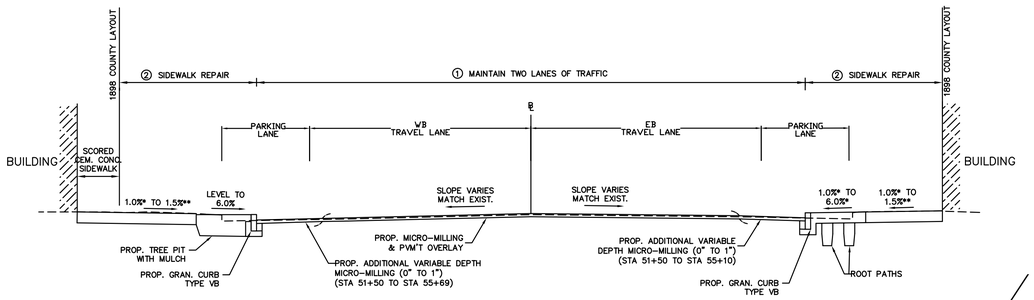
CHURCH STREET (STA 1+23 TO STA 2+80)
N.T.S.

TRAPELO ROAD (STA 37+15 TO 38+35)
N.T.S.

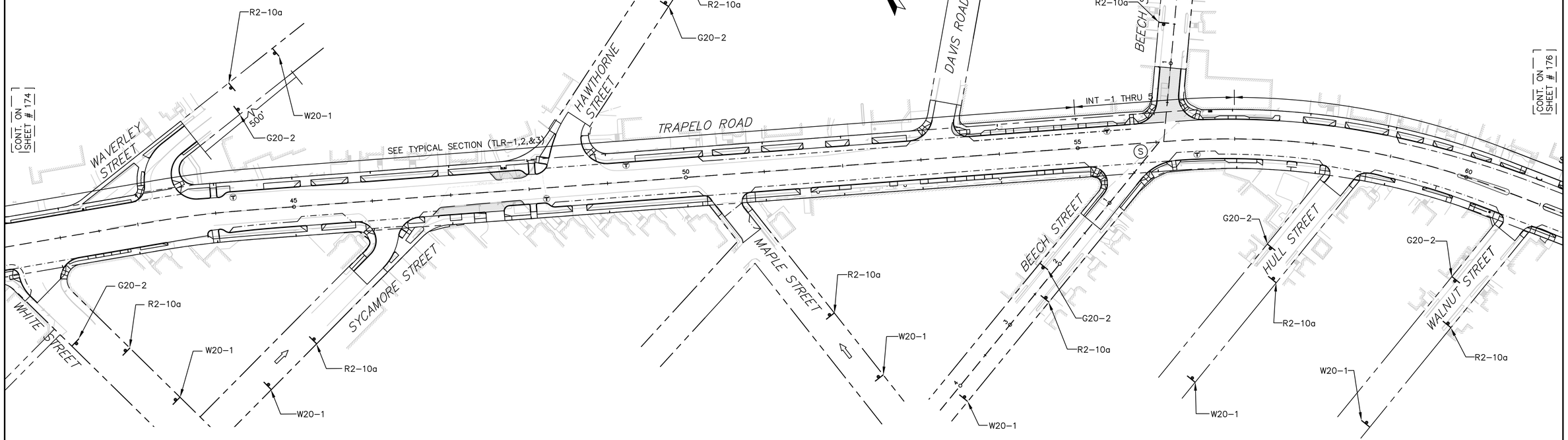
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

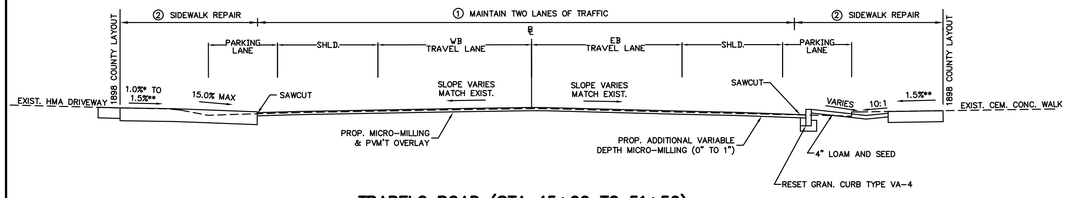
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	175	214
PROJ. FILE NO. 604688			

TRAFFIC MANAGEMENT PLAN

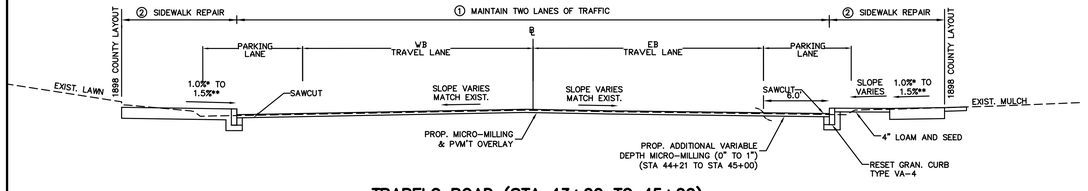


TRAPELO ROAD (STA 51+50 TO 58+00)
N.T.S.



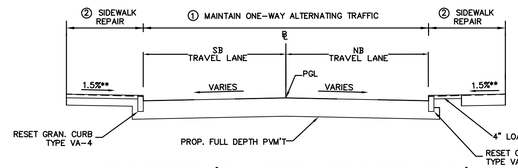


TRAPELO ROAD (STA 45+00 TO 51+50)
N.T.S.



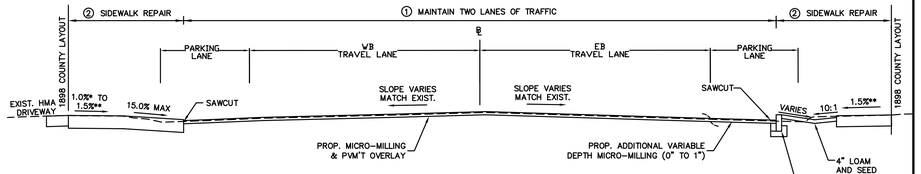
TRAPELO ROAD (STA 43+00 TO 45+00)
N.T.S.

HOR. SCALE IN FEET
0 60 150 300



SIDE STREET (FULL DEPTH RECONSTRUCTION)
N.T.S.

BEECH STREET (STA 0+25 TO STA 0+94)

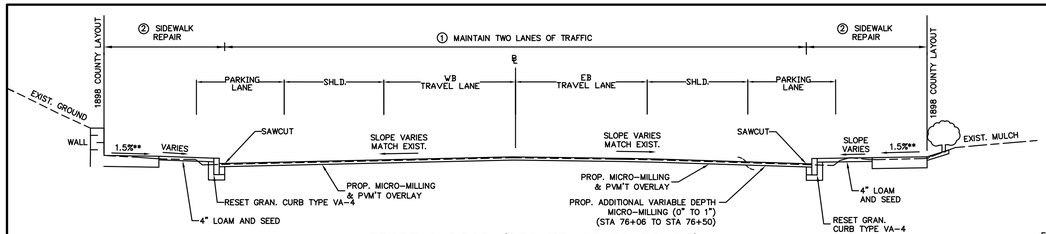


TRAPELO ROAD (STA 58+00 TO 61+05)
N.T.S.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

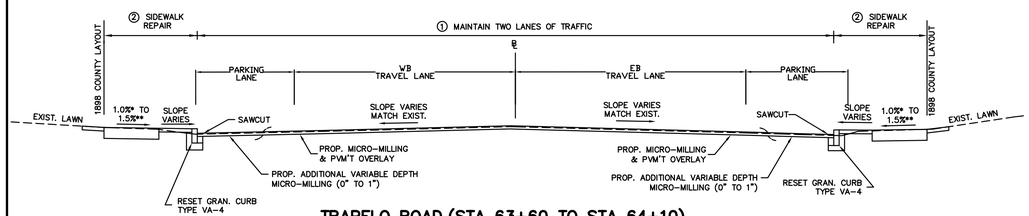
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	XXXXX	176	214
PROJ. FILE NO. 604688			

TRAFFIC MANAGEMENT PLAN



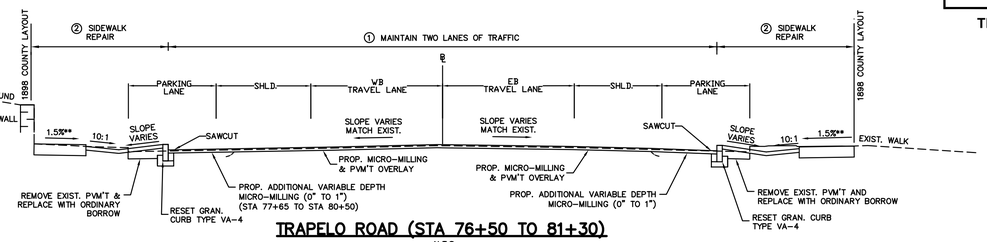
TRAPELO ROAD (STA 73+25 TO 76+50)

N.T.S.



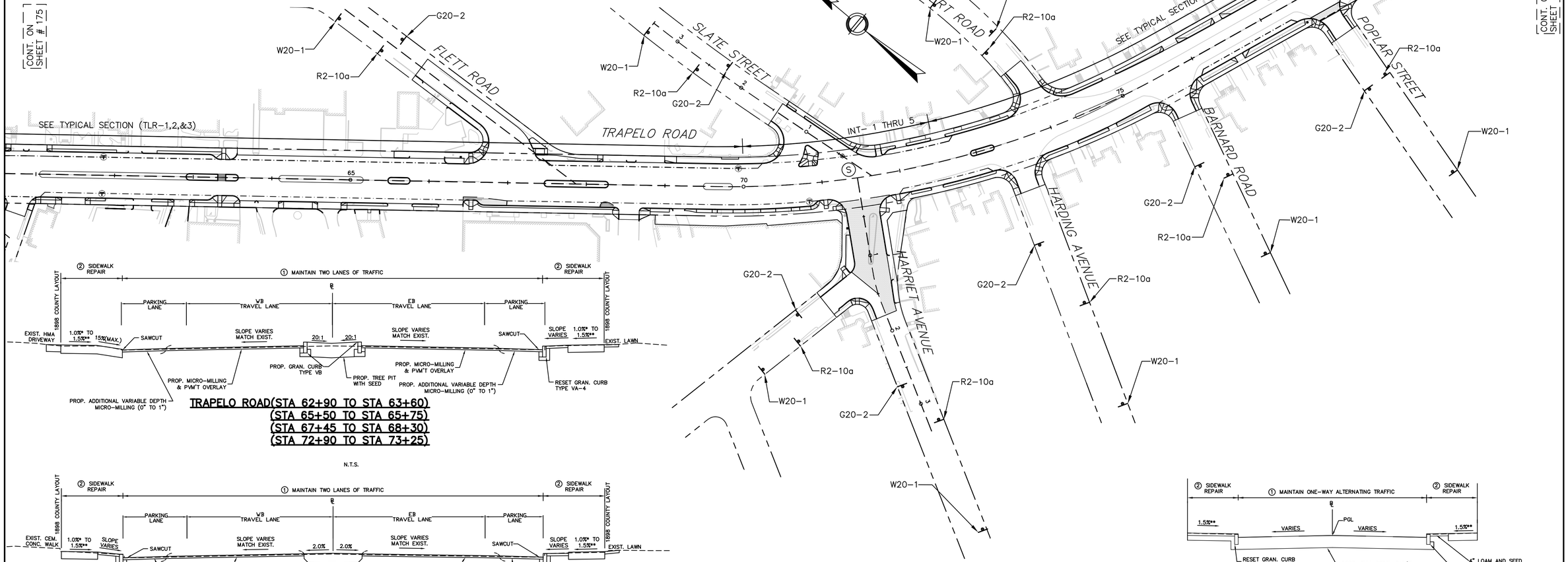
TRAPELO ROAD (STA 63+60 TO STA 64+10)
(STA 65+15 TO STA 65+50)
(STA 65+75 TO STA 67+45)
(STA 68+30 TO STA 69+50)
(STA 69+85 TO STA 72+90)

N.T.S.



TRAPELO ROAD (STA 76+50 TO 81+30)

N.T.S.



TRAPELO ROAD(STA 62+90 TO STA 63+60)
(STA 65+50 TO STA 65+75)
(STA 67+45 TO STA 68+30)
(STA 72+90 TO STA 73+25)

N.T.S.

TRAPELO ROAD (STA 61+05 TO STA 62+90)
(STA 64+10 TO STA 65+15)
(STA 69+50 TO STA 69+85)

N.T.S.

HOR. SCALE IN FEET
0 60 150 300

HARRIET AVENUE (STA 0+30 TO STA 1+78)

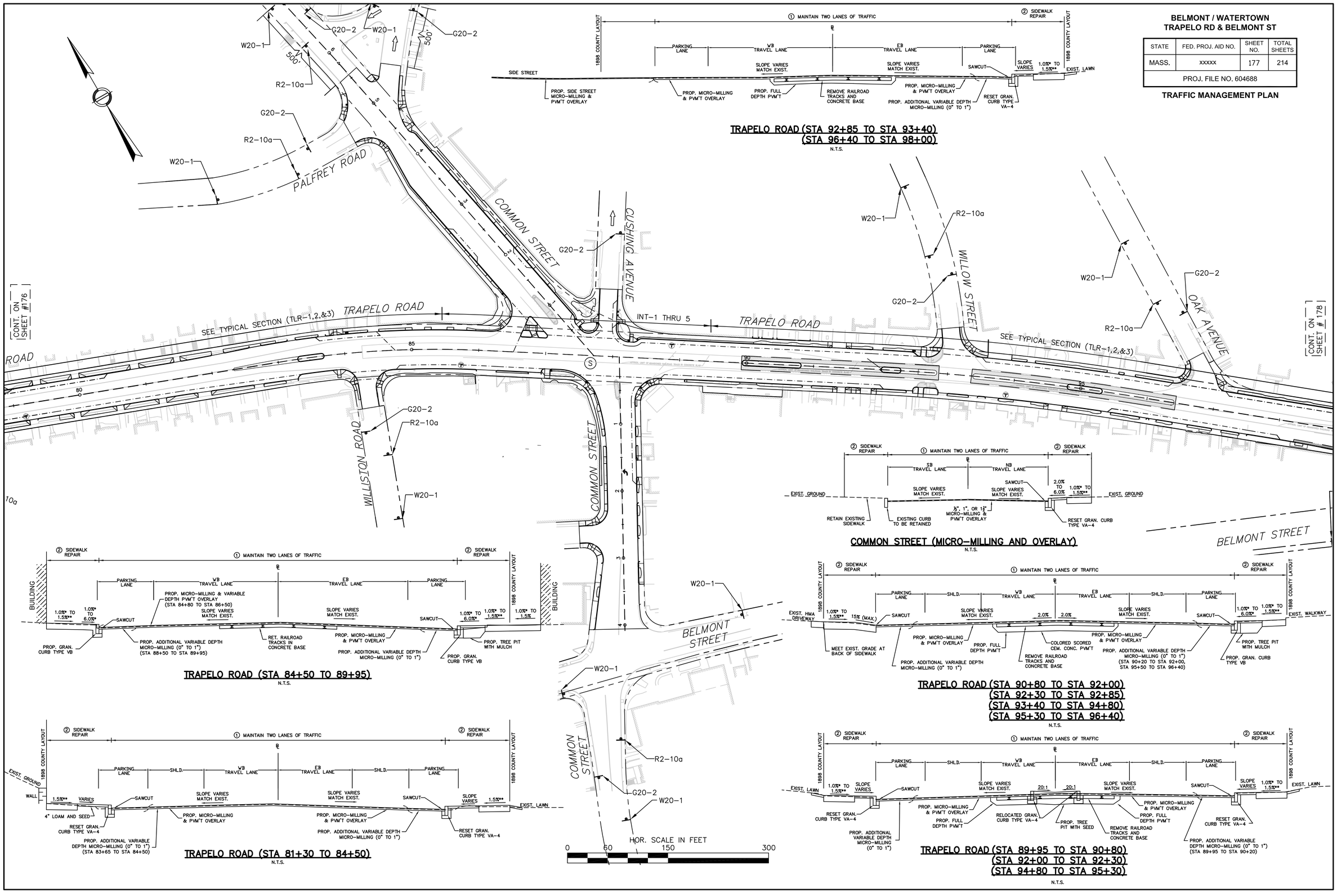
N.T.S.

SIDE STREET (FULL DEPTH RECONSTRUCTION)

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	XXXXX	177	214
PROJ. FILE NO. 604688			

TRAFFIC MANAGEMENT PLAN



TRAPELO ROAD (STA 92+85 TO STA 93+40)
(STA 96+40 TO STA 98+00)
N.T.S.

COMMON STREET (MICRO-MILLING AND OVERLAY)
N.T.S.

TRAPELO ROAD (STA 84+50 TO 89+95)
N.T.S.

TRAPELO ROAD (STA 90+80 TO STA 92+00)
(STA 92+30 TO STA 92+85)
(STA 93+40 TO STA 94+80)
(STA 95+30 TO STA 96+40)
N.T.S.

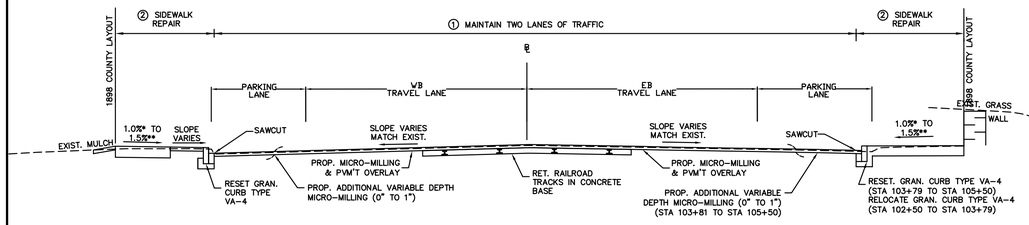
TRAPELO ROAD (STA 81+30 TO 84+50)
N.T.S.

TRAPELO ROAD (STA 89+95 TO STA 90+80)
(STA 92+00 TO STA 92+30)
(STA 94+80 TO STA 95+30)
N.T.S.

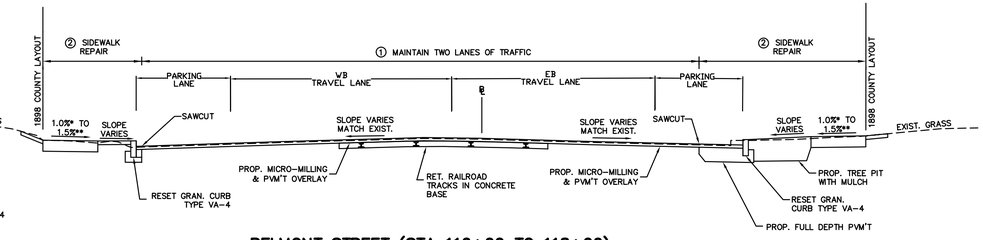
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	XXXXX	178	214
PROJ. FILE NO. 604688			

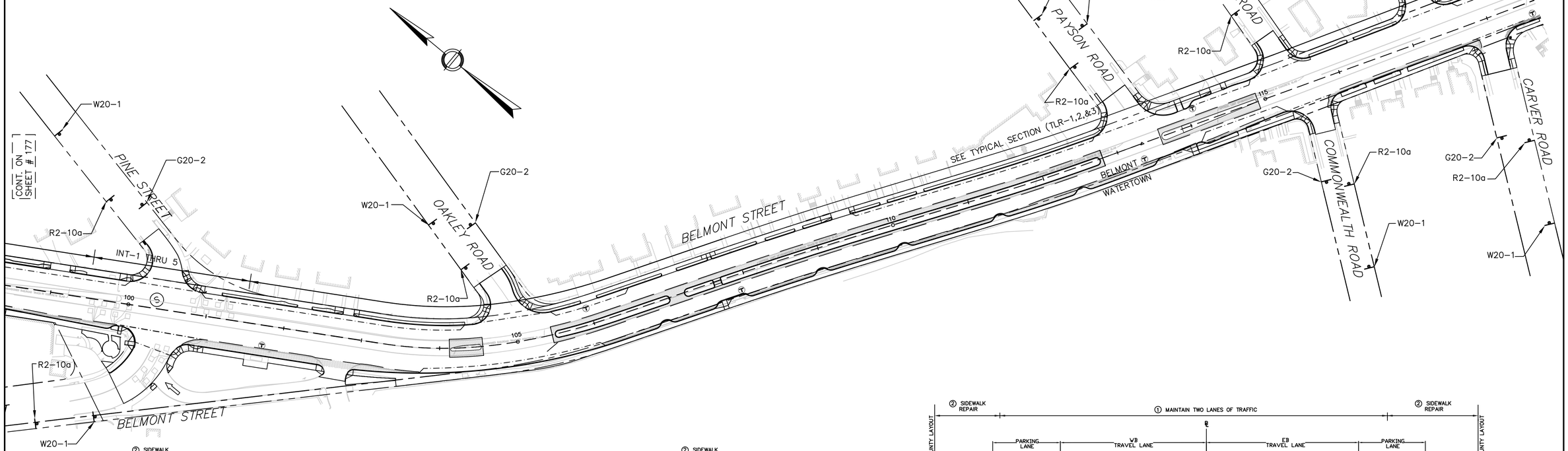
TRAFFIC MANAGEMENT PLAN

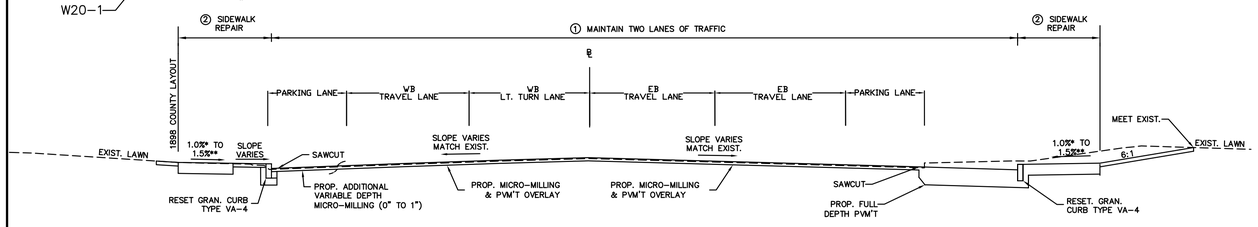


TRAPELO ROAD(STA 102+50 TO STA 105+50)
N.T.S.

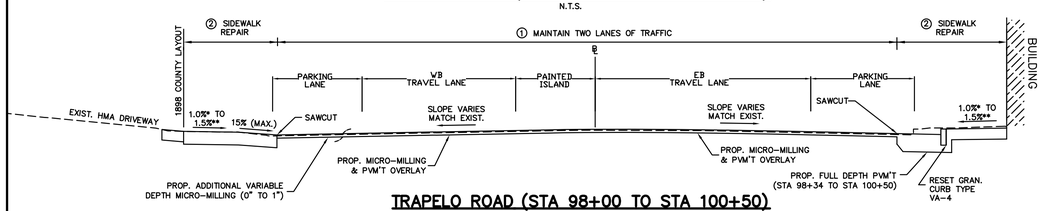


BELMONT STREET (STA 116+00 TO 118+00)
N.T.S.



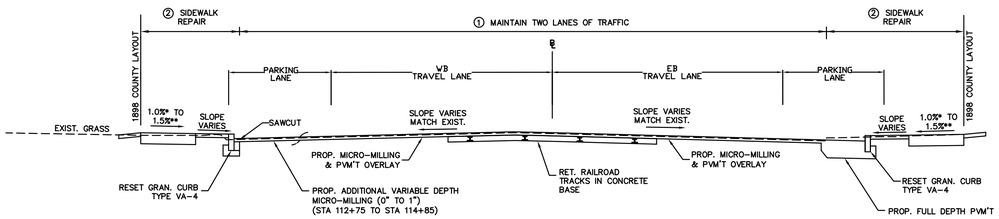


TRAPELO ROAD (STA 100+50 TO STA 102+50)
N.T.S.

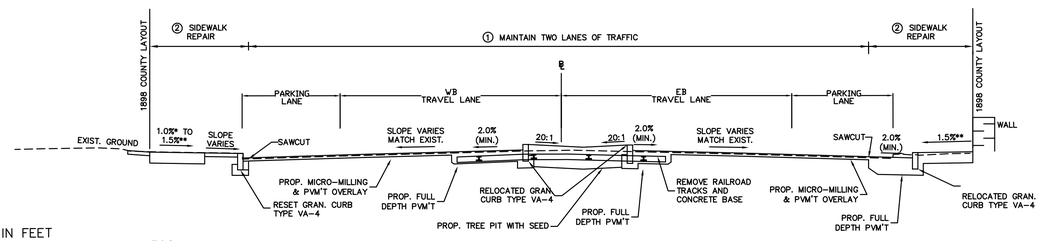


TRAPELO ROAD (STA 98+00 TO STA 100+50)
N.T.S.

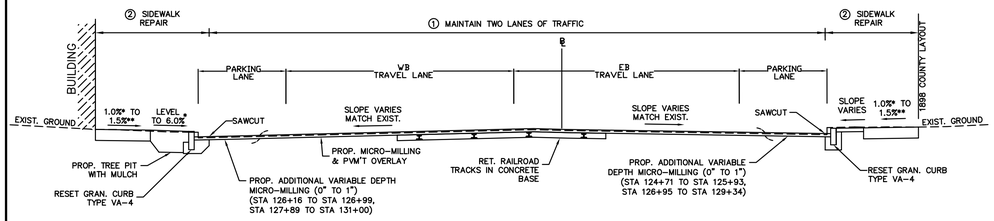
HOR. SCALE IN FEET
0 60 150 300



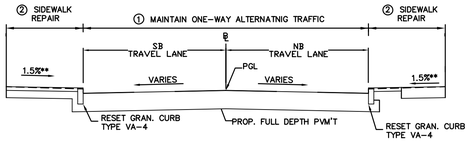
BELMONT STEET (STA 112+75 TO 116+00)
N.T.S.



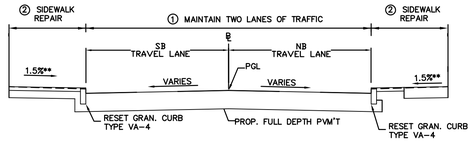
BELMONT STREET (STA 106+00 TO 112+75)
N.T.S.



BELMONT STREET (STA 124+50 TO 131+00)
N.T.S.



