

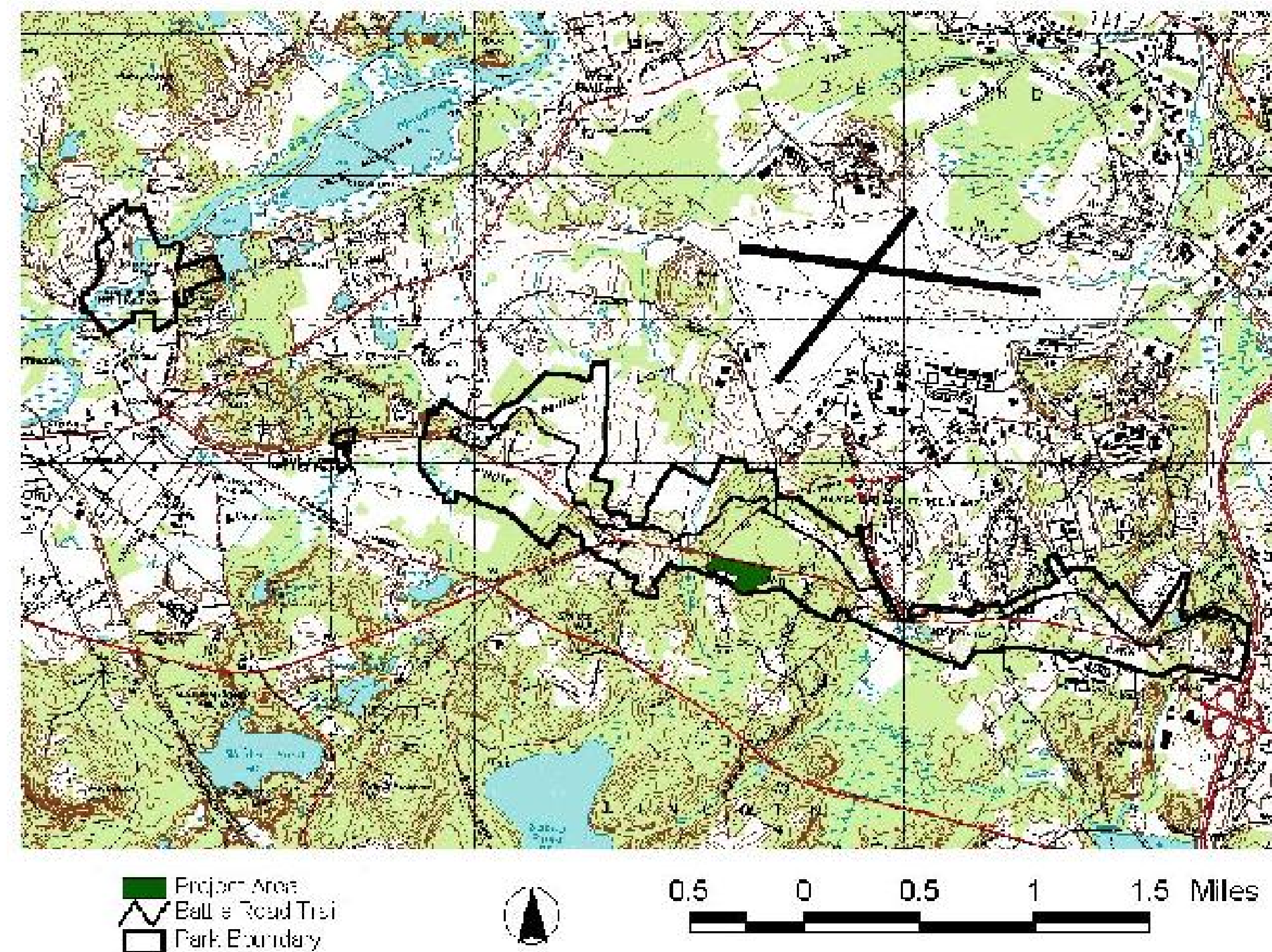
FINAL DESIGN

# MINUTE MAN NATIONAL HISTORICAL PARK

## SUNNYSIDE LANE CULVERT PROJECT AND BATTLE ROAD STREAM RESTORATION LINCOLN, MASSACHUSETTS

MMI # 2144-07

JUNE 30, 2005



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- 6 SITE DETAILS

PROJECT SITE VICINITY MAP:



James G. MacBroom, P.E.

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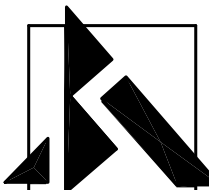


LEGEND

	APPROXIMATE PROJECT BOUNDARY
	EXISTING CONTOUR
	EXISTING INDEX CONTOUR
	SPOT GRADE
	STEAM LINE
	OVERHEAD WIRES
	SURFACE DRAIN
	SANITARY SEWER
	GAS
	ELECTRIC
	TELEPHONE
	WATER MAIN
	STREET LIGHTING, FIRE, STONEWALL
	CHAIN LINK FENCE
	BUILDING
	CATCH BASIN
	DMH
	DMH
	HYD
	MH
	POST
	SIGN
	STA
	TREE (CONIFER)
	TREE (DECIDUOUS)
	UP
	WG
	STAKED LOCATION FROM HAGER GEOSCIENCE, INC.
	SB
	STONE BOUND

ABBREVIATIONS

BIT	BITUMINOUS CONCRETE
BW	BOTTOM WALL
CIP	CAST IRON PIPE
CMP	CORROGATED METAL PIPE
CONC	CONCRETE
CU	CONNECTION UNKNOWN
GP	GATE POST
I	INVERT
NPS	NATIONAL PARK SERVICE
NPV	NO PIPES VISIBLE
PVC	POLYVINYL CHLORIDE
R	RIM
RCP	REINFORCED CONCRETE PIPE
S	SUMP
TW	TOP WALL
TYP	TYPICAL



SURVEY DATA PREPARED BY :  
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Boston, Massachusetts 02114–2127  
Phone (617) 248–0300 Fax (617) 248–0212

CONSTRUCTION NOTES:

1. ACCESS OFF OF SUNNYSIDE LANE SHALL NOT BE GRADED AND WIDENED AS NEEDED UNLESS APPROVED BY THE ENGINEER AND OWNERS REPRESENTATIVE.
2. ALL TEMPORARY ACCESS ROAD(S) SHALL BE BORDERED WITH SEDIMENT AND EROSION CONTROL FENCES AND HAYBALES. SEE DETAILS.
3. STOCKPILE AREA TO BE FLAGGED PRIOR TO CONSTRUCTION AND APPROVED BY ENGINEER.
4. STOCKPILE AREAS TO BE ENCLOSED BY FILTER FABRIC AND HAYBALES. SEE DETAILS.
5. TEMPORARY COFFERDAMS TO BE CONSTRUCTED OF: SANDBAGS WITH POLYETHYLENE BARRIER, OR JERSEY BARRIERS WITH POLYETHYLENE BARRIER, PORTADAM OR WATER FILLED TUBES. IF REQUIRED, COFFERDAM TO BE APPROVED BY ENGINEER PRIOR TO INSTALLATION. COFFERDAM TO BE REMOVED UPON COMPLETION OF PROJECT.
6. ALL DEWATERING PUMPS ARE TO DISCHARGE TO A TEMPORARY DEWATERING SEDIMENT BASIN.
7. TEMPORARY SEDIMENTATION BASINS TO BE CONSTRUCTED WITH SANDBAGS OR JERSEY BARRIERS AND LINED WITH POLYETHYLENE. COLLECTED SEDIMENT TO BE DISPOSED OF OFFSITE AT A REGULATED AND PERMITTED AREA AT THE CONTRACTOR’S EXPENSE.
8. ALL EXCAVATED & DEWATERED SEDIMENT TO BE DISPOSED OF OFF–SITE OR TO DESIGNATED AREA ON–SITE.
9. SAND AND GRAVEL EXCAVATED MAY BE REUSED AS FILL MATERIAL WHERE SPECIFIED.
10. ONLY NATIVE OR ROUNDED COBBLES SHALL BE ALLOWED FOR THE UPPER LAYER OF STREAM BED ARMORING. NO SHOT OR CRUSHED ANGULAR ROCK WILL BE ALLOWED ON THE STREAM BED SURFACE.
11. PLACE MINIMUM 4" DIAMETER ROUNDED STONE TO ARMOR STREAMBED IN DISTURBED AREAS AND TO GRADE THE CHANNEL TO THE FINAL ELEVATIONS SHOWN ON THE PLANS.
12. THE CONCRETE & CMP ARE TO BE REMOVED BY MECHANICAL MEANS.
13. ALL PIPE IS TO BE REMOVED AND DISPOSED OF OFF–SITE.
14. REMOVE TEMPORARY ACCESS ROAD(S) AND RESTORE ORIGINAL CONDITIONS AT END OF WORK.
15. STORAGE AREA AND DEWATERING BASINS ARE TO BE REMOVED AND RESTORED TO ORIGINAL CONDITION.
16. THE CONTRACTOR SHALL FIELD LOCATE, FLAG & TAKE PRECAUTIONS NOT TO DISTURB ANY EXISTING UTILITIES NOT CALLED TO BE RELOCATED ON THESE PLANS.

TRAFFIC CONTROL NOTES:

1. ALL CONSTRUCTION SIGNING SHALL CONFORM TO THE LATEST STANDARDS IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND THE REQUIREMENTS OF THE TOWN OF LINCOLN AND NPS UNLESS OTHERWISE NOTED ON THE PLANS.
2. LOCATIONS OF TEMPORARY SIGNS ARE APPROXIMATE AND SHALL BE ADJUSTED AS DIRECTED BY THE ENGINEER SO AS NOT TO CONFLICT WITH EXISTING PERMENANT SIGNS. EXISTING SIGNS IN CONFLICT WITH TEMPORARY SIGNS SHALL BE COVERED OR RELOCATED AS DIRECTED BY THE ENGINEER AND THE TOWN OF LINCOLN & NPS.
3. UPON COMPLETION OF PROJECT, ALL EXISTING SIGNS AND PAVEMENT MARKINGS WHICH ARE REMOVED IN ADVANCE OF CONSTRUCTION SHALL BE RE–ESTABLISHED AS DIRECTED BY THE ENGINEER AND THE TOWN.
4. THE CONTRACTOR SHALL MAINTAIN ALL ONE WAY AND TWO WAY TRAFFIC OPERATIONS USING THE TRAFFIC CONTROL DEVICES SHOWN AT ALL TIMES WHEN CONSTRUCTION ACTIVITIES ENCR OACH WITHIN OR IMMEDIATELY ADJACENT TO THE ROADWAY.
5. PORTABLE TEMPORARY SIGNS AND OTHER TEMPORARY TRAFFIC PROTECTIVE DEVICES SHALL REMAIN IN PLACE DURING ALL CONSTRUCTION ACTIVITIES AND NORMAL TRAFFIC OPERATIONS RESTORED AT THE END OF EACH WORK DAY.
6. THE CONTRACTOR SHALL ENSURE THAT ALL CONSTRUCTION EQUIPMENT, MATERIALS AND DEBRIS ARE REMOVED FROM THE ACCESSWAY AND ROADWAY PRIOR TO THE REMOVAL OF THE SIGNAGE.
7. TRAFFIC CONTROL SIGNS SHALL BE MOUNTED ON POSTS WHEN FEASIBLE. POST MOUNTED TRAFFIC CONTROL SIGNS SHALL BE COVERED AT THE END OF EACH WORK DAY.
8. THE CONTRACTOR SHALL NOTIFY THE TOWN OF LINCOLN, M.D.O.T. & NPS AT LEAST 14 DAYS IN ADVANCE OF HIS PLANS TO IMPLEMENT THE TRAFFIC CONTROL PLAN.
9. THE CONTRACTOR SHALL IMPLEMENT THE TRAFFIC CONTROL PLAN BEFORE THE START OF CONSTRUCTION.
10. THE CONTRACTOR IS TO INSTALL PLASTIC SAFETY FENCING AROUND THE PERIMETER OF OPEN EXCAVATIONS AND EQUIPMENT AT THE END OF EACH WORK DAY.
11. THE TRAFFIC SHALL BE MAINTAINED, WHERE SPECIFIED, ON ALL ROADWAYS DURING CONSTRUCTION. THE CONTRACTOR SHALL INSTALL TEMPORARY SIGNAGE & FENCING. UNLESS OTHERWISE SPECIFIED ON THESE PLANS, BY THE ENGINEER, TOWN OR NPS.

