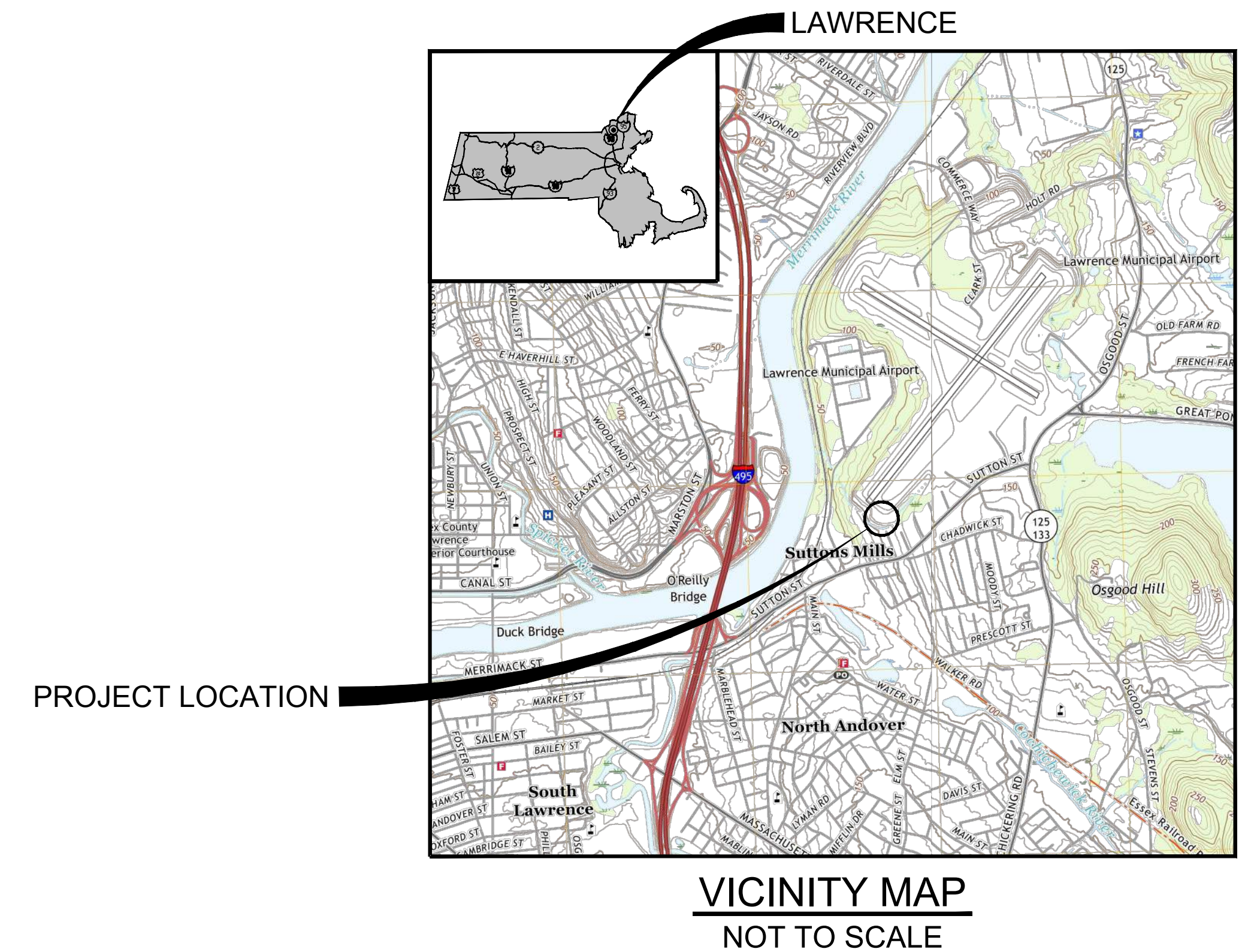


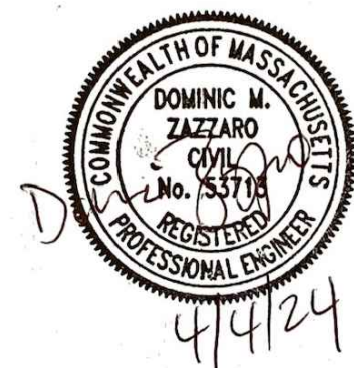


# LAWRENCE MUNICIPAL AIRPORT NORTH ANDOVER, MASSACHUSETTS



# RUNWAY 5 END DRAINAGE IMPROVEMENTS

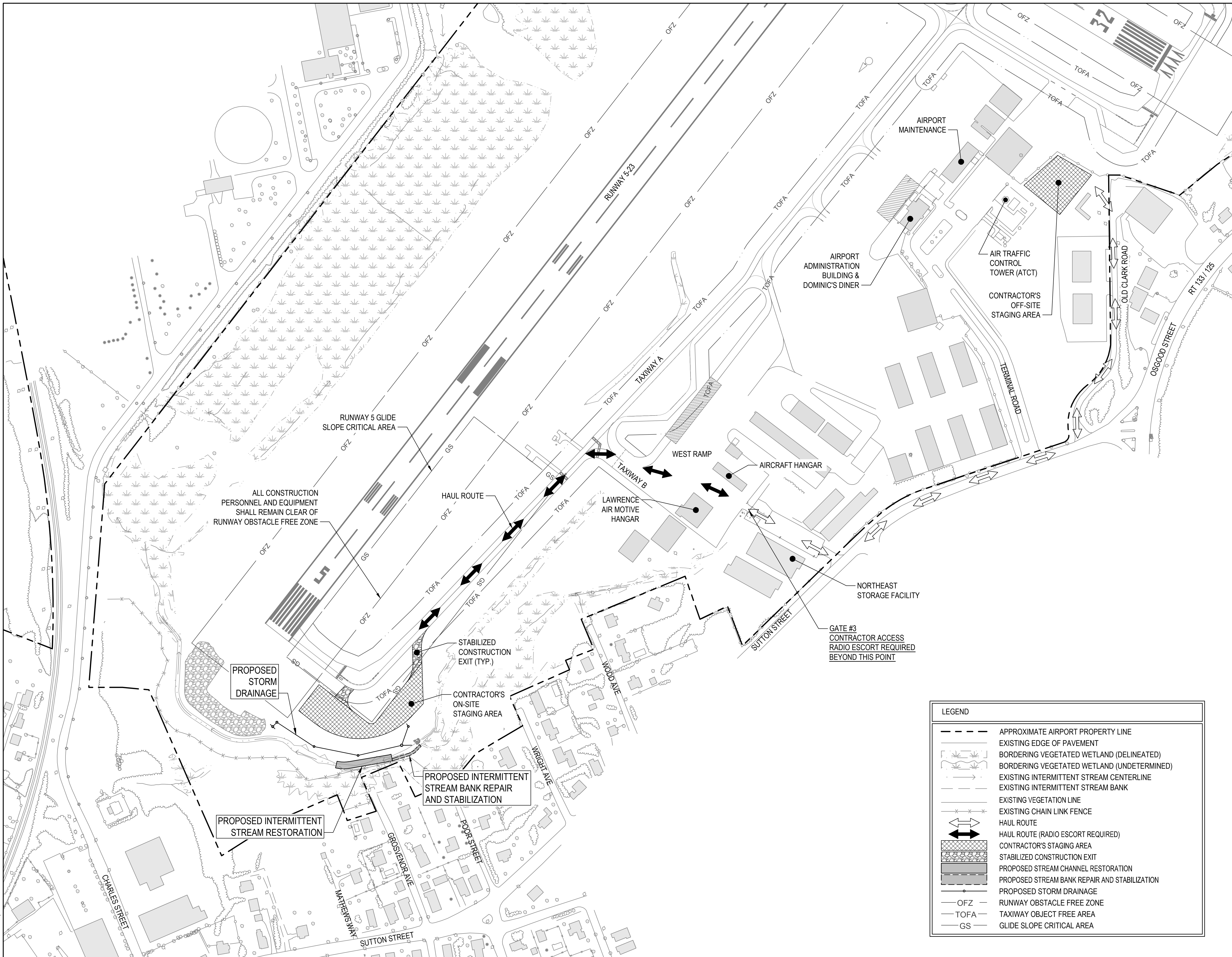
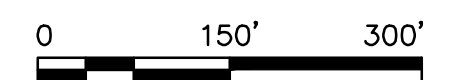
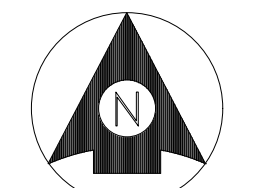
APRIL 5, 2024  
STANTEC PROJECT NO. 179450605



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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

Revision	By	Appd.	YY.MM.DD
1	DMZ	DMZ	24.04.05
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Permit-Seal  
  
 Client/Project  
 LAWRENCE MUNICIPAL AIRPORT  
 NORTH ANDOVER, MA

Runway 5 End Drainage Improvements  
 Title  
**GENERAL SITE PLAN**

Project No.  
 179450605  
 Drawing No. Sheet Revision  
 G001 2 of 21 0

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**ISSUED FOR BID**  
 APRIL 5, 2024

