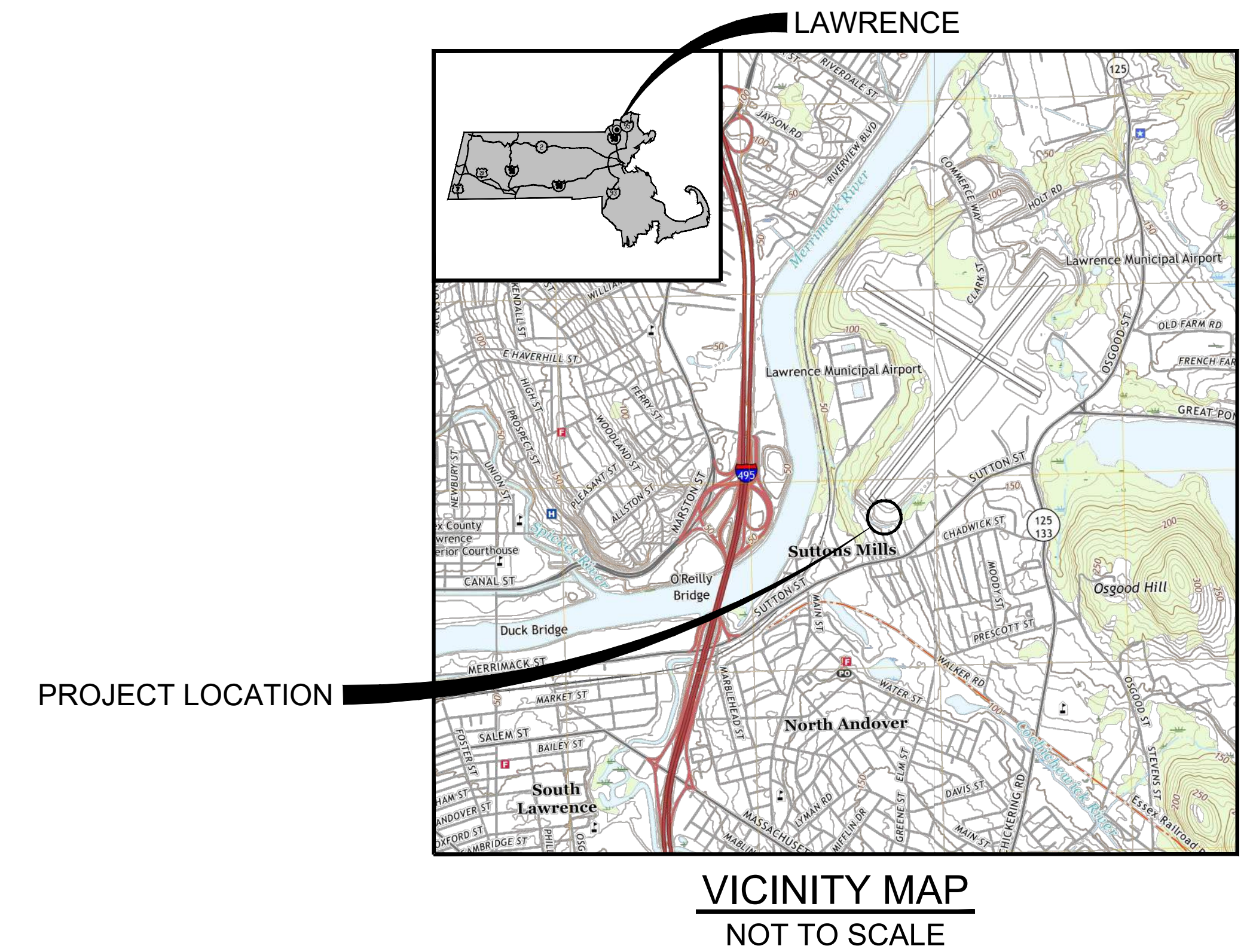




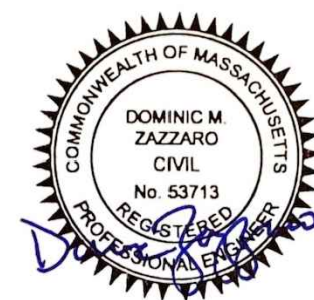
LAWRENCE MUNICIPAL AIRPORT NORTH ANDOVER, MASSACHUSETTS



RUNWAY 5 END DRAINAGE IMPROVEMENTS

FEBRUARY 12, 2025
STANTEC PROJECT NO. 179450605

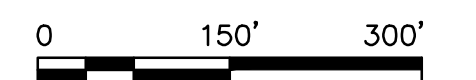
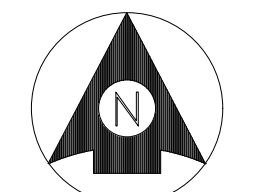
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FEBRUARY 12, 2025



INDEX OF SHEETS

SHEET NO.	DWG. NO.	TITLE
1	T001	TITLE SHEET
2	G001	GENERAL SITE PLAN
3	G002	GENERAL NOTES
4	G101	SAFETY & PHASING PLAN
5	G102	SAFETY & PHASING NOTES & DETAILS
6	V101	EXISTING CONDITIONS PLAN
7	C101	LAYOUT PLAN
8	C102	VEGETATION REMOVAL PLAN
9	C201	GRADING PLAN & PROFILE
10	C301	DRAINAGE PLAN
11	C302	DRAINAGE DETAILS
12	C401	STREAM RESTORATION & EROSION CONTROL PLAN
13	C402	STREAM RESTORATION - TYPICAL SECTIONS
14	C403	STREAM RESTORATION - NOTES & DETAILS
15	C404	EROSION CONTROL DETAILS - 1
16	C405	EROSION CONTROL DETAILS - 2
17	C406	EROSION CONTROL NOTES
18	C501	FENCE PLAN & DETAILS
19	C601	CROSS SECTIONS - 1
20	C602	CROSS SECTIONS - 2
21	E101	ELECTRICAL PLAN & DETAILS

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Revision	By	Appd.	YY.MM.DD
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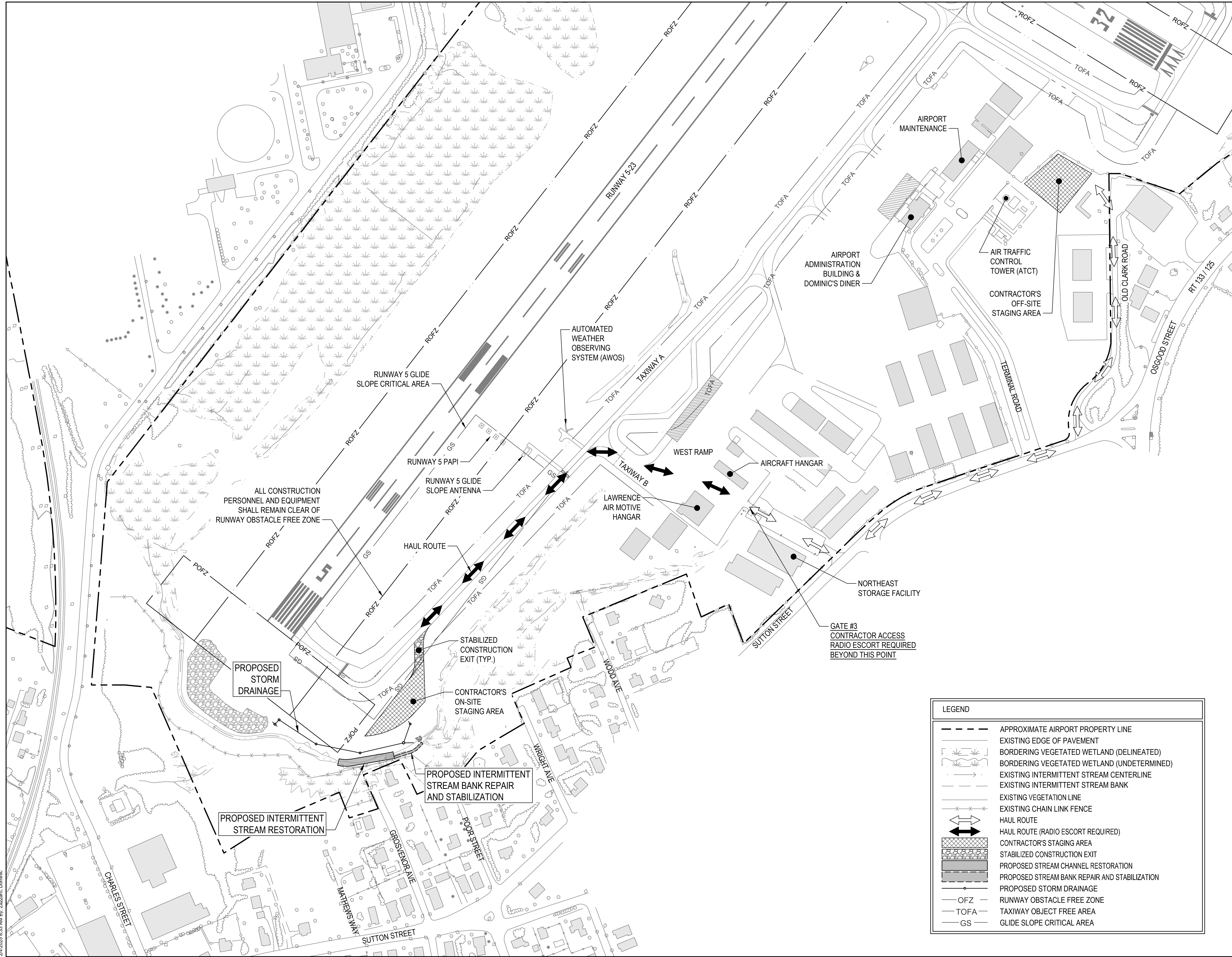
Client/Project
 LAWRENCE MUNICIPAL AIRPORT
 NORTH ANDOVER, MA
 RUNWAY 5 END
 DRAINAGE IMPROVEMENTS

Title
 GENERAL SITE PLAN

Project No.
 179450605

Drawing No. Sheet Revision

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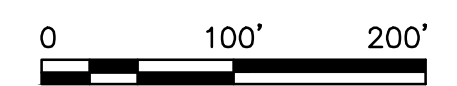
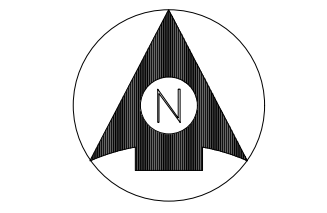
LEGEND

	APPROXIMATE AIRPORT PROPERTY LINE
	EXISTING EDGE OF PAVEMENT
	BORDERING VEGETATED WETLAND (DELINEATED)
	BORDERING VEGETATED WETLAND (UNDETERMINED)
	EXISTING INTERMITTENT STREAM CENTERLINE
	EXISTING INTERMITTENT STREAM BANK
	EXISTING VEGETATION LINE
	EXISTING CHAIN LINK FENCE
	HAUL ROUTE
	HAUL ROUTE (RADIO ESCORT REQUIRED)
	CONTRACTOR'S STAGING AREA
	STABILIZED CONSTRUCTION EXIT
	PROPOSED STREAM CHANNEL RESTORATION
	PROPOSED STREAM BANK REPAIR AND STABILIZATION
	PROPOSED STORM DRAINAGE
	OFZ - RUNWAY OBSTACLE FREE ZONE
	TOFA - TAXIWAY OBJECT FREE AREA
	GS - GLIDE SLOPE CRITICAL AREA

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PLAN IS INTENDED TO BE VIEWED IN COLOR



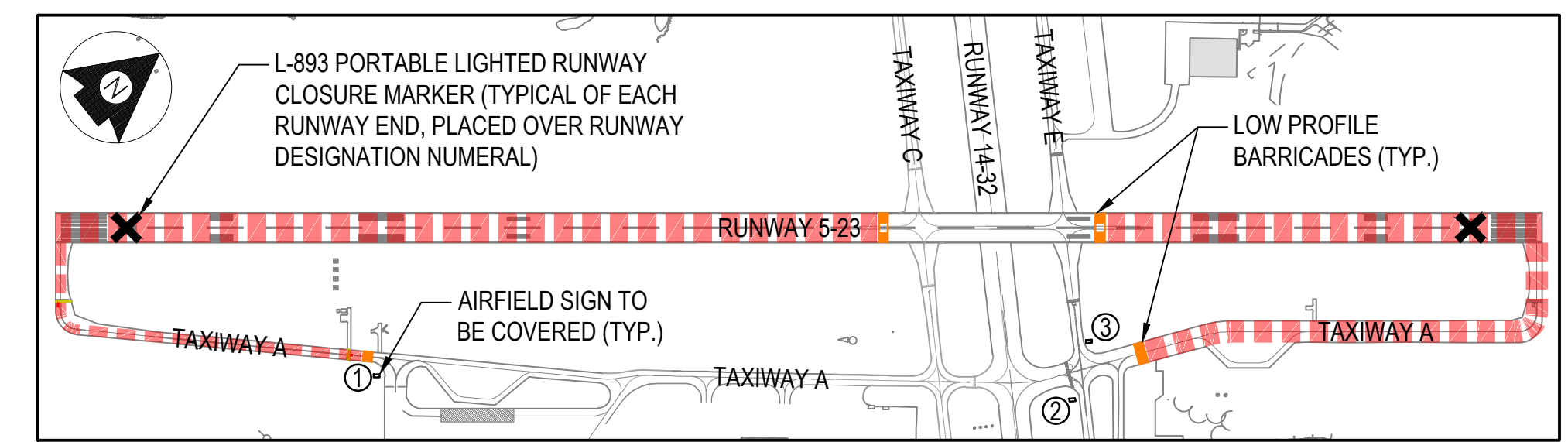
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Client/Project
 LAWRENCE MUNICIPAL AIRPORT
 NORTH ANDOVER, MA
 RUNWAY 5 END
 DRAINAGE IMPROVEMENTS

Title
 SAFETY & PHASING PLAN

Project No.
 179450605
 Drawing No. Sheet Revision



RUNWAY/TAXIWAY CLOSURE PLAN

SIGN BLACKOUTS	
SIGN NUMBER	SIGN LEGEND A
1	
2	
3	

**PHASE 0:
 (PROCUREMENT/MOBILIZATION)**

- MAJOR ITEMS:**
- PERFORM REQUIRED TOPOGRAPHIC SURVEY AND ESTABLISH BASELINE/BENCHMARKS.
 - PREPARE SPCD AND OTHER SUBMITTALS FOR REVIEW AND APPROVAL.
 - PROCURE LONG LEAD MATERIALS
 - PERFORM ANY SUBSURFACE EXPLORATIONS REQUIRED TO DETERMINE THE EXISTING SOIL CHARACTERISTICS.
 - LOCATE ALL SUBSURFACE UTILITIES WITHIN THE PROPOSED CONSTRUCTION LIMITS.

PHASE 1:

- WORK AREAS: A & B**
DURATION: 5 CONSECUTIVE CALENDAR DAYS
WORK SCHEDULE:
- MONDAY - FRIDAY: 7:00 AM - 5:00 PM
 - SATURDAY: NO WORK
 - SUNDAY: NO WORK

- RUNWAY CLOSURES:**
- RUNWAY 5-23
- RUNWAY CLOSURE NOTES:**
- RUNWAY SHALL BE CLOSED FOR A MAXIMUM OF 1 DAY DURING THIS PHASE.
 - RUNWAY CLOSURE IS REQUIRED FOR EROSION CONTROL INSTALLATION IN WORK AREA B.
 - RUNWAY CLOSURE REQUESTS SHALL BE SUBMITTED VIA EMAIL TO THE AIRPORT MANAGER THROUGH THE RPR A MINIMUM OF 7 DAYS IN ADVANCE.
 - RUNWAY SHALL BE REOPENED AT THE END OF THE WORK SHIFT.

- TAXIWAY CLOSURES:**
- TAXIWAY A BETWEEN TAXIWAY B AND RUNWAY 5
 - TAXIWAY A BETWEEN TAXIWAY E AND RUNWAY 23

- TAXIWAY CLOSURE NOTES:**
- TAXIWAYS SHALL ONLY BE CLOSED WHEN RUNWAY 5-23 IS CLOSED UNLESS OTHERWISE APPROVED BY THE AIRPORT MANAGER.

- MAJOR WORK ITEMS:**
- PLACE BARRICADES, RUNWAY CLOSURE MARKERS AND COVER SIGNS AS REQUIRED FOR RUNWAY/TAXIWAY CLOSURES
 - INSTALL SAFETY FENCE AND SIGNAGE
 - INSTALL EROSION CONTROLS
 - INSTALL CONSTRUCTION EXIT

- NOTES:**
- SEE ADDITIONAL NOTES AND REQUIREMENTS THIS SHEET.
 - ALL EROSION CONTROLS SHALL BE INSTALLED AND INSPECTED BY THE RPR AND THE NORTH ANDOVER CONSERVATION COMMISSION PRIOR TO COMMENCING PHASE 2 WORK.

PHASE 2:

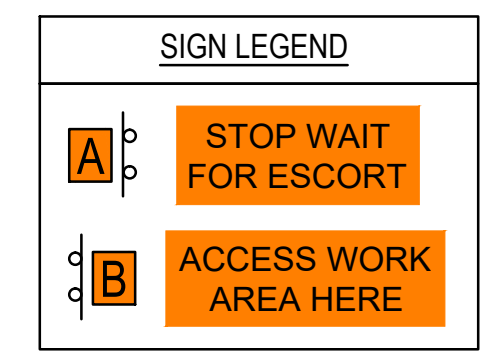
- WORK AREA: A**
DURATION: 5 CONSECUTIVE CALENDAR DAYS (MAY BE CONCURRENT WITH PHASE 3)
WORK SCHEDULE:
- MONDAY - FRIDAY: 7:00 AM - 5:00 PM
 - SATURDAY: 7:00 AM - 3:00 PM (AS NEEDED)
 - SUNDAY: NO WORK

- RUNWAY CLOSURES:**
- RUNWAY 5-23
- RUNWAY CLOSURE NOTES:**
- RUNWAY SHALL ONLY BE CLOSED WHEN WORKING WITHIN WORK AREA B
 - RUNWAY CLOSURE REQUESTS SHALL BE SUBMITTED VIA EMAIL TO THE AIRPORT MANAGER THROUGH THE RPR A MINIMUM OF 7 DAYS IN ADVANCE.
 - RUNWAY SHALL BE REOPENED AT THE END OF EACH WORK SHIFT

- TAXIWAY CLOSURES:**
- TAXIWAY A BETWEEN TAXIWAY B AND RUNWAY 5
 - TAXIWAY A BETWEEN TAXIWAY E AND RUNWAY 23

- MAJOR WORK ITEMS:**
- PLACE BARRICADES, RUNWAY CLOSURE MARKERS AND COVER SIGNS AS REQUIRED FOR RUNWAY/TAXIWAY CLOSURES
 - INSTALL DRAINAGE PIPE AND MANHOLES

- NOTES:**
- SEE ADDITIONAL NOTES AND REQUIREMENTS THIS SHEET.



NOTE:
 REFER TO DRAWING G102 FOR SIGN DETAILS

PHASE 3:

- WORK AREA: B**
DURATION: 35 CONSECUTIVE CALENDAR DAYS
WORK SCHEDULE:
- MONDAY - FRIDAY: 7:00 AM - 5:00 PM
 - SATURDAY: 7:00 AM - 3:00 PM (AS NEEDED)
 - SUNDAY: NO WORK

- RUNWAY CLOSURES:**
- NONE

- TAXIWAY CLOSURES:**
- TAXIWAY A BETWEEN TAXIWAY B AND RUNWAY 5 AS APPROVED BY AIRPORT MANAGER

- TAXIWAY CLOSURE NOTES:**
- THE CONTRACTOR MAY REQUEST A PARTIAL CLOSURE OF TAXIWAY A BETWEEN TAXIWAY B AND RUNWAY 5 FOR A PARTICULAR DAY OR TIME IF IT IS DETERMINED BY THE RPR AND THE AIRPORT MANAGER THAT THE CLOSURE IS JUSTIFIED BASED ON THE NEED.
 - ALL TAXIWAY CLOSURE REQUESTS SHALL BE SUBMITTED VIA EMAIL TO THE AIRPORT MANAGER THROUGH THE RPR A MINIMUM OF 24 HOURS IN ADVANCE. APPROVAL OF CLOSURE REQUESTS WILL BE AT THE DISCRETION OF THE AIRPORT MANAGER AND WILL BE BASED ON THE PREDICTED WIND AND WEATHER AND THE OPERATIONAL NEED OF THE TAXIWAY FOR THE SPECIFIC DAY OR TIME THE CLOSURE IS BEING REQUESTED FOR.
 - WHEN A TAXIWAY CLOSURE REQUEST IS APPROVED, LOW PROFILE BARRICADES SHALL BE PLACED AT LOCATIONS AS SHOWN ON THE PLAN IMMEDIATELY FOLLOWING NOTIFICATION FROM THE AIRPORT MANAGER THAT THE TAXIWAY HAS BEEN CLOSED.
 - THE TAXIWAY SHALL BE VACUUM SWEEPED CLEAN AND SHALL BE FREE OF ALL FOREIGN OBJECT DEBRIS (FOD) PRIOR TO REQUESTING A REOPENING INSPECTION BY THE AIRPORT MANAGER. ALL BARRICADES SHALL REMAIN IN PLACE UNTIL THE AIRPORT MANAGER HAS INSPECTED THE PAVEMENT AND APPROVED THE REMOVAL OF THE BARRICADES.

- MAJOR WORK ITEMS:**
- PLACE LOW PROFILE BARRICADES FOR TAXIWAY CLOSURE WHEN REQUIRED (SEE TAXIWAY CLOSURE NOTES)
 - INSTALL DRAINAGE PIPE AND MANHOLES
 - REMOVE VEGETATION
 - INSTALL STONE CHECK DAM
 - INSTALL SANDBAG DIVERSION DAM AND PUMP
 - EXCAVATION, EMBANKMENT AND PLACEMENT OF SUBBASE MATERIAL FOR STREAM RESTORATION
 - REMOVE AND REPLACE CHAIN LINK FENCE
 - TOPSOIL, SEED AND MULCH
 - INSTALL TURF REINFORCEMENT MAT AND EROSION CONTROL BLANKET

- NOTES:**
- SEE ADDITIONAL NOTES AND REQUIREMENTS THIS SHEET.
 - ALL DRAINAGE PIPE, MANHOLES, SANDBAG DAMS, CHECK DAMS SHALL BE INSTALLED AND OPERATIONAL PRIOR TO COMMENCING ANY WORK WITHIN THE INTERMITTENT STREAM.

PHASE 4:

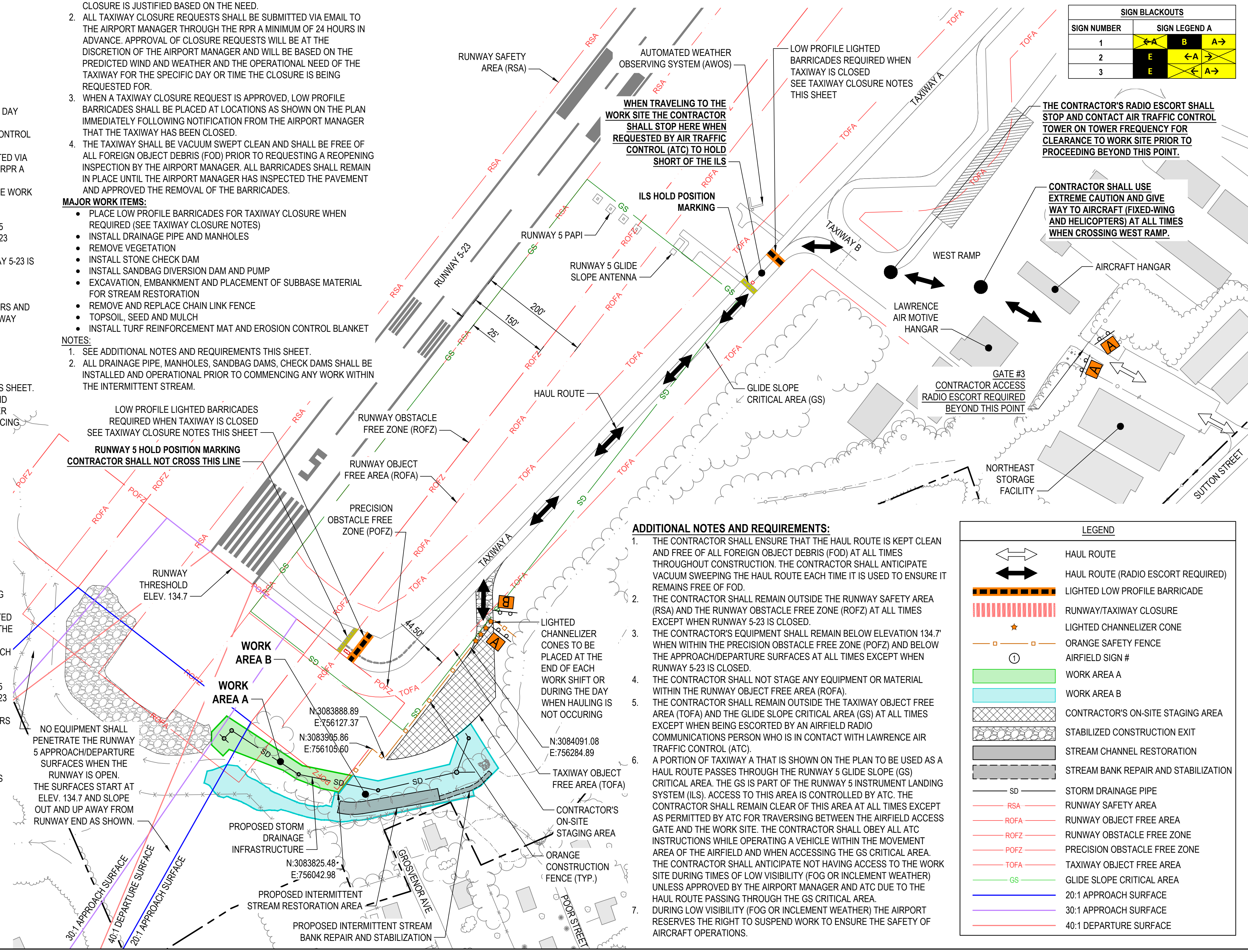
- WORK AREA: B**
DURATION: 5 CONSECUTIVE CALENDAR DAYS
WORK SCHEDULE:
- DECEMBER 1ST - 19TH OR APRIL 1ST - 30TH
 - MONDAY - FRIDAY: 7:00 AM - 5:00 PM
 - SATURDAY: NO WORK
 - SUNDAY: NO WORK

- RUNWAY CLOSURES:**
- NONE

- TAXIWAY CLOSURES:**
- NONE

- MAJOR WORK ITEMS:**
- PLANT LIVE STAKES, STICKERS AND WATTLES

- NOTES:**
- SEE ADDITIONAL NOTES AND REQUIREMENTS THIS SHEET.



ADDITIONAL NOTES AND REQUIREMENTS:

- THE CONTRACTOR SHALL ENSURE THAT THE HAUL ROUTE IS KEPT CLEAN AND FREE OF ALL FOREIGN OBJECT DEBRIS (FOD) AT ALL TIMES THROUGHOUT CONSTRUCTION. THE CONTRACTOR SHALL ANTICIPATE VACUUM SWEEPING THE HAUL ROUTE EACH TIME IT IS USED TO ENSURE IT REMAINS FREE OF FOD.
- THE CONTRACTOR SHALL REMAIN OUTSIDE THE RUNWAY SAFETY AREA (RSA) AND THE RUNWAY OBSTACLE FREE ZONE (ROFZ) AT ALL TIMES EXCEPT WHEN RUNWAY 5-23 IS CLOSED.
- THE CONTRACTOR'S EQUIPMENT SHALL REMAIN BELOW ELEVATION 134.7' WHEN WITHIN THE PRECISION OBSTACLE FREE ZONE (POFZ) AND BELOW THE APPROACH/DEPARTURE SURFACES AT ALL TIMES EXCEPT WHEN RUNWAY 5-23 IS CLOSED.
- THE CONTRACTOR SHALL NOT STAGE ANY EQUIPMENT OR MATERIAL WITHIN THE RUNWAY OBJECT FREE AREA (ROFA).
- THE CONTRACTOR SHALL REMAIN OUTSIDE THE TAXIWAY OBJECT FREE AREA (TOFA) AND THE GLIDE SLOPE CRITICAL AREA (GS) AT ALL TIMES EXCEPT WHEN BEING ESCORTED BY AN AIRFIELD RADIO COMMUNICATIONS PERSON WHO IS IN CONTACT WITH LAWRENCE AIR TRAFFIC CONTROL (ATC).
- A PORTION OF TAXIWAY A THAT IS SHOWN ON THE PLAN TO BE USED AS A HAUL ROUTE PASSES THROUGH THE RUNWAY 5 GLIDE SLOPE (GS) CRITICAL AREA. THE GS IS PART OF THE RUNWAY 5 INSTRUMENT LANDING SYSTEM (ILS). ACCESS TO THIS AREA IS CONTROLLED BY ATC. THE CONTRACTOR SHALL REMAIN CLEAR OF THIS AREA AT ALL TIMES EXCEPT AS PERMITTED BY ATC FOR TRAVERSING BETWEEN THE AIRFIELD ACCESS GATE AND THE WORK SITE. THE CONTRACTOR SHALL OBEY ALL ATC INSTRUCTIONS WHILE OPERATING A VEHICLE WITHIN THE MOVEMENT AREA OF THE AIRFIELD AND WHEN ACCESSING THE GS CRITICAL AREA. THE CONTRACTOR SHALL ANTICIPATE NOT HAVING ACCESS TO THE WORK SITE DURING TIMES OF LOW VISIBILITY (FOG OR INCLEMENT WEATHER) UNLESS APPROVED BY THE AIRPORT MANAGER AND ATC DUE TO THE HAUL ROUTE PASSING THROUGH THE GS CRITICAL AREA.
- DURING LOW VISIBILITY (FOG OR INCLEMENT WEATHER) THE AIRPORT RESERVES THE RIGHT TO SUSPEND WORK TO ENSURE THE SAFETY OF AIRCRAFT OPERATIONS.

LEGEND

	HAUL ROUTE
	HAUL ROUTE (RADIO ESCORT REQUIRED)
	LIGHTED LOW PROFILE BARRICADE
	RUNWAY/TAXIWAY CLOSURE
	LIGHTED CHANNELIZER CONE
	ORANGE SAFETY FENCE
	AIRFIELD SIGN #
	WORK AREA A
	WORK AREA B
	CONTRACTOR'S ON-SITE STAGING AREA
	STABILIZED CONSTRUCTION EXIT
	STREAM CHANNEL RESTORATION
	STREAM BANK REPAIR AND STABILIZATION
	STORM DRAINAGE PIPE
	RUNWAY SAFETY AREA
	RUNWAY OBJECT FREE AREA
	RUNWAY OBSTACLE FREE ZONE
	PRECISION OBSTACLE FREE ZONE
	TAXIWAY OBJECT FREE AREA
	GLIDE SLOPE CRITICAL AREA
	20:1 APPROACH SURFACE
	30:1 APPROACH SURFACE
	40:1 DEPARTURE SURFACE

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SAFETY AND PHASING NOTES:

1. SAFETY/SECURITY PLAN: THE CONTRACTOR SHALL REVIEW THE OUTLINED REQUIREMENTS AND PROCEDURES CONTAINED IN THE FAA ADVISORY CIRCULAR NO. 150/5370-2G OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION AND THE CONSTRUCTION SAFETY AND PHASING PLAN (CSPP), A COPY OF WHICH IS INCLUDED IN THE SPECIFICATIONS. THE CONTRACTOR SHALL PREPARE AND SUBMIT FOR APPROVAL A SAFETY PLAN COMPLIANCE DOCUMENT (SPCD) IN ACCORDANCE WITH THE REQUIREMENTS OF AC 150/5370-2G. THE AIRPORT MANAGER AND THE ENGINEER SHALL REVIEW THE CONTRACTOR'S SPCD, AND THE APPROVAL OF THE PLAN WILL BE REQUIRED PRIOR TO THE CONTRACTOR'S MOBILIZATION FOR THE PROJECT. THE SPCD SHALL ADDRESS THE FOLLOWING MAJOR ITEMS AT A MINIMUM AS THEY PERTAIN TO THE SCHEDULED WORK EFFORTS:

- NOTIFICATION OF SCHEDULED CONSTRUCTION ACTIVITIES.
- CONSTRUCTION ACTIVITIES NEAR RUNWAY AND TAXIWAY SAFETY AREAS, OBSTACLE FREE ZONES, AND OTHER AIRPORT OPERATIONAL AREAS.
- PROCEDURES AND REQUIREMENTS FOR RUNWAY AND TAXIWAY CLOSURES.
- DAILY AIRFIELD AND RADIO COMMUNICATIONS.
- PLACEMENT OF SAFETY FENCE
- CONSTRUCTION AND PUBLIC ROADWAY SIGNAGE.
- GATE ACCESS PROCEDURES.

2. SAFETY OFFICER: THE CONTRACTOR SHALL PROVIDE A SAFETY OFFICER/POINT OF CONTACT PERSON WHO CAN BE CONTACTED 24 HOURS A DAY SEVEN DAYS A WEEK FOR THE DURATION OF THE PROJECT. THIS PERSON SHALL BE RESPONSIBLE FOR TAKING IMMEDIATE ACTION TO CORRECT ANY CONSTRUCTION ACTIVITIES IDENTIFIED AS NOT IN THE BEST INTEREST OF AIRPORT'S SAFE OPERATION AND/OR SECURITY.

3. AT NO TIME SHALL THE CONTRACTOR CROSS/ACCESS ACTIVE RUNWAYS/TAXIWAYS OR STAGE EQUIPMENT IN ACTIVE RUNWAY APPROACHES, THE RUNWAY OBSTACLE FREE ZONE OR TAXIWAY OBJECT FREE AREAS WITHOUT PRIOR COORDINATION WITH THE AIRPORT MANAGER AND THE RPR. CROSSING OF ACTIVE RUNWAYS ARE STRICTLY PROHIBITED. THE CONTRACTOR'S RADIO COMMUNICATIONS PERSONNEL SHALL MONITOR AND COMMUNICATE WITH THE TOWER ON THE FOLLOWING FREQUENCY:

- LAWRENCE TOWER: 119.25 (7:00AM-10:00PM)

IF RESPONDING TO AN EMERGENCY BETWEEN 10:00PM - 7:00AM THE CONTRACTOR SHALL MONITOR AND COMMUNICATE WITH OTHER PILOTS ON THE FOLLOWING FREQUENCY:

- LAWRENCE COMMON TRAFFIC ADVISORY FREQUENCY (CTAF): 122.8 (10:00PM - 7:00AM)

4. THE CONTRACTOR SHALL HAVE ON SITE AT ALL TIMES AT LEAST ONE RADIO EQUIPPED ESCORT VEHICLE WITH QUALIFIED OPERATOR WHO SHALL MONITOR THE RADIO DURING ALL WORKING HOURS. CONTRACTOR'S RADIO PERSONNEL SHALL BE REQUIRED TO MEET LAWRENCE'S SAFETY AND SECURITY REQUIREMENTS AND SHALL MAINTAIN PROPER RADIO PROTOCOL. THE CONTRACTOR SHALL PROVIDE ALL APPROVED VEHICLES, RADIOS, EQUIPMENT, PERSONNEL AND PRIOR TRAINING FOR THIS PURPOSE. THE CONTRACTOR SHALL NOTE THAT CROSSING OF ACTIVE RUNWAYS ARE STRICTLY PROHIBITED.

5. ALL CONSTRUCTION VEHICLES EXCEPT FOR VEHICLES MAKING PERIODIC DELIVERIES, SHALL DISPLAY AN ORANGE/WHITE CHECKERED FLAG OR SHALL HAVE AN AMBER/YELLOW STROBE BEACON LIGHT ATTACHED TO THE ROOF AND BE CLEARLY IDENTIFIED BY EITHER ASSIGNED INITIALS OR NUMBERS PROMINENTLY DISPLAYED ON EACH SIDE OF VEHICLE. THERE SHALL BE NO SEPARATE PAYMENT FOR PROVIDING FLASHING YELLOW BEACONS AND ORANGE/WHITE CHECKERED FLAGS IN ACCORDANCE WITH FAA AC 150/5210-5D.

6. CONSTRUCTION PERSONNEL: ALL PERSONNEL SHALL WEAR APPROPRIATE REFLECTIVE SAFETY VESTS AND CUSTOMARY PERSONAL PROTECTIVE EQUIPMENT (PPE) AT ALL TIMES WHEN WORKING ON THE AIRFIELD AND ADJACENT WORK AREAS. THE CONTRACTOR SHALL MAKE ALL PERSONNEL AWARE OF SAFETY REQUIREMENTS AND THE DANGERS OF WORKING ADJACENT TO ACTIVE AIRCRAFT OPERATIONAL AREAS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL ENSURE THAT ALL PERSONNEL UNDERSTAND AND COMPLY WITH THE AIRFIELD'S SAFETY/SECURITY REQUIREMENTS AND THE FOREIGN OBJECT DEBRIS (FOD) PROCEDURES.

7. IN THE EVENT OF A CONSTRUCTION ACCIDENT THE CONTRACTOR SHALL CALL 911 AND IMMEDIATELY NOTIFY THE RPR AND THE AIRPORT MANAGER.

8. ACTIVE TAXIWAYS AND RAMP AREAS SHALL BE KEPT CLEAN AT ALL TIMES WHEN UTILIZING THESE PAVEMENTS AS HAUL ROUTES.

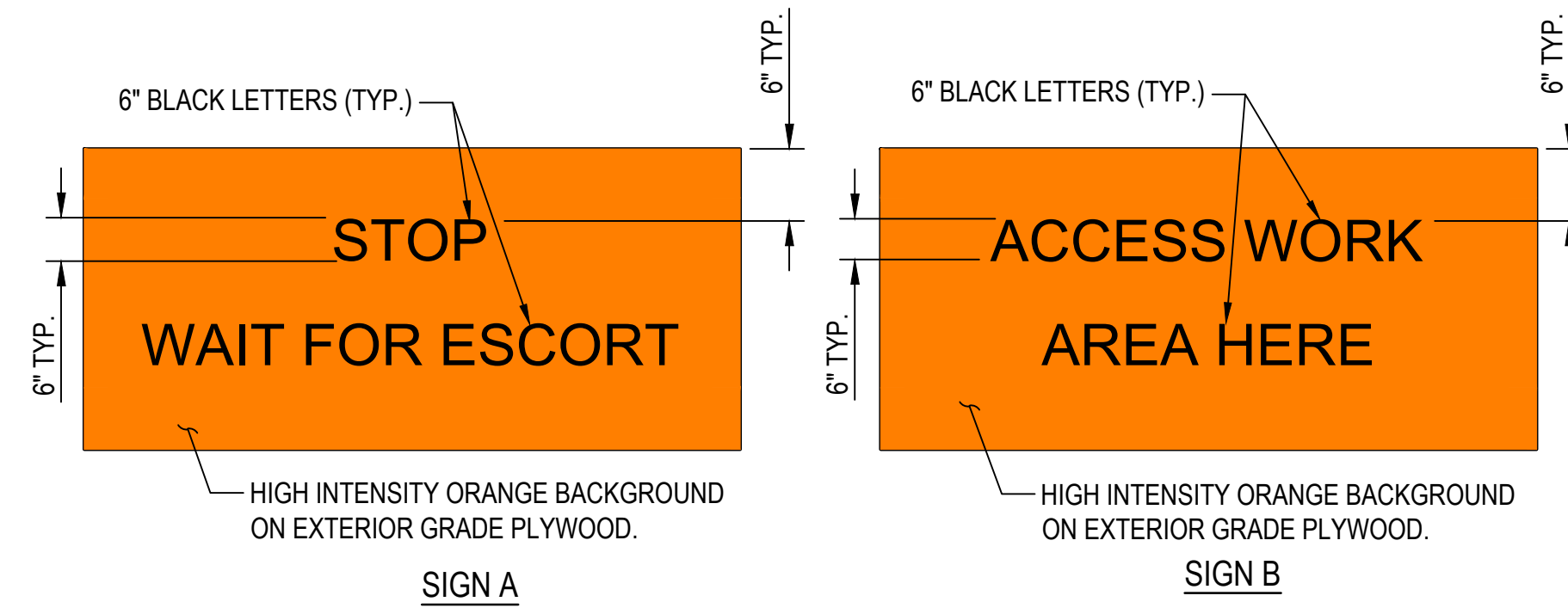
9. ANY WORK THAT NEEDS TO BE PERFORMED ON A RUNWAY OR WITHIN THE OBSTACLE FREE ZONE (OFZ) OF A RUNWAY SHALL REQUIRE A RUNWAY CLOSURE. ALL RUNWAY CLOSURES MUST BE COORDINATED IN WRITING WITH THE AIRPORT MANAGER THROUGH THE RPR A MINIMUM OF 7 DAYS IN ADVANCE.

10. PRIOR TO REOPENING ANY RUNWAY OR TAXIWAY PAVEMENTS (INCLUDING DAILY/NIGHTLY CLOSURES):

- ALL PAVEMENTS SHALL BE CLEANED AND FREE FROM FOD
- ALL TRENCHES AND EXCAVATIONS ADJACENT TO PAVED SURFACES AND WITHIN RUNWAY/TAXIWAY SAFETY AREAS SHALL BE BACKFILLED AND GRADED TO WITHIN +/- 2 INCHES OF ADJACENT EXISTING GRADES. ALL OTHER TRENCHES SHALL BE PROTECTED AND LIGHTED.
- THE CONTRACTOR SHALL REQUEST AN INSPECTION OF THE WORK AREA BY THE AIRPORT MANAGER AND THE RPR. THE CONTRACTOR SHALL CORRECT ANY HAZARDS WHICH MAY PRESENT A SAFETY CONCERN TO AIRCRAFT, VEHICLES OR PERSONS AS DETERMINED BY THE AIRPORT MANAGER AND THE RPR.

10. CLOSURE BARRICADES/CONES: ALL REQUIRED LIGHTED SAFETY BARRICADES, LIGHTED CHANNELIZER CONES, FLAGGED STAKES, TRAFFIC CONES, TEMPORARY TRAFFIC SIGNS, COVERED AIRFIELD SIGNS, COVERED AIRFIELD LIGHTING, ETC., SHALL BE IN PLACE PRIOR TO THE COMMENCEMENT OF WORK. THERE SHALL BE NO SEPARATE PAYMENT FOR FURNISHING, PLACING, RELOCATING, MAINTAINING, AND REMOVAL OF THESE AS MAY BE REQUIRED BY THE AIRPORT MANAGER OR THE ENGINEER TO ENSURE SAFETY OVER THE LIFE OF THE PROJECT. THIS WORK SHALL BE INCIDENTAL TO PAY ITEM DIV II-27.01 "CONSTRUCTION SAFETY AND PHASING" PAY ITEM. AT THE COMPLETION OF THE PROJECT, ALL LIGHTED SAFETY BARRICADES, CHANNELIZER CONES AND SIGNS SHALL BE REMOVED, AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR. METHODS FOR COVERING AIRFIELD SIGNS AND LIGHTS (BLANK PANELS/LENS, SECURED FABRIC, ETC.) SHALL BE AS APPROVED BY THE RPR. SIGNS IDENTIFIED TO BE COVERED THAT WILL BE REMOVED/REPLACED AS PART OF THIS PROJECT MAY HAVE PANELS OR SIGN REMOVED AT START OF CONSTRUCTION IN LIEU OF COVERING THE SIGN.

11. MATERIAL STOCKPILING AND EQUIPMENT PARKING: NO MATERIAL SHALL BE STOCKPILED WITHIN THE OBJECT FREE AREA OF AN OPEN RUNWAY OR TAXIWAY. NO EQUIPMENT SHALL BE PARKED WITH AN ACTIVE RUNWAY/TAXIWAY OBJECT FREE AREA WHEN NOT IN USE AND/OR OUTSIDE WORK HOURS.

