

THE CITY OF WALTHAM
MASSACHUSETTS

PURCHASING DEPARTMENT

**ROADWAY IMPROVEMENT AND SIDEWALK CONSTRUCTION
TRAPELO ROAD FROM SMITH STREET TO LEXINGTON STREET**

ADDENDUM NO. 1

March 1, 2017

CHANGES, CORRECTIONS AND CLARIFICATIONS

The attention of bidders submitting proposals for the above subject project is called to the following addendum to the specifications. The items set forth herein, whether of omission, addition, substitution or clarification are all to be included in and form a part of the proposal submitted.

THE NUMBER OF THIS ADDENDUM (NO. 1) MUST BE ACKNOWLEDGED AS RECEIVED IN THE LAST PAGE OF THE "FORM FOR GENERAL BID" SECTION 00300.

ITEM 1: ANSWERS TO POSED QUESTIONS:

1. **Q** - Are there any potential staging areas available along Trapelo Road for construction?
 A – There are no City-owned parcels along the project.

2. **Q** – Will night paving be allowed for the entire project?
 A – The Police Department will not allow night paving in residential areas.

3. **Q** – Will work on Saturdays be allowed?
 A – Saturday work needs to be approved by Waltham Consolidated Public Works Department. Saturday work is typically allowed with prior permission from DPW.

4. **Q** – The contract is missing items for lowering, plating, and remodeling structures affected by full-depth construction. (It was indicated at the meeting that this question will be submitted in writing)
 A- See revised Items 220.5 and 220.8 attached

5. **Q** – Will the City provide temporary parking arrangements for homeowners during construction that affects their access?
 A- Residents will be asked to park along side streets and at the Graverson Park Parking lot.

6. **Q.** In the Full Depth Reconstruction area it will be necessary to lower any water gates as well as to lower and plate any manholes. Normally items # 220.50 (DMH Remodels) And item # 220.80 (SMH Remodels) are used to pay for raising their respective manholes back up to either binder or finished grade and there should be a special water gate item to account for the extra work involved in raising the buried gates. Can you add these items or if not how do you plan to for this work?
- A.** Item 220.5, Drainage Structure Remodeled, and Item 220.8, Sanitary Structure Remodeled have been added to the project. The adjustment of all water gate boxes, regardless of depth, will be paid for under Item 358., Gate Box Adjusted
7. **Q.** Can you provide what the new VB granite curb radiuses will be at each location?
- A.** New curved curb radii will match the existing roadway curb or edge of road. A list of proposed curb radii required will be provided to the Contractor prior to Construction.

ITEM 2: DELETE AND REPLACE:

- a. **DELETE** the technical drawings found in the bid document and **REPLACE** them with the attached file.
- b. **DELETE** the Form for General Bid Section 0300 and **REPLACE** with the one attached here.
- c. **DELETE** Technical specifications ITEM 220.5 and **REPLACE** with the one attached here.
- d. **DELETE** Technical specifications ITEM 220.8 and **REPLACE** with the one attached here.

End of Addendum 1

BIDDER MUST BE DOT PRE-APPROVED

00300 FORM FOR GENERAL BID

From: _____
 (Name of Bidder)

To: Mr. Joseph Pedulla, CPO
City of Waltham (the "City")

The Undersigned proposes to furnish all labor and materials required for the Roadway Reconstruction project on Trapelo Road from Smith Street to Lexington Street in Waltham, Massachusetts, in accordance with the accompanying plans and specifications for the contract unit prices specified below, subject to additions and deductions according to the terms of the specifications.

| Item No. | Approx. Quantity | Item with Unit Bid Price Written in Words | Unit Price | | Amount | | |
|------------------------|------------------|---|------------|-------|---------|-------|--|
| | | | Dollars | Cents | Dollars | Cents | |
| 102.51 | 33 | Tree Protection, at _____ Per Each | | | | | |
| 102.52 | 680 | Temp. Tree & Shrub Protection Fence, at _____ Per Foot | | | | | |
| 103. | 10 | Tree Removed- Diameter Under 24 Inches, at _____ Per Each | | | | | |
| 104. | 2 | Tree Removed – Diameter 24 Inches and Over, at _____ Per Each | | | | | |
| 105. | 1 | Stump Removed, at _____ Per Each | | | | | |
| 120.1 | 3,200 | Unclassified Excavation, at _____ Per Cubic Yard | | | | | |
| CARRIED FORWARD | | | | | | | |

| Item No. | Approx. Quantity | Item with Unit Bid Price Written in Words | Unit Price | | Amount | |
|------------------------|------------------|--|------------|-------|---------|-------|
| | | | Dollars | Cents | Dollars | Cents |
| 141. | 775 | Class A Trench Excavation, at _____ _____ Per Cubic Yard | | | | |
| 141.1 | 50 | Test Pit For Excavation, at _____ _____ Per Cubic Yard | | | | |
| 144. | 20 | Class B Rock Excavation, at _____ _____ Per Cubic Yard | | | | |
| 151. | 2,400 | Gravel Borrow, at _____ _____ Per Cubic Yard | | | | |
| 170. | 8,500 | Fine Grading and Compacting, at _____ _____ Per Square Yard | | | | |
| 220. | 47 | Drainage Structure Adjusted, at _____ _____ Per Each | | | | |
| 220.2 | 5 | Drainage Structure Rebuilt, at _____ _____ Per Foot | | | | |
| 220.5 | 1 | Drainage Structure Remodeled, at _____ _____ Per Each | | | | |
| 220.6 | 5 | Sanitary Structure Rebuilt, at _____ _____ Per Foot | | | | |
| <i>CARRIED FORWARD</i> | | | | | | |

BIDDER MUST BE DOT PRE-APPROVED

| Item No. | Approx. Quantity | Item with Unit Bid Price Written in Words | Unit Price | | Amount | |
|------------------------|------------------|--|------------|-------|---------|-------|
| | | | Dollars | Cents | Dollars | Cents |
| 220.7 | 38 | Sanitary Structure Adjusted, at _____ _____ Per Each | | | | |
| 220.8 | 4 | Sanitary Structure Remodeled, at _____ _____ Per Each | | | | |
| 222.1 | 6 | Frame and Grate – MassDOT Cascade Type, at _____ _____ Per Each | | | | |
| 223.1 | 6 | Frame and Grate (or Cover) Removed and Stacked, at _____ _____ Per Each | | | | |
| 227.3 | 5 | Removal of Drainage Structure Sediment, at _____ _____ Per Cubic Yard | | | | |
| 346.21 | 26 | 2 Inch Service Pipe Removed and Discarded, at _____ _____ Per Foot | | | | |
| 358. | 50 | Gate Box Adjusted, at _____ _____ Per Each | | | | |
| 358.1 | 1 | Gate Box Removed and Stacked, at _____ _____ Per Each | | | | |
| CARRIED FORWARD | | | | | | |

| Item No. | Approx. Quantity | Item with Unit Bid Price Written in Words | Unit Price | | Amount | |
|------------------------|------------------|--|------------|-------|---------|-------|
| | | | Dollars | Cents | Dollars | Cents |
| 402. | 130 | Dense Graded Crushed Stone for Subbase, at _____ _____ Per Cubic Yard | | | | |
| 415. | 19,000 | Pavement Micromilling, at _____ _____ Per Square Yard | | | | |
| 440. | 12,700 | Calcium Chloride for Roadway Dust Control, at _____ _____ Per Pound | | | | |
| 443. | 20 | Water for Roadway Dust Control, at _____ _____ Per Million Gallons | | | | |
| 450.90 | 2,350 | Contractor Quality Control, at _____ _____ Per Ton | | | | |
| 451. | 10 | HMA for Patching, at _____ _____ Per Ton | | | | |
| 452. | 1,400 | Asphalt Emulsion for Tack Coat, at _____ _____ Per Gallon | | | | |
| 453. | 30,680 | HMA Joint Sealant, at _____ _____ Per Foot | | | | |
| 455.23 | 1,870 | Superpave Surface Course-12.5 (SSC-12.5), at _____ _____ Per Ton | | | | |
| <i>CARRIED FORWARD</i> | | | | | | |

BIDDER MUST BE DOT PRE-APPROVED

| Item No. | Approx. Quantity | Item with Unit Bid Price Written in Words | Unit Price | | Amount | |
|------------------------|------------------|--|------------|-------|---------|-------|
| | | | Dollars | Cents | Dollars | Cents |
| 455.31 | 150 | Superpave Intermediate Course-12.5 (SIC-12.5), at _____ _____ Per Ton | | | | |
| 455.42 | 330 | Superpave Base Course-37.5 (SBC-37.5), at _____ _____ Per Ton | | | | |
| 472. | 10 | Hot Mix Asphalt for Miscellaneous Work, at _____ _____ Per Ton | | | | |
| 482.3 | 2,700 | Sawing Asphalt Pavement, at _____ _____ Per Foot | | | | |
| 482.4 | 300 | Sawing Cement Concrete Sidewalk, at _____ _____ Per Foot | | | | |
| 506. | 6,400 | Granite Curb Type VB, Straight, at _____ _____ Per Foot | | | | |
| 506.1 | 1,000 | Granite Curb Type VB, Curved, at _____ _____ Per Foot | | | | |
| 509. | 200 | Granite Transition Curb for Wheelchair Ramps, Straight, at _____ _____ Per Foot | | | | |
| <i>CARRIED FORWARD</i> | | | | | | |

| Item No. | Approx. Quantity | Item with Unit Bid Price Written in Words | Unit Price | | Amount | |
|------------------------|------------------|--|------------|-------|---------|-------|
| | | | Dollars | Cents | Dollars | Cents |
| 509.1 | 300 | Granite Transition Curb for Wheelchair Ramps, Curved, at _____ _____ Per Foot | | | | |
| 514. | 20 | Granite Curb Inlet, Straight, at _____ _____ Per Each | | | | |
| 515. | 1 | Granite Curb Inlet, Curved, at _____ _____ Per Each | | | | |
| 516. | 196 | Granite Curb Corner – Type A, at _____ _____ Per Each | | | | |
| 570.1 | 20 | Hot Mix Asphalt Curb Type 1, at _____ _____ Per Foot | | | | |
| 580. | 600 | Curb Removed and Reset, at _____ _____ Per Foot | | | | |
| 582. | 10 | Curb Corner Removed and Reset, at _____ _____ Per Each | | | | |
| 602. | 10 | Guardrail Post - Steel, at _____ _____ Per Each | | | | |
| <i>CARRIED FORWARD</i> | | | | | | |

| Item No. | Approx. Quantity | Item with Unit Bid Price Written in Words | Unit Price | | Amount | |
|------------------------|------------------|--|------------|-------|---------|-------|
| | | | Dollars | Cents | Dollars | Cents |
| 620.1 | 400 | Steel W Beam Highway Guard (Single Faced), at _____ _____ Per Foot | | | | |
| 627.1 | 3 | Steel W Beam Terminal Section (Single Faced), at _____ _____ Per Each | | | | |
| 627.8 | 3 | Steel Beam Highway Guard Tangent End Treatment, at _____ _____ Per Each | | | | |
| 630. | 50 | Highway Guard Removed and Reset, at _____ _____ Per Foot | | | | |
| 645.148 | 210 | 48 Inch Chain Link Fence (PTR) Vinyl Coated-Black (Line Post Opt.), at _____ _____ Per Foot | | | | |
| 666. | 80 | Chain Link Fence Removed and Reset, at _____ _____ Per Foot | | | | |
| 670. | 510 | Fence Removed and Reset, at _____ _____ Per Foot | | | | |
| 691.1 | 65 | Stone Border Removed and Reset, at _____ _____ Per Foot | | | | |
| <i>CARRIED FORWARD</i> | | | | | | |

| Item No. | Approx. Quantity | Item with Unit Bid Price Written in Words | Unit Price | | Amount | |
|------------------------|------------------|--|------------|-------|---------|-------|
| | | | Dollars | Cents | Dollars | Cents |
| 693. | 3,500 | Modular Block Retaining Wall, at _____ _____ Per Square Foot | | | | |
| 693.1 | 70 | Concrete Block Wall Removed and Rebuilt, at _____ _____ Per Foot | | | | |
| 697. | 720 | Sedimentation Fence, at _____ _____ Per Foot | | | | |
| 697.1 | 31 | Silt Sack, at _____ _____ Per Each | | | | |
| 701. | 3,700 | Cement Concrete Sidewalk, at _____ _____ Per Square Yard | | | | |
| 701.1 | 2,300 | Cement Concrete Sidewalk at Driveways, at _____ _____ Per Square Yard | | | | |
| 701.2 | 600 | Cement Concrete Wheelchair Ramp, at _____ _____ Per Square Yard | | | | |
| 702. | 5 | Hot Mix Asphalt Walk Surface, at _____ _____ Per Ton | | | | |
| <i>CARRIED FORWARD</i> | | | | | | |

BIDDER MUST BE DOT PRE-APPROVED

| Item No. | Approx. Quantity | Item with Unit Bid Price Written in Words | Unit Price | | Amount | |
|------------------------|------------------|--|------------|-------|---------|-------|
| | | | Dollars | Cents | Dollars | Cents |
| 703. | 200 | Hot Mix Asphalt Driveway, at _____ _____ Per Ton | | | | |
| 705.1 | 5 | Flagstone Walk Removed and Reset, at _____ _____ Per Square Yard | | | | |
| 706.1 | 10 | Brick Walk (or Pavers) Removed and Relaid, at _____ _____ Per Square Yard | | | | |
| 711. | 10 | Bound Removed and Reset, at _____ _____ Per Each | | | | |
| 748. | 1 | Mobilization, at _____ _____ Per Lump Sum | | | | |
| 751. | 300 | Loam Borrow, at _____ _____ Per Cubic Yard | | | | |
| 756. | 1 | NPDES Stormwater Pollution Prevention Plan, at _____ _____ Per Lump Sum | | | | |
| 765. | 2,500 | Seeding, at _____ _____ Per Square Yard | | | | |
| <i>CARRIED FORWARD</i> | | | | | | |

BIDDER MUST BE DOT PRE-APPROVED

| Item No. | Approx. Quantity | Item with Unit Bid Price Written in Words | Unit Price | | Amount | |
|------------------------|------------------|---|------------|-------|---------|-------|
| | | | Dollars | Cents | Dollars | Cents |
| 767.6 | 500 | Aged Pine Bark Mulch, at _____ _____ Per Square Yard | | | | |
| 767.8 | 240 | Bales of Hay for Erosion Control, at _____ _____ Per Each | | | | |
| 812.30 | 2 | Standard Signal Post Foundation SD3.031, at _____ _____ Per Each | | | | |
| 824.50 | 2 | Flashing Warning Beacon Removed and Reset, at _____ _____ Per Each | | | | |
| 832. | 50 | Warning, Regulatory and Route Marker Aluminum Panel Type A, at _____ _____ Per Square Foot | | | | |
| 847.1 | 42 | Sign Support (N/Guide) and Route Marker w/1 Breakaway Post Assembly-Steel, at _____ _____ Per Each | | | | |
| 852. | 450 | Safety Signing for Construction Operations, at _____ _____ Per Square Foot | | | | |
| <i>CARRIED FORWARD</i> | | | | | | |

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| Item No. | Approx. Quantity | Item with Unit Bid Price Written in Words | Unit Price | | Amount | |
|------------------------|------------------|--|------------|-------|---------|-------|
| | | | Dollars | Cents | Dollars | Cents |
| 853.1 | 20 | Potable Breakaway Barricade-Type III, at _____ _____ Per Each | | | | |
| 854.036 | 10,300 | Temporary Pavement Markings – 6 Inch (Tape), at _____ _____ Per Foot | | | | |
| 856. | 360 | Arrow Board, at _____ _____ Per Day | | | | |
| 856.12 | 720 | Portable Changeable Message Board, at _____ _____ Per Day | | | | |
| 859. | 18,000 | Reflectorized Drum, at _____ _____ Per Drum Day | | | | |
| 864.04 | 2,710 | Pavement Arrows and Legends Refl. White (Thermoplastic), at _____ _____ Per Square Foot | | | | |
| 866.104 | 10,200 | 4 Inch Reflectorized White Line (Thermoplastic), at _____ _____ Per Foot | | | | |
| 866.112 | 250 | 12 Inch Reflectorized White Line (Thermoplastic), at _____ _____ Per Foot | | | | |
| <i>CARRIED FORWARD</i> | | | | | | |

| Item No. | Approx. Quantity | Item with Unit Bid Price Written in Words | Unit Price | | Amount | |
|---------------------------------------|------------------|--|------------|-------|-----------|-------|
| | | | Dollars | Cents | Dollars | Cents |
| 867.104 | 10,300 | 4 Inch Reflectorized Yellow Line (Thermoplastic), at _____ _____ Per Foot | | | | |
| 867.112 | 100 | 12 Inch Reflectorized Yellow Line (Thermoplastic), at _____ _____ Per Foot | | | | |
| 874.2 | 34 | Traffic Signs Removed and Reset, at _____ _____ Per Each | | | | |
| 901. | 5 | 4000 PSI, 1.5 Inch, 565 Cement Concrete, at _____ _____ Per Cubic Yard | | | | |
| 999.001 | 1 | Lump Sum Police Detail, at <u>Three hundred ten thousand dollars</u> <u>and zero cents</u> Per Lump Sum | 310,000 | 00 | \$310,000 | 00 |
| <i>CARRIED FORWARD</i> | | | | | | |
| | | | | | | |
| <i>ESTIMATED TOTAL CONTRACT PRICE</i> | | | | | | |

(TOTAL CONTRACT PRICE in words)

BIDDER MUST BE DOT PRE-APPROVED

Addendum – 3/3/2017

| | | |
|--------------------------|--|--------------------|
| <u>ITEM 220.5</u> | <u>DRAINAGE STRUCTURE REMODELED</u> | <u>EACH</u> |
| <u>ITEM 220.8</u> | <u>SANITARY STRUCTURE REMODELED</u> | <u>EACH</u> |

The work under these items shall conform to the relevant provisions of Sections 201 and 220 of the Standard Specifications, the requirements of the City of Waltham Engineering Department, and the following:

The Contractor shall remove and/or lower castings and plate holes as required to meet the finished grades within areas of full depth roadway reconstruction, and the work shall be considered incidental to this item.

Method of Measurement and Basis of Payment

Drainage structures remodeled and sanitary structures remodeled will be paid for at the Contract unit price per each, which price shall include all labor, materials, equipment, and incidental costs required to complete the work, including lowering, plating, and adjusting the structures to finished grade.

ROADWAY & SIDEWALK IMPROVEMENT PROJECT TRAPELO ROAD

IN THE CITY OF

WALTHAM

MIDDLESEX COUNTY

COMMONWEALTH OF MASSACHUSETTS

WALTHAM
TRAPELO ROAD

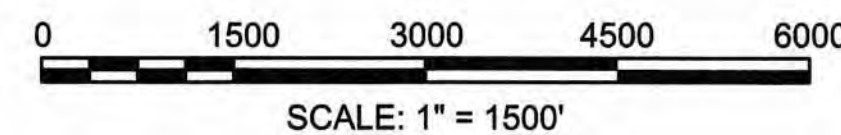
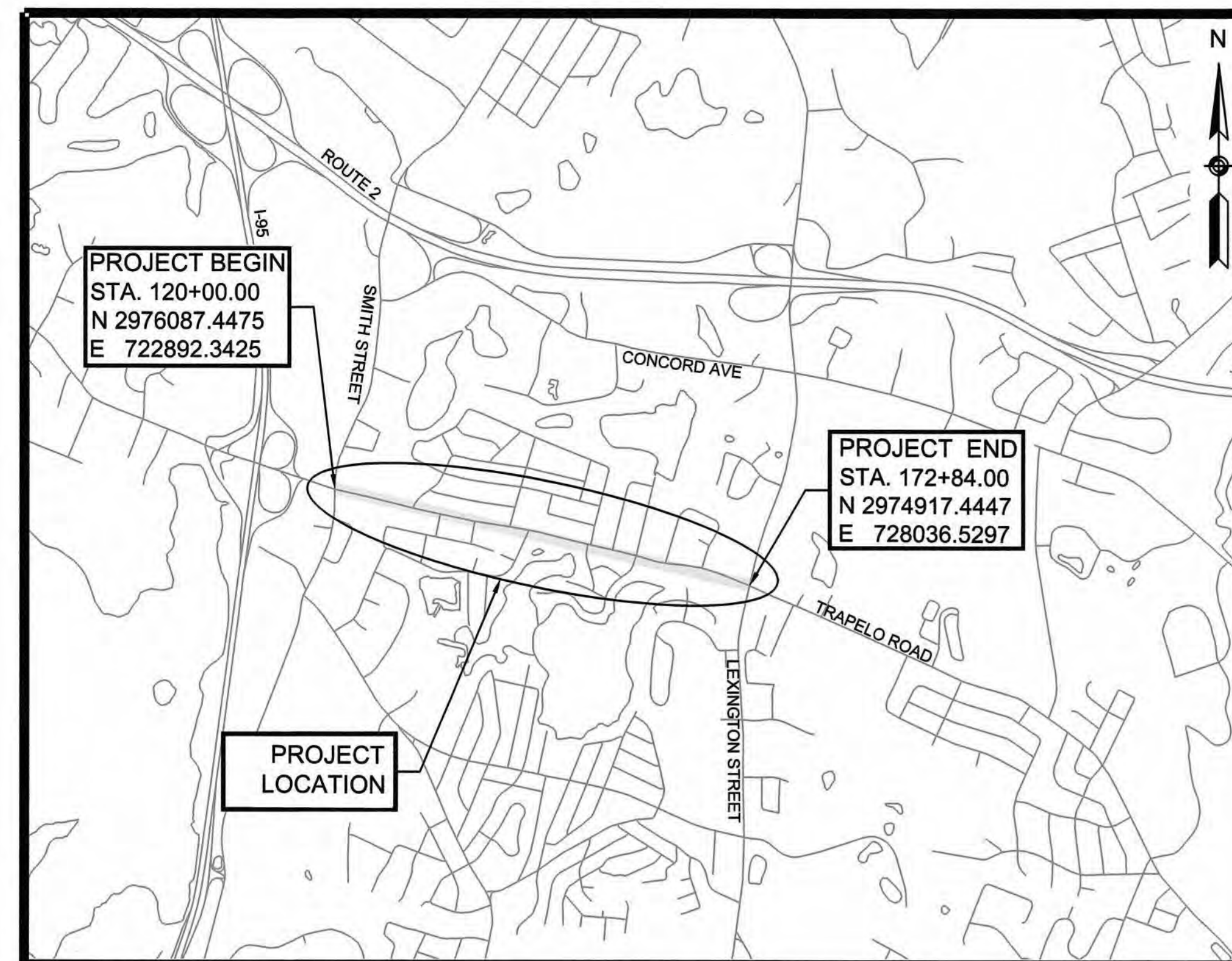
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 1 | 37 |

TITLE SHEET & INDEX

THE MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES DATED 1988, AS AMENDED, THE SUPPLEMENTAL SPECIFICATIONS DATED JULY 1, 2015, THE 2016 CONSTRUCTION STANDARD DETAILS, THE 2015 OVERHEAD SIGNAL STRUCTURE AND FOUNDATION STANDARD DRAWINGS, MASSDOT TRAFFIC MANAGEMENT PLANS AND DETAIL DRAWINGS, THE LATEST MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS WITH MASSACHUSETTS AMENDMENTS, THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS, THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING, AND THE LATEST EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, WILL GOVERN.

INDEX

| SHEET NO. | DESCRIPTION |
|-----------|-----------------------------------|
| 1 | TITLE SHEET & INDEX |
| 2 | LEGEND & ABBREVIATIONS |
| 3 | TYPICAL SECTIONS |
| 4-12 | CONSTRUCTION PLANS |
| 13 | FULL DEPTH RECONSTRUCTION PROFILE |
| 14-22 | DRAINAGE & UTILITY PLANS |
| 23-31 | TRAFFIC SIGN & PAVEMENT MARKINGS |
| 32-35 | CONSTRUCTION DETAILS |
| 36-37 | TEMPORARY TRAFFIC CONTROL PLANS |



LENGTH OF PROJECT = 5,300 FEET = 1.00 MILES



DESIGNED BY:



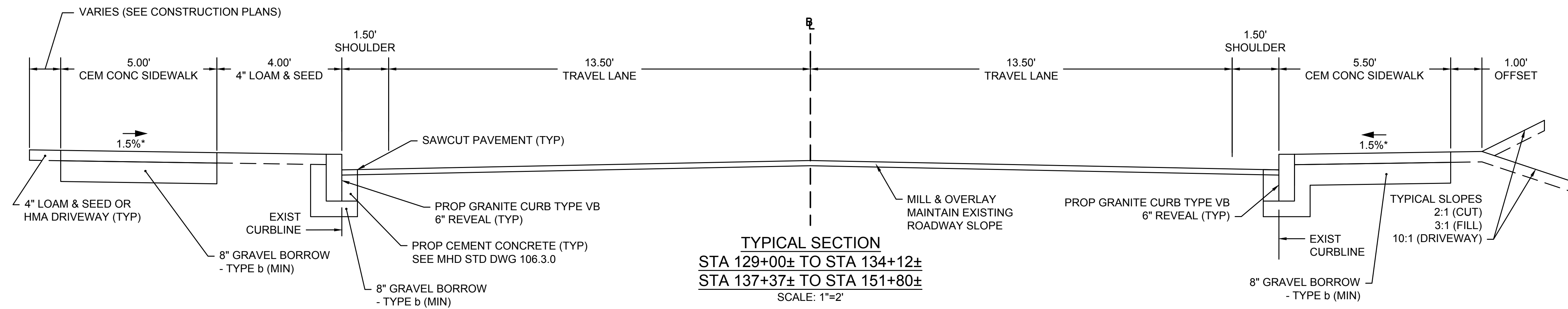
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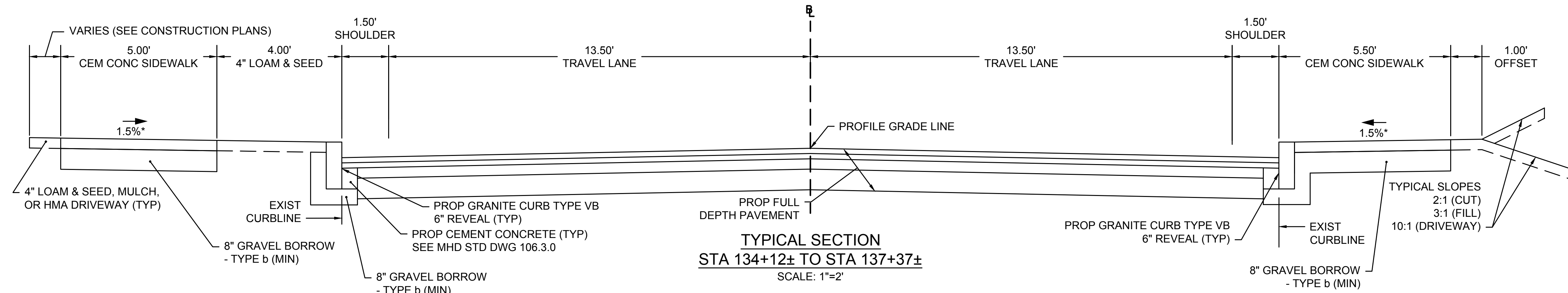
**WALTHAM
TRAPELO ROAD**

| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 3 | 37 |

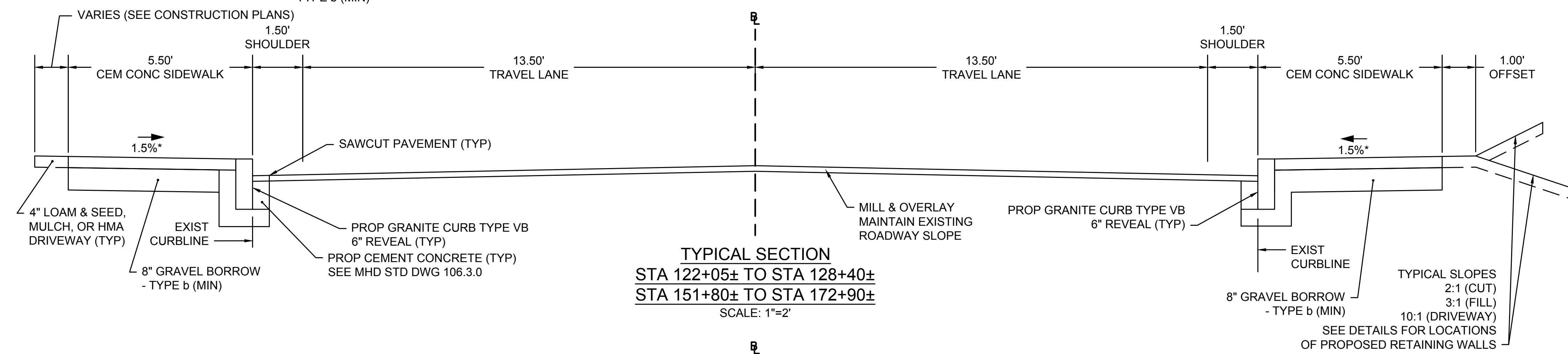
TYPICAL SECTIONS



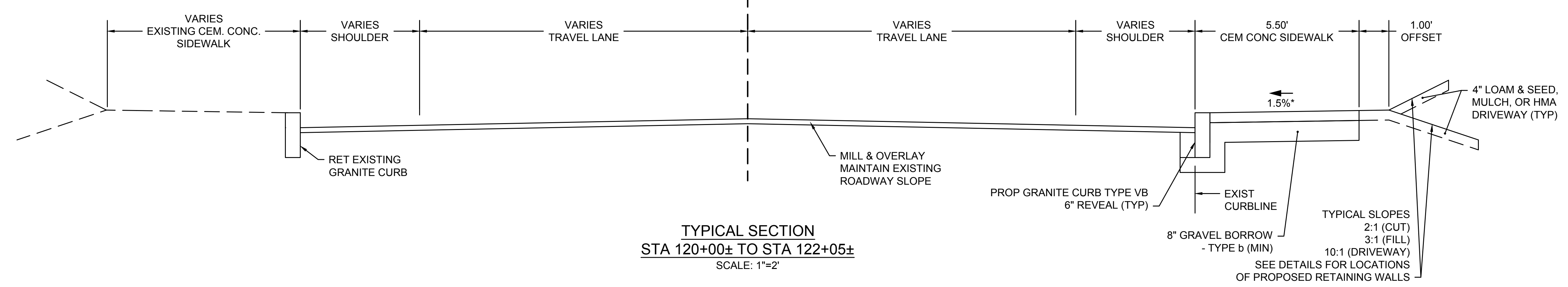
TYPICAL SECTION
STA 129+00± TO STA 134+12±
STA 137+37± TO STA 151+80±
SCALE: 1"=2'



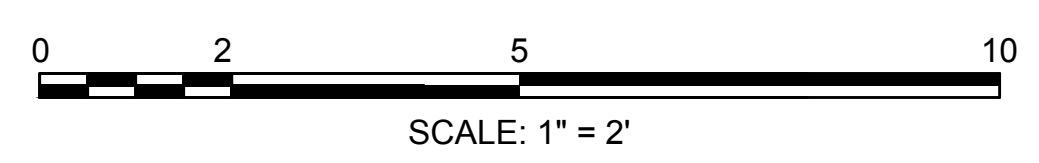
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SCALE: 1"=2'



TYPICAL SECTION
STA 122+05± TO STA 128+40±
STA 151+80± TO STA 172+90±
SCALE: 1"=2'



TYPICAL SECTION
STA 120+00± TO STA 122+05±
SCALE: 1"=2'



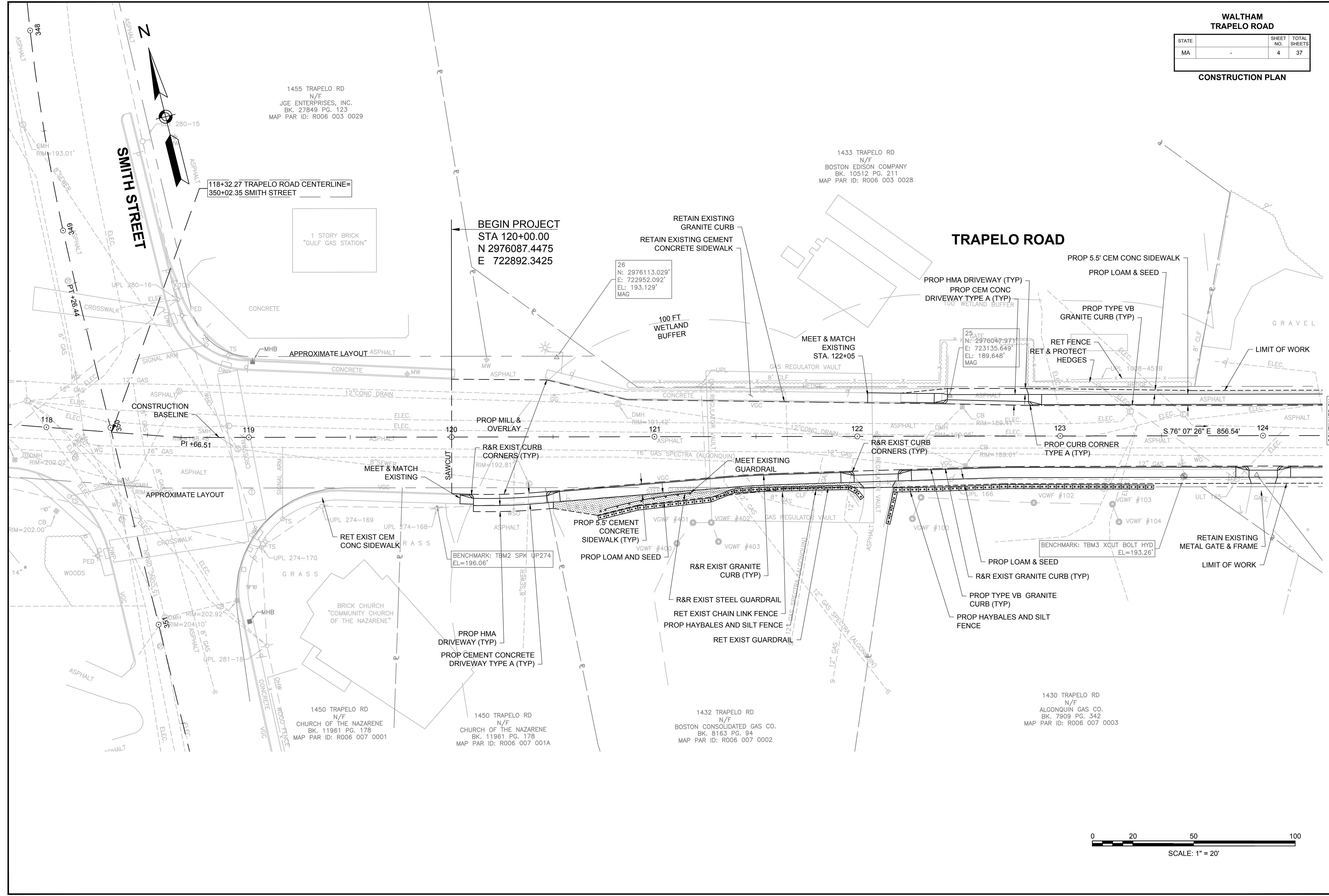
PAVEMENT NOTES

- PAVEMENT MILLING AND RESURFACING**
- SURFACE:** 1-1/2" HOT MIX ASPHALT SUPERPAVE SURFACE COURSE 12.5 (SSC 12.5)
- MILLING:** 1-1/2" PAVEMENT MICRO MILLING
- CEMENT CONCRETE SIDEWALK / PEDESTRIAN RAMP / DRIVEWAYS**
- SURFACE:** 4" CEMENT CONCRETE (SIDEWALK/PEDESTRIAN RAMP)
6" CEMENT CONCRETE (DRIVEWAY)
- SUBBASE:** 8" GRAVEL BORROW TYPE b (EXISTING IN-SITU GRAVEL DETERMINED TO BE SUITABLE SHALL REMAIN)
- HOT MIX ASPHALT DRIVEWAYS**
- SURFACE:** 3 1/2" PLACED IN TWO LAYERS:
1 1/2" SURFACE COURSE MATERIAL OVER
2" INTERMEDIATE COURSE MATERIAL.
- SUBBASE:** 8" GRAVEL BORROW TYPE b (EXISTING IN-SITU GRAVEL DETERMINED TO BE SUITABLE SHALL REMAIN)
- FULL DEPTH PAVEMENT**
- SURFACE:** 1-1/2" HOT MIX ASPHALT SUPERPAVE SURFACE COURSE 12.5 (SSC 12.5) OVER
- INTERMEDIATE:** 2" HOT MIX ASPHALT SUPERPAVE INTERMEDIATE COURSE 12.5 (SIC 12.5) OVER
- BASE:** 4.5" (OR MATCH EXISTING) HOT MIX ASPHALT SUPERPAVE BASE COURSE 37.5 (SBC 37.5) OVER
- SUBBASE:** 4" DENSE GRADED CRUSHED STONE OVER
8" GRAVEL BORROW TYPE b (EXISTING IN-SITU GRAVEL DETERMINED TO BE SUITABLE SHALL REMAIN)
- NOTES:** BITUMEN FOR TACK COAT (RS-1) SHALL BE SPRAY APPLIED FOR DOUBLE OVERLAP COVERAGE AT 0.07 GAL./SY. OVER MILLED SURFACES AND 0.05 GAL./SY. OVER SMOOTH SURFACE
- *±.5% FOR CONSTRUCTION TOLERANCE
- SEE SHEET 34 FOR TYPICAL RETAINING WALL SECTIONS AND DETAILS