**GENERAL NOTES:**

1. **ANTICIPATED NOTICE TO PROCEED FOR CONSTRUCTION IS APPROXIMATELY JULY 29, 2024.**
2. **THE ANTICIPATED DATE FOR CONTRACT EXECUTION IS JUNE 3, 2024.** UPON EXECUTION OF THE CONTRACT, THE CONTRACTOR SHALL EXPEDITE THE SUBMISSION OF SHOP DRAWINGS, ORDERING OF MATERIALS AND MOBILIZATION EFFORTS.
3. CONTRACT DURATION IS 45 CALENDAR DAYS AND ALL WORK SHALL BE COMPLETED WITHIN THE 45 CALENDAR DAY PROJECT DURATION.
4. THE CONTRACTOR SHALL SCHEDULE ALL MANPOWER AND EQUIPMENT AND HAVE ALL REQUIRED MATERIALS READILY AVAILABLE TO ENSURE ALL SCHEDULED WORK CAN BE COMPLETED IN ITS ENTIRETY WITHIN THE SPECIFIED TIME FRAME.
5. THE CONTRACTOR SHALL MAINTAIN COMMUNICATION AND PROJECT COORDINATION WITH THE RESIDENT PROJECT REPRESENTATIVE (RPR) AND AIRPORT MANAGER AT ALL TIMES.
6. THE CONTRACTOR SHALL PROVIDE A POINT OF CONTACT TO THE AIRPORT MANAGER AND THE RPR WHO CAN BE CONTACTED AT ANY TIME (24-HOURS A DAY) THROUGHOUT THE COURSE OF THE CONTRACT. THIS INDIVIDUAL SHALL BE CAPABLE OF COORDINATING AN IMMEDIATE RESPONSE TO CORRECT ANY CONSTRUCTION RELATED ACTIVITY THAT MAY ADVERSELY AFFECT AIRCRAFT SAFETY AND PUBLIC SAFETY.
7. THE CONTRACTOR SHALL COMPLY WITH ALL AIRPORT SECURITY REQUIREMENTS INCLUDING OBTAINING SECURITY BADGES AND ATTENDING AIRFIELD DRIVER AND SECURITY TRAINING OFFERED BY THE AIRPORT FOR OPERATION OF VEHICLES WITHIN THE SECURED AREA OF THE AIRPORT AND THE AIR OPERATIONS AREA (AOA), AND MAINTAINING A SECURE PERIMETER OF THE AIRPORT WHEN ACCESSING AIRFIELD VEHICLE GATES. THE AIRPORT DOES NOT CHARGE A FEE TO THE CONTRACTOR FOR THE COST OF PROVIDING SECURITY BADGES OR FOR PROVIDING DRIVER OR SECURITY TRAINING. AT A MINIMUM THE CONTRACTOR'S PROJECT MANAGER, SUPERINTENDENT, FOREMAN, AND ESCORTS AND ALL SUBCONTRACTOR'S SUPERINTENDENTS, FOREMAN AND ESCORTS SHALL OBTAIN SECURITY BADGES AND ATTEND AIRFIELD DRIVING AND SECURITY TRAINING.
8. THE CONTRACTOR COVENANTS AND AGREES THAT THEY AND THEIR SUBCONTRACTORS AND EMPLOYEES WILL PROVIDE AND MAINTAIN A SAFE PLACE TO WORK AND THAT THEY WILL COMPLY WITH ALL LAWS AND REGULATIONS OF ANY GOVERNMENTAL AUTHORITY HAVING JURISDICTION THEREOF, AND THE CONTRACTOR AGREES TO INDEMNIFY, DEFEND AND HOLD HARMLESS THE RPR, OWNER AND OTHERS FROM AND AGAINST ANY LIABILITY, LOSS, DAMAGE OR EXPENSE, INCLUDING ATTORNEY'S FEES, ARISING FROM A FAILURE OR ALLEGED FAILURE ON THE PART OF THE CONTRACTOR, THEIR SUBCONTRACTORS AND THEIR AGENTS AND EMPLOYEES TO PROVIDE AND MAINTAIN A SAFE PLACE TO WORK AND TO COMPLY WITH ALL LAWS AND REGULATIONS OF ANY GOVERNMENTAL AUTHORITY HAVING JURISDICTION THEREOF. IN ADDITION TO ALL APPLICABLE OSHA SAFETY REQUIREMENTS ALL PERSONNEL SHALL WEAR APPROPRIATE REFLECTIVE SAFETY VESTS AND REQUIRED PERSONAL PROTECTIVE EQUIPMENT (PPE) AT ALL TIMES.
9. AIRCRAFT OPERATING AREAS (AOA), WHICH ARE ALL AREAS WITHIN THE AIRFIELD SECURITY FENCE, SHALL REMAIN ACTIVE THROUGHOUT THE PROJECT. CONTRACTOR SHALL PLACE CONSTRUCTION SAFETY FENCE AT THE LOCATIONS SHOWN ON THE CONSTRUCTION SAFETY AND PHASING PLAN AND/OR AS DIRECTED BY THE RPR AND AIRPORT MANAGER.
10. THE CONTRACTOR SHALL REFER TO DIVISION I AND DIVISION II, GENERAL AND SPECIAL PROVISIONS OF THE CONTRACT DOCUMENTS FOR ADDITIONAL SAFETY CONSIDERATIONS.
11. NOTICE TO AIR MISSIONS (NOTAMS) SHALL BE ISSUED BY THE AIRPORT MANAGER AFTER COORDINATING WITH THE RPR. NOTAMS SHALL BE ISSUED WHEN A RUNWAY OR A TAXIWAY IS REQUIRED TO BE CLOSED. A RUNWAY SHALL BE CLOSED WHEN WORK NEEDS TO OCCUR WITHIN THE RUNWAY SAFETY AREA (RSA) OR OBSTACLE FREE ZONE (OFZ). A TAXIWAY SHALL BE CLOSED WHEN WORK NEEDS TO OCCUR WITHIN THE TAXIWAY OBJECT FREE AREA (TOFA). THE CONTRACTOR SHALL COORDINATE SCHEDULED RUNWAY CLOSURES A MINIMUM OF 7 DAYS IN ADVANCE AND TAXIWAY CLOSURES A MINIMUM OF 72 HOURS IN ADVANCE UNLESS OTHERWISE SPECIFIED.
12. IF CRANES OR EQUIPMENT OVER 30' IN HEIGHT ARE TO BE UTILIZED FOR THE PROJECT, THE CONTRACTOR IS REQUIRED TO FILE AN FAA 7460 AND REQUEST AN AIRSPACE REVIEW BY MASSDOT. THE FAA AND MASSDOT REVIEWS CAN TAKE UP TO 45 DAYS FOR A DETERMINATION. IF THE CONTRACTOR IS UNSURE IF THEY HAVE TO FILE, THE CONTRACTOR SHALL CONTACT THE AIRPORT FOR A DETERMINATION.
13. THE LOCATION OF THE CONTRACTOR'S STAGING AREA FOR STORING AND STOCKPILING MATERIALS AND PARKING CONSTRUCTION EQUIPMENT IS AS SHOWN ON THE DRAWINGS. THE LOCATION OF ALL CONTRACTOR MATERIAL STOCKPILE AREA(S) SHALL BE APPROVED IN ADVANCE BY THE RPR AND SHALL BE LOCATED OUTSIDE THE ACTIVE RUNWAY AND TAXIWAY OBJECT FREE AREAS. EQUIPMENT AND MATERIAL SHALL REMAIN BELOW THE AIRPORT'S PROTECTED AIRSPACE SURFACES AT ALL TIMES AS DETERMINED BY THE CONTRACTOR'S REGISTERED SURVEYOR AND APPROVED BY THE RPR (WHEN RUNWAYS ARE ACTIVE). THE CONTRACTOR SHALL RESTORE ALL CONTRACTOR STAGING, STORAGE AND EQUIPMENT PARKING AREAS TO THEIR PRE-PROJECT OR IMPROVED CONDITION AT THE COMPLETION OF THE PROJECT WITHOUT ADDITIONAL EXPENSE TO THE OWNER. THIS SHALL INCLUDE AT A MINIMUM, REMOVING DEBRIS, SCARIFYING THE AREA TO LOOSEN COMPACTED MATERIAL, PLACING TOPSOIL, SEEDING AND MULCHING. THE CONTRACTOR SHALL DOCUMENT (PHOTOGRAPH/VIDEO) THE CONDITIONS OF ALL PROPOSED STAGING AND STOCKPILE AREAS BY PHOTOGRAPHING AND VIEWING THE AREAS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ONLY AUTHORIZED VEHICLES ARE ALLOWED ACCESS THROUGH THE DESIGNATED AIRFIELD ACCESS GATE FOR THE PROJECT. AIRFIELD ACCESS GATES SHALL REMAIN CLOSED AT ALL TIMES TO MAINTAIN A SECURE PERIMETER OF THE AIRPORT. A GATE GUARD POSSESSING A LAWRENCE AIRPORT SIDA BADGE SHALL BE POSTED AT THE GATE IF THE GATE IS REQUIRED TO BE OPENED FOR AN EXTENDED PERIOD OF TIME FOR THE PASSAGE OF CONSTRUCTION EQUIPMENT OR VEHICLES. ALL COSTS ASSOCIATED WITH A GATE GUARD SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS CONTRACT ITEMS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY FOR THE DURATION OF THE PROJECT TO MAINTAIN THE GATES IN GOOD CONDITION, AND REPAIR/REPLACE ANY FENCING OR GATE SYSTEM COMPONENTS AT NO ADDITIONAL COST TO THE OWNER THAT ARE DAMAGED BY THE CONTRACTOR'S ACTIVITIES.

