MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION

BEVERLY BRIMBAL AVE, EXIT 19/ROUTE 128			
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	1	80
PROJECT FILE NO.	604369		

TITLE SHEET & INDEX

PLAN AND PROFILE OF

BRIMBAL AVENUE

IN THE CITY OF

BEVERLY

ESSEX COUNTY

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED JUNE 12, 2012, THE 2012 CONSTRUCTION STANDARD DETAILS, THE 1996 CONSTRUCTION AND TRAFFIC STANDARD DETAILS (AS RELATES TO TRAFFIC STANDARD DETAILS ONLY), THE 2009 MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, WILL GOVERN.

25% SUBMITTAL

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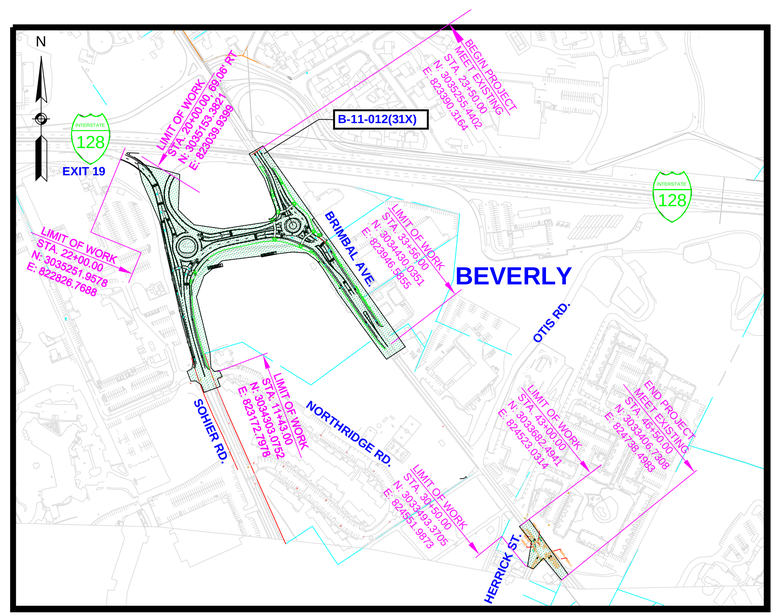


PROJECT LOCATION

300 0 300 600

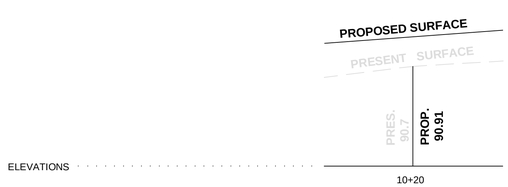
SCALE 1" =300'

LENGTH OF PROJECT
BRIMBAL AVENUE = 1,356 FEET = 0.26 MILES
CONNECTOR ROAD = 458 FEET = 0.09 MILES
SOHIER ROAD = 1,057 FEET = 0.20 MILES
HERRICK STREET = 100 FEET = 0.02 MILES

DESIGN DESIGNATION (STREET/RTE # OR NAME)

	BRIMBAL AVE.	SOHIER ROAD	CONNECTOR ROAD
DESIGN SPEED	35 MPH	30 MPH	35 MPH
ADT (2013)	15,090	8,850	9,420
ADT (2021)	19,290	10,250	13,230
K	0.9%	0.9%	0.9%
D	55%	52%	55%
T (PEAK HOUR)	3%	5%	3%
T (AVERAGE DAY)	2%	2%	2%
DHV	1,740	920	1,190
DDHV	870	480	660
FUNCTIONAL CLASSIFICATION	URBAN MINOR ARTERIAL	URBAN MINOR ARTERIAL	URBAN MINOR ARTERIAL

CONVENTIONAL SIGNS



25% SUBMISSION

June 2, 2014

DATE	DESCRIPTION	REV #

PREPARED BY:

JACOBS 343 Congress Street Suite 2100 Boston, MA 02210

massDOT Massachusetts Department of Transportation Highway Division

RECOMMENDED FOR APPROVAL

CHIEF ENGINEER DATE

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

APPROVED

HIGHWAY ADMINISTRATOR DATE

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Jacobs \\BOSFIL11\NAI_Proj\MHD\200\BE2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Title Sheet).dwg May 30, 2014

LEGEND

GENERAL SYMBOLS

EXISTING	PROPOSED	
JB OR BRJB	JB OR BRJB	JERSEY BARRIER ON BRIDGE OR JERSEY BARRIER
CB	CB	CATCH BASIN
CI	CI	CURB INLET
	BUOY	BUOY
		BORROW PIT OR CONSTRUCTION SITE
	FPL	FLAG POLE
		GOLF COURSE
		GAS PUMP
		GRAVEL PIT
DI	DI	DROP INLET
MB	MB	MAIL BOX
GR	GRAN POST	GRANITE POST
PLN	PLANTER	PLANTER
PST	POST	POST
TBH	TBH	TELEPHONE BOOTH
VLT	VLT	VAULT
VLV	VLV	VALVE
WELL	WELL	WELL
EHH	EHH	ELECTRIC MANHOLE (HANDHOLE)
FCGA		GATE POST
FL	FL	FLOW LINE
GG		GAS GATE
BH	BH	BORING HOLE
		MONITORING WELL
	TEP	TEST PIT
HC	CONC. HDWL	CONCRETE HEADWALL
HH		HANDHOLE
HS	STONE HDWL	STONE HEADWALL
HYD	HYD	HYDRANT
LPL	LPL	LIGHT POLE
CO. BO.	CO. BD.	COUNTY BOUND
GPS		GPS POINT
CMH		CABLE MANHOLE
DMH		DRAINAGE MANHOLE
EMH		ELECTRIC MANHOLE
GMH		GAS MANHOLE
MMH		MISC MANHOLE
OMH		OTHER MANHOLE
SMH		SEWER MANHOLE
TMH		TELEPHONE MANHOLE
WMH		WATER MANHOLE
MHB	MHB	MHD BOUND
MON	MON	MONUMENT
SB	SB	STONE BOUND
TOWN OR CITY BD.	TOWN OR CITY BD.	TOWN OR CITY BOUND
	TSN	TRAVERSE OR TRIANGULATION STATION
TPL OR GUY	TPL OR GUY	TROLLEY POLE OR GUY POLE
TRNP		TRANS. POLE
UFB	UFB	UP W ITH FIREBOX
LPDL	LPDL	POLE WITH DOUBLE LIGHT
ULT	ULT	UP W ITH 1 LIGHT
UPL	UPL	UTILITY POLE
	BUSH	BUSH
	TREE	TREE
STUMP		STUMP
		SWAMP / MARSH
WG	WG	WATER GATE
FA	FA	FIRE ALARM BOX
PM	PM	PARKING METER
		ELECTRICAL GROUND
	GV	GATE VALVE
		RIP RAP
		OVERHEAD CABLE
		DIRECT BURIAL CABLE
		CURBING
185	185	CONTOURS
D	D	DRAIN PIPE (DOUBLE LINE 24 INCH AND OVER)
E	E	ELECTRIC DUCT (DOUBLE LINE 24 INCH AND OVER)
G	G	GAS MAIN (DOUBLE LINE 24 INCH AND OVER)
S	S	SEWER MAIN (DOUBLE LINE 24 INCH AND OVER)
T	T	TELEPHONE DUCT (DOUBLE LINE 24 INCH AND OVER)
W	W	WATER MAIN (DOUBLE LINE 24 INCH AND OVER)
		BALANCE STONE WALL
		CULVERT
		GUARD RAIL
		GUTTER LINE AT DRIVEWAYS
		CHAIN LINK FENCE
		STOCKADE FENCE

GENERAL SYMBOLS (CONT.)

EXISTING	PROPOSED	
		COMPOST FILTER TUBE
		RETAINING WALL
		TREE LINE OR LIMIT OF CLEARING AND GRUBBING
		SAWCUT LINE
		TOP OR BOTTOM OF SLOPE
		LIMIT OF EDGE OF PAVEMENT OR COLD PLAN & OVERLAY
		BANK OF RIVER OR STREAM
WF-#		BORDER OF WETLAND
		100 FT WETLAND OR 200 FT RIVERFRONT BUFFER
DATE OF LAYOUT		STATE HIGHWAY LAYOUT
DATE OF LAYOUT		TOWN OR CITY LAYOUT
DATE OF LAYOUT		COUNTY LAYOUT
R.R. S/L		RAILROAD SIDELINE
		TOWN OR CITY BOUNDARY LINE
P OR APPROX. P		PROPERTY LINE OR APPROXIMATE PROPERTY LINE
		EASEMENT

TRAFFIC SIGNAL SYMBOLS

EXISTING	PROPOSED	
1	1	CONTROLLER PHASE ACTUATED
		TRAFFIC SIGNAL HEAD (SIZE AS NOTED)
		WIRE LOOP DETECTOR (6'X 6' TYPICAL UNLESS OTHERWISE SPECIFIED)
		VIDEO SURVEILLANCE CAMERA
		MICROWAVE DETECTOR
		MAGNETOMETER (2 SHOWN)
		PEDESTRIAN PUSH BUTTON, SIGN (DIRECTIONAL ARROW AS SHOWN) AND SADDLE
*	*	OPTICOM CONFIRMATION STROBE LIGHT
		VEHICULAR SIGNAL HEAD
		VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED
		FLASHING BEACON
		PEDESTRIAN SIGNAL HEAD (TYPE AS NOTED OR AS SPECIFIED)
		PEDESTRIAN SIGNAL HEAD, OPTICALLY PROGRAMMED
		PEDESTRIAN SIGNAL POST AND BASE
RRSG	RRSG	RAILROAD SIGNAL
OR		SIGNAL POST AND BASE (ALPHA-NUMERIC DESIGNATION NOTED)
	20'	STEEL OR ALUMINUM MAST ARM, SHAFT AND BASE (ARM LENGTH AS NOTED)
		HIGH MAST POLE OR TOWER
		SIGN AND POST
		SIGN AND POST (TWO POSTS)
	20'	SIGNAL AND LIGHTING MAST ARM(OPTICOM)
		EMERGENCY PRE-EMPTION DETECTOR
		CONTROL CABINET, GROUND MOUNTED
		CONTROL CABINET, POLE MOUNTED
		FLASHING BEACON CONTROL & METER PEDESTAL
		LOAD CENTER ASSEMBLY
		PULL BOX 12"X12" (AND AS NOTED)
		ELECTRIC HANDHOLE 12" X 24"
		TRAFFIC SIGNAL INTERCONNECT CONDUIT
		TRAFFFIC SIGNAL CONDUIT(TYPE AS NOTED)

PAVEMENT MARKINGS AND SIGNING SYMBOLS

EXISTING	PROPOSED	
		PAVEMENT ARROW - WHITE
ONLY	ONLY	LEGEND "ONLY" - WHITE
	SL	STOP LINE - 12"
	CW	CROSSWALK
	SWLL	SOLID WHITE LANE LINE
	BWLL	BROKEN WHITE LANE LINE (10' LINE, 30' SPACE TYP.)
	SWEL	SOLID WHITE EDGE LINE
	YGL	YELLOW GORE LINE - 12"
	DYCL	DOUBLE YELLOW CENTER LINE
	SWCHL	SOLID WHITE CHANNELIZATION LINE - 8"
	WGL	WHITE GORE LINE - 12"
	SYEL	SOLID YELLOW EDGE LINE
	BYCL	BROKEN YELLOW CENTER LINE (10' LINE, 30' SPACE TYP.) - 4"
	SYCL	SOLID YELLOW CENTER LINE
	DWLL	DOTTED WHITE LANE LINE - 4" (2' LINE, 4' SPACE)
		DIRECTION OF TRAFFIC FLOW

ABBREVIATIONS

GENERAL

AADT	ANNUAL AVERAGE DAILY TRAFFIC
ABAN	ABANDON
ADJ	ADJUST
APPROX.	APPROXIMATE
A.C.	ASPHALT CONCRETE
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
BIT.	BITUMINOUS
BC	BOTTOM OF CURB
BD.	BOUND
BL	BASELINE
BLDG	BUILDING
BM	BENCH MARK
BO	BY OTHERS
BOS	BOTTOM OF SLOPE
BR.	BRIDGE
CB	CATCH BASIN
CBCI	CATCH BASIN WITH CURB INLET
CC	CEMENT CONCRETE
CCM	CEMENT CONCRETE MASONRY
CEM	CEMENT
CI	CURB INLET
CIP	CAST IRON PIPE
CI.	CLASS (CONCRETE, EXCAVATION, ETC.)
CLF	CHAIN LINK FENCE
CL	CENTERLINE
CMP	CORRUGATED METAL PIPE
CSP	CORRUGATED STEEL PIPE
CO.	COUNTY
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCTION
CR GR	CROWN GRADE
DHV	DESIGN HOURLY VOLUME
DI	DROP INLET
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DSCB	DEEP SUMP CATCH BASIN
DSDMH	DEEP SUMP MANHOLE
DW	STEADY DON'T WALK - PORTLAND ORANGE
DWY	DRIVEWAY
ELEV (OR EL.)	ELEVATION
EMB	EMBANKMENT
EOP	EDGE OF PAVEMENT
EXIST (OR EX)	EXISTING
EXC	EXCAVATION
F&C	FRAME AND COVER
F&G	FRAME AND GRATE
FDN.	FOUNDATION
FLDSTN	FIELDSTONE
GAR	GARAGE
GD	GROUND
GG	GAS GATE
GI	GUTTER INLET
GIP	GALVANIZED IRON PIPE
GRAN	GRANITE
GRAV	GRAVEL
GRD	GUARD
HB	HIGHWAY BORING
HDW	HEADWALL
HMA	HOT MIX ASPHALT
HOR	HORIZONTAL
HYD	HYDRANT
IB	INFILTRATION BASIN BORING
INV	INVERT
JCT	JUNCTION
L	LENGTH OF CURVE
LB	LEACHING BASIN
LP	LIGHT POLE
LT	LEFT
MAX	MAXIMUM
MB	MAIL BOX
MH	MANHOLE
MHB	MASSACHUSETTS HIGHWAY BOUND
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
P.G.L.	PROFILE GRADE LINE
PI	POINT OF INTERSECTION
POC	POINT ON CURVE
POT	POINT ON TANGENT
PRC	POINT OF REVERSE CURVATURE
PROJ	PROJECT
PROP	PROPOSED
PSB	PLANTABLE SOIL BORROW
PVC	POINT OF VERTICAL CURVATURE
PT	POINT OF TANGENCY
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
PVMT	PAVEMENT
PWW	PAVED WATER WAY

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

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LEGENDS & ABBREVIATIONS

GENERAL (CONT.)

R	RADIUS OF CURVATURE
R&D	REMOVE AND DISPOSE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RDWY	ROADWAY
REM	REMOVE
RET	RETAIN
RET WALL	RETAINING WALL
ROW	RIGHT-OF-WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
RT	RIGHT
SB	STONE BOUND
SHLD	SHOULDER
SMH	SEWER MANHOLE
ST	STREET
STA	STATION
SSB	SIGNAL SUPPORTS BORING
SSD	STOPPING SIGHT DISTANCE
SHLO	STATE HIGHWAY LAYOUT LINE
SW	SIDEWALK
T	TANGENT DISTANCE OF CURVE/ TRUCK PERCENTAGE
TAN	TANGENT
TEMP	TEMPORARY
TC	TOP OF CURB
TOS	TOP OF SLOPE
TYP	TYPICAL
UP	UTILITY POLE
VAR	VARIES
VERT	VERTICAL
VC	VERTICAL CURVE
WCR	WHEELCHAIR RAMP
WG	WATER GATE
WIP	WROUGHT IRON PIPE
WM	WATER METER/WATER MAIN
X-SECT	CROSS SECTION

TRAFFIC SIGNAL

CAB.	CABINET
CCVE	CLOSED CIRCUIT VIDEO EQUIPMENT
DW	STEADY DON'T WALK - PORTLAND ORANGE
FDW	FLASHING DON'T WALK - PORTLAND ORANGE
FYV	FLASHING AMBER VERTICAL ARROW
FR	FLASHING CIRCULAR RED
FW	FLASHING WALK - LUNAR WHITE
FY	FLASHING CIRCULAR AMBER
FRL	FLASHING RED LEFT ARROW
FRR	FLASHING RED RIGHT ARROW
FRV	FLASHING RED VERTICAL ARROW
G	STEADY CIRCULAR GREEN
GL	STEADY GREEN LEFT ARROW
GR	STEADY GREEN RIGHT ARROW
GSL	STEADY GREEN SLASH LEFT ARROW
GSR	STEADY GREEN SLASH RIGHT ARROW
GV	STEADY GREEN VERTICAL ARROW
OL	OVERLAP
OP	OPTICOM
PED	PEDESTRIAN
PTZ	PAN, TILE, ZOOM
R	STEADY CIRCULAR RED
RV	STEADY RED VERTICAL ARROW
RL	STEADY RED LEFT ARROW
RR	STEADY RED RIGHT ARROW
TR SIG	TRAFFIC SIGNAL
TSC	TRAFFIC SIGNAL CONDUIT
W	STEADY WALK - LUNAR WHITE
Y	STEADY CIRCULAR AMBER
YL	STEADY AMBER LEFT ARROW
YR	STEADY AMBER RIGHT ARROW
YV	STEADY AMBER VERTICAL ARROW

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604369_HD(LEGEND-ABBREVIATIONS).DWG Plotted on 30-May-2014 2:24 PM

GENERAL NOTES:

1. EXISTING SURVEY PROVIDED BY HANCOCK ASSOCIATES, 185 CENTRE ST., DANVERS, MA.
2. THE HORIZONTAL CONTROL IS BASED ON THE MASSACHUSETTS MAINLAND STATE PLANE COORDINATE SYSTEM AND THE NATIONAL GEODETIC SURVEY (NAD83). ALL ELEVATIONS IN US FEET, REFERENCED TO THE NORTH AMERICA VERTICAL DATUM OF 1988 (NAVD88).
3. THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND GRADES IN THE FIELD BEFORE COMMENCING WORK AND PROMPTLY NOTIFY THE ENGINEER OF ANY DISCREPANCIES. WHERE THE CLEAR INTENT OF THE NEW WORK IS TO MATCH EXISTING CONDITIONS, THE FIELD DATA SHALL GOVERN.
4. THE CONTRACTOR SHALL VERIFY BY TEST PIT, THE LOCATIONS OF EXISTING UTILITIES WHICH MAY CONFLICT WITH THE PROPOSED DRAINAGE STRUCTURES AND PIPES. ANY FIELD ADJUSTMENTS REQUIRED WILL BE MADE AS APPROVED OR DIRECTED BY THE ENGINEER. ONLY AFTER THE CONTRACTOR VERIFIES ELEVATIONS FOR THE CONSTRUCTABILITY OF THE DRAINAGE SYSTEM SHALL ANY STRUCTURES BE ORDERED.
5. EXISTING UTILITY LINES INDICATED OR NOTED ON THESE DRAWINGS ARE SHOWN AS OBTAINED FROM EXISTING INFORMATION AND ARE ONLY APPROXIMATE IN LOCATION. EXISTING UTILITIES OTHER THAN THOSE INDICATED ON THESE DRAWINGS MAY BE PRESENT. THE CONTRACTOR IS WARNED TO PROCEED WITH CAUTION WITH ALL WORK, ESPECIALLY EXCAVATION WORK. THE CONTRACTOR IS TO MAKE ALL POSSIBLE INVESTIGATIONS AS TO POSSIBLE UNMARKED UTILITY LINES. BEFORE EXCAVATING, BLASTING, INSTALLING, BACKFILLING, GRADING, PAVEMENT RESTORATION OR REPAIRING, ALL UTILITY COMPANIES PUBLIC AND PRIVATE MUST BE NOTIFIED, INCLUDING THOSE IN CONTROL OF UTILITIES NOT SHOWN ON THESE PLANS. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN.
6. THE CONTRACTOR SHALL COORDINATE ALL ACTIVITIES WITH OTHER CONTRACTORS PERFORMING WORK WITHIN AND AT THE PROJECT LIMITS.
7. THE CONTRACTOR SHALL NOTIFY DIG-SAFE (1-888-344-7233), AT LEAST 72 BUSINESS HOURS BEFORE ANY CONSTRUCTION BEGINS.
8. ALL EXISTING PAVEMENT SHALL BE SAWCUT TO A NEAT LINE WHERE IT MEETS PROPOSED CONDITIONS.
9. ALL GRASSED AREAS DISTURBED BY CONSTRUCTION AND NOT COVERED BY PAVEMENT, STRUCTURES, BALLAST, ETC., SHALL RECEIVE FOUR INCHES OF LOAM AND SEED.
10. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED, BY THE CONTRACTOR, TO THEIR ORIGINAL CONDITION, AT THE CONTRACTOR'S EXPENSE.
11. ALL WHEELCHAIR RAMPS SHALL CONFORM TO THE LATEST EDITION OF THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (AAB) RULES AND REGULATIONS AND WITH THE AMERICANS WITH DISABILITIES ACT (ADA) GUIDELINES, AS AMENDED.
12. IT IS THE INTENT OF THE DESIGN TO PROVIDE A MINIMUM CONSTRUCTED SIDEWALK WIDTH FOR A PATH OF TRAVEL PAST ALL OBSTRUCTIONS OF 3 FEET. THE CONTRACTOR SHALL VERIFY THAT ALL POTENTIAL OBSTRUCTIONS, INCLUDING BUT NOT LIMITED TO SIGNS, MAILBOXES, UTILITY POLES, HYDRANTS, AND TRAFFIC SIGNAL EQUIPMENT ARE LOCATED AS TO PROVIDE THIS MINIMUM PATH OF TRAVEL CLEARANCE.
13. ALL UNDERGROUND UTILITY AND DRAINAGE WORK SHALL BE PERFORMED PRIOR TO THE HMA PROPOSED PAVING.
14. ALL PROPOSED DRAINAGE PIPES, NOT USED TO REPLACE EXISTING PIPES, SHALL BE INSTALLED WITH A MINIMUM SLOPE OF 0.4%, UNLESS OTHERWISE NOTED.
15. THE CONTRACTOR SHALL COORDINATE ALL ARRANGEMENTS FOR THE ALTERATION AND/OR ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITY THROUGH THE MASSDOT HIGHWAY DIVISION UTILITY SECTION.
16. SHOULD AN EXISTING UTILITY BE FOUND TO BE IN CONFLICT WITH THE PROPOSED WORK, THE LOCATION, SIZE AND TYPE SHALL BE ACCURATELY DETERMINED WITHOUT DELAY, BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
17. WHERE NOTED, ADJUSTMENT OR REMODEL OF GAS, TELEPHONE AND ELECTRICAL STRUCTURES SHALL BE BY OTHERS. REMOVAL OF GAS, TELEPHONE AND ELECTRIC STRUCTURES, SHALL BE BY THE CONTRACTOR. ALSO, WHERE NOTED (R&R), REMOVED & RESET, OF UTILITY POLES SHALL BE BY OTHERS.
18. ALL EXISTING WATER GATES TO BE RETAINED WITHIN AREAS OF RESURFACING OR RECONSTRUCTION SHALL BE ADJUSTED TO PROPOSED LINE AND GRADE UNLESS OTHERWISE NOTED ON THE PLANS.
19. ALL PROPOSED DRAIN MANHOLES SHALL BE LAID OUT AND REVIEWED WITH THE ENGINEER TO ENSURE THAT THEY ARE OUT OF THE TRAVEL LANES WHEREVER POSSIBLE.
20. ALL CATCH BASIN FRAME AND GRATES WITHIN THE PROJECT LIMITS SHALL BE HOOK-LOCK AS DESCRIBED IN DIRECTIVE E-09-003 DATED 6/18/09.
21. TREES AND SHRUBS WITHIN THE LIMITS OF WORK NOT SCHEDULED FOR REMOVAL AS INDICATED ON THE PLANS SHALL ONLY BE REMOVED UPON APPROVAL OF THE ENGINEER.
22. WETLAND RESOURCES MUST BE PROTECTED FROM SILTATION THROUGHOUT THE PROJECT. ALL EROSION CONTROLS MUST BE INSTALLED PRIOR TO THE START OF CONSTRUCTION. THE CONTROLS MUST BE APPROVED BY THE RESIDENT ENGINEER PRIOR TO ANY CONSTRUCTION OR EARTHWORK.
23. ALL EROSION CONTROLS MUST BE CHECKED/REPAIRED, AND ANY SILTATION REMOVED AFTER EACH RAIN EVENT.
24. SAFETY CONTROLS FOR CONSTRUCTION OPERATIONS AND WORKZONE PROTECTION SHALL BE IN ACCORDANCE WITH CURRENT MASSDOT AND MUTCD REQUIREMENTS AND SPECIFICATIONS.
25. ALL CONSTRUCTION SIGNS IN PLACE BUT NOT PERTINENT TO THE ONGOING CONSTRUCTION PHASING SHALL BE “BAGGED”.
26. THE CONTRACTOR SHALL PROVIDE FOR THE SAFE AND ORDERLY PASSAGE OF VEHICULAR AND PEDESTRIAN TRAFFIC IN AREAS UNDER CONSTRUCTION.
27. NIGHT WORK SHALL BE PROPERLY ILLUMINATED AS REQUIRED TO PERFORM THE SPECIFIC WORK ACTIVITY TO THE LEVEL OF QUALITY AND SAFETY REQUIRED IN THE SPECIFICATIONS. FURTHERMORE, THE ILLUMINATION SHALL BE MODIFIED AS DEEMED NECESSARY BY THE ENGINEER.
28. ANY AND ALL TRAFFIC RELATED ITEMS REQUIRED TO MAINTAIN TRAFFIC FLOW THROUGH OR AROUND THE PROJECT AREA SHALL BE MAINTAINED IN A CONDITION ACCEPTABLE TO THE ENGINEER. FURTHERMORE, THE CONTRACTOR SHALL REPLACE THOSE ITEMS AS REQUIRED BY THE SPECIFICATIONS OR AS DEEMED NECESSARY BY THE ENGINEER.
29. EXISTING WETLAND RESOURCE AREAS SHOWN WERE DELINEATED BY JACOBS ENGINEERING GROUP INC. IN MAY 2009, AND FIELD VERIFIED TO BE ACCURATE IN APRIL 2013.
30. TEST PITS WILL NEED TO BE PERFORMED AT ALL LOCATIONS WHERE THE PROPOSED AND/OR EXISTING DRAINAGE LINES, SEWER LINES, GAS LINES, WATER LINES, ELECTRIC DUCTS, TELEPHONE DUCTS, CABLE DUCTS, SIGNAL/LIGHTING CONDUIT, ETC. MAY CONFLICT WITH EACH OTHER OR ANY COMPONENT OF THIS PROJECT.

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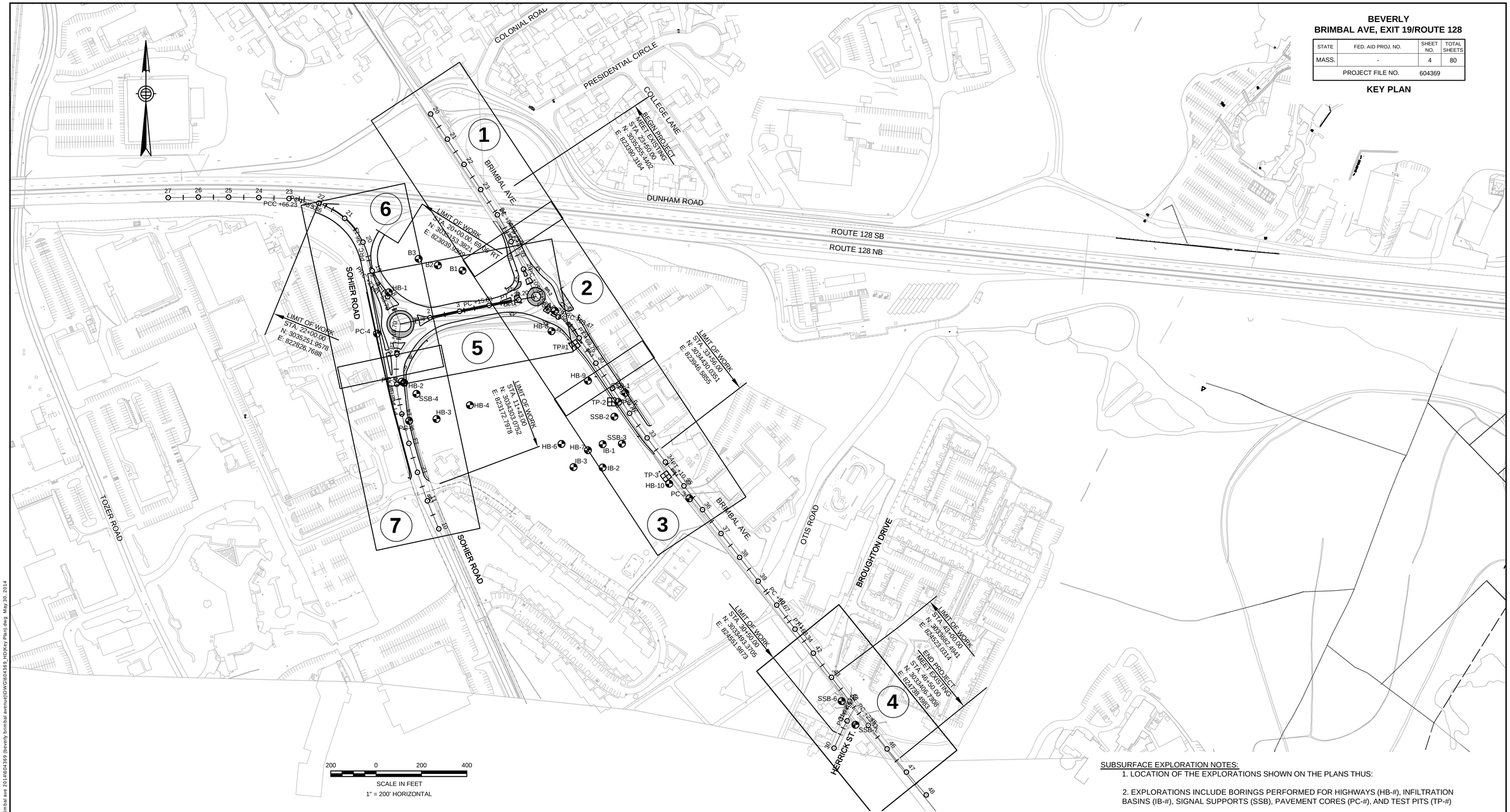
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	4	80
PROJECT FILE NO.		604369	

KEY PLAN



20 SCALE	PLATE 1	PLATE 2	PLATE 3	PLATE 4	PLATE 5	PLATE 6	PLATE 7
SURVEY CONTROL PLAN	12	13	14	15	16	17	18
CONSTRUCTION PLAN	24	25	26	27	28	29	30
PROFILE	31	32	33	-	34	35-36	36-37
DRAINAGE AND UTILITY PLAN	40	41	42	43	44	45	46
SIGN AND PAVEMENT MARKING PLAN	48	49	50	51	52	53	54

SUBSURFACE EXPLORATION NOTES:

1. LOCATION OF THE EXPLORATIONS SHOWN ON THE PLANS THUS:

2. EXPLORATIONS INCLUDE BORINGS PERFORMED FOR HIGHWAYS (HB-#), INFILTRATION BASINS (IB-#), SIGNAL SUPPORTS (SSB), PAVEMENT CORES (PC-#), AND TEST PITS (TP-#)

3.INITIAL EXPLORATIONS WERE MADE IN MAY THROUGH JULY 2013 BY NEW HAMPSHIRE BORING, INC. OF BROCKTON, MA AND WERE OBSERVED BY JACOBS ENGINEERING GROUP.

4. THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 IS USED THROUGHOUT.

5. WATER LEVELS RECORDED DURING DRILLING, AFTER COMPLETION OF THE BORINGS, IN MONITORING WELLS OR IN TEST PITS SHOULD BE CONSIDERED APPROXIMATE AND REFER ONLY TO THE TIMES AND PLACES INDICATED. WATER LEVELS MAY VARY WITH TIME, SEASONAL CONDITIONS, OR CONSTRUCTION ACTIVITY.

6. AS-DRILLED EXPLORATION LOCATIONS AND GROUND ELEVATIONS FOR ALL EXPLORATIONS EXCEPT HB-5 WERE SURVEYED BY A LICENSED ENGINEER OR LAND SURVEYOR. BORING HB-5 WAS APPROXIMATELY LOCATED BY HANDHELD GPS AND SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

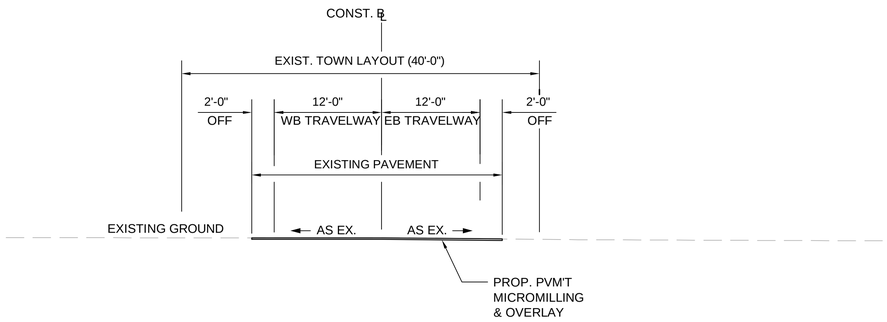
604369_HD(KEY PLAN).DWG Plotted on 30-May-2014 2:24 PM

Jacobs - \\BOSFIL11\NAL Proj\MHD\2008\E2X41107\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Key Plan).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	5	80
PROJECT FILE NO.	604369		

TYPICAL SECTIONS



HERRICK STREET
STA. 30+00 STA. 31+50

PAVEMENT NOTES

PROPOSED FULL DEPTH PAVEMENT

SURFACE COURSE: 1 3/4" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5) OVER

INTERMEDIATE COURSE: 2 3/4" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0) OVER

BASE COURSE: 4 1/2" SUPERPAVE BASE COURSE 37.5 (SBC-37.5) OVER

SUB-BASE: 4" DENSE GRADED CRUSH STONE OVER
8" GRAVEL BORROW TYPE B
24" SPECIAL BORROW

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

SURFACE COURSE: 1 3/4" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5) OVER

INTERMEDIATE COURSE: 2 3/4" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0) OVER

BASE COURSE: 6 1/2" H.E.S. CEMENT CONCRETE BASE COURSE OVER

SUB-BASE: 10" GRAVEL BORROW TYPE B

PAVEMENT MICROMILLING AND OVERLAY

SURFACE COURSE: 1 3/4" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5) OVER

SURFACE PREPARATION: 1 3/4" PAVEMENT MICROMILLING, TACK COAT 0.07 GAL. BITUMEN (RS-1) PER SQUARE YARD

CEMENT CONCRETE SIDEWALK/SHARED USE PATH, WHEELCHAIR RAMP AND DRIVEWAY APRON

SURFACE COURSE: 4" CEMENT CONCRETE (AIR ENT. 4000 PSI, 3/4"-610 LB)
6" CEMENT CONCRETE (AIR ENT. 4000 PSI, 3/4"-610 LB)(DRIVEWAYS, ONLY)

BASE COURSE: 8" GRAVEL BORROW TYPE B

DRIVEWAY CONSTRUCTION (HMA)

SURFACE COURSE: 1 1/2" SUPERPAVE SURFACE COURSE 12.5 (SSC-12.5) OVER

INTERMEDIATE COURSE: 2" SUPERPAVE INTERMEDIATE COURSE 19.0 (SIC-19.0) OVER
8" GRAVEL BORROW TYPE B OR EXISTING GRAVEL BORROW TO REMAIN

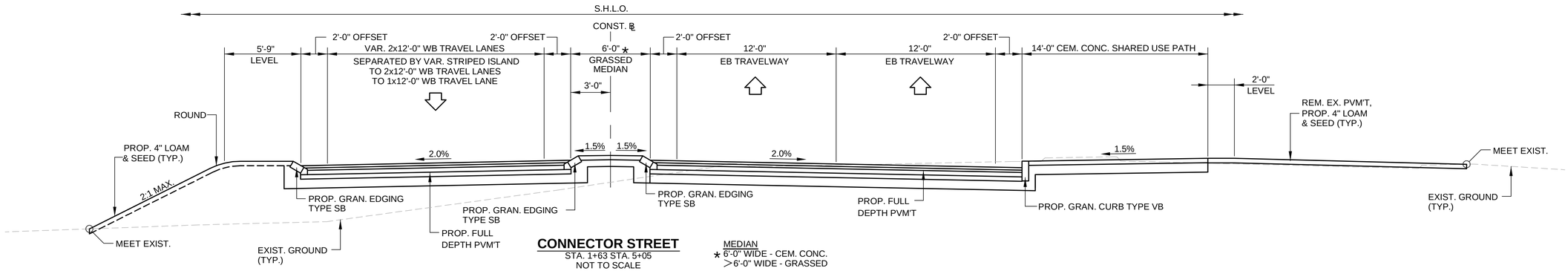
MOUNTABLE TRUCK APRON

SURFACE COURSE: 8" COLORED, STAMPED CEMENT CONCRETE OVER

INTERMEDIATE COURSE: 8" GRAVEL BORROW TYPE B

NOTES:

1. ALL SUPERPAVE HOT MIX ASPHALT SHALL BE WARM MIX ASPHALT PAVEMENT LATEX MODIFIED.
2. THE SURFACE COURSE SHALL BE PLACED IN ONE CONTINUOUS LAYER.
3. A LEVELING COURSE OF HOT MIX ASPHALT SHALL BE USED WHERE REQUIRED TO MEET PROPOSED GRADES.
4. TACK COAT AT 0.05 GAL/SY SHALL BE PLACED ON THE BASE, INTERMEDIATE, LEVELING AND CEMENT CONCRETE COURSE..
5. HMA JOINT SEALANT SHALL BE APPLIED TO ALL PAVEMENT JOINTS IN THE SURFACE COURSE BETWEEN SUCCESSIVE PASSES OF THE PAVER.
6. TOLERANCE FOR CONSTRUCTION 0.5% ±.
7. EXISTING SUBBASE MATERIAL, IF DETERMINED TO BE SUITABLE SHALL REMAIN.



CONNECTOR STREET
STA. 1+63 STA. 5+05
NOT TO SCALE

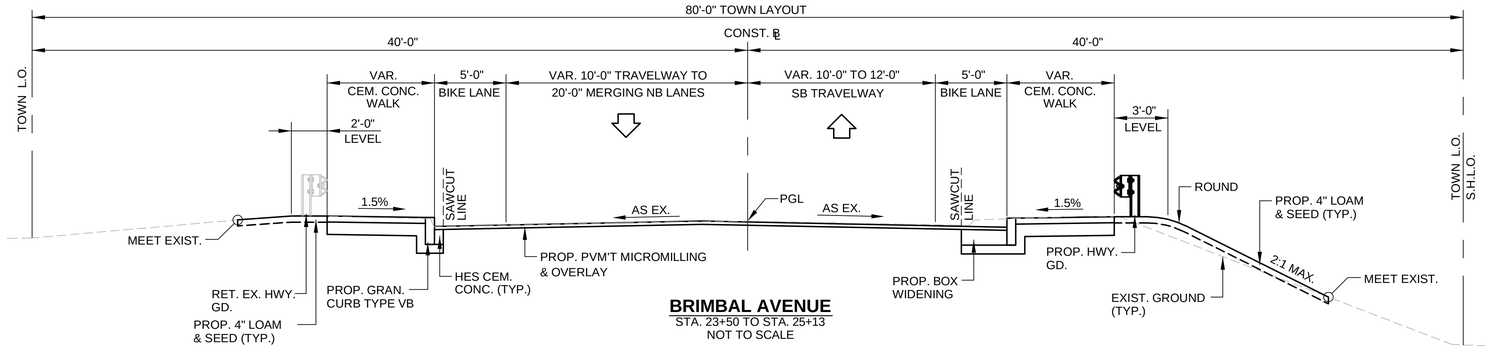
MEDIAN
* 6'-0" WIDE - CEM. CONC.
>6'-0" WIDE - GRASSED

Jacobs - \\BOSFIL11\NA\Proj\MHD\200\BE2X4110\assignment 23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Typical Sections).dwg May 30, 2014
604369_HD(TYPICAL SECTIONS).DWG Plotted on 30-May-2014 2:24 PM

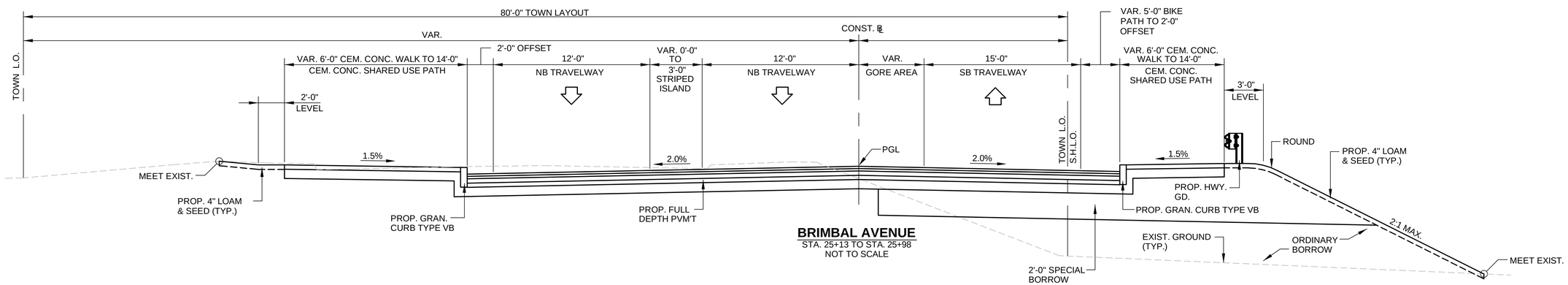
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	6	80
PROJECT FILE NO.	604369		

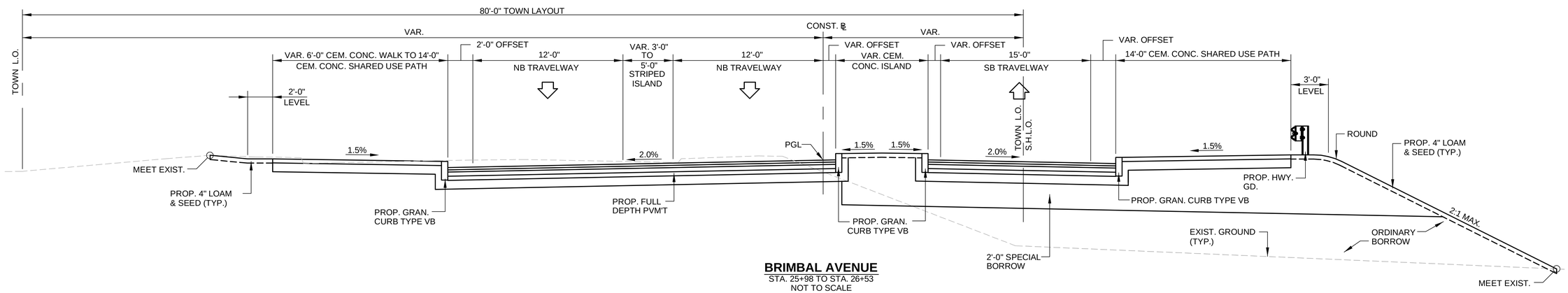
TYPICAL SECTIONS



BRIMBAL AVENUE
STA. 23+50 TO STA. 25+13
NOT TO SCALE



BRIMBAL AVENUE
STA. 25+13 TO STA. 25+98
NOT TO SCALE



BRIMBAL AVENUE
STA. 25+98 TO STA. 26+53
NOT TO SCALE

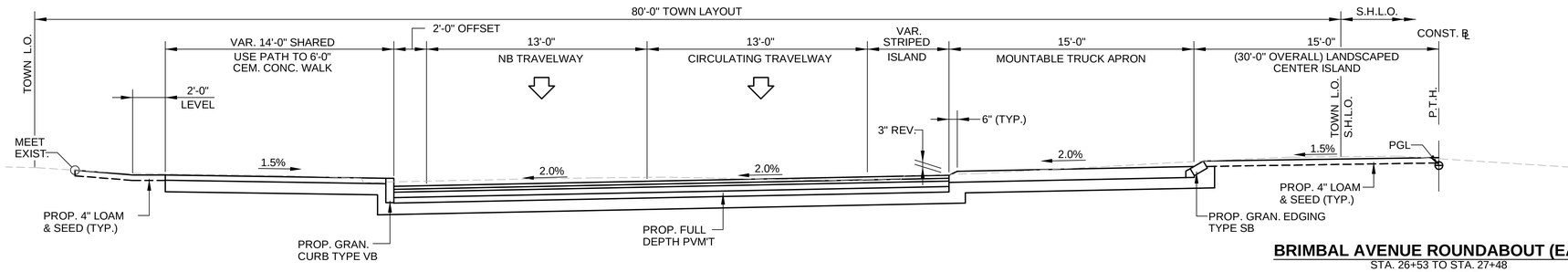
Plotted on 30-May-2014 2:24 PM
604369_HD(TYPICAL SECTIONS).DWG

Jacobs - \\BOSFIL11\NA_Proj\MHD\208\E2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Typical Sections).dwg May 30, 2014

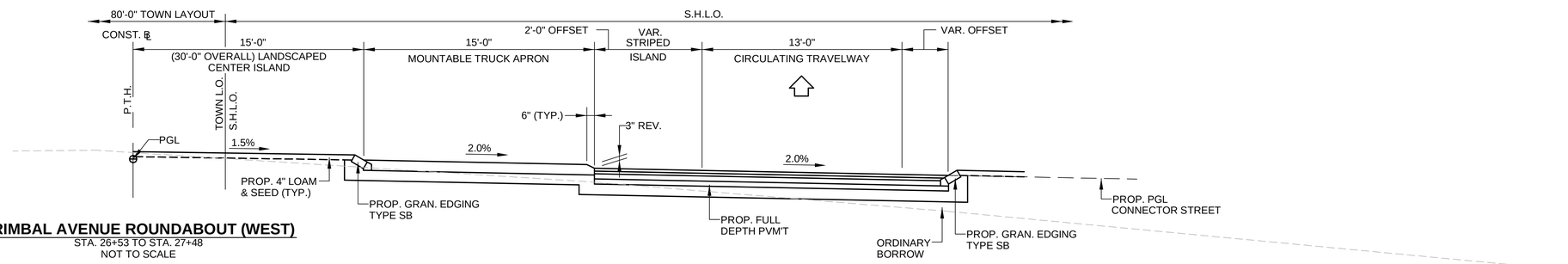
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	7	80
PROJECT FILE NO.	604369		

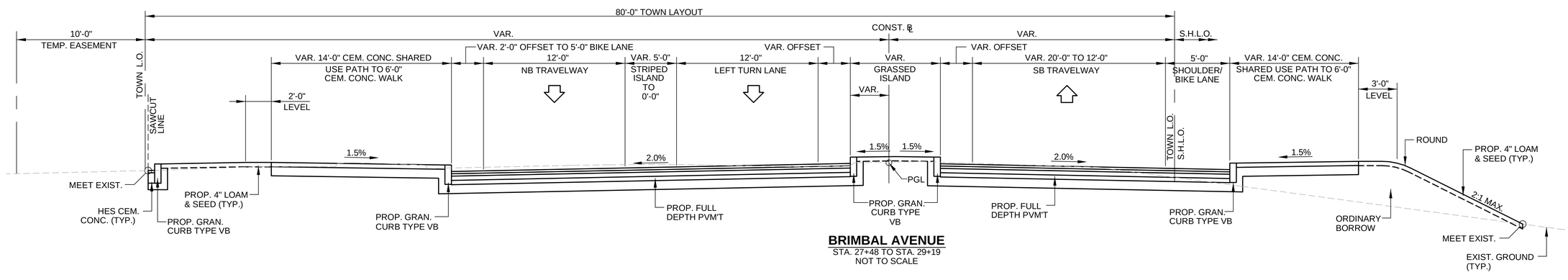
TYPICAL SECTIONS



BRIMBAL AVENUE ROUNDABOUT (EAST)
STA. 26+53 TO STA. 27+48
NOT TO SCALE



BRIMBAL AVENUE ROUNDABOUT (WEST)
STA. 26+53 TO STA. 27+48
NOT TO SCALE



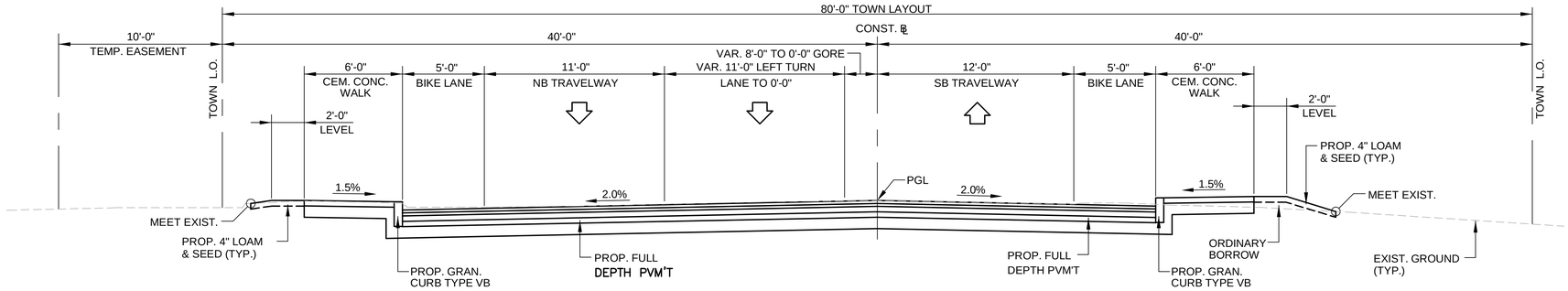
BRIMBAL AVENUE
STA. 27+48 TO STA. 29+19
NOT TO SCALE

Plotted on 30-May-2014 2:24 PM
604369_HD(TYPICAL SECTIONS).DWG
Jacobs - \\BOSFIL11\NA\Proj\MHD\200\E2X4110\Assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Typical Sections).dwg May 30, 2014

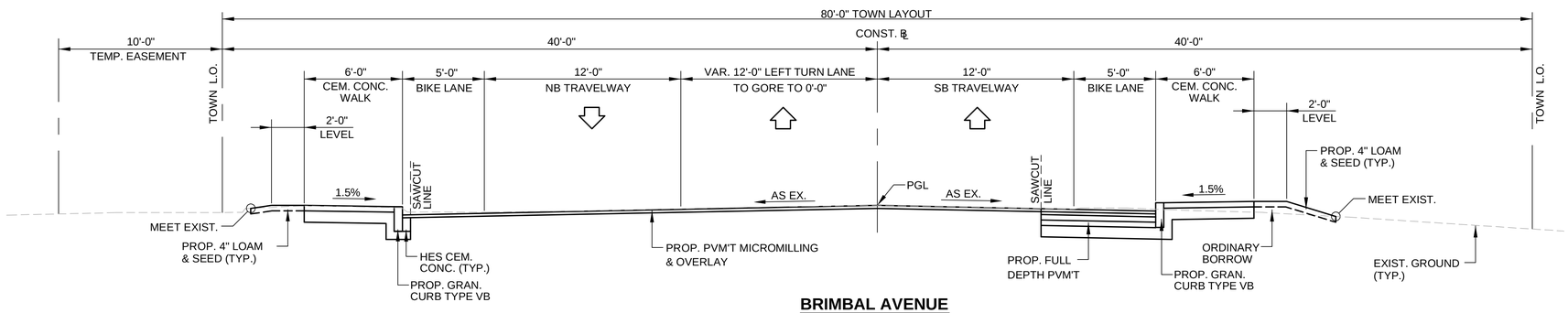
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	8	80
PROJECT FILE NO.	604369		

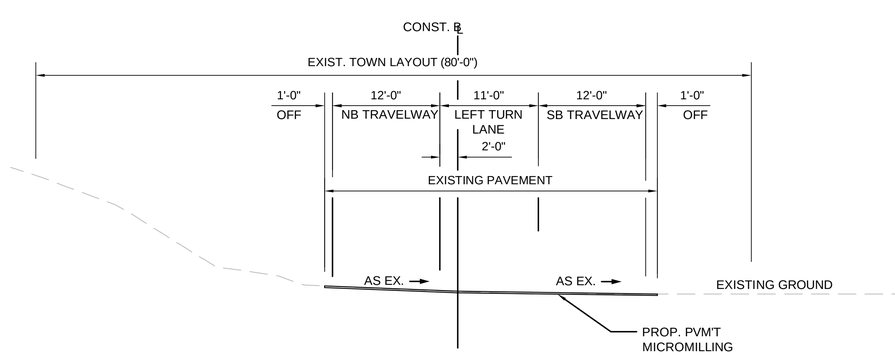
TYPICAL SECTIONS



BRIMBAL AVENUE
STA. 29+19 TO STA. 29+85
NOT TO SCALE



BRIMBAL AVENUE
STA. 29+85 TO STA. 33+56
NOT TO SCALE



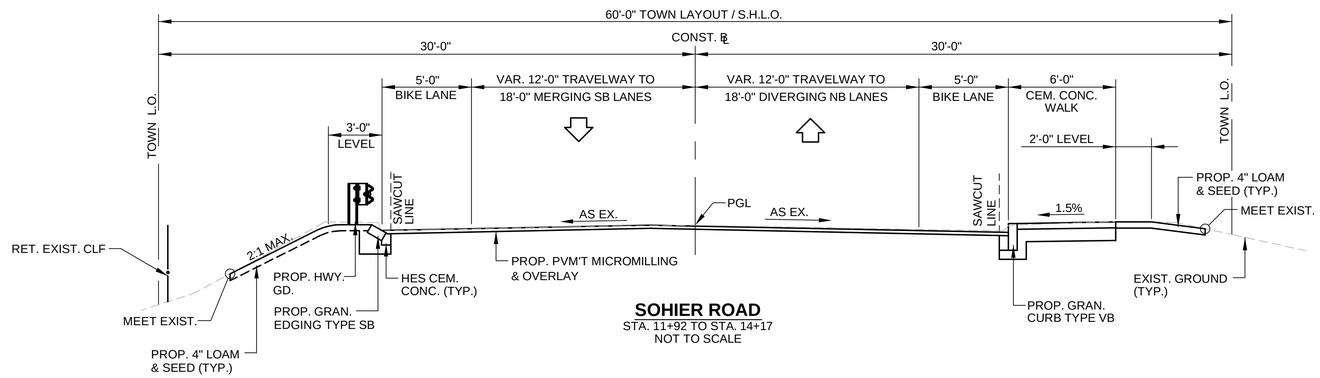
BRIMBAL AVENUE
STA. 44+50 TO STA. 46+50
NOT TO SCALE