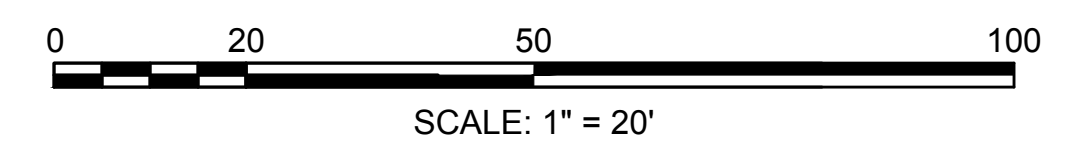
**WALTHAM
TRAPELO ROAD**

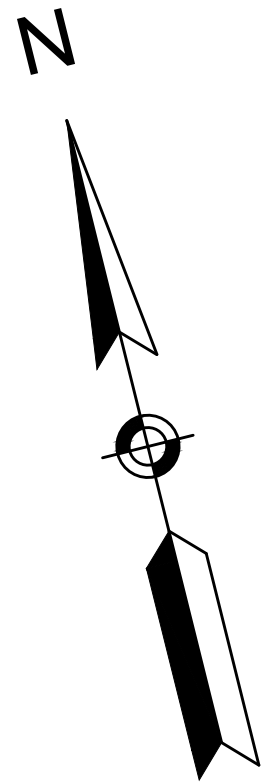
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 4 | 37 |

CONSTRUCTION PLAN



CONTINUED ON SHEET NO. 5





**WALTHAM
TRAPELO ROAD**

| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 5 | 37 |

CONSTRUCTION PLAN

1433 TRAPELO RD
N/F
CITY OF WALTHAM
BK. 13060 PG. 432
MAP PAR ID: R006 003 0017

1393 TRAPELO RD
N/F
BEARISTO, WILLIAM E. & ETHEL M
BK. 47822 PG. 43
MAP PAR ID: R006 003 0026

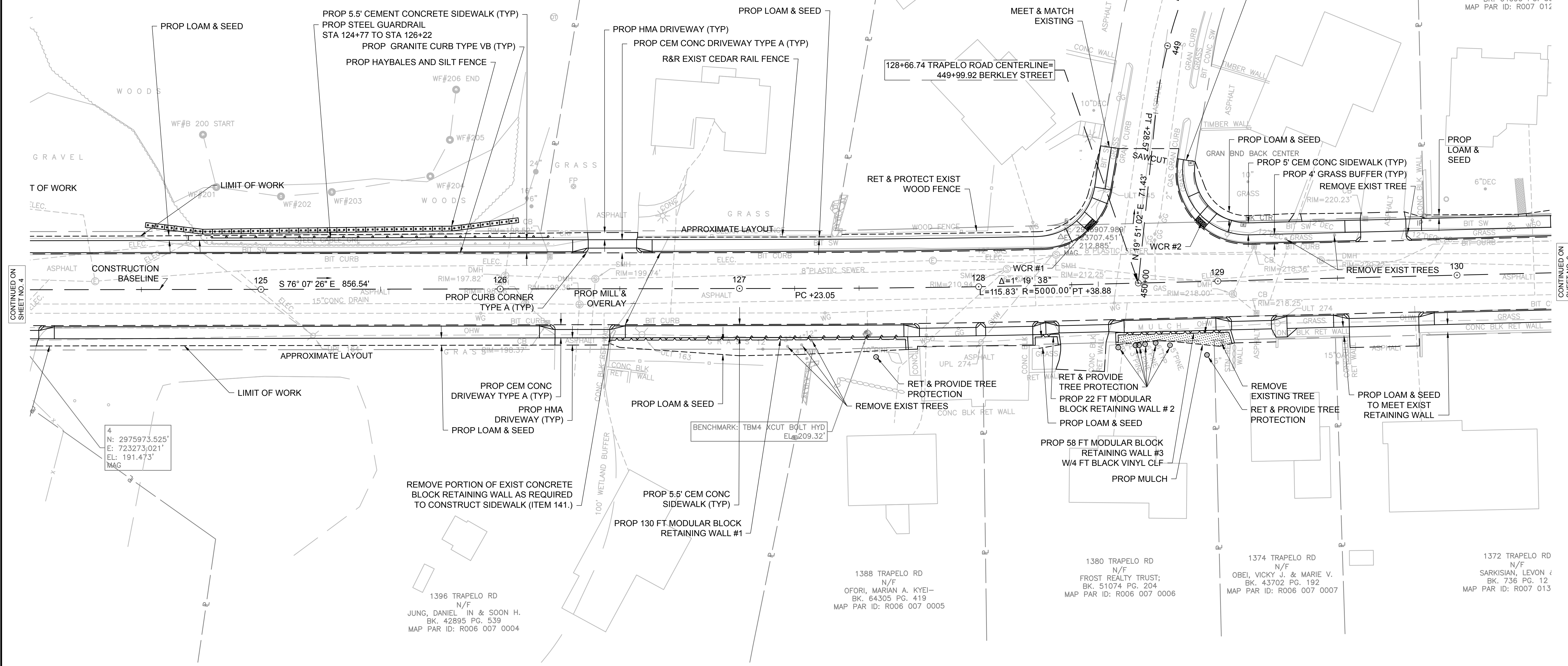
1385 TRAPELO RD
N/F
SAMIOS, LISA & CHARLES
BK. 28101 PG. 163
MAP PAR ID: R006 003 0025

1375 TRAPELO RD
N/F
FORCIER, LEA R.M. ALE;
BK. 61216 PG. 296
MAP PAR ID: R007 012 0026

1369 TRAPELO RD
N/F
PARENTE, FIORAVAN
AMEDEO & ANNA
BK. 64090 PG. 35
MAP PAR ID: R007 012

TRAPELO ROAD

BERKLEY STREET



CONTINUED ON
SHEET NO. 4

CONTINUED ON
SHEET NO. 6

4
N: 2975973.525'
E: 723273.021'
EL: 191.473'
MAG

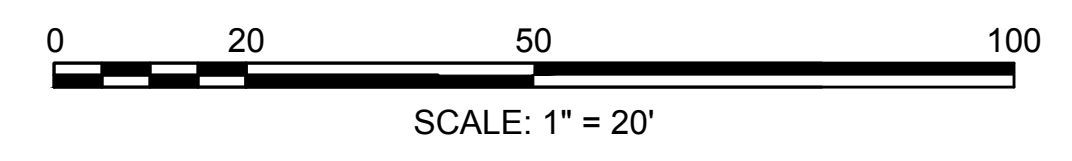
1396 TRAPELO RD
N/F
JUNG, DANIEL IN & SOON H.
BK. 42895 PG. 539
MAP PAR ID: R006 007 0004

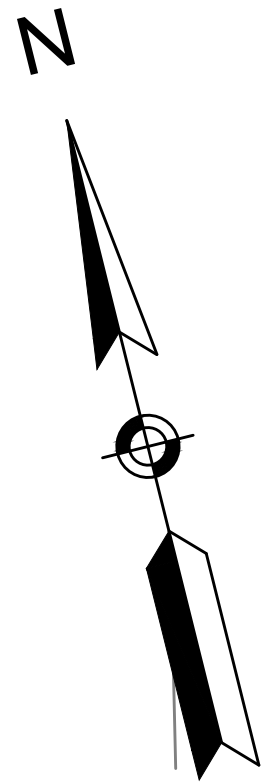
1388 TRAPELO RD
N/F
OFORI, MARIAN A. KYEI-
BK. 64305 PG. 419
MAP PAR ID: R006 007 0005

1380 TRAPELO RD
N/F
FROST REALTY TRUST;
BK. 51074 PG. 204
MAP PAR ID: R006 007 0006

1374 TRAPELO RD
N/F
OBEL, VICKY J. & MARIE V.
BK. 43702 PG. 192
MAP PAR ID: R006 007 0007

1372 TRAPELO RD
N/F
SARKISIAN, LEVON I
BK. 736 PG. 12
MAP PAR ID: R007 013

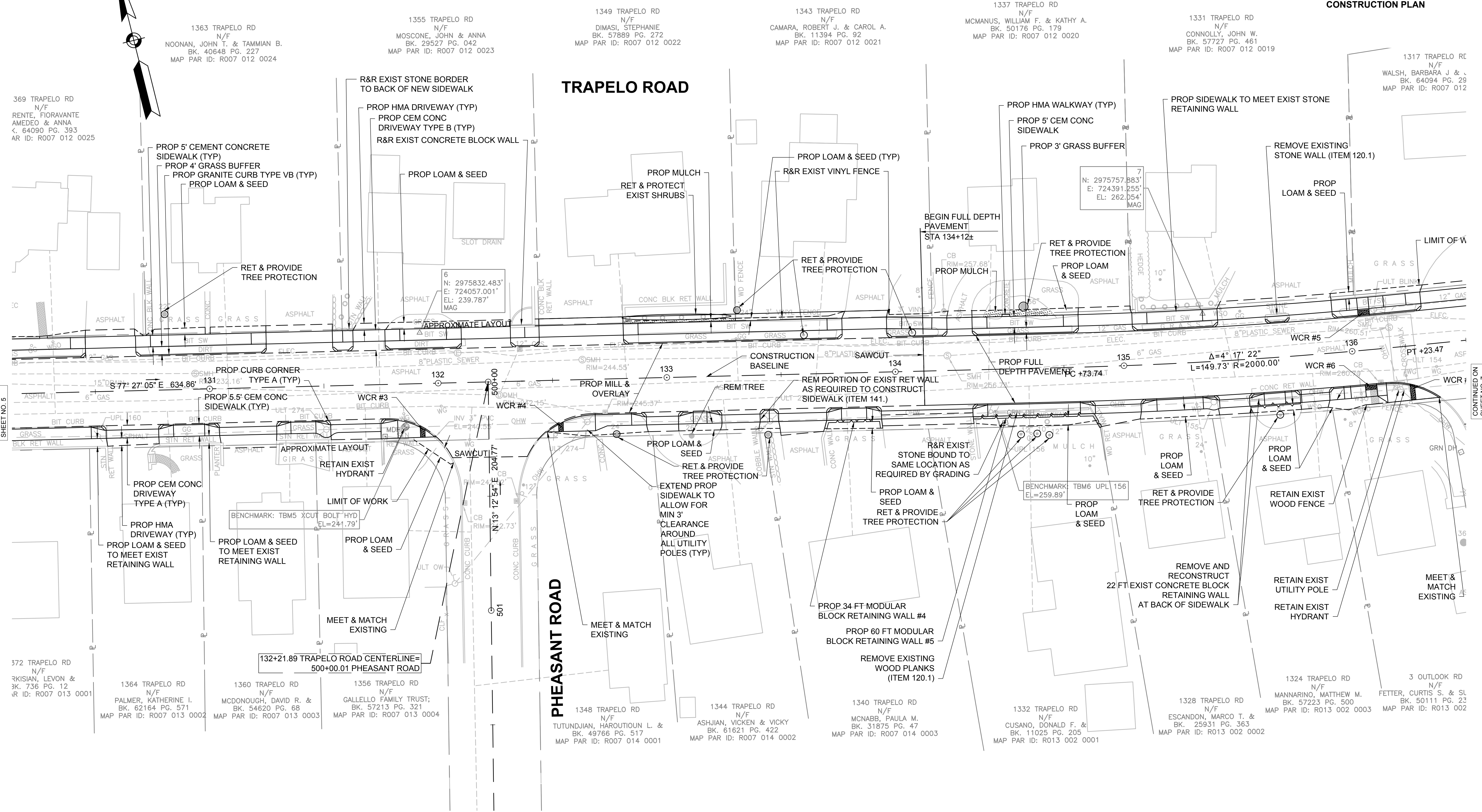




**WALTHAM
TRAPELO ROAD**

| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 6 | 37 |

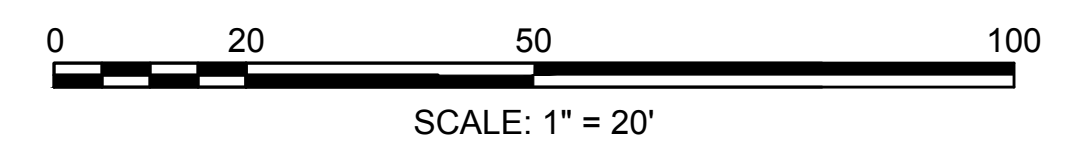
CONSTRUCTION PLAN



CONTINUED ON SHEET NO. 5

CONTINUED ON SHEET NO. 7

SEE SHEET 13 FOR PROFILE.



369 TRAPELO RD
N/F
RENTE, FIORAVANTE
AMDEO & ANNA
C. 64090 PG. 393
AR ID: R007 012 0025

1363 TRAPELO RD
N/F
NOONAN, JOHN T. & TAMMIAN B.
BK. 40648 PG. 227
MAP PAR ID: R007 012 0024

1355 TRAPELO RD
N/F
MOSCONE, JOHN & ANNA
BK. 29527 PG. 042
MAP PAR ID: R007 012 0023

1349 TRAPELO RD
N/F
DIMASI, STEPHANIE
BK. 57889 PG. 272
MAP PAR ID: R007 012 0022

1343 TRAPELO RD
N/F
CAMARA, ROBERT J. & CAROL A.
BK. 11394 PG. 92
MAP PAR ID: R007 012 0021

1337 TRAPELO RD
N/F
MCMANUS, WILLIAM F. & KATHY A.
BK. 50176 PG. 179
MAP PAR ID: R007 012 0020

1331 TRAPELO RD
N/F
CONNOLLY, JOHN W.
BK. 57727 PG. 461
MAP PAR ID: R007 012 0019

1317 TRAPELO RD
N/F
WALSH, BARBARA J. &
BK. 64094 PG. 29
MAP PAR ID: R007 012

372 TRAPELO RD
N/F
RKISIAN, LEVON &
3K. 736 PG. 12
AR ID: R007 013 0001

1364 TRAPELO RD
N/F
PALMER, KATHERINE I.
BK. 62164 PG. 571
MAP PAR ID: R007 013 0002

1360 TRAPELO RD
N/F
MCDONOUGH, DAVID R. &
BK. 54620 PG. 68
MAP PAR ID: R007 013 0003

1356 TRAPELO RD
N/F
GALLELLO FAMILY TRUST;
BK. 57213 PG. 321
MAP PAR ID: R007 013 0004

1348 TRAPELO RD
N/F
TUTUNDJIAN, HAROUTIOUN L. &
BK. 49766 PG. 517
MAP PAR ID: R007 014 0001

1344 TRAPELO RD
N/F
ASHJIAN, VICKEN & VICKY
BK. 61621 PG. 422
MAP PAR ID: R007 014 0002

1340 TRAPELO RD
N/F
MCNABB, PAULA M.
BK. 31875 PG. 47
MAP PAR ID: R007 014 0003

1332 TRAPELO RD
N/F
CUSANO, DONALD F. &
BK. 11025 PG. 205
MAP PAR ID: R013 002 0001

1328 TRAPELO RD
N/F
ESCANDON, MARCO T. &
BK. 25931 PG. 363
MAP PAR ID: R013 002 0002

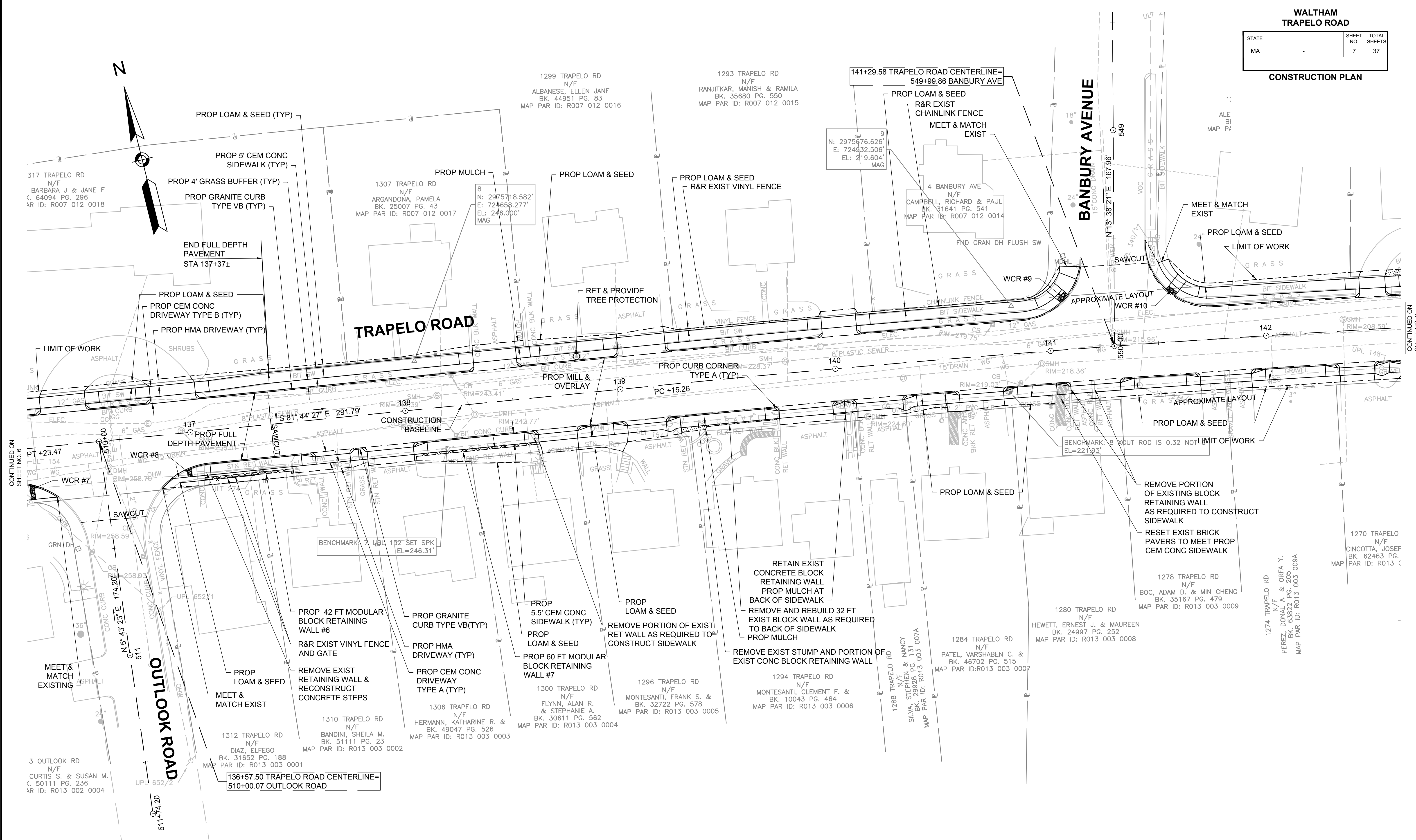
1324 TRAPELO RD
N/F
MANNARINO, MATTHEW M.
BK. 57223 PG. 500
MAP PAR ID: R013 002 0003

3 OUTLOOK RD
N/F
FETTER, CURTIS S. & SL
BK. 50111 PG. 23
MAP PAR ID: R013 002

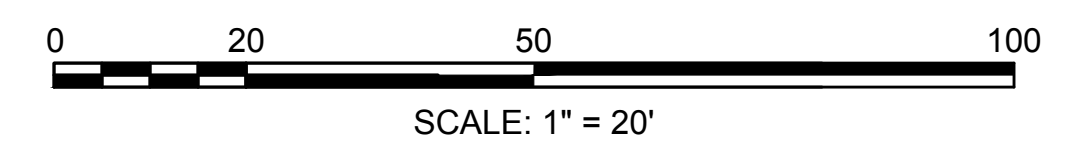
WALTHAM
TRAPELO ROAD

| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 7 | 37 |

CONSTRUCTION PLAN



SEE SHEET 13 FOR PROFILE.



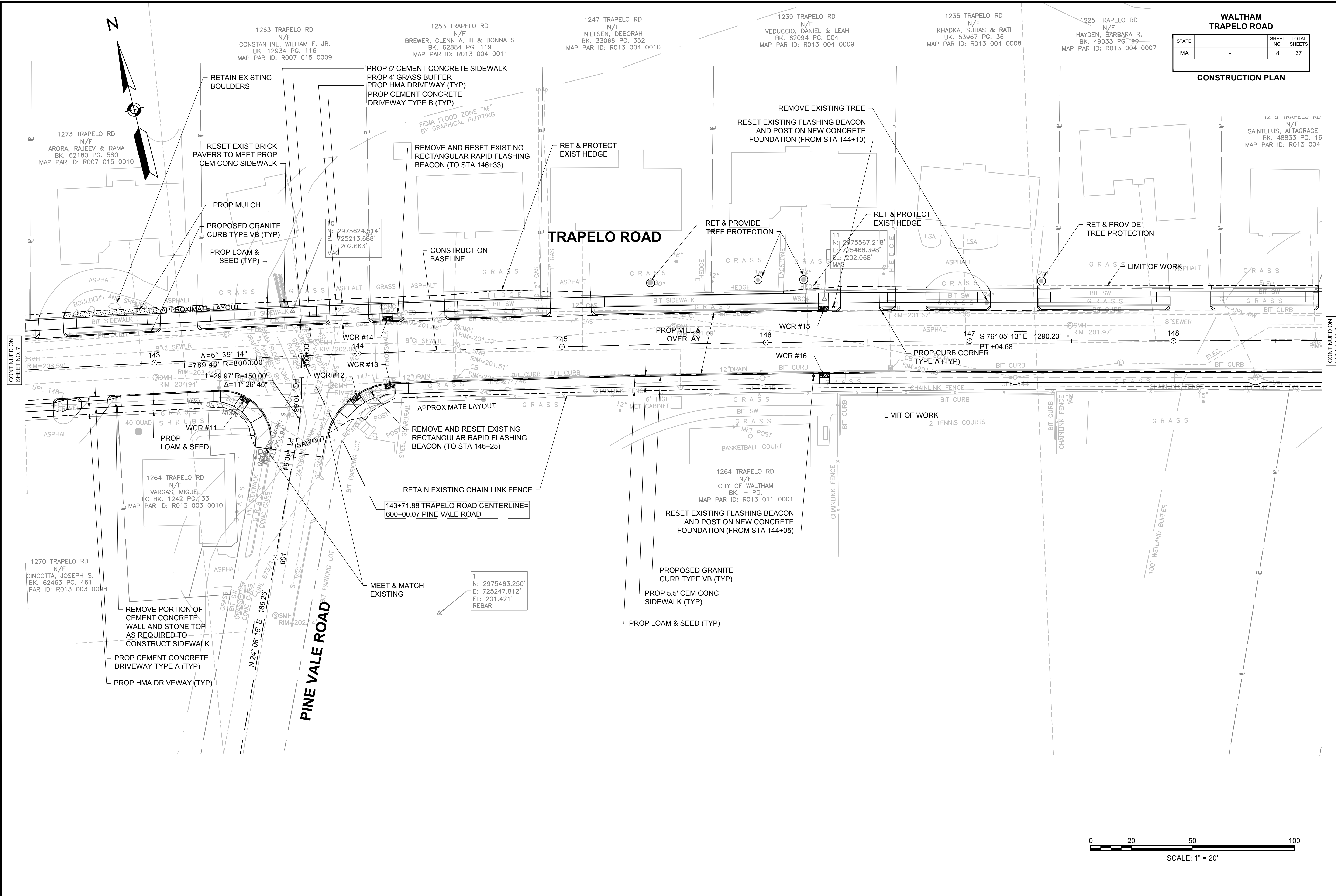
CONTINUED ON SHEET NO. 6

CONTINUED ON SHEET NO. 8

**WALTHAM
TRAPELO ROAD**

| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 8 | 37 |

CONSTRUCTION PLAN



CONTINUED ON
SHEET NO. 7

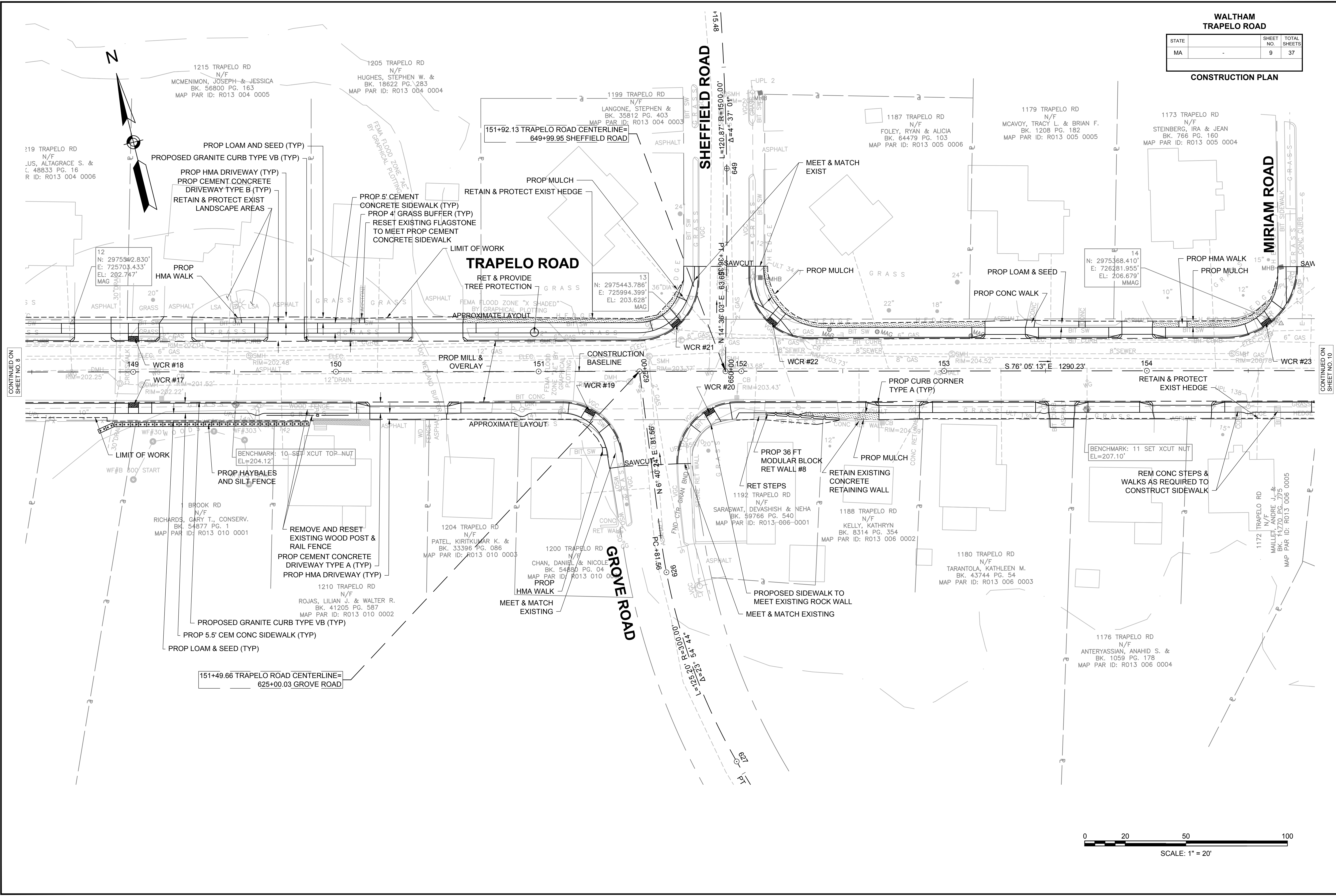
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SHEET NO. 9

11286_HPI(CONSTRUCTION).DWG
Plotted on 10-Mar-2015 3:39 PM

**WALTHAM
TRAPELO ROAD**

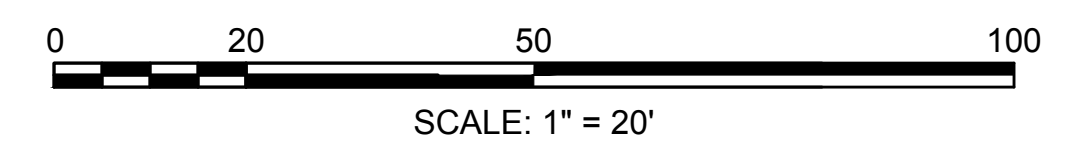
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 9 | 37 |

CONSTRUCTION PLAN



CONTINUED ON SHEET NO. 8

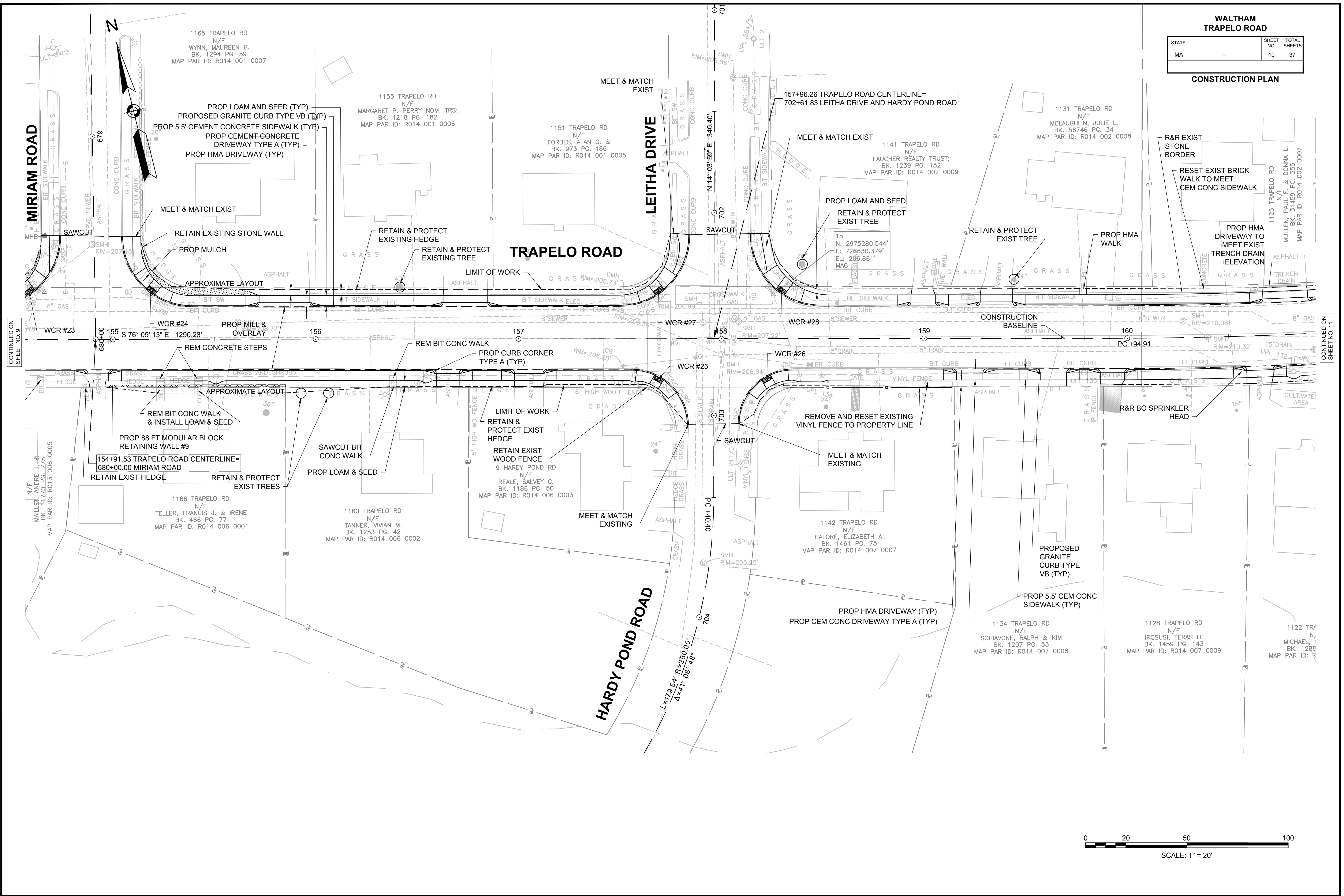
CONTINUED ON SHEET NO. 10



**WALTHAM
TRAPELO ROAD**

| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 10 | 37 |

CONSTRUCTION PLAN



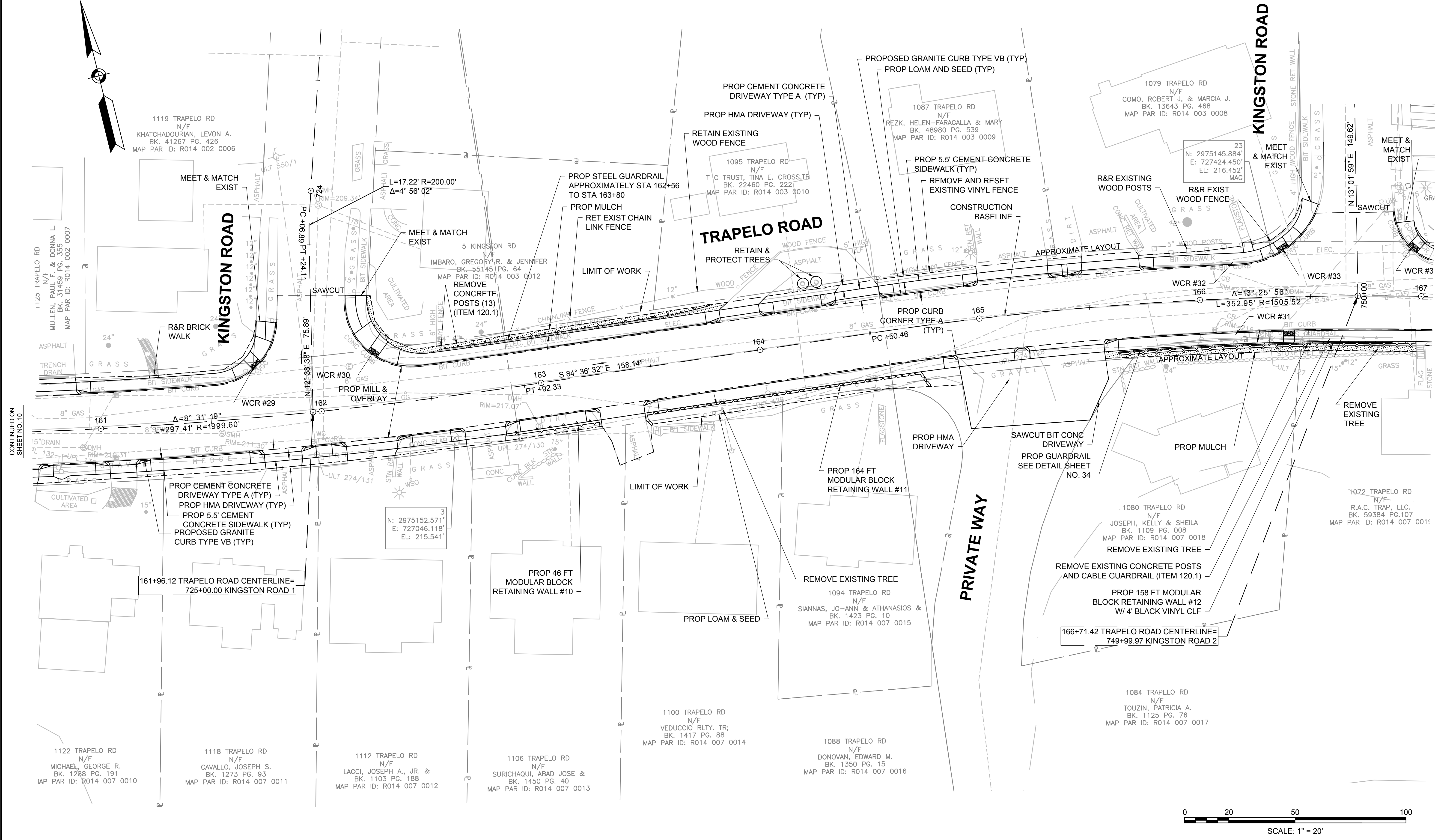
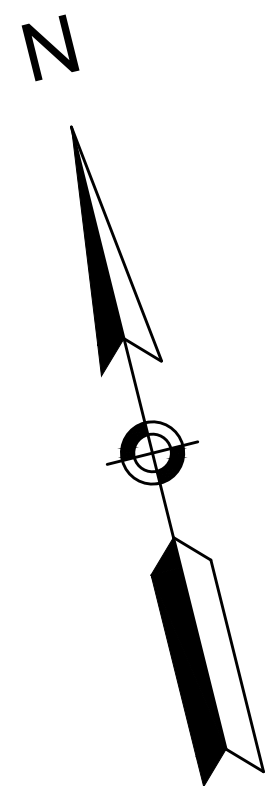
CONTINUED ON
SHEET NO. 9