15. THE CONTRACTOR SHALL PROVIDE SUFFICIENT SILTATION CONTROL DEVICES TO ENSURE THAT NO SILT OR OTHER CONSTRUCTION MATERIALS ARE DEPOSITED BEYOND THE PROJECT LIMITS. ALL SILTATION CONTROL DEVICES SHALL BE IN PLACE AND APPROVED BY THE RESIDENT PROJECT REPRESENTATIVE PRIOR TO THE COMMENCEMENT OF EARTHWORK. REFER TO CONTRACT SPECIFICATION C-102 AND EROSION CONTROL PLANS AND DETAILS.
16. THE CONTRACTOR SHALL LEGALLY DISPOSE OF ALL DEBRIS AND UNSATISFACTORY MATERIALS OFF AIRPORT PROPERTY IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS AT NO ADDITIONAL COST TO THE OWNER.
17. CONTRACTOR VEHICLES AND EQUIPMENT SHALL AT ALL TIMES GIVE WAY TO AIRCRAFT OPERATIONS, SUPPORT VEHICLES, AND EMERGENCY VEHICLES. THE CONTRACTOR'S VEHICLES/EQUIPMENT SHALL NOT ENTER ANY RUNWAY, TAXIWAY OR APRON IN THE AIR OPERATIONS AREA (AOA) AT ANY TIME, WITHOUT PRIOR AUTHORIZATION FROM THE AIRPORT MANAGER AND/OR RPR.
18. AT A MINIMUM, AT THE COMPLETION OF WORK EACH DAY, THE CONTRACTOR SHALL INSPECT THE WORK AREA FOR FOREIGN OBJECT DEBRIS (FOD) AND VERIFY THAT THE CONSTRUCTION SAFETY FENCE IS SECURE AND IN GOOD CONDITION.
19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THOROUGHLY CLEANING VEHICLE TIRES PRIOR TO THE VEHICLES LEAVING THE WORK AREA. AT THE END OF EACH SHIFT, THE CONTRACTOR AND THE RPR SHALL INSPECT THE ADJACENT ROADWAYS, AS WELL AS PAVED HAUL ROUTES USED BY THE CONTRACTOR WITHIN AIRPORT PROPERTY, AND CLEAN AS NECESSARY.
20. THE APPROXIMATE LOCATION OF THE HAUL ROUTE IS SHOWN ON THE PLANS. THE HAUL ROUTE REQUIRES OPERATING VEHICLES AND EQUIPMENT ON ACTIVE AIRCRAFT RAMPS AND TAXIWAYS. THE CONTRACTOR'S RADIO-EQUIPPED ESCORT SHALL LEAD CONSTRUCTION EQUIPMENT AND VEHICLES BETWEEN THE AIRFIELD ACCESS GATE AND THE SITE. SEE SPECIAL PROVISIONS IN DIVISION II OF THE SPECIFICATIONS FOR FURTHER DETAILS. EXACT LOCATION OF THE HAUL ROUTE SHALL BE DETERMINED IN THE FIELD BY THE AIRPORT OPERATOR AND THE RESIDENT PROJECT REPRESENTATIVE (RPR) IN COORDINATION WITH THE CONTRACTOR. GRASS PORTIONS OF HAUL ROUTES SHALL BE CLEARLY MARKED WITH CONES OR WOODEN STAKES AND FLAGGING ON THE AIRFIELD AS DIRECTED BY THE RPR FOR THE DURATION OF THE PROJECT TO ENSURE THAT CONSTRUCTION VEHICLES DO NOT STRAY INTO ACTIVE AIRFIELD OPERATIONS AREAS, WETLANDS, OR CREATE UNNECESSARY SOIL DISTURBANCE. IN AREAS WHERE THE HAUL ROUTE PASSES INTO ACTIVE RUNWAY OR TAXIWAY SAFETY AREAS, THE ROUTE SHALL BE MAINTAINED DAILY AND RE-GRADED SUCH THAT WHEEL RUTS ARE REDUCED TO TWO (2) INCHES OR LESS IN DEPTH. ALL NEW AND EXISTING UNDERGROUND CABLES SHALL BE PROTECTED FROM DAMAGE WHERE HAUL ROUTES CROSS OVER CABLES. THE CONTRACTOR SHALL REMOVE AND REPLACE IN KIND ANY CABLES DAMAGED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR'S USE OF HAUL ROUTES SHALL BE AT THE DISCRETION OF THE AIRPORT MANAGER AND/OR THE RPR. THE OWNER RESERVES THE RIGHT TO CHANGE THE HAUL ROUTE AT ANY TIME AT NO ADDITIONAL COST.
21. TEMPORARY STABILIZED CONSTRUCTION EXITS SHALL BE CONSTRUCTED WHERE HAUL ROUTES MEET WITH RUNWAYS, TAXIWAYS OR EXISTING GRAVEL OR PAVED ROADWAYS TO PREVENT TRACKING OF MUD AND DEBRIS FROM THE PROJECT SITE. TEMPORARY CONSTRUCTION EXITS SHALL BE CONSTRUCTED AT LOCATIONS SHOWN ON THE PLANS.
22. THE CONTRACTOR SHALL PHOTOGRAPH/VIDEO THE ENTIRE SITE, INCLUDING STAGING AREAS, HAUL ROUTES, AND THE AIRPORT ACCESS ROADS TO PROVIDE DOCUMENTATION OF PRE-CONSTRUCTION SITE CONDITIONS. AT THE COMPLETION OF CONSTRUCTION, ALL STAGING AREAS, STOCKPILE AREAS AND HAUL ROUTES SHALL BE RETURNED TO THEIR PRE-PROJECT CONDITION BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER. THIS SHALL INCLUDE AT A MINIMUM, REPAIR OR RECONSTRUCTION OF PORTIONS OF EXISTING PAVED RUNWAYS, TAXIWAYS, APRONS, GRAVEL/PAVED ROADWAYS, SCARIFYING, TOPSOILING, SEEDING AND MULCHING HAUL ROUTES IN TURF AREAS, AND SWEEPING OF ALL PAVED SURFACES THAT WERE UTILIZED FOR HAULING. ALL WORK ASSOCIATED WITH PHOTOGRAPHY/VIDEOTAPING THE SITE, MAINTAINING, AND RESTORING HAUL ROUTES, PUBLIC ROADWAYS, AND ADJACENT AREAS IS CONSIDERED INCIDENTAL TO THE OVERALL PROJECT COST.
23. EXISTING PAVED ACCESS ROADS INDICATED ON THE PLANS TO BE USED AS HAUL ROADS THAT MAY BE UNABLE TO SUPPORT CONSTRUCTION VEHICLES WITHOUT DAMAGE MAY REQUIRE REPAIRS AT THE END OF THE PROJECT AS DETERMINED BY THE RPR AND THE AIRPORT MANAGER. ANY DECISION INVOLVING THE REPAIR OF ACCESS ROADS SHALL BE MADE BY THE AIRPORT MANAGER. ACCESS ROAD REPAIRS SHALL BE COMPLETED IN ACCORDANCE WITH THE ACCESS ROAD REPAIR TYPICAL SECTIONS PROVIDED IN THE PLANS. THE TYPE AND LIMITS OF REPAIRS SHALL BE DETERMINED BY THE RPR WITH APPROVAL FROM THE AIRPORT MANAGER. NO ACCESS ROADS SHALL BE REPAIRED WITHOUT SPECIFIC APPROVAL IN WRITING FROM THE AIRPORT MANAGER. REPAIR OF ACCESS ROADS SHALL BE PAID UNDER THE RESPECTIVE DIVISION II PAY ITEMS FOR ACCESS ROAD REPAIRS INCLUDED IN THE SPECIAL PROVISIONS. ANY DAMAGE TO EXISTING PAVEMENTS AS A RESULT OF NEGLIGENCE ON THE PART OF THE CONTRACTOR FOR FAILURE TO PROPERLY PROTECT THE ROAD SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNER.
24. THE CONTRACTOR SHALL ANTICIPATE PROTECTING EXISTING IN PAVEMENT LOOP DETECTOR WIRES AT AIRFIELD SECURITY GATE #3 SHOWN ON THE PLANS TO BE UTILIZED FOR CONSTRUCTION ACCESS. THERE ARE 4 EXISTING LOOP DETECTOR WIRES INSTALLED AT GATE #3. LOOP DETECTOR WIRES DAMAGED SHALL BE REPLACED IN THEIR ENTIRETY AT NO ADDITIONAL COST TO THE OWNER. NO SPLICING OF LOOP WIRES WILL BE ACCEPTED.
25. THE CONTRACTOR SHALL PLACE CAUTION SIGNS AT AIRFIELD ACCESS LOCATIONS, LEADING UP TO (WITHIN 1/4 OF A MILE) AND AT LOCATIONS WHERE AIRFIELD ACCESS INTERSECTS WITH EXISTING PUBLIC ROADS OR AS APPROVED BY THE RPR AND AIRPORT MANAGER. THE SIGNS SHALL WARN PUBLIC OF CONSTRUCTIONS VEHICLES ENTERING/EXITING THE PUBLIC ROADWAY. THERE WILL BE NO SEPARATE PAYMENT FOR PRODUCING, PLACING, MAINTAINING AND REMOVING SIGNS AND SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.
26. AT THE COMPLETION OF THE CONTRACT, ALL CONTRACTOR'S AND SUBCONTRACTOR'S FACILITIES SHALL BE REMOVED PROMPTLY AND THE AREA LEFT CLEAN AND FREE OF ALL DEBRIS OR SURPLUS MATERIAL. ANY DISTURBED AREAS WITHIN THE SITE (INCLUDING ALL WORK AREAS, HAUL ROUTES, STAGING AREAS, AFFECTED DRAINAGE SWALES & UTILITIES, AND DISTURBED AREAS CAUSED BY THE REMOVAL OF EROSION CONTROL MEASURES) SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT NO ADDITIONAL EXPENSE TO THE OWNER. FAILURE TO DO SO MAY RESULT IN A DELAY OF PARTIAL/FINAL PAYMENT APPROVAL UNTIL AREA IS RESTORED TO THE SATISFACTION OF THE RPR. ALL COSTS ASSOCIATED WITH SITE RESTORATION SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS PROJECT ITEMS. EROSION CONTROLS SHALL REMAIN IN PLACE UNTIL GRASS IS ESTABLISHED AS DETERMINED BY THE RPR.
27. CONSTRUCTION VEHICLES MUST BE PARKED WITHIN THE PROJECT LIMITS OR STAGING AREAS. CONTRACTOR'S PERSONAL VEHICLES ARE NOT ALLOWED ON THE AIRFIELD SHALL BE PARKED IN A STAGING AREA OUTSIDE THE AIRFIELD SECURITY FENCE. NO CONTRACTOR EMPLOYEE PARKING SHALL BE ALLOWED IN THE AIRPORT/RESTAURANT PARKING AREA.
28. EQUIPMENT/MATERIAL STOCKPILES SHALL NOT BE PERMITTED OUTSIDE THE CONTRACTOR STAGING AREA. STOCKPILE HEIGHT IS SUBJECT TO THE APPROVAL OF THE RPR AND AIRPORT MANAGER SO AS NOT TO OBSTRUCT AIRSPACE PROTECTED SURFACES.
29. PRIOR TO THE COMMENCEMENT OF THE PROJECT, ALL CONTRACTOR AND SUBCONTRACTOR'S PERSONNEL SHALL ATTEND A FOREIGN OBJECT DEBRIS (FOD) AND SAFETY PRESENTATION AT THE AIRPORT MANAGER'S OFFICE. ALL ATTENDEES WILL BE REQUIRED TO UNDERSTAND AND COMPLY WITH SAFETY AND SECURITY REQUIREMENTS.
30. THE CONTRACTOR SHALL SUPPLY A DUMPSTER WITH COVER TO KEEP THE CONSTRUCTION SITE FREE OF PAPER, BOXES, AND OTHER DEBRIS WHICH COULD BE BLOWN ONTO THE AOA AND/OR ATTRACT WILDLIFE. ALL COSTS ASSOCIATED WITH THE DUMPSTER SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS PROJECT PAY ITEMS.
31. THE CONTRACTOR SHALL PAY PARTICULAR ATTENTION TO THE DUST CONTROL REQUIREMENTS OF THIS CONTRACT. THE CONTRACTOR SHALL FURNISH AND OPERATE A MINIMUM OF ONE (1) SELF-PROPELLED VACUUM SWEEPER TO MAINTAIN OPERATIONS OF THE RUNWAYS, TAXIWAYS, APRONS, AND OTHER AIRCRAFT OPERATING AREAS SENSITIVE TO DUST. THE CONTRACTOR SHALL ALSO PROVIDE A WATER TRUCK AND APPLY SUFFICIENT WATER TO CONTROL DUST WITHIN THE WORK AREA AND ENSURE DUST DOES NOT DRIFT INTO AIRCRAFT OPERATING OR PARKING AREAS. THE CONTRACTOR SHALL MAINTAIN ALL PUBLIC ROADS WITHIN 1/2 MILE OF AIRPORT ACCESS ROADS FREE OF DUST AND DEBRIS. THE RPR RESERVES THE RIGHT TO STOP WORK IF NECESSARY IN ORDER TO BRING DUST UNDER CONTROL. FAILURE TO CONTROL THESE ITEMS SHALL RESULT IN SUSPENSION OF PROJECT WORK. NO ADDITIONAL COMPENSATION OR TIME SHALL BE MADE TO THE CONTRACTOR SHOULD LOSS OF PRODUCTIVITY OR DOWN-TIME OCCUR AS A RESULT OF THE RPR LIMITING OR SUSPENDING WORK BECAUSE OF THE CONTRACTOR'S FAILURE TO CONTROL DUST. ADDITIONAL MEASURES MAY BE REQUIRED AS DIRECTED BY THE RPR. ALL COSTS ASSOCIATED WITH PROVIDING AND MAINTAINING A SWEEPER AND WATER TRUCK FOR FOD AND DUST CONTROL SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS CONTRACT ITEMS. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR LOCATING A HYDRANT AND OBTAINING APPROVAL FROM THE LOCAL WATER AUTHORITY FOR ITS USE AND METERING. THE CONTRACTOR IS RESPONSIBLE FOR PAYING FOR ALL WATER USED FOR DUST CONTROL, COMPACTION, AND ANY OTHER GENERAL CONSTRUCTION USE.
32. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT LOCATIONS AND/OR ELEVATIONS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE PLANS ARE BASED ON RECORD DRAWINGS AND WERE FIELD SURVEYED FOR CONFIRMATION ONLY WHERE POSSIBLE. THIS INFORMATION IS NOT TO BE RELIED ON AS BEING COMPLETE OR EXACT AND THE CONTRACTOR SHALL FIELD VERIFY ALL INFORMATION PRIOR TO COMMENCEMENT OF THE WORK. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE RPR IN WRITING OF ANY DISCREPANCY DISCOVERED DURING FIELD VERIFICATION.
33. THE CONTRACTOR MUST CALL DIGSAFE AND PROVIDE A UTILITY LOCATING SERVICE TO LOCATE/VERIFY UTILITY LOCATIONS PRIOR TO COMMENCING EXCAVATION. THE CONTRACTOR SHALL ALSO CONTACT JIM CAULFIELD, FAA SSC MANAGER (TEL. 781-372-5526) FOR ASSISTANCE IN LOCATING UNDERGROUND FAA UTILITIES PRIOR TO COMMENCING EXCAVATION. ALL EXISTING UTILITIES IN THE VICINITY OF ANY EXCAVATION SHALL BE CLEARLY MARKED ON THE GROUND BY THE CONTRACTOR PRIOR TO BEGINNING EXCAVATION. A MINIMUM OF 72 HOURS NOTICE TO THE RPR, AIRPORT MANAGER AND THE UTILITY COMPANY IS REQUIRED WHEN DISRUPTION OF UTILITIES ARE REQUESTED BY THE CONTRACTOR. ALL COSTS ASSOCIATED WITH LOCATING UTILITIES SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS PROJECT ITEMS. ANY DAMAGE TO EXISTING UTILITIES BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED IMMEDIATELY BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER. THE REPAIRS MUST BE INSPECTED AND APPROVED BY THE UTILITY OWNER. THE CONTRACTOR SHALL HAND DIG WHEN WITHIN THREE (3) FEET OF ANY KNOWN OR SUSPECTED UNDERGROUND UTILITY.
35. SMOKING IS PROHIBITED ON AIRPORT PROPERTY DURING CONSTRUCTION OPERATIONS.
36. NO TRUCKS SHALL IDLE FOR LONGER THAN FIVE (5) MINUTES OR BEFORE 7:00 AM OR AFTER 9:00 PM.