Jacobs - \\BOSFIL111\ALPROJ\MHD\200\E2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Typical Sections).dwg May 30, 2014
604369_HD(TYPICAL SECTIONS).DWG Plotted on 30-May-2014 2:24 PM

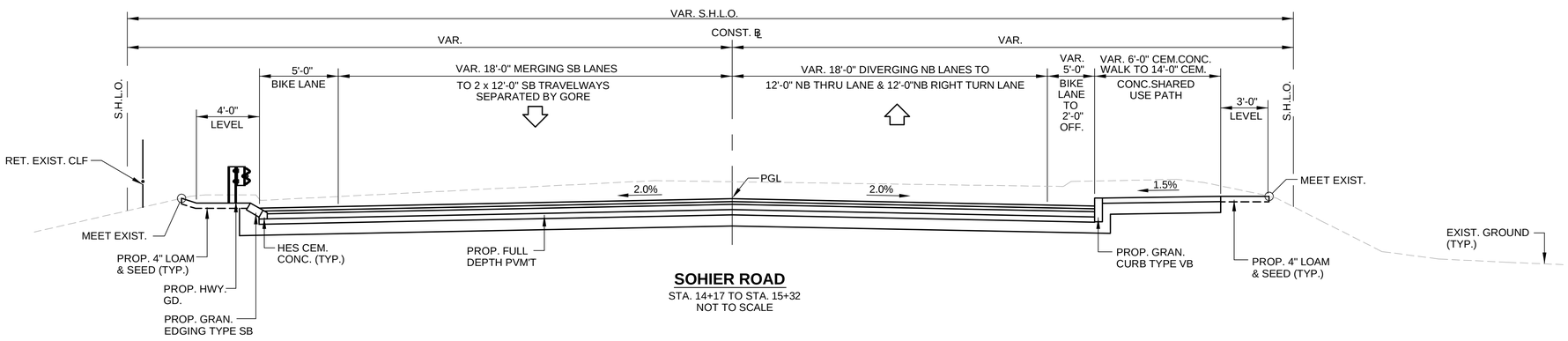
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	9	80
PROJECT FILE NO.	604369		

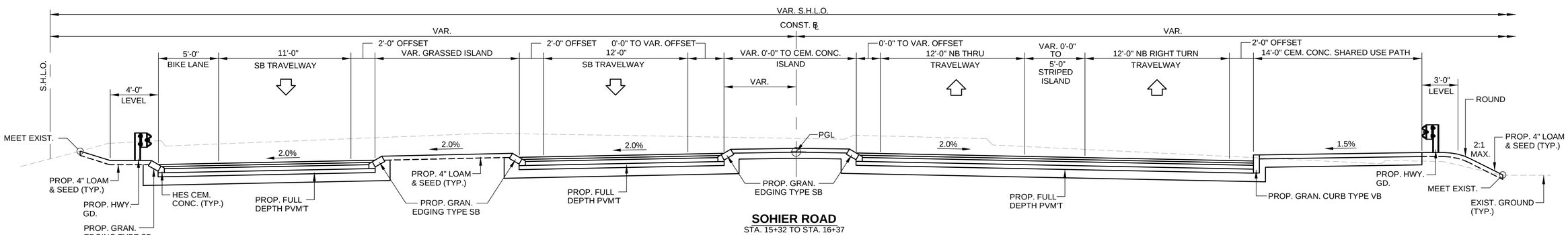
TYPICAL SECTIONS



SOHIER ROAD
STA. 11+92 TO STA. 14+17
NOT TO SCALE



SOHIER ROAD
STA. 14+17 TO STA. 15+32
NOT TO SCALE



SOHIER ROAD
STA. 15+32 TO STA. 16+37
NOT TO SCALE

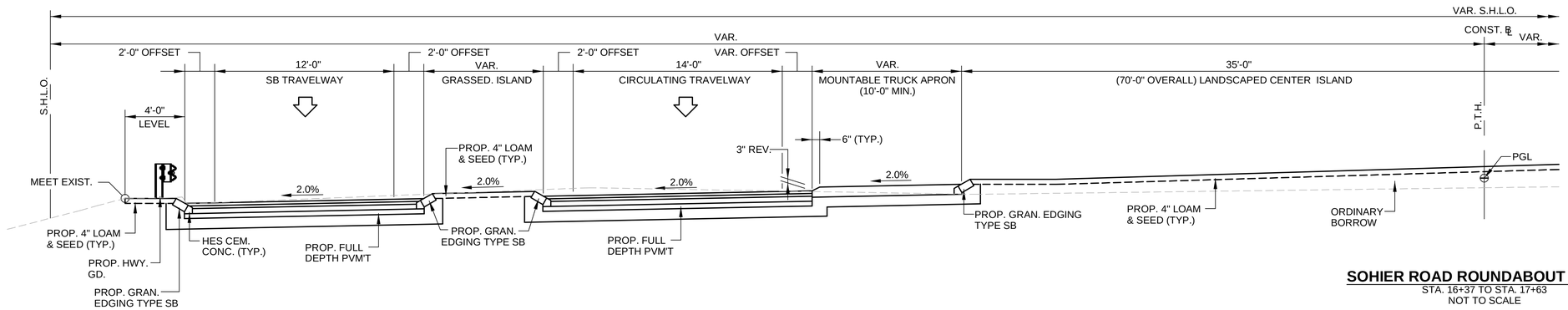
Plotted on 30-May-2014 2:24 PM
604369_HD(TYPICAL SECTIONS).DWG

Jacobs - \\BOSFILL11\NA_Proj\MHD\200\BE2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Typical Sections).dwg May 30, 2014

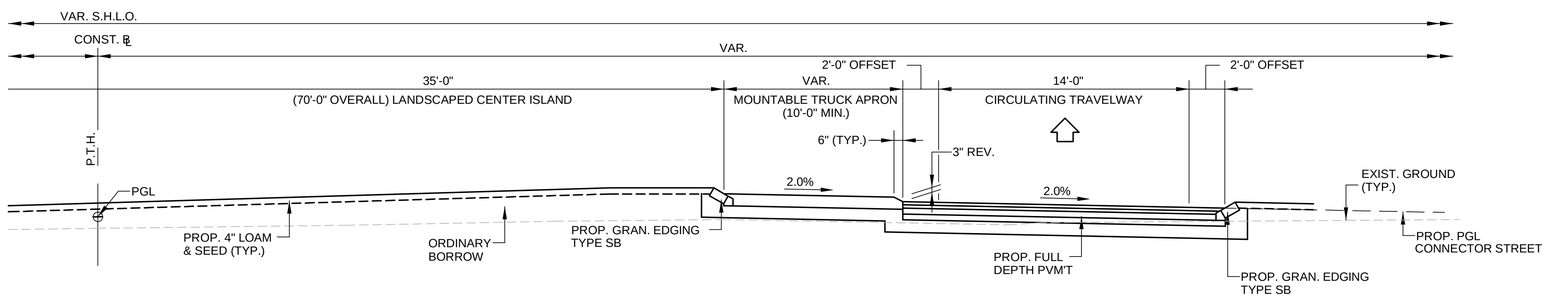
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	10	80
PROJECT FILE NO.	604369		

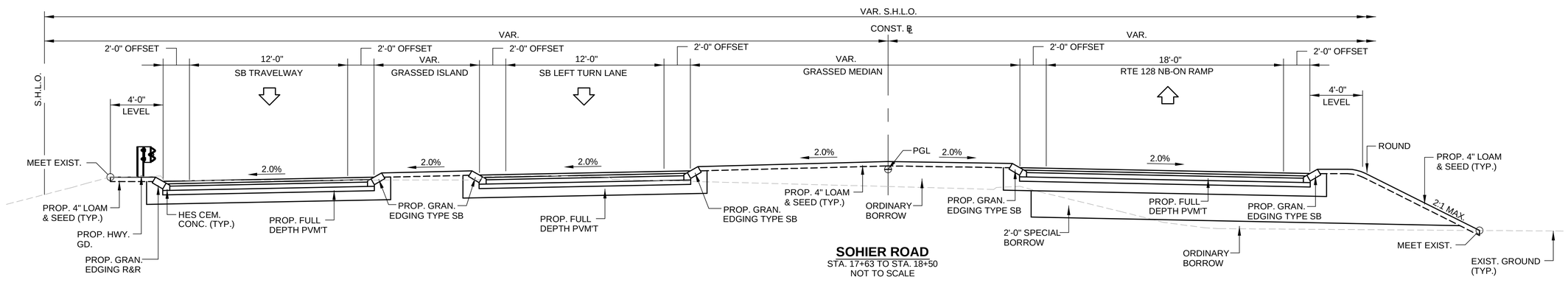
TYPICAL SECTIONS



SOHIER ROAD ROUNDABOUT (WEST)
STA. 16+37 TO STA. 17+63
NOT TO SCALE



SOHIER ROAD ROUNDABOUT (EAST)
STA. 16+37 TO STA. 17+63
NOT TO SCALE



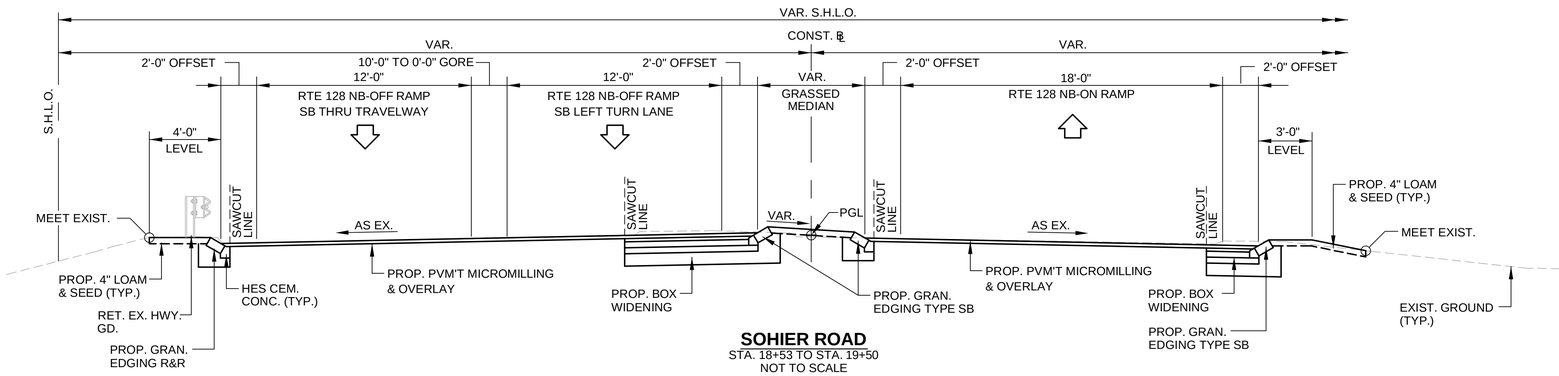
SOHIER ROAD
STA. 17+63 TO STA. 18+50
NOT TO SCALE

Plotted on 30-May-2014 2:24 PM
604369_HD(TYPICAL SECTIONS).DWG
Jacobs - \\BOSFILL11\NA_Proj\MHD\200\BE2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Typical Sections).dwg May 30, 2014

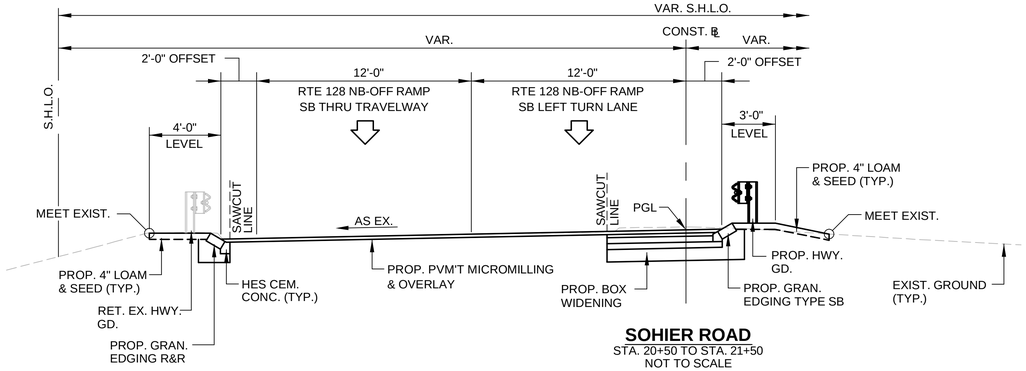
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	11	80
PROJECT FILE NO.	604369		

TYPICAL SECTIONS



SOHIER ROAD
STA. 18+53 TO STA. 19+50
NOT TO SCALE



SOHIER ROAD
STA. 20+50 TO STA. 21+50
NOT TO SCALE

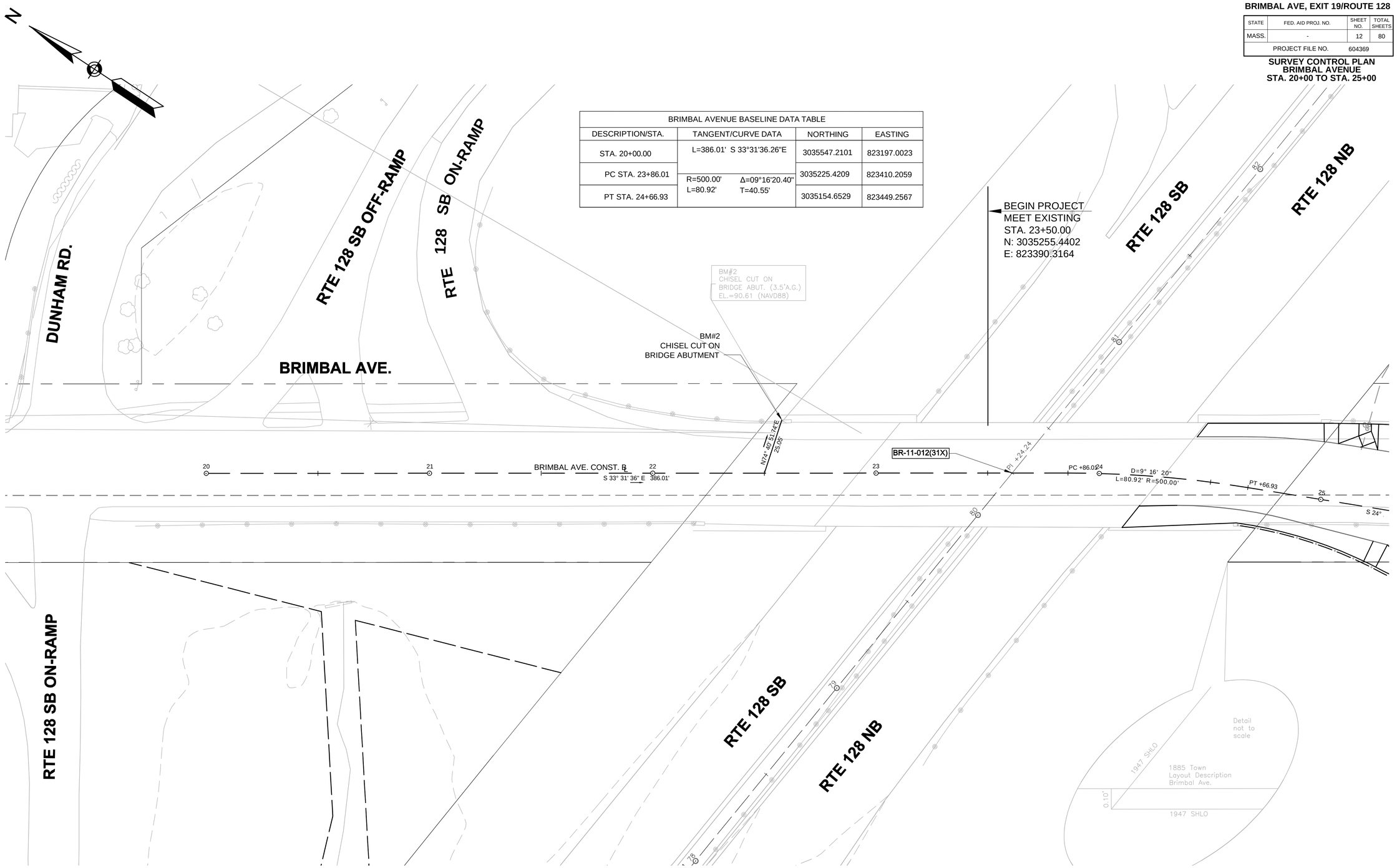
Plotted on 30-May-2014 2:24 PM
604369_HD(TYPICAL SECTIONS).DWG
Jacobs : \\BOSFIL11\NAI_Proj\MHD\2008E2X41110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Typical Sections).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	12	80
PROJECT FILE NO.	604369		

SURVEY CONTROL PLAN
BRIMBAL AVENUE
STA. 20+00 TO STA. 25+00

BRIMBAL AVENUE BASELINE DATA TABLE			
DESCRIPTION/STA.	TANGENT/CURVE DATA	NORTHING	EASTING
STA. 20+00.00	L=386.01' S 33°31'36.26"E	3035547.2101	823197.0023
PC STA. 23+86.01	R=500.00' Δ=09°16'20.40" L=80.92' T=40.55'	3035225.4209	823410.2059
PT STA. 24+66.93		3035154.6529	823449.2567



Plotted on 30-May-2014 2:24 PM

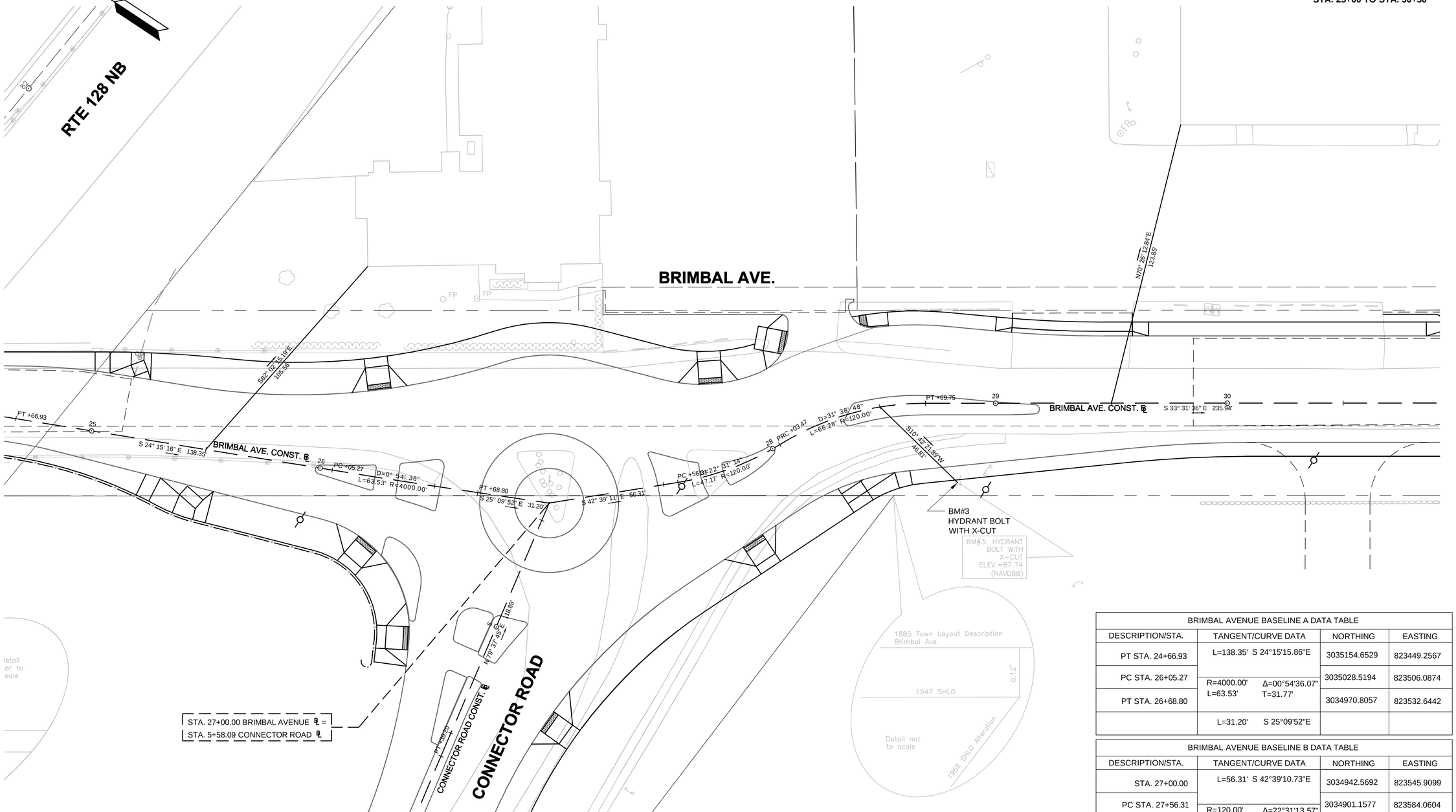
604369_HD(SURVEY CONTROL PLANS).DWG

Jacobs - \\BOSFIL11\NA_Proj\MHD\2008\E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Survey Control Plans).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	13	80
PROJECT FILE NO.	604369		

SURVEY CONTROL PLAN
BRIMBAL AVENUE
STA. 25+00 TO STA. 30+50



BRIMBAL AVENUE BASELINE A DATA TABLE				
DESCRIPTION/STA.	TANGENT/CURVE DATA		NORTHING	EASTING
PT STA. 24+66.93	L=138.35'	S 24°15'15.86"E	3035154.6529	823449.2567
PC STA. 26+05.27	R=4000.00' L=63.53'	Δ=00°54'36.07" T=31.77'	3035028.5194	823506.0874
PT STA. 26+68.80			3034970.8057	823532.6442
	L=31.20'	S 25°09'52"E		

BRIMBAL AVENUE BASELINE B DATA TABLE				
DESCRIPTION/STA.	TANGENT/CURVE DATA		NORTHING	EASTING
STA. 27+00.00	L=56.31'	S 42°39'10.73"E	3034942.5692	823545.9099
PC STA. 27+56.31	R=120.00' L=47.17'	Δ=22°31'13.57" T=23.89'	3034901.1577	823584.0604
PRC STA. 28+03.47			3034873.5545	823621.9321
	R=120.00' L=66.28'	Δ=31°38'4804" T=34.01'		
PT STA. 28+69.75	L=235.94'	S 33°31'36.26"E	3034830.9237	823671.5827

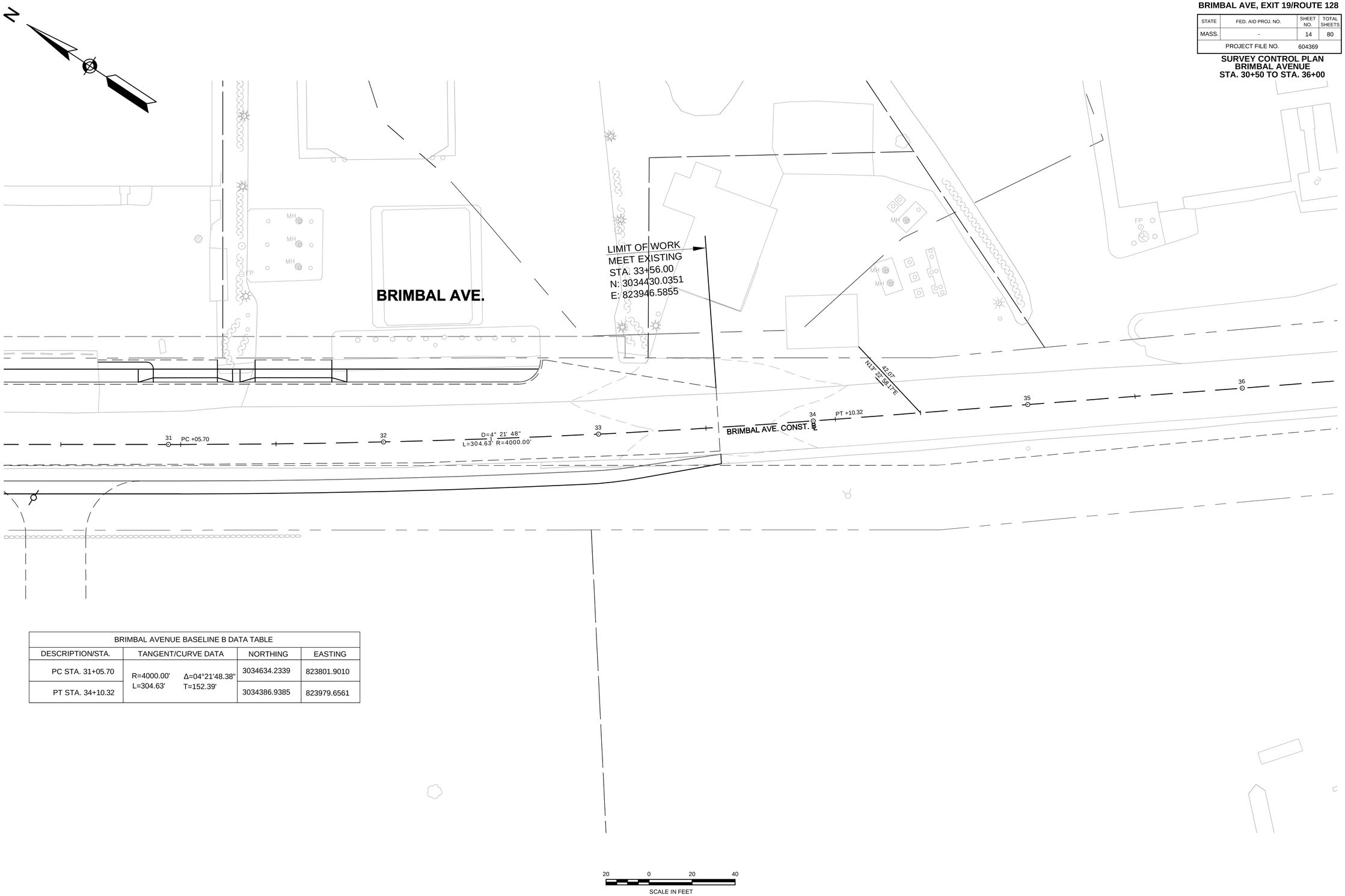
Jacobs - \\BOSFIL11\NA_Proj\MHD\200\BE2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Survey Control Plans).dwg May 30, 2014

604369_HD(SURVEY CONTROL PLANS).DWG Plotted on 30-May-2014 2:24 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	14	80
PROJECT FILE NO.	604369		

SURVEY CONTROL PLAN
BRIMBAL AVENUE
STA. 30+50 TO STA. 36+00



BRIMBAL AVENUE BASELINE B DATA TABLE			
DESCRIPTION/STA.	TANGENT/CURVE DATA	NORTHING	EASTING
PC STA. 31+05.70	R=4000.00' Δ=04°21'48.38" L=304.63' T=152.39'	3034634.2339	823801.9010
PT STA. 34+10.32		3034386.9385	823979.6561

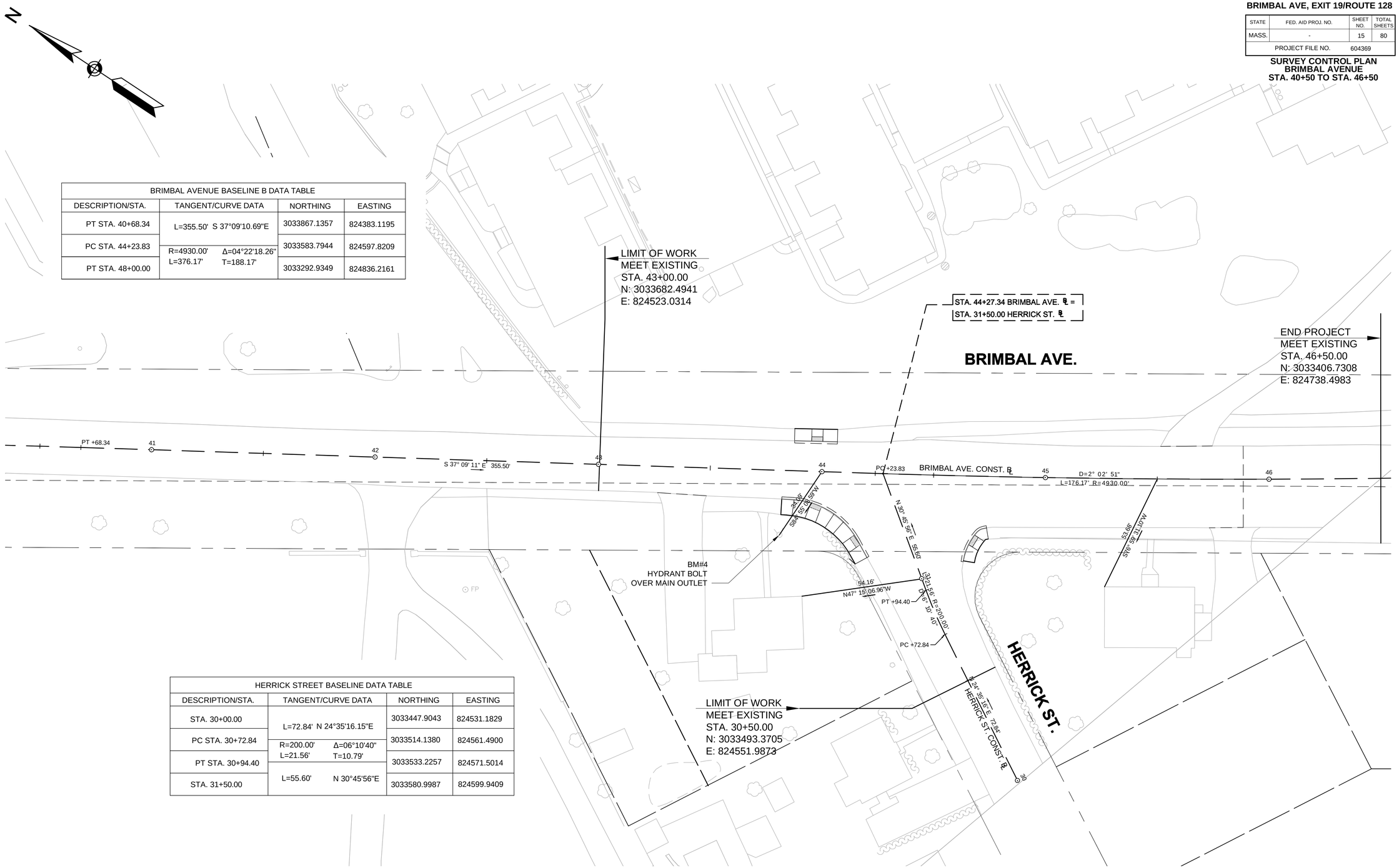
Plotted on 30-May-2014 2:24 PM
604369_HD(SURVEY CONTROL PLANS).DWG

Jacobs - IIBOSFIL11NAI.Proj\MHD\2009\E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Survey Control Plans).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	15	80
PROJECT FILE NO.	604369		

SURVEY CONTROL PLAN
BRIMBAL AVENUE
STA. 40+50 TO STA. 46+50



BRIMBAL AVENUE BASELINE B DATA TABLE			
DESCRIPTION/STA.	TANGENT/CURVE DATA	NORTHING	EASTING
PT STA. 40+68.34	L=355.50' S 37°09'10.69"E	3033867.1357	824383.1195
PC STA. 44+23.83	R=4930.00' Δ=04°22'18.26" L=376.17' T=188.17'	3033583.7944	824597.8209
PT STA. 48+00.00		3033292.9349	824836.2161

HERRICK STREET BASELINE DATA TABLE			
DESCRIPTION/STA.	TANGENT/CURVE DATA	NORTHING	EASTING
STA. 30+00.00	L=72.84' N 24°35'16.15"E	3033447.9043	824531.1829
PC STA. 30+72.84	R=200.00' Δ=06°10'40" L=21.56' T=10.79'	3033514.1380	824561.4900
PT STA. 30+94.40		3033533.2257	824571.5014
STA. 31+50.00	L=55.60' N 30°45'56"E	3033580.9987	824599.9409

20 0 20 40
SCALE IN FEET

Plotted on 30-May-2014 2:25 PM

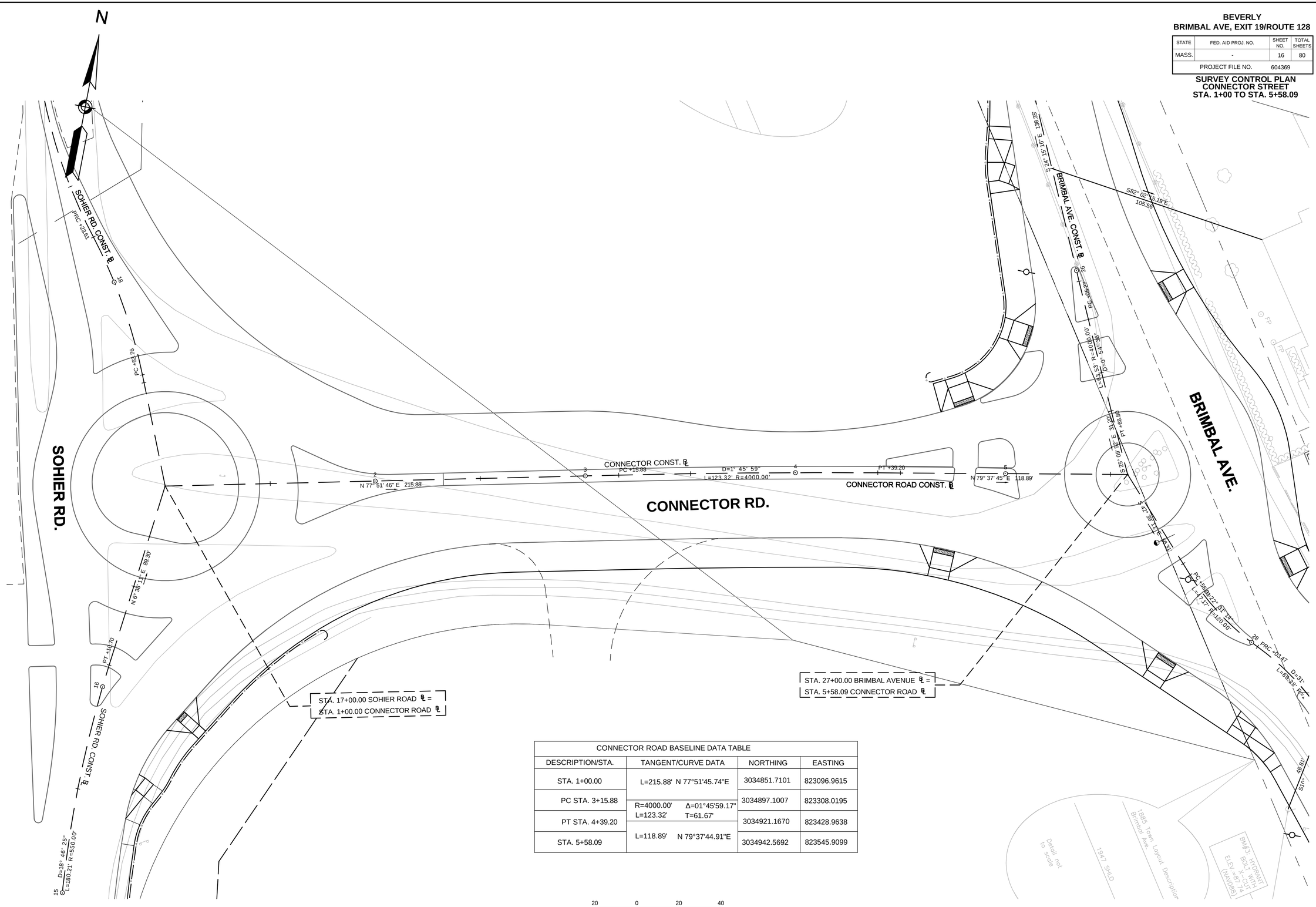
604369_HD(SURVEY CONTROL PLANS).DWG

Jacobs : \\BOSFIL11\NAI_Proj\MHD\2008E2X41110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Survey Control Plans).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	16	80
PROJECT FILE NO.	604369		

SURVEY CONTROL PLAN
CONNECTOR STREET
STA. 1+00 TO STA. 5+58.09



CONNECTOR ROAD BASELINE DATA TABLE			
DESCRIPTION/STA.	TANGENT/CURVE DATA	NORTHING	EASTING
STA. 1+00.00	L=215.88' N 77°51'45.74"E	3034851.7101	823096.9615
PC STA. 3+15.88	R=4000.00' Δ=01°45'59.17" L=123.32' T=61.67'	3034897.1007	823308.0195
PT STA. 4+39.20		3034921.1670	823428.9638
STA. 5+58.09	L=118.89' N 79°37'44.91"E	3034942.5692	823545.9099

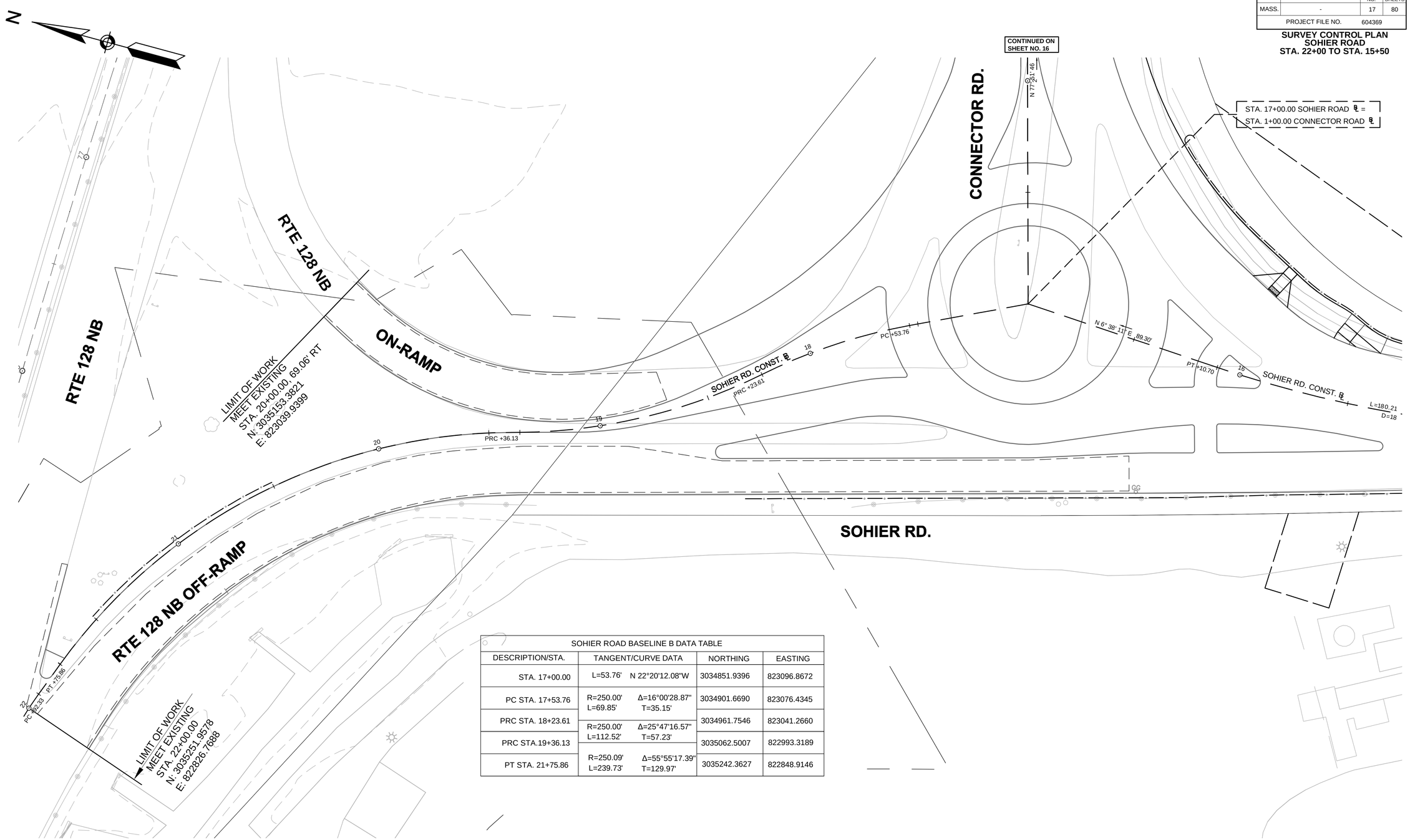
Jacobs - \\BOSFIL11\ALPrg\MHD\200\8E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Survey Control Plans).dwg May 30, 2014

604369_HD(SURVEY CONTROL PLANS).DWG Plotted on 30-May-2014 2:25 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	17	80
PROJECT FILE NO.	604369		

SURVEY CONTROL PLAN
SOHIER ROAD
STA. 22+00 TO STA. 15+50



SOHIER ROAD BASELINE B DATA TABLE

DESCRIPTION/STA.	TANGENT/CURVE DATA		NORTHING	EASTING
STA. 17+00.00	L=53.76'	N 22°20'12.08"W	3034851.9396	823096.8672
PC STA. 17+53.76	R=250.00' L=69.85'	Δ=16°00'28.87" T=35.15'	3034901.6690	823076.4345
PRC STA. 18+23.61	R=250.00' L=112.52'	Δ=25°47'16.57" T=57.23'	3034961.7546	823041.2660
PRC STA.19+36.13	R=250.09' L=239.73'	Δ=55°55'17.39" T=129.97'	3035062.5007	822993.3189
PT STA. 21+75.86			3035242.3627	822848.9146

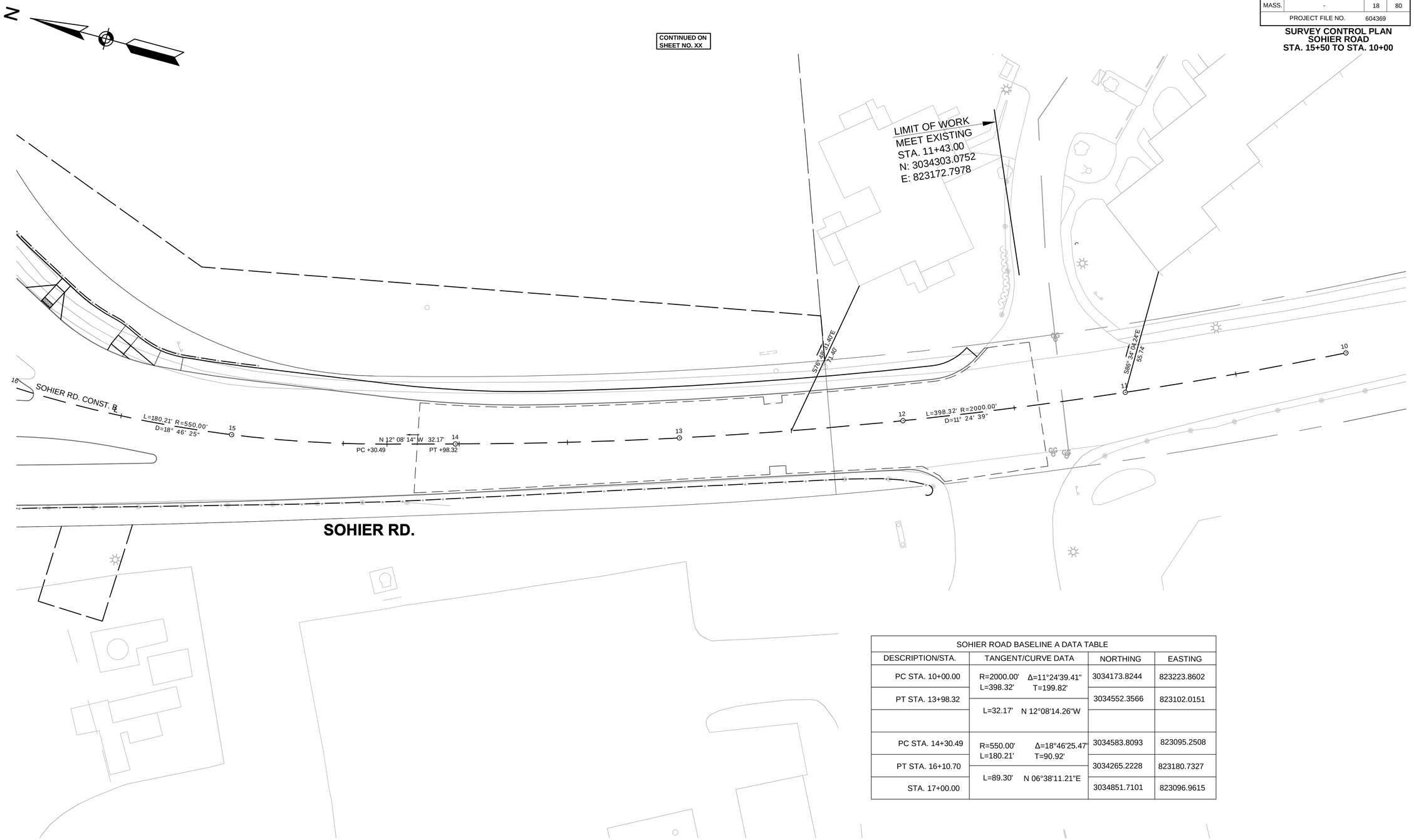
Plotted on 30-May-2014 2:25 PM
604369_HD(SURVEY CONTROL PLANS).DWG

Jacobs - \\BOSFIL11\NA_Proj\MHD\200\BE2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Survey Control Plans).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	18	80
PROJECT FILE NO.	604369		

SURVEY CONTROL PLAN
SOHIER ROAD
STA. 15+50 TO STA. 10+00



SOHIER ROAD BASELINE A DATA TABLE			
DESCRIPTION/STA.	TANGENT/CURVE DATA	NORTHING	EASTING
PC STA. 10+00.00	R=2000.00' Δ=11°24'39.41" L=398.32' T=199.82'	3034173.8244	823223.8602
PT STA. 13+98.32	L=32.17' N 12°08'14.26"W	3034552.3566	823102.0151
PC STA. 14+30.49	R=550.00' Δ=18°46'25.47" L=180.21' T=90.92'	3034583.8093	823095.2508
PT STA. 16+10.70	L=89.30' N 06°38'11.21"E	3034265.2228	823180.7327
STA. 17+00.00		3034851.7101	823096.9615

20 0 20 40
SCALE IN FEET

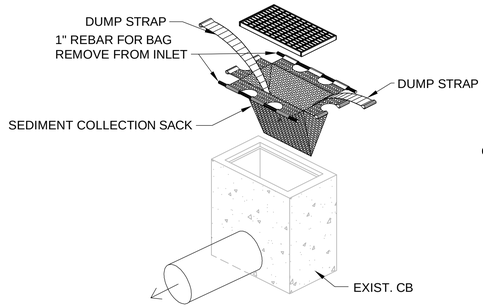
Jacobs :\BOSFILI1\NA\Proj\MHD\208\E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD\Survey Control Plans\.dwg May 30, 2014

604369_HD\SURVEY CONTROL PLANS\.DWG Plotted on 30-May-2014 2:25 PM

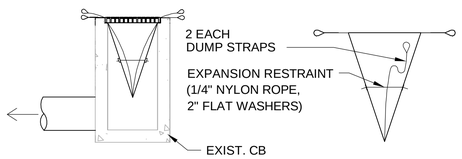
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	19	80
PROJECT FILE NO.	604369		

CONSTRUCTION DETAILS



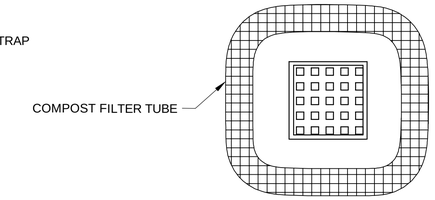
INSTALLATION DETAIL



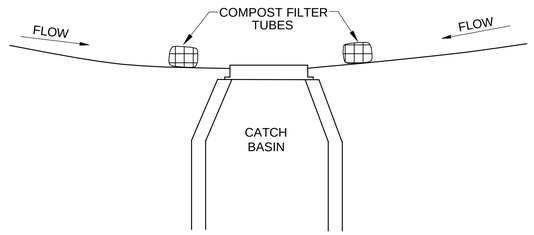
BAG DETAIL

SEDIMENT COLLECTION SACK DETAIL (ITEM 697.1)

NOT TO SCALE



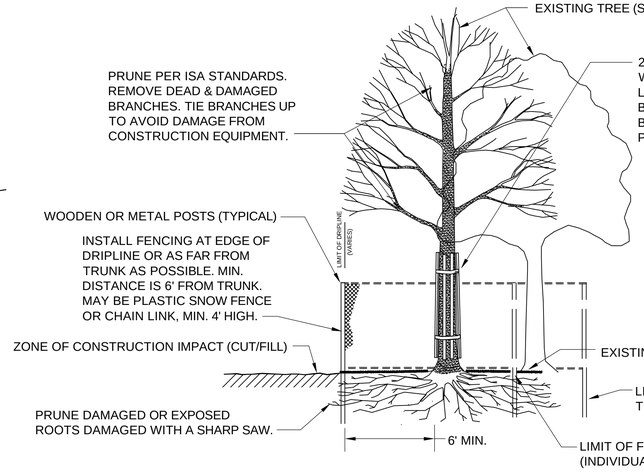
PLAN



SECTION

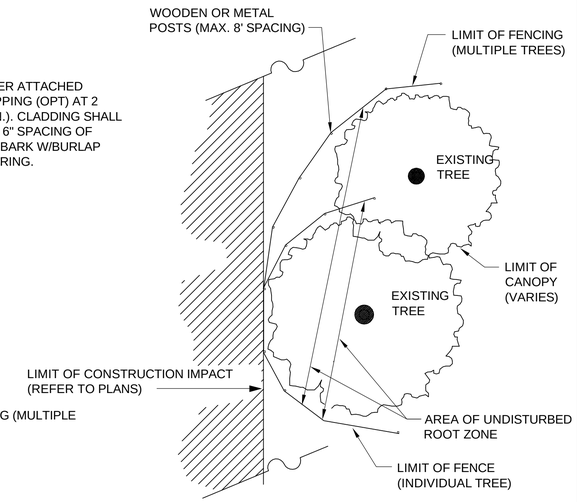
DETAIL FOR SEDIMENT CONTROL AT CATCH BASIN & DROP INLET

NOT TO SCALE

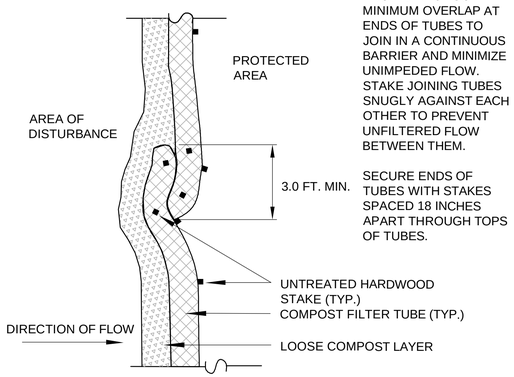


TREE PROTECTION DETAIL

NOT TO SCALE



PLAN VIEW



PROVIDE A 3 FOOT MINIMUM OVERLAP AT ENDS OF TUBES TO JOIN IN A CONTINUOUS BARRIER AND MINIMIZE UNIMPEDED FLOW. STAKE JOINING TUBES SNUGLY AGAINST EACH OTHER TO PREVENT UNFILTERED FLOW BETWEEN THEM.

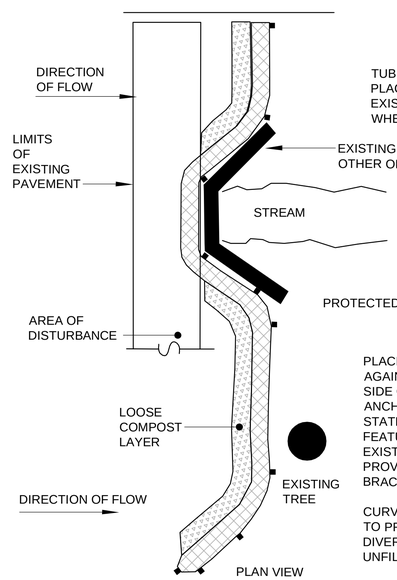
SECURE ENDS OF TUBES WITH STAKES SPACED 18 INCHES APART THROUGH TOPS OF TUBES.

PLAN VIEW - JOIN DETAIL

NOT TO SCALE

GENERAL NOTES:

1. PROVIDE A MINIMUM TUBE DIAMETER OF 12 INCHES FOR SLOPES UP TO 50 FEET IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER TUBE DIAMETER OR ADDITIONAL COURSING OF FILTER TUBES TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER OR STEEPER SLOPES.
2. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
3. DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
4. CONFIGURE TUBES AROUND EXISTING SITE FEATURES TO MINIMIZE SITE DISTURBANCE AND MAXIMIZE CAPTURE AREA OF STORM WATER RUN-OFF.



TUBES CAN BE PLACED DIRECTLY ON EXISTING PAVEMENT WHEN NECESSARY.

EXISTING HEADWALL OR OTHER OBSTACLE

STREAM

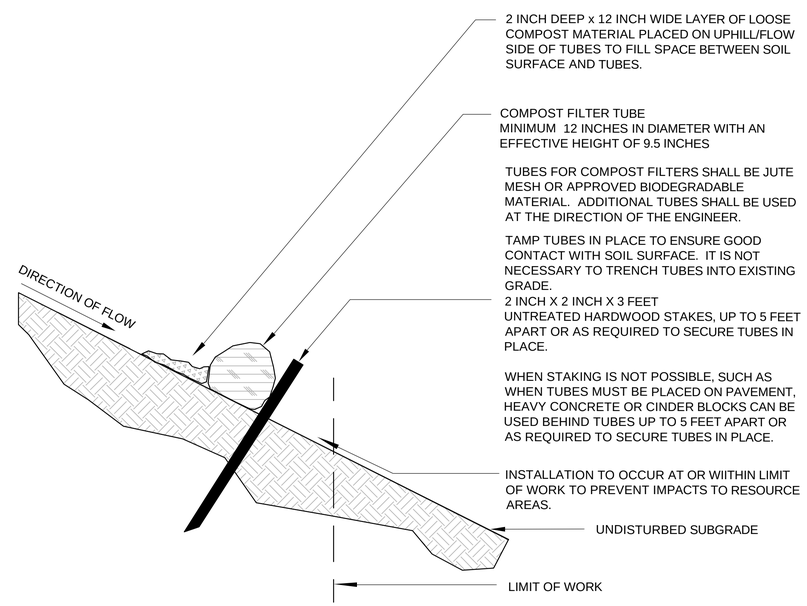
PROTECTED AREA

PLACING TUBES AGAINST THE UPHILL SIDE OF WELL-ANCHORED, STATIONARY FEATURES SUCH AS EXISTING TREES CAN PROVIDE ADDITIONAL BRACING.