CONTINUED ON
SHEET NO. 11

WALTHAM
TRAPELO ROAD

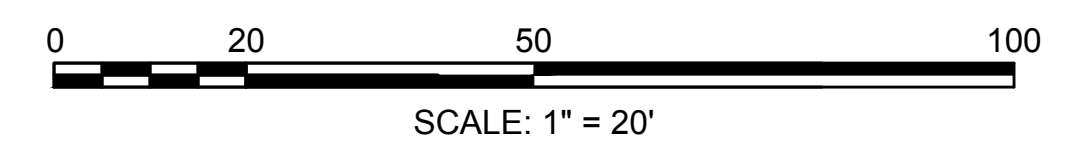
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 11 | 37 |

CONSTRUCTION PLAN



CONTINUED ON
SHEET NO. 10

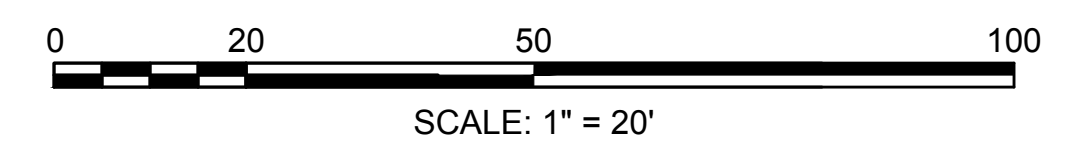
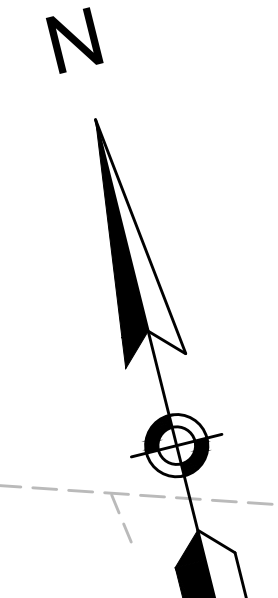
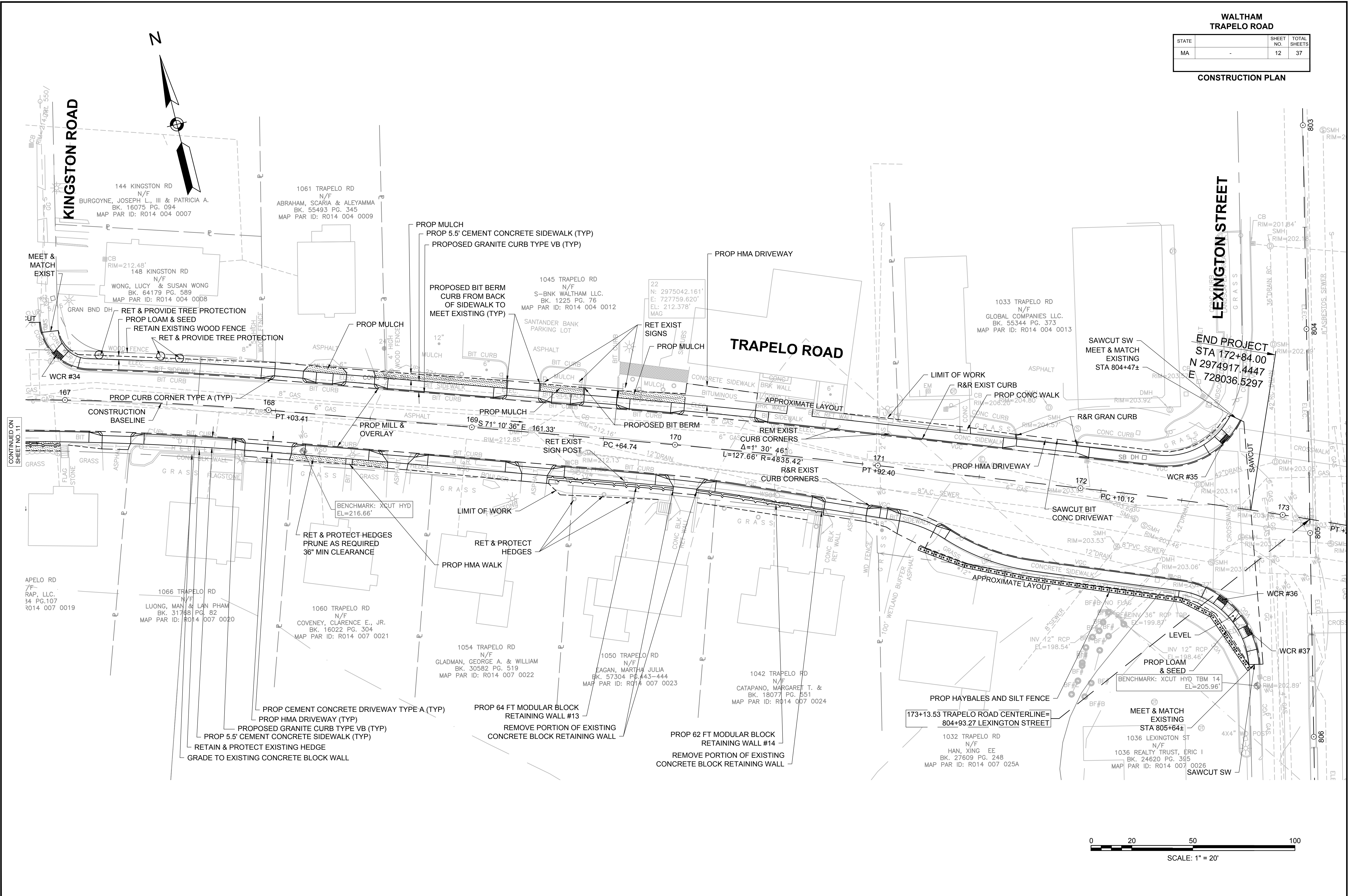
CONTINUED ON
SHEET NO. 12



WALTHAM
TRAPELO ROAD

| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 12 | 37 |

CONSTRUCTION PLAN

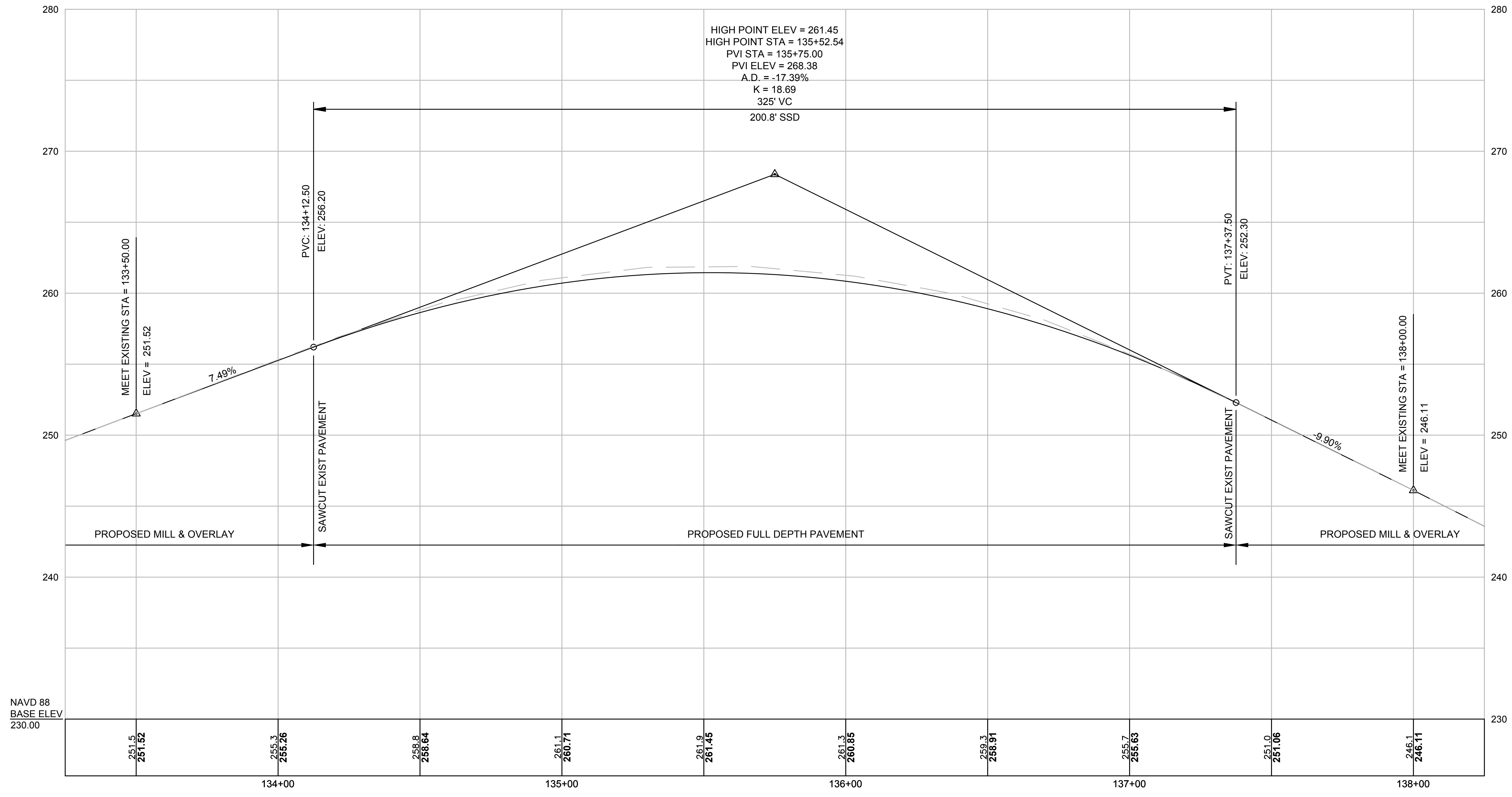


WALTHAM
TRAPELO ROAD

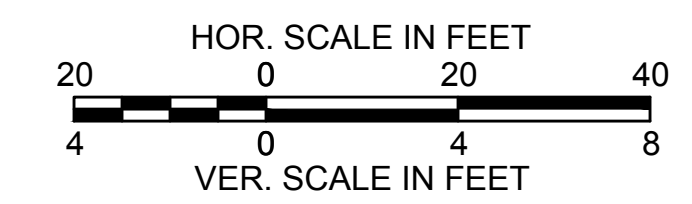
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 13 | 37 |

TRAPELO ROAD PROFILE

TRAPELO ROAD CENTERLINE



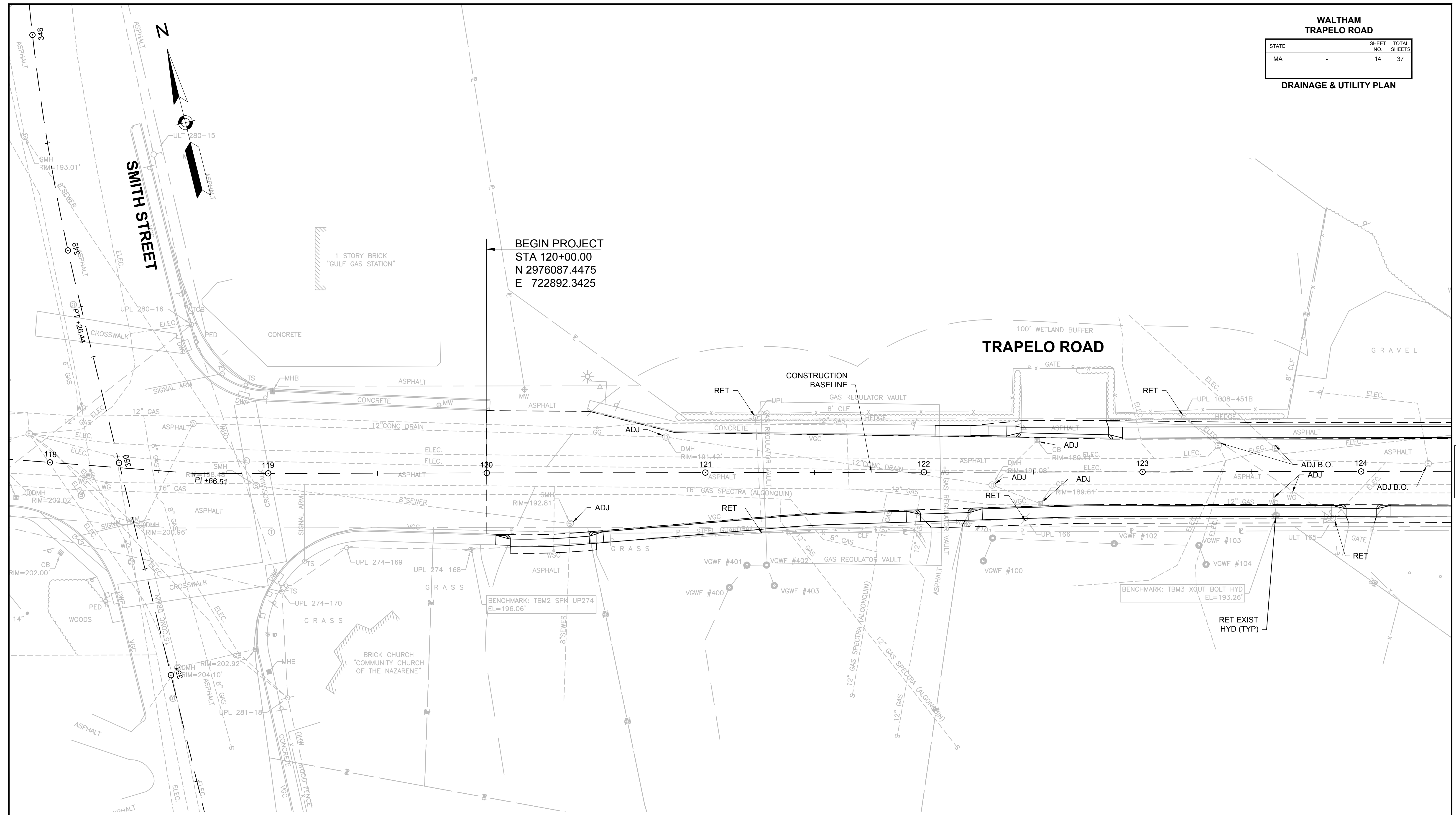
NAVD 88
BASE ELEV
230.00



WALTHAM
TRAPELO ROAD

| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 14 | 37 |

DRAINAGE & UTILITY PLAN



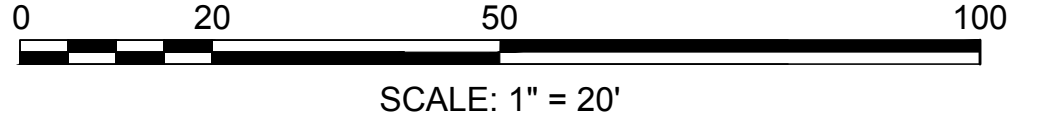
BEGIN PROJECT
STA 120+00.00
N 2976087.4475
E 722892.3425

TRAPELO ROAD

CONSTRUCTION
BASELINE

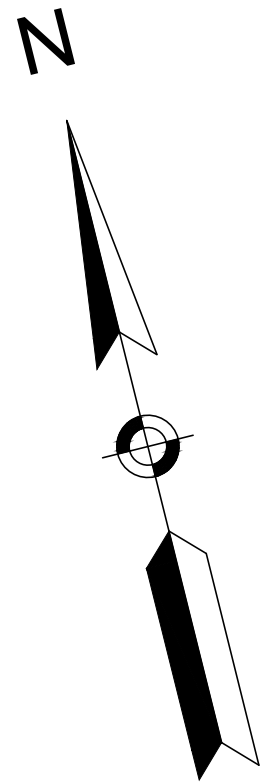
UTILITY NOTES:

1. ALL EXISTING UTILITY STRUCTURES SHALL BE ADJUSTED TO FINISHED GRADE.
2. WHERE NECESSARY, EXISTING CATCH BASINS SHALL BE REBUILT ALONG THE PROPOSED CURB LINE.
3. CURB INLETS SHALL BE PLACED AT ALL EXISTING AND PROPOSED CATCH BASINS.



11266_HD(UTILITY).DWG Plotted on 10-Mar-2015 3:39 PM

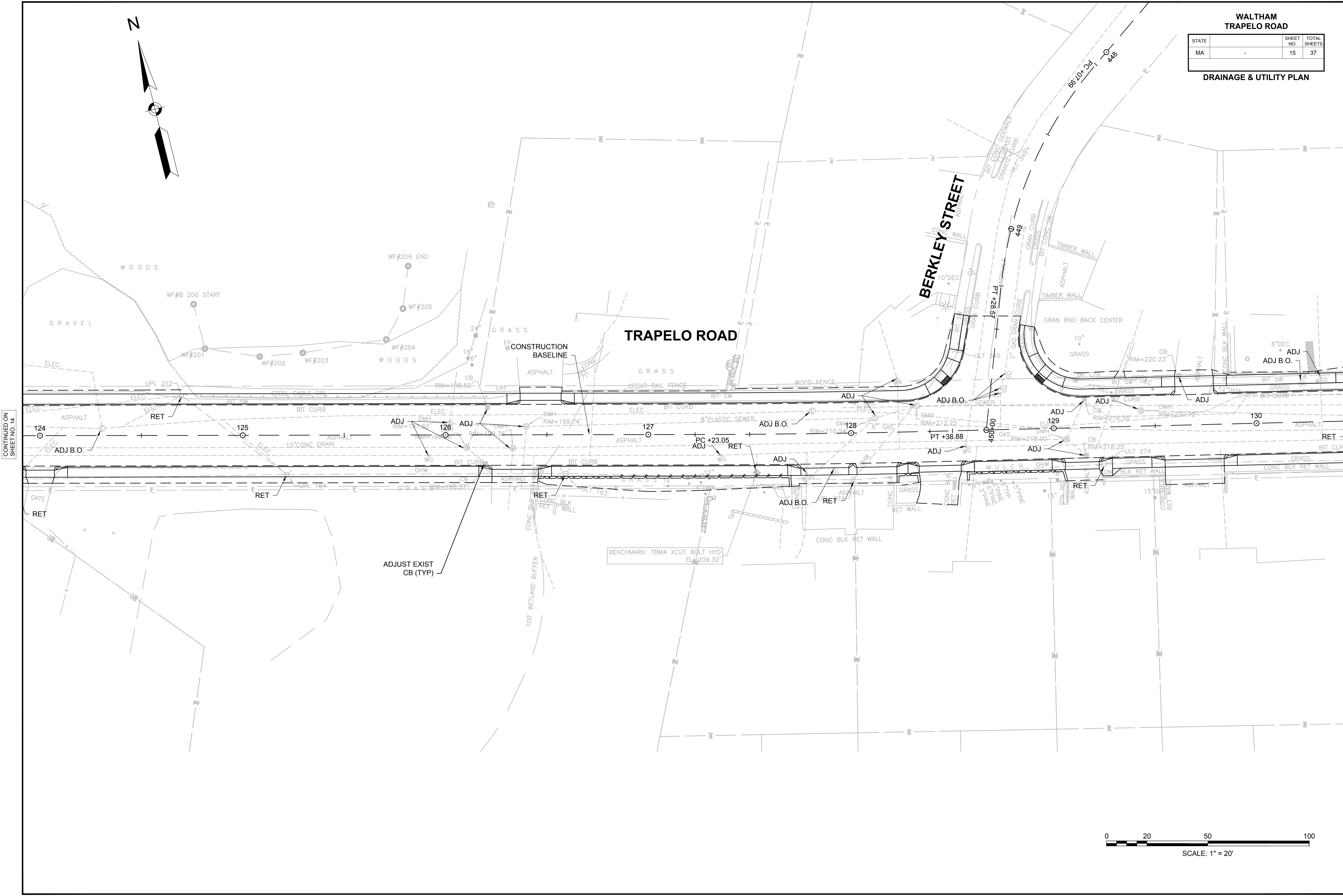
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**WALTHAM
TRAPELO ROAD**

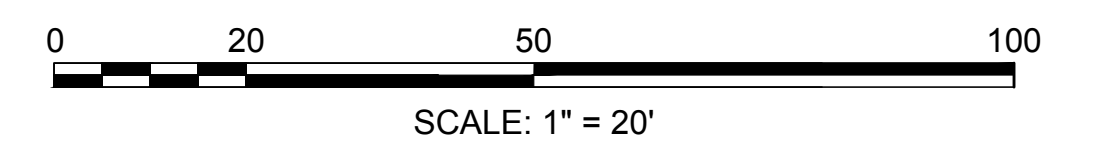
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 15 | 37 |

DRAINAGE & UTILITY PLAN



CONTINUED ON
SHEET NO. 14

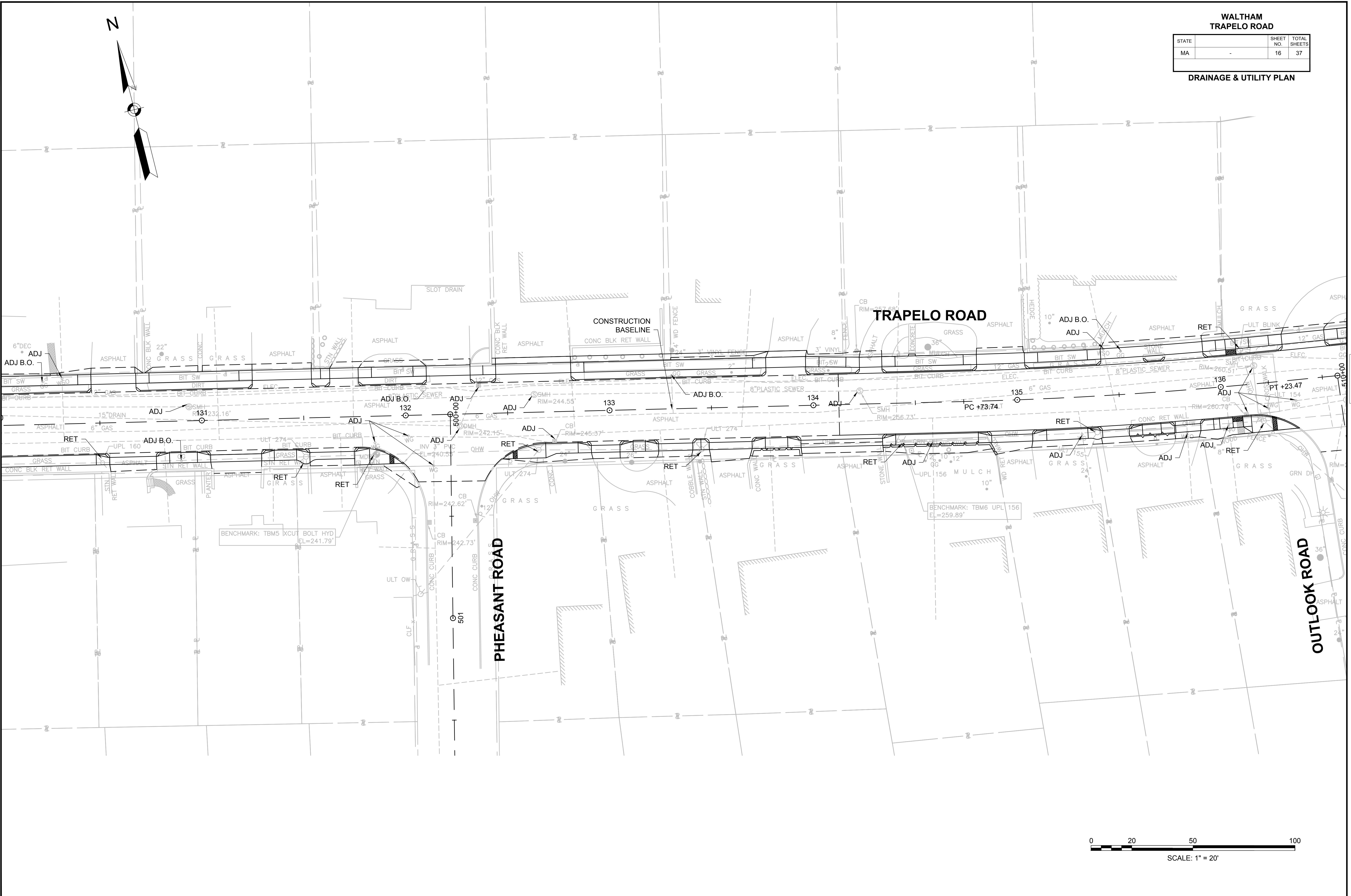
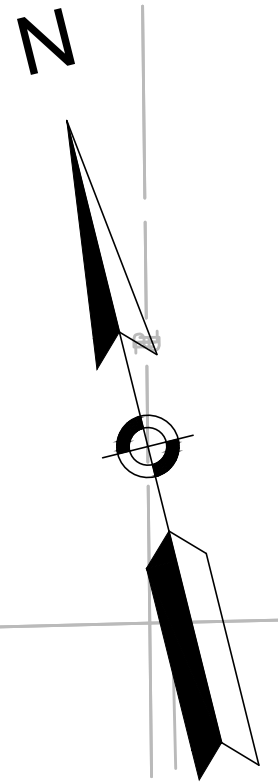
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SHEET NO. 16



WALTHAM
TRAPELO ROAD

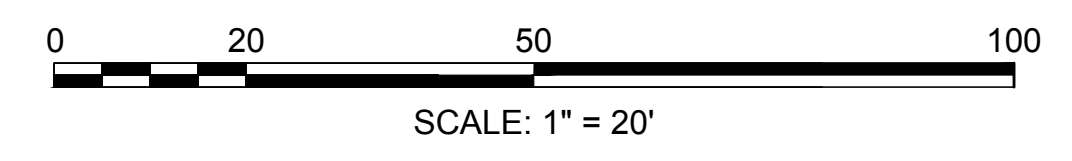
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 16 | 37 |

DRAINAGE & UTILITY PLAN



CONTINUED ON
SHEET NO. 15

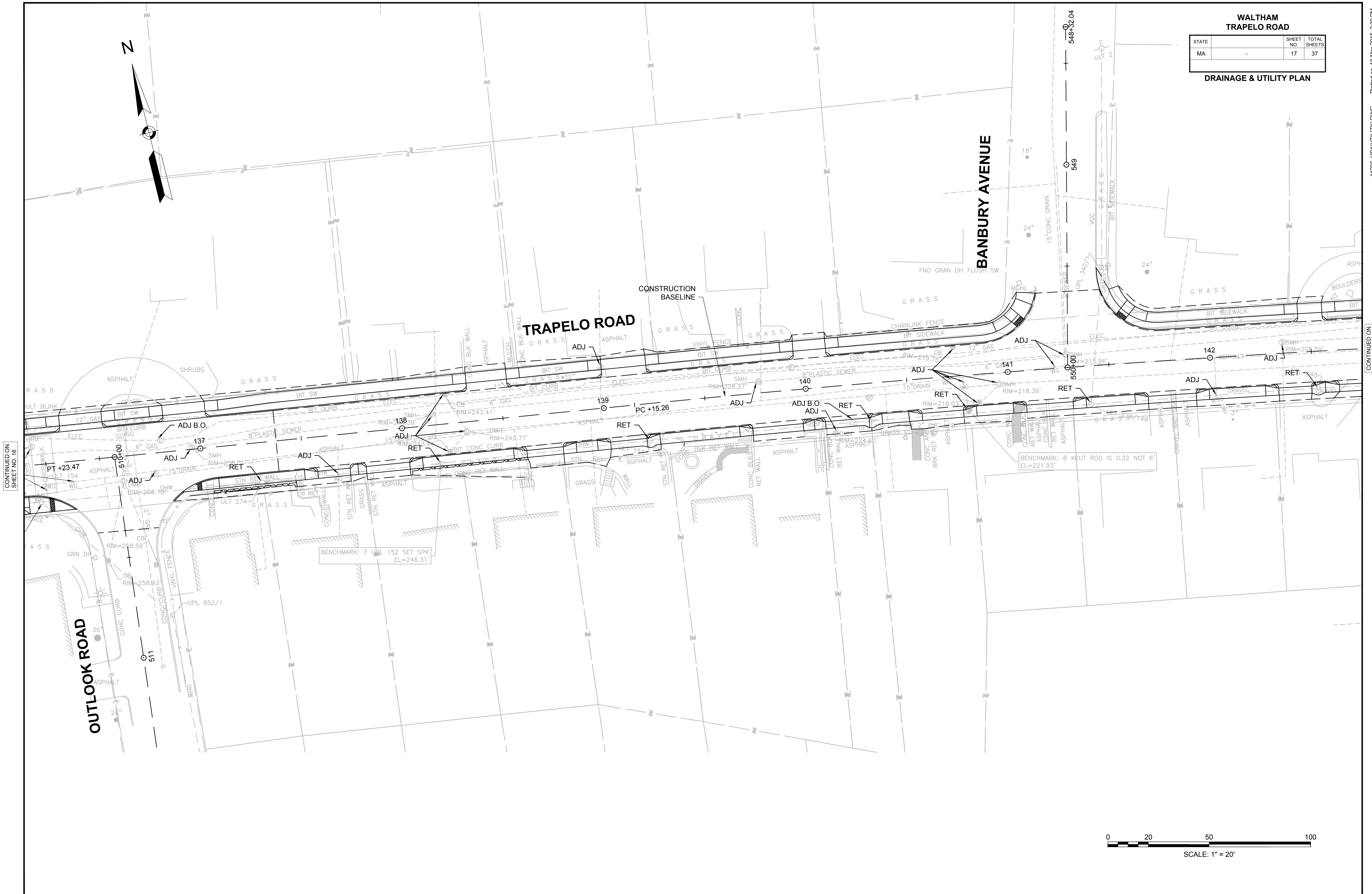
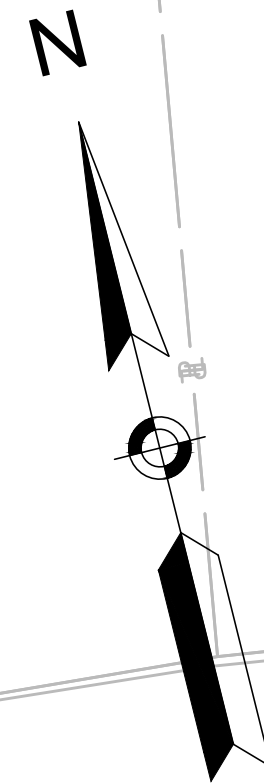
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SHEET NO. 17



WALTHAM
TRAPELO ROAD

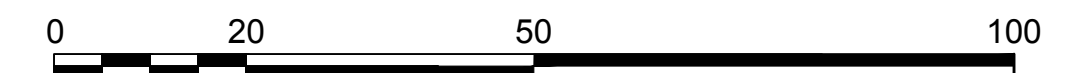
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 17 | 37 |

DRAINAGE & UTILITY PLAN



CONTINUED ON
SHEET NO. 16

CONTINUED ON
SHEET NO. 18

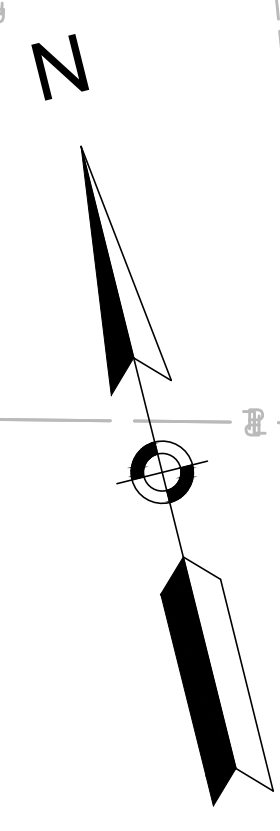


SCALE: 1" = 20'

WALTHAM
TRAPELO ROAD

| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 18 | 37 |

DRAINAGE & UTILITY PLAN



TRAPELO ROAD

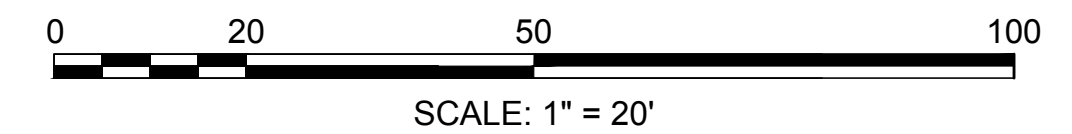
CONSTRUCTION
BASELINE

FEMA FLOOD ZONE "AE"
BY GRAPHICAL PLOTTING

REMOVE EXISTING WATER
SERVICE PIPE AND GATE BOX AND
CUT AND CAP PIPE AT MAIN

NOTES:

1. THE CONTRACTOR SHALL VERIFY WATER SHUT OFFS AND PIPE LOCATIONS WITH THE CITY OF WALTHAM PRIOR TO ANY WATER WORK.
2. THE COST OF REMOVAL AND RESETTING SECTIONS OF EXISTING CHAIN LINK FENCE AND ASSOCIATED WORK AS REQUIRED TO REMOVE THE WATER PIPE CONNECTION SHALL BE CONSIDERED INCIDENTAL TO THE PIPE REMOVAL ITEM.