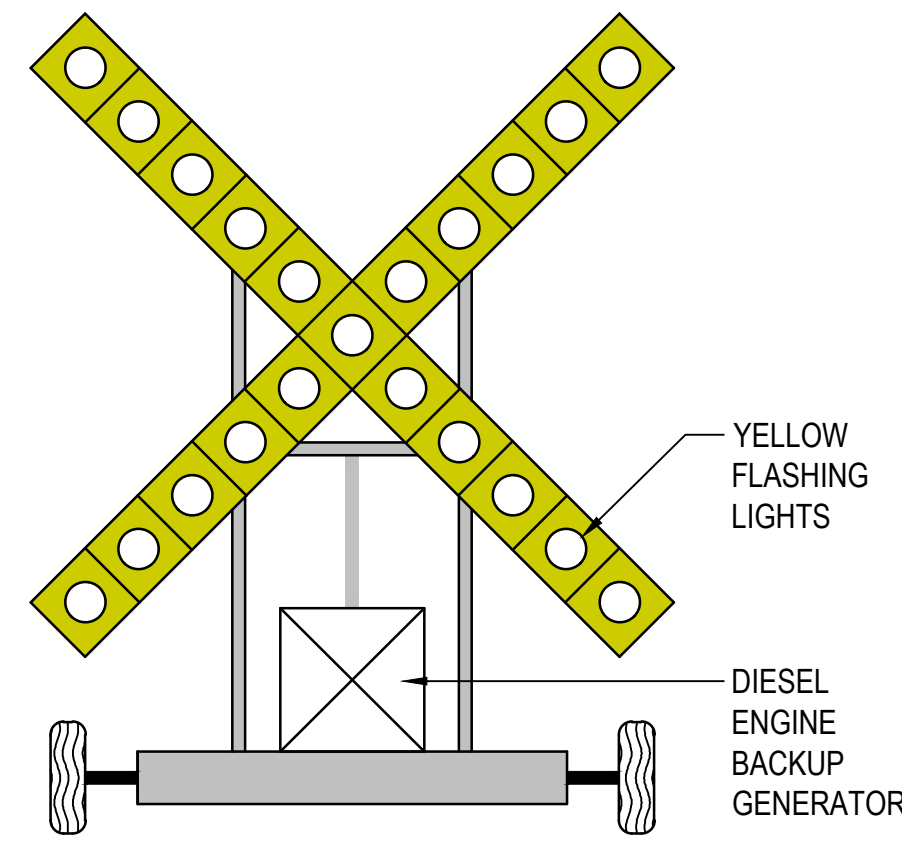


CONSTRUCTION SIGN NOTES:

1. SIGN SHALL CONFORM TO LATEST FHWA "STANDARD HIGHWAY SIGNS"
2. SIGNS SHALL NOT BE MOUNTED HIGHER THAN 4' ABOVE EXISTING GRADE.
3. IF WORKING IN MULTIPLE NON ADJACENT AREAS, THE CONTRACTOR SHALL PROVIDE ANY ADDITIONAL SIGNS REQUIRED AT THEIR OWN EXPENSE. THESE SIGNS SHALL REMAIN THE CONTRACTORS PROPERTY AT THE COMPLETION OF THE PROJECT.
4. THE CONTRACTOR SHALL ANCHOR THE SIGNS TO RESIST PROP WASH AND/OR WIND.
5. ALL COSTS ASSOCIATED WITH FURNISHING, INSTALLING AND MAINTAINING SIGNS SHALL BE INCIDENTAL TO THE VARIOUS CONTRACT PAY ITEMS.
6. REFER TO PHASING PLAN FOR SIGN LOCATIONS.

CONSTRUCTION SIGNAGE

NOT TO SCALE

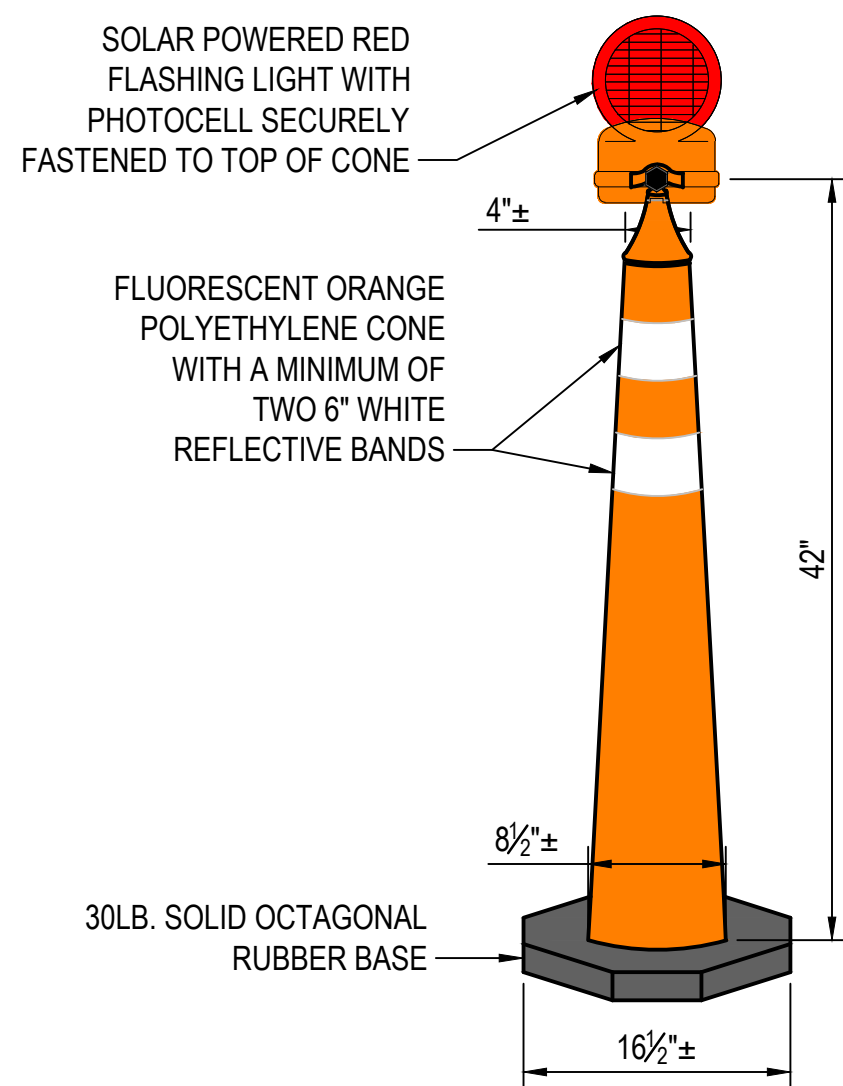


LIGHTED RUNWAY CLOSURE MARKER

NOT TO SCALE

LIGHTED RUNWAY CLOSURE MARKER NOTES:

1. ALL COSTS ASSOCIATED WITH COORDINATING WITH LAWRENCE MUNICIPAL AIRPORT, SUPPLYING, HAULING, PLACING, SECURING, CONNECTIONS FOR POWER, MAINTAINING, FUELING AND RELOCATING THESE MARKERS SHALL BE INCIDENTAL TO THE THE VARIOUS CONTRACT PAY ITEMS.
2. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING LIGHTED RUNWAY CLOSURE MARKERS WHILE THEY ARE IN USE.

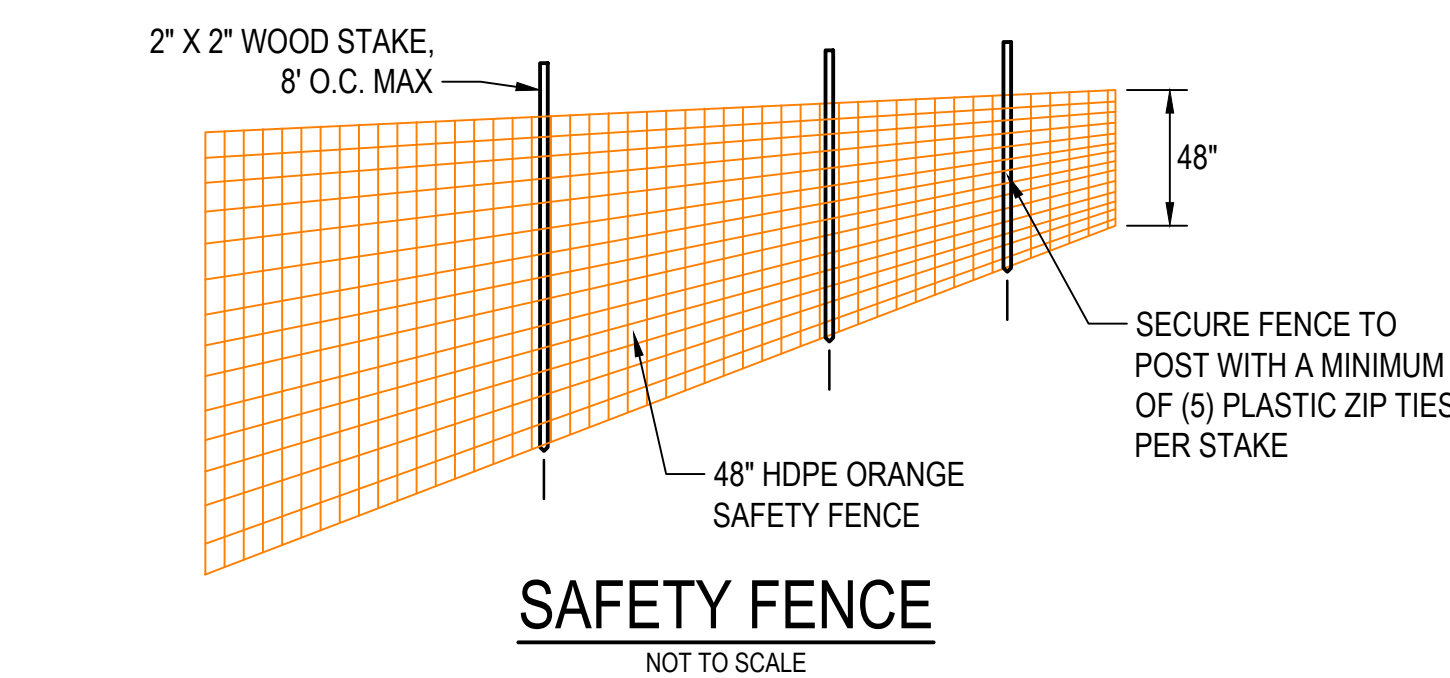
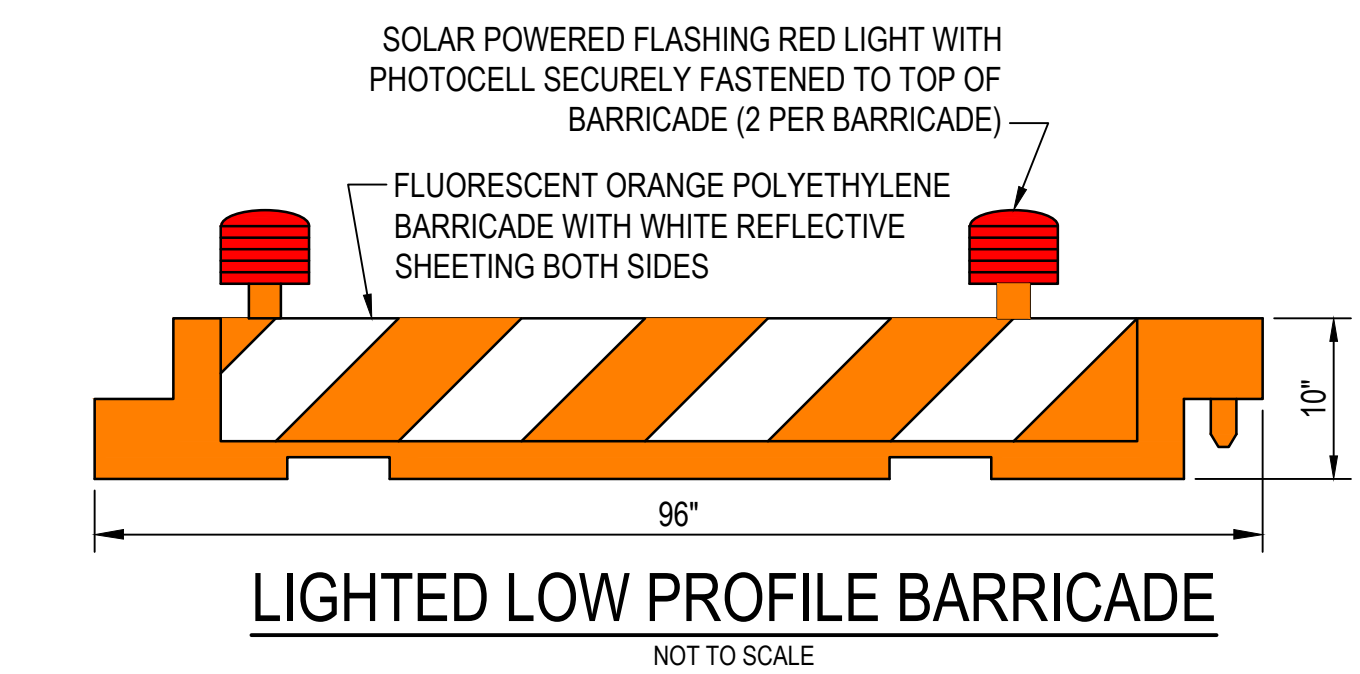
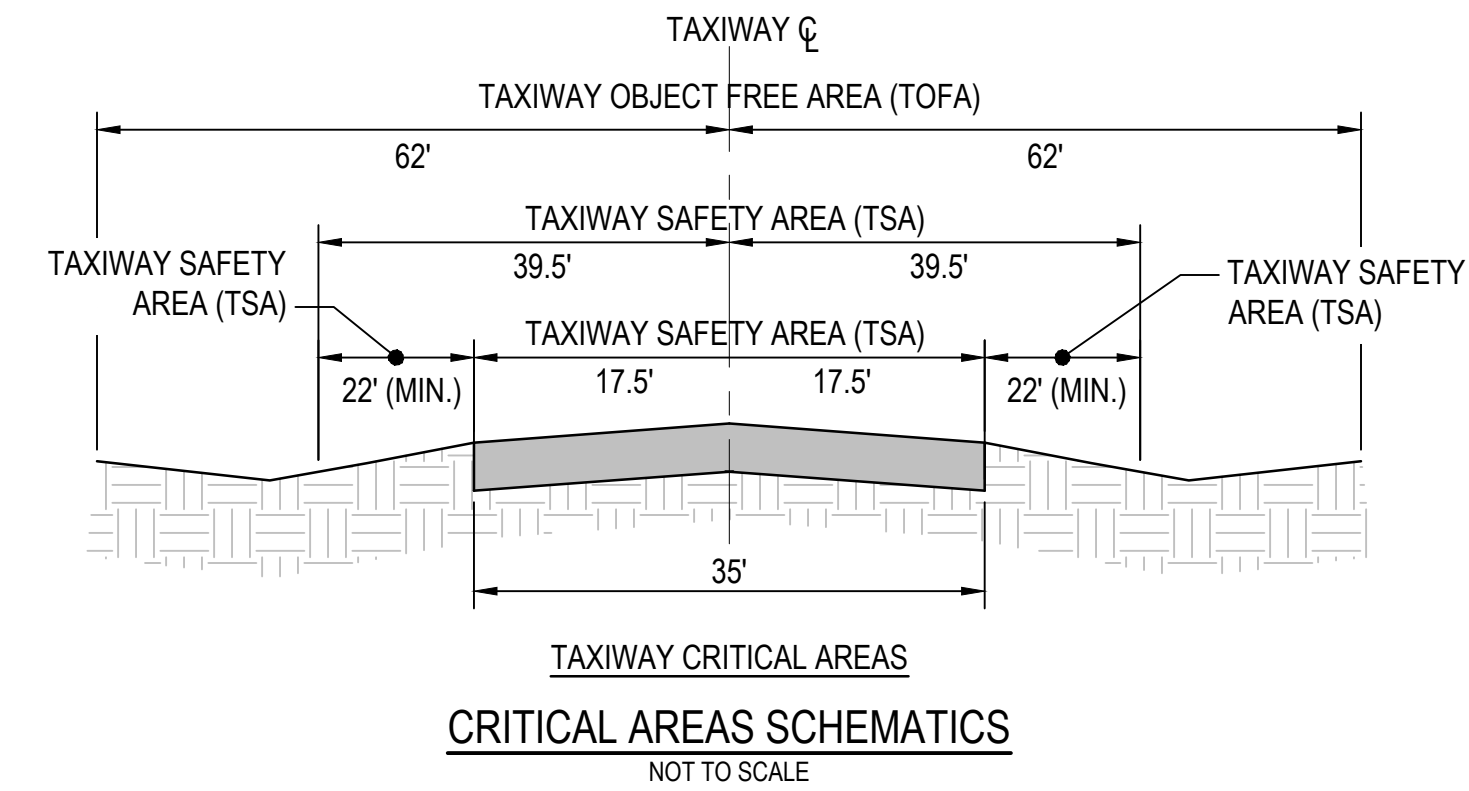
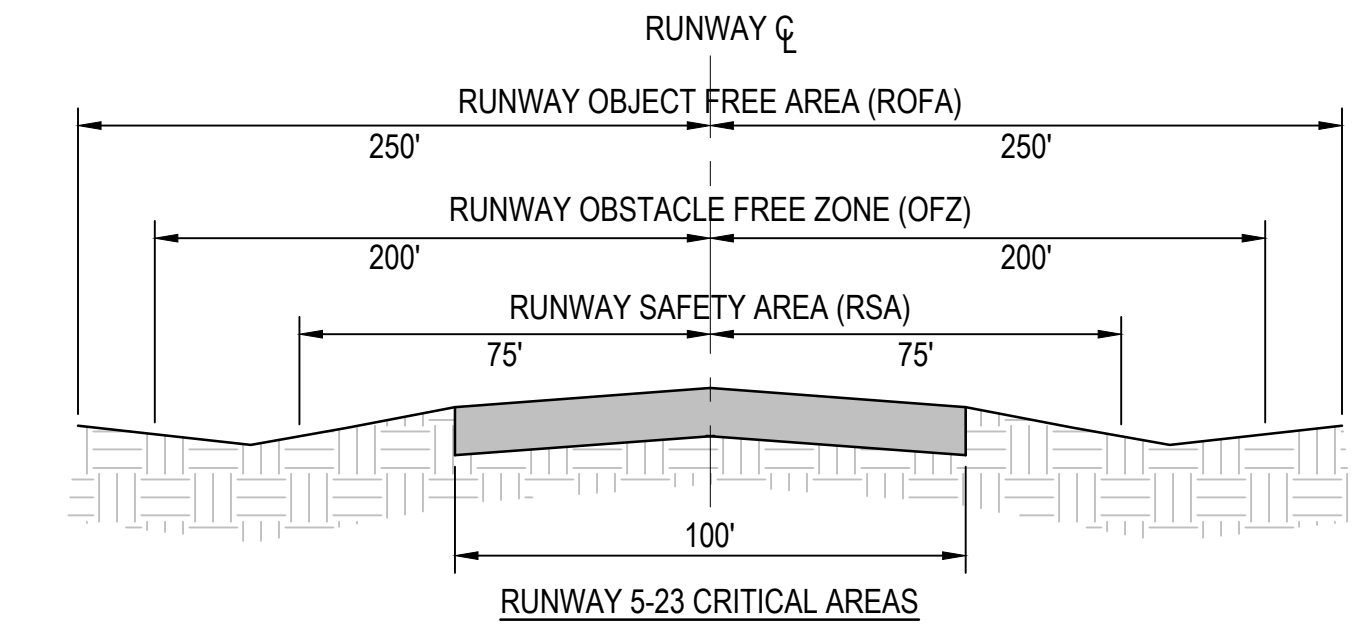
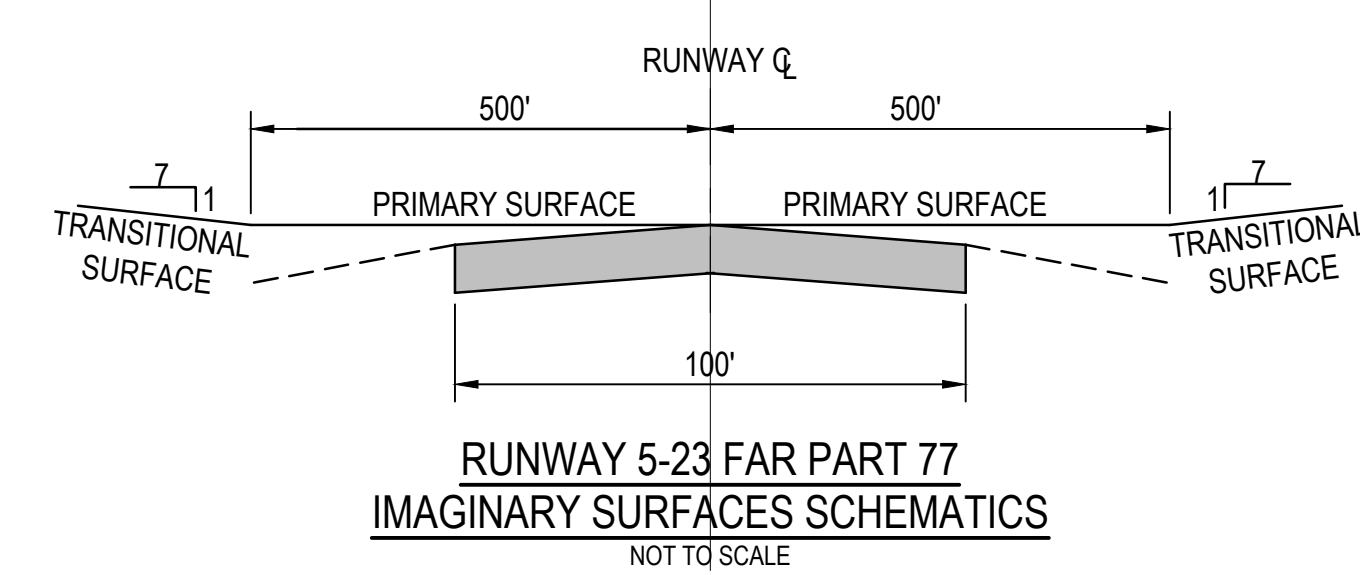


LIGHTED CHANNELIZER CONE

NOT TO SCALE

SAFETY FENCE, LIGHTED CHANNELIZER CONE AND LIGHTED LOW PROFILE BARRICADE NOTES:

1. ALL COSTS ASSOCIATED WITH FURNISHING, INSTALLING AND MAINTAINING SAFETY FENCE, BARRICADES, AND CONES SHALL BE INCIDENTAL TO THE VARIOUS CONTRACT PAY ITEMS.
2. THE LIGHTED SAFETY BARRICADES SHALL BE PLACED WHERE SHOWN ON PLANS AND BE USED WHEN A WORK AREA IS DIRECTLY ADJACENT TO AN ACTIVE TAXIWAY OR RUNWAY TO KEEP AIRCRAFTS AND VEHICLES FROM TRAVELING INTO A WORK AREA. BARRICADES SHALL BE INTERCONNECTED ON AIRFIELD PAVEMENTS AND WITHIN A.O.A.'s. BARRICADE SPACING MAY BE INCREASED TO 4' ON CENTER IN ALL OTHER AREAS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RELOCATING AND/OR PROVIDING ADDITIONAL BARRICADES AROUND THE SITE AS NECESSARY TO ACCOMMODATE THE PROPOSED WORK.
4. THE CONTRACTOR SHALL ENSURE THE CONTINUOUS OPERATION OF ALL LIGHTS FOR THE DURATION OF THE PROJECT. LIGHTS AND BATTERIES SHALL BE REPLACED AS NEEDED.
5. THE BARRICADES SHALL BE FILLED WITH WATER.
6. CHANNELIZER CONES SHALL BE PLACED CONTINUOUSLY AT 4' ON CENTER.



SAFETY FENCE

NOT TO SCALE



Stantec Consulting Services Inc.
45 Blue Sky Drive, 3rd Floor
Burlington, MA 01803 U.S.A.
Tel. 781.221.1000
Fax. 781.229.1115
www.stantec.com

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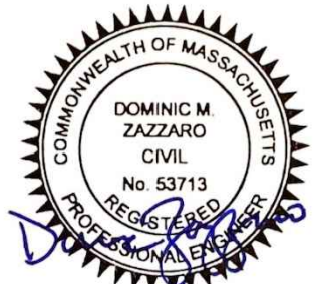
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PLAN IS INTENDED TO BE VIEWED IN COLOR

Revision	By	Appd.	YY.MM.DD
0	ISSUED FOR BID	DMZ	25.02.12
Issued		Appd.	YY.MM.DD

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Client/Project
LAWRENCE MUNICIPAL AIRPORT
NORTH ANDOVER, MA

RUNWAY 5 END
DRAINAGE IMPROVEMENTS

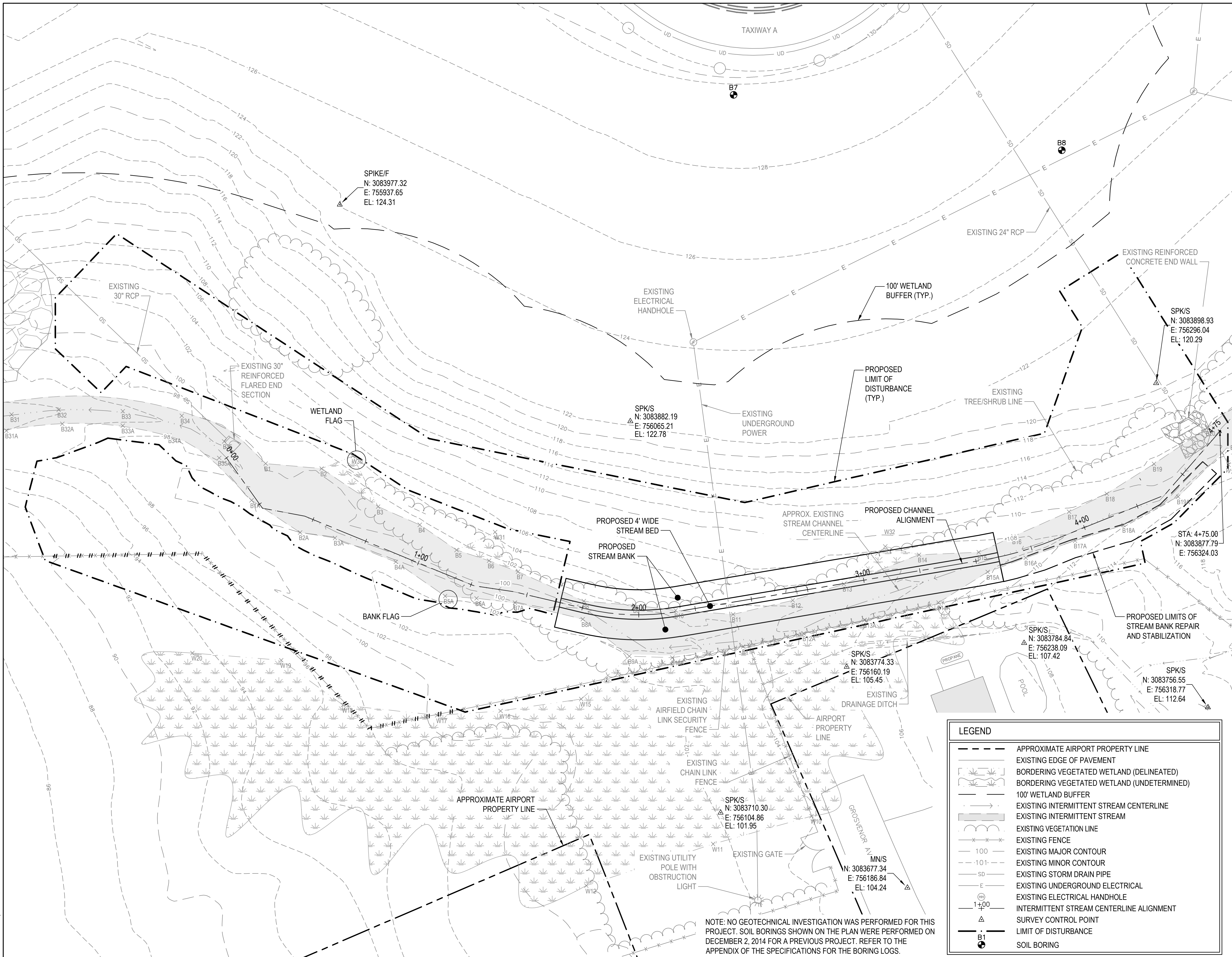
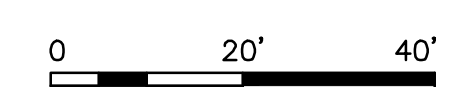
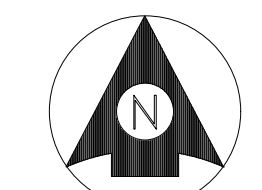
Title
SAFETY & PHASING NOTES & DETAILS

Project No.
179450605

Drawing No. Sheet Revision

G102 5 of 21 0

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 FEBRUARY 12, 2025



Revision	By	Appd.	YY.MM.DD
0	ISSUED FOR BID	DMZ	25.02.12
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Client/Project
 LAWRENCE MUNICIPAL AIRPORT
 NORTH ANDOVER, MA

RUNWAY 5 END
 DRAINAGE IMPROVEMENTS

Title
 EXISTING CONDITIONS PLAN

Project No.
 179450605

Drawing No. Sheet Revision

LEGEND

- APPROXIMATE AIRPORT PROPERTY LINE
- EXISTING EDGE OF PAVEMENT
- BORDERING VEGETATED WETLAND (DELINEATED)
- BORDERING VEGETATED WETLAND (UNDETERMINED)
- 100' WETLAND BUFFER
- EXISTING INTERMITTENT STREAM CENTERLINE
- EXISTING INTERMITTENT STREAM
- EXISTING VEGETATION LINE
- EXISTING FENCE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- SD EXISTING STORM DRAIN PIPE
- E EXISTING UNDERGROUND ELECTRICAL
- EXISTING ELECTRICAL HANDHOLE
- 1+00 INTERMITTENT STREAM CENTERLINE ALIGNMENT
- SURVEY CONTROL POINT
- LIMIT OF DISTURBANCE
- SOIL BORING

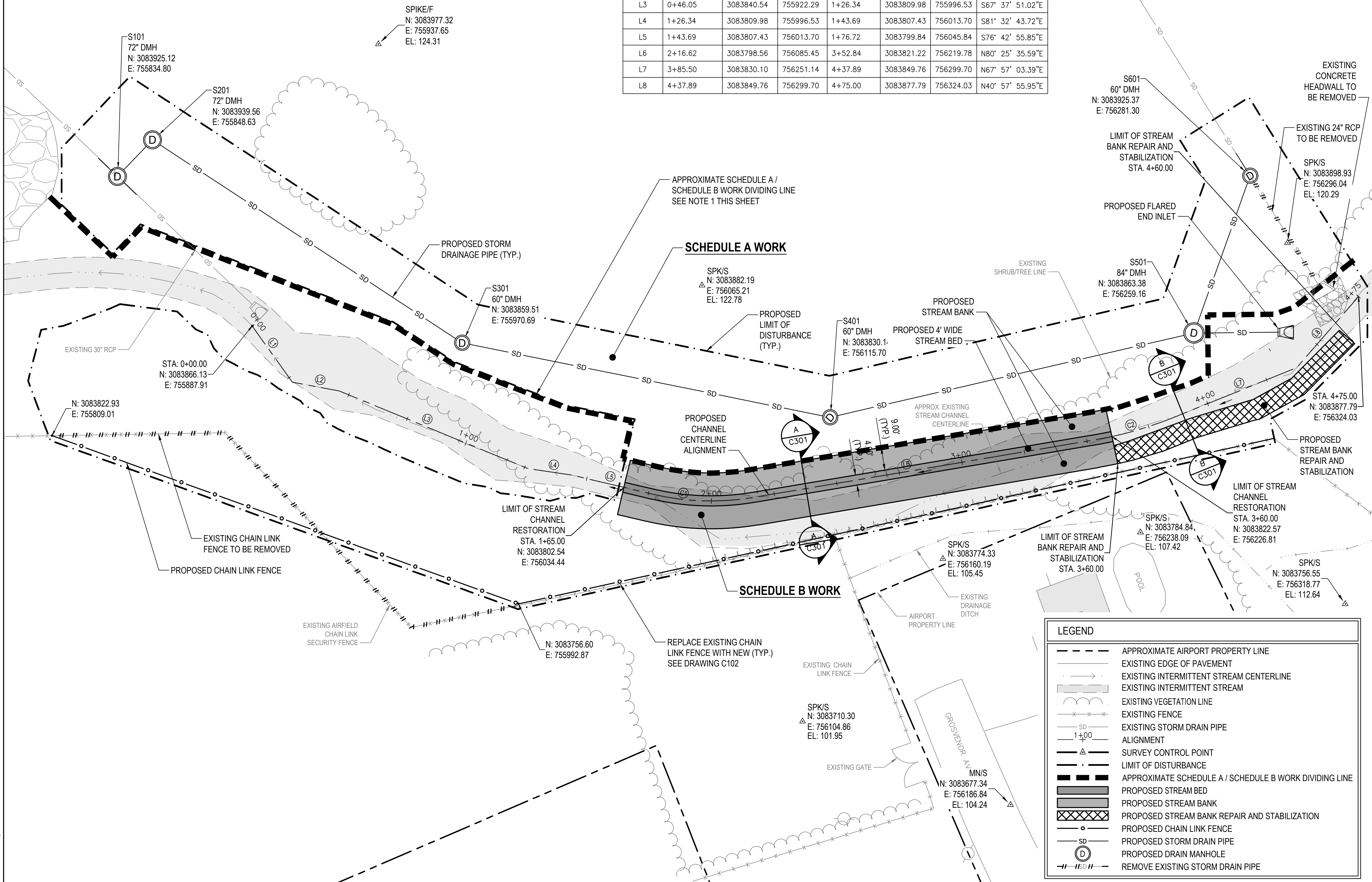
NOTE: NO GEOTECHNICAL INVESTIGATION WAS PERFORMED FOR THIS PROJECT. SOIL BORINGS SHOWN ON THE PLAN WERE PERFORMED ON DECEMBER 2, 2014 FOR A PREVIOUS PROJECT. REFER TO THE APPENDIX OF THE SPECIFICATIONS FOR THE BORING LOGS.

U:\179450605\Drawings\Drawings\Sheet\179450605_02_V101_existing_conditions_plan.dwg
 2/12/2025 8:31 AM By: Zazzaro, Dominic

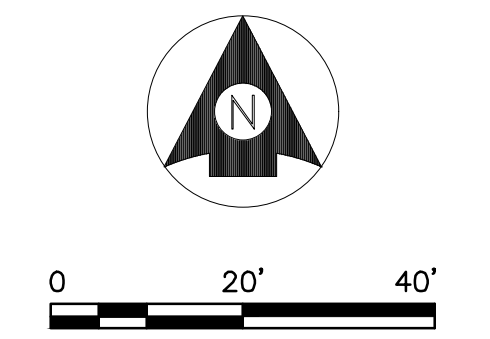
NOTES:
 1. ALL WORK NORTH OF DIVIDING LINE SHALL BE CONSIDERED SCHEDULE A WORK AND ALL WORK SOUTH OF DIVIDING LINE SHALL BE CONSIDERED SCHEDULE B WORK. WORK IS BROKEN OUT INTO SCHEDULE A AND SCHEDULE B FOR FUNDING PURPOSES ONLY.

CHANNEL ALIGNMENT CURVE DATA										
SEGMENT	START STATION	START NORTH	START EAST	END STATION	END NORTH	END EAST	LENGTH	RADIUS	TAN	DELTA
C1	1+76.72	3083799.84	756045.84	2+16.62	3083798.56	756085.45	39.89	100.00	20.22	22° 51' 29"
C2	3+52.84	3083821.22	756219.78	3+85.50	3083830.10	756251.14	32.66	150.00	16.40	12° 28' 32"

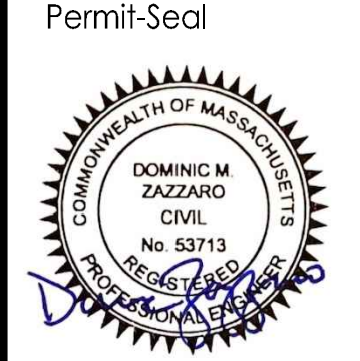
CHANNEL ALIGNMENT LINE DATA							
SEGMENT	START STATION	START NORTH	START EAST	END STATION	END NORTH	END EAST	BEARING
L1	0+00.00	3083866.13	755887.91	0+27.19	3083844.03	755903.76	S35° 38' 10.73"E
L2	0+27.19	3083844.03	755903.76	0+46.05	3083840.54	755922.29	S79° 19' 52.77"E
L3	0+46.05	3083840.54	755922.29	1+26.34	3083809.98	755996.53	S67° 37' 51.02"E
L4	1+26.34	3083809.98	755996.53	1+43.69	3083807.43	756013.70	S81° 32' 43.72"E
L5	1+43.69	3083807.43	756013.70	1+76.72	3083799.84	756045.84	S76° 42' 55.85"E
L6	2+16.62	3083798.56	756085.45	3+52.84	3083821.22	756219.78	N80° 25' 35.59"E
L7	3+85.50	3083830.10	756251.14	4+37.89	3083849.76	756299.70	N67° 57' 03.39"E
L8	4+37.89	3083849.76	756299.70	4+75.00	3083877.79	756324.03	N40° 57' 55.95"E



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Client/Project
 LAWRENCE MUNICIPAL AIRPORT
 NORTH ANDOVER, MA
 RUNWAY 5 END
 DRAINAGE IMPROVEMENTS

Title
 LAYOUT PLAN

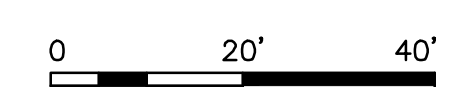
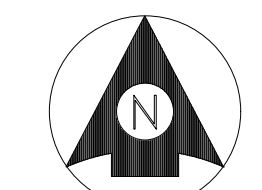
Project No.
 179450605
 Drawing No. Sheet Revision

LEGEND	
	APPROXIMATE AIRPORT PROPERTY LINE
	EXISTING EDGE OF PAVEMENT
	EXISTING INTERMITTENT STREAM CENTERLINE
	EXISTING INTERMITTENT STREAM
	EXISTING VEGETATION LINE
	EXISTING FENCE
	EXISTING STORM DRAIN PIPE ALIGNMENT
	SURVEY CONTROL POINT
	LIMIT OF DISTURBANCE
	APPROXIMATE SCHEDULE A / SCHEDULE B WORK DIVIDING LINE
	PROPOSED STREAM BED
	PROPOSED STREAM BANK
	PROPOSED STREAM BANK REPAIR AND STABILIZATION
	PROPOSED CHAIN LINK FENCE
	PROPOSED STORM DRAIN PIPE
	PROPOSED DRAIN MANHOLE
	REMOVE EXISTING STORM DRAIN PIPE

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 2/12/2025 9:34 AM By: Zazzaro, Dominic

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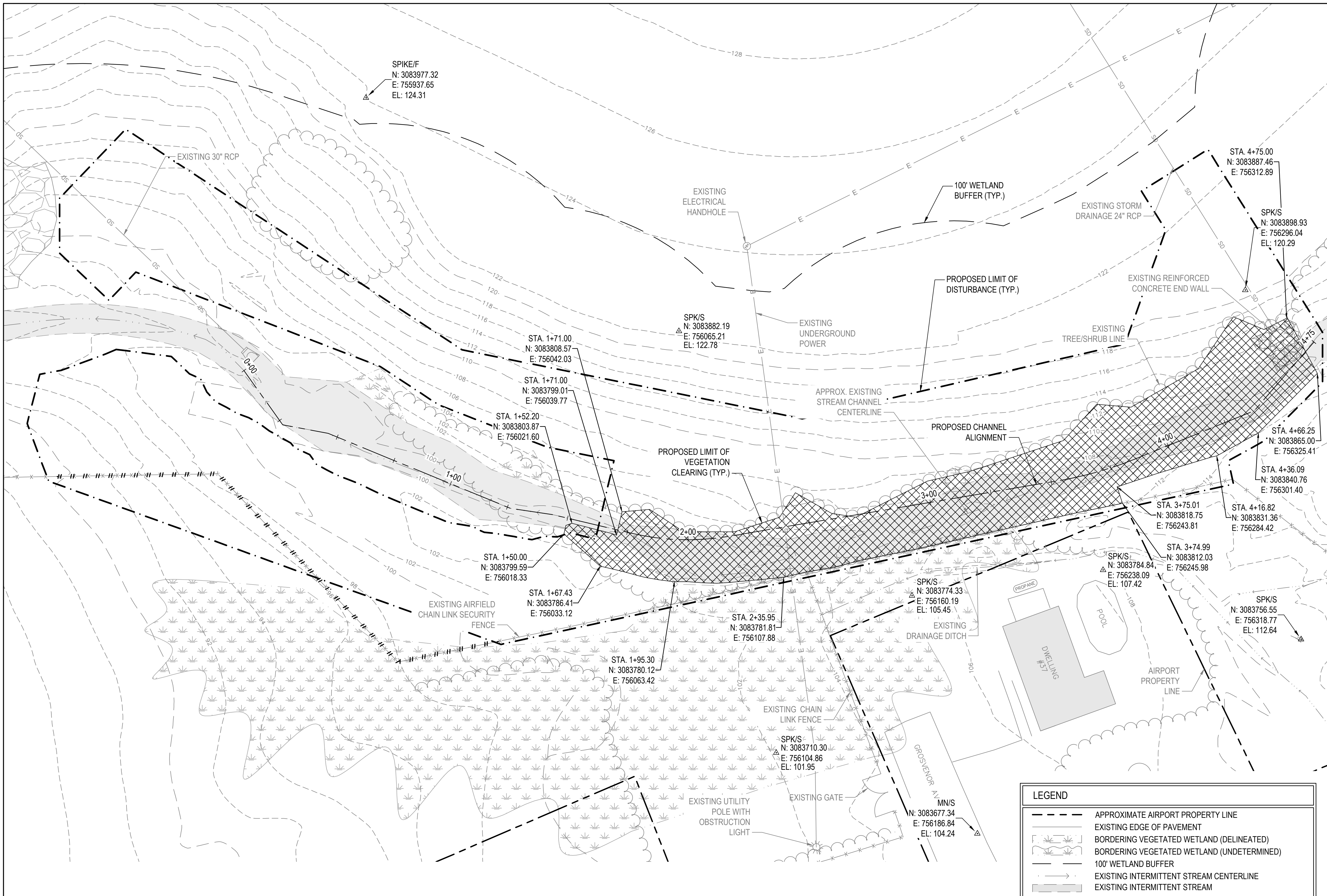
Client/Project
**LAWRENCE MUNICIPAL AIRPORT
 NORTH ANDOVER, MA**

Runway 5 End
 Drainage Improvements

Title
VEGETATION REMOVAL PLAN

Project No.
 179450605

Drawing No. Sheet Revision
 C102 8 of 21 0



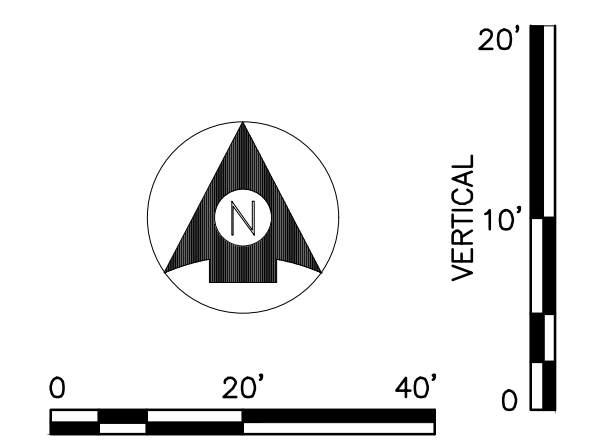
NOTE:
 1. VEGETATION REMOVAL SHALL BE LIMITED TO SMALL TRESS (8" GIRTH OR LESS) AND SHRUBS THAT NEED TO BE REMOVED TO ACCOMMODATE CONSTRUCTION. THE INTENT IS TO MINIMIZE THE VEGETATION REMOVAL TO THE FURTHEST EXTEND POSSIBLE.