CURVE ENDS UPHILL TO PREVENT DIVERSION OF UNFILTERED RUN-OFF.

SINGLE COMPOST FILTER TUBE DETAIL

NOT TO SCALE



CROSS SECTION

NOT TO SCALE

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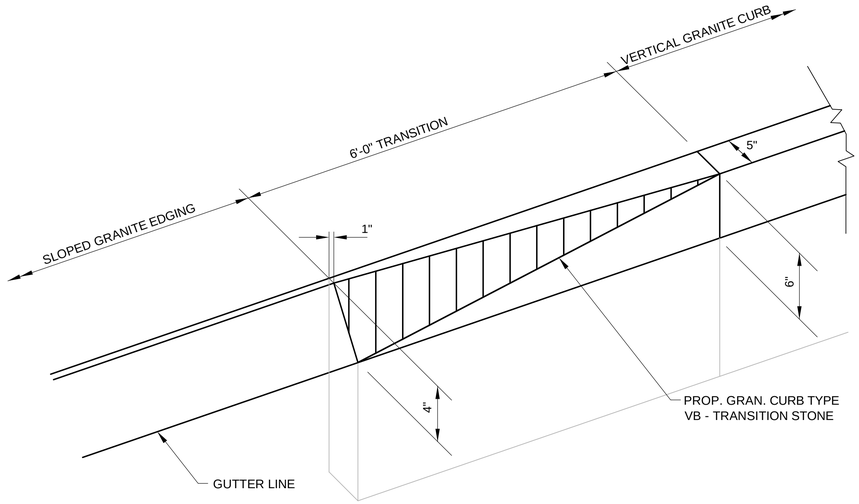
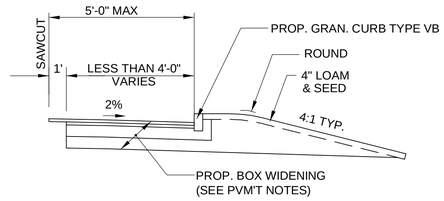
604369_HD(CONSTRUCTION DETAILS).DWG Plotted on 30-May-2014 2:25 PM



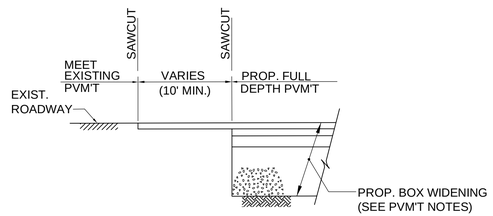
GRANITE CURB TYPE VB TO SLOPE GRANITE EDGING TRANSITION DETAIL (ITEM. 506.2)

NOT TO SCALE



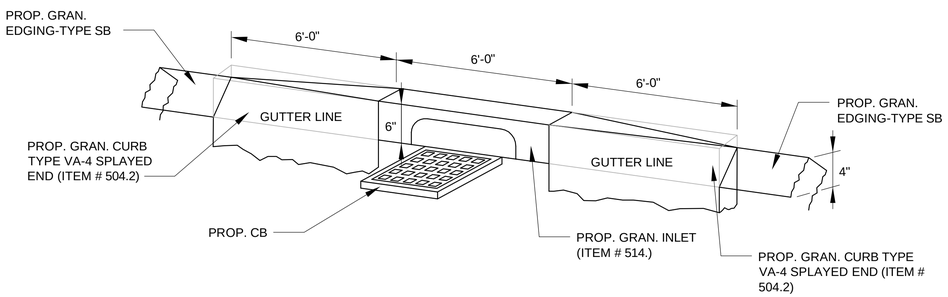
BOX WIDENING DETAIL (LESS THAN 4 FT.)

NOT TO SCALE



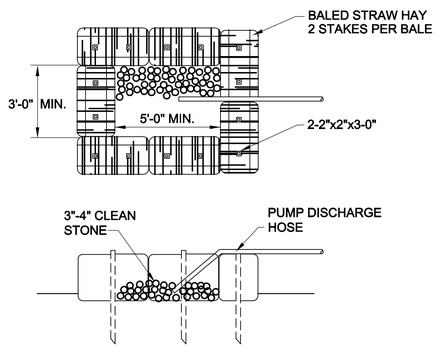
FULL DEPTH PAVEMENT TRANSITION

NOT TO SCALE



CB CURB INLET WITH SPLAYED ENDS (TRANSITION FROM CURB TO EDGING)

NOT TO SCALE



NOTE:
SEDIMENT TRAPS TO BE LINED WITH FABRIC (MIRAFI OR EQUAL) AND SHALL MEET MASSDOT SPECIFICATION
SEDIMENT TRAPS TO BE PLACED IN UPLAND LOCATIONS ONLY

SEDIMENT CONTROL TRAP

NOT TO SCALE

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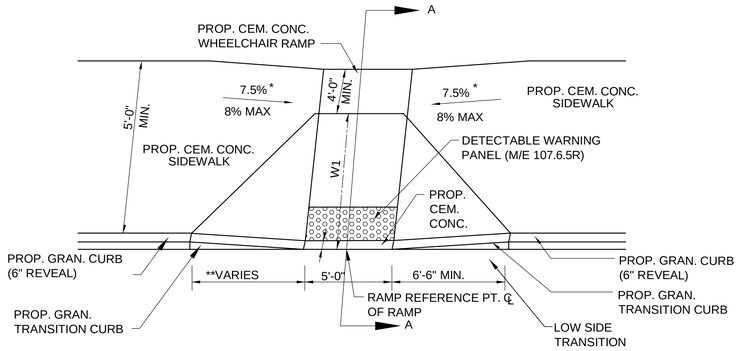
604369_HD(CONSTRUCTION DETAILS).DWG
Jacobs - \\BOSFIL11\NA_Proj\MHD\2006\E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Construction Details).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	21	80
PROJECT FILE NO.	604369		

CONSTRUCTION DETAILS

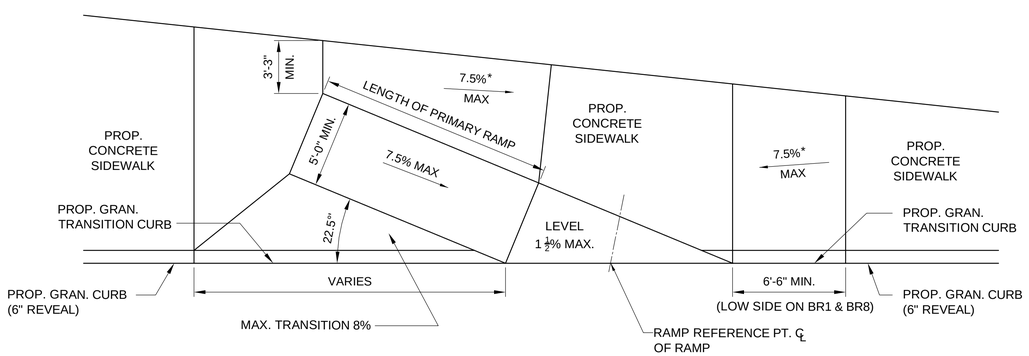


TYPICAL WHEELCHAIR RAMP DETAIL A

NOT TO SCALE

(E 107.3.0R)

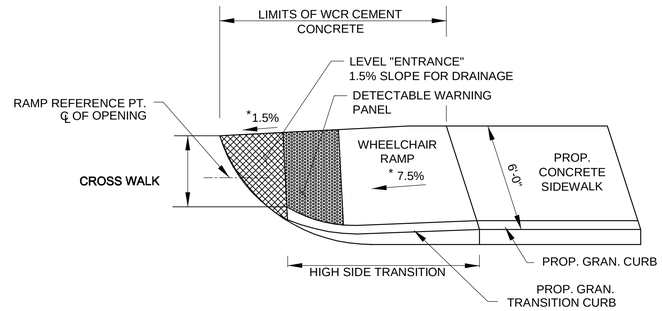
WHEELCHAIR RAMP DETAIL A TABLE									
								TRANSITION LENGTH AND SLOPE (%)	
				(W1) LENGTH OF PRIMARY RAMP	DEPTH OF LEVEL LANDING		WIDTH OF RAMP ENTRANCE	LEFT SIDE	RIGHT SIDE
WCR #	BASELINE	STATION	OFFSET			ELEVATION		L	R
2	BRIMBAL AVE	26+19.89	37.0' LT	10'-0"	4'-0"	83.40	10'-0"	7'-8"	7'-8"
4	BRIMBAL AVE	26+25.19	27.0' RT	10'-0"	4'-0"	83.69	10'-0"	6'-6"	11'-0"
5	CONNECTOR RD.	4+80.34	33.0' LT	10'-0"	4'-0"	82.22	10'-0"	6'-6"	9'-0"
6	CONNECTOR RD.	4+73.08	35.0' RT	10'-0"	4'-0"	82.66	10'-0"	11'-0"	6'-6"
7	BRIMBAL AVE	27+78.45	33.0' RT	10'-0"	4'-0"	83.78	10'-0"	6'-6"	9'-0"
9	BRIMBAL AVE	27+86.85	38.0' LT	10'-0"	4'-0"	83.64	10'-0"	9'-0"	6'-6"
10	BRIMBAL AVE	28+23.72	40.0' RT	9'-0"	4'-0"	83.42	10'-0"	6'-6"	9'-0"
12	SOHIER ROAD	15+96.84	38.0' RT	10'-0"	4'-0"	74.55	5'-0"	9'-0"	6'-6"



TYPICAL BICYCLE RAMP DETAIL (BR)

- NO DETECTABLE WARNING PANEL WILL BE PROVIDED FOR ANY BICYCLE RAMP.

BICYCLE RAMP DETAIL BR TABLE						
BR #	BASELINE	STATION	OFFSET	LENGTH OF PRIMARY RAMP	LENGTH AT TRANSITION CURB	ELEVATION
1	BRIMBAL AVENUE	25+19.65	26.0' LT	6'-0"	7'-8"	85.91
3	BRIMBAL AVENUE	25+41.50	16.0' RT	11'-0"	12'-0"	85.75
8	BRIMBAL AVENUE	28+41.00	29.0' RT	9'-0"	10'-0"	83.66
13	SOHIER ROAD	15+50.00	25.0' RT	11'-0"	12'-0"	74.98

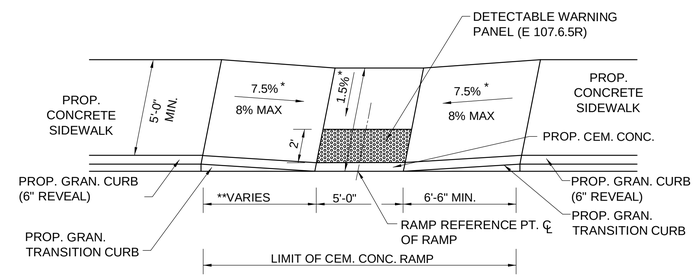


TYPICAL WHEELCHAIR RAMP DETAIL C

NOT TO SCALE

(E 107.6.0R)

WHEELCHAIR RAMP DETAIL C TABLE								
WCR #	BASELINE	STATION	OFFSET	WIDTH OF SIDEWALK	WIDTH OF OPENING	ROADWAY GUTTER SLOPE	DEPTH OF LEVEL LANDING	TRANSITION LENGTH RIGHT
11	BRIMBAL AVENUE	28+46.68	38.0' RT	6'-0"	4'-0"	1.4	4'-0"	9'-0"



TYPICAL WHEELCHAIR RAMP DETAIL D

NOT TO SCALE

(E 107.2.1R)

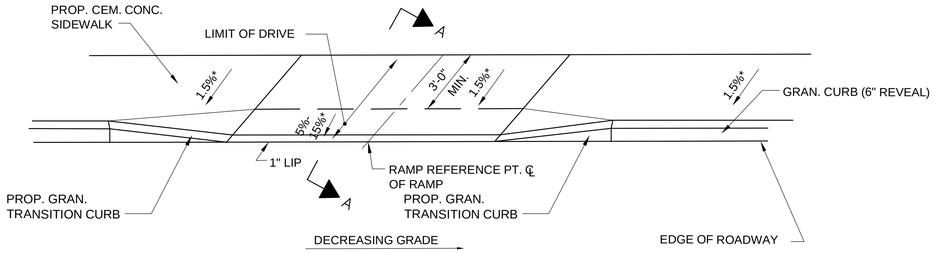
WHEELCHAIR RAMP DETAIL D TABLE							
						TRANSITION LENGTH	
				DEPTH OF LEVEL LANDING		LEFT SIDE	RIGHT SIDE
WCR #	BASELINE	STATION	OFFSET		ELEVATION	L	R
14	BRIMBAL AVE	43+97.91	15.0' RT	7'-0"	75.9	6'-6"	7'-8"
15	BRIMBAL AVE	44+16.76	30.0' RT	6'-0"	76.1	6'-6"	7'-8"
16	BRIMBAL AVE	44+67.61	28.0' RT	6'-0"	76.1	6'-6"	7'-8"
17	BRIMBAL AVE	43+97.49	13.0' RT	5'-6"	75.9	7'-8"	6'-6"

Plotted on 30-May-2014 2:25 PM
604369_HD(CONSTRUCTION DETAILS).DWG
Jacobs - \\BOSFILL11\AL\Proj\MHD\208\E2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD\Construction Details).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

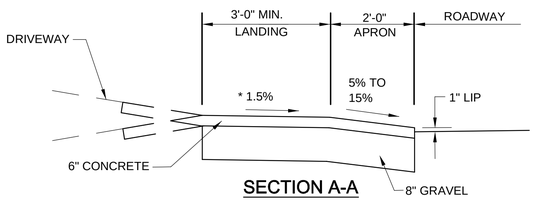
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	22	80
PROJECT FILE NO.	604369		

CONSTRUCTION DETAILS



CEMENT CONCRETE DRIVEWAY WITH SIDEWALK AND CURB RETURNS DETAIL

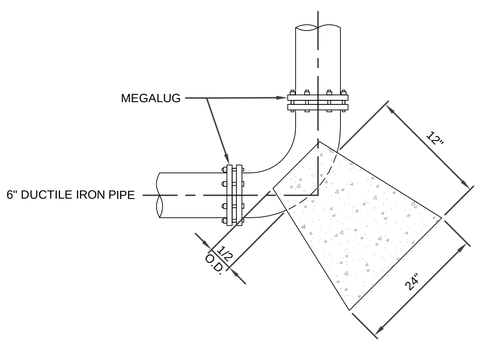
NOT TO SCALE
(E 107.7.0)



SECTION A-A

NOT TO SCALE

DRIVEWAY DETAIL TABLE						
DRIVEWAY #	℄ STATION/OFFSET OF DRIVEWAY RAMP AT GUTTER	LENGTH OF DRIVEWAY RAMP	DEPTH OF LEVEL LANDING	ELEVATION	TRANSITION LENGTH LEFT SIDE L	TRANSITION LENGTH RIGHT SIDE R
A	STA. 29+32.97, 16.18' LT BRIMBAL AVE	2'-0"	5'-4"	84.61	6'-6"	7'-8"
B	STA. 31+07.90, 15.92' LT BRIMBAL AVE	2'-0"	4'-0"	82.88	9'-0"	6'-6"
C	STA. 31+58.54, 16.00' LT BRIMBAL AVE	2'-0"	4'-0"	82.05	9'-0"	6'-6"



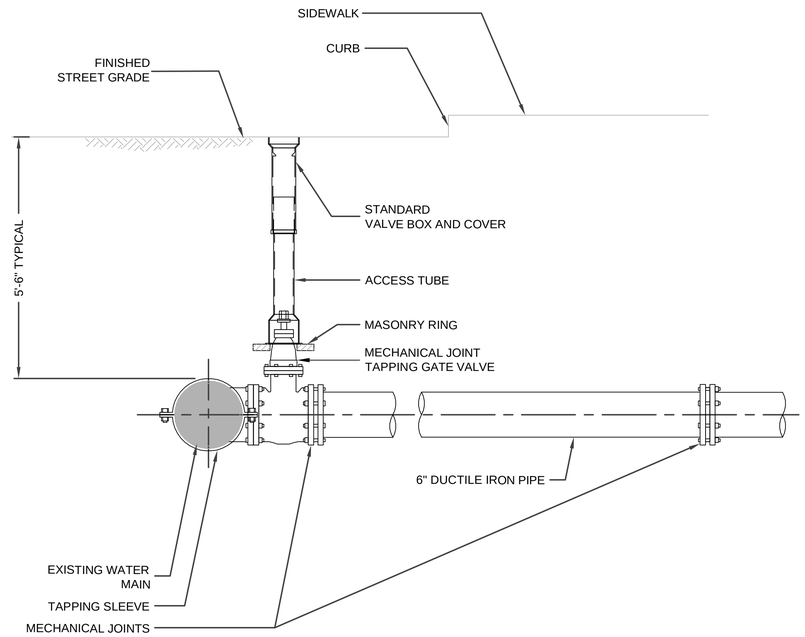
NOTES:

1. MEGALUG REQUIRED AT ALL BENDS IN ADDITION TO THRUST BLOCKS.
2. CONCRETE SHALL BE CLASS B, 3000 P.S.I.

HORIZONTAL THRUST RESTRAINT FOR 22 1/2° & 45° BEND OF WATERLINE

NOT TO SCALE

NOTES:
- CONCRETE THRUST BLOCK TO BE USED ONLY WHERE IT WILL BEAR ON UNDISTURBED EARTH.
- USE RESTRAINED JOINT FITTINGS OR TIE RODS WHERE CONCRETE THRUST BLOCK IS UNACCEPTABLE.
- SIZE OF BLOCK OR MEGALUG TO BE DESIGNED FOR SPECIFIC CONDITIONS.



TYPICAL WATER PIPE CONNECTION WITH TAPPING SLEEVE AND GATE VALVE

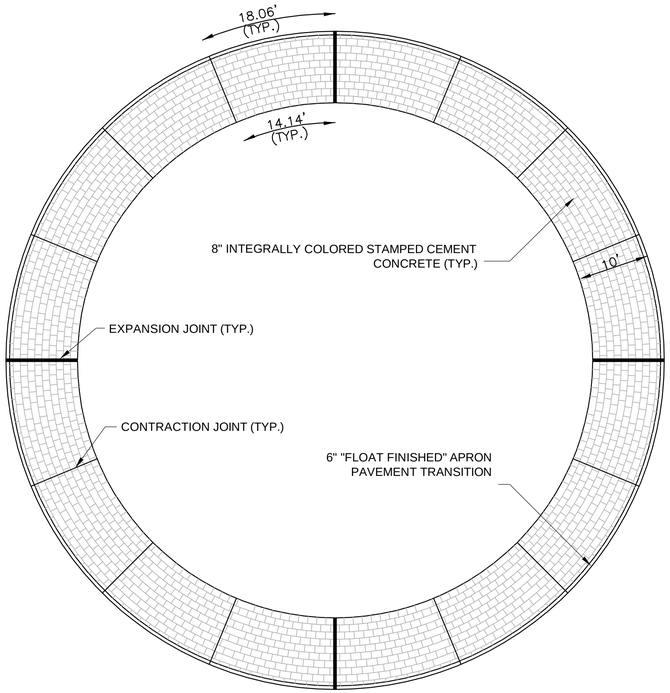
NOT TO SCALE

Jacobs - \\BOSFILL11\NA_Proj\MHD\200\BE2X4110\Assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Construction Details).dwg May 30, 2014
604369_HD(CONSTRUCTION DETAILS).DWG Plotted on 30-May-2014 2:25 PM

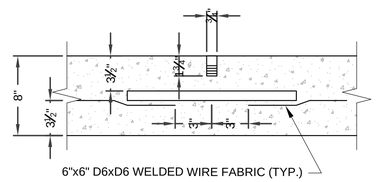
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	23	80
PROJECT FILE NO.	604369		

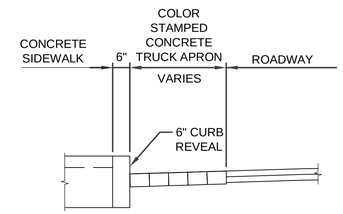
CONSTRUCTION DETAILS



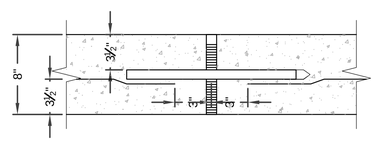
TRUCK APRON JOINTING PLAN
NTS



TRUCK APRON CONSTRUCTION JOINT
NTS



TRUCK APRON CROSS-SECTION
NOT TO SCALE



TRUCK APRON EXPANSION JOINT
NTS

TRUCK APRON NOTES:

1. NO UTILITY OR DRAINAGE STRUCTURES, GATE BOXES, ETC. SHALL BE ALLOWED IN THE TRUCK APRON. SLAB BREAKAGE PROBLEMS MAY OCCUR.

DOWEL NOTES:

1. DOWELS SHALL BE PLAIN STEEL BARS CONFORMING TO ASTM A615, GRADE 50.

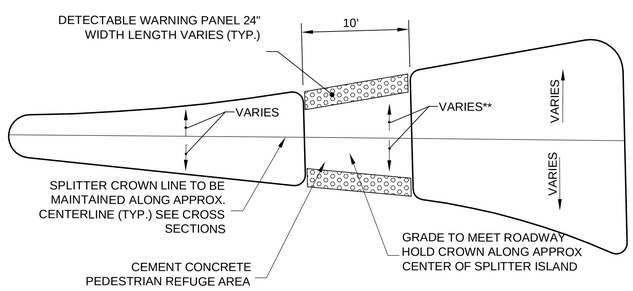
2. DOWELS IN EXPANSION JOINTS SHALL BE WIPED CLEAN AND COATED WITH A THIN FILM OF LUBRICATING OIL OR GREASE BEFORE CONCRETE IS PLACED.

JOINT NOTES:

1. NO ADDITIONAL CONSTRUCTION JOINTS SHALL BE PERMITTED. ALL CONSTRUCTION JOINTS SHALL BE LOCATED AT EXPANSION JOINTS.

2. POLYURETHANE JOINT SEALER SHALL CLOSELY MATCH THE CONCRETE COLOR.

3. TWELVE (12) CONTRACTION JOINTS AND FOUR (4) EXPANSION JOINTS SHALL BE SPACED EVENLY AROUND THE APRON.



SPLITTER ISLAND PEDESTRIAN REFUGE AREA
NTS

** SLOPE 0.4% MIN. TO 1.5% MAX. FOR DRAINAGE.

REFER TO MASSDOT CONSTRUCTION STANDARD DETAIL M/E107.6.5R FOR ADDITIONAL DETAIL REGARDING THE DETECTABLE WARNING PANEL SPECIFICATIONS.

REFUGE AREA SHALL BE PAID UNDER ITEM 702.1 CEMENT CONCRETE WHEELCHAIR RAMP (SY). NO ADDITIONAL COMPENSATION SHALL BE MADE FOR THE DETECTABLE WARNING PANELS.

Plotted on 30-May-2014 2:25 PM
604369_HD(CONSTRUCTION DETAILS).DWG
Jacobs - \\BOSFIL11\NA_Proj\MHD\2008E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Construction Details).dwg May 30, 2014

HIGHWAY GUARD DETAILS

NONE

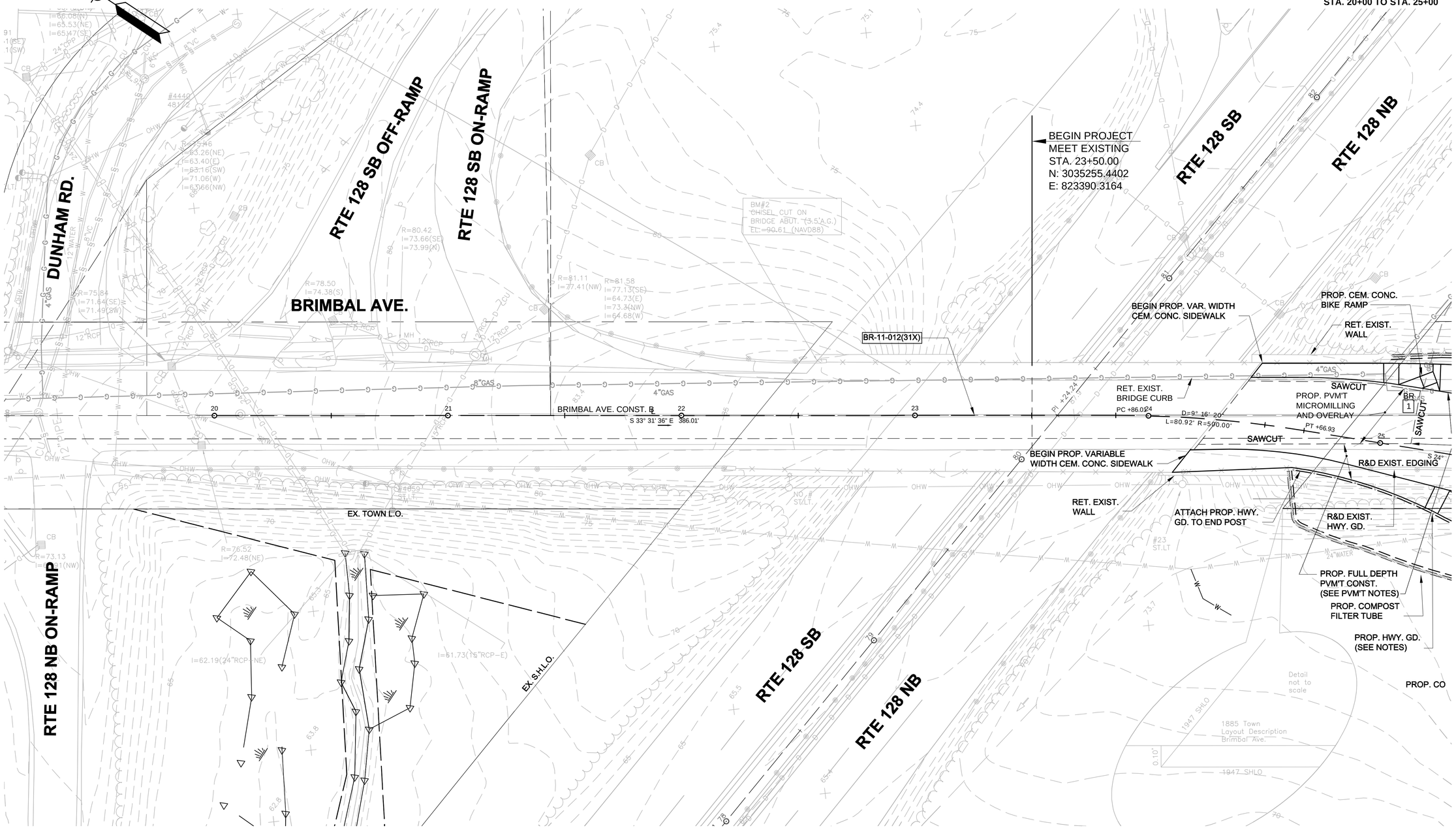
DRAINAGE DETAILS

NONE

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	24	80
PROJECT FILE NO.	604369		

CONSTRUCTION PLAN
BRIMBAL AVENUE
STA. 20+00 TO STA. 25+00



NOTE:
ALL EXISTING EDGE TREATMENTS SHALL BE REMOVED
AND DISCARDED UNLESS OTHERWISE NOTED.

20 0 20 40
SCALE IN FEET

FOR PROFILE: SEE SHEET NO. 31

Jacobs - \\BOSFILI1\NA_Proj\MHD\200\BE2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Construction Plans).dwg May 30, 2014
604369_HD(CONSTRUCTION PLANS).DWG Plotted on 30-May-2014 2:25 PM

HIGHWAY GUARD DETAILS

STA. 24+64 RT BRIDGE RAIL TO HIGHWAY GUARD RAIL TRANSITION (628.2)
STA. 24+91 RT (BRIMBAL) TO STA. 4+65 LT (CONNECTOR) STEEL W BEAM HIGHWAY GUARD (SINGLE FACED) (620.1)
STA. 4+65 LT (CONNECTOR) STEEL W BEAM TERMINAL SECTION (SINGLE FACED) (627.1)

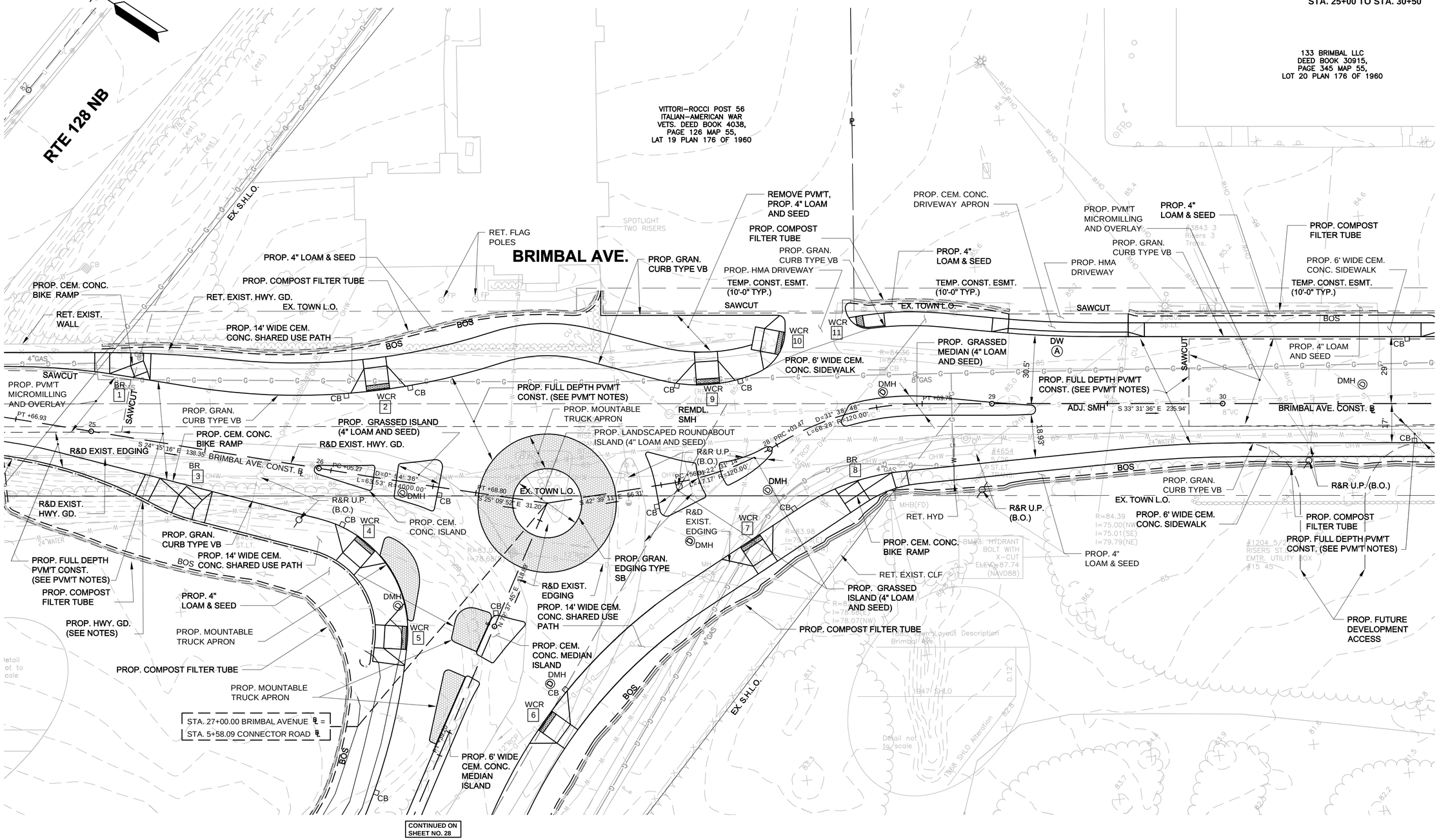
DRAINAGE DETAILS

SEE SHEET 41

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	25	80
PROJECT FILE NO.	604369		

CONSTRUCTION PLAN
BRIMBAL AVENUE
STA. 25+00 TO STA. 30+50



FOR PROFILE: SEE SHEET NO. 32

Jacobs - \\BOSFILL1\NA\Proj\MHD\2008\E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Construction Plans).dwg May 30, 2014
Plotted on 30-May-2014 2:25 PM
604369_HD(CONSTRUCTION PLANS).DWG

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	26	80
PROJECT FILE NO.	604369		

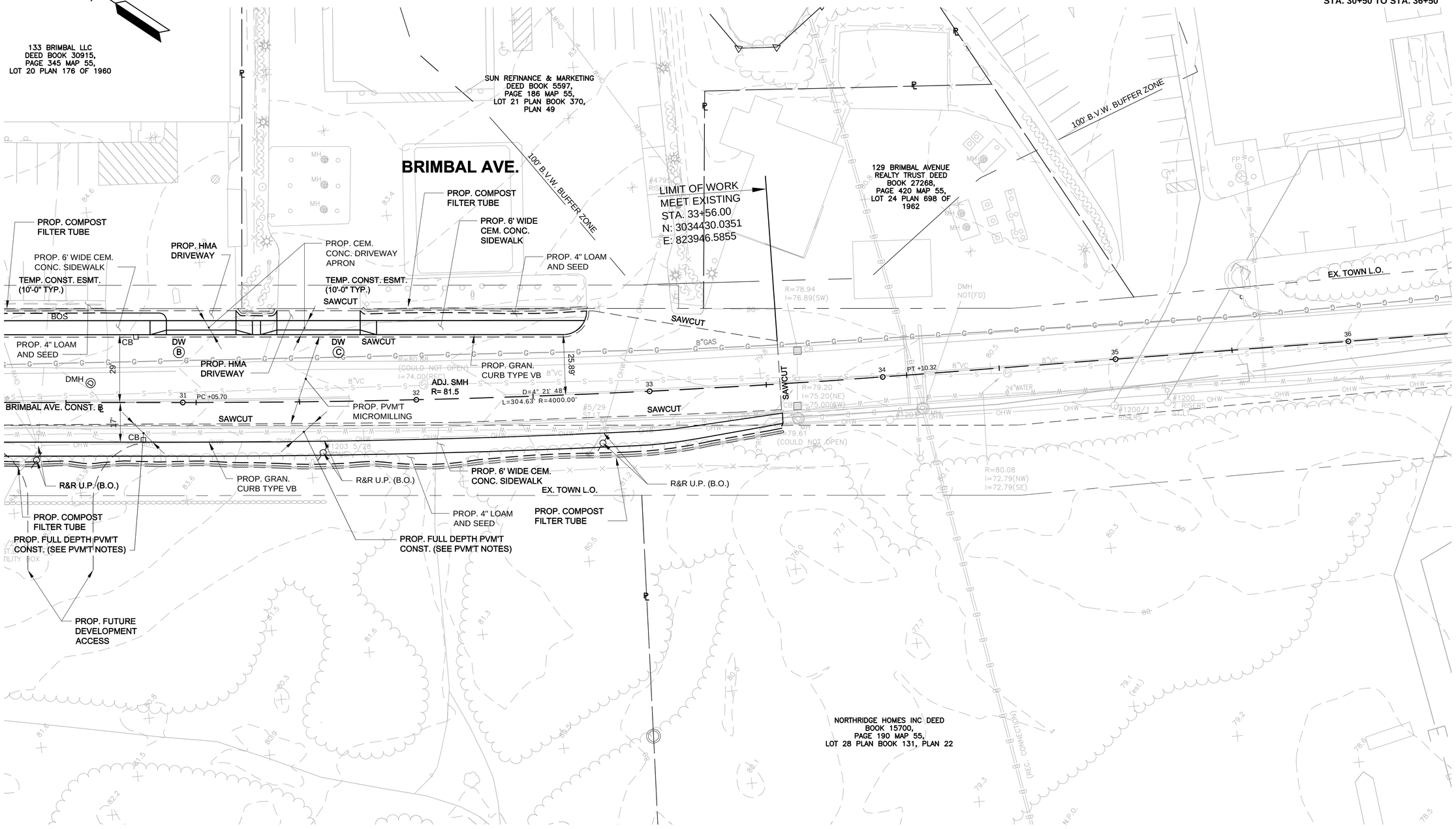
CONSTRUCTION PLAN
BRIMBAL AVENUE
STA. 30+50 TO STA. 36+50

HIGHWAY GUARD DETAILS

NONE

DRAINAGE DETAILS

SEE SHEET 42



20 0 20 40
SCALE IN FEET

FOR PROFILE: SEE SHEET NO. 33

Jacobs - \\BOSFILL11\NAI_Proj\MHD\200\BE2X1190\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Construction Plans).dwg May 30, 2014

604369_HD(CONSTRUCTION PLANS).DWG Plotted on 30-May-2014 2:25 PM

HIGHWAY GUARD DETAILS

NONE

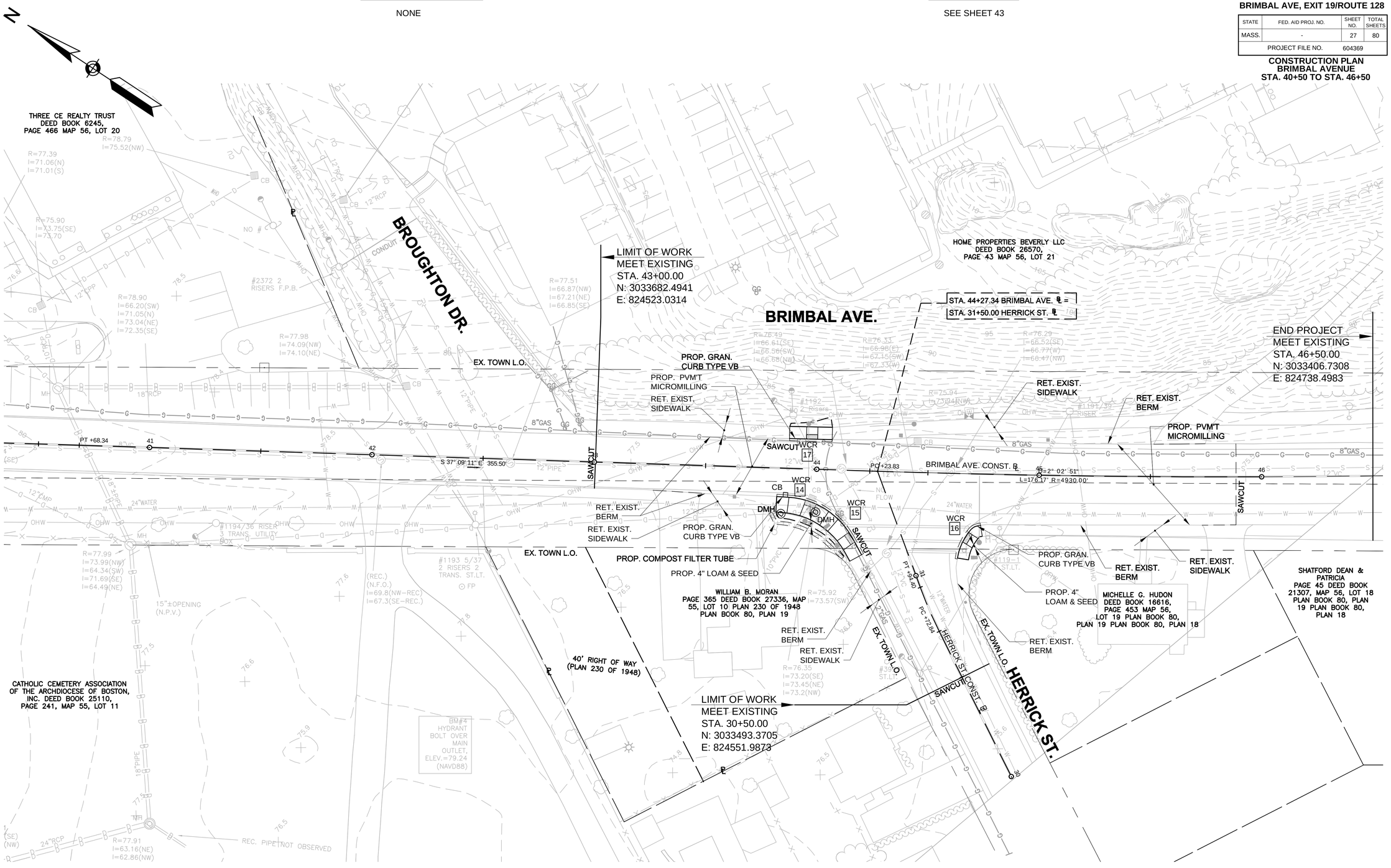
DRAINAGE DETAILS

SEE SHEET 43

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	27	80
PROJECT FILE NO.	604369		

CONSTRUCTION PLAN
BRIMBAL AVENUE
STA. 40+50 TO STA. 46+50



Plotted on 30-May-2014 2:25 PM

604369_HD(CONSTRUCTION PLANS).DWG

Jacobs - \\BOSFIL11\NA_Proj\MHD\200\6E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Construction Plans).dwg May 30, 2014

HIGHWAY GUARD DETAILS

STA. 14+91 RT STEEL W BEAM HIGHWAY GUARD BURIED END (SINGLE FACED) (620.4)
STA. 15+30.5 RT TO STA. 16+56 RT STEEL W BEAM HIGHWAY GUARD (SINGLE FACED) (620.1)
STA. 16+56 RT STEEL W BEAM TERMINAL SECTION (SINGLE FACED) (627.1)

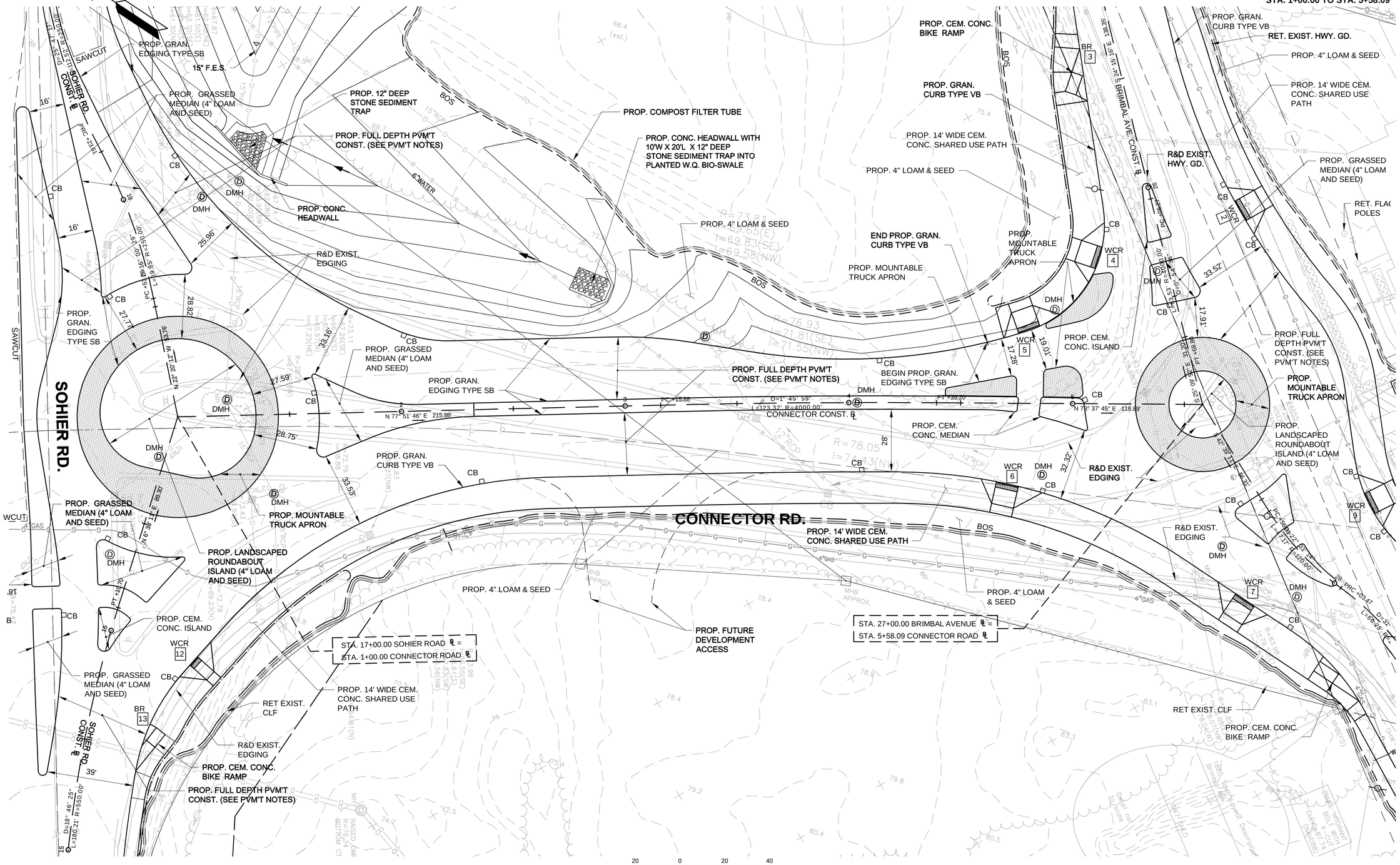
DRAINAGE DETAILS

SEE SHEET 44

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	28	80
PROJECT FILE NO.	604369		

CONSTRUCTION PLAN
CONNECTOR STREET
STA. 1+00.00 TO STA. 5+58.09



FOR PROFILE: SEE SHEET NO. 34

Jacobs - \\BOSFILL11\NA_Proj\MHD\200\9E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Construction Plans).dwg May 30, 2014

604369_HD(CONSTRUCTION PLANS).DWG Plotted on 30-May-2014 2:26 PM

HIGHWAY GUARD DETAILS

STA. 11+92 LT STEEL W BEAM TERMINAL SECTION (SINGLE FACED) (627.1)
STA. 11+92 LT TO STA. 18+12.5 LT STEEL W BEAM HIGHWAY GUARD (SINGLE FACED) (620.1)
STA. 14+02 LT TO STA. 18+10 LT HIGHWAY GUARD REMOVED AND DISCARDED (635.1)
STA. 20+50 RT STEEL W BEAM TERMINAL SECTION (SINGLE FACED) (627.1)
STA. 20+50 RT TO STA. 21.12.5 RT STEEL W BEAM HIGHWAY GUARD (SINGLE FACED) (620.1)
STA. 21+12.5 RT STEEL BEAM HIGHWAY GUARD TANGENT END TREATMENT (627.8)

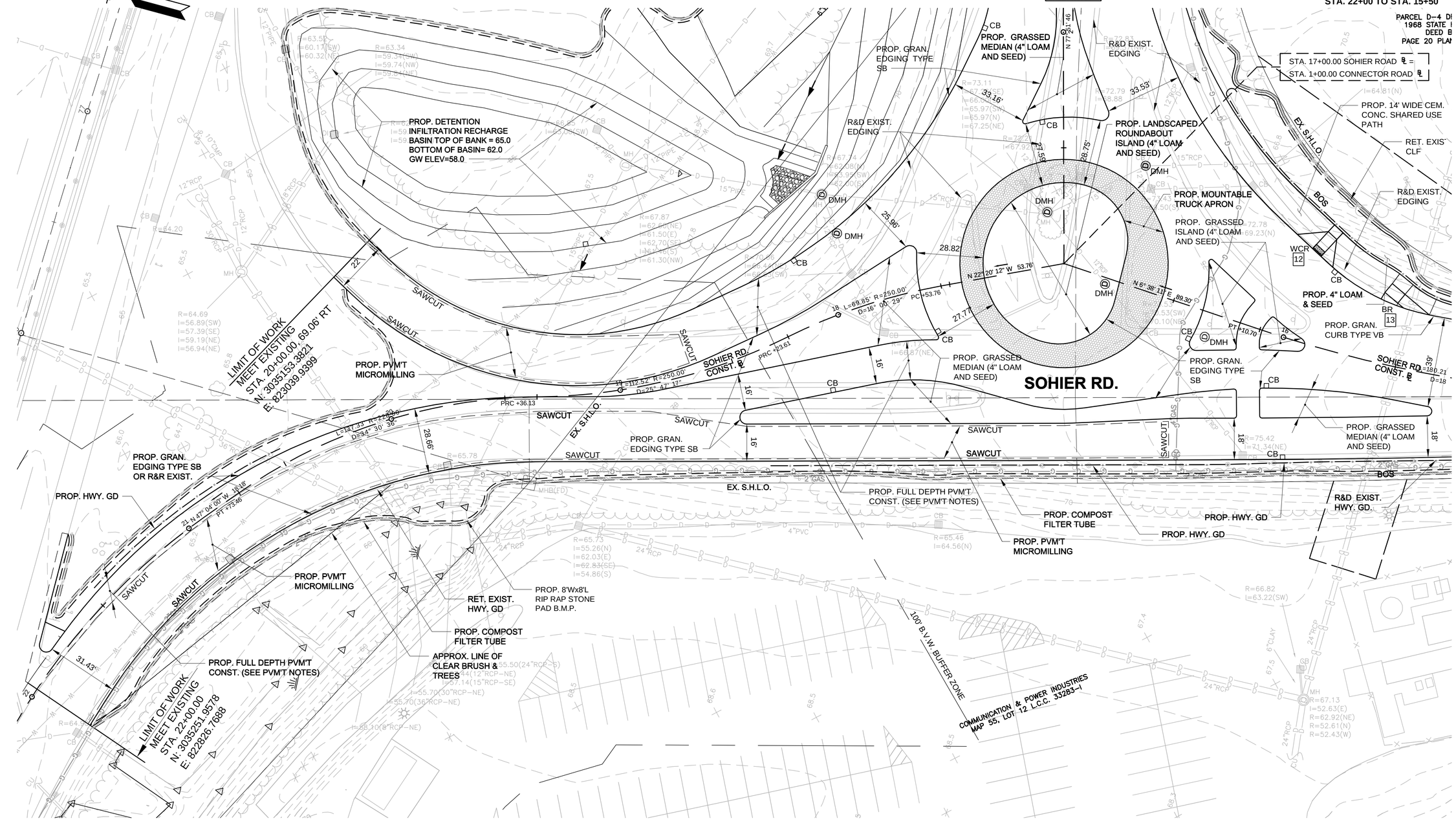
DRAINAGE DETAILS

SEE SHEET 45

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	29	80
PROJECT FILE NO.	604369		

CONSTRUCTION PLAN
SOHIER ROAD
STA. 22+00 TO STA. 15+50



20 0 20 40
SCALE IN FEET

FOR PROFILE: SEE SHEET NO. 35,36

Jacobs - \\BOSFIL11N\AI_Proj\MHD\D208E2X4110\assignment 23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Construction Plans).dwg May 30, 2014
604369_HD(CONSTRUCTION PLANS).DWG Plotted on 30-May-2014 2:26 PM

HIGHWAY GUARD DETAILS

STA. 11+89 LT TO STA. 12+38 LT HIGHWAY GUARD REMOVED AND DISCARDED (635.1)

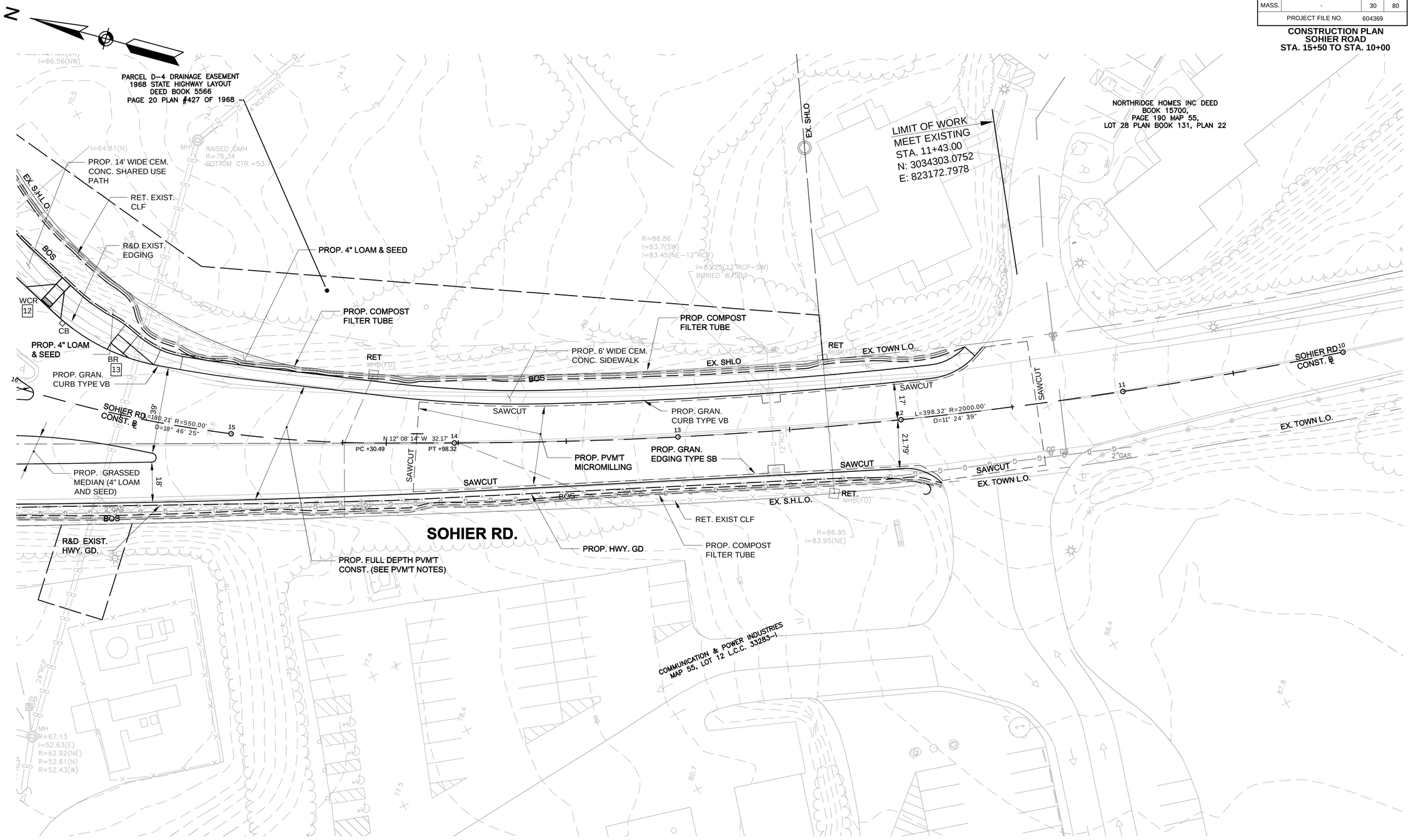
DRAINAGE DETAILS

SEE SHEET 46

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	30	80
PROJECT FILE NO.	604369		