GENERAL NOTES:

1. THE LOCATION OF ALL EXISTING UTILITIES MUST BE CONFIRMED 24 HRS. PRIOR TO CONSTRUCTION.
2. SEE SURVEY REFERENCES, SHEET 2, NOTES: 2 &3 FOR VERTICAL AND HORIZONTAL DATUM INFORMATION.
3. ALL DIMENSIONS AND ELEVATIONS SHALL BE VERIFIED IN THE FIELD PRIOR TO CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR DETERMINATION.
4. TOPOGRAPHY AND BOUNDARY LINES ARE BASED UPON SURVEY PERFORMED BY BRYANT ASSOCIATES, BOSTON, MASSACHUSETTS
5. ELEVATIONS SHOWN ARE REFERENCED TO A TEMPORARY BENCHMARK THE REFERENCE MARK HAS AN ELEVATION OF 200.59 FEET (UP#3)
7. ALL CONTRACTORS ARE ADVISED TO VISIT THE SITE PRIOR TO SUBMITTING BIDS.
8. THE CONTRACTOR IS RESPONSIBLE FOR WATER CONTROL DURING THE PROJECT. THE CONTRACTOR SHALL COORDINATE THE WATER CONTROL OF THE PROJECT AREA/PLAN WITH THE TOWN OF LINCOLN AND THE ENGINEER, AND THE NPS. THERE SHALL BE NO CLAIMS FOR EXTRA COMPENSATION TO WATER LEVELS RISING FROM NATURAL EVENTS, SUCH AS STORMS, ETC.
9. THE CONTRACTOR AND HIS JOB SUPERINTENDENT SHALL BE RESPONSIBLE FOR COMPLYING WITH THE JOB SPECIFICATIONS. THE CONTRACTOR SHALL DESIGNATE A SUPERINTENDENT AT THE START OF CONSTRUCTION AND THE CONTRACTOR’S SUPERINTENDENT SHALL BE ON–SITE AT ALL TIMES DURING CONSTRUCTION.
10. THE CONTRACTOR SHALL PROVIDE FIELD ENGINEERING SERVICES TO ESTABLISH AND RECORD GRADES, LINES, AND ELEVATIONS.
11. NO CONSTRUCTION VEHICLES SHALL BE STORED, SERVICED, WASHED OR FLUSHED IN A LOCATION WHERE LEAKS, SPILLAGE, WASTE MATERIALS, CLEANERS, OR WATERS WILL BE INTRODUCED OR FLOW INTO WETLANDS OR WATERCOURSES.
12. THE CONTRACTOR SHALL MAINTAIN ALL STREETS AND RIGHT OF WAYS IN THE AREA FREE OF SOIL, MUD AND CONSTRUCTION DEBRIS.
13. THE PROJECT SITE MAY BE SUBJECT TO FLOODING. THE CONTRACTOR SHALL MONITOR WEATHER FORECASTS AND REMOVE EQUIPMENT FROM FLOOD PRONE AREAS IN THE EVENT OF FLOOD WARNINGS.
14. REFER TO THE PROJECT SPECIFICATIONS FOR INFORMATION ON:

CLEARING AND GRUBBING  
TEMPORARY SEDIMENT AND EROSION CONTROL  
MAINTENANCE AND PROTECTION OF TRAFFIC  
POLICE  
DEMOLITION  
WATER CONTROL  
EARTHWORK  
SEDIMENT EXCAVATION & STORAGE  
MOBILIZATION  
ARMORING  
TOPSOIL, TURFING, & MULCHING

PEDESTRIAN & VEHICULAR TRAFFIC CONTROL NOTES:

CONSTRUCTION SIGN LEGEND		
PLAN DESIGNATION	MESSAGE	SIZE
Ⓐ		48" x 48"
Ⓑ		48" x 48"
Ⓒ		48" x 48"
Ⓓ		60" x 24"

NOTE 1: WHERE APPLICABLE, HIGH INTENSITY BARRICADE LIGHT TO BE MOUNTED ON TOP LEFT CORNER OF SIGN.

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REVISIONS

PD COMMENTS	6/30/05

NOTES & LEGEND

MINUTE MAN HISTORICAL NATIONAL PARK  
SUNNYSIDE LANE STREAM CHANNEL RESTORATION  
SUNNYSIDE LANE & GREAT ROAD (ROUTE 2A)  
LINCOLN, MASSACHUSETTS

DESIGNED	MRA	JGM
DRAWN	CHECKED	
SCALE	NOT TO SCALE	
DATE	JUNE 2005	
PROJECT NO.	2144-07-2	
DWG NAME	NOTES-LEGEND.DWG	

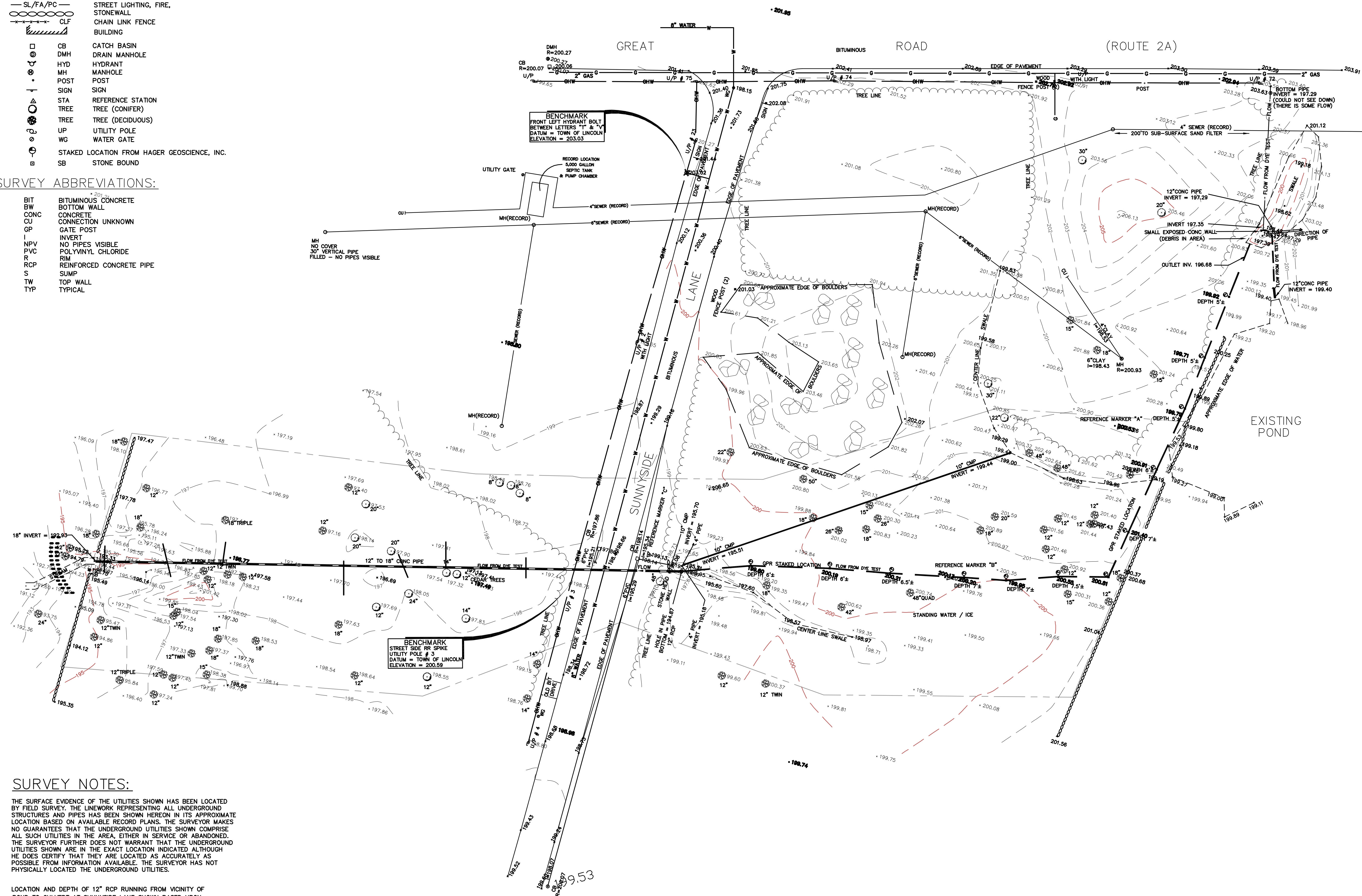


SURVEY LEGEND:

---	EXISTING CONTOUR
- - -	EXISTING INDEX CONTOUR
X 198.00	SPOT GRADE
STM	STEAM LINE
OHW	OVERHEAD WRES
D	SURFACE DRAIN
S	SANITARY SEWER
G	GAS
E	ELECTRIC
T	TELEPHONE
W	WATER MAIN
SL/FA/PC	STREET LIGHTING, FIRE, STONEWALL
CLF	CHAIN LINK FENCE
---	BUILDING
CB	CATCH BASIN
DMH	DRAIN MANHOLE
HYD	HYDRANT
MH	MANHOLE
POST	POST
SIGN	SIGN
STA	REFERENCE STATION
TREE	TREE (CONIFER)
TREE	TREE (DECIDUOUS)
UP	UTILITY POLE
WG	WATER GATE
SB	STAKED LOCATION FROM HAGER GEOSCIENCE, INC.
SB	STONE BOUND

SURVEY ABBREVIATIONS:

BIT	BITUMINOUS CONCRETE
BW	BOTTOM WALL
CONC	CONCRETE
CU	CONNECTION UNKNOWN
GP	GATE POST
I	INVERT
NPV	NO PIPES VISIBLE
PVC	POLYVINYL CHLORIDE
R	REINFORCED CONCRETE PIPE
RCP	SUMP
S	TOP WALL
TW	TYPICAL



SURVEY NOTES:

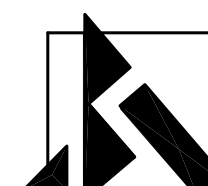
THE SURFACE EVIDENCE OF THE UTILITIES SHOWN HAS BEEN LOCATED BY FIELD SURVEY. THE LINEWORK REPRESENTING ALL UNDERGROUND STRUCTURES AND PIPES HAS BEEN SHOWN HEREON IN ITS APPROXIMATE LOCATION BASED ON AVAILABLE RECORD PLANS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

LOCATION AND DEPTH OF 12" RCP RUNNING FROM VICINITY OF POND TO CULVERT AT SUNNYSIDE LANE SHOWN BASED UPON GROUND PENETRATING RADAR (GPR) TECHNIQUES PERFORMED BY HAGER GEOSCIENCE, INC.

SURVEY REFERENCES:

- MINUTE MAN NATIONAL HISTORIC PARK SEWERAGE SYSTEM - RESIDENTIAL AREA
- VERTICAL DATUM = TOWN OF LINCOLN.
- HORIZONTAL DATUM = BASED UPON NATIONAL PARK SERVICE PLAN ENTITLED "NATIONAL PARK SERVICE TOPO SHEET 7 OF 13" BY NEW ENGLAND SURVEY SERVICES INC. DATED NOV. 1964
- SCREENED INFO SHOWN HEREON TAKEN FROM ABOVE REFERENCED PLANS (REF 3)

SURVEY PREPARED BY : DATE 3-24-05 SCALE: 1"=20'



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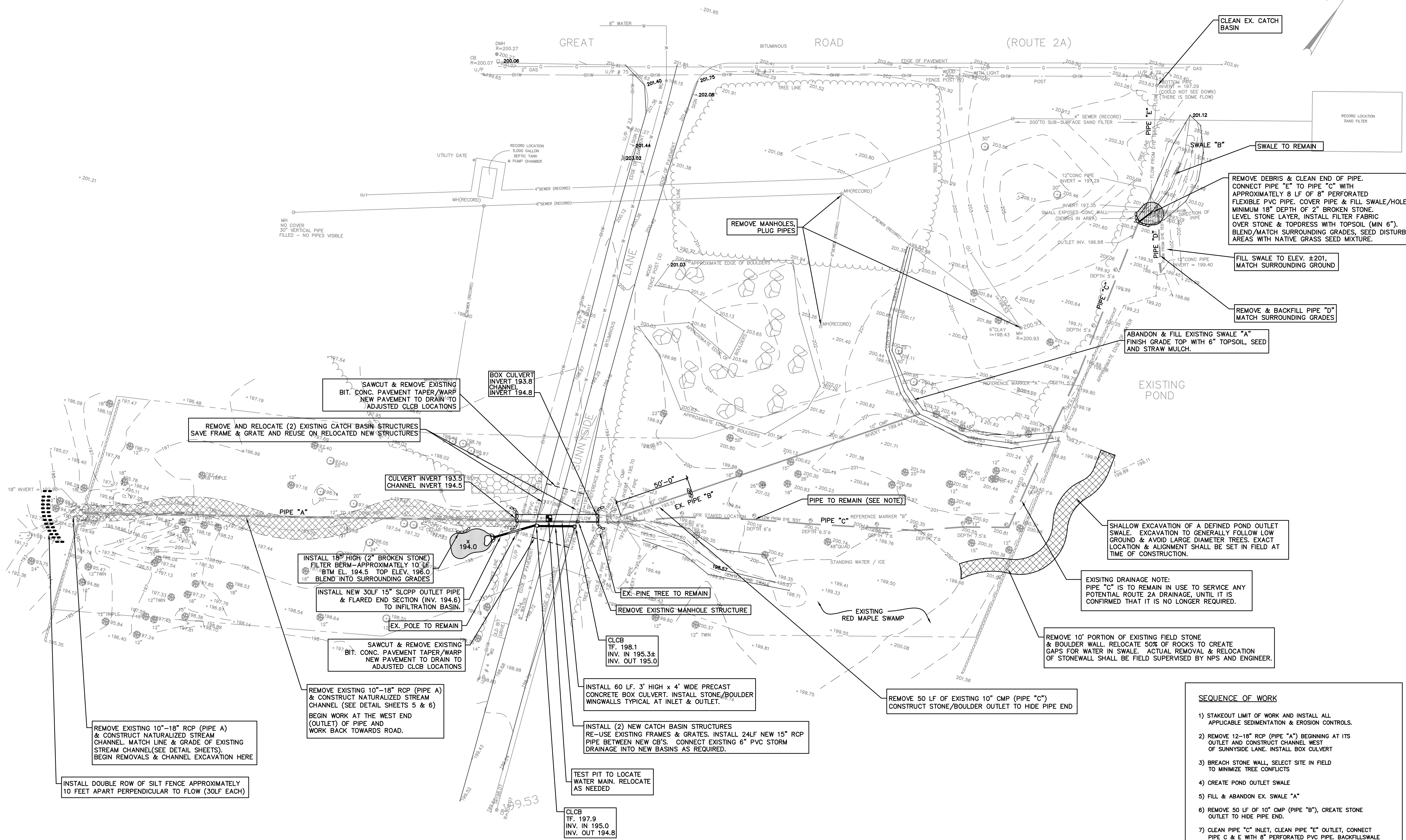
REVISIONS

PD COMMENTS	6/20/05

**SITE PLAN - EXISTING CONDITNS**  
**SUNNYSIDE ROAD STREAM CHANNEL RESTORATION**  
**MINUTE MAN HISTORICAL NATIONAL PARK**  
**SUNNYSIDE LANE & GREAT ROAD (ROUTE 2A)**  
**LINCOLN, MASSACHUSETTS**

BA DESIGNED	BA DRAWN	JGM CHECKED
SCALE 1" = 30'		
DATE JUNE 10, 2005		
PROJECT NO. 2144-07		
BASEPLAN.DWG		
2		
SHEET NO.		