CONTINUED ON
SHEET NO. 17

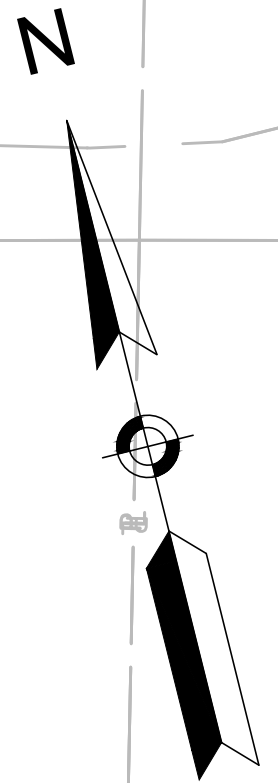
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SHEET NO. 19

11266_HD(UTILITY).DWG Plotted on 10-Mar-2015 3:39 PM

WALTHAM
TRAPELO ROAD

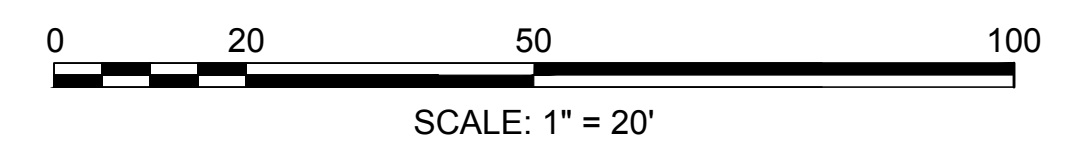
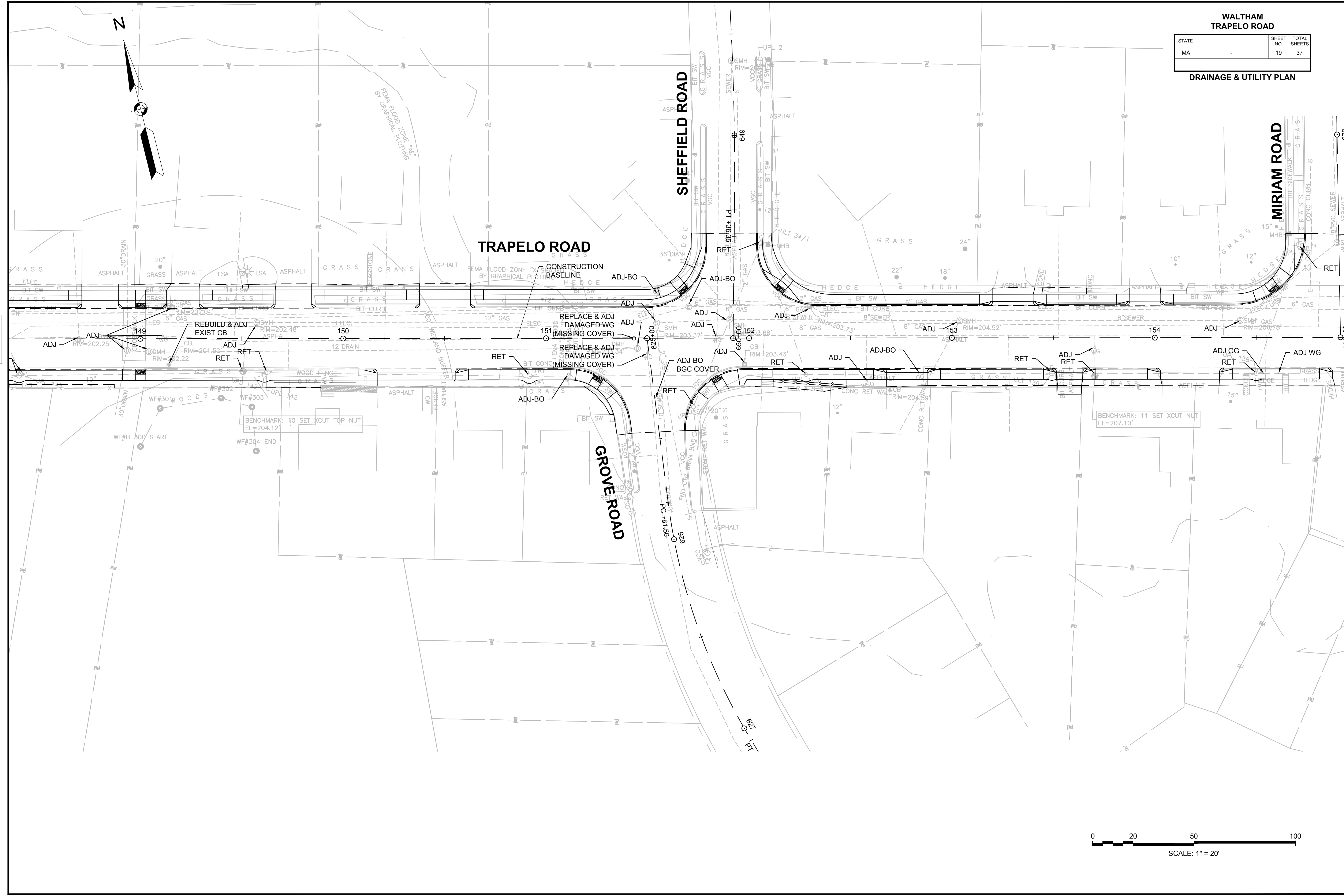
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 19 | 37 |

DRAINAGE & UTILITY PLAN



CONTINUED ON
SHEET NO. 18

CONTINUED ON
SHEET NO. 20



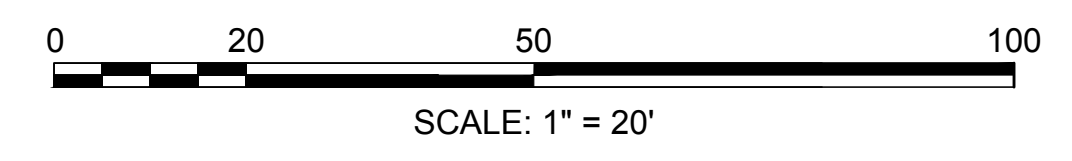
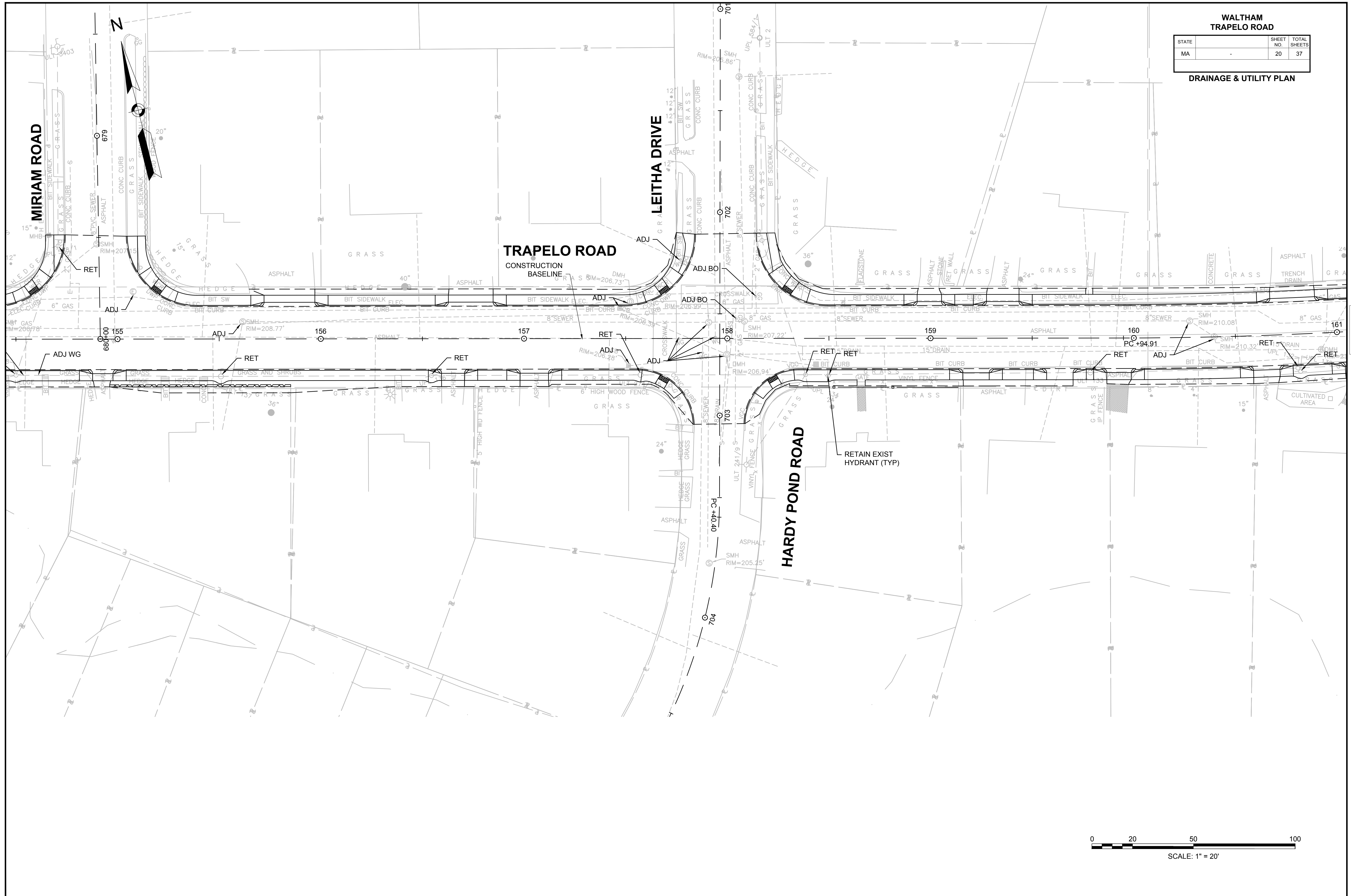
**WALTHAM
TRAPELO ROAD**

| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 20 | 37 |

DRAINAGE & UTILITY PLAN

CONTINUED ON
SHEET NO. 19

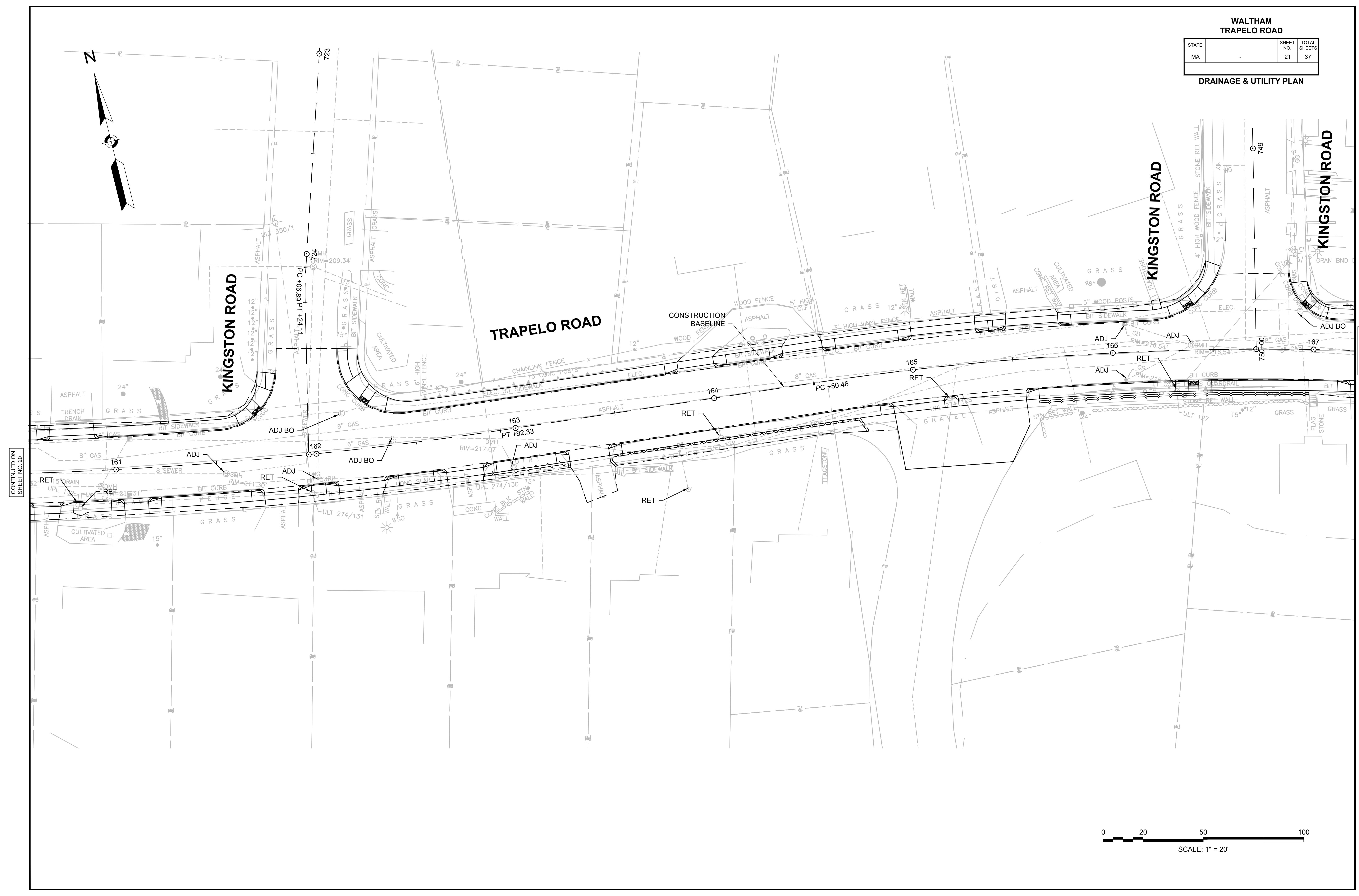
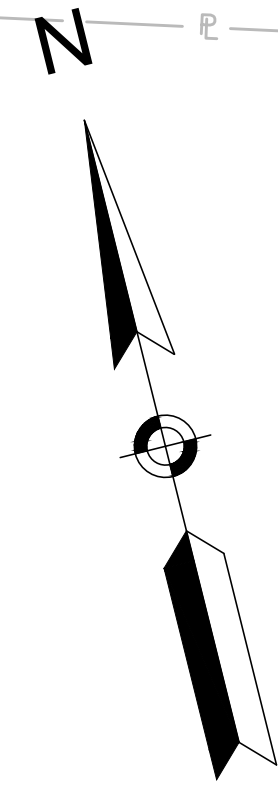
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WALTHAM
TRAPELO ROAD

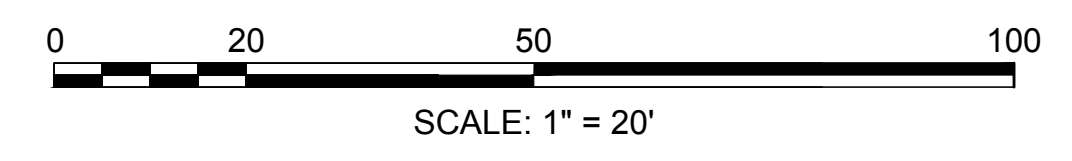
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 21 | 37 |

DRAINAGE & UTILITY PLAN



CONTINUED ON
SHEET NO. 20

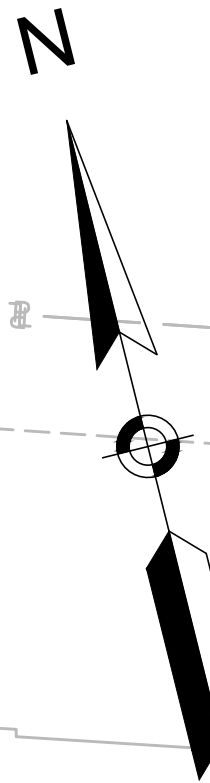
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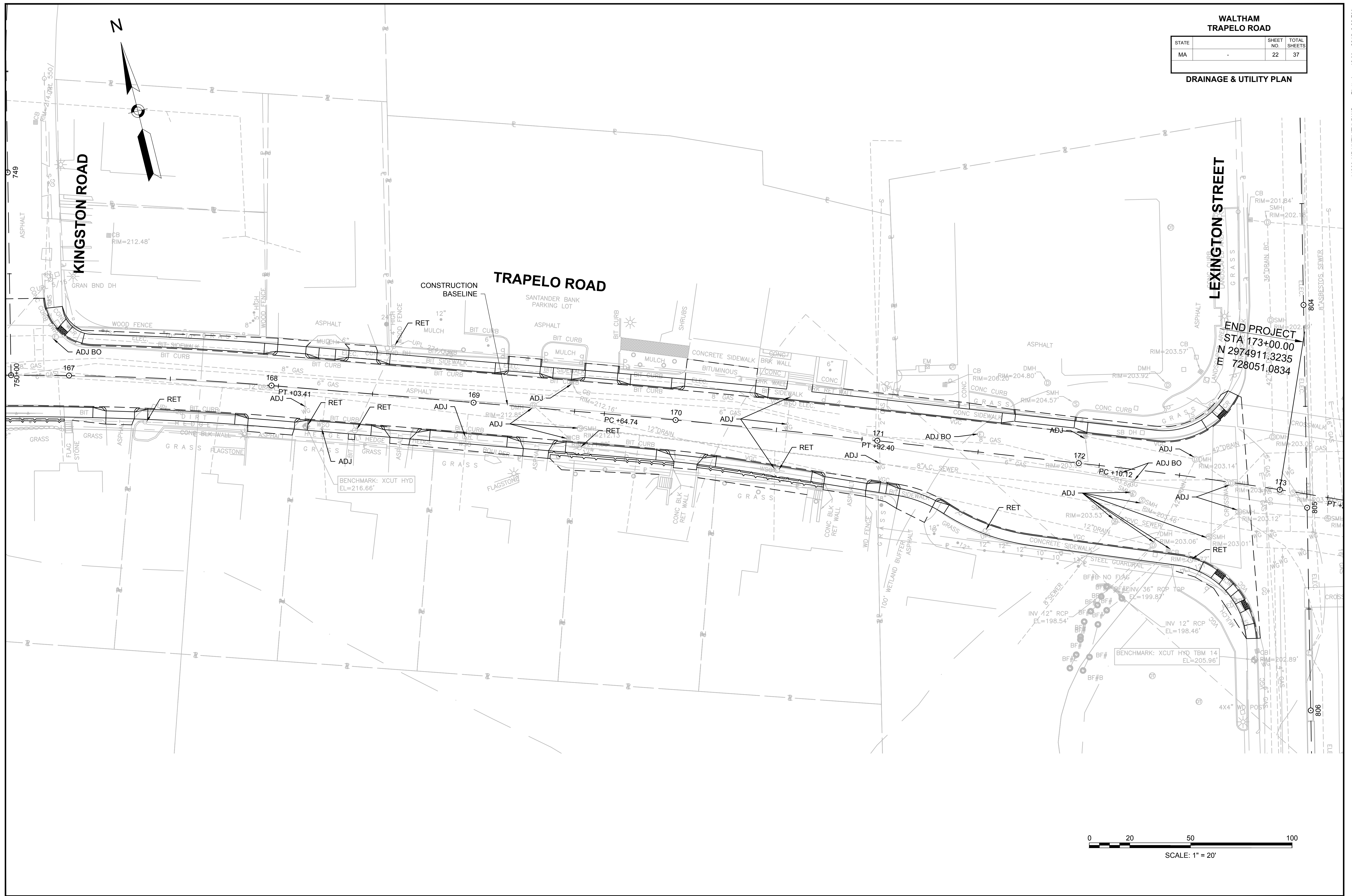
WALTHAM
TRAPELO ROAD

| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 22 | 37 |

DRAINAGE & UTILITY PLAN



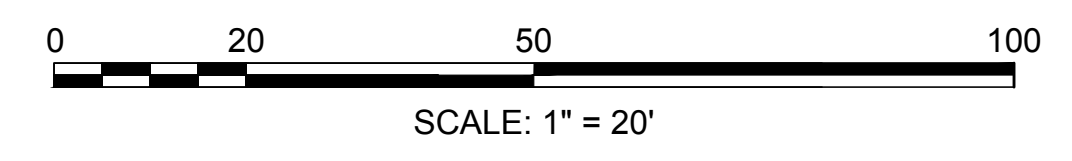
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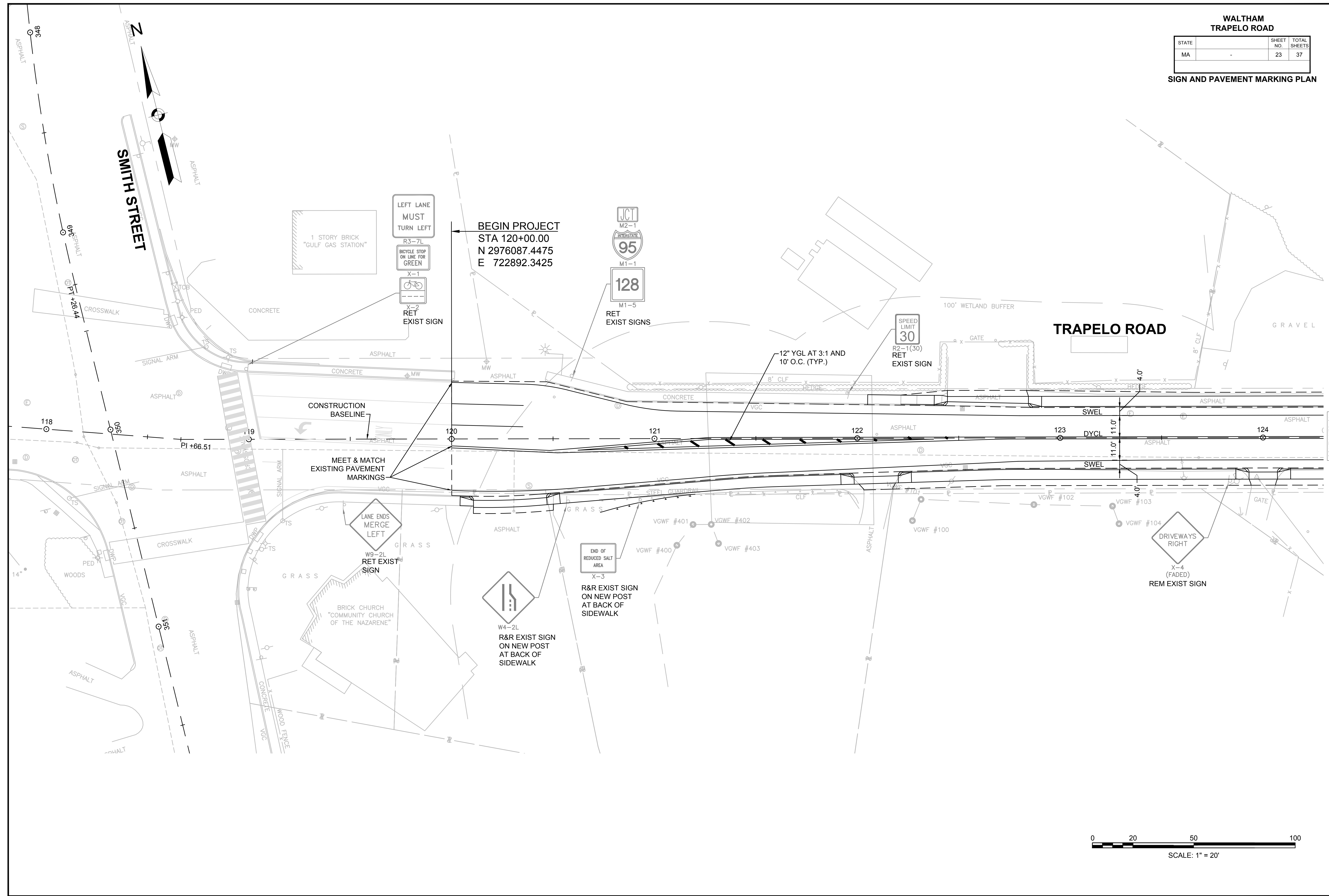


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E 728051.0834

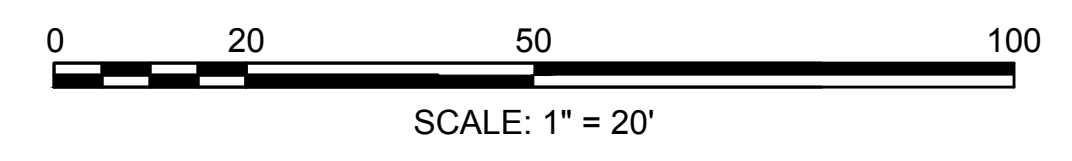
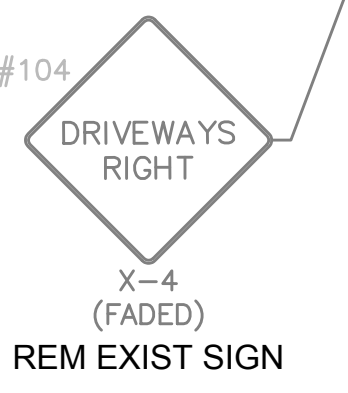
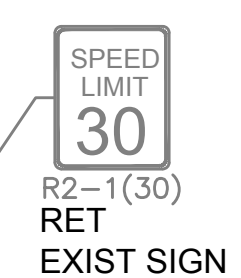
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EL=216.66'

BENCHMARK: X CUT HYD TBM 14
EL=205.96'

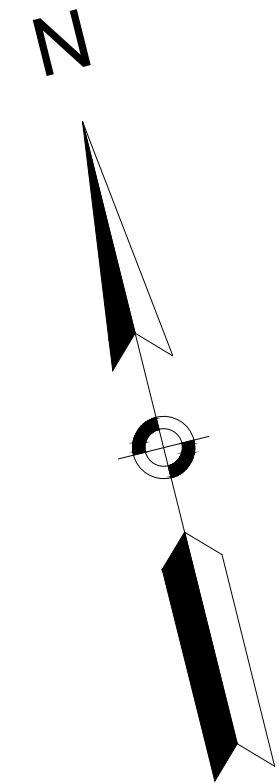




BEGIN PROJECT
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CONTINUED ON SHEET NO. 24



**WALTHAM
TRAPELO ROAD**

| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 24 | 37 |

SIGN AND PAVEMENT MARKING PLAN

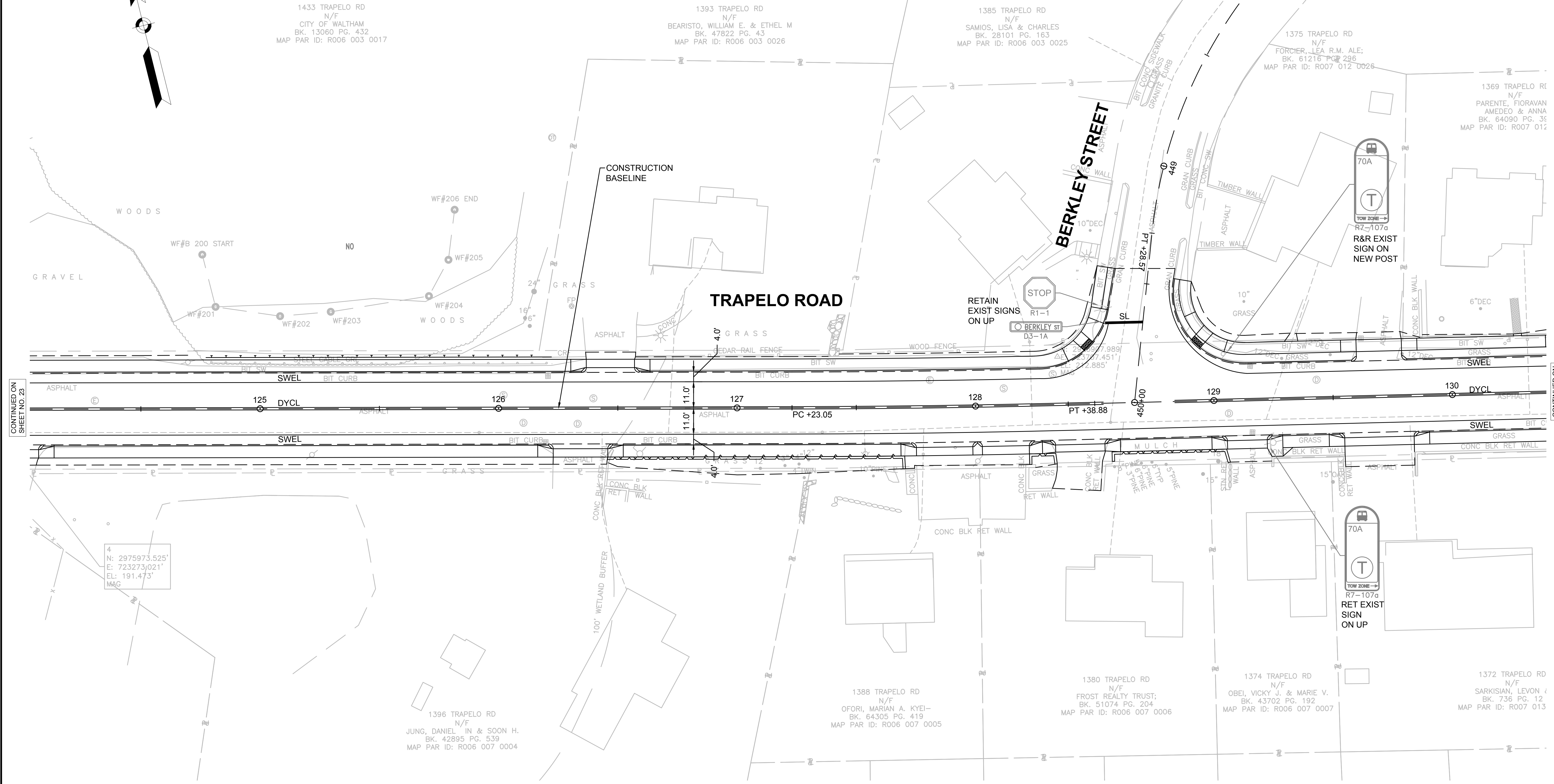
1433 TRAPELO RD
N/F
CITY OF WALTHAM
BK. 13060 PG. 432
MAP PAR ID: R006 003 0017

1393 TRAPELO RD
N/F
BEARISTO, WILLIAM E. & ETHEL M
BK. 47822 PG. 43
MAP PAR ID: R006 003 0026

1385 TRAPELO RD
N/F
SAMIOS, LISA & CHARLES
BK. 28101 PG. 163
MAP PAR ID: R006 003 0025

1375 TRAPELO RD
N/F
FORCIER, LEA R.M. ALE;
BK. 61216 PG. 296
MAP PAR ID: R007 012 0026

1369 TRAPELO RD
N/F
PARENTE, FIORAVAN
AMEDEO & ANNA
BK. 64090 PG. 35
MAP PAR ID: R007 012



CONTINUED ON
SHEET NO. 23

CONTINUED ON
SHEET NO. 25

4
N: 2975973.525'
E: 723273.021'
EL: 191.473'
MAG

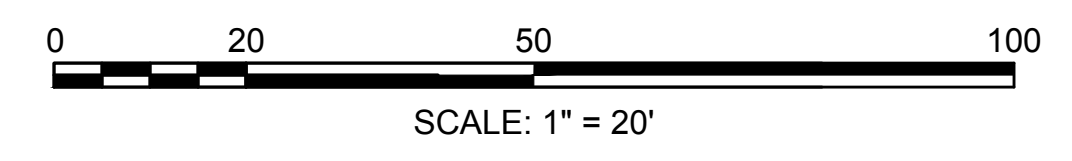
1396 TRAPELO RD
N/F
JUNG, DANIEL IN & SOON H.
BK. 42895 PG. 539
MAP PAR ID: R006 007 0004

1388 TRAPELO RD
N/F
OFORI, MARIAN A. KYEI-
BK. 64305 PG. 419
MAP PAR ID: R006 007 0005

1380 TRAPELO RD
N/F
FROST REALTY TRUST;
BK. 51074 PG. 204
MAP PAR ID: R006 007 0006

1374 TRAPELO RD
N/F
OBEL, VICKY J. & MARIE V.
BK. 43702 PG. 192
MAP PAR ID: R006 007 0007

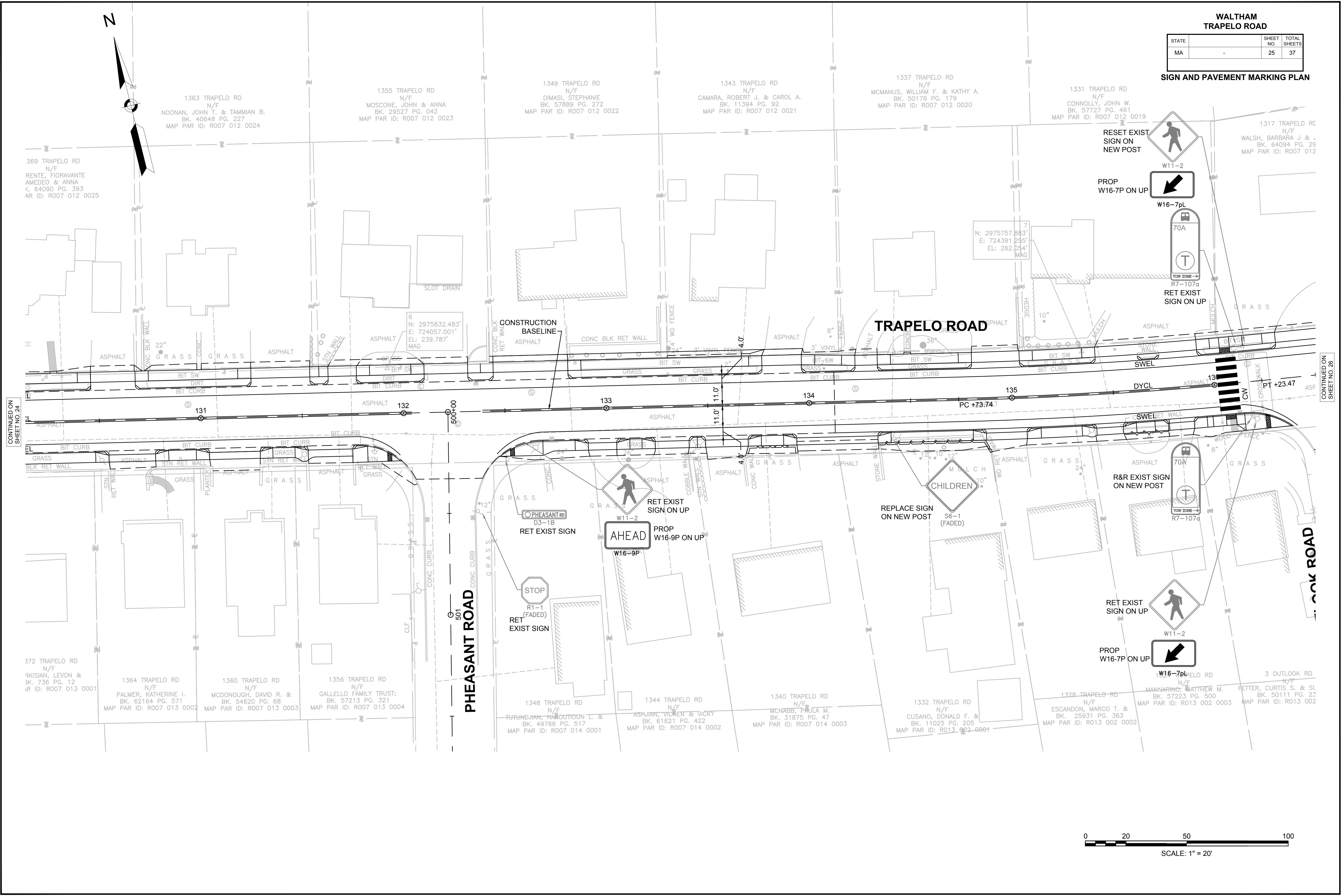
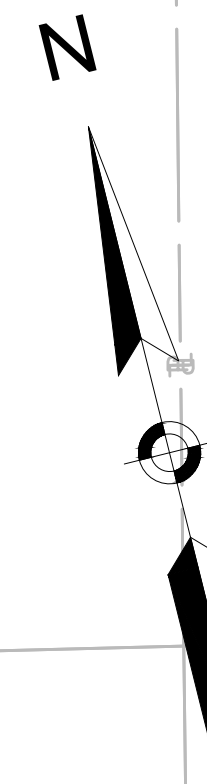
1372 TRAPELO RD
N/F
SARKISIAN, LEVON
BK. 736 PG. 12
MAP PAR ID: R007 013



**WALTHAM
TRAPELO ROAD**

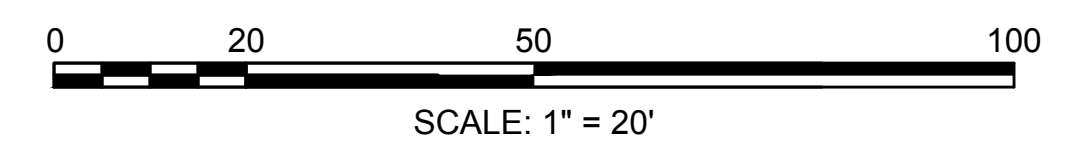
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 25 | 37 |

