# ROBINSON ROAD ROADWAY IMPROVEMENTS

IN THE TOWN OF

## LEXINGTON, MASSACHUSETTS
## MIDDLESEX COUNTY
## CONTRACT NO. 14-52

**INDEX**


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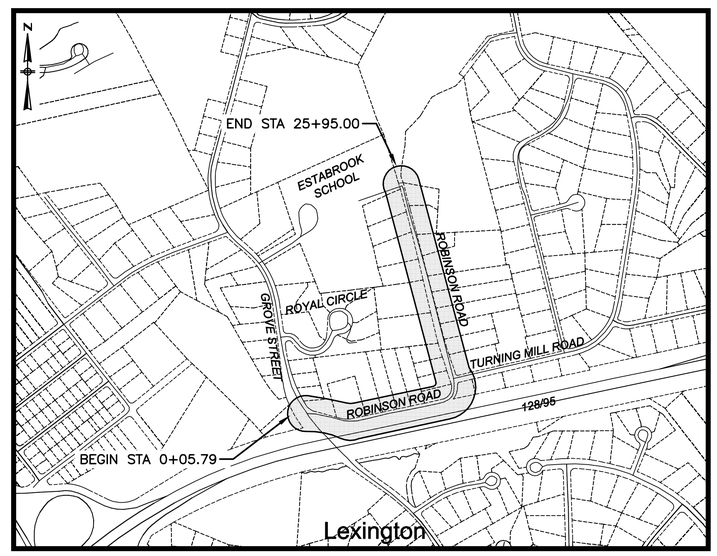


PROJECT LOCATION

**LOCUS MAP**
NOT TO SCALE

LENGTH OF PROJECT : 2,589 FT = 0.49 MILES

ALL WORK DONE UNDER THIS CONTRACT SHALL BE IN CONFORMANCE WITH THE 1988 MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES, THE SUPPLEMENTAL SPECIFICATIONS DATED JUNE 15, 2012; THE AMENDMENTS TO THE STANDARD AND SUPPLEMENTAL SPECIFICATIONS; THE MARCH 2012 CONSTRUCTION STANDARD DETAILS; THE 2009 "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" (MUTCD) WITH LATEST REVISIONS; THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS: THE 1968 "STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING"; AND THE LATEST EDITION OF AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z-60.1) WILL GOVERN.

COMMONWEALTH OF MASSACHUSETTS
DARSHAN N. JHAVERI
CIVIL
No. 41441
REGISTERED PROFESSIONAL ENGINEER
5/14/2014

**PREPARED BY:**


BETA Group, Inc.
Engineers • Planners • Landscape Architects • Scientists
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O:\4200s\4212 – Estabrook Area Roadway Improvements\Drawing Files\Plan Set\Robinson Road\4212 Cover.dwg

# LEGEND

## GENERAL SYMBOLS

| EXISTING | PROPOSED | |
|---|---|---|
| | | CURB OR BERM (TYPE AS NOTED) |
| | | EDGE OF PAVEMENT |
| | | CATCH BASIN (OR GUTTER INLET, LEACHING BASIN, DROP INLET, CATCH BASIN CURB INLET) |
| CB | CB | ELECTRIC HANDHOLE (NUMBER AS NOTED) |
| EHH | EHH | ELECTRIC MANHOLE |
| E | EMH | TELEPHONE MANHOLE |
| T | TMH | WATER MANHOLE |
| W | WMH | SEWER MANHOLE |
| S | SMH | DRAINAGE MANHOLE |
| GG | GGH | GAS GATE |
| WG | WG | WATER GATE |
| CS | CS | CURB STOP |
| HYD | HYD. | HYDRANT |
| FA | FAB | FIRE ALARM BOX |
| PM | PM | PARKING METER |
| LP | LP | STREET LIGHT POLE |
| UP | | UTILITY POLE |
| | | SIGN |
| GUY | GUY | GUY POLE |
| 12" RCP D | 10'-12" RCP D | DRAIN PIPE (SIZE AS NOTED) |
| 8" VCP S | 10'-8" PVC S | SEWER MAIN (SIZE AS NOTED) |
| E | | ELECTRIC DUCT |
| 4" HP G | 10'-4" HP G | GAS MAIN (SIZE AS NOTED) |
| 8" CI W | 8" DI W | WATER MAIN (SIZE AS NOTED) |
| T | T | TELEPHONE DUCT (SIZE AS NOTED) |
| CTV | CTV | CABLE TELEVISION LINE |
| | ECB | EROSION CONTROL BARRIER |
| MB | | MAIL BOX |
| | | WOOD GUARD RAIL STEEL BEAM GUARD, WOOD OR STEEL POSTS (TYPE AS NOTED) |
| | | STEEL GUARD RAIL, STEEL POSTS (TYPE NOTED) |
| | | STONE WALL |
| | | RETAINING WALL (TYPE NOTED) |
| BND | BND | HIGHWAY/PROPERTY BOUND (TYPE AS NOTED) |
| S.H.L.L. (Date of Layout) | | STATE HIGHWAY LAYOUT LINE (S.H.L.L.) |
| | | CITY, TOWN OR COUNTY LAYOUT LINE (R.O.W.) |
| Boundary Name | | CITY, TOWN, COUNTY OR STATE BOUNDARY LINE |
| ℄ | | PROPERTY LINE |
| | | EASEMENT LINE (TYPE NOTED) |
| | 2+00 | CONSTRUCTION BASELINE |
| N00°00'00"E 000.00' | | SURVEY LINE |
| | | RAILROAD OR STREET RAILWAY TRACKS WITH SIDELINES |
| | | WHEELCHAIR RAMP |
| 4" TREE | | TREE (SIZE AND TYPE AS NOTED) |
| | | HEDGE |
| x x x | x x x | FENCE (SIZE AND TYPE AS NOTED) |
| PM | P | PARKING PAY STATION |
| B | B | BENCH (4' OR 6') |
| | | BICYCLE RACK |
| | | TRASH RECEPTACLE |
| | | WOODED AREA / LIMIT OF CLEARING |
| x 00.0 | x 00.00 | SPOT GRADE |
| | | SAW CUT LINE |
| | TP-1 | TEST PIT |
| | C-1 | BORING |
| BM | | BENCHMARK |

# ABBREVIATIONS

## GENERAL

| | | | |
|---|---|---|---|
| ABAN. | ABANDON | SDWK. | SIDEWALK |
| ADJ. | ADJUST | SB | SOUTH BOUND OR STONE BOUND |
| AADT | ANNUAL AVERAGE DAILY TRAFFIC | S.H.L.O. | STATE HIGHWAY LAYOUT LINE |
| APPROX. | APPROXIMATE | STA. | STATION |
| ℄ | BASELINE | ST. | STREET |
| BM | BENCH MARK | SSD | STOPPING SIGHT DISTANCE |
| BIT. | BITUMINOUS | TAN | TANGENT |
| B.B. | BITUMINOUS BERM | T | TANGENT DISTANCE OF CURVE/TRUCK PERCENTAGE |
| B.C. | BITUMINOUS CURB | TEB | TEMPORARY EASEMENT BOUNDARY |
| BOS | BOTTOM OF SLOPE | TEMP. | TEMPORARY |
| BOW | BOTTOM OF WALL | TOS | TOP OF SLOPE |
| BD OR BND | BOUND | TOW | TOP OF WALL |
| BLDG. | BUILDING | TP | TURNING POINT |
| CEM. | CEMENT | TYP. | TYPICAL |
| ℄ | CENTER LINE | VERT. | VARIABLE |
| CLF | CHAIN LINK FENCE | VAR. | VERTICAL |
| CONC. | CONCRETE | VC | VERTICAL CURVE |
| C.C. | CONCRETE CURB | VGC | VERTICAL GRANITE CURB |
| CONT. | CONTINUOUS | WB | WEST BOUND |
| CONST. | CONSTRUCTION | WCR | WHEELCHAIR RAMP |
| CO. | COUNTY | WD | WOOD |
| D | DELTA ANGLE (CENTRAL ANGLE OF HORIZ. CURVE) | | |
| DHV | DESIGN HOURLY VOLUME | | |
| DWY. | DRIVEWAY | | |
| EB | EAST BOUND | | |
| E.P., E.O.P. | EDGE OF PAVEMENT | | |
| EL. | ELEVATION | | |
| E.T.W. | EDGE OF TRAVEL WAY | | |
| EXIST. | EXISTING | | |
| FLDSTN | FIELDSTONE | | |
| FDN. | FOUNDATION | | |
| GAR. | GARAGE | | |
| GRAN. | GRANITE | | |
| G.C. | GRANITE CURB | | |
| G.E. | GRANITE EDGING | | |
| GRAV. | GRAVEL | | |
| GD | GROUND | | |
| HOR. | HORIZONTAL | | |
| HMA | HOT MIX ASPHALT | | |
| HO | HOUSE | | |
| IP | IRON PIPE | | |
| JCT | JUNCTION | | |
| LT. | LEFT | | |
| L | LENGTH OF CURVE | | |
| LP | LOW POINT | | |
| MB | MAIL BOX | | |
| MHB | MASSACHUSETTS HIGHWAY BOUND | | |
| MAX. | MAXIMUM | | |
| MIN. | MINIMUM | | |
| NB | NORTH BOUND | | |
| N.T.S. | NOT TO SCALE | | |
| O.C. | ON CENTER | | |
| PVMT. | PAVEMENT | | |
| PEB | PERMANENT EASEMENT BOUNDARY | | |
| P.S.B. | PLANTABLE SOIL BORROW | | |
| PCC | POINT OF COMPOUND CURVATURE | | |
| PC | POINT OF CURVATURE | | |
| PRC | POINT OF REVERSE CURVATURE | | |
| PI | POINT OF INTERSECTION | | |
| PT | POINT OF TANGENCY | | |
| PVC | POINT OF VERTICAL CURVATURE | | |
| PVI | POINT OF VERTICAL INTERSECTION | | |
| PVT | POINT OF VERTICAL TANGENCY | | |
| PGL | PROFILE GRADE LINE | | |
| PROJ. | PROJECT | | |
| ℄ OR PROP. LINE | PROPERTY LINE | | |
| PROP. | PROPOSED | | |
| R | RADIUS OF CURVATURE | | |
| RR | RAILROAD | | |
| R&D | REMOVE & DISCARD | | |
| REM. | REMOVE | | |
| REMOD. | REMODEL | | |
| RET. | RETAINING | | |
| R&R | REMOVE AND RESET | | |
| R&S | REMOVE AND STACK | | |
| RT. | RIGHT | | |
| ROW OR R/W | RIGHT-OF-WAY | | |
| RD. | ROAD | | |
| SHT. | SHEET | | |
| SHLDR | SHOULDER | | |

## TRAFFIC SIGNAL SYSTEMS

| | |
|---|---|
| R | STEADY CIRCULAR RED |
| Y | STEADY CIRCULAR AMBER |
| G | STEADY CIRCULAR GREEN |
| FR | FLASHING CIRCULAR RED |
| FY | FLASHING CIRCULAR AMBER |
| G | STEADY GREEN VERTICAL ARROW |
| -R | STEADY RED RIGHT ARROW |
| -Y | STEADY AMBER RIGHT ARROW |
| -G | STEADY GREEN RIGHT ARROW |
| R- | STEADY RED LEFT ARROW |
| Y- | STEADY AMBER LEFT ARROW |
| G- | STEADY GREEN LEFT ARROW |
| W | STEADY WALK (PERSON WALKING) - LUNAR WHITE |
| DW | STEADY DON'T WALK (HAND) - PORTLAND ORANGE |
| FDW | FLASHING DON'T WALK (FLASHING HAND) - PORTLAND ORANGE |

## UTILITIES

| | |
|---|---|
| ACCMP | ASPHALT COATED CORRUGATED METAL PIPE |
| CB | CATCH BASIN |
| CBCI | CATCH BASIN WITH CURB INLET |
| CIP | CAST IRON PIPE |
| CIT | CHANGE IN TYPE |
| CL. | CLASS (PIPE, CONCRETE, EXCAVATION, ETC.) |
| COND. | CONDUIT |
| CAP | CORRUGATED ALUMINUM PIPE |
| CMP | CORRUGATED METAL PIPE |
| CPP | CORRUGATED PLASTIC PIPE |
| CSP | CORRUGATED STEEL PIPE |
| CULV. | CULVERT |
| CI | CURB INLET |
| DI | DROP INLET |
| DIP | DUCTILE IRON PIPE |
| EL. (OR ELEV.) | ELEVATION |
| FM | FORCE MAIN |
| F&C | FRAME AND COVER |
| F&G | FRAME AND GRATE |
| GIP | GALVANIZED IRON PIPE |
| GG | GAS GATE |
| GI | GUTTER INLET |
| GICI | GUTTER INLET WITH CURB INLET |
| HDW | HEADWALL |
| HYD. | HYDRANT |
| INV. | INVERT ELEVATION |
| L.P. | LIGHT POLE |
| MH | MANHOLE |
| PVC | POLY-VINYL-CHLORIDE PIPE |
| PWW | PAVED WATER WAY |
| RCP | REINFORCED CONCRETE PIPE (CLASS III UNLESS NOTED) |
| SMH | SEWER MANHOLE |
| SD | SUBDRAIN |
| TSV&B | TAPPING SLEEVE, VALVE AND BOX |
| TS | TRAFFIC SIGNAL |
| TSC | TRAFFIC SIGNAL CONDUIT |
| UP | UTILITY POLE |
| VCP | VITRIFIED CLAY PIPE |
| WG | WATER GATE |
| WM | WATER METER/WATER MAIN |
| WIP | WROUGHT IRON PIPE |

# TRAFFIC SIGNAL SYMBOLS

| EXISTING | PROPOSED | |
|---|---|---|
| | | CONTROL CABINET GROUND MOUNTED WITH FOUNDATION |
| | | CONTROL CABINET POLE MOUNTED |
| | ø2 | CONTROLLER PHASE |
| | MA-1 | MAST ARM, SHAFT & BASE (ARM LENGTH AS NOTED) |
| | | VEHICULAR SIGNAL HEAD (ALPHA-NUMERIC DESIGNATION AS NOTED) |
| | | VEHICULAR SIGNAL HEAD, OPTICALLY PROGRAMMED |
| | | VEHICULAR SIGNAL HEAD (REMOVED & RESET) |
| | | FLASHING BEACON |
| | | PEDESTRIAN SIGNAL HEAD |
| | | PEDESTRIAN SIGNAL HEAD, OPTICALLY PROGRAMMED |
| HH | | PULL BOX 12"x12" OR HANDHOLE |
| LOOP | | LOOP DETECTOR |
| | | PEDESTRIAN PUSH BUTTON (DIRECTION NOTED) |
| | | PRE-EMPTION DETECTOR |
| | | PRE-EMPTION CONFIRMATION STROBE |
| | | SIGNAL CONDUIT (SINGLE RUN) |
| | | SIGNAL CONDUIT (DOUBLE RUN) |
| | | SIGNAL POST & BASE |
| M | M | MAGNETIC DETECTOR |
| | | SCHOOL ZONE SPEED LIMIT SIGN |
| | | MICROWAVE OR ULTRASONIC DETECTOR |
| | | VIDEO DETECTION CAMERA |
| | | VIDEO DETECTION ZONE |

# PAVEMENT MARKINGS AND SIGNING SYMBOLS

## PROPOSED

| | |
|---|---|
| CW | CROSSWALK, 2 - 12" WHITE LINES |
| SL | STOP LINE - 12" WHITE LINE 4' BEHIND CW (TYP.) |
| SWEL | SOLID WHITE EDGE LINE - 4" |
| SWCHEV | SOLID WHITE CHEVRON LINES 12", (SPACING NOTED) |
| SWGL | SOLID WHITE GORE LINE 12" @ 33°, (SPACING NOTED) |
| SWL | SOLID WHITE LINE |
| SWLL | SOLID WHITE LANE LINE - 4" |
| SWPL | SOLID WHITE PARKING LINE - 4" |
| SYPL | SOLID YELLOW PARKING LINE - 4" |
| BWLL | BROKEN WHITE LANE LINE - 4" |
| BWGL | BROKEN WHITE GUIDE LINE - 4" (2' LINE & 4' GAP) |
| BYCL | BROKEN YELLOW CENTERLINE - 4" |
| BYLL | BROKEN YELLOW LANE LINE - 4" |
| DYCL | DOUBLE YELLOW CENTERLINE - 2 - 4" LINES |
| BYGL | BROKEN YELLOW GUIDE LINE - 4" (2' LINE & 4' GAP) |
| SYEL | SOLID YELLOW EDGE LINE - 4" |
| SYGL | SOLID YELLOW GORE LINE 12" @ 33°, (SPACING NOTED) |
| SYLL | SOLID YELLOW LANE LINE - 4" |
| SCHOOL | SCHOOL ZONE - WHITE |
| | HANDICAP SYMBOL - WHITE |
| | PAVEMENT ARROW - WHITE |
| ONLY | LEGEND "ONLY" - WHITE |

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

DRAWN BY: KY
DESIGNED BY: DJ
CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS DARSHAN N. JHAVERI CIVIL No. 41441 REGISTERED PROFESSIONAL ENGINEER

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SCALE: NOT TO SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

**Robinson Road Roadway Improvements**

**LEGEND**

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 09, 2014 3:14pm
ISSUE DATE 05/14/2014
SHEET 2 OF 29

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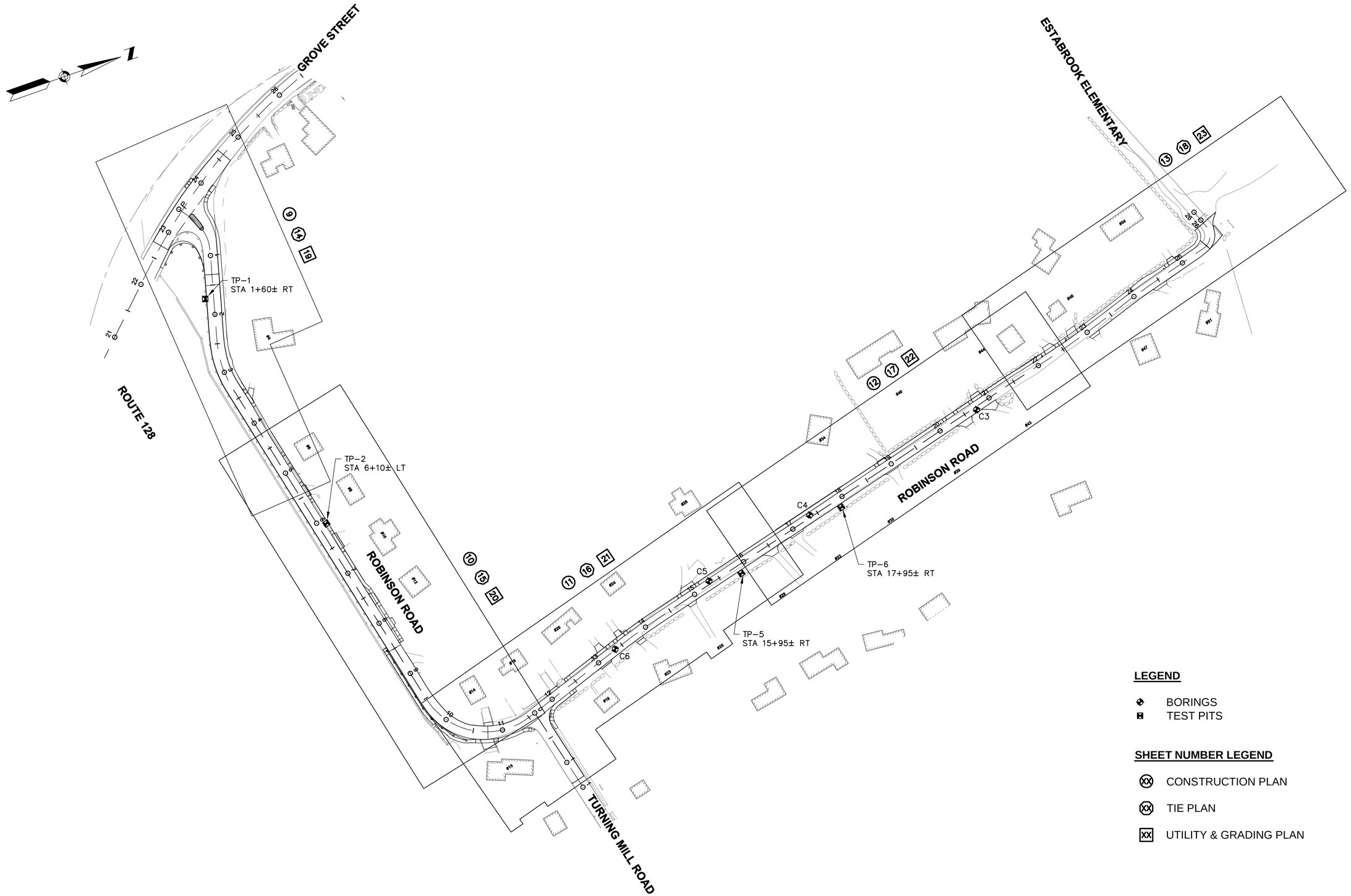


**LEGEND**

- BORINGS
- TEST PITS

**SHEET NUMBER LEGEND**

- (XX) CONSTRUCTION PLAN
- (XX) TIE PLAN
- [XX] UTILITY & GRADING PLAN

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

DRAWN BY: VV

DESIGNED BY: DJ

CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS
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SCALE:
75 0 75 150
SCALE IN FEET: 1"=75'

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

**Robinson Road Roadway Improvements**

# KEY PLAN

**Lexington, Massachusetts**

CONTRACT NO. 14-52

PLOT DATE: May. 09, 2014 3:14pm

ISSUE DATE 05/14/2014

SHEET 3 OF 29

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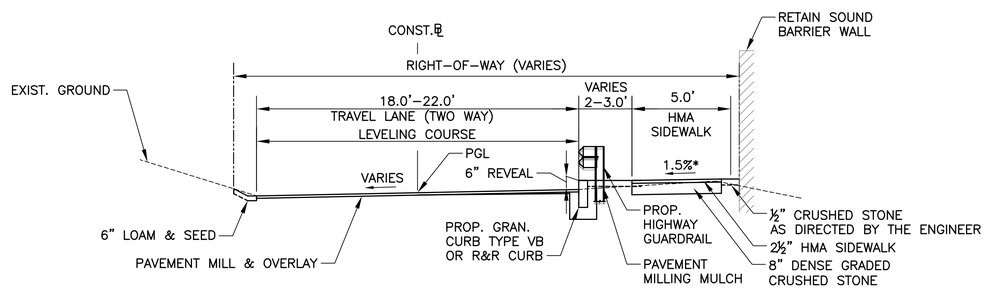
## GENERAL NOTES