LEGEND

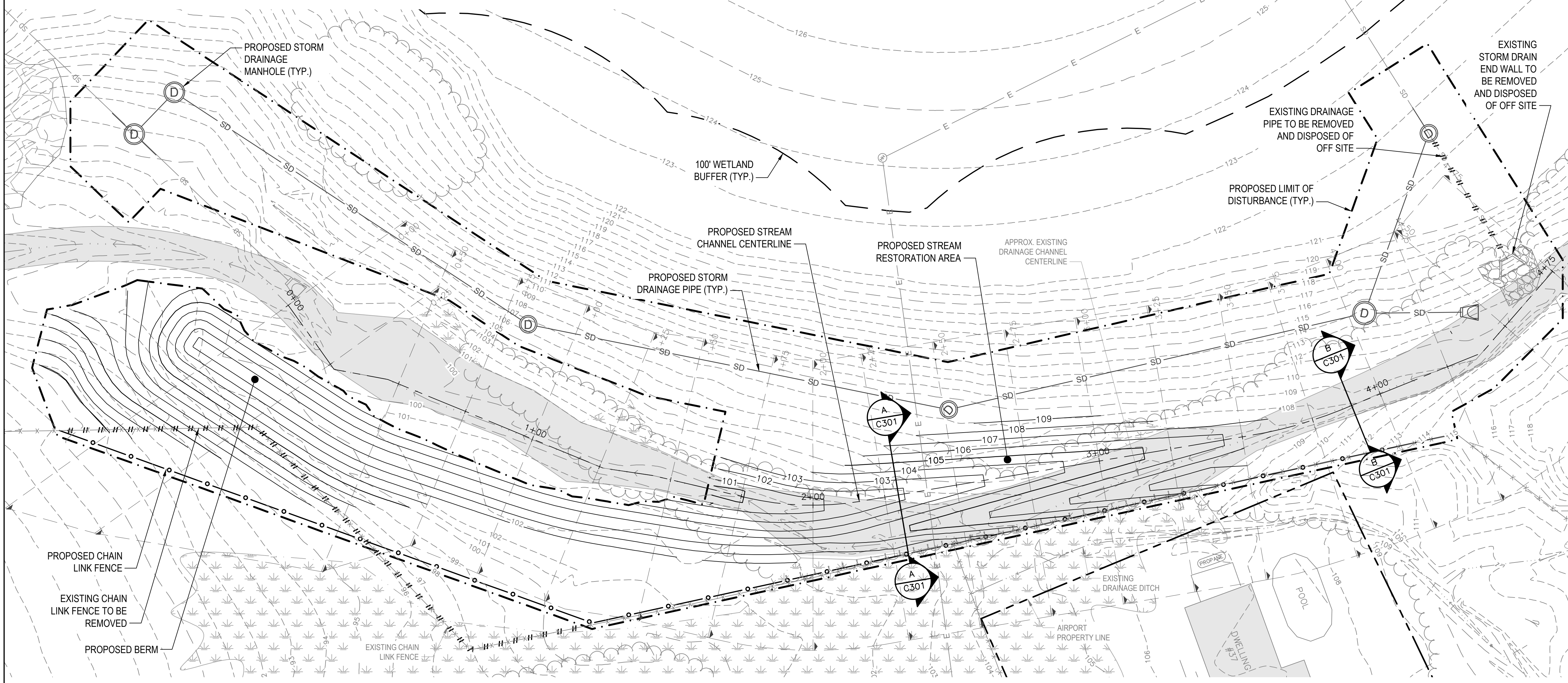
	APPROXIMATE AIRPORT PROPERTY LINE
	EXISTING EDGE OF PAVEMENT
	BORDERING VEGETATED WETLAND (DELINEATED)
	BORDERING VEGETATED WETLAND (UNDETERMINED)
	100' WETLAND BUFFER
	EXISTING INTERMITTENT STREAM CENTERLINE
	EXISTING INTERMITTENT STREAM
	EXISTING VEGETATION LINE
	EXISTING FENCE
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	EXISTING STORM DRAIN PIPE
	ALIGNMENT
	SURVEY CONTROL POINT
	LIMIT OF DISTURBANCE
	PROPOSED CLEARING

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 2/12/2025 8:42 AM By: Zazzaro, Dominic

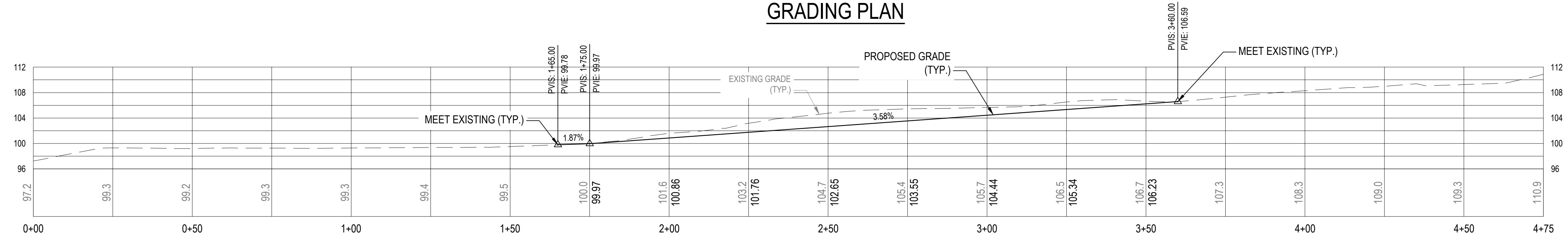
ISSUED FOR BID
 FEBRUARY 12, 2025



LEGEND			
	APPROXIMATE AIRPORT PROPERTY LINE		ALIGNMENT
	EXISTING EDGE OF PAVEMENT		SURVEY CONTROL POINT
	BORDERING VEGETATED WETLAND (DELINEATED)		LIMIT OF DISTURBANCE
	BORDERING VEGETATED WETLAND (UNDETERMINED)		PROPOSED SANDBAGS
	100' WETLAND BUFFER		PROPOSED STORM DRAIN PIPE
	EXISTING INTERMITTENT STREAM CENTERLINE		PROPOSED DRAIN MANHOLE
	EXISTING INTERMITTENT STREAM BANK		REMOVE EXISTING STORM DRAIN PIPE
	EXISTING INTERMITTENT STREAM		PROPOSED MAJOR CONTOUR
	EXISTING VEGETATION LINE		PROPOSED MINOR CONTOUR
	EXISTING FENCE		SECTION
	EXISTING MAJOR CONTOUR		REMOVE EXISTING CHAIN LINK FENCE
	EXISTING MINOR CONTOUR		PROPOSED CHAIN LINK FENCE
	EXISTING STORM DRAIN PIPE		

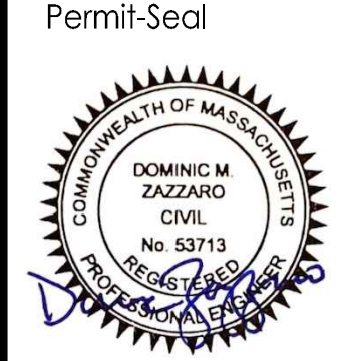


GRADING PLAN



INTERMITTENT STREAM PROFILE

Revision	By	Appd.	YY.MM.DD
0	DMZ	DMZ	25.02.12
1	DMZ	DMZ	25.02.12



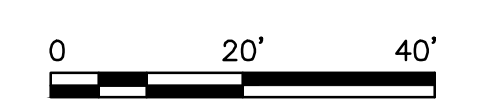
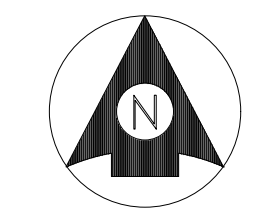
Client/Project
 LAWRENCE MUNICIPAL AIRPORT
 NORTH ANDOVER, MA
 RUNWAY 5 END
 DRAINAGE IMPROVEMENTS

Title
 GRADING PLAN & PROFILE

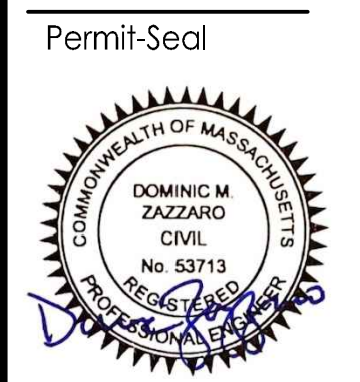
Project No. 179450605	Sheet C201	Revision 0
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 2/12/2025 8:45 PM By: Zazzaro, Dominic

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Revision	By	Appd.	YY.MM.DD
0	DMZ	DMZ	25.02.12
1	DMZ	DMZ	25.02.12



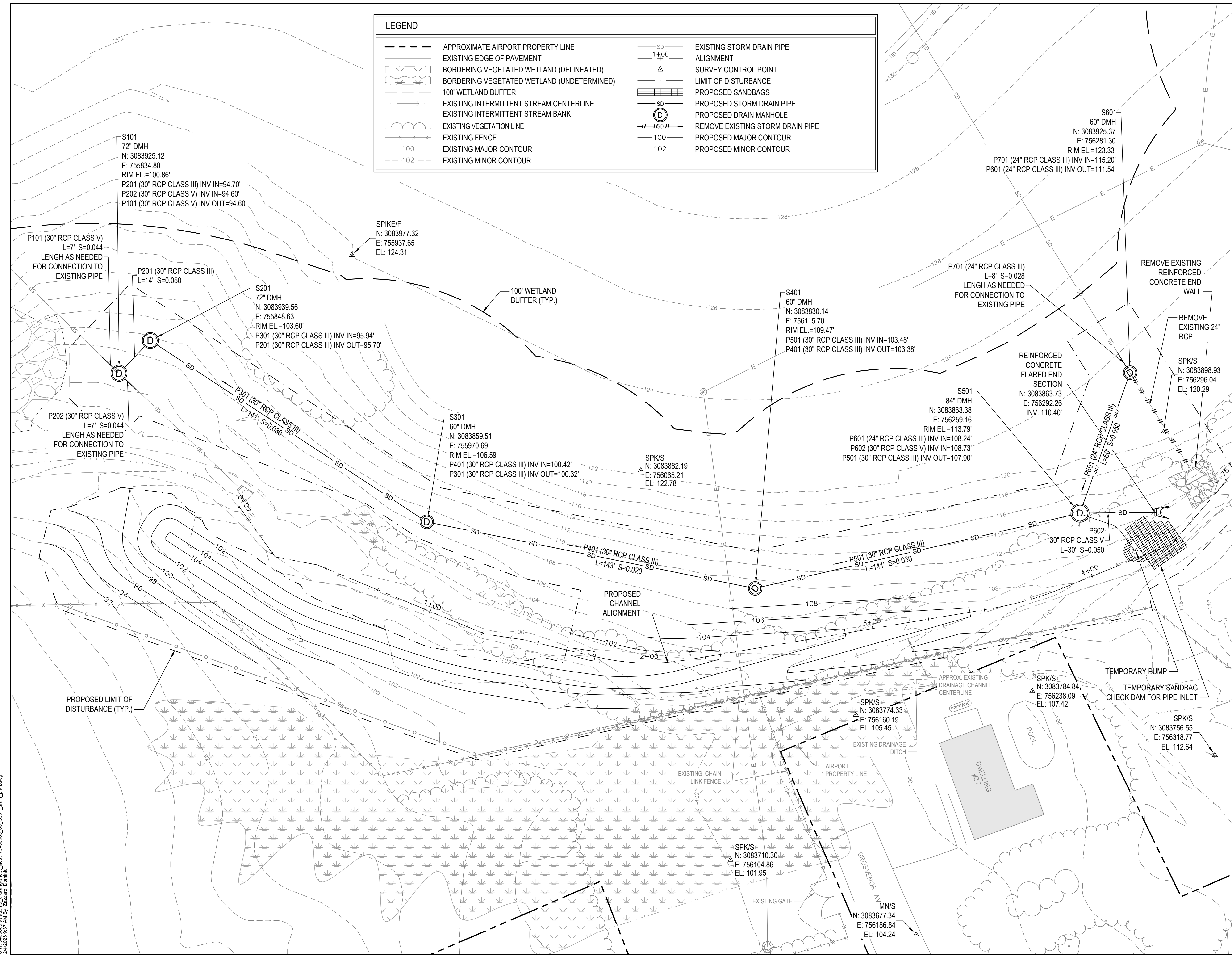
Client/Project
 LAWRENCE MUNICIPAL AIRPORT
 NORTH ANDOVER, MA
 RUNWAY 5 END
 DRAINAGE IMPROVEMENTS

Title
 DRAINAGE PLAN

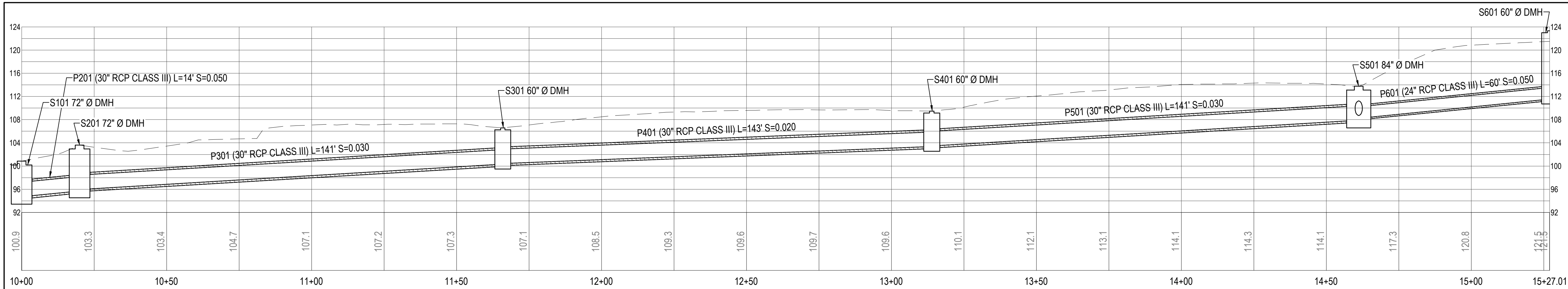
Project No.
 179450605

Drawing No. Sheet Revision
 C301 10 of 21 0

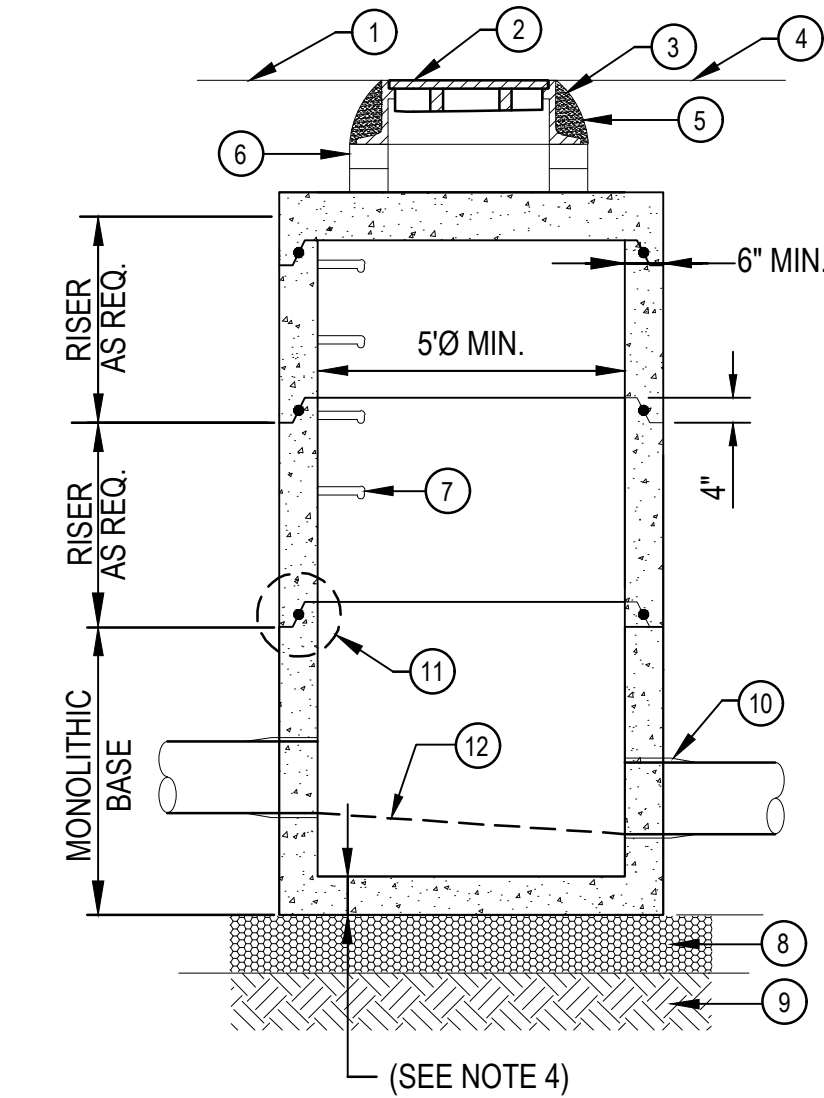
LEGEND	
	APPROXIMATE AIRPORT PROPERTY LINE
	EXISTING EDGE OF PAVEMENT
	BORDERING VEGETATED WETLAND (DELINEATED)
	BORDERING VEGETATED WETLAND (UNDETERMINED)
	100' WETLAND BUFFER
	EXISTING INTERMITTENT STREAM CENTERLINE
	EXISTING INTERMITTENT STREAM BANK
	EXISTING VEGETATION LINE
	EXISTING FENCE
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	EXISTING STORM DRAIN PIPE ALIGNMENT
	SURVEY CONTROL POINT
	LIMIT OF DISTURBANCE
	PROPOSED SANDBAGS
	PROPOSED STORM DRAIN PIPE
	PROPOSED DRAIN MANHOLE
	REMOVE EXISTING STORM DRAIN PIPE
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR



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 2/12/25 9:37 AM By: Zazzaro, Dominic



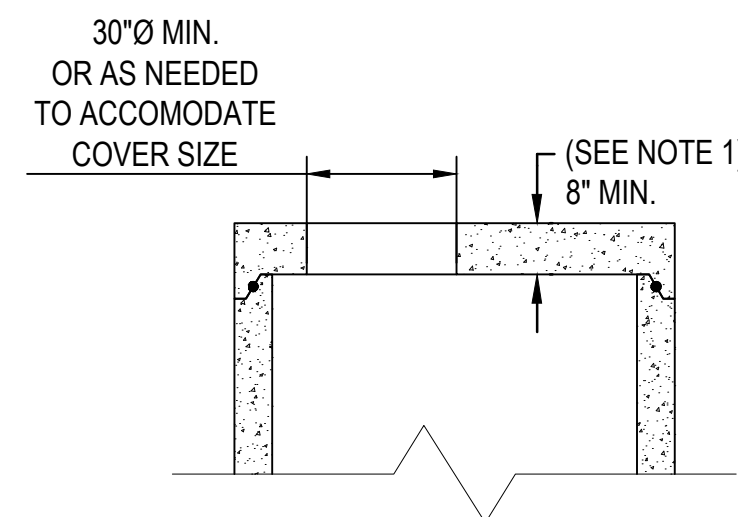
DRAINAGE PIPE PROFILE



- 1 UNPAVED SURFACE (4" TOPSOIL, SEED AND MULCH)
- 2 HEAVY DUTY CAST IRON MANHOLE FRAME & COVER (LABELED DRAIN), BOLT DOWN, SHALL MEET AASHTO M306 (LATEST VERSION)
- 3 FRAME TO BE SET IN FULL BED OF MORTAR
- 4 FINISHED GRADE
- 5 MORTAR
- 6 ADJUST TO GRADE WITH BRICK OR PRECAST CONCRETE RINGS: MAX. 6" ADJUSTMENT
- 7 COPOLYMER POLYPROPYLENE MANHOLE STEP @ 12" O.C. (TYP)
- 8 12" CRUSHED STONE
- 9 UNDISTURBED SUBGRADE
- 10 NEOPRENE BOOT AND STAINLESS STEEL CLAMPS
- 11 BUTYL RUBBER JOINTS
- 12 PRECAST OR FIELD POURED INVERT

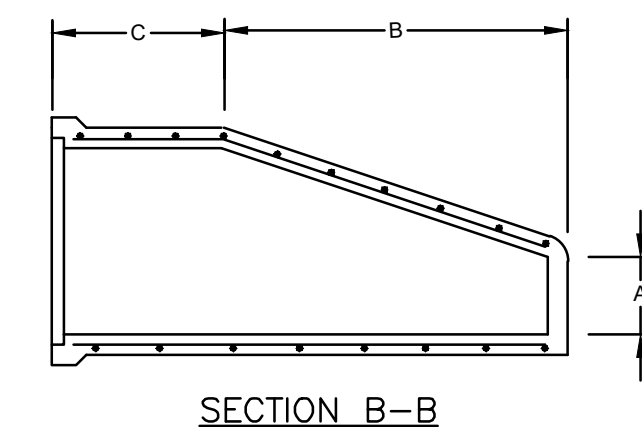
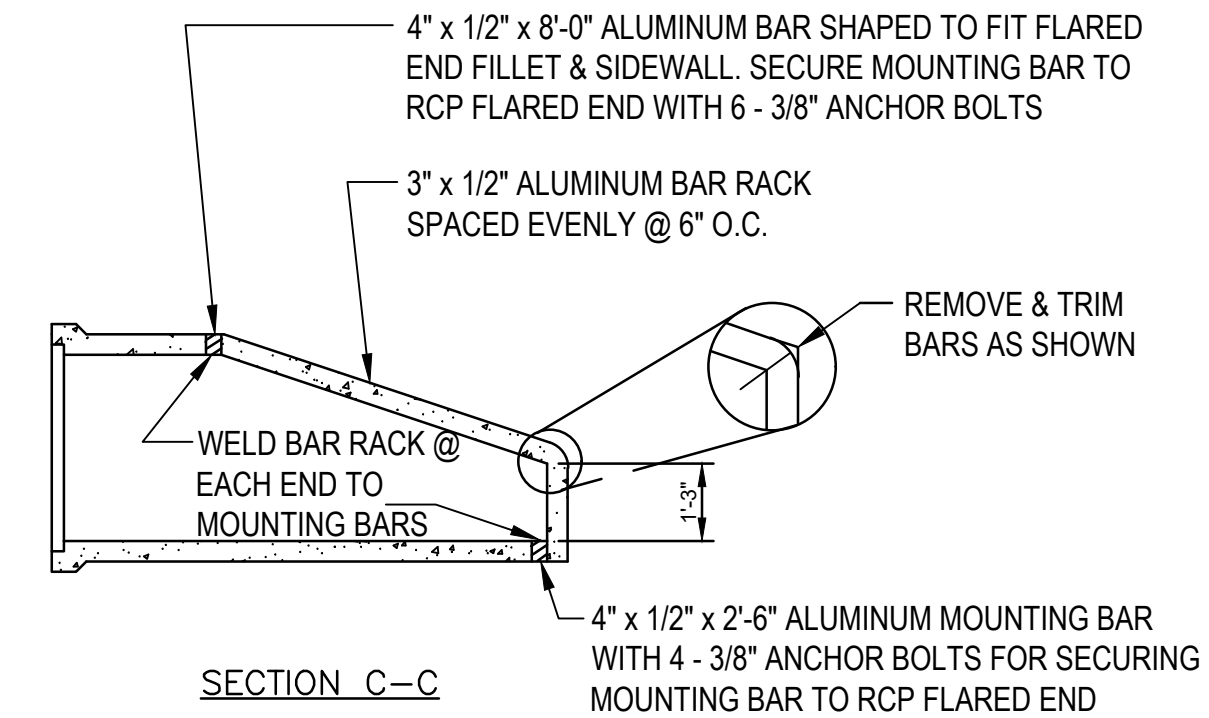
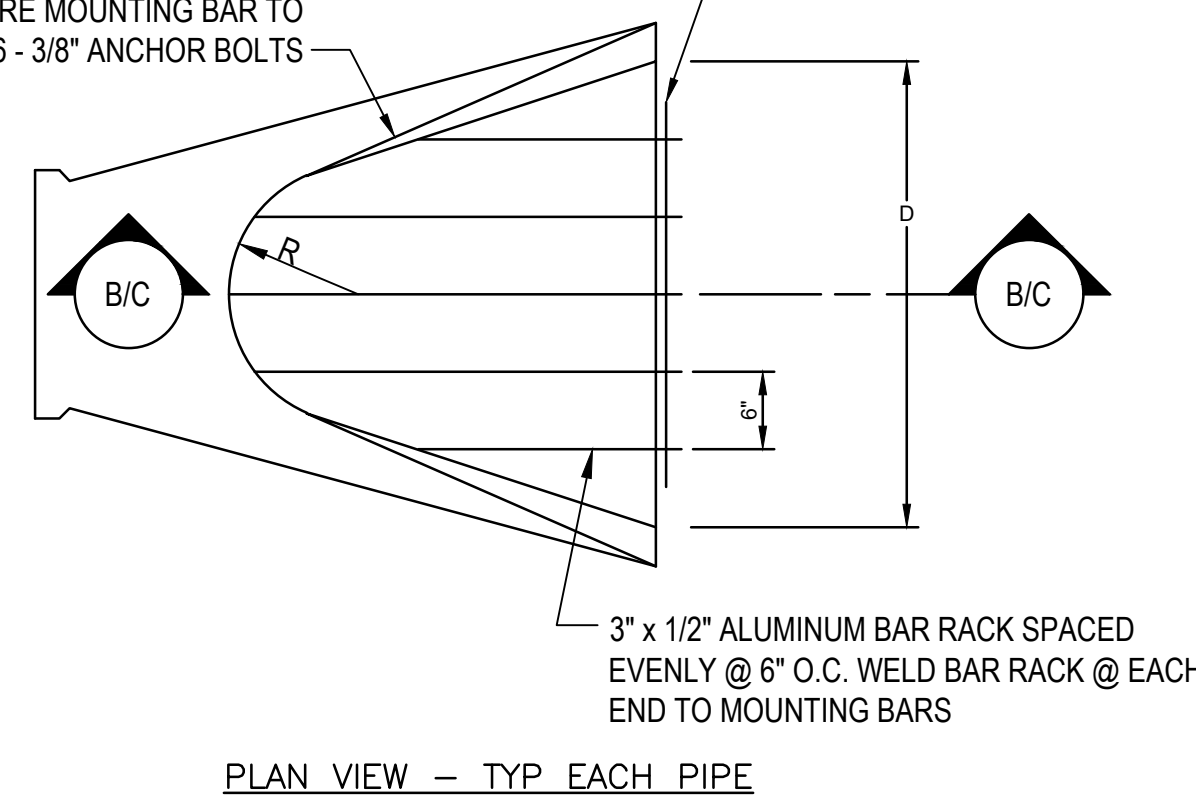
NOTES:

1. PRECAST CONCRETE STRUCTURES AND CASTINGS SHALL ACCOMMODATE H20 LOADINGS.
2. UNLESS OTHERWISE NOTED, MANHOLES SHALL BE 60" I.D. MINIMUM
3. WALL THICKNESS SHALL BE 5" MIN. AND FLOOR THICKNESS SHALL BE 8" MIN.
4. PRECAST CONCRETE STRUCTURES SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM-C-478. THE CONCRETE SHALL HAVE AN ULTIMATE STRENGTH, $f_c = 4,000$ PSI AT 28 DAYS UNLESS OTHERWISE NOTED.
5. THE REINFORCING STEEL SHALL CONFORM TO AASHTO M31, GRADE 60. ALL REINFORCING STEEL SHALL BE EPOXY COATED. THE MINIMUM CLEAR COVER TO REINFORCING BARS SHALL BE 2" UNLESS OTHERWISE NOTED.
6. STRUCTURES WITH MULTIPLE PIPES SHALL HAVE A MIN OF 12" OF INSIDE SURFACE BETWEEN HOLES. NO MORE THAN 75% OF A HORIZONTAL CROSS SECTION SHALL BE HOLES CLOSER THAN 3" TO JOINTS.
7. ALL INVERTS SHALL BE BRICKED



4" x 1/2" x 2'-6" ALUMINUM MOUNTING BAR WITH 4 - 3/8" ANCHOR BOLTS FOR SECURING MOUNTING BAR TO RCP FLARED END

4" x 1/2" x 8'-0" ALUMINUM BAR SHAPED TO FIT FLARED END FILLET & SIDEWALL. SECURE MOUNTING BAR TO RCP FLARED END WITH 6 - 3/8" ANCHOR BOLTS



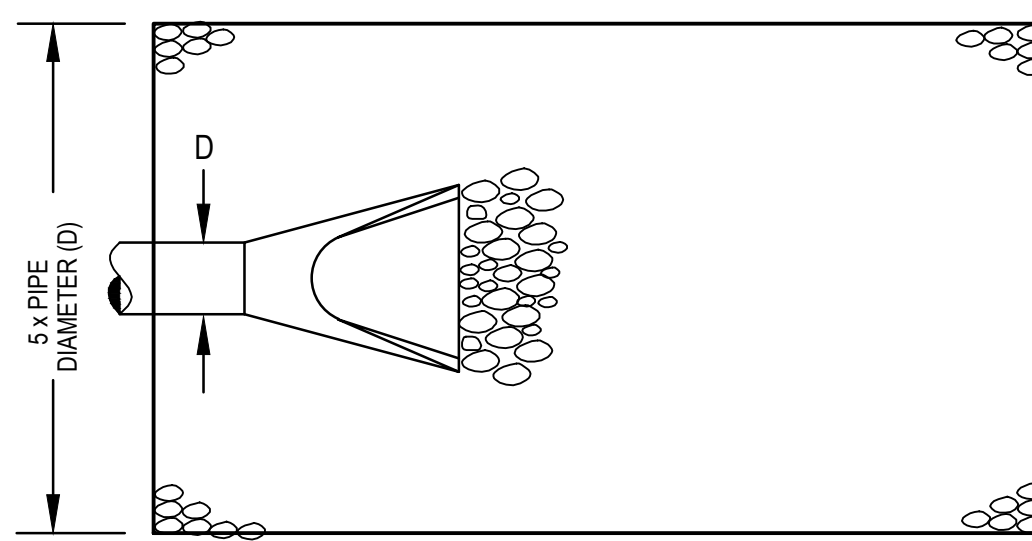
DIA.	A	B	C	D	E	R
30"	12"	4'-6"	1'-7 3/4"	5'-0"	3 1/2"	15"

PLAN VIEW - TYP EACH PIPE

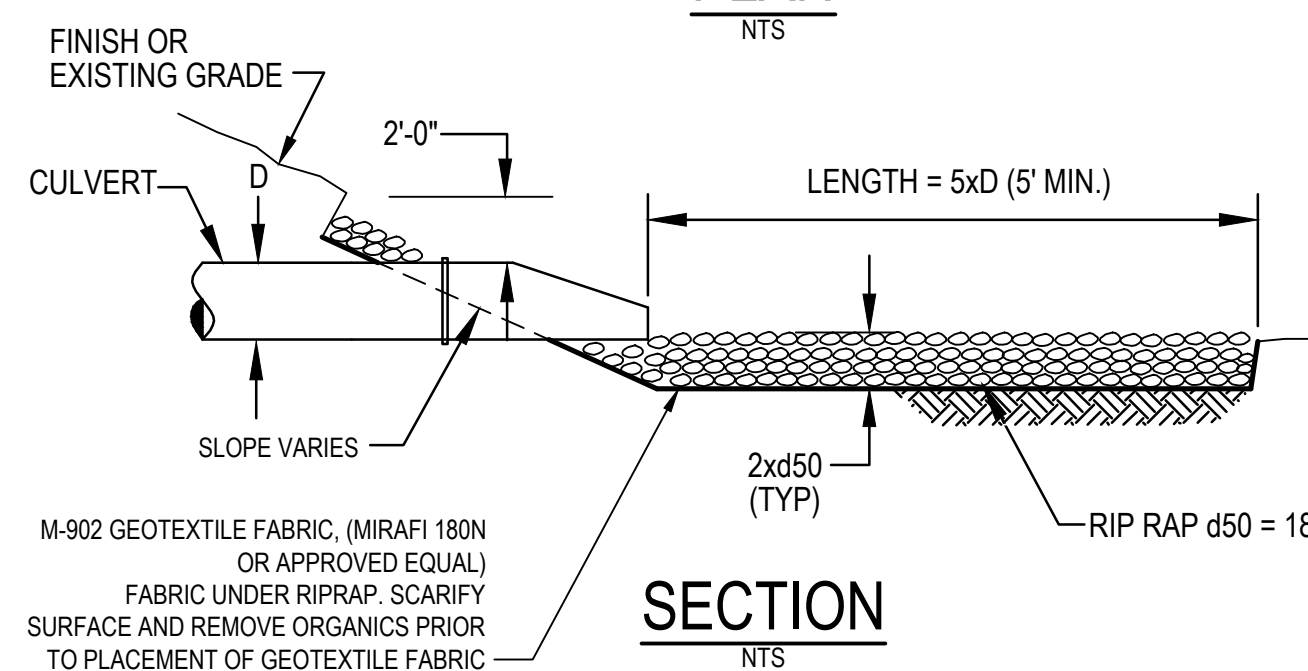
END VIEW

2 RCP FLARED END SECTION DETAIL

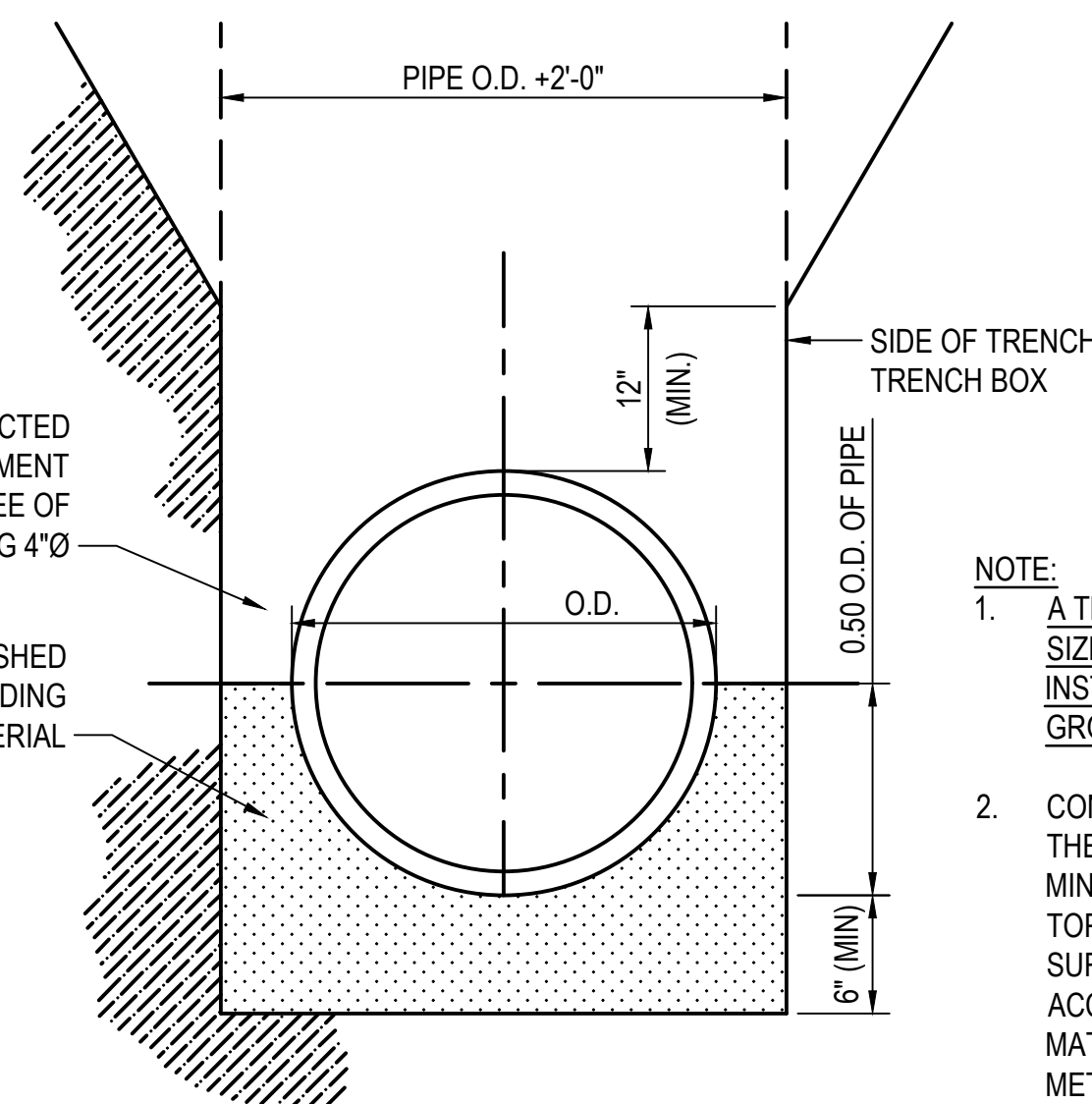
NOT TO SCALE



PLAN NTS



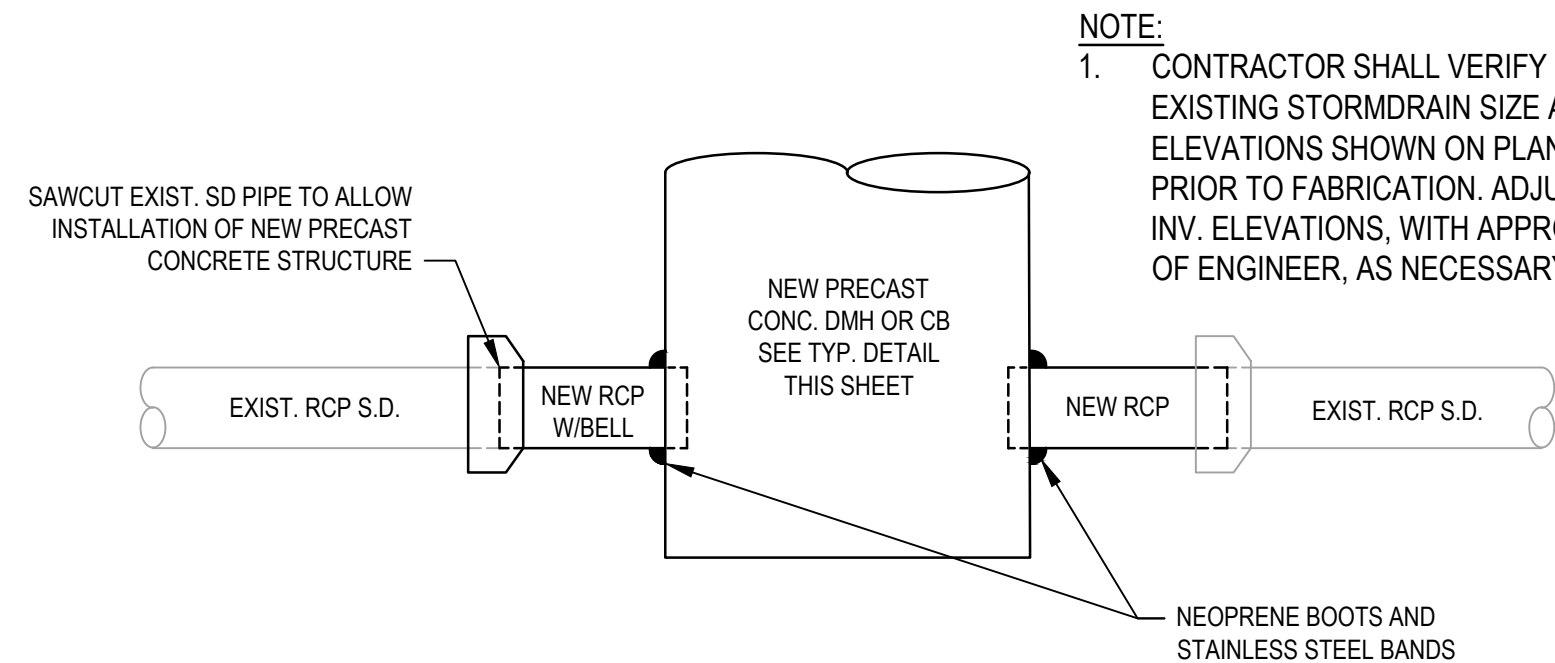
SECTION NTS



5 STORMDRAIN TRENCH NOT TO SCALE

1 PRECAST CONCRETE MANHOLE DETAIL

NOT TO SCALE



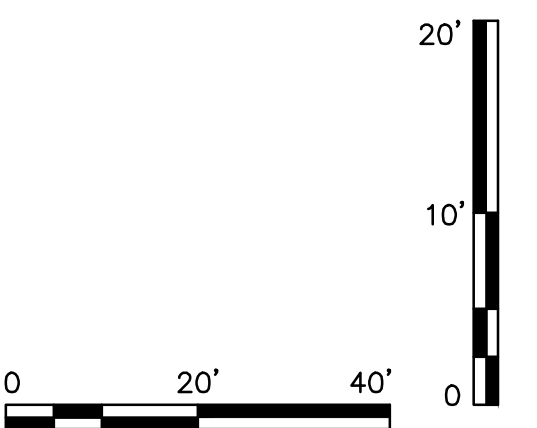
3 EXISTING STORM DRAIN PIPE CONNECTION TO NEW DRAIN STRUCTURE

NOT TO SCALE

4 RIPRAP INLET DETAIL

NTS

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 FEBRUARY 12, 2025



DRAINAGE PIPE PROFILE SCALE

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0	DMZ	DMZ	25.02.12
1	DMZ	DMZ	25.02.12

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Client/Project
 LAWRENCE MUNICIPAL AIRPORT
 NORTH ANDOVER, MA
 RUNWAY 5 END
 DRAINAGE IMPROVEMENTS

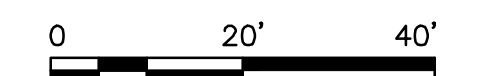
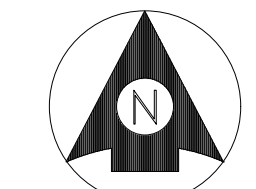
Title
 DRAINAGE DETAILS

Project No.
 179450605

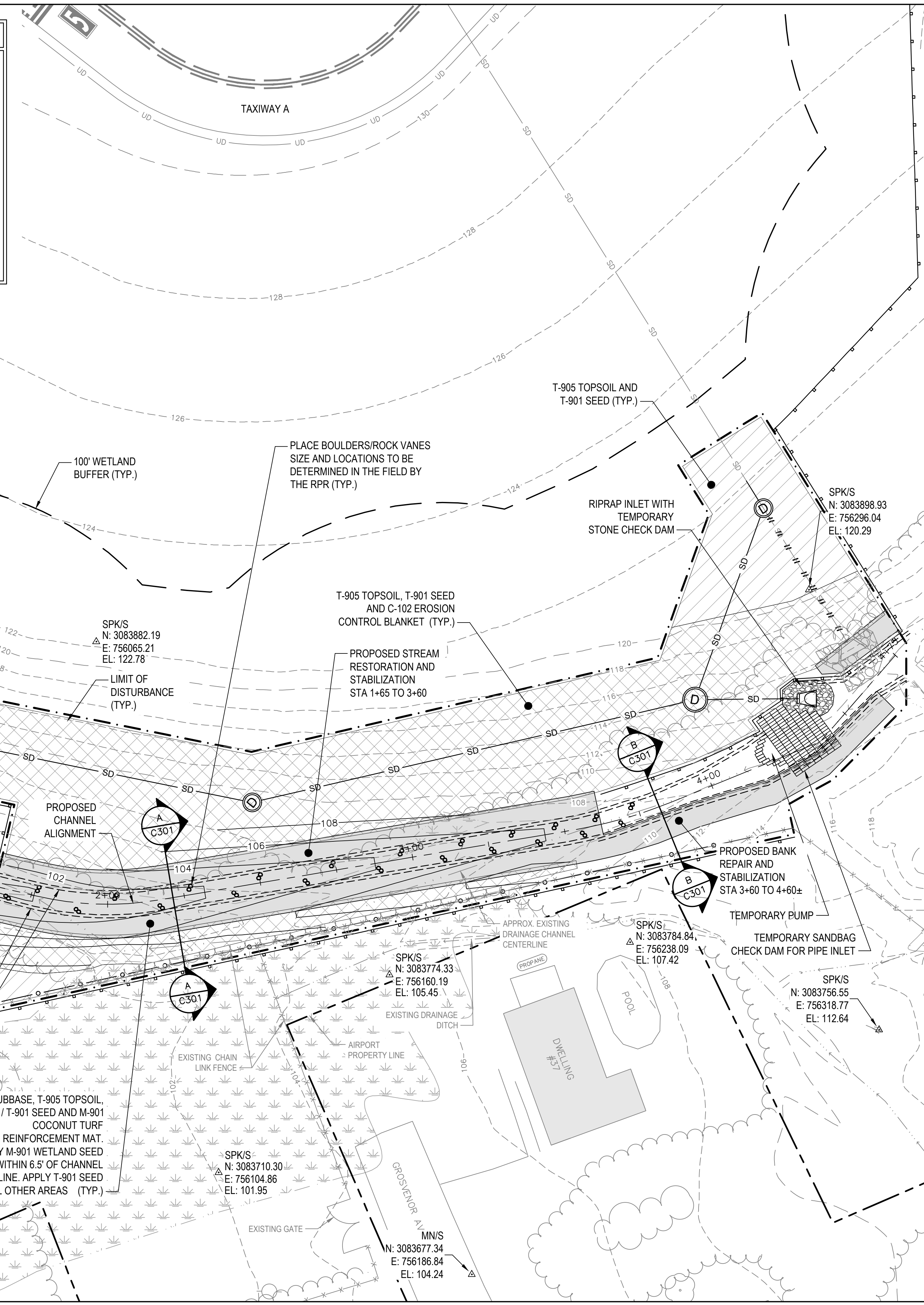
Drawing No. Sheet Revision

NOTES:

- ANY AREAS DISTURBED BEYOND WHAT IS SHOWN ON THIS PLAN SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
- AN ADDITIONAL SILT FENCE REQUIRED FOR STOCKPILES SHALL NOT BE MEASURED AND SHALL BE CONSIDERED INCIDENTAL TO THE SEDIMENT BARRIER ITEM.