SIGN AND PAVEMENT MARKING PLAN



CONTINUED ON SHEET NO. 24

CONTINUED ON SHEET NO. 26

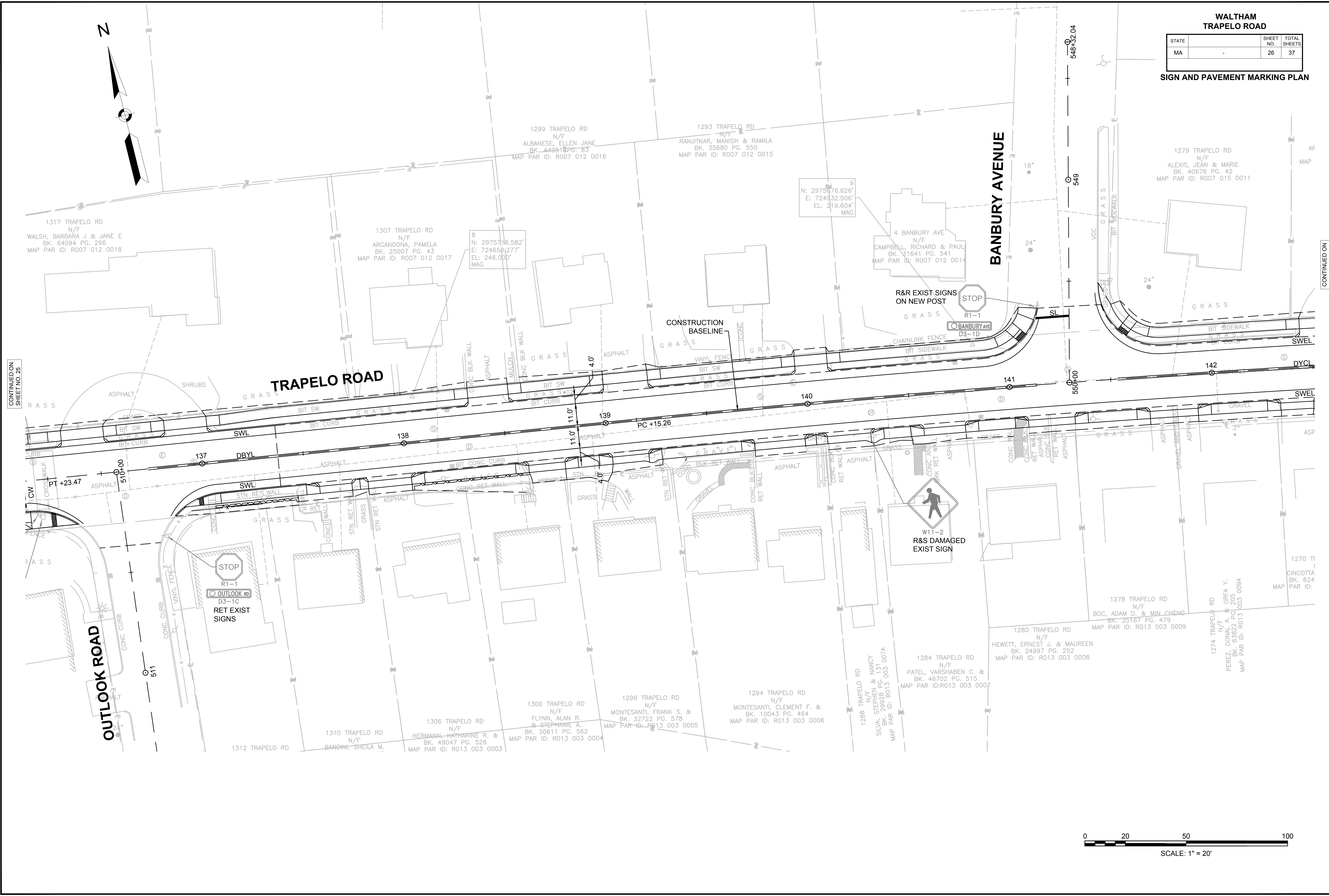
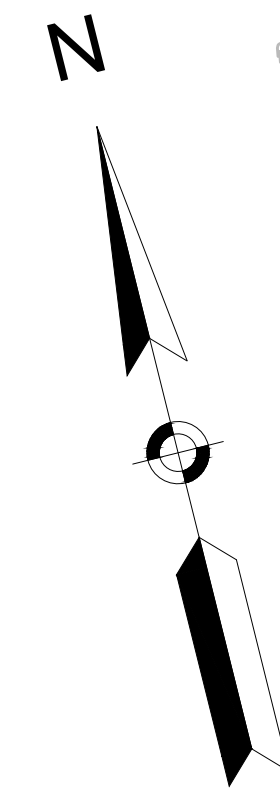


11266_SPM.DWG Plocted on: 31-Mar-2016 2:17 PM

**WALTHAM
TRAPELO ROAD**

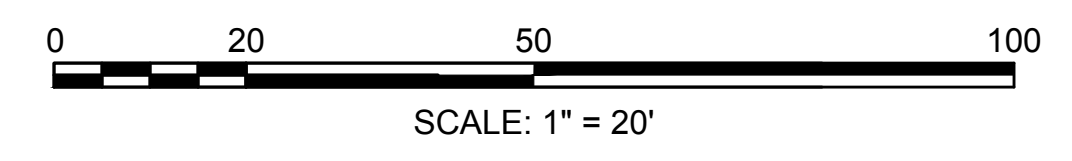
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 26 | 37 |

SIGN AND PAVEMENT MARKING PLAN



CONTINUED ON
SHEET NO. 25

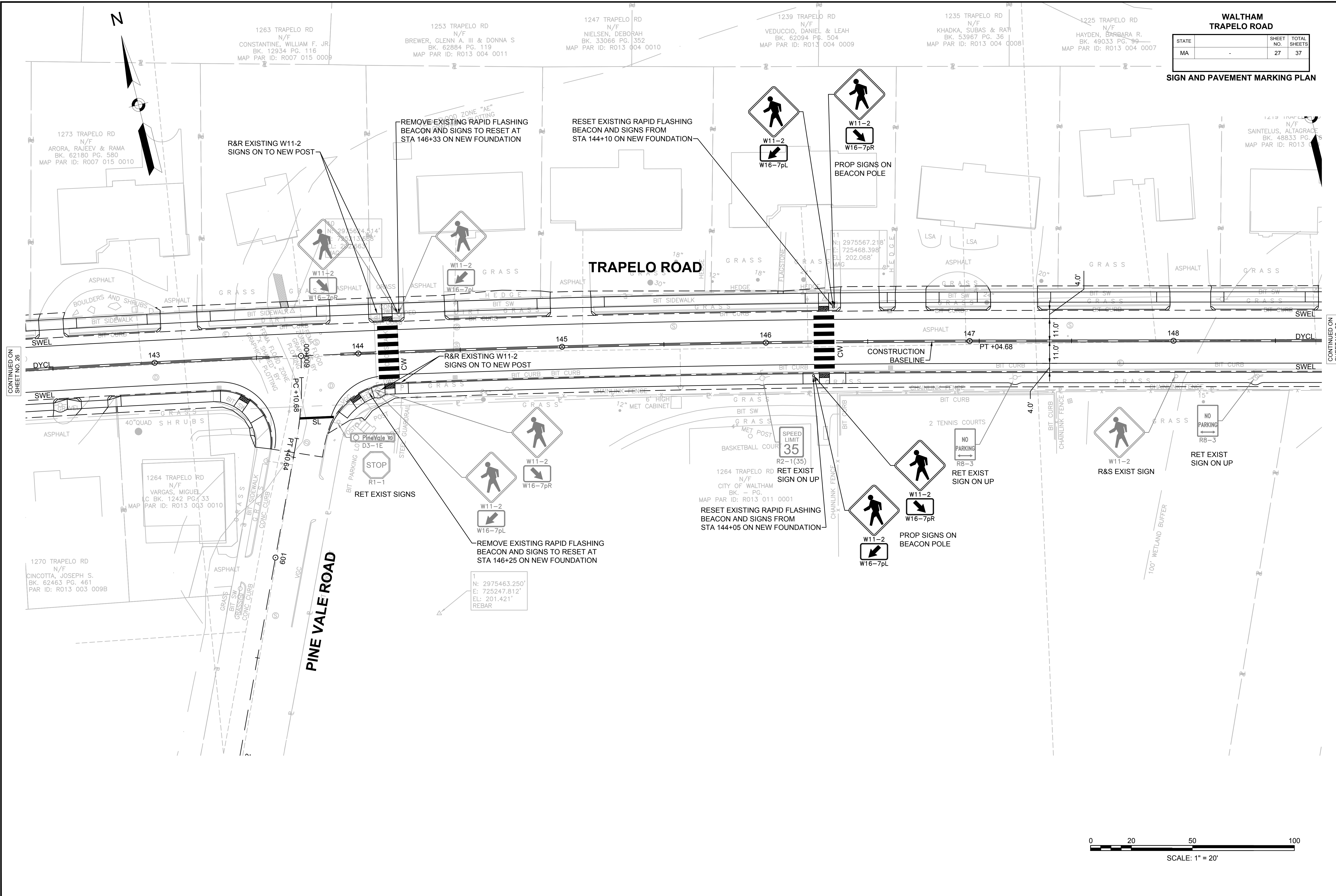
CONTINUED ON
SHEET NO. 27



**WALTHAM
TRAPELO ROAD**

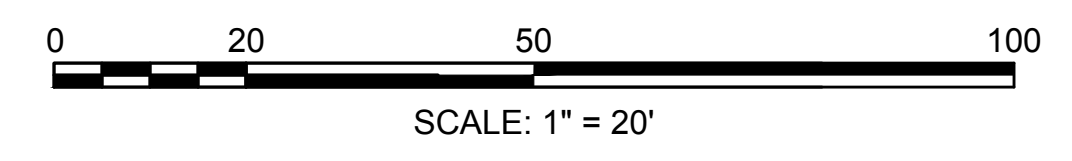
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 27 | 37 |

SIGN AND PAVEMENT MARKING PLAN



CONTINUED ON
SHEET NO. 26

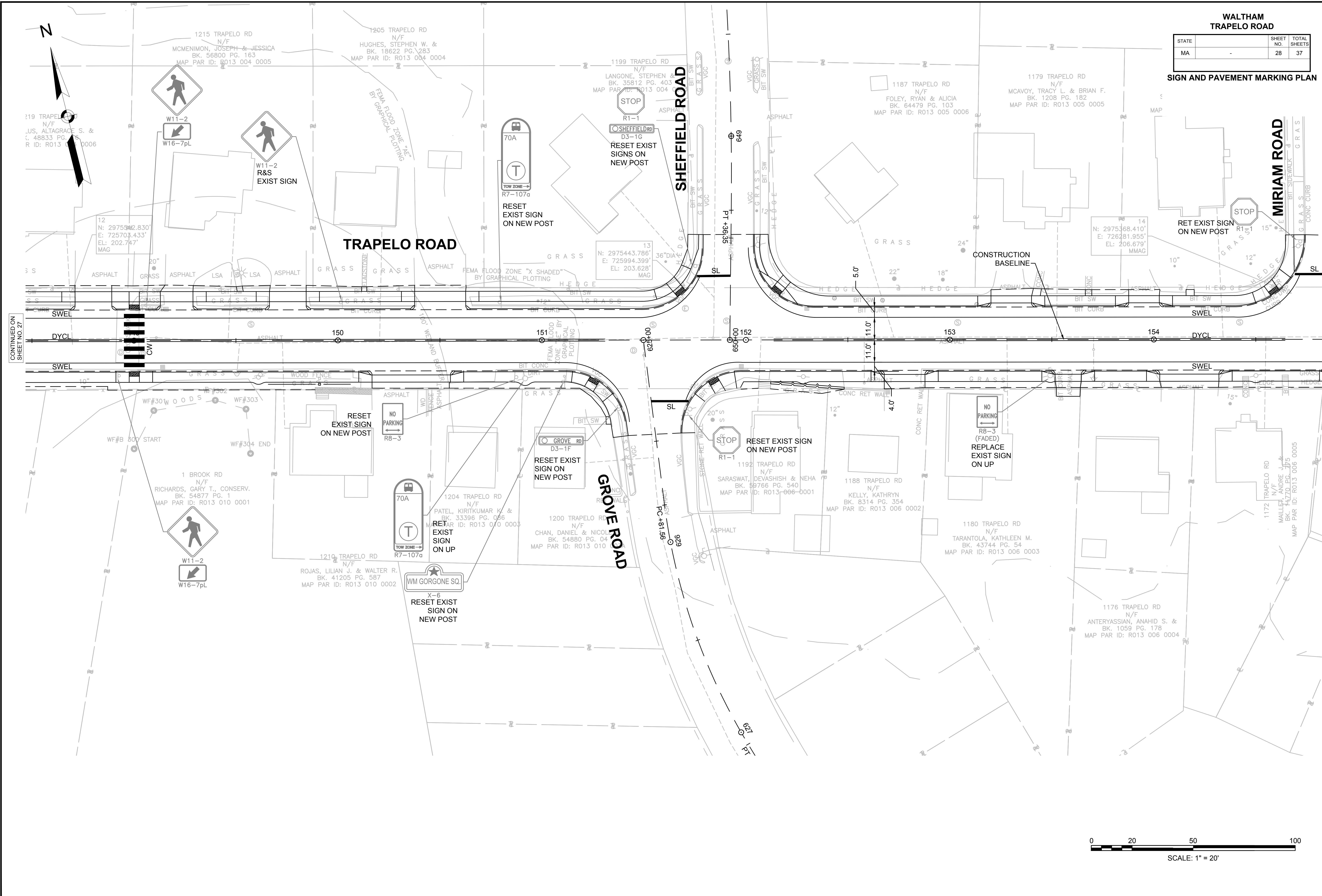
CONTINUED ON
SHEET NO. 28



**WALTHAM
TRAPELO ROAD**

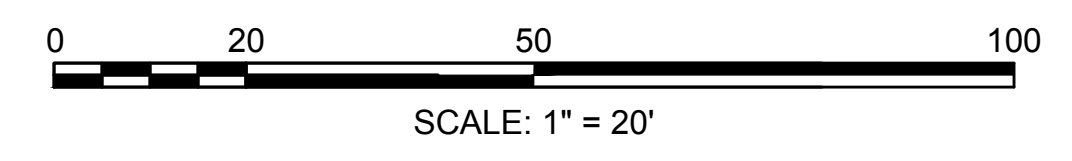
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 28 | 37 |

SIGN AND PAVEMENT MARKING PLAN



CONTINUED ON
SHEET NO. 27

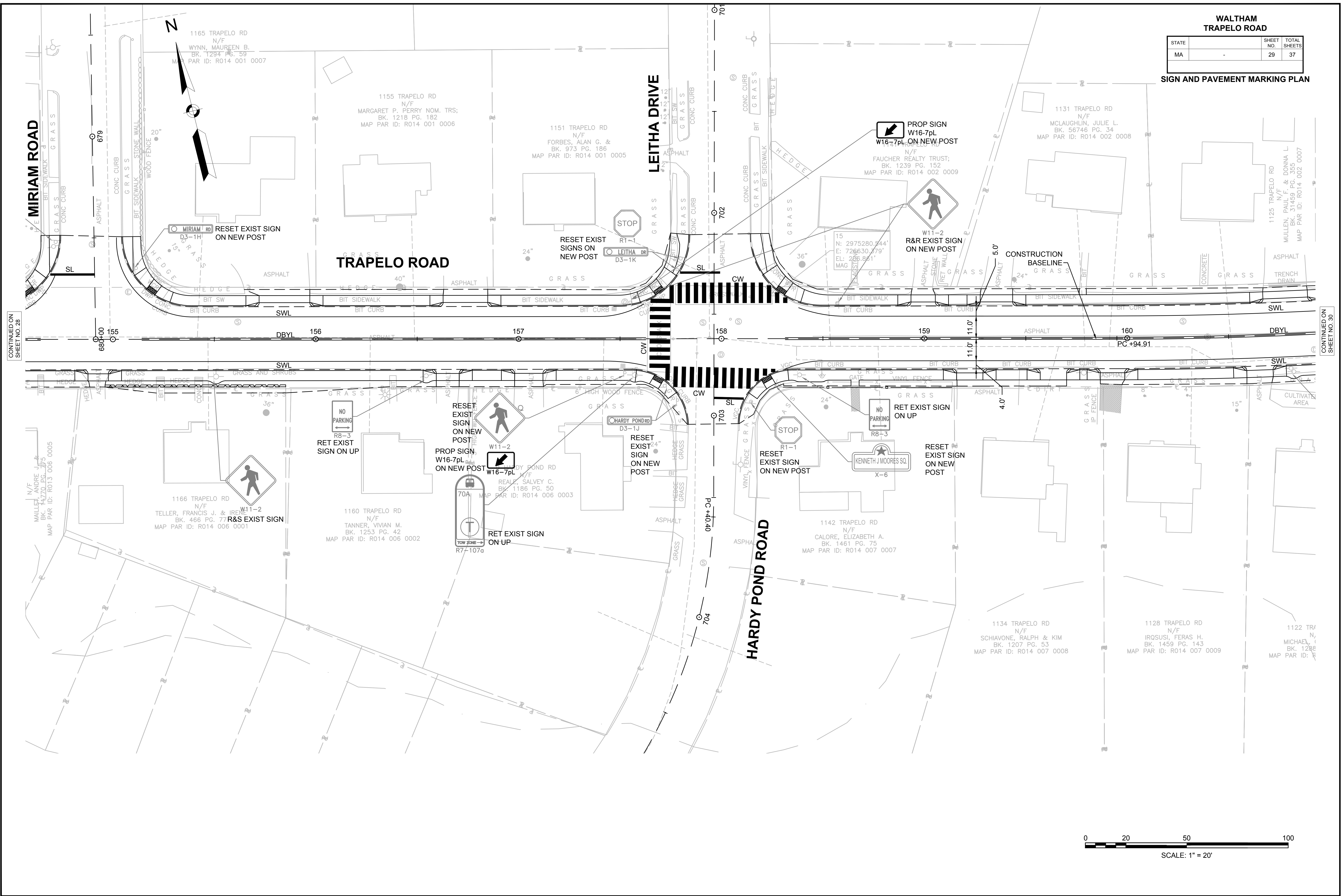
CONTINUED ON
SHEET NO. 29



**WALTHAM
TRAPELO ROAD**

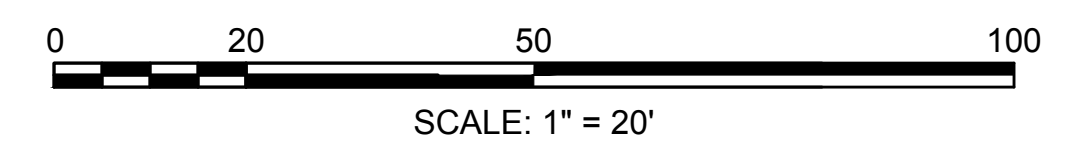
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 29 | 37 |

SIGN AND PAVEMENT MARKING PLAN



CONTINUED ON
SHEET NO. 28

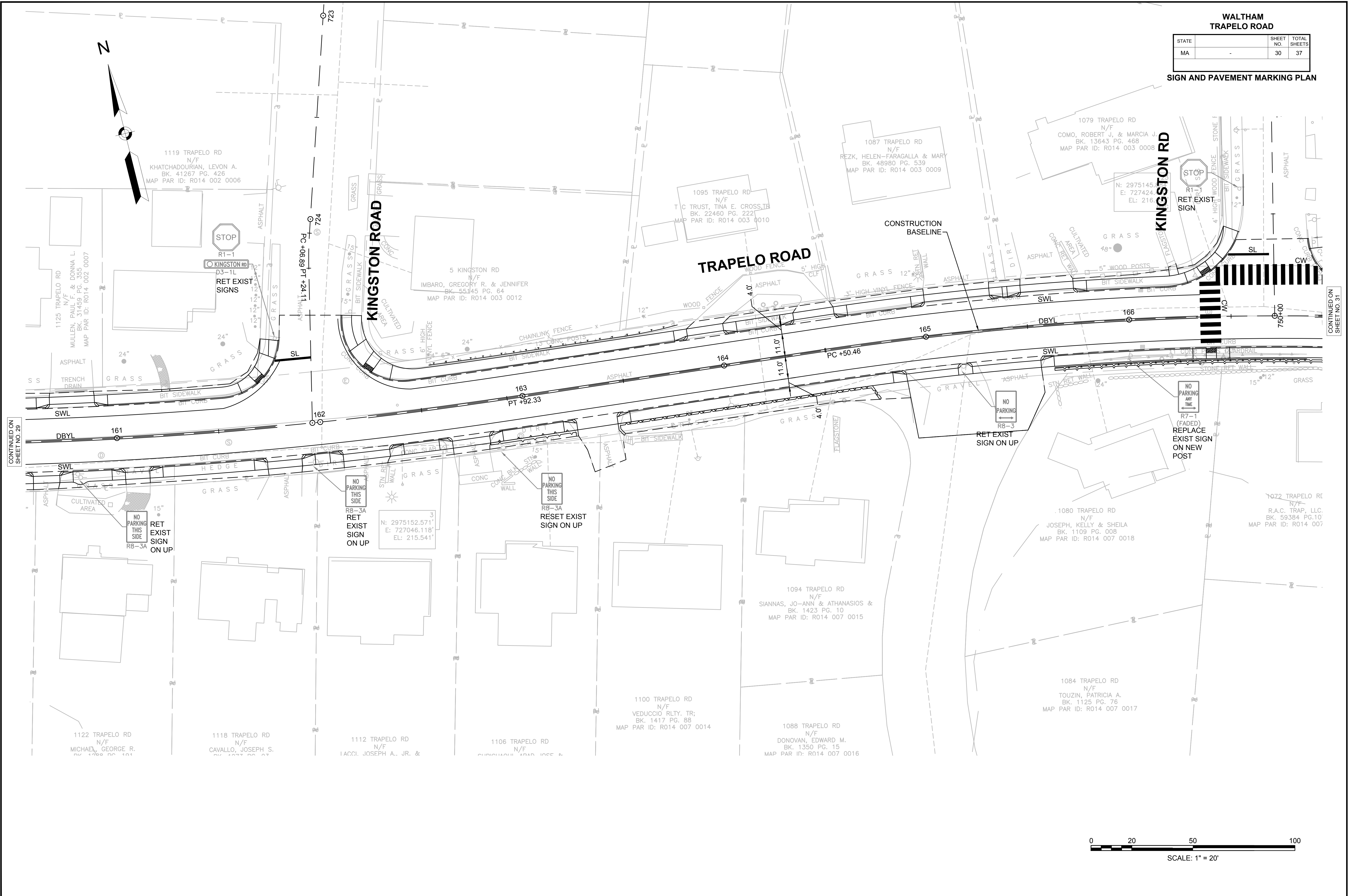
CONTINUED ON
SHEET NO. 30



**WALTHAM
TRAPELO ROAD**

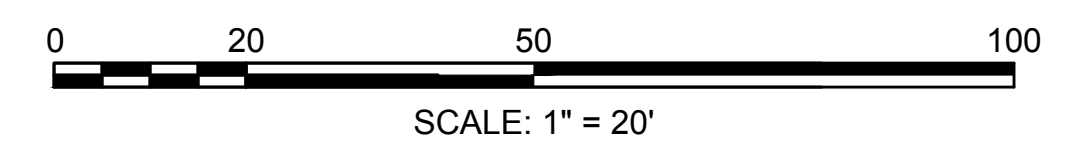
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 30 | 37 |

SIGN AND PAVEMENT MARKING PLAN



CONTINUED ON SHEET NO. 29

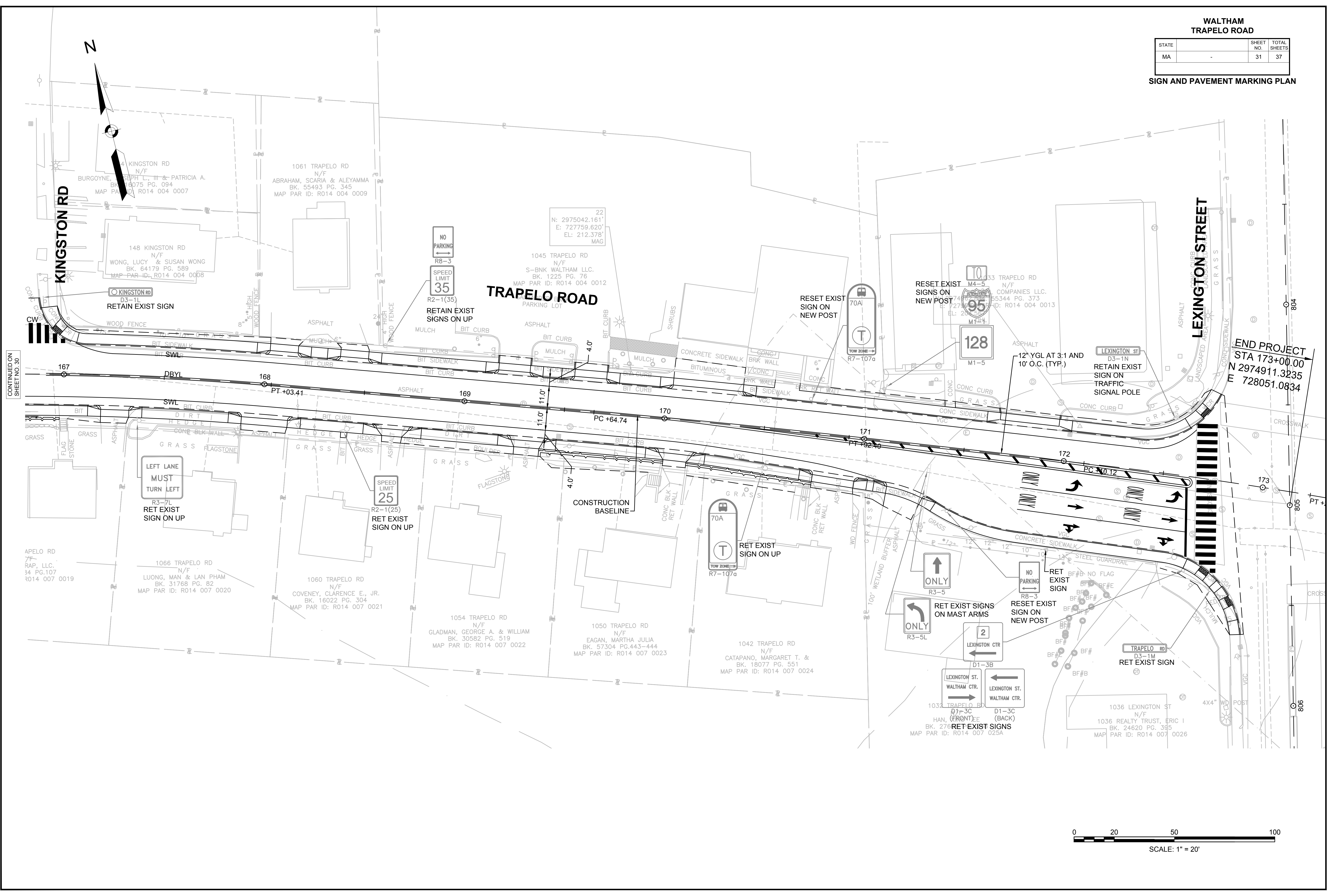
CONTINUED ON SHEET NO. 31



**WALTHAM
TRAPELO ROAD**

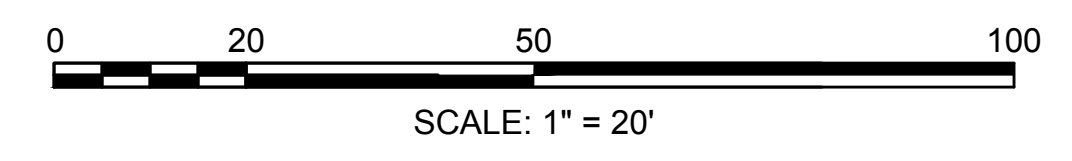
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 31 | 37 |

SIGN AND PAVEMENT MARKING PLAN



CONTINUED ON
SHEET NO. 30

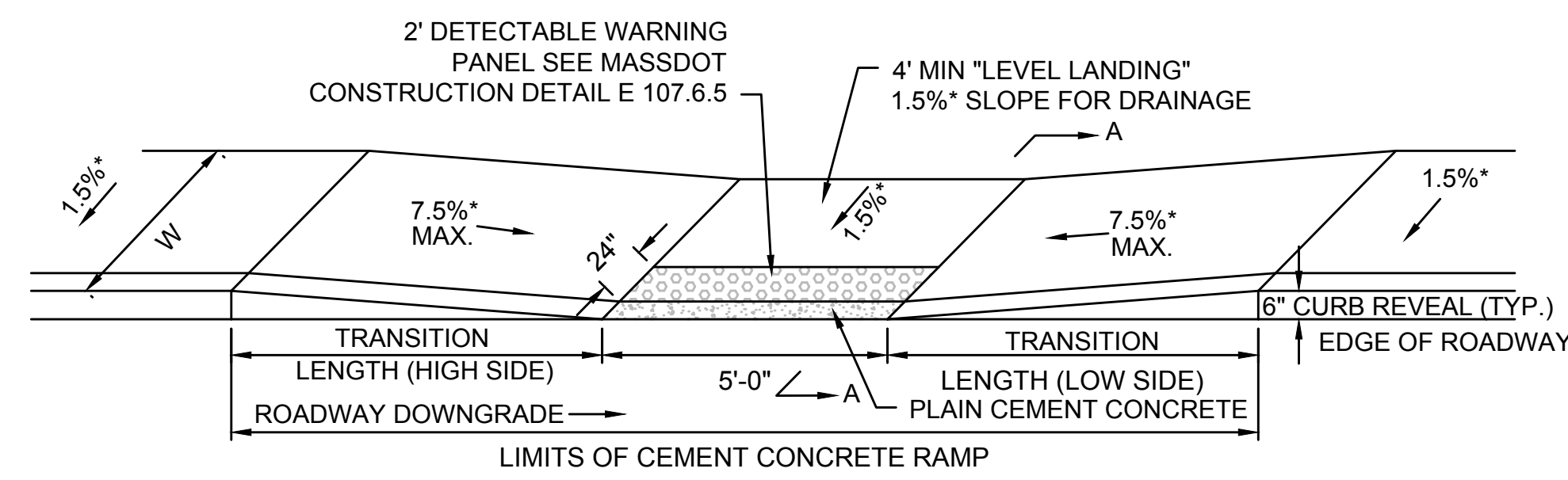
END PROJECT
STA 173+00.00
N 2974911.3235
E 728051.0834



**WALTHAM
TRAPELO ROAD**

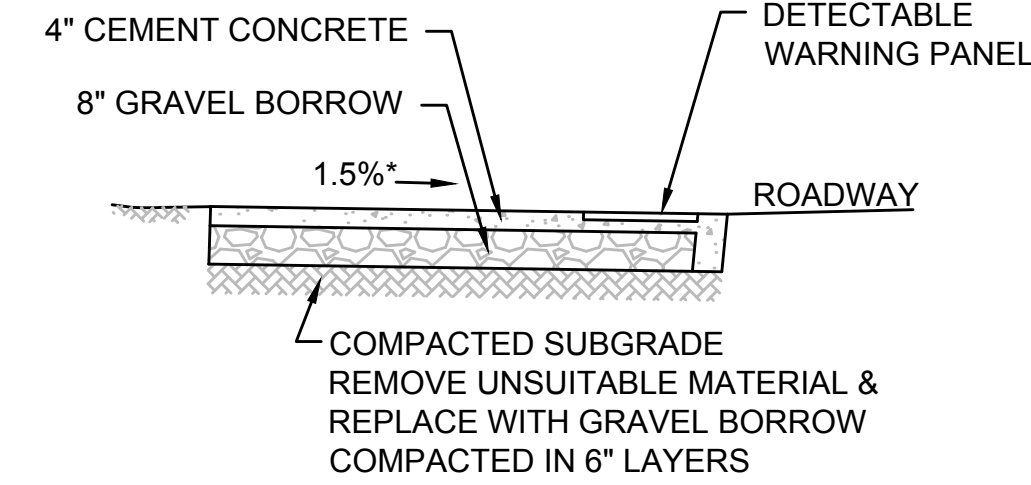
| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 32 | 37 |

CONSTRUCTION DETAILS



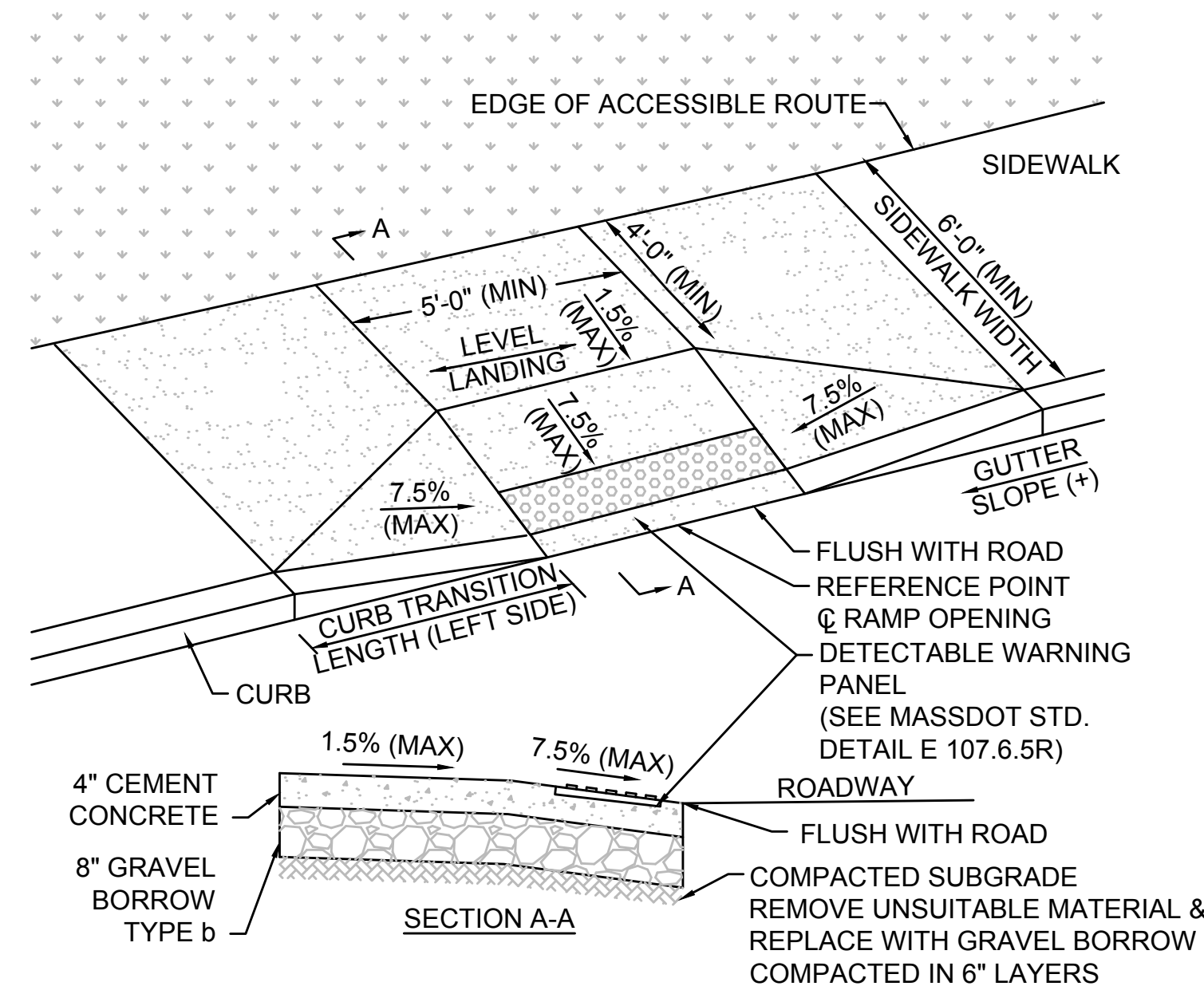
LEGEND
W = SIDEWALK WIDTH
* = TOLERANCE FOR CONSTRUCTION (± 0.5%)

NOTE:
1. SEE DRAWING E107.2.1R OF THE MASSDOT CONSTRUCTION STANDARDS.