SIDE STREET (FULL DEPTH RECONSTRUCTION)
N.T.S.
SCHOOL STREET (STA 0+35 TO STA 1+25)
WORCESTER STREET (STA 0+35 TO STA 0+79)
NEWTON STREET (STA 0+35 TO STA 0+80)

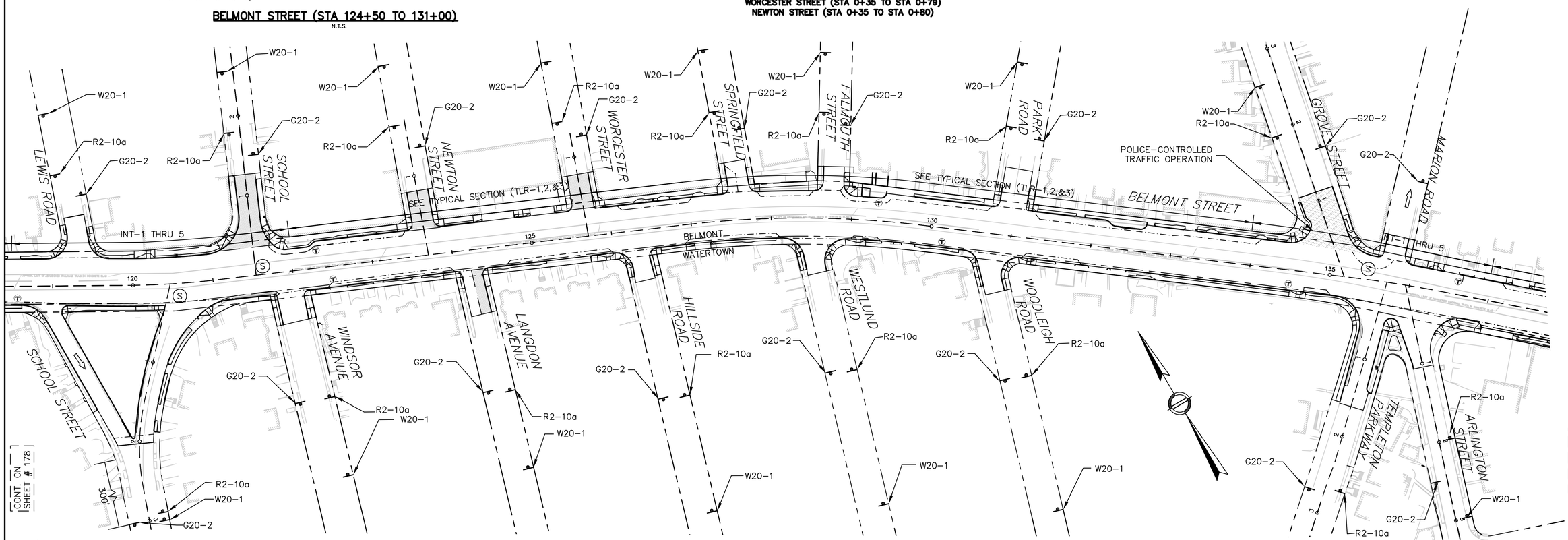


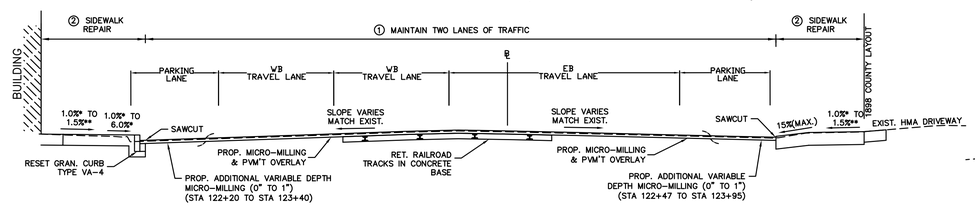
SIDE STREET (FULL DEPTH RECONSTRUCTION)
N.T.S.
GROVE STREET (STA 0+36 TO STA 1+11)

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

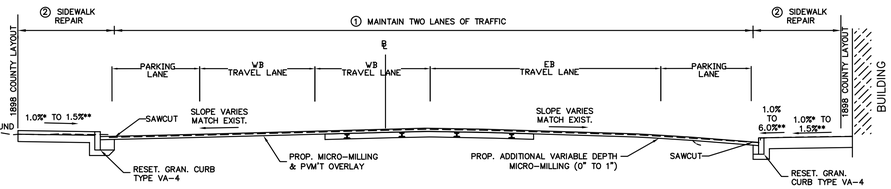
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	XXXXX	179	214
PROJ. FILE NO. 604688			

TRAFFIC MANAGEMENT PLAN

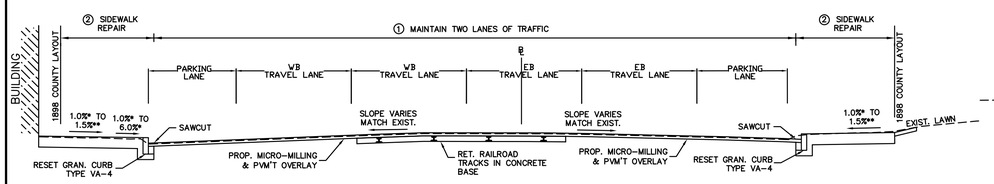




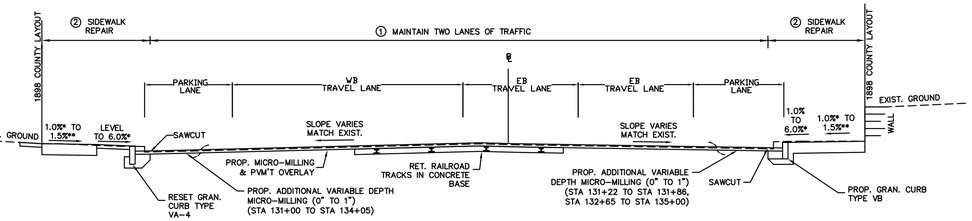
BELMONT STREET (STA 121+50 TO 124+50)
N.T.S.



BELMONT STREET (STA 135+00 TO 138+00)
N.T.S.



BELMONT STREET (STA 118+00 TO 121+50)
N.T.S.



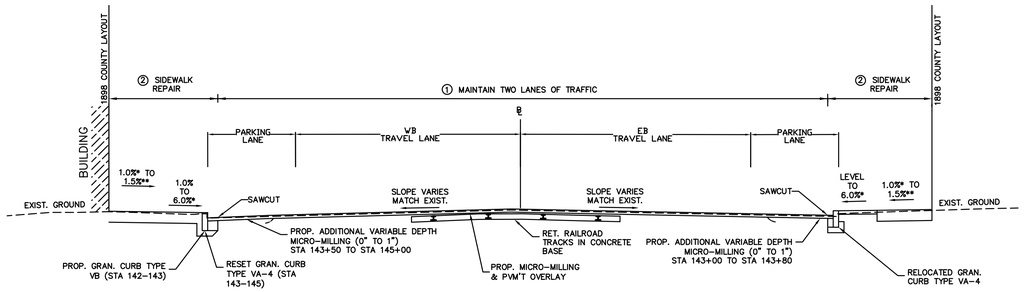
BELMONT STREET (STA 131+00 TO 135+00)
N.T.S.

HOR. SCALE IN FEET
0 60 150 300

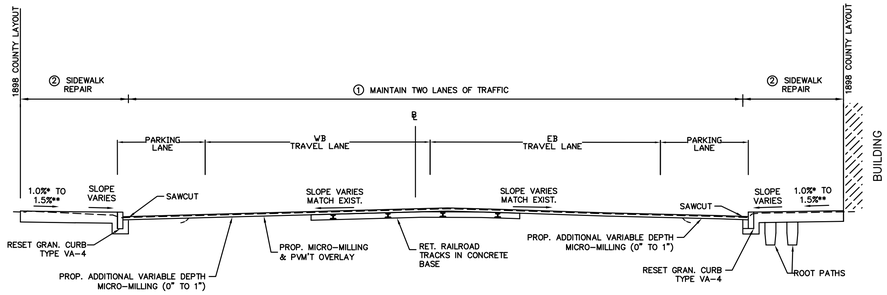
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	180	214
PROJ. FILE NO. 604688			

TRAFFIC MANAGEMENT PLAN



BELMONT STREET (STA 141+00 TO 147+30)
N.T.S.



BELMONT STREET (STA 138+00 TO 141+00)
N.T.S.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	181	214
PROJ. FILE NO. 604688			

TRAFFIC MANAGEMENT PLAN

TRAFFIC SIGN SUMMARY (CONSTRUCTION)

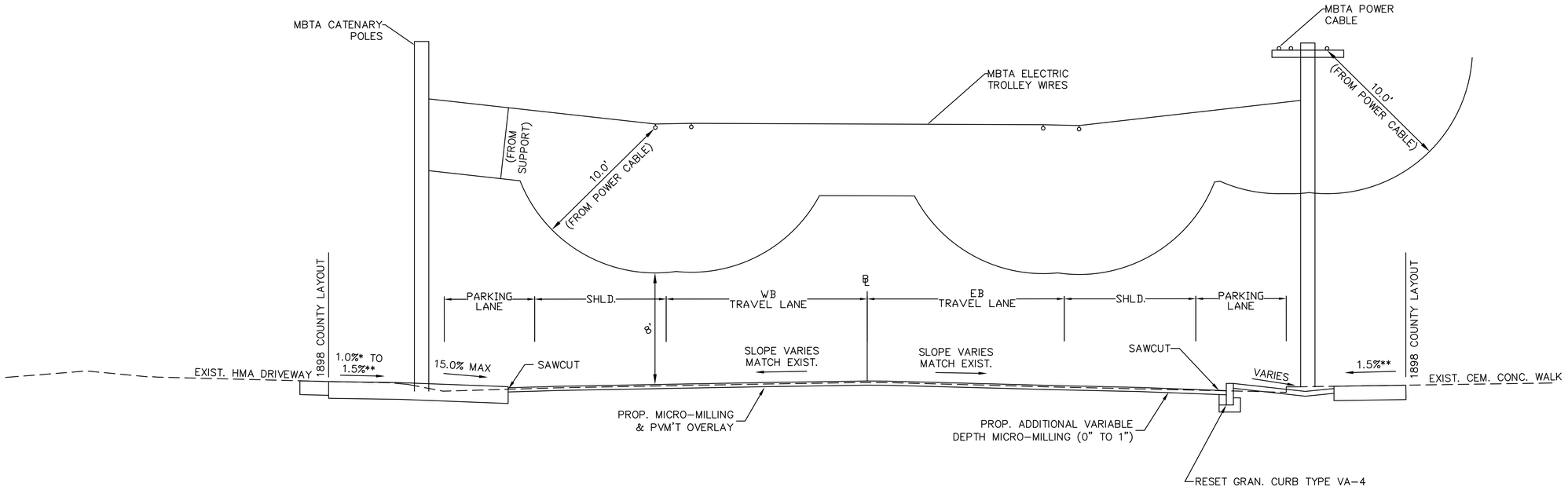
IDENTIFI-CATION NUMBER	SIZE OF SIGN WIDTH (in)	SIZE OF SIGN HEIGHT (in)	TEXT	TEXT DIMENSIONS (in) LETTER HEIGHT	TEXT DIMENSIONS (in) VERTICAL SPACING	TEXT DIMENSIONS (in) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK-GROUND	COLOR LEGEND	COLOR BORDER	UNIT AREA (S.F.)	AREA (S.F.)
R2-10a	48	36	WORK ZONE SPEEDING FINES DOUBLED	SEE MASSDOT STANDARDS			66	SEE MASSDOT STANDARDS			12.00	900.00
R3-7R/L	30	30	RIGHT LANE MUST TURN RIGHT / LEFT LANE MUST TURN LEFT	SEE 2003 M.U.T.C.D.			2 / 2	SEE 2003 M.U.T.C.D.			6.25	12.50 / 12.50
R4-7	24	30					4				5.00	20.00
R9-8	36	18	PEDESTRIAN CROSSWALK				4				4.50	18.00
R9-9	24	12	SIDEWALK CLOSED				8				2.00	16.00
R9-10	24	12	SIDEWALK CLOSED USE OTHER SIDE				8				2.00	16.00
R9-11R/L	24	18	SIDEWALK CLOSED AHEAD CROSS HERE / SIDEWALK CLOSED AHEAD CROSS HERE				8				3.00	24.00
R9-11aR/L	24	12	SIDEWALK CLOSED CROSS HERE / SIDEWALK CLOSED CROSS HERE				8				2.00	16.00
W1-4R/L	36	36					4 / 4				9.00	36.00 / 36.00
W4-2R/L	36	36					2 / 2				9.00	36.00
W4-7R/L	36	36	THRU TRAFFIC MERGE RIGHT / THRU TRAFFIC MERGE LEFT				2 / 2				9.00	18.00 / 18.00
W5-1	36	36	ROAD NARROWS	SEE MASSDOT STANDARDS			4	SEE MASSDOT STANDARDS			9.00	36.00
W8-3	36	36	PAVEMENT ENDS	SEE 2003 M.U.T.C.D.			4	SEE 2003 M.U.T.C.D.			9.00	36.00
W8-8	36	36	ROUGH ROAD				4				9.00	36.00
W11-2	36	36					4				9.00	36.00
W12-1	36	36					2				9.00	18.00
W16-7pR/L	24	12					2 / 2				2.00	4.00 / 4.00
W16-9p(AHD)	24	12	AHEAD				4				2.00	8.00
W20-1(AHD)	36	36	ROAD WORK AHEAD				70				9.00	675.00
W20-4(AHD)	36	36	ONE LANE ROAD AHEAD				4				9.00	36.00

IDENTIFI-CATION NUMBER	SIZE OF SIGN WIDTH (in)	SIZE OF SIGN HEIGHT (in)	TEXT	TEXT DIMENSIONS (in) LETTER HEIGHT	TEXT DIMENSIONS (in) VERTICAL SPACING	TEXT DIMENSIONS (in) ARROW RTE. MKR.	NUMBER OF SIGNS REQUIRED	COLOR BACK-GROUND	COLOR LEGEND	COLOR BORDER	UNIT AREA (S.F.)	AREA (S.F.)
W20-5R/C/L (AHD)	36	36	RIGHT LANE CLOSED AHEAD / CENTER LANE CLOSED AHEAD / LEFT LANE CLOSED AHEAD	SEE 2003 M.U.T.C.D.			2 / 1 / 2	SEE 2003 M.U.T.C.D.			9.00	18.00 / 9.00 / 18.00
W20-7a	36	36					4				9.00	36.00
W20-8 (AHD)	36	36	POLICE OFFICER AHEAD	SEE MASSDOT STDS			4	SEE MASSDOT STDS			9.00	36.00
W21-5aR	36	36	RIGHT SHOULDER CLOSED	SEE 2003 M.U.T.C.D.			4	SEE 2003 M.U.T.C.D.			9.00	36.00
W30-8R	36	36	SQUEEZE RIGHT	SEE MASSDOT STDS			4	SEE MASSDOT STDS			9.00	36.00
G20-2	36	18	END ROAD WORK	SEE 2003 M.U.T.C.D.			66	SEE 2003 M.U.T.C.D.			4.50	337.50

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

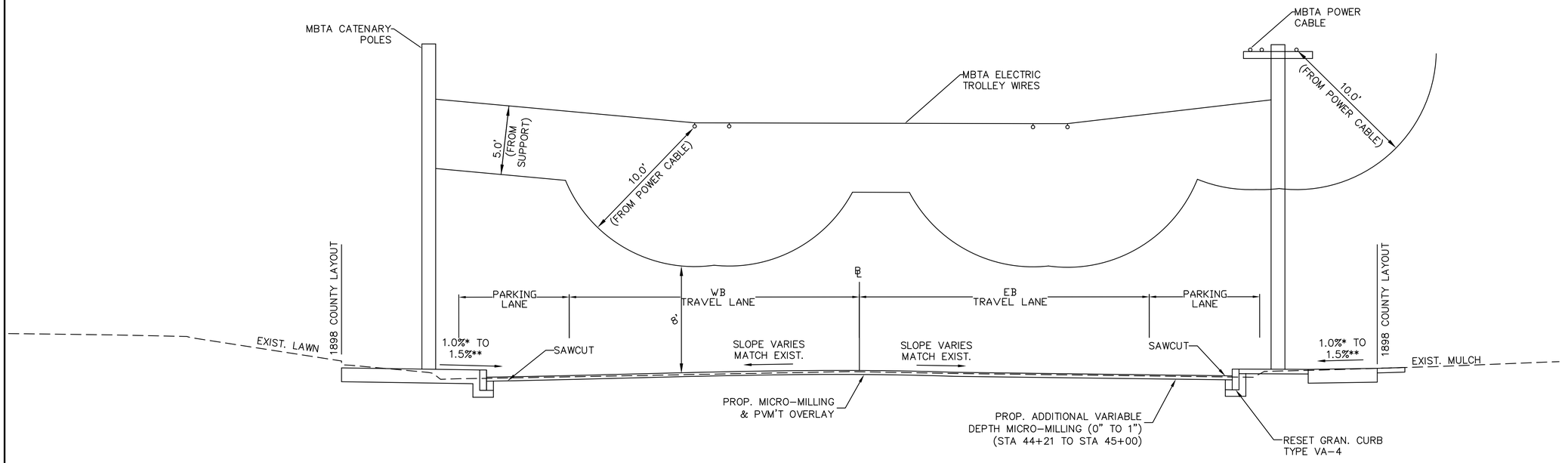
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	182	214
PROJ. FILE NO. 604688			

TRAFFIC MANAGEMENT PLAN



MBTA CLEARANCE ENVELOPE– ROADWAY NARROWING

N.T.S.



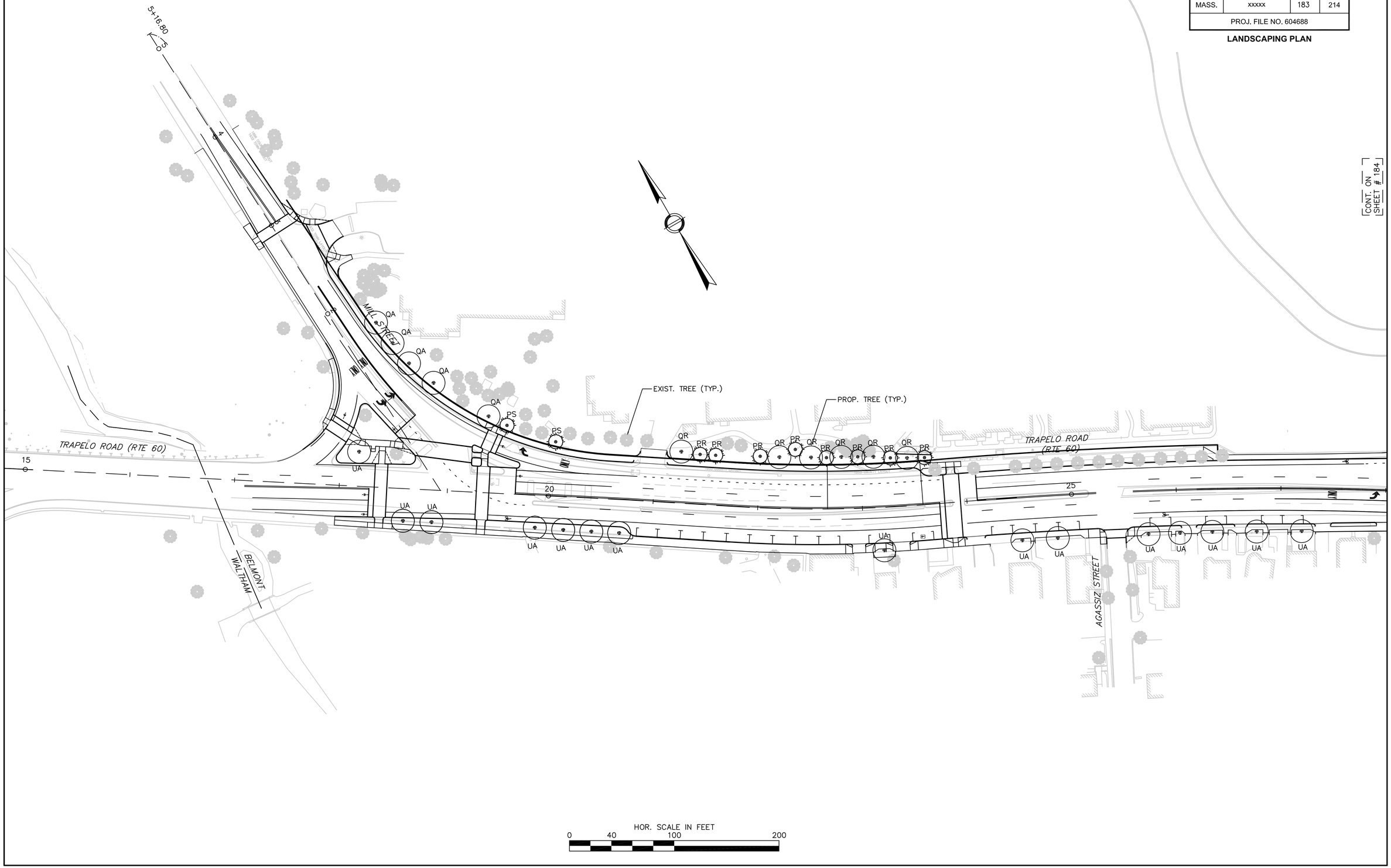
MBTA CLEARANCE ENVELOPE

N.T.S.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	183	214
PROJ. FILE NO. 604688			

LANDSCAPING PLAN



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	184	214
PROJ. FILE NO. 604688			

LANDSCAPING PLAN

CONT. ON SHEET # 183

CONT. ON SHEET # 185

OLMSTEAD DRIVE

PLEASANT STREET (RTE 60)

TRAPELO ROAD

TRAPELO ROAD

SHAW'S DRIVE

MORAINE STREET

CHURCH STREET

LEXINGTON STREET

THAYER ROAD

PROP. TREE (TYP.)

EXIST. TREE (TYP.)

UA

PA

SJ

SA

GT

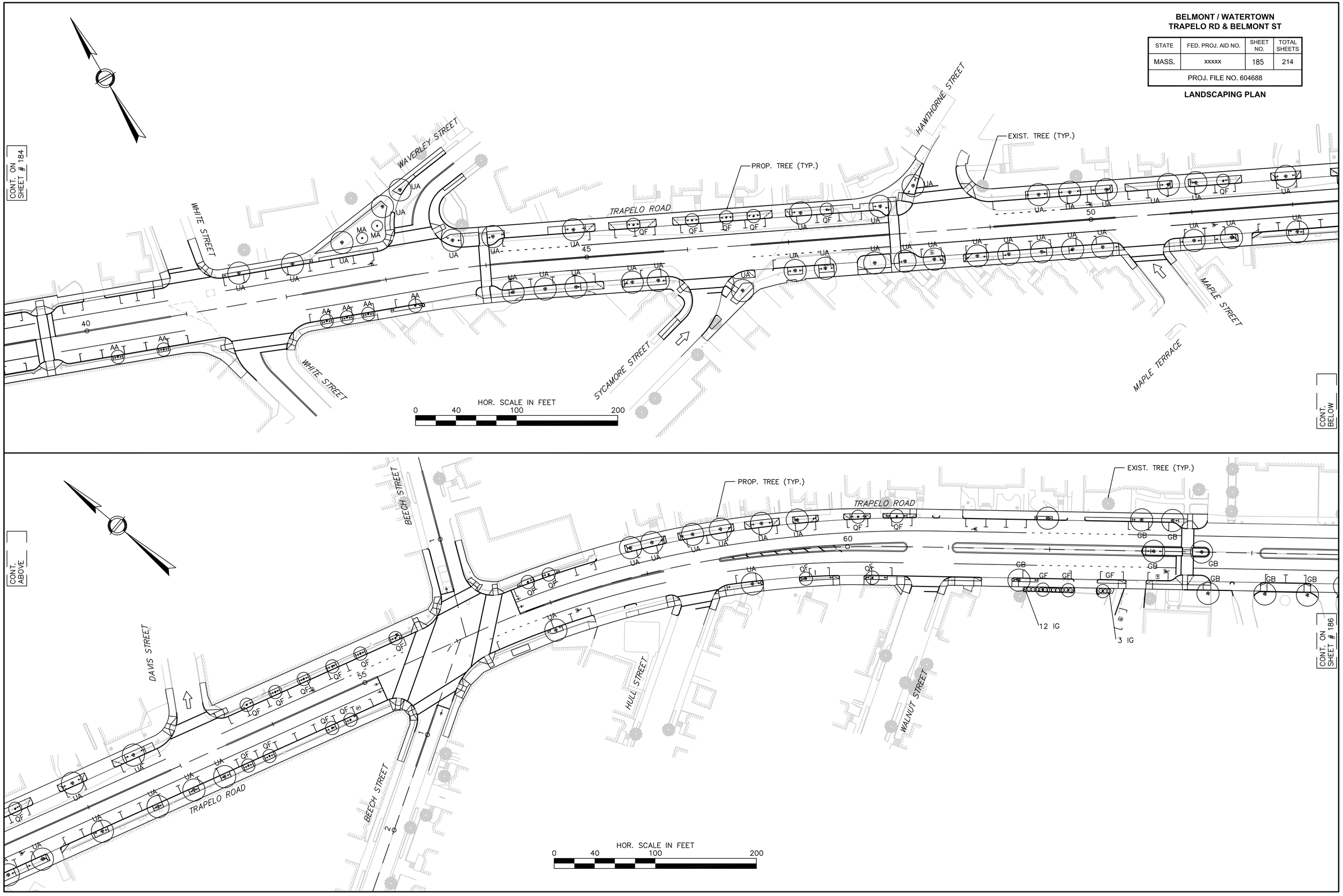
HOR. SCALE IN FEET

0 40 100 200

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	185	214
PROJ. FILE NO. 604688			

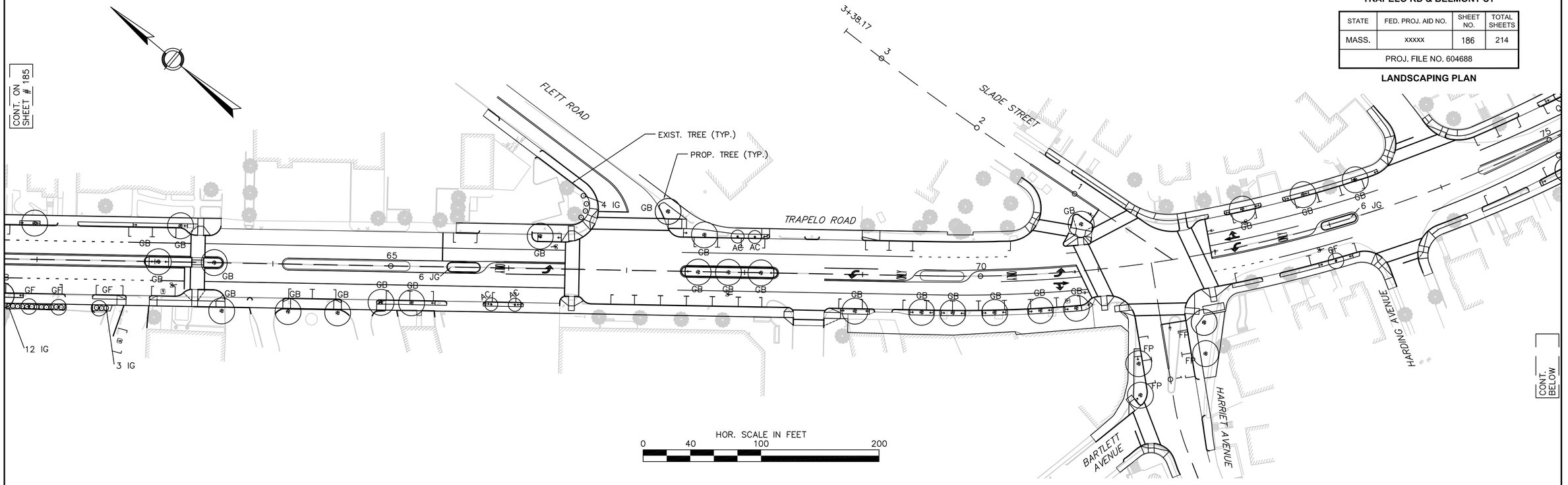
LANDSCAPING PLAN



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	186	214
PROJ. FILE NO. 604688			