- SEQUENCE OF WORK**
- 1) STAKEOUT LIMIT OF WORK AND INSTALL ALL APPLICABLE SEDIMENTATION & EROSION CONTROLS.
  - 2) REMOVE 12-18" RCP (PIPE "A") BEGINNING AT ITS OUTLET AND CONSTRUCT CHANNEL WEST OF SUNNYSIDE LANE. INSTALL BOX CULVERT
  - 3) BREACH STONE WALL, SELECT SITE IN FIELD TO MINIMIZE TREE CONFLICTS
  - 4) CREATE POND OUTLET SWALE
  - 5) FILL & ABANDON EX. SWALE "A"
  - 6) REMOVE 50 LF OF 10" CMP (PIPE "B"), CREATE STONE OUTLET TO HIDE PIPE END.
  - 7) CLEAN PIPE "C" INLET, CLEAN PIPE "E" OUTLET, CONNECT PIPE C & E WITH 8" PERFORATED PVC PIPE. BACKFILL SWALE WITH STONE & TOPDRESS WITH TOPSOIL AND SEED.
  - 8) REMOVE PIPE "D"

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REVISIONS	
PD COMMENTS	DATE
	6/30/05

**SITE PLAN - LAYOUT, GRADING & UTILITIES**

**MINUTE MAN HISTORICAL NATIONAL PARK**

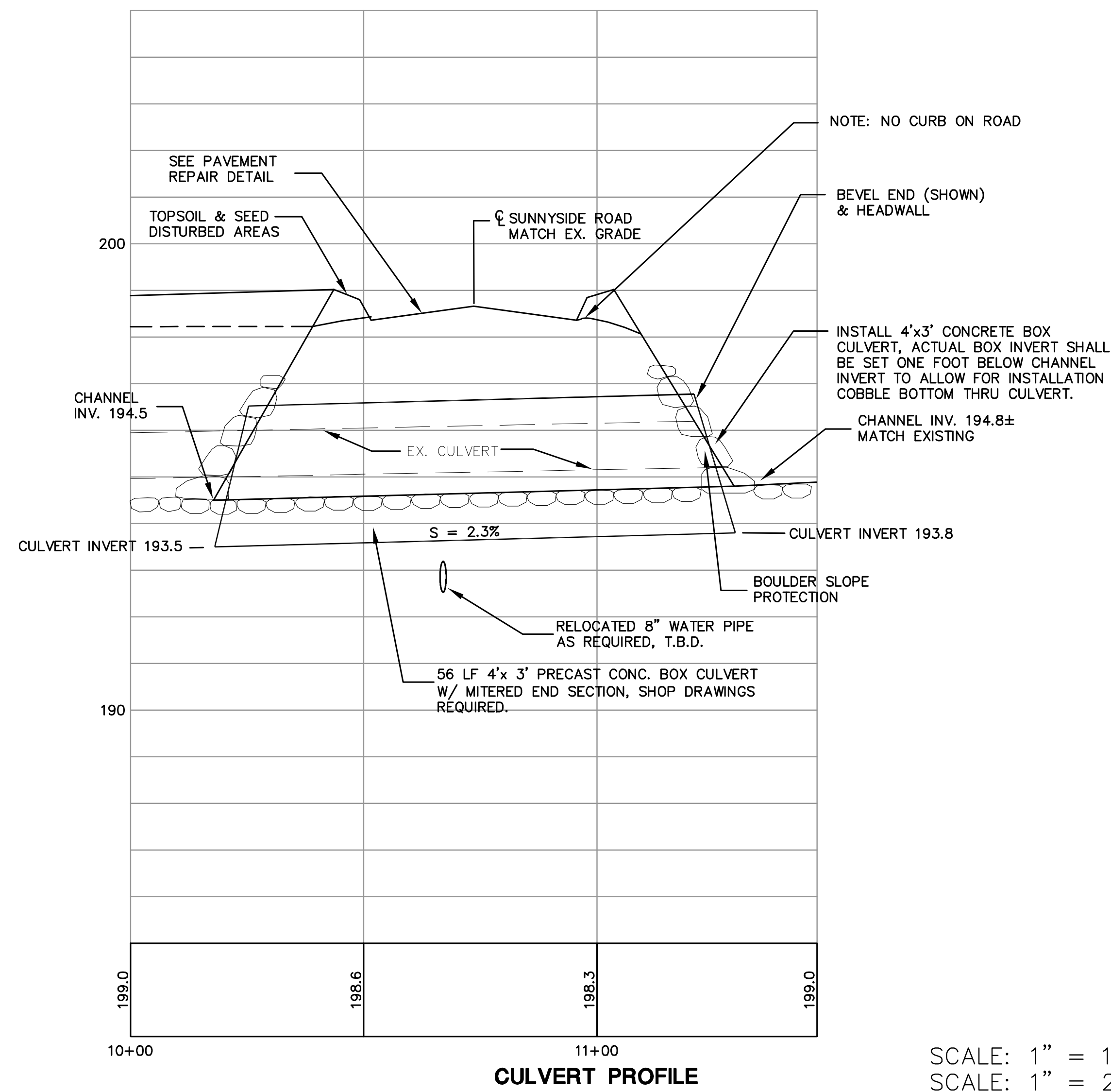
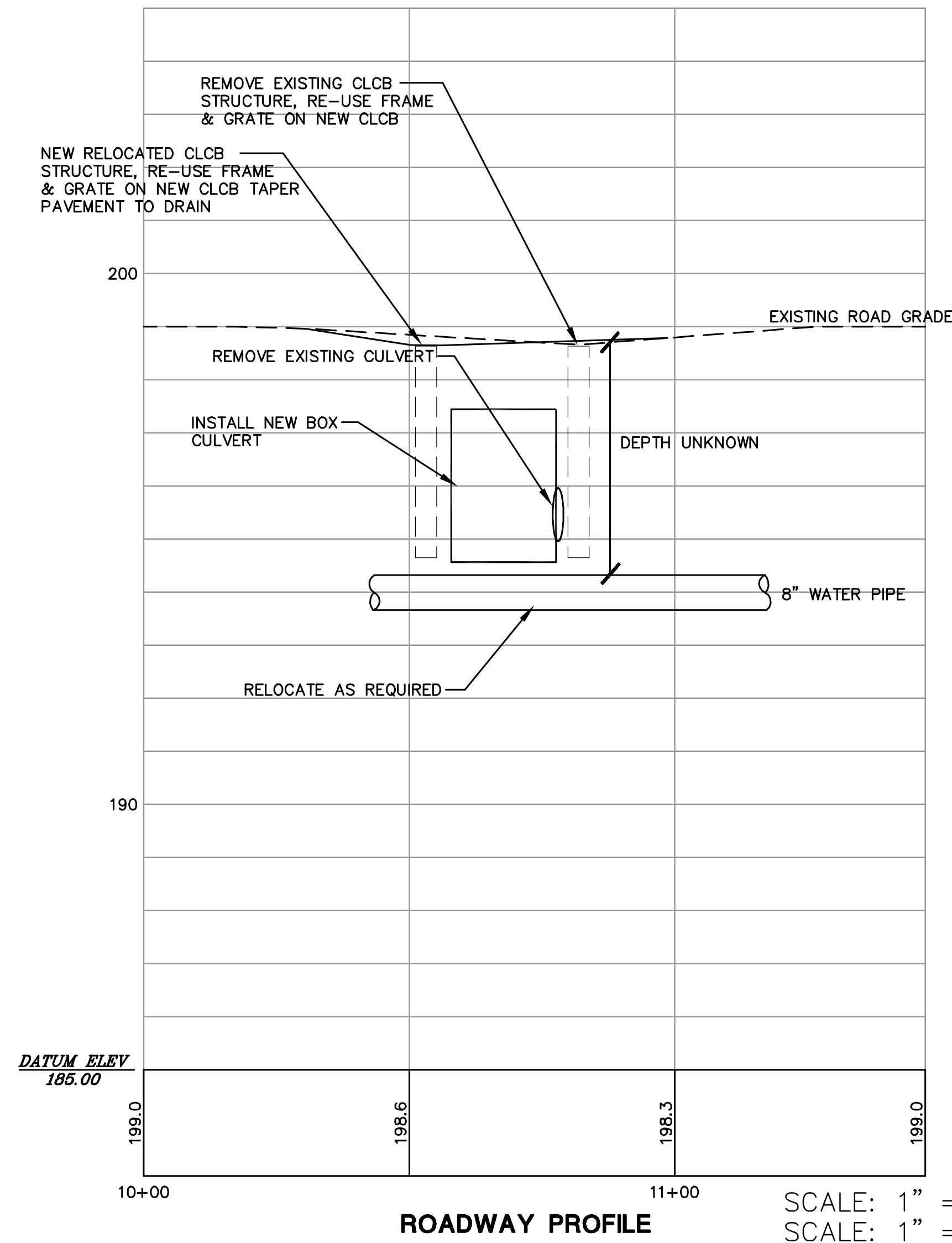
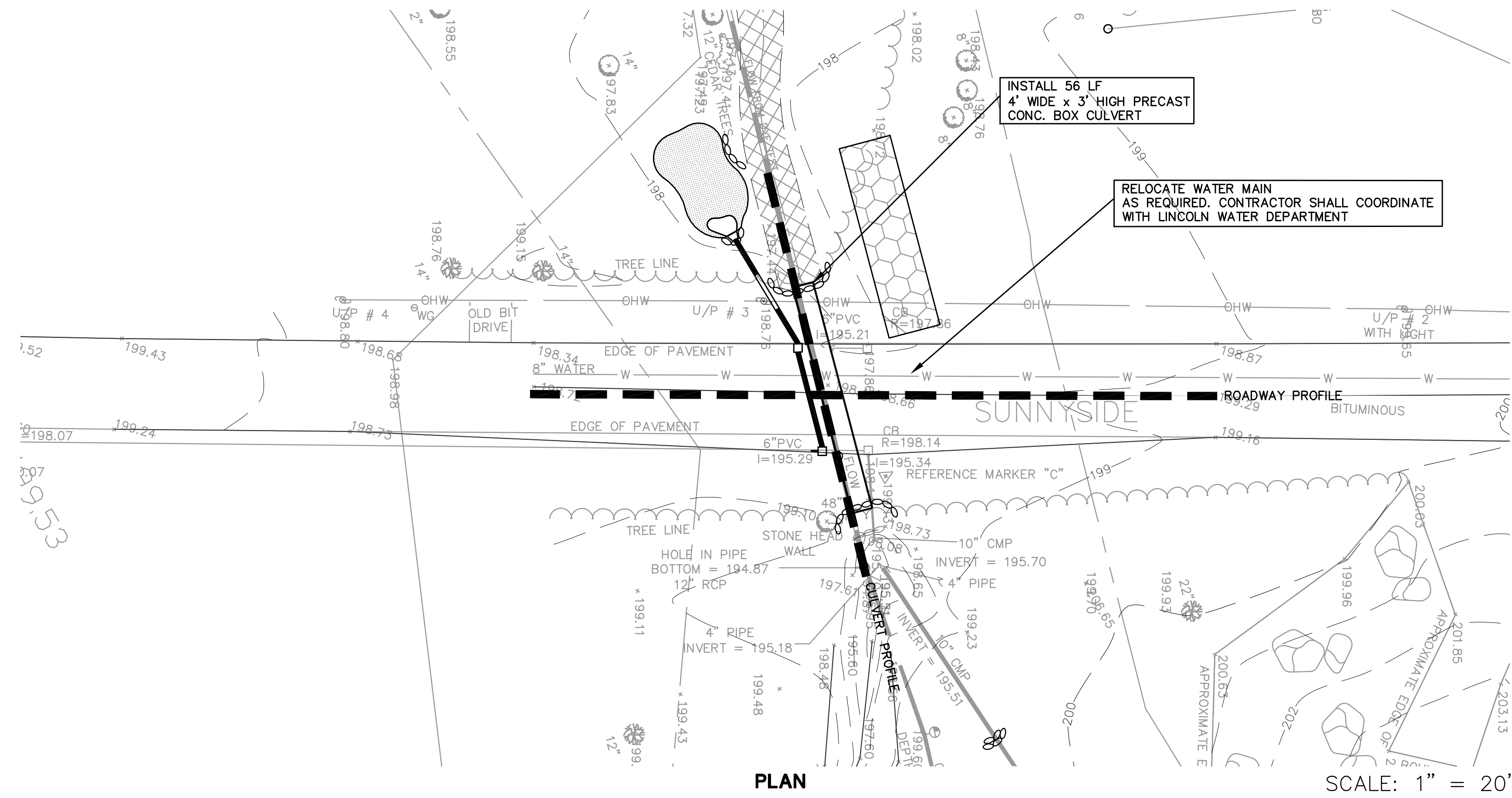
**SUNNYSIDE ROAD STREAM CHANNEL RESTORATION**

**SUNNYSIDE LANE & GREAT ROAD (ROUTE 2A)**

**LINCOLN, MASSACHUSETTS**

JGM DESIGNED	MRA DRAWN	JGM CHECKED
SCALE: 1" = 30'		
DATE: JUNE 10, 2005		
PROJECT NO: 2144-07-2		
BASEPLAN.DWG		
3		
SHEET NO.		