CONSTRUCTION PLAN
SOHIER ROAD
STA. 15+50 TO STA. 10+00



20 0 20 40
SCALE IN FEET

FOR PROFILE: SEE SHEET NO. 36,37

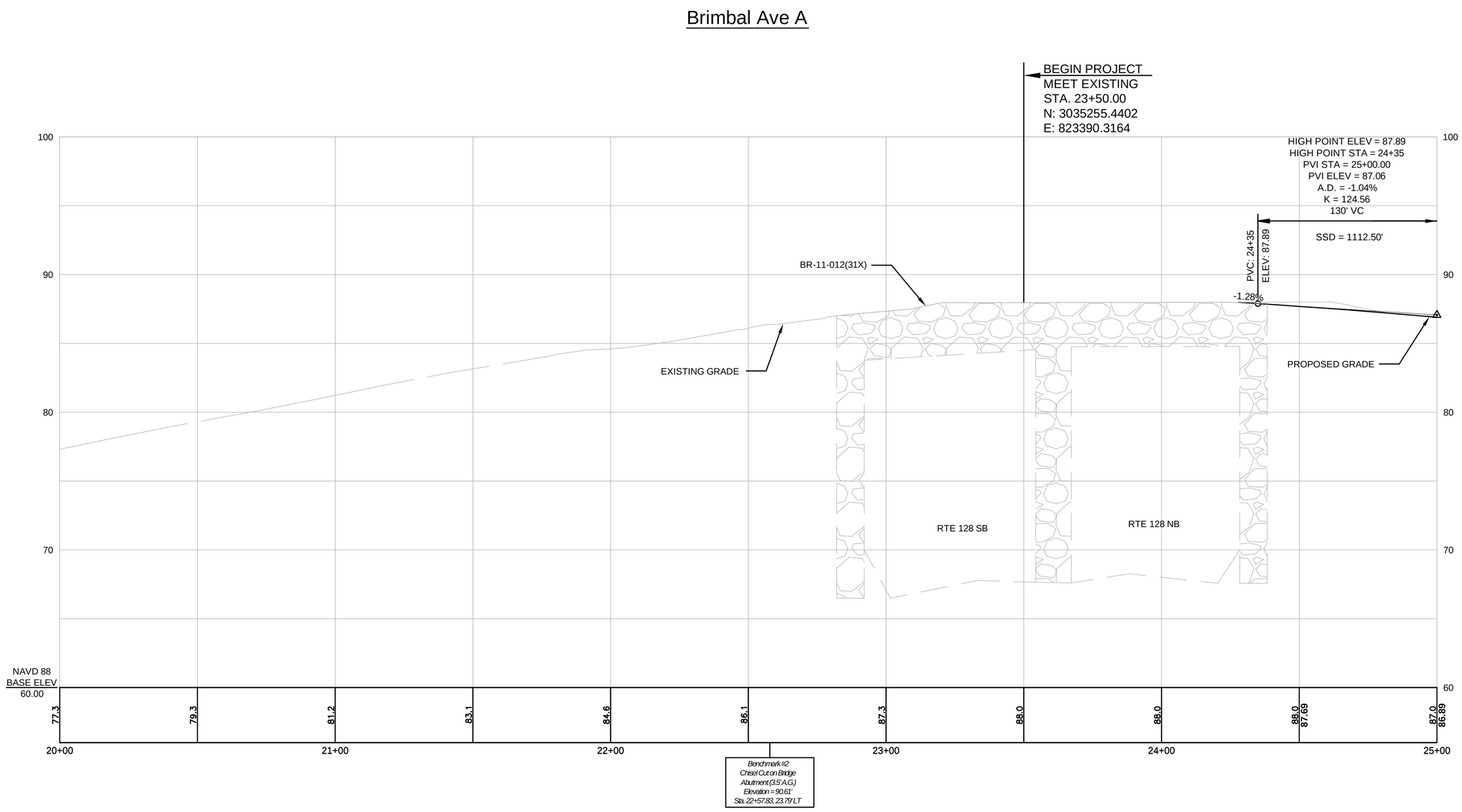
Jacobs - \\BOSFILL11\ALPro\MHD\208E2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD\Construction Plans\.dwg May 30, 2014

604369_HD(CONSTRUCTION PLANS).DWG Plotted on 30-May-2014 2:26 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	31	80
PROJECT FILE NO.	604369		

PROFILE
BRIMBAL AVENUE



CONTINUED ON SHEET 32

FOR CONSTRUCTION PLANS SEE SHEET 24

604369_HD(PROFILE PLANS).DWG Plotted on 30-May-2014 2:29 PM

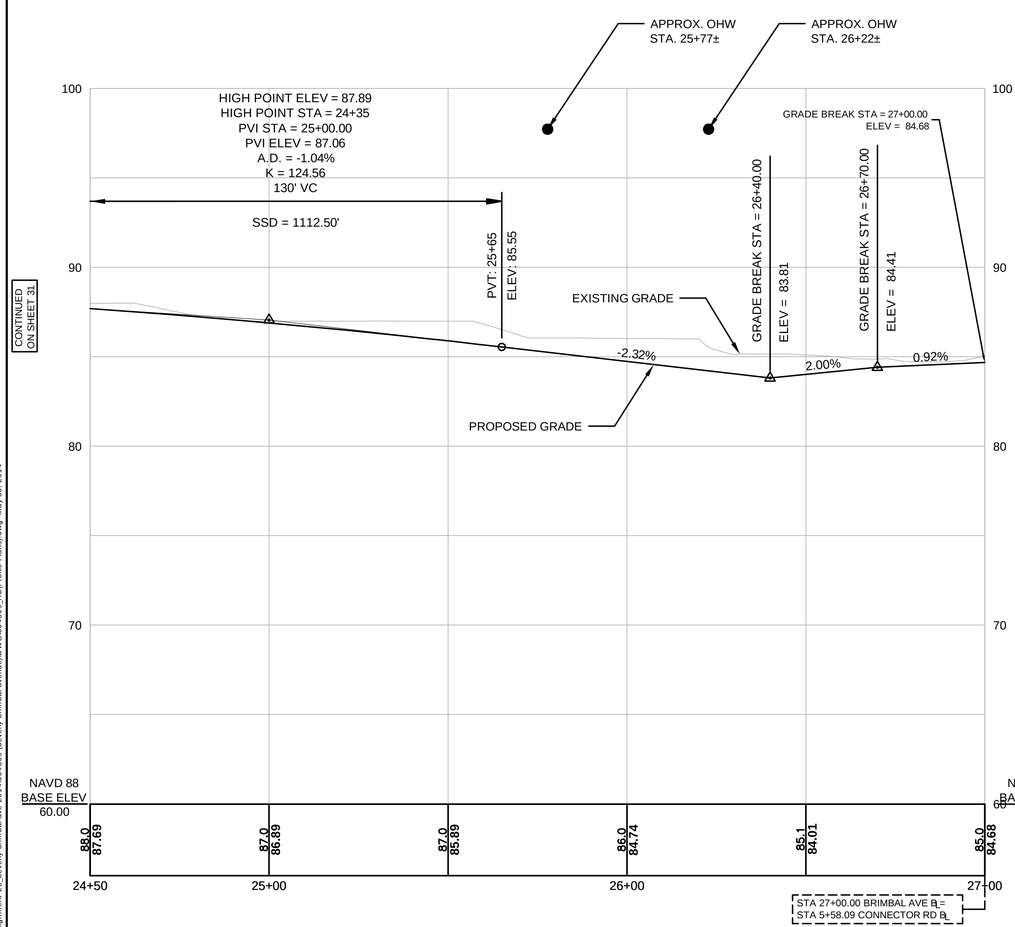
Jacobs - \\BOSFIL11\AL_Proj\MHD\2008\E2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Profile Plans).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

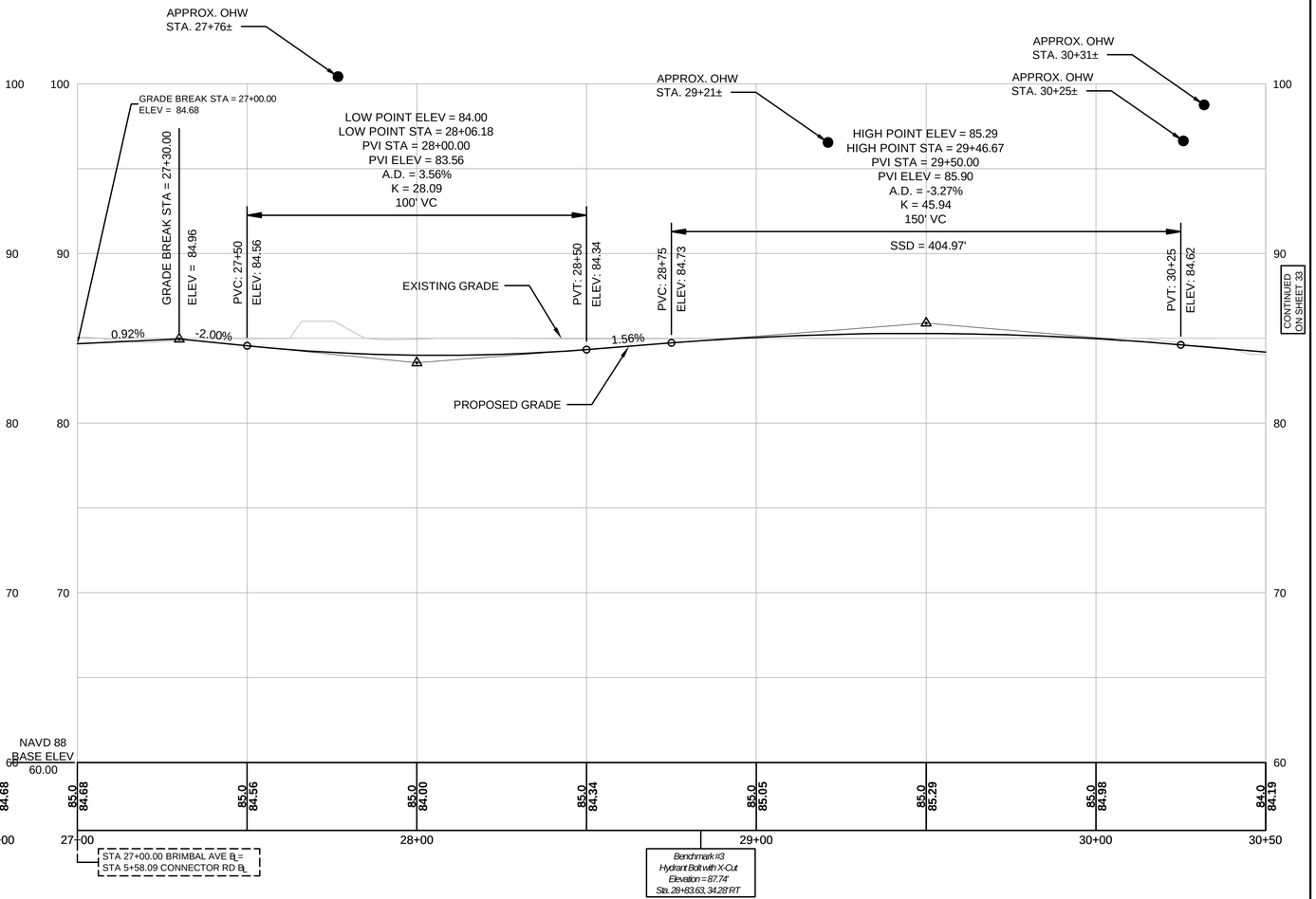
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	32	80
PROJECT FILE NO.	604369		

PROFILE
BRIMBAL AVENUE

Brimbal Ave A



Brimbal Ave B



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

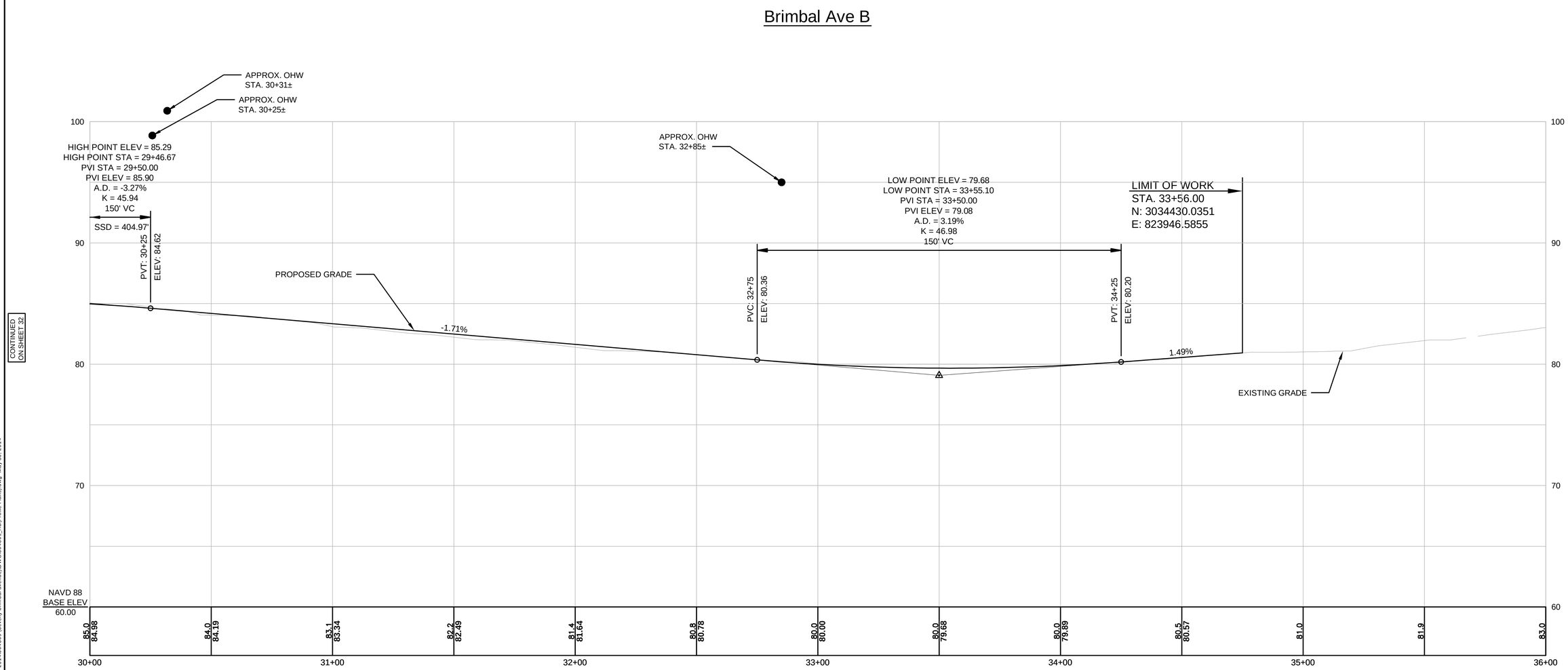
FOR CONSTRUCTION PLANS SEE SHEET 25

Jacobs - \\BOSFIL11\NA_Proj\MHD\206\E2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(PROFILE PLANS).dwg May 30, 2014
604369_HD(PROFILE PLANS).DWG Plotted on 30-May-2014 2:29 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	33	80
PROJECT FILE NO.	604369		

PROFILE
BRIMBAL AVENUE



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

FOR CONSTRUCTION PLANS SEE SHEET 26

604369_HD(PROFILE PLANS).DWG Plotted on 30-May-2014 2:29 PM

Jacobs - \\BOSFIL11\ALProjMHD\2008E2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Profile Plans).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	34	80
PROJECT FILE NO.	604369		

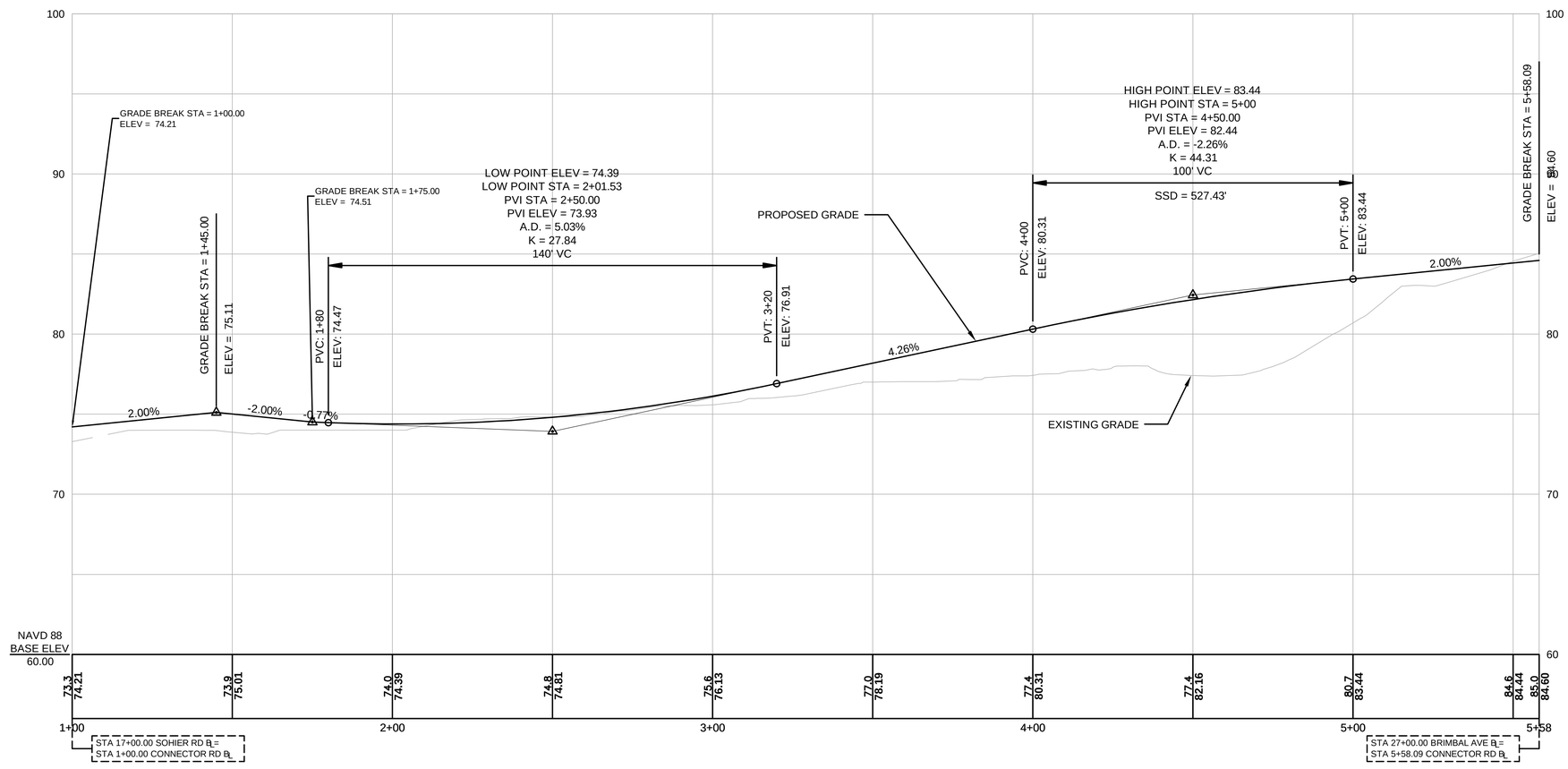
PROFILE
CONNECTOR ROAD

Plotted on 30-May-2014 2:29 PM

604369_HD(PROFILE PLANS).DWG

Jacobs - \\BOSFIL11\NA_Proj\MHD\200\6E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Profile Plans).dwg May 30, 2014

Connector Rd.



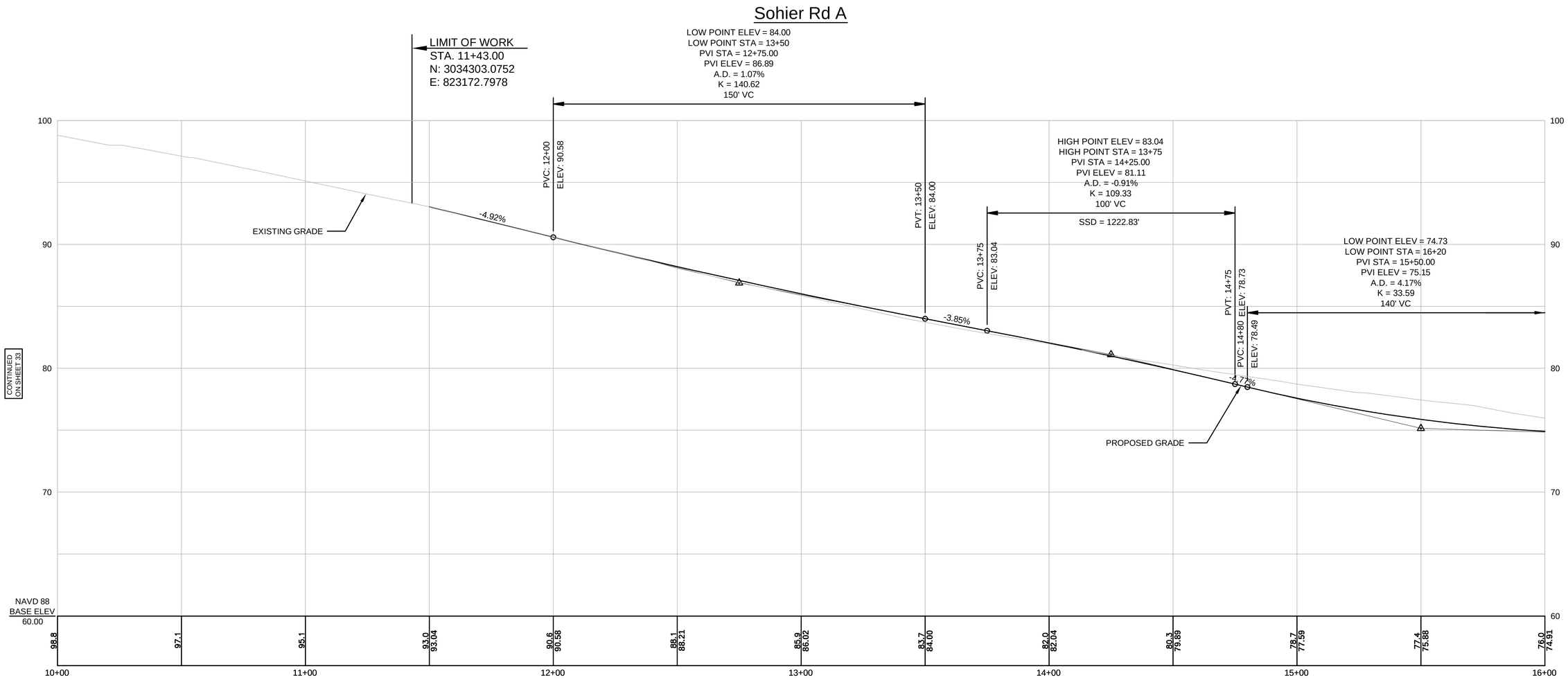
HOR. SCALE IN FEET
20 0 20 40
4 0 4 8
VER. SCALE IN FEET

FOR CONSTRUCTION PLANS SEE SHEET 28

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	35	80
PROJECT FILE NO.	604369		

PROFILE
SOHIER ROAD



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

FOR CONSTRUCTION PLANS SEE SHEET 29

604369_HD(PROFILE PLANS).DWG Plotted on 30-May-2014 2:29 PM

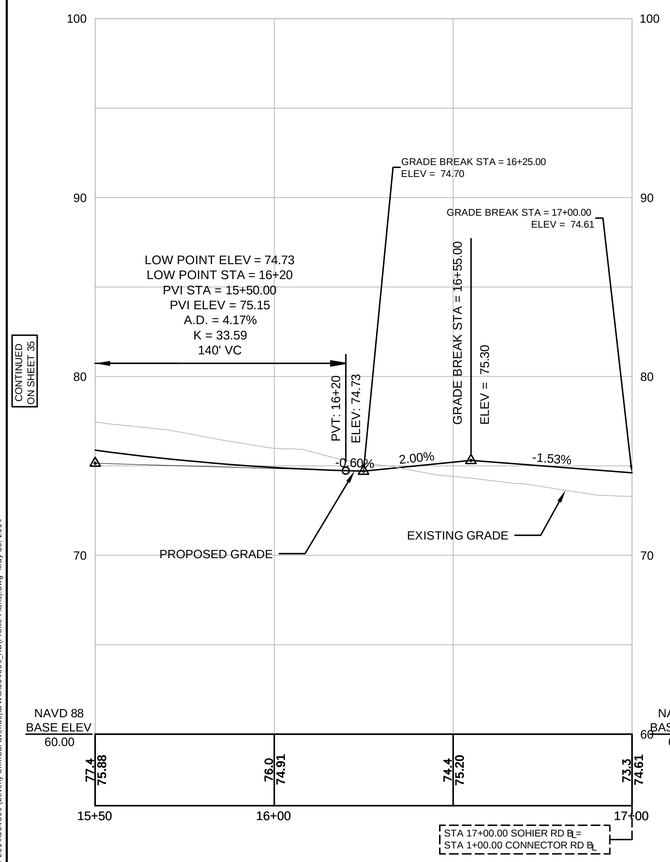
Jacobs - \\BOSFIL11\ALPro\MHD\2008\E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Profile Plans).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

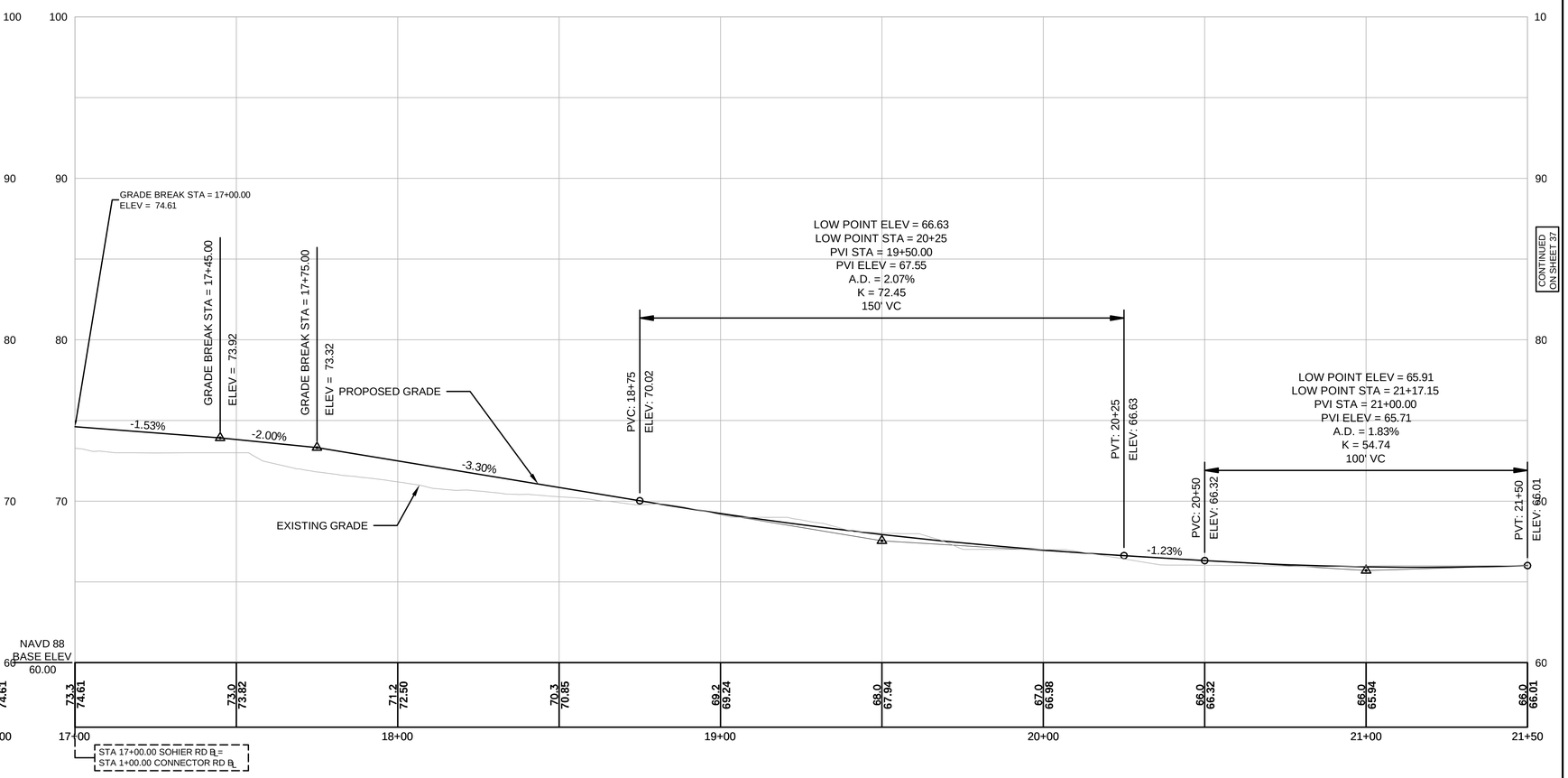
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	36	80
PROJECT FILE NO.	604369		

PROFILE
SOHIER ROAD

Sohier Rd A



Sohier Rd B



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

FOR CONSTRUCTION PLANS SEE SHEET 30

Jacobs - \\BOSFIL11\NAL\Proj\MHD\2008\E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Profile Plans).dwg May 30, 2014
604369_HD(PROFILE PLANS).DWG Plotted on 30-May-2014 2:29 PM

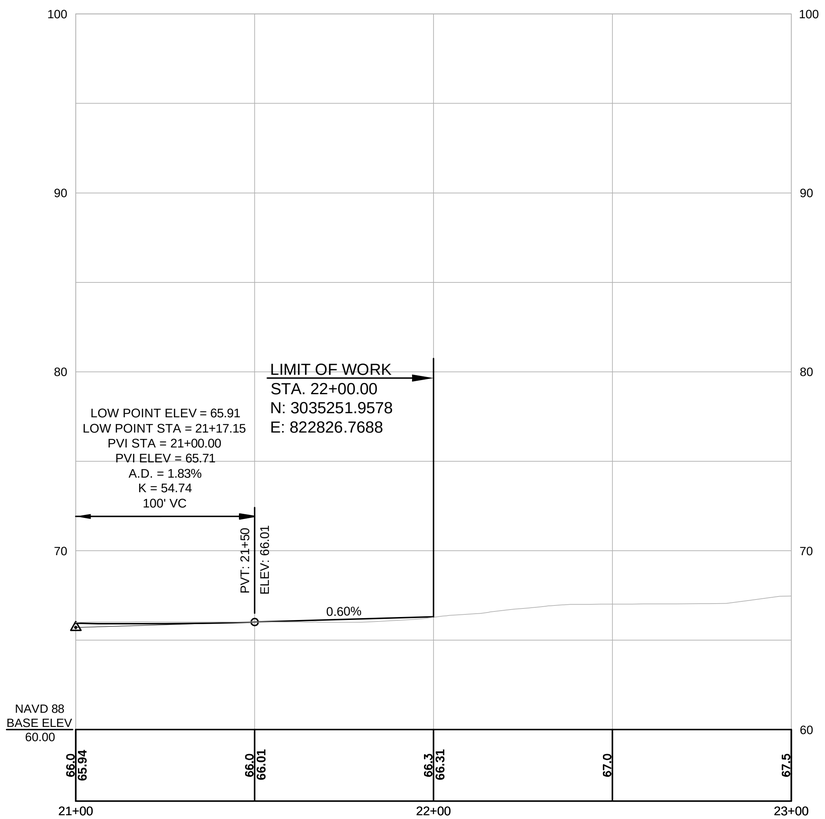
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	37	80
PROJECT FILE NO.	604369		

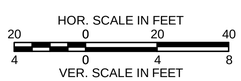
PROFILE
SOHIER ROAD

604369_HD(PROFILE PLANS).DWG Plotted on 30-May-2014 2:29 PM

Sohier Rd B



CONTINUED ON SHEET 36



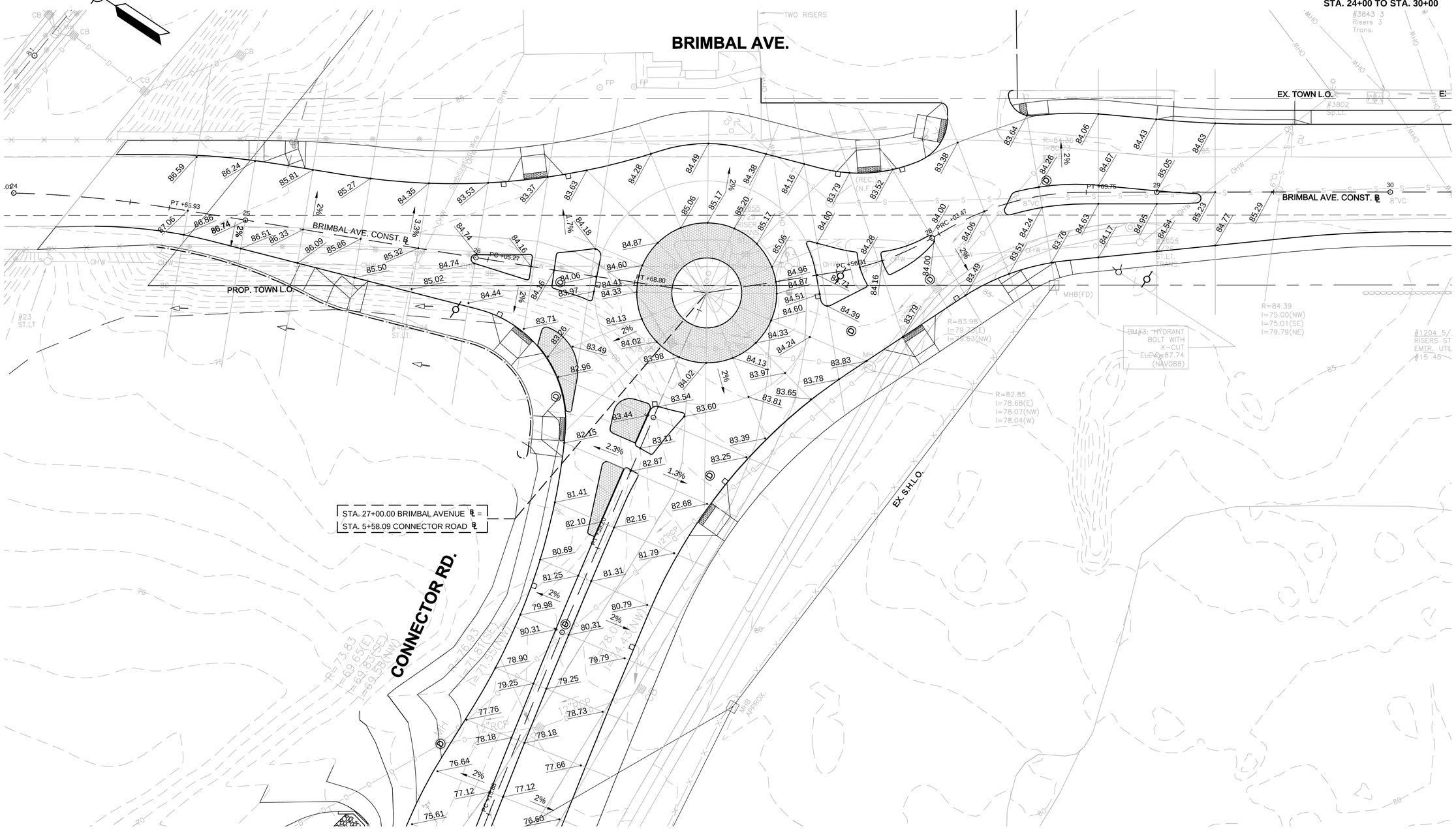
FOR CONSTRUCTION PLANS SEE SHEET 30

Jacobs - \\BOSFIL11\NA_Proj\MHD\2008\E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Profile Plans).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	38	80
PROJECT FILE NO.	604369		

GRADING PLAN
BRIMBAL AVENUE
STA. 24+00 TO STA. 30+00



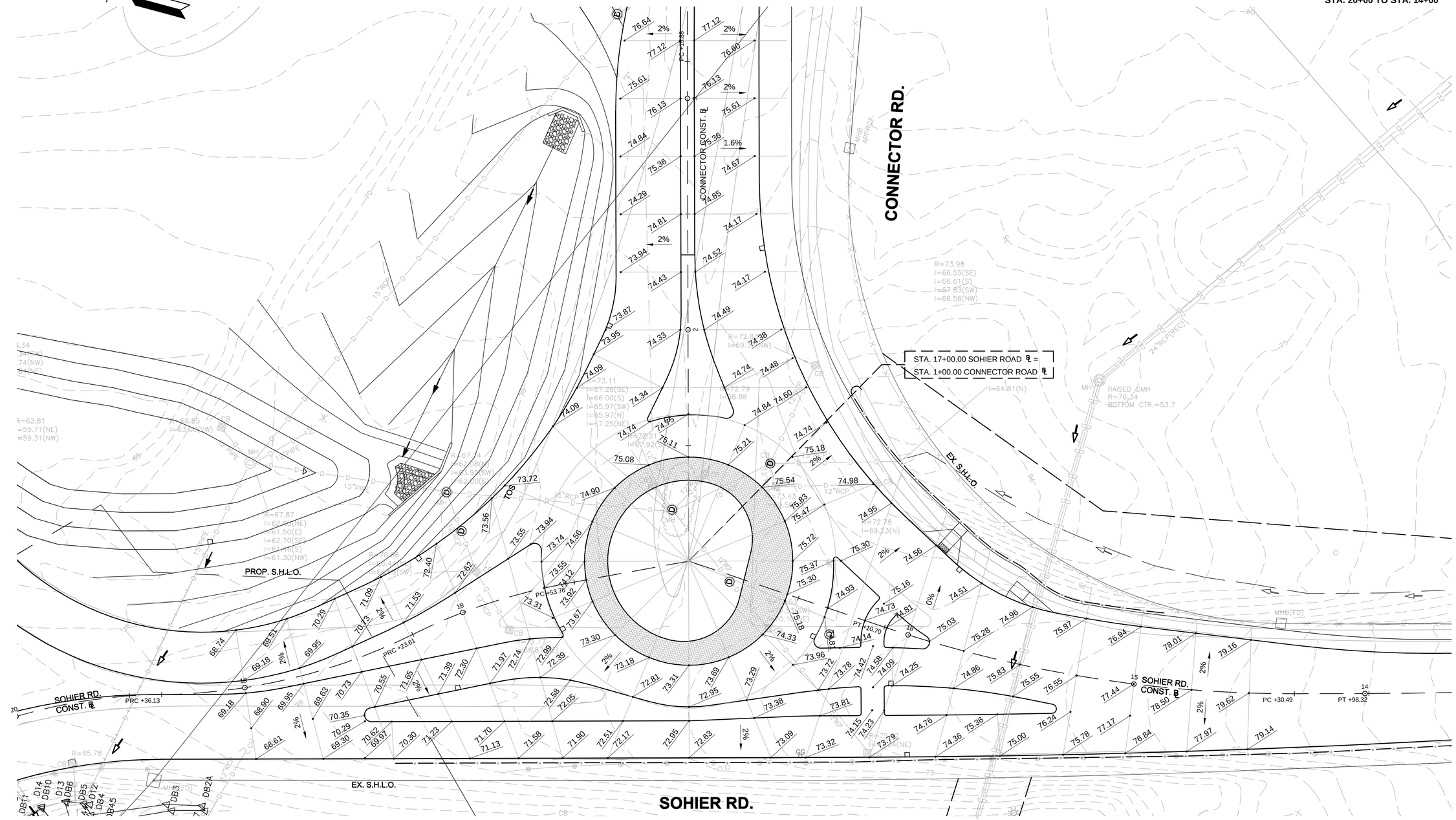
Jacobs - \\BOSFIL11\NA_Proj\MHD\2008\E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Grading Plans).dwg May 30, 2014

604369_HD(GRADING PLANS).DWG Plotted on 30-May-2014 2:29 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	39	80
PROJECT FILE NO.	604369		

GRADING PLAN
SOHIER ROAD
STA. 20+00 TO STA. 14+00



20 0 20 40
SCALE IN FEET

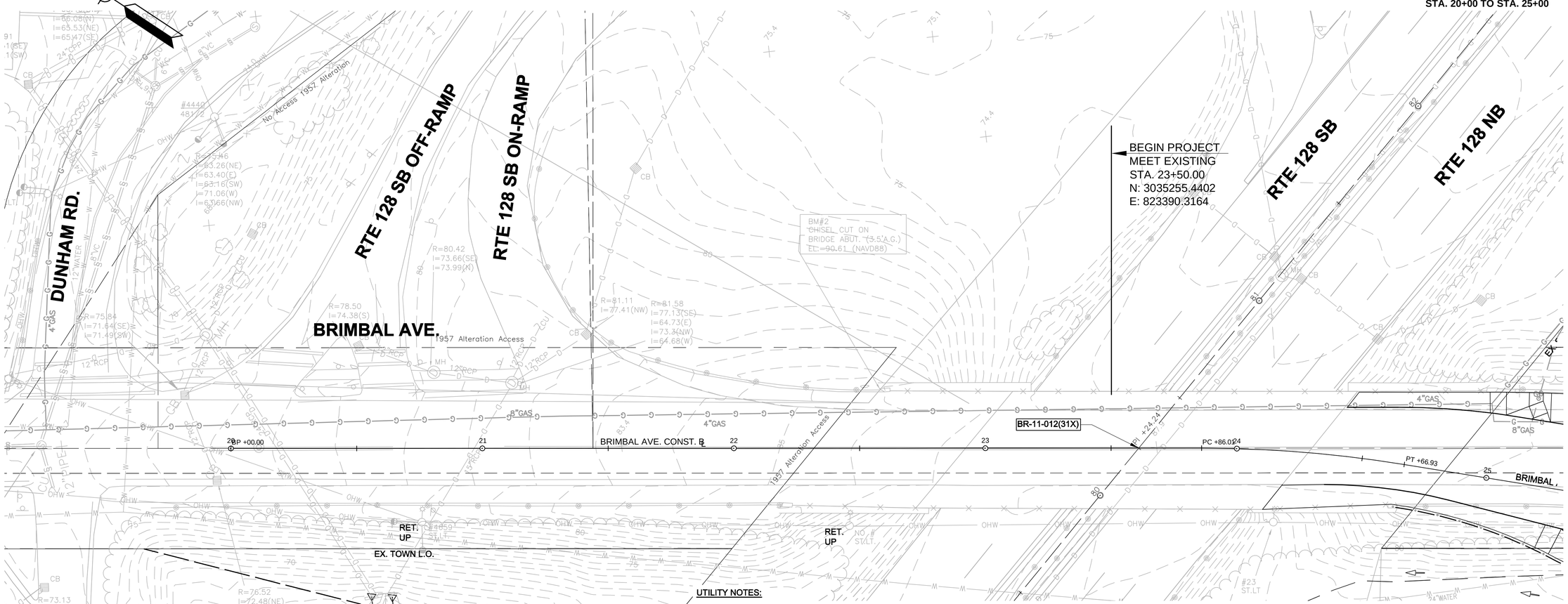
Jacobs : \\BOSFIL11\NA_Proj\MHD\200\EE2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Grading Plans).dwg May 30, 2014

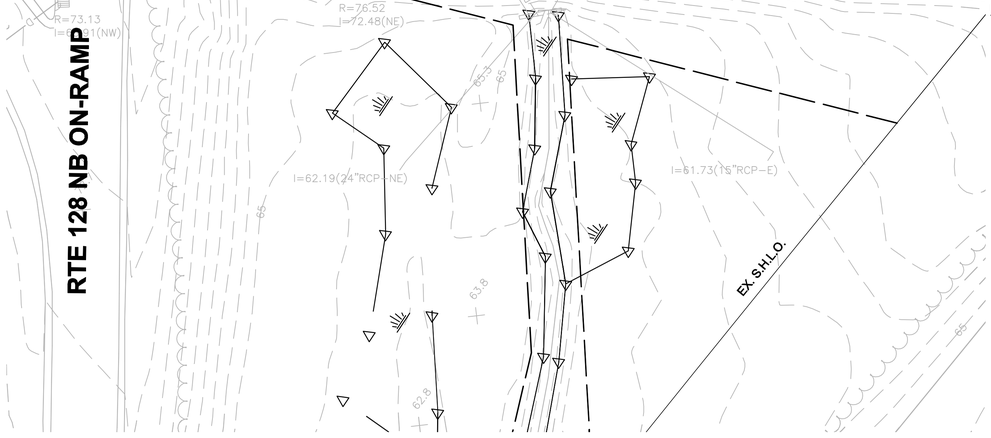
604369_HD(GRADING PLANS).DWG Plotted on 30-May-2014 2:29 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	40	80
PROJECT FILE NO.	604369		

DRAINAGE AND UTILITY PLAN
BRIMBAL AVENUE
STA. 20+00 TO STA. 25+00





UTILITY NOTES:

1. THE LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES SHALL BE CONSIDERED APPROXIMATE AND MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO ANY UTILITY CONNECTIONS OR CROSSINGS OF PROPOSED UTILITIES AND EXISTING UTILITIES. THE CONTRACTOR SHALL CONTACT THE RESPECTIVE UTILITY COMPANIES RELATIVE TO THE LOCATIONS AND ELEVATIONS OF THEIR LINES. THE CONTRACTOR SHALL KEEP A RECORD OF ANY DISCREPANCIES OR CHANGES IN THE LOCATIONS OF ANY UTILITIES SHOWN OR ENCOUNTERED DURING CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED TO JACOBS ENGINEERING.

2. THE CONTRACTOR SHALL COMPLY WITH MASSACHUSETTS GENERAL LAWS CHAPTER 82, SECTION 40, AS AMENDED, WHICH STATES THAT NO ONE MAY EXCAVATE IN THE COMMONWEALTH OF MASSACHUSETTS EXCEPT IN AN EMERGENCY WITHOUT 72 HOURS NOTICE, EXCLUSIVE OF SATURDAYS, SUNDAYS, AND LEGAL HOLIDAYS, TO NATURAL GAS PIPELINE COMPANIES, AND MUNICIPAL UTILITY DEPARTMENTS THAT SUPPLY GAS, ELECTRICITY, TELEPHONE, OR CABLE TELEVISION SERVICE IN OR TO THE CITY OR TOWN WHERE THE EXCAVATION IS TO BE MADE. THE CONTRACTOR SHALL CALL "DIG SAFE" AT 1-888-DIG-SAFE.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL EXISTING ELECTRIC AND TELEPHONE STRUCTURES, DUCTS, AND CONDUITS BEING ABANDONED ONCE THEY HAVE BEEN DISCONNECTED AND THE CABLES REMOVED.

4. THE CONTRACTOR SHALL COMPLY WITH MASSACHUSETTS GENERAL LAWS CHAPTER 82A, ALSO REFERRED TO AS JACKIE'S LAW, AS DETAILED IN SECTION 520 CMR 14.00 OF THE CODE OF MASSACHUSETTS REGULATIONS.

5. IT SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO SEE THAT ALL PERMITS AND APPROVALS ARE OBTAINED BEFORE STARTING CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MAKING ALL NECESSARY ARRANGEMENTS FOR AND FOR PERFORMING ANY NECESSARY WORK INVOLVED IN CONNECTION WITH THE DISCONTINUANCE OF ANY UTILITIES OR WITHIN THE JURISDICTION OF ANY UTILITY COMPANIES, SUCH AS ELECTRICITY, TELEPHONE, WATER, GAS, CABLE, AND ANY SYSTEM OR SYSTEMS WHICH WILL BE AFFECTED BY THE WORK TO BE PERFORMED UNDER THIS CONTRACT. THE CONTRACTOR SHALL NOTIFY ALL APPROPRIATE AGENCIES, DEPARTMENTS, AND UTILITY COMPANIES, IN WRITING, AT LEAST 48 HOURS AND NOT MORE THAN 30 DAYS PRIOR TO ANY CONSTRUCTION.

6. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS, RULES, REGULATIONS AND SAFETY CODES IN THE CONSTRUCTION OF ALL IMPROVEMENTS.

7. THE CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES INCLUDING ELECTRICITY, TELEPHONE, WATER, GAS, CABLE, AND ANY SYSTEM OR SYSTEMS WHICH WILL BE AFFECTED IN ORDER TO MAINTAIN SERVICE TO ITS CUSTOMERS AT ALL TIMES, UNLESS OTHERWISE NOTED OR PERMITTED.

8. UTILITY STRUCTURES TO BE ABANDONED SHALL BE REMOVED TO A DEPTH OF NO LESS THAN 3 FEET BELOW FINISHED GRADE, THE BOTTOMS OF THE STRUCTURES SHALL BE BROKEN AND THE STRUCTURES SHALL BE BACKFILLED WITH GRAVEL BORROW AND COMPACTED.