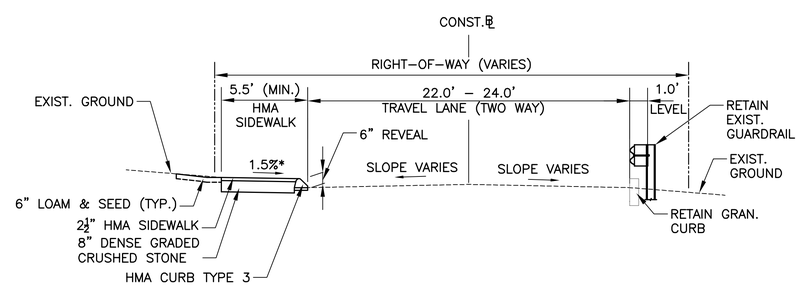
1. THE LOCATION OF SUBSURFACE UTILITIES SHOWN IS APPROXIMATE AND NOT GUARANTEED TO BE COMPLETE OR ACCURATE. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND ELEVATIONS OF EXISTING UTILITY LINES AND STRUCTURES PRIOR TO COMMENCEMENT OF WORK. THE CONTRACTOR MUST NOTIFY DIG SAFE PRIOR TO ANY EXCAVATION, DEMOLITION OR EXPLOSION WORK IN PUBLIC OR PRIVATE WAYS OR UTILITY COMPANY RIGHT-OF-WAY OR EASEMENT.
2. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE ENGINEER FOR THE RESOLUTION OF THE CONFLICT.
3. THE CONTRACTOR SHALL ALTER THE MASONRY OF THE TOP SECTION OF ALL EXISTING DRAINAGE AND SANITARY STRUCTURES AS NECESSARY FOR THE CHANGES IN GRADE, AND RESET ALL WATER, SEWER, AND DRAINAGE FRAMES, GRATES AND BOXES TO THE PROPOSED FINISH SURFACE GRADE. REQUIRED NEW MASONRY SHALL BE CLAY BRICK CONFORMING TO M4.05.2.
4. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE, CABLE TV, FIRE ALARM AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES. ALL UTILITY CASTING SHALL BE ADJUSTED TO FINISH GRADE BY THEIR RESPECTIVE OWNERS.
5. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
6. THE TERM "PROPOSED" (PROP.) MEANS WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET" (R&R).
7. JOINTS BETWEEN NEW BITUMINOUS CONCRETE ROADWAY PAVEMENT AND SAWCUT EXISTING PAVEMENT SHALL BE SEALED WITH BITUMEN AND BACKSANDED.
8. FRAMES AND GRATES/COVERS FOR PROPOSED DRAINAGE STRUCTURES SHALL BE LEXINGTON TOWN STANDARD.
9. CATCH BASIN AND MANHOLE FRAMES AND GRATES/COVERS SHALL CLEARLY ALIGN WITH THE OPENINGS IN THE PRECAST STRUCTURES AND THE GRADE OF THE ROADWAY.
10. WHERE DRAINAGE PIPES OR STRUCTURES ARE ABANDONED IN PLACE THE CONTRACTOR SHALL MAKE SURE THAT ALL CONNECTING PIPES, INLETS AND OUTLETS ARE PLUGGED. ALL LIVE CONNECTIONS SHALL BE CONNECTED TO THE NEW SYSTEM.
11. ALL CURB TIE DIMENSIONS ARE TO THE FACE OF THE CURB (GUTTER LINE) OR EDGE OF TRAVEL WAY.
12. CONSTRUCTION BASELINE TIES ARE SHOWN ON TIE PLANS.
13. IN ALL LOCATIONS WHERE PROPOSED SIDEWALK TRANSITIONS DOWN TO MEET EXISTING GRADE, EXISTING SIDEWALK OR PAVED AREA, SLOPE SHALL NOT EXCEED 1:12.
14. THE LOCATION OF THE PROPOSED DRIVEWAY OPENINGS ARE SHOWN ON PLANS. EXACT LOCATIONS MAY BE ADJUSTED IF NECESSARY OR AS REQUIRED BY THE ENGINEERS IN THE FIELD.
15. CONTRACTOR SHALL VERIFY LOCATION OF ALL OBJECTS (SIGNS, TREES, GRATE, POLES ETC.) TO BE SET WITHIN SIDEWALK PRIOR TO FINAL PLACEMENT TO PROVIDE A MINIMUM CLEAR PATH OF 60". CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY LOCATION WHICH CANNOT MEET THE CLEARANCE REQUIREMENTS.
16. SIGNS, POLES AND OTHER FEATURES LOCATED IN PROPOSED CEMENT CONCRETE SIDEWALK SHALL BE BOXED AND PROVIDED FLEXIBLE JOINT FILLER.
17. CONTRACTOR SHALL VERIFY EXISTING GRADES. IF ANY ADJUSTMENT IS REQUIRED DUE TO DIFFERENT EXISTING GRADES FOUND IN THE FIELD, THE CONTRACTOR SHALL NOTIFY AND SEEK THE APPROVAL OF THE ENGINEER PRIOR TO PERFORMING THE WORK.
18. IN AREAS OF NEW SIDEWALK, NEW EDGE OF PAVEMENT OR CURB WITHOUT SIDEWALK OR ANY WORK ADJACENT TO EXISTING GRASS AREAS, EVEN WHEN NO SLOPE-MATCHING OR GRADING IS NECESSARY AND THE EXISTING GRADE IS MET, LOAM BORROW AND SEED SHALL BE PROVIDED AS NECESSARY TO REPAIR AND COMPLETE ANY DAMAGE TO THE GRADE CAUSED BY THE CONSTRUCTION PROCESS.
19. IN FILL AREAS, TOP SOIL SHALL BE REMOVED AS DIRECTED BY THE ENGINEER. SUBGRADE AREAS WILL BE COMPACTED PRIOR TO THE PLACEMENT OF FILL MATERIAL.
20. ALL NEW GRANITE CURB SHALL BE MASSDOT TYPE VB, UNLESS OTHERWISE NOTED ON THE PLANS.
21. ALL EXISTING GRANITE CURB SHALL BE REMOVED AND DISCARDED BY THE CONTRACTOR UNLESS DIRECTED BY THE ENGINEER.
22. ALL PROPOSED PAVEMENT MARKINGS ON ROADWAY SHALL BE REFLECTORIZED EPOXY.
23. SAFETY CONTROLS FOR CONSTRUCTION OPERATIONS SHALL BE IN ACCORDANCE WITH MASSDOT REQUIREMENTS AND THE LATEST VERSION OF THE MUTCD.
24. TREES TO BE RETAINED WHICH RESTRICT SIGHT DISTANCE OR RESTRICT HORIZONTAL OR VERTICAL CLEARANCES SHALL BE PRUNED AS REQUIRED BY THE ENGINEER.
25. FOR EXISTING TREES TO REMAIN OR BE REMOVED, SEE PLANS. IMPORTANT: NO TREE SHALL BE REMOVED PRIOR TO APPROVAL OF THE TOWN OF LEXINGTON.
26. WHEN WORKING NEXT TO EXISTING WALLS, BERMS, AND OTHER STRUCTURES, CONTRACTOR SHALL EXERCISE EXTREME CAUTION NOT TO DISTURB THE EXISTING STRUCTURES. ANY DAMAGE TO THE EXISTING STRUCTURES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS OWN EXPENSE.
27. FIELD SURVEY WAS PERFORMED BY GCG ASSOCIATES AND DATED JANUARY 2012.
28. INVERT ELEVATIONS SHOWN ARE PROPOSED AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS SHALL BE CONFIRMED IN THE FIELD.
29. THE CONTRACTOR SHALL PROVIDE TEMPORARY SUPPORT TO EXISTING UTILITY POLES DURING CONSTRUCTION.
30. PRIVATE MAILBOXES TO BE R&R SHALL BE LOCATED IN THE FIELD AS DIRECTED BY THE ENGINEER.

## WHEELCHAIR RAMP NOTES

1. ALL WHEELCHAIR RAMPS SHALL CONFORM TO THE REQUIREMENTS OF THE ARCHITECTURAL ACCESS BOARD (A.A.B.) AND THE AMERICANS WITH DISABILITIES ACT (A.D.A.). AND THE LATEST MASSDOT STANDARDS.
2. THE LOCATION OF PROPOSED WHEELCHAIR RAMPS ARE SHOWN ON CONSTRUCTION PLANS AND THE WHEELCHAIR RAMP DETAILS. EXACT LOCATIONS MAY BE ADJUSTED, IF NECESSARY, BY THE ENGINEER IN THE FIELD.
3. ALL PROPOSED WHEELCHAIR RAMPS SHALL HAVE DETECTABLE WARNING PANELS INSTALLED IN ACCORDANCE WITH MASSDOT CONSTRUCTION STANDARD DRAWINGS. THE COLOR OF THE PANEL SHALL BE APPROVED BY THE ENGINEER.
4. IN INSTANCES WHERE AN EXISTING MANHOLE, HANDHOLE OR OTHER "SURFACE" TYPE STRUCTURE THAT CANNOT BE REMOVED OR RESET, IS WITHIN THE ACTUAL WHEELCHAIR RAMP PATH, THE STRUCTURE SHALL BE CAREFULLY ADJUSTED SUCH THAT THE TOPMOST SURFACES OF THE STRUCTURE COVER SHALL BE FLUSH WITH THE RAMP SURFACE AND SHALL MATCH THE SLOPE OF THE NEW WHEELCHAIR RAMP AS DIRECTED BY THE ENGINEER.
5. IN NO CASE, EXCEPT MAXIMUM LENGTH HIGH SIDE TRANSITIONS, SHALL ANY TRANSITION SLOPE OF ANY WHEELCHAIR RAMP EXCEED 7.5%. PROPOSED WHEELCHAIR RAMP SLOPES, ESPECIALLY HIGH SIDE TRANSITIONS, SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO POURING OF CONCRETE AND ADJUSTED, IF NECESSARY, AT THE DIRECTION OF THE ENGINEER.




**TYPICAL SECTION - ROBINSON ROAD**
STA 8+50 TO 10+75
NOT TO SCALE




**TYPICAL SECTION - ROBINSON ROAD**
STA 1+50 TO 8+50
NOT TO SCALE

## PAVEMENT NOTES

### PAVEMENT MILLING AND OVERLAY

| | |
|---|---|
| PAVEMENT MILLING | REMOVE 1 1/2" HMA PAVEMENT |
| SURFACE COURSE | 1 1/2" HMA SURFACE COUSE (MODIFIED TOP) MATERIAL, PLACED IN ONE LAYER<br>VARIABLE DEPTH HMA LEVELING COURSE (DENSE BINDER) |

### GROVE ST. INTERSECTION/APPROACH FULL DEPTH RECONSTRUCTION

| | |
|---|---|
| SURFACE COURSE | 4" HMA SURFACE COUSE (MODIFIED TOP) MATERIAL, PLACED IN TWO LAYERS<br>1 1/2" HMA SURFACE COURSE (MODIFIED TOP) OVER<br>2 1/2" HMA INTERMEDIATE COURSE (DENSE BINDER) |
| BASE COURSE | 3" HMA BASE COURSE MATERIAL, PLACED IN ONE LAYER |
| SUB BASE | 4" DENSE GRADED CRUSHED STONE FOR SUB BASE OVER<br>8" GRAVEL BORROW TYPE b |

### ROBINSON RD. FULL DEPTH RECONSTRUCTION

| | |
|---|---|
| SURFACE COURSE | 4" HMA SURFACE COUSE (MODIFIED TOP) MATERIAL, PLACED IN TWO LAYERS<br>2" HMA SURFACE COURSE (MODIFIED TOP) OVER<br>2" HMA INTERMEDIATE COURSE (DENSE BINDER) |
| SUB BASE | 4" DENSE GRADED CRUSHED STONE FOR SUB BASE OVER<br>8" GRAVEL BORROW TYPE b |
| TACK COAT | TACK COAT SHALL BE APPLIED FOR UNIFORM COVERAGE OF 90%, AT RATE OF 0.07 GALLONS PER SQUARE YARD FOR MILLED SURFACES AND 0.05 GALLONS PER SQUARE YARD FOR SMOOTH TIGHT PAVED SURFACES. |

### HMA SIDEWALK

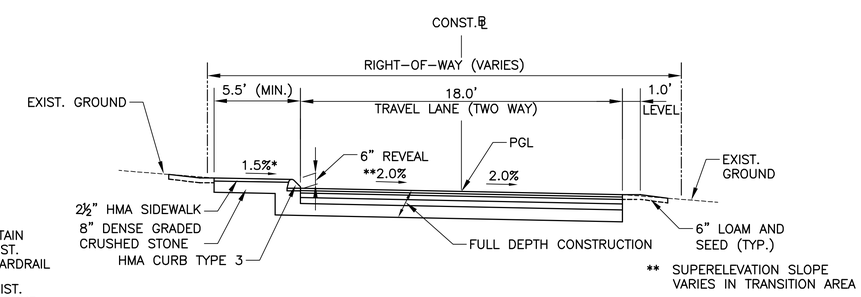
| | |
|---|---|
| SURFACE COURSE | 2 1/2" HMA WALK SURFACE PLACED IN TWO EQUAL LAYERS |
| SUB BASE | 8" DENSE GRADED CRUSHED STONE (M2.01.7) |

### HMA DRIVEWAY

| | |
|---|---|
| SURFACE COURSE | 3 1/2" HMA DRIVEWAY PLACED IN TWO LAYERS,<br>1 1/2" TOP COURSE MATERIAL OVER<br>2" BOTTOM COURSE MATERIAL |
| SUB BASE | 8" DENSE GRADED CRUSHED STONE (M2.01.7) |

### CEMENT CONCRETE WHEELCHAIR RAMP

| | |
|---|---|
| SURFACE COURSE | 4" CEMENT CONCRETE<br>(AIR ENTRAINED 4000 PSI, 3/4", 610) |
| SUB BASE | 8" DENSE GRADED CRUSHED STONE (M2.01.7) |




**TYPICAL SECTION - ROBINSON ROAD**
STA 10+50 TO 25+50
NOT TO SCALE

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

DRAWN BY: KY
DESIGNED BY: DJ
CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS — DARSHAN N. JHAVERI — CIVIL — No. 41441 — REGISTERED PROFESSIONAL ENGINEER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SCALE: NOT TO SCALE

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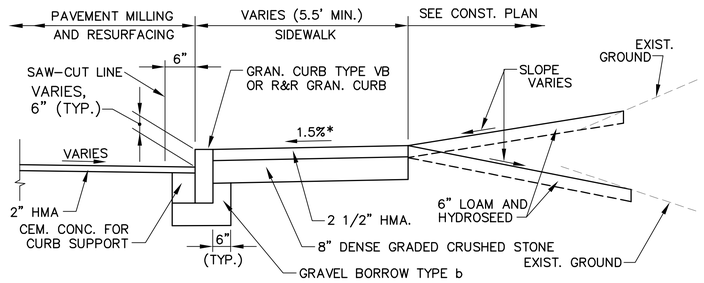
**Robinson Road Roadway Improvements**

# GENERAL NOTES AND TYPICAL SECTIONS

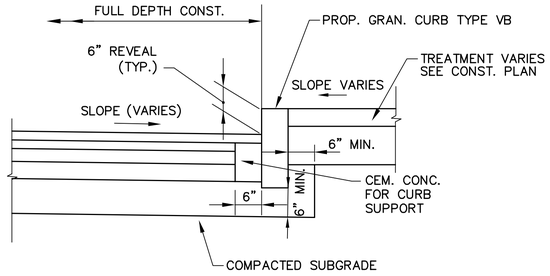
**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 09, 2014 3:14pm
ISSUE DATE 05/14/2014
SHEET 4 OF 29

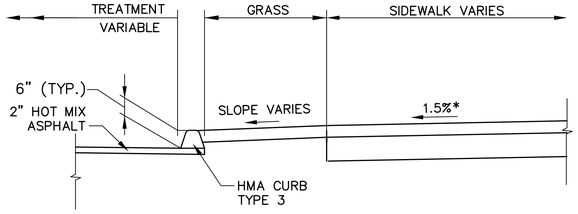
O:\4200s\4212 - Estabrook Area Roadway Improvements\Drawing Files\Plan Set\Robinson Road\4212 Legend.dwg



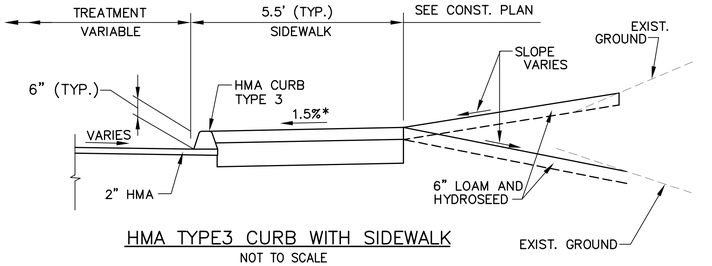

GRANITE CURB WITH SIDEWALK
IN COLD PLANING AREA
NOT TO SCALE



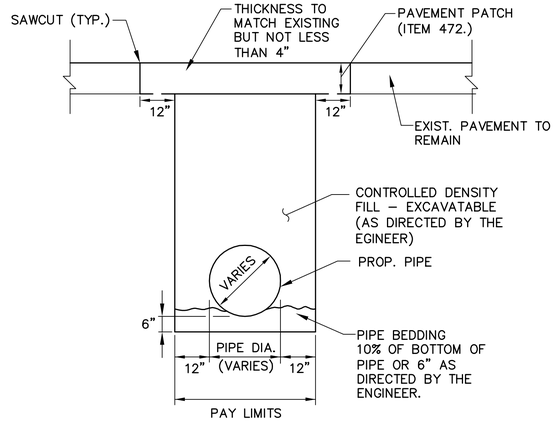

CONCRETE CURB FULL DEPTH AREA
NOT TO SCALE



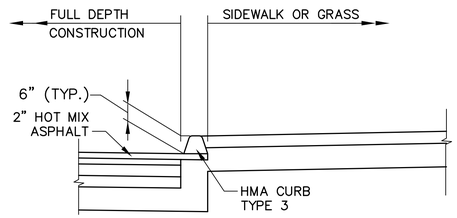

HMA TYPE3 CURB SIDEWALK
W/ GRASS STRIP
NOT TO SCALE



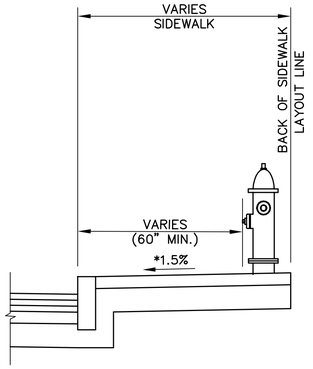

HMA TYPE3 CURB WITH SIDEWALK
NOT TO SCALE



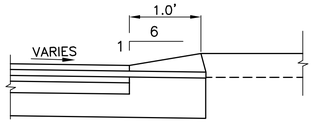

PERMANENT TRENCH PATCH
IN MILLED AREAS
(FOR TRENCH WIDTH LESS THAN 4')
NOT TO SCALE



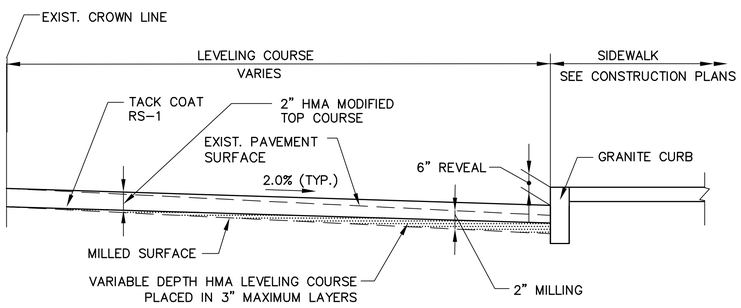

HMA TYPE3 CURB W/ SIDEWALK
FULL DEPTH AREA
NOT TO SCALE



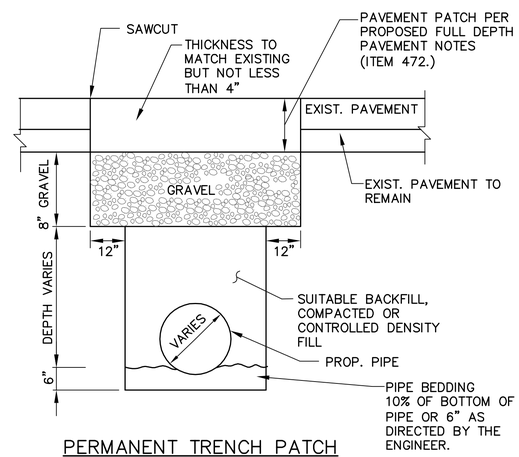

HYDRANT AT BACK OF SIDEWALK
NOT TO SCALE



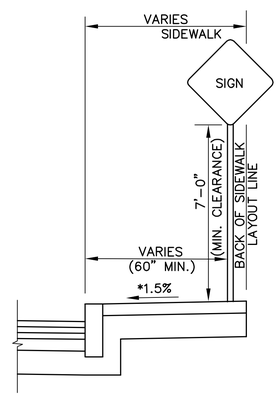

HMA BERM TYPE A – MODIFIED
IN FULL DEPTH AREA
STA 21+09 TO STA 22+99 RT
NOT TO SCALE



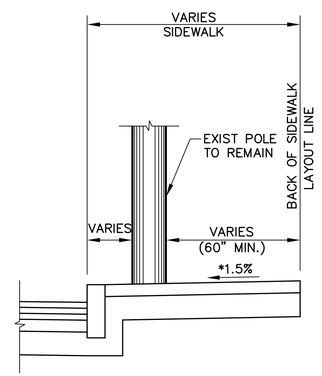

MILLING & RESURFACING
WITH VARIABLE DEPTH LEVELING COURSE
NOT TO SCALE



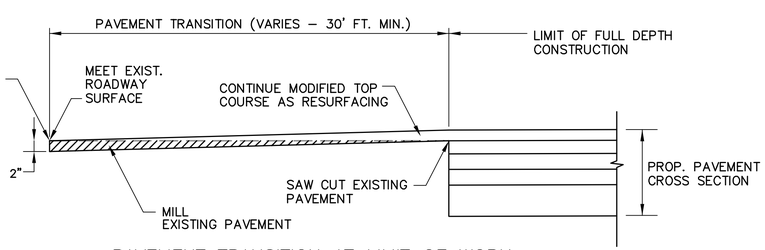

PERMANENT TRENCH PATCH
IN MILLED AREAS
(FOR TRENCH WIDTH GREATER THAN 4')
NOT TO SCALE




SIGN AT BACK OF SDWK.
NOT TO SCALE




UTILITY POLE AT CURBLINE
NOT TO SCALE




PAVEMENT TRANSITION AT LIMIT OF WORK
NOT TO SCALE

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

DRAWN BY: KY
DESIGNED BY: DJ
CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS DARSHAN N. JHAVERI CIVIL No. 41441 REGISTERED PROFESSIONAL ENGINEER

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SCALE: NOT TO SCALE

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**Robinson Road Roadway Improvements**

**CONSTRUCTION DETAILS**
**CURB / SIDEWALK**

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 09, 2014 3:14pm
ISSUE DATE 05/14/2014
SHEET 5 OF 29

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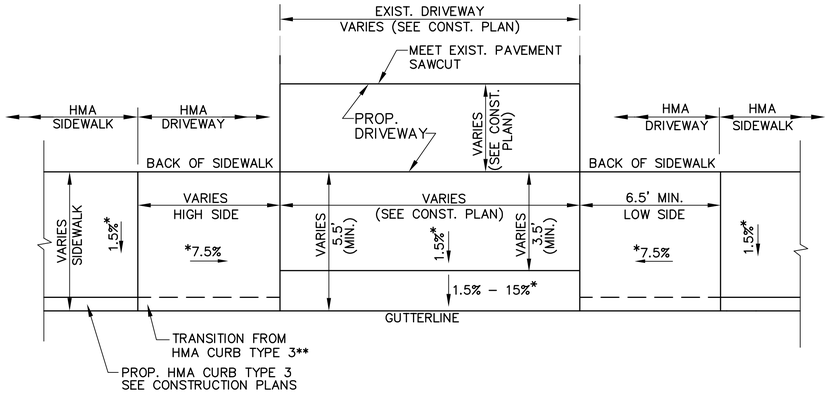
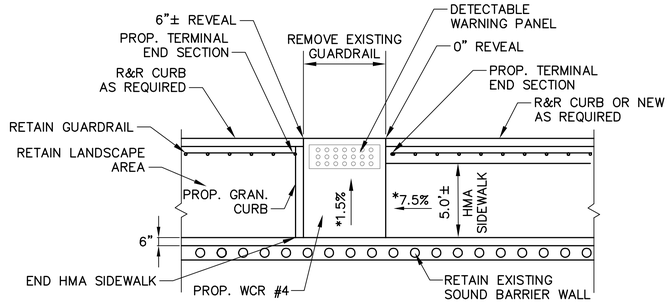


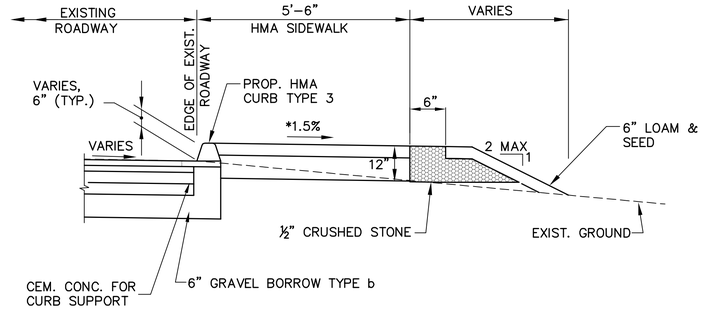

** SEE TABLE ON SHEET 8

TYPICAL DRIVEWAY
NOT TO SCALE

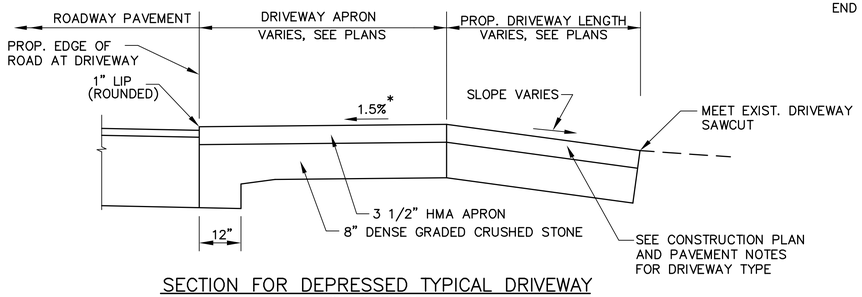
| DRIVEWAY OPENING DATA | | | | | | |
|---|---|---|---|---|---|---|
| ℄ STATION/OFFSET OF DRIVEWAY OPENING AT GUTTER | GUTTER PROFILE SLOPE | OPENING WIDTH AT GUTTER | DEPTH OF GUTTER TO BACK OF SIDEWALK | PATH OF TRAVEL WIDTH ACROSS DRIVEWAY | TRANSITION LENGTH | |
| | | | | | LEFT SIDE | RIGHT SIDE |
| STA. 1+51.8 RT. (GROVE STREET) | 3.34% | 15.5' | 6.9'–8.5" | 5.0' | 14.0' | 6.5' |
| STA. 2+24.9 RT. (GROVE STREET) | 2.56% | 23.5' | 7.2'–8.5' | 5.0' | 11.0' | 6.5' |
| STA. 3+70.2 RT. (GROVE STREET) | 2.82% | 15.5' | 5.5' | 3.5' | 11.0' | 6.5' |