LEGEND			
	APPROXIMATE AIRPORT PROPERTY LINE		SURVEY CONTROL POINT
	EXISTING EDGE OF PAVEMENT		LIMIT OF DISTURBANCE
	BORDERING VEGETATED WETLAND (DELINEATED)		PROPOSED TOPSOIL, SEED AND CHANNEL REINFORCEMENT LINER
	BORDERING VEGETATED WETLAND (UNDETERMINED)		PROPOSED TOPSOIL, SEED AND EROSION CONTROL BLANKET
	100' WETLAND BUFFER		PROPOSED TOPSOIL AND SEED
	EXISTING INTERMITTENT STREAM CENTERLINE		PROPOSED RIP RAP
	EXISTING INTERMITTENT STREAM BANK		PROPOSED SANDBAGS
	EXISTING VEGETATION LINE		PROPOSED SEDIMENT BARRIER
	EXISTING FENCE		PROPOSED COIR LOG
	100		PROPOSED STORM DRAIN PIPE
	EXISTING MAJOR CONTOUR		PROPOSED DRAIN MANHOLE
	EXISTING MINOR CONTOUR		REMOVE EXISTING STORM DRAIN PIPE
	EXISTING STORM DRAIN PIPE		100
	ALIGNMENT		PROPOSED MAJOR CONTOUR
			102
			PROPOSED MINOR CONTOUR



Revision	By	Appd.	YY.MM.DD
0	ISSUED FOR BID	DMZ	25.02.12
Issued		By	Appd.
		DMZ	YY.MM.DD

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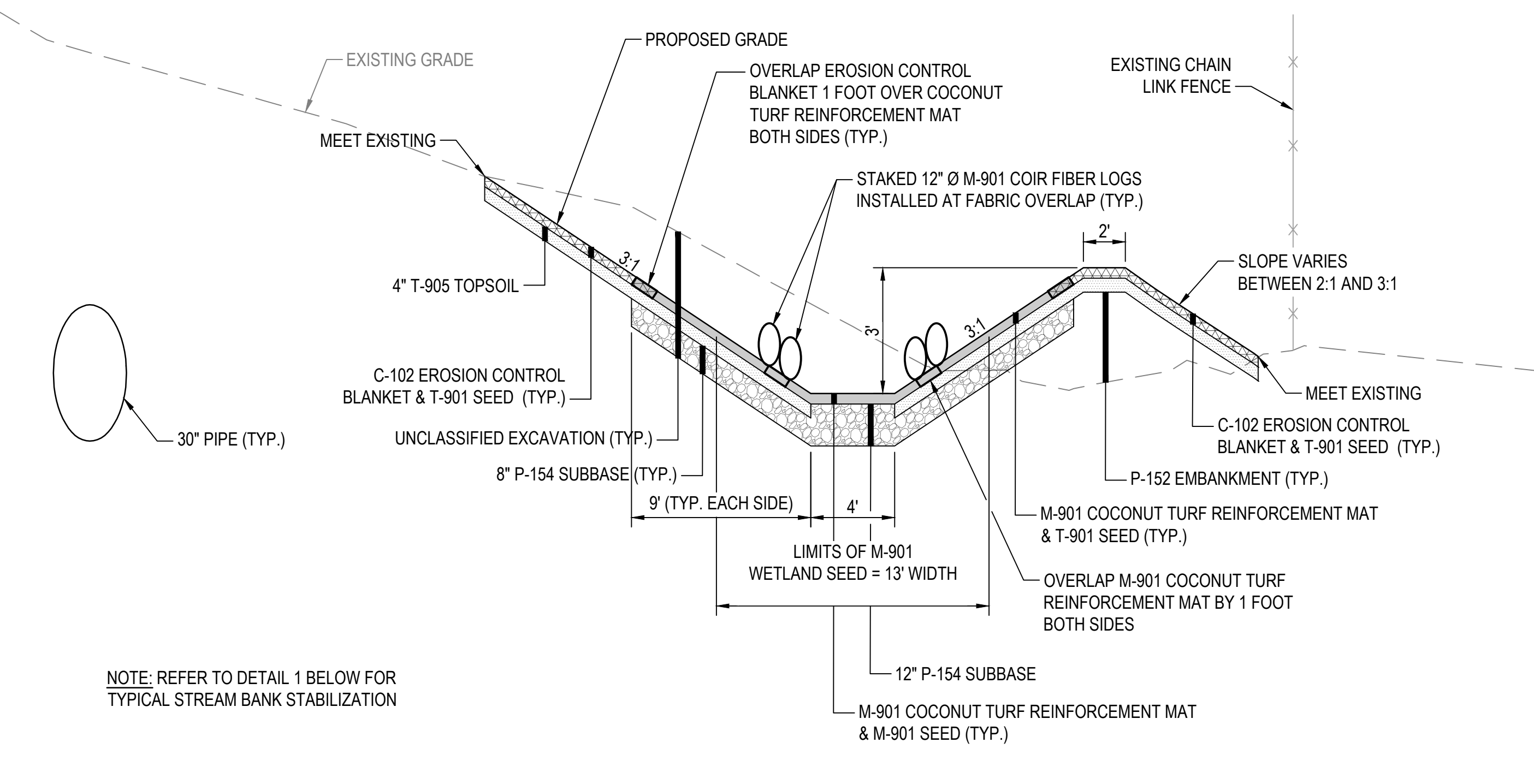
Client/Project
 LAWRENCE MUNICIPAL AIRPORT
 NORTH ANDOVER, MA
 RUNWAY 5 END
 DRAINAGE IMPROVEMENTS

Title
 STREAM RESTORATION &
 EROSION CONTROL PLAN

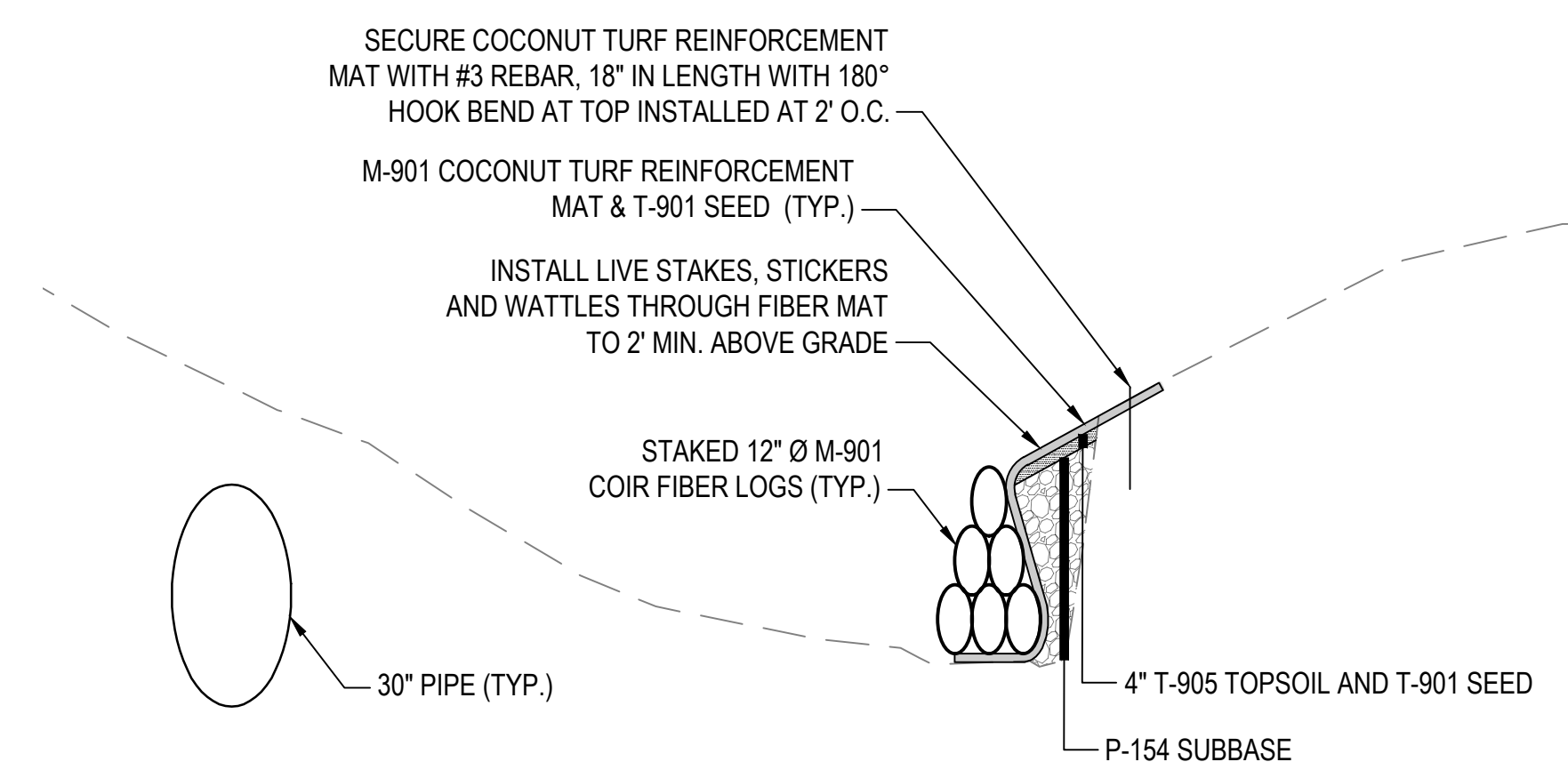
Project No. 179450605	Sheet C401	Revision 0
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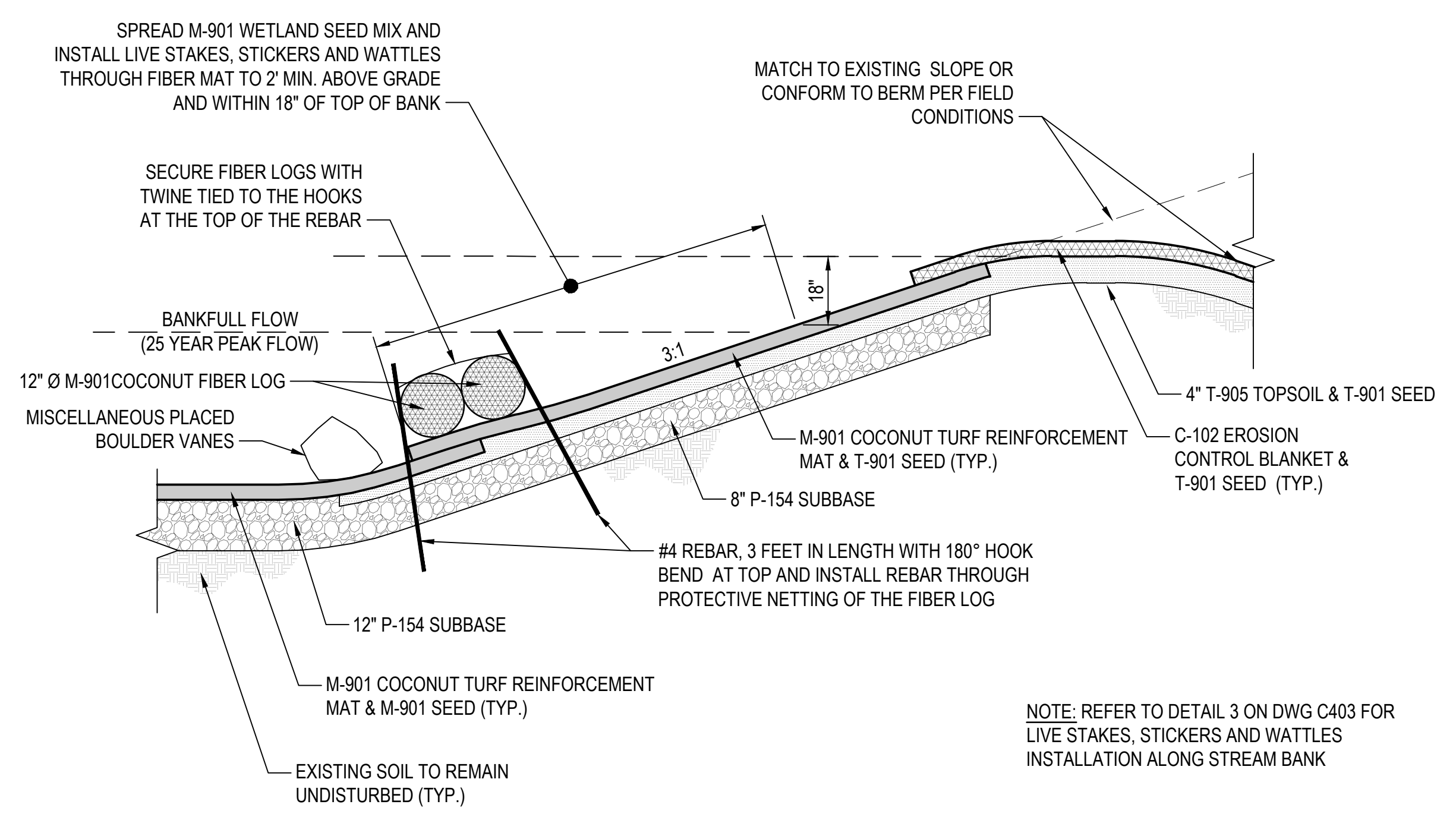


A-A STREAM CHANNEL RESTORATION
 TYPICAL SECTION A-A (STA. 1+75 TO 3+60)



B-B STREAM BANK REPAIR AND STABILIZATION
 TYPICAL SECTION B-B (STA. 3+60 TO 4+75)

NOTE: REFER TO DETAIL 1 BELOW FOR TYPICAL STREAM BANK STABILIZATION



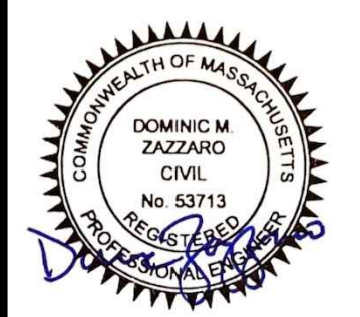
1 TYPICAL STREAM BANK STABILIZATION FOR CHANNEL RESTORATION
 NOT TO SCALE

NOTE: REFER TO DETAIL 3 ON DWG C403 FOR LIVE STAKES, STICKERS AND WATTLES INSTALLATION ALONG STREAM BANK

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 NORTH ANDOVER, MA
 RUNWAY 5 END
 DRAINAGE IMPROVEMENTS

Title
 STREAM RESTORATION -
 TYPICAL SECTIONS

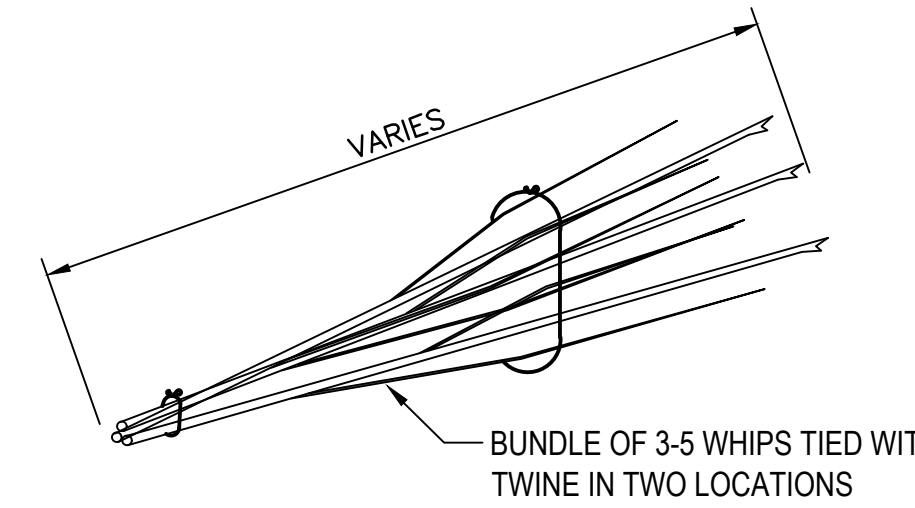
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STREAM CHANNEL RESTORATION NOTES:

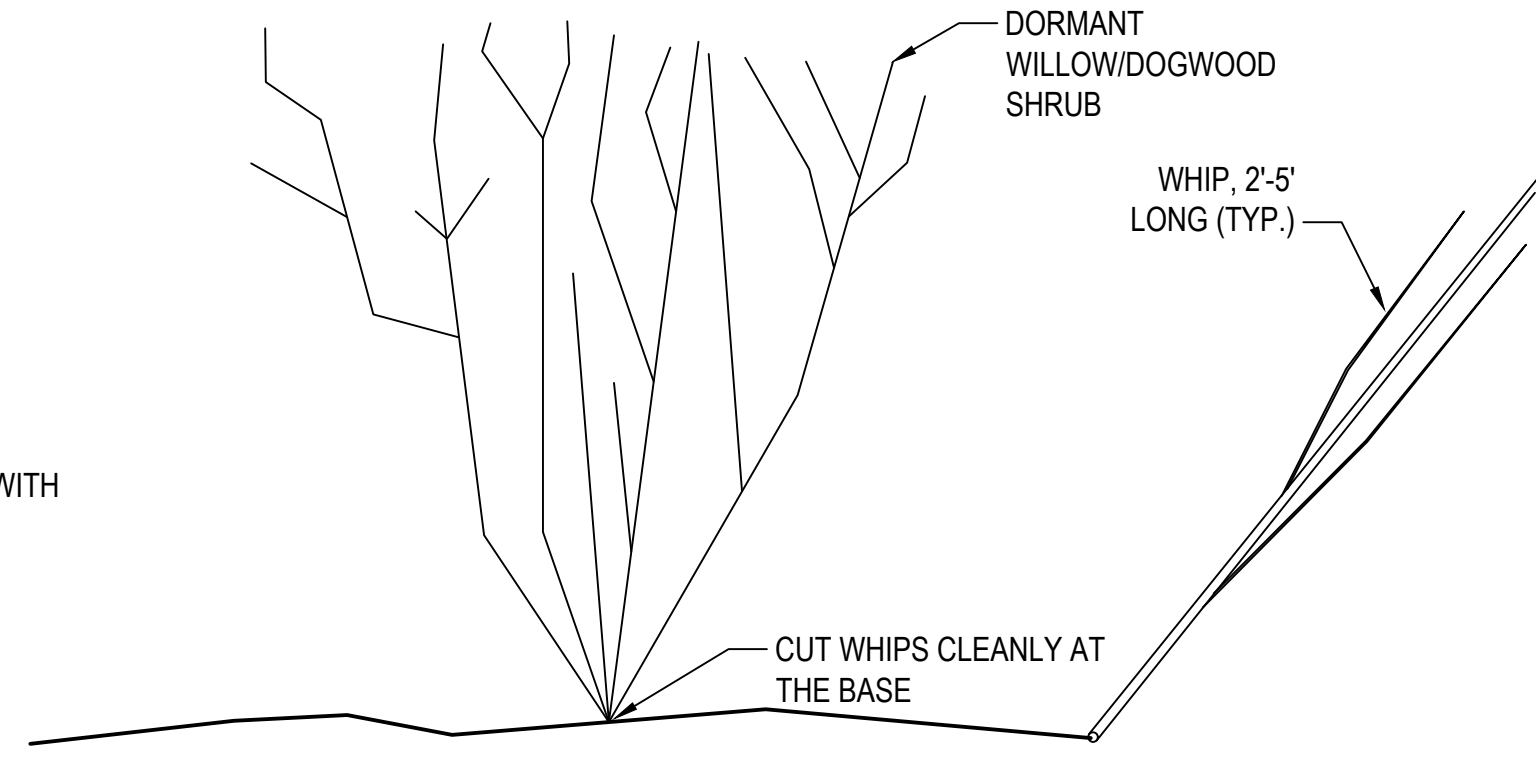
- CONSTRUCTION SHALL BE SCHEDULED TO OCCUR DURING A PERIOD OF NORMAL ANTICIPATED FLOW CONDITIONS AND OPTIMALLY DURING A SELECTED PREDICTION OF EXPECTED DRY WEATHER TO LIMIT POTENTIAL FOR EROSION, SEDIMENTATION, AND IMPACTS TO AQUATIC ORGANISMS. ALL WORK ASSOCIATED WITH THIS PROJECT SHALL BE AS APPROVED FOR CONSTRUCTION DURING THE SUMMER (JUNE 1 THROUGH OCTOBER 1) SEASON. HOWEVER, SAID WORK IS SUBJECT TO ALL CONDITIONS OF APPROVAL AND APPLICABLE PROVISIONS HEREIN.
- WRITTEN MEASURES SHALL BE PROPOSED BY CONTRACTOR AND SUBMITTED FOR NORTH ANDOVER CONSERVATION COMMISSION (NACC) REVIEW AND WRITTEN APPROVAL PRIOR TO COMMENCEMENT OF CONSTRUCTION ASSOCIATED WITH CHANNEL MAINTENANCE AND DIVERTING FLOWS FROM INTERMITTENT STREAM DURING CONSTRUCTION. SAID WRITTEN MEASURES SHALL BE PROVIDED CONCURRENTLY TO THE INDEPENDENT OBSERVER AND MASSDEP.
- IN GENERAL, THE MOST FAVORABLE TIME FOR THIS WORK IS DURING PERIODS OF LOW FLOW, GENERALLY JULY 1 TO OCTOBER 1. THE STREAM FLOW WILL NEED TO BE MAINTAINED FOR MOST OF THE CONSTRUCTION DURATION TO PROVIDE DRY WORKING CONDITIONS TO THE MAXIMUM EXTENT PRACTICABLE. WITH THE STREAM BASE FLOW FLOWING THROUGH THE DIVERSION, THE CONSTRUCTION AREA SHALL BE DEWATERED, AS NECESSARY, TO MAINTAIN DRY CONDITIONS DURING THE CONSTRUCTION PERIOD. THIS WILL REQUIRE THAT THE BASE STREAM FLOW IS INTERRUPTED TO CREATE A DRY CONDITION OF THE PROPOSED STREAM RESTORATION WORK AREA. IN ADDITION TO TEMPORARY SAND BAG DAM AND BYPASS CULVERT THE CONTRACTOR SHALL INSTALL A PUMPED BYPASS FOR DEWATERING AT THE UPSTREAM LOCATION OF THE WORK AREA TO BE UTILIZED, AS NEEDED, TO PUMP TO AN APPROVED STABLE AREA, IN ORDER TO MAINTAIN DRY CONDITIONS WITHIN THE PROJECT WORK AREA. THIS PUMPED BYPASS WILL BE INSTALLED TO BLOCK OR PREVENT FLOW FROM ENTERING THE WORK AREA FOR THE SHORT DURATION REQUIRED TO PERFORM THE NECESSARY STREAM MAINTENANCE ACTIVITIES.
- CONTRACTOR SHALL SCHEDULE WORK AND MOBILIZE WELL IN ADVANCE OF SCHEDULED DATE OF CONSTRUCTION AND SHALL PLAN TO COMMENCE WORK DURING A DRY PERIOD OF NO FLOW OR LOW FLOW CONDITIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR MONITORING WEATHER CONDITIONS AND FORECAST AT LEAST ONE WEEK PRIOR TO CONSTRUCTION AND SHALL RESCHEDULE DATE OF COMMENCEMENT OF CONSTRUCTION, OR INTERRUPTION OF WORK, IF SIGNIFICANT RAINFALL IS PREDICTED WITHIN 48 HOURS BEFORE OR AFTER START OF SIGNIFICANT CONSTRUCTION ACTIVITIES. A DRY PERIOD SHALL BE CONSIDERED TO BE AN EXTENDED PERIOD OF AT LEAST ONE WEEK IN WHICH THE EXTENDED FORECAST PREDICTS LESS THAN ONE QUARTER INCH OF CUMULATIVE RAINFALL DURING THIS PERIOD.
- CONTRACTOR SHALL PROVIDE A DETAILED SCHEDULE OF WORK TO THE RESIDENT PROJECT REPRESENTATIVE (RPR) AND ENVIRONMENTAL MONITOR (EM) WELL IN ADVANCE OF SCHEDULED DATE OF CONSTRUCTION AND SHALL NOT COMMENCE WITH WORK UNTIL THE SCHEDULE IS DEEMED TO BE ACCEPTABLE BY THE RPR. CONTRACTOR SHALL MOBILIZE ALL NECESSARY EQUIPMENT AND MATERIALS TO BE AVAILABLE ON SITE IN ADVANCE OF STARTING WORK AND SHALL PERFORM AS MUCH PREPARATORY WORK AS POSSIBLE IN ADVANCE OF STREAM RESTORATION WORK. THE CONTRACTOR SHALL BE AWARE OF THE POTENTIAL FOR SIGNIFICANTLY HIGHER FLOWS THAN ANTICIPATED. IN ADDITION TO ALL OF THE PROVISIONS INCLUDED HEREIN, THE CONTRACTOR SHALL PREPARE AN EMERGENCY CONTINGENCY PLAN TO ADDRESS PROVISIONS FOR PROVIDING ADDITIONAL PUMPING CAPACITY AND EMERGENCY MEASURES TO BE IMPLEMENTED AT LEAST 12 HOURS PRIOR TO PREDICTED RAINFALL EVENTS IN EXCESS OF 1/2 INCH. PLAN SHALL INCLUDE MEASURES TO PROVIDE ADDITIONAL PUMPS, HOSES AND NECESSARY EQUIPMENT TO PASS ANTICIPATED FLOWS. EQUIPMENT SHALL BE PLACED ON SITE AND IN A MADE READY CONDITION FOR IMMEDIATE IMPLEMENTATION. ADDITIONAL MEASURES SHALL BE ADDRESSED TO HANDLE UNEXPECTED BREACHES AND BLOWOUTS OF COFFERDAMS AND SANDBAG DIVERSIONS. ADDITIONAL SANDBAGS, EROSION CONTROL MATERIALS, EQUIPMENT AND PERSONNEL SHALL BE ON HAND TO IMMEDIATELY RESPOND TO ANY SUCH INCIDENTS OR EMERGENCIES AT EACH LOCATION INVOLVING STREAM DIVERSIONS OR PUMPED BYPASSES. A PLAN SHALL BE SUBMITTED TO NORTH ANDOVER CONSERVATION COMMISSION AND COPIES PROVIDED TO EM, RPR AND PRIOR TO INSTALLATION OF ANY ADDITIONAL DIVERSION OR BYPASS.
- EVALUATION OF THE SITE SHALL INCLUDE PROVISIONS FOR IMPLEMENTING ADDITIONAL PUMPING CAPACITY, AS NEEDED, AND FOR EXPANSION OF COFFERDAMS, SANDBAG BARRIERS AND DIVERSIONS IN THE EVENT OF EMERGENCY CONDITIONS. THE CONTRACTOR SHALL OBSERVE AND INSPECT ALL PRACTICES TO ENSURE THAT PROBLEMS ARE CORRECTED AS SOON AS THEY DEVELOP AND COORDINATE ALL WORK AND SCHEDULING WITH RE AND EM.
- THE CONTRACTOR SHALL PLAN WORK SO THAT THE TEMPORARY DIVERSION CULVERT CAN BE CONSTRUCTED FIRST, INCLUDING ANY TEMPORARY UPSTREAM PUMPED DEWATERING PROVISIONS NECESSARY TO INSTALL THE CULVERT AND SANDBAG DAMS, WHILE MAINTAINING CONTINUOUS FLOW CONDITIONS FOR THE BASE STREAM FLOW AND DIVERSION MEASURES.
- ALL WORK INCLUDING VEGETATION REMOVAL WILL NEED TO BE COMPLETED "IN-THE-DRY" CONDITIONS TO MAXIMUM EXTENT PRACTICABLE. TIMBER MATS OR OTHER MEANS MAY BE NECESSARY TO AVOID RUTTING BY WORK EQUIPMENT. ALL SOIL DISTURBANCE ACTIVITIES INCLUDING THE MAINTENANCE AND RECONSTRUCTION OF THE NATURAL CHANNEL SHALL BE CONSTRUCTED UNDER DRY CONDITIONS OR UNDER NO-FLOW CONDITIONS OF THE INTERMITTENT STREAM. THE NORMAL FLOW OF THE STREAM MUST BE DIVERTED AND THE WORK AREA MUST BE ISOLATED AND DRY TO ALLOW THE PROJECT TO PROCEED. SANDBAGS OR TEMPORARY DIVERSIONS SHALL BE DEMONSTRATED TO ADEQUATELY MAINTAIN THE STREAM AND BYPASS FLOWS PRIOR TO CONSTRUCTION. CONTRACTOR SHALL BE PREPARED TO RESPOND TO EXCESSIVE STORM FLOWS OR EMERGENCY CONDITIONS IN ACCORDANCE WITH

EMERGENCY CONTINGENCY PLAN. ADDITIONAL SANDBAGS, PUMPS, OR OTHER MEANS SHALL BE UTILIZED, AS NECESSARY, TO PASS BASE STREAM FLOW AND TO SEPARATE AND MAINTAIN DRY WORK AREA FROM CHANNEL FLOWS.

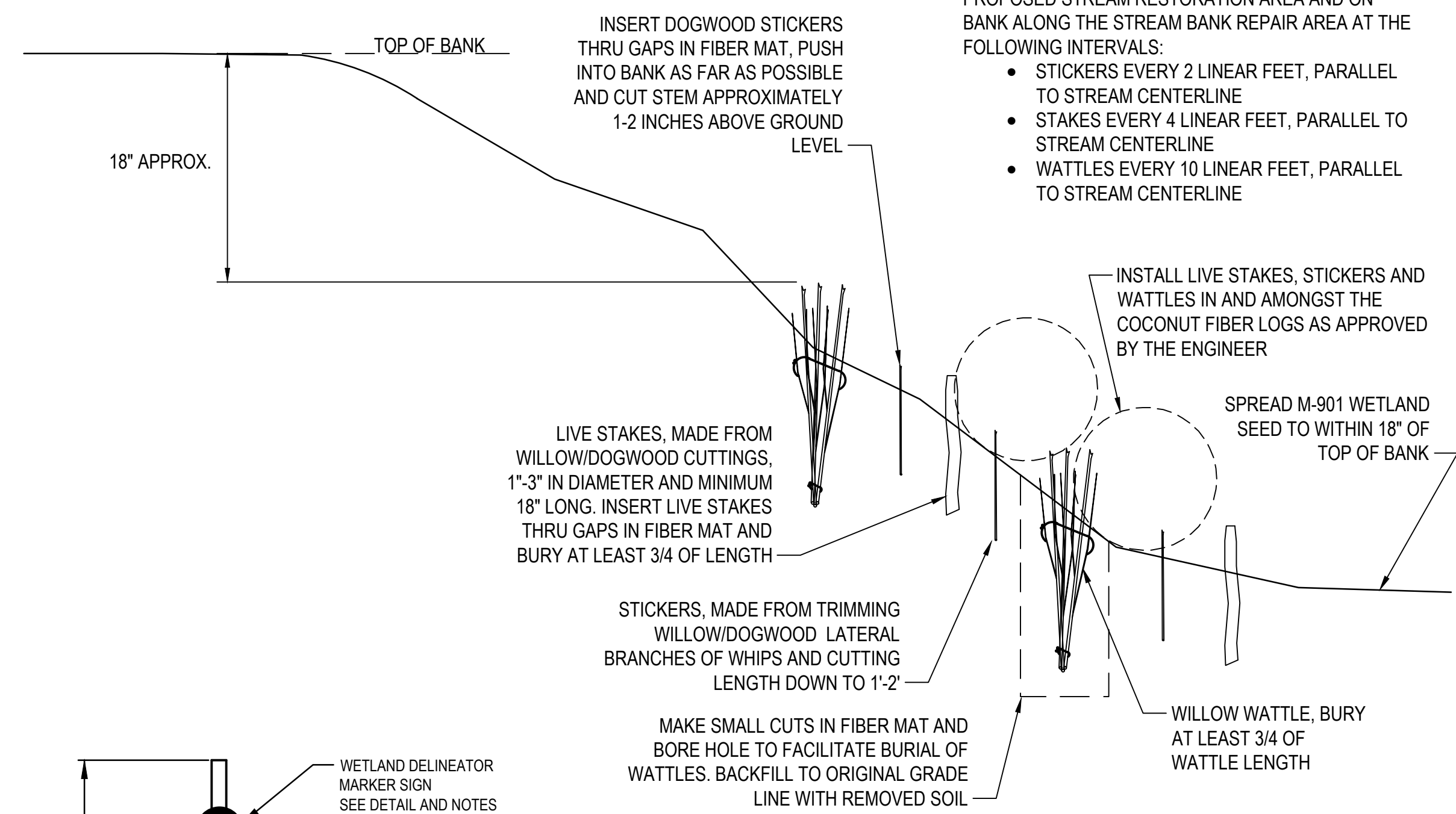
- ALL MATERIALS AND EQUIPMENT SHOULD BE LOCATED AND STOCKPILED ON-SITE, AT APPROVED LOCATION PRIOR TO CONSTRUCTION. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PERFORMED AS NEEDED TO ENSURE THAT THE DIVERSION, STREAMBED AND STREAMBANKS ARE MAINTAINED AND NOT DAMAGED.
- WORK AREA AND DIVERSIONS SHALL BE CAREFULLY MONITORED AT ALL TIMES AND SHALL BE REVISED OR REPAIRED WHEN PROBLEMS ARE OBSERVED OR ANTICIPATED. INSPECTION AND MONITORING SHALL INCLUDE CONSTRUCTION DOWNTIMES SUCH AS EVENINGS, WEEKENDS AND HOLIDAYS. DURING ACTIVE STREAM BYPASS PERIOD, ALL STREAM FLOWS SHALL BE HANDLED AND EFFECTIVELY BYPASSED, AT ALL TIMES, REGARDLESS IF ANY CONSTRUCTION ACTIVITIES ARE OCCURRING. INSPECTIONS SHALL BE MADE HOURLY OR AT SUFFICIENT INTERVALS TO MONITOR FOR EQUIPMENT FAILURES, FUELING OF EQUIPMENT, POTENTIAL HAZARDS, RAINFALL EVENTS, VANDALISM, OR UNANTICIPATED EVENTS, TO ENSURE THAT SUFFICIENT CAPACITY IS PROVIDED AND MAINTAINED AT ALL TIMES.
- TEMPORARY COFFERDAMS AND DIVERSION MEASURES WILL BE CONSTRUCTED TO FACILITATE DEWATERING USING SHORT DURATION TEMPORARY BYPASS PUMPING DURING CONSTRUCTION DISCHARGING TO AN APPROVED STABLE LOCATION. SAND BAG BERMS AND DIVERSIONS WILL BE EMPLOYED TO DEWATER WORK SITE AND BYPASS STREAM FLOWS.
- CONSTRUCT THE SANDBAG DIVERSION BERMS TO MAINTAIN STREAM AND BYPASS CONTINUITY DURING CONSTRUCTION. CONSTRUCT CLEAN WATER SUMPS AND INSTALL DEWATERING AND PUMPING APPARATUS TO MAINTAIN "IN THE DRY" CONDITIONS FOR THE CONSTRUCTION SITE. CONTRACTOR SHALL HAVE EXTRA SANDBAGS FOR REPAIRS TO DIVERSION BERMS AND A SECOND PUMP ON SITE FOR BACKUP OR ADDITIONAL CAPACITY AS NEEDED. WHEN USING PUMPED BYPASS DIVERSION, MAKE SURE ADEQUATE PUMPING CAPACITY IS AVAILABLE TO HANDLE STORM FLOWS.
- THE HEIGHT OF THE SANDBAG DIVERSION STRUCTURE SHALL BE AS INDICATED ON DRAWINGS AND DETAILS. CONTRACTOR SHALL INCREASE SANDBAG DIVERSION BERM HEIGHT AS NEEDED BASED ON FIELD CONDITIONS OR UNDER EMERGENCY CONDITIONS IN ORDER TO MAINTAIN ONE FOOT OF FREEBOARD TO TOP OF DIVERSION BERM.
- ALL EROSION AND SEDIMENT CONTROL MEASURES AND DEVICES SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES. DEWATER WORK AREA AND BYPASS STREAM FLOW PRIOR TO EXCAVATION OR CONSTRUCTION ACTIVITIES. USE UPSTREAM SUMPS, IF NECESSARY, TO COLLECT SURFACE RUNOFF AND BASE FLOW AND PREVENT IT FROM ENTERING THE CONSTRUCTION SITE. SEGREGATE CLEAN DIVERSION WATER FROM SEDIMENT-LADEN RUNOFF OR SEEPAGE WATER. GRADUALLY DEWATER AND REWATER STREAM SEGMENTS TO AVOID ABRUPT CHANGES IN STREAM FLOW. MANAGE AND TREAT SURFACE AND GROUNDWATER ENCOUNTERED DURING EXCAVATION WITH PUMPED BYPASS DIVERSIONS, OR DEWATERING MEASURES.
- A STOCKPILE OF ADDITIONAL EROSION CONTROL MATERIAL SUCH AS SILT FENCE, MULCH, RIPRAP, FILTER FABRIC, SANDBAGS, ETC. SHALL BE ON SITE SUFFICIENT TO HANDLE EMERGENCIES, REVISIONS, REPAIRS, ETC. EMERGENCY CONTINGENCY PLAN SHALL BE IMPLEMENTED TO BE READY AT LEAST 12 HOURS PRIOR TO PREDICTED RAINFALL EVENTS IN EXCESS OF 1/2 INCHES. ADDITIONAL SANDBAGS, EROSION CONTROL MATERIALS, EQUIPMENT AND PERSONNEL SHALL BE ON HAND TO IMMEDIATELY RESPOND TO ANY INCIDENTS OR EMERGENCIES AT EACH LOCATION INVOLVING STREAM DIVERSIONS OR BYPASSES.
- ENSURE THAT TEMPORARY OR PERMANENT EROSION AND PROTECTION MEASURES ARE BEING IMPLEMENTED AS INDICATED ON DRAWINGS, SPECIFIED OR REQUIRED. INSPECT AND MONITOR SITE FREQUENTLY DURING AND AFTER CONSTRUCTION TO ENSURE SITE REMAINS STABLE AND IS ADEQUATELY RE-VEGETATED, AND THAT TEMPORARY AND PERMANENT MEASURES AND STABILIZATION PRACTICES ARE FUNCTIONING AS INTENDED.
- CONTRACTOR SHALL INSPECT SITE FREQUENTLY, AND PRIOR TO, AND IMMEDIATELY AFTER, RAINFALL EVENTS FOR EVIDENCE OF EROSION OR SEDIMENTATION AND EVALUATE ALL STRUCTURES, CHANNELS AND DISTURBED AREAS FOR STABILITY. MAKE ANY REPAIRS AS NEEDED AND PERFORM ANY APPROPRIATE PREVENTIVE MEASURES TO PROTECT SITE AND ADJACENT RESOURCES. DURING ACTIVE STREAM BYPASS PERIODS, ALL STREAM FLOWS SHALL BE MAINTAINED AND EFFECTIVELY BYPASSED, AT ALL TIMES, REGARDLESS IF ANY CONSTRUCTION ACTIVITIES ARE OCCURRING. INSPECTIONS SHALL BE MADE HOURLY OR AT SUFFICIENT INTERVALS TO MONITOR FOR EQUIPMENT FAILURES, FUELING OF EQUIPMENT, POTENTIAL HAZARDS, RAINFALL EVENTS, VANDALISM, OR UNANTICIPATED EVENTS, TO ENSURE THAT SUFFICIENT CAPACITY IS PROVIDED AND MAINTAINED AT ALL TIMES.
- CONTRACTOR SHALL INSPECT FOR EVIDENCE OF STREAM INSTABILITY AND FOR PRESENCE OF DEBRIS ACCUMULATIONS OR OTHER PHYSICAL BARRIERS AT OR WITHIN STREAM OR CULVERT AND REPAIR AS NEEDED.
- CONTRACTOR SHALL INSPECT FOR SCOURING OF THE STREAMBED DOWNSTREAM OR THE ACCUMULATION OF SEDIMENT UPSTREAM OF THE WORK.