Revision	By	Appd.	YY.MM.DD
1	DMZ	DMZ	24.04.05
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4/1/24

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

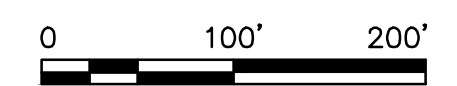
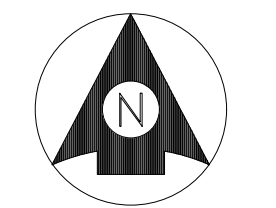
Title  
 GENERAL NOTES

Project No.  
 179450605

Drawing No. Sheet Revision

G002 3 of 21 0

**ISSUED FOR BID**  
 APRIL 5, 2024



Revision	By	Appd.	YY.MM.DD
1	DMZ	DMZ	24.04.05
Issued	By	Appd.	YY.MM.DD

Permit-Seal  

 Client/Project  
 LAWRENCE MUNICIPAL AIRPORT  
 NORTH ANDOVER, MA

Runway 5 End Drainage Improvements  
 Title  
**SAFETY & PHASING PLAN**

Project No. 179450605  
 Drawing No. G101  
 Sheet 4 of 21  
 Revision 0

**CONSTRUCTION SCHEDULE AND NOTES:**

DURATION: 45 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

**TEMPORARY TAXIWAY CLOSURES AS APPROVED BY AIRPORT MANAGER**

- TAXIWAY A\* (FROM MAIN RAMP TO RUNWAY 5)
- TAXIWAY B\*

\*SEE TAXIWAY CLOSURE NOTES FOR ADDITIONAL INFORMATION AND REQUIREMENTS

**MAJOR WORK ITEMS:**

- PLACE LOW PROFILE BARRICADES FOR TAXIWAY CLOSURE WHEN REQUIRED (SEE TAXIWAY CLOSURE NOTES)
- INSTALL SAFETY FENCE AND SIGNAGE
- INSTALL EROSION CONTROLS
- INSTALL CONSTRUCTION EXITS
- 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
- REPAIR CHAIN LINK FENCE
- TOPSOIL, SEED AND MULCH
- INSTALL TURF REINFORCEMENT MAT AND EROSION CONTROL BLANKET
- PLANT LIVE STAKES, STICKERS AND WATTLES

**AFFECTED CIRCUITS / NAVAIDS:**

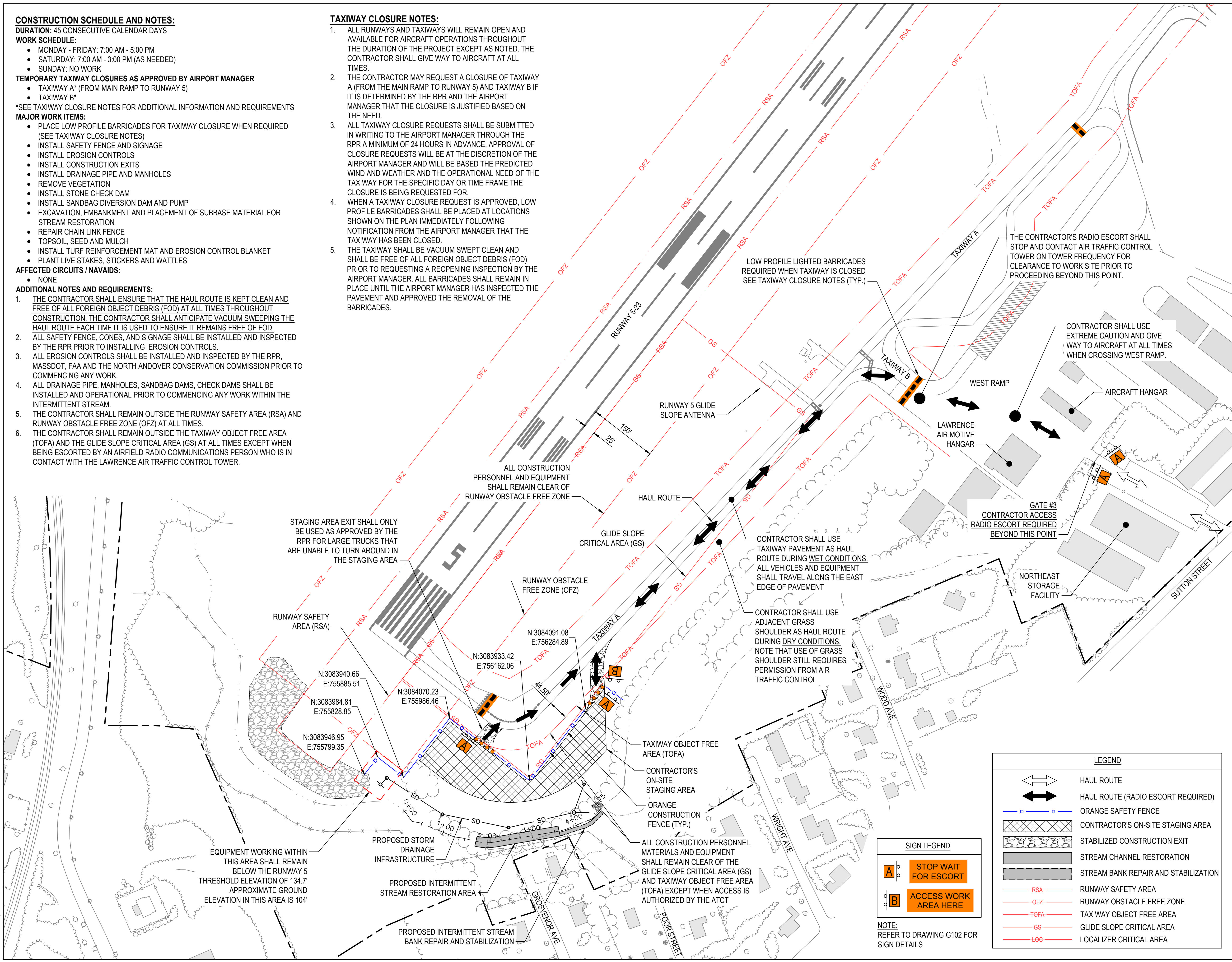
- NONE

**ADDITIONAL NOTES AND REQUIREMENTS:**

1. 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.
2. ALL SAFETY FENCE, CONES, AND SIGNAGE SHALL BE INSTALLED AND INSPECTED BY THE RPR PRIOR TO INSTALLING EROSION CONTROLS.
3. ALL EROSION CONTROLS SHALL BE INSTALLED AND INSPECTED BY THE RPR, MASSDOT, FAA AND THE NORTH ANDOVER CONSERVATION COMMISSION PRIOR TO COMMENCING ANY WORK.
4. ALL DRAINAGE PIPE, MANHOLES, SANDBAG DAMS, CHECK DAMS SHALL BE INSTALLED AND OPERATIONAL PRIOR TO COMMENCING ANY WORK WITHIN THE INTERMITTENT STREAM.
5. THE CONTRACTOR SHALL REMAIN OUTSIDE THE RUNWAY SAFETY AREA (RSA) AND RUNWAY OBSTACLE FREE ZONE (OFZ) AT ALL TIMES.
6. 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 THE LAWRENCE AIR TRAFFIC CONTROL TOWER.

**TAXIWAY CLOSURE NOTES:**

1. ALL RUNWAYS AND TAXIWAYS WILL REMAIN OPEN AND AVAILABLE FOR AIRCRAFT OPERATIONS THROUGHOUT THE DURATION OF THE PROJECT EXCEPT AS NOTED. THE CONTRACTOR SHALL GIVE WAY TO AIRCRAFT AT ALL TIMES.
2. THE CONTRACTOR MAY REQUEST A CLOSURE OF TAXIWAY A (FROM THE MAIN RAMP TO RUNWAY 5) AND TAXIWAY B IF IT IS DETERMINED BY THE RPR AND THE AIRPORT MANAGER THAT THE CLOSURE IS JUSTIFIED BASED ON THE NEED.
3. ALL TAXIWAY CLOSURE REQUESTS SHALL BE SUBMITTED IN WRITING 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 THE PREDICTED WIND AND WEATHER AND THE OPERATIONAL NEED OF THE TAXIWAY FOR THE SPECIFIC DAY OR TIME FRAME THE CLOSURE IS BEING REQUESTED FOR.
4. WHEN A TAXIWAY CLOSURE REQUEST IS APPROVED, LOW PROFILE BARRICADES SHALL BE PLACED AT LOCATIONS SHOWN ON THE PLAN IMMEDIATELY FOLLOWING NOTIFICATION FROM THE AIRPORT MANAGER THAT THE TAXIWAY HAS BEEN CLOSED.
5. 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.



LOW PROFILE LIGHTED BARRICADES REQUIRED WHEN TAXIWAY IS CLOSED SEE TAXIWAY CLOSURE NOTES (TYP.)

THE CONTRACTOR'S RADIO ESCORT SHALL STOP AND CONTACT AIR TRAFFIC CONTROL TOWER ON TOWER FREQUENCY FOR CLEARANCE TO WORK SITE PRIOR TO PROCEEDING BEYOND THIS POINT.

CONTRACTOR SHALL USE EXTREME CAUTION AND GIVE WAY TO AIRCRAFT AT ALL TIMES WHEN CROSSING WEST RAMP.