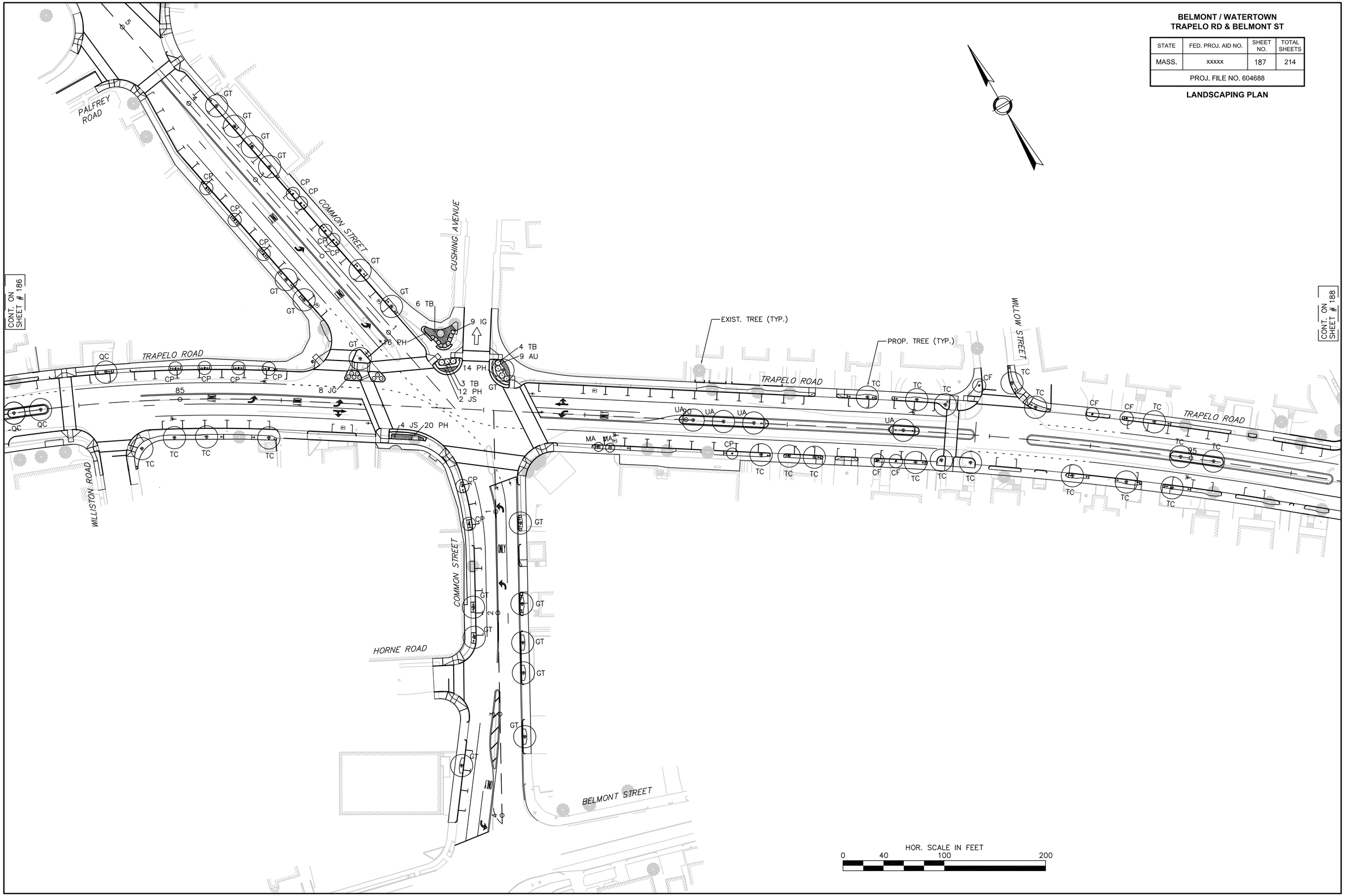
LANDSCAPING PLAN



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	187	214
PROJ. FILE NO. 604688			

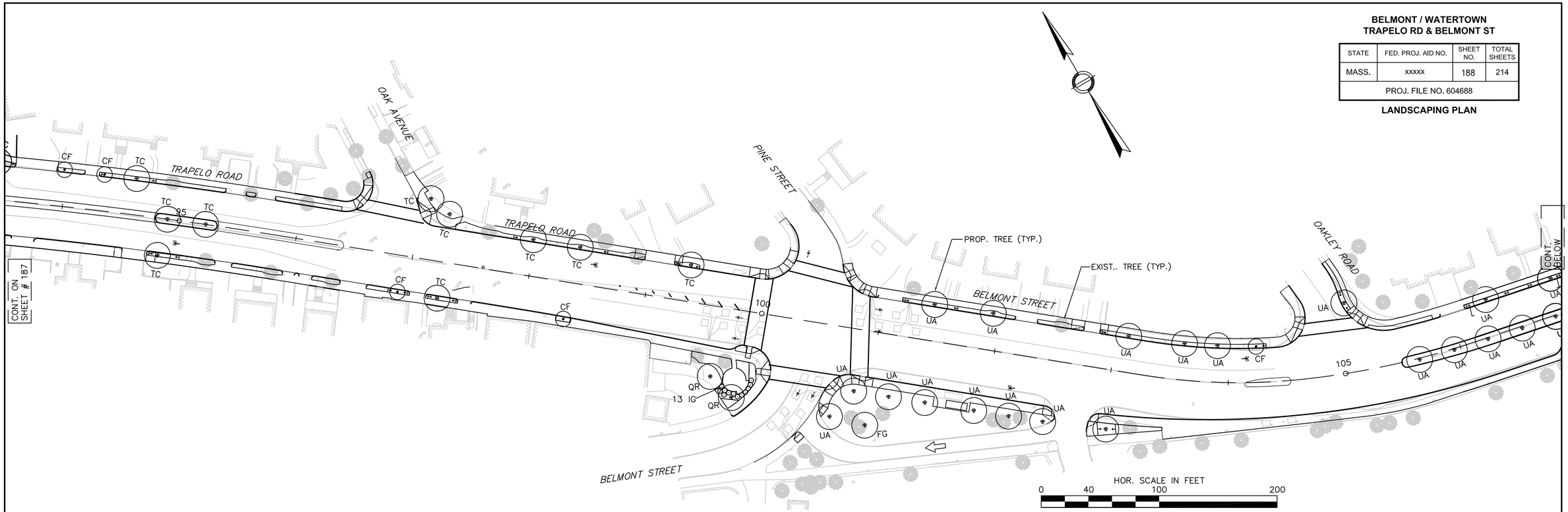
LANDSCAPING PLAN



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	188	214
PROJ. FILE NO. 604688			

LANDSCAPING PLAN



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

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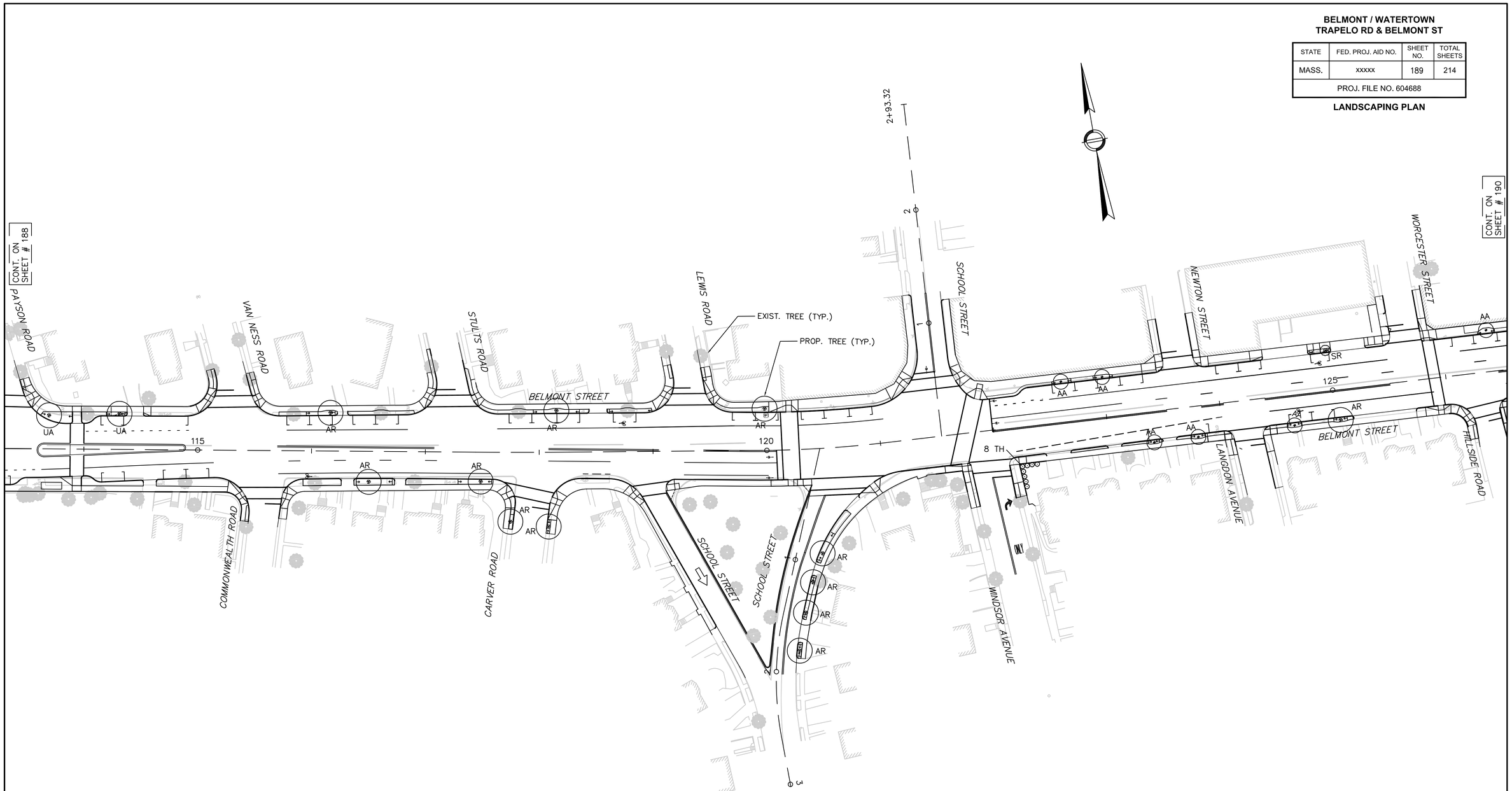
LANDSCAPING PLAN



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

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LANDSCAPING PLAN

WORCESTER STREET
SPRINGFIELD STREET
FALMOUTH STREET
PARK ROAD
GROVE STREET
BELMONT STREET
HILLSIDE ROAD
WESTLAND ROAD
WOODLEIGH ROAD
TEMPLETON PARKWAY
ARLINGTON STREET
MARLBORO STREET
OXFORD AVENUE
EXETER STREET
ERICSSON STREET
PRENTISS STREET
KEENAN STREET
BRIMMER STREET

EXIST. TREE (TYP.)
PROP. TREE (TYP.)

CONT. ON SHEET # 189
CONT. BELOW
CONT. ABOVE

STA. 140+80.76 TRAPELO ROAD B =
STA. 0+00.00 OXFORD AVENUE B
N=2962091.1031 E=765942.7184

HOR. SCALE IN FEET
0 40 100 200

PLANT SUMMARY TABLE

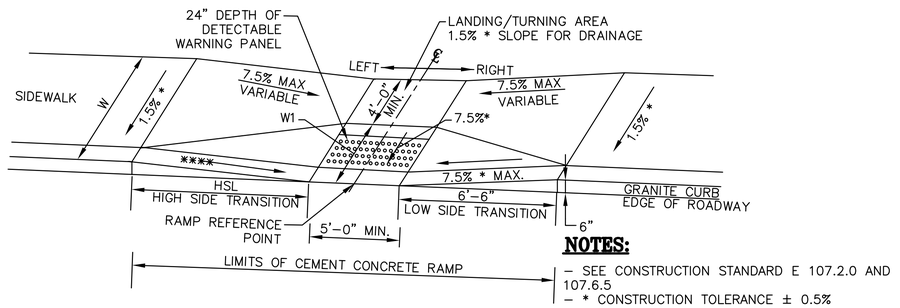
QT.	SYMBOL	COMMON NAME	SCIENITIFIC NAME	SIZE
CANOPY TREES				
119	UA	ELM AMERICAN – 'VALLEY FORGE'	ULMUS AMERICANA 'VALLEY FORGE'	2.5–3" CALIPER
8	QR	OAK – NORTHERN RED	QUERCUS RUBRA	2–2.5" CALIPER
5	QA	OAK – WHITE	QUERCUS ALBA	2.5–3" CALIPER
11	PA	PLANETREE – LONDON	PLATANUS ACERIFOLIA 'BLOOD GOOD'	2–2.5" CALIPER
3	SJ	PAGODA TREE 'REGENT'	SOPHORA JAPONICA 'REGENT'	2–2.5" CALIPER
3	CC	KATSURA TREE	CERCIDIPHYLLUM JAPONICUM	2–2.5" CALIPER
24	GT	LOCUST – HONEY – 'SKYLINE'	GLEDITSIA TRIACANTHOS INERMIS 'SKYLINE'	2–2.5" CALIPER
26	GB	GINKGO – BILOBA	GINKGO BILOBA	2–2.5" CALIPER
4	FP	ASH – GREEN	FRAXINUS PENSYLVANICA	2–2.5" CALIPER
32	QC	OAK – SCARLET	QUERCUS COCCINEA	2–2.5" CALIPER
14	QP	OAK – PIN GREEN PILLAR	QUERCUS PALUSTRIS 'GREEN PILLAR'	2–2.5" CALIPER
25	TC	LINDEN – LITTLE LEAF – 'GREENSPIRE'	TILLIA CORDATA 'GREENSPIRE'	2–2.5" CALIPER
32	AR	MAPLE – RED – 'OCTOBER GLORY'	ACER RUBRUM 'OCTOBER GLORY'	2–2.5" CALIPER
NOTE: CANOPY TREES SHALL BE WELL ROOTED B&B, AND SHALL BE MATCHED SPECIMINES				
EVERGREEN TREES				
8	PR	PINE – RED	PINUS RESINOSA	8–10' HEIGHT
2	PS	PINE – WHITE	PINUS STROBUS	5–6' HEIGHT
NOTE: EVERGREEN TREES SHALL BE CONTAINER GROWN UNLESS OTHERWISE APPROVED				
COLUMNAR TREES				
16	AA	MAPLE – RED – 'ARMSTRONG'	ACER RUBRUM 'ARMSTRONG'	2–2.5" CALIPER
22	QF	OAK – PYRAMIDAL ENGLISH	QUERCUS ROBUR 'FASTIGIATA'	2–2.5" CALIPER
10	GF	GINKGO – BILOBA 'FASTIGIATA'	COLUMNAR GINKGO BILOBA	2–2.5" CALIPER
14	CP	PEAR – CALLERY – 'CHANTICLEER'	PYRUS CALLERYANA 'CHANTICLEAR'	2–2.5" CALIPER
11	CF	HORNBEAM – 'FASTIGIATE'	CARPINUS BETULUS 'FASTIGIATA'	2.5–3" CALIPER
NOTE: COLUMNAR TREES SHALL BE WELL ROOTED B&B, AND SHALL BE MATCHED SPECIMINES				
ORNAMENTAL TREES				
5	MA	CRABAPPLE – 'ADIRONDACK'	MALUS 'ADIRONDACK'	1.5–2" CALIPER
5	SR	LILAC TREE – JAPANESE	SYRINGA RETICULATA 'IVORY SILK'	1.5–2" CALIPER
4	AC	MAPLE –HEDGE	ACER CAMPESTRE	1.5–2" CALIPER
4	SA	MOUNTAIN ASH – KOREAN – PYRAMIDAL	SORBUS ALNIFOLIA FASTIGIATA	2–2.5" CALIPER
1	FG	BEECH – RIVERS PURPLE	FAGUS SYLVATICA 'RIVERSII'	2–2.5" CALIPER
NOTE: ORNAMENTAL TREES SHALL BE MATCHED SPECIMINES WHERE GROUPED				
SHRUBS				
1	FO	'FORSYTHIA – 'ARNOLD DWARF'	FORSYTHIA X INTERMEDIA 'ARNOLD DWARF'	15–24" HEIGHT
4	LI	PRIVET – REGAL	LIGUSTRUM IBOLIUM 'REGAL'	18–24" HEIGHT
20	JG	JUNIPER – 'SEAGREEN'	JUNIPARUS CHINENSIS 'SEA GREEN'	18–24" HEIGHT
41	IG	INKBERRY – DENSA	ILEX GLABRA 'DENSA'	2–3' HEIGHT
8	TH	YEW – HICK'S	TAXUS 'MEDIA HICKSII'	30–36" HEIGHT
GROUNDCOVER				
13	TB	YEW – SPREADING ENGLISH	TAXUS BACCATA REPANDENS	15–18" SPREAD
6	JS	JUNIPER – SARGENT'S	JUNIPARUS CHINENSIS 'SARGENTII'	15–18" SPREAD
9	AU	BEAR BERRY	ARCTOSTAPHYLOS UVA–URSI	2 GALLON
62	PH	DWARF FOUNTAIN GRASS	PENNISETUM ALOPECUROIDES 'HAMELN'	1 GALLON

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	191	214
PROJ. FILE NO. 604688			

LANDSCAPING PLAN

WHEELCHAIR RAMP
STYLE "A" – PARALLEL PERPENDICULAR



NOTES:

– SEE CONSTRUCTION STANDARD E 107.2.0 AND 107.6.5
– * CONSTRUCTION TOLERANCE ± 0.5%
– ** ABUTS <6" CURB REVEAL
– *** SIDEWALK ENDS
– **** SEE CONSTRUCTION STANDARD E 107.9.0

WCR #	℄ RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	WIDTH OF SIDEWALK (W)	LENGTH OF PRIMARY RAMP (W1)	WIDTH OF PRIMARY RAMP	DEPTH OF LEVEL LANDING Min. 4'-0"	TRANSITION LENGTH AND ROADWAY GUTTER SLOPE (%)			
						LEFT SIDE		RIGHT SIDE	
						L	%	L	%
A8	23+86.10/34.00RT	VARIES	2.22	5.0	4.0	6.5	N/A	9.0	1.73
A10	29+98.28/39.31LT	7.9	3.9	5.0	4.0	15.0	7.21	6.5	N/A
A12	33+90.39/62.95RT	9.5	5.5	5.0	4.0	N/A	N/A	4.5**	1.53
A15	35+17.25/59.56RT	VARIES	4.16	5.0	4.0	5.5**	2.21	9.0	1.84
A16	35+46.25/38.89RT	VARIES	5.50	5.0	4.0	6.5	N/A	3.25**	0.31
A17	LEXINGTON ST. 3+43.70/15.00RT	10.0	6.0	5.0	4.0	6.5	N/A	7.0**	3.93
A18	LEXINGTON ST. 4+10.78/16.50LT	8.5	4.5	5.0	4.0	11.0	2.54	6.5	N/A
A19	CHURCH ST. 3+48.75/37.45RT	VARIES	5.58	5.0	4.0	15.0	4.83	6.5	N/A
A21	37+83.54/38.62RT	VARIES	5.38	5.0	4.2	6.5	N/A	15.0	5.31
A24	41+22.13/38.83LT	5.0	2.23	5.0	4.92	6.5	N/A	6.5	N/A
A27	43+14.00/39.03LT	8.5	2.57	5.0	5.29	7.66	0.19	6.5	N/A
A29	53+10.38/35.72LT	VARIES	6.39	5.0	4.44	6.5	N/A	9.0	1.78
A31	55+24.18/27.99RT	12.5	7.42	5.0	4.09	3.25**	N/A	7.5**	1.64
A32	55+34.59/46.53RT	6.5	3.47	5.0	4.00	6.5	N/A	5.5**	2.52
A33	55+82.39/40.81RT	VARIES	6.81	5.0	4.14	6.5	N/A	6.5	N/A
A36	56+35.38/40.89LT	VARIES	3.11	5.0	4.0	7.66	0.36	3.25**	N/A
A37	55+99.21/37.30LT	VARIES	3.85	5.0	4.0	7.66	0.42	7.66	0.93
A39	66+73.70/41.21LT	VARIES	4.78	5.0	4.0	6.5	N/A	7.66	0.09
A40	70+50.77/42.98LT	VARIES	2.52	5.0	4.0	7.66	0.63	6.5	N/A
A42	HARRIET AVE. 1+47.47/27.11RT	7.0	3.83	5.0	4.03	15.0	7.84	6.5	N/A
A46	73+35.54/41.78RT	8.5	4.95	5.0	4.0	14.0	3.23	6.5	N/A
A47	73+64.49/1.93RT	8.5	4.47	5.0	4.0	15.0	6.09	6.5	N/A
A49	73+70.77/38.94LT	8.5	4.78	5.0	4.0	6.5	N/A	15.0	10.08
A50	75+43.34/34.79RT	VARIES	7.48	5.0	4.28	9.0	1.48	6.5	N/A
A51	75+78.12/34.60RT	12.5	7.67	5.0	4.40	15.0	5.18	6.5	N/A
A52	83+89.00/29.00LT	8.5	4.5	5.0	4.0	6.5	N/A	9.0	1.47
A53	84+45.45/44.95RT	8.5	4.81	5.0	4.0	15.0	4.29	9.0	1.14
A54	N. COMMON ST. 5+14.55/40.25LT	7.5	3.91	5.0	4.0	9.0	1.46	6.5	N/A
A55	N. COMMON ST. 4+67.90/42.63LT	8.0	3.23	5.0	4.0	6.5	N/A	15.0	4.85
A56	N. COMMON ST. 4+40.67/26.36LT	8.0	3.88	5.0	4.0	6.5	N/A	6.5	N/A
A60	88+39.12/50.54RT	8.0	4.93	5.0	4.0	3.83**	0.58	9.0	1.71
A61	88+59.16/31.22RT	8.5	4.96	5.0	4.0	9.0	1.65	4.79**	0.84
A62	S. COMMON ST. 2+50.00/41.79RT	VARIES	4.37	5.0	4.59	11.0	2.75	6.5	N/A
A63	S. COMMON ST. 2+79.98/42.28RT	VARIES	4.67	5.0	4.07	15.0	5.21	6.5	N/A
A64	93+27.78/37.67LT	8.5	5.93	5.0	4.03	6.5	N/A	6.5	N/A

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	192	214
PROJ. FILE NO. 604688			

CONSTRUCTION DETAILS
WHEELCHAIR RAMPS

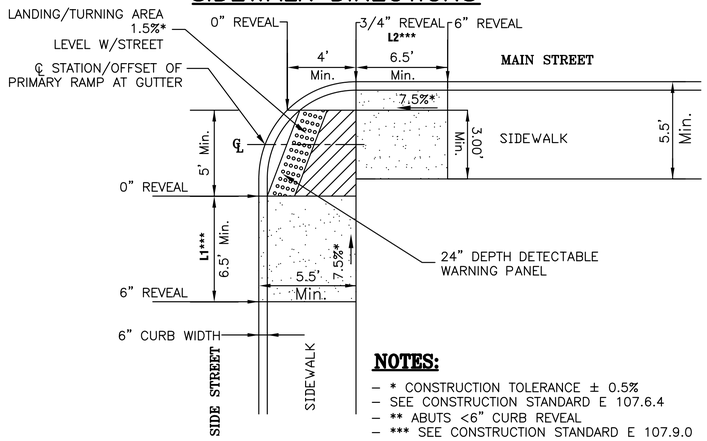
WCR #	C RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	WIDTH OF SIDEWALK (W)	LENGTH OF PRIMARY RAMP (W1)	WIDTH OF PRIMARY RAMP (W1)	DEPTH OF LEVEL LANDING Min. 4'-0"	TRANSITION LENGTH AND ROADWAY GUTTER SLOPE (%)			
						LEFT SIDE		RIGHT SIDE	
						L	%	L	%
A65	96+53.30/38.89LT	8.5	4.08	5.0	4.01	6.5	N/A	14.0	3.61
A68	100+67.35/48.29RT	8.0	4.53	5.0	4.06	6.5	N/A	6.5	N/A
A69	100+89.53/39.00RT	7.50	3.50	5.0	4.0	6.5	N/A	7.66	0.10
A70	100+84.36/29.65LT	8.5	4.42	5.0	4.0	4.5**	1.90	6.5	N/A
A71	100+65.19/43.00LT	8.5	4.15	5.0	4.0	7.66	0.86	3.25**	N/A
A73	99+95.78/29.04LT	8.5	4.46	5.0	4.00	9.00	1.34	3.25**	N/A
A74	104+68.94/43.85LT	8.5	4.50	5.0	4.0	15.0	4.98	6.5	N/A
A75	105+15.81/43.13LT	8.5	4.59	5.0	4.0	7.66	0.57	6.5	N/A
A76	113+02.06/44.48LT	8.5	3.38	5.0	4.0	15.0	5.54	6.5	N/A
A77	115+12.88/44.09LT	8.0	3.16	5.0	4.03	14.0	3.15	7.66	0.91
A78	113+49.16/43.49LT	VARIES	6.57	6.0	4.82	7.66	0.24	6.5	N/A
A79	115+40.76/37.78RT	VARIES	2.52	5.0	4.0	7.66	0.81	14.0	3.02
A80	115+74.72/38.92RT	VARIES	3.39	5.0	4.13	6.5	N/A	9.0	1.83
A81	117+06.38/46.47LT	7.5	4.03	5.0	4.0	9.0	1.86	6.5	N/A
A84	118+10.19/41.69RT	VARIES	5.31	5.0	4.0	6.5	N/A	15.0	5.25
A85	118+86.55/35.17RT	VARIES	3.49	5.0	4.0	7.66	0.67	6.5	N/A
A86	119+15.03/47.52LT	7.5	3.95	5.0	4.0	14.0	3.58	9.0	1.77
A87	119+48.10/47.33LT	8.5	4.63	5.0	4.0	15.0	6.47	6.5	N/A
A88	120+20.29/33.35LT	7.5	5.91	5.0	4.0	15.0	5.28	6.5	N/A
A90	121+28.83/46.84LT	VARIES	6.54	5.0	4.34	15.0	4.73	6.5	N/A
A91	121+70.92/9.28LT	8.0	4.0	5.0	4.0	6.5	N/A	4.5**	1.45
A94	125+92.70/24.50RT	7.5	4.0	5.0	4.0	6.5	N/A	11.0	2.26
A95	126+19.15/35.92RT	7.5	4.19	5.0	4.02	6.5	N/A	11.0	2.81
A97	128+71.18/39.19RT	7.5	4.41	5.0	4.0	6.5	N/A	9.0	1.96
A98	129+09.94/24.50RT	7.5	3.75	5.0	4.06	6.5	N/A	14.0	3.81
A99	130+65.02/44.00RT	7.0	2.82	5.0	4.0	14.0	3.36	6.5	N/A
A100	130+93.57/43.69RT	7.5	5.24	5.0	4.01	6.5	N/A	15.0	4.27
A101	131+25.83/25.00RT	7.5	3.5	5.0	4.0	6.5	N/A	11.0	2.87
A102	134+63.86/24.99RT	7.5	3.57	5.0	4.0	6.5	N/A	9.0	1.24
A105	135+22.20/44.79LT	VARIES	4.33	5.0	4.0	6.5	N/A	7.66	0.81
A106	136+27.97/25.32LT	7.5	3.5	5.0	4.0	7.66	0.31	6.5	N/A
A110	144+18.45/42.97RT	8.0	4.86	5.0	4.0	9.0	1.23	6.5	N/A
A111	144+51.84/42.82RT	8.5	4.63	5.0	4.0	6.5	N/A	11.0	2.17
A113	146+46.67/45.66RT	VARIES	4.56	5.0	4.0	6.5	N/A	11.0	1.31
A114	146+76.67/43.28RT	7.0	4.05	5.0	4.11	7.66	0.15	6.5	N/A
A117	77+64.16/36.66RT	12.5	6.56	5.0	4.0	6.5	N/A	6.5	N/A
A119	29+10.87/60.04LT	VARIES	5.57	5.0	4.0	6.5	N/A	11.0	2.28
A120	ARLINGTON ST. 3+21.44/17.45LT	7.50	2.36	5.0	4.10	7.66	0.83	6.5	N/A
A121	87+70.11/45.48RT	VARIES	4.20	5.0	4.0	9.0	1.36	6.5	N/A