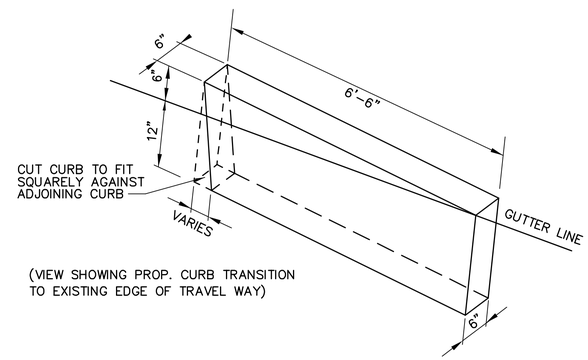

DETAIL FOR WHEELCHAIR RAMP #4
BARRIER OPENING AT STA 8+44.1 RT
NOT TO SCALE




LID HMA SIDEWALK
STA 22+88 TO 25+93 LT
NOT TO SCALE

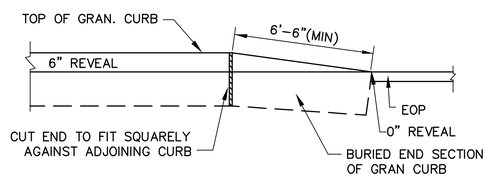



SECTION FOR DEPRESSED TYPICAL DRIVEWAY
NOT TO SCALE

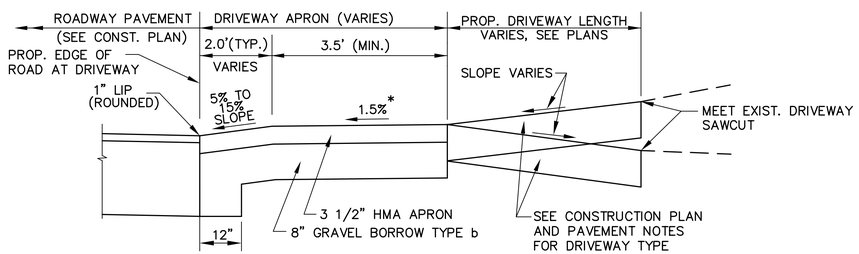



(VIEW SHOWING PROP. CURB TRANSITION TO EXISTING EDGE OF TRAVEL WAY)

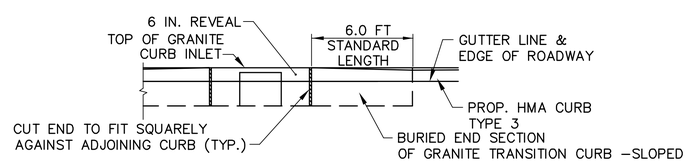
GRANITE TRANSITION CURB
NOT TO SCALE



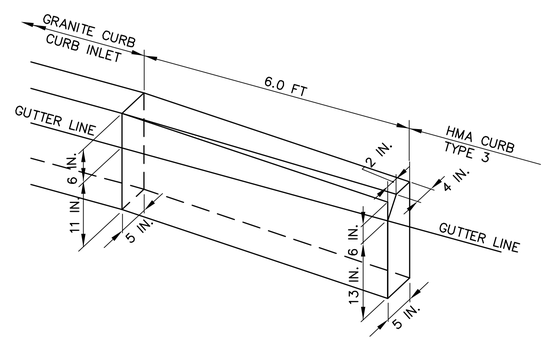

TRANSITION CURB (6" TO 0" REVEAL)
NOT TO SCALE




SECTION FOR TYPICAL DRIVEWAY
NOT TO SCALE




TRANSITION CURB – PROP. CURB TO HMA CURB
NOT TO SCALE




DETAIL FOR GRANITE TRANSITION CURB – SPLAYED
NOT TO SCALE

| DRIVEWAY OPENING DATA | | | | | | |
|---|---|---|---|---|---|---|
| ℄ STATION/OFFSET OF DRIVEWAY OPENING AT GUTTER | GUTTER PROFILE SLOPE | OPENING WIDTH AT GUTTER | DEPTH OF GUTTER TO BACK OF SIDEWALK | PATH OF TRAVEL WIDTH ACROSS DRIVEWAY | TRANSITION LENGTH | |
| | | | | | LEFT SIDE | RIGHT SIDE |
| STA. 11+61.4 RT. (CONCORD/GORDON ST) | 2.6% | 16.0' | 6.5' | 4.0' | 4.8' (3"REVEAL) | 3.5' (3"REVEAL) |

*TOLERANCE FOR CONSTRUCTION ±0.5%

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

DRAWN BY: KY
DESIGNED BY: DJ
CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS
DARSHAN N. JHAVERI
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**Robinson Road Roadway Improvements**

**CONSTRUCTION DETAILS**
**WCR/DRIVEWAY**

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 09, 2014 3:14pm
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SHEET 6 OF 29

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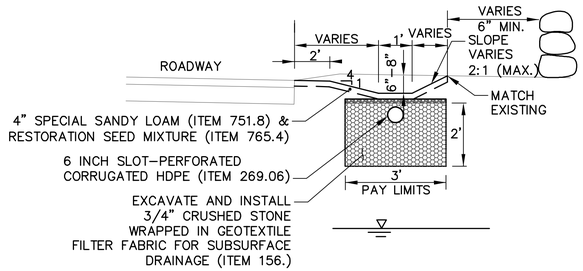
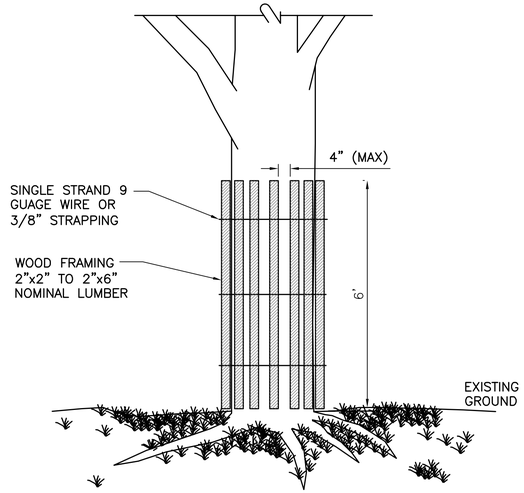
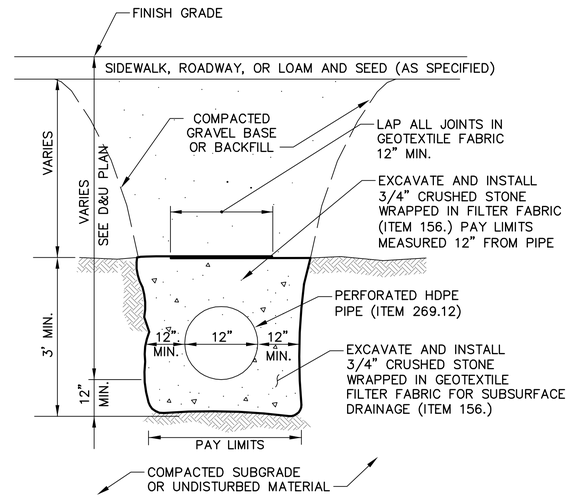


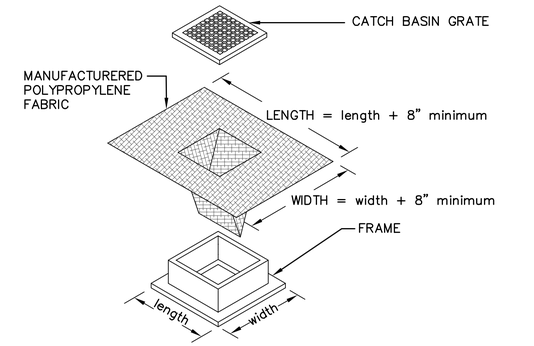

## ROADSIDE WATER QUALITY/INFILTRATION SWALE
## STA 15+31 TO STA 16+41 RT
## STA 17+25 TO STA 18+85 RT
NOT TO SCALE




## ROADSIDE TREE PROTECTION DETAIL
NOT TO SCALE

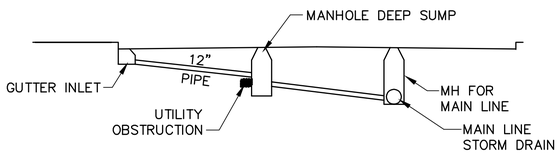



## LEACHING PIPE
NOT TO SCALE

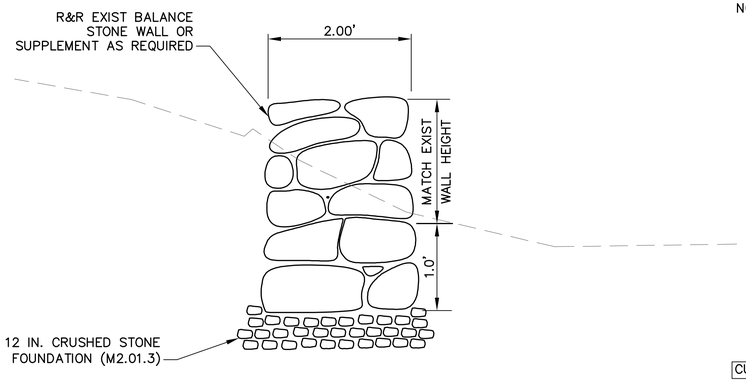



NOTES
1. LENGTH AND WIDTH OF POLYPROPYLENE FABRIC MUST EXCEED EXISTING CATCH BASIN FRAME DIMENSIONS BY A MINIMUM OF 8".
2. REMOVE CATCH BASIN GRATE AND INSTALL POLYPROPYLENE FABRIC OVER CATCH BASIN FRAME. REPLACE CATCH BASIN GRATE TO SECURE POLYPROPYLENE FABRIC IN PLACE.
3. CATCH BASIN EROSION CONTROL TO BE PLACED AT ALL CATCH BASIN WITHIN PROJECT LIMITS.

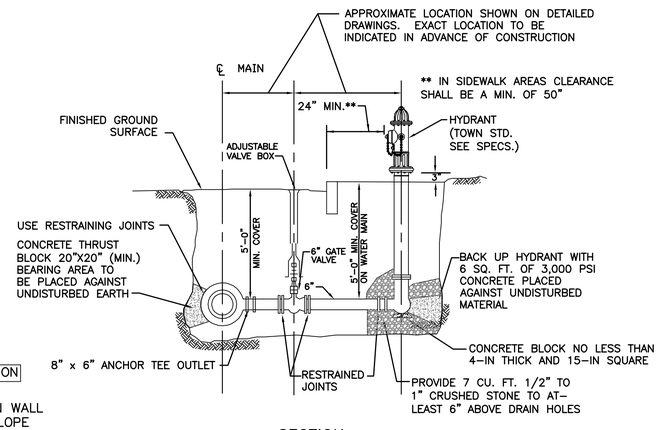
## CATCH BASIN EROSION CONTROL PROTECTION (TYP.)
NOT TO SCALE




## CONTINGENCY DETAIL FOR STORM DRAIN LATERAL LINES
(USE ONLY IF OBSTRUCTION IS ENCOUNTERED)
NOT TO SCALE

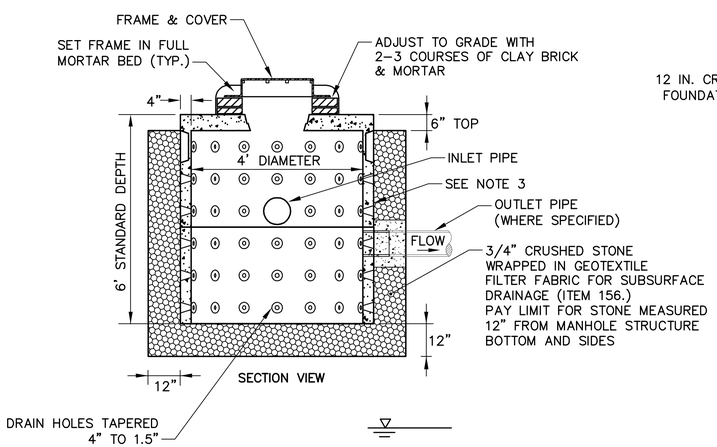



## DETAIL FOR BALANCE STONE WALL R&R
NOT TO SCALE




SECTION

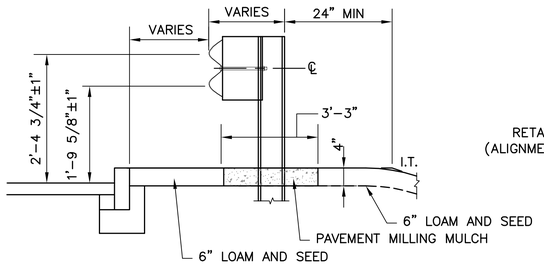
## HYDRANT ASSEMBLY (TYP.)
NOT TO SCALE



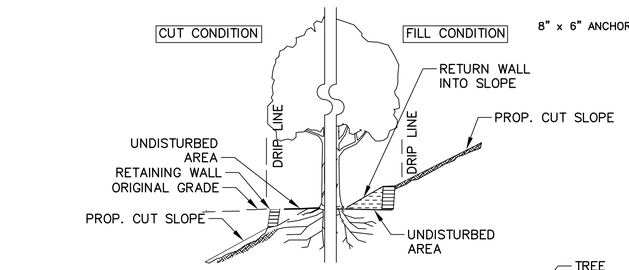

NOTES:

1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. STRUCTURE TO ACCOMODATE H-20 LOADING.
3. PROVIDE GALVANIZED WIRE SCREEN AROUND BASIN TO PREVENT MIGRATION OF STONE.

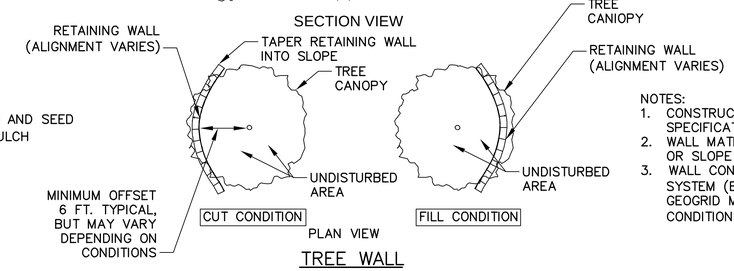
## LEACHING MANHOLE (ITEM 205.)
NOT TO SCALE




## GUARD RAIL INSTALLATION DETAIL AT GROVE STREET INTERSECTION
NOT TO SCALE




SECTION VIEW




## TREE WALL
NOT TO SCALE

NOTES:
1. CONSTRUCTED WALL MATERIAL SHALL BE PER SPECIFICATIONS.
2. WALL MATERIAL MAY BE DRY LAID BALANCE WALL OR SLOPE PAVING.
3. WALL CONSTRUCTION SHALL NOT COMPRISE ROOT SYSTEM (BURIED STRUCTURES, SUCH AS MSE OR GEOGRID MAY BE USED FOR FILL UT NOT CUT CONDITIONS).

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

DRAWN BY: MJC
DESIGNED BY: DJ
CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS
DARSHAN N. JHAVERI
CIVIL
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REGISTERED PROFESSIONAL ENGINEER

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**Robinson Road Roadway Improvements**

# CONSTRUCTION DETAILS

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 09, 2014 3:14pm
ISSUE DATE 05/14/2014
SHEET 7 OF 29

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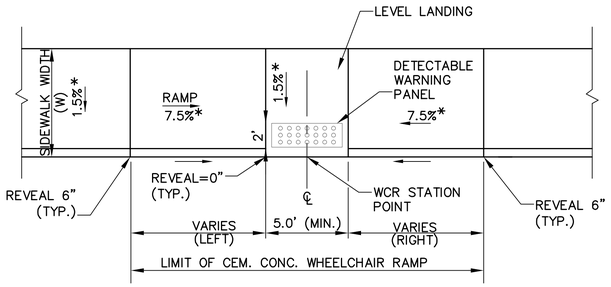
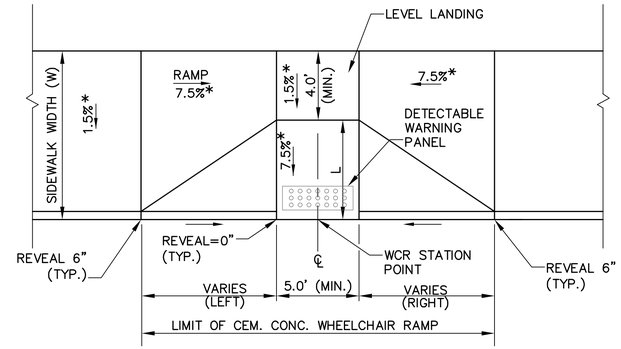



WHEELCHAIR RAMP DETAIL TYPE "A"
NOT TO SCALE

| WHEELCHAIR RAMPS DATA TYPE "A" | | | | | | | |
|---|---|---|---|---|---|---|---|
| WCR # | RAMP REFERENCE POINT | | WIDTH OF SIDEWALK (W) | WIDTH OF RAMP ENTRANCE 5.0' (MIN.) | ROADWAY GUTTER SLOPE | TRANSITION LENGTH | |
| | STATION | OFFSET | | | | LT. SIDE | RT. SIDE |
| 1 | 23+88 GROVE STREET | 13.8' LT | 5.2'–5.4' | 5.0' | 2.40% | 11.0' | 6.5' |
| 2 | 23+87 GROVE STREET | 19.1' RT | 5.5' | 5.0' | 1.20% | 6.5' | 9.0' |



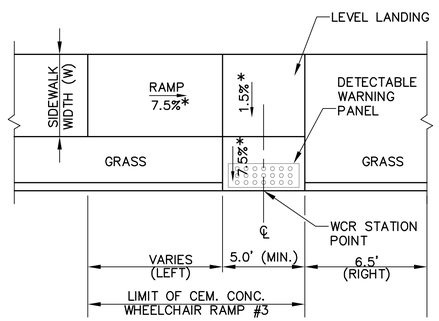

WHEELCHAIR RAMP DETAIL TYPE "B"
NOT TO SCALE

| TABLE I | |
|---|---|
| ROADWAY PROFILE GRADE | **HIGH SIDE TRANSITION LENGTH |
| % | (FEET) |
| = 0% | 6'–6" |
| >0% TO 1% | 7'–8" |
| >1% TO 2% | 9'–0" |
| >2% TO 3% | 11'–0" |
| >3% TO 4% | 14'–0" |
| >4% TO 5% | 15'–0" MAX. |

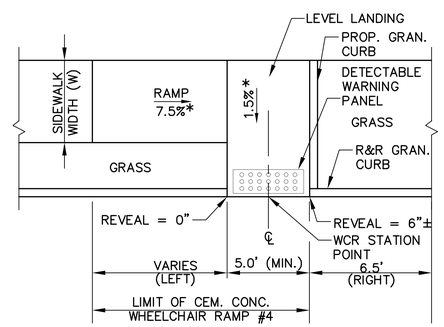
CURB TRANSITION LENGTHS FOR WHEELCHAIR RAMPS

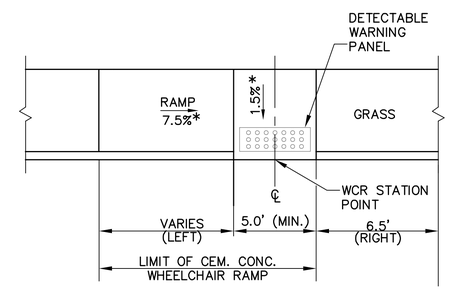
**BASED ON A DESIGN SLOPE OF 7.5% AND A REVEAL OF 6".

| WHEELCHAIR RAMPS DATA TYPE "B" | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WCR # | RAMP REFERENCE POINT | | LENGTH OF PRIMARY RAMP (L) | WIDTH OF SIDEWALK (W) | WIDTH OF RAMP ENTRANCE 5.0' (MIN.) | DEPTH OF LEVEL LANDING 4.0' (MIN.) | ROADWAY GUTTER SLOPE | TRANSITION LENGTH | |
| | STATION | OFFSET | | | | | | LT. SIDE | RT. SIDE |
| 6 | 11+79.9 ROBINSON RD. | 17.9' LT | 2.5' | 6.6'–7.4' | 5.0' | 4.5'–4.7' | 4.00% | 15.0' | 6.5' |




WHEELCHAIR RAMP DETAIL TYPE "C"
NOT TO SCALE




WHEELCHAIR RAMP DETAIL TYPE "D"
NOT TO SCALE

| WHEELCHAIR RAMPS DATA TYPE "C" | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WCR # | RAMP REFERENCE POINT | | LENGTH OF PRIMARY RAMP (L) | WIDTH OF SIDEWALK (W) | WIDTH OF RAMP ENTRANCE 5.0' (MIN.) | DEPTH OF LEVEL LANDING 4.0' (MIN.) | ROADWAY GUTTER SLOPE | TRANSITION LENGTH | |
| | STATION | OFFSET | | | | | | LT. SIDE | RT. SIDE |
| 3 | 8+44.1 ROBINSON RD. | 11.7' LT | 3.0' | 5.0' | 5.0' | 5.0' | 0.60% | 7.66' | 6.5' |
| 4 | 8+44.1 ROBINSON RD. | 11.0' RT | – | 5.0' | 5.0' | 7.0' | 0.60% | 7.66' | – |

| WHEELCHAIR RAMPS DATA TYPE "D" | | | | | | | |
|---|---|---|---|---|---|---|---|
| WCR # | RAMP REFERENCE POINT | | WIDTH OF SIDEWALK (W) | WIDTH OF RAMP ENTRANCE 5.0' (MIN.) | ROADWAY GUTTER SLOPE | TRANSITION LENGTH | |
| | STATION | OFFSET | | | | LT. SIDE | RT. SIDE |
| 5 | 11+42.4 ROBINSON RD. | 16.5' LT | 5.5' | 5.0' | 2.60% | 6.5' | 11.0' |
| 7 | 12+38.9 ROBINSON RD. | 9.0' RT | 6.0' | 5.0' | 4.00% | 6.5' | 15.0' |
| 8 | 12+38.9 ROBINSON RD. | 9.0' LT | 5.5' | 5.0' | 3.20% | 6.5' | 14.0' |

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

DRAWN BY: KY
DESIGNED BY: DJ
CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS
DARSHAN N. JHAVERI
CIVIL
No. 41441
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SCALE: NOT TO SCALE

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**Robinson Road Roadway Improvements**

**CONSTRUCTION DETAILS**
**WCR/DRIVEWAY**

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 09, 2014 3:14pm
ISSUE DATE 05/14/2014
SHEET 8 OF 29

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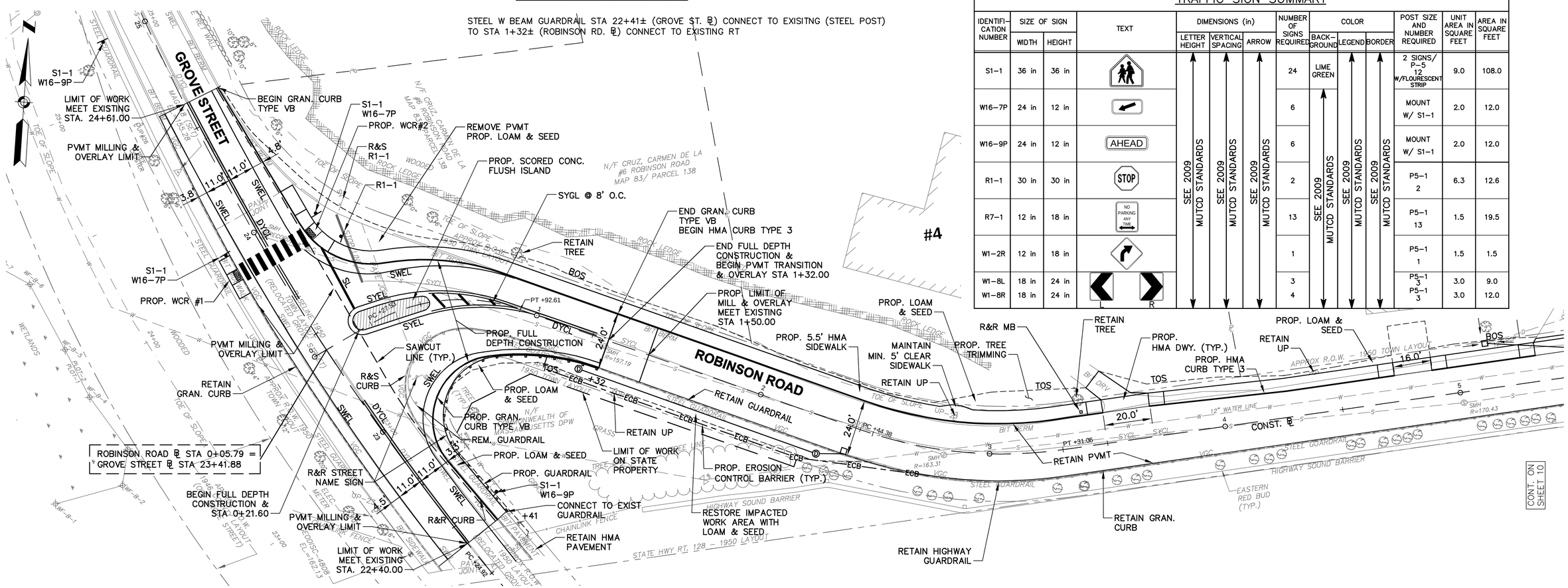
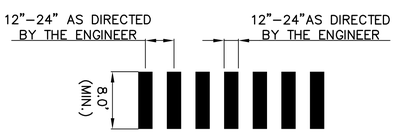
## HIGHWAY GUARDRAIL TABLE

STEEL W BEAM GUARDRAIL STA 22+41± (GROVE ST. ℄) CONNECT TO EXISITNG (STEEL POST) TO STA 1+32± (ROBINSON RD. ℄) CONNECT TO EXISTING RT

## TRAFFIC SIGN SUMMARY

| IDENTIFICATION NUMBER | SIZE OF SIGN WIDTH | SIZE OF SIGN HEIGHT | TEXT | DIMENSIONS (in) LETTER HEIGHT | DIMENSIONS (in) VERTICAL SPACING | DIMENSIONS (in) ARROW | NUMBER OF SIGNS REQUIRED | COLOR BACK-GROUND | COLOR LEGEND | COLOR BORDER | POST SIZE AND NUMBER REQUIRED | UNIT AREA IN SQUARE FEET | AREA IN SQUARE FEET |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S1-1 | 36 in | 36 in | | SEE 2009 MUTCD STANDARDS | SEE 2009 MUTCD STANDARDS | SEE 2009 MUTCD STANDARDS | 24 | LIME GREEN | SEE 2009 MUTCD STANDARDS | SEE 2009 MUTCD STANDARDS | 2 SIGNS/ P-5 12 W/FLOURESCENT STRIP | 9.0 | 108.0 |
| W16-7P | 24 in | 12 in | | | | | 6 | | | | MOUNT W/ S1-1 | 2.0 | 12.0 |
| W16-9P | 24 in | 12 in | AHEAD | | | | 6 | | | | MOUNT W/ S1-1 | 2.0 | 12.0 |
| R1-1 | 30 in | 30 in | STOP | | | | 2 | | | | P5-1 2 | 6.3 | 12.6 |
| R7-1 | 12 in | 18 in | NO PARKING ANY TIME | | | | 13 | | | | P5-1 13 | 1.5 | 19.5 |
| W1-2R | 12 in | 18 in | | | | | 1 | | | | P5-1 1 | 1.5 | 1.5 |
| W1-8L | 18 in | 24 in | L | | | | 3 | | | | P5-1 3 | 3.0 | 9.0 |
| W1-8R | 18 in | 24 in | R | | | | 4 | | | | P5-1 3 | 3.0 | 12.0 |

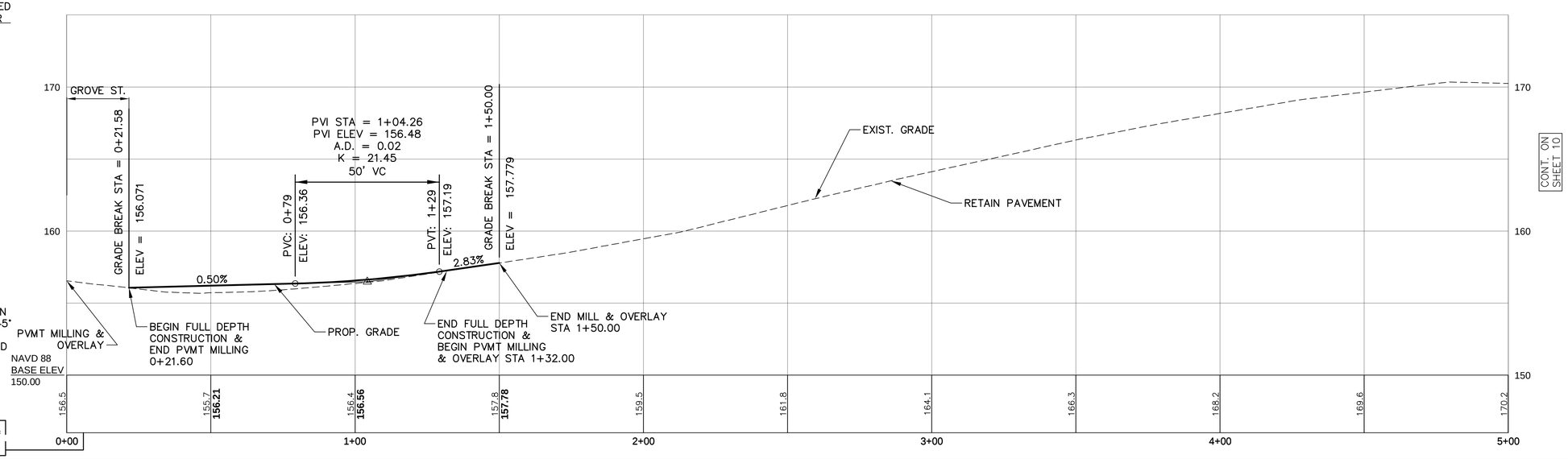



CROSSWALK DETAIL
N.T.S.