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REVISIONS	
PD COMMENTS	6/30/05

ROADWAY/CULVERT PLAN & PROFILE

MINUTE MAN HISTORICAL NATIONAL PARK  
SUNNYSIDE ROAD STREAM CHANNEL RESTORATION  
SUNNYSIDE LANE & GREAT ROAD (ROUTE 2A)  
LINCOLN, MASSACHUSETTS

JGM DESIGNED	MRA DRAWN	JGM CHECKED
SCALE: AS SHOWN		
DATE: JUNE 2005		
PROJECT NO. 2144-07-2		
P&P-PLAN.DWG		

4

SHEET NO.



SEDIMENT & EROSION CONTROL SPECIFICATIONS

GENERAL:

THESE SPECIFICATIONS SHALL APPLY TO ALL WORK CONSISTING OF ANY AND ALL TEMPORARY AND/OR PERMANENT MEASURES TO CONTROL WATER POLLUTION AND SOIL EROSION, AS MAY BE REQUIRED, DURING THE CONSTRUCTION OF THE PROJECT.

IN GENERAL, ALL CONSTRUCTION ACTIVITIES SHALL PROCEED IN SUCH A MANNER SO AS NOT TO POLLUTE ANY WETLANDS, WATERCOURSE, WATERBODY, AND CONDUIT CARRYING WATER, ETC. THE CONTRACTOR SHALL LIMIT, INsofar AS POSSIBLE, THE SURFACE AREA OF EARTH MATERIALS EXPOSED BY CONSTRUCTION METHODS AND IMMEDIATELY PROVIDE PERMANENT AND TEMPORARY POLLUTION CONTROL MEASURES TO PREVENT CONTAMINATION OF ADJACENT WETLANDS, WATERCOURSES, AND WATERBODIES, AND TO PREVENT, INsofar AS POSSIBLE, EROSION ON THE SITE.

LAND GRADING

GENERAL:

1. THE RESHAPING OF THE GROUND SURFACE BY EXCAVATION AND FILLING OR A COMBINATION OF BOTH, TO OBTAIN PLANNED GRADES, SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING CRITERIA:
  - a. THE CUT FACE OF EARTH EXCAVATION SHALL NOT BE STEEPER THAN TWO HORIZONTAL TO ONE VERTICAL (2:1).
  - b. THE PERMANENT EXPOSED FACES OF FILLS SHALL NOT BE STEEPER THAN TWO HORIZONTAL TO ONE VERTICAL (2:1).
  - c. THE CUT FACE OF ROCK EXCAVATION SHALL NOT BE STEEPER THAN ONE HORIZONTAL TO FOUR VERTICAL (1:4).
- d. PROVISION SHOULD BE MADE TO CONDUCT SURFACE WATER SAFELY TO STORM DRAINS TO PREVENT SURFACE RUNOFF FROM DAMAGING CUT FACES AND FILL SLOPES.
- e. EXCAVATIONS SHOULD NOT BE MADE SO CLOSE TO PROPERTY LINES AS TO ENDANGER ADJOINING PROPERTY WITHOUT PROTECTING SUCH PROPERTY FROM EROSION, SLIDING, SETTLING, OR CRACKING.
- f. NO FILL SHOULD BE PLACED WHERE IT WILL SLIDE OR WASH UPON THE PREMISES OF ANOTHER OWNER OR UPON ADJACENT WETLANDS, WATERCOURSES, OR WATERBODIES.
- g. PRIOR TO ANY REGRADING, A STABILIZED CONSTRUCTION ENTRANCE SHALL BE PLACED AT THE ENTRANCE TO THE WORK AREA IN ORDER TO REDUCE MUD AND OTHER SEDIMENTS FROM LEAVING THE SITE.

TOPSOILING

GENERAL:

1. TOPSOIL SHALL BE SPREAD OVER ALL EXPOSED AREAS IN ORDER TO PROVIDE A SOIL MEDIUM HAVING FAVORABLE CHARACTERISTICS FOR THE ESTABLISHMENT, GROWTH, AND MAINTENANCE OF VEGETATION.
  2. UPON ATTAINING FINAL SUBGRADES, SCARIFY SURFACE TO PROVIDE A GOOD BOND WITH TOPSOIL.
  3. REMOVE ALL LARGE STONES, TREE LIMBS, ROOTS AND CONSTRUCTION DEBRIS.
  4. APPLY LIME ACCORDING TO SOIL TEST OR AT THE RATE OF TWO (2) TONS PER ACRE.
- MATERIAL:
1. TOPSOIL SHOULD HAVE PHYSICAL, CHEMICAL, AND BIOLOGICAL CHARACTERISTICS FAVORABLE TO THE GROWTH OF PLANTS.
  2. TOPSOIL SHOULD HAVE A SANDY OR LOAMY TEXTURE.
  3. TOPSOIL SHOULD BE RELATIVELY FREE OF SUBSOIL MATERIAL AND MUST BE FREE OF STONES (OVER 1" IN DIAMETER), LUMPS OF SOIL, ROOTS, TREE LIMBS, TRASH, OR CONSTRUCTION DEBRIS. IT SHOULD BE FREE OF ROOTS OR RHIZOMES SUCH AS THISTLE, NUTGRASS, AND QUACKGRASS.
  4. AN ORGANIC MATTER CONTENT OF SIX PERCENT (6%) IS REQUIRED. AVOID LIGHT COLORED SUBSOIL MATERIAL.
  5. SOLUBLE SALT CONTENT OF OVER 500 PARTS PER MILLION (PPM) IS LESS SUITABLE. AVOID TIDAL MARSH SOILS BECAUSE OF HIGH SALT CONTENT AND SULFUR ACIDITY.
  6. THE pH SHOULD BE MORE THAN 6.0. IF LESS, ADD LIME TO INCREASE pH TO AN ACCEPTABLE LEVEL.

APPLICATION

1. AVOID SPREADING WHEN TOPSOIL IS WET OR FROZEN.
2. SPREAD TOPSOIL UNIFORMLY TO A DEPTH OF AT LEAST FOUR INCHES (4"), OR TO THE DEPTH SHOWN ON THE LANDSCAPING PLANS.

TEMPORARY VEGETATIVE COVER

GENERAL:

1. TEMPORARY VEGETATIVE COVER SHALL BE ESTABLISHED ON ALL UNPROTECTED AREAS THAT PRODUCE SEDIMENT, AREAS WHERE FINAL GRADING HAS BEEN COMPLETED, AND AREAS WHERE THE ESTIMATED PERIOD OF BARE SOIL EXPOSURE IS LESS THAN 12 MONTHS. TEMPORARY VEGETATIVE COVER SHALL BE APPLIED IF AREAS WILL NOT BE PERMANENTLY SEEDED BY OCTOBER 1.

SITE PREPARATION:

1. INSTALL REQUIRED SURFACE WATER CONTROL MEASURES.
2. REMOVE LOOSE ROCK, STONE, AND CONSTRUCTION DEBRIS FROM AREA.
3. TILLAGE SHOULD ACHIEVE A REASONABLY UNIFORM LOOSE SEEDBED. WORK ON CONTOUR IF SITE IS SLOPING.

ESTABLISHMENT:

1. SELECT APPROPRIATE RYEGRASS MIX FOR THE SITUATION. NOTE RATES AND SEEDING DATES (SEE VEGETATIVE COVER SELECTION & MULCHING SPECIFICATION BELOW).
2. APPLY SEED UNIFORMLY ACCORDING TO THE RATE INDICATED BY BROADCASTING, DRILLING, OR HYDRAULIC APPLICATION.
3. UNLESS HYDROSEEDED, COVER RYEGRASS SEEDS WITH NOT MORE THAN 4 INCHES OF SOIL USING SUITABLE EQUIPMENT.
4. MULCH IMMEDIATELY AFTER SEEDING IF REQUIRED. (SEE VEGETATIVE COVER SELECTION & MULCHING SPECIFICATION BELOW.) APPLY STRAW OR HAY MULCH AND ANCHOR TO SLOPES GREATER THAN 3% OR WHERE CONCENTRATED FLOW WILL OCCUR.

PERMANENT VEGETATIVE COVER

GENERAL:

1. PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED AS VARIOUS SECTIONS OF THE PROJECT ARE COMPLETED IN ORDER TO STABILIZE THE SOIL, REDUCE DOWNSTREAM DAMAGE FROM SEDIMENT AND RUNOFF, AND TO ENHANCE THE AESTHETIC NATURE OF THE SITE. IT WILL BE APPLIED TO ALL CONSTRUCTION AREAS WHERE FINAL GRADING HAS BEEN COMPLETED AND A PERMANENT COVER IS NEEDED.

SITE PREPARATION:

1. INSTALL REQUIRED SURFACE WATER CONTROL MEASURES.
2. REMOVE LOOSE ROCK, STONE, AND CONSTRUCTION DEBRIS FROM AREA.
3. PERFORM ALL PLANTING OPERATIONS PARALLEL TO THE CONTOURS OF THE SLOPE.
4. APPLY TOPSOIL AS INDICATED ELSEWHERE HEREIN.
5. APPLY FERTILIZER ACCORDING TO SOIL TEST OR:

- SPRING SEEDING: WORK DEEPLY IN SOIL, BEFORE SEEDING, 300 LBS. OF 10-10-10 FERTILIZER PER ACRE (7 LBS. PER 1,000 SQ. FT.); THEN SIX (6) TO EIGHT (8) WEEKS LATER, APPLY ON THE SURFACE AN ADDITIONAL 300 LBS. OF 10-10-10 FERTILIZER PER ACRE. AFTER SEPTEMBER 1, TEMPORARY VEGETATIVE COVER SHALL BE APPLIED.
- FALL SEEDING: WORK DEEPLY IN SOIL, BEFORE SEEDING, 600 LBS. OF 10-10-10 FERTILIZER PER ACRE (14 LBS. PER 1,000 SQ. FT.).

MULCHING:

STRAY OR SALT MARSH HAY 70-90 LBS./1,000 SQ.FT.  
(TEMPORARY VEGETATIVE AREAS)

WOOD FIBER IN HYDROMULCH SLURRY 25-50 LBS./1,000 SQ. FT.

VEGETATIVE COVER SELECTION & MULCHING

TEMPORARY VEGETATIVE COVER:

PERENNIAL RYEGRASS 3 LBS./1,000 SQ.FT.  
(LOLIUM PERENNE)

PERMANENT VEGETATIVE COVER:

SEE SEED MIX SPECIFICATIONS THIS SHEET

MULCHING:

STRAY OR SALT HAY 70-90 LBS./1,000 SQ.FT.  
(TEMPORARY VEGETATIVE AREAS)

WOOD FIBER IN HYDROMULCH SLURRY 25-50 LBS./1,000 SQ. FT.

ESTABLISHMENT:

1. SMOOTH AND FIRM SEEDBED WITH CULTIPACKER OR OTHER SIMILAR EQUIPMENT PRIOR TO SEEDING (EXCEPT WHEN HYDROSEEDING).
2. SELECT ADAPTED SEED MIXTURE FOR THE SPECIFIC SITUATION. NOTE RATES AND THE SEEDING DATES (SEE VEGETATIVE COVER SELECTION & MULCHING SPEC. BELOW).
3. APPLY SEED UNIFORMLY ACCORDING TO RATE INDICATED, BY BROADCASTING, DRILLING, OR HYDRAULIC APPLICATION.
4. COVER GRASS AND LEGUME SEED WITH NOT MORE THAN 1/4 INCH OF SOIL WITH SUITABLE EQUIPMENT (EXCEPT WHEN HYDROSEEDING).
5. MULCH IMMEDIATELY AFTER SEEDING, IF REQUIRED, ACCORDING TO TEMPORARY MULCHING SPECIFICATIONS. (SEE VEGETATIVE COVER SELECTION & MULCHING SPECIFICATION BELOW).
6. USE PROPER INOCULANT ON ALL LEGUME SEEDINGS, USE FOUR (4) TIMES NORMAL RATES WHEN HYDROSEEDING.
7. USE SOD WHERE THERE IS A HEAVY CONCENTRATION OF WATER AND IN CRITICAL AREAS WHERE IT IS IMPORTANT TO GET A QUICK VEGETATIVE COVER TO PREVENT EROSION.

EROSION CHECKS

GENERAL:

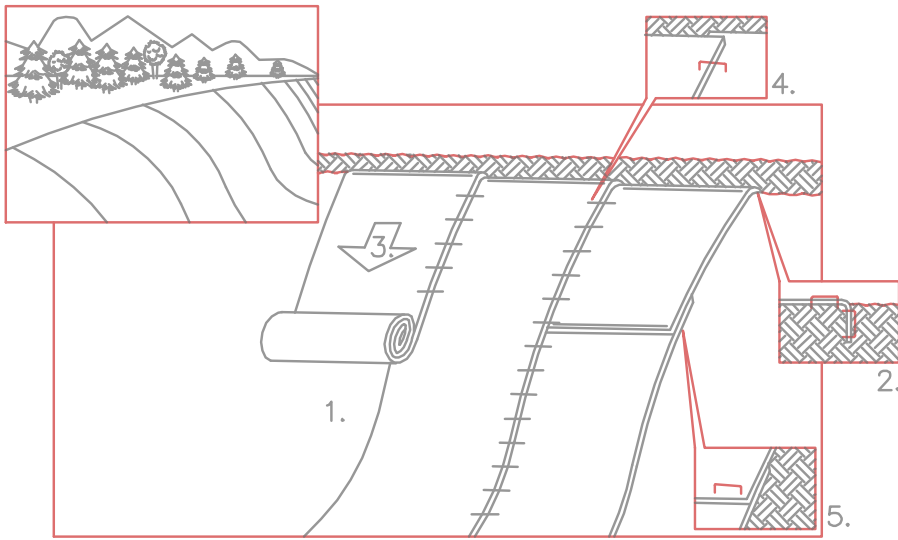
1. TEMPORARY PEROUS BARRIERS USING BALES OF STRAW (STRAW BALE BARRIER DETAIL), HELD IN PLACE WITH STAKES DRIVEN THROUGH THE BALES AND INTO THE GROUND OR SEDIMENT GEOTEXTILE FASTENED TO A FENCE POST AND BURIED INTO THE GROUND, SHALL BE INSTALLED AND MAINTAINED AS REQUIRED TO CHECK EROSION AND REDUCE SEDIMENTATION.