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	193	214
PROJ. FILE NO. 604688			

CONSTRUCTION DETAILS
WHEELCHAIR RAMPS

WHEELCHAIR RAMP
STYLE "C" – SINGLE STREET CROSSING SERVING TWO SIDEWALK DIRECTIONS

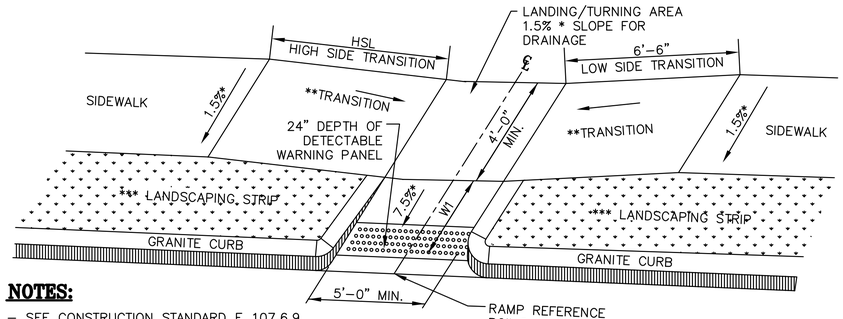


NOTES:

– * CONSTRUCTION TOLERANCE ± 0.5%
– SEE CONSTRUCTION STANDARD E 107.6.4
– ** ABUTS <6" CURB REVEAL
– *** SEE CONSTRUCTION STANDARD E 107.9.0

WCR #	℄ RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	LEVEL LANDING LENGTH	RAMP WIDTH	ROADWAY 1 WIDTH OF SIDEWALK	TRANSITION 1		ROADWAY 2 WIDTH OF SIDEWALK	TRANSITION 2	
					GUTTER GRADE	L1		GUTTER GRADE	L2
C1	25+31.23/39.99RT	5.73	5.00	6.00	N/A	6.5	8.50	2.41	11.00
C3	33+37.55/52.44RT	7.06	6.25	8.00	N/A	6.5	6.00	3.30	14.00
C4	33+62.55/60.03RT	8.42	5.00	8.50	1.10	9.00	9.50	5.47	7.50**
C5	40+89.18/35.00LT	7.91	5.00	9.0	N/A	6.5	8.50	1.08	9.00
C6	50+32.86/35.00RT	7.46	5.00	6.30	2.06	11.00	12.50	N/A	6.50
C7	50+69.14/35.00RT	6.14	5.00	7.00	2.34	11.00	12.50	2.16	11.00
C8	58+26.52/35.00RT	6.42	5.00	7.00	N/A	6.5	12.50	2.73	7.00**
C9	58+60.24/35.93RT	5.87	5.00	5.75	0.82	7.66	11.00	N/A	7.00
C10	60+63.73/35.00RT	6.49	5.00	7.23	N/A	6.5	8.50	0.60	7.66
C11	60+93.24/35.87RT	6.69	5.32	6.79	N/A	6.5	8.50	N/A	6.50
C12	122+10.96/30.00RT	7.91	5.00	9.06	6.37	15.0	7.50	N/A	6.50
C13	123+54.11/40.38LT	6.21	5.00	6.68	1.43	9.0	7.50	4.45	15.0
C14	123+81.98/40.01LT	5.78	5.00	6.00	N/A	6.5	8.50	2.41	11.00
C16	124+35.32/29.98RT	5.82	5.00	6.60	4.26	15.0	7.50	N/A	6.50
C17	125+64.65/40.00LT	6.18	5.00	6.80	0.66	7.66	7.50	3.06	7.00**
C19	126+44.68/30.00RT	8.45	5.00	9.17	3.73	14.0	7.50	N/A	6.50
C20	127+48.28/39.88LT	6.26	5.00	7.20	0.09	7.66	8.50	1.81	9.00
C21	127+74.88/40.16LT	6.55	5.00	7.00	2.91	11.00	7.91	N/A	6.50
C22	128+63.92/44.18LT	7.23	5.00	7.34	N/A	6.5	VARIES	2.41	11.00
C23	130+80.35/40.00LT	7.82	5.00	8.34	N/A	6.5	7.50	0.26	7.66
C24	135+62.71/34.63LT	5.70	5.00	6.00	N/A	6.5	7.60	0.34	7.66
C25	135+90.18/33.15LT	6.13	5.00	7.50	1.38	9.00	7.50	N/A	6.50
C26	138+19.62/31.00LT	6.73	5.00	8.11	N/A	6.5	7.50	0.17	7.66
C27	138+55.02/30.98LT	6.95	5.00	8.00	N/A	6.5	8.00	N/A	6.50
C28	140+66.36/35.00LT	5.73	5.00	6.14	N/A	6.5	8.00	N/A	6.50
C30	143+10.18/35.00LT	6.61	5.00	7.00	N/A	6.5	8.00	1.20	9.00
C31	143+37.69/35.00LT	6.63	5.00	7.00	N/A	6.5	VARIES	N/A	6.50
C32	146+02.75/35.00LT	7.65	5.00	8.00	N/A	6.5	8.50	1.40	9.00
C33	146+29.06/35.00LT	5.94	5.00	7.60	N/A	6.5	VARIES	N/A	6.50
C34	LEXINGTON ST. 4+43.04/22.50RT	7.50	5.00	8.50	2.48	11.00	9.50	N/A	6.50

WHEELCHAIR RAMP
STYLE "B" – PARALLEL PERPENDICULAR W/ LANDSCAPING STRIP

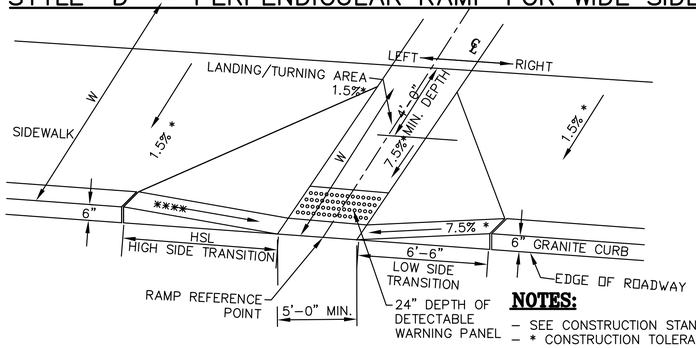


NOTES:

– SEE CONSTRUCTION STANDARD E 107.6.9
– * CONSTRUCTION TOLERANCE ± 0.5%
– ** SEE CONSTRUCTION STANDARD E 107.9.0
– *** NON–WALKING SURFACE

WCR #	C RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	WIDTH OF SIDEWALK (W)	LENGTH OF PRIMARY RAMP (W1)	WIDTH OF PRIMARY RAMP	DEPTH OF LEVEL LANDING Min. 4'–0"	TRANSITION LENGTH AND ROADWAY GUTTER SLOPE (%)			
						LEFT SIDE		RIGHT SIDE	
						L	%	L	%
B4	18+39.47/28.49RT	5.0	5.42	8.0	4.94	9.0	1.62	6.50	1.50
B9	23+86.53/26.97RT	5.0	6.81	8.0	4.97	7.66	0.83	6.50	2.14
B31	107+65.16/29.00LT	5.0	3.50	5.0	5.0	14.0	3.61	6.50	3.70

WHEELCHAIR RAMP
STYLE "D" – PERPENDICULAR RAMP FOR WIDE SIDEWALKS

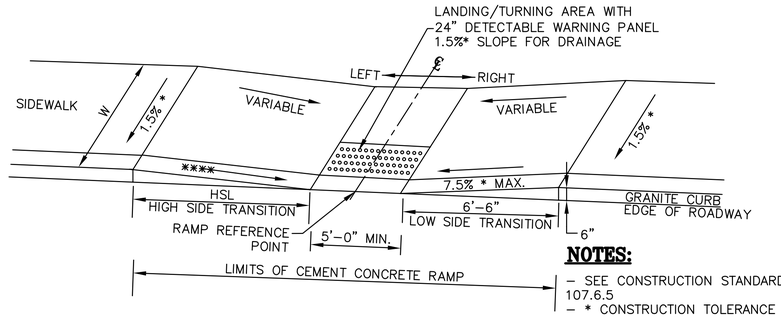


NOTES:

– SEE CONSTRUCTION STANDARD E 107.3.0 AND 107.6.5R
– * CONSTRUCTION TOLERANCE ± 0.5%
– ** ABUTS <6" CURB REVEAL
– *** SIDEWALK ENDS
– **** SEE CONSTRUCTION STANDARD E 107.9.0

WCR #	℄ RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	WIDTH OF SIDEWALK (W)	LENGTH OF PRIMARY RAMP (W1)	WIDTH OF PRIMARY RAMP (W1)	DEPTH OF LEVEL LANDING Min. 4'–0"	TRANSITION LENGTH AND ROADWAY GUTTER SLOPE (%)			
						LEFT SIDE		RIGHT SIDE	
						L	%	L	%
D6	38+65.66/37.33RT	VARIES	8.25	5.0	4.0	6.5	N/A	6.5	N/A
D7	43+53.42/39.43LT	VARIES	8.31	5.0	4.0	6.5	N/A	7.66	0.59
D11	48+77.84/37.36LT	12.5	8.09	5.0	4.0	6.5	N/A	11.0	2.44
D12	63+38.28/23.00LT	8.5	8.13	5.0	6.84	8.17	0.56	6.0	N/A
D13	134+50.65/34.69LT	7.5	8.0	5.0	4.0	9.0	1.32	3.25**	N/A
D15	66+53.71/23.00RT	8.5	8.0	5.0	4.0	9.0	1.04	7.66	0.80
D16	68+42.07/35.00RT	8.5	8.0	5.0	4.0	6.5	N/A	6.33	N/A
D17	68+67.90/35.00RT	8.5	8.0	5.0	4.0	6.33	N/A	6.5	N/A
D18	71+02.26/23.00RT	VARIES	8.0	5.0	4.0	7.5**	5.38	6.5	N/A
D21	77+95.27/36.96RT	VARIES	10.89	5.0	4.0	11.0	2.55	6.5	N/A
D22	83+88.62/23.00RT	14.5	8.0	5.0	4.0	9.0	1.28	6.5	N/A
D24	N. Common St. 4+39.32/12.67RT	8.0	8.07	5.0	4.0	9.0	1.57	6.5	N/A
D25	86+38.12/38.34LT	VARIES	6.5	5.0	4.0	6.5	N/A	14.0	3.21
D30	97+01.89/35.77LT	VARIES	8.44	5.0	4.91	11.0	2.31	7.66	0.63
D33	107+65.66/26.00RT	VARIES	7.5	6.0	4.0	6.5	N/A	14.0	3.79
D37	128+88.83/43.76LT	VARIES	6.95	5.0	4.0	6.5	N/A	7.66	0.64
D38	134+67.46/48.38LT	VARIES	8.13	5.0	4.0	7.0**	3.18	6.5	N/A
D40	135+95.95/52.78RT	VARIES	8.0	5.0	N/A	6.5	N/A	14.0	3.79
D41	136+44.98/46.19RT	VARIES	9.04	5.0	4.0	3.83**	0.75	6.5	N/A
D44	146+52.00/23.00LT	VARIES	8.32	5.0	4.0	3.83**	0.81	6.5	N/A
D45	Mill St. 2+48.18/30.51RT	VARIES	8.21	5.0	4.0	15.0	8.16	6.5	N/A
D48	18+39.46/22.53LT	6.0	8.09	6.0	4.0	6.5	N/A*	6.5	N/A*
D50	34+50.81/37.02LT	VARIES	8.13	5.0	4.0	6.5	N/A	14.0	3.96
D51	41+40.19/38.81RT	VARIES	8.28	5.0	4.0	6.5	N/A	9.0	1.74
D52	45+96.12/34.40RT	12.5	6.18	5.0	4.0	7.66	0.74	9.0	1.81
D54	56+04.08/28.37RT	VARIES	8.35	5.0	4.0	7.66	0.33	7.66	0.52
D55	56+52.74/26.14LT	12.5	6.69	5.0	4.0	4.5**	1.28	6.5	N/A
D56	55+71.10/25.00LT	VARIES	8.5	5.0	4.0	7.66	0.69	6.5	N/A
D57	70+78.61/35.08LT	N/A	5.44	5.0	4.0	8.96	N/A	8.97	N/A
D58	70+87.42/22.00LT	N/A	6.10	5.0	4.0	10.46	N/A	4.0	N/A
D59	70+97.48/29.93LT	N/A	5.56	5.0	4.0	4.0	N/A	4.16	N/A
D60	71+66.91/44.25RT	VARIES	8.17	5.0	4.0	15.0	4.77	6.5	N/A
D61	71+91.89/28.94RT	VARIES	8.0	5.0	4.0	15.0	5.58	6.5	N/A
D62	78+14.21/19.51RT	VARIES	8.16	5.0	4.0	15.0	4.28	6.5	N/A
D66	100+15.18/48.34RT	VARIES	8.46	5.0	4.0	9.0	1.64	7.5	4.95
D67	121+88.75/28.56LT	VARIES	9.43	5.0	4.0	4.5**	1.19	6.50	N/A
D68	141+06.18/23.50LT	14.0	8.0	5.0	6.0	3.83*	0.22	6.5	N/A
D69	141+04.91/23.50RT	14.0	8.0	5.0	4.0	6.5	N/A	7.66	0.36
D70	146+25.25/24.01RT	VARIES	8.14	5.0	4.0	6.5	N/A	9.0	1.09
D73	39+58.46/23.00RT	5.5	9.0	8.0	5.87	9.95	N/A	7.95	0.97
D74	39+58.46/23.00LT	8.25	8.0	8.0	4.0	7.95	0.35	7.95	N/A
D75	Church St. 3+69.77/32.68RT	N/A	5.69	5.0	4.0	15.0	4.23	7.0	5.50
D76	Church St. 3+76.73/13.00RT	N/A	13.68	5.0	4.0	6.75	1.34	12.50	0.0
D77	Church St. 3+85.20/33.12RT	N/A	8.0	5.0	4.0	15.0	3.45	7.0	3.98
D78	120+88.62/34.71RT	12.0	8.0	5.0	4.0	6.5	N/A	10.0**	7.47
D79	41+94.62/43.06RT	8.5	4.23	5.0	4.10	7.66	0.24	6.5	N/A

WHEELCHAIR RAMP
STYLE "G" – NARROW SIDEWALK



NOTES:

– SEE CONSTRUCTION STANDARD E 107.2.0 AND 107.6.5
– * CONSTRUCTION TOLERANCE ± 0.5%
– ** ABUTS <6" CURB REVEAL
– *** SIDEWALK ENDS
– **** SEE CONSTRUCTION STANDARD E 107.9.0

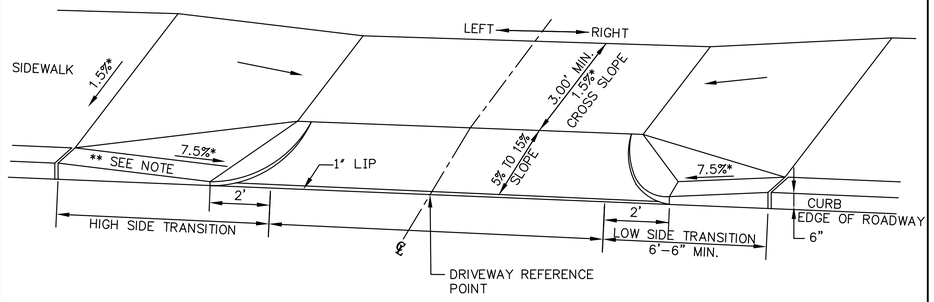
WCR #	℄ RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	WIDTH OF SIDEWALK (W)	TRANSITION LENGTH AND ROADWAY GUTTER SLOPE (%)			
			LEFT SIDE		RIGHT SIDE	
			L	%	L	%
G1	17+87.31/59.24LT	5.5	6.5	N/A	11.0	2.92
G2	MILL ST. 2+95.59/19.75LT	5.25	6.5	N/A	15.0	8.35
G3	MILL ST. 2+96.29/20.83RT	5.5	15.0	6.02	3.25**	N/A
G4	MILL ST. 2+79.51/33.23RT	5.5	6.5	N/A	15.0	4.06
G5	19+44.45/58.67LT	6	6.5	N/A	9.0	1.79
G6	100+19.08/43.80LT	5.8	7.5**	4.58	11.0	2.22
G7	29+29.97/24.40RT	VARIES	N/A	N/A	11.0	2.05
G8	35+42.63/26.00LT	VARIES	7.66	0.92	7.66	0.70
G9	29+29.97/24.40RT	9.5	6.5	N/A	9.0	1.05
G10	120+20.25/26.16RT	5.5	3.25**	N/A	15.0	4.90

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	194	214
PROJ. FILE NO. 604688			

CONSTRUCTION DETAILS
WHEELCHAIR RAMPS

SIDEWALK THROUGH DRIVEWAYS – TYPE F

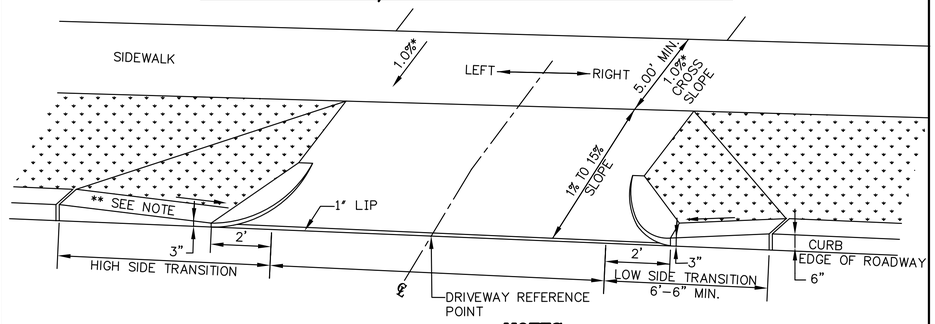


NOTES:

- * CONSTRUCTION TOLERANCE ± 0.5%
- ** SEE CONSTRUCTION STANDARD E 107.8.0 AND 107.9.0
- *** ABUTS <6" CURB REVEAL

DRIVEWAY #	DRIVEWAY REFERENCE POINT		WIDTH OF SIDEWALK	WIDTH OF TRAVEL PATH ACROSS OPENING	LEFT SIDE TRANSITION LENGTH	RIGHT SIDE TRANSITION LENGTH	ROADWAY GUTTER SLOPE
	STATION	OFFSET					
F1	29+54.13	22.67RT	VARIES	3.54	6.50	6.50	1.20%
F2	30+05.68	19.32RT	VARIES	3.62	6.50	9.00	1.20%
F3	30+38.37	26.00LT	4.50	2.32	9.0	6.50	1.95%
F4	31+20.80	26.00LT	4.50	2.33	9.0	6.50	1.95%
F5	31+62.14	15.31RT	6.00	4.00	6.50	9.00	1.27%
F6	32+03.64	18.92RT	VARIES	4.73	6.50	8.00	1.87%
F7	30+62.48	16.70RT	6.00	3.86	6.50	9.00	1.96%
F8	36+04.86	26.00LT	VARIES	5.21	6.50	15.00	0.57%
F10	60+03.51	28.42RT	9.50	5.86	6.50	6.50	0.72%
F11	61+48.26	29.00RT	8.50	5.00	6.50	7.66	0.20%
F14	22+95.61	34.00RT	8.50	5.00	9.00	6.50	1.52%
F15	23+35.07	34.00RT	8.50	5.00	7.66	6.50	0.72%
F16	32+53.09	28.80RT	8.50	5.00	6.50	11.00	2.36%
F17	LEXINGTON ST. 01+62.94	15.00RT	10.00	7.00	7.66	6.50	0.35%
F18	LEXINGTON ST. 03+04.00	15.00RT	10.00	7.00	3.25***	7.0***	3.93%
F19	60+24.66	28.93LT	VARIES	5.00	6.50	N/A	0.59%
F20	59+99.76	29.00LT	VARIES	5.00	N/A	6.50	1.05%
F22	62+86.10	29.02RT	8.50	5.00	6.50	7.66	0.17%
F23	63+70.20	29.00RT	8.50	5.00	N/A	7.66	0.38%
F24	63+96.06	29.00RT	8.50	5.00	6.50	N/A	0.83%
F25	64+73.69	29.00RT	8.50	5.00	7.66	6.50	0.60%
F26	68+35.57	29.00LT	8.50	5.00	6.50	N/A	3.00%
F27	68+80.88	29.00LT	8.50	5.00	N/A	15.0	4.41%
F28	COMMON ST. 01+67.27	22.00LT	8.00	5.00	6.50	15.0	2.11%
F29	91+42.68	29.00RT	8.50	5.00	9.00	6.50	1.47%
F30	91+79.50	28.66RT	8.50	5.00	7.66	6.50	0.96%
F31	91+36.77	29.00LT	8.50	5.00	6.50	7.66	0.08%
F32	94+65.35	29.02RT	8.50	5.00	7.66	6.50	0.20%
F33	99+07.53	29.00LT	8.50	5.00	9.00	6.50	1.37%
F34	102+78.62	29.00LT	8.50	5.00	11.00	6.50	2.61%
F35	109+40.20	29.00LT	8.50	5.00	14.00	6.50	3.98%
F36	114+45.03	29.43LT	8.50	5.00	14.00	6.50	3.37%
F37	124+61.87	33.50LT	9.00	6.00	11.00	5.41***	2.90%
F38	125+17.37	33.50LT	9.00	6.00	9.17***	3.25***	2.25%
F39	127+11.83	24.50RT	8.00	5.00	6.50	11.00	2.41%
F40	137+19.44	34.00RT	8.00	5.00	7.66	6.50	0.88%
F41	137+36.04	25.08LT	8.50	5.50	7.66	6.50	0.27%
F42	142+63.94	28.50RT	9.00	6.00	6.50	7.66	0.95%
F43	140+09.12	28.51RT	9.25	6.25	7.66	6.50	0.04%

SIDEWALK THROUGH DRIVEWAYS W/ WIDE BUFFER – TYPE R



NOTES:

- * CONSTRUCTION TOLERANCE ± 0.5%
- ** SEE CONSTRUCTION STANDARD E 107.8.0 AND 107.9.0 WHERE ABUTTING AREA NOT GRASS

DRIVEWAY #	DRIVEWAY REFERENCE POINT		WIDTH OF SIDEWALK	WIDTH OF TRAVEL PATH ACROSS OPENING	LEFT SIDE TRANSITION LENGTH	RIGHT SIDE TRANSITION LENGTH	ROADWAY GUTTER SLOPE
	STATION	OFFSET					
R1	43+60.56	28.37RT	VARIES	5.00	N/A	6.50	0.15%
R2	45+23.95	25.00RT	12.50	5.00	6.50	6.50	1.37%
R3	45+17.10	25.00LT	12.50	5.00	6.50	6.50	1.41%
R4	45+89.11	25.00LT	12.50	5.00	6.50	6.50	1.87%
R5	46+92.50	25.00LT	12.50	5.00	6.50	6.50	1.59%
R6	46+73.57	25.00RT	VARIES	VARIES	6.50	6.50	0.38%
R7	47+54.67	25.00RT	VARIES	5.00	9.0	6.50	2.59%
R8	48+62.27	25.00RT	12.50	5.00	6.50	6.50	1.25%
R9	50+29.71	25.00LT	12.50	5.00	6.50	6.50	3.12%
R10	50+90.70	25.00LT	12.50	5.00	6.50	6.50	2.38%
R11	51+16.03	25.00LT	12.50	5.00	6.50	6.50	0.48%
R12	51+50.67	25.00RT	12.50	5.00	11.0	6.50	2.36%
R13	52+25.02	25.00LT	12.50	5.00	6.50	6.50	1.16%
R14	57+70.84	25.00LT	12.50	5.00	7.66	6.50	0.74%
R15	57+53.01	25.40RT	12.50	7.50	N/A	7.66	0.57%
R16	57+97.25	25.73RT	12.50	7.50	N/A	N/A	2.73%
R17	58+31.03	25.00LT	12.50	5.00	6.50	6.50	1.09%
R18	58+96.47	25.10LT	VARIES	5.00	6.50	6.50	0.60%
R19	59+31.48	27.27RT	10.50	7.50	6.50	6.50	0.76%
R20	59+41.80	25.59LT	VARIES	5.00	6.50	6.50	0.23%
R21	59+84.98	26.45LT	VARIES	5.00	6.50	6.50	0.41%
R22	60+28.84	27.69LT	VARIES	5.00	6.50	6.50	0.79%
R23	75+84.02	25.96LT	VARIES	5.00	6.50	6.50	4.29%
R24	76+52.83	25.00LT	12.50	5.00	6.50	6.50	3.46%
R25	77+56.96	25.00LT	12.50	5.00	6.50	N/A	3.73%
R26	77+73.87	25.00LT	12.50	5.00	N/A	6.50	3.73%
R27	78+20.72	25.00LT	12.50	5.00	6.50	6.50	4.15%
R28	76+53.76	25.00RT	12.50	5.00	6.50	6.50	2.78%
R29	78+78.81	25.00LT	12.50	5.00	6.50	6.50	4.17%
R30	79+26.35	25.00RT	12.50	5.00	11.0	6.50	2.73%
R31	79+39.19	25.00LT	12.50	5.00	6.50	6.50	3.50%
R32	79+91.46	25.00RT	12.50	5.00	6.50	6.50	4.08%
R33	79+97.60	25.00LT	12.50	5.00	6.50	6.50	3.33%
R34	80+87.23	25.00LT	12.50	5.00	6.50	6.50	3.30%
R35	81+20.20	25.00RT	12.50	5.00	6.50	6.50	4.11%
R36	81+51.42	25.10LT	12.50	5.00	6.50	6.50	3.33%
R37	81+84.20	25.69RT	12.50	5.00	6.50	6.50	2.93%
R38	80+56.82	25.00RT	12.50	5.00	6.50	6.50	3.29%

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	195	214
PROJ. FILE NO. 604688			

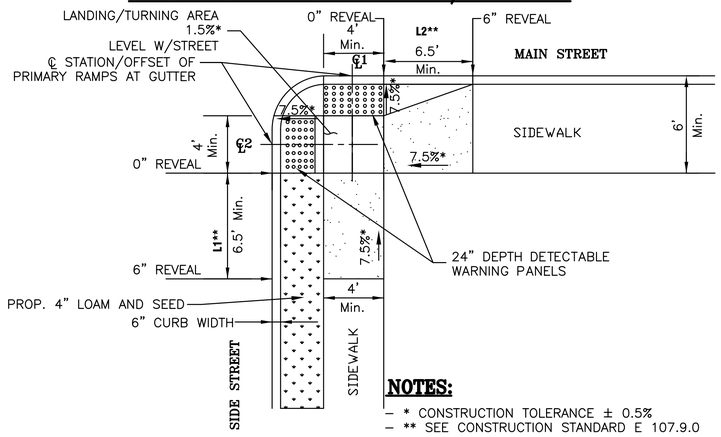
CONSTRUCTION DETAILS
WHEELCHAIR RAMPS

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	196	214
PROJ. FILE NO. 604688			