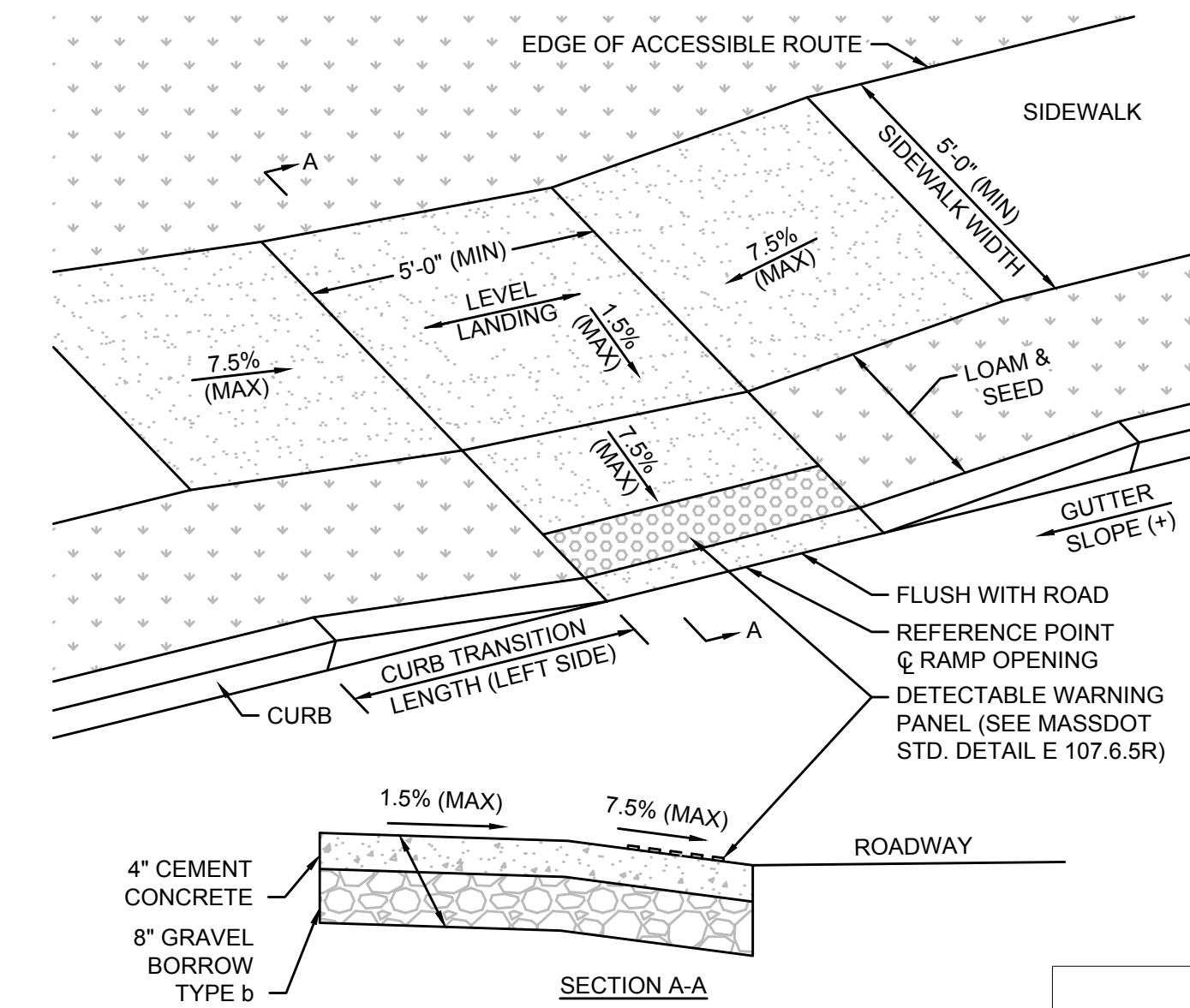
SECTION A-A

WHEELCHAIR RAMP TYPE A DETAIL
NOT TO SCALE

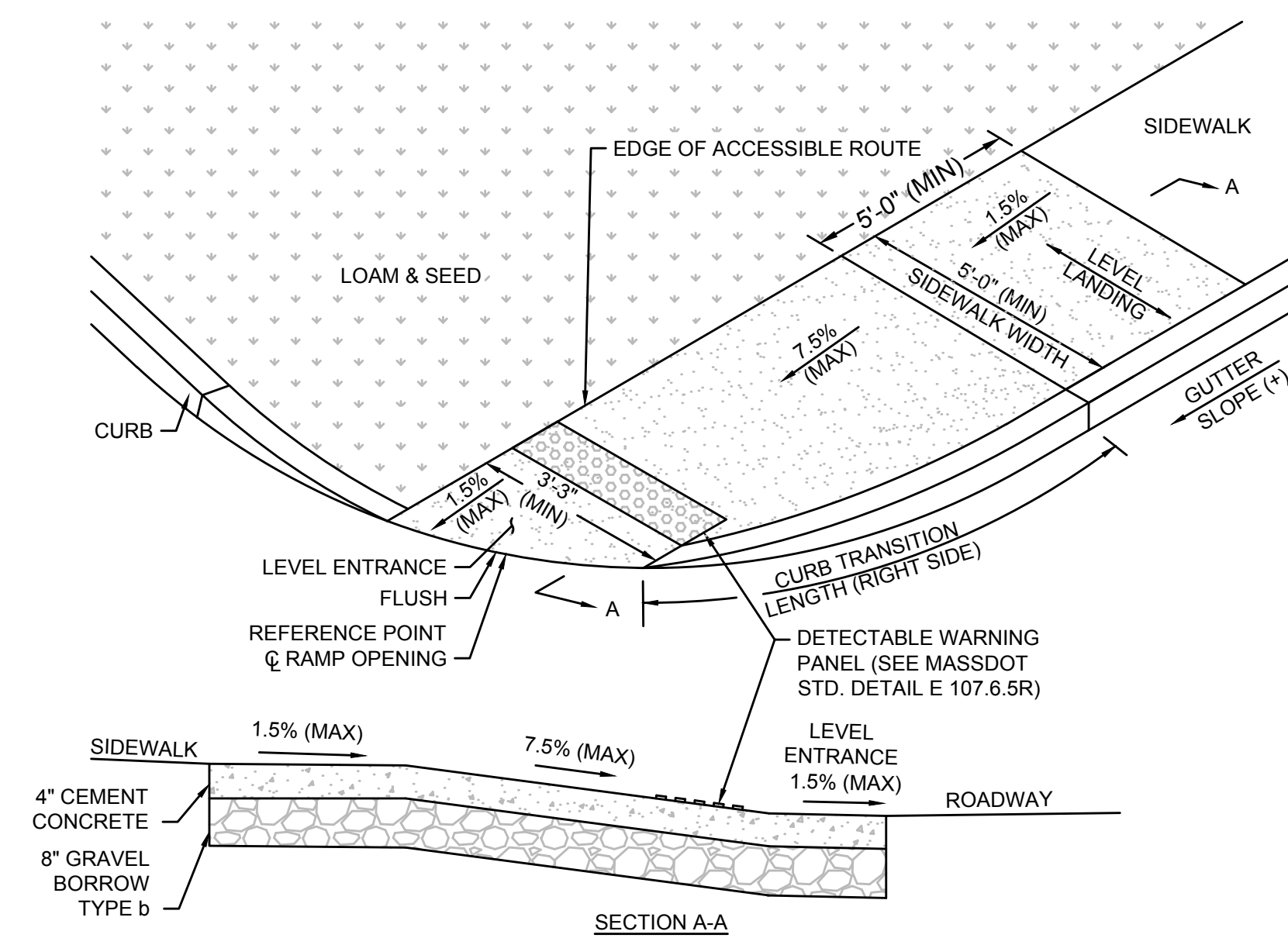


SEE MASSDOT STANDARD DRAWING NUMBER E107.2.0. FOR WHEEL CHAIR RAMP LESS THAN 12'-4" SIDEWALK.

WHEELCHAIR RAMP TYPE B DETAIL
NOT TO SCALE

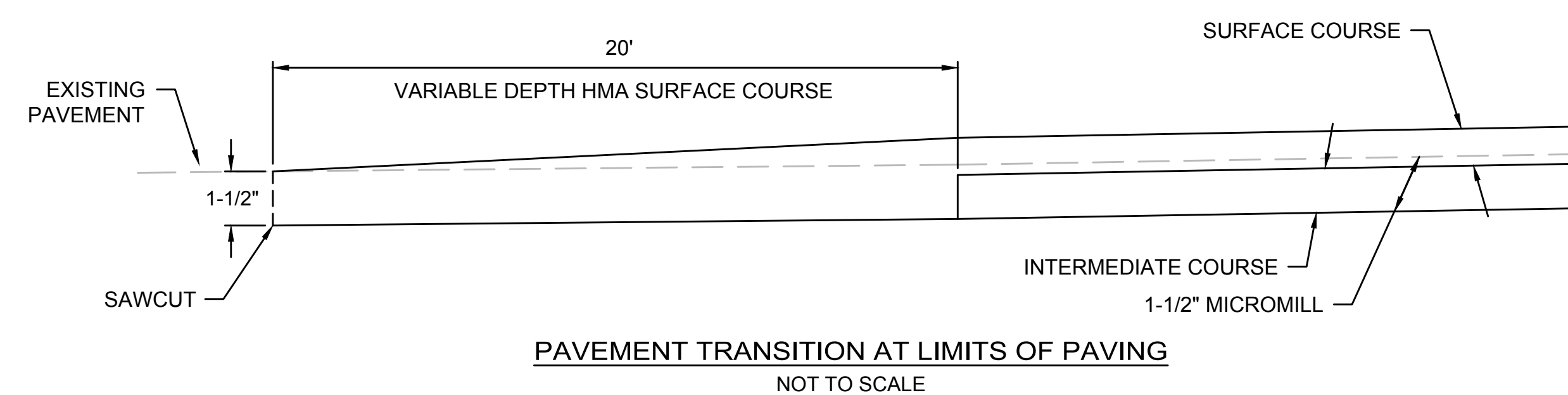


WHEELCHAIR RAMP TYPE C DETAIL
NOT TO SCALE



WHEELCHAIR RAMP TYPE D DETAIL
NOT TO SCALE

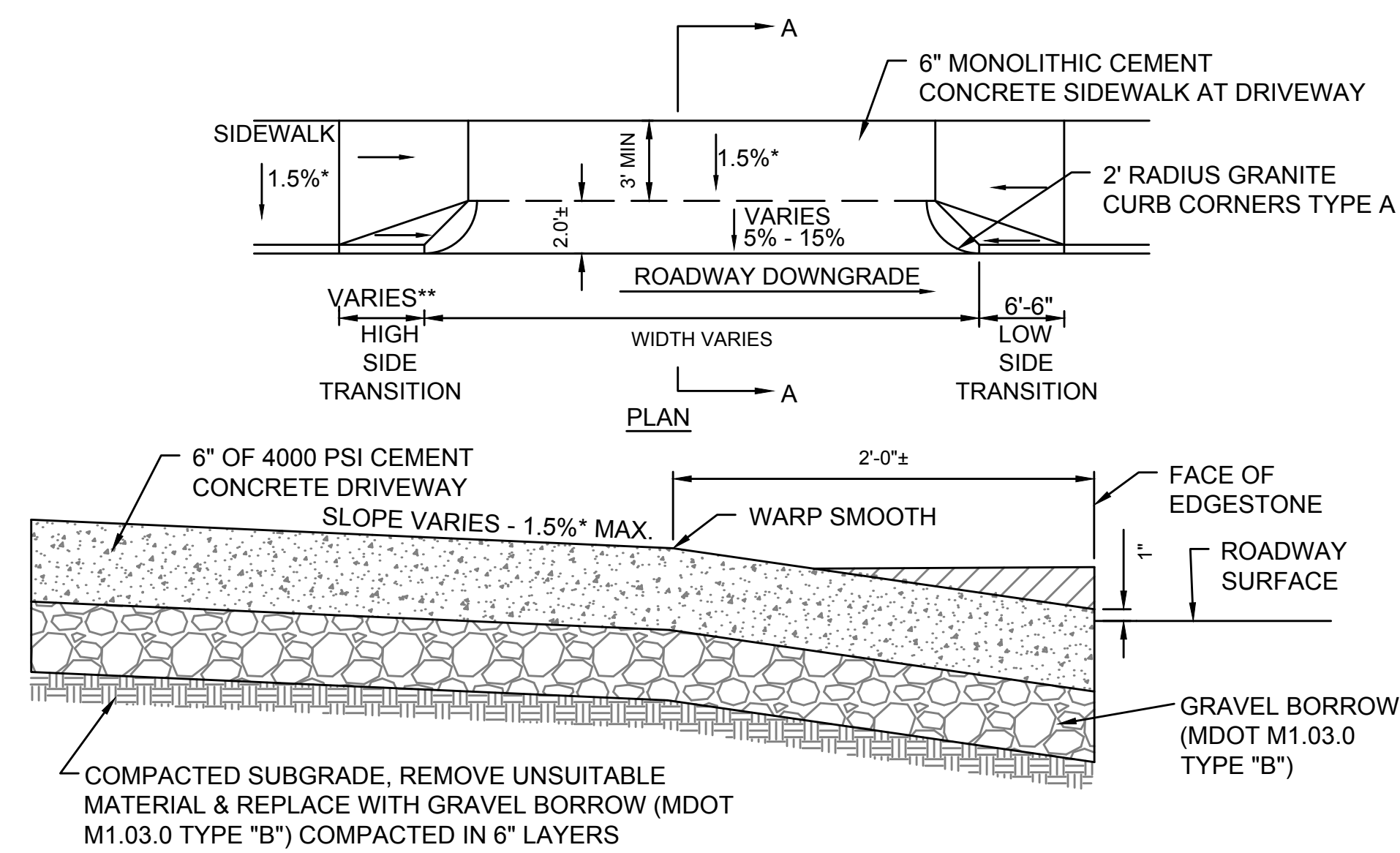
| WCR # | STATION | SIDE | RAMP TYPE |
|-------|---------|------|-----------|
| 1 | 128+50 | L | B |
| 2 | 128+90 | L | C |
| 3 | 131+90 | R | D |
| 4 | 132+50 | R | D |
| 5 | 136+00 | L | C |
| 6 | 136+00 | R | A |
| 7 | 136+30 | R | D |
| 8 | 137+00 | R | D |
| 9 | 141+00 | L | C |
| 10 | 141+50 | L | C |
| 11 | 143+50 | R | A |
| 12 | 144+00 | R | A |
| 13 | 144+15 | R | A |
| 14 | 144+15 | L | C |
| 15 | 146+30 | L | C |
| 16 | 146+30 | R | A |
| 17 | 149+00 | R | A |
| 18 | 149+00 | L | C |
| 19 | 151+25 | R | B |
| 20 | 151+85 | R | B |
| 21 | 151+70 | L | C |
| 22 | 152+15 | L | B |
| 23 | 154+60 | L | A |
| 24 | 155+15 | L | A |
| 25 | 157+70 | R | A |
| 26 | 158+20 | R | A |
| 27 | 157+70 | L | B |
| 28 | 158+30 | L | B |
| 29 | 161+75 | L | B |
| 30 | 162+25 | L | B |
| 31 | 166+15 | R | A |
| 32 | 166+15 | L | A |
| 33 | 166+40 | L | A |
| 34 | 167+00 | L | A |
| 35 | 172+70 | L | A |
| 36 | 172+75 | R | A |
| 37 | 172+90 | R | A |



PAVEMENT TRANSITION AT LIMITS OF PAVING
NOT TO SCALE

| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 33 | 37 |

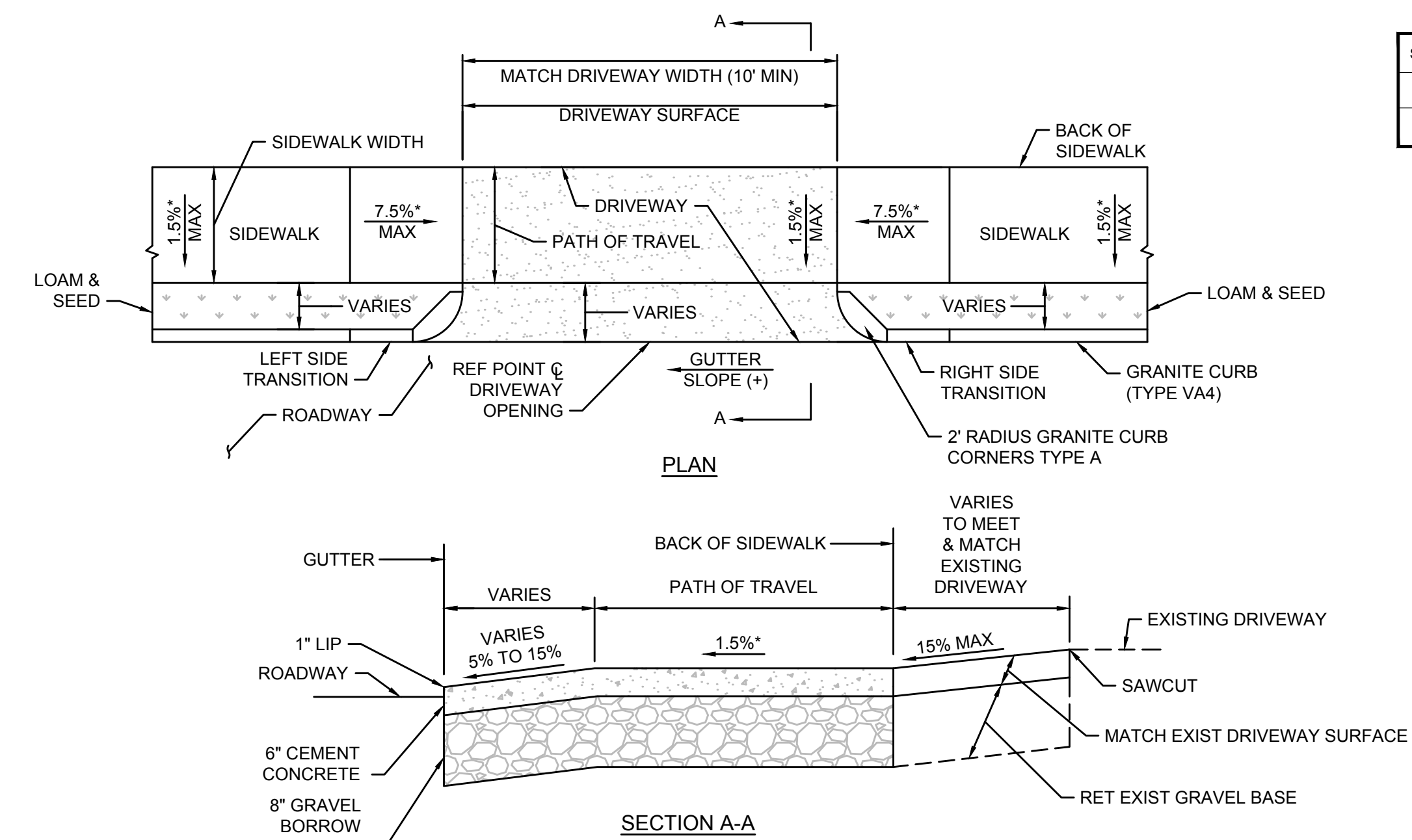
CONSTRUCTION DETAILS



DRIVEWAY TYPE A DETAIL
NOT TO SCALE

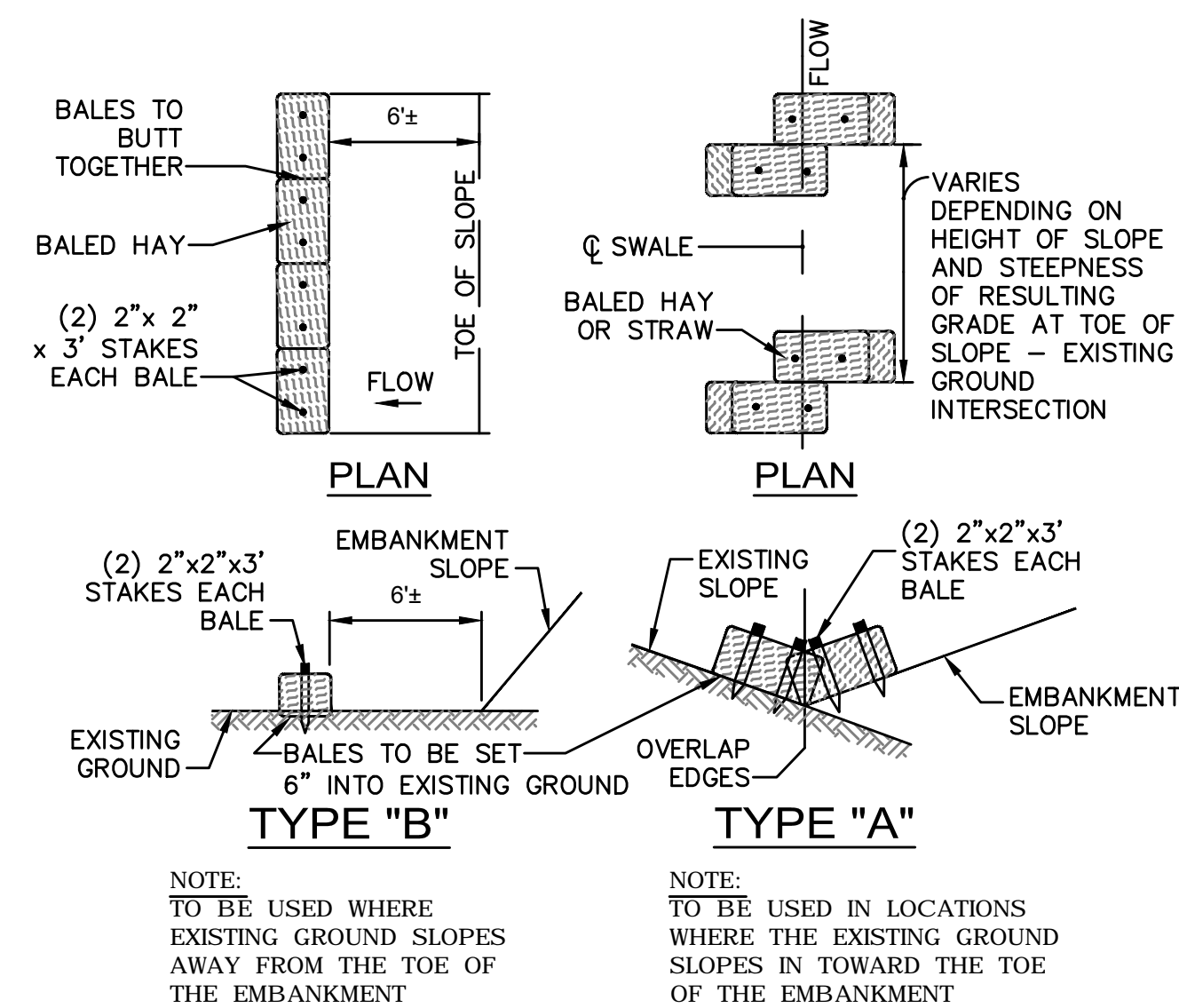
NOTE: ALL PROPOSED DRIVEWAYS ARE TYPE A UNLESS OTHERWISE NOTED ON THE CONSTRUCTION PLANS.

* TOLERANCE FOR CONSTRUCTION ±0.5%

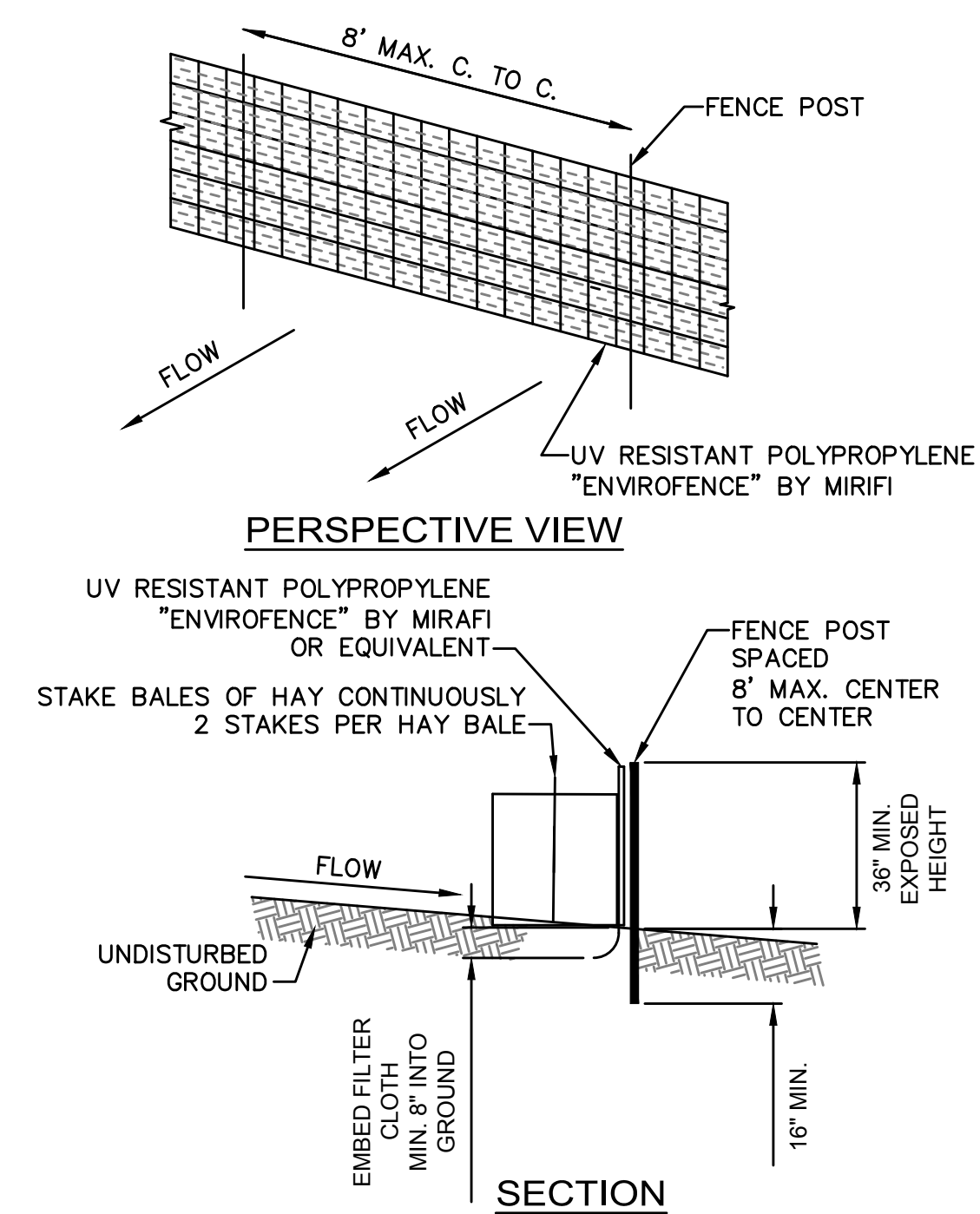


DRIVEWAY TYPE B DETAIL
NOT TO SCALE

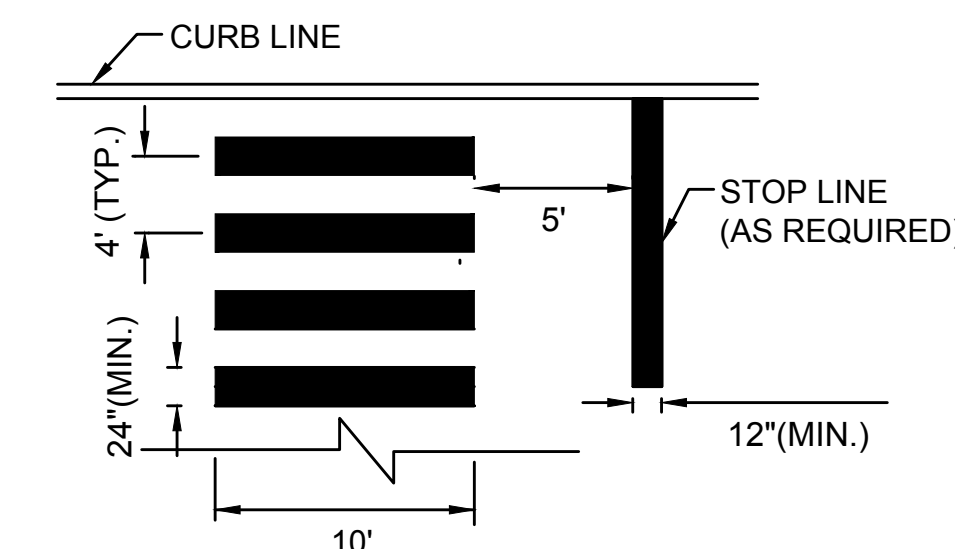
* TOLERANCE FOR CONSTRUCTION ±0.5%



BALED HAY EROSION CHECKS
NOT TO SCALE

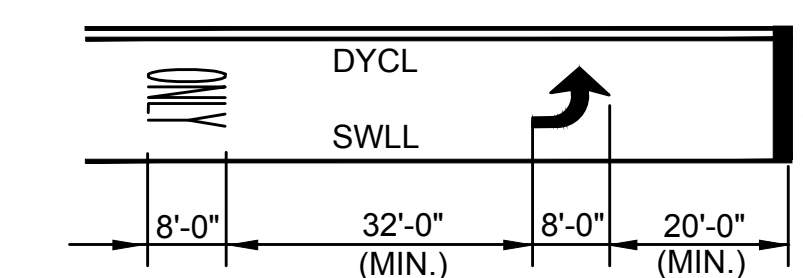


SILT FENCE DETAIL WITH HAY BALE
NOT TO SCALE

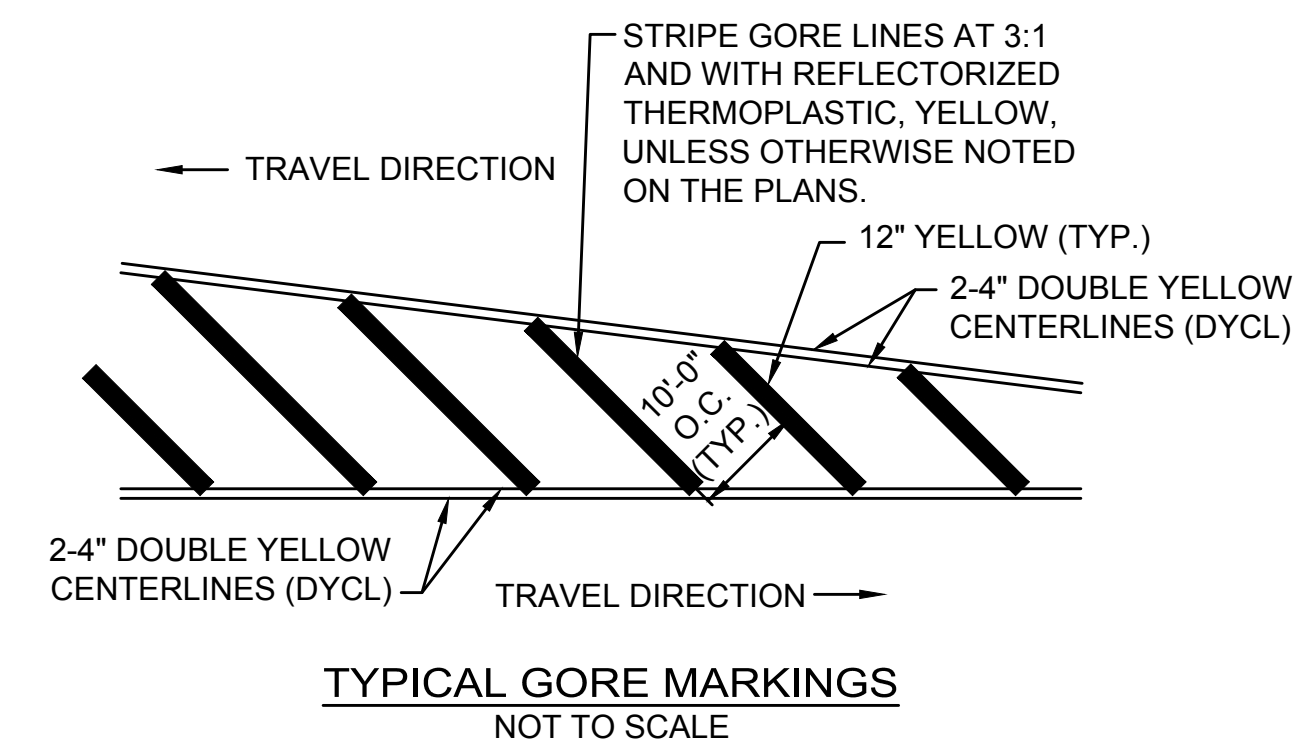


NOTES:
1. ALL PROPOSED STOP LINES AND CROSSWALKS SHALL BE REFLECTORIZED THERMOPLASTIC.