9. CONTRACTOR SHALL MAINTAIN ALL EXISTING UTILITIES EXCEPT THOSE NOTED TO BE ABANDONED OR REMOVED & DISPOSED.

10. CONTRACTOR MUST OBTAIN ACCESS PERMITS FROM MASSDOT - DISTRICT 4 PRIOR TO CONSTRUCTION.

11. MASSDOT IS NOT RESPONSIBLE FOR ANY IMPACTS TO THE SOLID WASTE LANDFILL..

12. ABANDON EXISTING WATER LINE IN PLACE AND FILL BOTH ENDS WITH CONCRETE PLUG.

20 0 20 40
SCALE IN FEET

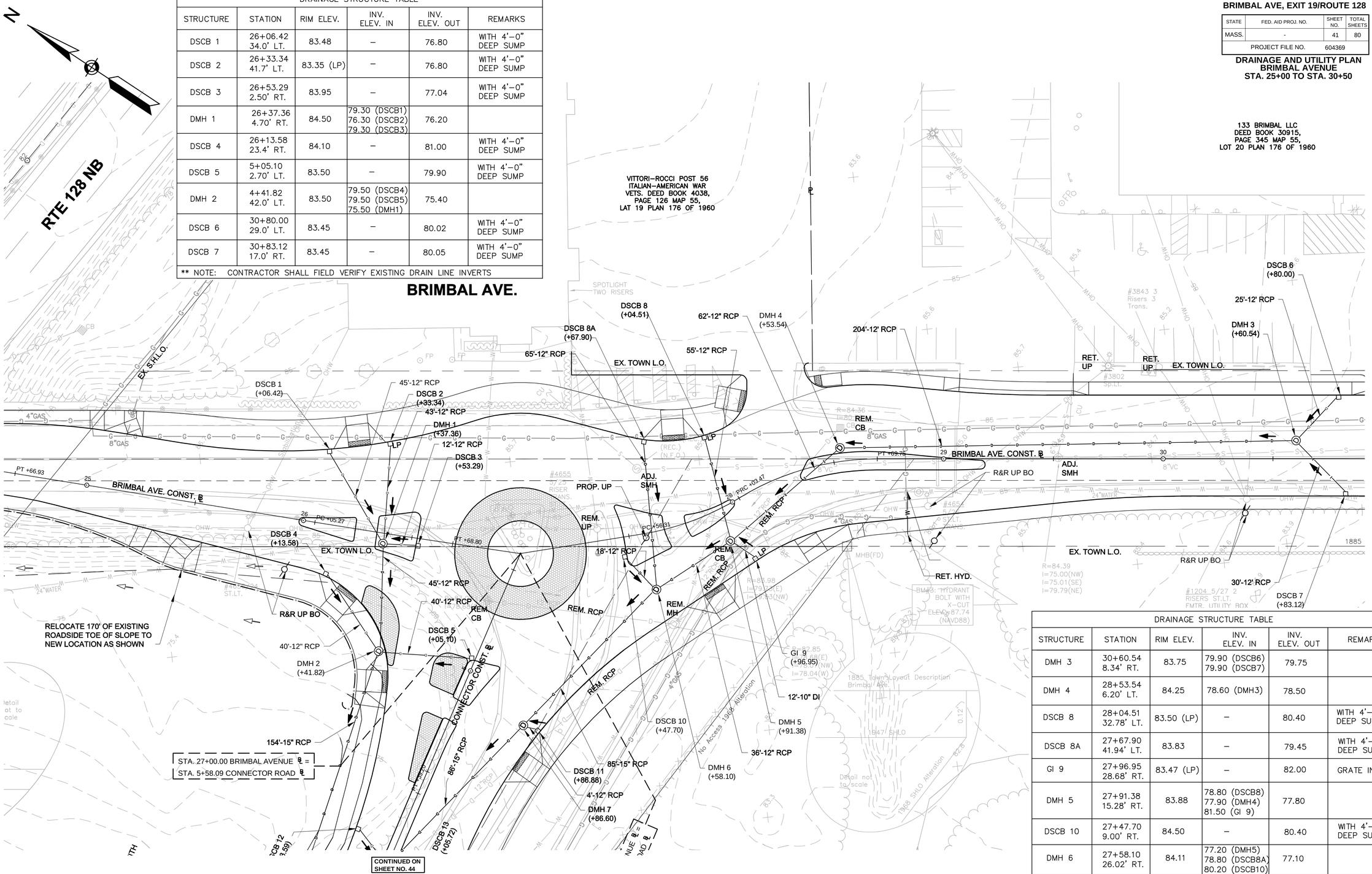
Jacobs - \\BOSFIL11\NAI_Proj\MHD\200\BE2X4110\Assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_UT(Drainage and Utility Plans).dwg May 30, 2014
604369_UT(DRAINAGE AND UTILITY PLANS).DWG Plotted on 30-May-2014 2:30 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	41	80
PROJECT FILE NO.	604369		

DRAINAGE AND UTILITY PLAN
BRIMBAL AVENUE
STA. 25+00 TO STA. 30+50

DRAINAGE STRUCTURE TABLE					
STRUCTURE	STATION	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
DSCB 1	26+06.42 34.0' LT.	83.48	–	76.80	WITH 4'–0" DEEP SUMP
DSCB 2	26+33.34 41.7' LT.	83.35 (LP)	–	76.80	WITH 4'–0" DEEP SUMP
DSCB 3	26+53.29 2.50' RT.	83.95	–	77.04	WITH 4'–0" DEEP SUMP
DMH 1	26+37.36 4.70' RT.	84.50	79.30 (DSCB1) 76.30 (DSCB2) 79.30 (DSCB3)	76.20	
DSCB 4	26+13.58 23.4' RT.	84.10	–	81.00	WITH 4'–0" DEEP SUMP
DSCB 5	5+05.10 2.70' LT.	83.50	–	79.90	WITH 4'–0" DEEP SUMP
DMH 2	4+41.82 42.0' LT.	83.50	79.50 (DSCB4) 79.50 (DSCB5) 75.50 (DMH1)	75.40	
DSCB 6	30+80.00 29.0' LT.	83.45	–	80.02	WITH 4'–0" DEEP SUMP
DSCB 7	30+83.12 17.0' RT.	83.45	–	80.05	WITH 4'–0" DEEP SUMP
** NOTE: CONTRACTOR SHALL FIELD VERIFY EXISTING DRAIN LINE INVERTS					



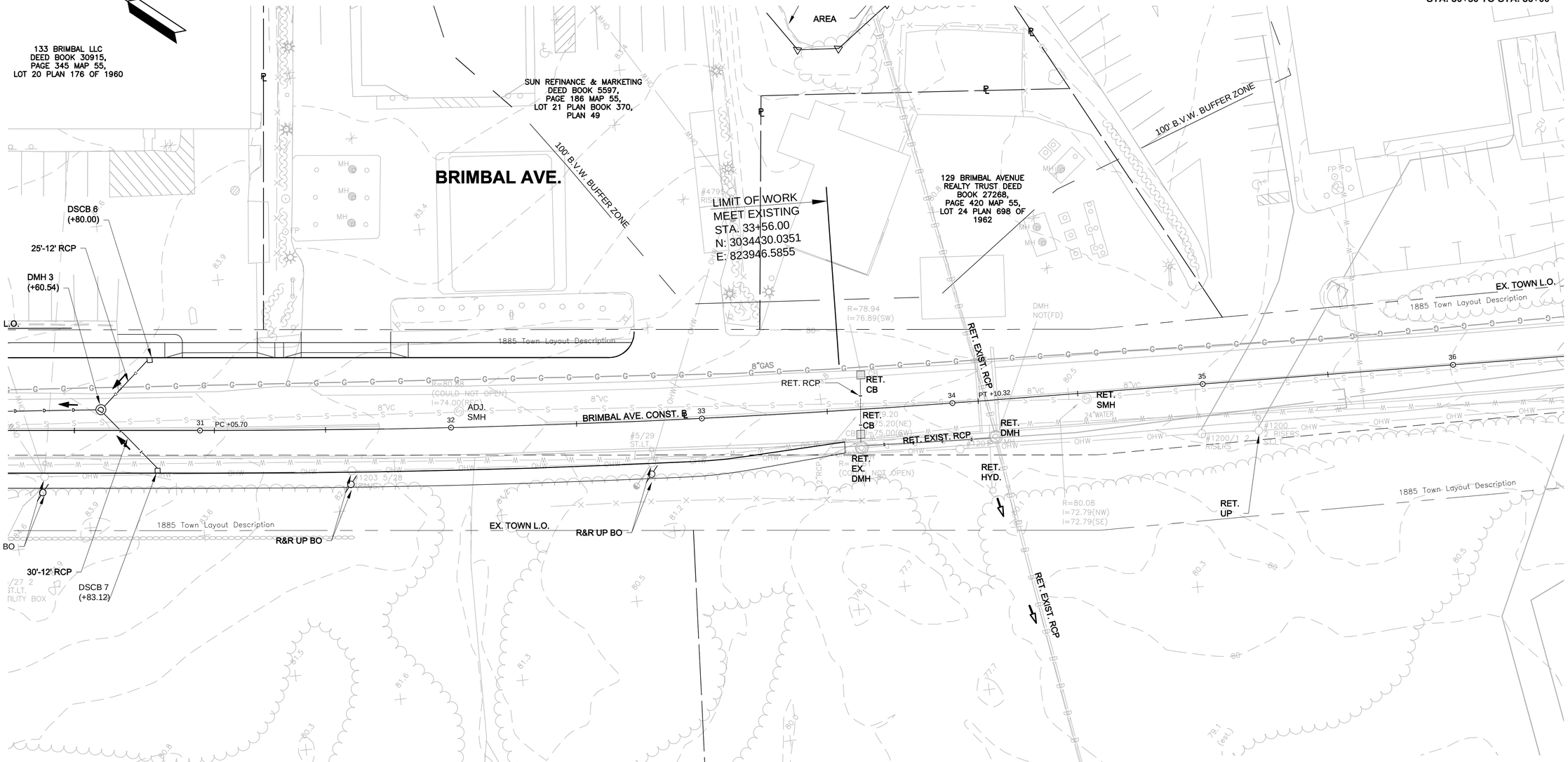
DRAINAGE STRUCTURE TABLE					
STRUCTURE	STATION	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
DMH 3	30+60.54 8.34' RT.	83.75	79.90 (DSCB6) 79.90 (DSCB7)	79.75	
DMH 4	28+53.54 6.20' LT.	84.25	78.60 (DMH3)	78.50	
DSCB 8	28+04.51 32.78' LT.	83.50 (LP)	–	80.40	WITH 4'–0" DEEP SUMP
DSCB 8A	27+67.90 41.94' LT.	83.83	–	79.45	WITH 4'–0" DEEP SUMP
GI 9	27+96.95 28.68' RT.	83.47 (LP)	–	82.00	GRATE INLET
DMH 5	27+91.38 15.28' RT.	83.88	78.80 (DSCB8) 77.90 (DMH4) 81.50 (GI 9)	77.80	
DSCB 10	27+47.70 9.00' RT.	84.50	–	80.40	WITH 4'–0" DEEP SUMP
DMH 6	27+58.10 26.02' RT.	84.11	77.20 (DMH5) 78.80 (DSCB8A) 80.20 (DSCB10)	77.10	
DSCB 11	4+86.88 38.87' RT.	82.90	–	79.50	WITH 4'–0" DEEP SUMP
DMH 7	4+86.60 31.97' RT.	82.96	79.00 (DMH11) 74.85 (DMH6)	74.85	
** NOTE: CONTRACTOR SHALL FIELD VERIFY EXISTING DRAIN LINE INVERTS					

604369_UT(DRAINAGE AND UTILITY PLANS).DWG Plotted on 30-May-2014 2:30 PM
Jacobs : \\BOSFILL11\NA_Proj\MHD\200\BE2X4110\Assignment 23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_UT(Drainage and Utility Plans).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	42	80
PROJECT FILE NO.	604369		

DRAINAGE AND UTILITY PLAN
BRIMBAL AVENUE
STA. 30+50 TO STA. 36+00



DRAINAGE STRUCTURE TABLE					
STRUCTURE	STATION	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
DSCB 6	30+80.00 29.00' LT.	83.45	–	80.02	WITH 4'–0" DEEP SUMP
DSCB 7	30+83.12 17.00' RT.	83.45	–	80.05	WITH 4'–0" DEEP SUMP
DMH 3	30+60.54 8.34' RT.	83.75	79.90 (DSCB6) 79.90 (DSCB7)	79.75	
** NOTE: CONTRACTOR SHALL FIELD VERIFY EXISTING DRAIN LINE INVERTS					

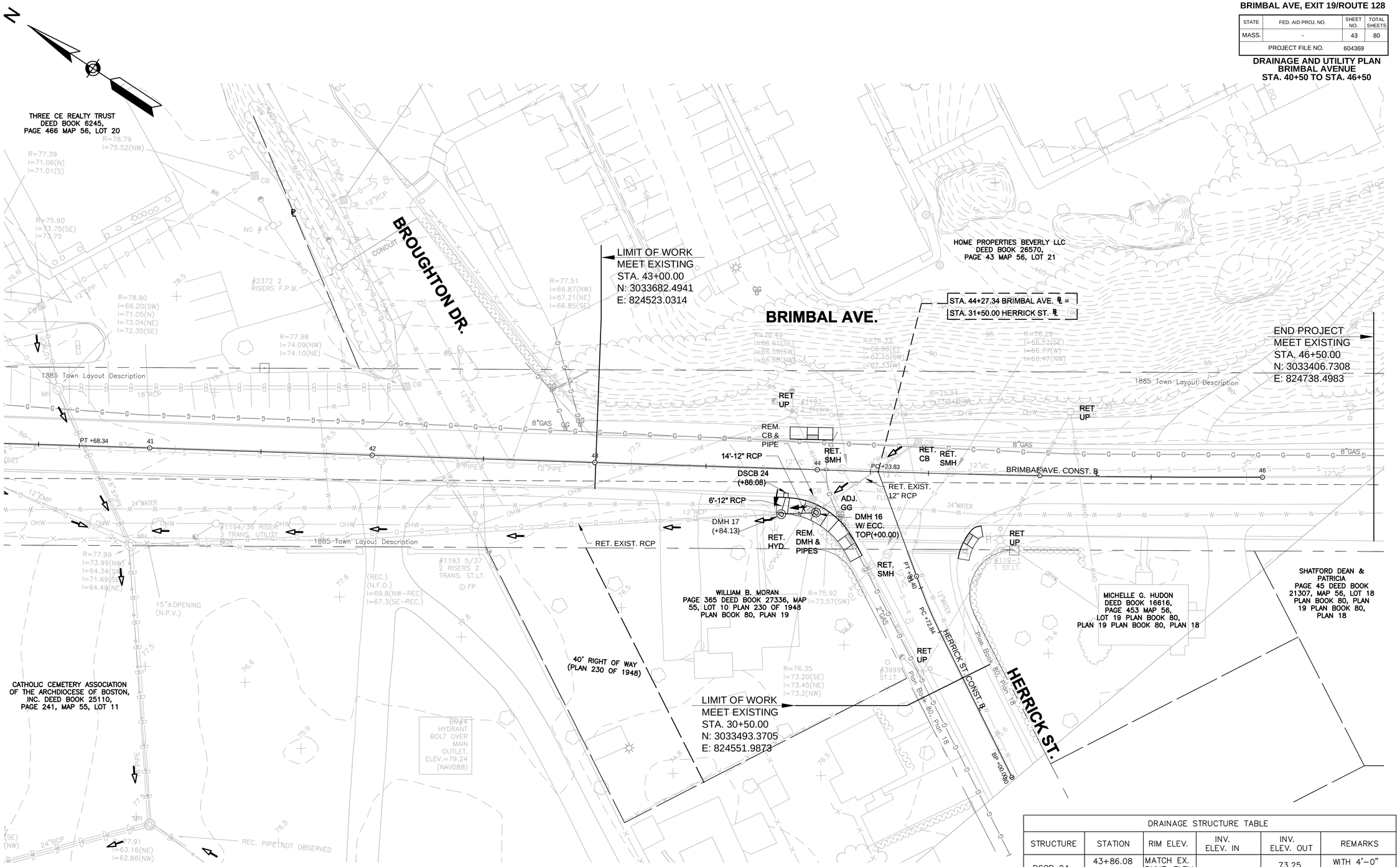
Jacobs - \\BOSFILL11\NA_Proj\MHD\209\EZX41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_UT(Drainage and Utility Plans).dwg May 30, 2014

604369_UT(DRAINAGE AND UTILITY PLANS).DWG Plotted on 30-May-2014 2:30 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	43	80
PROJECT FILE NO.	604369		

DRAINAGE AND UTILITY PLAN
BRIMBAL AVENUE
STA. 40+50 TO STA. 46+50



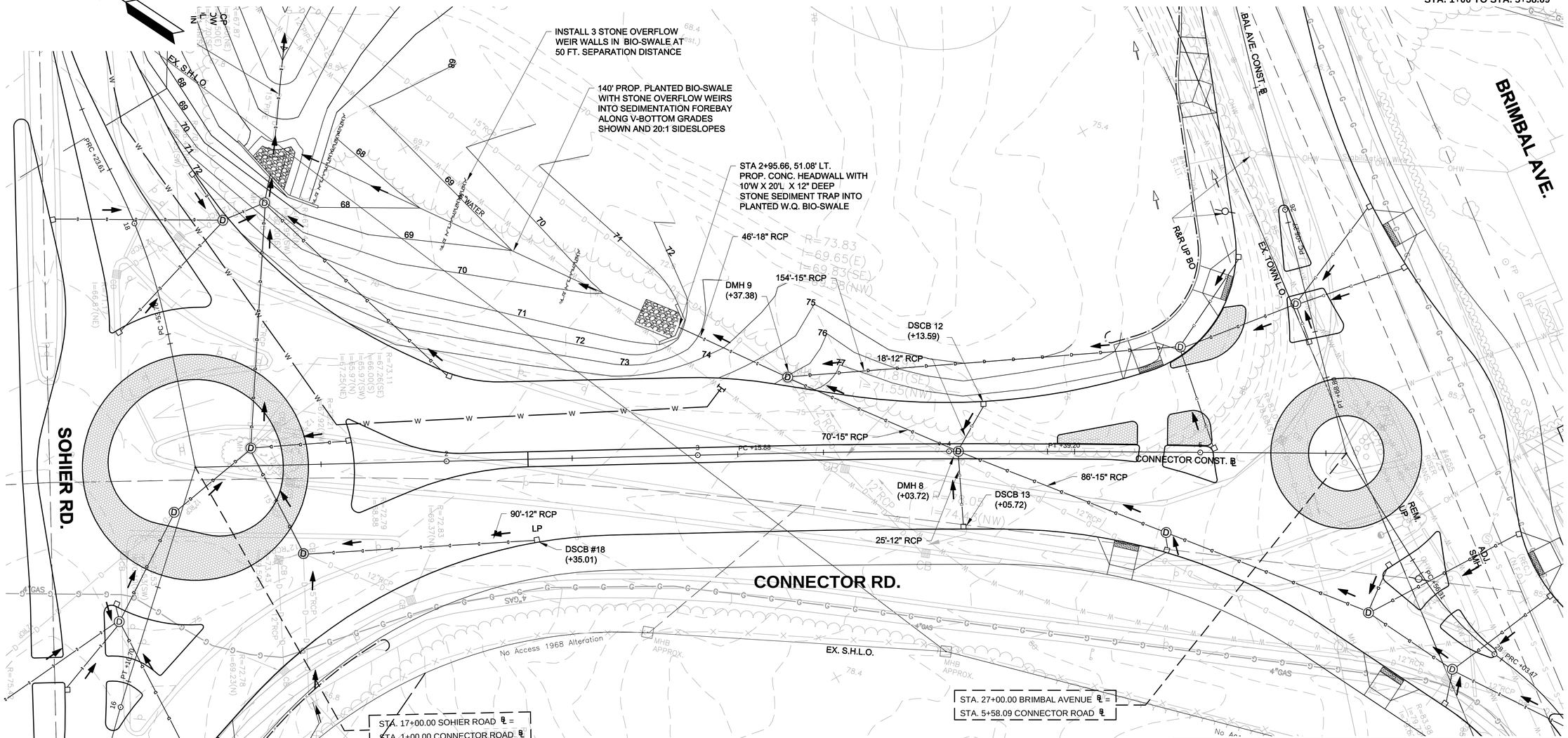
DRAINAGE STRUCTURE TABLE					
STRUCTURE	STATION	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
DSCB 24	43+86.08 12.93 RT.	MATCH EX. PVMT. ELEV.	–	73.25	WITH 4'–0" DEEP SUMP
DMH 16	44+00.00 19.26 RT.	MATCH EX. PVMT. ELEV.	73.20 (EXIST. 12"RCP INV.)	73.20	ECCENTRIC FLAT TOP
DMH 17	43+84.13 20.73 RT.	MATCH EX. PVMT. ELEV.	73.10 (DSCB24) 73.00 (DMH16)	72.90	
** NOTE: CONTRACTOR SHALL FIELD VERIFY EXISTING DRAIN LINE INVERTS					

Plotted on 30-May-2014 2:30 PM
604369_UT(DRAINAGE AND UTILITY PLANS).DWG
Jacobs - \\BOSFIL11\Al_Proj\MHD\20\BE2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal ave\mun)\DWG\604369_UT(Drainage and Utility Plans).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	44	80
PROJECT FILE NO.	604369		

DRAINAGE AND UTILITY PLAN
CONNECTOR STREET
STA. 1+00 TO STA. 5+58.09



DRAINAGE STRUCTURE TABLE					
STRUCTURE	STATION	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
DSCB 12	4+13.59 19.81' LT.	80.34	–	76.20	WITH 4'–0" DEEP SUMP
DSCB 13	4+05.72 29.09' RT.	80.00	–	76.30	WITH 4'–0" DEEP SUMP
DMH 8	4+03.72 0.00' LT.	80.85	75.80 (DSCB12) 75.80 (DSCB13) 72.80 (DMH7)	72.70	
DMH 9	3+37.38 30.23' LT.	76.00	71.30 (DMH2) 71.30 (DMH8)	71.20	
HEADWALL 1	2+95.66 51.08' LT.	–	–	70.50	DISCHARGE TO STONE SED TRAP AND BIO–SWALE
DSCB 18	2+35.01 31.46' RT.	74.12 (LP)	–	70.00	WITH 4'–0" DEEP SUMP

** NOTE: CONTRACTOR SHALL FIELD VERIFY EXISTING DRAIN LINE INVERTS

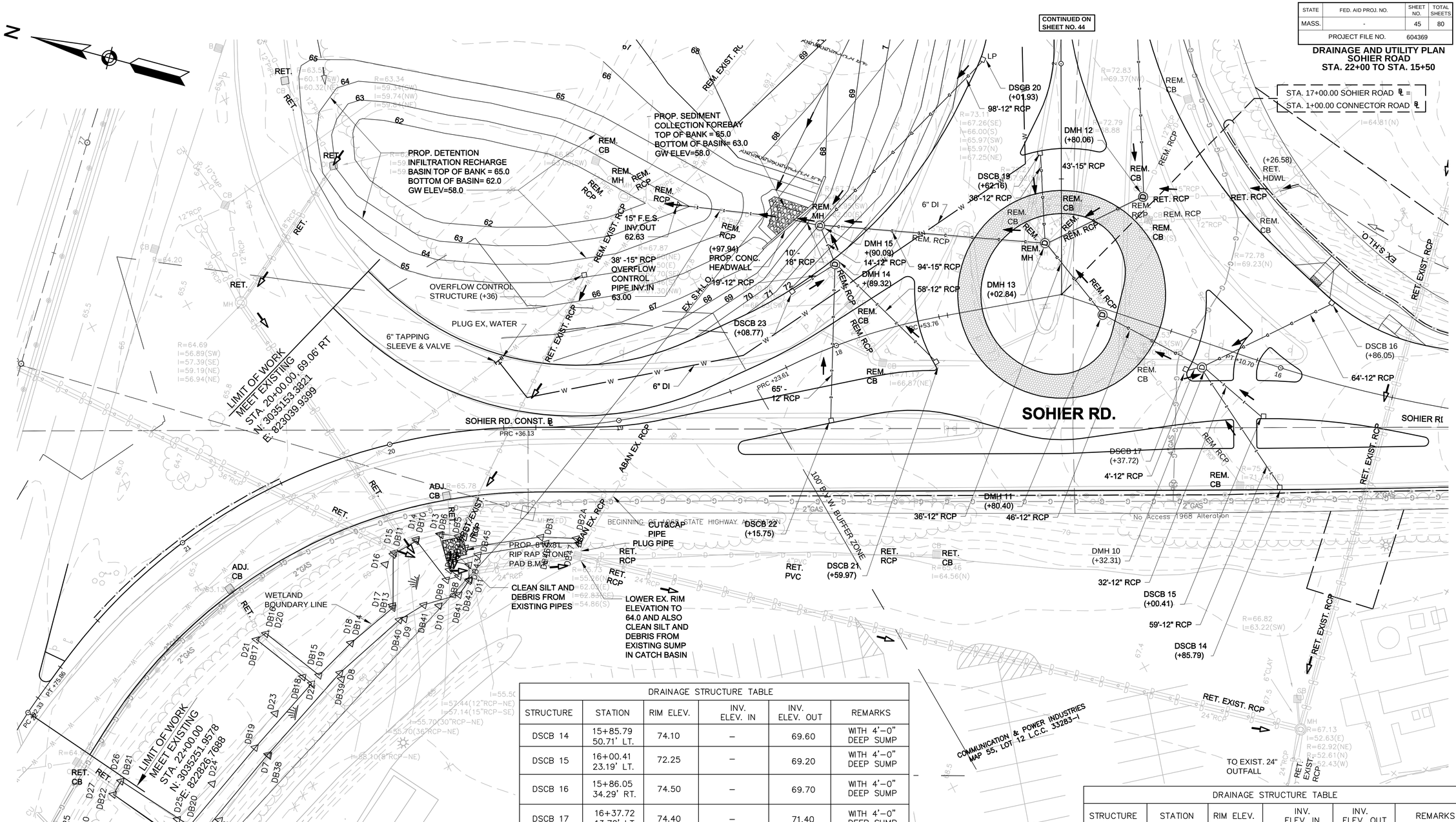
Jacobs - \\BOSFILL1\NA_Proj\MHD\200808\EX41100\assignment 23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_UT(Drainage and Utility Plans).dwg May 30, 2014

604369_UT(DRAINAGE AND UTILITY PLANS).DWG Plotted on 30-May-2014 2:31 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	45	80
PROJECT FILE NO.	604369		

DRAINAGE AND UTILITY PLAN
SOHIER ROAD
STA. 22+00 TO STA. 15+50



DRAINAGE STRUCTURE TABLE					
STRUCTURE	STATION	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
DSCB 19	1+62.16 9.35' LT.	74.70	–	70.00	WITH 4'–0" DEEP SUMP
DMH 13	17+02.84 23.17' RT.	76.00	70.00 (DSCB19) 67.00 (DMH 11) 66.00 (DMH 12)	66.00	
DSCB 20	2+01.93 34.69' LT.	73.87	–	69.90	WITH 4'–0" DEEP SUMP
DSCB 21	17+59.97 19.29' LT.	73.00	–	69.00	WITH 4'–0" DEEP SUMP

DRAINAGE STRUCTURE TABLE					
STRUCTURE	STATION	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
DSCB 14	15+85.79 50.71' LT.	74.10	–	69.60	WITH 4'–0" DEEP SUMP
DSCB 15	16+00.41 23.19' LT.	72.25	–	69.20	WITH 4'–0" DEEP SUMP
DSCB 16	15+86.05 34.29' RT.	74.50	–	69.70	WITH 4'–0" DEEP SUMP
DSCB 17	16+37.72 13.72' LT.	74.40	–	71.40	WITH 4'–0" DEEP SUMP
DMH 10	16+32.31 10.60' LT.	75.00	71.00 (DSCB17) 68.70 (DSCB16) 68.70 (DSCB15) 68.70 (DSCB14)	68.60	
DMH 11	16+80.40 2.75' LT.	76.00	67.80 (DMH10)	67.70	
EXISTING HEADWALL	16+26.58 71.17' RT.	–	67.81	–	SWALE OVERFLOW PIPE TO REMAIN
DSCB 18	2+35.01 31.46' RT.	74.12 (LP)	–	70.00	WITH 4'–0" DEEP SUMP
DMH 12	16+80.06 51.29' RT.	75.37	66.61 (EX.HWL) 68.20 (DSCB18)	66.50	

DRAINAGE STRUCTURE TABLE					
STRUCTURE	STATION	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
DSCB 22	18+15.75 30.12' LT.	71.62	–	67.50	WITH 4'–0" DEEP SUMP
DMH 14	17+89.32 33.29' RT.	72.85	68.90 (DSCB23) 67.90 (DSCB21) 65.80 (DSCB22)	65.70	
DSCB 23	18+08.77 29.88' RT.	72.00	–	69.30	WITH 4'–0" DEEP SUMP
DMH 15	17+90.09 51.30' RT.	70.50	67.40 (DSCB20) 65.40 (DMH 13) 65.40 (DMH 14)	65.00	
HEADWALL 2	17+97.94 57.22' RT.	–	–	65.00	DISCHARGE TO STONE SED TRAP WITHIN FOREBAY

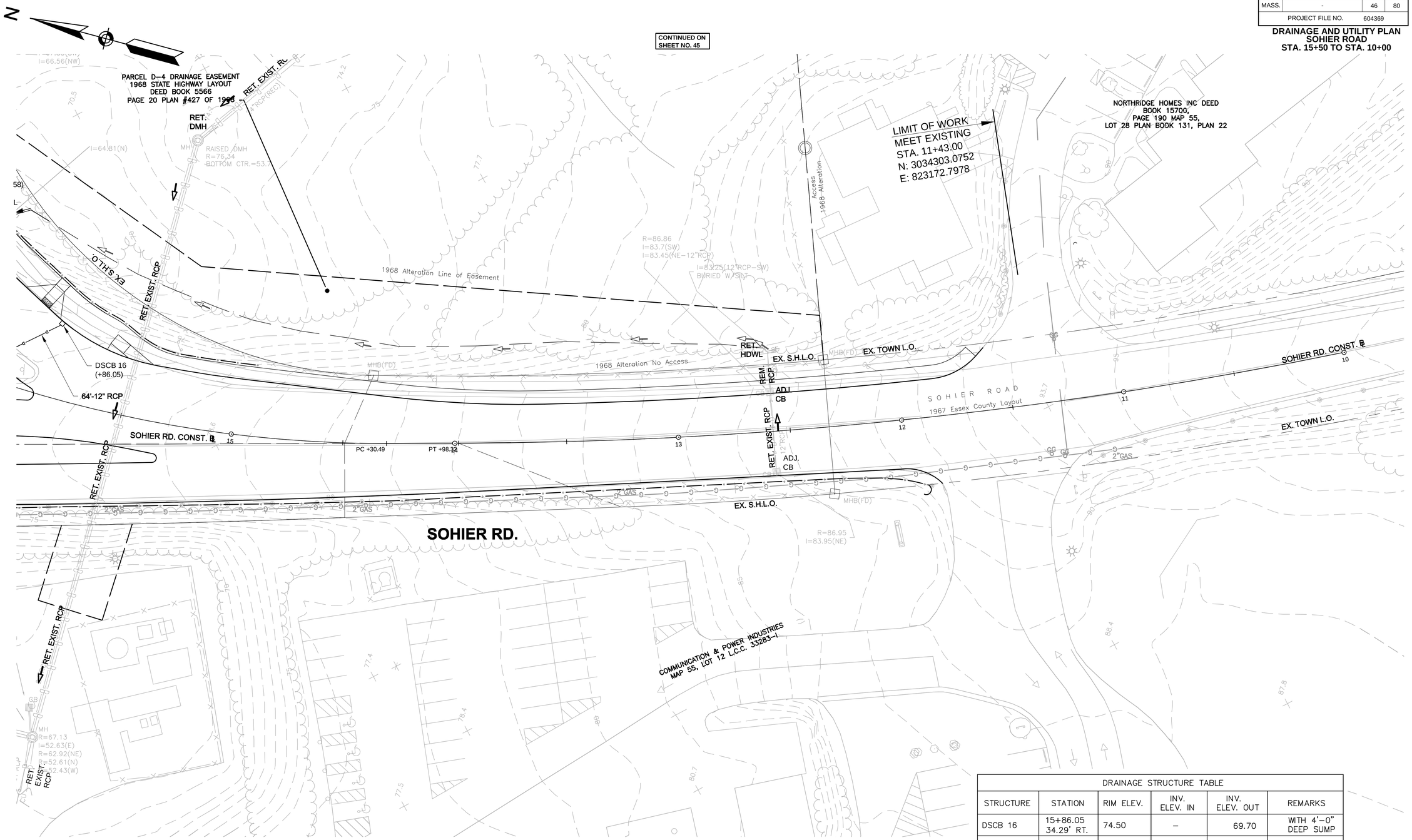
** NOTE: CONTRACTOR SHALL FIELD VERIFY EXISTING DRAIN LINE INVERTS

Plotted on 30-May-2014 2:31 PM
604369_UTI(DRAINAGE AND UTILITY PLANS).DWG
Jacobs - \\BOSFIL11\ALPro\MHD\2008\E2X4100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_UTI(Drainage and Utility Plans).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	46	80
PROJECT FILE NO.	604369		

DRAINAGE AND UTILITY PLAN
SOHIER ROAD
STA. 15+50 TO STA. 10+00



DRAINAGE STRUCTURE TABLE					
STRUCTURE	STATION	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT	REMARKS
DSCB 16	15+86.05 34.29' RT.	74.50	–	69.70	WITH 4'–0" DEEP SUMP

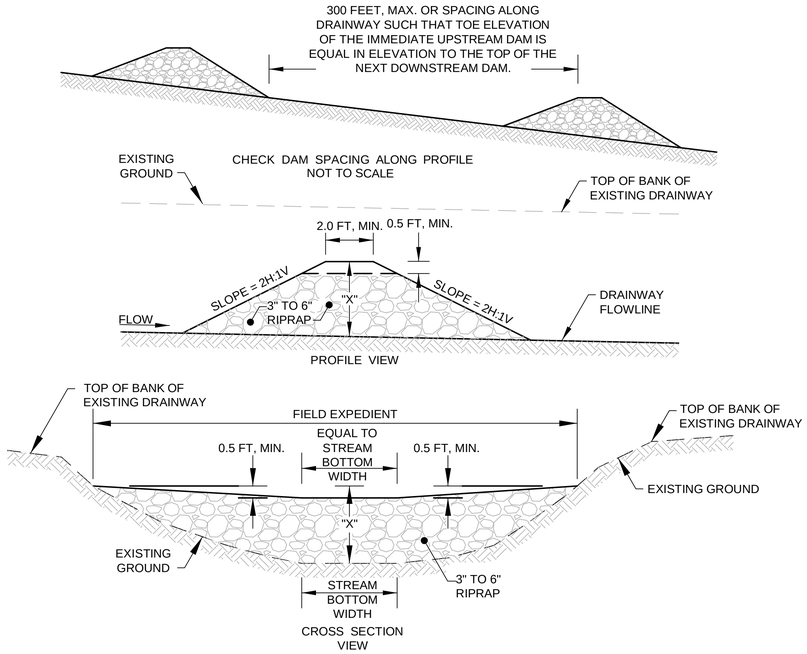
** NOTE: CONTRACTOR SHALL FIELD VERIFY EXISTING DRAIN LINE INVERTS

Jacobs - \\BOSFILL11\NA_Proj\MHD\200\BE2X4119\0\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal ave)\DWG\604369_UT(Drainage and Utility Plans).dwg May 30, 2014
604369_UT(DRAINAGE AND UTILITY PLANS).DWG Plotted on 30-May-2014 2:31 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	47	80
PROJECT FILE NO.	604369		

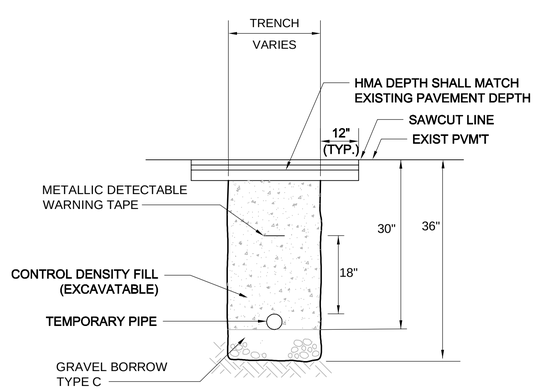
DRAINAGE AND UTILITY DETAILS



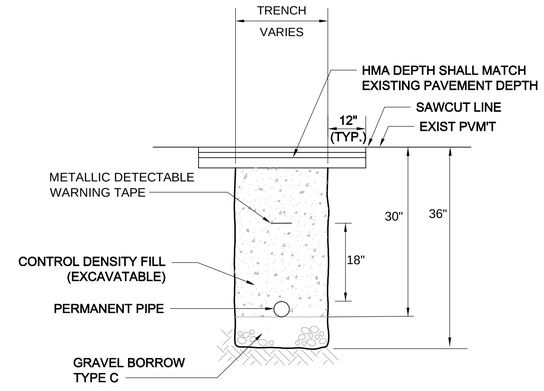
NOTES:

1. "X" DIMENSION AS DETAILED BY THE SPECIFCATIONS, FOR SEDIMENT CONTROL THE MAXIMUM HEIGHT OF THE ROCK CHECK DAM IS 3 FEET. HOWEVER, ROCK CHECK DAMS CAN BE CONSTRUCTED IN SMALLER DITCHES. THE CENTER OF THE ROCK CHECK DAM SHALL BE 0'-6" LOWER THAN THE OUTER EDGES AS SHOWN.
2. ROCK CHECK DAMS ARE NORMALLY INSTALLED IN EXISTING DRAINS AND THE TOP CROSS SECTION OF THE DAM SHOULD HAVE A LEVEL CENTER SECTION THE SAME WIDTH AS THE EXISTING CHANNEL BOTTOM AND 0'-6" LOWER THAN THE OUTER EDGES OF THE DAM. ROCK CHECK DAMS PLACED IN PROJECT CONSTRUCTED FLAT-BOTTOM DITCHES SHALL HAVE SIMILAR DIMENSIONS.
3. THE CENTER OF ROCK CHECK DAMS CONSTRUCTED IN PROJECT CONSTRUCTED "VEE" SHAPED OR EXISTING "VEE" SHAPED DITCHES SHALL BE 0'-6" LOWER THAN AND SLOPED TO THE OUTER TOP EDGES OF THE DITCH SO HIGH FLOWS GO OVER THE TOP OF THE DAM AND NOT AROUND THE EDGES.
4. ROCK CHECK DAMS SHALL BE REMOVED AFTER THE FIRST GROWING SEASON.

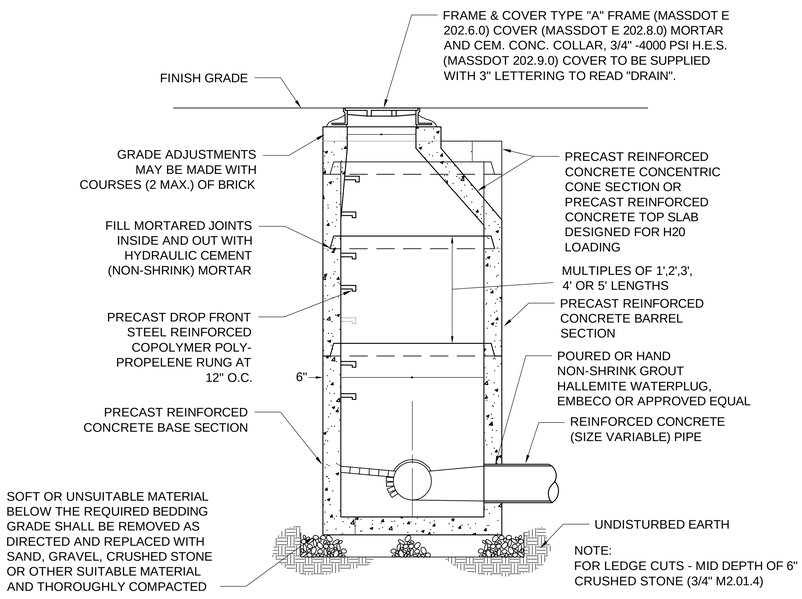
ROCK CHECK DAM
NOT TO SCALE



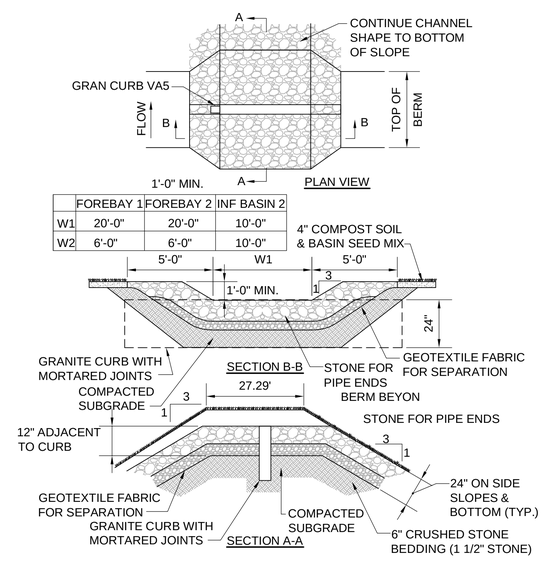
TEMPORARY PIPE TRENCH DETAIL
NOT TO SCALE



PERMANENT PIPE TRENCH DETAIL
NOT TO SCALE



PRECAST CONCRETE DRAIN MANHOLE
NOT TO SCALE



	FOREBAY 1	FOREBAY 2	INF BASIN 2
W1	20'-0"	20'-0"	10'-0"
W2	6'-0"	6'-0"	10'-0"

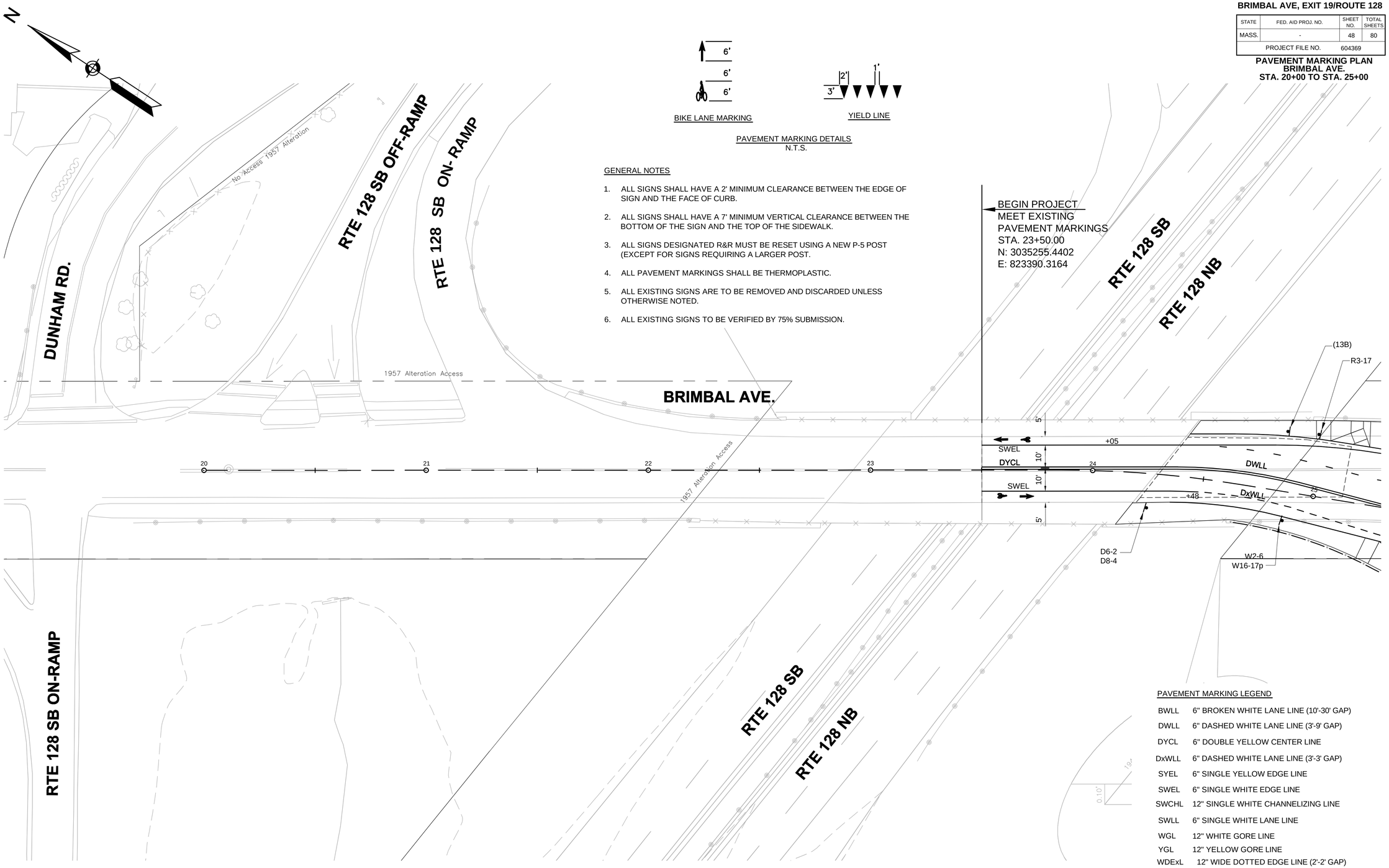
STONE OVERFLOW WEIR
NOT TO SCALE

Jacobs - \\BOSFIL11\NA_Proj\HHD\0208E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_UT(Drainage and Utility Details).dwg May 30, 2014
604369_UT(DRAINAGE AND UTILITY DETAILS).DWG Plotted on 30-May-2014 2:31 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	48	80
PROJECT FILE NO.	604369		

PAVEMENT MARKING PLAN
BRIMBAL AVE.
STA. 20+00 TO STA. 25+00



PAVEMENT MARKING DETAILS
N.T.S.

GENERAL NOTES

1. ALL SIGNS SHALL HAVE A 2' MINIMUM CLEARANCE BETWEEN THE EDGE OF SIGN AND THE FACE OF CURB.
2. ALL SIGNS SHALL HAVE A 7' MINIMUM VERTICAL CLEARANCE BETWEEN THE BOTTOM OF THE SIGN AND THE TOP OF THE SIDEWALK.
3. ALL SIGNS DESIGNATED R&R MUST BE RESET USING A NEW P-5 POST (EXCEPT FOR SIGNS REQUIRING A LARGER POST.
4. ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC.
5. ALL EXISTING SIGNS ARE TO BE REMOVED AND DISCARDED UNLESS OTHERWISE NOTED.
6. ALL EXISTING SIGNS TO BE VERIFIED BY 75% SUBMISSION.

PAVEMENT MARKING LEGEND

BWLL	6" BROKEN WHITE LANE LINE (10'-30' GAP)
DWLL	6" DASHED WHITE LANE LINE (3'-9' GAP)
DYCL	6" DOUBLE YELLOW CENTER LINE
DxWLL	6" DASHED WHITE LANE LINE (3'-3' GAP)
SYEL	6" SINGLE YELLOW EDGE LINE
SWEL	6" SINGLE WHITE EDGE LINE
SWCHL	12" SINGLE WHITE CHANNELIZING LINE
SWLL	6" SINGLE WHITE LANE LINE
WGL	12" WHITE GORE LINE
YGL	12" YELLOW GORE LINE
WDExL	12" WIDE DOTTED EDGE LINE (2'-2' GAP)

20 0 20 40
SCALE IN FEET

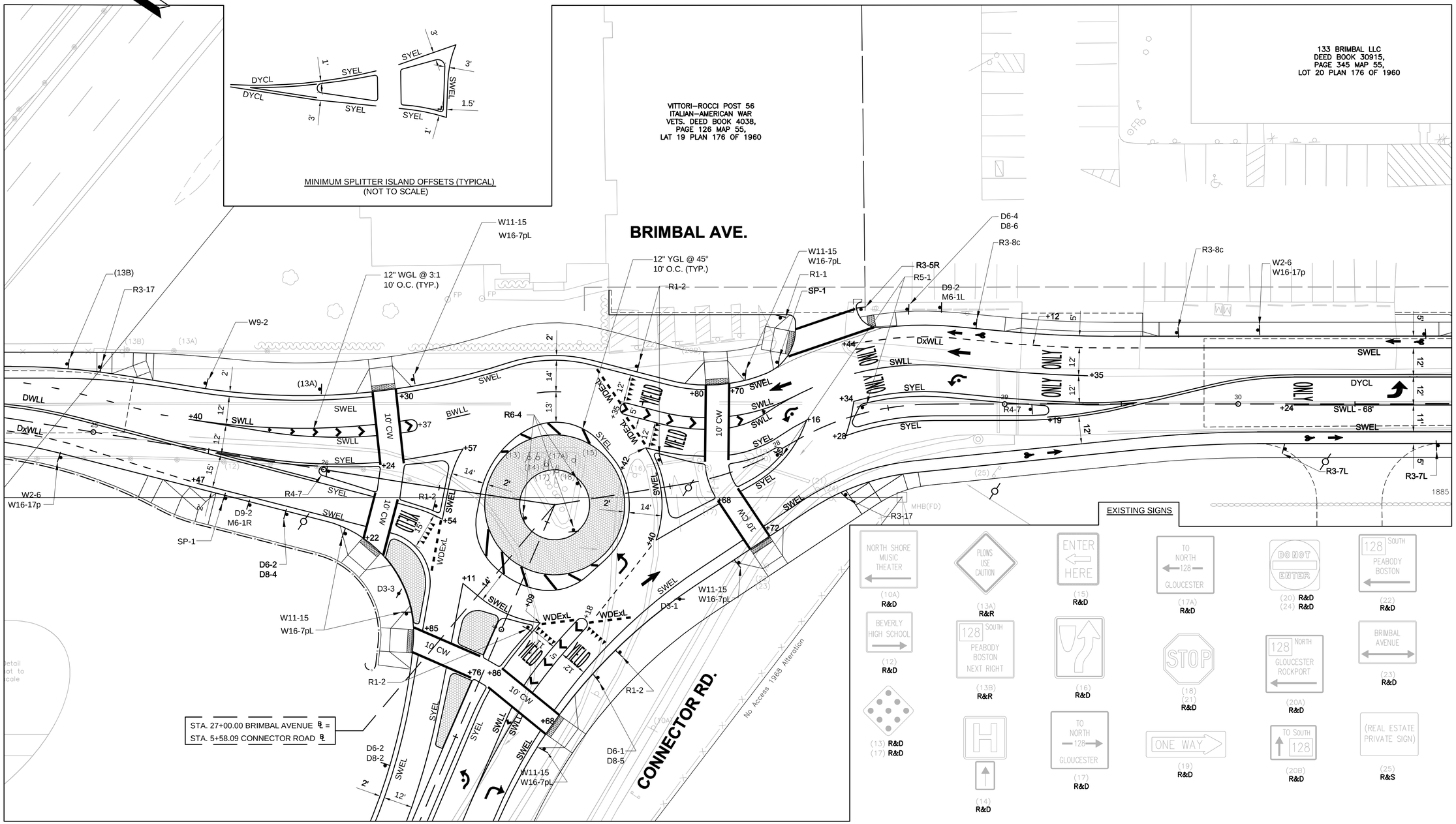
604369_TR(PAVEMENT MARKING PLANS).DWG Plotted on 30-May-2014 2:32 PM

Jacobs - \\BOSFIL11\NA1.Proj\MHD\2009\E2X4110\Assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Pavement Marking Plans).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	49	80
PROJECT FILE NO.	604369		

PAVEMENT MARKING PLAN
BRIMBAL AVE.
STA. 25+00 TO STA. 30+50



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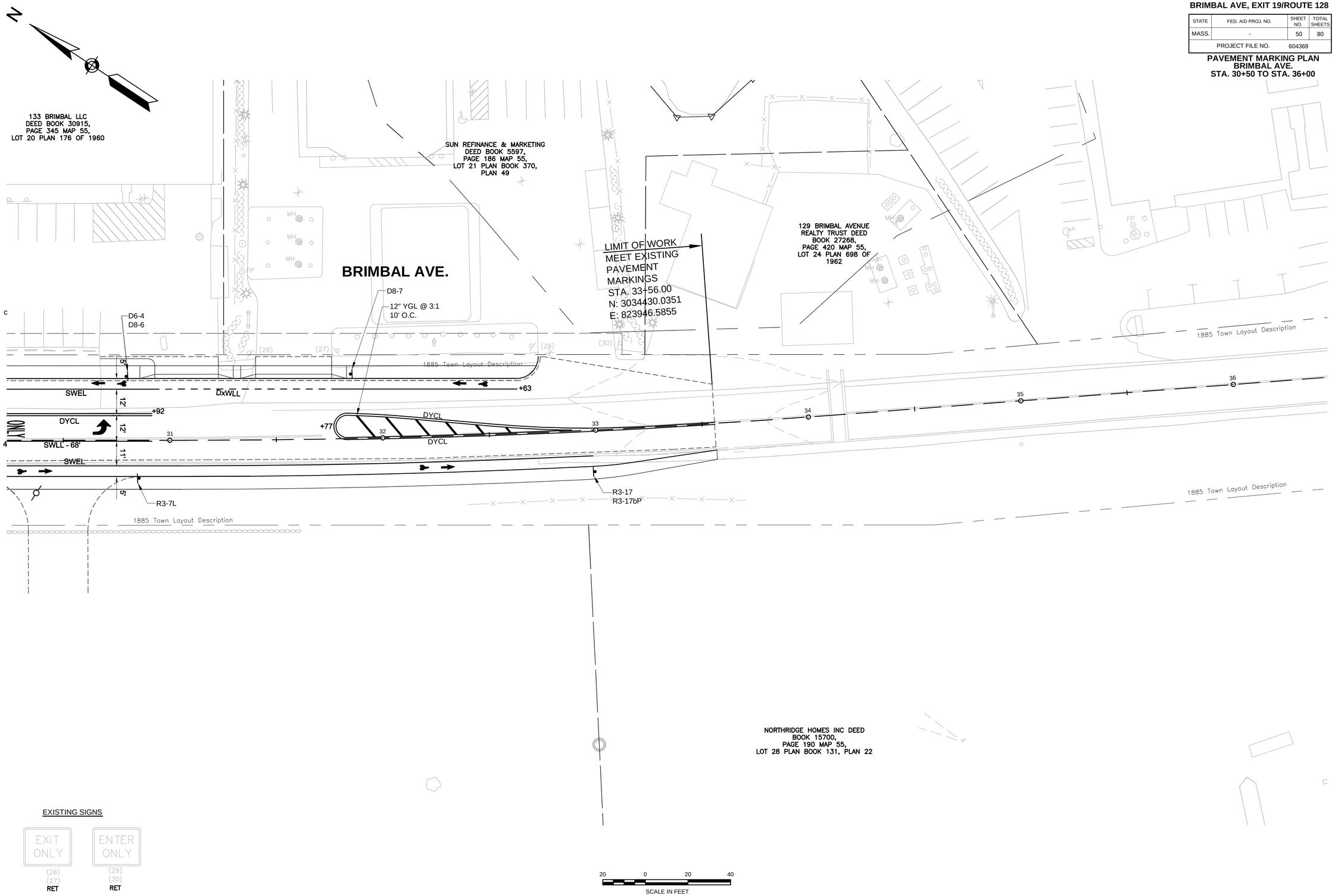
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	50	80
PROJECT FILE NO.	604369		

PAVEMENT MARKING PLAN
BRIMBAL AVE.
STA. 30+50 TO STA. 36+00



Plotted on 30-May-2014 2:32 PM

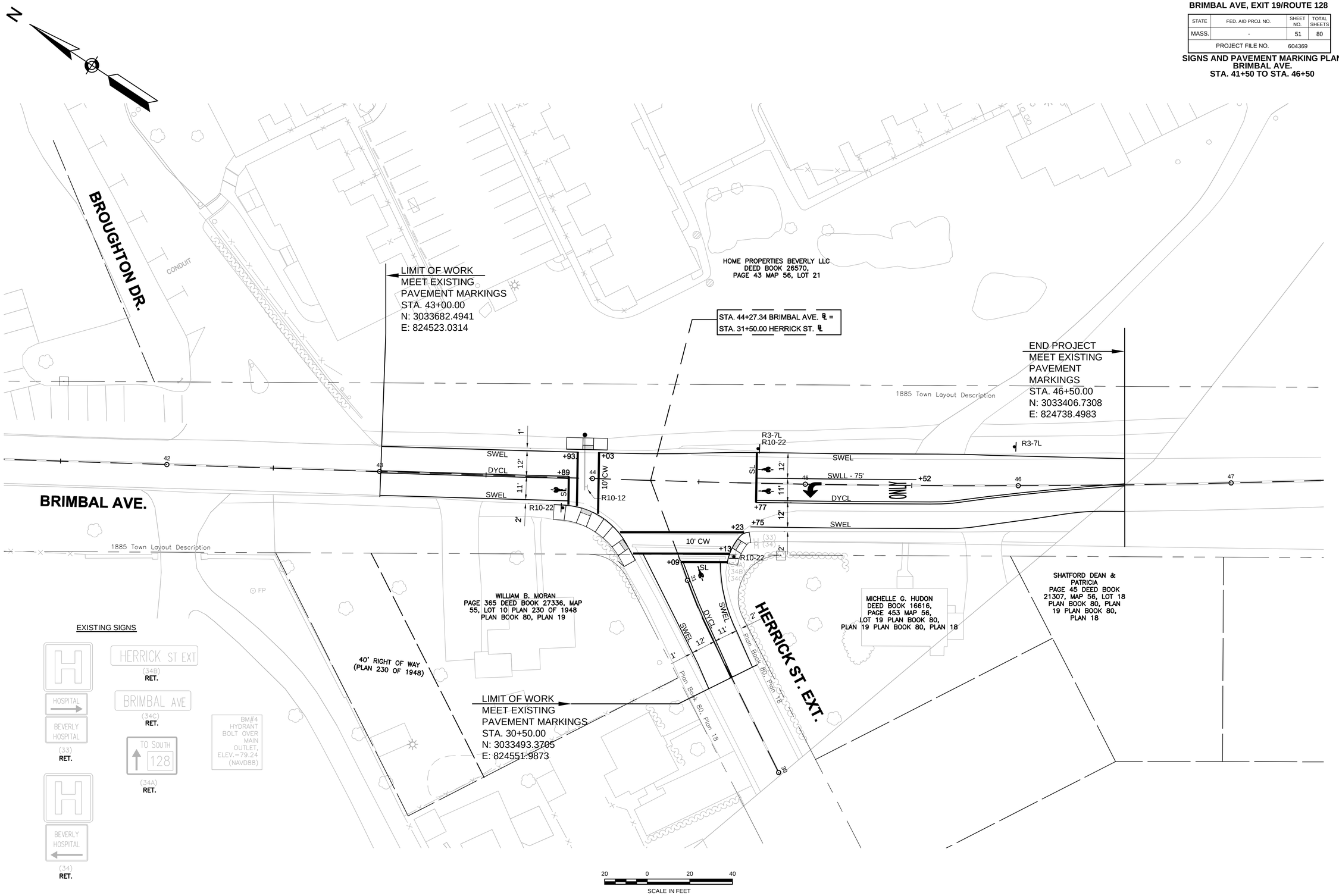
604369_TR(PAVEMENT MARKING PLANS).DWG

Jacobs - \\BOSFIL11\ALProjMHD\20\8E2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Pavement Marking Plans).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	51	80
PROJECT FILE NO.	604369		