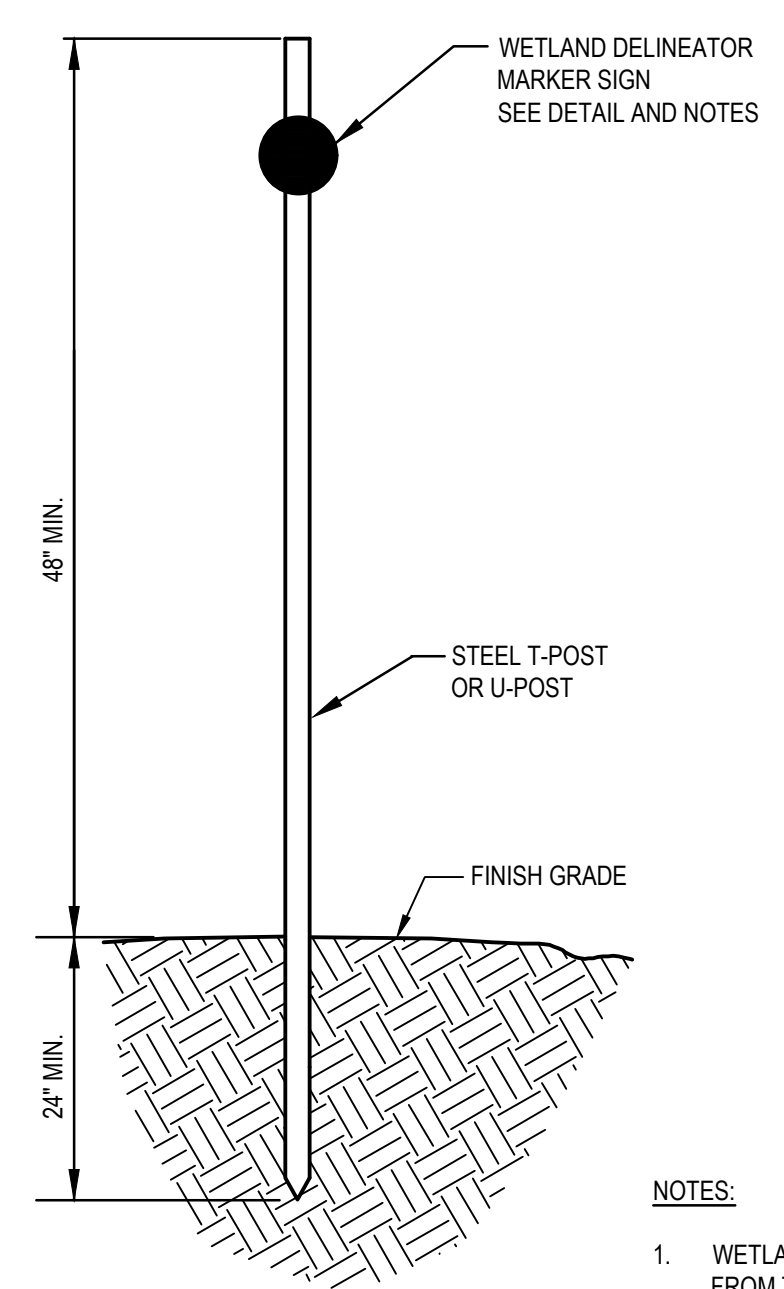
1 SHRUB WATTLE
NOT TO SCALE



2 WHIP
NOT TO SCALE



3 LIVE STAKES, STICKERS AND WATTLES FOR STREAM BANK STABILIZATION
NOT TO SCALE



WETLAND DELINEATOR MARKER SIGN
NOT TO SCALE

- NOTES:**
- WETLAND DELINEATOR MARKER SIGNS SHALL BE PURCHASED FROM THE NORTH ANDOVER CONSERVATION COMMISSION.
 - THE CONTRACTOR SHALL FURNISH AND INSTALL WETLAND DELINEATORS AS REQUIRED BY THE ORDER OF CONDITIONS AS REFERENCED. THE COST TO FURNISH AND INSTALL ALL MARKERS SHALL BE INCIDENTAL TO THE PROJECT.



WETLAND DELINEATOR MARKER SIGN
NOT TO SCALE

NOTE: LIVE STAKES, STICKERS AND WATTLES SHALL BE INSTALLED ON BOTH SIDES OF BANK ALONG THE PROPOSED STREAM RESTORATION AREA AND ON BANK ALONG THE STREAM BANK REPAIR AREA AT THE FOLLOWING INTERVALS:

- STICKERS EVERY 2 LINEAR FEET, PARALLEL TO STREAM CENTERLINE
- STAKES EVERY 4 LINEAR FEET, PARALLEL TO STREAM CENTERLINE
- WATTLES EVERY 10 LINEAR FEET, PARALLEL TO STREAM CENTERLINE



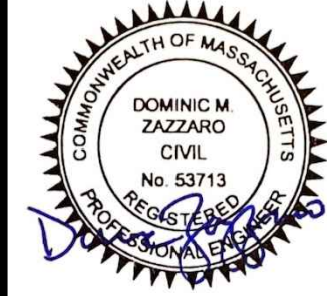
Stantec Consulting Services Inc.
45 Blue Sky Drive, 3rd Floor
Burlington, MA 01803 U.S.A.
Tel. 781.221.1000
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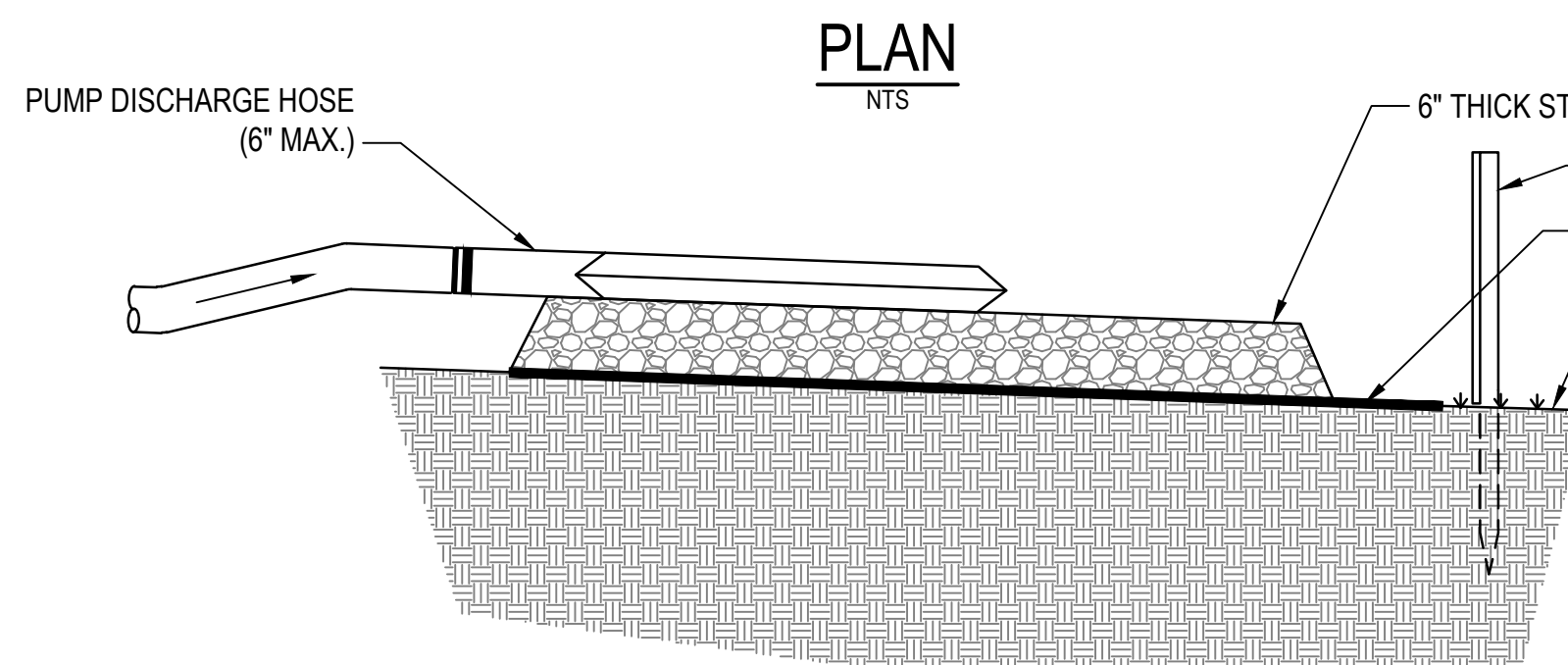
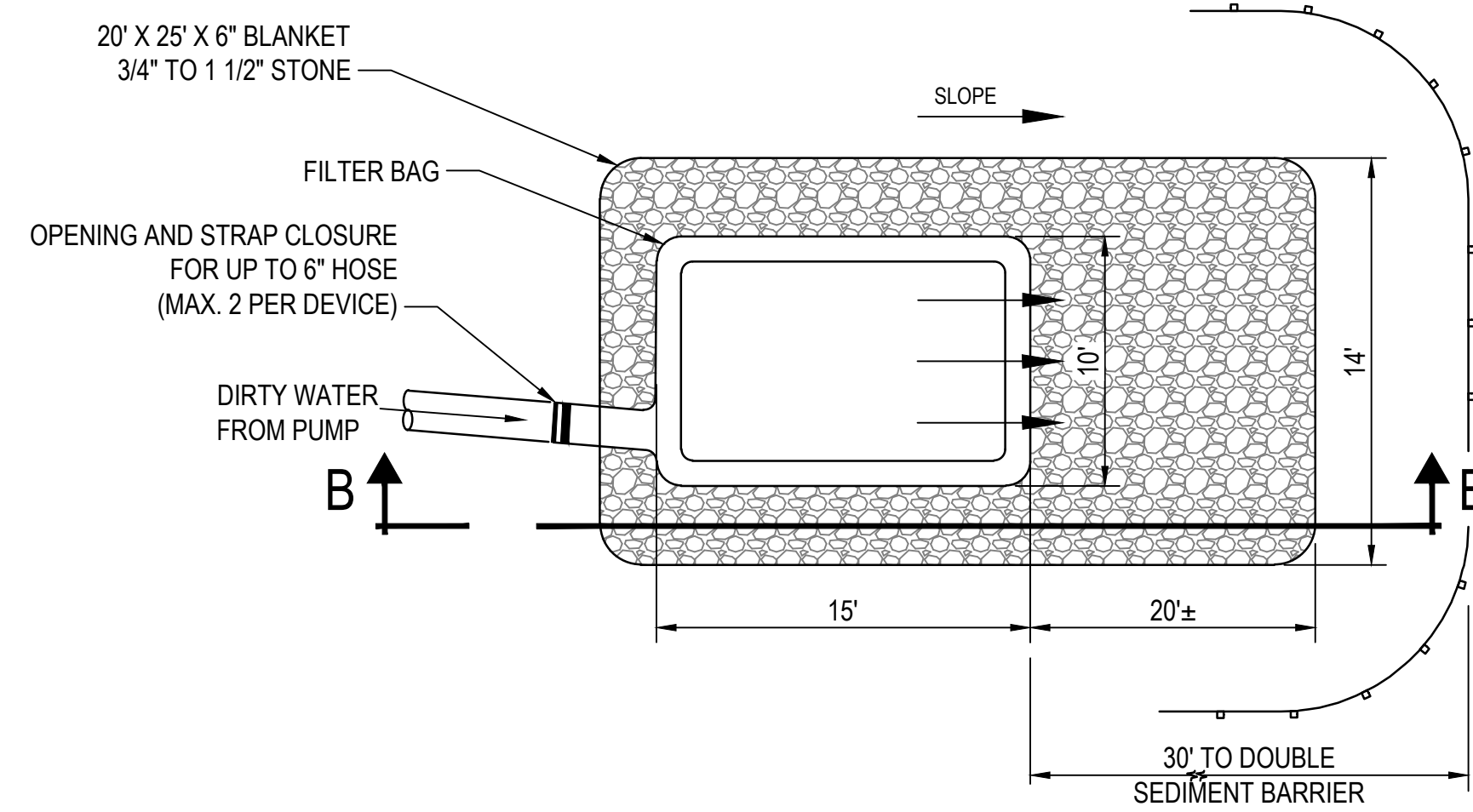
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NOTES & DETAILS

Project No. 179450605	Sheet	Revision
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C403 14 of 21 0

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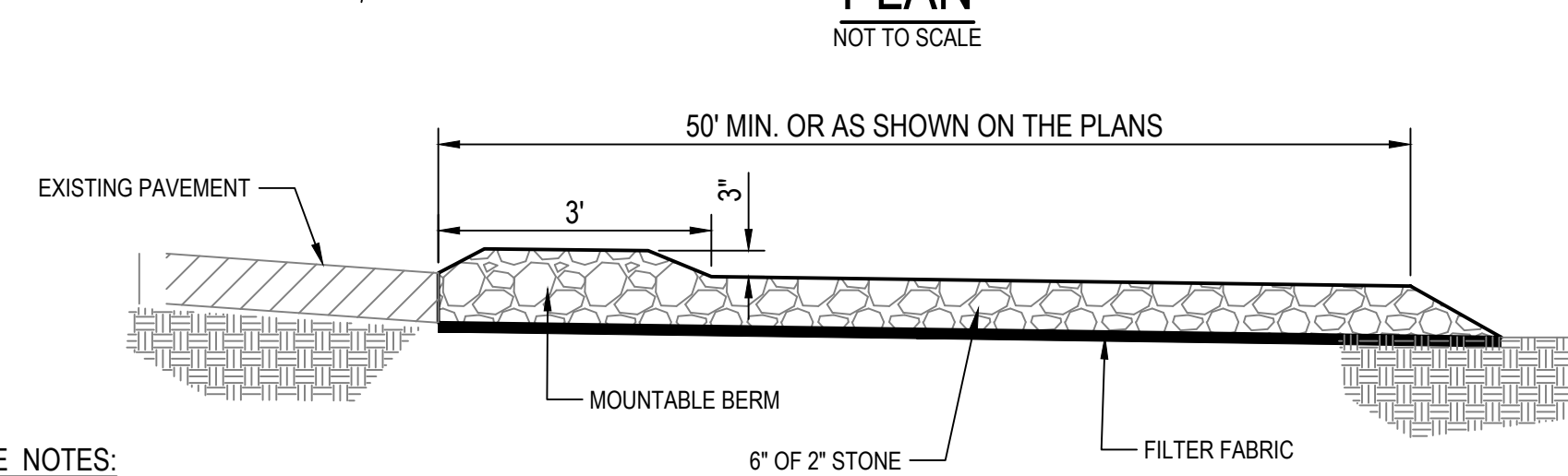
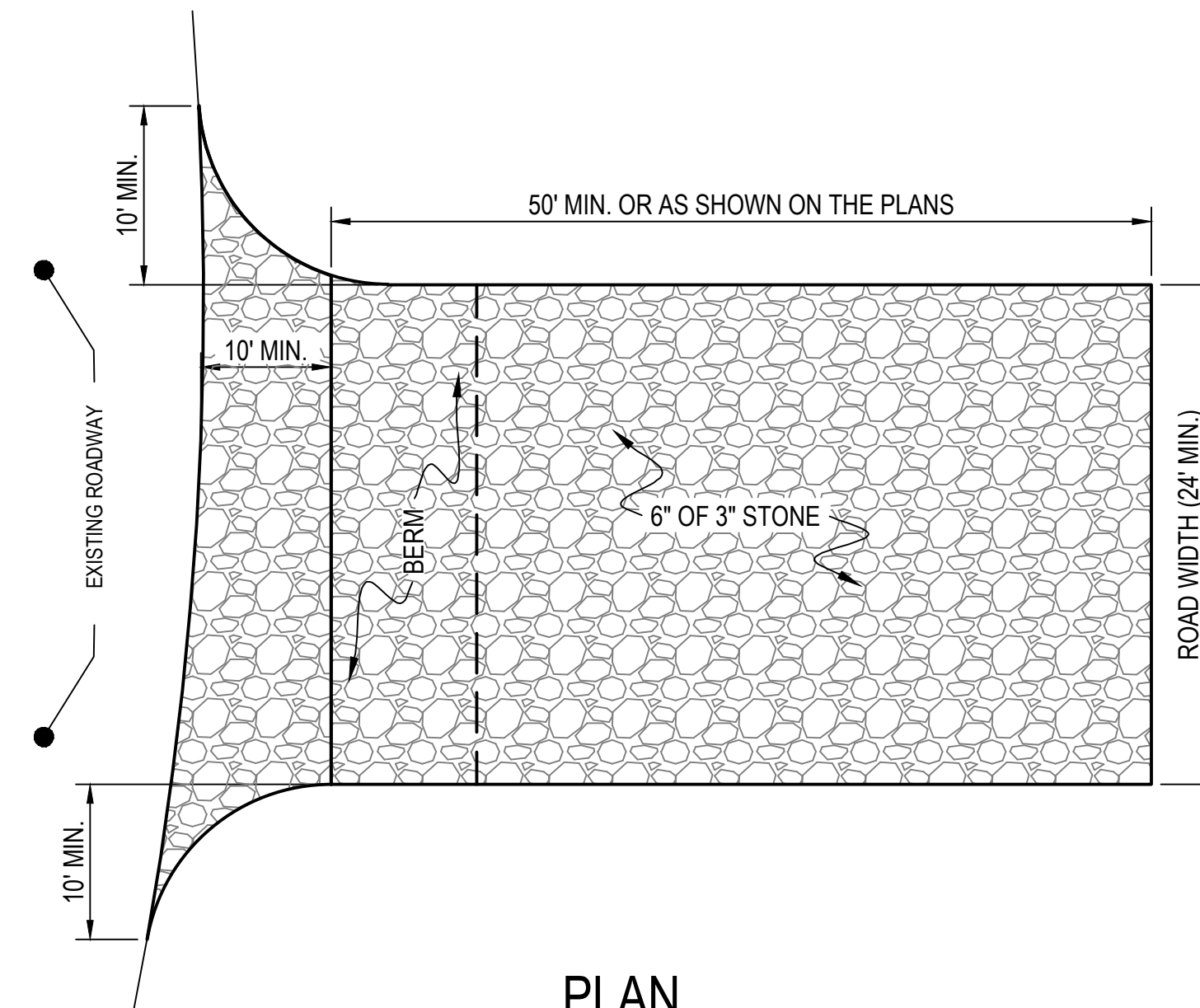


SECTION B-B
 NTS

1 TEMPORARY DEWATERING SEDIMENT DEVICE
 NOT TO SCALE

TEMPORARY DEWATERING SEDIMENT DEVICE NOTES:

- ALL COSTS ASSOCIATED WITH EXCAVATION, PLACEMENT OF STONE, FABRIC, FILTER BAG, HOSE, SEDIMENT BARRIER, REMOVAL OF STONE/FABRIC AND RESTORATION OF SITE, SHALL BE CONSIDERED INCIDENTAL TO THE INSTALLATION AND REMOVAL OF DEWATERING SEDIMENT DEVICE C-102 PAY ITEM.

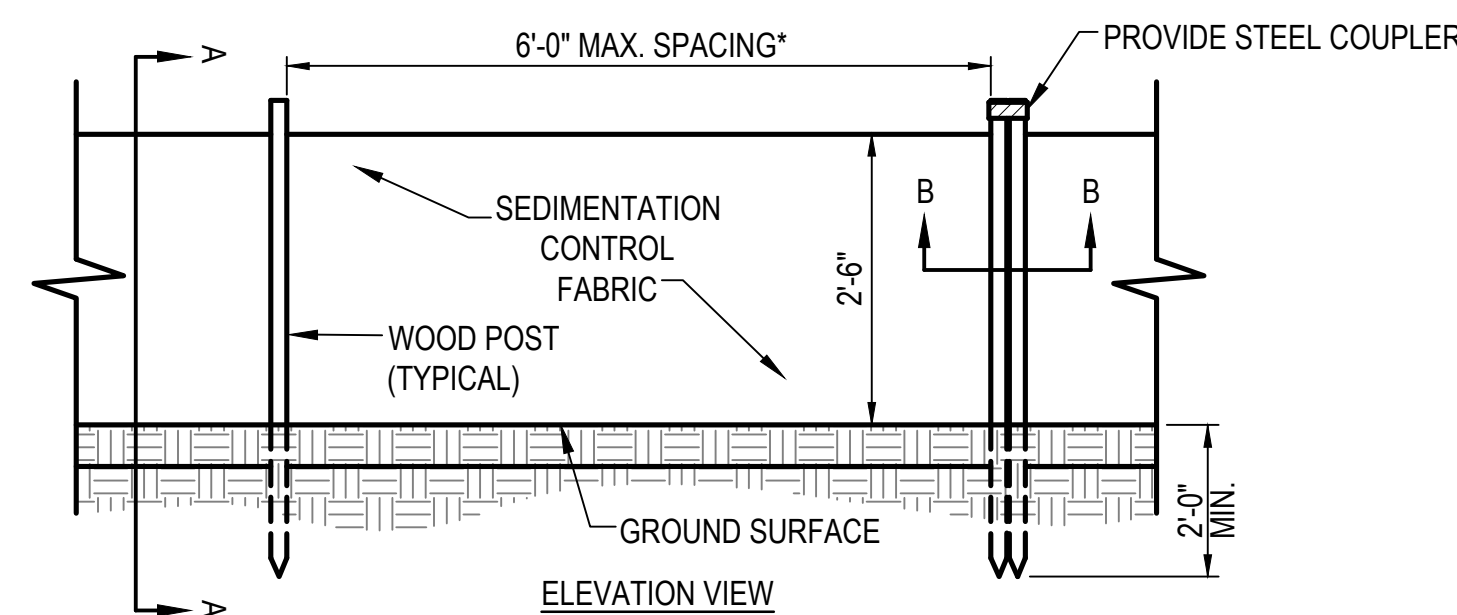


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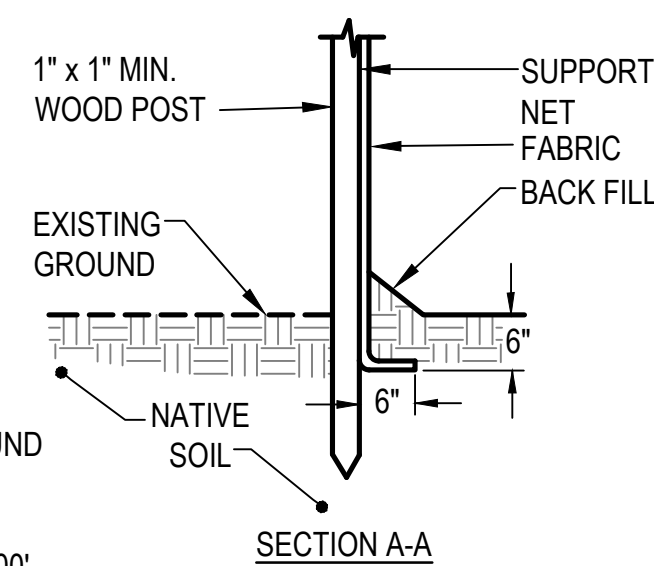
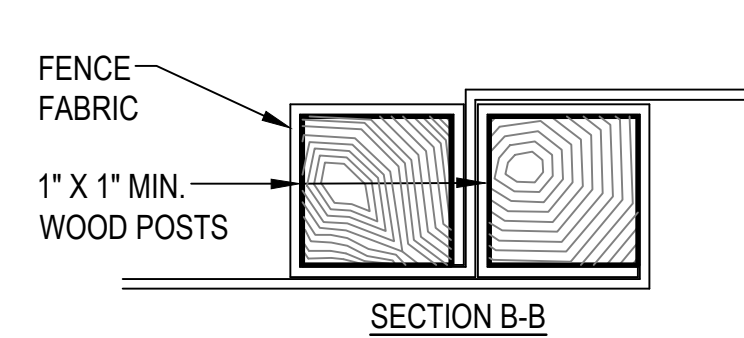
2 TEMPORARY STABILIZED CONSTRUCTION EXIT
 NOT TO SCALE

STABILIZED CONSTRUCTION EXIT NOTES:

- PROVIDE STABILIZED CONSTRUCTION EXITS AT LOCATIONS SHOWN ON PLANS AND AT LOCATIONS DIRECTED BY THE RESIDENT PROJECT REPRESENTATIVE, IN ACCORDANCE WITH THE MASSACHUSETTS EROSION AND SEDIMENTATION CONTROL GUIDELINES.
- ALL COSTS ASSOCIATED WITH EXCAVATION, PLACEMENT OF STONE, FABRIC, REMOVAL OF STONE/FABRIC AND RESTORATION OF SITE, SHALL BE CONSIDERED INCIDENTAL TO THE STABILIZED CONSTRUCTION EXIT C-102 PAY ITEM.



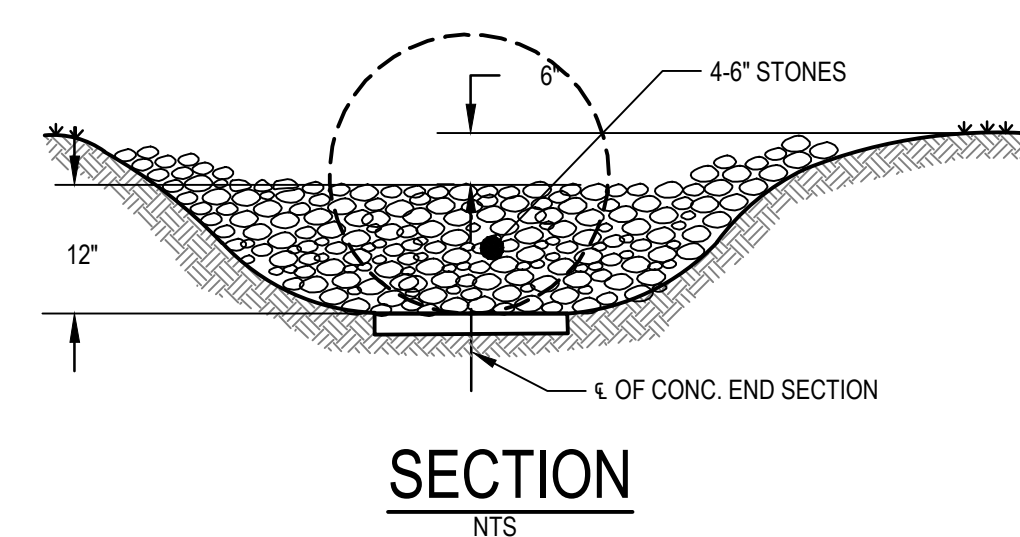
*NOTE: THE SILT FENCE SHOULD HAVE A MAXIMUM STAKING DISTANCE OF 6', UNLESS THE FENCE IS SUPPORTED BY WIRE FENCE REINFORCEMENT, A MAXIMUM 14 GAUGE AND WITH A MINIMUM MESH SPACING OF 6'.



NOTES:

- BOTTOM OF SILT FENCE MUST BE TOED INTO GROUND OR NO PAYMENT SHALL BE MADE. SEE EROSION CONTROL PLAN(S) FOR SILT FENCE LOCATION(S).
- INSTALL J-HOOKS IN THE SILT FENCE LINE EVERY 100' AND AS NEEDED BASED ON SITE TOPOGRAPHY.
- WHERE DOUBLE SEDIMENT BARRIERS ARE CALLED FOR ON THE PLANS, TWO ROWS OF SILT FENCE SHALL BE INSTALLED, 5 FEET APART.

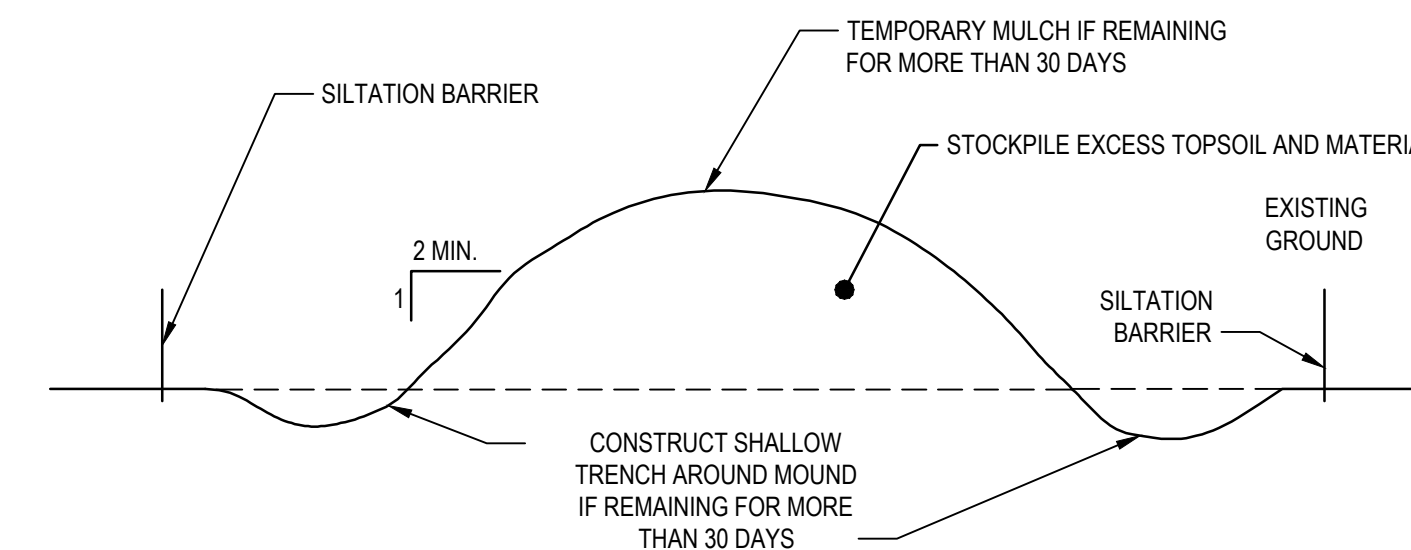
3 SEDIMENT BARRIER DETAIL
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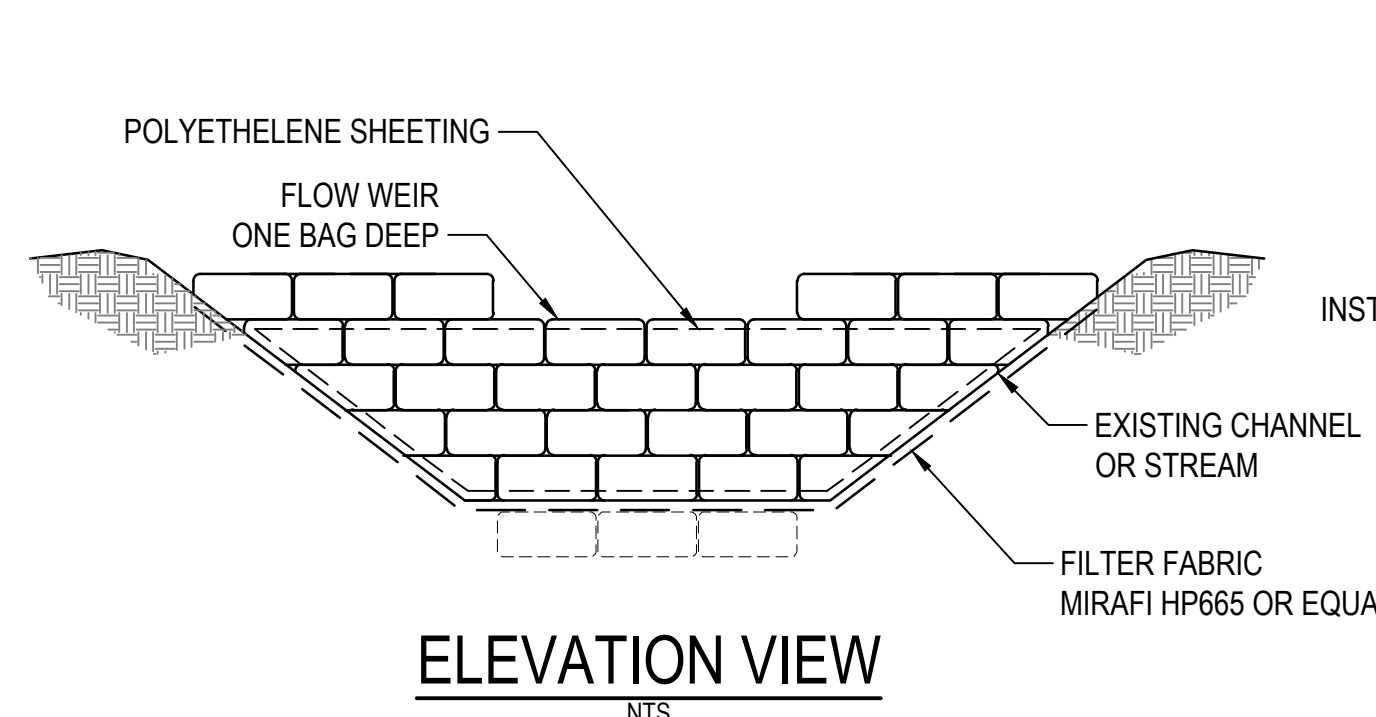
SECTION
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NOTE: SEDIMENT SHOULD BE REMOVED FROM BEHIND CHECK DAM WHEN IT HAS ACCUMULATED TO ONE HALF OF THE ORIGINAL HEIGHT OF THE DAM.

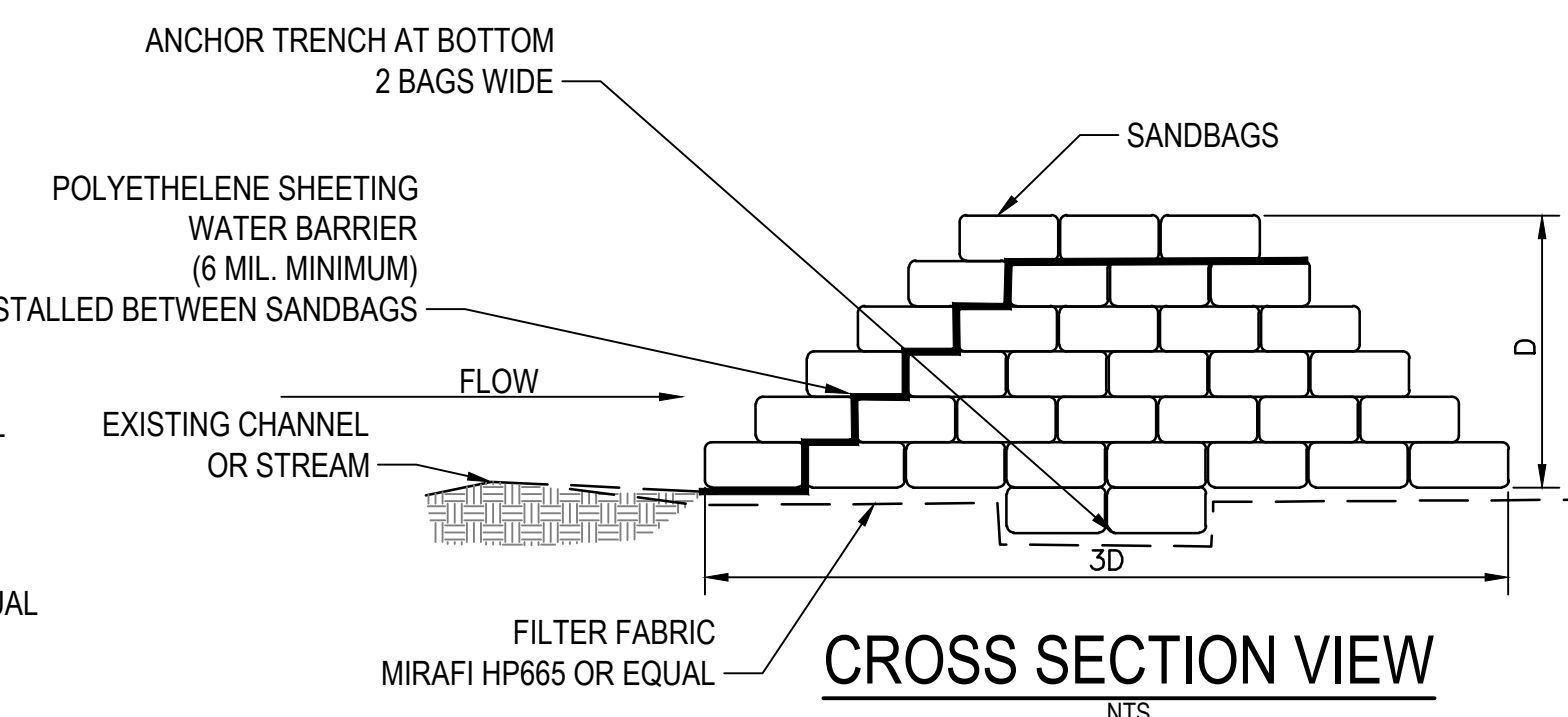
4 STONE CHECK DAM
 NOT TO SCALE



5 TOPSOIL STOCKPILE MOUND
 NOT TO SCALE



ELEVATION VIEW
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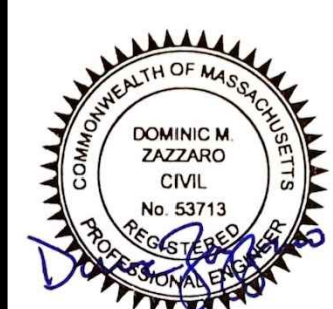


CROSS SECTION VIEW
 NTS

6 UPSTREAM SANDBAG DIVERSION BERM AND PIPE DETAIL
 NOT TO SCALE

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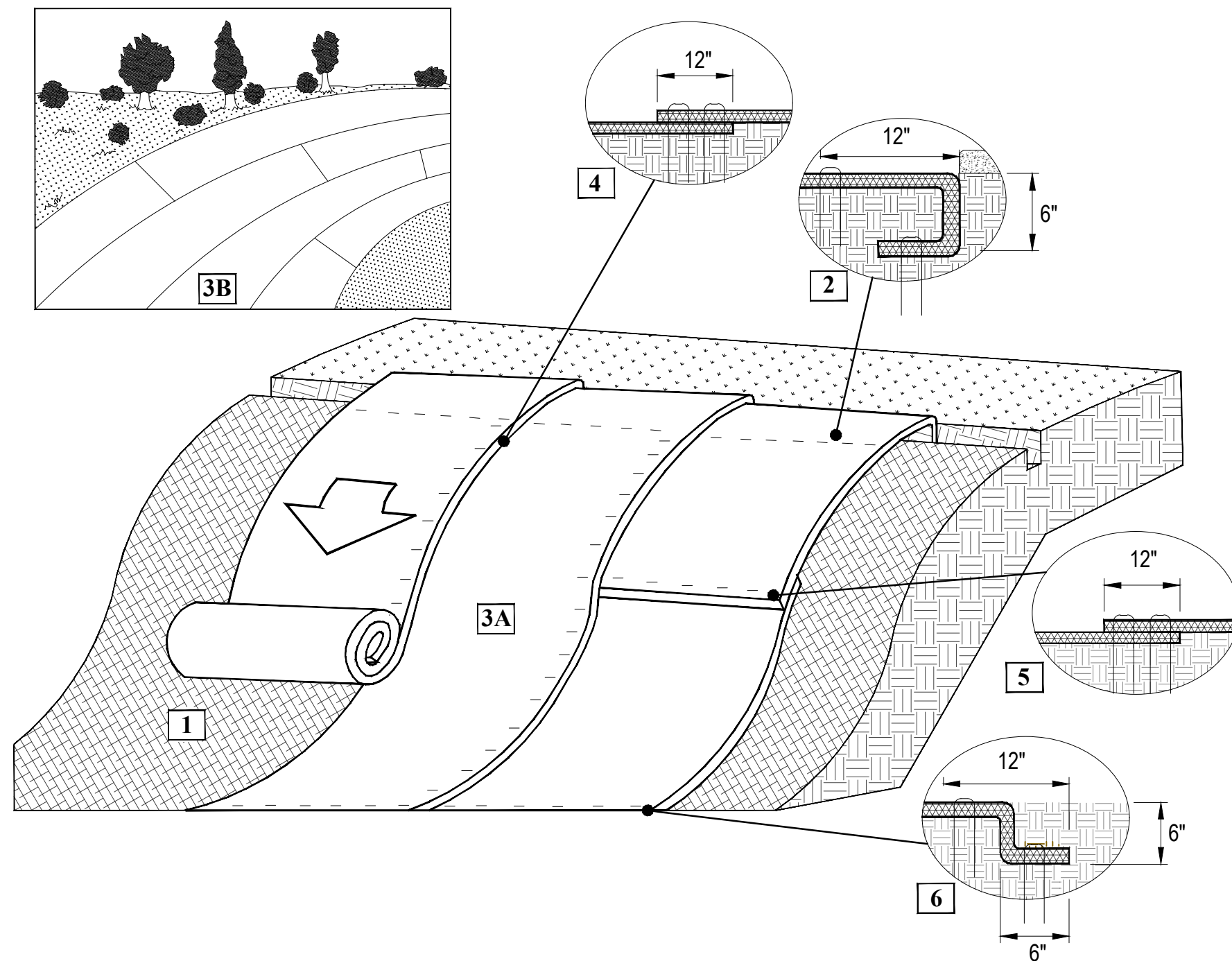
Title
 EROSION CONTROL DETAILS - 1

Project No.
 179450605

Drawing No. Sheet Revision

C404 15 of 21 0

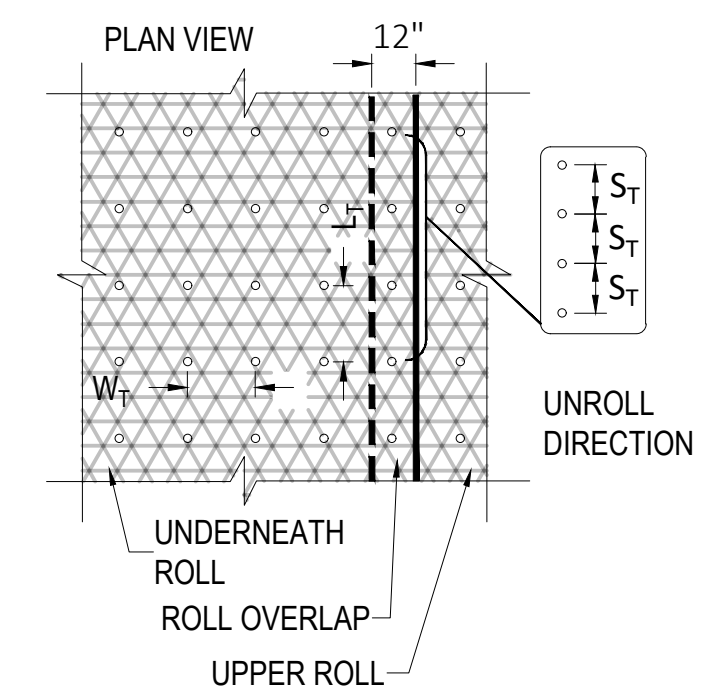
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INSTRUCTIONS:

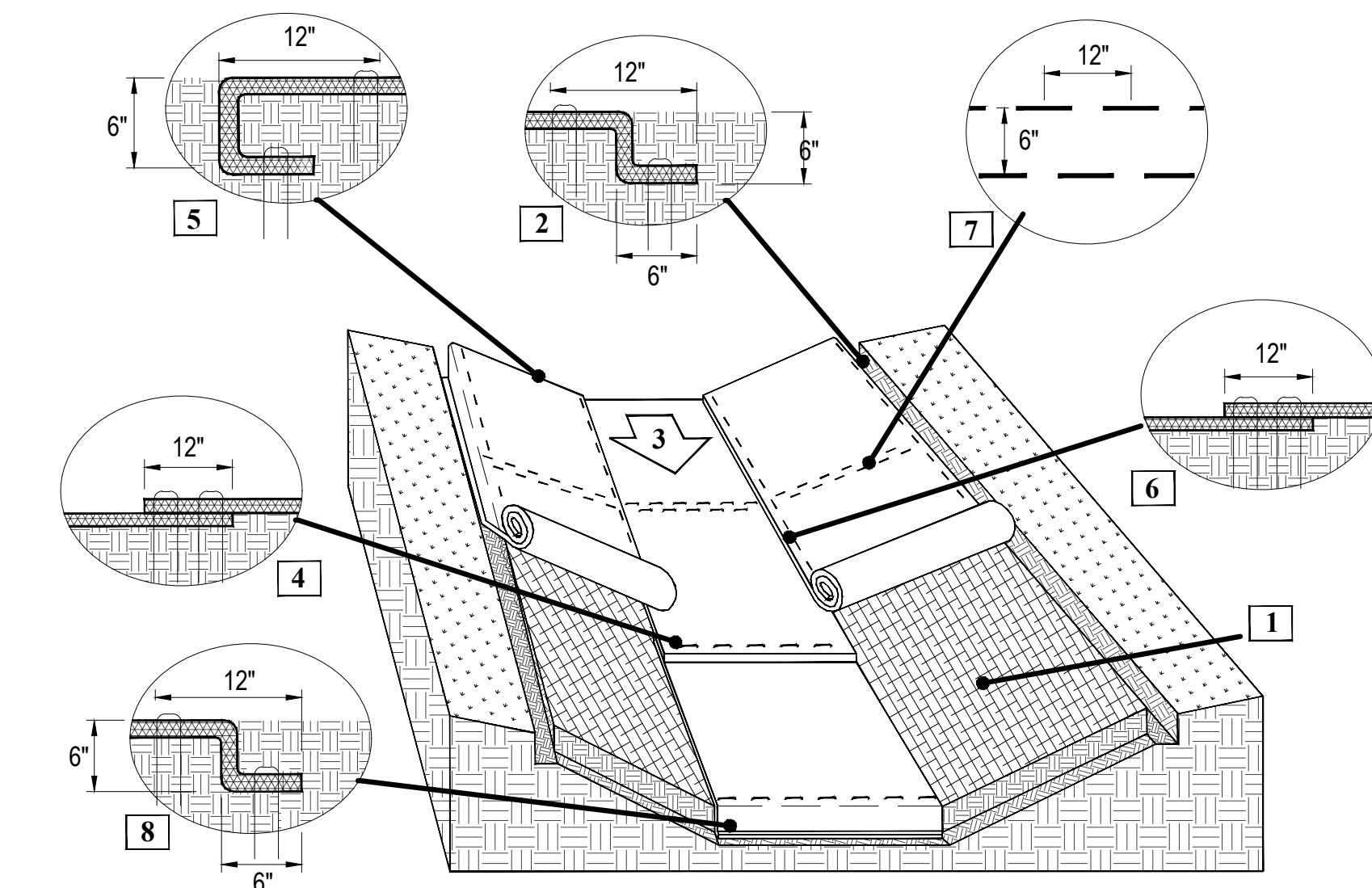
1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECPS), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. GROUND SURFACE MUST BE FREE OF DEBRIS, ROCKS, CLAY CLOUDS AND RAKED SMOOTH SUFFICIENT TO ALLOW INTIMATE CONTACT OF THE RECP WITH THE SOIL OVER THE ENTIRETY OF THE INSTALLATION.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE RECPS IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECPS EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. USE SHOREMAX MAT AT THE CHANNEL/CULVERT OUTLET AS SUPPLEMENTAL SCOUR PROTECTION AS NEEDED. ANCHOR THE RECPS WITH A ROW OF STAPLES/STAKES/PINS APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO THE COMPACTED SOIL AND FOLD THE REMAINING 12" PORTION OF RECPS BACK OVER THE SEED AND COMPACTED SOIL. SECURE RECPS OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES/PINS SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE RECPS.
3. ROLL CENTER RECPS IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. RECPS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECPS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES/PINS IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. PLACE CONSECUTIVE RECPS END-OVER-END (SHINGLE STYLE) WITH A 4"-6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE RECPS.
5. FULL LENGTH EDGE OF RECPS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES/PINS SPACED AT S_T APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT RECPS MUST BE OVERLAPPED APPROXIMATELY 4"-6" AND SECURED WITH STAPLES/STAKES/PINS AT S_T .
7. IN HIGH FLOW CHANNEL APPLICATIONS A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 6" APART AND 12" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE RECPS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES/PINS SPACED AT S_T APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
9. FASTENERS SHOULD PROVIDE A MINIMUM OF TWENTY POUNDS OF PULLOUT RESISTANCE. 6" X 1" ELEVEN GAUGE STAPLES ARE TYPICALLY ADEQUATE. IN LOOSE SOILS, LONGER STAPLES MAY BE NECESSARY. TWIST PINS CAN PROVIDE THE GREATEST PULLOUT RESISTANCE. IN HARD OR ROCKY SOILS, STRAIGHT PINS MAY BE USED WHERE STAPLES OR TWIST PINS ARE REFUSED, PROVIDED THE MINIMUM PULLOUT REQUIREMENTS ARE MET. BIO-DEGRADABLE FASTENERS SHALL NOT BE USED WITH TURF REINFORCEMENT MAT MATERIALS.