CONSTRUCTION:

1. BALES SHOULD BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED INTO THE SOIL A MINIMUM OF FOUR (4") INCHES.
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY WOOD STAKES OR REINFORCEMENT BARS DRIVEN THROUGH THE BALES AND INTO THE GROUND. THE FIRST STAKE IN EACH BALE SHALL BE ANGLED TOWARD THE PREVIOUSLY LAID BALE TO FORCE BALES TOGETHER.
4. GEOTEXTILE SHALL BE SECURELY ANCHORED AT THE TOP OF A THREE FOOT (3') HIGH FENCE AND BURIED A MINIMUM OF FOUR INCHES (4") TO THE SOIL. SEAMS BETWEEN SECTIONS OF FILTER FABRIC SHALL OVERLAP A MINIMUM OF TWO FEET (2').

INSTALLATION AND MAINTENANCE:

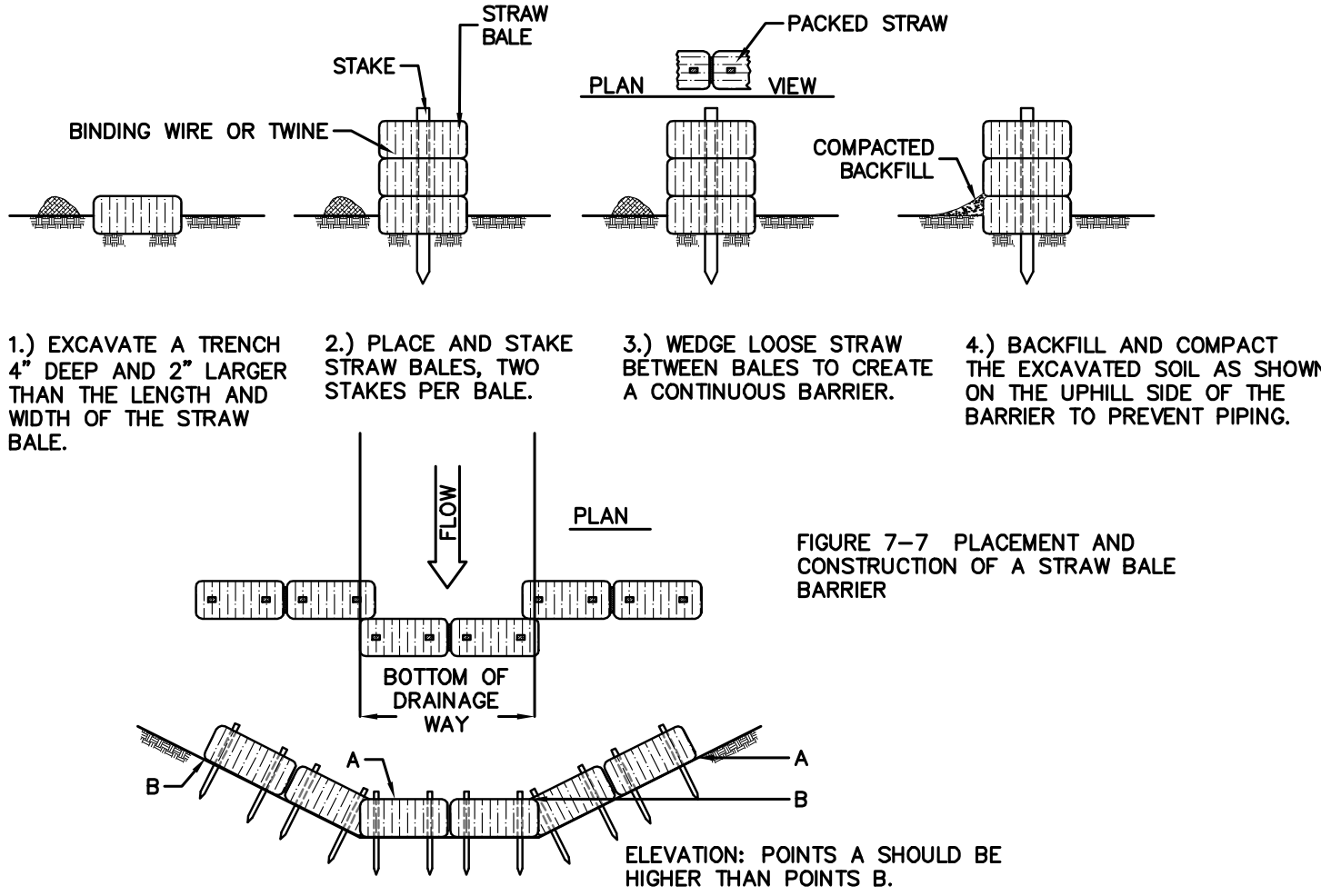
1. BALED HAY EROSION BARRIERS SHALL BE INSTALLED AT ALL STORM SEWER INLETS WHEN BASIN IS BOTTOM OF ALL SLOPES.
2. BALED HAY EROSION BARRIERS AND SEDIMENT FILTER FENCE SHALL BE INSTALLED AT THE LOCATION INDICATED ON THE PLAN AND IN ADDITIONAL AREAS AS MAY BE DEEMED APPROPRIATE DURING CONSTRUCTION.
3. ALL EROSION CHECKS SHALL BE MAINTAINED UNTIL ADJACENT AREAS ARE STABILIZED.
4. INSPECTION SHALL BE FREQUENT (AT MINIMUM WEEKLY AND BEFORE AND AFTER HEAVY RAIN) AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
5. EROSION CHECKS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORMWATER FLOW OR DRAINAGE.



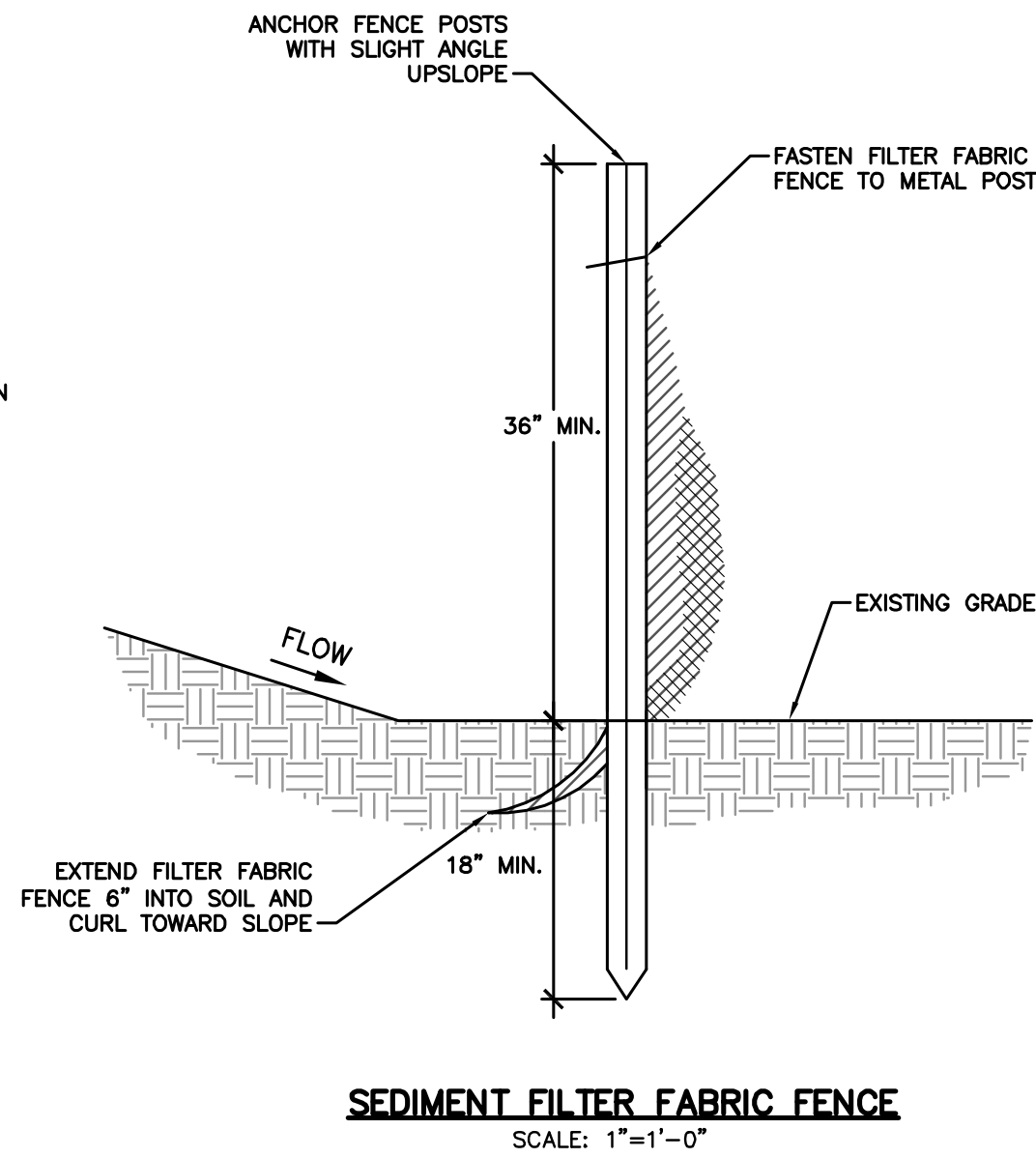
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING SCC225, DO NOT SEED PREPARED AREA. SCC225 MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
3. ROLL THE BLANKETS DOWN THE SLOPE IN THE DIRECTION OF THE WATER FLOW.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2" OVERLAP.
5. WHEN BLANKETS MUST BE SPICED DOWN THE SLOPE, PLACE BLANKETS END OVER END (SHINGLE STYLE) WITH APPROXIMATELY 6" OVERLAP. STAPLE THROUGH OVERLAP AREA, APPROXIMATELY 12" APART.

REFER TO GENERAL STAPLE PATTERN GUIDE IN NORTH AMERICAN GREEN CATALOG FOR CORRECT STAPLE PATTERN RECOMMENDATIONS FOR SLOPE INSTALLATIONS.

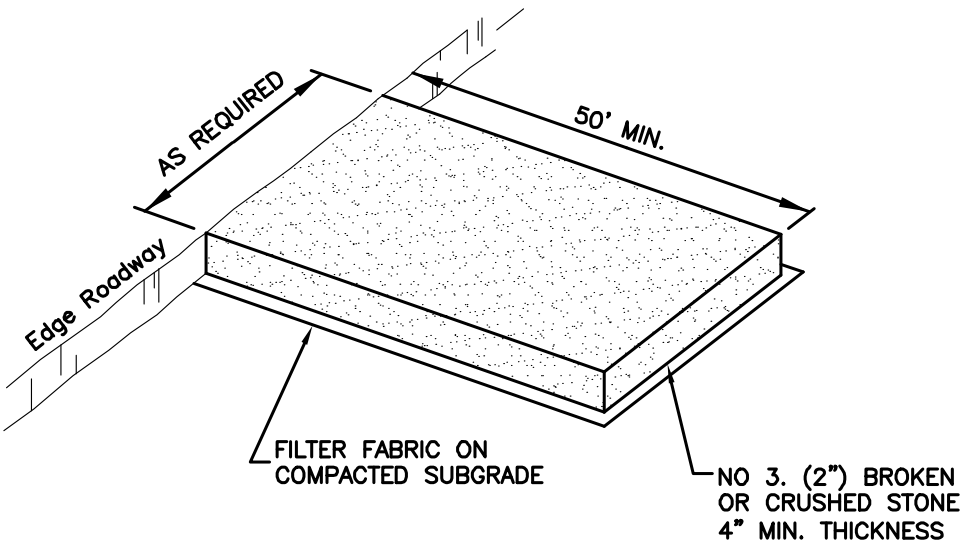
APPLICATION OF EROSION CONTROL  
BLANKET ON SLOPES  
NOT TO SCALE



PLACEMENT & CONSTRUCTION OF  
A STRAW BALE BARRIER  
N.T.S.