SIGNS AND PAVEMENT MARKING PLAN
BRIMBAL AVE.
STA. 41+50 TO STA. 46+50



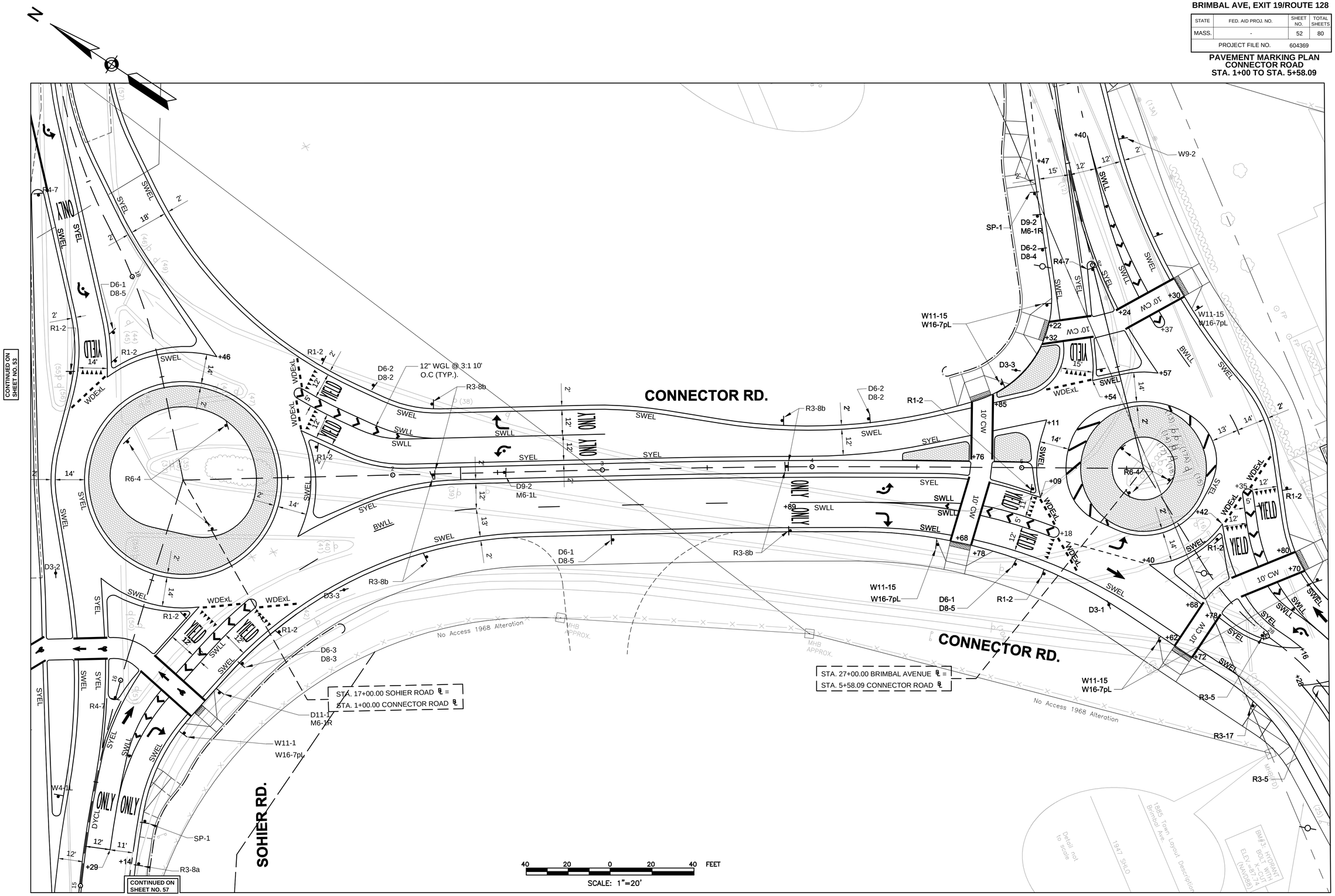
Jacobs - \\BOSFIL11\NA_Proj\MHD\200\BEE2X4110\Assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR\Pavement Marking Plans\.dwg May 30, 2014

604369_TR\PAVEMENT MARKING PLANS\.DWG Plotted on 30-May-2014 2:32 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	52	80
PROJECT FILE NO.	604369		

PAVEMENT MARKING PLAN
CONNECTOR ROAD
STA. 1+00 TO STA. 5+58.09

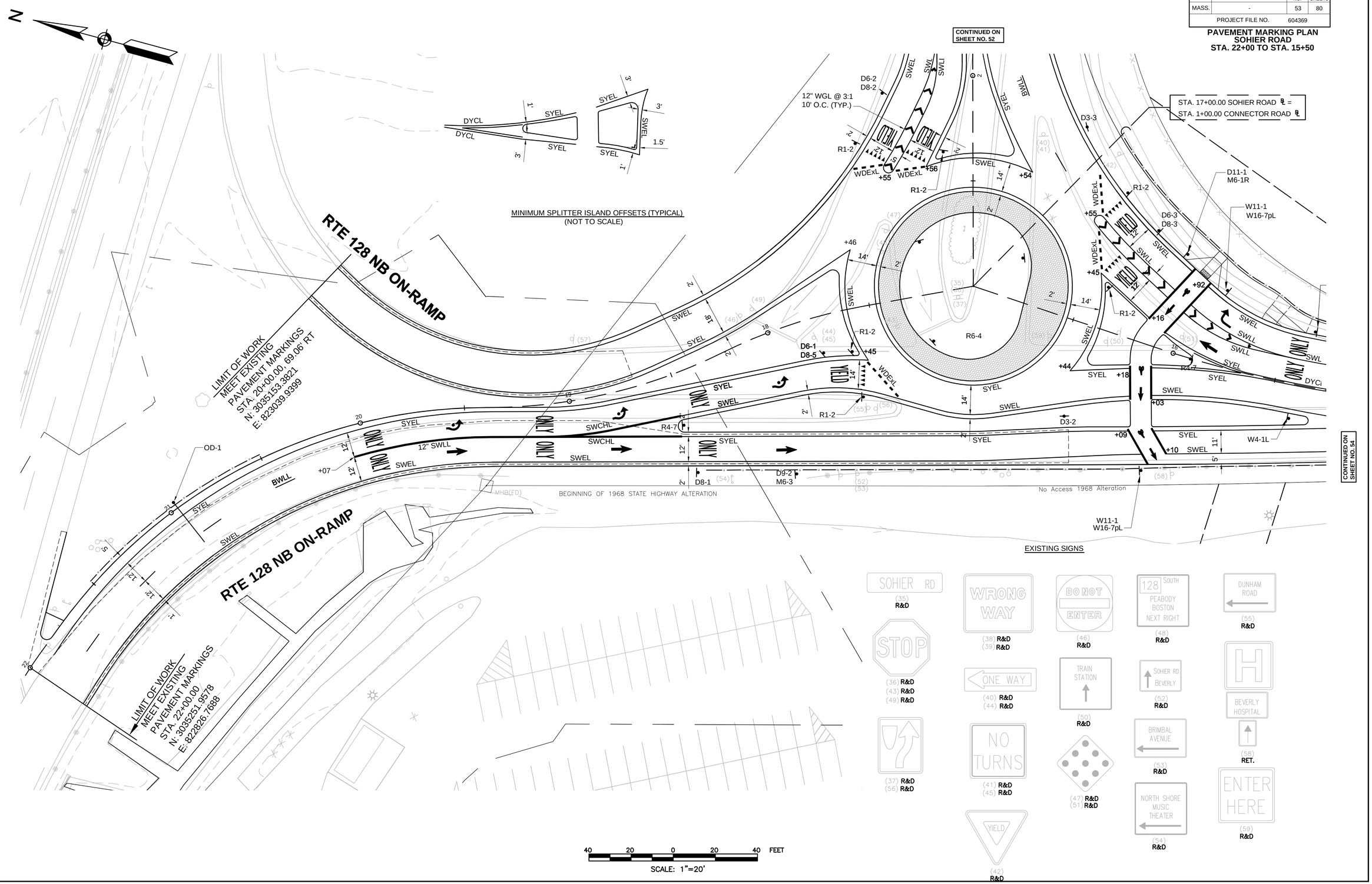


Plotted on 30-May-2014 2:32 PM
604369_TR(PAVEMENT MARKING PLANS).DWG
Jacobs - \\BOSFIL11\AL\Proj\MHD\200\BE2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Pavement Marking Plans).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	53	80
PROJECT FILE NO.	604369		

PAVEMENT MARKING PLAN
SOHIER ROAD
STA. 22+00 TO STA. 15+50



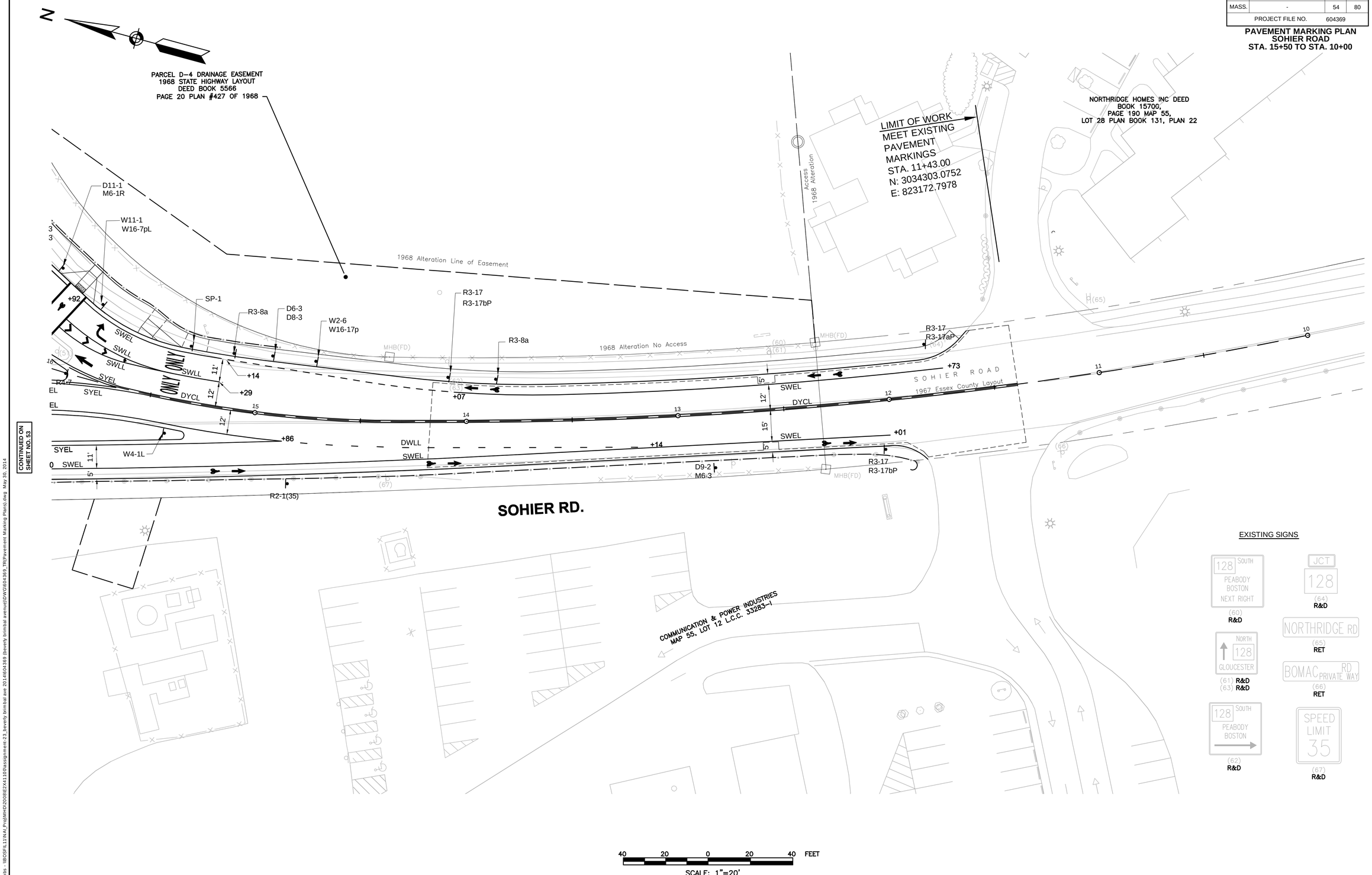
Jacobs : \\BOSFIL11\NA\Proj\MHD\200\BE2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR\Pavement Marking Plans).dwg May 30, 2014

604369_TR\PAVEMENT MARKING PLANS).DWG Plotted on 30-May-2014 2:32 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	54	80
PROJECT FILE NO.	604369		

PAVEMENT MARKING PLAN
SOHIER ROAD
STA. 15+50 TO STA. 10+00



Plotted on 30-May-2014 2:32 PM

604369_TR(PAVEMENT MARKING PLANS).DWG

Jacobs - \\BOSFIL11\NA_Proj\MHD\2009\E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Pavement Marking Plans).dwg May 30, 2014

TRAFFIC SIGN SUMMARY

SIGN ID NUMBER	SIZE WIDTH (IN)	SIZE HEIGHT (IN)	MESSAGE	DIMENSIONS (IN) LETTER HEIGHT	DIMENSIONS (IN) VERTICAL SPACING	DIMENSIONS (IN) ARROW RTE. MKR.	NUMBER REQUIRED	COLOR BACK-GROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	TOTAL AREA (S.F.)
D3-1	30	12	Brimbal AVE	6"/4.5"	3" 3"	N/A	1	GREEN	WHITE	WHITE	P5 1 REQ'D	EACH	EACH
D3-2	30	12	Sohier RD	6"/4.5"	3" 3"	N/A	1	GREEN	WHITE	WHITE	P5 1 REQ'D	EACH	EACH
D3-3	30	12	Connector RD	6"/4.5"	3" 3"	N/A	2	GREEN	WHITE	WHITE	P5 2 REQ'D	EACH	EACH
D9-2	24	24	H	1	1	1	5	BLUE	WHITE	WHITE	P5 5 REQ'D	4.00	20.00
D11-1	24	18	BIKE ROUTE				1	GREEN	WHITE	WHITE	P5 1 REQ'D	3.00	3.00
M6-1L	21	15	←				1	BLUE	WHITE	WHITE	MOUNT 1 WITH D9-2	2.19	2.19
M6-1R	21	15	→				2	WHITE BLUE	BLACK WHITE	BLACK WHITE	MOUNT 1 WITH D11-1 1 WITH D9-2	2.19	4.38
M6-3	21	15	↑				2	BLUE	WHITE	WHITE	MOUNT 2 WITH D9-2	2.19	4.38
R1-1	30	30	STOP				1	RED	WHITE	WHITE	P5 1 REQ'D	6.25	6.25
R1-2	36X36X36		YIELD				11	WHITE	RED	RED	P5 11 REQ'D	3.75	41.25

TRAFFIC SIGN SUMMARY (CONT'D.)

SIGN ID NUMBER	SIZE WIDTH (IN)	SIZE HEIGHT (IN)	MESSAGE	DIMENSIONS (IN) LETTER HEIGHT	DIMENSIONS (IN) VERTICAL SPACING	DIMENSIONS (IN) ARROW RTE. MKR.	NUMBER REQUIRED	COLOR BACK-GROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	TOTAL AREA (S.F.)
R2-1(35)	24	30	SPEED LIMIT 35	1	1	1	1	WHITE	BLACK	BLACK	P5 1 REQ'D	5.00	5.00
R3-5R	30	36	↱ ONLY				1	WHITE	BLACK	BLACK	P5 1 REQ'D	7.50	7.50
R3-7L	30	30	LEFT LANE MUST TURN LEFT				4	WHITE	BLACK	BLACK	P5 4 REQ'D	6.25	25.00
R3-8a	36	36	↰ ONLY ↱ ONLY	SEE DETAIL SHEET 59			2	WHITE	BLACK	BLACK	P5 2 REQ'D	9.00	18.00
R3-8b	36	30	↱ ONLY ↱ ONLY	SEE DETAIL SHEET 59			8	WHITE	BLACK	BLACK	P5 6 REQ'D	7.50	60.00
R3-8c	36	36	↑ ONLY ↑ ONLY	SEE DETAIL SHEET 59			2	WHITE	BLACK	BLACK	P5 1 REQ'D	9.00	18.00
R3-8d	36	30	↰ ONLY ↰ ONLY	SEE DETAIL SHEET 59			2	WHITE	BLACK	BLACK	P5 1 REQ'D	7.50	15.00
R3-17	24	18	BIKE LANE	1	1	1	7	WHITE	BLACK	BLACK	P5 7 REQ'D	3.00	21.00
R3-17aP	24	8	AHEAD				1	WHITE	BLACK	BLACK	MOUNT 1 WITH R3-17	1.33	1.33
R3-17bP	24	8	ENDS				2	WHITE	BLACK	BLACK	MOUNT 2 WITH R3-17	1.33	2.66

NOTES:

1. NUMERICAL LIMITS AND JUSTIFCATION FOR SPEED & ADVISORY EXIT SPEED SIGNS SHALL BE OBTAINED FROM THE SPEED ZONING UNIT OF THE TRAFFIC ENGINEERING SECTION, MASSDOT, BEFORE FABRICATION AND/OR ERECTION.
2. HIGH INTENSITY ENCAPSULATED LENS REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" 2009 EDITION, THE 1996 MASSDOT CONSTRUCTION AND TRAFFIC STANDARD DETAILS", AND ALL ADMENDMENTS WILL GOVERN.
3. (1) SEE MUTCD 2009 EDITION, 1979 STD. HWY. SIGNS AND SECTION M9.30.0 TYPE III OF THE MASSDOT STANDARD SPECIFICATION FOR TEXT DIMENSIONS AND COLOR.

604369_TR(SIGN SUMMARY).DWG Plotted on 30-May-2014 2:33 PM
Jacobs : \\BOSFILL1\NAL_Proj\MHD\2008E2X4110\assignment 23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Sign Summary).dwg May 30, 2014

TRAFFIC SIGN SUMMARY (CONTINUED)

SIGN ID NUMBER	SIZE WIDTH (IN)	SIZE HEIGHT (IN)	MESSAGE	DIMENSIONS (IN) LETTER HEIGHT	DIMENSIONS (IN) VERTICAL SPACING	DIMENSIONS (IN) ARROW RTE. MKR.	NUMBER REQUIRED	COLOR BACK-GROUND	COLOR LEGEND	COLOR BORDER	POST SIZE AND NUMBER REQUIRED	UNIT AREA (S.F.)	TOTAL AREA (S.F.)
R4-7	24	30		1	1	1	4	WHITE	BLACK	BLACK	P5 4 REQ'D	5.00	20.00
R5-1	30	30					2	WHITE/ RED	WHITE	BLACK	P5 2 REQ'D	6.25	12.50
R6-4	30	24					6	YELLOW	BLACK	BLACK	P5 6 REQ'D	5.00	30.00
R10-12	30	36					1	WHITE	BLACK	BLACK	MOUNT 1 ON MAST ARM	7.50	7.50
R10-22	12	18					3	WHITE	BLACK	BLACK	MOUNT 1 W/R3-7L 2 ON P5 POST	1.50	4.50
SP-1	12	18		SEE DETAIL THIS SHEET			3	WHITE	BLACK	BLACK	P5 3 REQ'D	1.50	4.50
W2-6	36	36		1	1	1	4	YELLOW	BLACK	BLACK	P5 4 REQ'D	9.00	36.00
W4-1L	36	36					1	YELLOW	BLACK	BLACK	P5 1 REQ'D	9.00	9.00
W9-2	36	36					1	YELLOW	BLACK	BLACK	P5 1 REQ'D	9.00	9.00
W11-1	30	30					3	YELLOW	BLACK	BLACK	P5 3 REQ'D	6.25	18.75
W11-15	30	30					6	YELLOW	BLACK	BLACK	P5 6 REQ'D	6.25	37.50
W16-7pL	24	12					9	YELLOW	BLACK	BLACK	MOUNT 3 W/ W11-1 & 6 W/ W11-15	2.00	18.00
W16-17p	24	12					4	YELLOW	BLACK	BLACK	MOUNT 4 WITH W2-6	2.00	8.00

1.5" RADIUS, 0.4" BORDER, 0.4" INDENT, BLACK ON WHITE;
SYMBOL RG025; [SHARED] C 2K SPECIFIED LENGTH;
[USE] C 2K SPECIFIED LENGTH;
[PATH] C 2K SPECIFIED LENGTH;

SP-1		
1.00	1.50	1.50 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE

NOTES:

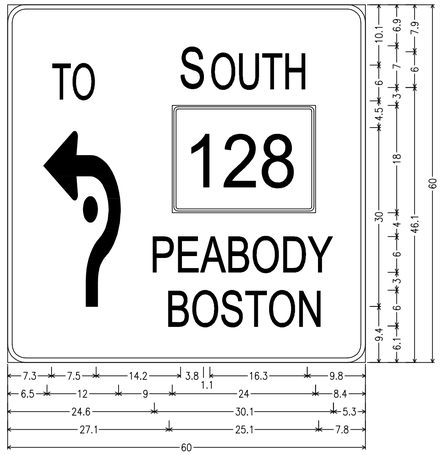
1. NUMERICAL LIMITS AND JUSTIFCATION FOR SPEED & ADVISORY EXIT SPEED SIGNS SHALL BE OBTAINED FROM THE SPEED ZONING UNIT OF THE TRAFFIC ENGINEERING SECTION, MASSDOT, BEFORE FABRICATION AND/OR ERECTION.
2. HIGH INTENSITY ENCAPSULATED LENS REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" 2009 EDITION, THE 1996 MASSDOT CONSTRUCTION AND TRAFFIC STANDARD DETAILS", AND ALL ADMENDMENTS WILL GOVERN.
3. (1) SEE MUTCD 2009 EDITION, 1979 STD. HWY. SIGNS AND SECTION M9.30.0 TYPE III OF THE MASSDOT STANDARD SPECIFICATION FOR TEXT DIMENSIONS AND COLOR.

604369_TR(SIGN SUMMARY).DWG Plotted on 30-May-2014 2:33 PM
Jacobs - \\BOSFILL11NAL\Proj\MHD\200\BE2X1180\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Sign Summary).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	57	80
PROJECT FILE NO.	604369		

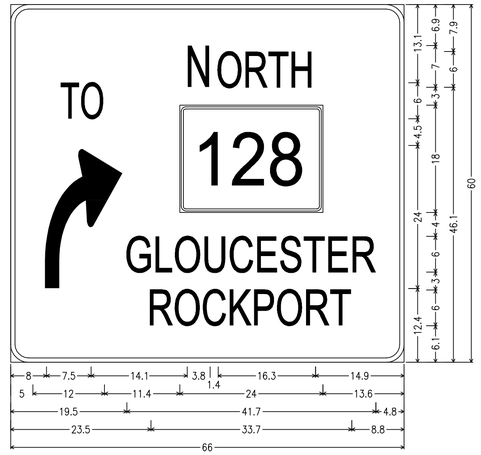
TRAFFIC SIGN SUMMARY
SHEET 3 OF 6



3.0" RADIUS, 0.8" BORDER, WHITE ON GREEN;
[TO] C; [SOUTH] C; STATE HIGHWAY 128 M1-5; [PEABODY] C;
[BOSTON] C;

D6-1		
5.00	5.00	25.00 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE

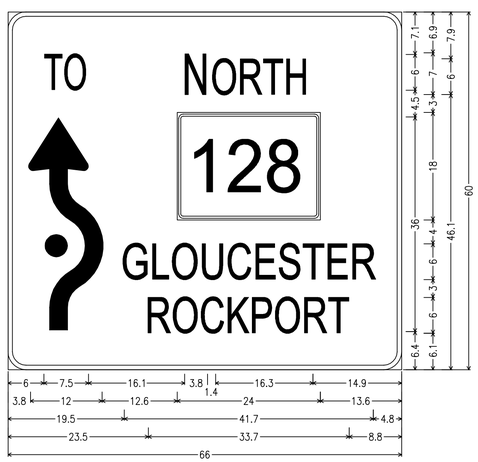
NUMBER REQUIRED: 3



3.0" RADIUS, 0.8" BORDER, WHITE ON GREEN;
[TO] C; [NORTH] C; STATE HIGHWAY 128 M1-5; [GLOUCESTER] C;
[ROCKPORT] C;

D6-2		
5.50	5.00	27.50 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE

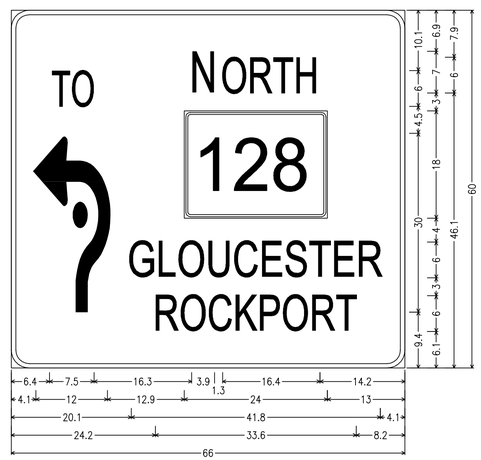
NUMBER REQUIRED: 4



3.0" RADIUS, 0.8" BORDER, WHITE ON GREEN;
[TO] C; [NORTH] C; STATE HIGHWAY 128 M1-5; [GLOUCESTER] C;
[ROCKPORT] C;

D6-3		
5.50	5.00	27.50 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE

NUMBER REQUIRED: 2



3.0" RADIUS, 0.8" BORDER, WHITE ON GREEN;
[TO] C; [NORTH] C; STATE HIGHWAY 128 M1-5; [GLOUCESTER] C;
[ROCKPORT] C;

D6-4		
5.50	5.00	27.50 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE

NUMBER REQUIRED: 2

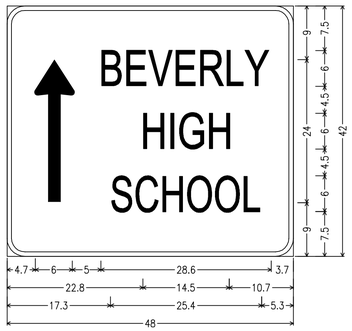
SHEET SUMMARY
TOTAL AREA OF D6 SIGNS 295.00 SF

Jacobs \\BOSFIL11\NA_Proj\MHD\208\E24110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Sign Summary).dwg May 30, 2014
604369_TR(SIGN SUMMARY).DWG Plotted on 30-May-2014 2:33 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	58	80
PROJECT FILE NO.	604369		

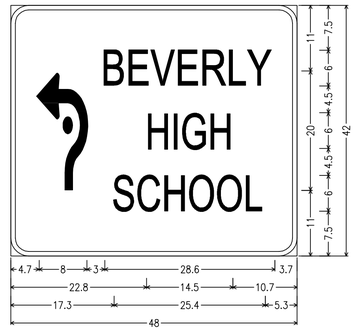
TRAFFIC SIGN SUMMARY
SHEET 4 OF 6



3.0" RADIUS, 0.8" BORDER, WHITE ON GREEN;
[BEVERLY] C; [HIGH] C; [SCHOOL] C;

D8–1		
4.00	3.50	14.00 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE

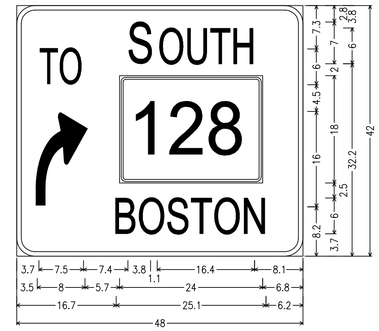
NUMBER REQUIRED: 1



3.0" RADIUS, 0.8" BORDER, WHITE ON GREEN;
[BEVERLY] C; [HIGH] C; [SCHOOL] C;

D8–2		
4.00	3.50	14.00 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE

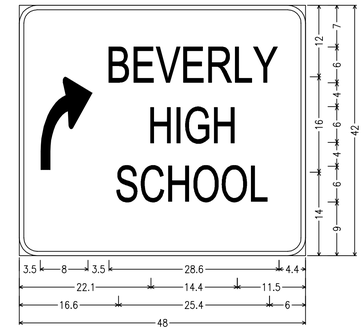
NUMBER REQUIRED: 2



3.0" RADIUS, 0.8" BORDER, WHITE ON GREEN;
[TO] C; [SOUTH] C; STATE HIGHWAY 128 M1–5;
[BOSTON] C;

D8–3		
4.00	3.50	14.00 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE

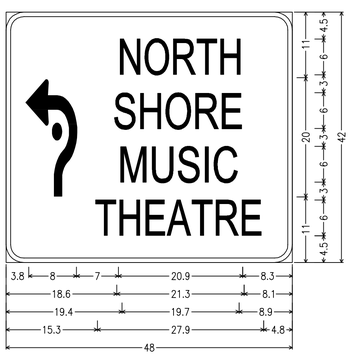
NUMBER REQUIRED: 2



3.0" RADIUS, 0.8" BORDER, WHITE ON GREEN;
[BEVERLY] C; [HIGH] C; [SCHOOL] C;

D8–4		
4.00	3.50	14.00 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE

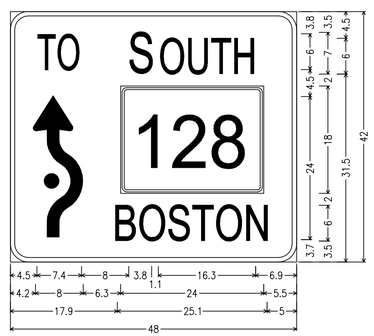
NUMBER REQUIRED: 2



3.0" RADIUS, 0.8" BORDER, WHITE ON GREEN;
[NORTH] C; [SHORE] C; [MUSIC] C; [THEATRE] C;

D8–5		
4.00	3.50	14.00 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE

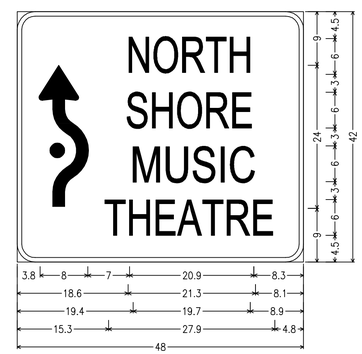
NUMBER REQUIRED: 3



3.0" RADIUS, 0.8" BORDER, WHITE ON GREEN;
[TO] C; [SOUTH] C; STATE HIGHWAY 128 M1–5;
[BOSTON] C;

D8–6		
4.00	3.50	14.00 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE

NUMBER REQUIRED: 2



3.0" RADIUS, 0.8" BORDER, WHITE ON GREEN;
[NORTH] C; [SHORE] C; [MUSIC] C; [THEATRE] C;

D8–7		
4.00	3.50	14.00 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE

NUMBER REQUIRED: 1

SHEET SUMMARY
TOTAL AREA OF D8 SIGNS
182.00 SF

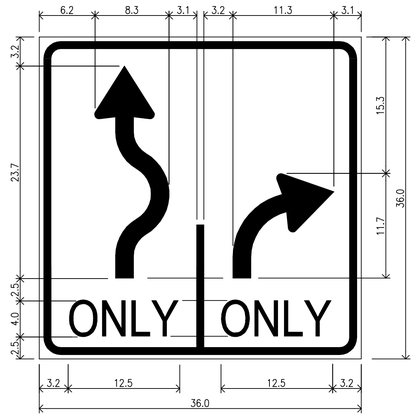
604369_TR(SIGN SUMMARY).DWG Plotted on 30-May-2014 2:33 PM

Jacobs - \\BOSFIL11\NA\Proj\MHD\200\E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Sign Summary).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

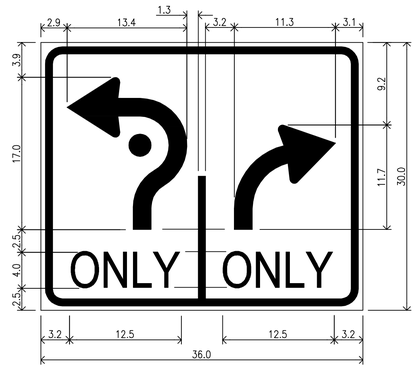
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	59	80
PROJECT FILE NO.	604369		

TRAFFIC SIGN SUMMARY
SHEET 5 OF 6



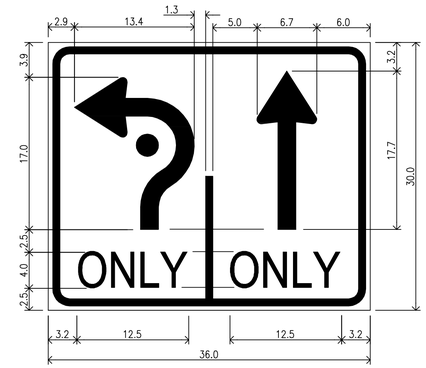
1.9" RADIUS, 0.8" BORDER, 0.5" INDENT; BLACK ON WHITE;
[ONLY] D MOD 60% SPACING;

R3–8A		
3.00	3.00	9.00 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE

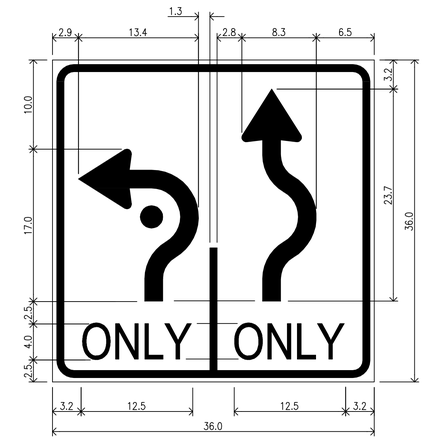


1.9" RADIUS, 0.8" BORDER, 0.5" INDENT; BLACK ON WHITE;
[ONLY] D MOD 60% SPACING;

R3–8B		
3.00	2.50	7.50 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE

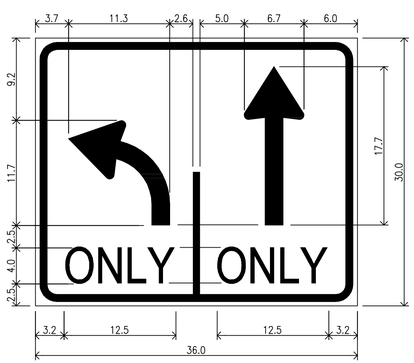


R3–8C		
3.00	2.50	7.50 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE



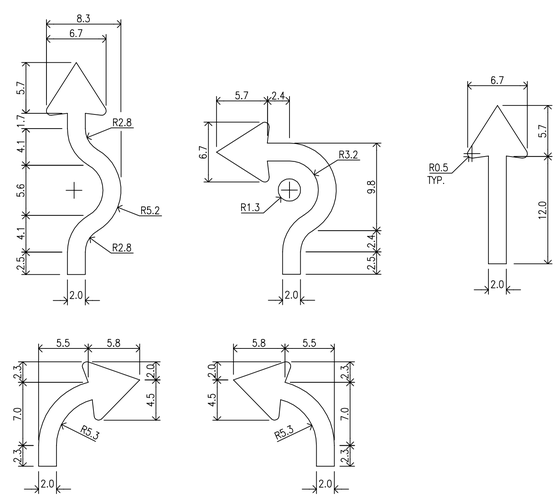
1.9" RADIUS, 0.8" BORDER, 0.5" INDENT; BLACK ON WHITE;
[ONLY] D MOD 60% SPACING;

R3–8D		
3.00	3.00	9.00 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE



1.9" RADIUS, 0.8" BORDER, 0.5" INDENT; BLACK ON WHITE;
[ONLY] D MOD 60% SPACING;

R3–8E		
3.00	2.50	7.50 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE



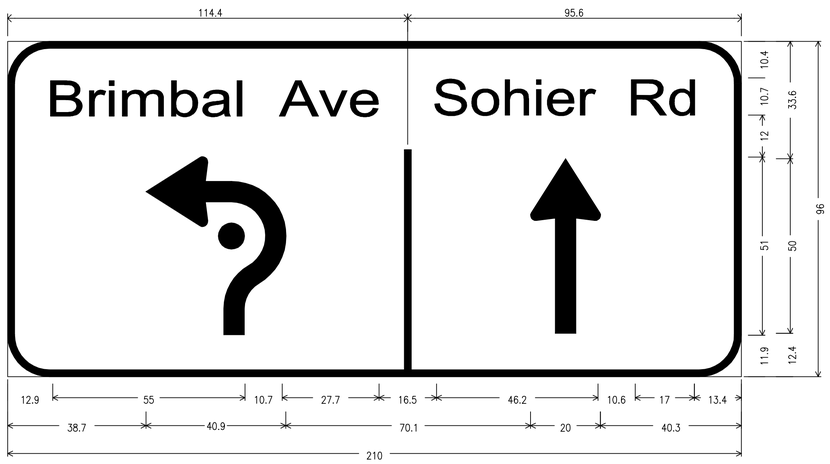
ARROW DETAILS (R3-X SIGNS)
N.T.S.

Jacobs : \\BOSFIL11\NA_Proj\MHD\2008E2X4110\assignment 23_beverly brimbal ave 20140604369 (beverly brimbal avenue)\DWG\604369_TR(Sign Summary).dwg May 30, 2014
604369_TR(SIGN SUMMARY).DWG Plotted on 30-May-2014 2:33 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

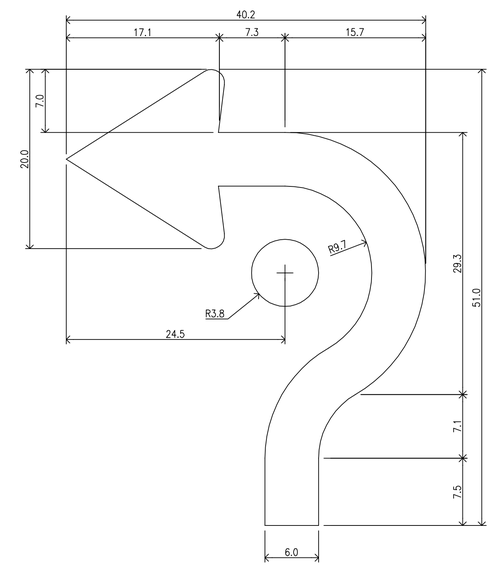
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	60	80
PROJECT FILE NO.	604369		

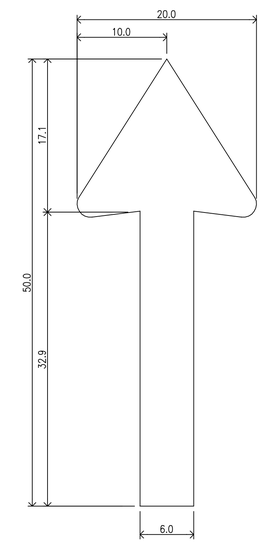
TRAFFIC SIGN SUMMARY
SHEET 6 OF 6



12.0" RADIUS, 2.0" BORDER, WHITE ON GREEN;
[BRIMBAL AVE] E MOD 60} SPACING; [SOHIER RD] E MOD 60} SPACING;

OD-1		
17.50	8.00	140.00 SF
BACKGROUND	LEGEND	BORDER
GREEN REFL.	SILVER WHITE	SILVER WHITE





OVERHEAD SIGN ARROW DETAILS
N.T.S.

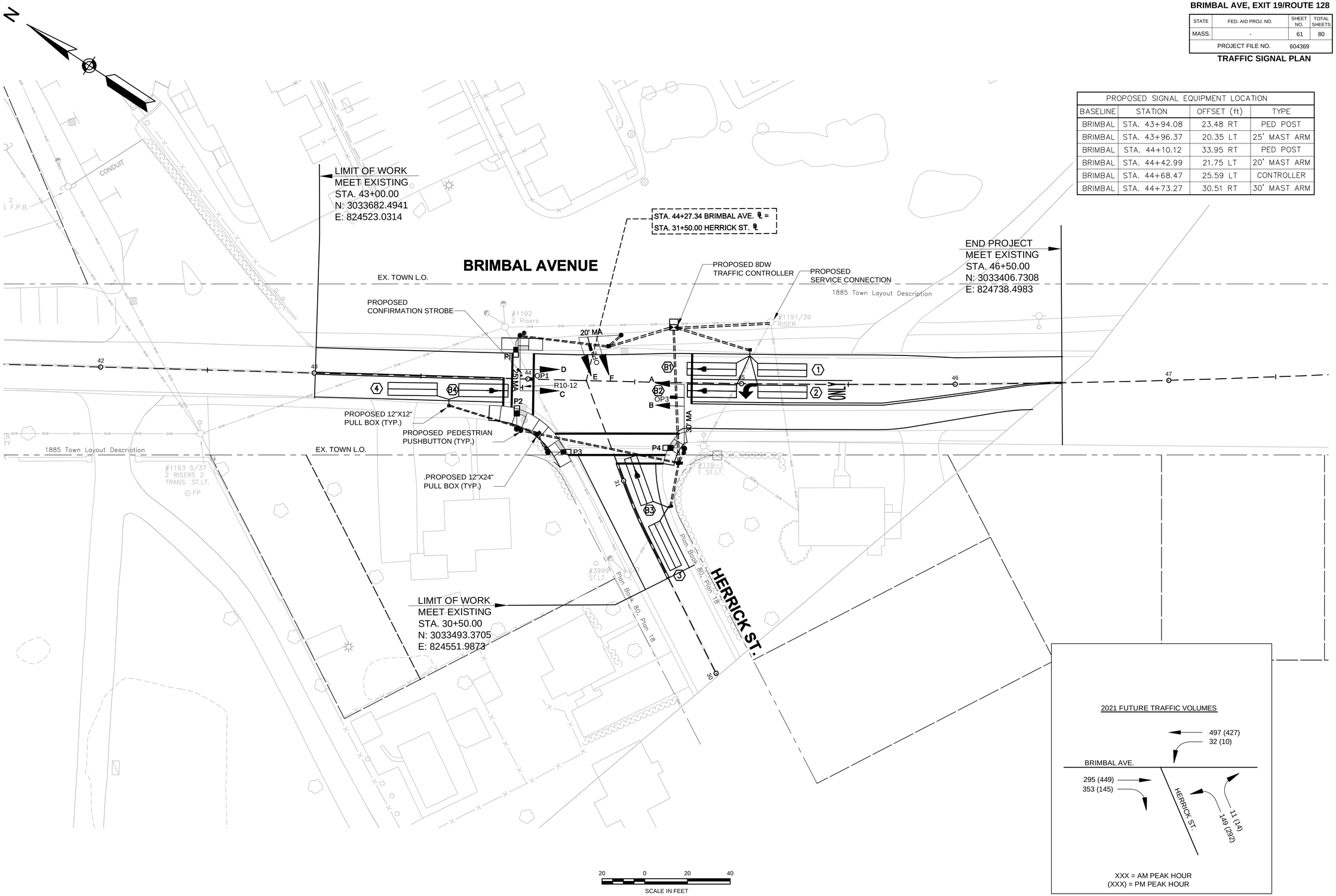
Jacobs \\BOSFIL11\NA\Proj\MHD\208\E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Sign Summary).dwg May 30, 2014
604369_TR(SIGN SUMMARY).DWG Plotted on 30-May-2014 2:33 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	61	80
PROJECT FILE NO.	604369		

TRAFFIC SIGNAL PLAN

PROPOSED SIGNAL EQUIPMENT LOCATION			
BASELINE	STATION	OFFSET (ft)	TYPE
BRIMBAL	STA. 43+94.08	23.48 RT	PED POST
BRIMBAL	STA. 43+96.37	20.35 LT	25' MAST ARM
BRIMBAL	STA. 44+10.12	33.95 RT	PED POST
BRIMBAL	STA. 44+42.99	21.75 LT	20' MAST ARM
BRIMBAL	STA. 44+68.47	25.59 LT	CONTROLLER
BRIMBAL	STA. 44+73.27	30.51 RT	30' MAST ARM



2021 FUTURE TRAFFIC VOLUMES

XXX = AM PEAK HOUR
(XXX) = PM PEAK HOUR

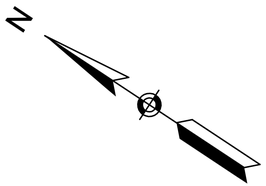
Jacobs \\BOSFIL11\NA\Proj\MHO\2008\E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Traffic Signal Plan and Data).dwg May 30, 2014

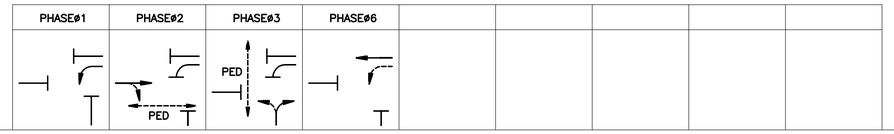
604369_TR(TRAFFIC SIGNAL PLAN AND DATA).DWG Plotted on 30-May-2014 2:34 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	62	80
PROJECT FILE NO.	604369		

TRAFFIC SIGNAL DATA





SEQUENCE AND TIMING FOR FULL ACTUATED CONTROL (ISOLATED)

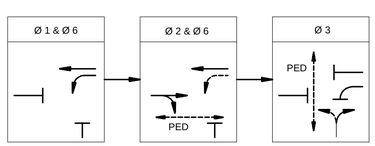
STREET	DIRECTION	HOUSINGS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	FLASH OPER.
BRIMBAL AVE	NB L	C	R/GL	R/YL	R	R	R	R	R	R	R	G	Y	R																FY
BRIMBAL AVE	NB	D	R	R	R	R	R	R	R	R	R	G	Y	R																FY
BRIMBAL AVE	SB	A, B	R	R	R	G	Y	R	R	R	R	R	R	R																FY
HERRICK ST	WB	E, F	R	R	R	R	R	R	G	Y	R	R	R	R																FR
PEDESTRIANS	N–S	P3, P4	DW	DW	DW	W/FDW	DW	DW	DW	DW	DW	DW	DW	DW																OFF
PEDESTRIANS	E–W	P1, P2	DW	DW	DW	DW	DW	DW	W/FDW	DW	DW	DW	DW	DW																OFF
TIMING IN SECONDS																														
MINIMUM GREEN (INITIAL)			5			10			5			10																		EMERGENCY ONLY
PASSAGE TIME (VEHICLE)			2			2			2			2																		
MAXIMUM 1			8			22			20			30																		
MAXIMUM 2			8			22			20			30																		
YELLOW CLEARANCE				4			4			3.5			4																	
RED CLEARANCE					1			1			1.5			1																
WALK (W)						7			7																					
PEDESTRIAN CLEARANCE						14			8																					
MEMORY			NON–LOCK			NON–LOCK			NON–LOCK			NON–LOCK																		
RECALL			OFF			SOFT			OFF			SOFT																		

NOTES:
1. AUTOMATIC FLASHING OPERATION PER 2009 MUTCD, AS AMENDED.
2. STOP AND GO OPERATION FOR 24 HOURS PER DAY, FLASHING OPERATION FOR EMERGENCY ONLY.
3. DURING PEDESTRIAN INTERVAL, FDW THROUGH YELLOW OPERATION SHALL NOT BE IN EFFECT

MAJOR ITEMS REQUIRED

PAY ITEM	QUANTITY	ITEM
815.1	1	CONTROLLER NEMA 8 PHASE TS2–TYPE 1, CAB.& FDN.
	1	SERVICE CONNECTION, TYPE OVERHEAD
	1	8' SIGNAL POLE, BASE, & FDN.
	1	20 FT TYPE II, GALV. STEEL MAST ARM ASSEMBLY, BASE & FDN., LIGHT
	1	25 FT TYPE II, GALV. STEEL MAST ARM ASSEMBLY, BASE & FDN., HEAVY
	1	30 FT TYPE II, GALV. STEEL MAST ARM ASSEMBLY, BASE & FDN., LIGHT
	5	1 WAY, 3 SECTION, SIGNAL HOUSING (12" L.E.D.)
	1	1 WAY, 5 SECTION, SIGNAL HOUSING (12" L.E.D.)
	4	APS PEDESTRIAN PUSH BUTTON, SIGN & SADDLES
	4	PEDESTRIAN COUNTDOWN SIGNAL HOUSING 16" LED
	6	DUAL CHANNEL LOOP DETECTOR AMPLIFIER (2 SPARE)
	8	ROADWAY LOOP DETECTOR (6'X23')
	3	PRE–EMPTION RECEIVER–SINGLE CHANNEL OPTICAL DETECTORS
	2	PRE–EMPTION PHASE SELECTOR MODULE–DUAL CHANNEL
	1	PRE–EMPTION COMFIRMATION STROBE (WHITE)
811.31	4	12" X 24" PULL BOX – SD2.031
811.21	2	ELECTRIC HANDHOLE – SD2.022
		Plus all necessary duct, cable, labor, miscellaneous
		material and equipment to complete the installation.

PREFERENTIAL PHASING SEQUENCE



EMERGENCY PRE-EMPTION DATA

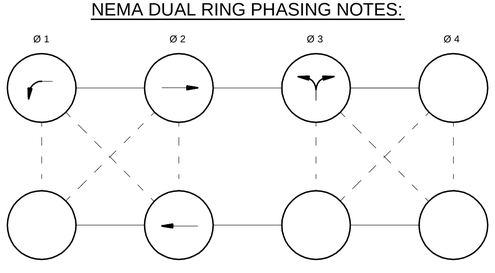
APPROACH	PREEMPTION PHASE	DETECTOR
BRIMBAL AVE. NORTHBOUND	Ø1 + Ø6	OP1
BRIMBAL AVE. SOUTHBOUND	Ø2	OP3
HERRICK ST. WESTBOUND	Ø3	OP2

DETECTOR DATA

DELAY TIME EFFECTIVE ONLY DURING CALLED ø RED. TIME IN SEC.

DETECTOR NUMBER	AMPLIFIER NUMBER	CHANNEL NUMBER	LOOP SIZE	NUM. OF TURNS	ø CALLED	ø EXT.	MODE A=PULSE B=PRES.	DELAY TIME	EXT. TIME
1	1	1	1 @ 6'X23'	2–4–2	ø6	ø6	B	0	0
2	2	1	1 @ 6'X23'	2–4–2	ø1+6	ø1	B	0	0
3	3	1	1 @ 6'X23'	2–4–2	ø3	ø3	B	0	0
4	4	1	1 @ 6'X23'	2–4–2	ø2	ø2	B	0	0
B1	1	2	1 @ 6'X23'	2–4–2	ø6	ø6	B	0	0
B2	2	2	1 @ 6'X23'	2–4–2	ø1	ø1+6	B	0	0
B3	3	2	1 @ 6'X23'	2–4–2	ø3	ø3	B	0	0
B4	4	2	1 @ 6'X23'	2–4–2	ø2	ø2	B	0	0

NEMA DUAL RING PHASING NOTES:

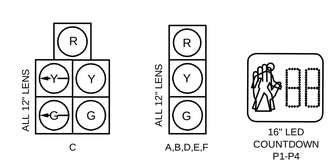


1. PHASES ASSOCIATED BY A SOLID LINE SHALL NOT OPERATE CONCURRENTLY.
2. PHASES ASSOCIATED BY A DASHED LINE MAY OPERATE CONCURRENTLY.
3. THROUGH MOVEMENTS MAY INCLUDE RIGHT TURNS.
4. IF THE ASSIGNED RIGHT OF WAY FOR ANY TRAFFIC MOVEMENT IS TO REMAIN IN EFFECT DURING THE NEXT CALLED PHASE, THE SIGNAL INDICATIONS FOR THAT TRAFFIC MOVEMENT SHALL NOT CHANGE DURING THE CHANGE INTERVAL(S) UNLESS OTHERWISE NOTED.

EMERGENCY VEHICLE PREEMPTION OPERATION:

1. EMERGENCY VEHICLE PREEMPTION SHALL BE ACTUATED BY AN OPTICAL SIGNAL FROM AN OPTICAL EMITTER MOUNTED ON AN EMERGENCY VEHICLE AND RECEIVED BY AN OPTICAL DETECTOR LOCATED AT INTERSECTION. A SEPARATE RECEIVING DETECTOR IS REQUIRED FOR EACH DETECTED APPROACH.
2. PREEMPTION SIGNALS FROM MULTIPLE APPROACHES SHALL BE SERVICED ON A FIRST DETECTED FIRST SERVED BASIS.
3. IN RESPONSE TO A PREEMPTION SIGNAL RECEIVED AT AN INTERSECTION BY AN OPTICAL DETECTOR, THE CONTROLLER SHALL TIME THE CLEARANCE INTERVALS OF THE ACTIVE PHASE (IF DIFFERENT THAT TO BE SERVICED) AND ADVANCE TO AND/OR HOLD IN EMERGENCY VEHICLE PREEMPTION PHASE UNTIL PREEMPTION SIGNAL CEASES. THE CONTROLLER SHALL THEN TIME CLEARANCES AND SIMILARLY SERVICE OTHER EMERGENCY VEHICLE PREEMPTION SEQUENCES IN THE ORDER RECEIVED (IF RECEIVED) OTHERWISE, RESUME NORMAL PREFERENTIAL PHASE SEQUENCE.
4. PREEMPTION MINIMUM GREENS SHALL BE SIX SECONDS.
5. NORMAL CLEARANCES SHALL BE PROVIDED ON PHASES THAT ARE TERMINATED BY PREEMPTION DEMAND.
6. ACTUAL TIMMING FOR PREEMPTION SHALL BE DETERMINED IN THE FIELD IN COORDINATION WITH THE FIRE DEPARTMENT AND SHALL BE APPROVED BY CITY PRIOR TO OPERATION.