PAVEMENT MARKING NOTES

1. ALL PROPOSED PAVEMENT MARKINGS SHALL BE REFLECTORIZED EPOXY. ALL EXISTING PAVEMENT MARKINGS THAT CONFLICT WITH THE PROPOSED PAVEMENT MARKINGS SHALL BE REMOVED.
2. ALL R&R SIGNS SHALL BE MOUNTED ON NEW POSTS.
3. SIGNS TO BE MOUNTED NEAR THE CURB LINE SHALL BE SET BACK 6" FROM THE EDGE OF THE SIGN PANEL TO THE CURB LINE. NO SIGN SHALL OVERHAND THE CURB LINE.
4. ALL SIGNS TO BE R&R SHALL BE RESET IN THEIR ORIGINAL LOCATION EXCEPT WHERE NOTED.
5. ALL R7 PARKING SIGNS SHALL BE MOUNTED AT AN ANGLE OF NOT LESS THAN 30° NOR MORE THAN 45° TO THE CURB AND FACING THE FLOW OF TRAFFIC. ALL OTHER SIGNS SHALL BE 90° TO THE CURB AND FACING FLOW OF TRAFFIC.




ROBINSON ROAD ℄ STA 0+05.79 = GROVE STREET ℄ STA 23+41.88

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

DRAWN BY: KY
DESIGNED BY: DJ
CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS DARSHAN N. JHAVERI CIVIL No. 41441 REGISTERED PROFESSIONAL ENGINEER

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**Robinson Road Roadway Improvements**

# CONSTRUCTION PLAN & PROFILE

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 12, 2014 1:18pm
ISSUE DATE 05/14/2014
SHEET 9 OF 29

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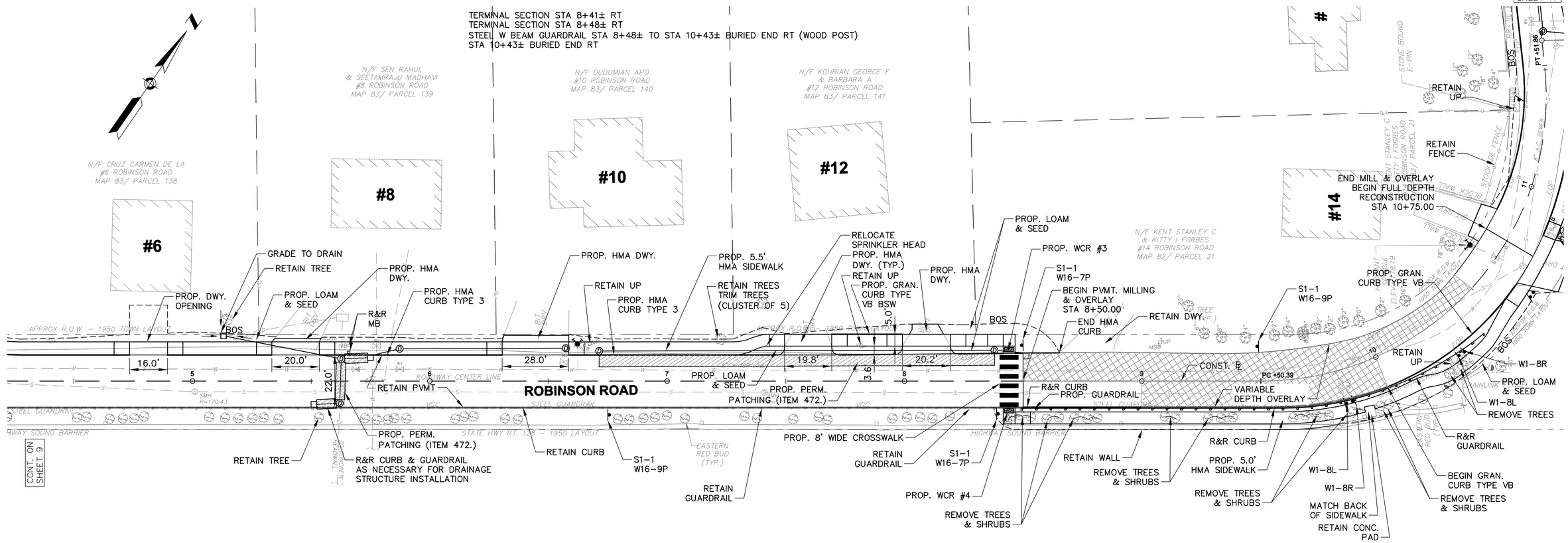
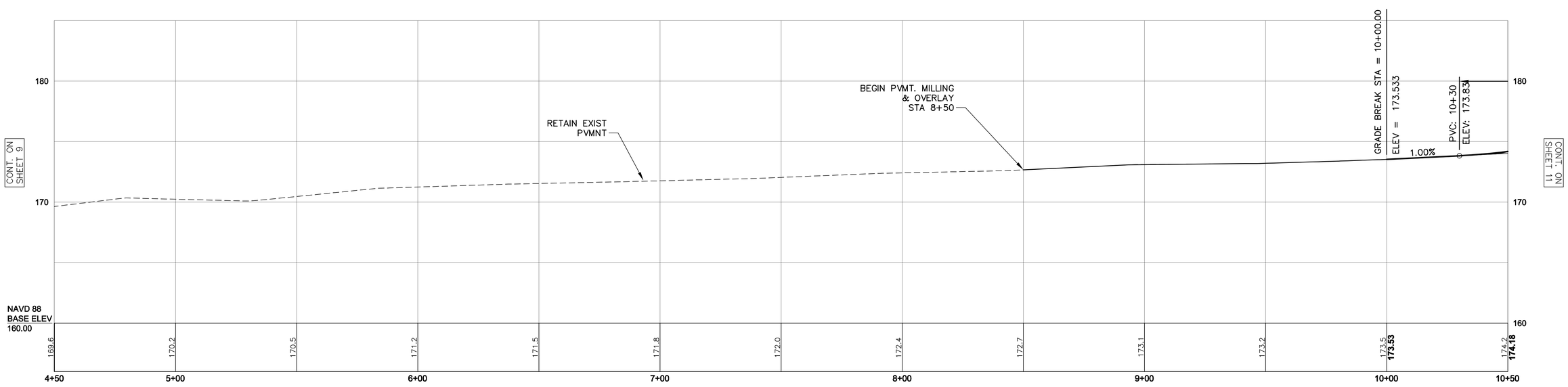
## HIGHWAY GUARDRAIL TABLE

TERMINAL SECTION STA 8+41± RT
TERMINAL SECTION STA 8+48± RT
STEEL W BEAM GUARDRAIL STA 8+48± TO STA 10+43± BURIED END RT (WOOD POST)
STA 10+43± BURIED END RT

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|---|---|---|---|---|
| | | | | |

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**Robinson Road Roadway Improvements**

# CONSTRUCTION PLAN & PROFILE

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 12, 2014 12:30pm
ISSUE DATE 05/14/2014
SHEET 10 OF 29

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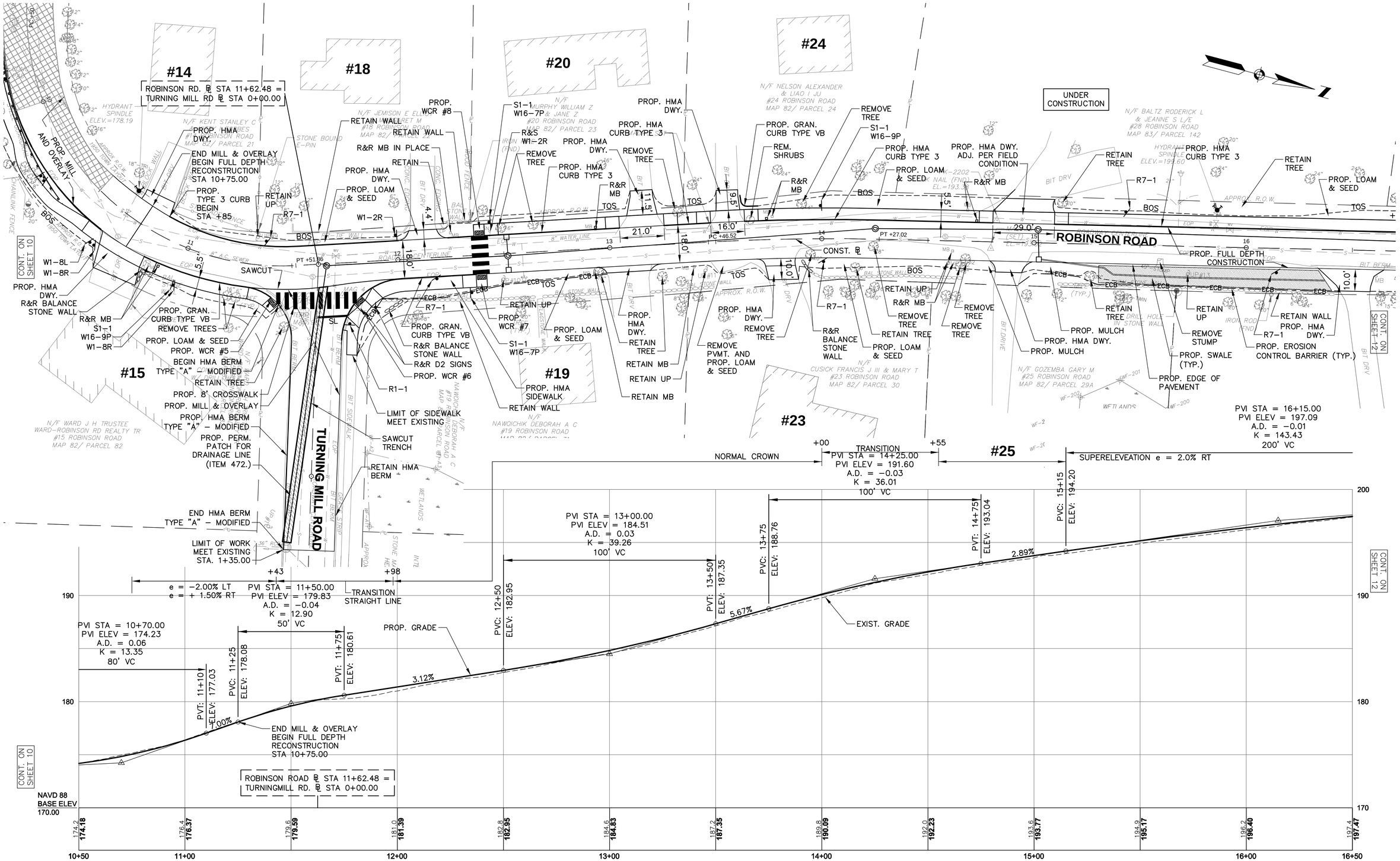


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|---|---|---|---|---|
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**Robinson Road Roadway Improvements**

# CONSTRUCTION PLANS & PROFILES

**Lexington, Massachusetts**

CONTRACT NO. 14-52

PLOT DATE: May. 09, 2014 3:15pm

ISSUE DATE 05/14/2014

SHEET 11 OF 29

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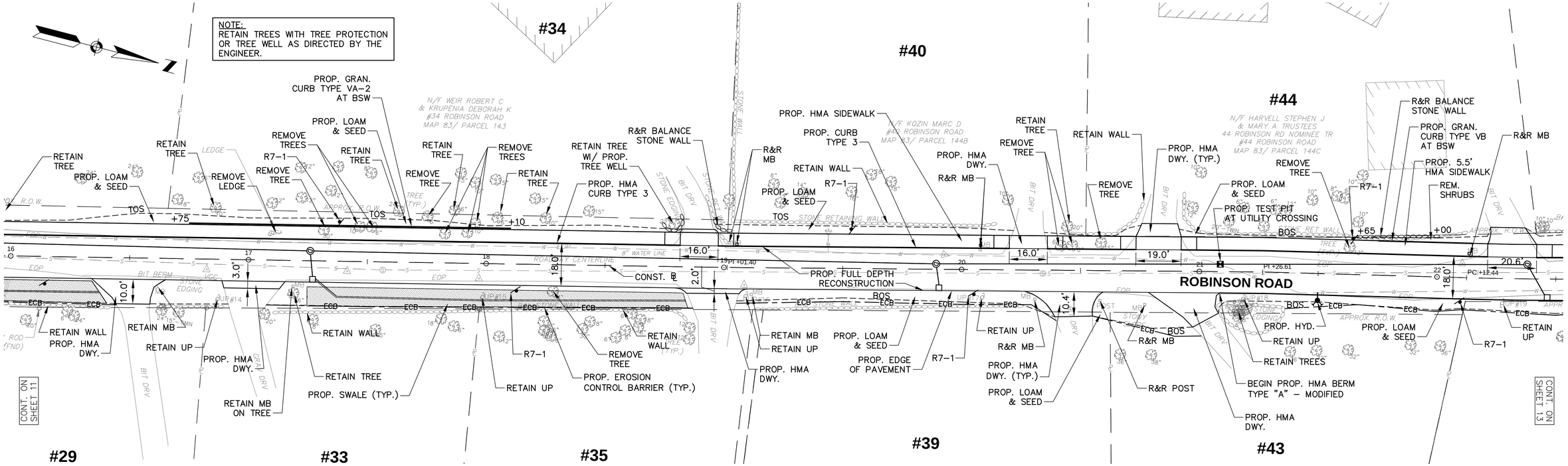
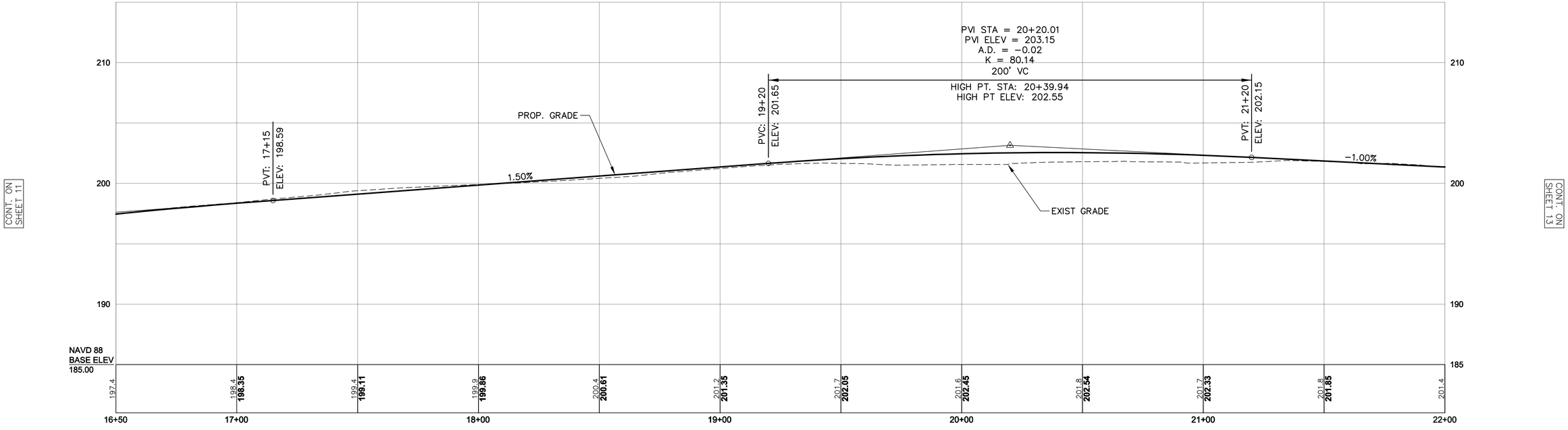
NOTE:
RETAIN TREES WITH TREE PROTECTION OR TREE WELL AS DIRECTED BY THE ENGINEER.




SUPERELEVATION e = 2.00% RT

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COMMONWEALTH OF MASSACHUSETTS
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4 0 4 8

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**Robinson Road Roadway Improvements**

# CONSTRUCTION PLAN & PROFILE

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 09, 2014 3:15pm
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SHEET 12 OF 29

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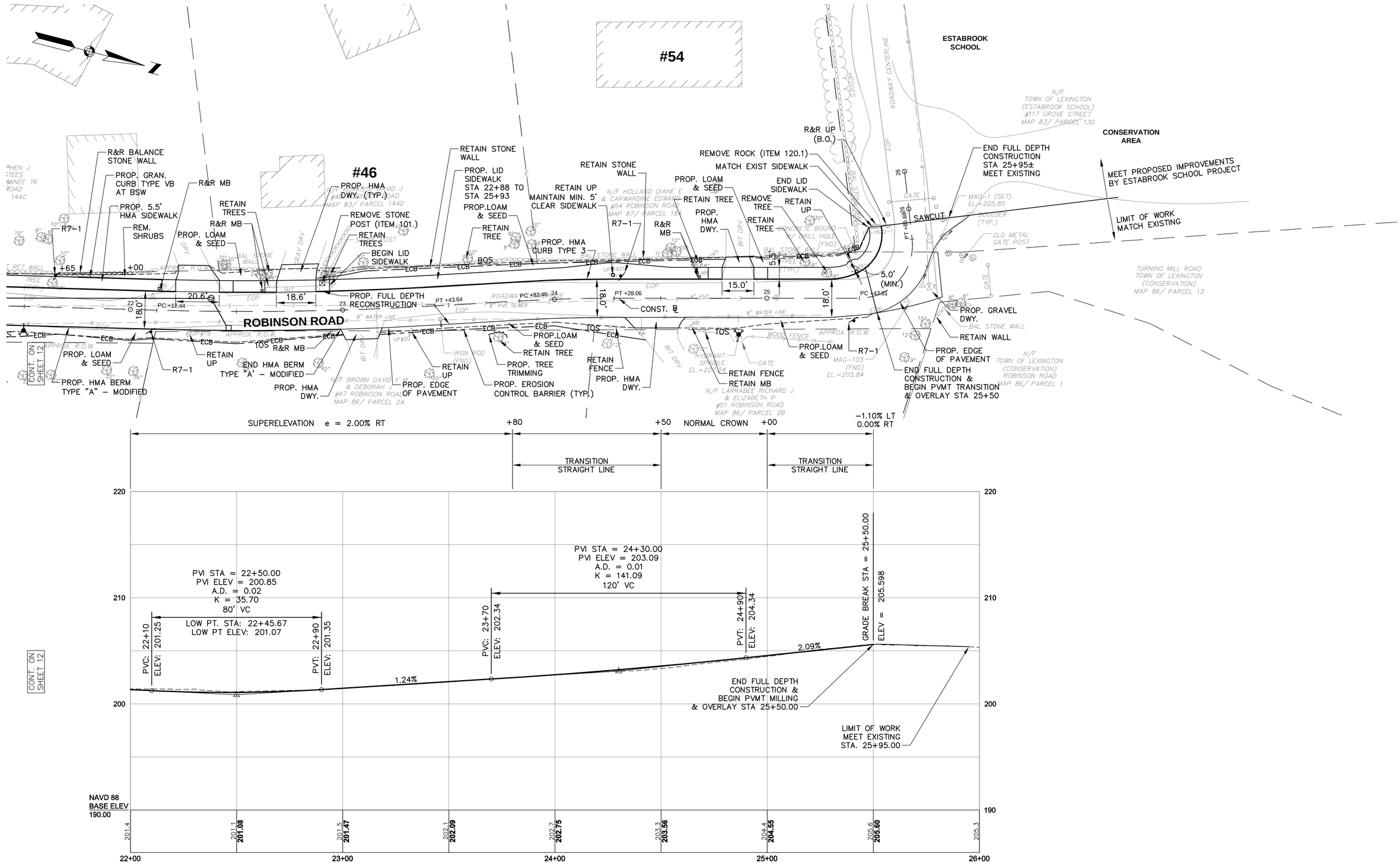


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# CONSTRUCTION PLAN & PROFILE

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 09, 2014 3:15pm
ISSUE DATE 05/14/2014
SHEET 13 OF 29