STAPLE PATTERN GUIDE



* PIN / STAPLE / TWIST PIN, AS APPROPRIATE FOR FIELD CONDITIONS

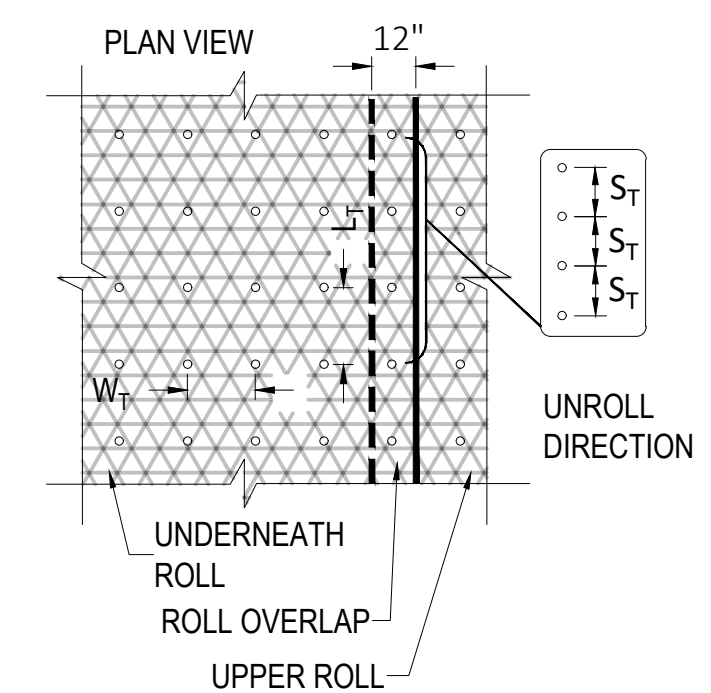
DIMENSION	STAPLE PATTERN	
	C	D
W_T	30"	24"
L_T	30"	20"
S_T	18"	18"
NOMINAL FREQUENCY	1.7 / SY	3.0 / SY
APPLICATION	ECB (DEGRADABLE)	TRM (PERMANENT)



INSTRUCTIONS:

1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECPS), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. GROUND SURFACE MUST BE FREE OF DEBRIS, ROCKS, CLAY CLOUDS AND RAKED SMOOTH SUFFICIENT TO ALLOW INTIMATE CONTACT OF THE RECP WITH THE SOIL OVER THE ENTIRETY OF THE INSTALLATION.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE RECPS IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECPS EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. USE SHOREMAX MAT AT THE CHANNEL/CULVERT OUTLET AS SUPPLEMENTAL SCOUR PROTECTION AS NEEDED. ANCHOR THE RECPS WITH A ROW OF STAPLES/STAKES/PINS APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO THE COMPACTED SOIL AND FOLD THE REMAINING 12" PORTION OF RECPS BACK OVER THE SEED AND COMPACTED SOIL. SECURE RECPS OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES/PINS SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE RECPS.
3. ROLL CENTER RECPS IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. RECPS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECPS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES/PINS IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. PLACE CONSECUTIVE RECPS END-OVER-END (SHINGLE STYLE) WITH A 4"-6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE RECPS.
5. FULL LENGTH EDGE OF RECPS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES/PINS SPACED AT S_T APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT RECPS MUST BE OVERLAPPED APPROXIMATELY 4"-6" AND SECURED WITH STAPLES/STAKES/PINS AT S_T .
7. IN HIGH FLOW CHANNEL APPLICATIONS A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT (9-12M) INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 6" APART AND 12" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE RECPS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES/PINS SPACED AT S_T APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
9. FASTENERS SHOULD PROVIDE A MINIMUM OF TWENTY POUNDS OF PULLOUT RESISTANCE. SIX-INCH X ONE-INCH ELEVEN GAUGE STAPLES ARE TYPICALLY ADEQUATE. IN LOOSE SOILS, LONGER STAPLES MAY BE NECESSARY. TWIST PINS CAN PROVIDE THE GREATEST PULLOUT RESISTANCE. IN HARD OR ROCKY SOILS, STRAIGHT PINS MAY BE USED WHERE STAPLES OR TWIST PINS ARE REFUSED, PROVIDED THE MINIMUM PULLOUT REQUIREMENTS ARE MET. BIO-DEGRADABLE FASTENERS SHALL NOT BE USED WITH TURF REINFORCEMENT MAT MATERIALS.

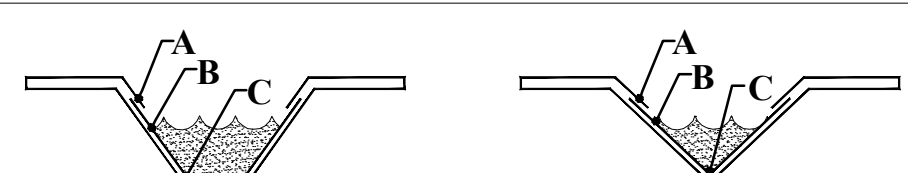
STAPLE PATTERN GUIDE



* PIN / STAPLE / TWIST PIN, AS APPROPRIATE FOR FIELD CONDITIONS

DIMENSION	STAPLE PATTERN
	E
W_T	20"
L_T	20"
S_T	18"
NOMINAL FREQUENCY	3.8 / SY

CRITICAL POINTS
 A. OVERLAPS AND SEAMS
 B. PROJECTED WATER LINE
 C. CHANNEL BOTTOM/SIDE SLOPE VERTICES



NOTES:

*HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.

16 EROSION CONTROL BLANKET AND TURF REINFORCEMENT MAT INSTALLATION
 NOT TO SCALE

Revision	By	Appd.	YY.MM.DD
0	ISSUED FOR BID	DMZ	25.02.12
Issued		By	Appd.

DMZ Dwn. Chkd. Dsgn.

Permit-Seal



Client/Project

LAWRENCE MUNICIPAL AIRPORT
 NORTH ANDOVER, MA

RUNWAY 5 END
 DRAINAGE IMPROVEMENTS

Title

EROSION CONTROL DETAILS - 2

Project No.
 179450605

Drawing No. Sheet Revision

C405 16 of 21 0



Stantec Consulting Services Inc.
 45 Blue Sky Drive, 3rd Floor
 Burlington, MA 01803 U.S.A.
 Tel. 781.221.1000
 Fax. 781.229.1115
 www.stantec.com

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ISSUED FOR BID
 FEBRUARY 12, 2025

EROSION AND SEDIMENT CONTROL PLAN

A. GENERAL DESCRIPTION

THIS EROSION CONTROL PLAN HAS BEEN DEVELOPED FOR THE CONSTRUCTION OF THE RUNWAY 5 END DRAINAGE IMPROVEMENT PROJECT AT THE LAWRENCE MUNICIPAL AIRPORT. THE PRINCIPAL TEMPORARY EROSION CONTROL MEASURES INCLUDE THE ESTABLISHMENT OF SEDIMENT BARRIERS ALONG THE PROJECT CONSTRUCTION LIMITS, PUMPED DISCHARGE DEWATERING DEVICES, EROSION CONTROL MATTING ON STEEP SLOPES AND IN CHANNEL BOTTOMS, AND TEMPORARY DIVERSION IN CHANNELS. PERMANENT EROSION CONTROL MEASURES INCLUDE REVEGETATION, SEEDING AND MULCHING OF ALL DISTURBED SOILS, CHANNEL BOTTOMS AND SIDE SLOPES. ALL EROSION CONTROL MEASURES SHALL COMPLY WITH THE MASSACHUSETTS EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUB URBAN AREAS HANDBOOK AND THE MASSACHUSETTS STORMWATER MANAGEMENT TECHNICAL HANDBOOK.

B. EROSION AND SEDIMENT CONTROL MEASURES

EROSION AND SEDIMENT CONTROL MEASURES SHALL BE EMPLOYED TO PREVENT THE EROSION AND TRANSPORT OF SEDIMENT INTO RESOURCE AREAS DURING THE EARTHWORK AND SOIL DISTURBANCE PHASES OF THE PROJECT. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED AND INSPECTED BY THE ENGINEER AND THE NORTH ANDOVER CONSERVATION ADMINISTRATOR PRIOR TO ANY GROUND DISTURBANCE AND SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL REMAIN UNTIL VEGETATION IS ESTABLISHED AND REMOVAL IS APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL NOTIFY THE ENGINEER WHEN THE EROSION AND SEDIMENTATION CONTROLS HAVE BEEN INSTALLED AND ARE READY FOR INSPECTION. BUSINESS DAYS FOR THE ENGINEER TO SCHEDULE AND COMPLETE THE INSPECTION WITH THE INSPECTOR WITH THE CONSERVATION ADMINISTRATOR. ALL COORDINATION WITH THE CONSERVATION ADMINISTRATOR SHALL BE THROUGH THE ENGINEER. DESCRIBED BELOW ARE THE EROSION AND SEDIMENT CONTROL MEASURES THAT WILL BE IMPLEMENTED AT THE PROJECT SITE FOR THIS PROJECT.

SEDIMENT BARRIERS

SEDIMENT BARRIERS ARE TEMPORARY SEDIMENT CONTROL FEATURES. THE BARRIERS ARE PLACED TO TRAP SEDIMENT TRANSPORTED BY RUNOFF BEFORE IT REACHES THE DRAINAGE SYSTEM OR LEAVES THE CONSTRUCTION SITE. WHEN NECESSARY, ADDITIONAL BARRIERS WILL BE INSTALLED IMMEDIATELY DOWN GRADIENT OF EROSION-PRONE AREAS, SUCH AS THE BASE OF STEEP EXPOSED SLOPES AND AROUND THE BASE OF STOCKPILES, THROUGHOUT THE CONSTRUCTION PHASE OF THE PROJECT. IT IS ESSENTIAL FOR PERFORMANCE THAT A LAYER OF COMPOST MATERIAL BE PLACED BETWEEN THE BARRIER AND THE GROUND SURFACE AS SHOWN ON THE DRAWINGS. IN AREAS ADJACENT TO WETLANDS OR OTHER PROTECTED RESOURCES, A DOUBLE LAYER OF SEDIMENT BARRIERS SHALL BE INSTALLED AS SHOWN ON THE PLANS AND DETAILS.

SOIL STOCKPILING

STOCKPILES FOR SOIL MATERIALS WILL BE LOCATED IN DESIGNATED UPLAND AREAS AS APPROVED BY THE RESIDENT ENGINEER. ALL STOCKPILES WILL BE SURROUNDED WITH COMPOST FILTER TUBES, SILT FENCE OR APPROPRIATE SEDIMENT BARRIERS AS SHOWN ON THE PLANS. TEMPORARY STABILIZATION OF STOCKPILES INCLUDING MULCHING AND SEEDING WILL BE PERFORMED IN ACCORDANCE WITH THE SCHEDULE SHOWN IN THE TABLE ON THIS SHEET. THE MAXIMUM HEIGHT OF STOCKPILES, IF LOCATED NEAR AIRCRAFT PAVEMENTS SHALL BE APPROVED BY THE RESIDENT ENGINEER ON A CASE-BY-CASE BASIS AND SHALL BE LIMITED BASED ON PROXIMITY TO AIRFIELD PAVEMENTS TO KEEP THE STOCKPILES FROM OBSTRUCTING PROTECTED AIRSPACES. AS A RULE OF THUMB, THE TOP OF ALL SOIL STOCKPILES SHALL REMAIN BELOW THE ELEVATION OF THE ADJACENT RUNWAY CENTERLINE.

SEPARATE STOCKPILES WILL BE CONSTRUCTED FOR EACH DIFFERENT TYPE OF SOIL MATERIAL AS SPECIFIED BELOW.

- TOPSOIL THAT HAS BEEN STRIPPED AND WILL BE REUSED
- SUITABLE EXCAVATED MATERIAL TO BE USED AS FILL
- STOCKPILES OF MATERIALS FROM OFFSITE FOR USE AS BORROW OR SUBBASE

PERIMETER EROSION AND SEDIMENTATION CONTROLS WILL BE REQUIRED AROUND EACH INDIVIDUAL STOCKPILE.

STOCKPILES SHALL BE SETBACK AT LEAST 50 FEET FROM ANY BORDERING VEGETATED WETLANDS (BVW) BANK (SUCH AS BANK ASSOCIATED WITH LAND UNDER WATER, INCLUDING STREAMS), AND ENCLOSED BY PERIMETER CONTROLS. ALL STOCKPILE LOCATIONS SHALL BE CONSIDERED TEMPORARY FOR PURPOSES OF TRANSFERRING MATERIALS INCLUDING FILL OR BORROW TO OR FROM THE WORK LOCATIONS ESTABLISHED ON THE PLANS AND SHALL BE PERMANENTLY REMOVED AFTER COMPLETION OF WORK REQUIRING SUCH MATERIALS.

MULCHING

STRAW, OR SYNTHETIC MULCH SHALL BE APPLIED TO EXPOSED AND DISTURBED OR REGRADED SOILS IN ORDER TO PREVENT THE EROSION OF BARE OR DISTURBED AREAS. MULCH WILL BE SUBSTITUTED WITH MATTING WHERE NECESSARY OR AS SPECIFIED.

MATTING

MATTING SHALL CONSIST OF SPECIFIED ROLLED EROSION CONTROL PRODUCTS (RECPs). MATTING AND RECPs SHALL BE USED AS FOLLOWS:

- (1) IN THE BASE OF STREAM OR SWALE AS INDICATED ON PLANS.
- (2) ON EXCAVATED OR GRADED SIDE SLOPES WHERE INDICATED ON PLANS.
- (3) IN ANY SENSITIVE AREAS, SUBJECT TO, OR EXPERIENCING EROSION WHERE NOT INDICATED ON THE PLANS.
- (4) ON DISTURBED OR NEWLY GRADED BERMS AND SLOPES 33% (3H:1V) OR STEEPER AND LOCATED WITHIN 100 FEET OF A PERENNIAL OR INTERMITTENT STREAM OR OTHER SENSITIVE AREA.
- (5) WHERE STRAW MULCH HAS BEEN DETERMINED TO BE INEFFECTIVE BASED ON OBSERVATIONS MADE IN THE FIELD OR AS DIRECTED BY THE ENGINEER.

RIP-RAP

STONE RIP-RAP SHALL BE USED AS SHOWN ON THE PLANS TO PROTECT SOILS FROM EXCESSIVE FLOW VELOCITIES. IT SHALL BE OF THE SIZE AND DEPTHS SPECIFIED ON THE PLANS. A MINIMUM RIP-RAP SIZE OF D50 - 12 IN. SHALL BE USED IF NOT OTHERWISE INDICATED ON PLANS.

INLET PROTECTION

ALL CULVERT INLETS SHALL BE PROTECTED AS NOTED ON THE PLANS AND DETAILS. CULVERT END SECTIONS SHALL BE USED WHERE INDICATED. RIP-RAP SHALL BE THE SAME SIZE AS THAT SPECIFIED AT THE INLET. A D50 - 12 IN SHALL BE USED IF NOT OTHERWISE SPECIFIED.

OUTLET PROTECTION

ALL CULVERT OUTLETS SHALL BE PROTECTED AS NOTED ON THE PLANS AND DETAILS. CULVERT END SECTIONS SHALL BE USED WHERE INDICATED. RIP-RAP SHALL BE THE SAME SIZE AS THAT SPECIFIED AT THE OUTLET. A D50 - 12 IN SHALL BE USED IF NOT OTHERWISE SPECIFIED.

STONE CHECK DAMS

STONE CHECK DAMS SHALL BE INSTALLED AT EXISTING CULVERT OUTLET AS SHOWN ON THE PLANS AND SHALL REMAIN AFTER THE SITE HAS FULLY STABILIZED. CHECK DAMS SERVE TO REDUCE FLOW VELOCITIES IN SWALES HELPING TO REDUCE RILLING. CHECK DAMS SHALL BE CONSTRUCTED OF 3 IN. TO 4 IN. STONE.

DUST CONTROL

FUGITIVE DUST WILL BE CONTROLLED USING A WATER TRUCK.

DIVERSION CHANNELS

DIVERSION CHANNELS ARE TEMPORARY CONTROLS TO DIVERT RUNOFF AROUND WORK ZONES AND DISCHARGE IT TO A STABLE AREA. DIVERSION CHANNELS WILL BE CONSTRUCTED WITH TEMPORARY DIVERSION PIPE AS SHOWN ON PLANS AND SHALL DISCHARGE TO STABILIZED BEDS USING CRUSHED STONE, TEMPORARY DEWATERING SEDIMENT DEVICE (FILTER BAGS), PLASTIC OR OTHER APPROVED MATERIALS, CRUSHED STONE CHECK DAMS, AS NECESSARY. TEMPORARY DIVERSIONS WILL REMAIN IN PLACE UNTIL SLOPES AND STREAM BED ARE PERMANENTLY STABILIZED.

TEMPORARY DEWATERING SEDIMENT DEVICE (FILTER BAGS)

IN AREAS OF THE SITE WHERE DEWATERING IS REQUIRED DURING CONSTRUCTION, MANUFACTURED FILTER BAGS WILL BE USED FOR THE DISCHARGE UNLESS OTHERWISE SPECIFIED OR APPROVED BY RESIDENT ENGINEER. TO ENSURE PROPER INSTALLATION, FILTER BAGS WILL BE PLACED ON A BED OF STONE ON RELATIVELY FLAT TERRAIN FREE OF BRUSH AND STUMPS TO AVOID RIPPERS AND PUNCTURES. PROPER INSTALLATION REQUIRES CUTTING A SMALL HOLE IN THE CORNER OF THE BAG, INSERTING THE PUMP DISCHARGE HOSE, AND SECURING THE DISCHARGE HOSE TO THE BAG WITH A HOSE CLAMP. A MAXIMUM OF TWO SIX INCH DISCHARGE HOSES WILL BE ALLOWED PER FILTER BAG. TO HELP PREVENT PUNCTURES, GEOTEXTILE WILL BE PLACED BENEATH THE FILTER BAG'S STONE BED. UNATTENDED FILTER BAGS WILL BE ENCLOSED WITH A DOUBLE SEDIMENT BARRIER. THE CONTRACTOR WILL BE RESPONSIBLE TO IMPLEMENT ALL THE NECESSARY PROCEDURES OF DISCHARGING THE PUMPED WATER IN CONFORMANCE WITH STATE AND LOCAL DEWATERING REQUIREMENTS. ALL DEWATERING SHALL BE DONE IN CONFORMANCE WITH THE SPECIFICATIONS IN THE CONTRACT DOCUMENTS.

EXTRA MEASURES

EXTRA EROSION CONTROL MEASURES OF EACH TYPE SHALL BE STORED ON SITE AT ALL TIMES FOR EMERGENCY AND ROUTINE REPLACEMENT. THE MATERIALS SHALL INCLUDE, BUT NOT BE LIMITED TO, SANDBAGS, RIPRAP, STRAW BALES, SILT FENCE, STAKES, AND OTHER MATERIALS, AS MAY BE NEEDED. MATERIALS SHALL BE STORED IN A REASONABLE MANNER AT AN APPROVED LOCATION AND ACCESSIBLE AT ALL TIMES. NO PAYMENT WILL BE MADE FOR STORING EXTRA EROSION CONTROL MATERIALS ON SITE. PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE FOR INSTALLATION OF ADDITIONAL EROSION CONTROL MEASURES WHEN DIRECTED BY THE RPR.

C. EROSION CONTROL NOTES

THE CONTRACTOR SHALL FURNISH AND INSTALL A SIGN NOT LESS THAN TWO SQUARE FEET OR MORE THAN THREE SQUARE FEET IN SIZE BEARING THE WORDS "MASSACHUSETTS DEP, FILE NUMBER XXX-XXX". THE SIGN SHALL BE INSTALLED AT A LOCATION AS DIRECTED BY THE ENGINEER.

1. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL MARK THE BOUNDARY AND/OR MAINTAIN PRIOR MARKINGS FOR THE EDGE OF ALL DELINEATED WETLANDS IN THE VICINITY OF THE PROPOSED WORK AREA WITH WOODEN STAKES OR FLAGGING. ONCE IN PLACE THE MARKERS SHALL BE MAINTAINED UNTIL A CERTIFICATE OF COMPLIANCE HAS BEEN ISSUED BY THE NORTH ANDOVER CONSERVATION COMMISSION (NACC). IF REQUESTED THE CONTRACTOR SHALL PERMANENTLY MARK WETLANDS WITH SIGNS OR MARKERS SPACED EVENLY EVERY 50 FEET OR LESS INCORPORATING THE FOLLOWING TEXT: "PROTECTED WETLAND RESOURCE AREA" (1 SQUARE FOOT FOR EVERY 3 ROUNDS AND MARKERS). THESE MARKERS SHALL REMAIN POSTED AND BE REPLACED AS NECESSARY IN PERPETUITY BY AIRPORT MAINTENANCE. MARKERS MAY BE OBTAINED AT THE CONSERVATION DEPARTMENT (62 ROUND/\$3 SQUARE). SEE WETLAND DELINEATOR MARKER DETAIL.
2. ALL TEMPORARY SEDIMENTATION BARRIERS OR MEASURES SHALL BE MAINTAINED IN GOOD REPAIR UNTIL ALL DISTURBED AREAS HAVE BEEN FULLY STABILIZED WITH VEGETATION OR OTHER MEANS. AT NO TIME SHALL SEDIMENTS BE DEPOSITED ON A WETLAND OR WATER BODY. DURING CONSTRUCTION THE CONTRACTOR SHALL INSPECT THE EROSION CONTROLS ON A DAILY BASIS AND SHALL REMOVE ACCUMULATED SEDIMENTS AS NEEDED. THE CONTRACTOR SHALL IMMEDIATELY CONTROL ANY EROSION PROBLEMS THAT OCCUR AT THE SITE.
3. THE CONTRACTOR SHALL HAVE ON HAND AT THE START OF ANY SOIL DISTURBANCE, REMOVAL OR STOCKPILING FIFTEEN (15) STRAW BALES, ADDITIONAL COMPOST FILTER TUBES, AND SUFFICIENT STAKES FOR STAKING SAID BALES. STOCKPILES OF MATERIALS SHALL BE KEPT FOR USE ONLY FOR THE CONTROL OF EMERGENCY EROSION PROBLEMS AND SHALL NOT BE USED FOR THE NORMAL CONTROL OF EROSION.
4. ALL EXPOSED SOIL FINISH GRADE SURFACES SHALL BE IMMEDIATELY LANDSCAPED (NATIVE PLANTINGS/SEED MIXES) AND STABILIZED, OR LOAMED, SEEDED AND MULCHED, WITH A LAYER OF STRAW MULCH OR MATTING (NATURAL FIBERS ONLY). ALL FINISHED DISTURBED AREAS MUST BE GRADED, LOAMED AND SEEDED PRIOR TO OCTOBER 1ST. DURING CONSTRUCTION, ANY AREA OF EXPOSED SOILS THAT WILL BE LEFT IDLE FOR MORE THAN 3 DAYS SHALL BE STABILIZED WITH A LAYER OF STRAW MULCH OR OTHER MEANS APPROVED BY NACC.
5. THERE SHALL BE NO STOCKPILING OF SOIL OR OTHER MATERIALS WITHIN FIFTY (50) FEET OF ANY RESOURCE AREA. STOCKPILED MATERIALS SHALL BE MAINTAINED WITHIN EROSION CONTROL BARRIERS.
6. ALL WASTE GENERATED BY, OR ASSOCIATED WITH, THE CONSTRUCTION ACTIVITY SHALL BE CONTAINED WITHIN THE LIMIT OF WORK, AND AWAY FROM ANY WETLAND RESOURCE AREA. THERE SHALL BE NO BURYING OF SPENT CONSTRUCTION MATERIALS OR DISPOSAL OF WASTE ON THE SITE BY ANY OTHER MEANS. THE CONTRACTOR SHALL MAINTAIN WASTE CONTAINERS (OR OTHER SUITABLE MEANS) AT THE SITE FOR THE STORAGE AND REMOVAL OF SUCH SPENT CONSTRUCTION MATERIALS OR TRASH/DEBRIS OFF-SITE. HOWEVER, NO TRASH CONTAINERS WILL BE ALLOWED WITHIN 50' OF AREAS SUBJECT TO PROTECTION UNDER THE ACT OR LOCAL BYLAW.
7. DURRING ENGINEERING AND CONSTRUCTION STANDARDS AND PROCEDURES SHALL BE FOLLOWED IN THE COMPLETION OF THE PROJECT.
8. ACCEPTED AND AFTER WORK ON THIS PROJECT, THERE SHALL BE NO DISCHARGE OR SPILLAGE OF FUEL, OR OTHER POLLUTANTS INTO ANY WETLAND RESOURCE AREA. IF THERE IS A SPILL OR DISCHARGE OF ANY POLLUTANT DURING ANY PHASE OF CONSTRUCTION THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY. NO CONSTRUCTION VEHICLES ARE TO BE STORED, AND NO VEHICLE REFUELING, EQUIPMENT LUBRICATION, OR MAINTENANCE IS TO BE DONE WITHIN THE 100 FOOT WETLAND BUFFER.

D. CONSTRUCTION PERIOD POLLUTION PREVENTION MEASURES

ADDITIONAL SOURCES OF POLLUTION IN STORMWATER RUNOFF INCLUDE CONSTRUCTION DEBRIS, FLUIDS ASSOCIATED WITH CONSTRUCTION EQUIPMENT (FUEL AND OILS), CHEMICALS ASSOCIATED WITH SEEDING (FERTILIZER AND LIME), AND HERBICIDES.

PRECAUTIONS SHALL BE IMPLEMENTED WHICH MINIMIZE THE RISK OF POTENTIAL POLLUTANTS IMPACTING STORMWATER. CONSTRUCTION DEBRIS SHALL NOT BE STORED ON-SITE FOR LONG DURATIONS BUT SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY. STOCKPILED MATERIAL IS INTENDED FOR USE AT THE PROJECT AREA. NO STOCKPILED MATERIAL SHALL REMAIN ON-SITE AFTER THE COMPLETION OF THE PROJECT. DEBRIS WILL BE STOCKPILED WHEN NECESSARY IN AREAS WHICH HAVE MINIMUM POTENTIAL FOR EROSION AND WILL BE KEPT AS FAR AS POSSIBLE FROM EXISTING DRAINAGE AREAS. ALL STOCKPILES EXPECTED TO REMAIN LONGER THAN 14 DAYS SHALL BE TREATED WITH MULCH. STOCKPILES EXPECTED TO REMAIN LONGER THAN 3 DAYS SHALL BE ENCLOSED WITH COMPOST FILTER TUBE OR SILT FENCE AT THE DOWN-GRADIENT TOE OF THE PILE. AT A MINIMUM, ANY DISTURBED SOILS WHERE ACTIVITY IS SUSPENDED FOR GREATER THAN 14 DAYS SHALL BE MULCHED WITH STRAW TO STABILIZE ERODIBLE MATERIAL.

STAGING AND STORAGE AREAS SHALL BE ESTABLISHED IN STABLE, RELATIVELY LEVEL AREAS AWAY FROM WETLANDS. FUEL AND OILS WILL NOT BE STORED ON THE SITE UNLESS PROTECTED FROM SPILLS.

THE FOLLOWING PRODUCT-SPECIFIC PRACTICES WILL BE FOLLOWED ON-SITE.

CONSTRUCTION EQUIPMENT AND CONSTRUCTION EMPLOYEE VEHICLES

ALL CONSTRUCTION EQUIPMENT WHEN NOT IN USE SHALL BE PARKED IN STAGING AND STORAGE AREAS DESIGNATED BY THE RESIDENT ENGINEER AND CONTRACTOR. STAGING AND STORAGE AREAS WILL BE LOCATED IN UPLAND AREAS REMOVED FROM STORMWATER CONVEYANCE CHANNELS, CATCH BASINS AND SURFACE WATERS INCLUDING WETLAND RESOURCE AREAS. IF PARKING OF CONSTRUCTION EQUIPMENT IS REQUIRED IN BUFFER ZONES (DEFINED AS WITHIN 100 FEET OF A DELINEATED WETLAND EDGE), DRIP PANS WILL BE UTILIZED FOR EACH PIECE OF EQUIPMENT.

CONSTRUCTION EMPLOYEE VEHICLES WILL BE PARKED IN AREAS AS INDICATED ON THE PLANS OR DESIGNATED BY THE RESIDENT ENGINEER.

PETROLEUM PRODUCTS

ALL ON-SITE VEHICLES WILL BE MONITORED FOR LEAKS AND WILL RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE. NO VEHICLE MAINTENANCE OR HANDLING OF PETROLEUM PRODUCTS WILL OCCUR WITHIN 100 FEET OF A WATERWAY. ALL PERSONNEL RESPONSIBLE FOR RE-FUELING OF ON-SITE CONSTRUCTION VEHICLES SHALL BE TRAINED IN THE PROPER PROCEDURES FOR RE-FUELING ACTIVITIES TO MINIMIZE THE POTENTIAL FOR SPILLS TO WETLAND RESOURCES. PETROLEUM PRODUCTS WILL BE STORED IN TIGHTLY SEALED CONTAINERS THAT ARE CLEARLY LABELED. NO PETROLEUM-BASED OR ASPHALT SUBSTANCES WILL BE STORED WITHIN 100 FEET OF A WATERWAY.

FERTILIZERS

FERTILIZERS WILL BE APPLIED ONLY IN THE MINIMUM AMOUNTS RECOMMENDED BY THE MANUFACTURER. ONCE APPLIED, THE FERTILIZER WILL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER. STORAGE WILL BE IN A COVERED AREA; AND THE CONTENTS OF ANY PARTIALLY USED BAGS WILL BE TRANSFERRED TO A SEALABLE, PLASTIC BIN TO AVOID SPILLS.

SPILL RESPONSE

IN THE EVENT OF AN EMERGENCY SPILL OR LEAK DURING CONSTRUCTION ACTIVITIES, THE SPILL RESPONSE PLAN (I.E., CLEAN UP) FOR THIS CONSTRUCTION SITE SHALL BE AS FOLLOWS:

1. THE OWNER/OPERATOR/CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING THE SPILL RESPONSE PLAN;
2. IF POSSIBLE AND IT IS SAFE TO DO SO, ALL SPILLS WILL BE CLEANED UP IMMEDIATELY UPON DISCOVERY;
3. NOTIFY LAWRENCE MUNICIPAL AIRPORT AND THE NORTH ANDOVER FIRE DEPARTMENT (911) OF ANY EMERGENCY SPILL OR LEAK;
4. CONTACT THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (MASS DEP) EMERGENCY RESPONSE UNIT FOR ANY RELEASE OF PETROLEUM BASED MATERIAL OR OTHER HAZARDOUS SUBSTANCE THAT BECOMES HAZARDOUS UPON RELEASE AND POSSES A THREAT TO HUMAN HEALTH OR THE ENVIRONMENT. THE MASS DEP EMERGENCY RESPONSE PHONE NUMBER IS (888) 304-1133. THE MASS DEP EMERGENCY RESPONSE UNIT DISPATCH IS AVAILABLE 24 HOURS A DAY;
5. STORE SPILL RESPONSE EQUIPMENT IN A PRE-ESTABLISHED AND READILY ACCESSIBLE LOCATION. THE SPILL RESPONSE EQUIPMENT SHALL INCLUDE:

SAFETY EQUIPMENT: EYE GUARDS, PROTECTIVE CLOTHING, FIRE EXTINGUISHER, AND RUBBER GLOVES.
CLEAN-UP EQUIPMENT: BROOMS, SORBENT PADS AND BOOMS, SHOVELS, SPEEDY DRY, CAT LITTER, AND APPROPRIATE DISPOSAL CONTAINERS.

THE FOLLOWING PROCEDURES ARE REQUIRED BY EPA IN THE EVENT OF A SPILL THAT REACHES OR THREATENS NAVIGABLE WATERS OF THE UNITED STATES (INCLUDING WETLANDS):

1. THE AIRPORT MANAGER (OR OTHER AIRPORT OFFICIAL) IS REQUIRED TO NOTIFY THE NATIONAL RESPONSE CENTER AT (800) 424-8802, AS SOON AS HE OR SHE IS AWARE OF THE DISCHARGE.
2. THE FACILITY SUPPORT FOR THE AIRPORT MUST BE UPDATED WITHIN 14 CALENDAR DAYS OF A SPILL OR LEAK OF A REPORTED SPILL. THE UPDATE MUST INCLUDE A DESCRIPTION OF THE RELEASE, AN ACCOUNT OF THE CIRCUMSTANCES LEADING TO THE RELEASE, AND THE DATE OF THE RELEASE. IN ADDITION, THE SWPPP MUST BE REVIEWED TO IDENTIFY MEASURES TO PREVENT THE RECURRENCE OF SUCH RELEASES, AND IT MUST BE MODIFIED WHERE APPROPRIATE.
3. IN THE EVENT OF A REPORTED DISCHARGE, THE AIRPORT MUST ALSO SUBMIT TO EPA WITHIN 14 CALENDAR DAYS OF KNOWLEDGE OF THE RELEASE, A WRITTEN DESCRIPTION OF THE RELEASE (INCLUDING THE TYPE AND ESTIMATE OF THE AMOUNT OF MATERIAL RELEASED), THE DATE THAT SUCH RELEASE OCCURRED, THE CIRCUMSTANCES LEADING TO THE RELEASE, AND STEPS TO BE TAKEN TO MODIFY THE POLLUTION PREVENTION PLAN AT THE AIRPORT.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE SPILL PREVENTION MEASURES ARE IN PLACE PRIOR TO CONSTRUCTION AND THE CONTRACTOR SHALL BE FAMILIAR WITH SPILL RESPONSE PROCEDURES PRIOR TO INITIATING CONSTRUCTION ACTIVITY. IF A SPILL OCCURS DURING CONSTRUCTION IT SHALL BE THE RESPONSIBILITY OF THE AIRPORT MANAGER TO ENSURE THAT SPILL REPORTING REQUIREMENTS OUTLINED ABOVE HAVE BEEN SATISFIED.

E. VEGETATION PLANNING

FOLLOWING LAND CLEARING ACTIVITIES, ONLY THOSE AREAS UNDER ACTIVE CONSTRUCTION SHALL BE LEFT IN AN UNTREATED OR UN-VEGETATED CONDITION. ANY DISTURBED AREA, INCLUDING SOIL STOCKPILES, WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED SHALL BE STABILIZED ACCORDING TO THE TEMPORARY SEEDING AND MULCHING SCHEDULE SHOWN BELOW. IN NO INSTANCE SHALL A DISTURBED AREA BE LEFT UNSTABILIZED FOR LONGER THAN 14 CALENDAR DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED.

TEMPORARY SEEDING AND MULCHING:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MONITORING DAILY WEATHER REPORTS WHEN WORKING IN IDENTIFIED SENSITIVE AREAS AND FOR MONITORING WEEKLY REPORTS IN OTHER AREAS. THE CONTRACTOR SHALL ADJUST THE WORK SCHEDULE IN ANTICIPATION OF RAINS AND SHALL STABILIZE THE SITE AS INDICATED.

TEMPORARY SEEDING AND MULCHING SCHEDULE

WORK AREA	EXPECTED INTERIM PERIOD (CALENDAR DAYS)		NO TREATMENT	TEMPORARY MULCHING (1)	SEEDING AND MULCHING (2)
	<7	7-21			
SENSITIVE AREA (3)	<7	X		X	
	>21				X
NON SENSITIVE AREA	<14	X			
	14-45			X	
	>45				X

TEMPORARY SEEDING RATES

DATE	SEED	RATES	
		LBS/MSF	LBS/ACRE
4/1 TO 9/1	ANNUAL RYE GRASS	1.00	40
9/15 TO 9/15	ANNUAL RYE GRASS	1.00	40
9/1 TO 9/30	FOXTAIL MILLET	0.70	30
4/1 TO 7/1	CATS	2.00	80
8/15 TO 9/15	CATS	2.00	80
9/15 TO 10/15	WINTER RYE	3.00	120

- (1) MULCHING SHALL BE APPLIED AT A RATE OF 90 LBS/L,000 SQ. FT. (180 LBS/1,000 SQ. FT. FOR WINTER CONSTRUCTION).
 - (2) TEMPORARY SEEDING RATES SHALL BE AS SHOWN.
 - (3) THE TIME LIMIT FOR MULCHING IN SENSITIVE AREAS MAY BE OVERRIDDEN BY THE MOST CURRENT WEATHER FORECAST. ALL EXPOSED SOILS IN SENSITIVE AREAS SHALL BE MULCHED PRIOR TO EVERY ANTICIPATED STORM EVENT.
 - (4) STABILIZATION OF SENSITIVE AREAS FOR PERIODS OF LESS THAN 7 DAYS MAY BE REQUIRED IF SO DIRECTED BY THE RESIDENT ENGINEER, WETLAND SCIENTIST, NACC OR MASSDEP.
2. GRADING WILL BE HELD TO A MAXIMUM 3:1 SLOPE WHERE PRACTICAL EXCEPT IN ROCK CUTS OR AS DEPICTED ON THE PLANS. ALL SLOPES SHALL BE STABILIZED WITH ROLLED EROSION CONTROL PRODUCTS, PERMANENT SEEDING AND MULCHING IMMEDIATELY AFTER FINAL GRADING IS COMPLETE. IF FINAL GRADING WILL NOT BE COMPLETED IMMEDIATELY, REFER TO THE TEMPORARY SEEDING AND MULCHING SCHEDULE. IT IS UNDERSTOOD THAT IMMEDIATELY MEANS WITHIN 72 HOURS OF THE COMPLETION OF WORK.
 3. FOR ANY WORK PROPOSED DURING THE WINTER SEASON, ALTHOUGH NOT ANTICIPATED FOR THIS PROJECT, THE CONTRACTOR SHALL ADHERE TO THE FOLLOWING PRACTICES:
 - (a) A PLAN AND SCHEDULE OF ACTIVITIES SHALL BE SUBMITTED TO THE ENGINEER AND APPROVED PRIOR TO ANY WORK BEING DONE.
 - (b) THE INTERIM PERIOD FOR ANY EXPOSED AREA SHALL BE LIMITED TO 7 CALENDAR DAYS.
 - (c) WHERE REQUIRED, INSTALLATION OF ADDITIONAL OR DOUBLE SEDIMENTATION DEVICES MAY BE MODIFIED FROM THE DETAIL ON THE PLANS TO SUBSTITUTE 6 INCHES OF CLEAN GRAVEL OVER THE BOTTOM OF THE SILT FENCE IN LIEU OF TRENCHING AND BACKFILLING FABRIC.
 - (d) MULCHING AND SEEDING RATES SHALL ADHERE TO THE TEMPORARY SEEDING AND MULCHING SCHEDULE. NOTE THAT ALL MULCHING RATES SHALL BE DOUBLED AS SHOWN IN NOTE 1 AND SHALL FOLLOW THE SENSITIVE AREA SCHEDULE.