CONSTRUCTION DETAILS
WHEELCHAIR RAMPS

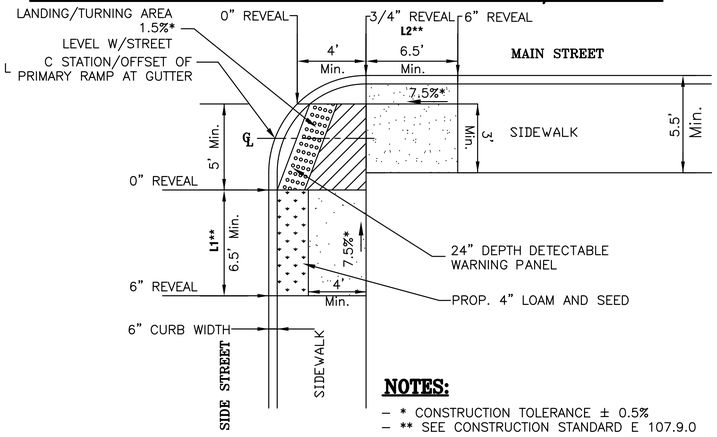
WHEELCHAIR RAMP
STYLE "J" – DOUBLE STREET CROSSING SERVING TWO SIDEWALK DIRECTIONS W/ GRASS



NOTES:
– * CONSTRUCTION TOLERANCE ± 0.5%
– ** SEE CONSTRUCTION STANDARD E 107.9.0

WCR #	℄1 RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	℄2 RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	RAMP 1 WIDTH	RAMP 2 WIDTH	ROADWAY 1 WIDTH OF SIDEWALK	TRANSITION 1		ROADWAY 2 WIDTH OF SIDEWALK	TRANSITION 2	
						GUTTER GRADE	L1		GUTTER GRADE	L2
J1	121+71.42/26.50RT	121+77.03/31.02RT	5.13	5.0	6.5	4.83	15.0	N/A	1.28	9.0

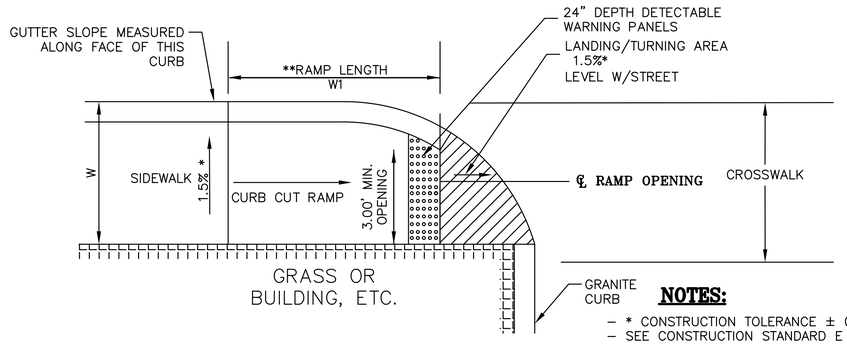
WHEELCHAIR RAMP
STYLE "K" – DIRECTIONAL SINGLE STREET CROSSING SERVING TWO SIDEWALK DIRECTIONS W/ GRASS



NOTES:
– * CONSTRUCTION TOLERANCE ± 0.5%
– ** SEE CONSTRUCTION STANDARD E 107.9.0

WCR #	℄ RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	LEVEL LANDING LENGTH	RAMP WIDTH	ROADWAY 1 WIDTH OF SIDEWALK	TRANSITION 1		ROADWAY 2 WIDTH OF SIDEWALK	TRANSITION 2	
					GUTTER GRADE	L1		GUTTER GRADE	L2
K1	124+08.67/29.98RT	7.45	5.00	8.05	N/A	6.5	7.50	4.74	15.0
K2	126+44.89/30.00RT	8.45	5.00	9.17	3.73	14.0	7.50	N/A	6.50

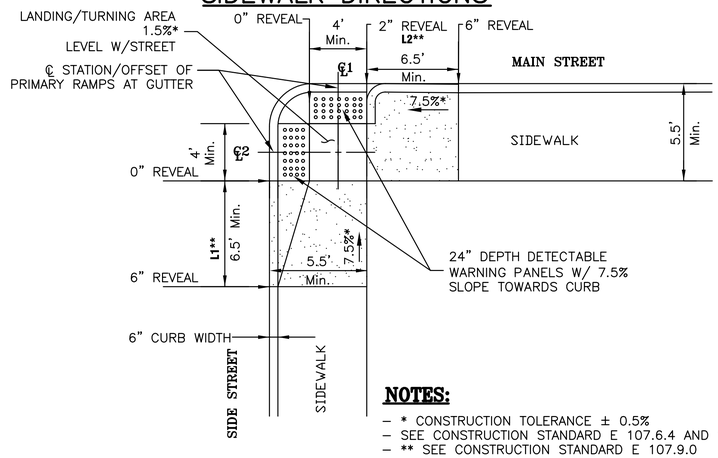
WHEELCHAIR RAMP
STYLE "H" – SINGLE DIRECTION WITH LEVEL ENTRANCE



NOTES:
– * CONSTRUCTION TOLERANCE ± 0.5%
– SEE CONSTRUCTION STANDARD E 107.6.0
– ** SEE CONSTRUCTION STANDARD E 107.9.0

WCR #	℄ RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	WIDTH OF SIDEWALK W	WIDTH OF OPENING	ROADWAY GUTTER SLOPE (%)	LENGTH OF RAMP (W1)
H1	25+50.51/40.00RT	8.5	8.5	2.58	6.42
H2	N. COMMON ST. 5+23.06/22.79RT	9.5	9.5	1.16	9.00
H3	100+50.27/96.19RT	4.20	4.20	2.24	7.57
H4	100+62.29/76.14RT	4.39	4.39	1.84	7.60
H5	102+57.19/42.75RT	7.5	7.5	0.59	7.66
H6	102+89.52/42.17RT	7.5	7.5	1.96	6.50
H7	120+37.93/28.98RT	5.5	5.0	4.90	7.5**
H8	Church St. 3+11.39/26.09RT	10.0	5.0	N/A	8.65
H9	Church St. 2+87.39/26.06RT	10.0	5.0	N/A	8.33
H10	Church St. 1+52.38/25.97RT	10.0	5.0	N/A	8.62
H11	Church St. 1+28.36/25.94RT	10.0	5.0	N/A	8.74

WHEELCHAIR RAMP
STYLE "E" – DOUBLE STREET CROSSING SERVING TWO SIDEWALK DIRECTIONS



NOTES:
– * CONSTRUCTION TOLERANCE ± 0.5%
– SEE CONSTRUCTION STANDARD E 107.6.4 AND 107.6.5
– ** SEE CONSTRUCTION STANDARD E 107.9.0

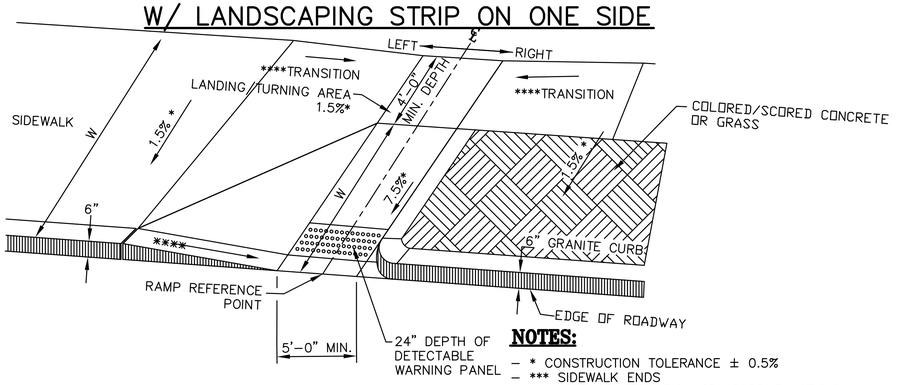
WCR #	℄1 RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	℄2 RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	RAMP 1 WIDTH	RAMP 2 WIDTH	ROADWAY 1 WIDTH OF SIDEWALK	TRANSITION 1		ROADWAY 2 WIDTH OF SIDEWALK	TRANSITION 2	
						GUTTER GRADE	L1		GUTTER GRADE	L2
E1	LEXINGTON ST. 4+02.56/15.72RT	LEXINGTON ST. 04+07.77/22.10RT	5.0	5.0	10.0	2.14	11.0	8.0	2.13	11.00
E3	125+81.99/39.25LT	125+87.36/33.50LT	6.5	5.0	9.0	2.34	6.50	6.75	2.41	11.00

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	197	214
PROJ. FILE NO. 604688			

CONSTRUCTION DETAILS
WHEELCHAIR RAMPS

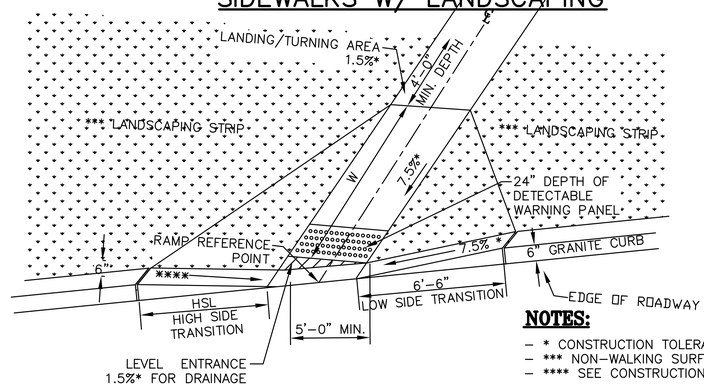
WHEELCHAIR RAMP
STYLE "M" – PERPENDICULAR RAMP FOR WIDE SIDEWALKS W/ LANDSCAPING STRIP ON ONE SIDE



NOTES:
– * CONSTRUCTION TOLERANCE ± 0.5%
– *** SIDEWALK ENDS
– **** SEE CONSTRUCTION STANDARD E 107.9.0

WCR #	℄ RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	WIDTH OF SIDEWALK (W)	LENGTH OF PRIMARY RAMP (W1)	WIDTH OF PRIMARY RAMP (W1)	DEPTH OF LEVEL LANDING Min. 4'–0"	TRANSITION LENGTH AND ROADWAY GUTTER SLOPE (%)			
						LEFT SIDE		RIGHT SIDE	
						L	%	L	%
M1	N. COMMON ST. 4+76.16/27.99RT	12.00	8.00	5.0	4.0	7.66	0.30	6.5	0.61
M2	117+78.97/41.39RT	9.5	5.82	5.0	4.0	11.0	2.78	6.5	N/A
M3	128+37.56/38.70RT	7.5	4.40	5.0	4.0	6.5	N/A	9.0	1.88
M4	130+63.25/39.25RT	7.0	2.82	5.0	4.0	14.0	3.36	6.5	N/A
M5	130+94.88/38.84RT	7.5	5.24	5.0	4.01	6.5	N/A	15.0	4.27
M6	140+93.83/35.50LT	VARIES	3.26	5.0	3.22	6.5	N/A	N/A	N/A
M7	142+07.16/38.06RT	8.0	5.49	5.0	4.0	6.5	N/A	11.0	2.27
M8	141+71.98/36.72RT	VARIES	10.98	5.0	4.0	N/A	N/A	9.0	1.27
M9	CHURCH ST. 3+88.07/22.00LT	11.7	7.66	5.0	4.0	7.67	0.49	6.5	N/A
M10	71+35.37/42.68LT	VARIES	3.45	5.0	4.0	6.5	N/A	15.0	6.18
M11	74+16.31/39.68LT	8.5	4.30	5.0	4.05	14.0	3.50	11.0	2.79
M12	84+15.92/43.51RT	VARIES	6.94	5.0	4.99	7.66	0.51	7.66	0.14
M13	115+48.58/45.00LT	7.5	3.29	5.0	4.03	14.0	3.24	6.5	N/A
M14	117+40.76/46.83LT	7.5	3.64	5.0	4.0	14.0	3.91	6.5	N/A
M15	135+42.95/48.10RT	7.5	4.74	5.0	4.0	6.5	N/A	9.0	1.31

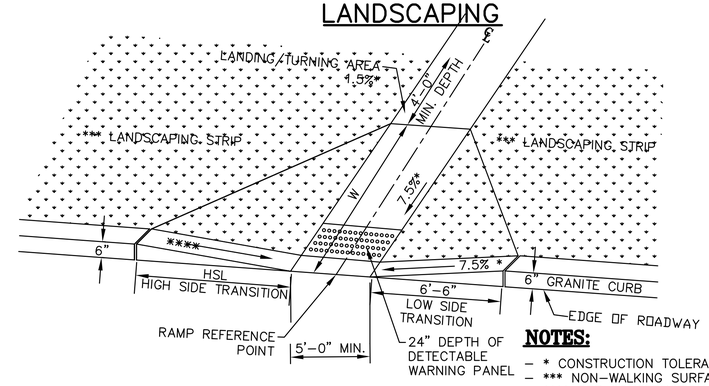
WHEELCHAIR RAMP
STYLE "N" – DIRECTIONAL PERPENDICULAR RAMP FOR SIDEWALKS W/ LANDSCAPING



NOTES:
– * CONSTRUCTION TOLERANCE ± 0.5%
– *** NON–WALKING SURFACE
– **** SEE CONSTRUCTION STANDARD E 107.9.0

WCR #	℄ RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	WIDTH OF SIDEWALK (W)	LENGTH OF PRIMARY RAMP (W1)	WIDTH OF PRIMARY RAMP (W1)	DEPTH OF LEVEL LANDING Min. 4'–0"	TRANSITION LENGTH AND ROADWAY GUTTER SLOPE (%)			
						LEFT SIDE		RIGHT SIDE	
						L	%	L	%
N1	18+58.72/41.02LT	6.0	8.00	6.0	4.0	6.5	N/A	6.5	N/A
N2	34+26.72/54.78RT	5.0	12.92	5.0	4.0	6.5	N/A	6.5	N/A
N3	119+11.92/32.09RT	N/A	7.0	5.0	4.0	6.5	N/A	9.0	1.36

WHEELCHAIR RAMP
STYLE "P" – PERPENDICULAR RAMP FOR SIDEWALKS W/ LANDSCAPING



NOTES:
– * CONSTRUCTION TOLERANCE ± 0.5%
– *** NON–WALKING SURFACE
– **** SEE CONSTRUCTION STANDARD E 107.9.0

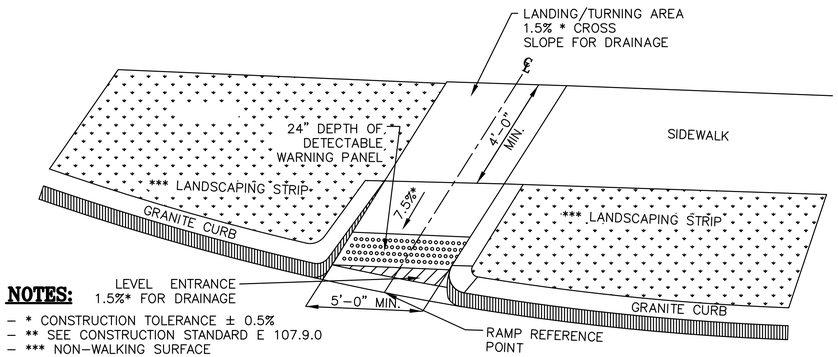
WCR #	℄ RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	WIDTH OF SIDEWALK (W)	LENGTH OF PRIMARY RAMP (W1)	WIDTH OF PRIMARY RAMP (W1)	DEPTH OF LEVEL LANDING Min. 4'–0"	TRANSITION LENGTH AND ROADWAY GUTTER SLOPE (%)			
						LEFT SIDE		RIGHT SIDE	
						L	%	L	%
P1	18+07.66/47.55LT	6.0	11.00	6.0	4.0	6.5	N/A*	6.5	N/A*
P2	34+77.79/49.52RT	5.0	8.00	5.0	4.0	6.5	N/A	6.5	N/A
P3	63+34.28/23.00RT	14.5	7.66	5.0	6.84	6.5	N/A	7.66	0.24

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	198	214
PROJ. FILE NO. 604688			

CONSTRUCTION DETAILS
WHEELCHAIR RAMPS

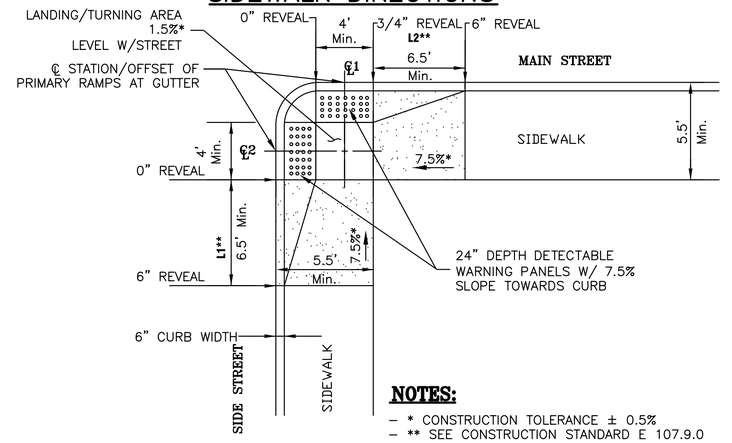
WHEELCHAIR RAMP
STYLE "S" – DIRECTIONAL PARALLEL PERPENDICULAR W/ LANDSCAPING STRIPS



NOTES:
– * CONSTRUCTION TOLERANCE ± 0.5%
– ** SEE CONSTRUCTION STANDARD E 107.9.0
– *** NON–WALKING SURFACE

WCR #	℄ RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	WIDTH OF SIDEWALK W	WIDTH OF OPENING	ROADWAY GUTTER SLOPE (%)	LENGTH OF RAMP (W1)
S1	92+83.36/35.54LT	VARIES	5.00	0.30	7.66
S2	67+34.53/40.21LT	VARIES	8.0	2.43	11.0
S3	86+66.02/36.97LT	N/A	8.0	3.67	5.00
S4	86+92.34/36.62LT	N/A	8.0	0.67	2.00
S5	86+83.43/23.00LT	N/A	8.0	1.04	7.60

WHEELCHAIR RAMP
STYLE "T" – DOUBLE STREET CROSSING SERVING TWO SIDEWALK DIRECTIONS



NOTES:
– * CONSTRUCTION TOLERANCE ± 0.5%
– ** SEE CONSTRUCTION STANDARD E 107.9.0

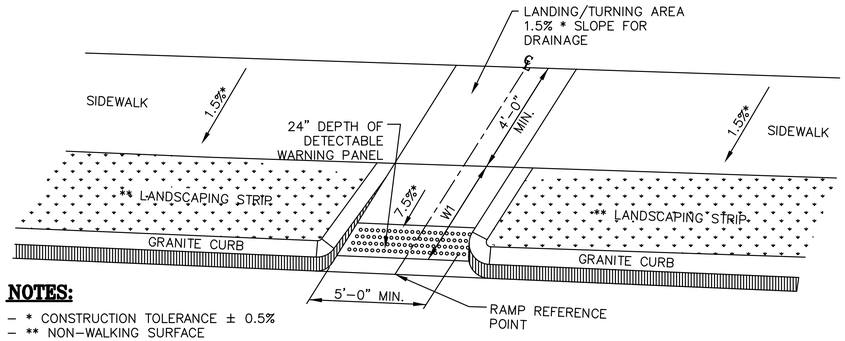
WCR #	℄1 RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	℄2 RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	RAMP 1 WIDTH	RAMP 2 WIDTH	ROADWAY 1 WIDTH OF SIDEWALK	TRANSITION 1		ROADWAY 2 WIDTH OF SIDEWALK	TRANSITION 2	
						GUTTER GRADE	L1		GUTTER GRADE	L2
T1	131+19.93/34.00LT	131+14.82/40.02LT	5.0	5.0	7.5	N/A	6.5	8.0	N/A	6.5

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	199	214
PROJ. FILE NO. 604688			

CONSTRUCTION DETAILS
WHEELCHAIR RAMPS

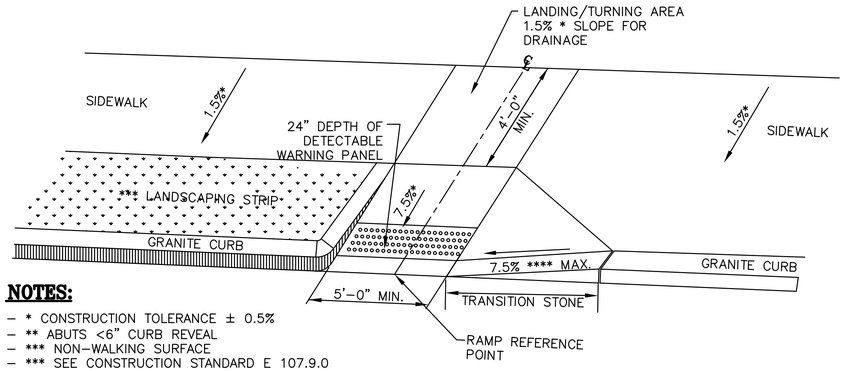
WHEELCHAIR RAMP
STYLE "U" – PERPENDICULAR W/ LANDSCAPING STRIP



NOTES:
– * CONSTRUCTION TOLERANCE ± 0.5%
– ** NON–WALKING SURFACE

WCR #	℄ RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	WIDTH OF SIDEWALK W	WIDTH OF OPENING	ROADWAY GUTTER SLOPE (%)	LENGTH OF RAMP (W1)
U1	19+36.95/26.00RT	5.0	8.0	1.85	9.03
U2	43+99.73/19.60LT	VARIES	8.0	1.16	13.46
U3	48+5.26/18.57LT	VARIES	8.0	1.07	12.93
U4	48+26.80/33.56LT	VARIES	8.0	0.31	11.54
U5	71+76.77/23.00LT	8.5	8.0	6.68	9.51
U6	78+05.50/25.00LT	12.5	5.0	4.11	6.5
U7	92+62.30/23.01LT	VARIES	8.0	4.12	10.13
U8	92+62.22/23.00RT	VARIES	8.0	0.22	8.53
U9	113+93.89/22.58LT	VARIES	8.0	2.96	10.17
U10	48+5.26/18.00RT	VARIES	8.0	1.67	9.71
U11	19+37.45/25.00LT	6.0	6.0	1.65	7.91
U12	19+25.02/35.42LT	5.0	5.0	0.00	9.43
U13	19+38.40/40.71LT	6.0	6.0	1.23	4.05
U14	29+20.68/42.07LT	6.0	6.0	0.30	6.86
U15	29+24.11/27.51LT	6.0	6.0	1.43	4.28
U16	29+42.60/37.28LT	6.0	6.0	3.17	12.13

WHEELCHAIR RAMP
STYLE "V" – PERPENDICULAR W/ LANDSCAPING STRIP ON ONE SIDE



NOTES:
– * CONSTRUCTION TOLERANCE ± 0.5%
– ** ABUTS <6" CURB REVEAL
– *** NON–WALKING SURFACE
– *** SEE CONSTRUCTION STANDARD E 107.9.0

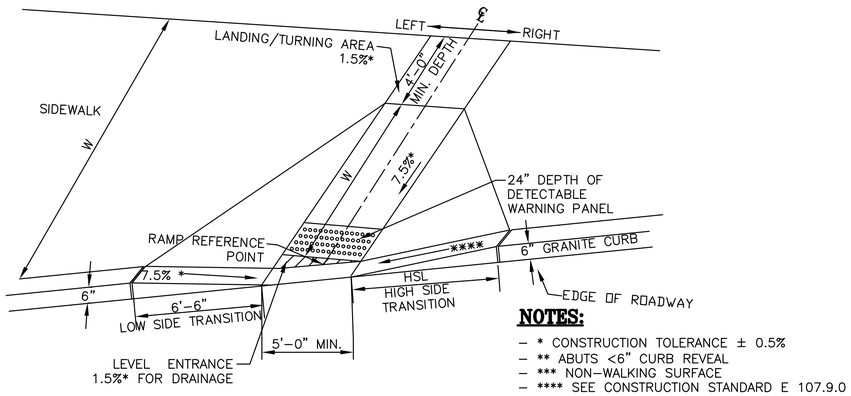
WCR #	C RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	WIDTH OF SIDEWALK (W)	LENGTH OF PRIMARY RAMP (W1)	WIDTH OF PRIMARY RAMP	DEPTH OF LEVEL LANDING Min. 4'–0"	TRANSITION LENGTH AND ROADWAY GUTTER SLOPE (%)			
						LEFT SIDE		RIGHT SIDE	
						L	%	L	%
V1	43+97.15/21.14RT	VARIES	11.30	8.0	5.86	N/A	N/A	8.61	N/A
V2	46+35.72/35.90RT	VARIES	8.10	5.0	4.0	6.5	N/A	N/A	N/A
V4	HARRIET AVE. 1+19.79/31.45RT	VARIES	8.0	5.0	4.0	6.5	N/A	N/A	N/A
V5	87+03.78/23.00RT	VARIES	8.5	8.0	4.0	N/A	N/A	6.5	N/A
V6	87+45.22/43.62LT	VARIES	8	5.0	4.0	7.95	0.59	N/A	N/A
V7	87+76.62/52.79LT	VARIES	8.91	5.0	4.0	N/A	N/A	6.5	N/A
V8	88+03.33/53.00LT	VARIES	8.01	5.0	4.0	6.5	N/A	N/A	N/A
V9	113+93.97/23.84RT	VARIES	9.14	8.0	4.0	N/A	N/A	11.0	2.93
V10	88+26.65/23.00LT	VARIES	8.0	5.0	4.0	N/A	N/A	7.95	N/A
V11	99+94.48/35.13RT	VARIES	8.0	5.0	4.0	3.25**	N/A	15.0	4.13
V12	129+08.51/29.00LT	VARIES	11.14	5.0	4.0	11.0	2.89	6.5	N/A
V13	136+61.01/30.43RT	VARIES	8.35	8.0	4.0	N/A	N/A	3.25**	N/A
V14	135+75.32/56.55RT	VARIES	8.0	5.0	N/A	7.66	N/A	N/A	N/A

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	200	214
PROJ. FILE NO. 604688			

CONSTRUCTION DETAILS
WHEELCHAIR RAMPS

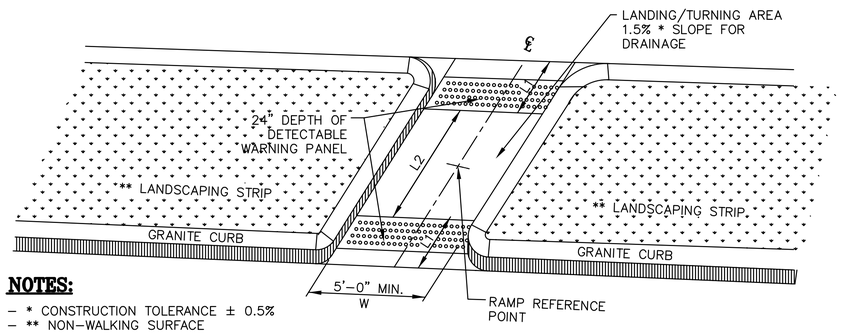
WHEELCHAIR RAMP
STYLE "W" – DIRECTIONAL RAMP FOR WIDE SIDEWALKS



NOTES:
- * CONSTRUCTION TOLERANCE ± 0.5%
- ** ABUTS <6" CURB REVEAL
- *** NON-WALKING SURFACE
- **** SEE CONSTRUCTION STANDARD E 107.9.0