CROSSWALK & STOP LINE
NOT TO SCALE



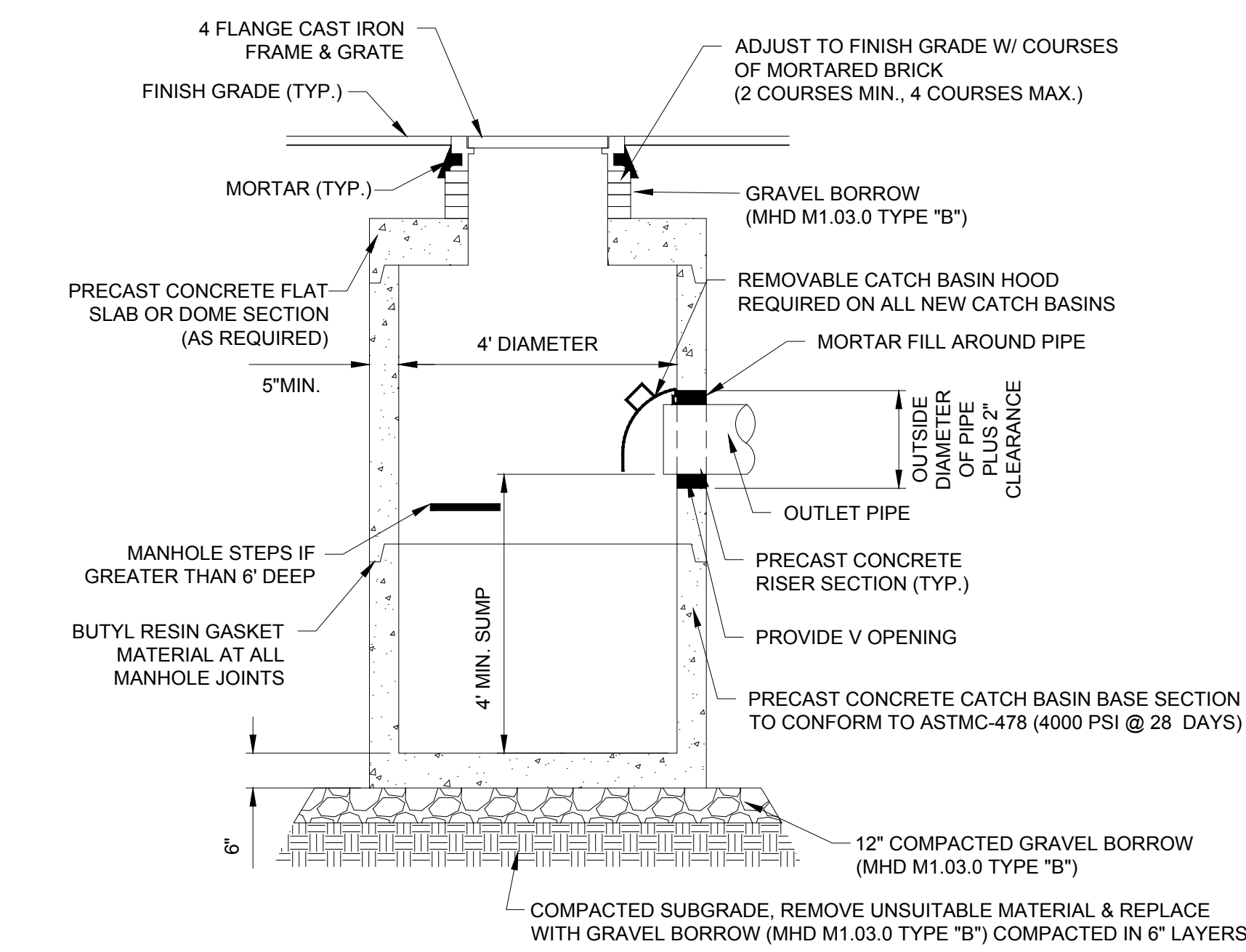
DIMENSION FOR TYPICAL PAVEMENT MARKINGS
NOT TO SCALE



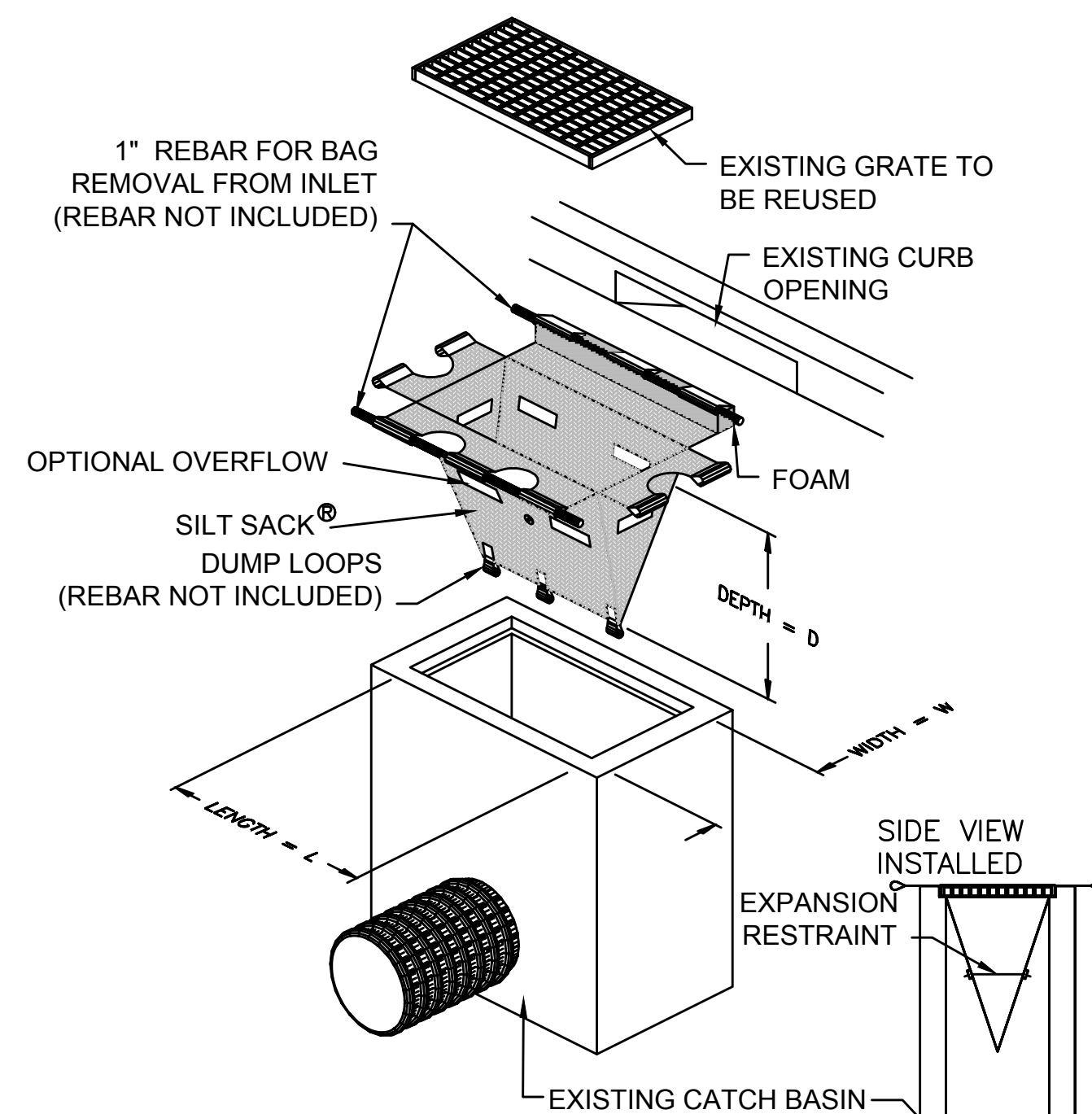
TYPICAL GORE MARKINGS
NOT TO SCALE

| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 34 | 37 |

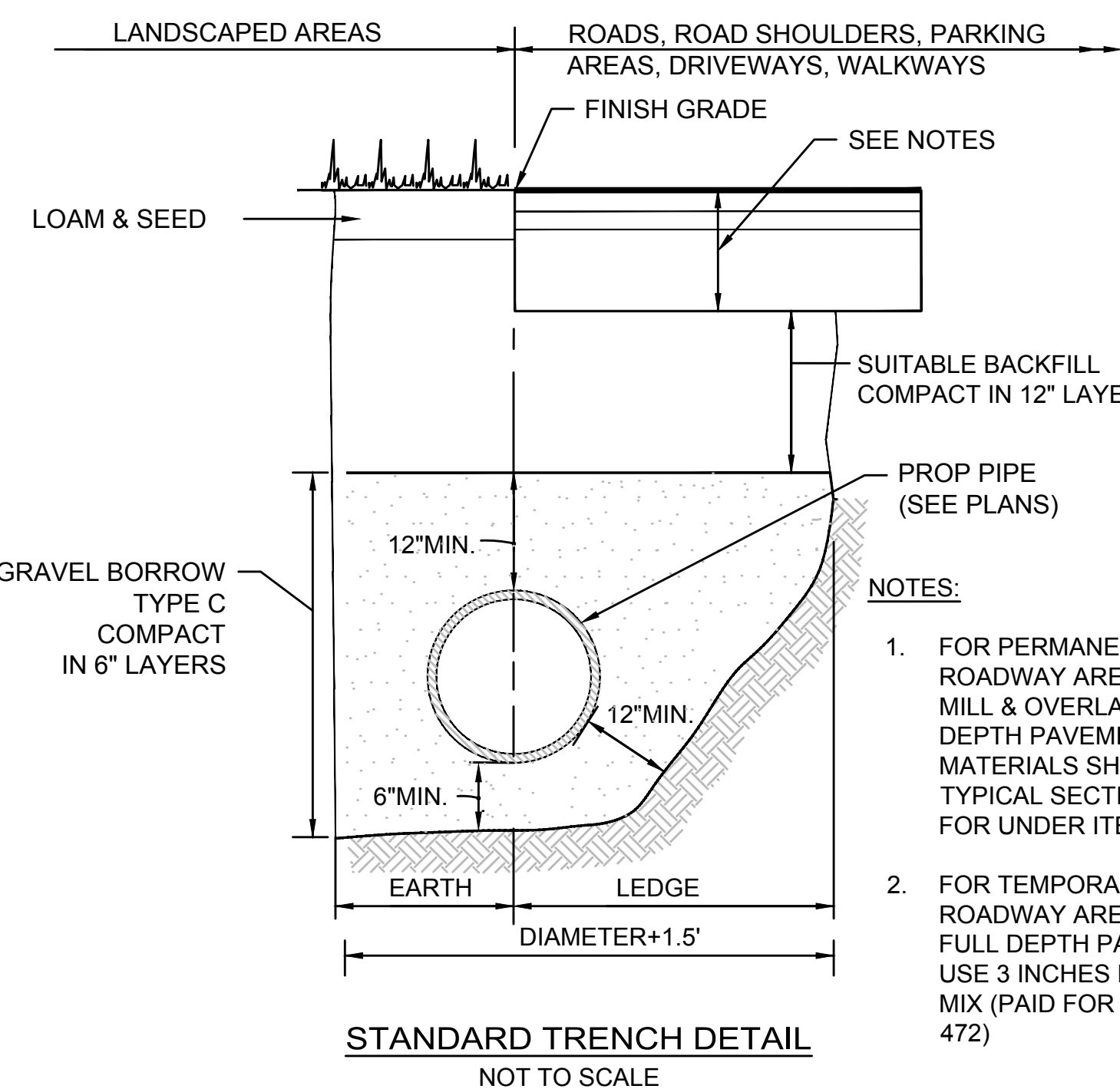
CONSTRUCTION DETAILS



TYPICAL CATCH BASIN DETAIL
NOT TO SCALE

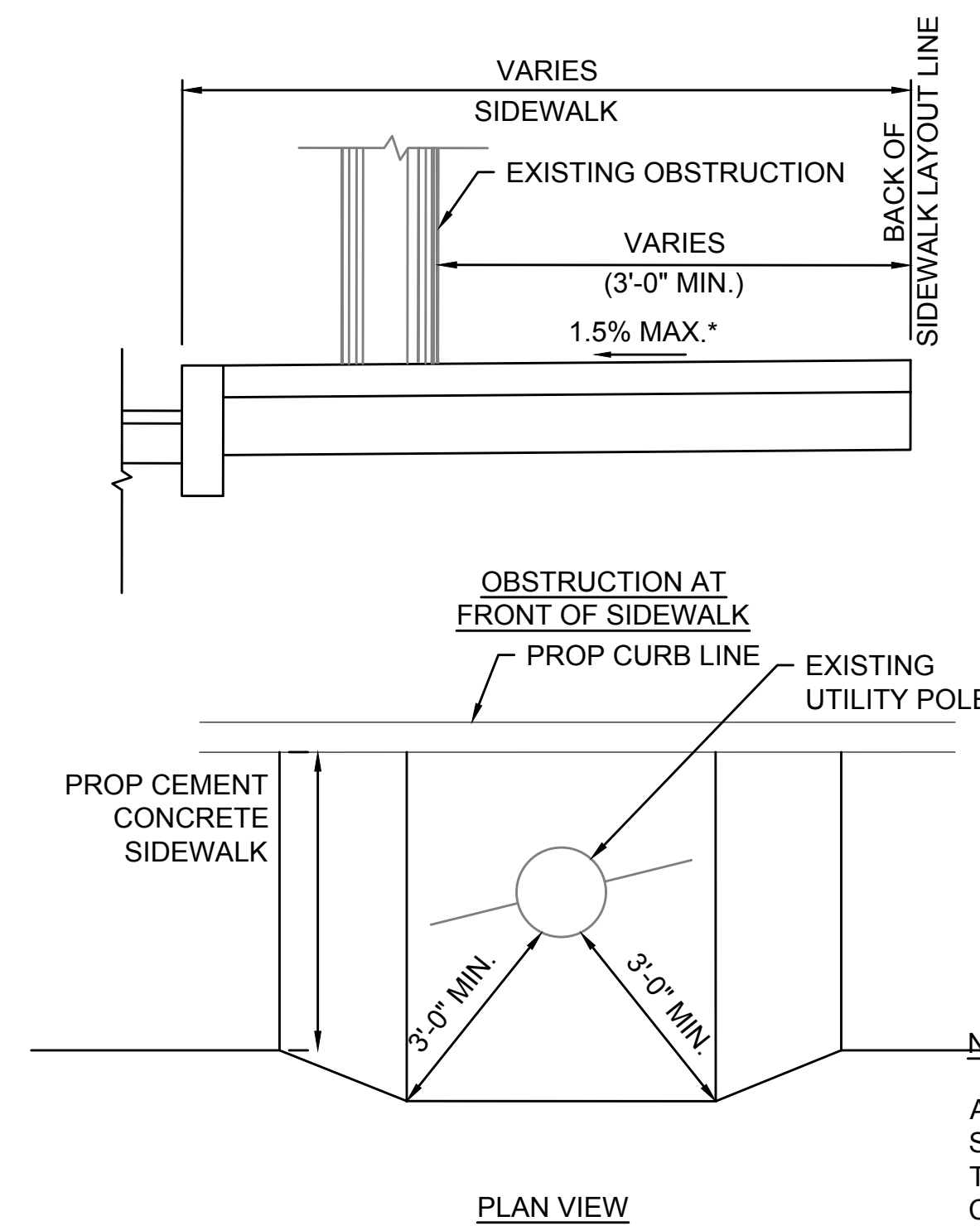


CATCH BASIN W/ SILTSACK
INLET PROTECTION
NOT TO SCALE



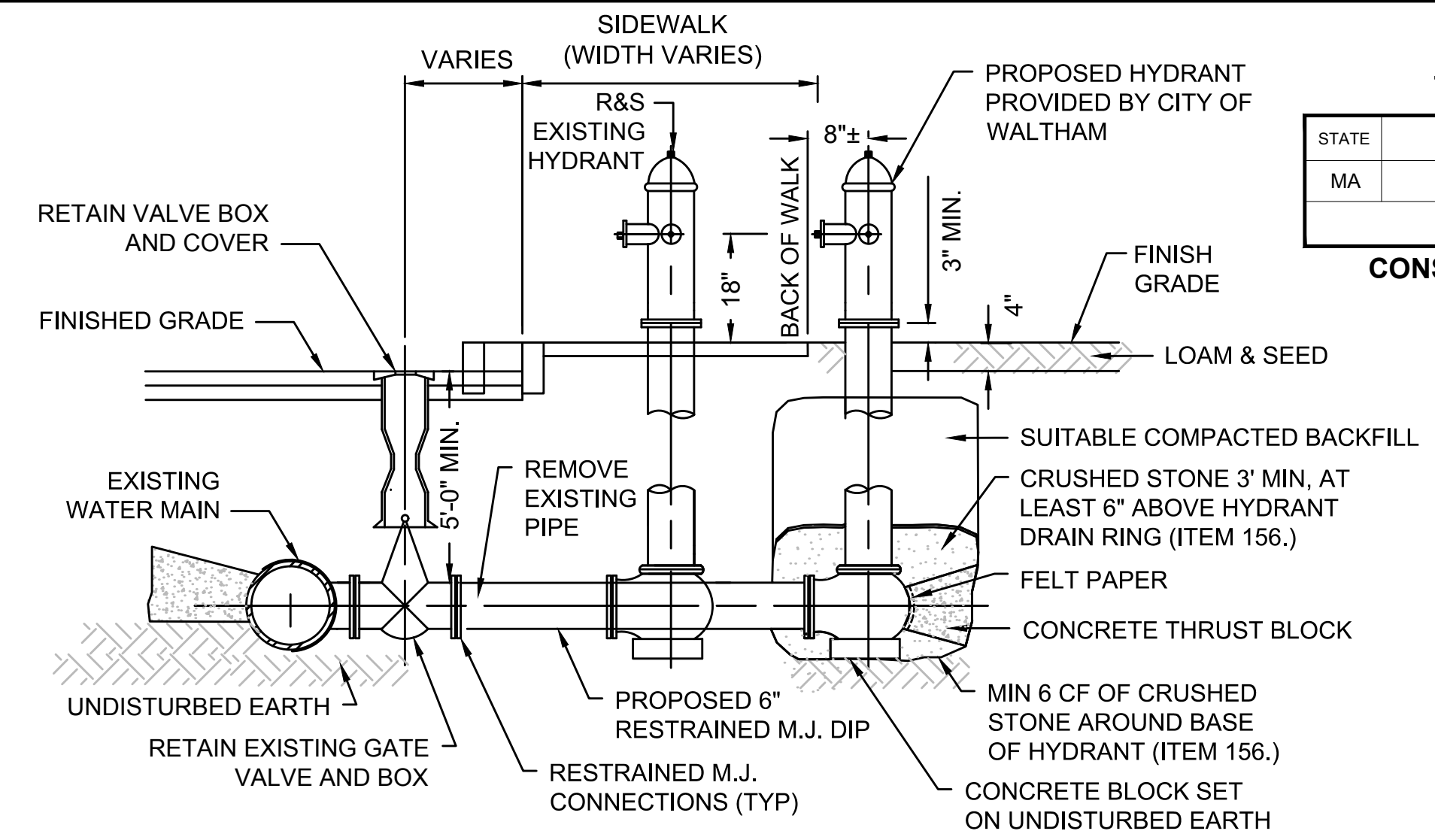
STANDARD TRENCH DETAIL
NOT TO SCALE

- NOTES:
- FOR PERMANENT PATCH IN ROADWAY AREAS WITH MILL & OVERLAY USE FULL DEPTH PAVEMENT MATERIALS SHOWN ON TYPICAL SECTIONS (PAID FOR UNDER ITEM 451)
 - FOR TEMPORARY PATCH IN ROADWAY AREAS WITH FULL DEPTH PAVEMENT USE 3 INCHES HMA BINDER MIX (PAID FOR UNDER ITEM 472)

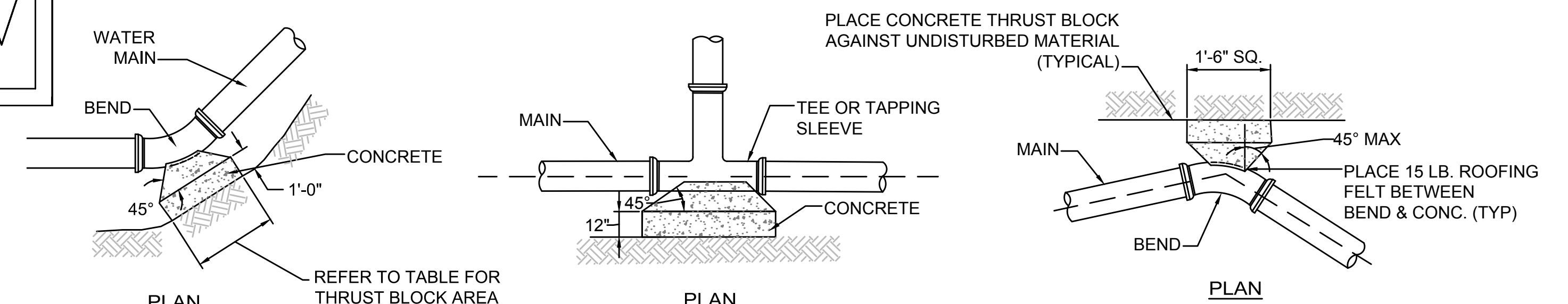


UTILITY/STREET LIGHT POLE IN SIDEWALK
NOT TO SCALE

* TOLERANCE FOR CONSTRUCTION ±0.5%



REMOVE AND RESET HYDRANT DETAIL
NOT TO SCALE



THRUST BLOCK DETAILS
NOT TO SCALE

TABLE OF BEARING AREAS IN SQUARE FEET AGAINST UNDISTURBED MATERIAL FOR FITTING. *

| SIZE OF MAIN (INCHES) | 90° BEND (S.F.) | 45° BEND (S.F.) | DEAD END (S.F.) |
|-----------------------|-----------------|-----------------|-----------------|
| ≤ 8 | 6.0 | 3.0 | 4.0 |
| 10 & 12 | 12.0 | 7.0 | 9.0 |
| 16 | 21.0 | 12.0 | 16.0 |

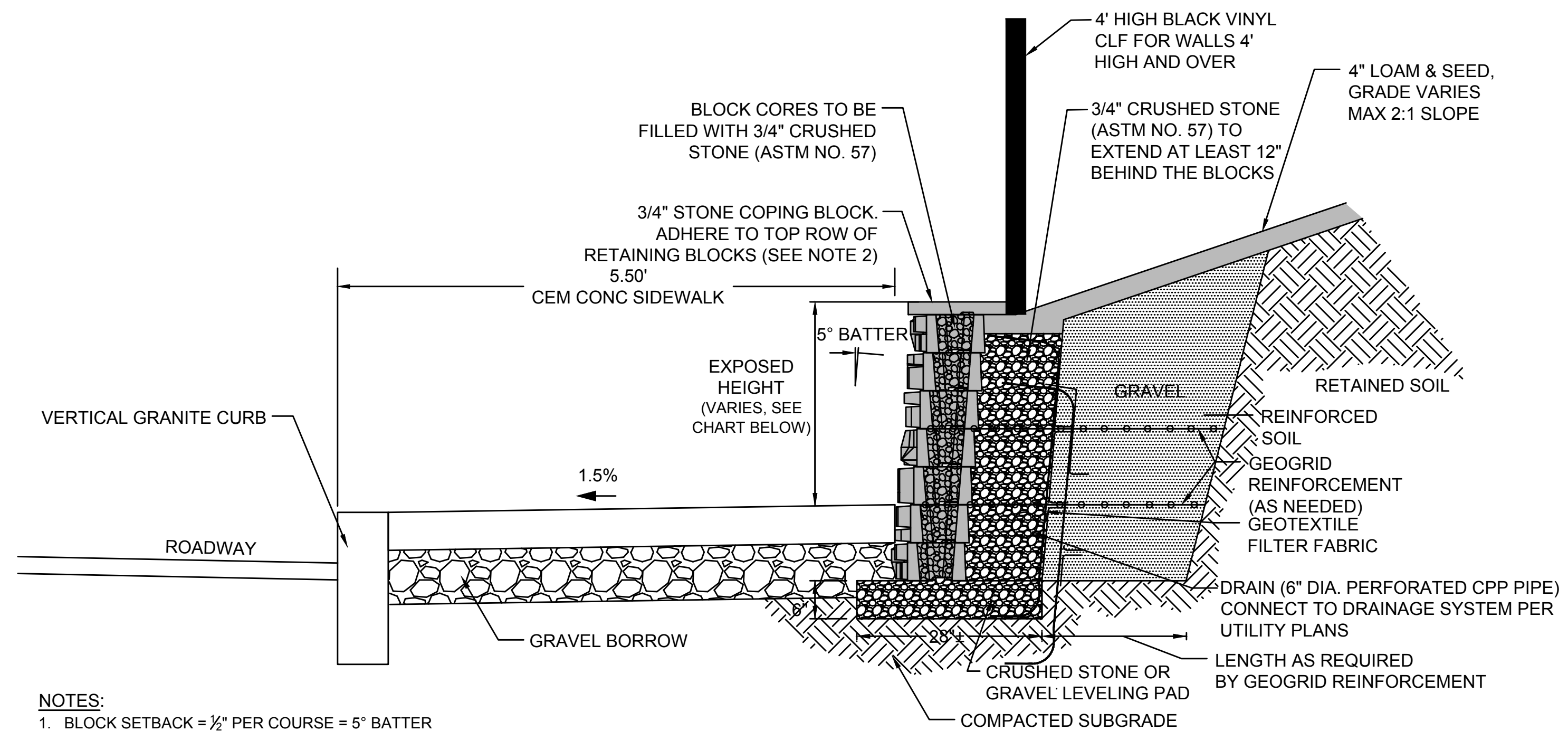
NOTES:

- THRUST BLOCKS TO BE USED ON ALL PIPES AT HORIZONTAL AND VERTICAL BENDS GREATER OR EQUAL TO 45°, TEES AND DEAD ENDS.
- FOR FITTINGS WITH LESS THAN 45° DEFLECTION USE BEARING AREAS FOR 45° BEND. BEARING AREAS FOR 45° BEND.
- BEARING AREAS BASED ON HORIZONTAL PASSIVE SOIL PRESSURE OF 2000 PSF AND A MINIMUM INTERNAL WATER PRESSURE OF 175 PSIG. JOINTS SHALL NOT BE ENCASED IN CONCRETE. BEARING AREAS MAY BE DISREGARDED FOR TRENCHES IN ROCK WHERE THE TOP OF THE ROCK FACE IS AT OR ABOVE THE CROWN OF THE PIPE. HOWEVER, CONCRETE BACKING SHALL BE PLACED BETWEEN THE PIPE AND THE ROCK FACE.

**WALTHAM
TRAPELO ROAD**

| STATE | SHEET NO. | TOTAL SHEETS |
|-------|-----------|--------------|
| MA | 35 | 37 |

CONSTRUCTION DETAILS

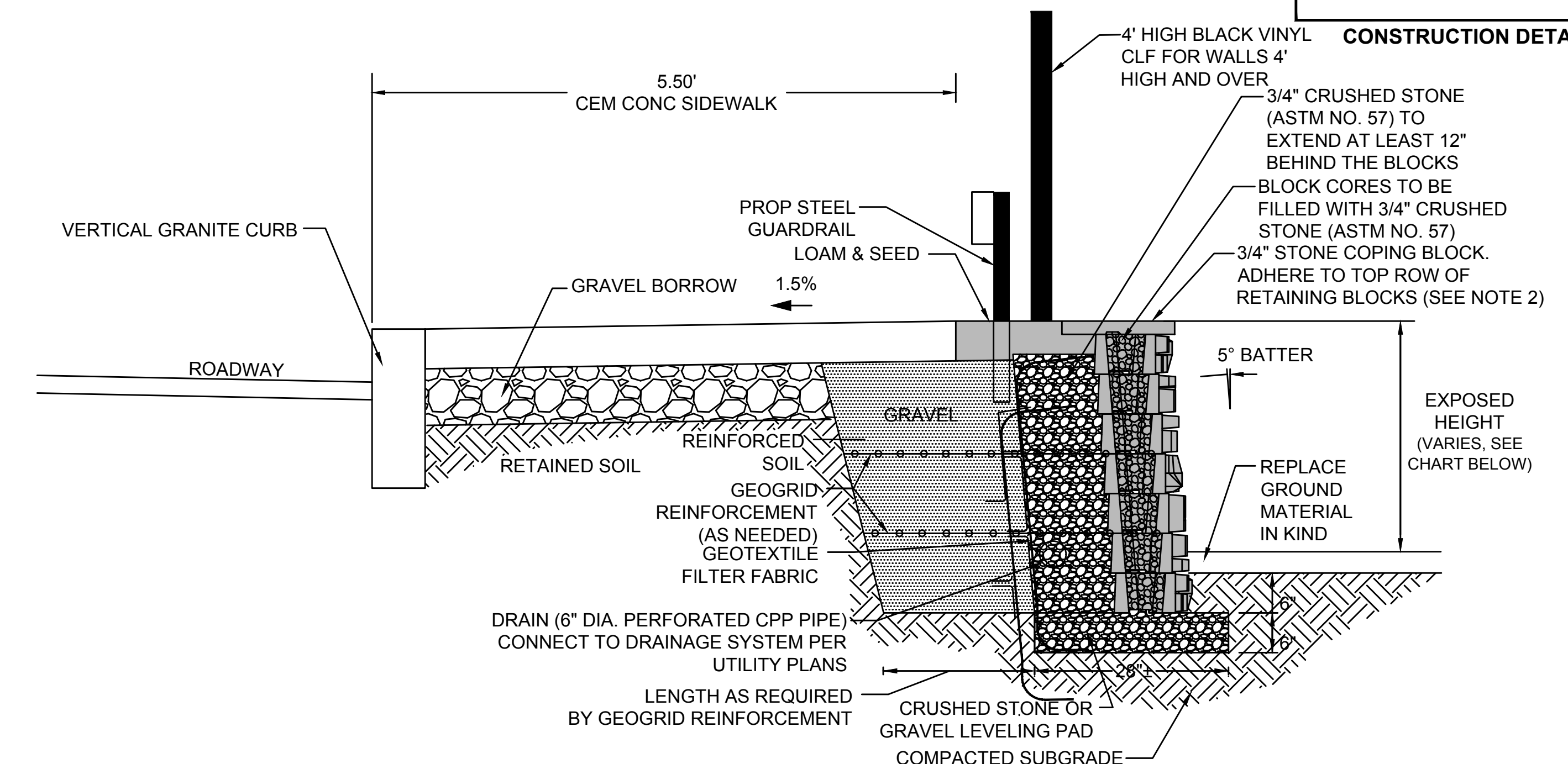


- NOTES:**
1. BLOCK SETBACK = 1/2" PER COURSE = 5" BATTER
 2. CONSTRUCTION ADHESIVES SHALL BE SPECIFICALLY FORMULATED FOR SEGMENTAL BLOCK WALL CONSTRUCTION AND SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
 3. BLOCKS ARE PRODUCED WITH DIFFERENT FACE TEXTURES. EXPOSED BLOCK FACES WILL VARY THROUGHOUT THE WALL DEPENDING ON INSTALLATION PATTERN.
 4. GEOGRID REINFORCEMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS FOR HEIGHT AND PLACEMENT.

MODULAR BLOCK RETAINING WALL ABOVE BACK OF SIDEWALK
NOT TO SCALE

| RWALL # | SIDE | START STATION | EXPOSED HEIGHT AT START (FT) | EXPOSED HEIGHT HIGH POINT STATION | EXPOSED HEIGHT AT HIGH POINT (FT) | END STATION | EXPOSED HEIGHT AT END (FT) | NOTES |
|---------|------|---------------|------------------------------|-----------------------------------|-----------------------------------|-------------|----------------------------|--|
| 1 | RT | 126+45.75 | 2.00 | 127+25.00 | 3.00 | 127+70.00 | 1.50 | MEET EXISTING BLOCK WALL AT START AND EXISTING STAIRS AT END, HEIGHT VARIES FROM START TO FINISH |
| 2 | RT | 128+22.00 | 3.50 | | | 128+33.00 | 3.50 | MEET EXISTING BLOCK WALL AT START |
| 3 | RT | 128+56.76 | 4.00 | | | 129+05.00 | 4.00 | MEET EXISTING WALLS AT BOTH ENDS |
| 4 | RT | 133+69.50 | 3.00 | | | 133+93.50 | 3.00 | MEET EXISTING WALL AT START |
| 5 | RT | 134+33.61 | 2.00 | 134+75.00 | 3.50 | 134+86.90 | 3.50 | MEET EXISTING WALL AT START, HEIGHT VARIES FROM START TO HIGH POINT |
| 6 | RT | 137+00.00 | 1.50 | | | 137+50.00 | 2.00 | MEET EXISTING STAIRS TO START AND EXISTING TIMBER WALL AT END, HEIGHT VARIES FROM START TO FINISH |
| 7 | RT | 138+00.00 | 3.00 | | | 138+60.00 | 3.00 | MEET EXISTING WALL AT END |
| 8 | RT | 152+12.19 | 1.50 | | | 152+48.20 | 1.00 | MEET EXISTING STAIRS AT START AND EXISTING BLOCK WALL AT END |
| 9 | RT | 154+96.12 | 1.50 | | | 155+85.17 | 1.50 | |
| 10 | RT | 162+81.28 | 1.00 | | | 163+24.32 | 1.00 | |
| 11 | RT | 163+44.34 | 3.00 | | | 164+98.80 | 3.00 | HEIGHT VARIES FROM START TO STA 163+44.00. 3.00' EXPOSED WALL HEIGHT FROM STA 163+44.00 TO STA 164+70.00. HEIGHT VARIES FROM STA 164+70.00 TO END. |
| 13 | RT | 169+38.87 | 2.50 | | | 170+01.00 | 2.50 | |
| 14 | RT | 170+12.64 | 2.50 | | | 170+76.04 | 2.50 | |

- NOTES:**
1. WALL HEIGHTS AND LENGTHS PROVIDED ARE FOR ESTIMATING PURPOSES. HEIGHTS SHALL BE ADJUSTED IN THE FIELD IN ORDER TO MEET EXISTING ADJACENT WALLS TO REMAIN AND TO SUPPORT SLOPES AS REQUIRED.
 2. THE CONTRACTOR SHALL PROVIDE SAMPLES THAT CLOSELY MATCH THE COLOR AND TEXTURE OF EXISTING ADJACENT WALLS TO REMAIN OR AS REQUIRED BY THE ENGINEER.
 3. WALL COLORS AND FINISH SHALL BE APPROVED BY THE ENGINEER AND DIRECTOR OF CONSOLIDATED PUBLIC WORKS PRIOR TO ORDERING WALL MATERIALS.



- NOTES:**
1. BLOCK SETBACK = 1/2" PER COURSE = 5" BATTER
 2. CONSTRUCTION ADHESIVES SHALL BE SPECIFICALLY FORMULATED FOR SEGMENTAL BLOCK WALL CONSTRUCTION AND SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
 3. BLOCKS ARE PRODUCED WITH DIFFERENT FACE TEXTURES. EXPOSED BLOCK FACES WILL VARY THROUGHOUT THE WALL DEPENDING ON INSTALLATION PATTERN.
 4. GEOGRID REINFORCEMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS FOR HEIGHT AND PLACEMENT.

MODULAR BLOCK RETAINING WALL BELOW BACK OF SIDEWALK
NOT TO SCALE

| RWALL # | SIDE | START STATION | EXPOSED HEIGHT AT START (FT) | EXPOSED HEIGHT HIGH POINT STATION | EXPOSED HEIGHT AT HIGH POINT (FT) | END STATION | EXPOSED HEIGHT AT END (FT) | NOTES |
|---------|------|---------------|------------------------------|-----------------------------------|-----------------------------------|-------------|----------------------------|--|
| 12 | RT | 165+61.84 | 3.00 | 166+25.00 | 4.00 | 167+18.79 | 1.50 | HEIGHT VARIES FROM START TO STA 166+25.00. 4.00' EXPOSED WALL HEIGHT FROM STA 166+25.00 TO STA 166+50.00. HEIGHT VARIES FROM STA 166+50.00 TO END. GUARDRAIL SHALL BE INSTALLED ON TOP OF THE PROPOSED RETAINING WALL AS REQUIRED. |

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, UNLESS SUPERCEDED BY THESE PLANS.
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, CHANNELIZING DEVICES, BARRIERS, AND CRASH ATTENUATORS MUST PASS THE CRITERIA SET FORTH IN NCHRP REPORT 350, "RECOMMENDED PROCEDURES FOR THE SAFETY PERFORMANCE EVALUATION OF HIGHWAY FEATURES" AND/OR "MANUAL FOR ASSESSING SAFETY HARDWARE" (MASH).
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 WORK TO BE DONE BETWEEN STATION 171+00 AND STA 173+00 ON TRAPELO ROAD AT THE INTERSECTION WITH LEXINGTON STREET IS REQUIRED TO BE DONE DURING OFF-PEAK HOURS AND SOME TASKS MAY BE REQUIRED TO BE COMPLETED DURING NIGHT-TIME HOURS. THE CONTRACTOR SHALL SUBMIT A SCHEDULE FOR THIS WORK TO BE APPROVED BY THE CITY OF WALTHAM CONSOLIDATED PUBLIC WORKS DEPARTMENT PRIOR TO COMMENCING WITH ANY WORK IN THIS AREA.
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 MPH.
12. MINIMUM LANE WIDTH IS TO BE 11 FEET (3.3m) UNLESS OTHERWISE SHOWN. MINIMUM LANE WIDTH TO BE MEASURED FROM THE EDGE OF DRUMS OR MEDIAN BARRIER.
13. ALL SIGNS SHALL BE MOUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.

LEGEND:

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> ● REFLECTORIZED PLASTIC DRUM OR 36" CONE P/F POLICE/FLAGGER DETAIL ▨ TYPE III BARRICADE □ CHANGEABLE MESSAGE SIGN ➡ ARROW BOARD | <ul style="list-style-type: none"> ▨ WORK ZONE ➡ DIRECTION OF TRAFFIC ⊘ IMPACT ATTENUATOR □ MEDIAN BARRIER ▨ MEDIAN BARRIER WITH WARNING LIGHTS | <ul style="list-style-type: none"> ▨ WORK VEHICLE ▨ TRUCK MOUNTED ATTENUATOR ➡ TRAFFIC OR PEDESTRIAN SIGNAL ● SIGN |
|---|--|--|

THE IDEAL CAPACITY OF A MAJOR HIGHWAY IS GENERALLY CONSIDERED TO BE 1900 PASSENGER CARS PER HOUR PER LANE (PCPHPL). IN WORK ZONES ON A MULTI-LANE DIVIDED HIGHWAY, THE FOLLOWING VOLUME GUIDELINES HAVE BEEN SUGGESTED:

MEASURED AVERAGE WORK ZONE CAPACITIES

| NUMBER OF LANES | | NUMBER OF STUDIES | AVERAGE CAPACITY | |
|-------------------|-------------------|-------------------|------------------|-------|
| NORMAL (EXISTING) | OPEN (TO TRAFFIC) | | VPH | VPHPL |
| 3 | 1 | 7 | 1,170 | 1,170 |
| 2 | 1 | 8 | 1,340 | 1,340 |
| 5 | 2 | 8 | 2,740 | 1,370 |
| 4 | 2 | 4 | 2,960 | 1,480 |
| 3 | 2 | 9 | 2,980 | 1,490 |
| 4 | 3 | 4 | 4,560 | 1,520 |

Source: Dudek, C., *Notes on Work Zone Capacity and Level of Service*. Texas Transportation Institute, Texas A&M University, College Station, Texas (1984)

BY OBTAINING HOURLY TRAFFIC COUNTS FOR A PARTICULAR ROADWAY (WITH A MINIMUM OF A 48-HOUR AUTOMATIC TRAFFIC RECORDER (ATR) COUNT), THIS WILL HELP TO DETERMINE AT WHAT TIMES OF THE DAY OR NIGHT A CERTAIN NUMBER OF LANES MAY BE CLOSED.

SUGGESTED WORK ZONE WARNING SIGN SPACING

| ROAD TYPE | DISTANCE BETWEEN SIGNS ** | | |
|-------------------------------|---------------------------|-------------|-------------|
| | A | B | C |
| LOCAL OR LOW VOLUME ROADWAYS* | 350 (100) | 350 (100) | 350 (100) |
| MOST OTHER ROADWAYS* | 500 (150) | 500 (150) | 500 (150) |
| FREEWAYS AND EXPRESSWAYS* | 1,000 (300) | 1,500 (450) | 2,640 (800) |

* ROAD TYPE TO BE DETERMINED BY THE ENGINEER.