PERMANENT SEEDING AND MULCHING:

THE FOLLOWING GENERAL PRACTICES WILL BE USED TO RE-ESTABLISH FINAL VEGETATION:

1. LOAMING - A MINIMUM OF 4 INCHES OF LOAM WILL BE SPREAD OVER DISTURBED AREAS AND GRADED TO A UNIFORM DEPTH AND A NATURAL APPEARANCE. ALL LOAM SHALL BE AS SPECIFIED OR APPROVED BY THE ENGINEER.
2. FINAL SEEDING - ALL FINAL SEEDING SHALL BE COMPLETED IMMEDIATELY FOLLOWING FINAL GRADING. ALL FINAL FERTILIZING AND SEEDING SHALL ADHERE TO THE SPECIFICATIONS UNLESS OTHERWISE APPROVED BY THE ENGINEER.
3. MULCHING - ALL AREAS SHALL BE MULCHED AFTER IT HAS BEEN SEEDED UNLESS DEEMED UNNECESSARY BY THE RESIDENT ENGINEER. MULCHING SHALL CONSIST OF STRAW MULCH, HYDRO-MULCH OR ANY SUITABLE SUBSTITUTE PRODUCT. MULCHING SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF DISTURBANCE ACTIVITIES RELATED TO EACH EROSION CONTROL MEASURE. HOWEVER, IT SHALL BE AVOIDED, TO THE EXTENT PRACTICAL, IN THE WINTER AND MUD SEASON. SEE DRAWINGS AND DETAILS FOR LOCATIONS AND INSTALLATION PROCEDURES.
 - (a) STRAW MULCH SHALL BE APPLIED AT THE RATE OF 2 TONS PER ACRE (90 LBS. OR 2 BALES/1,000 SQ. FT.).
 - (b) HYDRO-MULCH SHALL CONSIST OF A MIXTURE OF WOOD FIBER, PAPER FIBER, OR SYNTHETIC FIBER AND WATER SPRAYED OVER A SEEDED AREA. HYDRO-MULCH SHALL NOT BE USED DURING THE FALL, WINTER OR MUD SEASON.
 - (c) MULCHING SHALL BE MONITORED ACCORDING TO THE MONITORING SCHEDULE. SHOULD MULCHING PROVE TO BE INEFFECTIVE, THEN NETTING OR MATTING SHALL BE USED IN ITS PLACE.
4. DORMANT SEEDING: CONSTRUCTION SHALL BE PLANNED TO ELIMINATE THE NEED FOR SEEDING DURING THE FALL, WINTER OR MUD SEASON. SHOULD SEEDING BE NECESSARY BETWEEN THESE DATES, THE FOLLOWING PROCEDURE SHALL BE FOLLOWED:
 - (a) UNFROZEN LOAM SHALL BE USED.
 - (b) LOAMING, SEEDING AND MULCHING WILL NOT BE DONE OVER SNOW COVER. IF SNOW EXISTS, IT MUST BE REMOVED PRIOR TO PLACEMENT OF SEED.
 - (b) NO PERMANENT SEEDING WILL BE DONE DURING FALL, WINTER OR MUD SEASON UNLESS SPECIFICALLY APPROVED BY THE ENGINEER.
 - (c) WHERE TEMPORARY SEEDING IS REQUIRED, THE RATES SPECIFIED IN THE TEMPORARY SEEDING AND MULCHING SCHEDULE SHALL BE ADHERED TO.
 - (d) FERTILIZING, SEEDING AND MULCHING SHALL BE DONE ON LOAM THE SAME DAY THE LOAM IS SPREAD. WINTER MULCH RATES SHALL APPLY AS SPECIFIED IN THE TEMPORARY SEEDING AND MULCHING SCHEDULE.
 - (e) ON SLOPES GREATER THAN 3:1, STRAW MATTING OR EXCELISOR MATTING WILL BE SUBSTITUTED FOR MULCH, EXCEPT THAT BIODEGRADABLE NETTING OVER MULCH MAY BE USED WHERE APPROVED BY THE ENGINEER.

FOLLOWING FINAL SEEDING, THE SITE WILL BE INSPECTED EVERY 30 DAYS UNTIL 80% COVER HAS BEEN ESTABLISHED. RESEEDING AND MULCHING SHALL BE CARRIED OUT AS REQUIRED, AT NO ADDITIONAL EXPENSE TO THE OWNER, UNTIL AN ADEQUATE CATCH IS ESTABLISHED IN ALL SEEDED AREAS, AS AGREED UPON BY THE OWNER AND ENGINEER.

F. SEQUENCING OF EROSION AND SEDIMENTATION CONTROLS

PRIOR TO RECEIVING RUNOFF, ALL EROSION CONTROL MEASURES AND DISTURBED SLOPES WILL BE STABILIZED TO THE SATISFACTION OF THE RESIDENT ENGINEER. ALL EROSION CONTROL MEASURES AND REVEGETATION INSTALLED IN THE STREAM CHANNEL WILL BE COMPLETELY STABILIZED PRIOR TO RECEIVING STREAM FLOW.

1. SENSITIVE AREAS - ALL WORK PROPOSED IN THE DEFINED SENSITIVE AREAS MUST BE COMPLETED OUTSIDE OF THE MUD SEASON. ALL WORK ADJACENT TO, OR IN, AREAS WHICH DRAIN TO SENSITIVE AREAS SHALL BE PROTECTED WITH APPROPRIATE EROSION CONTROLS TO PREVENT EROSION OR SEDIMENTATION OF THE IDENTIFIED SENSITIVE AREAS AT ALL TIMES DURING CONSTRUCTION UNTIL THE AREAS UNDER CONSTRUCTION ARE STABLE.
2. EROSION & SEDIMENTATION CONTROLS INSTALLATION - EROSION CONTROL INSTALLATION MAY OCCUR ALL YEAR LONG, EXCEPT THAT SUCH INSTALLATION SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF DISTURBANCE ACTIVITIES RELATED TO EACH EROSION CONTROL MEASURE. HOWEVER, IT SHALL BE AVOIDED, TO THE EXTENT PRACTICAL, IN THE WINTER AND MUD SEASON. SEE DRAWINGS AND DETAILS FOR LOCATIONS AND INSTALLATION PROCEDURES.
3. CLEARING - CLEARING MAY OCCUR ALL YEAR LONG EXCEPT DURING "MUD SEASON" IN NON SENSITIVE AREAS. IN SENSITIVE AREAS, CLEARING MAY ONLY OCCUR DURING DRY WEATHER CONDITIONS TO ALLOW CONSTRUCTION EQUIPMENT TO PROCEED WITHOUT RUTTING OR OTHERWISE DAMAGING THE GROUND SURFACE.

NOTE: "MUD SEASON" SHALL BE DETERMINED BY RESIDENT ENGINEER FOR THE CONSTRUCTION PERIOD BASED ON OBSERVED FIELD CONDITIONS IN CONSULTATION WITH THE WETLAND SCIENTIST.

G. MAINTENANCE OF EROSION AND SEDIMENTATION CONTROLS

MAINTENANCE MEASURES WILL BE PERFORMED AS NEEDED DURING THE ENTIRE CONSTRUCTION CYCLE. AFTER EACH RAINFALL, A VISUAL INSPECTION WILL BE MADE TO INSURE THEIR CONTINUING FUNCTION AS DESIGNED. THE FOLLOWING SECTIONS OUTLINE THE SPECIFIC MAINTENANCE PROGRAMS AND SCHEDULES FOR THE MEASURES TO BE IMPLEMENTED DURING CONSTRUCTION:

1. STONE CHECK DAMS, SANDBAG DAMS, STRAW BALE BARRIERS, SEDIMENT BARRIERS, DOUBLE SEDIMENT BARRIERS, RECPs AND MATTING AND MULCH SHALL BE INSPECTED AND REPAIRED (IF NECESSARY) ONCE A WEEK OR IMMEDIATELY FOLLOWING ANY SIGNIFICANT RAINFALL. SEDIMENT TRAPPED BEHIND THESE BARRIERS SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES (OR 1/2 THE HEIGHT OF THE DAM FOR CHECK DAMS) AND REDISTRIBUTED TO AREAS UNDERGOING FINAL GRADING.
2. DEWATERING FILTER DISCHARGE DEVICES AND INLET SUMPS SHALL BE VISUALLY INSPECTED ONCE A WEEK OR IMMEDIATELY AFTER EACH SIGNIFICANT RAINFALL, AND CLEANED AND REPAIRED AS NEEDED, OR AS NECESSARY AFTER EACH STORM. THE SEDIMENT REMOVED SHALL BE TRANSPORTED TO AN UPSLOPE AREA UNDERGOING FINAL GRADING, OR REMOVED FROM THE SITE. THE SEDIMENT AND THE REMOVAL THEREOF SHALL BE HANDLED IN A MANNER WHICH DOES NOT PROMOTE FURTHER EROSION OR SEDIMENTATION.
3. EMERGENCY PROTECTION PROCEDURES - SHOULD CONSTRUCTION BE HAMPERED BY EXCESSIVE RUNOFF AND SEDIMENT ENTERING STREAM CHANNELS, THE CONTRACTOR SHALL IMMEDIATELY EMPLOY CORRECTIVE MEASURES (STRUCTURAL OR NON STRUCTURAL, IN ACCORDANCE WITH MASSDEP EROSION CONTROL REGULATIONS) NECESSARY TO REMEDIATE THE SITUATION.

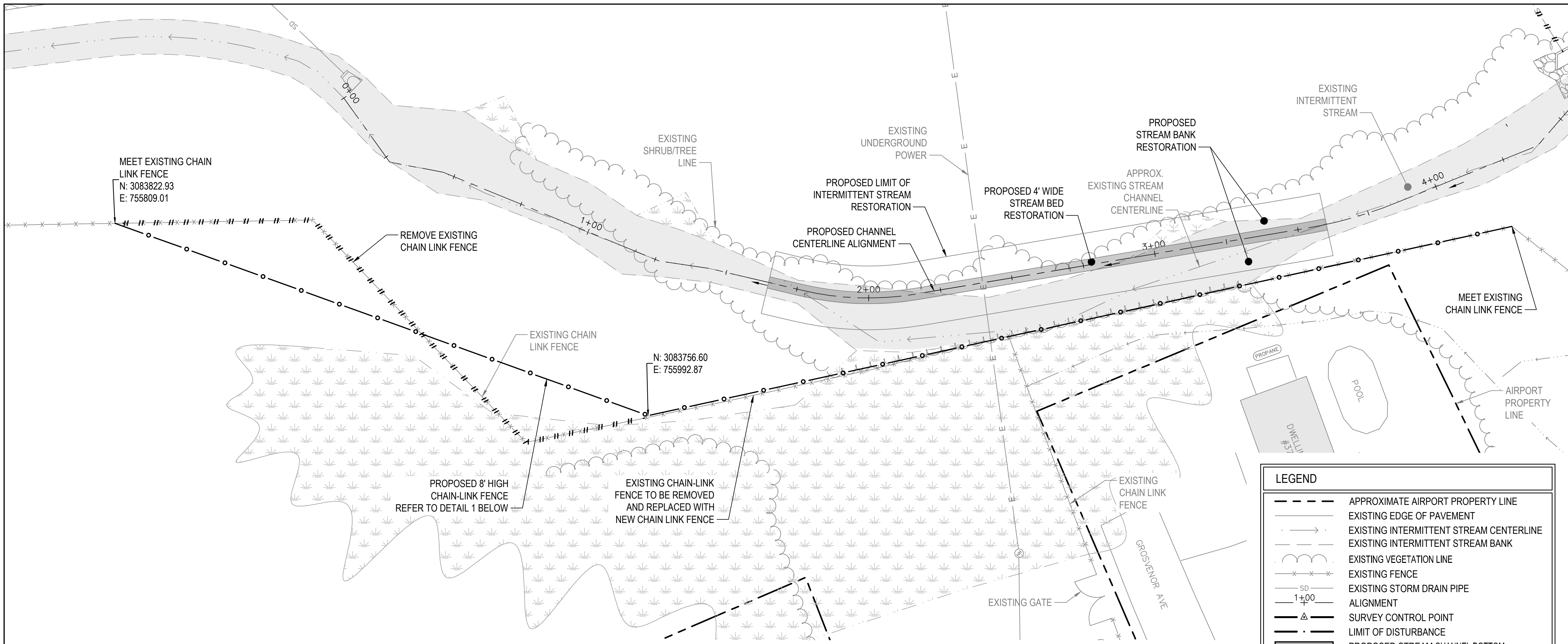
EROSION CONTROL MEASURE REMOVAL

REMOVAL OF TEMPORARY EROSION CONTROL MEASURES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. ALL EROSION CONTROLS SHALL REMAIN IN PLACE AND MAINTAINED BY THE CONTRACTOR UNTIL ALL RELATED CONSTRUCTION IS COMPLETE AND THE AREA IS STABLE. AN AREA IS CONSIDERED STABLE IF:

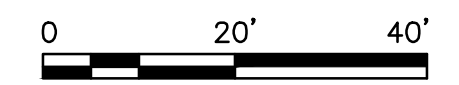
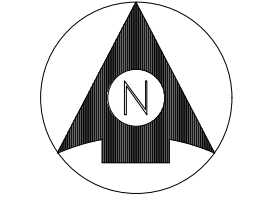
- (1) AN 80% COVER OF GRASS HAS BEEN ESTABLISHED.
 - (2) IT IS COVERED WITH 4-INCHES OF LONG-TERM MULCH.
- STRAW BALES, COMPOST FILTER TUBES AND SILT BARRIERS SHALL BE REMOVED BY THE CONTRACTOR ONCE THE AREAS UPSTREAM ARE STABLE. THE STRAW BALES, COMPOST FILTER TUBES, AND SILT FENCE SHALL BE DISPOSED OF LEGALLY AND PROPERLY OFF-SITE. ALL SEDIMENT TRAPPED BEHIND THESE CONTROLS SHALL BE:
- (1) DISTRIBUTED TO AN AREA UNDERGOING FINAL GRADING.
 - (2) GRADED IN AN AESTHETIC MANNER TO CONFORM TO THE TOPOGRAPHY, AND FERTILIZED, SEEDED AND MULCHED IN ACCORDANCE WITH THE RATES PREVIOUSLY STATED.
 - (3) REMOVED AND DISPOSED OF OFF SITE

RIP-RAP AND STONE, AND ALL COMPONENTS OF THE DEWATERING DEVICES AND DIVERSIONS SHALL BE REMOVED. ONCE ALL THE TRAPPED SEDIMENTS HAVE BEEN REMOVED FROM THE

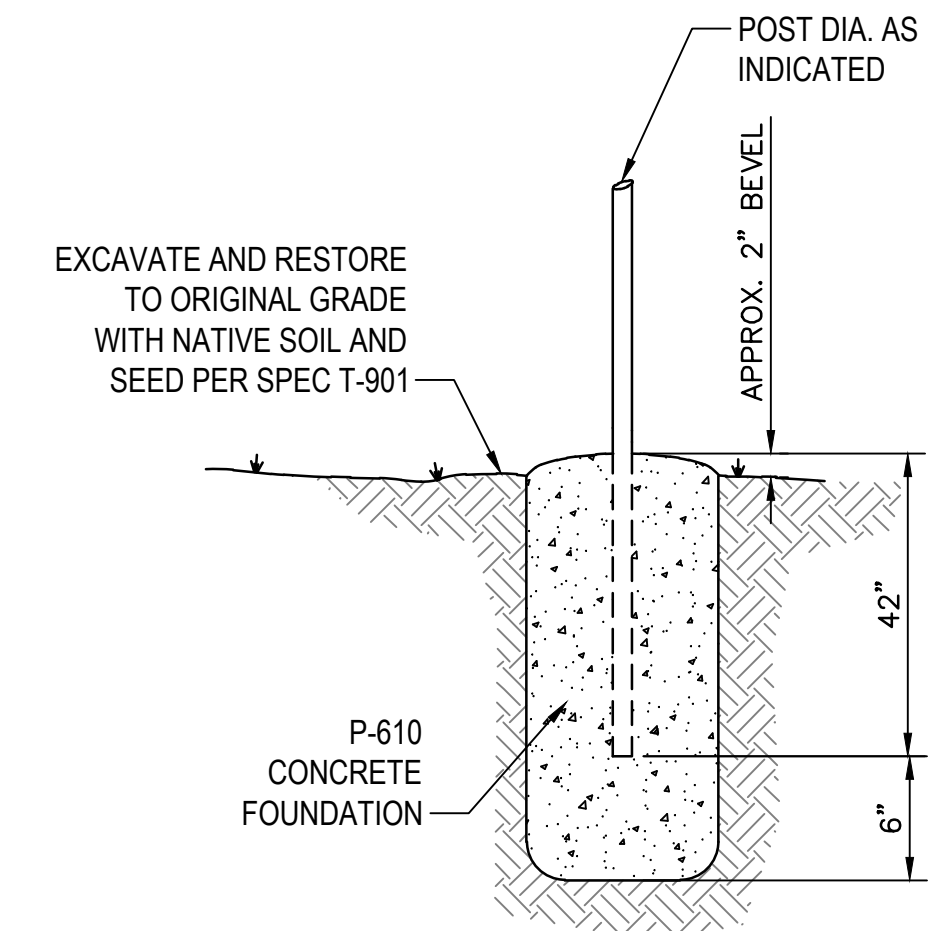
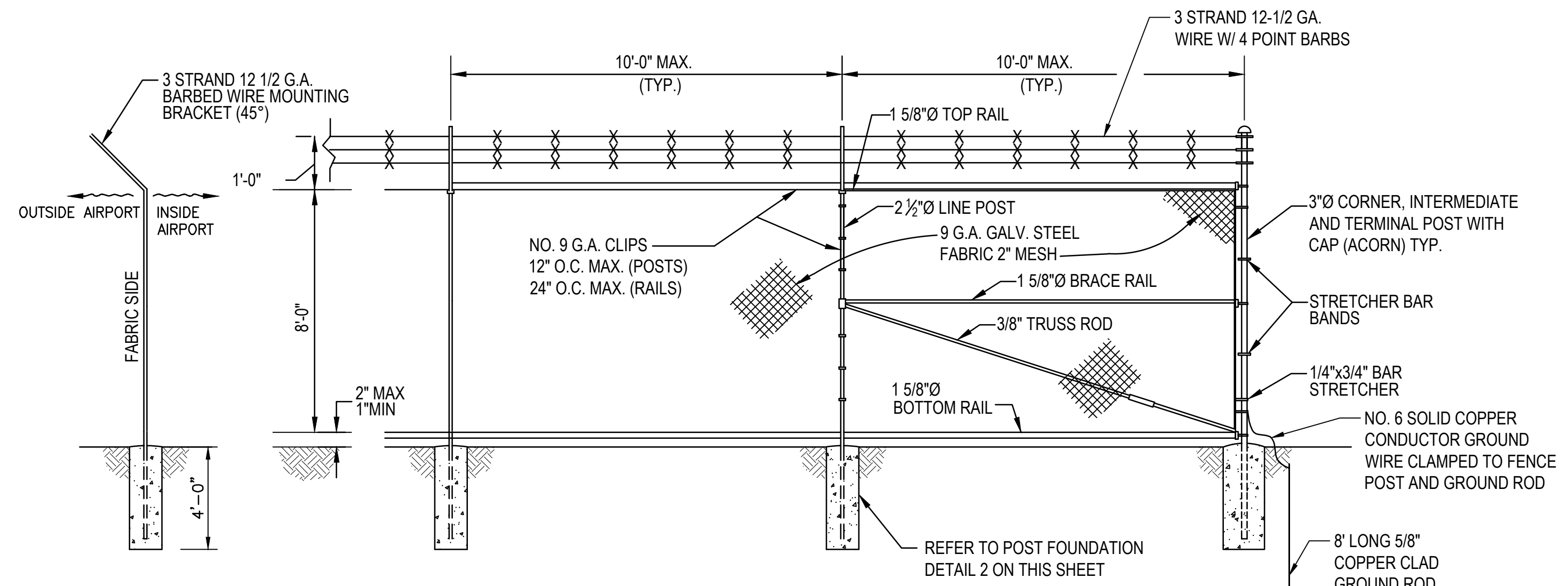
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LEGEND	
	APPROXIMATE AIRPORT PROPERTY LINE
	EXISTING EDGE OF PAVEMENT
	EXISTING INTERMITTENT STREAM CENTERLINE
	EXISTING INTERMITTENT STREAM BANK
	EXISTING VEGETATION LINE
	EXISTING FENCE
	EXISTING STORM DRAIN PIPE ALIGNMENT
	SURVEY CONTROL POINT
	LIMIT OF DISTURBANCE
	PROPOSED STREAM CHANNEL BOTTOM
	PROPOSED STREAM CHANNEL BANK
	REMOVE EXISTING CHAIN LINK FENCE
	PROPOSED CHAIN LINK FENCE



FENCE PLAN



- NOTES:
- FENCE POSTS/RAILS/BRACES/ETC. DIMENSIONS SHALL BE AT A MINIMUM WHAT IS SHOWN OR IN ACCORDANCE WITH FEDERAL SPEC. RR-F-191, WHICHEVER IS GREATER.
 - END JOINTS BETWEEN ADJACENT SECTIONS OF WIRE FABRIC SHALL BE LAPPED 4" AND TIED WITH GALVANIZED WIRE TIES AT 2' O.C. AND AT EDGES.
 - ALL MATERIALS SHALL CONFORM TO FEDERAL SPECIFICATION RR-F-191
 - FENCE POST SPACING MAY BE ADJUSTED TO ACCOMMODATE UNDERGROUND UTILITIES, ANY POST LOCATION ADJUSTMENTS OR ADDITIONAL POSTS REQUIRED TO ACCOMMODATE UNDERGROUND UTILITIES SHALL BE CONSIDERED INCIDENTAL TO THE FENCE PAY ITEMS.
 - ELECTRICAL GROUNDS SHALL BE INSTALLED AT 500' INTERVALS AND DIRECTLY BELOW THE POINT OF ANY CROSSING POWER LINES.

- NOTE:
- EXCAVATION AND RESTORATION SHALL BE CONSIDERED INCIDENTAL TO FENCE PAY ITEMS.
 - FENCE POST FOUNDATIONS SHALL BE INSTALLED WITH A NEAT VERTICAL FACE.

1 8' HIGH CHAIN LINK FENCE
 NOT TO SCALE

2 FENCE POST FOUNDATION
 NOT TO SCALE

Revision	By	Appd.	YY.MM.DD
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Client/Project
 LAWRENCE MUNICIPAL AIRPORT
 NORTH ANDOVER, MA
 RUNWAY 5 END
 DRAINAGE IMPROVEMENTS

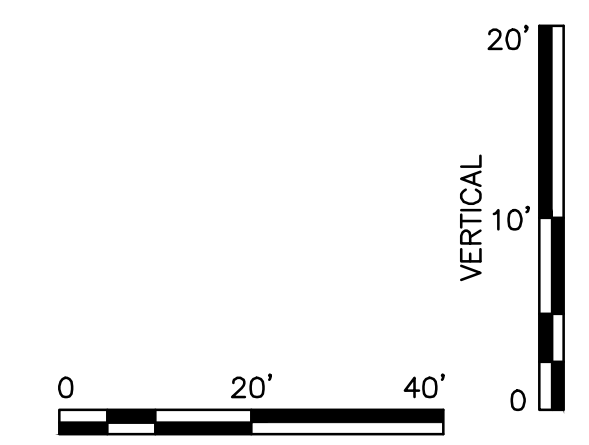
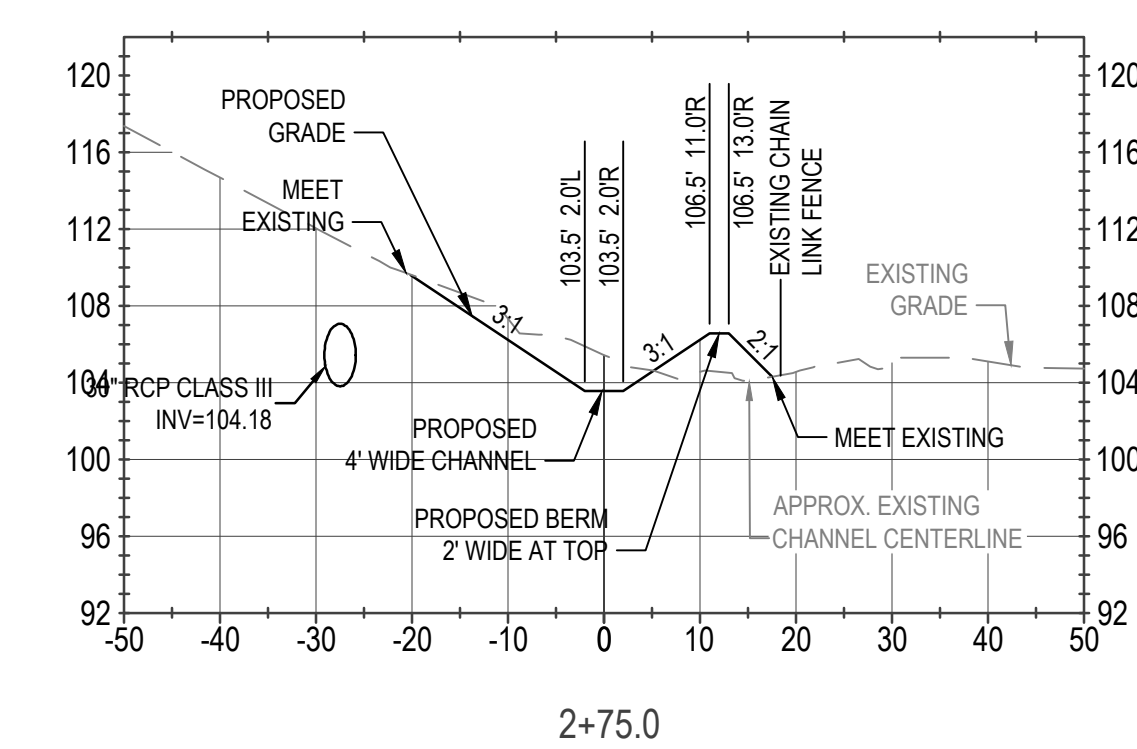
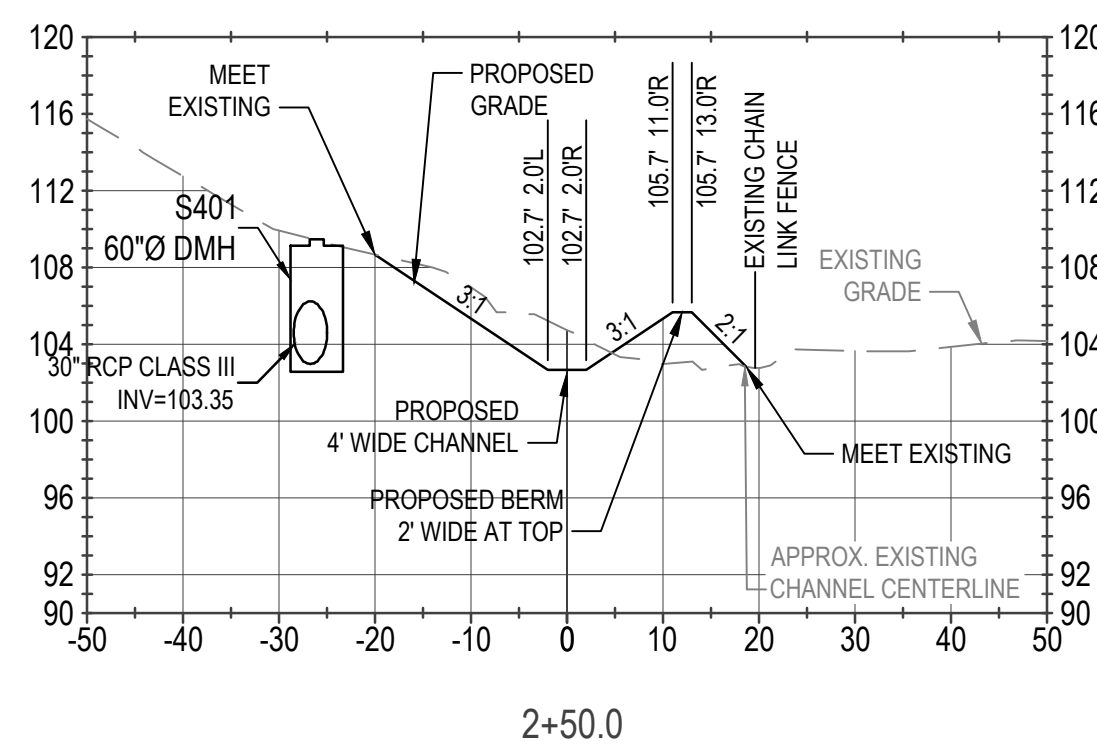
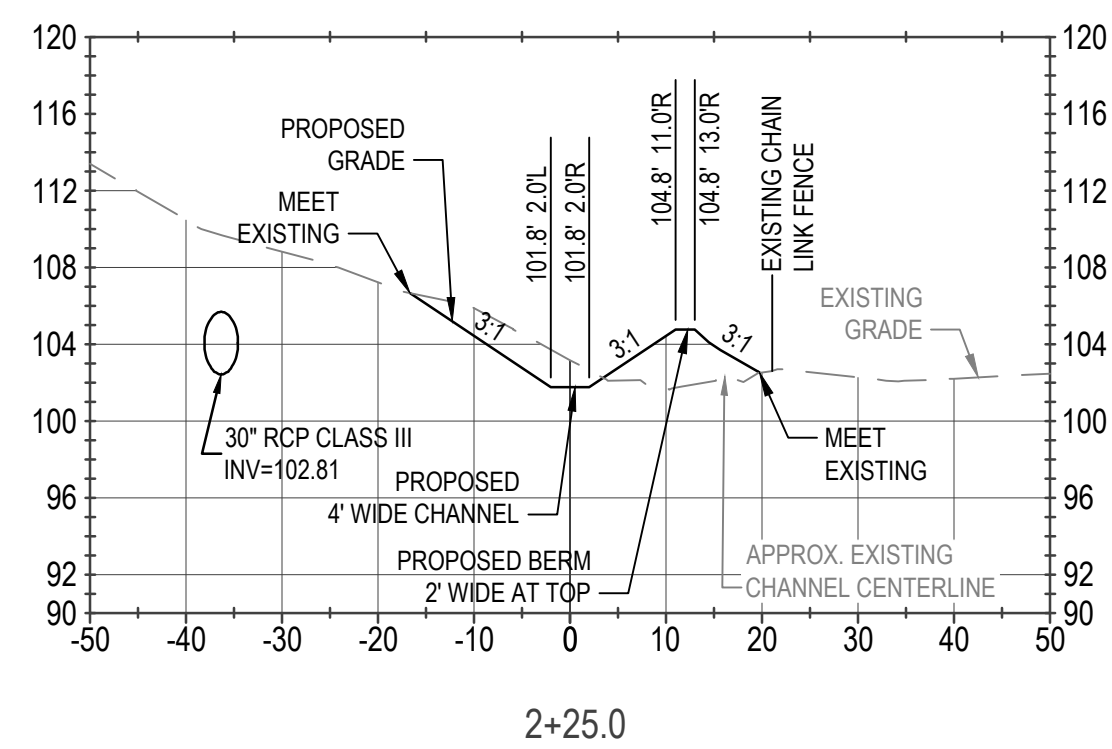
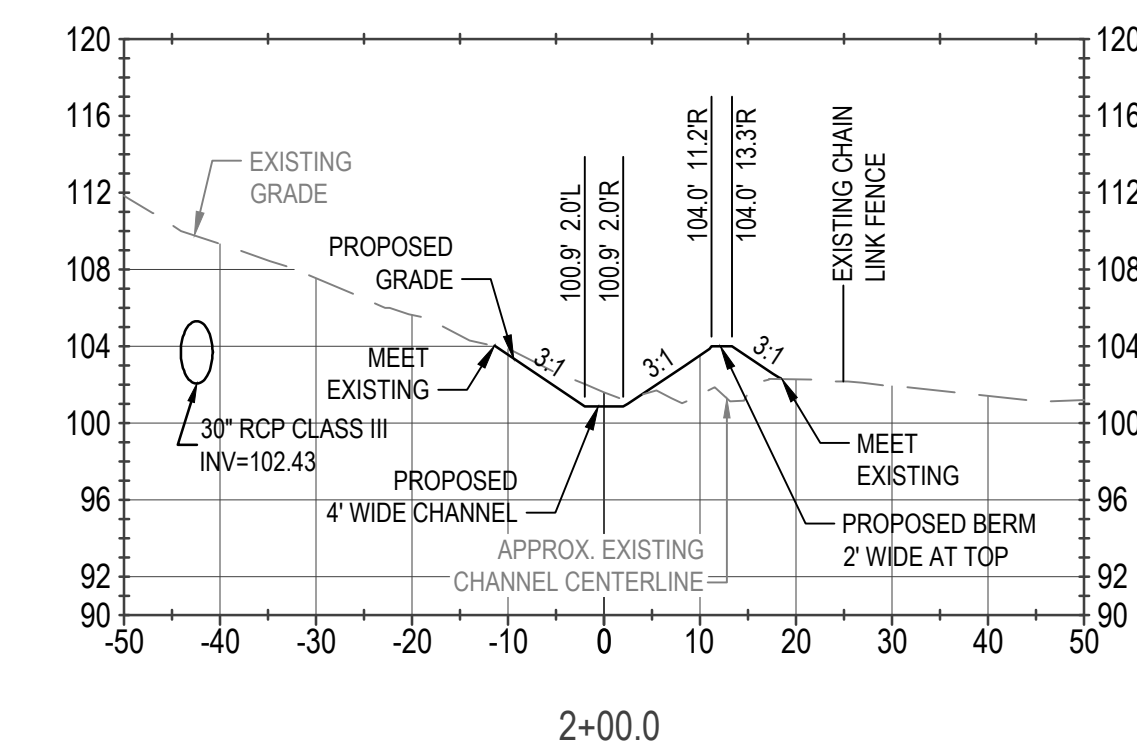
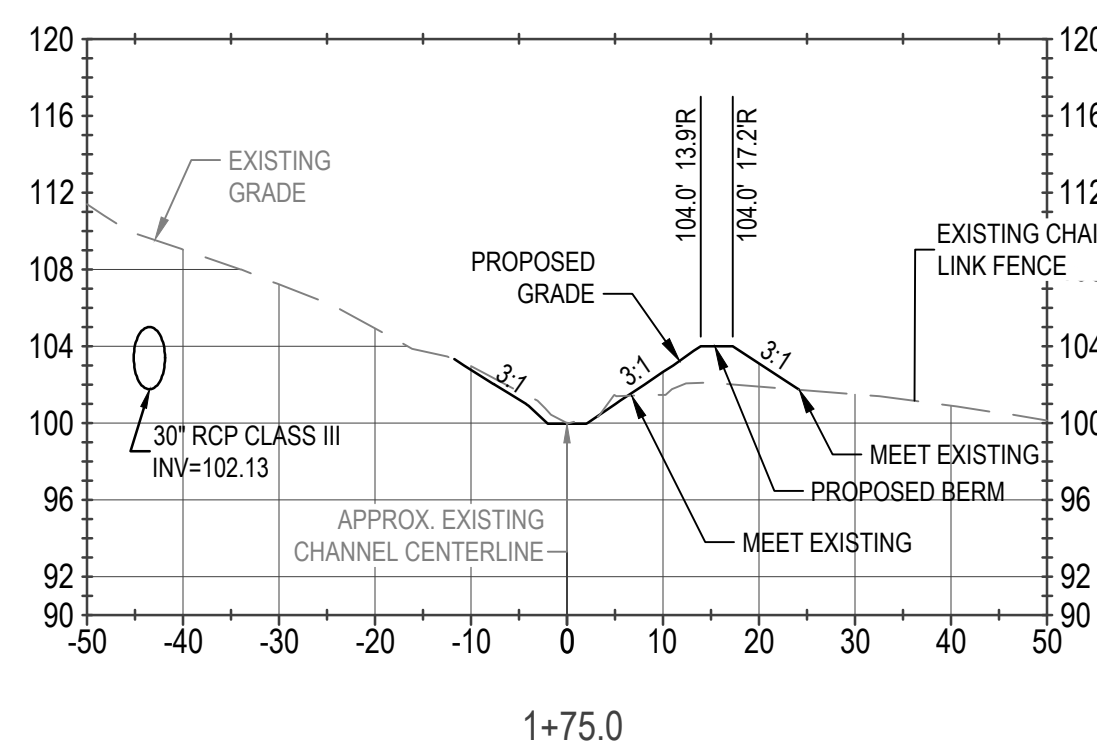
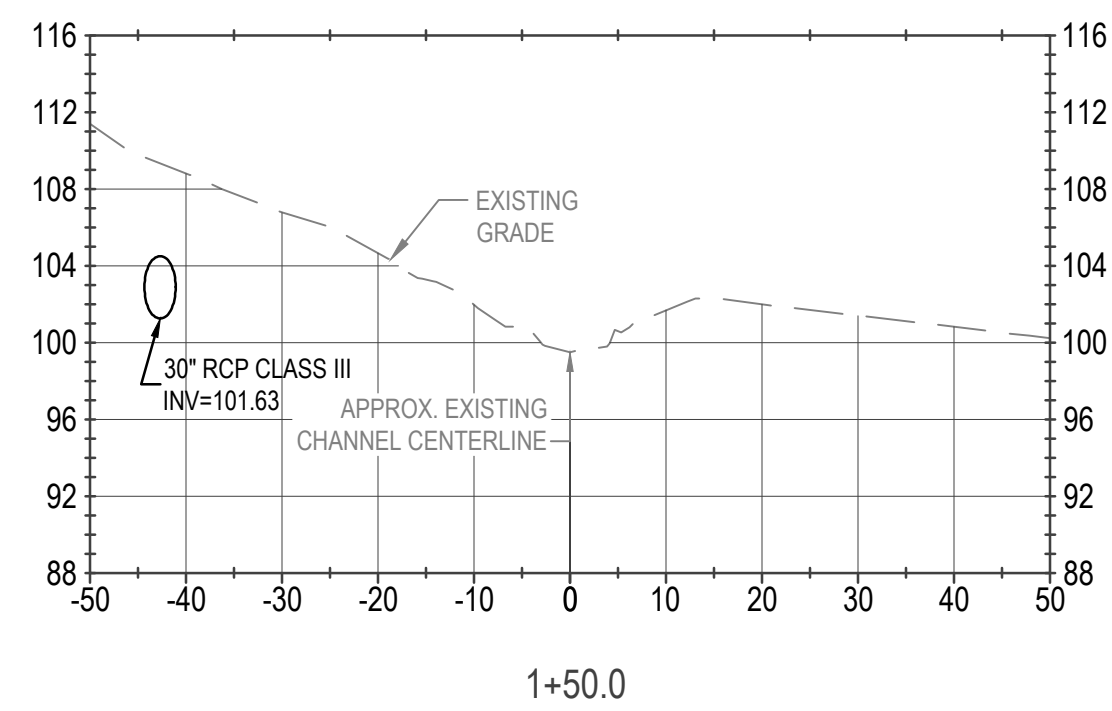
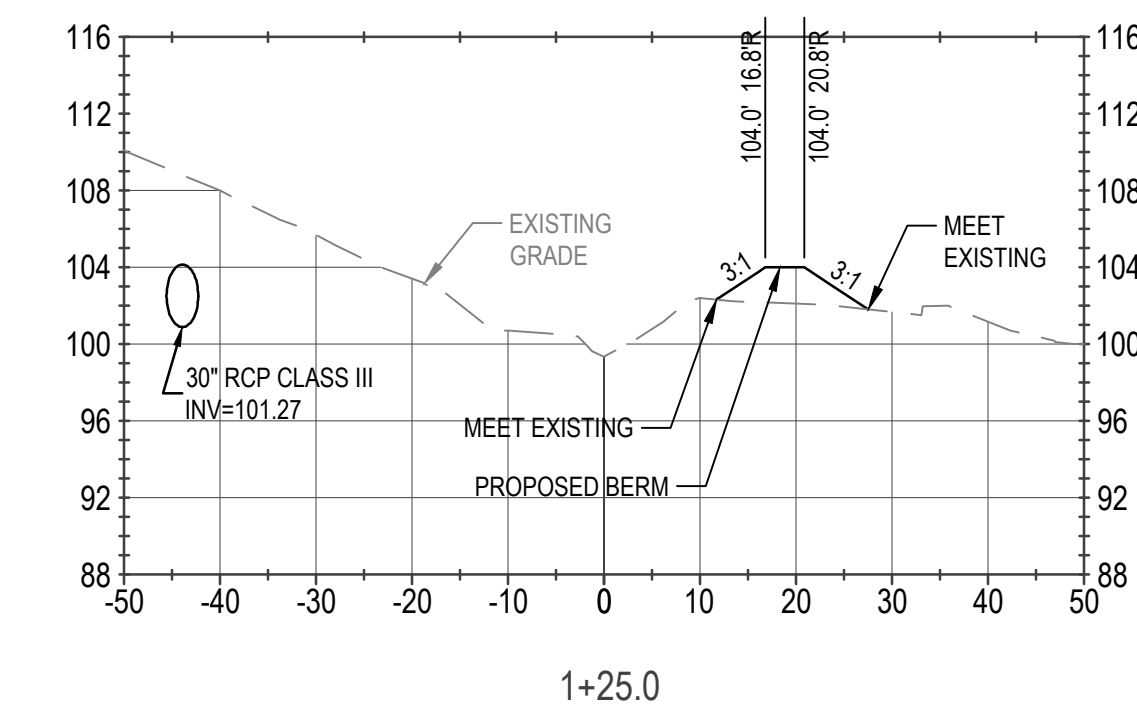
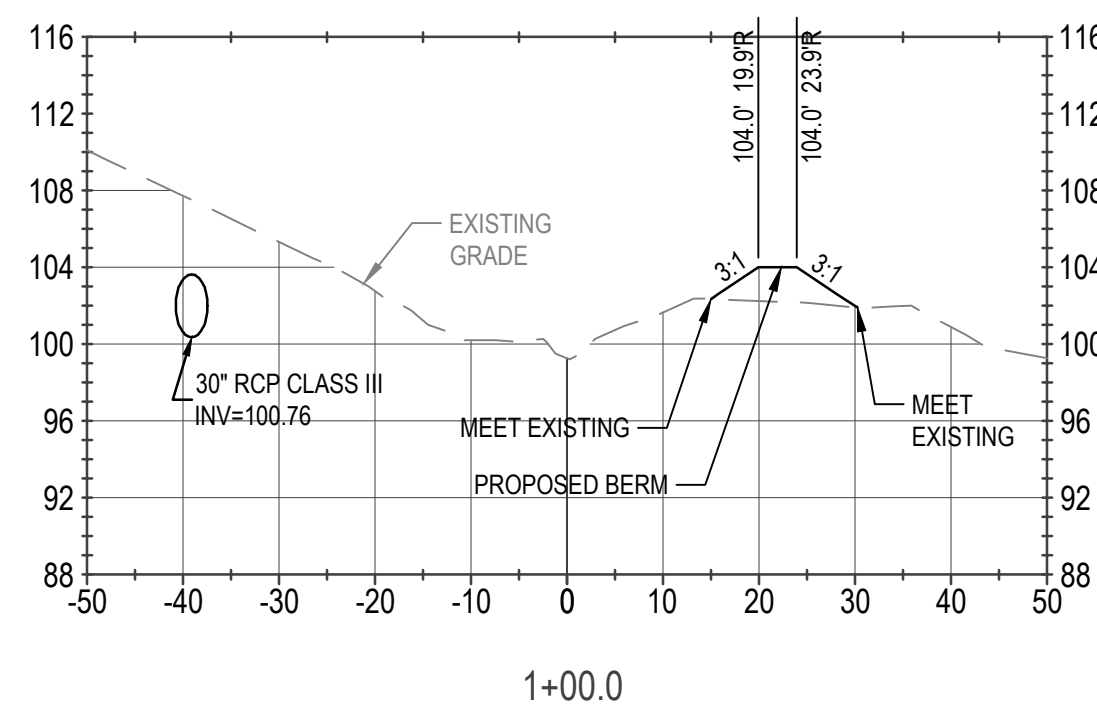
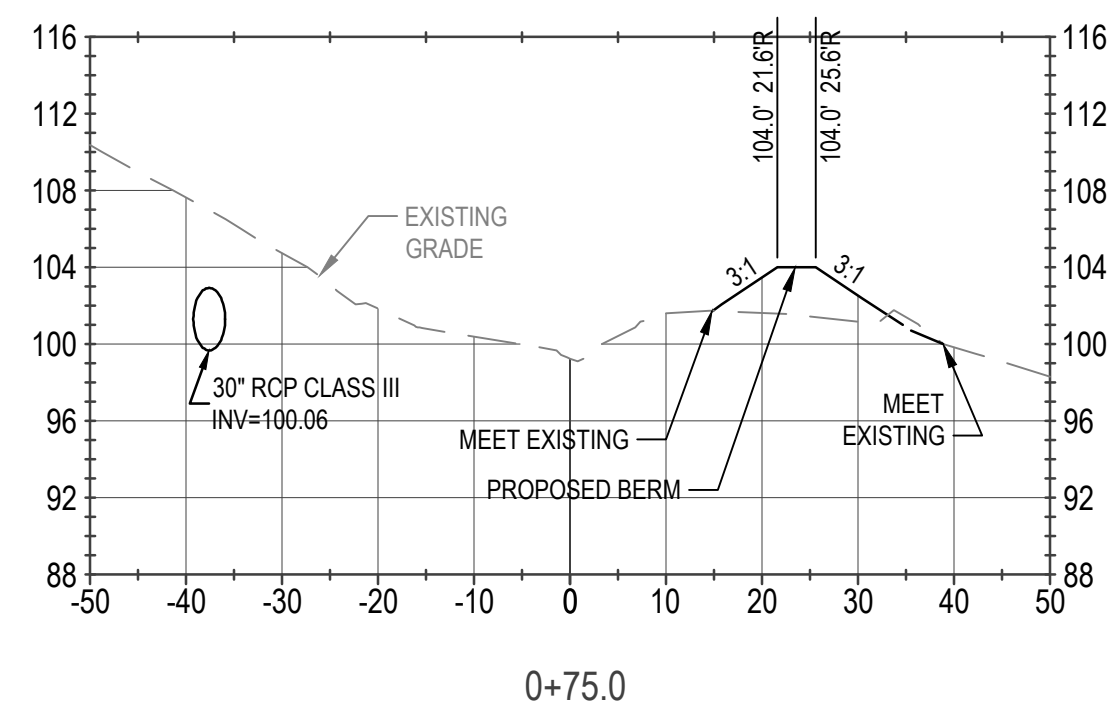
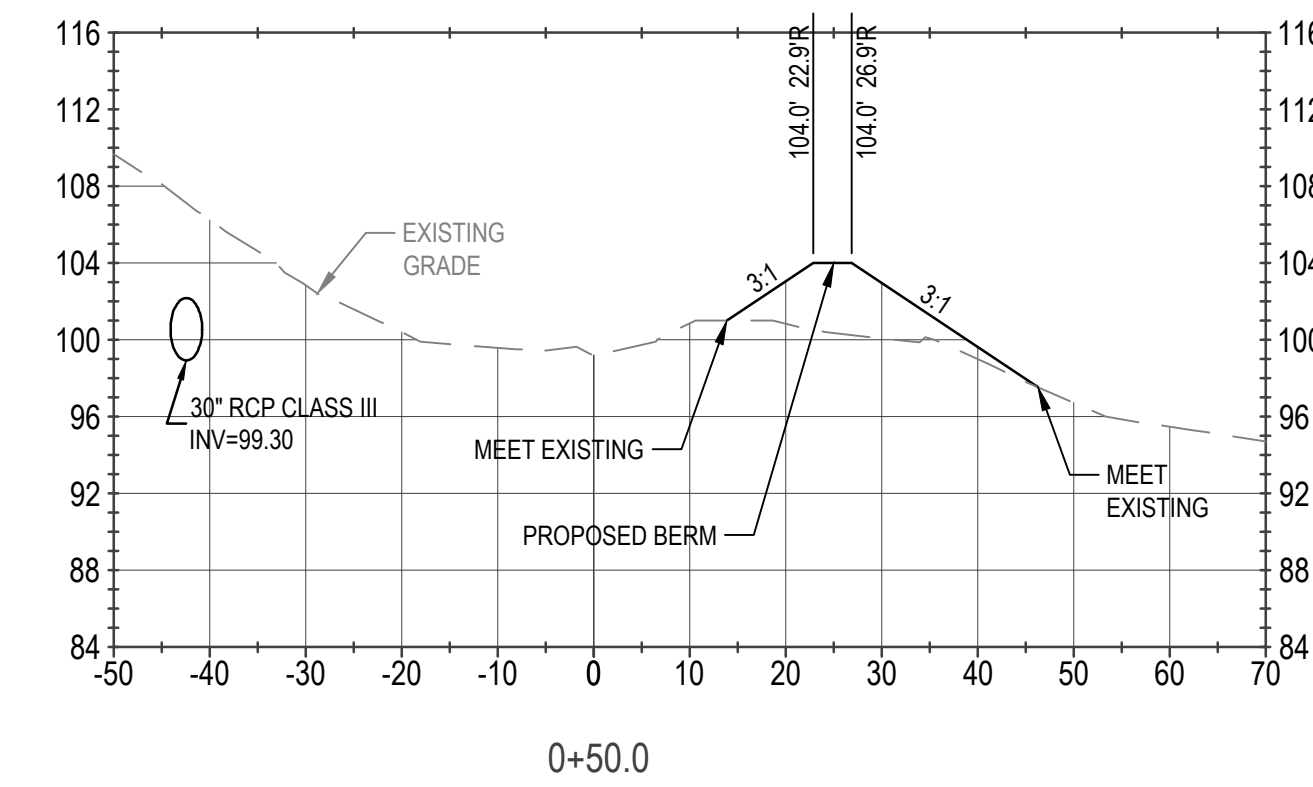
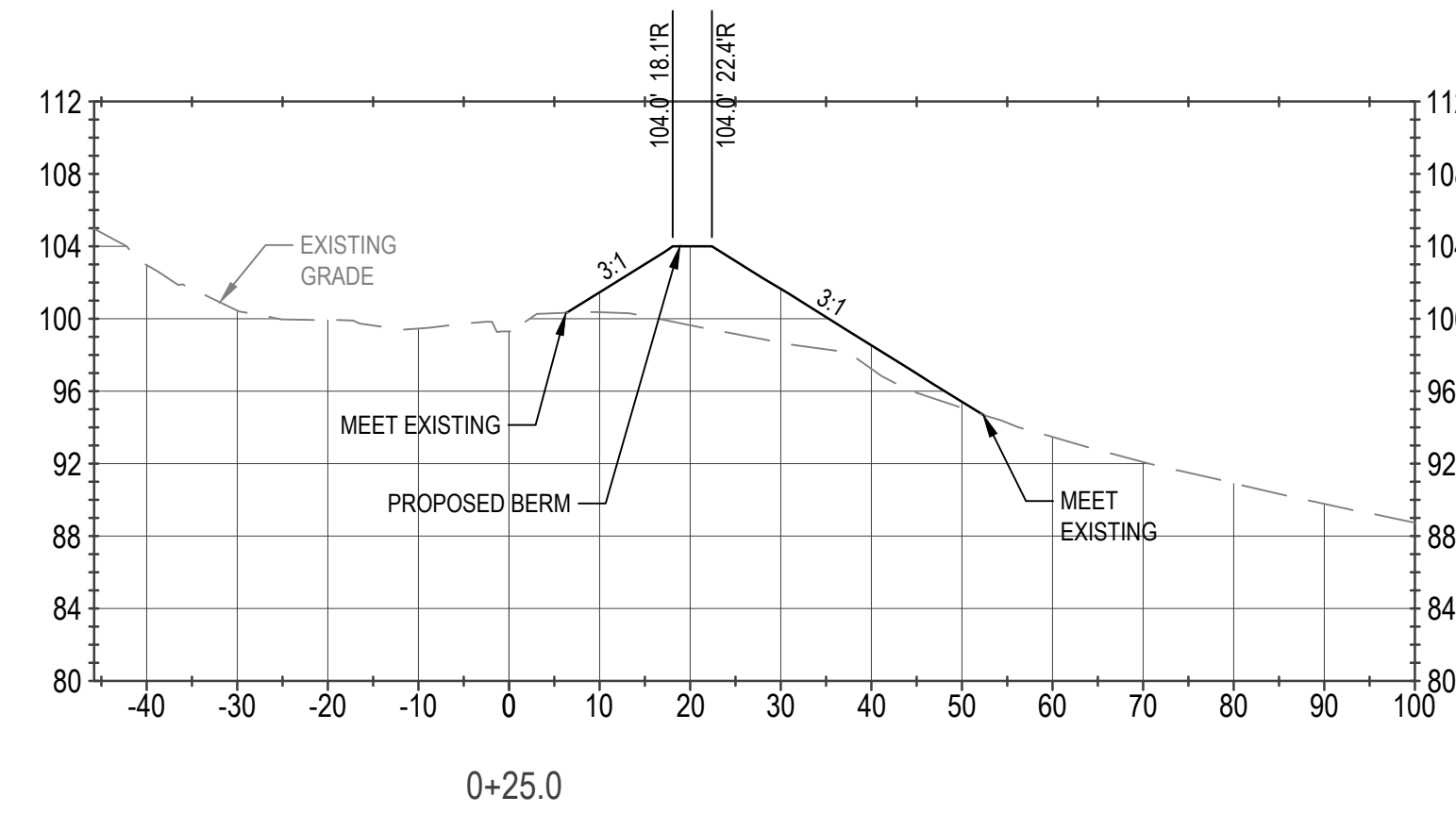
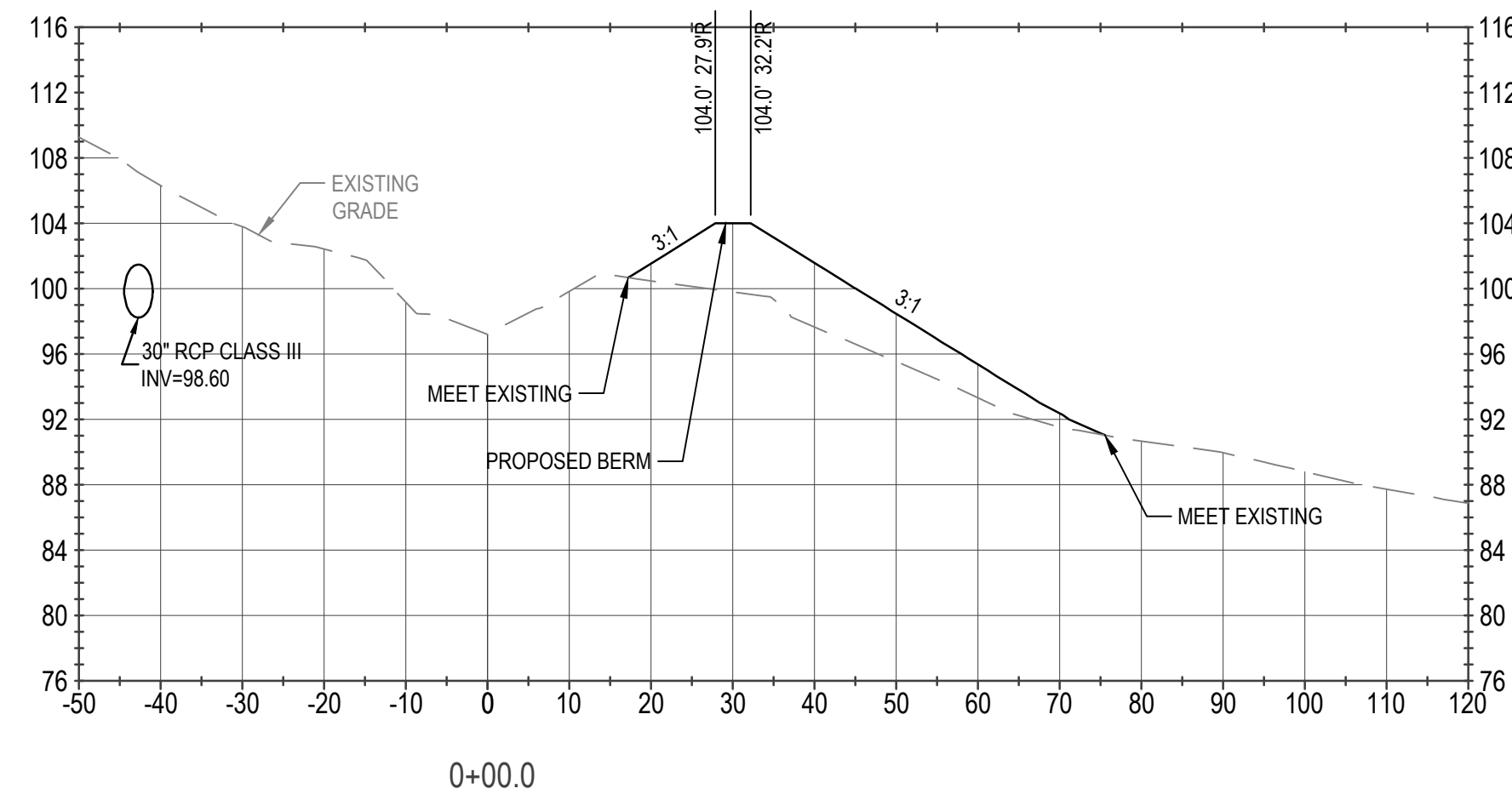
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Project No.
 179450605