WCR #	℄ RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	WIDTH OF SIDEWALK (W)	LENGTH OF PRIMARY RAMP (W1)	WIDTH OF PRIMARY RAMP (W1)	DEPTH OF LEVEL LANDING Min. 4'-0"	TRANSITION LENGTH AND ROADWAY GUTTER SLOPE (%)			
						LEFT SIDE		RIGHT SIDE	
						L	%	L	%
W1	71+21.90/35.00RT	VARIES	8.00	5.0	4.0	7.66	0.28	4.50**	1.34
W2	66+53.02/23.64LT	14.5	8.40	5.0	4.0	6.5	N/A	7.66	0.14
W3	53+51.64/31.30LT	16.2	9.00	5.0	4.0	6.5	N/A	7.66	0.45

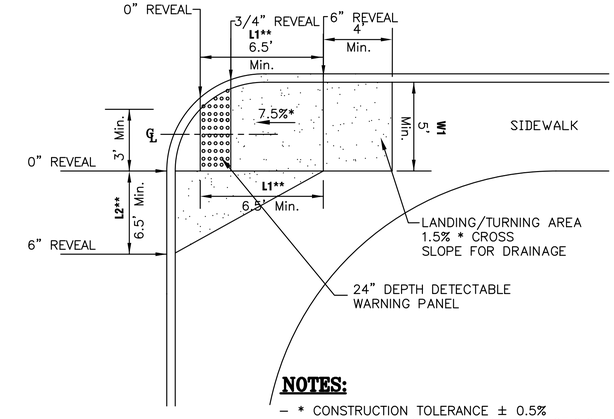
WHEELCHAIR RAMP
STYLE "X" – MEDIAN ISLAND CROSSINGS



NOTES:
- * CONSTRUCTION TOLERANCE ± 0.5%
- ** NON-WALKING SURFACE

WCR #	℄ RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	WIDTH OF OPENING (W)	LENGTH OF RAMP (L1)	LENGTH OF LANDING (L2)
X1	63+36.27/00.00	10.0	2.5	3.0
X2	107+65.16/01.50RT	10.0	3.0	4.0

WHEELCHAIR RAMP
STYLE "Y" – SINGLE STREET CROSSING SERVING TWO SIDEWALK DIRECTIONS



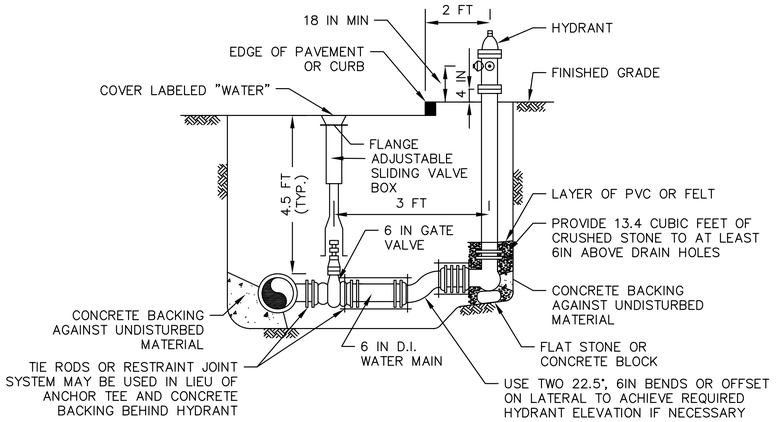
NOTES:
- * CONSTRUCTION TOLERANCE ± 0.5%
- ** SEE CONSTRUCTION STANDARD E 107.9.0

WCR #	℄ RAMP REFERENCE POINT (STATION/OFFSET) Ref Street for Centerline	LEVEL LANDING LENGTH	RAMP WIDTH	ROADWAY 1 WIDTH OF SIDEWALK	TRANSITION 1		ROADWAY 2 WIDTH OF SIDEWALK	TRANSITION 2	
					GUTTER GRADE	L1		GUTTER GRADE	L2
Y1	34+44.44/32.59LT	4.0	7.68	VARIES	2.13	9.0	VARIES	2.13	11.0
Y2	35+17.47/32.50LT	6.24	6.87	VARIES	0.31	7.66	VARIES	2.22	11.0

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

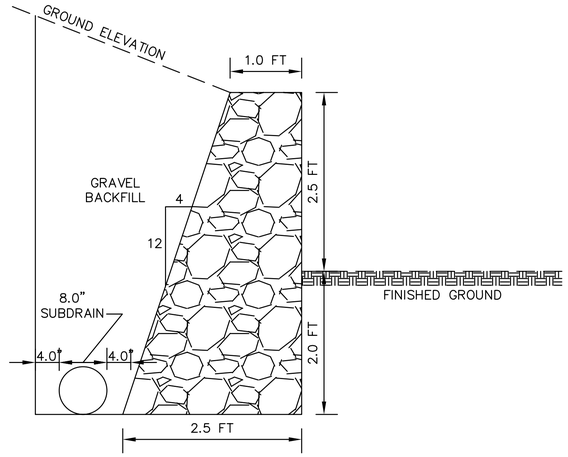
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	201	214
PROJ. FILE NO. 604688			

CONSTRUCTION DETAILS
MISCELLANEOUS



HYDRANT AND VALVE DETAIL

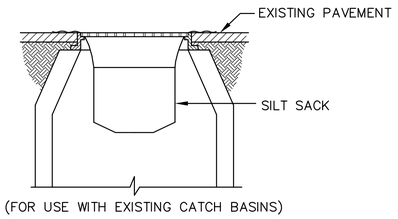
N.T.S.



NOTE: ALL CONCRETE DIMENSIONS SHOWN ARE MINIMUM.

CEMENTED STONE MASONRY WALL LOW

N.T.S.

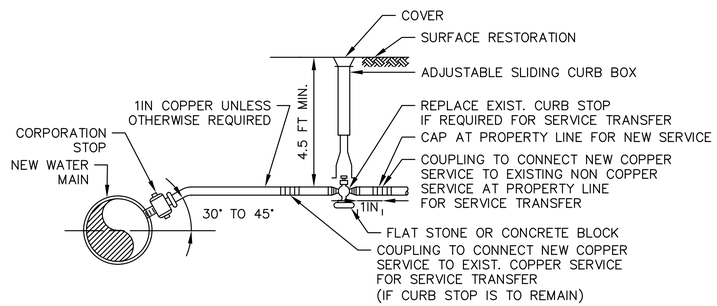


(FOR USE WITH EXISTING CATCH BASINS)

NOTE: SILT SACKS TO BE PLACED IN ALL CATCH BASINS IN THE VICINITY OF NEW CONSTRUCTION. CATCH BASINS ARE TO BE PROTECTED AS SHOWN, WITH MINIMUM WEEKLY MAINTENANCE, OR AS REQUIRED AND REPLACED IF NECESSARY.

SILT SACK INLET PROTECTION

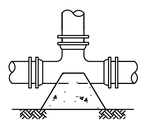
N.T.S.



NOTE: PROVIDE SADDLE FOR ALL AC AND PVC MAINS AND ALL 2 IN OR LARGER STOPS

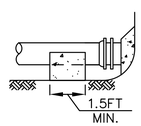
WATER SERVICE DETAIL

N.T.S.



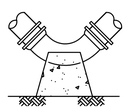
TEE DETAIL

PLAN VIEW
N.T.S.



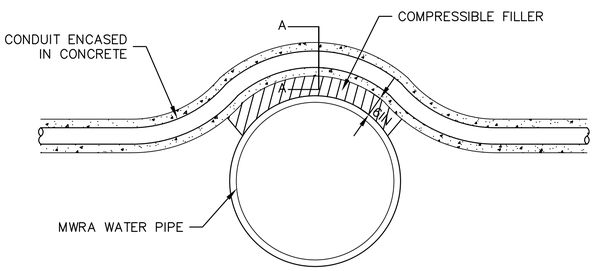
CAP DETAIL (PLUG SIMILAR)

SECTION VIEW
N.T.S



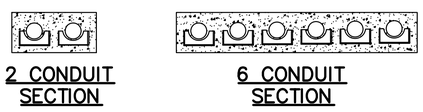
BEND DETAIL

PLAN VIEW
N.T.S.



TYPICAL ELECTRICAL CONDUIT CROSSING OVER MWRA WATER PIPE

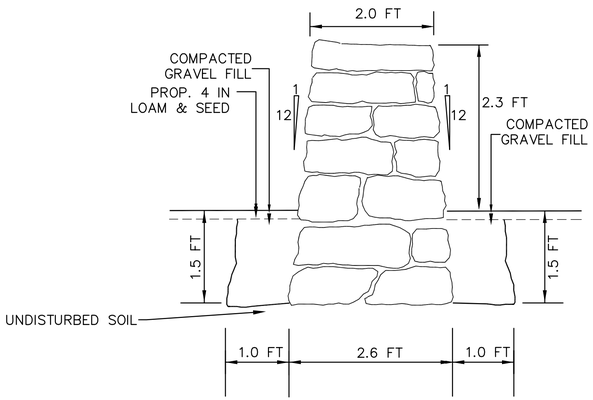
N.T.S.



2 CONDUIT SECTION

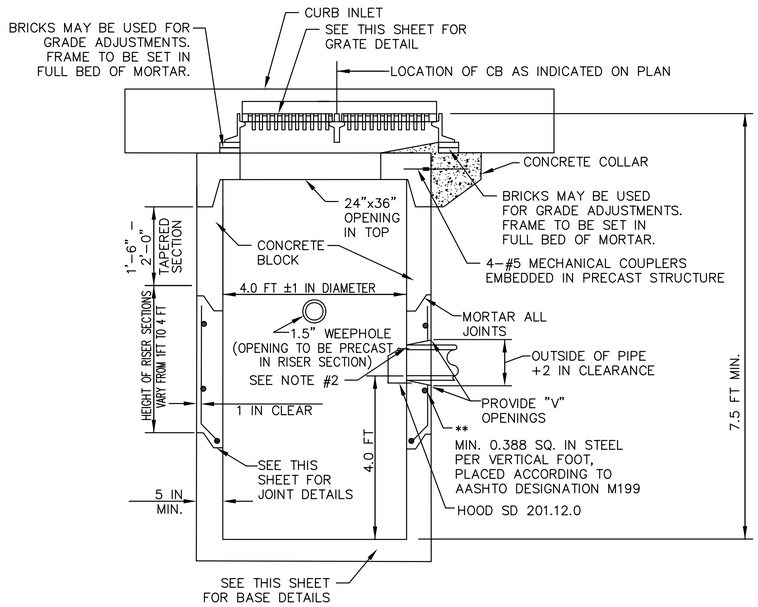
6 CONDUIT SECTION

SECTION A–A



CEMENTED STONE MASONRY WALL BALANCED

SCALE: NONE



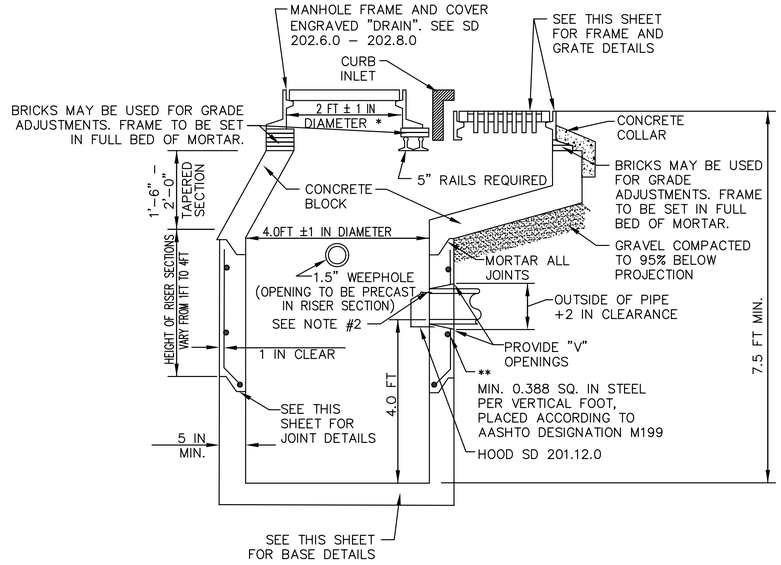
** REINFORCED STEEL BASED ON A WALL THICKNESS OF 5 IN.

NOTES:

1. DETAILS NOT INDICATED ABOVE ARE TO BE SIMILAR TO THOSE SHOWN ON 201.3.0
2. FACE OF PIPE FLUSH OR NOT TO PROJECT MORE THAN 4 IN FROM FACE OF WALL ALONG CENTERLINE OF PIPE.
3. FOR DESCRIPTION, MATERIALS AND CONSTRUCTION METHOD, SEE STANDARD SPECIFICATIONS.
4. ALL CONCRETE TO BE AIR ENTRAINED.
5. DESIGN TO CONFORM TO H.20 LOADING.

CATCH BASIN MUNICIPAL STANDARD TYPE 2

N.T.S.



** REINFORCED STEEL BASED ON A WALL THICKNESS OF 5 IN.

NOTES:

1. DETAILS NOT INDICATED ABOVE ARE TO BE SIMILAR TO THOSE SHOWN ON 201.3.0
2. FACE OF PIPE FLUSH OR NOT TO PROJECT MORE THAN 4 IN FROM FACE OF WALL ALONG CENTERLINE OF PIPE.
3. FOR DESCRIPTION, MATERIALS AND CONSTRUCTION METHOD, SEE STANDARD SPECIFICATIONS.
4. ALL CONCRETE TO BE AIR ENTRAINED.
5. DESIGN TO CONFORM TO H.20 LOADING.

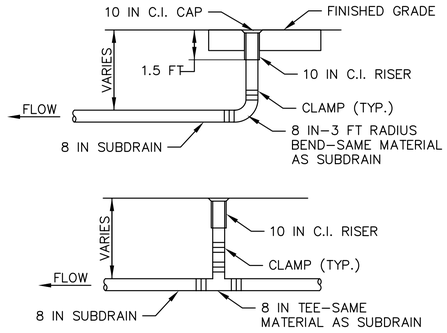
CATCH BASIN MUNICIPAL STANDARD TYPE 3

N.T.S.

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

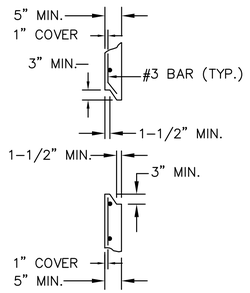
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	202	214
PROJ. FILE NO. 604688			

CONSTRUCTION DETAILS
DRAINAGE DETAILS



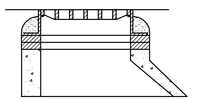
CLEANOUTS FOR 8-INCH SUBDRAIN

N.T.S.

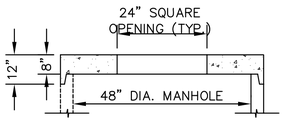


JOINT DETAILS

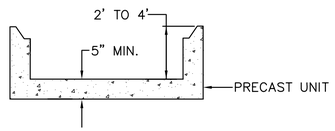
N.T.S.



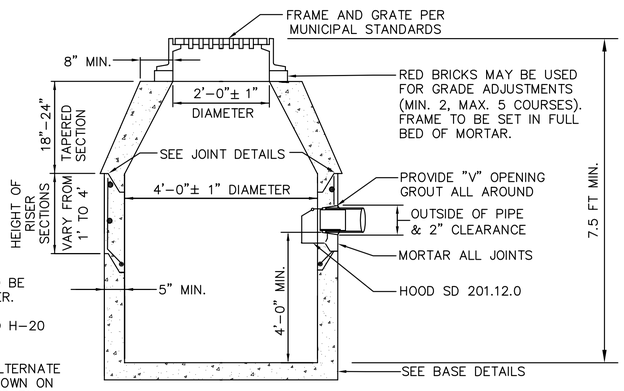
ALTERNATE ECCENTRIC CONE SECTION



ALTERNATE TOP SLAB



BASE DETAILS

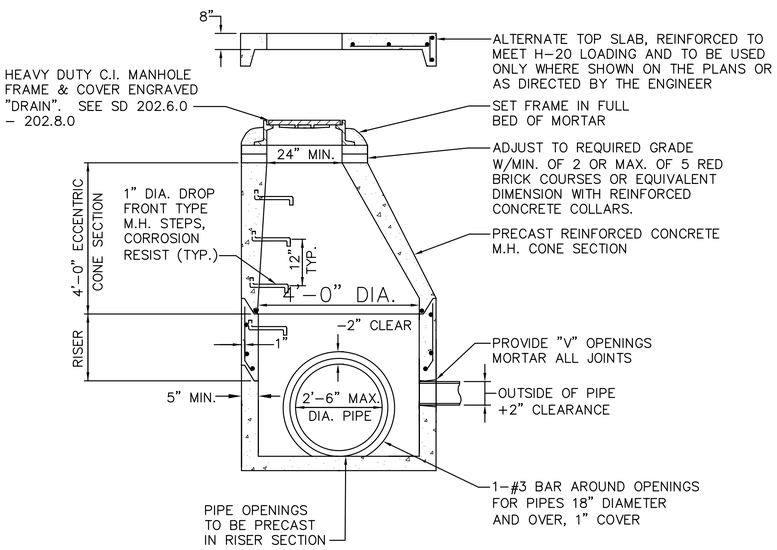


NOTES:

1. ALL PRECAST JOINTS TO BE SEALED WITH BUTYL RUBBER.
2. DESIGN TO CONFORM TO H-20 LOADING.
3. CONTRACTOR TO USE ALTERNATE TOP SLAB ONLY WHERE SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

CATCH BASIN MUNICIPAL STANDARD

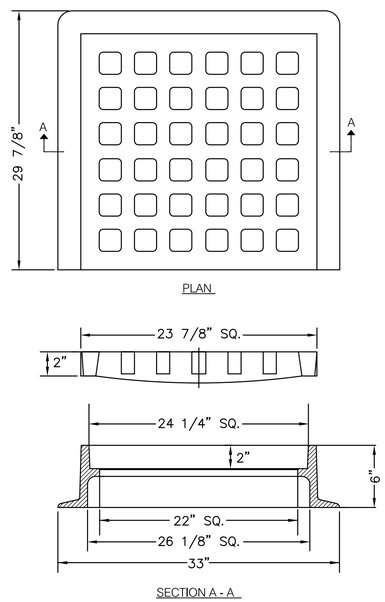
N.T.S.



NOTE:
PREFORMED BITUMASTIC SEALANT AS SPECIFIED. SHALL FILL AT LEAST 75% OF JOINT CAVITY. RUBBER OR "O" RING SET IN RECESS.

MANHOLE MUNICIPAL STANDARD

N.T.S.



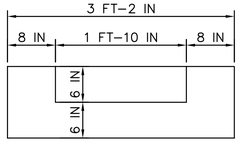
CATCH BASIN FRAME AND GRATE DETAIL

N.T.S.

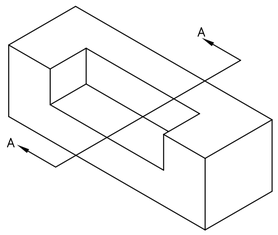
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	203	214
PROJ. FILE NO. 604688			

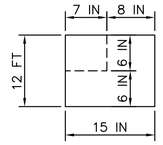
CONSTRUCTION DETAILS
DRAINAGE DETAILS



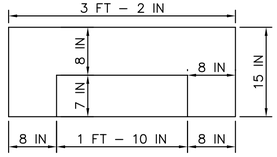
FRONT VIEW



ISOMETRIC VIEW

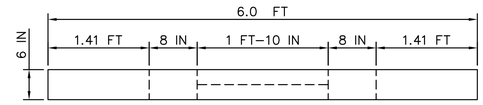


SECTION A–A

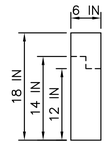


TOP VIEW

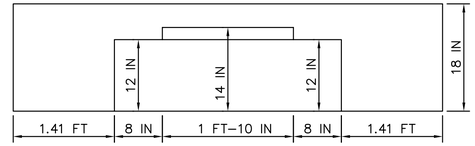
PRECAST CONCRETE THROAT OPENING



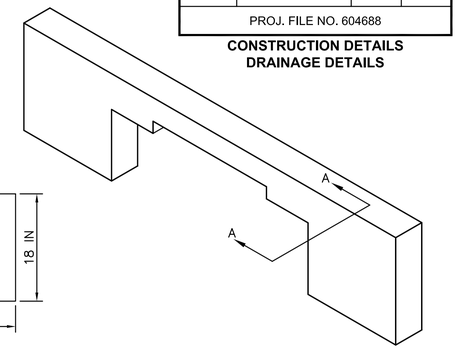
TOP VIEW



SECTION A–A

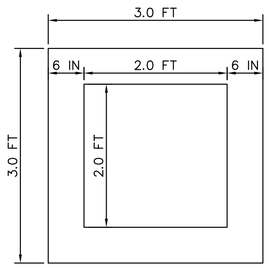


FRONT VIEW

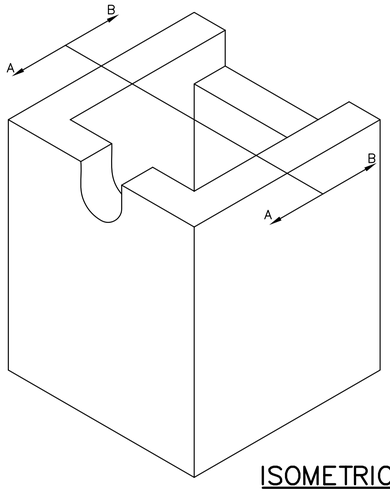


ISOMETRIC VIEW

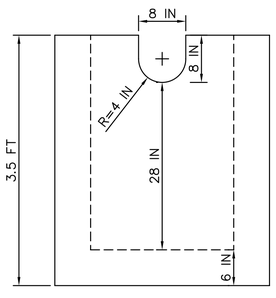
CURB INLET MUNICIPAL STANDARD



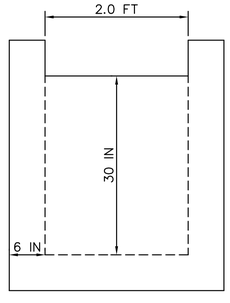
TOP VIEW



ISOMETRIC VIEW

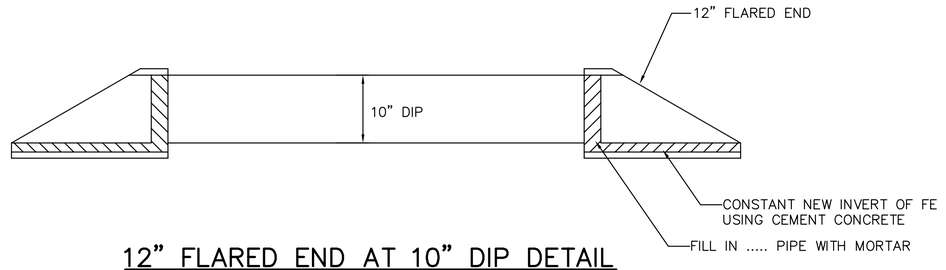


SECTION A–A



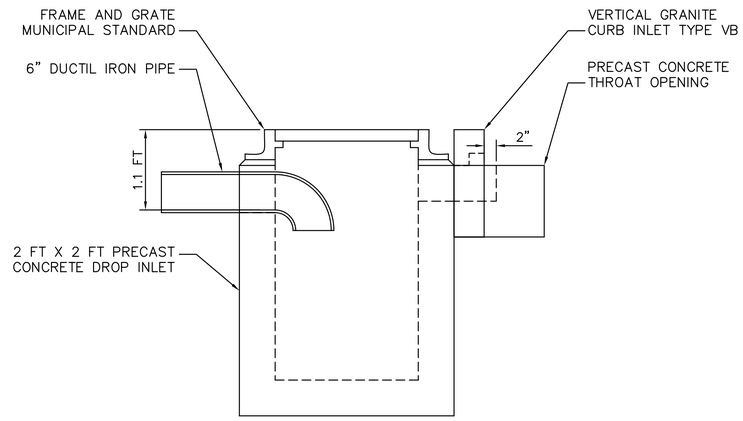
SECTION B–B

2 FT X 2FT DROP INLET



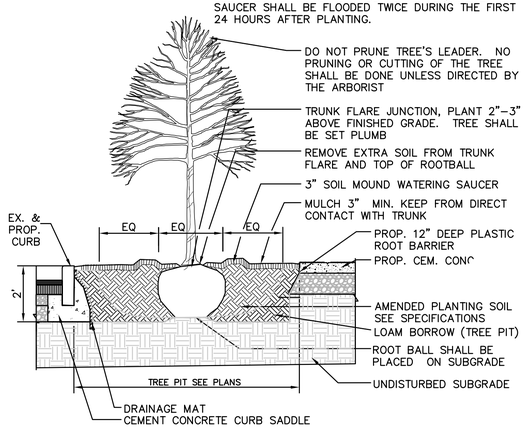
12" FLARED END AT 10" DIP DETAIL

N.T.S.

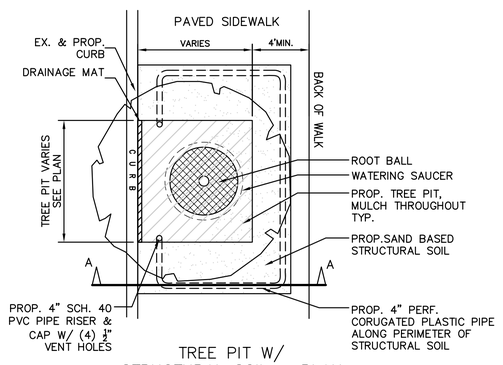


CATCH BASIN MUNICIPAL
STANDARD TYPE 4

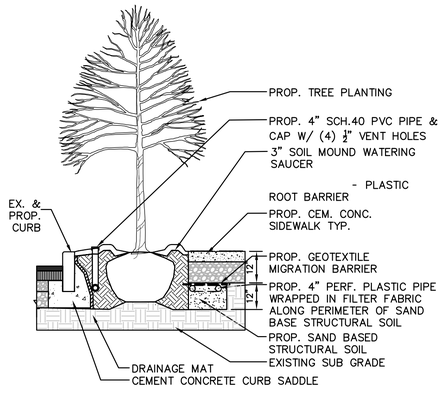
NOTES:
SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
SAUCER SHALL BE FLOODED TWICE DURING THE FIRST 24 HOURS AFTER PLANTING.