** DISTANCES ARE SHOWN IN FEET (METERS). THE COLUMN HEADINGS A, B, AND C ARE THE DIMENSIONS SHOWN IN THE DETAIL/ TYPICAL SETUP FIGURES. THE A DIMENSION IS THE DISTANCE FROM THE TRANSITION OR POINT OF RESTRICTION TO THE FIRST SIGN. THE B DIMENSION IS THE DISTANCE BETWEEN THE FIRST AND SECOND SIGNS. THE C DIMENSION IS THE DISTANCE BETWEEN THE SECOND AND THIRD SIGNS. (THE "THIRD" SIGN IS THE FIRST ONE TYPICALLY ENCOUNTERED BY A DRIVER APPROACHING A TEMPORARY TRAFFIC CONTROL (TTC) ZONE.)

THE "THIRD" SIGN ABOVE IS TYPICALLY REFERRED TO AS AN "ADVANCE WARNING" SIGN ON THE TTC SETUPS. THESE ADVANCE WARNING SIGNS ARE LOCATED PRIOR TO THE PROJECT LIMITS ON ALL APPROACHES (i.e. THE W20-1 SERIES (ROAD WORK XX FT) SIGNS), AND USUALLY REMAIN FOR THE DURATION OF THE PROJECT. ADDITIONAL SIGNS (i.e. "RIGHT LANE CLOSED 1 MILE" AND "LEFT LANE CLOSED 1 MILE") HAVE BEEN SHOWN IN SOME FIGURES AS EXAMPLES OF REINFORCEMENT SIGN PLACEMENT BUT ARE USED IN RARE OCCASIONS.

THE FIRST AND SECOND WARNING SIGNS ABOVE ARE REFERRED TO AS THE OPERATIONAL (DAY-TO-DAY) WORK ZONE SIGNS AND MAY BE MOVED DEPENDING ON WHERE THE SPECIFIC ROADWAY WORK FOR THAT DAY IS LOCATED.

R2-10a SIGNS SHALL BE PLACED BETWEEN THE SECOND AND THIRD SIGNS AS DESCRIBED ABOVE.

R2-10a, R2-10e, AND W20-1 SERIES SIGNS ARE TO BE INCLUDED ON ALL DETAILS/TYPICAL SETUPS.

Based on: Table 6C-1 MUTCD LATEST EDITION

STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED

| SPEED* (km/h) | DISTANCE (m) | SPEED* (mph) | DISTANCE (ft) |
|---------------|--------------|--------------|---------------|
| 30 | 35 | 20 | 115 |
| 40 | 50 | 25 | 155 |
| 50 | 65 | 30 | 200 |
| 60 | 85 | 35 | 250 |
| 70 | 105 | 40 | 305 |
| 80 | 130 | 45 | 360 |
| 90 | 160 | 50 | 425 |
| 100 | 185 | 55 | 495 |
| 110 | 220 | 60 | 570 |
| 120 | 250 | 65 | 645 |
| | | 70 | 730 |
| | | 75 | 820 |

*POSTED SPEED, OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED

THESE VALUES MAY BE USED TO DETERMINE THE LENGTH OF LONGITUDINAL BUFFER SPACES.

THE DISTANCES IN THE ABOVE CHART REPRESENT THE MINIMAL VALUES FOR BUFFER SPACING.

Source: Table 6C-2 MUTCD LATEST EDITION

CONVENTIONAL ROADWAY- A STREET OR HIGHWAY OTHER THAN A LOW-VOLUME ROAD, EXPRESSWAY, OR FREEWAY.

EXPRESSWAY- A DIVIDED HIGHWAY WITH PARTIAL CONTROL OF ACCESS.

FREEWAY- A DIVIDED HIGHWAY WITH FULL CONTROL OF ACCESS.

LOW-VOLUME ROAD- A FACILITY LYING OUTSIDE OF BUILT-UP AREAS OF CITIES, TOWNS, AND COMMUNITIES, AND IT SHALL HAVE A TRAFFIC VOLUME OF LESS THAN 400 AADT. IT SHALL NOT BE A FREEWAY, EXPRESSWAY, INTERCHANGE RAMP, FREEWAY SERVICE ROAD OR A ROAD ON A DESIGNATED STATE HIGHWAY SYSTEM.

Source: MUTCD LATEST EDITION

TAPER LENGTH CRITERIA FOR TEMPORARY TRAFFIC CONTROL ZONES

| TYPE OF TAPER | TAPER LENGTH (L)* |
|---------------------------------|---|
| MERGING TAPER | AT LEAST L |
| SHIFTING TAPER | AT LEAST 0.5L |
| SHOULDER TAPER | AT LEAST 0.33L |
| ONE-LANE, TWO-WAY TRAFFIC TAPER | 50 FT MIN.(15 m) 100 FT(30 m) MAX. |
| DOWNSTREAM TAPER | 50 FT MIN.(15 m) 100 FT MAX.(30 m) PER LANE |

Source: Table 6C-3 MUTCD LATEST EDITION

FORMULAS FOR DETERMINING TAPER LENGTHS

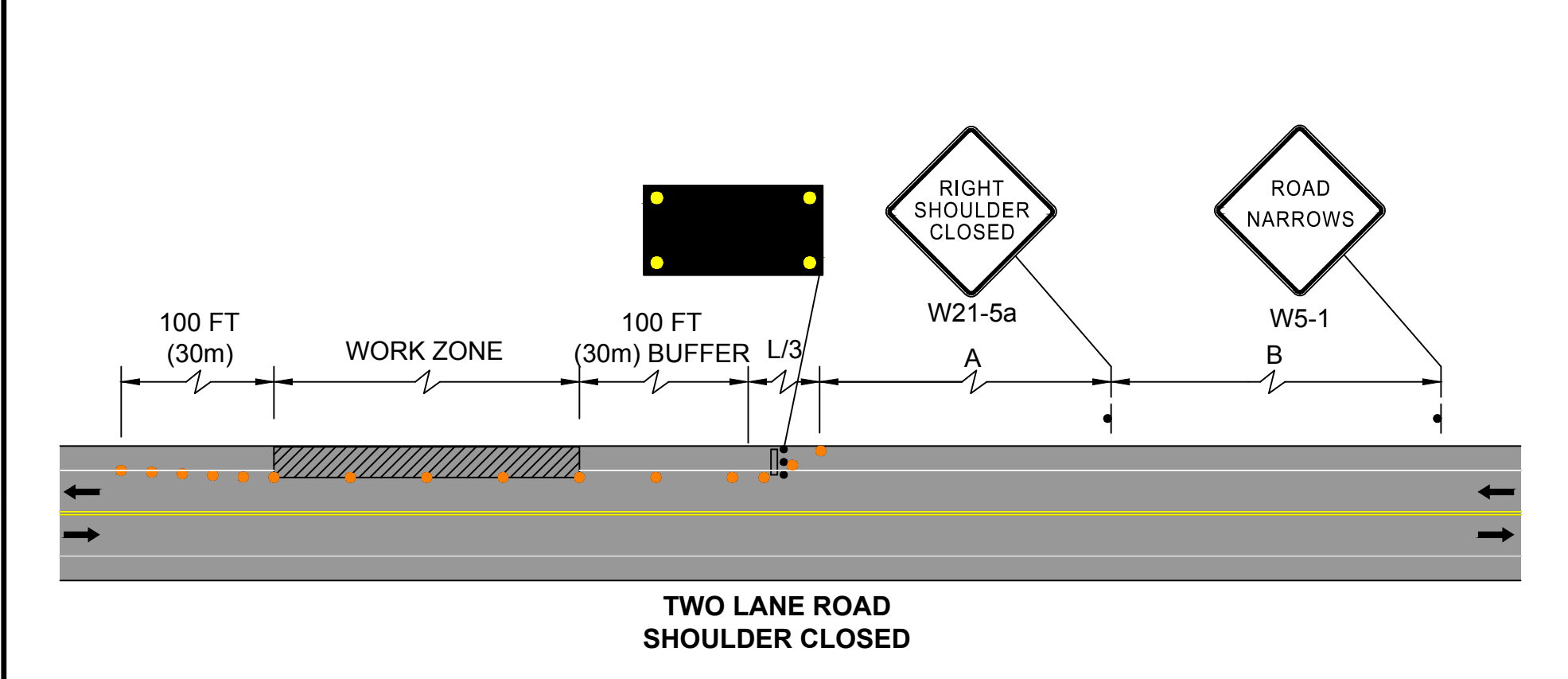
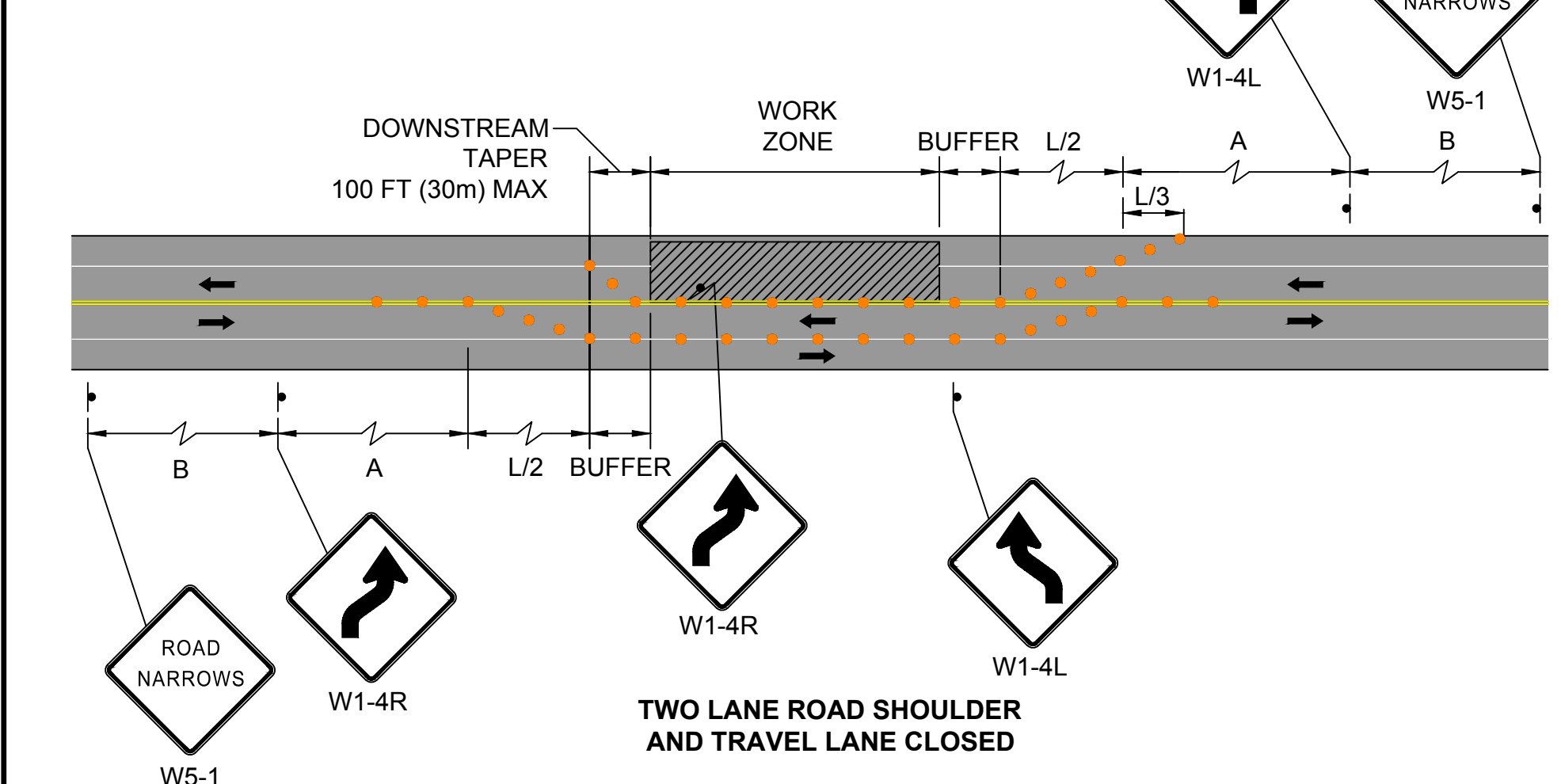
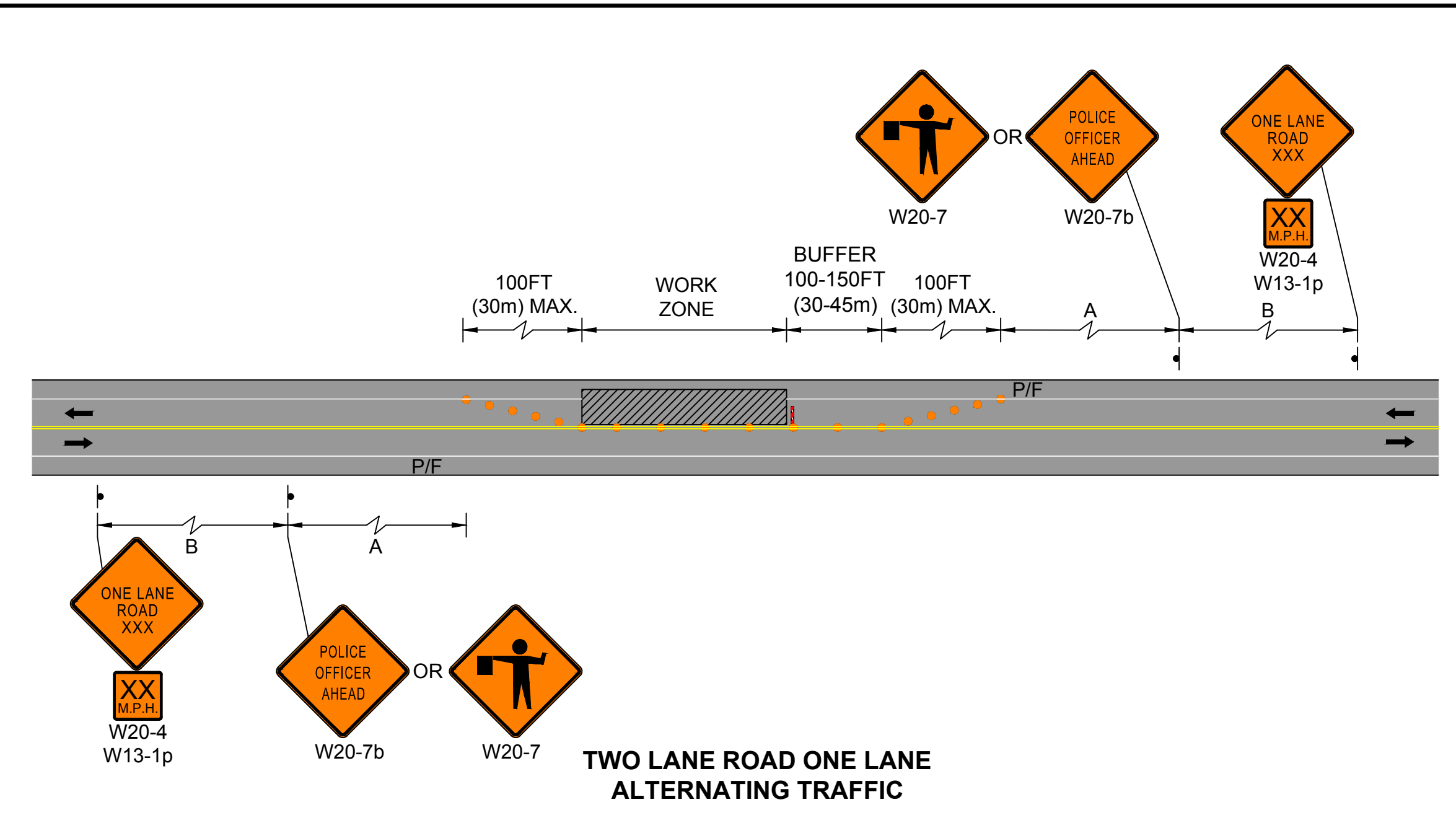
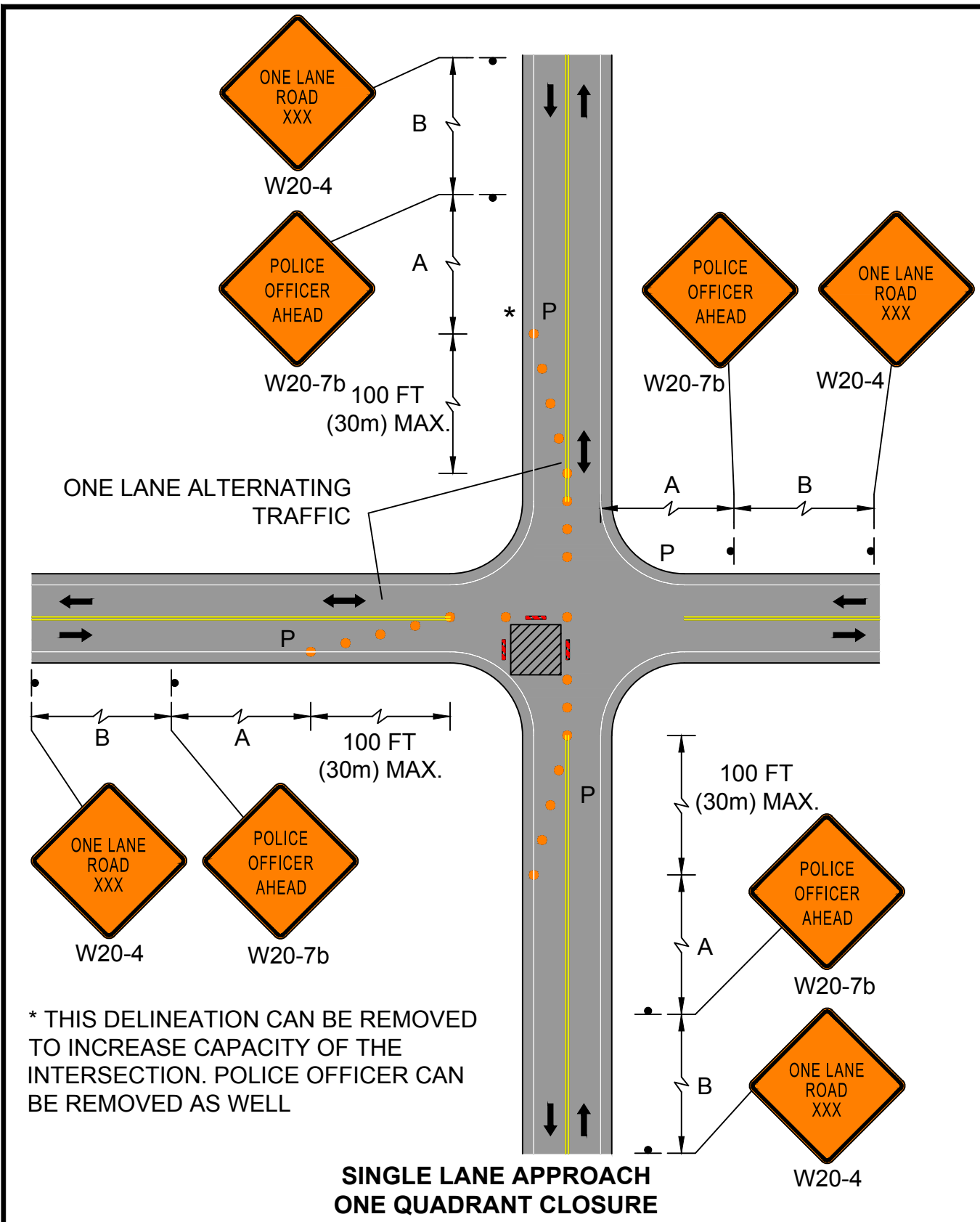
| SPEED LIMIT (S) | TAPER LENGTH (L) FEET | SPEED LIMIT (S) | TAPER LENGTH (L) Meters |
|-----------------|-----------------------|-----------------|-------------------------|
| 40 MPH OR LESS | $L = \frac{WS^2}{60}$ | 60 KM/H OR LESS | $L = \frac{WS^2}{155}$ |
| 45 MPH OR MORE | $L = WS$ | 70 KM/H OR MORE | $L = \frac{WS}{1.6}$ |

WHERE: L = TAPER LENGTH IN FEET (METERS)

W = WIDTH OF OFFSET IN FEET (METERS)

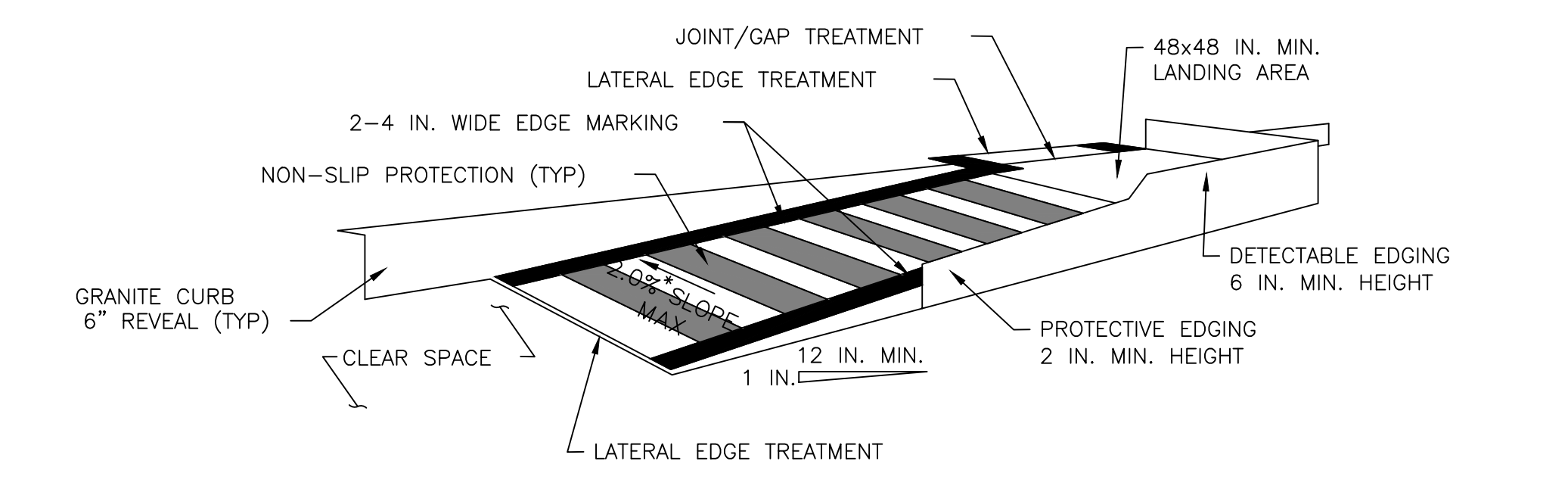
S = POSTED SPEED LIMIT, OR OFF-PEAK 85TH-PERCENTILE SPEED PRIOR TO WORK STARTING, OR THE ANTICIPATED OPERATING SPEED IN MPH (KM/H)

Source: Table 6C-4 MUTCD LATEST EDITION

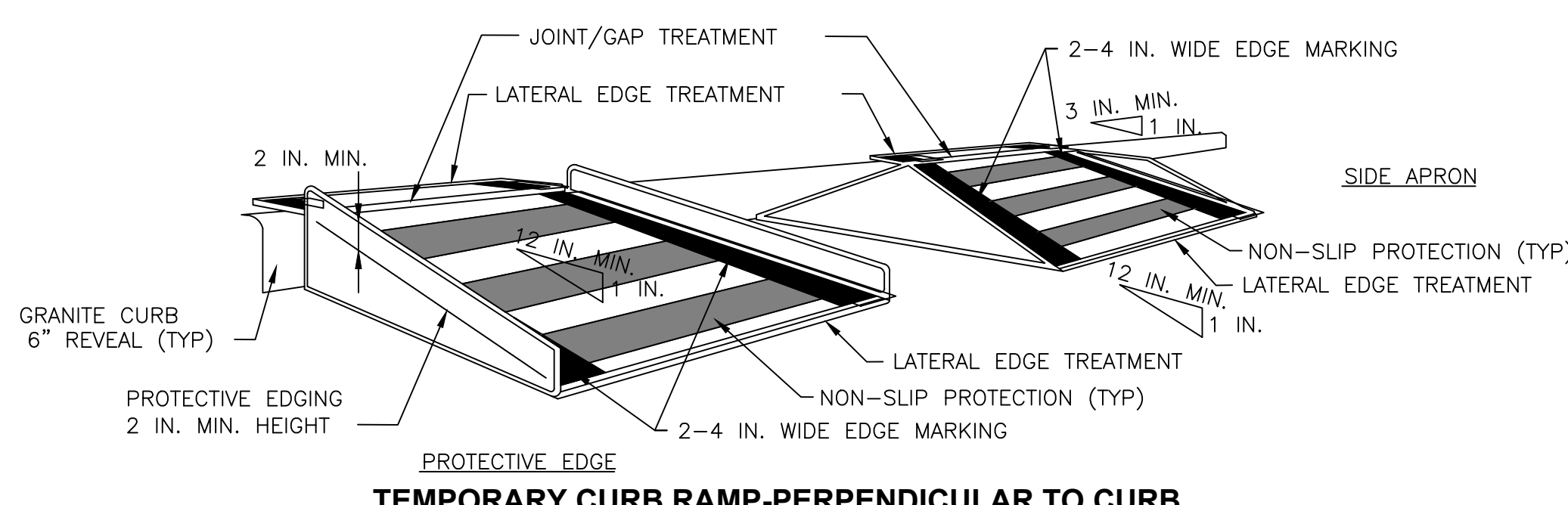


NOTES:

- CURB RAMP SHALL BE 60 IN. MINIMUM WIDTH WITH A FIRM, STABLE AND NON-SLIP SURFACE.
- PROTECTIVE EDGING WITH A 2 IN. MINIMUM HEIGHT SHALL BE INSTALLED WHEN THE CURB RAMP OR LANDING PLATFORM HAS A VERTICAL DROP OF 6 IN. OR GREATER OR HAS A SIDE APRON SLOPE STEEPER THAN 1:3 (33%). PROTECTIVE EDGING SHOULD BE CONSIDERED WHEN THE CURB RAMP OR LANDING PLATFORMS HAVE A VERTICAL DROP OF 3 IN. OR MORE.
- DETECTABLE EDGING WITH 6 IN. MINIMUM HEIGHT AND CONTRASTING COLOR SHALL BE INSTALLED ON ALL CURB RAMP LANDINGS WHERE THE WALKWAY CHANGES DIRECTION (TURNS).
- CURB RAMP AND LANDINGS SHOULD HAVE A 1:50 (2%) MAX CROSS-SLOPE.
- CLEAR SPACE OF 48x48 IN. MINIMUM SHALL BE PROVIDED ABOVE AND BELOW THE CURB RAMP.
- THE CURB RAMP WALKWAY EDGE SHALL BE MARKED WITH A CONTRASTING COLOR 2 TO 4 IN. WIDE MARKING. THE MARKING IS OPTIONAL WHERE COLOR CONTRASTING EDGING IS USED.
- WATER FLOW IN THE GUTTER SYSTEM SHALL HAVE MINIMAL RESTRICTION.
- LATERAL JOINTS OR GAPS BETWEEN SURFACES SHALL BE LESS THAN 0.5 IN. WIDTH.
- CHANGES BETWEEN SURFACE HEIGHTS SHOULD NOT EXCEED 0.5 IN. LATERAL EDGES SHOULD BE VERTICAL UP TO 0.25 IN. HIGH, AND BEVELED AT 1:2 BETWEEN 0.25 IN. AND 0.5 IN. HEIGHT.

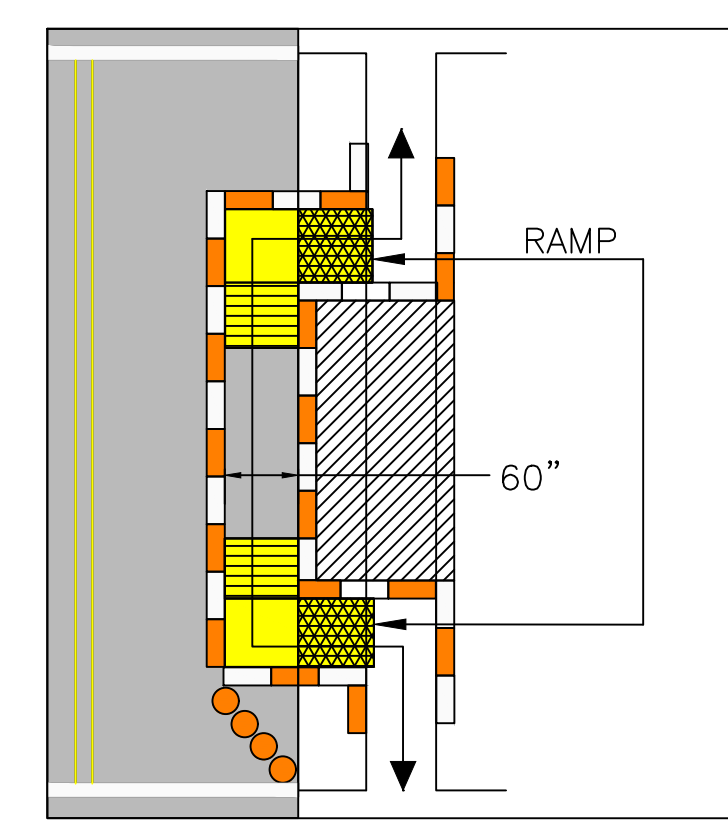
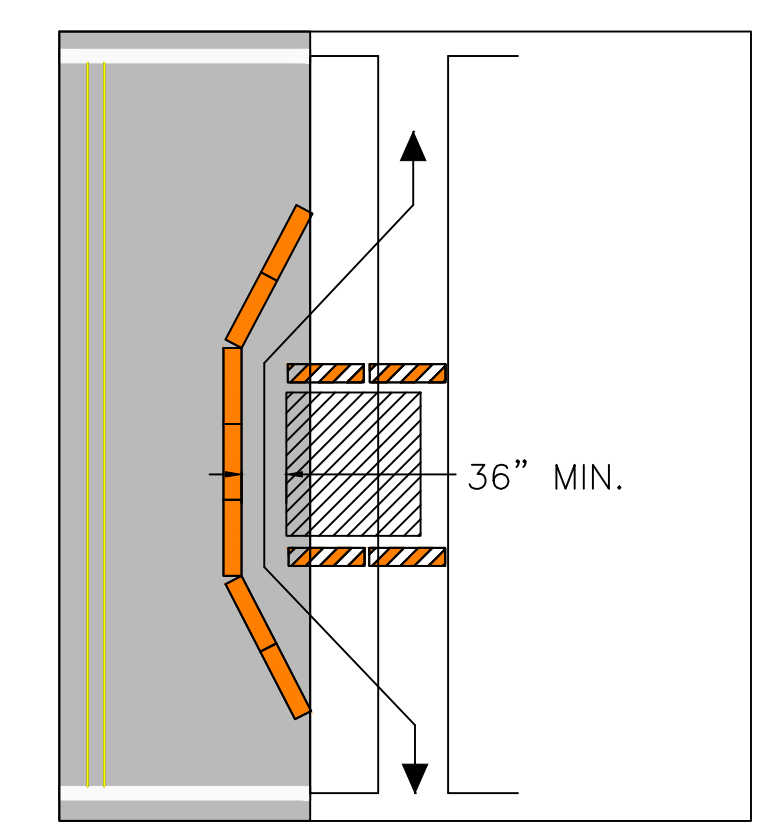


TEMPORARY CURB RAMP-PARALLEL TO CURB



TEMPORARY CURB RAMP-PERPENDICULAR TO CURB

PEDESTRIAN DETAILS

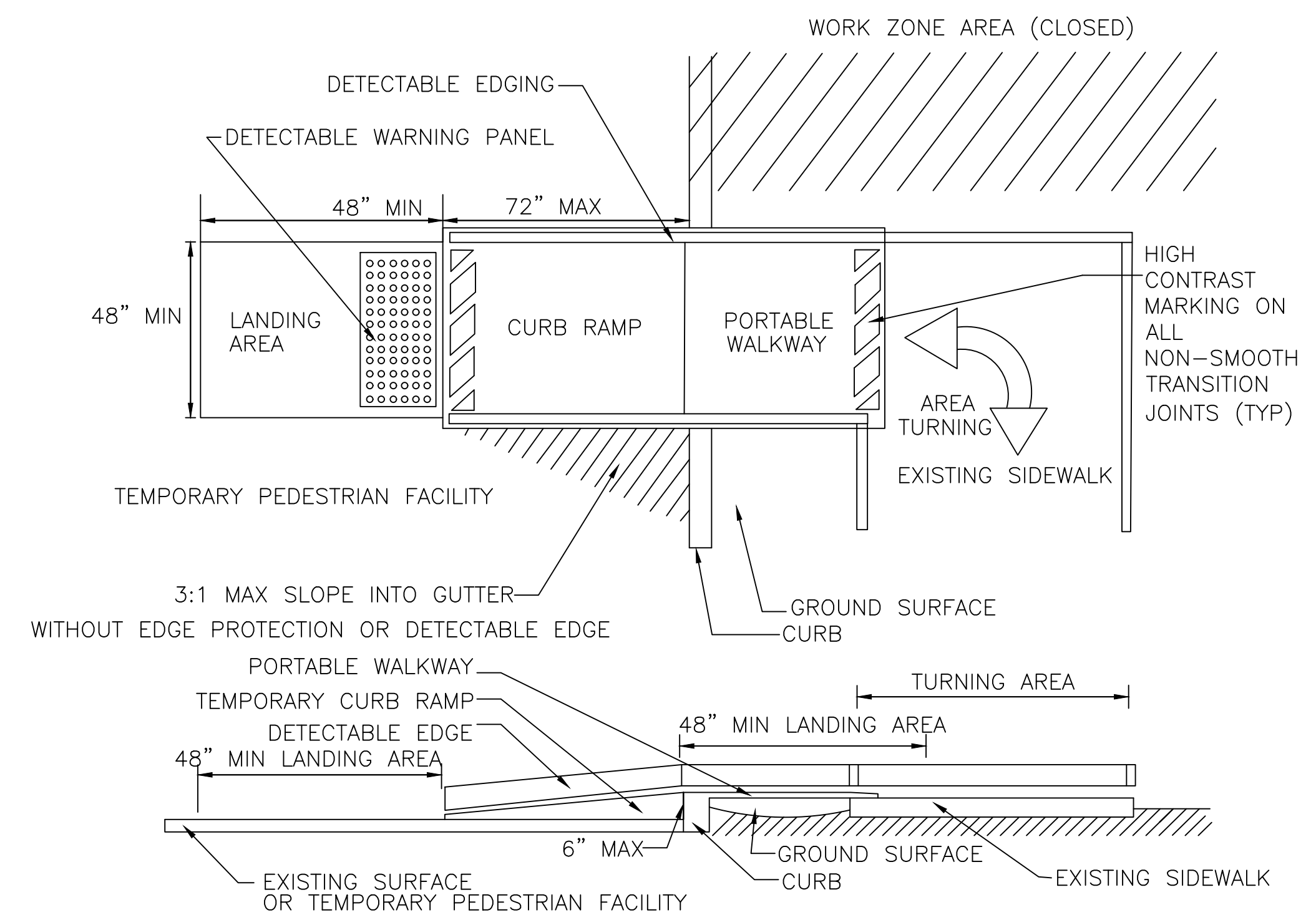


- When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, temporary facilities shall be provided and they shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility.
- A pedestrian channelizing device that is detectable by a person with a visual disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.
- When used, temporary ramps shall comply with Americans with Disabilities Act (see Figures Ped-1 & Ped-2).
- The alternate pathway should have a smooth continuous hard surface for the entire length of the temporary pedestrian facility.
- The protective requirements of a TTC situation have priority in determining the need for temporary traffic barriers and their use in this situation should be based on engineering judgment.
- Audible information devices should be considered where midblock closings and changed crosswalk areas cause inadequate communication to be provided to pedestrians who have visual disabilities.

AUDIBLE DEVICES

For long term sidewalk closures (at a minimum overnight) a form of speech messaging for pedestrians with visual disabilities shall be provided. Audible information devices such as detectable barriers or barricades and other passive pedestrian activation (motion activated) devices should be considered for these cases. These audible devices can be mountable or stand alone.

PEDESTRIAN DETAILS



TEMPORARY CURB RAMP-TYPE 2

PEDESTRIAN DETAILS