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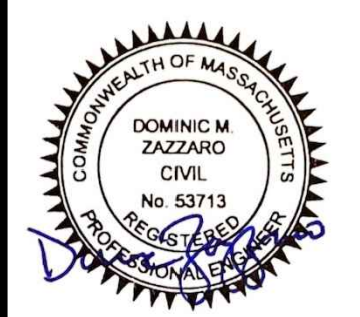
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Client/Project
 LAWRENCE MUNICIPAL AIRPORT
 NORTH ANDOVER, MA
 RUNWAY 5 END
 DRAINAGE IMPROVEMENTS

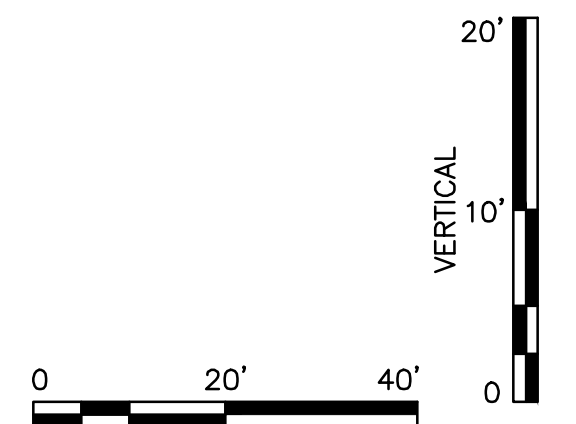
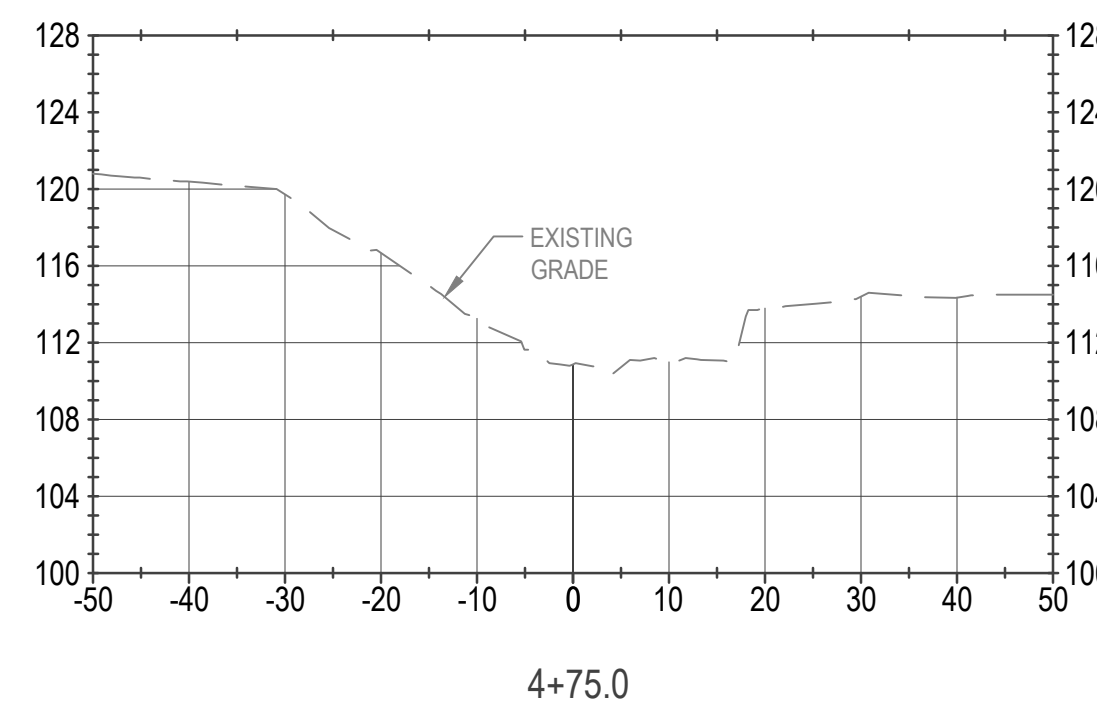
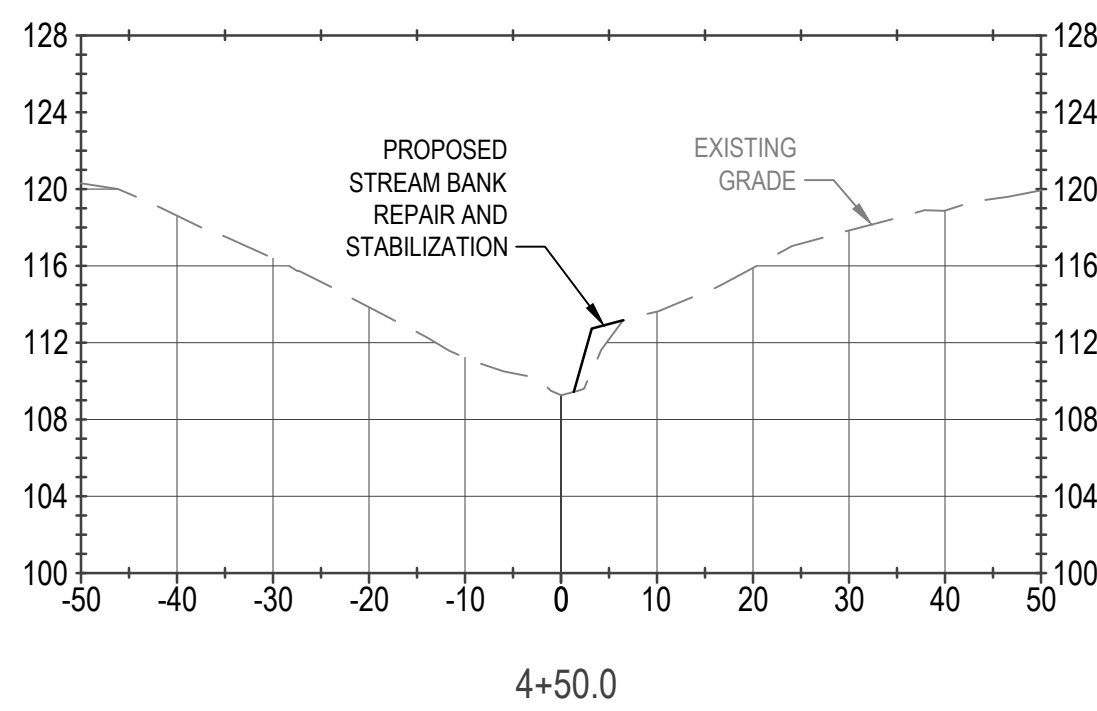
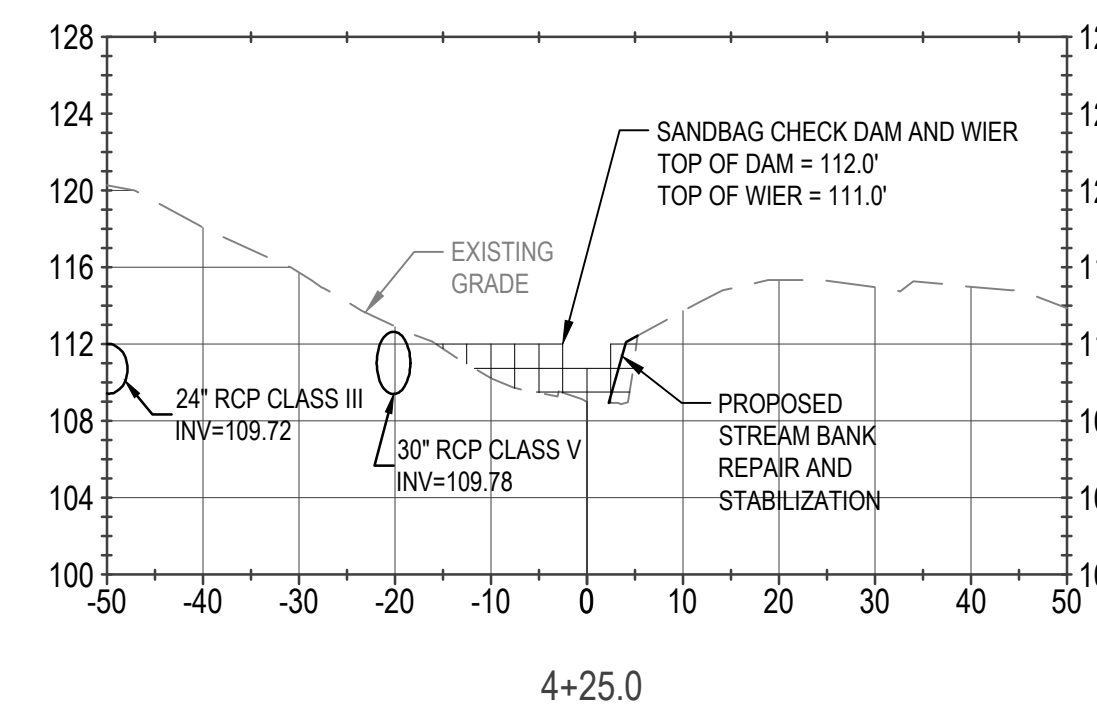
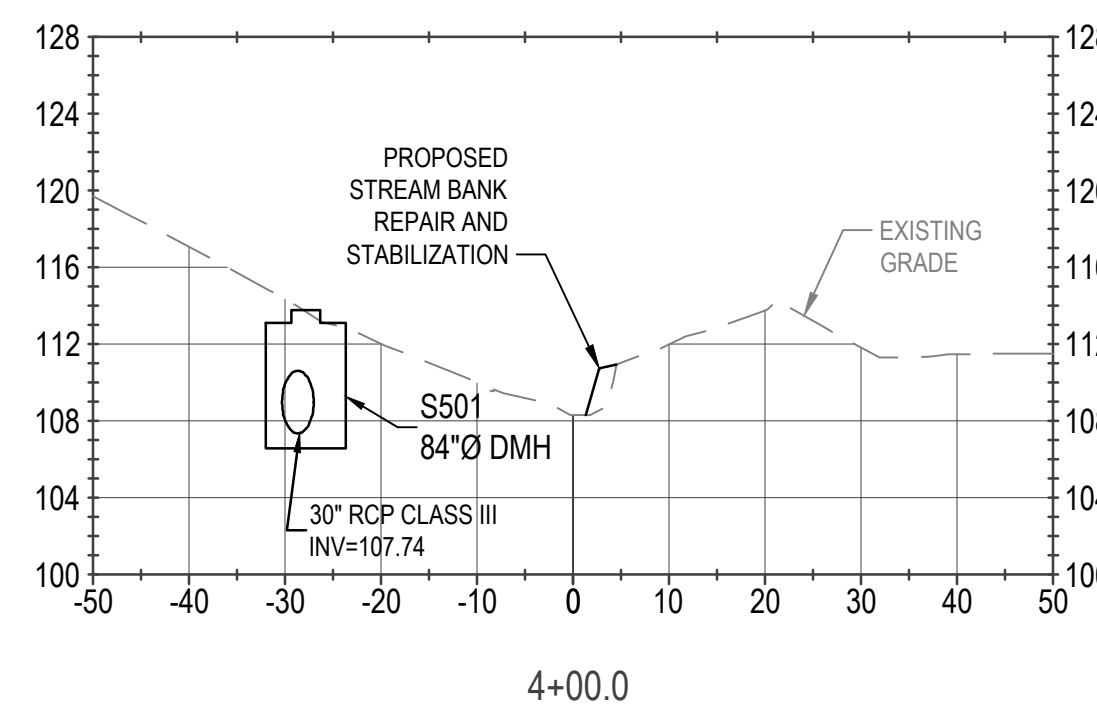
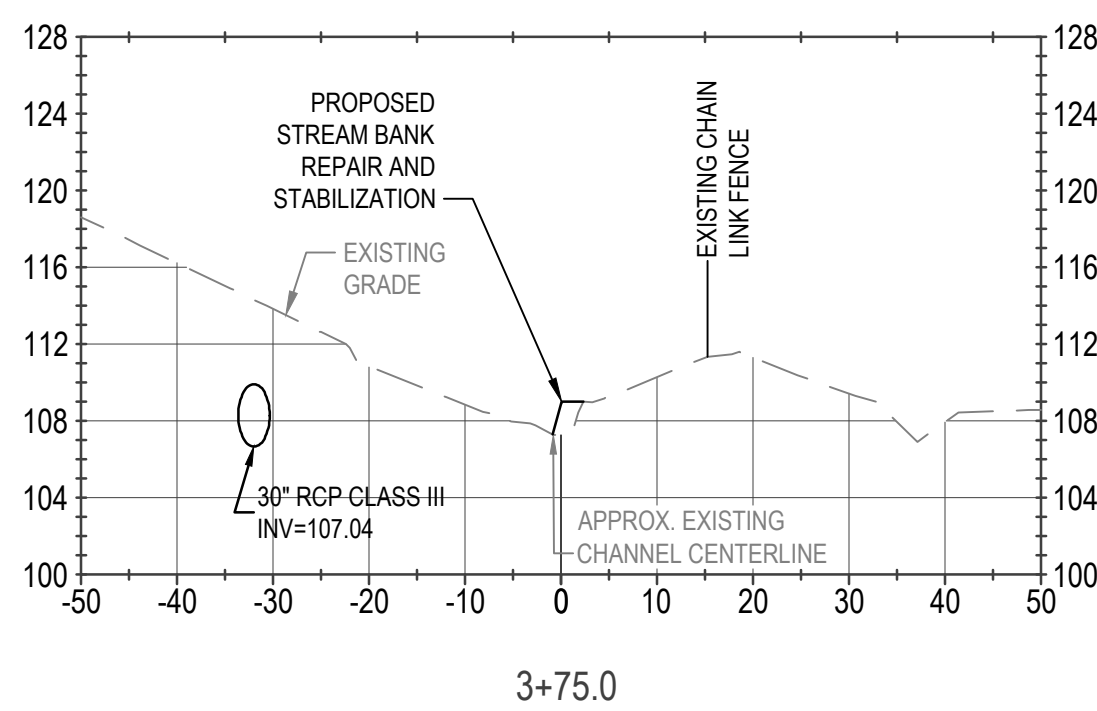
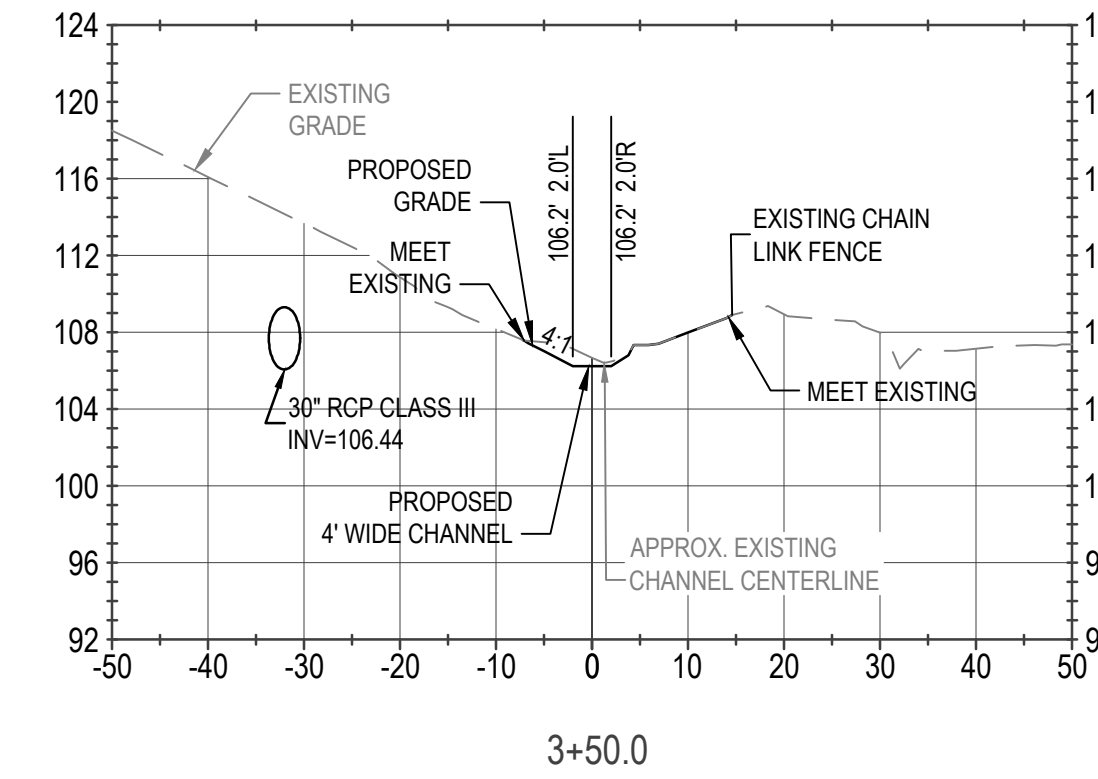
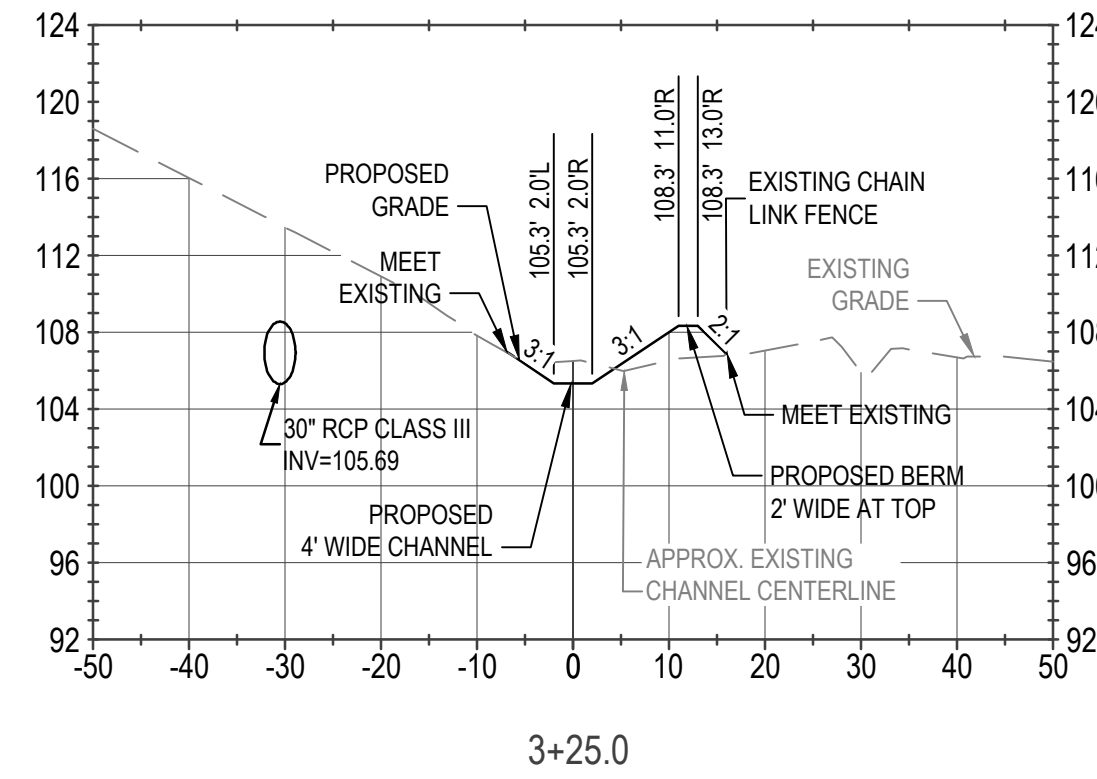
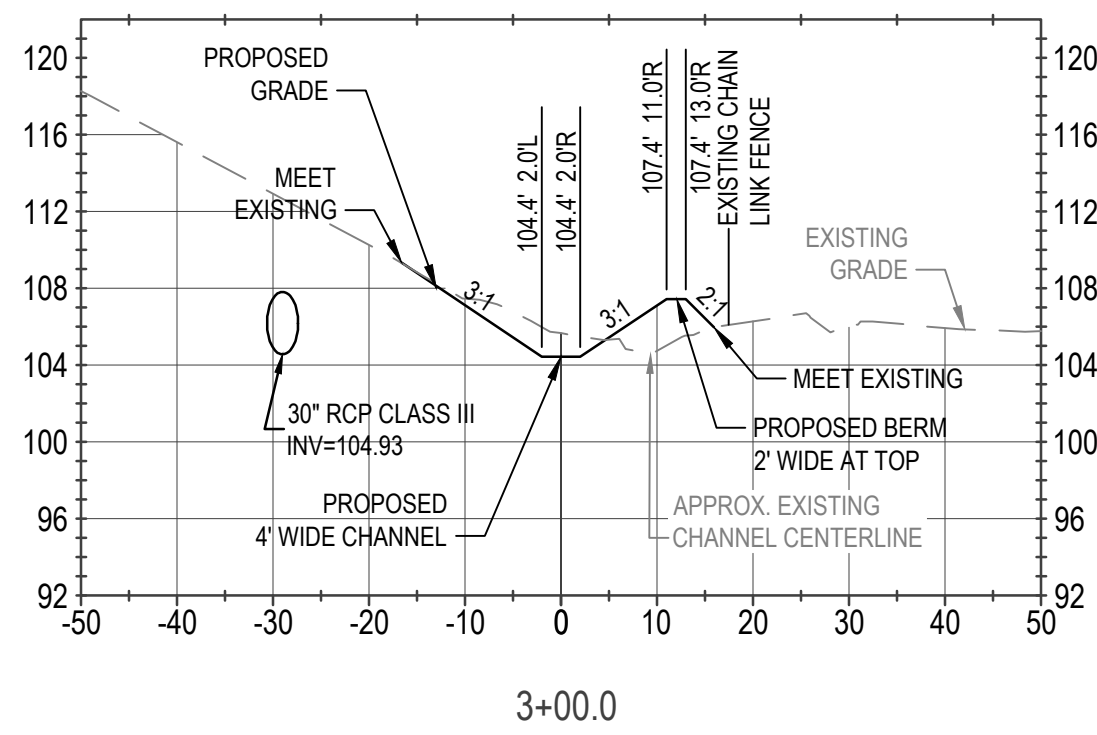
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 CROSS SECTIONS - 1

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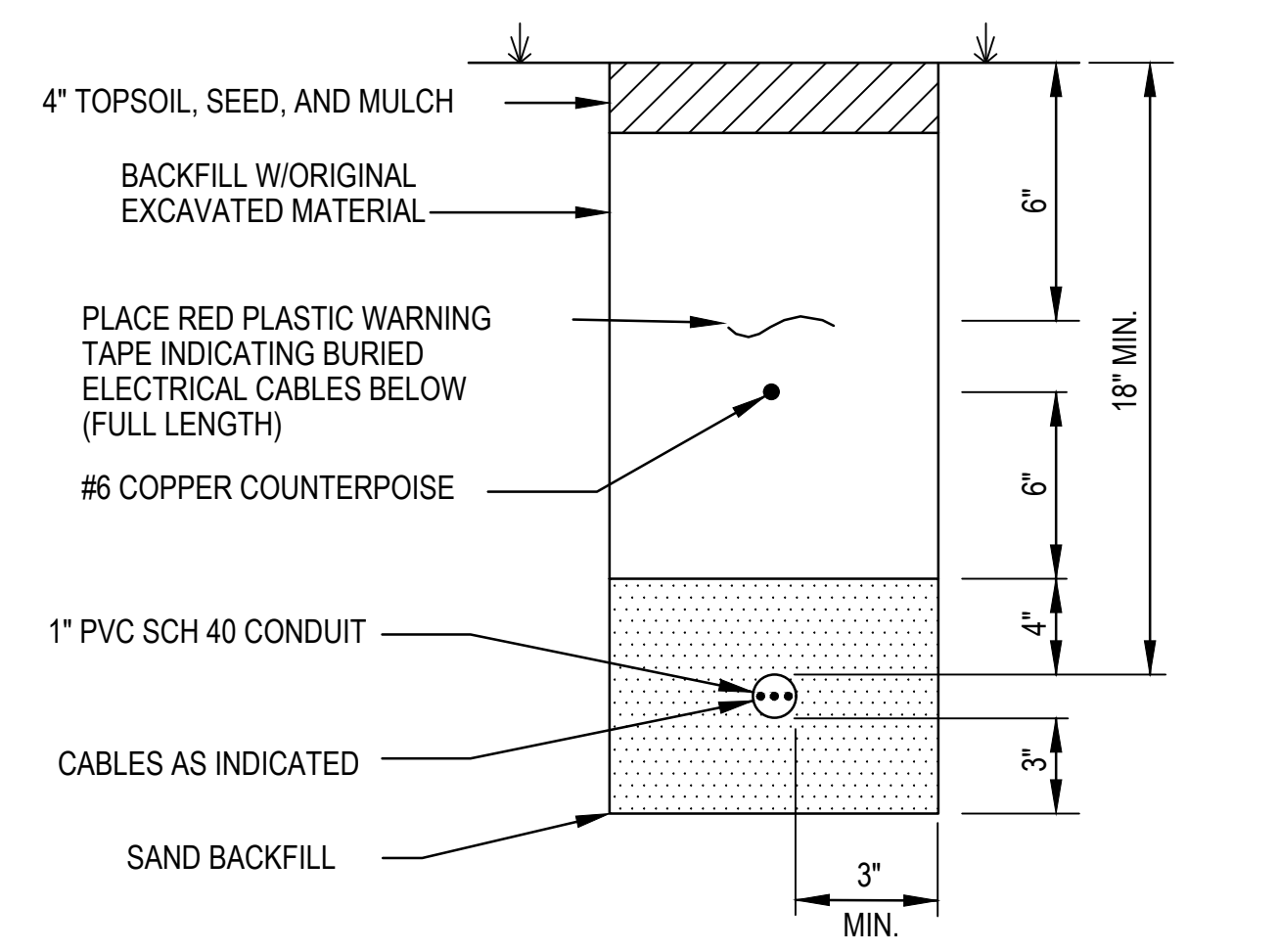
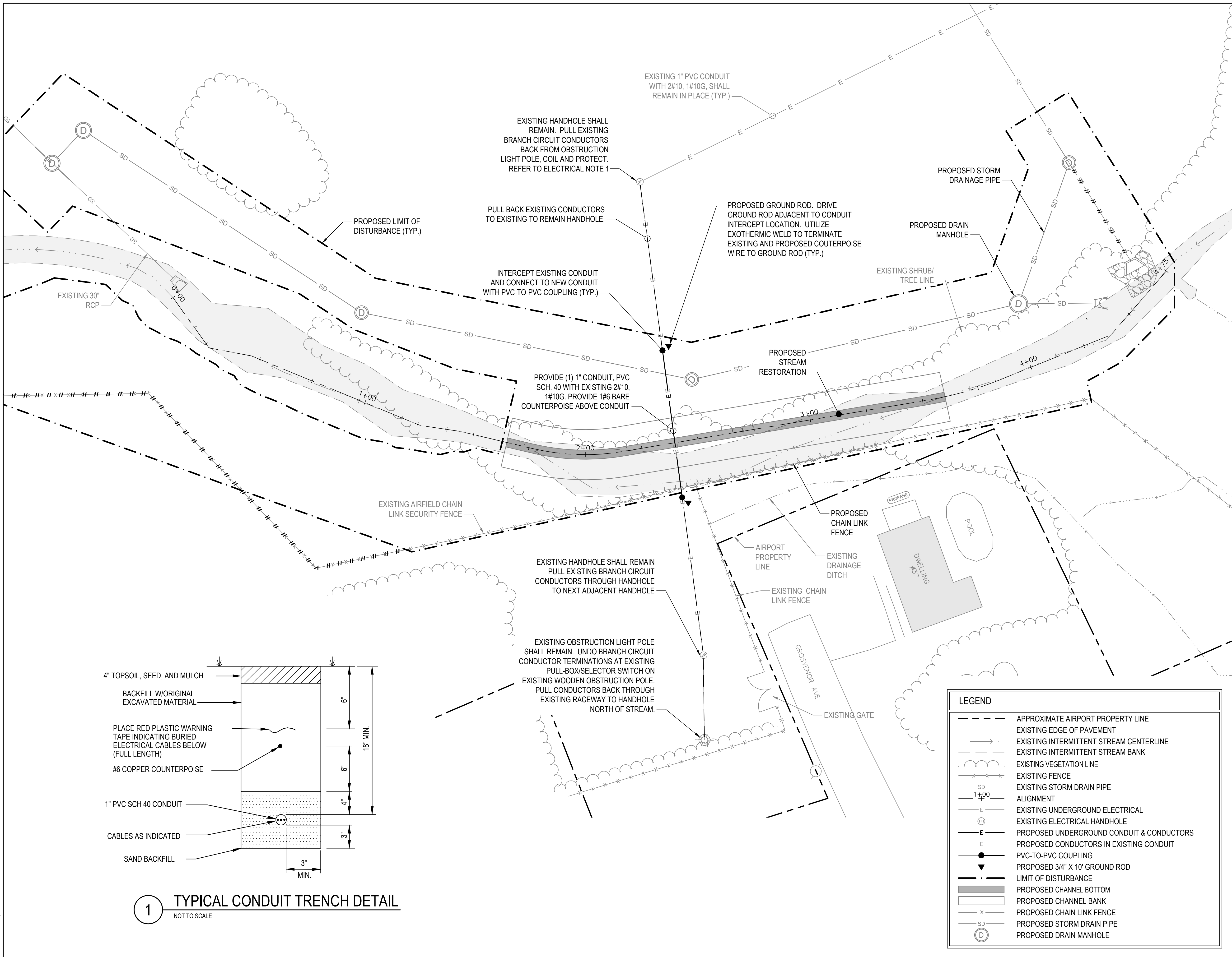
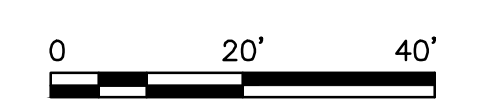
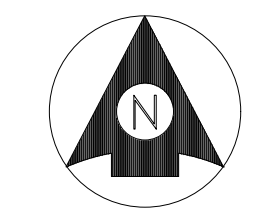
Client/Project
 LAWRENCE MUNICIPAL AIRPORT
 NORTH ANDOVER, MA
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Title
 CROSS SECTIONS - 2

Project No.
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Drawing No. Sheet Revision
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1 TYPICAL CONDUIT TRENCH DETAIL
 NOT TO SCALE

LEGEND	
	APPROXIMATE AIRPORT PROPERTY LINE
	EXISTING EDGE OF PAVEMENT
	EXISTING INTERMITTENT STREAM CENTERLINE
	EXISTING INTERMITTENT STREAM BANK
	EXISTING VEGETATION LINE
	EXISTING FENCE
	EXISTING STORM DRAIN PIPE
	ALIGNMENT
	EXISTING UNDERGROUND ELECTRICAL
	EXISTING ELECTRICAL HANDHOLE
	PROPOSED UNDERGROUND CONDUIT & CONDUCTORS
	PROPOSED CONDUCTORS IN EXISTING CONDUIT
	PVC-TO-PVC COUPLING
	PROPOSED 3/4" X 10' GROUND ROD
	LIMIT OF DISTURBANCE
	PROPOSED CHANNEL BOTTOM
	PROPOSED CHANNEL BANK
	PROPOSED CHAIN LINK FENCE
	PROPOSED STORM DRAIN PIPE
	PROPOSED DRAIN MANHOLE

Revision	By	Appd.	YY.MM.DD
0	DMZ	DMZ	25.02.12

Permit-Seal



Client/Project
 LAWRENCE MUNICIPAL AIRPORT
 NORTH ANDOVER, MA
 RUNWAY 5 END
 DRAINAGE IMPROVEMENTS

Title
 ELECTRICAL PLAN & DETAILS

Project No.
 179450605

Drawing No. Sheet Revision

E101 21 of 21 0

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 2/12/2025 8:21 PM By: Zdziczo, Dominic