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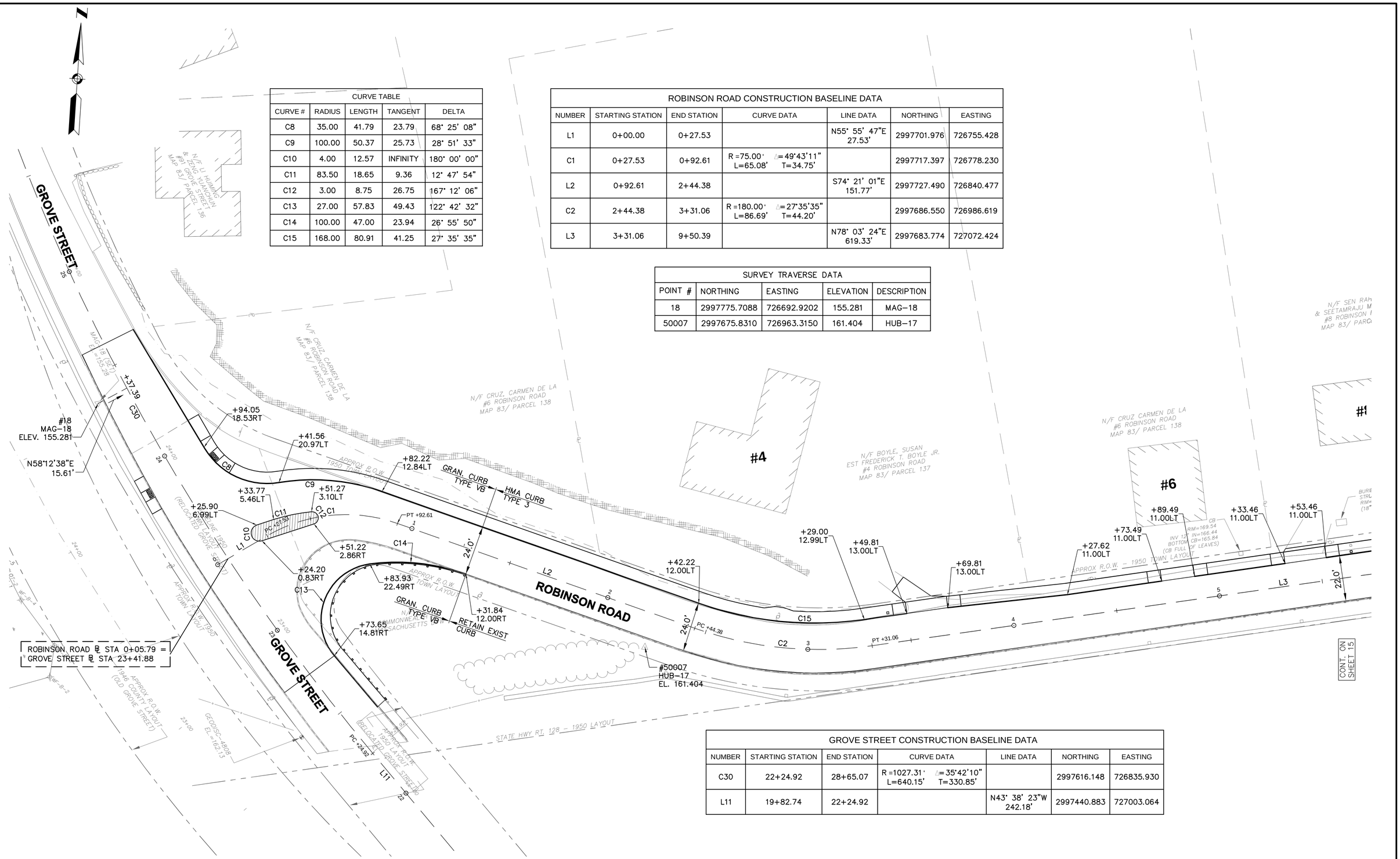


| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE # | RADIUS | LENGTH | TANGENT | DELTA |
| C8 | 35.00 | 41.79 | 23.79 | 68° 25' 08" |
| C9 | 100.00 | 50.37 | 25.73 | 28° 51' 33" |
| C10 | 4.00 | 12.57 | INFINITY | 180° 00' 00" |
| C11 | 83.50 | 18.65 | 9.36 | 12° 47' 54" |
| C12 | 3.00 | 8.75 | 26.75 | 167° 12' 06" |
| C13 | 27.00 | 57.83 | 49.43 | 122° 42' 32" |
| C14 | 100.00 | 47.00 | 23.94 | 26° 55' 50" |
| C15 | 168.00 | 80.91 | 41.25 | 27° 35' 35" |

| ROBINSON ROAD CONSTRUCTION BASELINE DATA | | | | | | |
|---|---|---|---|---|---|---|
| NUMBER | STARTING STATION | END STATION | CURVE DATA | LINE DATA | NORTHING | EASTING |
| L1 | 0+00.00 | 0+27.53 | | N55° 55' 47"E 27.53' | 2997701.976 | 726755.428 |
| C1 | 0+27.53 | 0+92.61 | R =75.00' △=49°43'11" L=65.08' T=34.75' | | 2997717.397 | 726778.230 |
| L2 | 0+92.61 | 2+44.38 | | S74° 21' 01"E 151.77' | 2997727.490 | 726840.477 |
| C2 | 2+44.38 | 3+31.06 | R =180.00' △=27°35'35" L=86.69' T=44.20' | | 2997686.550 | 726986.619 |
| L3 | 3+31.06 | 9+50.39 | | N78° 03' 24"E 619.33' | 2997683.774 | 727072.424 |

| SURVEY TRAVERSE DATA | | | | |
|---|---|---|---|---|
| POINT # | NORTHING | EASTING | ELEVATION | DESCRIPTION |
| 18 | 2997775.7088 | 726692.9202 | 155.281 | MAG-18 |
| 50007 | 2997675.8310 | 726963.3150 | 161.404 | HUB-17 |

| GROVE STREET CONSTRUCTION BASELINE DATA | | | | | | |
|---|---|---|---|---|---|---|
| NUMBER | STARTING STATION | END STATION | CURVE DATA | LINE DATA | NORTHING | EASTING |
| C30 | 22+24.92 | 28+65.07 | R =1027.31' △=35°42'10" L=640.15' T=330.85' | | 2997616.148 | 726835.930 |
| L11 | 19+82.74 | 22+24.92 | | N43° 38' 23"W 242.18' | 2997440.883 | 727003.064 |

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

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DESIGNED BY: DJ
CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS
DARSHAN N. JHAVERI
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**Robinson Road Roadway Improvements**

**TIE PLAN**

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 09, 2014 3:16pm
ISSUE DATE 05/14/2014
SHEET 14 OF 29

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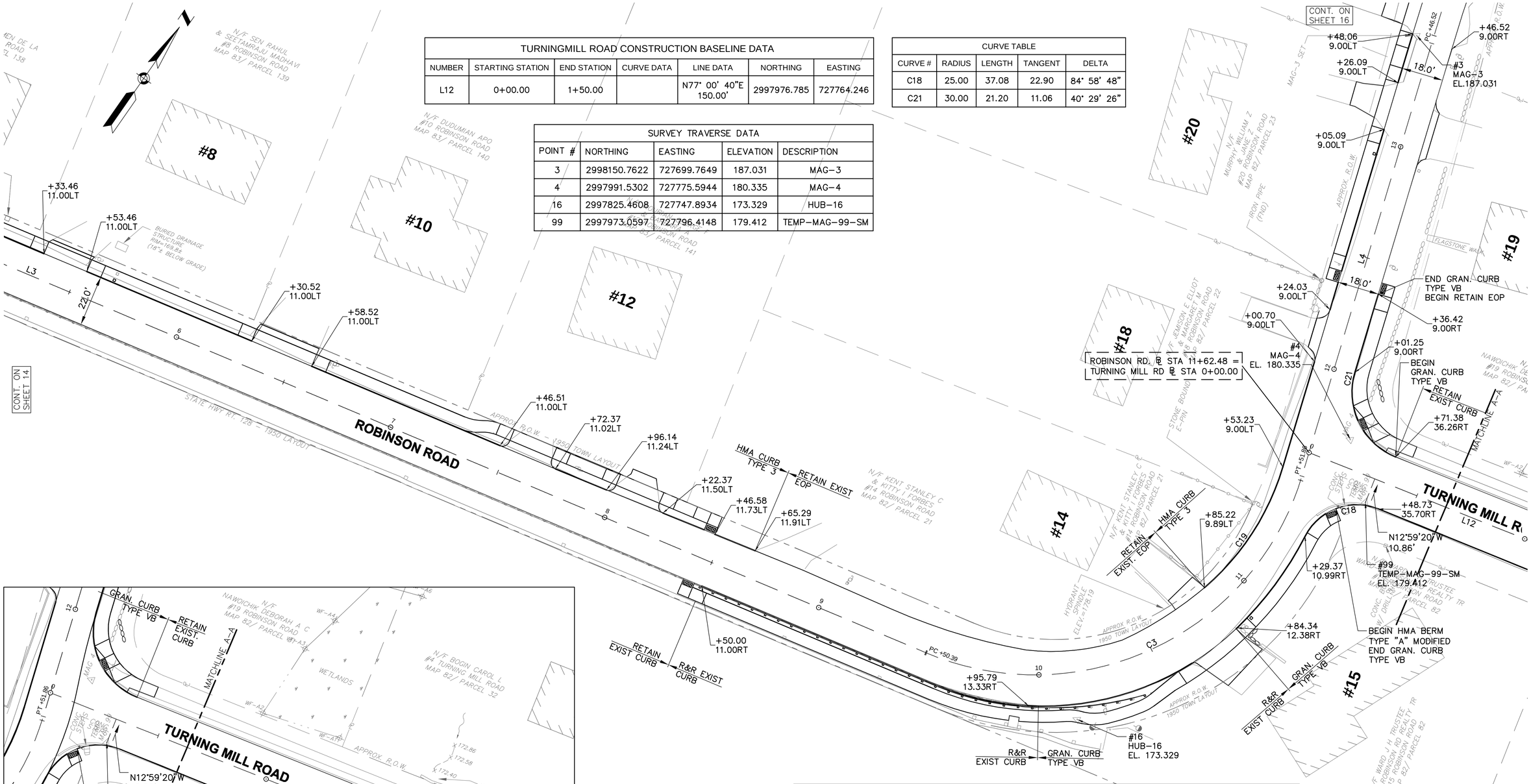
| TURNINGMILL ROAD CONSTRUCTION BASELINE DATA | | | | | | |
|---|---|---|---|---|---|---|
| NUMBER | STARTING STATION | END STATION | CURVE DATA | LINE DATA | NORTHING | EASTING |
| L12 | 0+00.00 | 1+50.00 | | N77° 00' 40"E 150.00' | 2997976.785 | 727764.246 |

| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE # | RADIUS | LENGTH | TANGENT | DELTA |
| C18 | 25.00 | 37.08 | 22.90 | 84° 58' 48" |
| C21 | 30.00 | 21.20 | 11.06 | 40° 29' 26" |

| SURVEY TRAVERSE DATA | | | | |
|---|---|---|---|---|
| POINT # | NORTHING | EASTING | ELEVATION | DESCRIPTION |
| 3 | 2998150.7622 | 727699.7649 | 187.031 | MAG-3 |
| 4 | 2997991.5302 | 727775.5944 | 180.335 | MAG-4 |
| 16 | 2997825.4608 | 727747.8934 | 173.329 | HUB-16 |
| 99 | 2997973.0597 | 727796.4148 | 179.412 | TEMP-MAG-99-SM |




| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

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COMMONWEALTH OF MASSACHUSETTS DARSHAN N. JHAVERI CIVIL No. 41441 REGISTERED PROFESSIONAL ENGINEER

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**Robinson Road Roadway Improvements**

**TIE PLAN**

**Lexington, Massachusetts**

CONTRACT NO. 14-52

PLOT DATE: May. 09, 2014 3:16pm

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SHEET 15 OF 29

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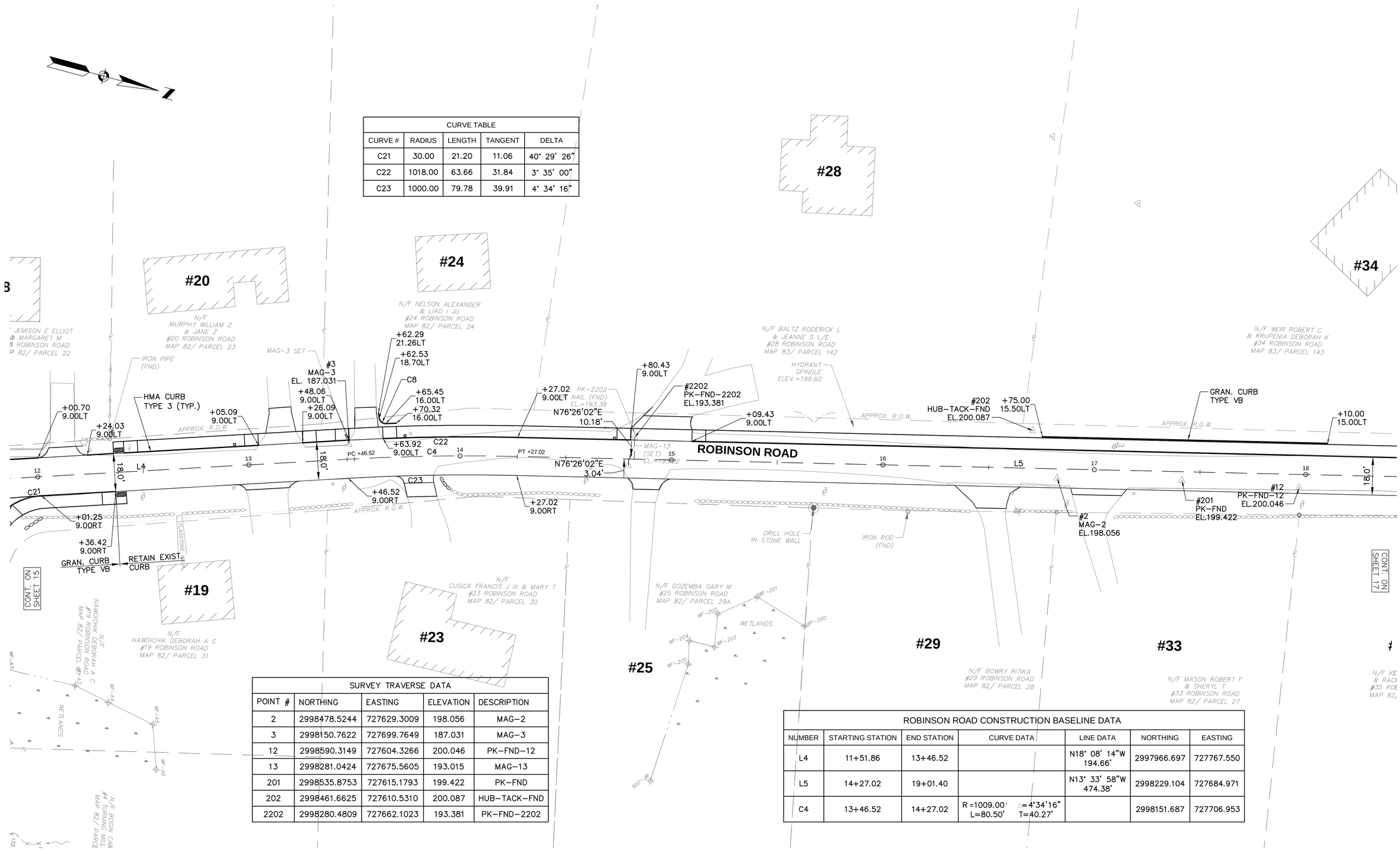
| ROBINSON ROAD CONSTRUCTION BASELINE DATA | | | | | | |
|---|---|---|---|---|---|---|
| NUMBER | STARTING STATION | END STATION | CURVE DATA | LINE DATA | NORTHING | EASTING |
| L3 | 3+31.06 | 9+50.39 | | N78° 03' 24"E 619.33' | 2997683.774 | 727072.424 |
| C3 | 9+50.39 | 11+51.86 | R =120.00' L=201.47' | Δ=96°11'38" T=133.73' | 2997811.939 | 727678.346 |
| L4 | 11+51.86 | 13+46.52 | | N18° 08' 14"W 194.66' | 2997966.697 | 727767.550 |




| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE # | RADIUS | LENGTH | TANGENT | DELTA |
| C21 | 30.00 | 21.20 | 11.06 | 40° 29' 26" |
| C22 | 1018.00 | 63.66 | 31.84 | 3° 35' 00" |
| C23 | 1000.00 | 79.78 | 39.91 | 4° 34' 16" |

| SURVEY TRAVERSE DATA | | | | |
|---|---|---|---|---|
| POINT # | NORTHING | EASTING | ELEVATION | DESCRIPTION |
| 2 | 2998478.5244 | 727629.3009 | 198.056 | MAG-2 |
| 3 | 2998150.7622 | 727699.7649 | 187.031 | MAG-3 |
| 12 | 2998590.3149 | 727604.3266 | 200.046 | PK-FND-12 |
| 13 | 2998281.0424 | 727675.5605 | 193.015 | MAG-13 |
| 201 | 2998535.8753 | 727615.1793 | 199.422 | PK-FND |
| 202 | 2998461.6625 | 727610.5310 | 200.087 | HUB-TACK-FND |
| 2202 | 2998280.4809 | 727662.1023 | 193.381 | PK-FND-2202 |

| ROBINSON ROAD CONSTRUCTION BASELINE DATA | | | | | | |
|---|---|---|---|---|---|---|
| NUMBER | STARTING STATION | END STATION | CURVE DATA | LINE DATA | NORTHING | EASTING |
| L4 | 11+51.86 | 13+46.52 | | N18° 08' 14"W 194.66' | 2997966.697 | 727767.550 |
| L5 | 14+27.02 | 19+01.40 | | N13° 33' 58"W 474.38' | 2998229.104 | 727684.971 |
| C4 | 13+46.52 | 14+27.02 | R =1009.00' △=4°34'16" L=80.50' T=40.27' | | 2998151.687 | 727706.953 |

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

DRAWN BY: KY
DESIGNED BY: DJ
CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS
DARSHAN N. JHAVERI
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SCALE: NOT TO SCALE

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

**Robinson Road Roadway Improvements**

**TIE PLAN**

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 09, 2014 3:16pm
ISSUE DATE 05/14/2014
SHEET 16 OF 29

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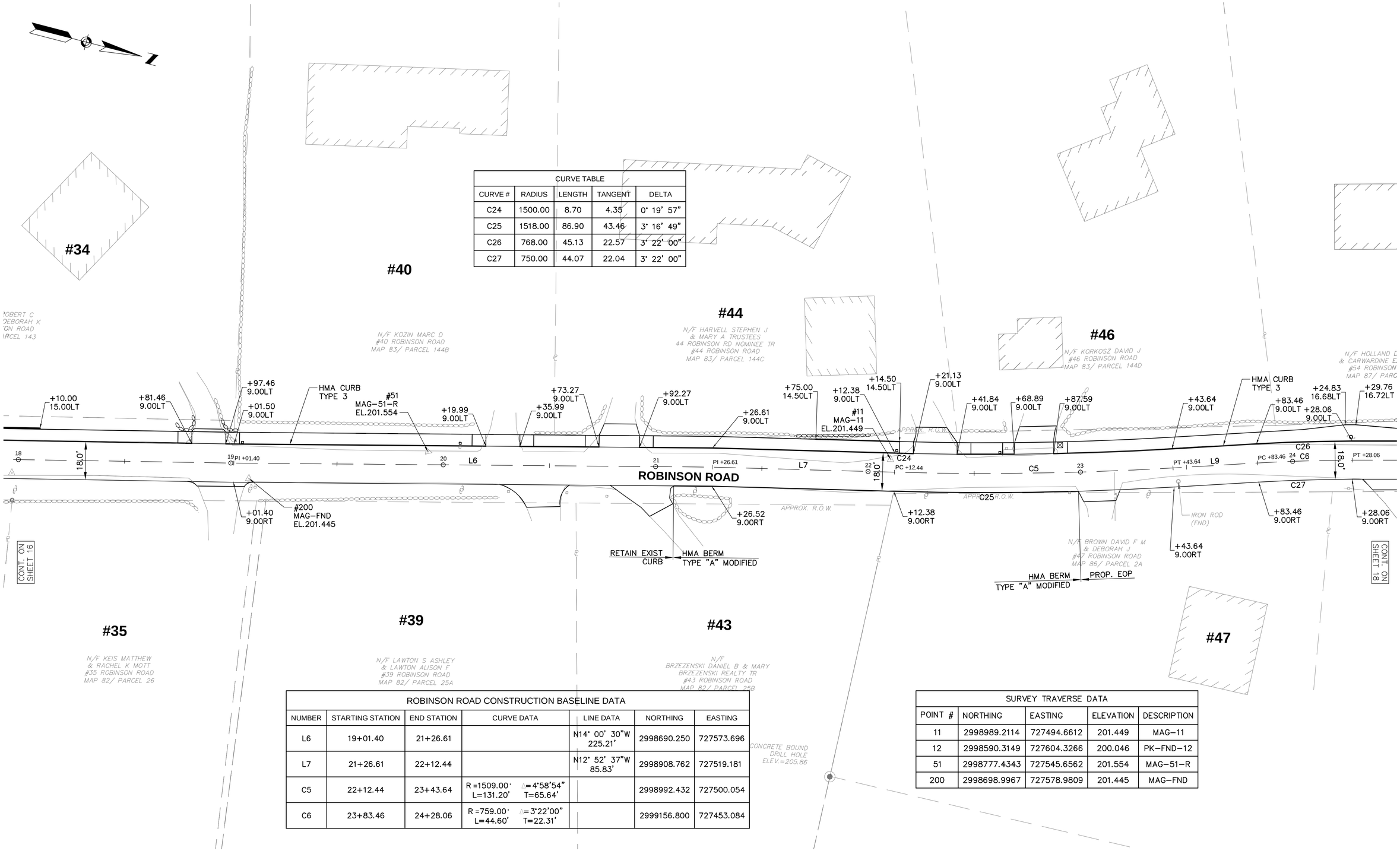


| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE # | RADIUS | LENGTH | TANGENT | DELTA |
| C24 | 1500.00 | 8.70 | 4.35 | 0° 19' 57" |
| C25 | 1518.00 | 86.90 | 43.46 | 3° 16' 49" |
| C26 | 768.00 | 45.13 | 22.57 | 3° 22' 00" |
| C27 | 750.00 | 44.07 | 22.04 | 3° 22' 00" |

| ROBINSON ROAD CONSTRUCTION BASELINE DATA | | | | | | |
|---|---|---|---|---|---|---|
| NUMBER | STARTING STATION | END STATION | CURVE DATA | LINE DATA | NORTHING | EASTING |
| L6 | 19+01.40 | 21+26.61 | | N14° 00' 30"W 225.21' | 2998690.250 | 727573.696 |
| L7 | 21+26.61 | 22+12.44 | | N12° 52' 37"W 85.83' | 2998908.762 | 727519.181 |
| C5 | 22+12.44 | 23+43.64 | R =1509.00' Δ=4°58'54" L=131.20' T=65.64' | | 2998992.432 | 727500.054 |
| C6 | 23+83.46 | 24+28.06 | R =759.00' Δ=3°22'00" L=44.60' T=22.31' | | 2999156.800 | 727453.084 |

| SURVEY TRAVERSE DATA | | | | |
|---|---|---|---|---|
| POINT # | NORTHING | EASTING | ELEVATION | DESCRIPTION |
| 11 | 2998989.2114 | 727494.6612 | 201.449 | MAG-11 |
| 12 | 2998590.3149 | 727604.3266 | 200.046 | PK-FND-12 |
| 51 | 2998777.4343 | 727545.6562 | 201.554 | MAG-51-R |
| 200 | 2998698.9967 | 727578.9809 | 201.445 | MAG-FND |

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

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DESIGNED BY: DJ
CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS
DARSHAN N. JHAVERI
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**Robinson Road Roadway Improvements**

**TIE PLAN**

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 09, 2014 3:16pm
ISSUE DATE 05/14/2014
SHEET 17 OF 29

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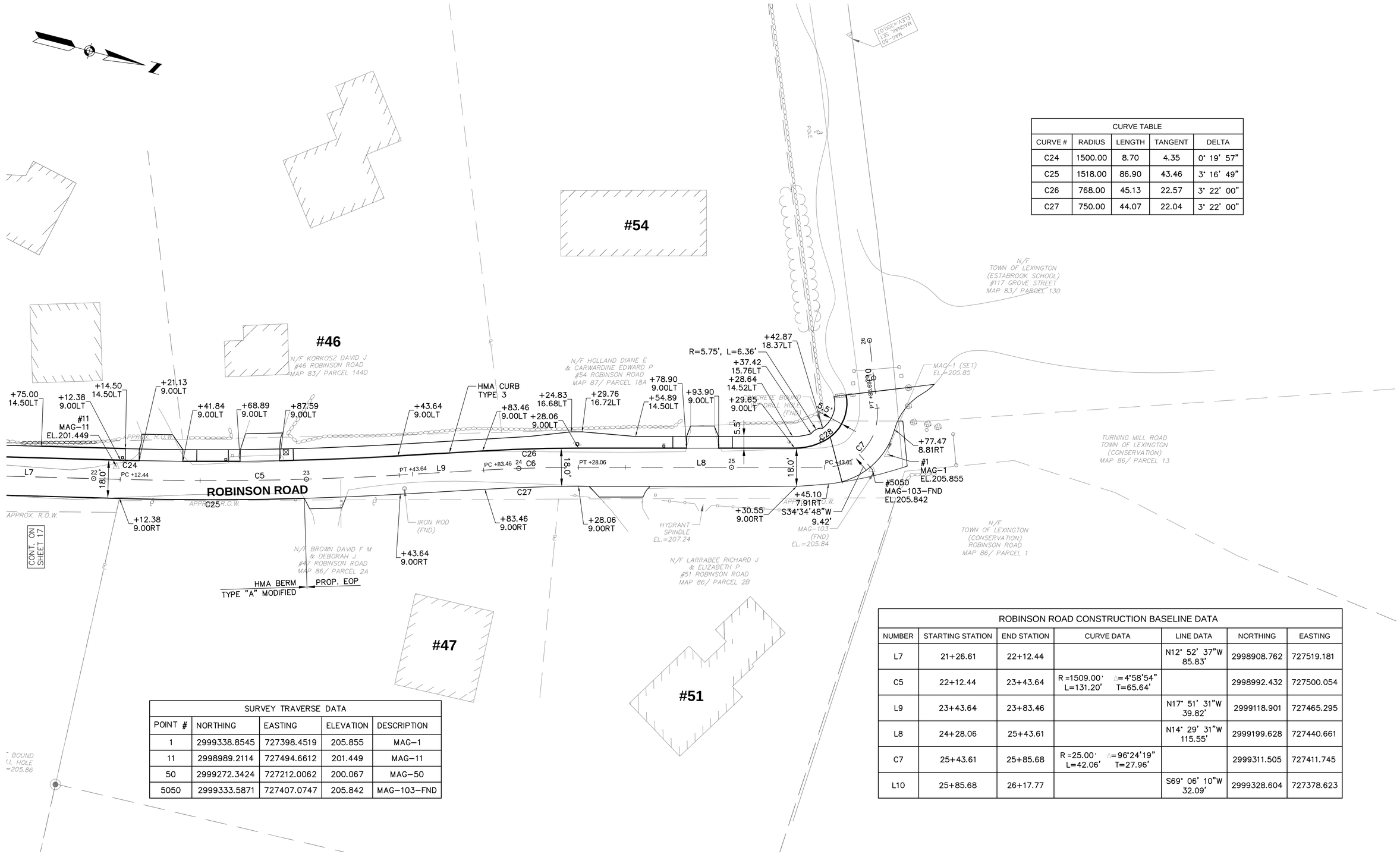


| CURVE TABLE | | | | |
|---|---|---|---|---|
| CURVE # | RADIUS | LENGTH | TANGENT | DELTA |
| C24 | 1500.00 | 8.70 | 4.35 | 0° 19' 57" |
| C25 | 1518.00 | 86.90 | 43.46 | 3° 16' 49" |
| C26 | 768.00 | 45.13 | 22.57 | 3° 22' 00" |
| C27 | 750.00 | 44.07 | 22.04 | 3° 22' 00" |

| ROBINSON ROAD CONSTRUCTION BASELINE DATA | | | | | | |
|---|---|---|---|---|---|---|
| NUMBER | STARTING STATION | END STATION | CURVE DATA | LINE DATA | NORTHING | EASTING |
| L7 | 21+26.61 | 22+12.44 | | N12° 52' 37"W 85.83' | 2998908.762 | 727519.181 |
| C5 | 22+12.44 | 23+43.64 | R =1509.00' Δ= 4°58'54" L=131.20' T=65.64' | | 2998992.432 | 727500.054 |
| L9 | 23+43.64 | 23+83.46 | | N17° 51' 31"W 39.82' | 2999118.901 | 727465.295 |
| L8 | 24+28.06 | 25+43.61 | | N14° 29' 31"W 115.55' | 2999199.628 | 727440.661 |
| C7 | 25+43.61 | 25+85.68 | R =25.00' Δ=96°24'19" L=42.06' T=27.96' | | 2999311.505 | 727411.745 |
| L10 | 25+85.68 | 26+17.77 | | S69° 06' 10"W 32.09' | 2999328.604 | 727378.623 |

| SURVEY TRAVERSE DATA | | | | |
|---|---|---|---|---|
| POINT # | NORTHING | EASTING | ELEVATION | DESCRIPTION |
| 1 | 2999338.8545 | 727398.4519 | 205.855 | MAG-1 |
| 11 | 2998989.2114 | 727494.6612 | 201.449 | MAG-11 |
| 50 | 2999272.3424 | 727212.0062 | 200.067 | MAG-50 |
| 5050 | 2999333.5871 | 727407.0747 | 205.842 | MAG-103-FND |