GATE #3  
 CONTRACTOR ACCESS RADIO ESCORT REQUIRED BEYOND THIS POINT

CONTRACTOR SHALL USE TAXIWAY PAVEMENT AS HAUL ROUTE DURING WET CONDITIONS. ALL VEHICLES AND EQUIPMENT SHALL TRAVEL ALONG THE EAST EDGE OF PAVEMENT

CONTRACTOR SHALL USE ADJACENT GRASS SHOULDER AS HAUL ROUTE DURING DRY CONDITIONS. NOTE THAT USE OF GRASS SHOULDER STILL REQUIRES PERMISSION FROM AIR TRAFFIC CONTROL

ALL CONSTRUCTION PERSONNEL AND EQUIPMENT SHALL REMAIN CLEAR OF RUNWAY OBSTACLE FREE ZONE

STAGING AREA EXIT SHALL ONLY BE USED AS APPROVED BY THE RPR FOR LARGE TRUCKS THAT ARE UNABLE TO TURN AROUND IN THE STAGING AREA

EQUIPMENT WORKING WITHIN THIS AREA SHALL REMAIN BELOW THE RUNWAY 5 THRESHOLD ELEVATION OF 134.7' APPROXIMATE GROUND ELEVATION IN THIS AREA IS 104'

**LEGEND**

- ⇄ HAUL ROUTE
- ⇄ HAUL ROUTE (RADIO ESCORT REQUIRED)
- ORANGE SAFETY FENCE
- ▨ CONTRACTOR'S ON-SITE STAGING AREA
- ▨ STABILIZED CONSTRUCTION EXIT
- ▨ STREAM CHANNEL RESTORATION
- ▨ STREAM BANK REPAIR AND STABILIZATION
- RSA — RUNWAY SAFETY AREA
- OFZ — RUNWAY OBSTACLE FREE ZONE
- TOFA — TAXIWAY OBJECT FREE AREA
- GS — GLIDE SLOPE CRITICAL AREA
- LOC — LOCALIZER CRITICAL AREA

**SIGN LEGEND**

- A STOP WAIT FOR ESCORT
- B ACCESS WORK AREA HERE

NOTE: REFER TO DRAWING G102 FOR SIGN DETAILS

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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. AIRFIELD RADIO COMMUNICATIONS PERSONNEL SHALL NOT PERFORM ANY OTHER TASK DURING PERFORMANCE OF THIS DUTY. 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 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.

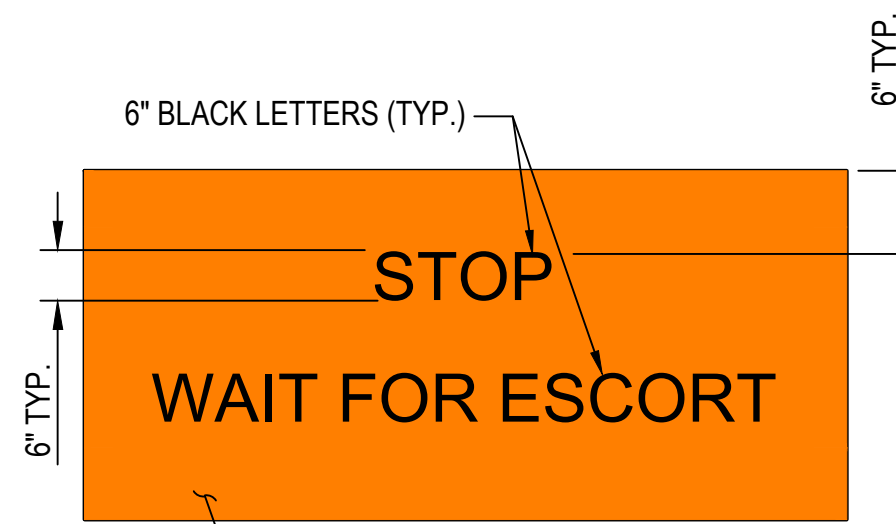
9. ANY WORK THAT NEEDS TO BE PERFORMED ON A RUNWAY OR WITHIN THE OBSTACLE FREE ZONE (OFZ) OF A RUNWAY SHALL REQUIRE A RUNWAY CLOSURE. ALL RUNWAY CLOSURES MUST BE COORDINATED IN WRITING WITH THE AIRPORT MANAGER THROUGH THE RPR A MINIMUM OF 7 DAYS IN ADVANCE.

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

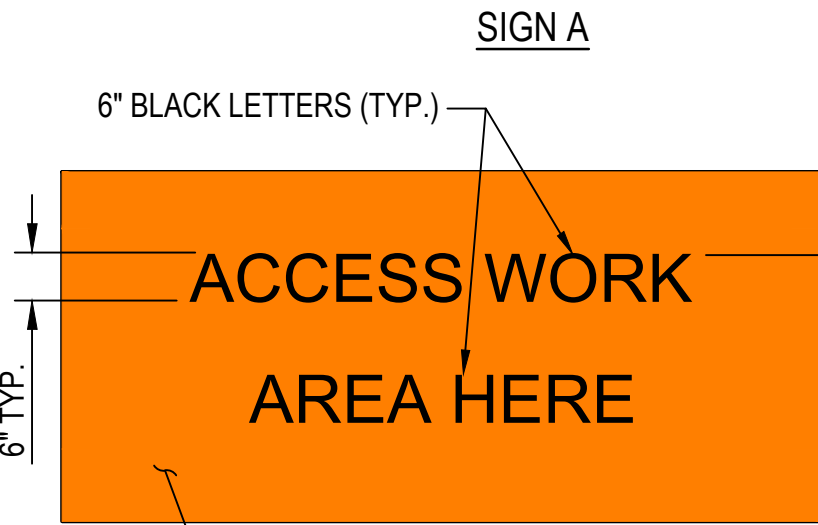
- ALL PAVEMENTS SHALL BE CLEANED AND FREE FROM FOD
- ALL TRENCHES AND EXCAVATIONS ADJACENT TO PAVED SURFACES AND WITHIN RUNWAY/TAXIWAY SAFETY AREAS SHALL BE BACKFILLED AND GRADED TO WITHIN +/- 2 INCHES OF ADJACENT EXISTING GRADES. ALL OTHER TRENCHES SHALL BE PROTECTED AND LIGHTED.
- THE CONTRACTOR SHALL 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.



HIGH INTENSITY ORANGE BACKGROUND ON EXTERIOR GRADE PLYWOOD.



HIGH INTENSITY ORANGE BACKGROUND ON EXTERIOR GRADE PLYWOOD.