SIGNAL IDENTIFICATION



NOTES:

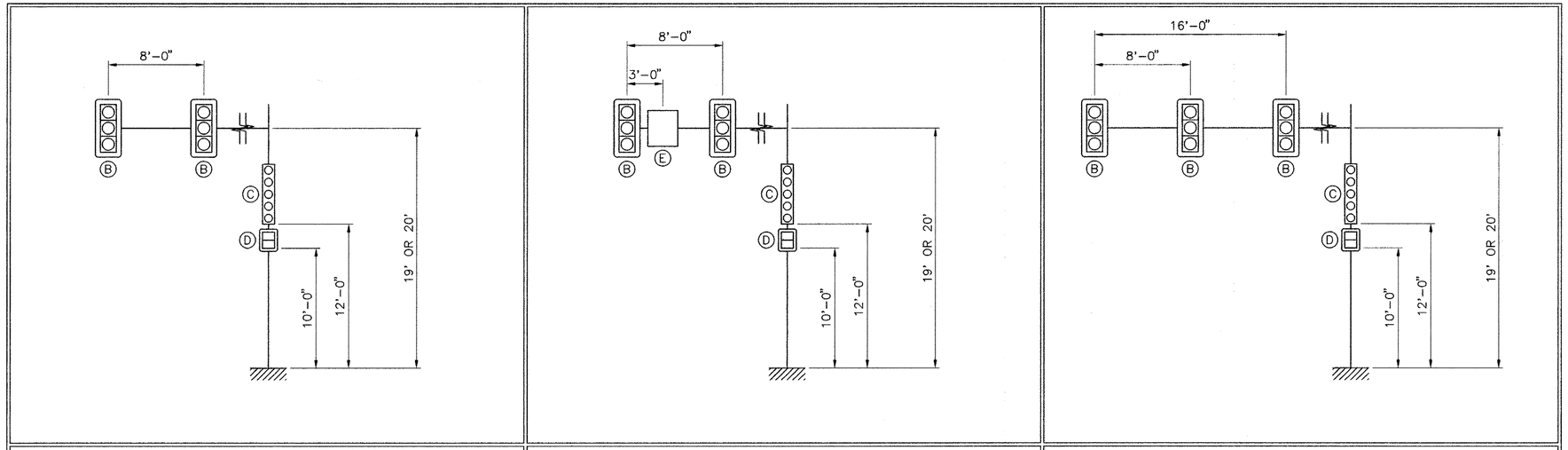
1. ALL SIGNALS SHALL HAVE CUT AWAY VISORS.
2. ALL SIGNALS SHALL HAVE 12" LED WITH 5" NON-LOUVERED BACK PLATES W/ 3" REFLECTIVE BORDER

Jacobs - \\BOSFILL1\NA_Proj\MHD\200\BE274110\0\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Traffic Signal Plan and Data).dwg May 30, 2014
604369_TR(TRAFFIC SIGNAL PLAN AND DATA).DWG Plotted on 30-May-2014 2:34 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

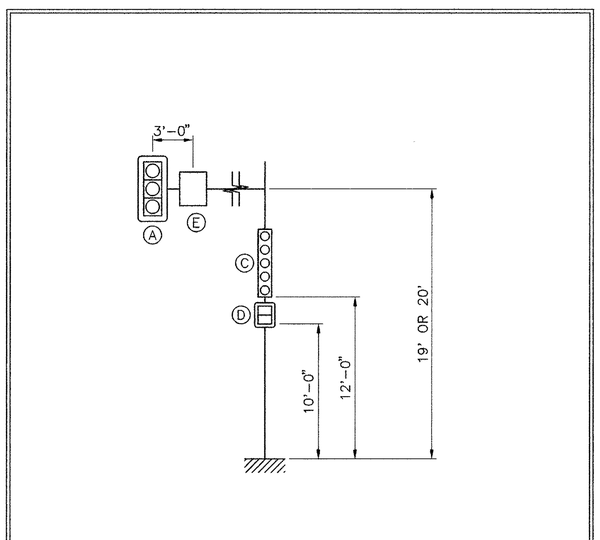
STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	63	80
PROJECT FILE NO.	604369		

TRAFFIC SIGNAL DETAILS



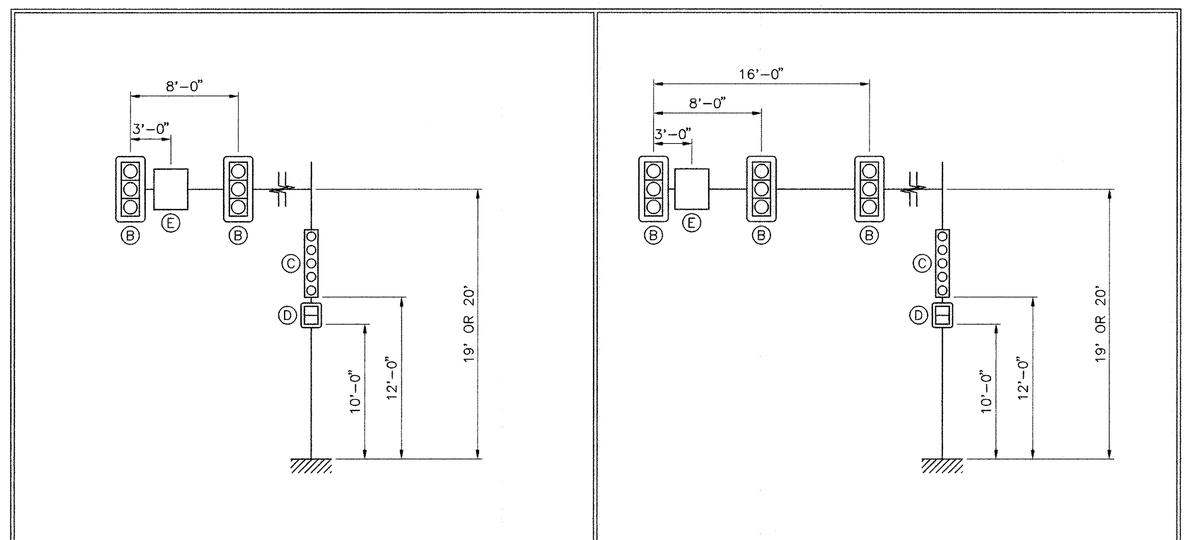
20', 25', 40' & 45' SPANS | 30' SPAN | 35' SPAN

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

2/24/2011
CHIEF ENGINEER
BRIDGE ENGINEER
TRAFFIC ENGINEER

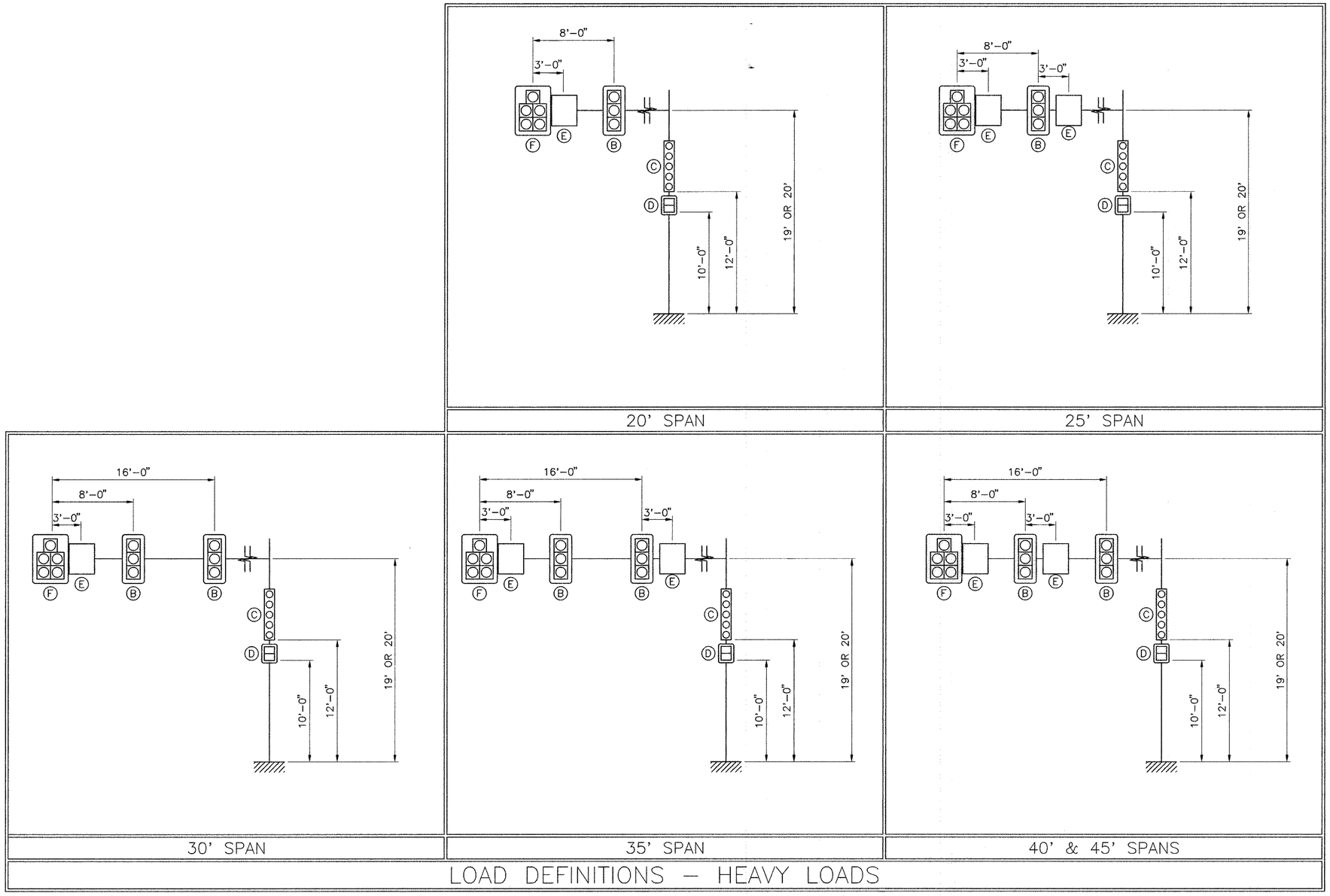
SHEET 2 OF 5 SHEETS

604369_TR(TRAFFIC SIGNAL DETAILS).DWG Plotted on 30-May-2014 2:34 PM
Jacobs : \\BOSFILI1\NA_Proj\MHD\200\BE2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Traffic Signal Details).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	64	80
PROJECT FILE NO.	604369		

TRAFFIC SIGNAL DETAILS



DEVICE	DESCRIPTION	PROJ. AREA (FT^2)	WEIGHT (LBS)
A	3 SECTION, 3 WAY SIGNAL	18.29	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
F	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

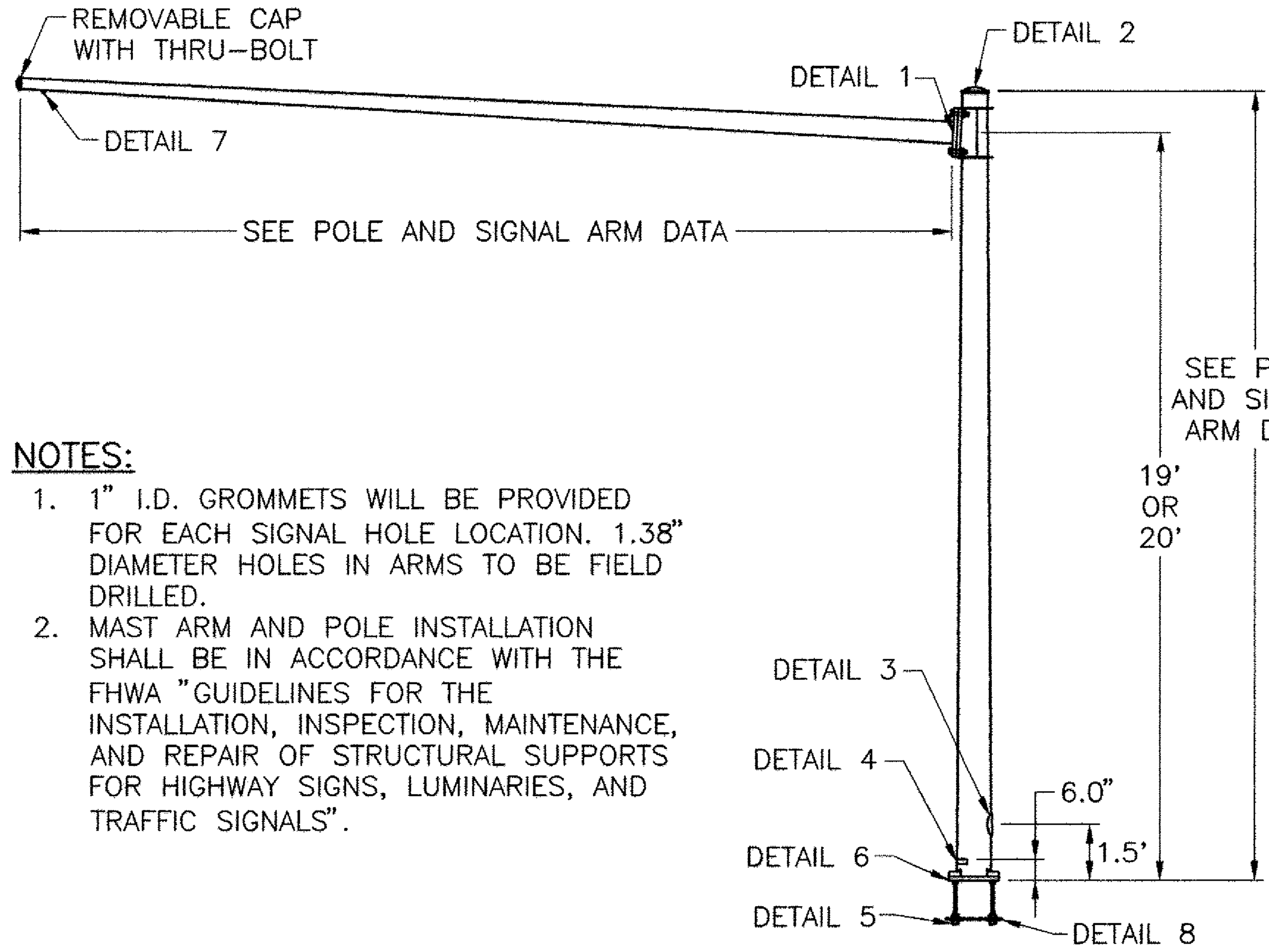
SHEET 3 OF 5 SHEETS

Jacobs - \\BOSFIL11\NA.Proj\MHD\2008\E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Traffic Signal Details).dwg May 30, 2014
604369_TR(TRAFFIC SIGNAL DETAILS).DWG Plotted on 30-May-2014 2:34 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	65	80
PROJECT FILE NO. 604369			

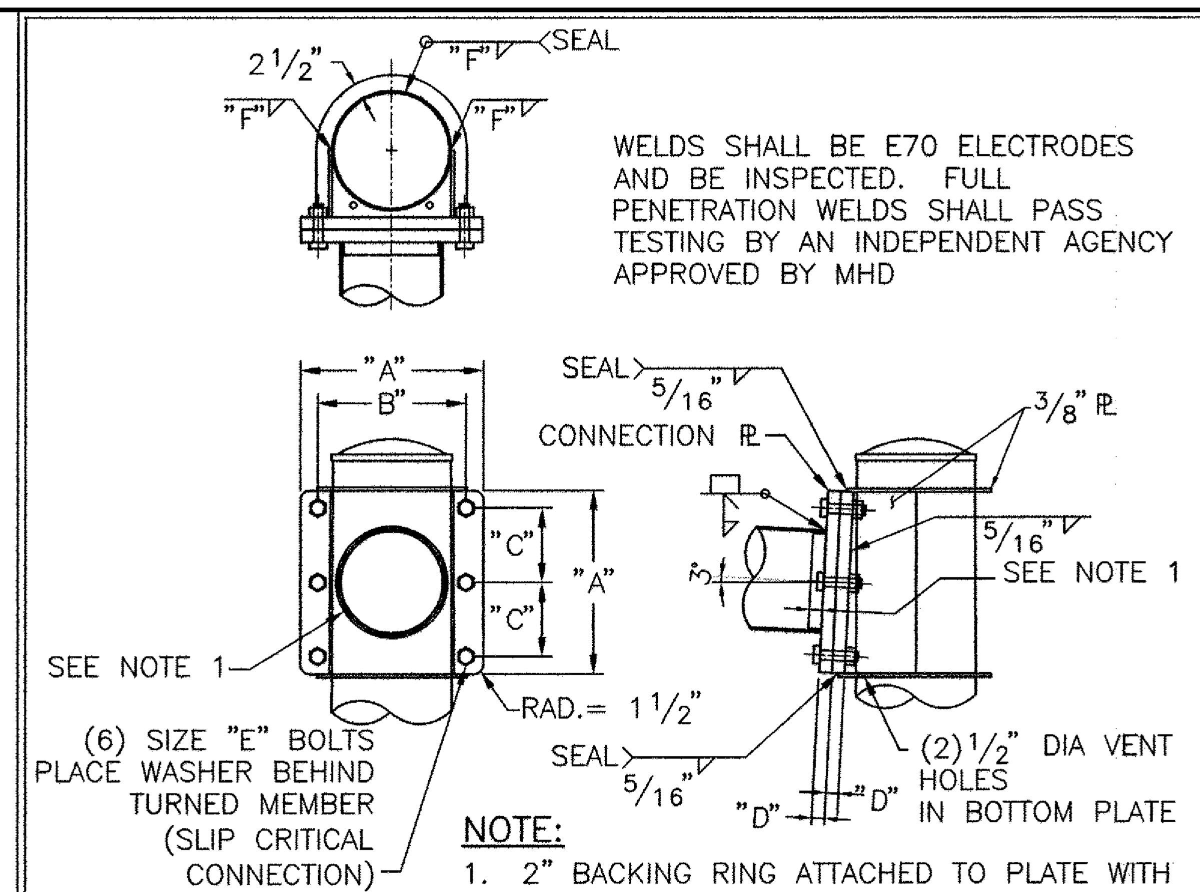
TRAFFIC SIGNAL DETAILS



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".

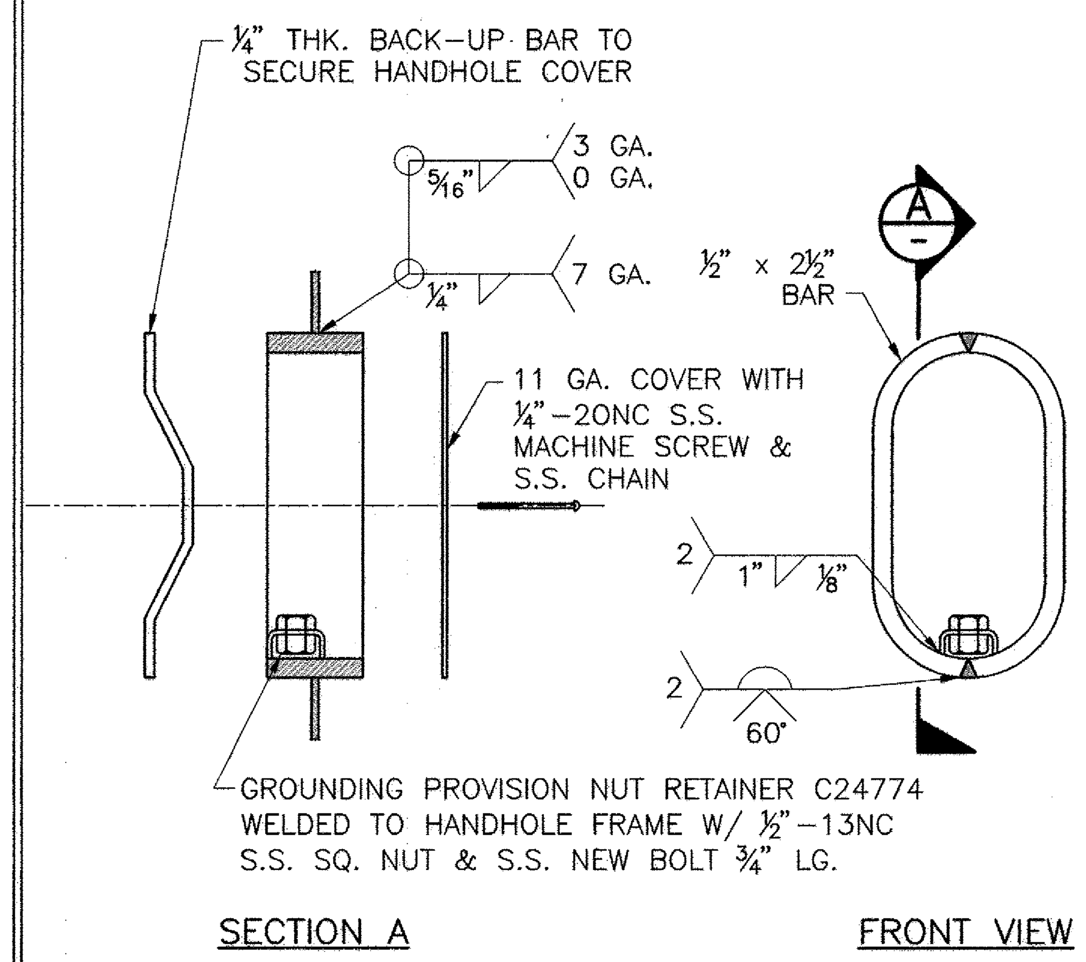
MAST ARM ELEVATION



WELDS SHALL BE E70 ELECTRODES AND BE INSPECTED. FULL PENETRATION WELDS SHALL PASS TESTING BY AN INDEPENDENT AGENCY APPROVED BY MHD

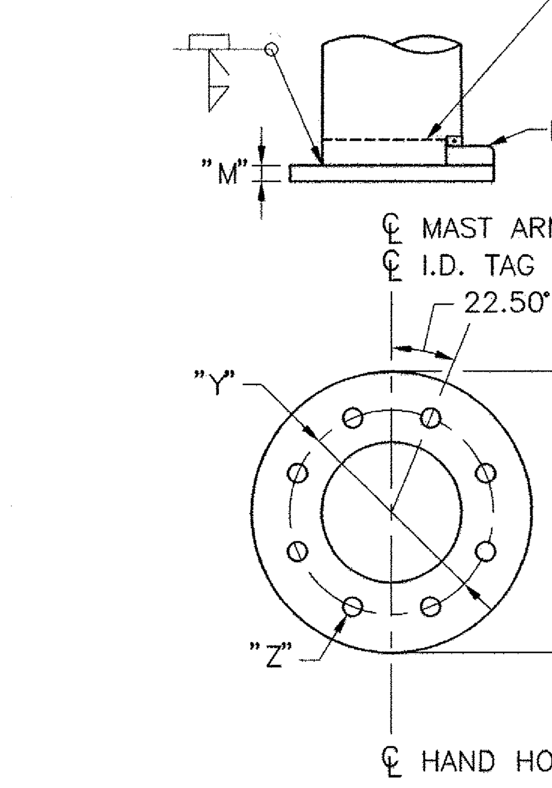
NOTE:
1. 2" BACKING RING ATTACHED TO PLATE WITH FULL PENETRATION WELD, OR WITH A CONTINUOUS FILLET WELD AROUND INTERIOR FACE OF BACKING RING. THE THICKNESS OF THE BACKING RING SHALL NOT EXCEED ⅜" WITH FILLET WELD ATTACHMENT TO PLATE.

DETAIL 1 SIGNAL ARM ATTACHMENT



DETAIL 3 4"x8" HANDHOLE

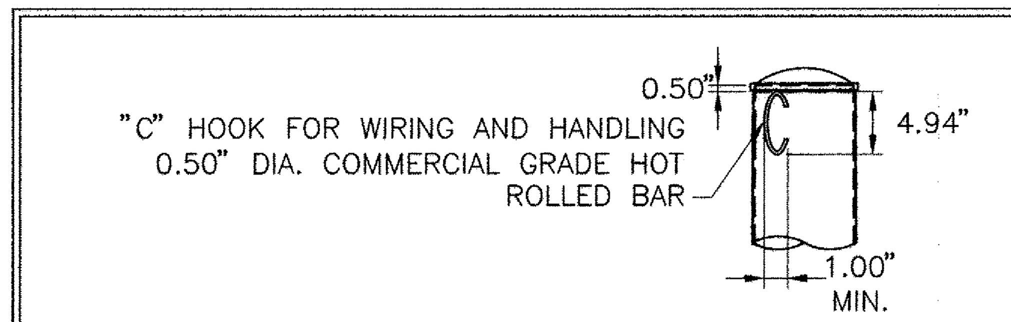
2" BACKING RING ATTACHED TO PLATE WITH FULL PENETRATION WELD, OR WITH A CONTINUOUS FILLET WELD AROUND INTERIOR FACE OF BACKING RING. THE THICKNESS OF THE BACKING RING SHALL NOT EXCEED ⅜" WITH FILLET WELD ATTACHMENT TO PLATE.



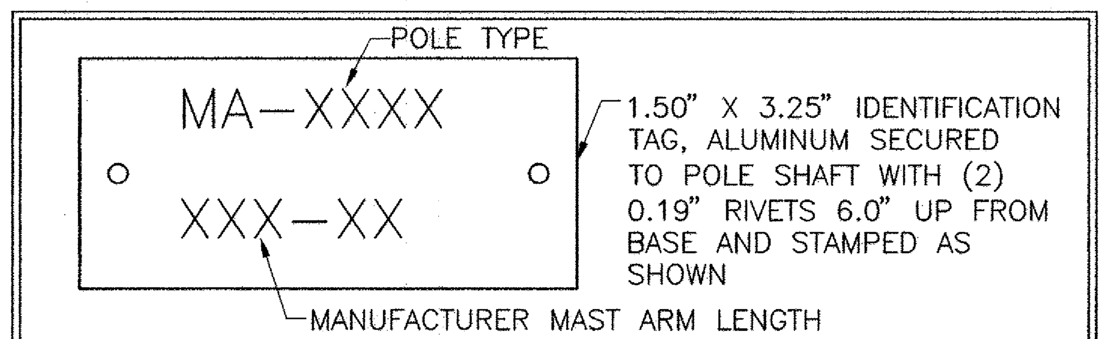
DETAIL 6 POLE BASE

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

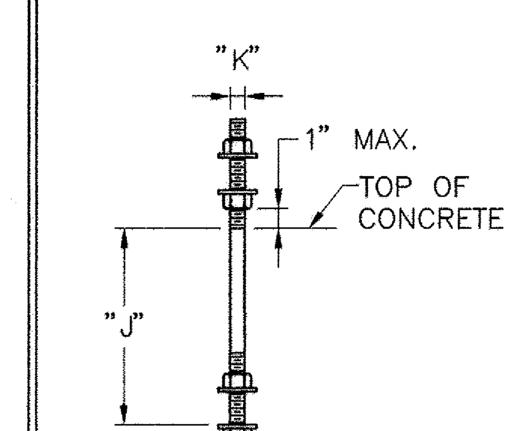
LOCATIONS	SIGNAL ARM TUBE: SPAN (FT)	SIGNAL ARM TUBE: FIXED END DIA. (IN)	SIGNAL ARM TUBE: FREE END DIA. (IN)	SIGNAL ARM TUBE: WALL THK.	POLE TUBE: BASE DIA. (IN)	POLE TUBE: TOP DIA. (IN)	POLE TUBE: LENGTH (FT)	POLE TUBE: WALL THK.	POLE BASE: PLATE CIRCLE "S" (IN)	POLE BASE: BOLT CIRCLE "Y" (IN)	POLE BASE: THK. "M" (IN)	POLE BASE: HOLE "Z" (IN)	ANCHOR BOLT: DIA. "K" (IN)	ANCHOR BOLT: 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)	SIGNAL ARM TUBE: FIXED END DIA. (IN)	SIGNAL ARM TUBE: FREE END DIA. (IN)	SIGNAL ARM TUBE: WALL THK.	POLE TUBE: BASE DIA. (IN)	POLE TUBE: TOP DIA. (IN)	POLE TUBE: LENGTH (FT)	POLE TUBE: WALL THK.	POLE BASE: PLATE CIRCLE "S" (IN)	POLE BASE: BOLT CIRCLE "Y" (IN)	POLE BASE: THK. "M" (IN)	POLE BASE: HOLE "Z" (IN)	ANCHOR BOLT: DIA. "K" (IN)	ANCHOR BOLT: 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

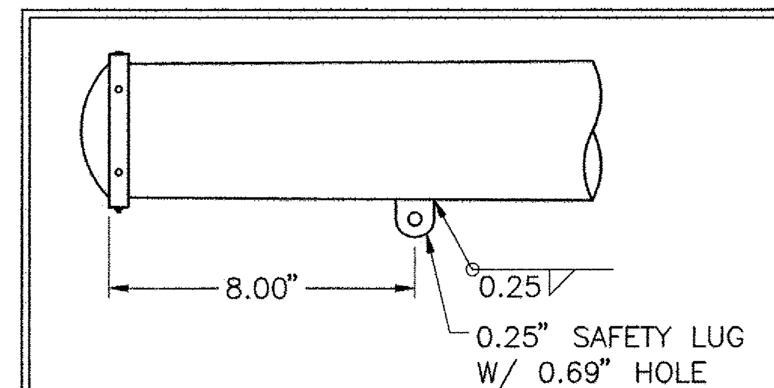
POLE AND SIGNAL ARM DATA - HEAVY LOADS

LOCATIONS	SIGNAL ARM TUBE: SPAN (FT)	SIGNAL ARM TUBE: FIXED END DIA. (IN)	SIGNAL ARM TUBE: FREE END DIA. (IN)	SIGNAL ARM TUBE: WALL THK.	POLE TUBE: BASE DIA. (IN)	POLE TUBE: TOP DIA. (IN)	POLE TUBE: LENGTH (FT)	POLE TUBE: WALL THK.	POLE BASE: PLATE CIRCLE "S" (IN)	POLE BASE: BOLT CIRCLE "Y" (IN)	POLE BASE: THK. "M" (IN)	POLE BASE: HOLE "Z" (IN)	ANCHOR BOLT: DIA. "K" (IN)	ANCHOR BOLT: 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

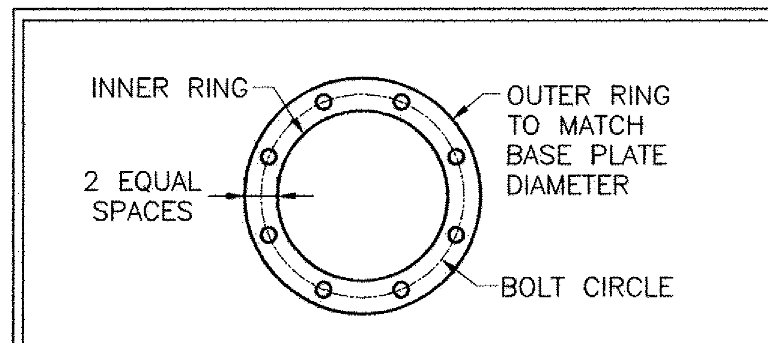


(8) ANCHOR BOLTS WITH (4) HEX NUTS, (4) FLAT WASHERS, AND (1) LOCK-WASHER PER BOLT.

DETAIL 5 ANCHOR BOLT



DETAIL 7 SAFETY HANGER LUG



DETAIL 8 ANCHOR PLATE

MONTH_DD_YYYY ISSUED FOR CONSTRUCTION

massDOT Highway

STANDARD DRAWINGS

TYPE II MAST ARMS DETAILS

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

2/24/2011
CHIEF ENGINEER
BRIDGE ENGINEER
TRAFFIC ENGINEER

SHEET 4 OF 5 SHEETS

Plotted on 30-May-2014 2:34 PM
604369_TR(TRAFFIC SIGNAL DETAILS).DWG
Jacobs - \\BOSFIL11\NAI_Proj\MHD\2008\E2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Traffic Signal Details).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	66	80
PROJECT FILE NO.	604369		

TRAFFIC SIGNAL DETAILS

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

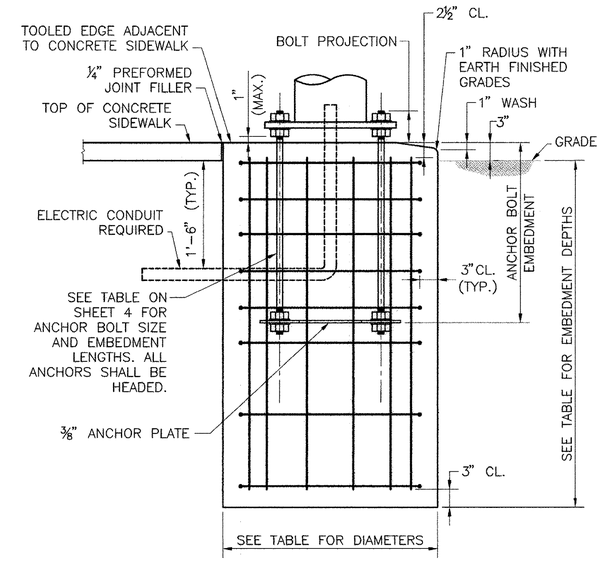
SOIL TYPE	15' & 20' MAST ARMS			25' & 30' MAST ARMS			35' & 40' MAST ARMS			45' MAST ARMS		
	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS	DIAMETER	DEPTH	VERTICAL BARS
DRY SAND	3'–6"	8'–0"	18–#8	3'–6"	10'–0"	18–#8	4'–0"	11'–0"	18–#9	4'–6"	10'–0"	18–#10
WET SAND	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

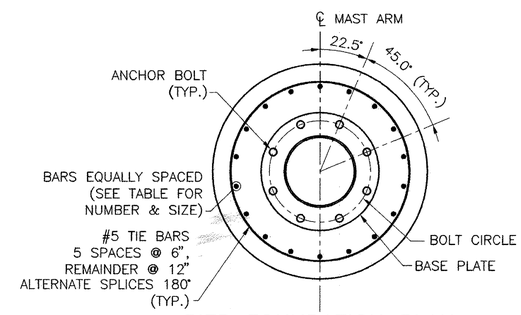
NOTES:

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.



PIER FOUNDATION DETAIL

NO SCALE



PIER FOUNDATION PLAN

NO SCALE

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

2/24/2011
CHIEF ENGINEER

BRIDGE ENGINEER

Neil E. Boudreau
TRAFFIC ENGINEER

SHEET 5 OF 5 SHEETS

604369_TR(TRAFFIC SIGNAL DETAILS).DWG Plotted on 30-May-2014 2:35 PM
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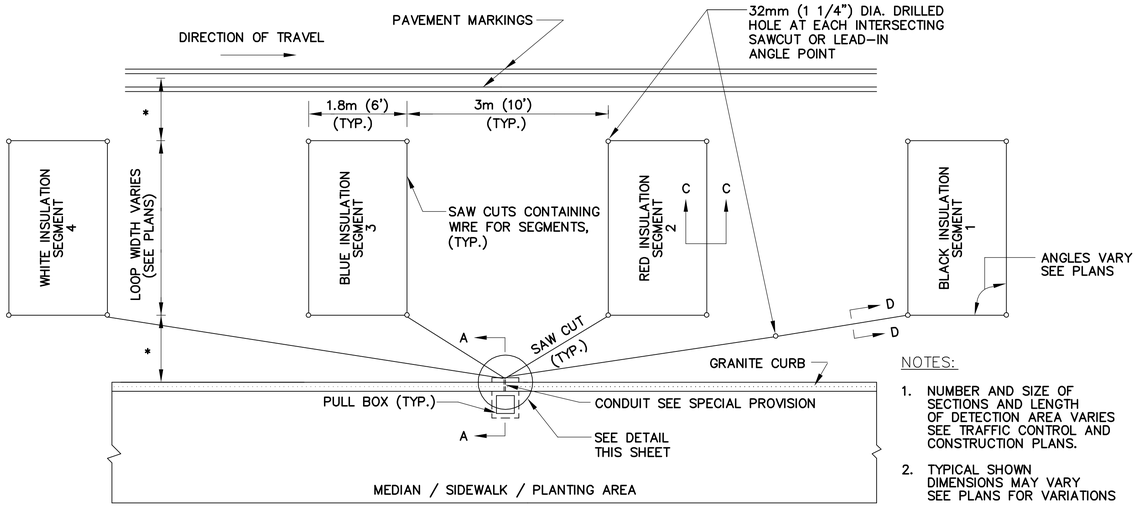
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	67	80
PROJECT FILE NO.	604369		

TRAFFIC SIGNAL DETAILS



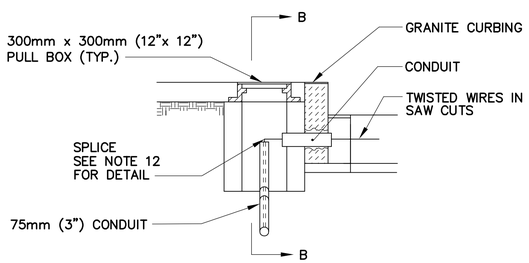
* OFFSETS FROM CURB TO LOOP AND EDGE OF LANE TO LOOP EQUAL IF NOT SHOWN.

NOTES:

1. NUMBER AND SIZE OF SECTIONS AND LENGTH OF DETECTION AREA VARIES SEE TRAFFIC CONTROL AND CONSTRUCTION PLANS.
2. TYPICAL SHOWN DIMENSIONS MAY VARY SEE PLANS FOR VARIATIONS

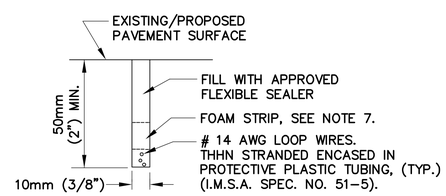
PLAN OF SEGMENTED DETECTOR DETAIL

NOT TO SCALE



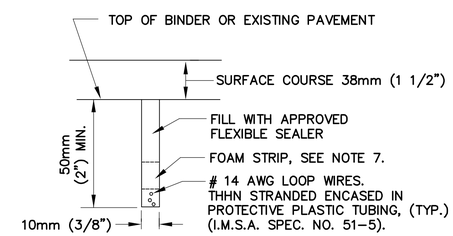
SECTION A–A

NOT TO SCALE



SECTION C–C & D–D

LOOPS IN SURFACE COURSE
NOT TO SCALE

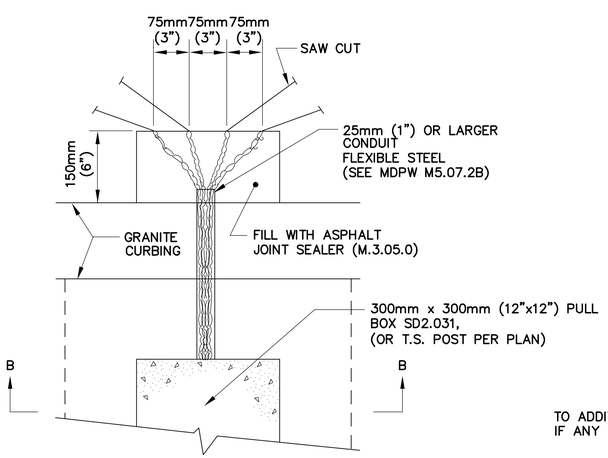


SECTION C–C & D–D

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

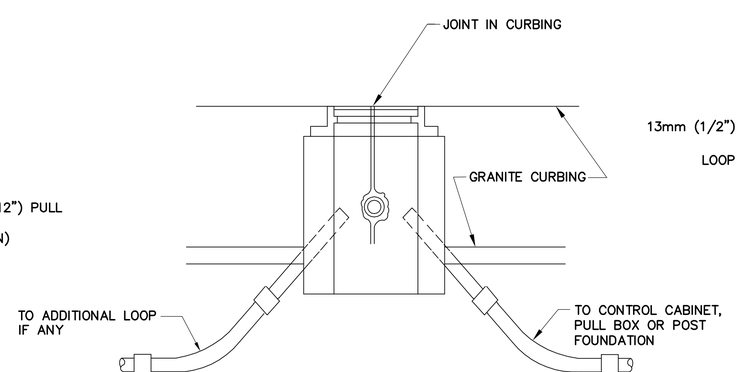
DETECTOR NOTES:

1. IN HANDHOLE, SPLICE ALL SEGMENTS TO TYPE II–SHIELDED LOOP DETECTOR LEAD–IN CABLE. SEGMENTS SHALL BE SPLICED IN PARALLEL, IN SERIES, OR IN A COMBINATION OF PARALLEL & SERIES AS SHOWN ON THE PLAN SHEET FOR EACH DETECTOR. NUMBER OF TURNS OF WIRE SHALL ALSO BE AS SHOWN ON THE PLAN SHEET FOR EACH DETECTOR. SEE NOTE 12.
2. SEE SPECIAL PROVISIONS FOR REQUIREMENTS OF DETECTOR AMPLIFIER.
3. LEAD IN WIRES SHALL BE TWISTED FROM SEGMENT TO SPLICE WITH SHIELDED CABLE FIVE TURNS PER FOOT. LEAD–IN SHALL BE TYPE II (M8. 16. II).
4. BEFORE STARTING ANY SPLICING, THE ELECTRICAL CONTRACTOR SHALL FURNISH DATA SHEETS ON THE MATERIALS AND/OR METHODS TO BE USED IN ACCORDANCE WITH THE DEPARTMENTS STANDARD OPERATING PROCEDURES FOR APPROVAL OF SHOP DRAWINGS SEE SECTION 815.64, ESPECIALLY PARAGRAPH 1.
5. THE METALLIC SHIELD WHICH SHALL ENCASE THE DETECTOR LEADS FROM A SPLICE (TYPICALLY LOCATED IN A PULL BOX NEAR THE ROADWAY COMPONENT OF THE DETECTOR) TO THE CONTROLLER, AND THE DRAIN WIRE UNDER THE METALLIC SHIELD, SHALL NOT BE GROUNDED TO THE EARTH GROUNDING BUSS IN THE CONTROLLER, AND THE SHIELD AND DRAIN WIRE SHALL BE CAREFULLY INSULATED FROM THE TRANSFORMER NEUTRAL OR FROM EARTH GROUND AT ALL POINTS ALONG ITS LENGTH. SPECIFICALLY, THIS INCLUDES CAREFUL INSULATION OF THE EXPOSED PORTION OF THE SHIELD AND THE DRAIN WIRE AT THE END AWAY FROM THE CONTROLLER WHERE IT IS SPLICED TO WIRES LEADING TO THE ROADWAY COMPONENT OF THE DETECTOR. THIS IS IMPORTANT TO AVOID A GROUND RETURN LOOP.
6. FILL ALL CONDUIT OPENINGS WITH DUCT SEAL.
7. AFTER SAWCUTS ARE COMPLETE, BLOW OUT WATER WITH OIL–FREE COMPRESSED AIR UNTIL CUTS ARE CLEAN AND DRY. INSERT WIRE INTO CLEAN SLOT WITH A BLUNT, SMOOTH, ROUND EDGED TOOL OF WOOD OR PLASTIC SUCH AS A PAINT STIRRER. DO NOT USE A SCREWDRIVER, THEN INSERT FOAM PLASTIC HOLD DOWN STRIPS, SIMILAR TO ETHA FOAM SB STRIPS SHALL BE ABOUT 50mm (2") LONG, PLACED IN THE SLOT ABOUT EVERY 2 FEET THEN POUR SEALER, TAKING CARE TO ELIMINATE BUBBLES.
8. THE COMBINED ROADWAY LOOP, TWISTED LEAD–IN WIRES, SPLICE AND SHIELDED LEAD–IN CABLE SHALL HAVE A RESISTANCE TO GROUND OF AT LEAST 100 MEGOHMS. SEE SPECIAL PROVISIONS FOR ADDITIONAL REQUIREMENTS.
9. FOR INSTALLATION OF SINGLE (ONE SEGMENT) SMALL WIRE LOOP DETECTOR DETAIL IS THE SAME.
10. DETECTOR WIRE SHALL BE A DIFFERENT COLOR FOR EACH SEGMENT OF A DETECTOR GROUP. SEE DETAIL.
11. SPLICING PATTERN P = SERIES/PARALLEL: SPLICE SEGMENTS 1 AND 3 OF AN INDIVIDUAL DETECTOR IN SERIES. SPLICE SEGMENTS 2 AND 4 IN SERIES. SPLICE THE RESULTANT TWO GROUPS IN PARALLEL. SPLICE THE RESULTANT COMBINATION TO ONE LEAD–IN CABLE. CONNECT THIS CABLE TO AN OTHERWISE UNUSED AMPLIFIER CHANNEL.
12. SPLICING PATTERN S = SERIES: SPLICE ALL SEGMENTS (TYPICALLY FOUR, BUT MAY BE LESS) OF AN INDIVIDUAL DETECTOR IN SERIES. SPLICE THE RESULTANT COMBINATION TO ONE LEAD–IN CABLE TO AN OTHERWISE UNUSED AMPLIFIER CHANNEL.



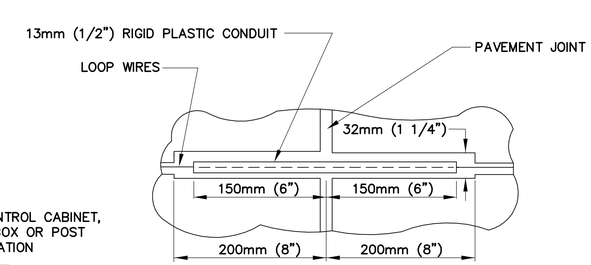
DETAIL – PLAN VIEW

NOT TO SCALE



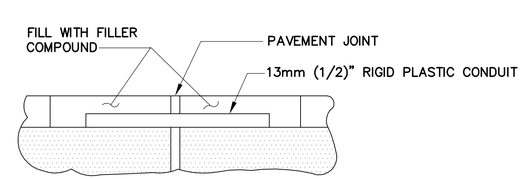
SECTION B–B

NOT TO SCALE



PLAN

TREATMENT AT PAVEMENT JOINTS
NOT TO SCALE

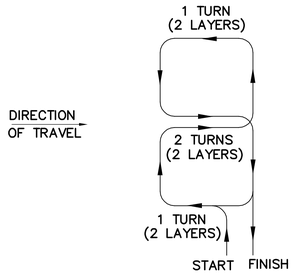


VERTICAL SECTION

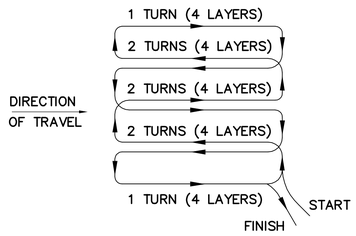
TREATMENT AT PAVEMENT JOINTS
NOT TO SCALE

Plotted on 30-May-2014 2:35 PM
604369_TR(TRAFFIC SIGNAL DETAILS).DWG
Jacobs : \\BOSFILL1\NAJ_Proj\MHD\200\BE2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Traffic Signal Details).dwg May 30, 2014

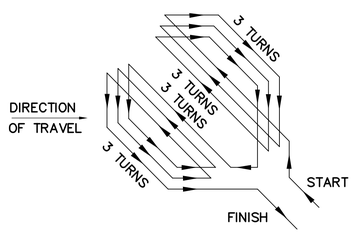
WINDING DETAILS



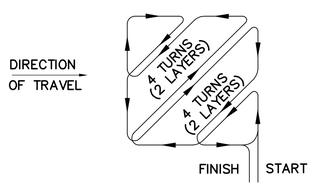
TYPE Q DETECTOR



TYPE D–Q DETECTOR

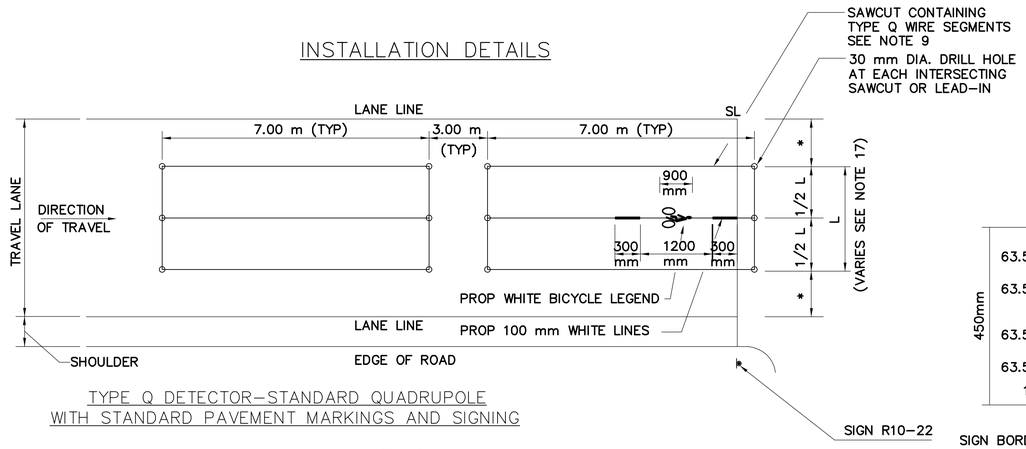


TYPE D–1 DETECTOR

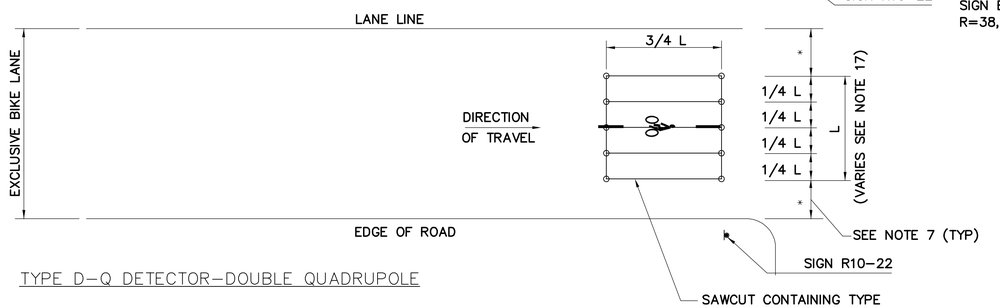


TYPE D–2 DETECTOR

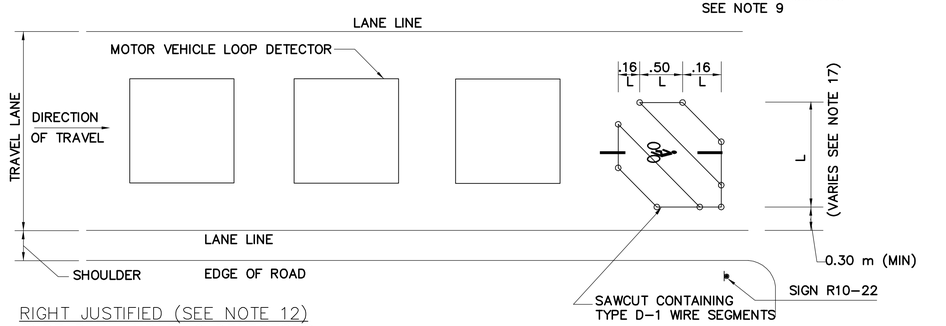
INSTALLATION DETAILS



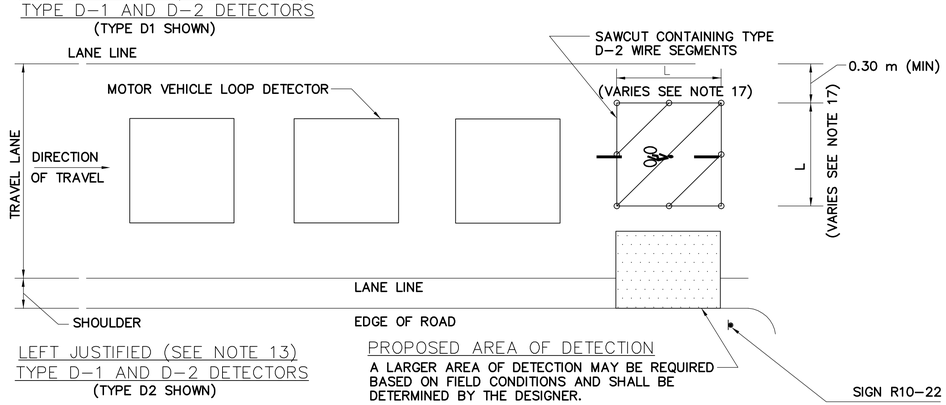
TYPE Q DETECTOR–STANDARD QUADRUPOLE
WITH STANDARD PAVEMENT MARKINGS AND SIGNING



TYPE D–Q DETECTOR–DOUBLE QUADRUPOLE



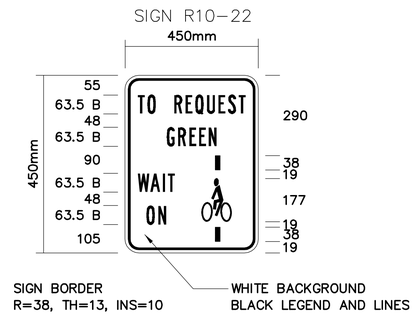
RIGHT JUSTIFIED (SEE NOTE 12)
TYPE D–1 AND D–2 DETECTORS
(TYPE D1 SHOWN)



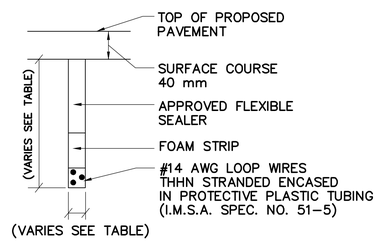
LEFT JUSTIFIED (SEE NOTE 13)
TYPE D–1 AND D–2 DETECTORS
(TYPE D2 SHOWN)

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

BICYCLE LOOP DETECTOR DETAILS



NOTE: ALL SIGN DIMENSIONS IN MILLIMETERS
SIGN PANEL NOT SHOWN TO SCALE



SECTION THRU LOOP DETECTOR

SAWCUT SLOT DEPTH GUIDE

TURNS OF WIRE	SLOT SIZE	
	DEPTH (mm)	WIDTH (mm)
1	40	13
2	40	13
3	40	13
4	50	13
5	50	13
6	50	13
7	50	13
8	50	13

NOTES:

1. REFER TO VEHICLE LOOP DETECTOR DETAIL SHEET FOR ADDITIONAL NOTES AND CONSTRUCTION DETAILS.
2. ALL DETAILS ARE GRAPHICAL WITH NO SCALE.
3. THE NUMBER, SIZE, LOCATION AND LENGTH OF DETECTION AREA VARIES AND SHALL BE DETERMINED BY THE DESIGNER REFER TO TRAFFIC SIGNAL PLAN.
4. BICYCLE LOOPS SHALL BE CONNECTED TO SEPARATE LOOP DETECTOR AMPLIFIERS CAPABLE OF HIGHER LEVELS OF SENSITIVITY.
5. BICYCLE LOOPS SHALL BE INSTALLED IN THE BASE COURSE OF EXISTING PAVEMENT. THE EXISTING PAVEMENT SHALL BE COLD PLANED TO THE BASE COURSE AND SAWCUT FOR LOOP INSTALLATION.
6. SIGNS AND PAVEMENT MARKINGS SHALL BE INSTALLED FOR ALL BICYCLE DETECTORS TO INFORM CYCLISTS OF THE DETECTION AREA.
7. * OFFSETS FROM LANE LINE EQUAL UNLESS OTHERWISE NOTED. SEE PLANS.
8. TYPE Q DETECTORS SHALL BE WIRED IN A FIGURE EIGHT PATTERN WITH A DOUBLE LAYER DESIGN ("2–4–2") WITH 2 TURNS IN THE PERIMETER SLOTS AND 4 TURNS IN THE CENTER SLOT AS SHOWN IN THE WINDING DETAIL.
9. BICYCLES WILL BE DETECTED WITHIN 100 mm OF THE INTERIOR LONGITUDINAL LOOP WIRES FOR TYPE Q AND D–Q DETECTORS.
10. PROVIDE 3 TURNS FOR TYPE D–1 DETECTORS.
11. INSTALL 2 LAYERS OF WIRE WOUND IN THE SAME DIRECTION IN BOTH LAYERS FOR TYPE D–2 DETECTORS. THE RESULT IS 4 TURNS IN EACH DIAGONAL.
12. RIGHT JUSTIFIED LOOP DETECTORS SHALL BE CONSIDERED FOR THE FOLLOWING CONDITIONS:
    a) BICYCLE STOPPING ON THE RIGHT SIDE OF A THRU TRAVEL LANE.
    b) BICYCLE STOPPING ON THE RIGHT SIDE OF AN EXCLUSIVE LEFT TURN LANE.
13. LEFT JUSTIFIED LOOP DETECTORS SHALL BE CONSIDERED FOR THE FOLLOWING CONDITIONS:
    a) BICYCLE STOPPING ON THE LEFT SIDE OF A SHARED LEFT/THRU LANE.
    b) BICYCLE STOPPING JUST TO THE RIGHT OF THE CENTERLINE WHEN TURNING LEFT ON A TWO–LANE ROADWAY.
14. RECTANGULAR LOOP DETECTORS SHALL BE CONSIDERED FOR BICYCLES STOPPING ON EITHER THE LEFT OR RIGHT SIDE OF A TWO–LANE ROADWAY. THE MINIMUM OFFSET FROM LANE LINE AND CURB LINE SHALL BE 0.30 m.
15. PAVEMENT CORES OR TEST PITS MAY BE REQUIRED TO DETERMINE THE DEPTH OF EXISTING PAVEMENT AND CONFIRM THAT THE DETECTION OPTION CHOSEN AND CORRESPONDING WINDING PATTERN CAN BE ACCOMMODATED.
16. THESE DETAILS APPLY TO BICYCLE LOOPS INSTALLED IN ROADWAYS. PUSH BUTTON ACTUATION SHALL BE CONSIDERED FOR RECREATIONAL BIKE PATHS.
17. THE MINIMUM DIMENSION FOR L SHALL BE 1.8 m MIN. FOR DETECTORS TYPE D–Q, D–1 & D–2. FINAL DIMENSIONS SHALL BE DETERMINED BY THE DESIGN ENGINEER.