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|---|---|---|---|---|
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REVISIONS

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CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS
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**Robinson Road Roadway Improvements**

**TIE PLAN**

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 09, 2014 3:16pm
ISSUE DATE 05/14/2014
SHEET 18 OF 29

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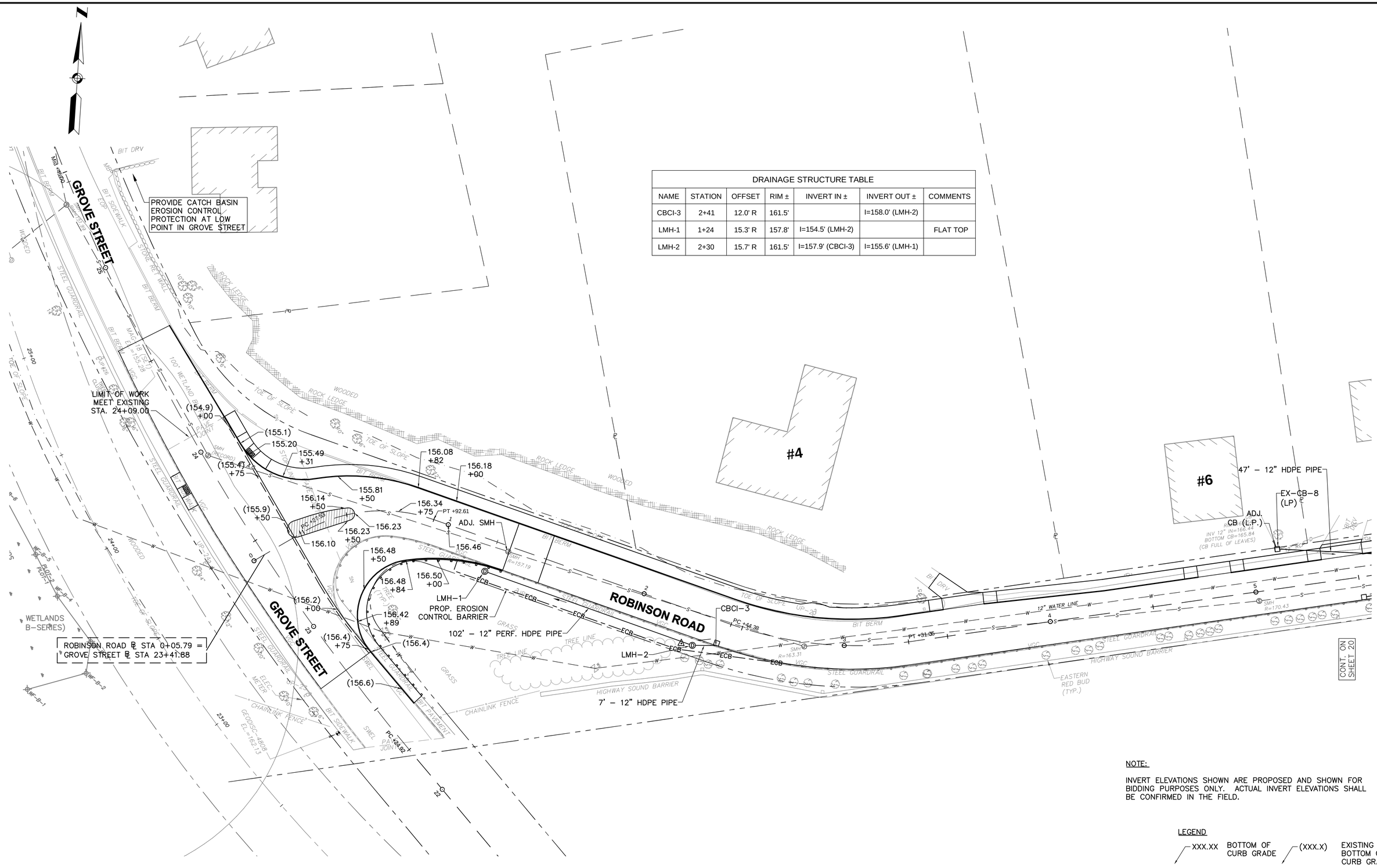


| DRAINAGE STRUCTURE TABLE | | | | | | |
|---|---|---|---|---|---|---|
| NAME | STATION | OFFSET | RIM ± | INVERT IN ± | INVERT OUT ± | COMMENTS |
| CBCI-3 | 2+41 | 12.0' R | 161.5' | | I=158.0' (LMH-2) | |
| LMH-1 | 1+24 | 15.3' R | 157.8' | I=154.5' (LMH-2) | | FLAT TOP |
| LMH-2 | 2+30 | 15.7' R | 161.5' | I=157.9' (CBCI-3) | I=155.6' (LMH-1) | |

NOTE:

INVERT ELEVATIONS SHOWN ARE PROPOSED AND SHOWN FOR BIDDING PURPOSES ONLY. ACTUAL INVERT ELEVATIONS SHALL BE CONFIRMED IN THE FIELD.

LEGEND

XXX.XX BOTTOM OF CURB GRADE

(XXX.X) EXISTING BOTTOM OF CURB GRADE

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

DRAWN BY: KY/MC

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COMMONWEALTH OF MASSACHUSETTS DARSHAN N. JHAVERI CIVIL No. 41441 REGISTERED PROFESSIONAL ENGINEER

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20 0 20 40
SCALE IN FEET: 1"=20'

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**Robinson Road Roadway Improvements**

# UTILITY AND GRADING PLAN

**Lexington, Massachusetts**

CONTRACT NO. 14-52

PLOT DATE: May. 09, 2014 3:16pm

ISSUE DATE 05/14/2014

SHEET 19 OF 29

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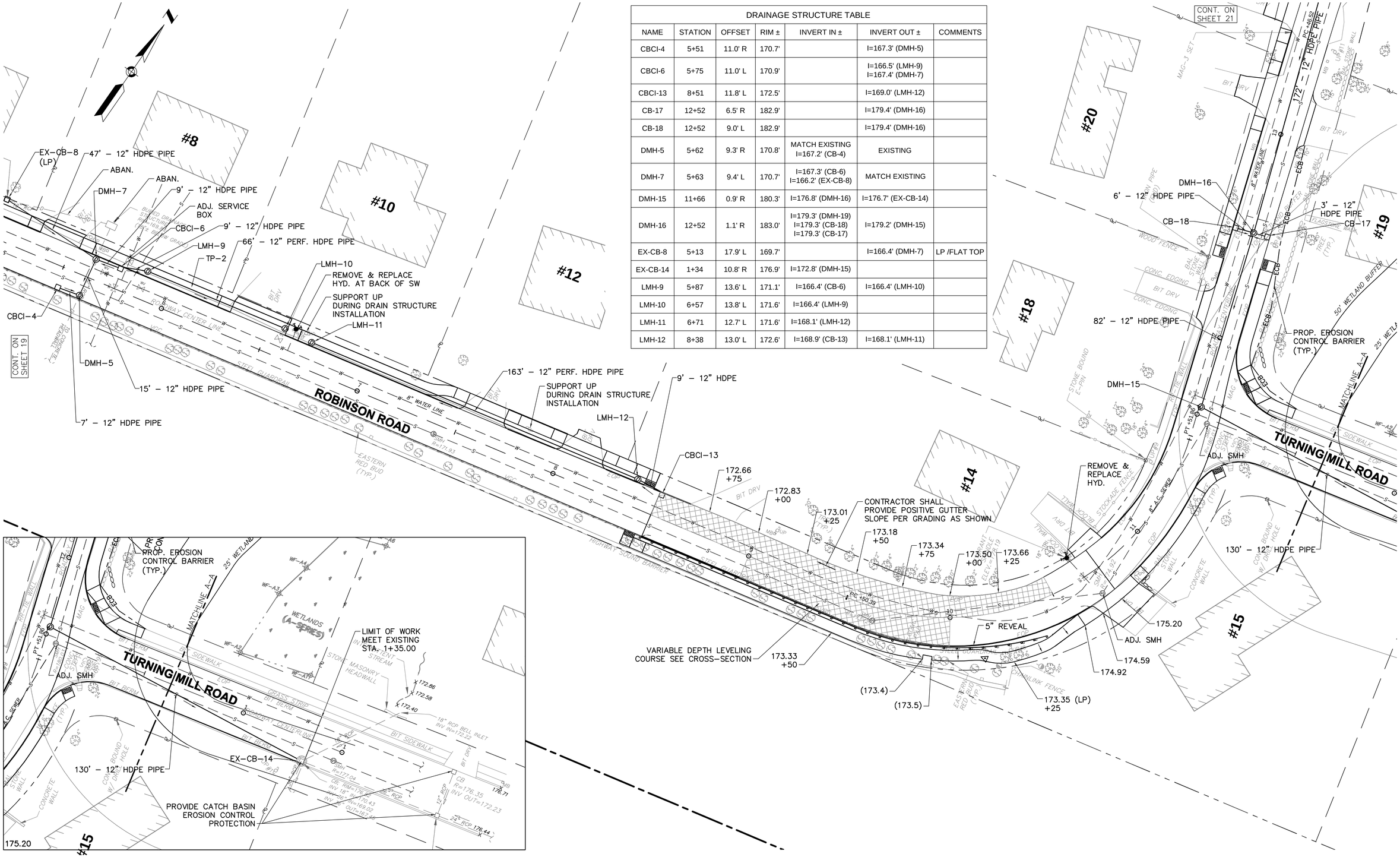
| DRAINAGE STRUCTURE TABLE | | | | | | |
|---|---|---|---|---|---|---|
| NAME | STATION | OFFSET | RIM ± | INVERT IN ± | INVERT OUT ± | COMMENTS |
| CBCI-4 | 5+51 | 11.0' R | 170.7' | | I=167.3' (DMH-5) | |
| CBCI-6 | 5+75 | 11.0' L | 170.9' | | I=166.5' (LMH-9)<br>I=167.4' (DMH-7) | |
| CBCI-13 | 8+51 | 11.8' L | 172.5' | | I=169.0' (LMH-12) | |
| CB-17 | 12+52 | 6.5' R | 182.9' | | I=179.4' (DMH-16) | |
| CB-18 | 12+52 | 9.0' L | 182.9' | | I=179.4' (DMH-16) | |
| DMH-5 | 5+62 | 9.3' R | 170.8' | MATCH EXISTING<br>I=167.2' (CB-4) | EXISTING | |
| DMH-7 | 5+63 | 9.4' L | 170.7' | I=167.3' (CB-6)<br>I=166.2' (EX-CB-8) | MATCH EXISTING | |
| DMH-15 | 11+66 | 0.9' R | 180.3' | I=176.8' (DMH-16) | I=176.7' (EX-CB-14) | |
| DMH-16 | 12+52 | 1.1' R | 183.0' | I=179.3' (DMH-19)<br>I=179.3' (CB-18)<br>I=179.3' (CB-17) | I=179.2' (DMH-15) | |
| EX-CB-8 | 5+13 | 17.9' L | 169.7' | | I=166.4' (DMH-7) | LP /FLAT TOP |
| EX-CB-14 | 1+34 | 10.8' R | 176.9' | I=172.8' (DMH-15) | | |
| LMH-9 | 5+87 | 13.6' L | 171.1' | I=166.4' (CB-6) | I=166.4' (LMH-10) | |
| LMH-10 | 6+57 | 13.8' L | 171.6' | I=166.4' (LMH-9) | | |
| LMH-11 | 6+71 | 12.7' L | 171.6' | I=168.1' (LMH-12) | | |
| LMH-12 | 8+38 | 13.0' L | 172.6' | I=168.9' (CB-13) | I=168.1' (LMH-11) | |




| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
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REVISIONS

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DESIGNED BY: DJ

CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS
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20 0 20 40
SCALE IN FEET: 1"=20'

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**Robinson Road Roadway Improvements**

# UTILITY AND GRADING PLAN

**Lexington, Massachusetts**

CONTRACT NO. 14-52

PLOT DATE: May. 09, 2014 3:16pm

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SHEET 20 OF 29

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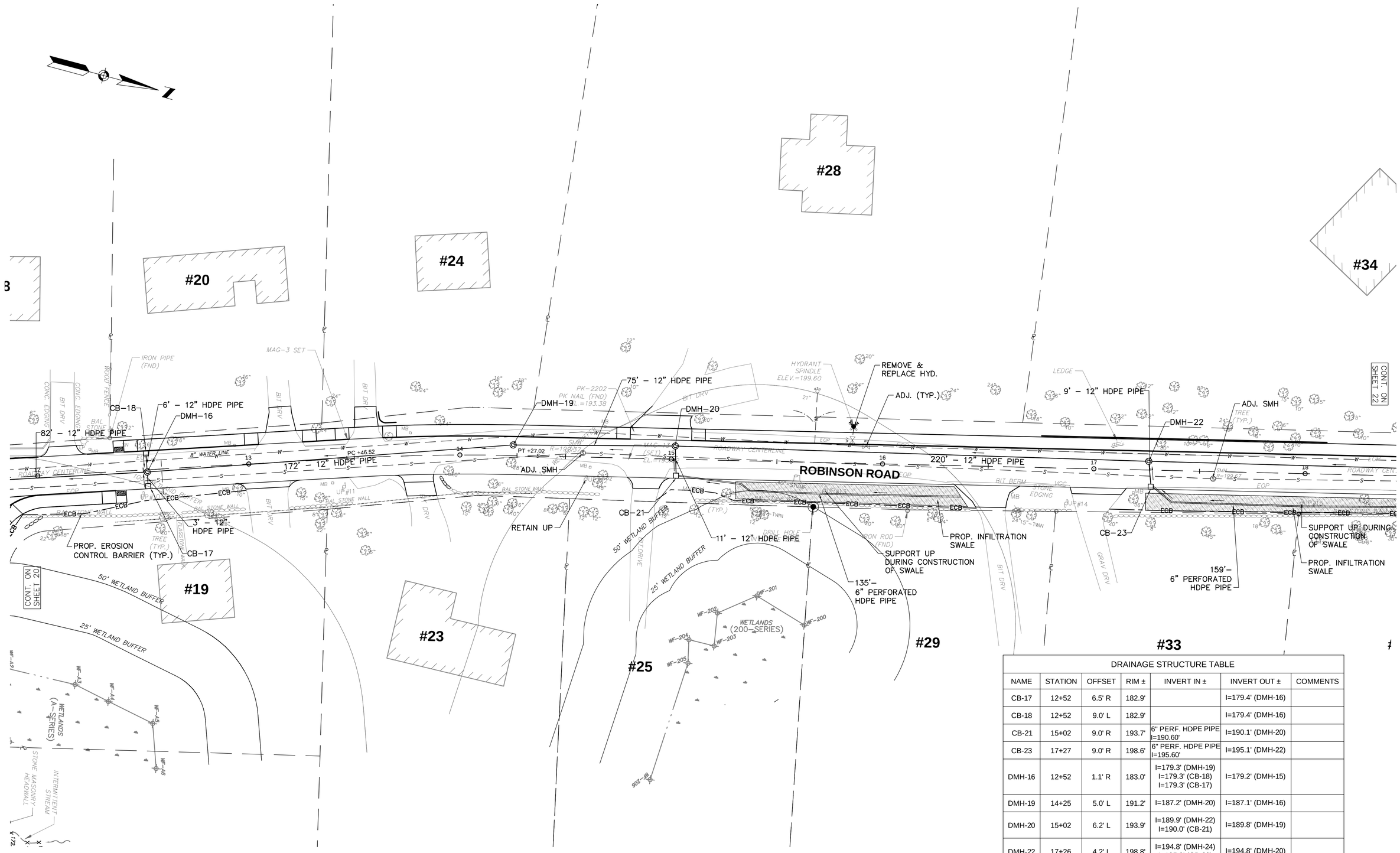


| DRAINAGE STRUCTURE TABLE | | | | | | |
|---|---|---|---|---|---|---|
| NAME | STATION | OFFSET | RIM ± | INVERT IN ± | INVERT OUT ± | COMMENTS |
| CB-17 | 12+52 | 6.5' R | 182.9' | | I=179.4' (DMH-16) | |
| CB-18 | 12+52 | 9.0' L | 182.9' | | I=179.4' (DMH-16) | |
| CB-21 | 15+02 | 9.0' R | 193.7' | 6" PERF. HDPE PIPE I=190.60' | I=190.1' (DMH-20) | |
| CB-23 | 17+27 | 9.0' R | 198.6' | 6" PERF. HDPE PIPE I=195.60' | I=195.1' (DMH-22) | |
| DMH-16 | 12+52 | 1.1' R | 183.0' | I=179.3' (DMH-19) I=179.3' (CB-18) I=179.3' (CB-17) | I=179.2' (DMH-15) | |
| DMH-19 | 14+25 | 5.0' L | 191.2' | I=187.2' (DMH-20) | I=187.1' (DMH-16) | |
| DMH-20 | 15+02 | 6.2' L | 193.9' | I=189.9' (DMH-22) I=190.0' (CB-21) | I=189.8' (DMH-19) | |
| DMH-22 | 17+26 | 4.2' L | 198.8' | I=194.8' (DMH-24) I=195.0' (CB-23) | I=194.8' (DMH-20) | |

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

DRAWN BY: KY/MC

DESIGNED BY: DJ

CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS DARSHAN N. JHAVERI CIVIL No. 41441 REGISTERED PROFESSIONAL ENGINEER

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**Robinson Road Roadway Improvements**

# UTILITY AND GRADING PLAN

**Lexington, Massachusetts**

CONTRACT NO. 14-52

PLOT DATE: May. 09, 2014 3:17pm

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SHEET 21 OF 29

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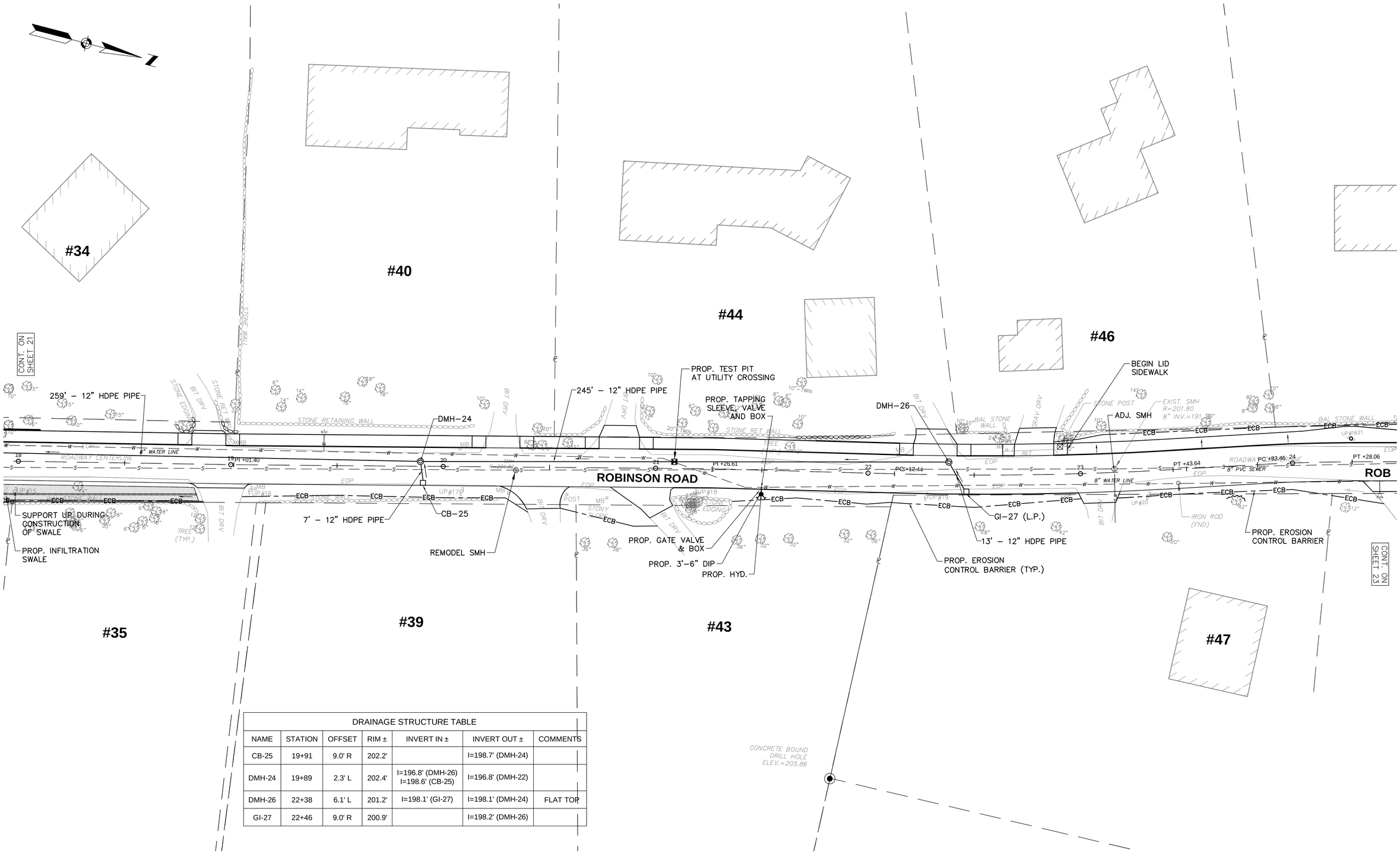


DRAINAGE STRUCTURE TABLE

| NAME | STATION | OFFSET | RIM ± | INVERT IN ± | INVERT OUT ± | COMMENTS |
|---|---|---|---|---|---|---|
| CB-25 | 19+91 | 9.0' R | 202.2' | | I=198.7' (DMH-24) | |
| DMH-24 | 19+89 | 2.3' L | 202.4' | I=196.8' (DMH-26)<br>I=198.6' (CB-25) | I=196.8' (DMH-22) | |
| DMH-26 | 22+38 | 6.1' L | 201.2' | I=198.1' (GI-27) | I=198.1' (DMH-24) | FLAT TOP |
| GI-27 | 22+46 | 9.0' R | 200.9' | | I=198.2' (DMH-26) | |

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

DRAWN BY: KY/MC

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CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS
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# UTILITY AND GRADING PLAN