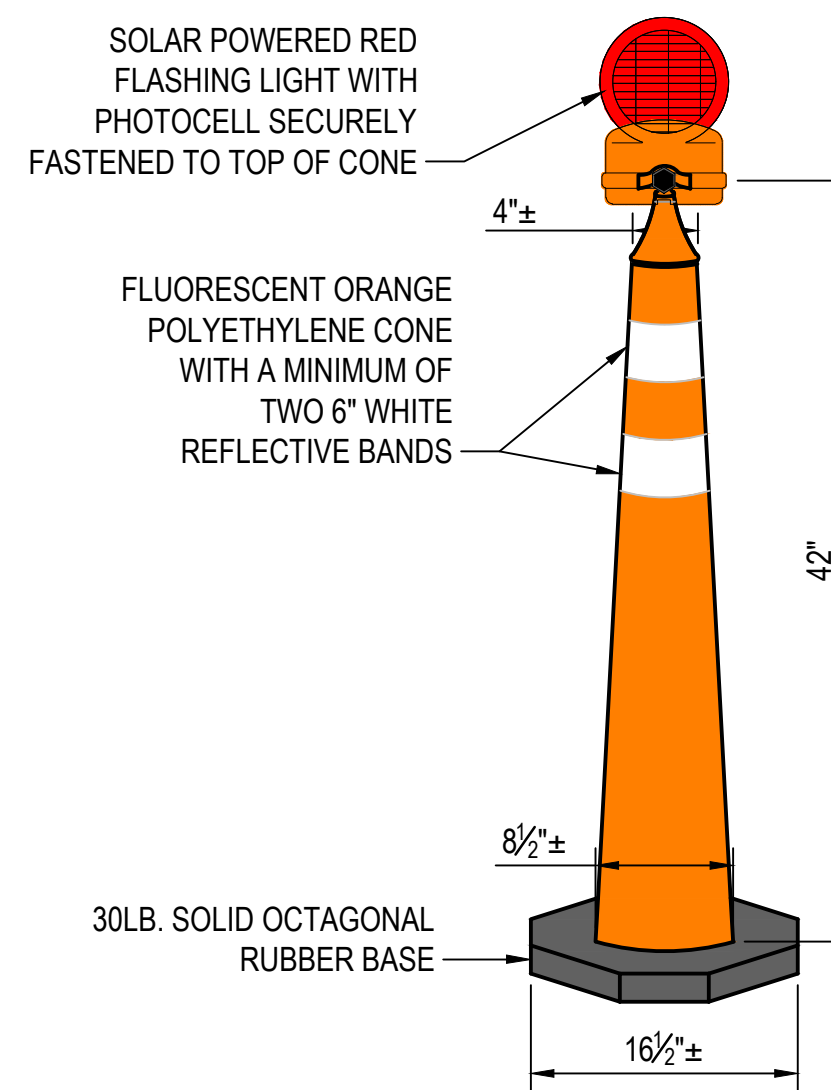
SIGN B

**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

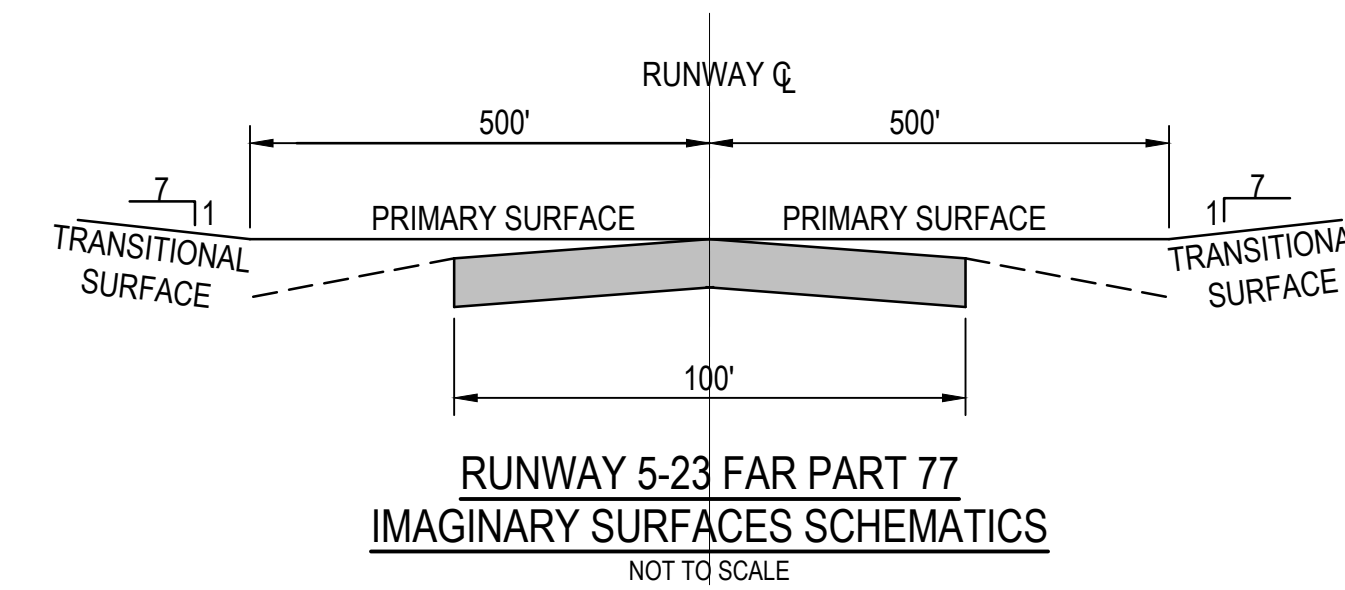


**LIGHTED CHANNELIZER CONE**

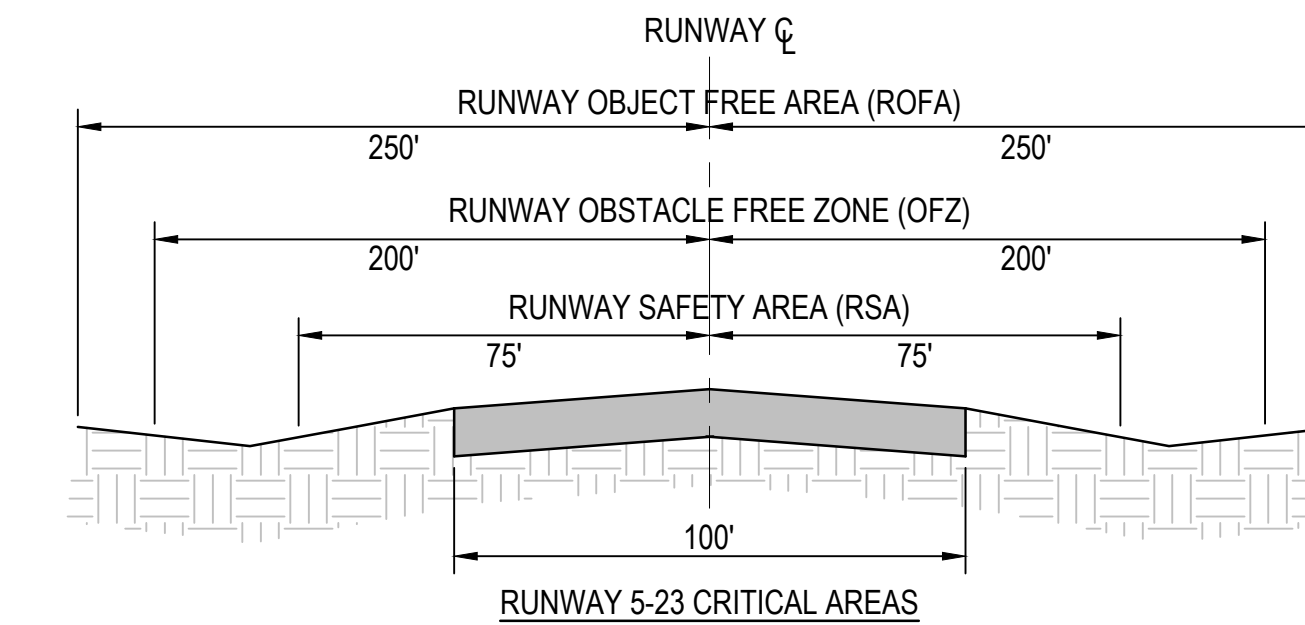
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**SAFETY FENCE, LIGHTED CHANNELIZER CONE AND LIGHTED LOW PROFILE BARRICADE NOTES:**

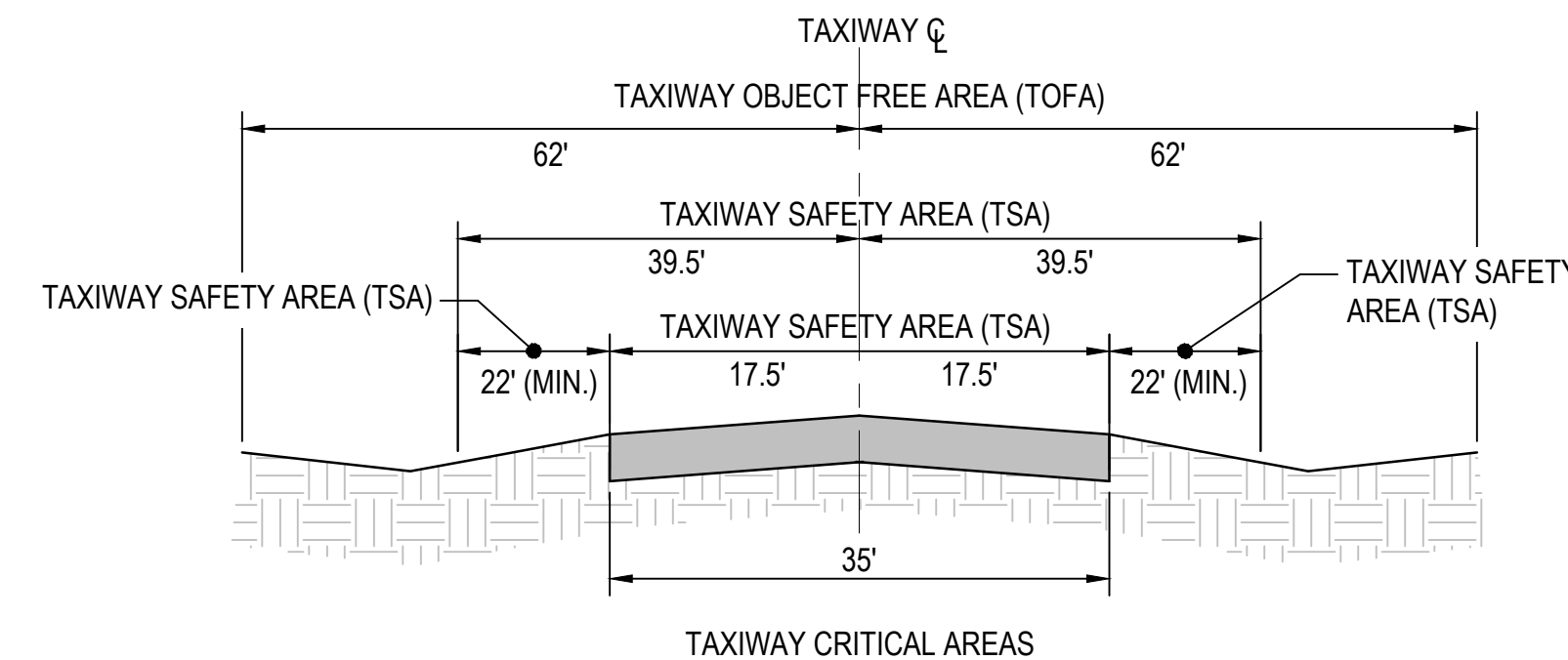
1. ALL COSTS ASSOCIATED WITH FURNISHING, INSTALLING AND MAINTAINING SAFETY FENCE, BARRICADES, AND CONES SHALL BE INCIDENTAL TO THE VARIOUS CONTRACT PAY ITEMS.
2. THE LIGHTED SAFETY BARRICADES SHALL BE PLACED WHERE SHOWN ON PLANS AND BE USED WHEN A WORK AREA IS DIRECTLY ADJACENT TO AN ACTIVE TAXIWAY OR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



RUNWAY 5-23 FAR PART 77  
IMAGINARY SURFACES SCHEMATICS  
NOT TO SCALE



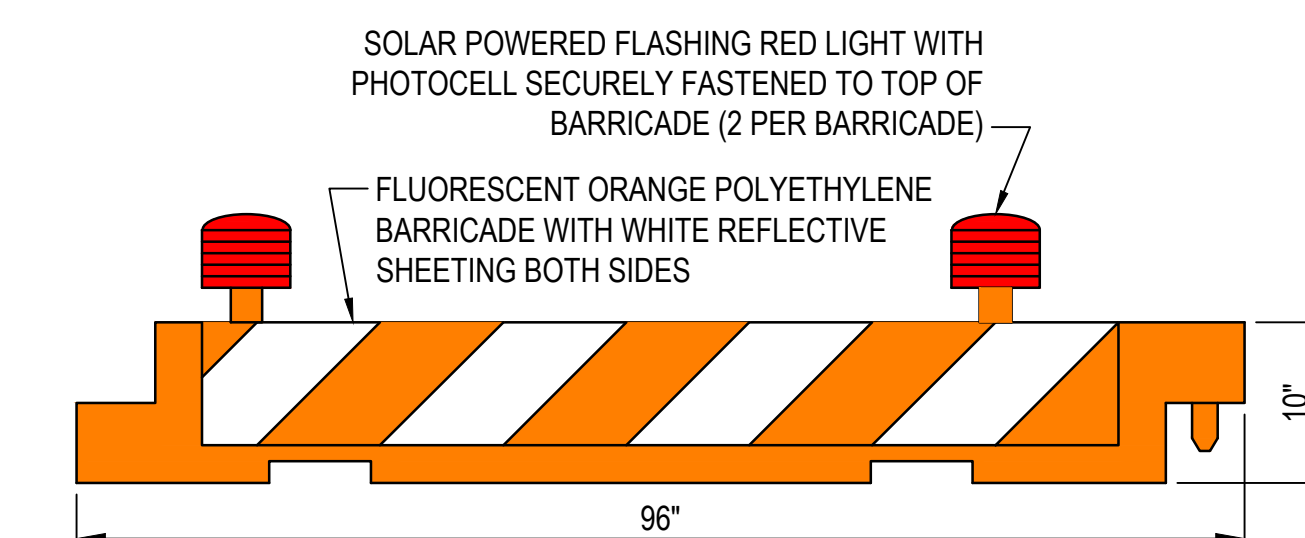
RUNWAY 5-23 CRITICAL AREAS



TAXIWAY CRITICAL AREAS

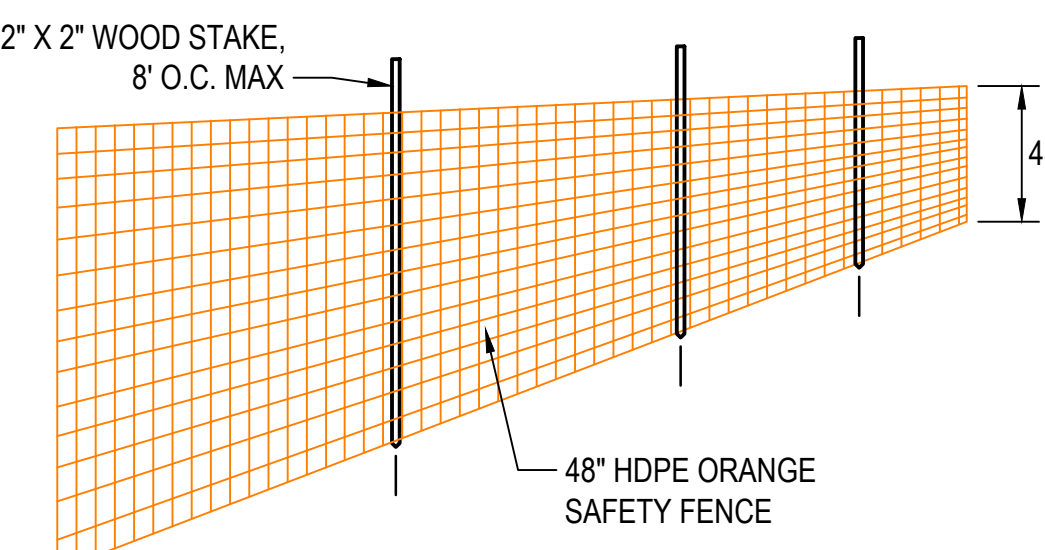
**CRITICAL AREAS SCHEMATICS**

NOT TO SCALE



**LIGHTED LOW PROFILE BARRICADE**

NOT TO SCALE



**SAFETY FENCE**

NOT TO SCALE



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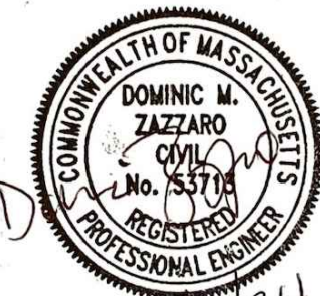
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LAWRENCE MUNICIPAL AIRPORT  
NORTH ANDOVER, MA