TREE PLANTING/ TREE PIT
SCALE: NONE



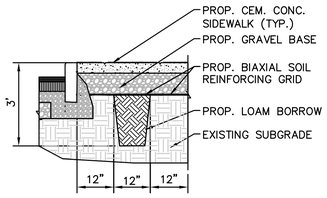
TREE PIT W/
STRUCTURAL SOIL – PLAN



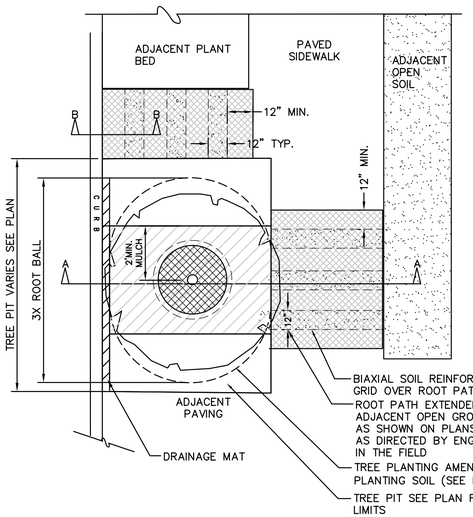
SECTION A–A

STRUCTURAL SOIL (AT TREE PITS)
SCALE: NONE

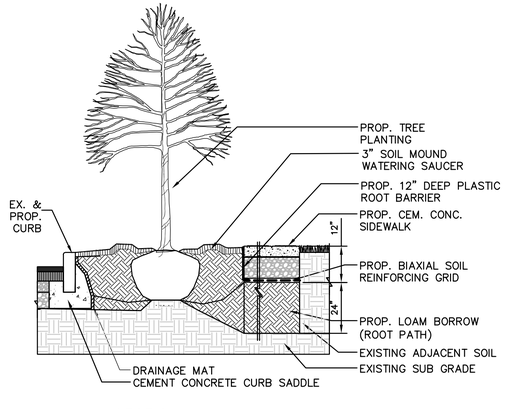
NOTES:
DRAINAGE MAT, AND ROOT PATHS SHALL BE CONSTRUCTED PRIOR TO CONSTRUCTION OF THE SIDEWALK.
MODIFY DEPTH AND LOCATION OF ROOT PATHS TO ACCOMMODATE EXISTING UTILITIES.
TREE PITS SHALL RECEIVE EITHER LOAM & SEED OR MULCH SEE PLANS.



SECTION B–B



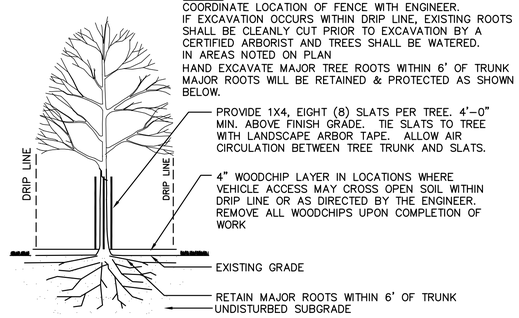
TREE PIT WITH ROOT PATHS – PLAN

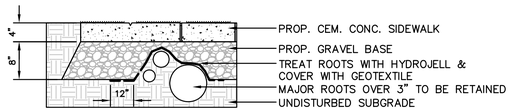


SECTION A–A

ROOT PATHS (AT TREE PIT)
SCALE: NONE

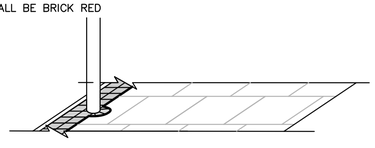
NOTES:
COORDINATE LOCATION OF FENCE WITH ENGINEER.
IF EXCAVATION OCCURS WITHIN DRIP LINE, EXISTING ROOTS SHALL BE CLEANLY CUT PRIOR TO EXCAVATION BY A CERTIFIED ARBORIST AND TREES SHALL BE WATERED.
IN AREAS NOTED ON PLAN
HAND EXCAVATE MAJOR TREE ROOTS WITHIN 6' OF TRUNK
MAJOR ROOTS WILL BE RETAINED & PROTECTED AS SHOWN BELOW.



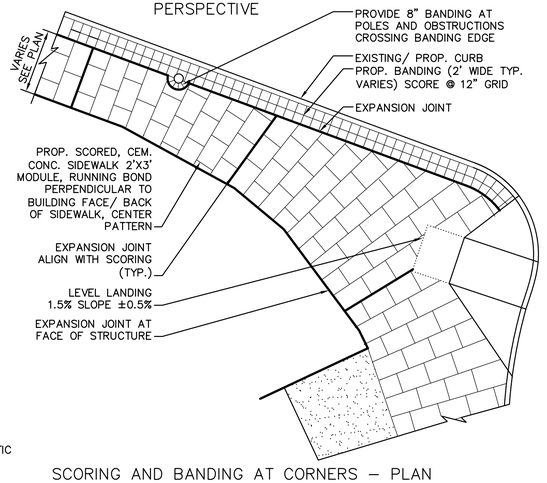


EXISTING TREE PROTECTION
SCALE: NONE

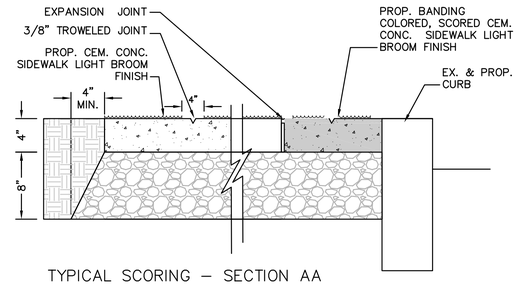
NOTES:
PROVIDE EXPANSION JOINT @ 20' O.C. MAX. BETWEEN WALK & BANDING AND AT FACE OF STRUCTURES EXPANSION JOINTS SHALL BE SEALED COLOR OF SEALANT TO MATCH CONCRETE.
BANDING COLOR SHALL BE BRICK RED



PERSPECTIVE



SCORING AND BANDING AT CORNERS – PLAN



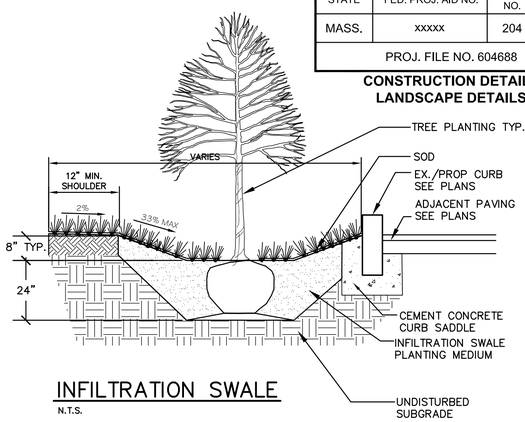
TYPICAL SCORING – SECTION AA

CEM. CONC. SIDEWALK SCORING AND BANDING
SCALE: NONE

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

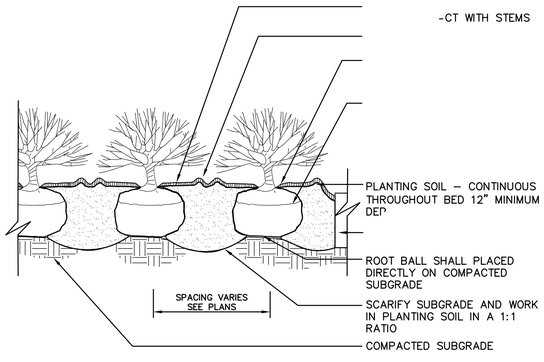
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	204	214
PROJ. FILE NO. 604688			

CONSTRUCTION DETAILS
LANDSCAPE DETAILS



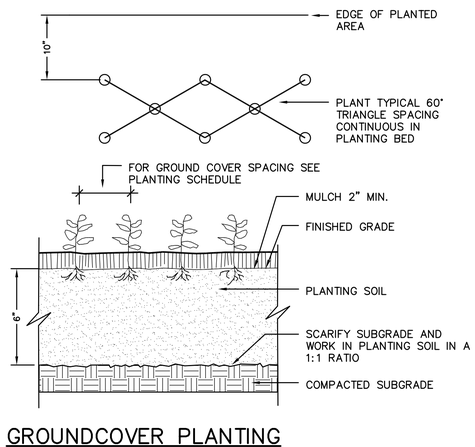
INFILTRATION SWALE
N.T.S.

SHRUB PLANTING NOTES:
1. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. NO PRUNING OR CUTTING UNLESS DIRECTED BY THE LANDSCAPE ARCHITECT.
3. SAUCER SHALL BE FLOODED TWICE DURING THE FIRST 24 HOURS AFTER PLANTING.
4. SHRUBS SHALL BE SET PLUMB AND PLANTED SO THAT THE TOP OF THE ROOTBALL IS 1"–2" ABOVE FINISHED GRADE.
5. FOR HEDGE PLANTING SHRUBS SHALL BE SPACED AS CALLED OUT ON PLANS AT QUANTITIES SUFICIENT TO PROVIDE COMPLETE COVERAGE OF AREA INDICATED



SHRUB PLANTING BED (HEDGE)
SCALE: NONE

NOTES:
SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS



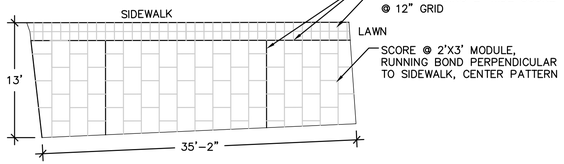
GROUNDCOVER PLANTING
SCALE: NONE

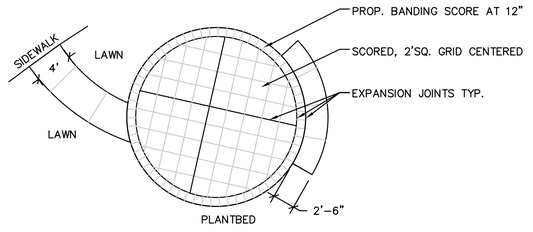
BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	205	214
PROJ. FILE NO. 604688			

CONSTRUCTION DETAILS
STREETSCAPE DETAILS

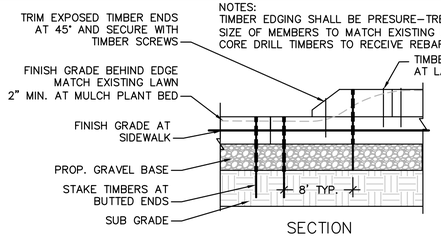
NOTES:
PATERN FOR COLORED SCORED CEMENT CONCRETE AT STATIONS 99+100 RIGHT



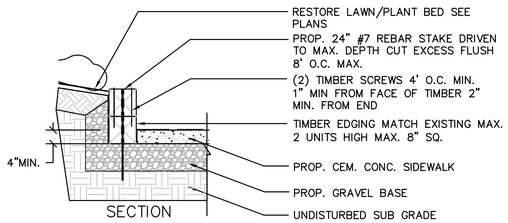


CUSTOM BANDING SCORING PATTERN AREAS
SCALE: NONE

NOTES:
TIMBER EDGING SHALL BE PRESURE-TREATED WOOD. SIZE OF MEMBERS TO MATCH EXISTING UP TO 8"SQ. CORE DRILL TIMBERS TO RECEIVE REBAR STAKES.



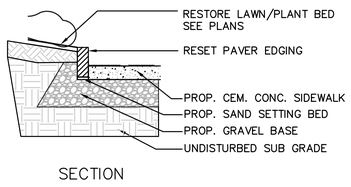
SECTION



SECTION

TIMBER EDGING
SCALE: NONE

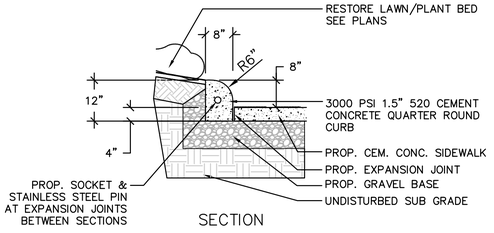
NOTES:
(PAVERS) INCLUDES LOOSE MODULAR BRICK, STONE, AND CONCRETE USED AS EDGING. STOCKPILE EXISTING PAVERS AND RESET TO REASONABLY MATCH ORIGINAL CONDITION.
FINISH GRADE BEHIND EDGE – MATCH EXISTING AT LAWN OR 2" MIN. AT MULCH PLANT BED.
WHERE EXISTING PAVERS ARE MISSING INSUFICIENT OR DETERIORATED THEY SHALL BE REPLACED IN KIND.
WHERE COMPARABLE PAVERS ARE UNAVAILABLE THE ENGINEER SHALL DETERMINE THE APPROPRIATE MATERIAL FOR REPLACEMENT.



SECTION

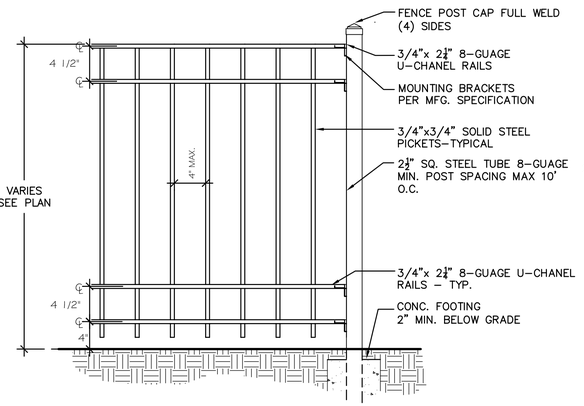
PAVER EDGING
SCALE: NONE

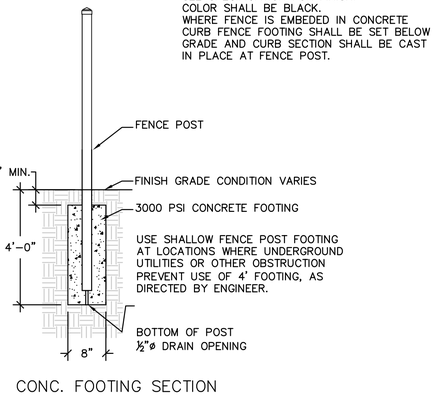
NOTES:
RADIAL CURB TO MATCH EXISTING VERIFY DIMENSIONS IN FIELD.
RADIAL CURB SHALL BE EXTRUDED OR PRECAST.
ALIGN JOINTS WITH SIDEWALK SCORING.
SAW CUT EXISTING CURB AT NEAREST JOINT.



SECTION

CEMENT CONCRETE QUARTER ROUND CURB
SCALE: NONE

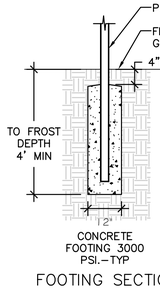




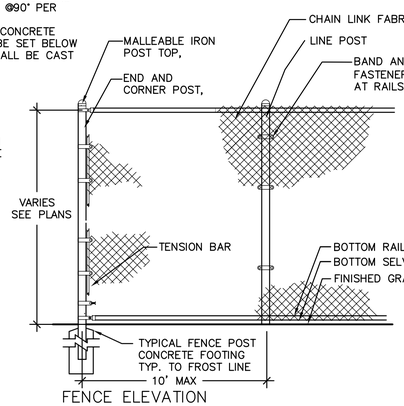
CONC. FOOTING SECTION

ORNAMENTAL STEEL FENCE
SCALE: NONE

NOTE:
SEE SPECIFICATION FOR FRAME MEMBER SIZING, MESH GAUGE & OPENING, FINISH, AND HARDWARE GATES SHALL HAVE 36" MIN. CLEAR OPENING EXCLUDING POST AND HINGE OFFSET WHEN GATE IS @90° PER ADA.
WHERE FENCE IS EMBEDDED IN CONCRETE CURB FENCE FOOTING SHALL BE SET BELOW GRADE AND CURB SECTION SHALL BE CAST IN PLACE AT FENCE POST.

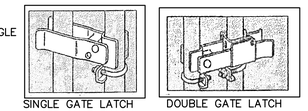


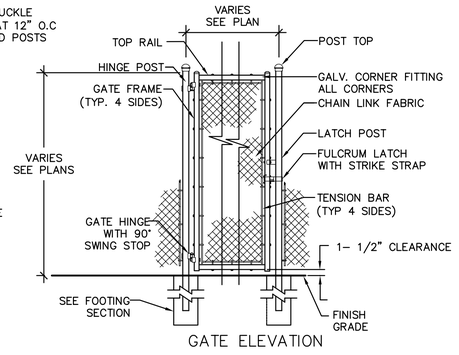
FOOTING SECTION



FENCE ELEVATION

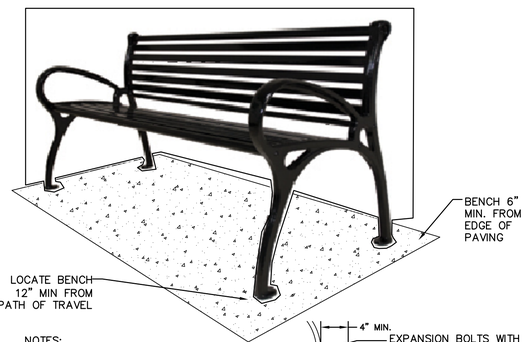
GATE LATCH
GATE LATCHES FOR SINGLE AND DOUBLE GATES





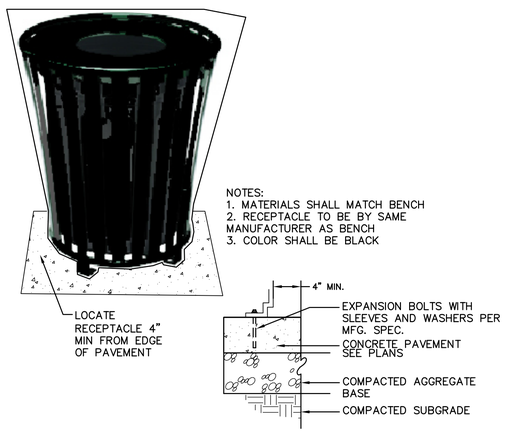
GATE ELEVATION

CHAIN LINK FENCE AND GATE DETAIL
SCALE: NONE



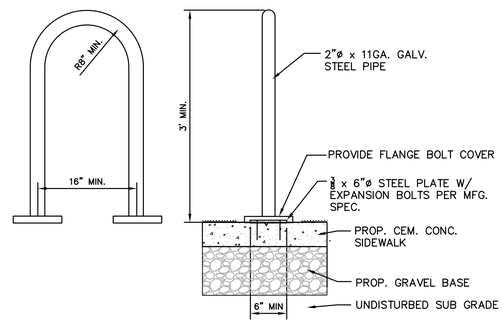
NOTES:
1. ALL STEEL MEMBERS COATED WITH ZINC RICH EPOXY THEN FINISHED WITH POLYESTER POWDER COATING.
2. COLOR SHALL BE BLACK
3. SURFACE MOUNT IN CONCRETE PAVEMENT

BENCH
SCALE: NONE



NOTES:
1. MATERIALS SHALL MATCH BENCH
2. RECEPTACLE TO BE BY SAME MANUFACTURER AS BENCH
3. COLOR SHALL BE BLACK

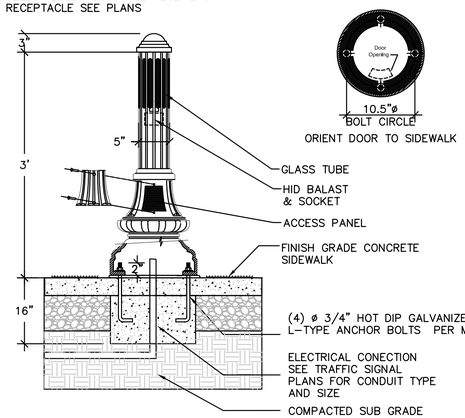
TRASH RECEPTACLE
SCALE: NONE



NOTES:
1. MATERIALS SHALL MATCH BENCH
2. BIKE RACK SHALL BE SURFACE MOUNTED ON CONCRETE PAVEMENT.
3. COLOR SHALL BE BLACK

BIKE RACK

NOTE:
SELECT BOLLARDS SHALL RECEIVE GFI RECEPTACLE SEE PLANS

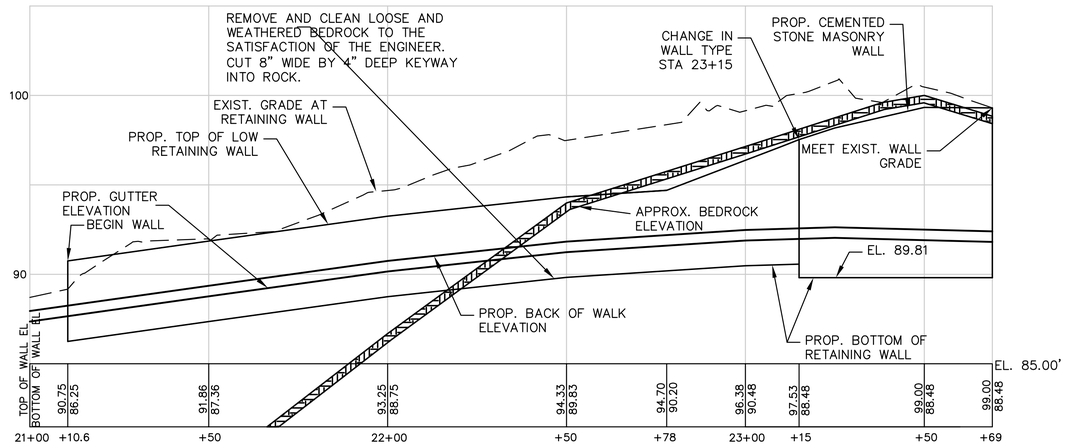


BOLLARD
SCALE: NONE

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	206	214
PROJ. FILE NO. 604688			

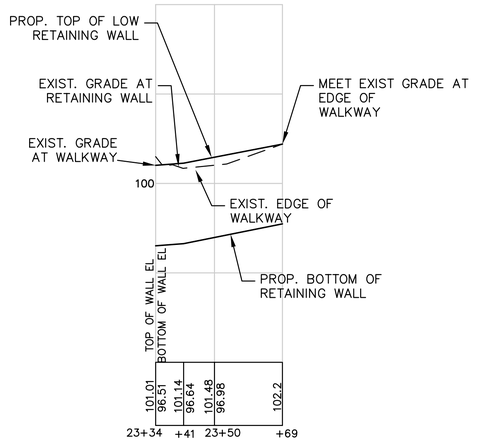
MISCELLANEOUS DETAILS
BRICK WALK STA. 23+90 RT



RETAINING WALL ELEVATION

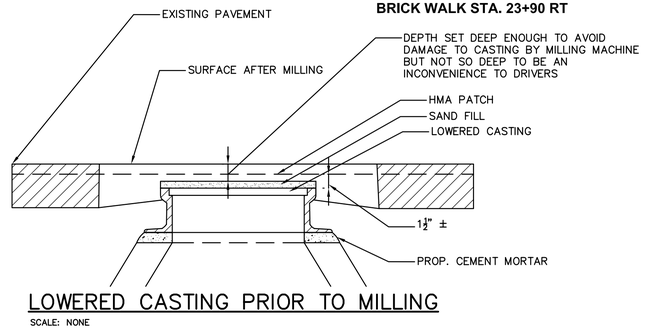
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4"

(SEE GRADING AND CURB TIE PLAN FOR HORIZONTAL ALIGNMENT OF WALLS.)



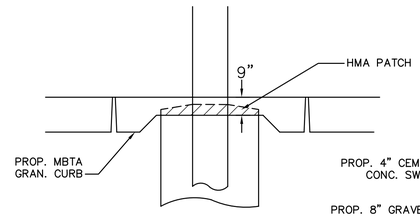
UPPER RETAINGING WALL ELEVATION

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 4"

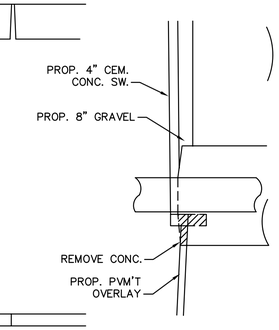


LOWERED CASTING PRIOR TO MILLING

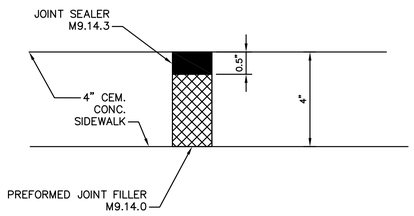
SCALE: NONE



SECTION A+A

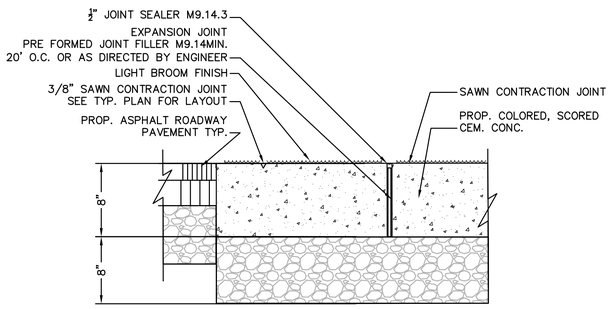


SECTION B+B



PERFORMED JOINT FILLER AND SEALER

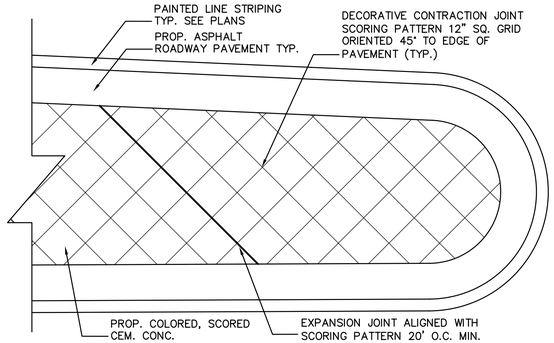
SCALE: NONE



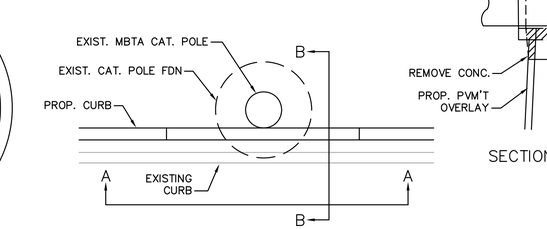
TYPICAL SCORING/JOINTING – SECTION

COLORED SCORED CEMENT CONCRETE PAVEMENT

SCALE: NONE



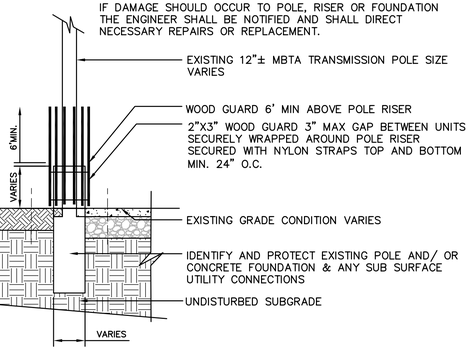
TYPICAL SCORING/JOINTING – PLAN



PLAN VIEW

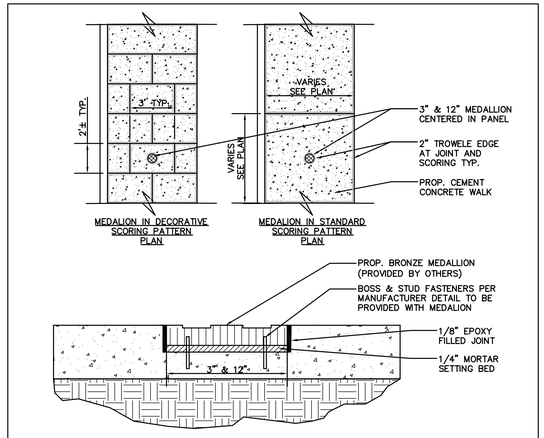
WIDENING ROADWAY AT MBTA CAT POLE

SCALE: NONE



EXISTING MBTA POLE PROTECTION

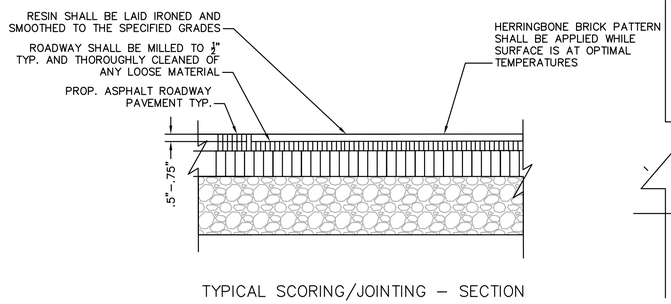
SCALE: NONE



WAVERLY TRAIL MEDALLION INSTALATION

SCALE: NONE

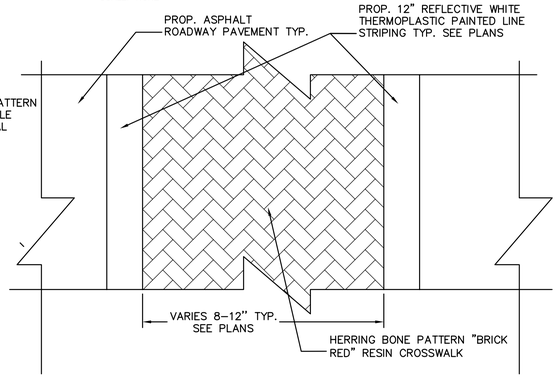
NOTE:
RESIN CROSSWALK SHALL NOT BE OPENED TO VEHICULAR OR PEDESTRIAN TRAFFIC UNTIL IT HAS COOLED AND HARDENED THROUGHOUT TO TEMPERATURE SPECIFIED. SURFACE SHALL BE INSPECTED AND APPROVED BY THE ENGINEER PRIOR TO BEING OPENED TO TRAFFIC.