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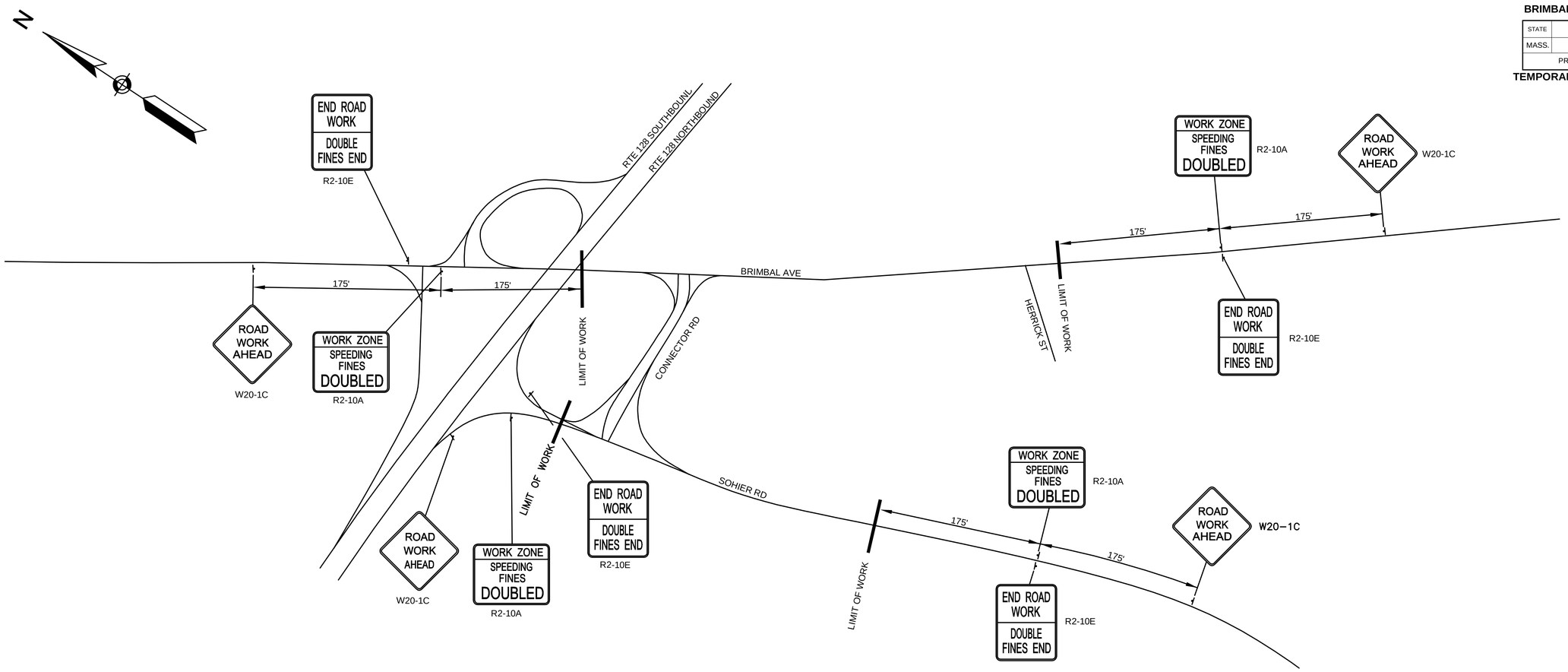
604369_TR(TRAFFIC SIGNAL DETAILS).DWG
Jacobs - \\BOSFIL11\NA\Proj\MHD\2008\E2X4110\assignment 23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Traffic Signal Details).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	69	80
PROJECT FILE NO.	604369		

TEMPORARY TRAFFIC CONTROL PLANS
SHEET 1 OF 6



ADVANCE SIGNING PLAN
(ALL STAGES)
NTS

TEMPORARY TRAFFIC CONTROL GENERAL 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 TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT AND SIMILAR OPERATIONS.
7. CONSTRUCTION VEHICLE ACCESS TO BE COORDINATED WITH POLICE DETAIL.
8. THE FIRST FIVE PLASTIC DRUMS OF A TAPER SHALL BE MOUNTED WITH TYPE A LIGHTS.
9. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
10. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
11. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN M.P.H.
12. MINIMUM LANE WIDTH IS TO BE 11 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF THE DRUMS OR MEDIAN BARRIER.
13. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS, UNLESS OTHERWISE NOTED.
14. ALL TEMPORARY PAVEMENT MARKINGS SHALL BE TEMPORARY 6" REFLECTORIZED PAINT.
15. TEMPORARY CONCRETE BARRIER SHALL HAVE TOP MOUNTED REFLECTORS EVERY 40 FEET.

BUFFER SPACING	
SPEED (MPH)	DISTANCE (FEET)
20	115
25	155
30	200
35	250
40	305
45	360
50	425

TAPER LENGTH FORMULAS	
SPEED LIMIT (S)	TAPER LENGTH (L) FEET
40 MPH OR LESS	$L = \frac{WS^2}{60}$
45 MPH OR MORE	L = WS

L = TAPER LENGTH IN FEET
W = WIDTH OFFSET IN FEET
S = DESIGN SPEED (40 MPH)

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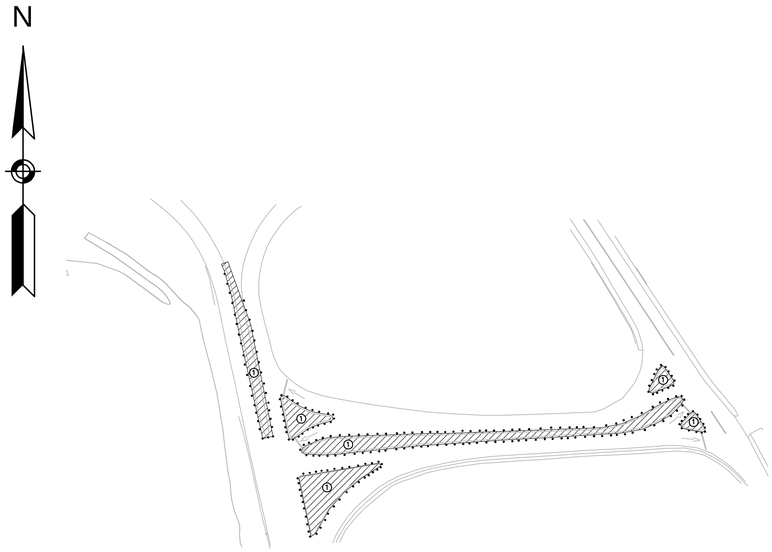
604369_TR(TEMPORARY TRAFFIC CONTROL PLANS).DWG Plotted on 30-May-2014 2:35 PM

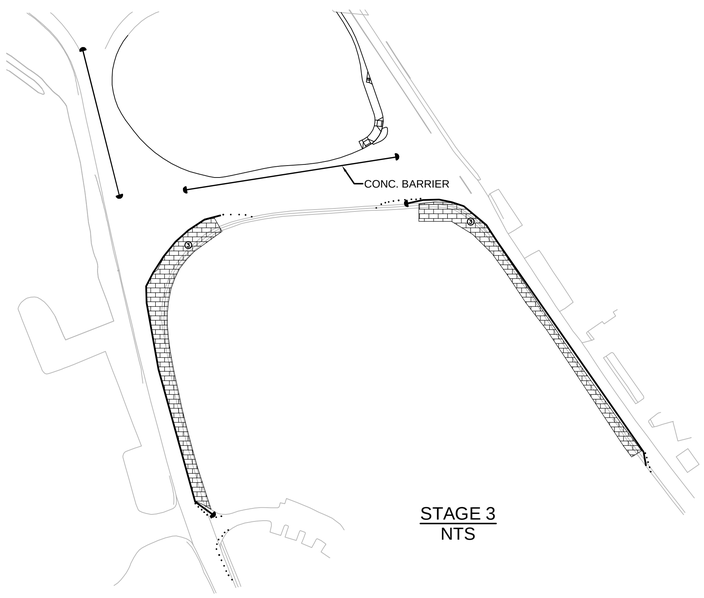
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	70	80
PROJECT FILE NO.	604369		

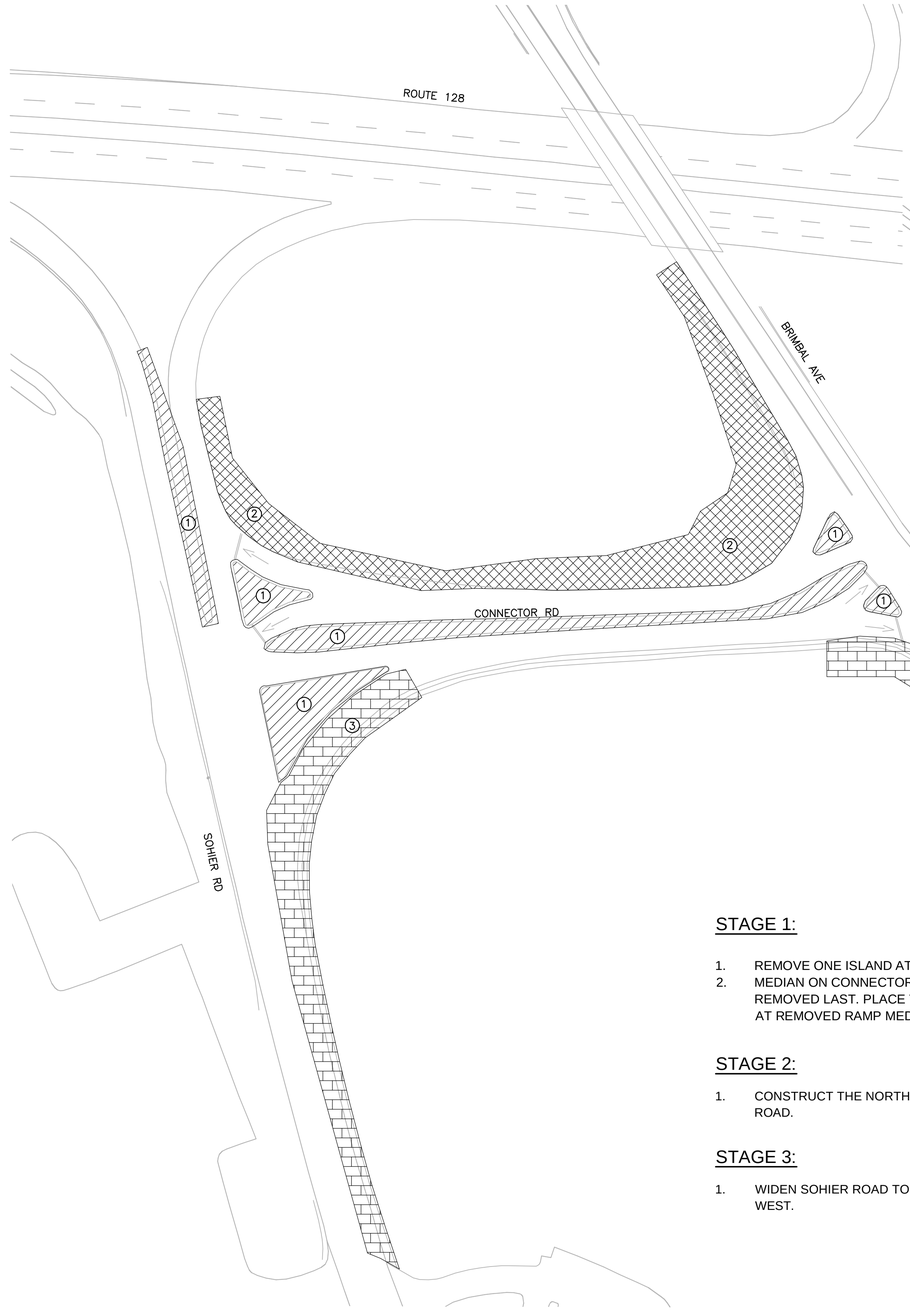
TEMPORARY TRAFFIC CONTROL PLANS
SHEET 2 OF 6



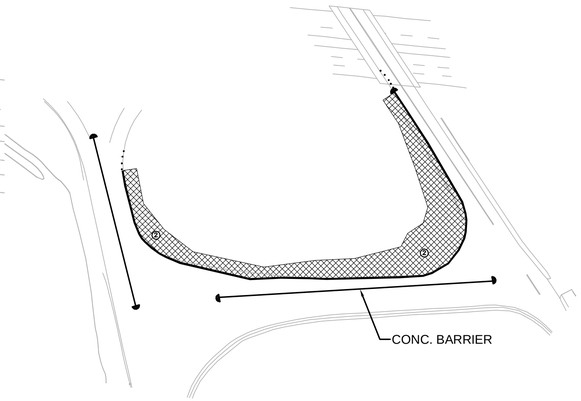
STAGE 1
NTS



STAGE 3
NTS



CONSTRUCTION STAGING PLAN (STAGES 1 - 3)
NTS



STAGE 2
NTS

STAGE 1:

1. REMOVE ONE ISLAND AT A TIME.
2. MEDIAN ON CONNECTOR ROAD AND RAMPS SHOULD BE REMOVED LAST. PLACE TEMPORARY CONCRETE BARRIER AT REMOVED RAMP MEDIAN LOCATION.

STAGE 2:

1. CONSTRUCT THE NORTH SIDE OF THE NEW CONNECTOR ROAD.

STAGE 3:

1. WIDEN SOHIER ROAD TO THE EAST AND BRIMBAL AVE TO THE WEST.

LEGEND

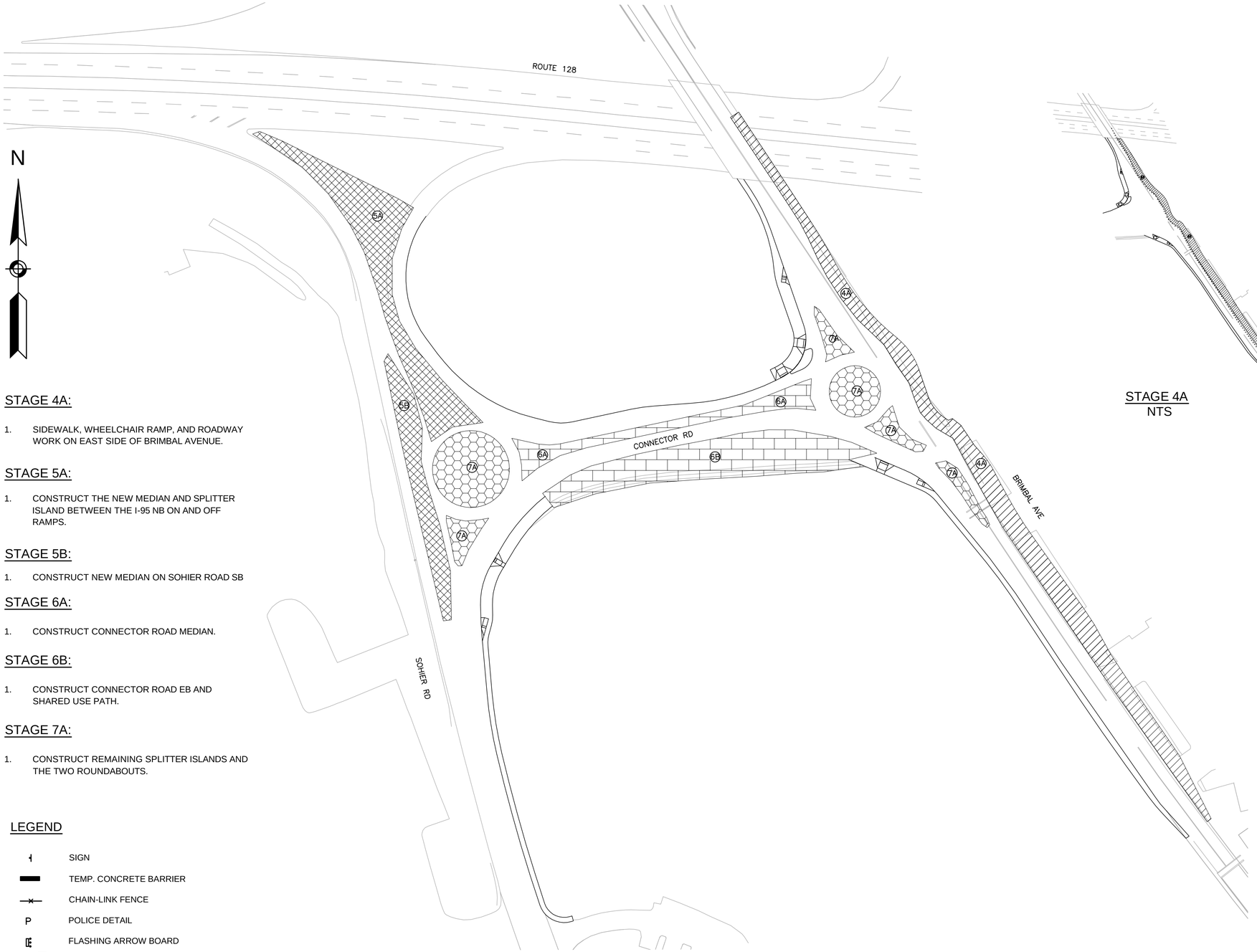
- SIGN
- TEMP. CONCRETE BARRIER
- CHAIN-LINK FENCE
- POLICE DETAIL
- FLASHING ARROW BOARD
- TRUCK MOUNTED ATTENUATOR
- TEMP. IMPACT ATTENUATOR
- DRUM

Jacobs - \\BOSFIL11N\AI_Proj\MHD\200\8E2X4110\Assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Temporary Traffic Control Plans).dwg May 30, 2014
604369_TR(TEMPORARY TRAFFIC CONTROL PLANS).DWG Plotted on 30-May-2014 2:35 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	71	80
PROJECT FILE NO.	604369		

TEMPORARY TRAFFIC CONTROL PLANS
SHEET 3 OF 6



CONSTRUCTION STAGING PLAN (STAGES 1 - 3)
NTS

STAGE 4A:

1. SIDEWALK, WHEELCHAIR RAMP, AND ROADWAY WORK ON EAST SIDE OF BRIMBAL AVENUE.

STAGE 5A:

1. CONSTRUCT THE NEW MEDIAN AND SPLITTER ISLAND BETWEEN THE I-95 NB ON AND OFF RAMPS.

STAGE 5B:

1. CONSTRUCT NEW MEDIAN ON SOHIER ROAD SB

STAGE 6A:

1. CONSTRUCT CONNECTOR ROAD MEDIAN.

STAGE 6B:

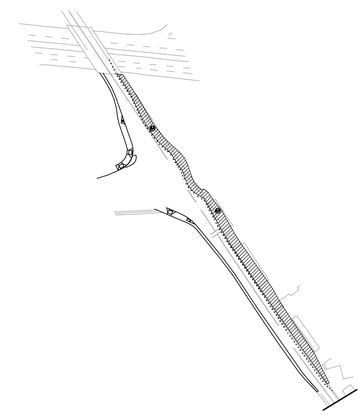
1. CONSTRUCT CONNECTOR ROAD EB AND SHARED USE PATH.

STAGE 7A:

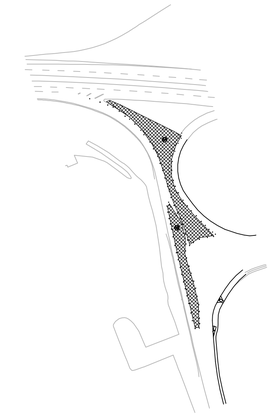
1. CONSTRUCT REMAINING SPLITTER ISLANDS AND THE TWO ROUNDABOUTS.

LEGEND

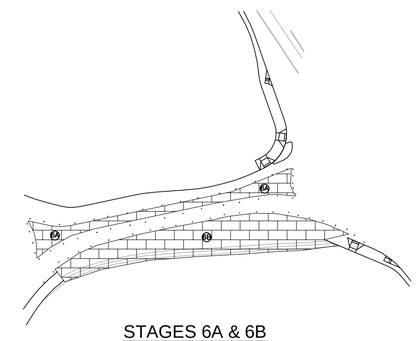
- SIGN
- TEMP. CONCRETE BARRIER
- CHAIN-LINK FENCE
- P POLICE DETAIL
- FLASHING ARROW BOARD
- TRUCK MOUNTED ATTENUATOR
- TEMP. IMPACT ATTENUATOR
- DRUM
- WORK ZONE



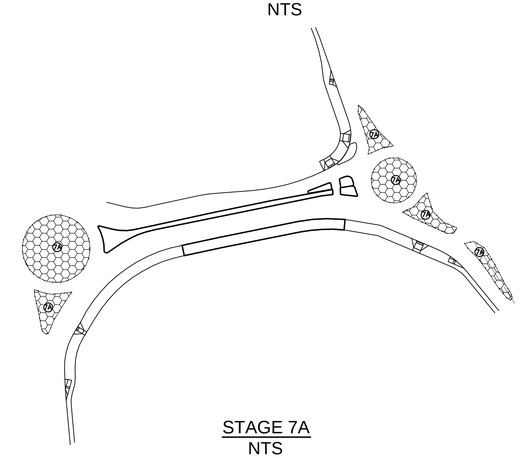
STAGE 4A
NTS



STAGES 5A & 5B
NTS



STAGES 6A & 6B
NTS



STAGE 7A
NTS

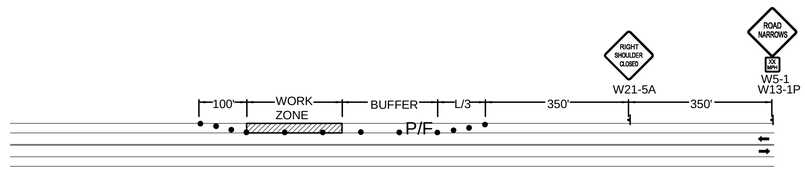
Jacobs - \\BOSFIL11\NA\Proj\MHD\2008\E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Temporary Traffic Control Plans).dwg May 30, 2014

604369_TR(TEMPORARY TRAFFIC CONTROL PLANS).DWG Plotted on 30-May-2014 2:36 PM

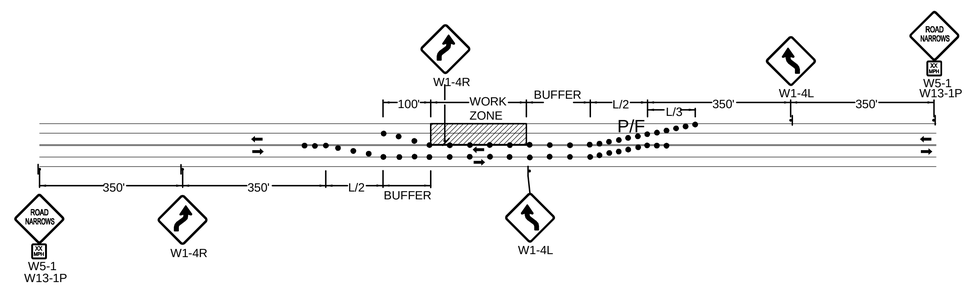
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	72	80
PROJECT FILE NO.	604369		

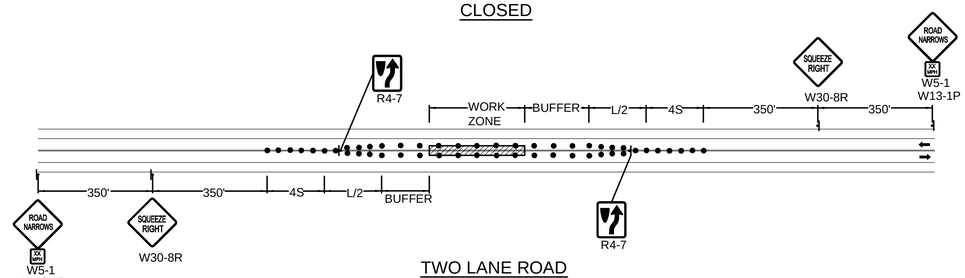
TEMPORARY TRAFFIC CONTROL PLANS
SHEET 4 OF 6



TWO LANE ROAD
SHOULDER CLOSED



TWO LANE ROAD
SHOULDER AND TRAVEL LANE
CLOSED



TWO LANE ROAD
CENTER OF ROAD
CLOSURE

LEGEND

- SIGN
- TEMP. CONCRETE BARRIER
- CHAIN-LINK FENCE
- POLICE DETAIL
- FLASHING ARROW BOARD
- TRUCK MOUNTED ATTENUATOR
- TEMP. IMPACT ATTENUATOR
- DRUM
- WORK ZONE

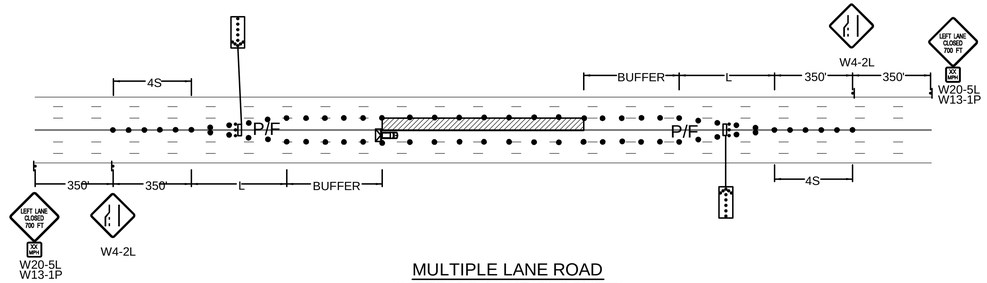
604369_TR(TEMPORARY TRAFFIC CONTROL PLANS).DWG Plotted on 30-May-2014 2:36 PM

Jacobs - \\BOSFILL11\ALPROJ\MHD\2008\E2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Temporary Traffic Control Plans).dwg May 30, 2014

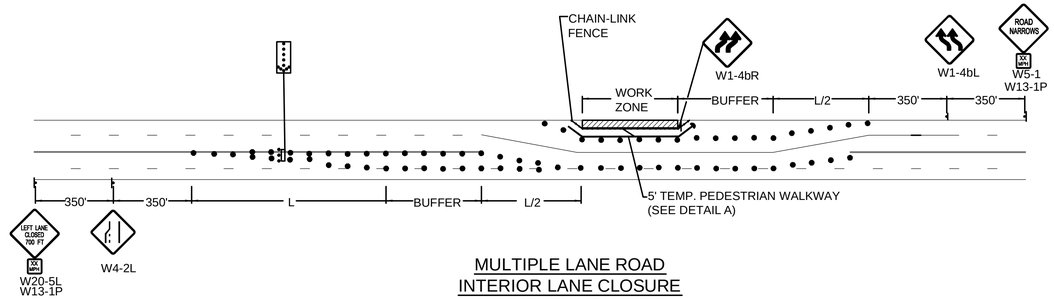
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	73	80
PROJECT FILE NO.	604369		

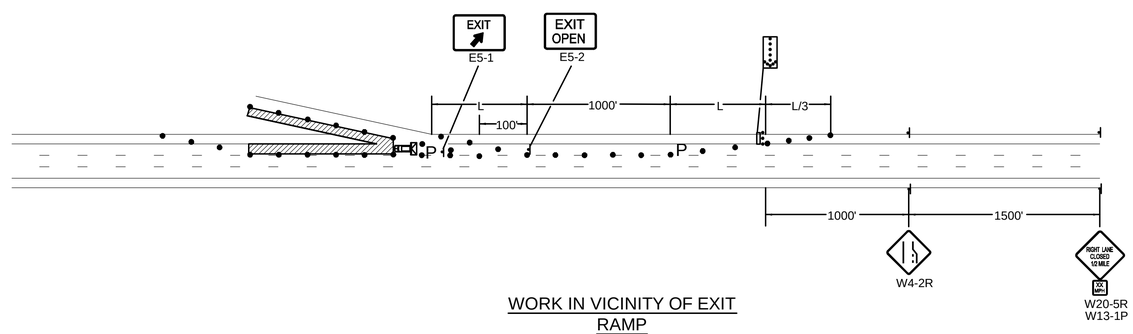
TEMPORARY TRAFFIC CONTROL PLANS
SHEET 5 OF 6



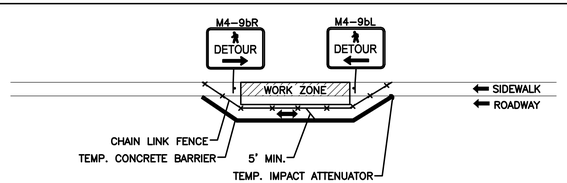
MULTIPLE LANE ROAD
INTERIOR LANE CLOSURE



MULTIPLE LANE ROAD
INTERIOR LANE CLOSURE
W/UNEVEN VOLUMES



WORK IN VICINITY OF EXIT
RAMP



DETAIL A
PEDESTRIAN DETOUR

PEDESTRIAN BYPASS NOTES:

1. ADDITIONAL ADVANCE WARNING SIGNS MAY BE NECESSARY AS DETERMINED BY THE ENGINEER.
2. STREET LIGHTING SHOULD BE CONSIDERED WHEN LOCATING CONTROL DEVICES.
3. PROPOSED TEMPORARY CROSSWALKS SHALL CONSIST OF 12" WHITE SURFACE APPLIED TAPE OR PAINT AS DIRECTED BY THE ENGINEER.
4. TEMPORARY PEDESTRIAN PATHWAYS SHALL BE MAINTAINED IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG), MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (MAAB) REQUIREMENTS, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), INCLUDING THE USE OF TEMPORARY RAMPS AND DETECTABLE BARRIERS.

LEGEND

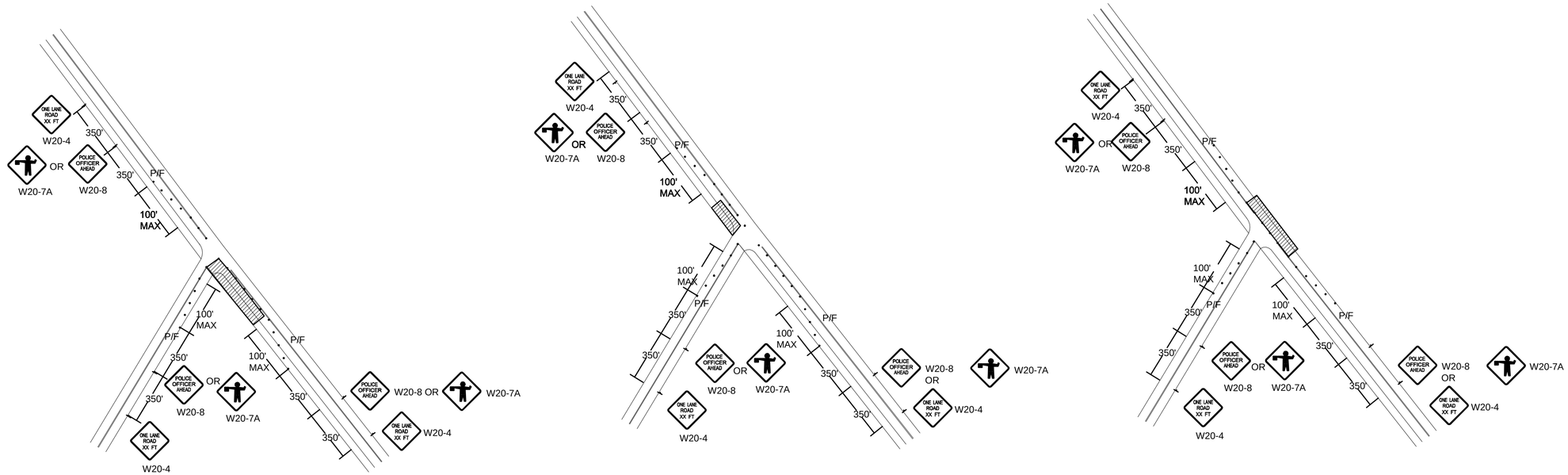
- SIGN
- TEMP. CONCRETE BARRIER
- CHAIN-LINK FENCE
- P — POLICE DETAIL
- FLASHING ARROW BOARD
- TRUCK MOUNTED ATTENUATOR
- TEMP. IMPACT ATTENUATOR
- DRUM
- WORK ZONE

Plotted on 30-May-2014 2:36 PM
604369_TR(TEMPORARY TRAFFIC CONTROL PLANS).DWG
Jacobs - \\BOSFIL11\AL\Proj\MHD\2008\E2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Temporary Traffic Control Plans).dwg May 30, 2014

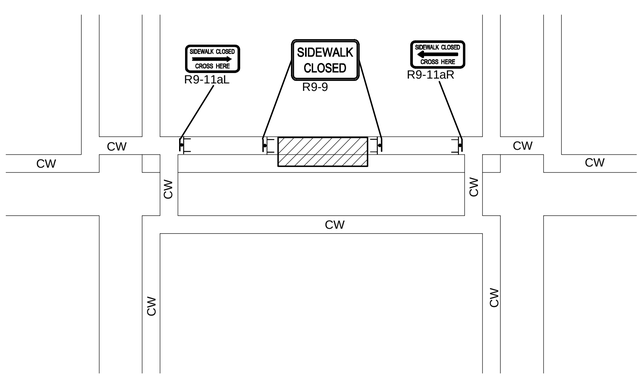
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	74	80
PROJECT FILE NO.	604369		

TEMPORARY TRAFFIC CONTROL PLANS
SHEET 6 OF 6



BRIMBAL AVE AT HERRICK ST
TRAFFIC SIGNAL INSTALLATION



SIDEWALK CLOSED WITH
DETOUR

LEGEND

- SIGN
- TEMP. CONCRETE BARRIER
- CHAIN-LINK FENCE
- P POLICE DETAIL
- FLASHING ARROW BOARD
- TRUCK MOUNTED ATTENUATOR
- TEMP. IMPACT ATTENUATOR
- DRUM
- WORK ZONE

Jacobs - \\BOSFIL11\NA_Proj\MHD\2009\E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Temporary Traffic Control Plans).dwg May 30, 2014
604369_TR(TEMPORARY TRAFFIC CONTROL PLANS).DWG Plotted on 30-May-2014 2:36 PM

CONSTRUCTION SIGN SHEET

IDENTIFI-CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (IN)			NUMBER OF SIGNS REQUIRED	COLOR			UNIT AREA (S.F.)	AREA IN SQUARE FEET
	WIDTH (IN)	HEIGHT (IN)		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER		
W1-4L/R	36	36		(1)	(1)	(1)	4 LEFT 4 RIGHT	ORANGE	BLACK	BLACK	9	72
W1-4bL/R	36	36					2 LEFT 2 RIGHT	ORANGE	BLACK	BLACK	9	36
W4-2L/R	36	36					2 LEFT 2 RIGHT	ORANGE	BLACK	BLACK	9	36
W5-1	36	36					2	ORANGE	BLACK	BLACK	9	18
W13-1P	24	24					8	ORANGE	BLACK	BLACK	4	32
W20-1C	36	36					4	ORANGE	BLACK	BLACK	9	36
W20-4	36	36					3	ORANGE	BLACK	BLACK	9	27
W20-5L	36	36					2	ORANGE	BLACK	BLACK	9	18
W20-8	36	36		(2)	(2)	(2)	3	ORANGE	BLACK	BLACK	9	27
W21-5aR	36	36		(1)	(1)	(1)	2	ORANGE	BLACK	BLACK	9	18
W30-8R	36	36		(1)	(1)	(1)	2	ORANGE	BLACK	BLACK	9	18

NOTES:

1. HIGH INTENSITY ENCAPSULATED LENS REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. THE 2009 "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", THE 1990 "STANDARD DRAWINGS FOR SIGNS AND SUPPORTS", AND ALL AMENDMENTS WILL GOVERN.

2. (1) SEE THE 2009 EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR THE LATEST SPECIFICATIONS ON TEXT DIMENSIONS AND COLOR (ALSO SEE SECTION M9.30.0 TYPE III MASSDOT STANDARD SPECIFICATION).

   (2) SEE MASSDOT SIGN STANDARDS.

Plotted on 30-May-2014 2:36 PM
604369_TR(TEMPORARY TRAFFIC CONTROL PLANS).DWG
Jacobs - \\BOSFIL11\NAL Proj\MHD\200\E2X4110\Assignment-23_beverly brimbal ave\DWG\604369_TR(Temporary Traffic Control Plans).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	76	80
PROJECT FILE NO.	604369		

CONSTRUCTION SIGN SUMMARY
SHEET 2 OF 2

CONSTRUCTION SIGN SHEET

IDENTIFI-CATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS (IN)			NUMBER OF SIGNS REQUIRED	COLOR			UNIT AREA (S.F.)	AREA IN SQUARE FEET
	WIDTH (IN)	HEIGHT (IN)		LETTER HEIGHT	VERTICAL SPACING	ARROW RTE. MKR.		BACK-GROUND	LEGEND	BORDER		
R2-10A	48	36	WORK ZONE / SPEEDING FINES / DOUBLED	(2)	(2)	(2)	4	WHITE	BLACK	BLACK	12	48
R2-10E	36	48	END ROAD WORK / DOUBLE FINES END	(2)	(2)	(2)	4	ORANGE	BLACK	BLACK	12	48
R4-7	24	30		(1)	(1)	(1)	2	WHITE	BLACK	BLACK	5	10
R9-9	24	12	SIDEWALK CLOSED				2	WHITE	BLACK	BLACK	2	4
R9-11aL/R	24	12	SIDEWALK CLOSED / CROSS HERE				1 LEFT 1 RIGHT	WHITE	BLACK	BLACK	2	4
E5-1	48	36	EXIT				1	GREEN	WHITE	WHITE	12	12
E5-2	48	36	EXIT OPEN				1	ORANGE	BLACK	BLACK	12	12
M4-9BL	30	24	DETOUR				1	ORANGE	BLACK	BLACK	5	5
M4-9BR	30	24	DETOUR				1	ORANGE	BLACK	BLACK	5	5

NOTES:

1. HIGH INTENSITY ENCAPSULATED LENS REFLECTIVE SHEETING SHALL BE USED FOR ALL SIGNS. THE 2009 "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", THE 1990 "STANDARD DRAWINGS FOR SIGNS AND SUPPORTS", AND ALL AMENDMENTS WILL GOVERN.

2. (1) SEE THE 2009 EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR THE LATEST SPECIFICATIONS ON TEXT DIMENSIONS AND COLOR (ALSO SEE SECTION M9.30.0 TYPE III MASSDOT STANDARD SPECIFICATION).

   (2) SEE MASSDOT SIGN STANDARDS.

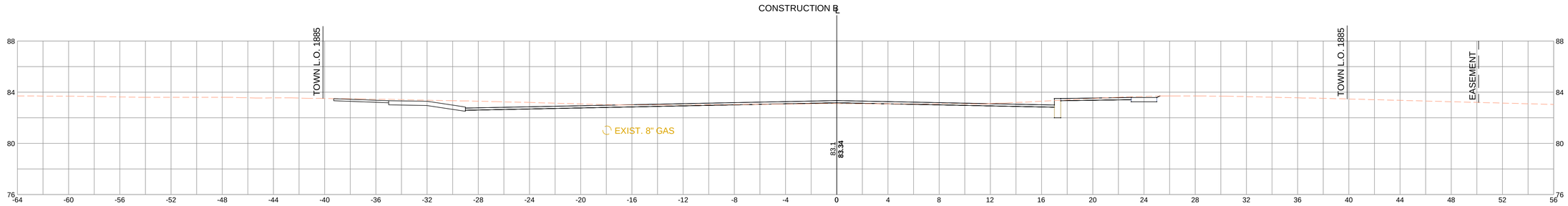
604369_TR(TEMPORARY TRAFFIC CONTROL PLANS).DWG Plotted on 30-May-2014 2:36 PM

Jacobs - \\BOSFILL11\NA_Proj\MHD\200\9E2X4110\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_TR(Temporary Traffic Control Plans).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	77	80
PROJECT FILE NO.	604369		

CRITICAL CROSS SECTIONS
BRIMBAL AVENUE



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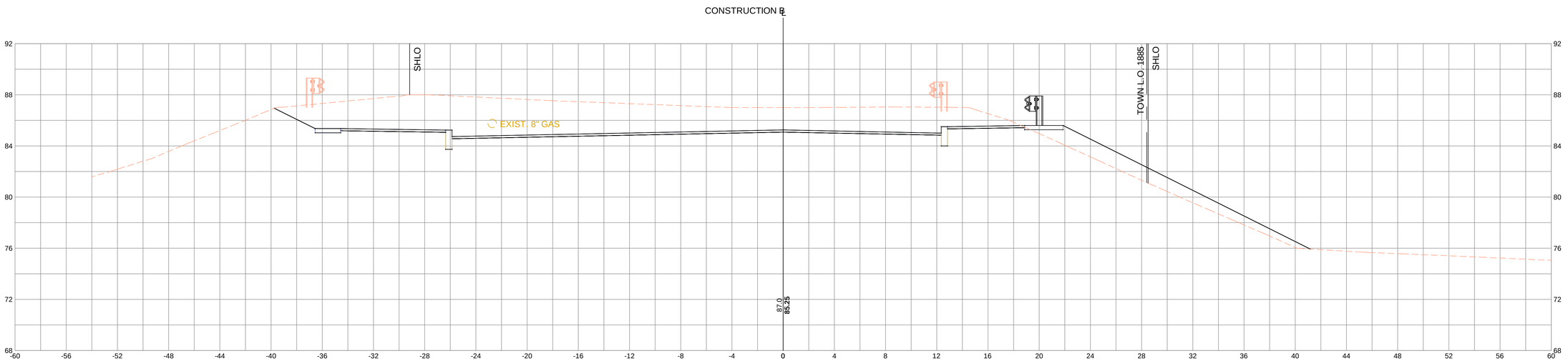

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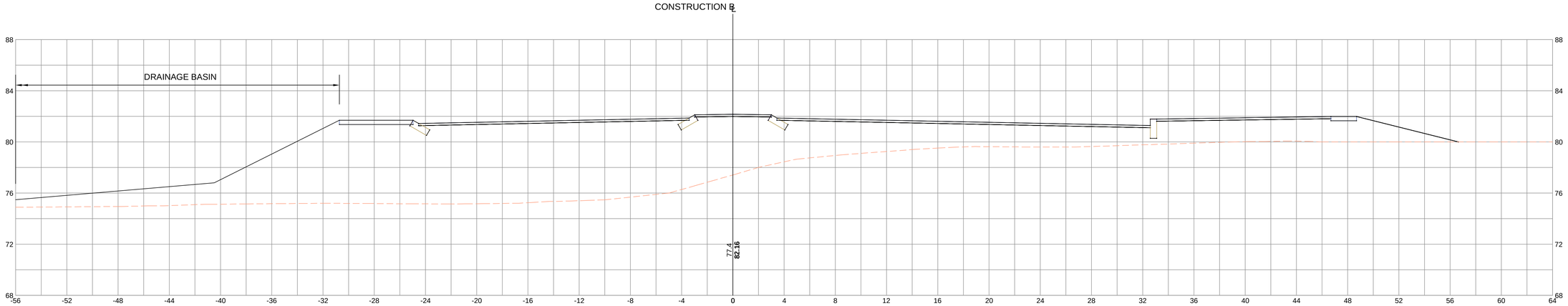
0 4 10 20
SCALE IN FEET

Jacobs - \\BOSFIL11\NA\Proj\MHD\208\E2X41100\assignment-23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Critical Sections).dwg May 30, 2014
604369_HD(CRITICAL SECTIONS).DWG Plotted on 30-May-2014 2:40 PM

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	78	80
PROJECT FILE NO.	604369		

CRITICAL CROSS SECTIONS
CONNECTOR ROAD



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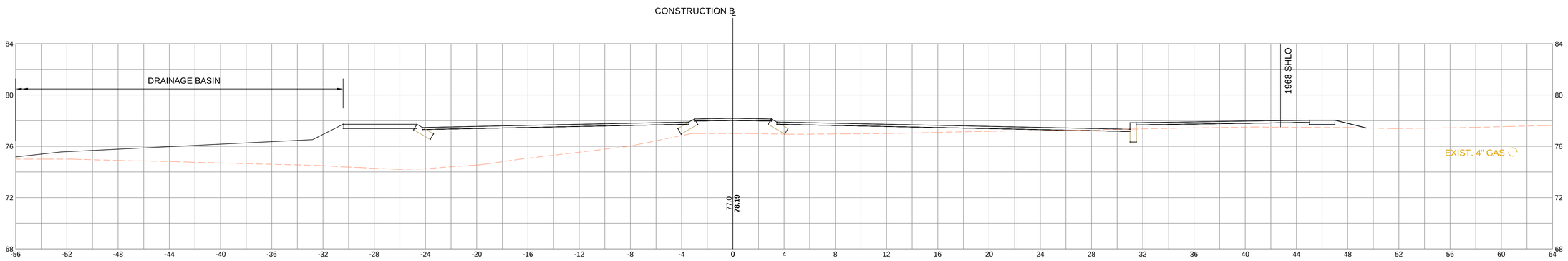

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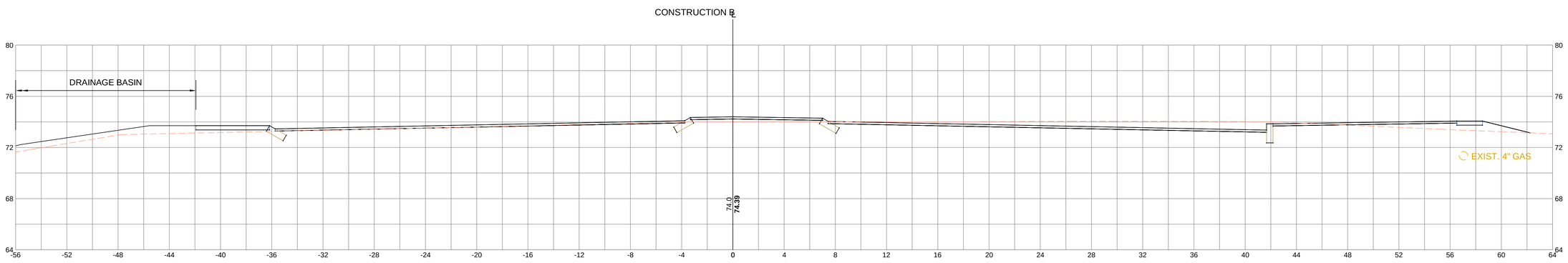

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SCALE IN FEET

Plotted on 30-May-2014 2:40 PM
604369_HD(CRITICAL SECTIONS).DWG

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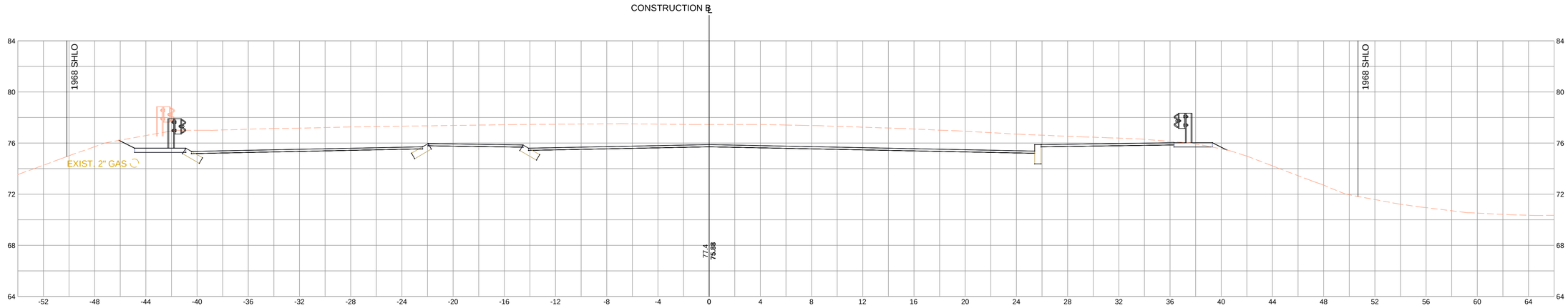
BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	79	80
PROJECT FILE NO.	604369		

CRITICAL CROSS SECTIONS
SOHIER ROAD



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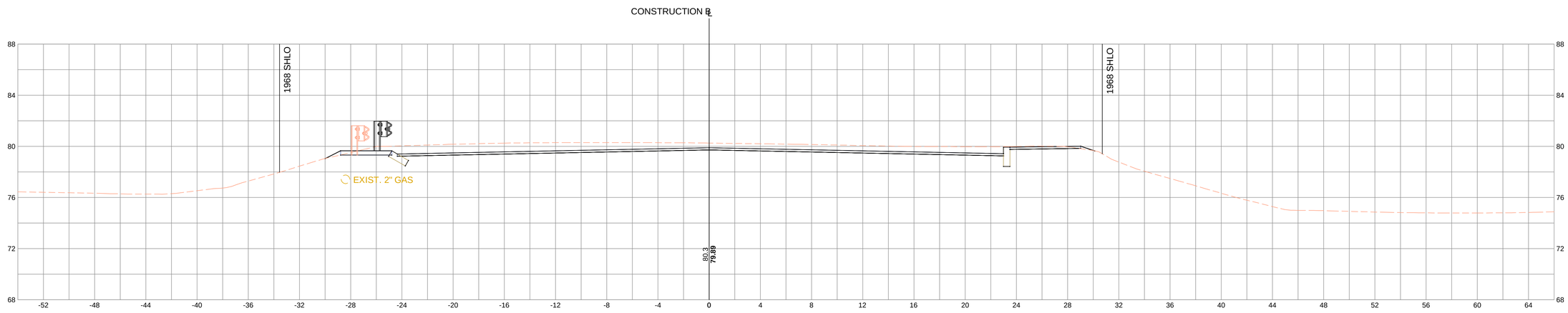

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SCALE IN FEET

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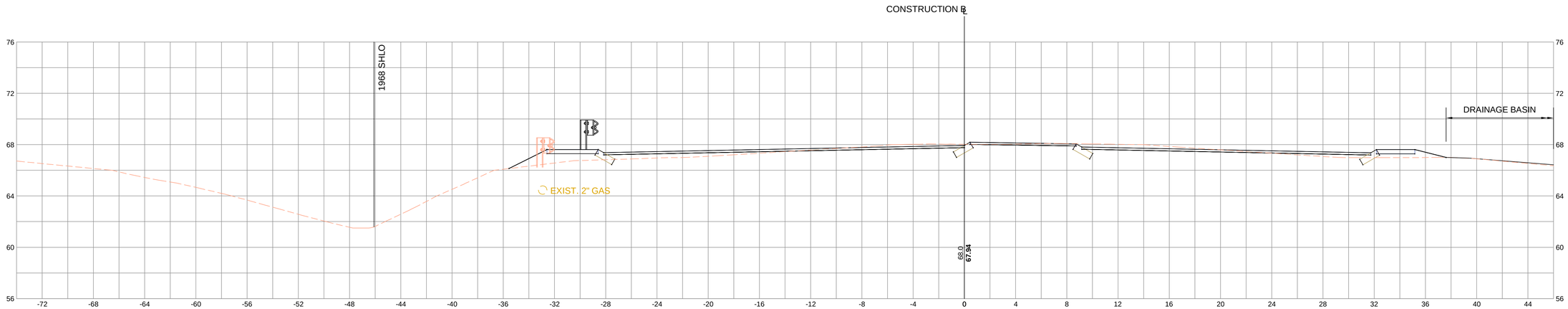
Jacobs - \\BOSFIL11\NA\Proj\MHD\200\E2X4110\Assignment-2-3_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Critical Sections).dwg May 30, 2014

BEVERLY
BRIMBAL AVE, EXIT 19/ROUTE 128

STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
MASS.	-	80	80
PROJECT FILE NO.	604369		

CRITICAL CROSS SECTIONS
SOHIER ROAD



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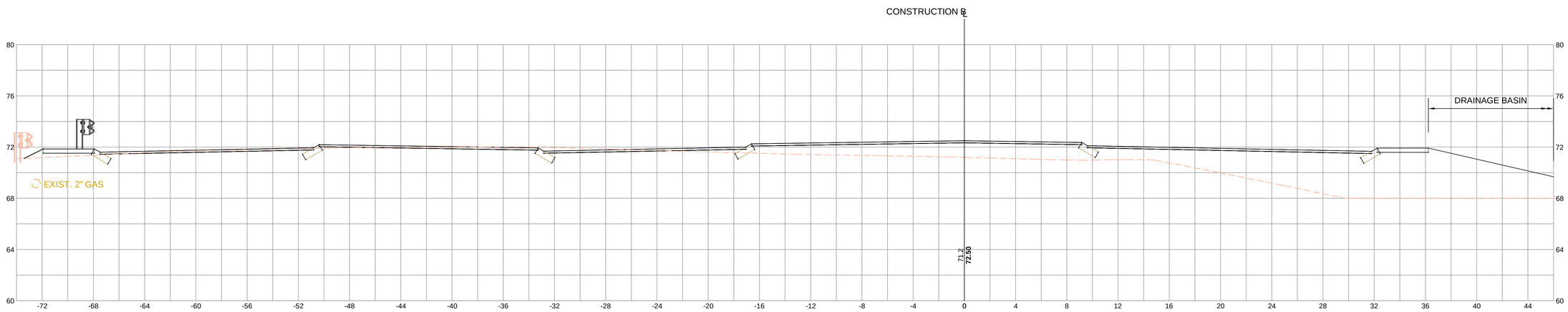

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604369_HD(CRITICAL SECTIONS).DWG

Jacobs : \\BOSFIL11\NA_Proj\MHD\200\E2X4110\assignment 23_beverly brimbal ave 2014\604369 (beverly brimbal avenue)\DWG\604369_HD(Critical Sections).dwg May 30, 2014