RUNWAY 5 END  
DRAINAGE IMPROVEMENTS

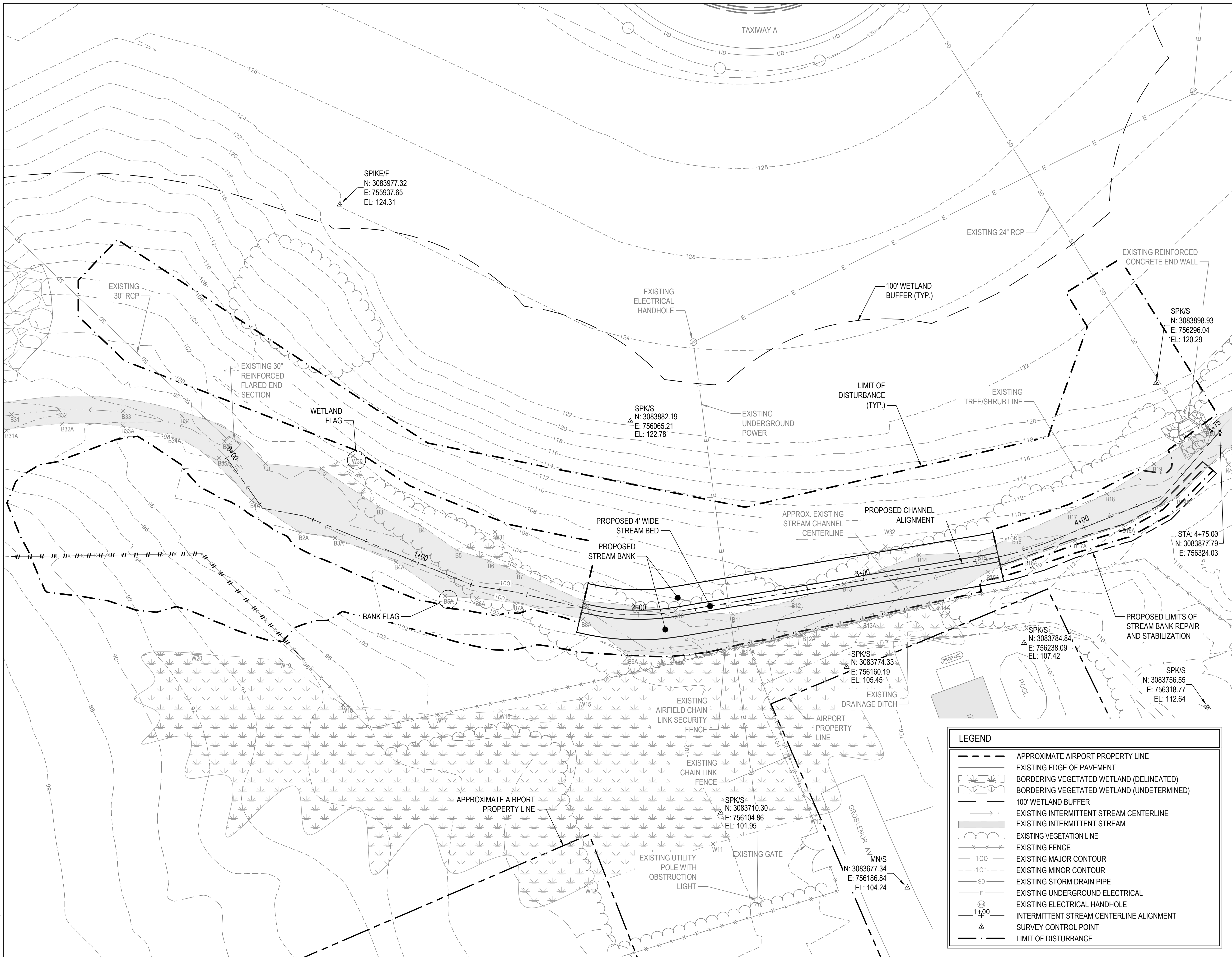
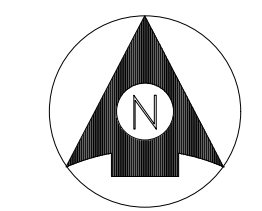
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SAFETY & PHASING NOTES & DETAILS

Project No.  
179450605

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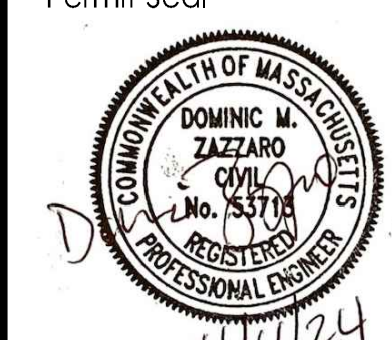
G102 5 of 21 0

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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
	EXISTING UNDERGROUND ELECTRICAL
	EXISTING ELECTRICAL HANDHOLE
	INTERMITTENT STREAM CENTERLINE ALIGNMENT
	SURVEY CONTROL POINT
	LIMIT OF DISTURBANCE

Revision	By	Appd.	YY.MM.DD
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Issued	By	Appd.	YY.MM.DD



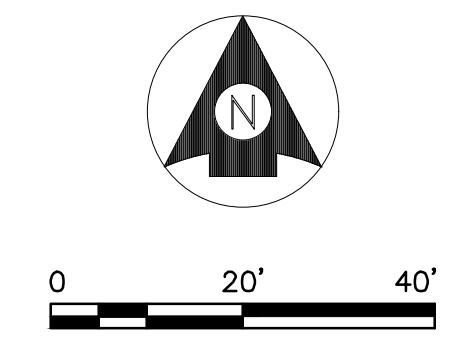
Client/Project  
 LAWRENCE MUNICIPAL AIRPORT  
 NORTH ANDOVER, MA  
 RUNWAY 5 END  
 DRAINAGE IMPROVEMENTS

Title  
 EXISTING CONDITIONS PLAN

Project No. 179450605	Sheet V101	Revision 0
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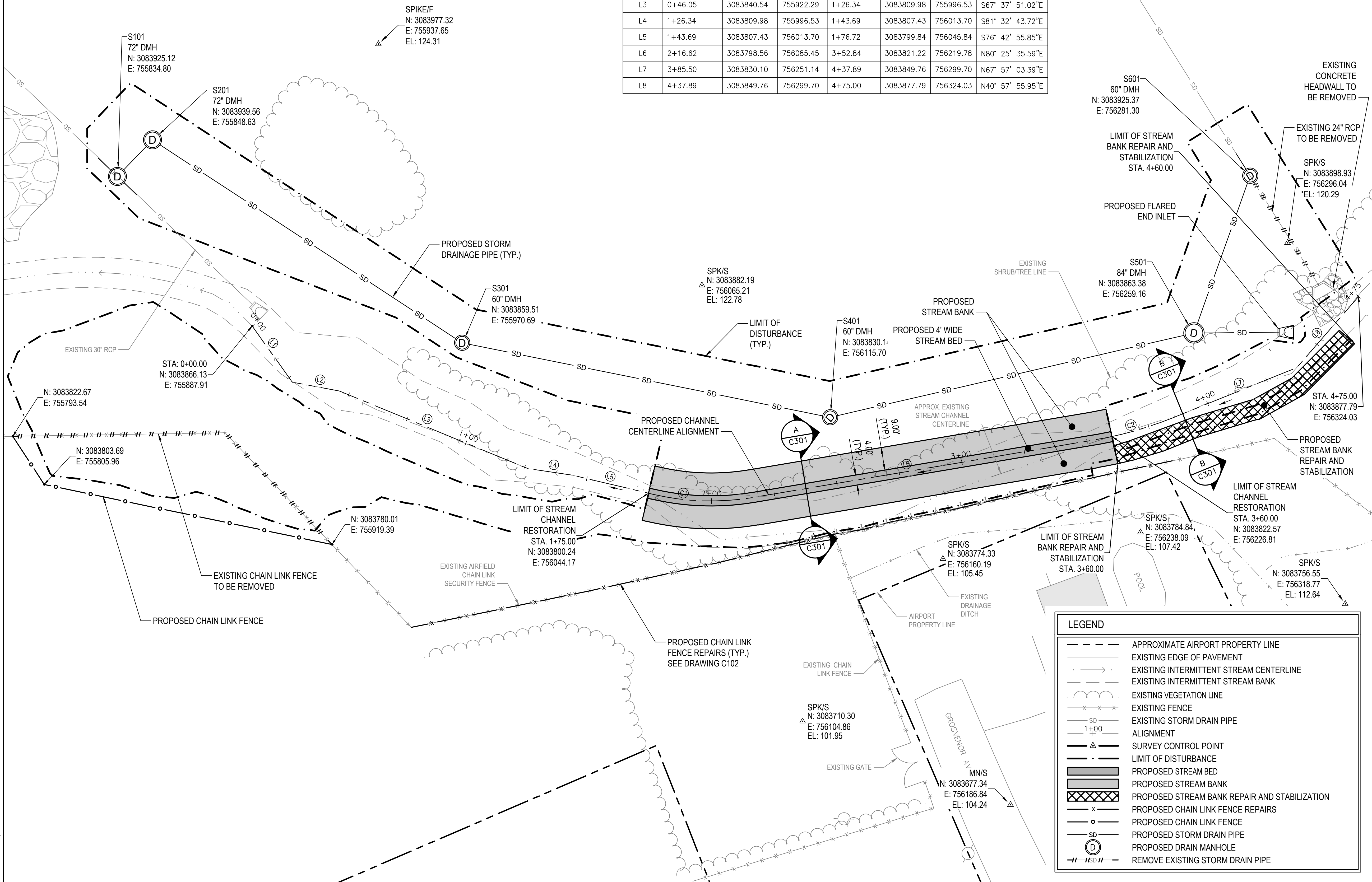
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CHANNEL ALIGNMENT CURVE DATA										
SEGMENT	START STATION	START NORTH	START EAST	END STATION	END NORTH	END EAST	LENGTH	RADIUS	TAN	DELTA
C1	1+76.72	3083799.84	756045.84	2+16.62	3083798.56	756085.45	39.89	100.00	20.22	22° 51' 29"
C2	3+52.84	3083821.22	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



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 BED
	PROPOSED STREAM BANK
	PROPOSED STREAM BANK REPAIR AND STABILIZATION
	PROPOSED CHAIN LINK FENCE REPAIRS
	PROPOSED CHAIN LINK FENCE
	PROPOSED STORM DRAIN PIPE
	PROPOSED DRAIN MANHOLE
	REMOVE EXISTING STORM DRAIN PIPE

Revision	By	Appd.	YY.MM.DD
1	DMZ	DMZ	24.04.05
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 Client/Project  
 LAWRENCE MUNICIPAL AIRPORT  
 NORTH ANDOVER, MA