TYPICAL SCORING/JOINTING – SECTION

COLORED SCORED CEMENT CONCRETE PAVEMENT

SCALE: NONE

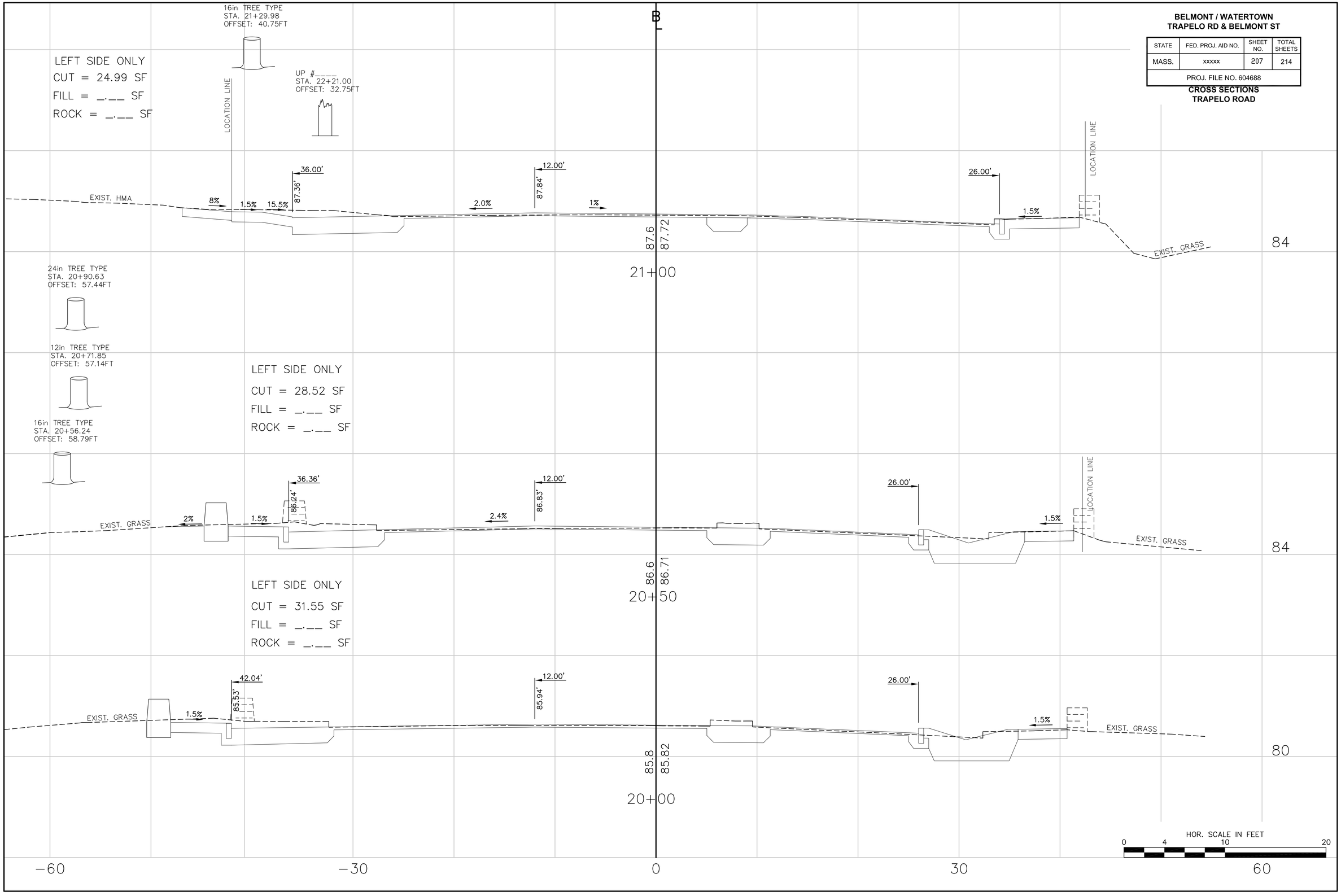


TYPICAL CROSSWALK – SECTION

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	207	214
PROJ. FILE NO. 604688			

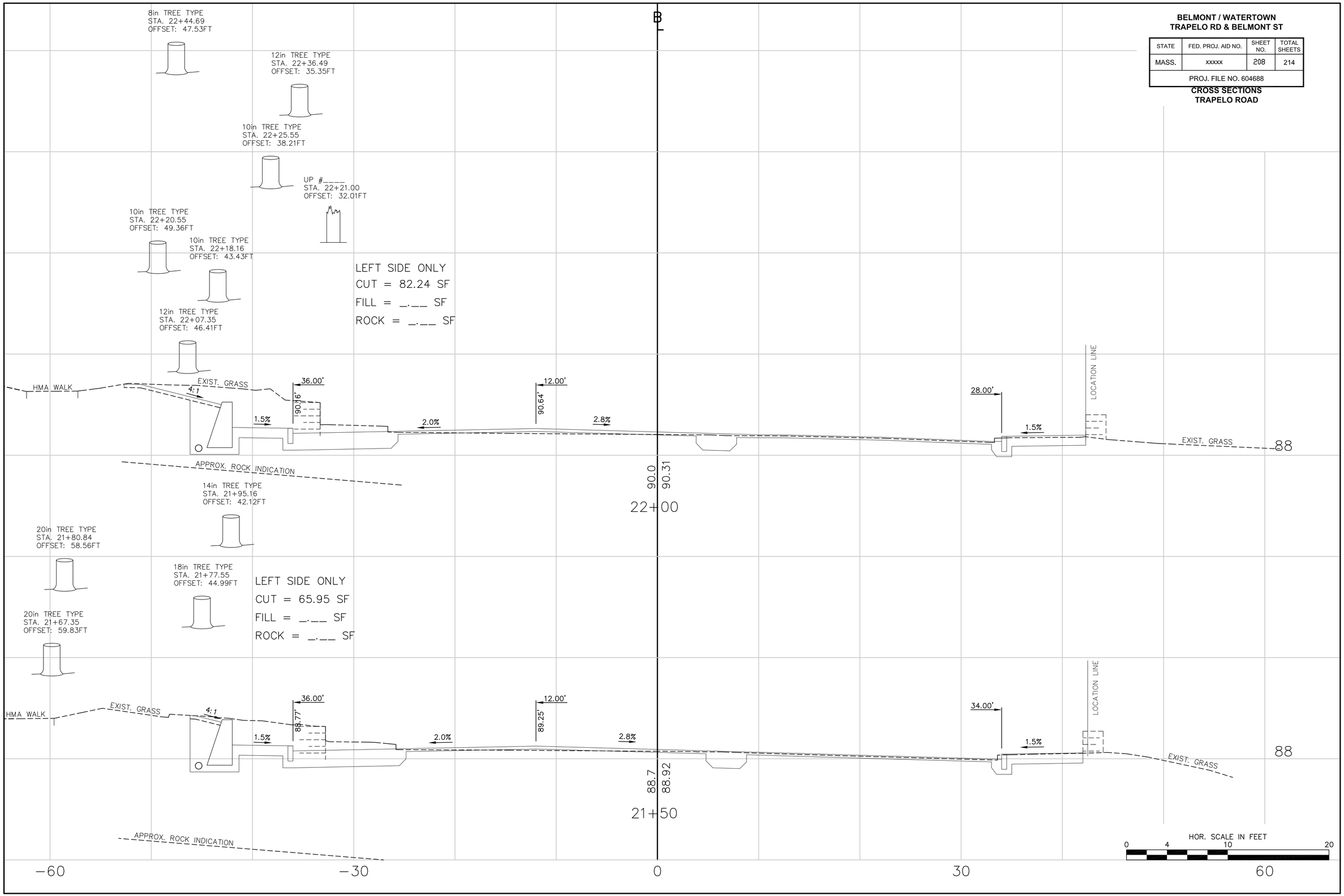
CROSS SECTIONS
TRAPELO ROAD



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	208	214
PROJ. FILE NO. 604688			

CROSS SECTIONS
TRAPELO ROAD



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	209	214
PROJ. FILE NO. 604688			

CROSS SECTIONS
TRAPELO ROAD

B

LEFT SIDE ONLY
CUT = 14.20 SF
FILL = _.__ SF
ROCK = 159.28 SF

14in TREE TYPE
STA. 23+53.98
OFFSET: 41.27FT

HMA WALK
4:1
APPROX. ROCK INDICATION
36.00'
92.08'
1.5%
2.0%
12.00'
92.56'
1.0%
34.00'
1.5%
LOCATION LINE
HMA DRIVE
90

92.3
92.45
23+50

LEFT SIDE ONLY
CUT = 59.37 SF
FILL = _.__ SF
ROCK = 86.34 SF

12in TREE TYPE
STA. 23+31.25
OFFSET: 41.98FT

14in TREE TYPE
STA. 23+28.90
OFFSET: 45.09FT

HMA WALK
4:1
APPROX. ROCK INDICATION
36.00'
91.89'
1.5%
2.4%
12.00'
92.43'
0.6%
UP #____
STA. 23+03.27
OFFSET: 32.01FT
34.00'
10.9%
1.5%
LOCATION LINE
HMA DRIVE
88

EARTH CUT
LEFT SIDE ONLY
131.93 SF

16in TREE TYPE
STA. 22+91.45
OFFSET: 38.84FT

92.2
92.36
23+00

LEFT SIDE ONLY
CUT = 99.19 SF
FILL = _.__ SF
ROCK = 51.28 SF

22in TREE TYPE
STA. 22+57.42
OFFSET: 47.36FT

HMA WALK
4:1
36.00'
91.74'
1.5%
2.0%
12.00'
91.72'
2.4%
34.00'
1.5%
LOCATION LINE
BLDG
90
APPROX. ROCK INDICATION

91.3
91.42
22+50

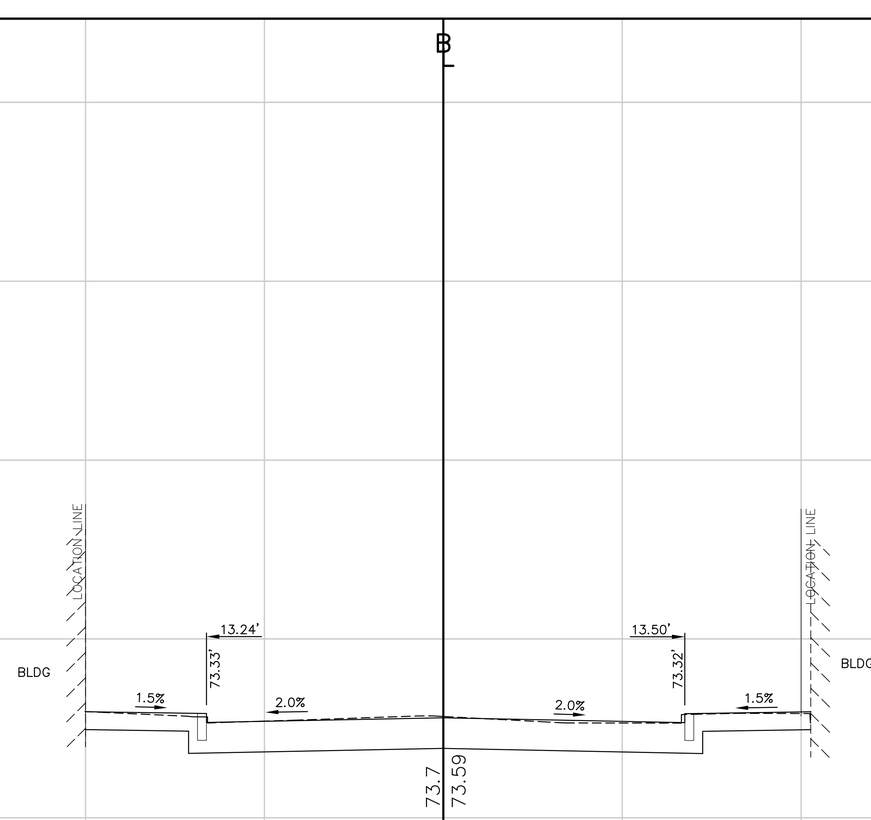
HOR. SCALE IN FEET
0 4 10 20

−60 −30 0 30

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

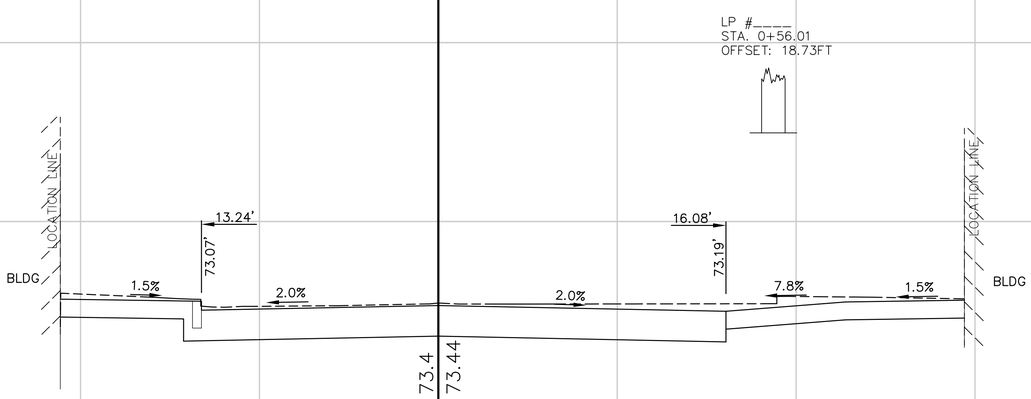
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	210	214
PROJ. FILE NO. 604688			

CROSS SECTIONS
BEECH STREET



CUT = 60.94 SF
FILL = _.__ SF
ROCK = _.__ SF

68



CUT = 83.81 SF
FILL = _.__ SF
ROCK = _.__ SF

68

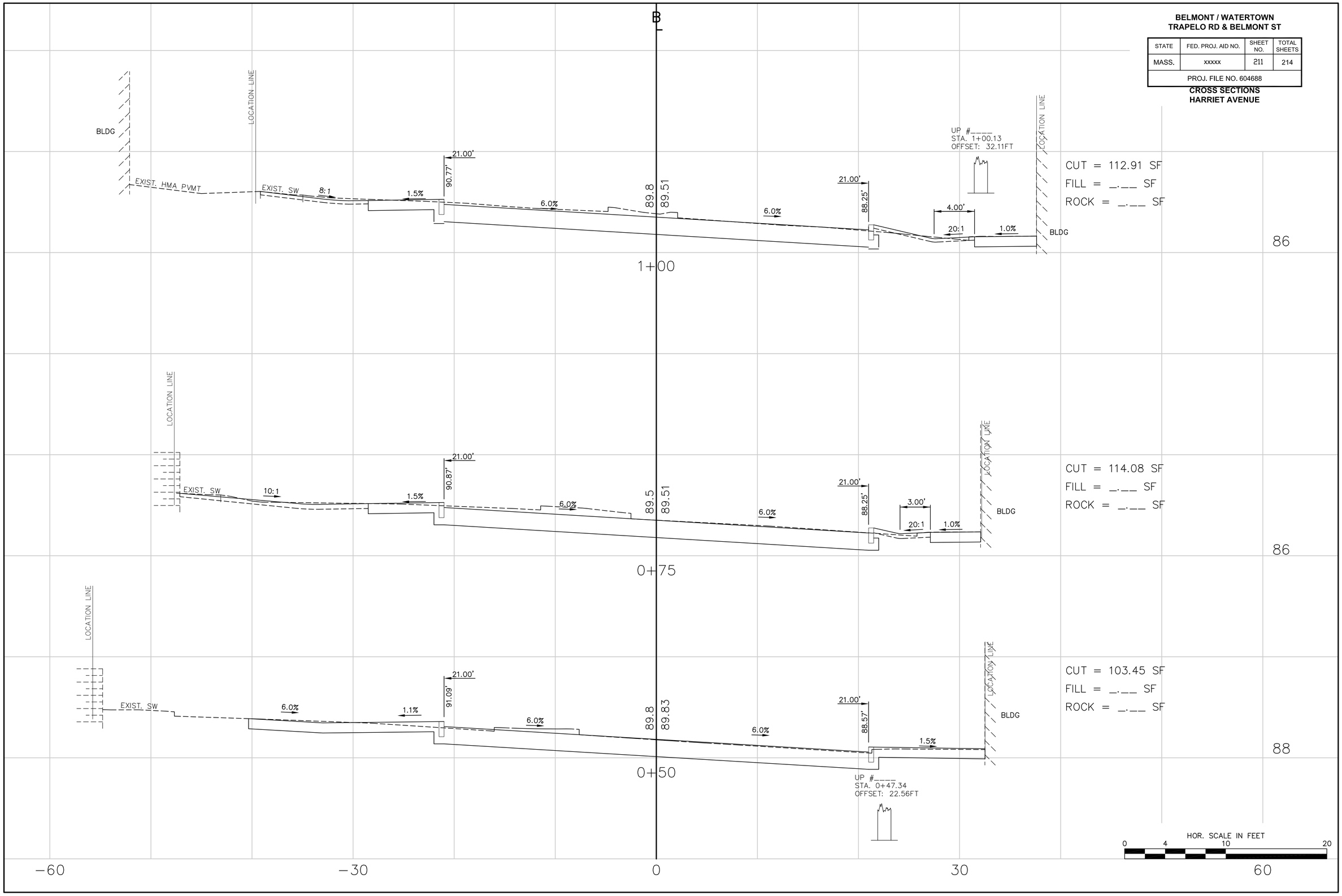
HOR. SCALE IN FEET
0 4 10 20

−60 −30 0 30 60

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	211	214
PROJ. FILE NO. 604688			

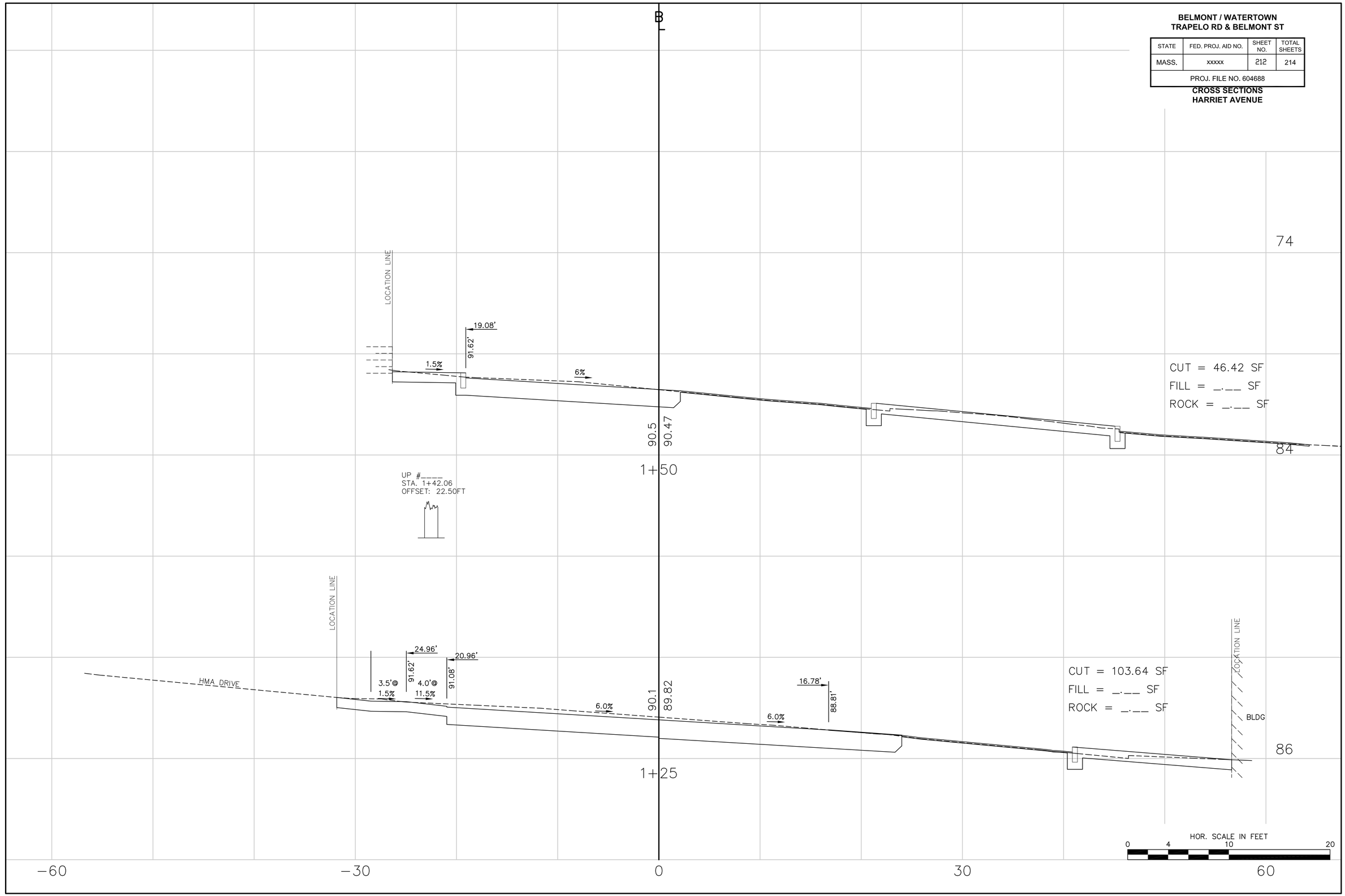
CROSS SECTIONS
HARRIET AVENUE



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	212	214
PROJ. FILE NO. 604688			

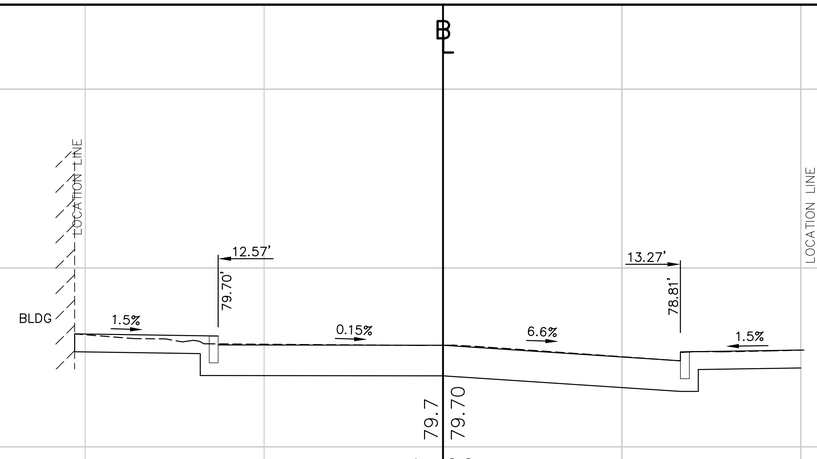
CROSS SECTIONS
HARRIET AVENUE



BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

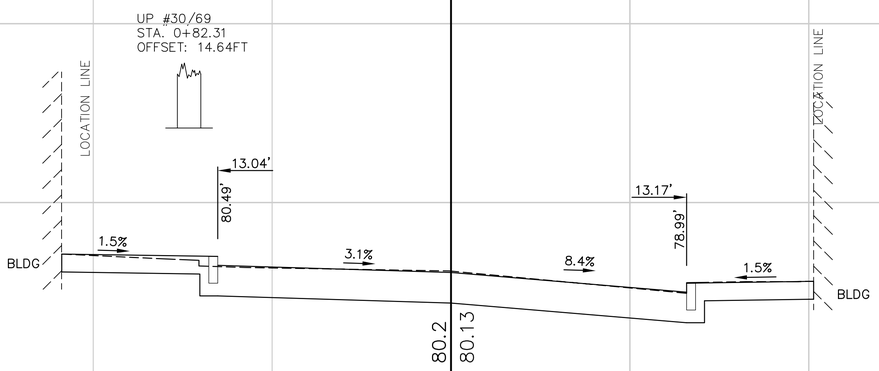
STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	213	214
PROJ. FILE NO. 604688			

CROSS SECTIONS
SCHOOL STREET NORTH



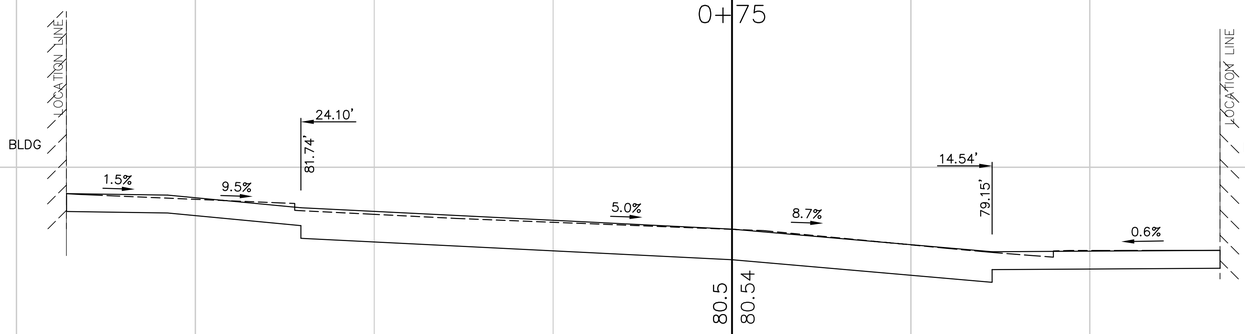
CUT = 60.20 SF
FILL = _.__ SF
ROCK = _.__ SF

74



CUT = 61.72 SF
FILL = _.__ SF
ROCK = _.__ SF

74



CUT = 88.38 SF
FILL = _.__ SF
ROCK = _.__ SF

74

HOR. SCALE IN FEET
0 4 10 20

−60 −30 0 30 60

BELMONT / WATERTOWN
TRAPELO RD & BELMONT ST

STATE	FED. PROJ. AID NO.	SHEET NO.	TOTAL SHEETS
MASS.	xxxxx	214	214
PROJ. FILE NO. 604688			

CROSS SECTIONS
GROVE STREET