**Lexington, Massachusetts**

CONTRACT NO. 14-52

PLOT DATE: May. 09, 2014 3:17pm

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SHEET 22 OF 29

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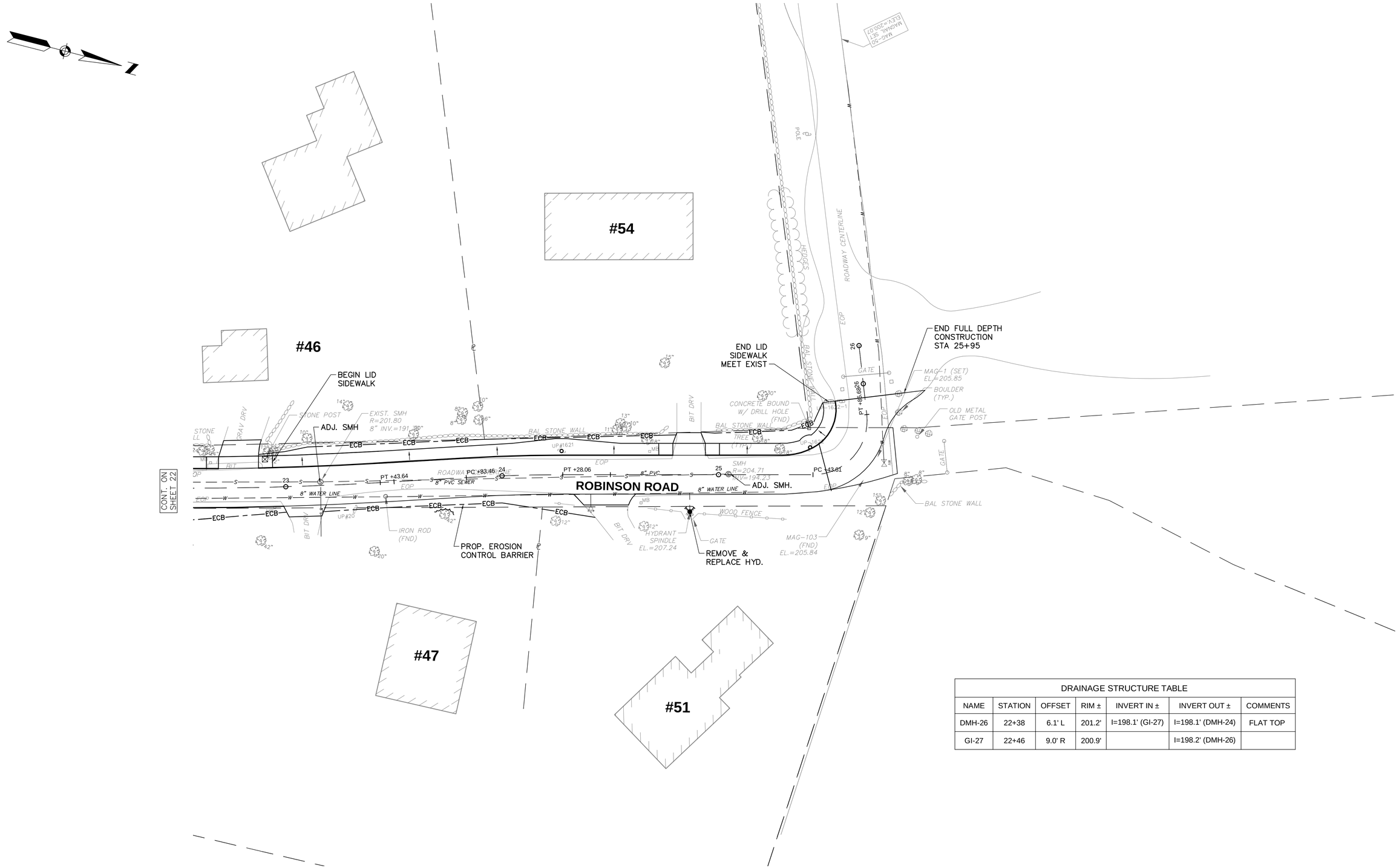


| DRAINAGE STRUCTURE TABLE | | | | | | |
|---|---|---|---|---|---|---|
| NAME | STATION | OFFSET | RIM ± | INVERT IN ± | INVERT OUT ± | COMMENTS |
| DMH-26 | 22+38 | 6.1' L | 201.2' | I=198.1' (GI-27) | I=198.1' (DMH-24) | FLAT TOP |
| GI-27 | 22+46 | 9.0' R | 200.9' | | I=198.2' (DMH-26) | |

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

DRAWN BY: KY/MC

DESIGNED BY: DJ/MC

CHECKED BY: ATL

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# UTILITY AND GRADING PLAN

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 09, 2014 3:17pm
ISSUE DATE 05/14/2014
SHEET 23 OF 29

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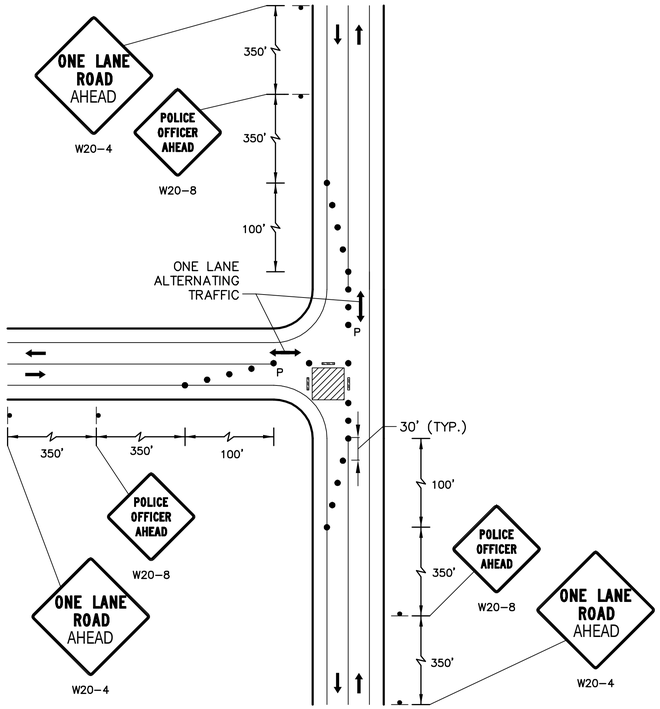
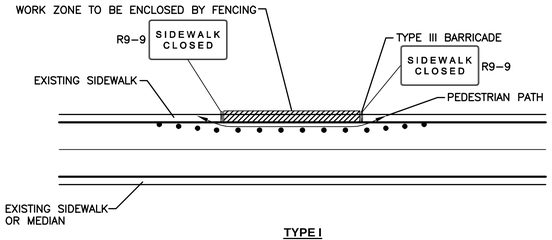


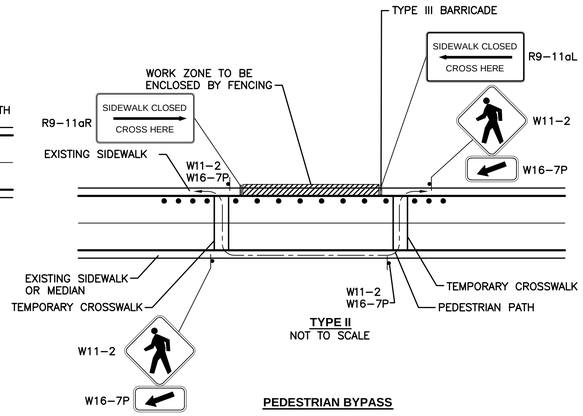

**INTERSECTION WITH LANE CLOSURE**

NOT TO SCALE




**TYPE I**

NOT TO SCALE



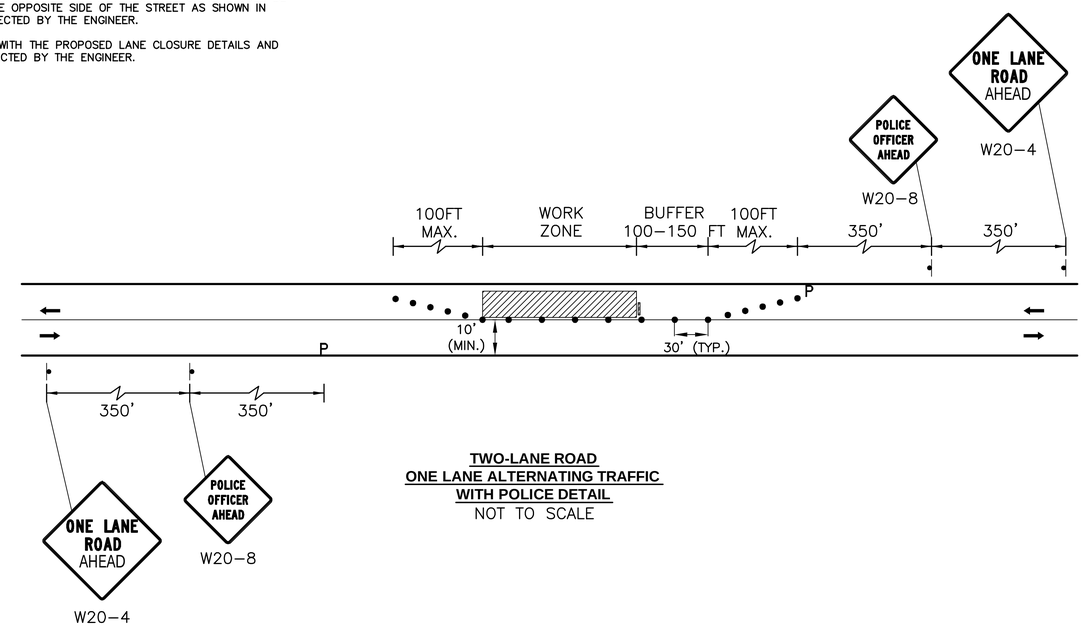

**TYPE II**

NOT TO SCALE

**PEDESTRIAN BYPASS**

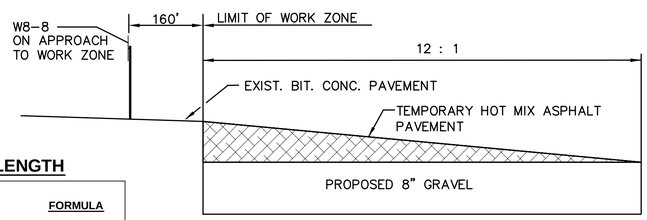
**NOTES**

1. ADDITIONAL ADVANCE WARNING MAY BE NECESSARY.
2. CONTROLS ONLY FOR PEDESTRIAN TRAFFIC ARE SHOWN. VEHICULAR TRAFFIC SHOULD BE HANDLED AS SHOWN ELSEWHERE.
3. STREET LIGHTING SHOULD BE CONSIDERED WHEN LOCATING CONTROL DEVICES.
4. ←——→ DIRECTION OF PEDESTRIAN TRAVEL.
5. IF THE WORK ZONE DOES NOT PERMIT PEDESTRIANS TO TRAVEL ADJACENT TO IT AS SHOWN IN PEDESTRIAN BYPASS TYPE I, TEMPORARY CROSSWALKS WITH APPROPRIATE SIGNS SHOULD BE INSTALLED TO CROSS PEDESTRIANS TO THE OPPOSITE SIDE OF THE STREET AS SHOWN IN PEDESTRIAN BYPASS TYPE II, AND AS DIRECTED BY THE ENGINEER.
6. BYPASS IS TO BE USED IN CONJUNCTION WITH THE PROPOSED LANE CLOSURE DETAILS AND DURING CONSTRUCTION STAGING, AS DIRECTED BY THE ENGINEER.




**TWO-LANE ROAD**
**ONE LANE ALTERNATING TRAFFIC**
**WITH POLICE DETAIL**

NOT TO SCALE



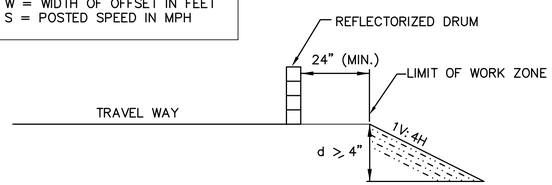

**TEMPORARY PAVEMENT RAMP**

NOT TO SCALE

**TAPER LENGTH**

| SPEED LIMIT | FORMULA |
|---|---|
| 40 MPH or Less | $L=WS^2/60$ |
| 45 MPH or Greater | $L=W \times S$ |

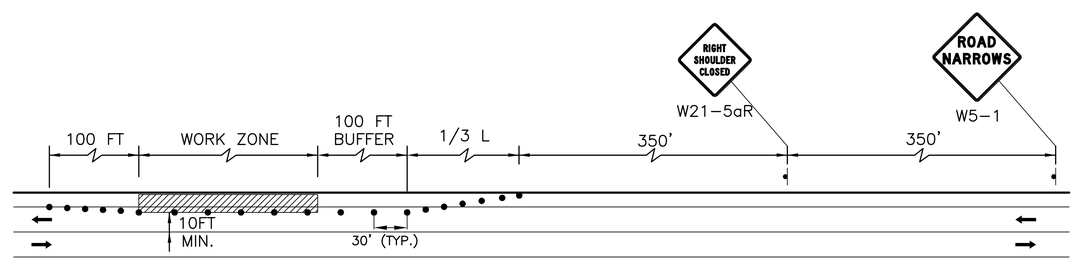
L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = POSTED SPEED IN MPH




**TEMPORARY TRAVEL WAY AND LATERAL PAVEMENT SLOPE**

**(AFTER WORK HOUR SETUP)**

NOT TO SCALE




**TWO-LANE ROAD**
**SHOULDER CLOSED**
**(GROVE STREET)**

NOT TO SCALE

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|

REVISIONS

DRAWN BY: KY
DESIGNED BY: DJ
CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS
DARSHAN N. JHAVERI
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SCALE: NOT TO SCALE

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**Robinson Road Roadway Improvements**

**TRAFFIC MANAGEMENT PLAN**
**TYPICALS**

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 09, 2014 3:17pm
ISSUE DATE 05/14/2014
SHEET 24 OF 29

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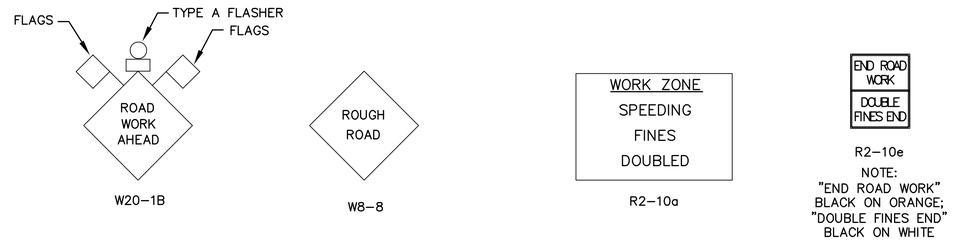
## SAFETY SIGNING FOR CONSTRUCTION OPERATIONS

| LEGEND | TYPE | SIZE | NO. SIGNS |
|---|---|---|---|
| ROAD WORK AHEAD | W20–1B | 36" x 36" | 4 |
| ONE LANE ROAD AHEAD | W20–4 | 36" x 36" | 2 |
| POLICE OFFICER AHEAD | W20–8 | 36" x 36" | 3 |
| RIGHT SHOULDER CLOSED | W21–5aR | 30" x 30" | 2 |
| ROUGH ROAD | W8–8 | 30" x 30" | 2 |
| ADVISORY SPEED | W13–1 | 24" x 30" | 2 |
| ROAD NARROWS | W5–1 | 36" x 36" | 2 |
| WORK ZONE SPEEDING FINES ..... | R2–10a | 48" x 36" | 3 |
| END ROAD WORK/DOUBLE FINES END | R2–10e | 36" x 48" | 3 |
| SIDEWALK CLOSED | R9–9 | 30" x 18" | 2 |
| SIDEWALK CLOSED USE OTHER SIDE | R9–10 | 48" x 24" | 2 |
| SIDEWALK CLOSED CROSS HERE | R9–11a | 48" x 24" | 2 |
| GRAPHICS | W11–2 | 30" x 30" | 2 |
| ARROW | W16–7P | 12" x 24" | 2 |



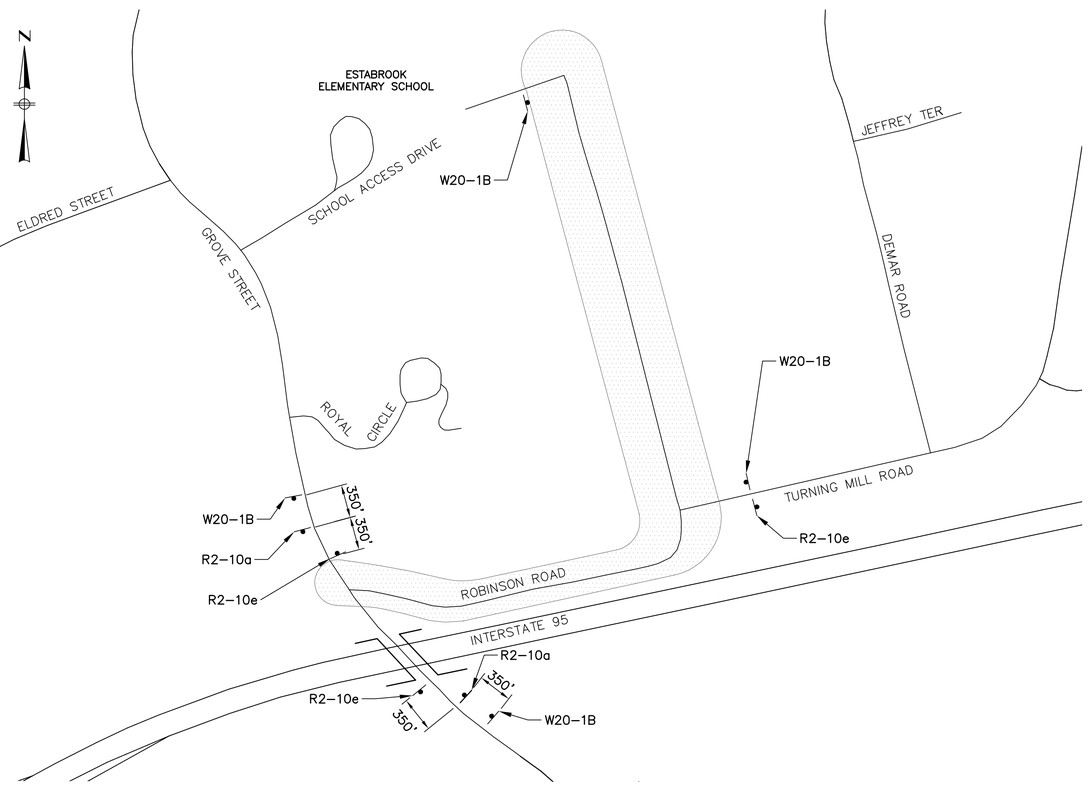

**CONSTRUCTION SIGNS**
NOT TO SCALE

### NOTES:

1. ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE 2009 EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ALL REVISIONS.
2. ALL SIGN LEGENDS, BORDERS AND MOUNTING SHALL BE IN ACCORDANCE WITH THE MUTCD.
3. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER TRAFFIC CONTROL DEVICES SHALL BE IN PLACE PRIOR TO THE START OF ANY WORK.
4. TEMPORARY CONSTRUCTION SIGNING, BARRICADES AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE REMOVED FROM THE HIGHWAY OR COVERED WHEN THEY ARE NOT REQUIRED FOR CONTROL OF TRAFFIC.
5. SIGNS AND SIGN SUPPORTS LOCATED ON OR NEAR THE TRAVELED WAY, AND REFLECTORIZED PLASTIC DRUMS WITH LIGHTING DEVICES MOUNTED ON THEM, MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, "RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES."
6. CONTRACTORS SHALL NOTIFY EACH ABUTTER AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS, SUCH AS CONDUIT INSTALLATION, EXISTING PAVEMENT EXCAVATION, TEMPORARY DRIVEWAY PAVEMENT PLACEMENT AND SIMILAR OPERATIONS.
7. THE FIRST THREE PLASTIC DRUMS OF A TAPER MAY BE MOUNTED WITH TYPE A LIGHTS.
8. THE ADVISORY SPEED LIMIT, IF REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
9. DISTANCES ARE A GUIDE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
10. MAXIMUM SPACING OF TRAFFIC DEVICES IN A TAPER (DRUMS OR CONES) IS EQUAL IN FEET TO THE SPEED LIMIT IN MPH.
11. MINIMUM LANE WIDTH IS TO BE 11 FEET UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
12. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.
13. TEMPORARY CONSTRUCTION SIGNING AND ALL OTHER NECESSARY WORK ZONE TRAFFIC CONTROL NOT COVERED IN THE PLAN SHALL REFER TO MASS HIGHWAY "STANDARD DETAILS AND DRAWINGS FOR THE DEVELOPMENT OF TRAFFIC MANAGEMENT PLANS".
14. IF NECESSARY, TRAFFIC DETOUR PLANS SHALL BE SUBMITTED TO THE TOWN FOR APPROVAL PRIOR TO IMPLEMENTATION. CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTATION OF DETOUR PLAN INCLUDING ALL MATERIALS AND LABOR.
15. IN ORDER TO MINIMIZE TRAFFIC IMPACT, THE CONTRACTOR SHALL FOLLOW THE REQUIREMENTS OF THE TRAFFIC MANAGEMENT PLAN IDENTIFIED ON SHEETS 10 AND 11 UNLESS OTHERWISE DIRECTED BY THE TOWN.

### LEGEND:

- REFLECTORIZED PLASTIC DRUM
- P POLICE DETAIL
- TYPE III BARRICADE
- FLASHING ARROW PANEL
- FLASHING ARROW PANEL
- WORK ZONE
- DIRECTION OF TRAFFIC
- IMPACT ATTENUATOR
- MEDIAN BARRIER
- MEDIAN BARRIER WITH WARNING LIGHTS
- WORK VEHICLE
- TRUCK MOUNTED ATTENUATOR
- TRAFFIC OR PEDESTRIAN SIGNAL
- SIGN




**PROJECT LIMIT SIGNING**
NOT TO SCALE

| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
|---|---|---|---|---|
| | | | | |

REVISIONS

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DESIGNED BY: DJ
CHECKED BY: ATL

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**Robinson Road Roadway Improvements**

**TRAFFIC MANAGEMENT PLAN**
**LEGEND & SIGN LOCATIONS**

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 09, 2014 3:17pm
ISSUE DATE 05/14/2014
SHEET 25 OF 29

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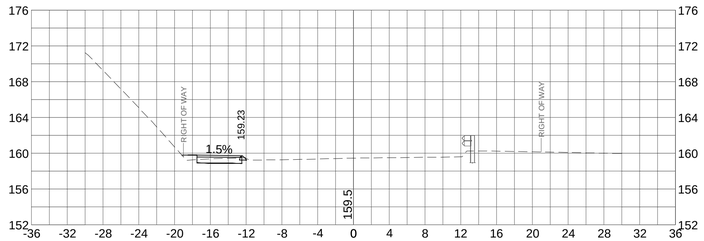


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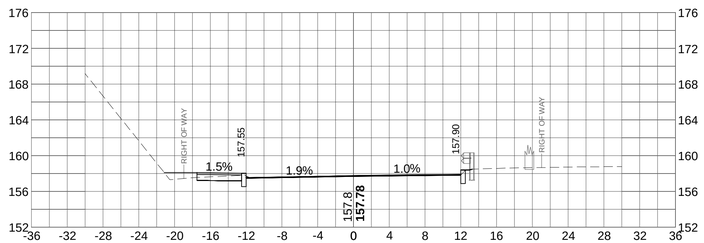


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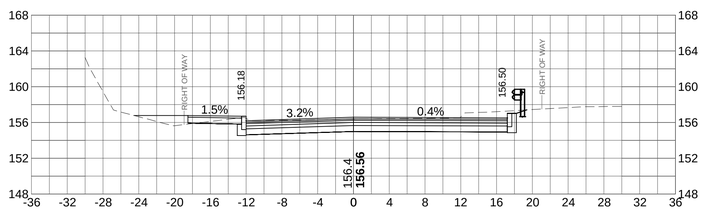


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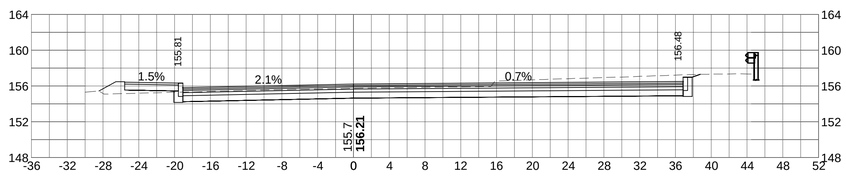


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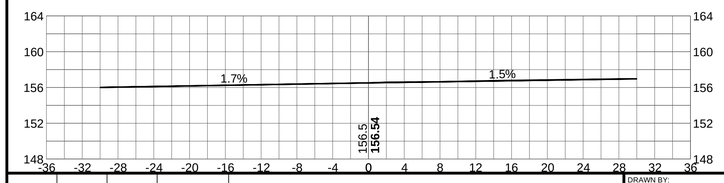


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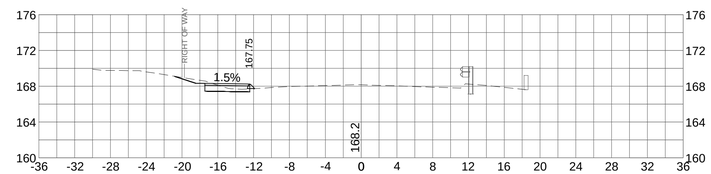


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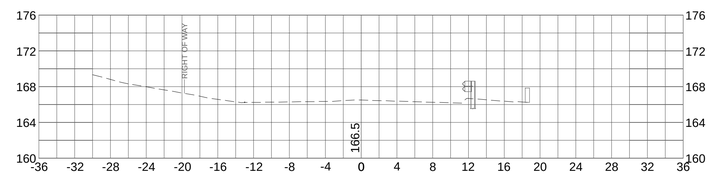


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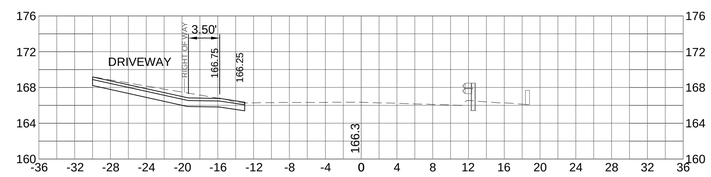


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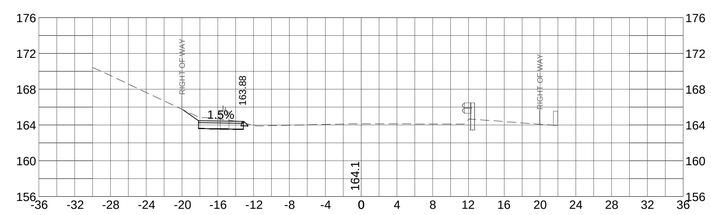


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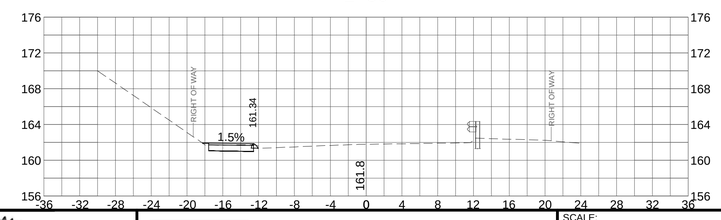