SEDIMENT FILTER FABRIC FENCE  
SCALE: 1"=1'-0"



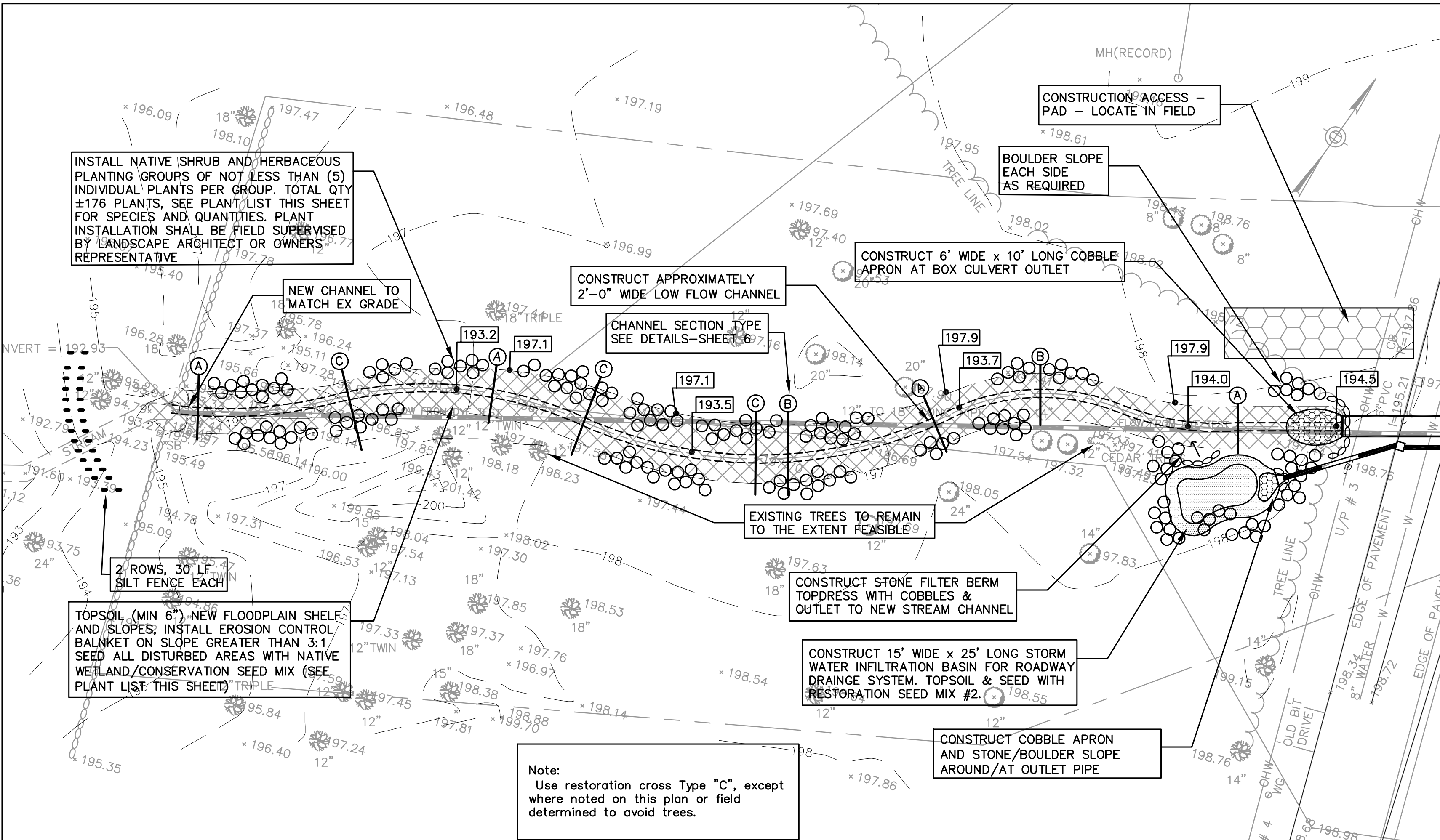
NOTE:  
CONSTRUCTION ENTRANCE PAD SHALL BE INSTALLED AND MAINTAINED DURING OPERATIONS WHICH PROMOTE VEHICULAR TRACKING OF MUD.

CONSTRUCTION ENTRANCE PAD  
N.T.S.

RESTORATION SEED MIX SCHEDULE

1. SEED MIX # 1 - STREAMBANK RESTORATION AREAS (SLOPES LESS THAN 3:1) - MIX SHALL BE NEW ENGLAND EROSION CONTROL/RESTORATION MIX BY NEW ENGLAND WETLAND PLANTS, INC., 800 MAIN ST., AMHERST MA 01002, (413) 256-1752 OR APPROVED EQUAL. SEEDING RATE: 25 POUND PER ACRE
2. SEED MIX # 2 - GRASS AREAS AND EMBANKMENTS OF 3:1 OR GRATER - MIX SHALL BE NEW ENGLAND NATIVE WARM SEASON GRASS MIX BY NEW ENGLAND WETLAND PLANTS, INC., 800 MAIN ST., AMHERST MA 01002, (413) 256-1752 OR APPROVED EQUAL. SEEDING RATE 25 POUND PER ACRE.

RESTORATION AREA	SHRUBS	QTY	SYM	SCIENTIFIC NAME	COMMON NAME	SIZE	DESCRIPTION
TOTAL 176	22	WAA	Aronia arbutifolia	Red Chokeberry	18"-24" HT.	B & B, Full & Dense	
	22	WCL	Clethra alnifolia	Sweet Pepperbush	3'-4' HT.	B & B, Full & Dense	
	22	WCA	Cornus amomum	Silky Dogwood	3'-4' HT.	B & B, Full & Dense	
	22	WCR	Cornus racemosa	Grey Dogwood	3'-4' HT.	B & B, Full & Dense	
	22	WIV	Ilex verticillata	Winterberry	2'-3' HT.	B & B, Full & Dense	
	22	WMP	Myrica pensylvanica	Bayberry	2'-3' HT.	B & B, Full & Dense	
	22	WSL	Spirea latifolia	Meadowsweet	18"-24" SP.	B & B, Full & Dense	
	22	WVD	Viburnum dentatum	Arrowood	3'-4' HT.	B & B, Full & Dense	



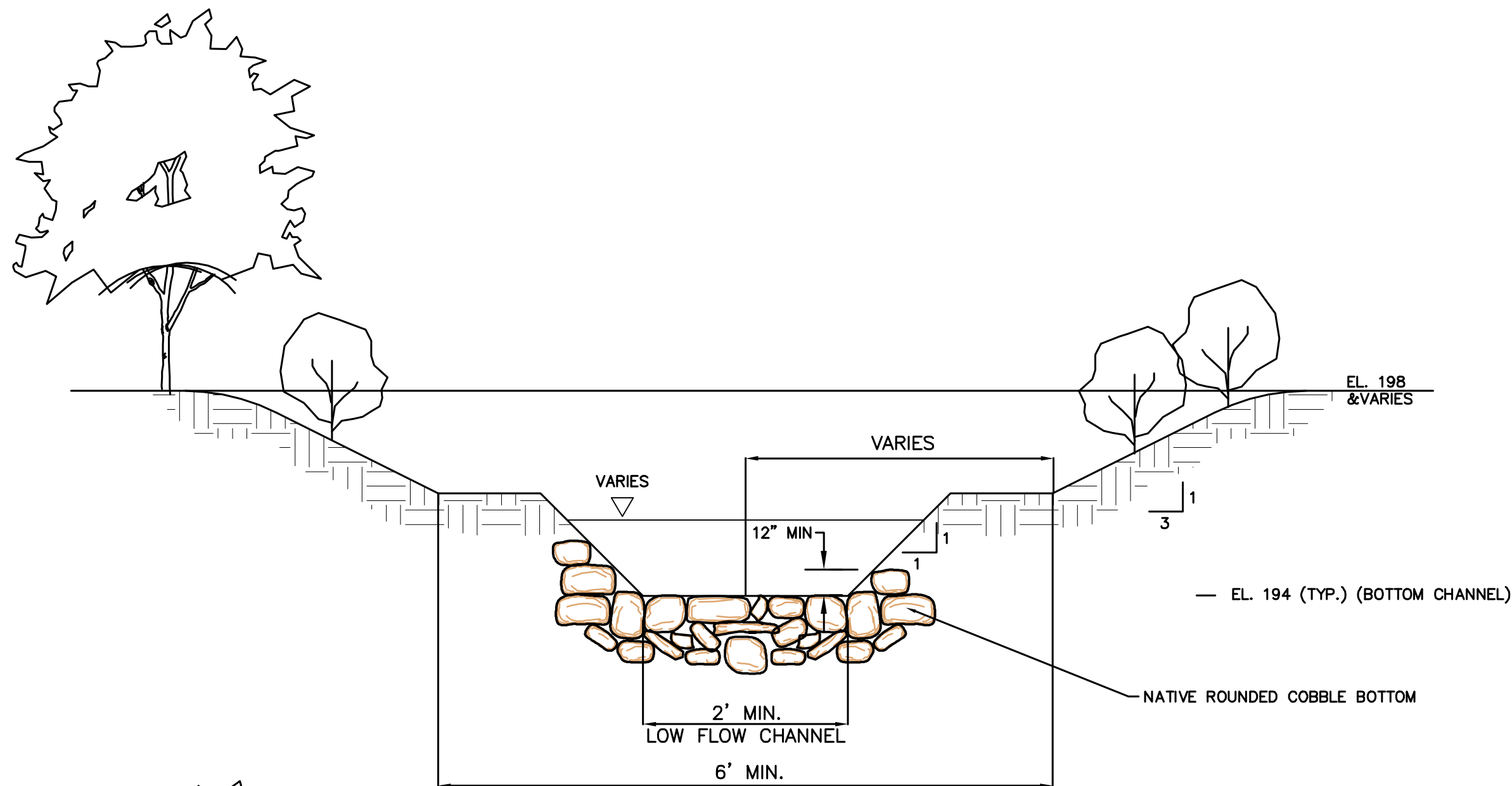
Note:  
Use restoration cross Type "C", except where noted on this plan or field determined to avoid trees.

STREAM RESTORATION DETAIL

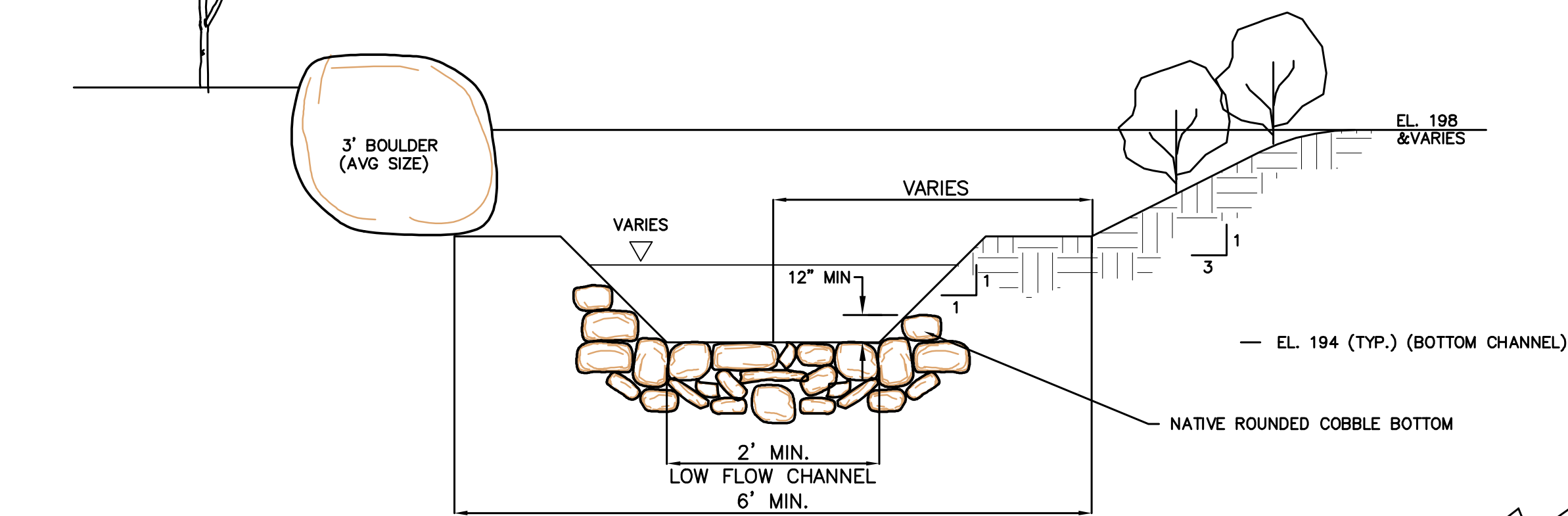
SCALE: 1"=20'