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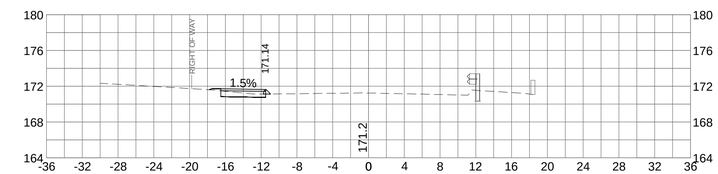


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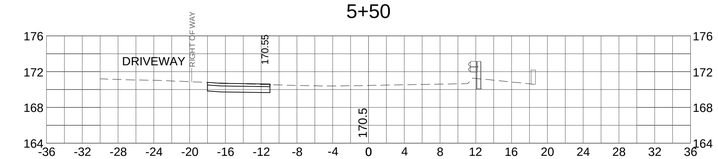


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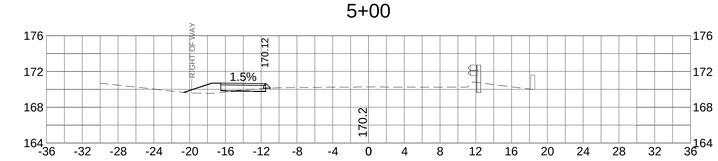


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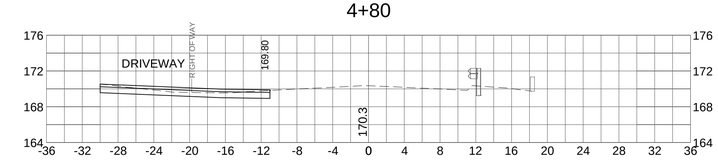


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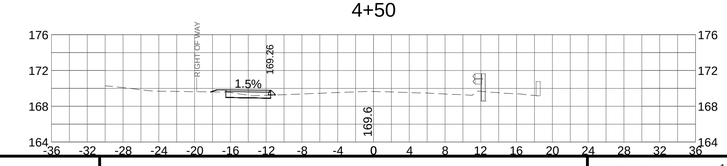


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|---|---|---|---|---|
| | | | | |

REVISIONS

DRAWN BY: KGY

DESIGNED BY: DJ

CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS
DARSHAN N. JHAVERI
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No. 41441
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SCALE:

8 0 8 16

SCALE IN FEET: 1"=8'

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**Robinson Road Roadway Improvements**

# CROSS-SECTIONS

**Lexington, Massachusetts**

CONTRACT NO. 14-52

PLOT DATE: May. 09, 2014 3:17pm

ISSUE DATE 05/14/2014

SHEET 26 OF 29

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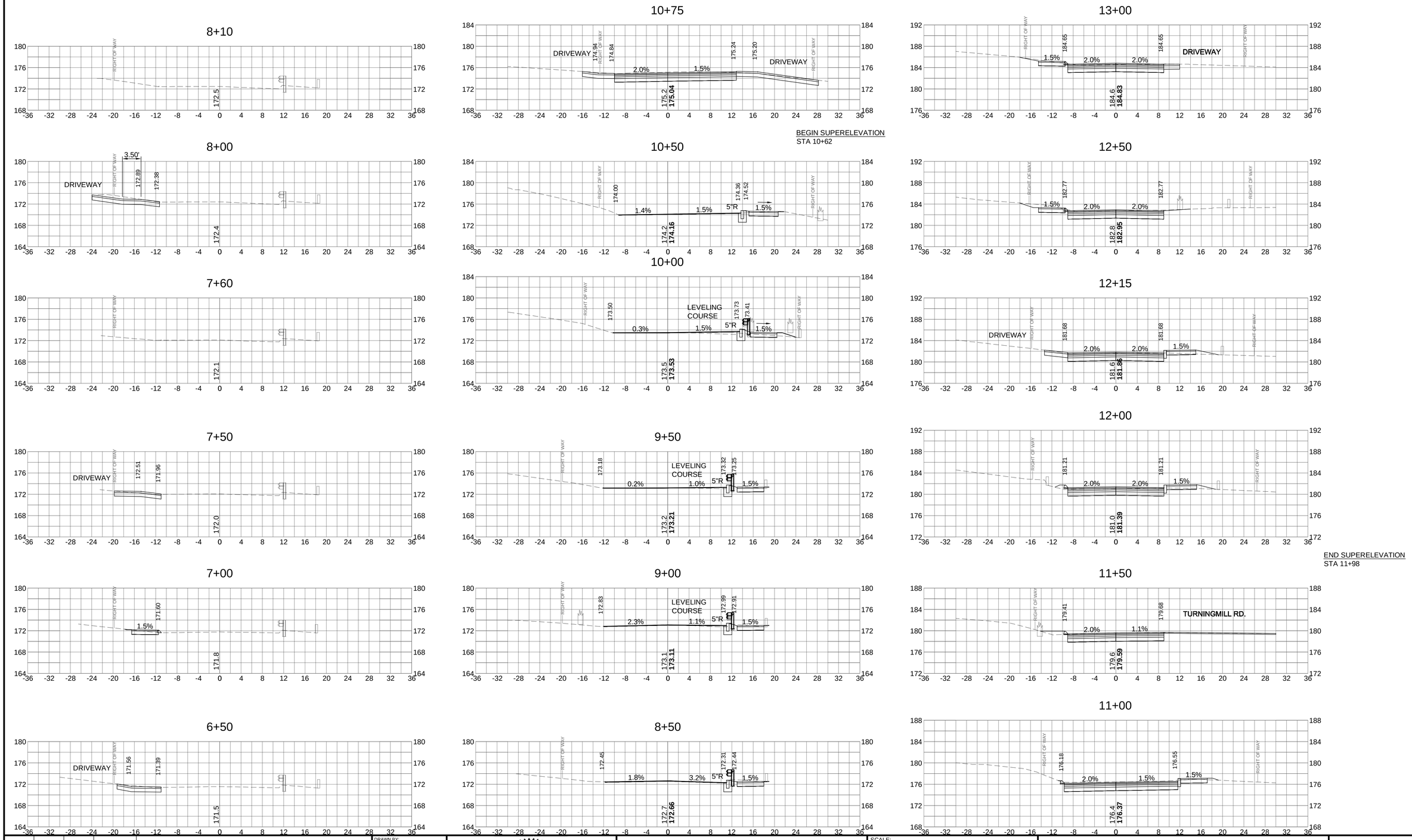


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SCALE:
8 0 8 16
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# CROSS-SECTIONS

**Lexington, Massachusetts**

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PLOT DATE: May. 09, 2014 3:17pm

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SHEET 27 OF 29

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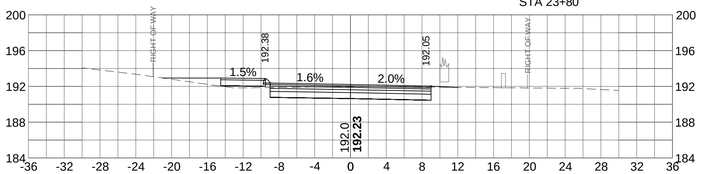
BEGIN FULL SUPERELEVATION
STA 14+55
e = 0.02
END FULL SUPERELEVATION
STA 23+80

BEGIN SUPERELEVATION
STA 14+00

## 14+50

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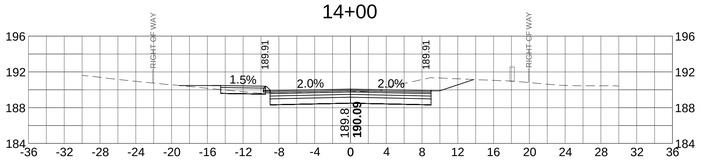


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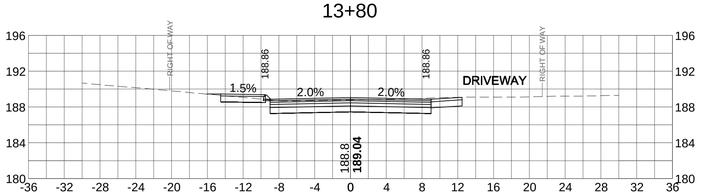


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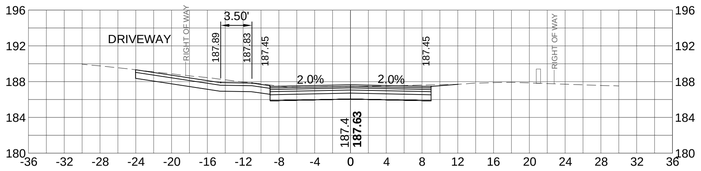


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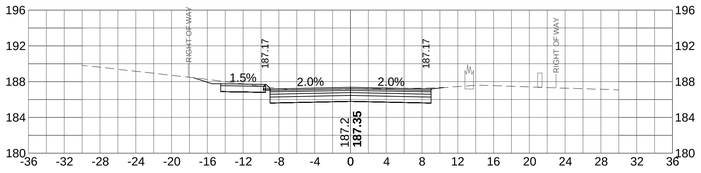


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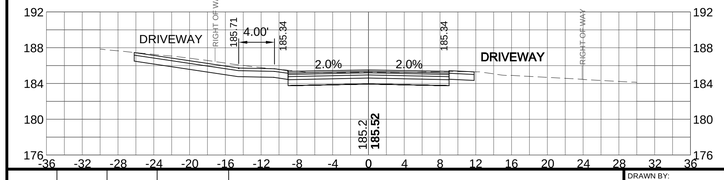


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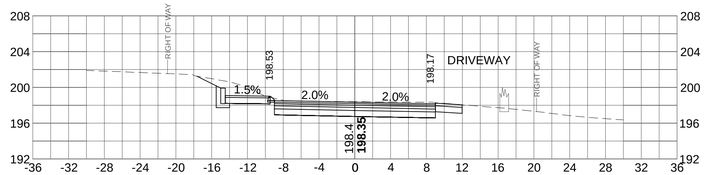


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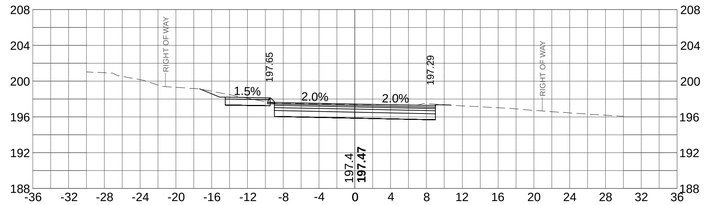


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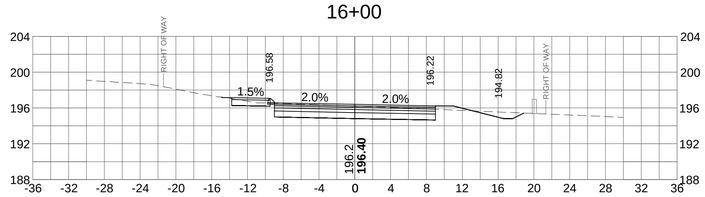


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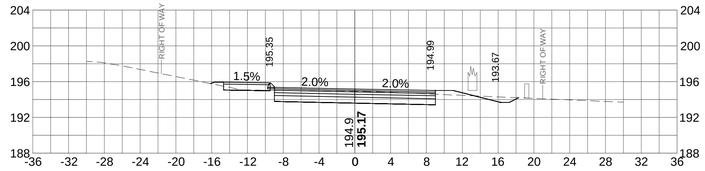


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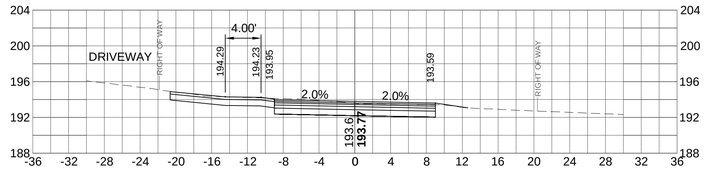


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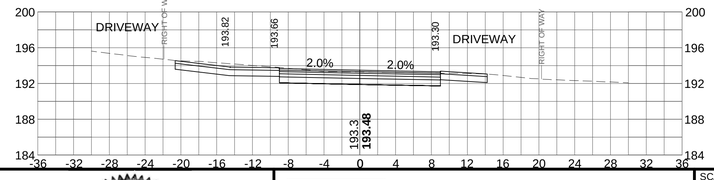


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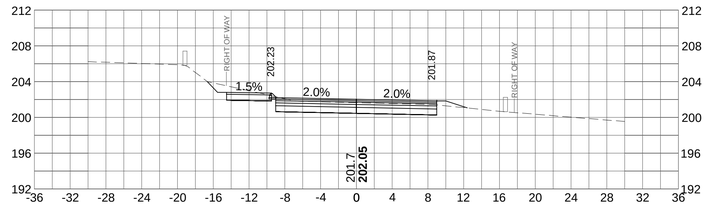


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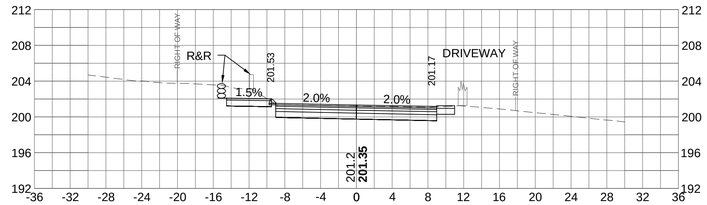


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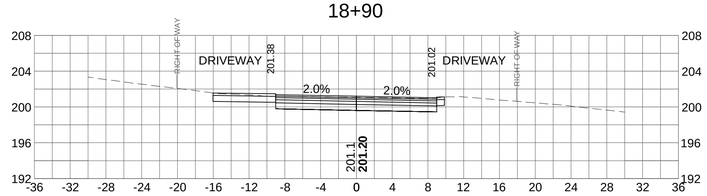


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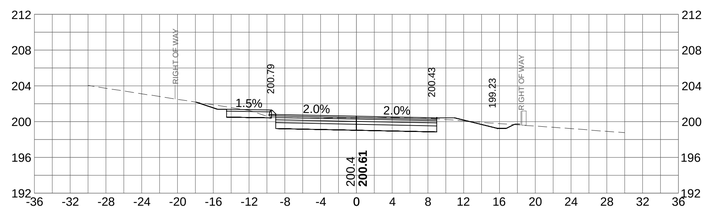
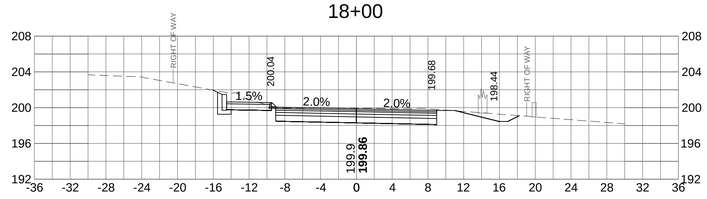



## 18+00

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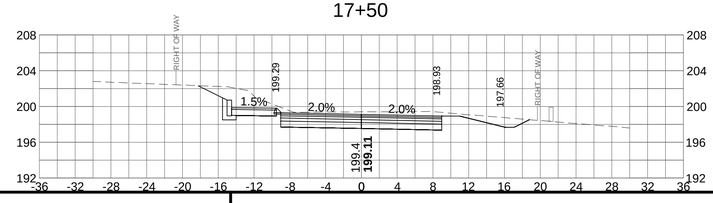


| NUMBER | DATE | MADE BY | CHECKED BY | DESCRIPTION |
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| | | | | |

REVISIONS

DRAWN BY: KGY
DESIGNED BY: DJ
CHECKED BY: ATL

COMMONWEALTH OF MASSACHUSETTS
DARSHAN N. JHAVERI
CIVIL
No. 41441
REGISTERED PROFESSIONAL ENGINEER


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SCALE:
8 0 8 16
SCALE IN FEET: 1"=8'

UNLESS OTHERWISE NOTED OR CHANGED BY REPRODUCTION

**Robinson Road Roadway Improvements**

# CROSS-SECTIONS

**Lexington, Massachusetts**

CONTRACT NO. 14-52
PLOT DATE: May. 09, 2014 3:17pm
ISSUE DATE 05/14/2014
SHEET 28 OF 29

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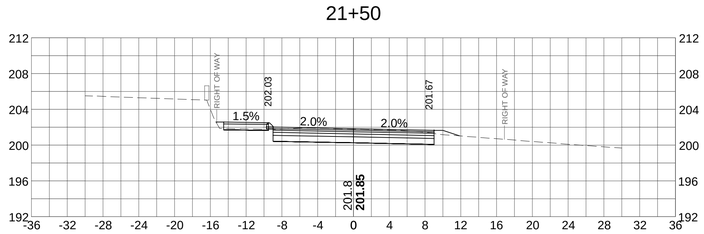
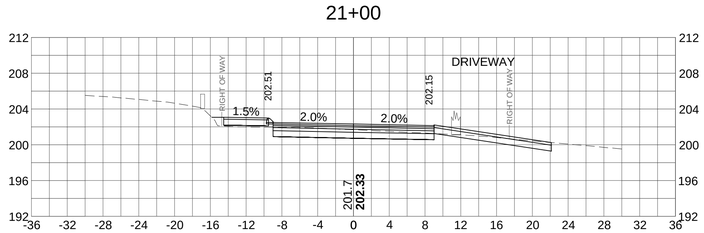
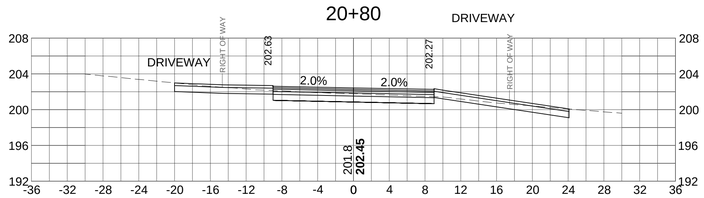
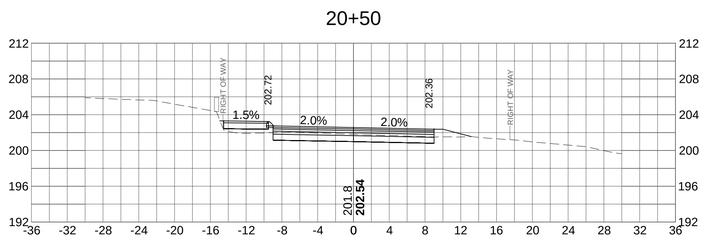
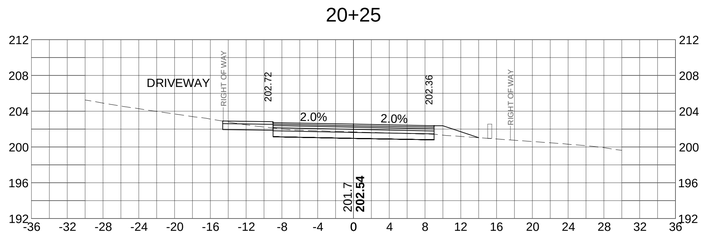
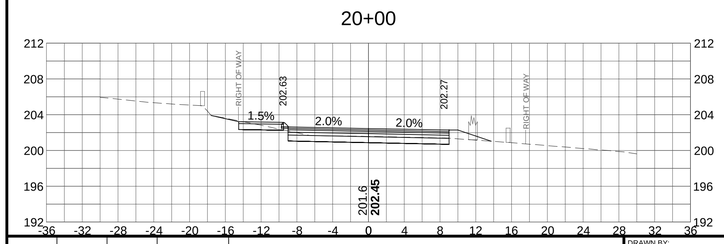


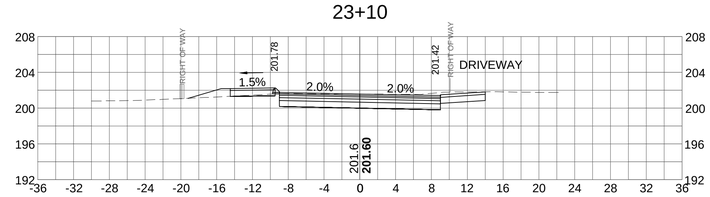



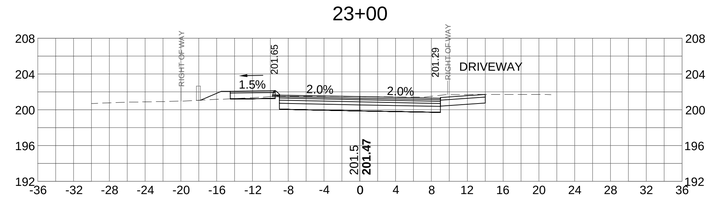



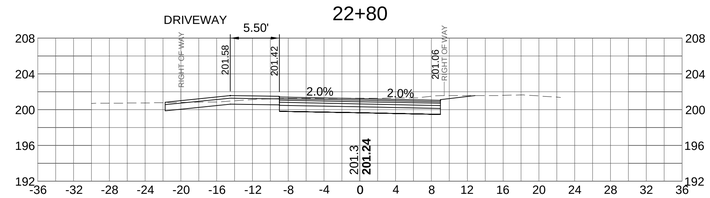



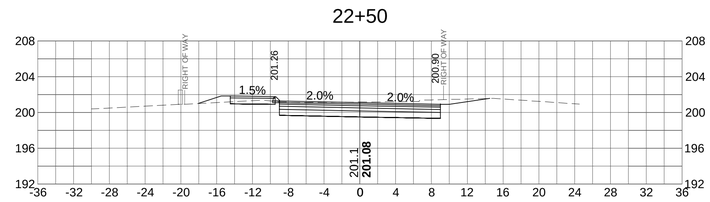



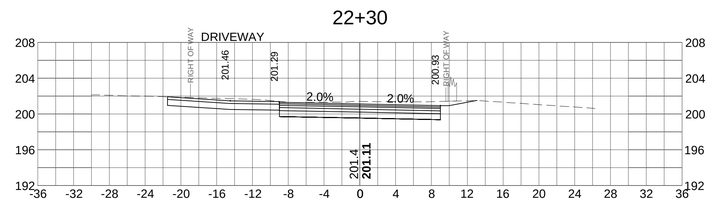



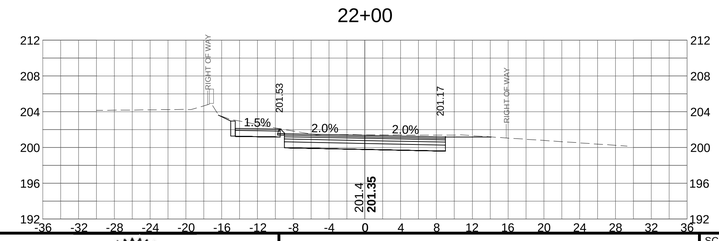



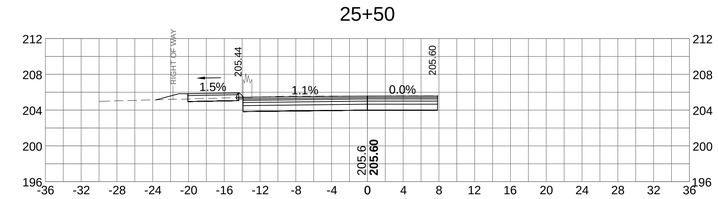



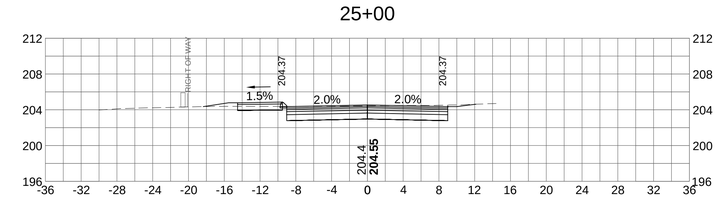



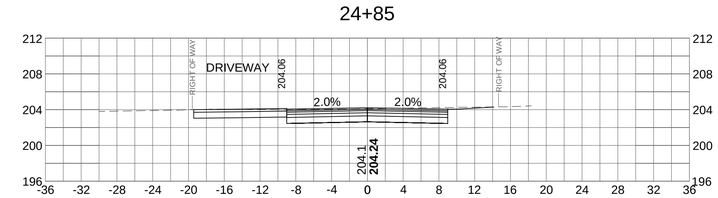



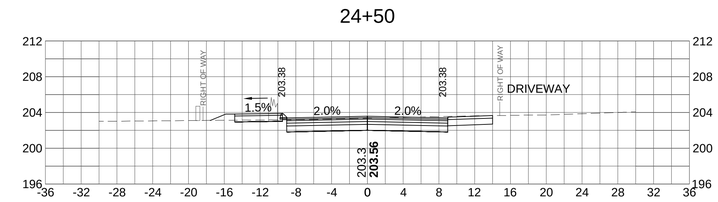



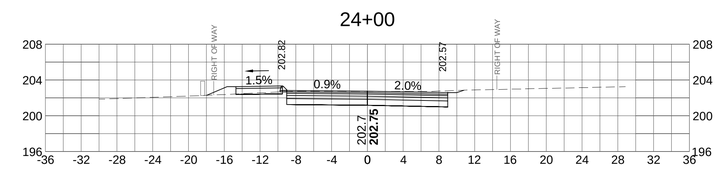



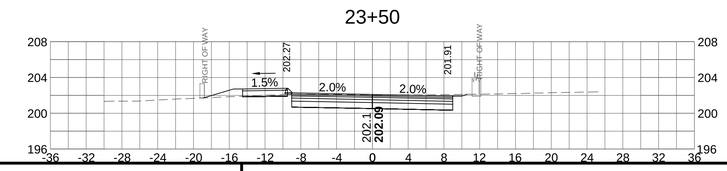




END SUPERELEVATION
STA 24+50




END FULL SUPERELEVATION
STA 23+80
e = 2.00% RT

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SHEET 29 OF 29

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