REVISIONS	6/30/05
PD COMMENTS	

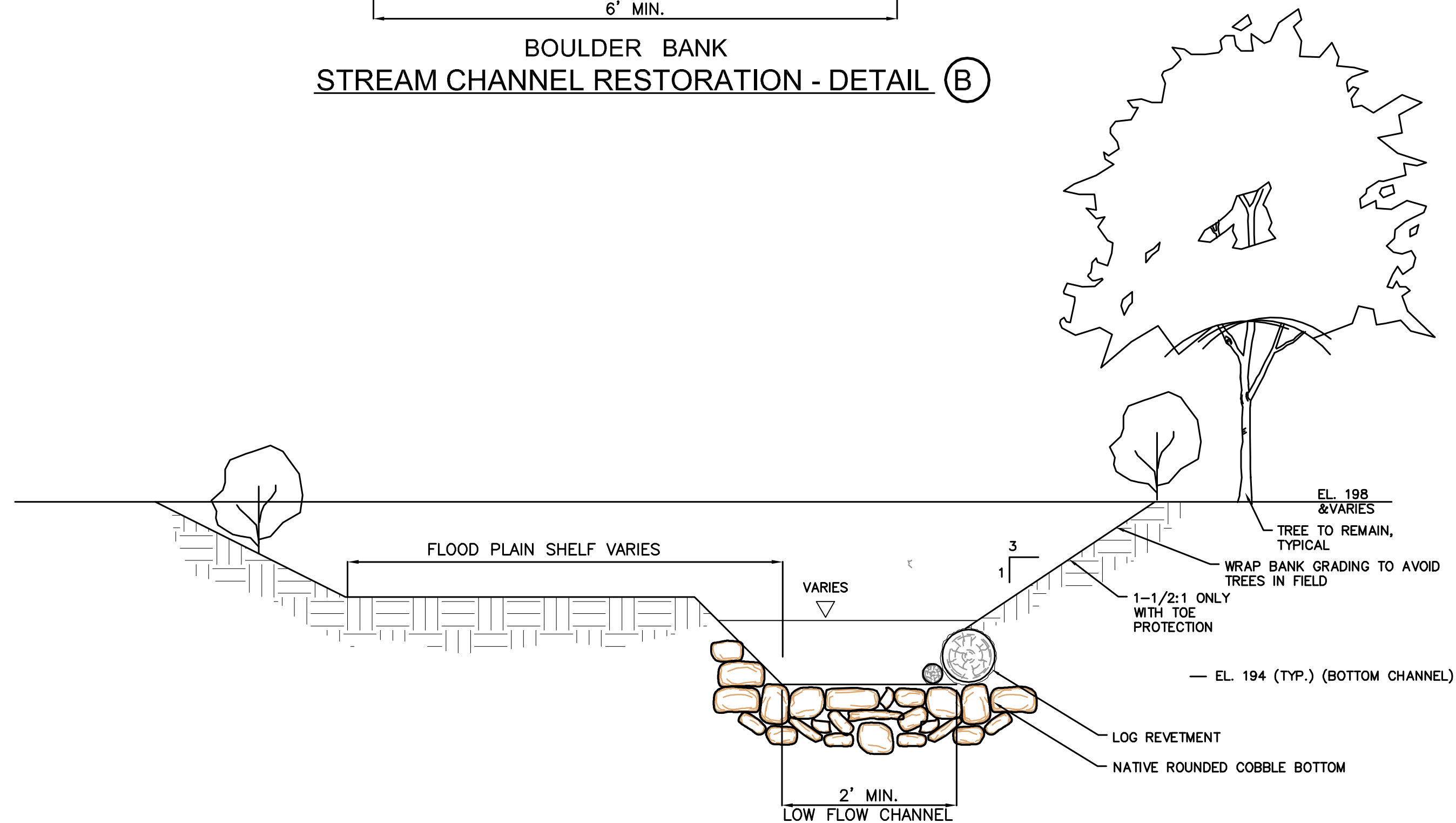




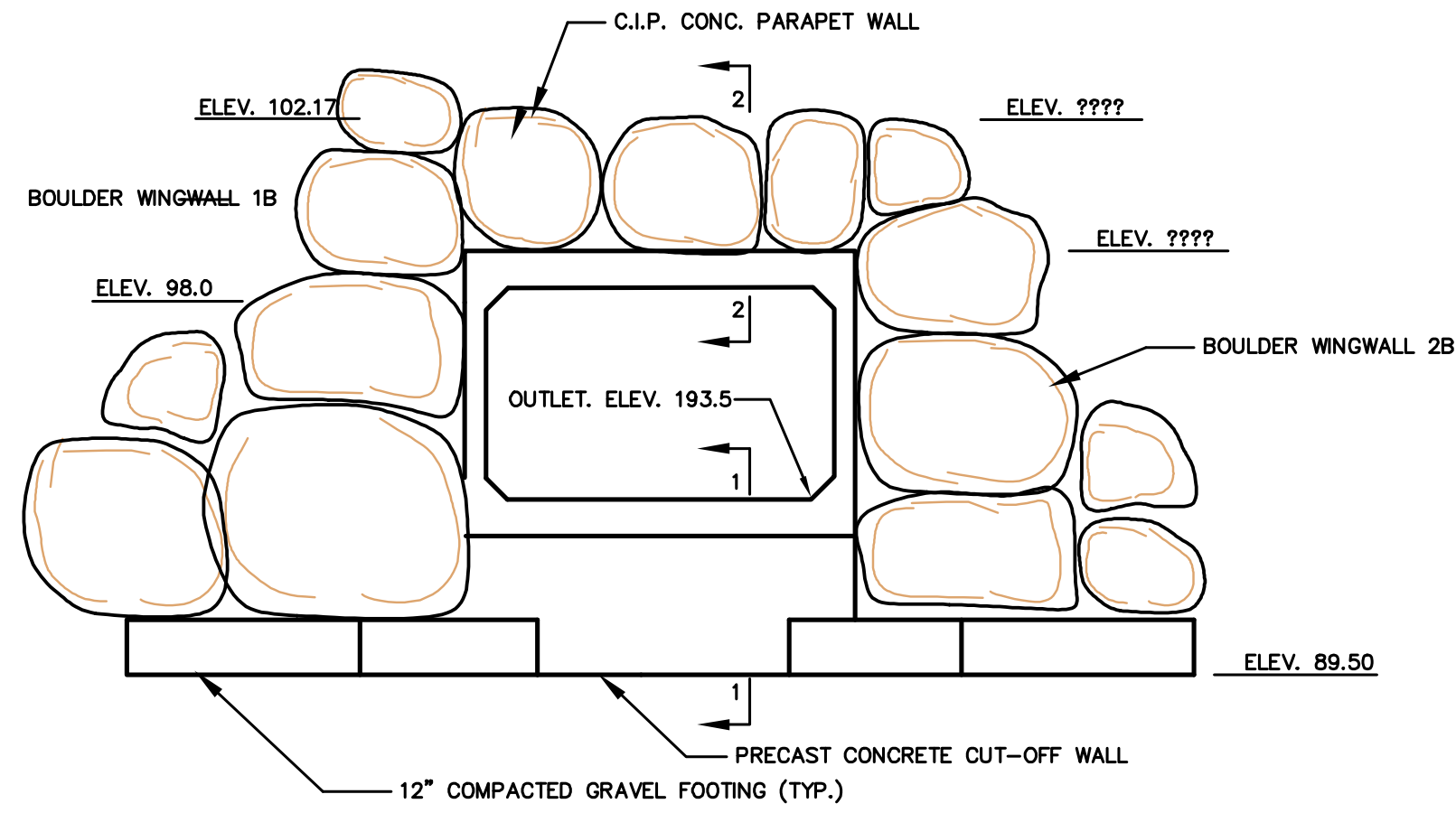
EARTH SECTION  
STREAM CHANNEL RESTORATION - DETAIL (A)



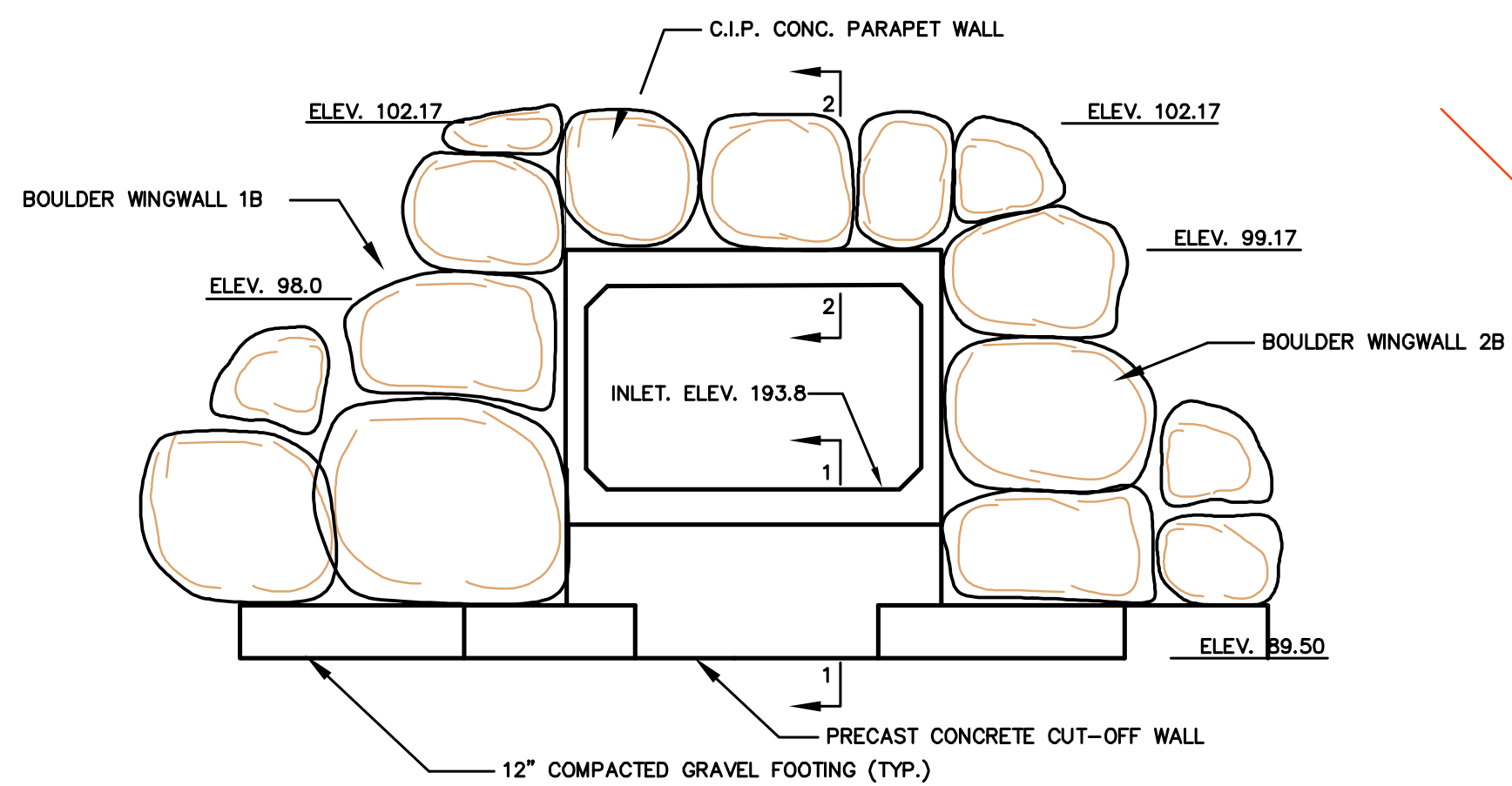
BOULDER BANK  
STREAM CHANNEL RESTORATION - DETAIL (B)



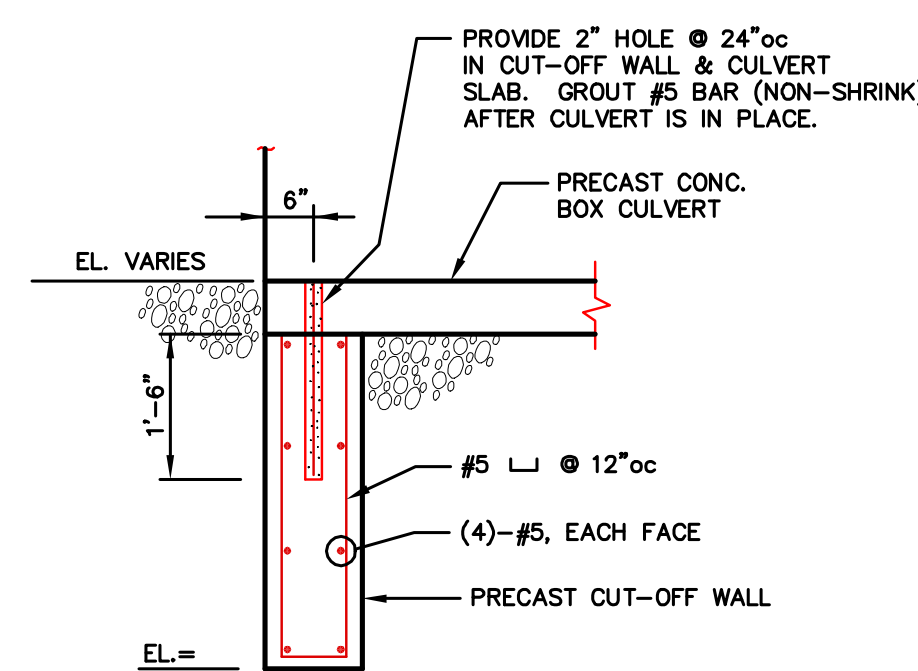
ASYMMETRIC SECTION  
STREAM CHANNEL RESTORATION - DETAIL (C)



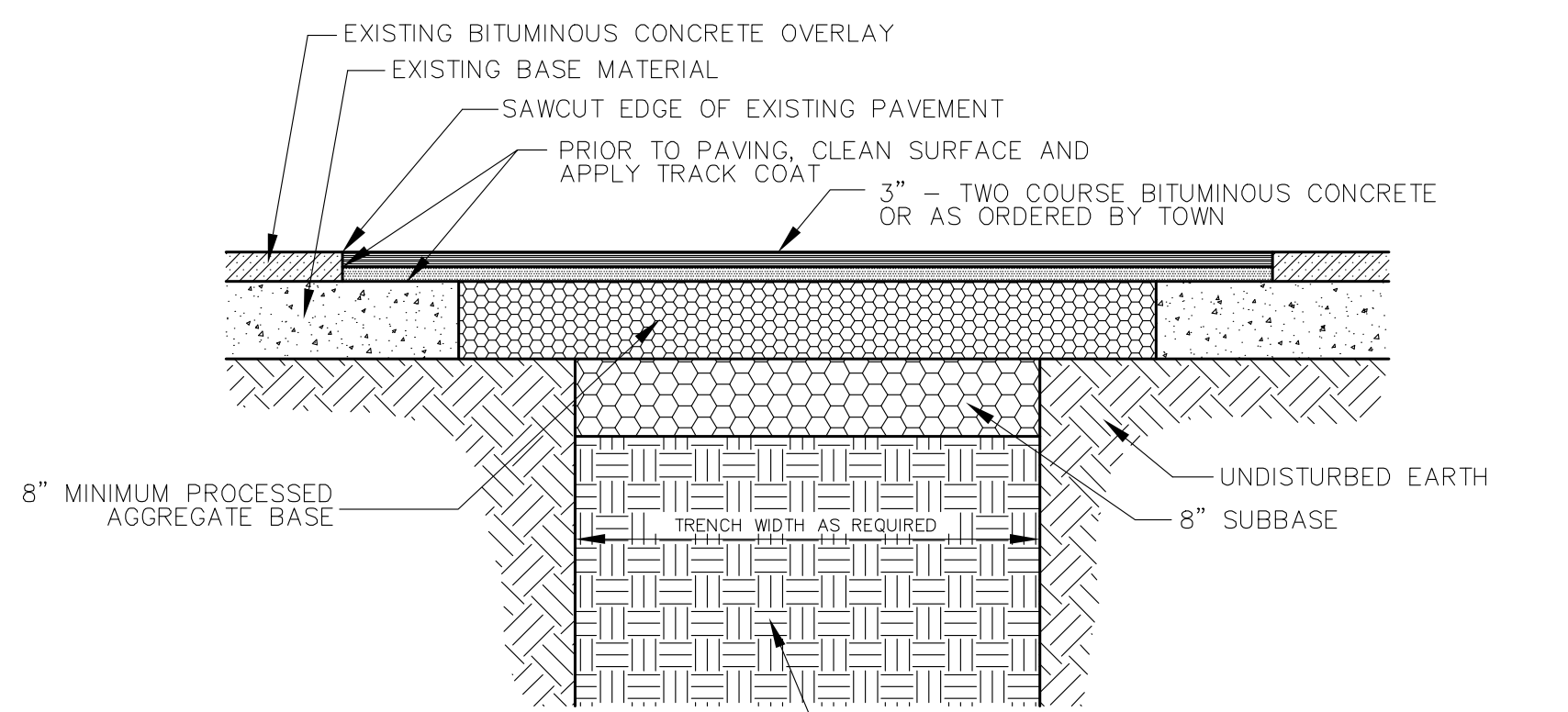
ELEV. WEST END  
NOT TO SCALE  
(BOULDER ENDWALL)



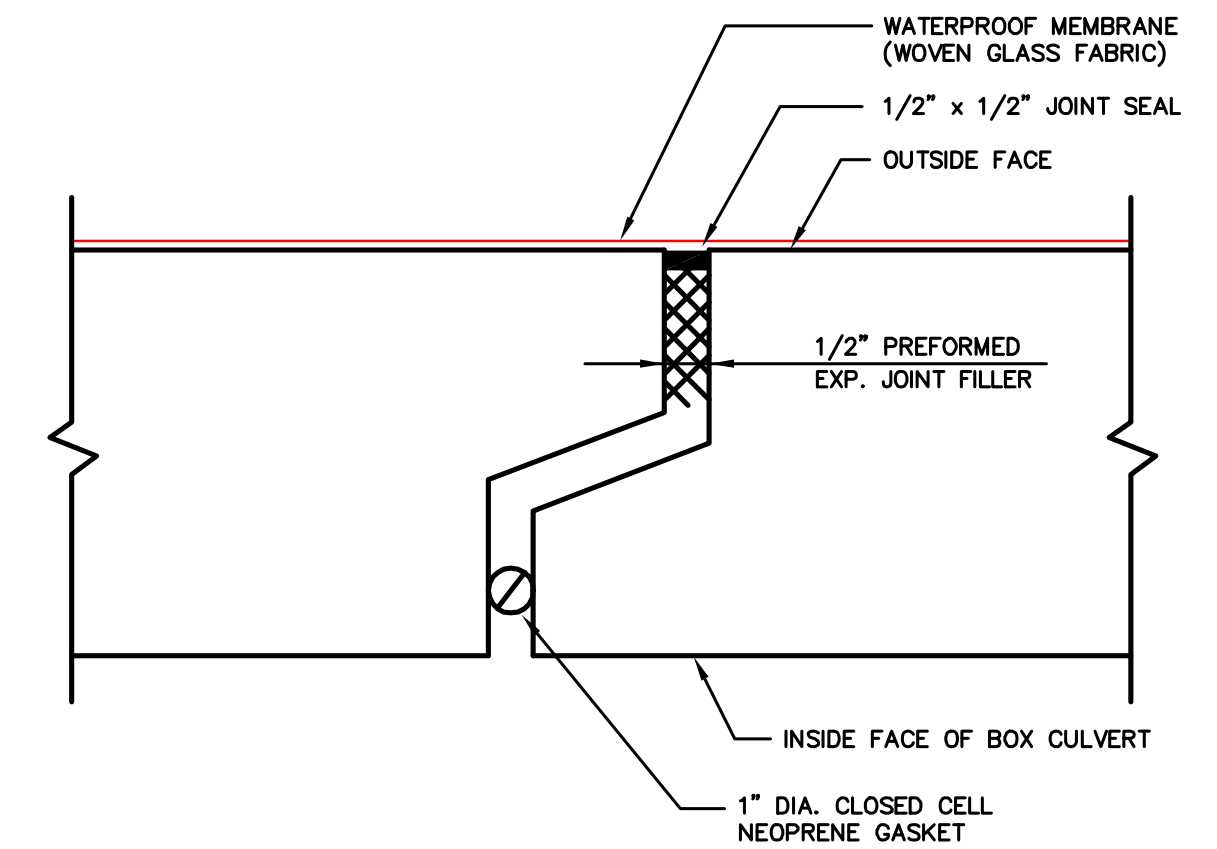
ELEV. EAST END  
NOT TO SCALE  
(BOULDER ENDWALL)



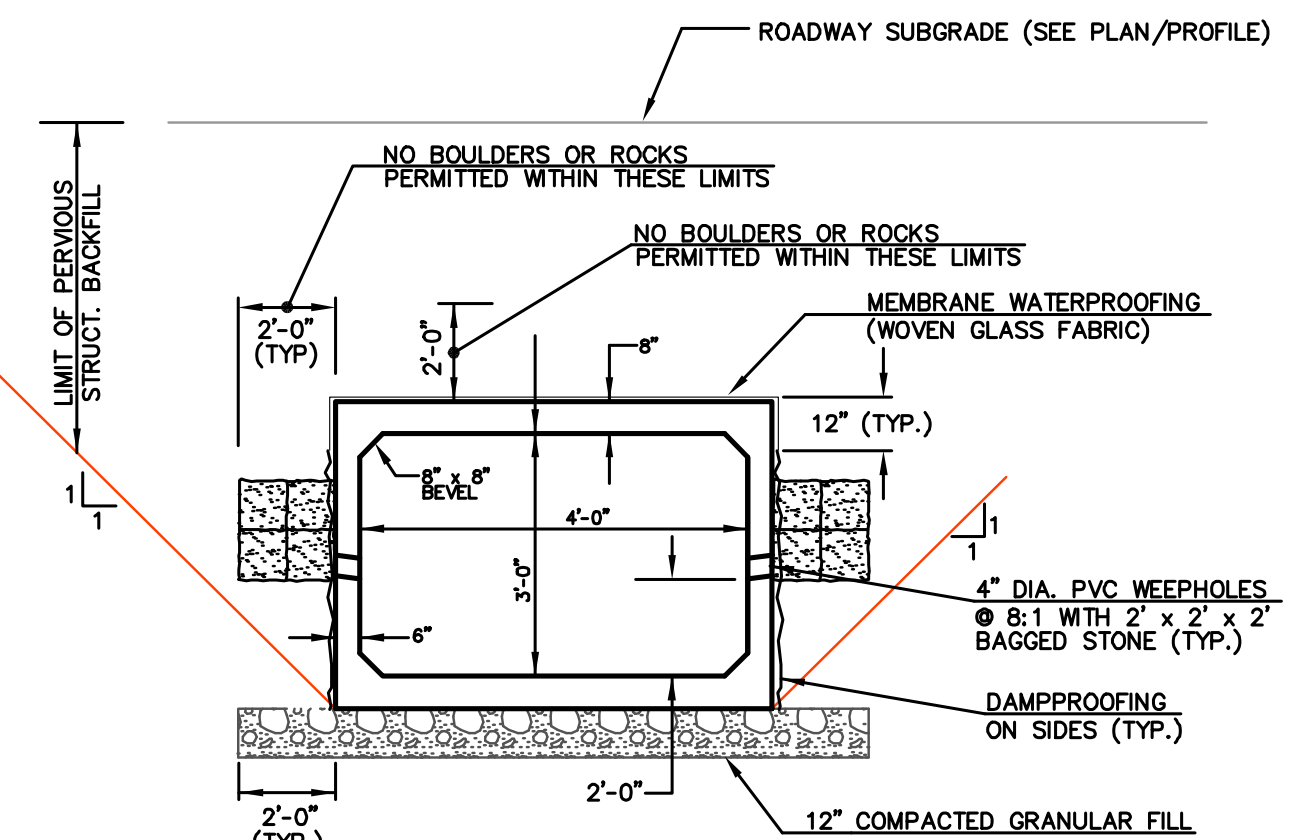
CUT OF WALL DETAIL  
N.T.S.



PERMANENT PAVEMENT REPAIR  
N.T.S.

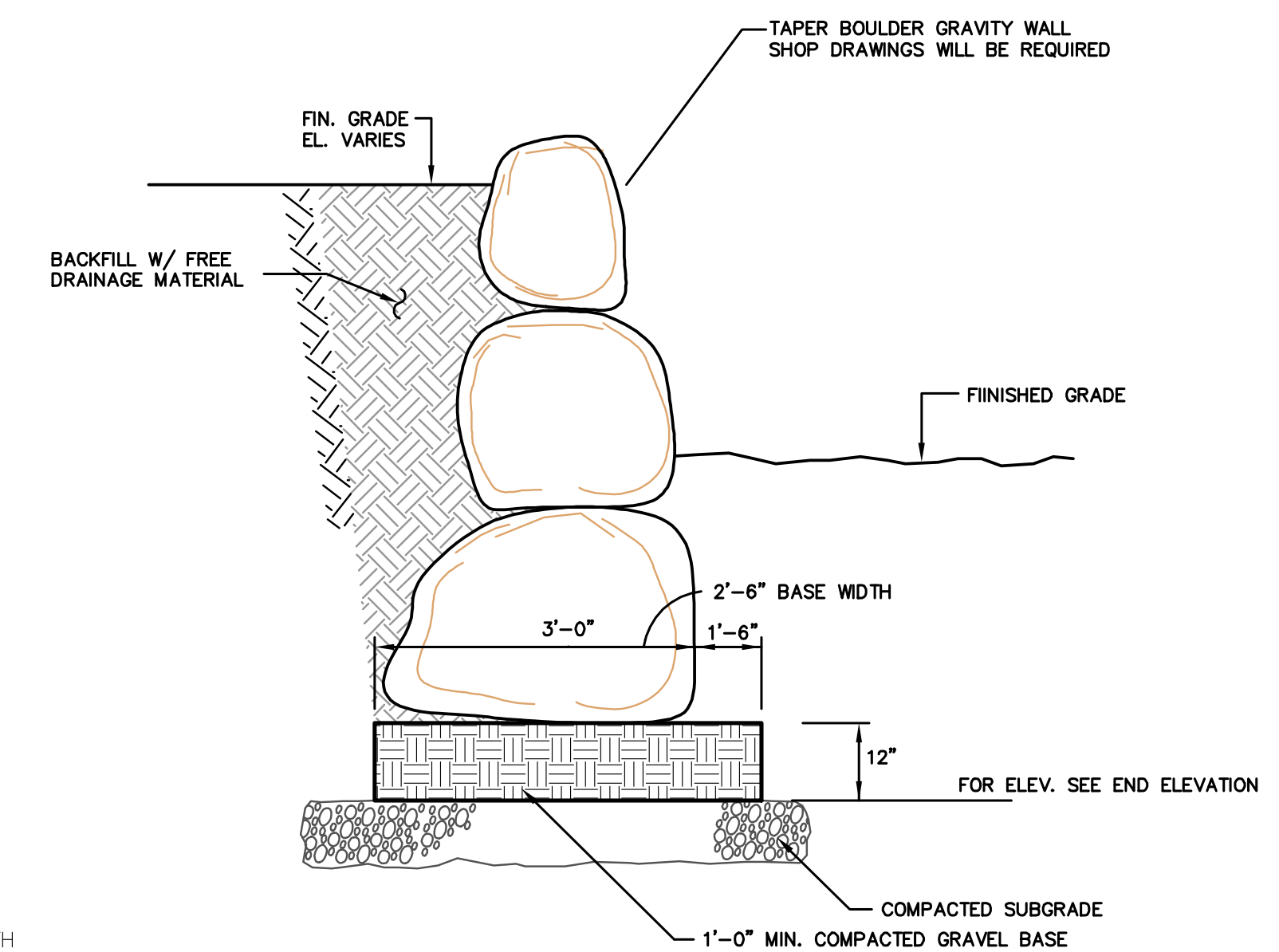


TYP. JOINT BETWEEN  
PRECAST CONC. SEGMENTS  
NOT TO SCALE



NOTE:  
CULVERT WALL AND SLAB THICKNESSES SHALL  
BE DETAILED PER SPECIFIED PRECASTER AT FINAL DESIGN  
APPROVED EQUAL & SHOP DRAWINGS WILL BE REQUIRED

TYPICAL BOX CULVERT SECTION  
NOT TO SCALE



SECTION THRU BOULDER ENDWALL - TYPICAL  
NOT TO SCALE

REVISIONS	6/24/05
PD COMMENTS	

JGM DESIGNED	MRA DRAWN	JGM CHECKED
SCALE	AS SHOWN	
DATE	JUNE 10, 2005	
PROJECT NO.	2144-07	