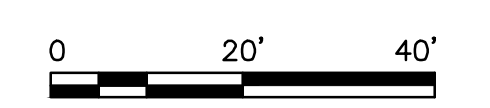
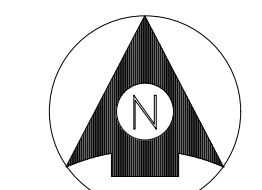
Runway 5 End Drainage Improvements  
 Title  
 LAYOUT PLAN

Project No.  
 179450605  
 Drawing No. Sheet Revision  
 C101 7 of 21 0

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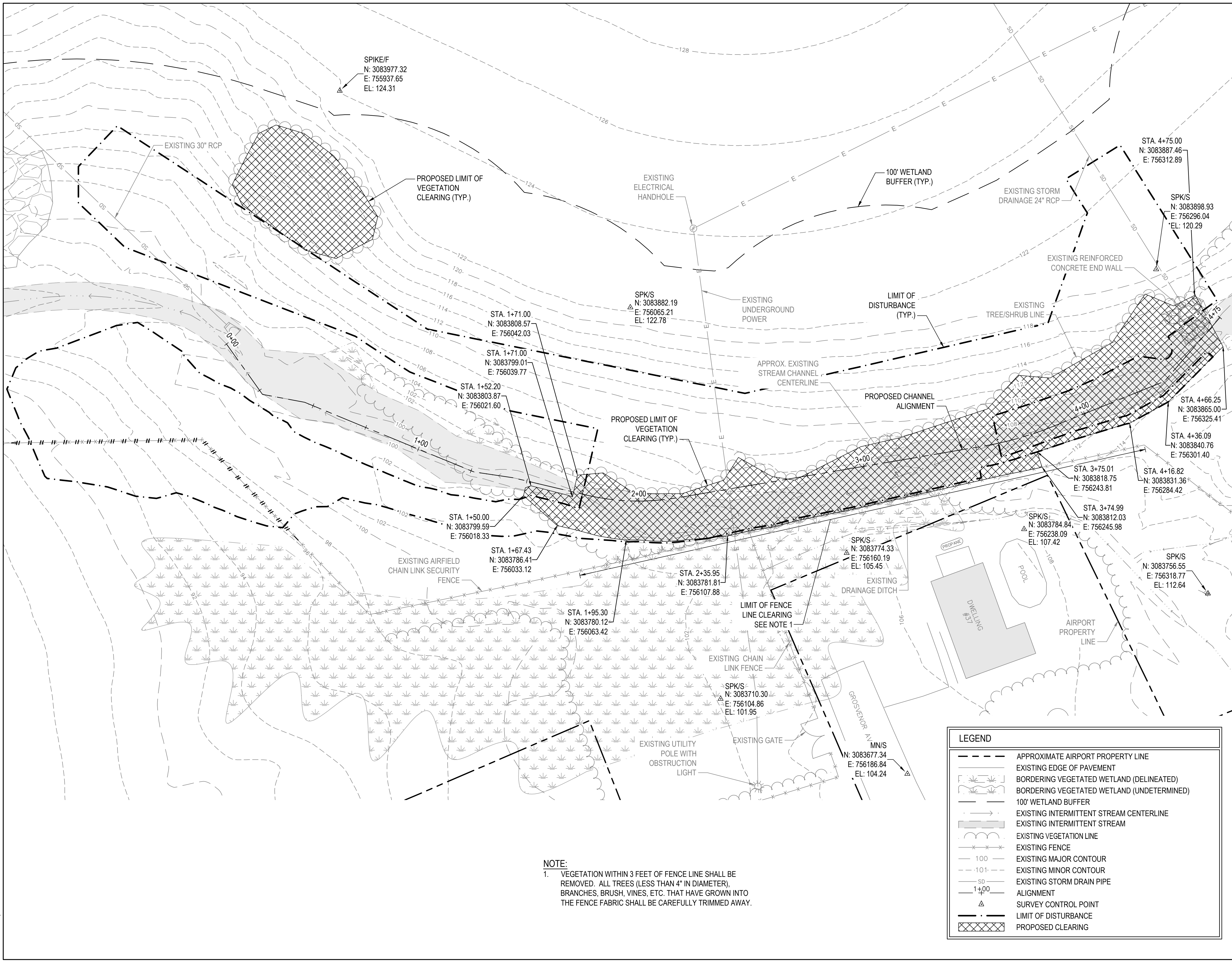


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1	DMZ	DMZ	24.04.05
Issued	By	Appd.	YY.MM.DD

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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 WITHIN 3 FEET OF FENCE LINE SHALL BE REMOVED. ALL TREES (LESS THAN 4" IN DIAMETER), BRANCHES, BRUSH, VINES, ETC. THAT HAVE GROWN INTO THE FENCE FABRIC SHALL BE CAREFULLY TRIMMED AWAY.

**LEGEND**

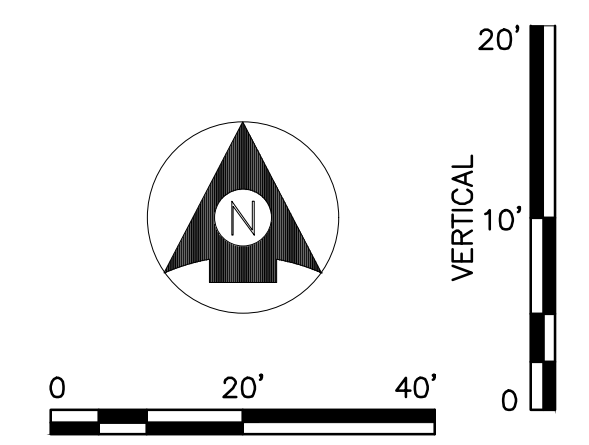
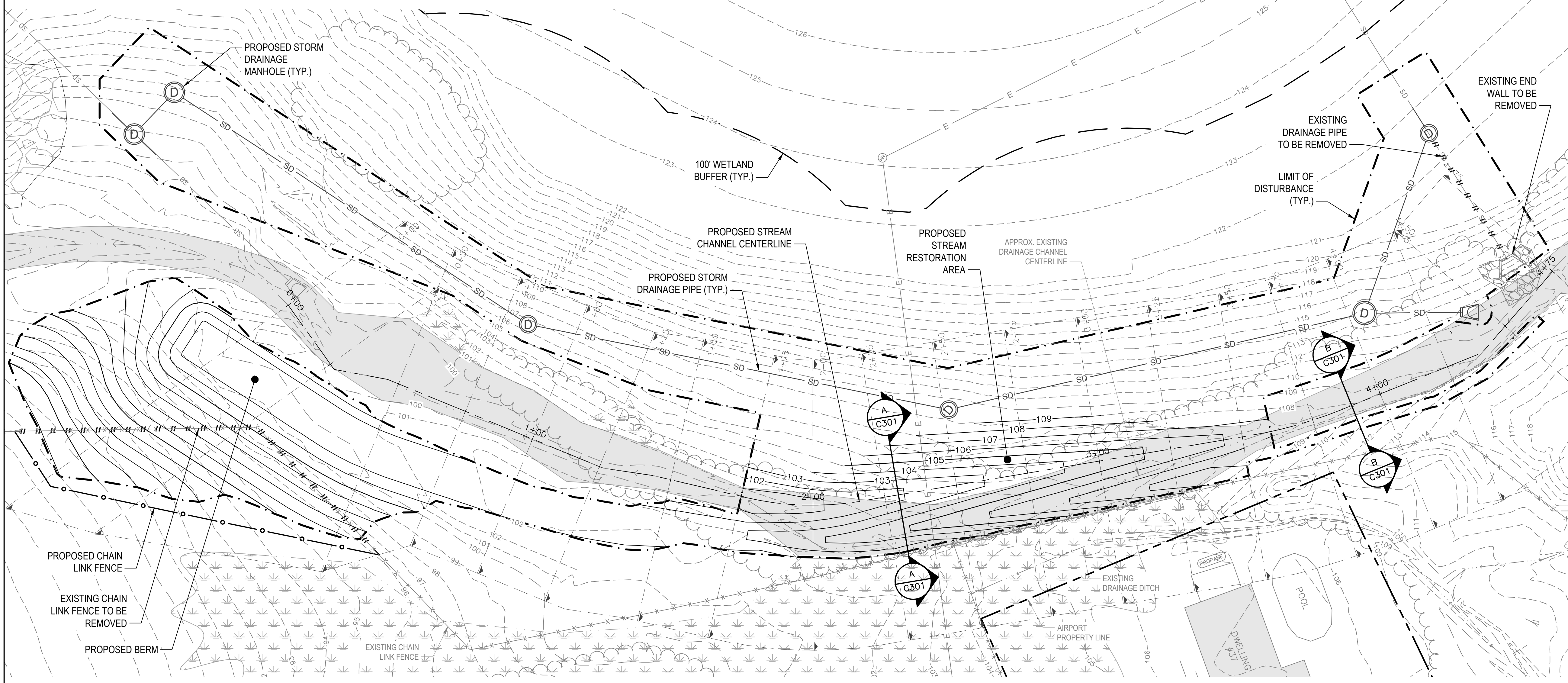
	APPROXIMATE AIRPORT PROPERTY LINE
	EXISTING EDGE OF PAVEMENT
	BORDERING VEGETATED WETLAND (DELINEATED)
	BORDERING VEGETATED WETLAND (UNDETERMINED)
	100' WETLAND BUFFER
	EXISTING INTERMITTENT STREAM CENTERLINE
	EXISTING INTERMITTENT STREAM
	EXISTING VEGETATION LINE
	EXISTING FENCE
	100
	EXISTING MAJOR CONTOUR
	-101-
	EXISTING MINOR CONTOUR
	SD
	1+00
	ALIGNMENT
	SURVEY CONTROL POINT
	LIMIT OF DISTURBANCE
	PROPOSED CLEARING

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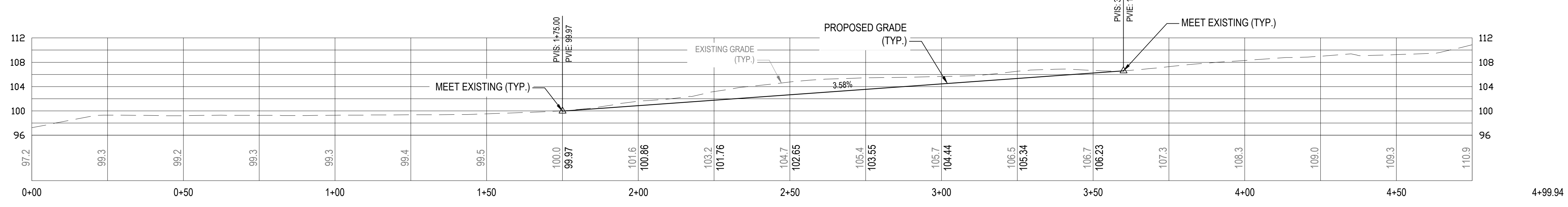


**ISSUED FOR BID**  
 APRIL 5, 2024

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 INTERMITTENT STREAM
	EXISTING VEGETATION LINE
	EXISTING FENCE
	100' EXISTING MAJOR CONTOUR
	101' EXISTING MINOR CONTOUR
	SD EXISTING STORM DRAIN PIPE
	1+00 ALIGNMENT
	SURVEY CONTROL POINT
	LIMIT OF DISTURBANCE
	PROPOSED SANDBAGS
	SD PROPOSED STORM DRAIN PIPE
	PROPOSED DRAIN MANHOLE
	REMOVE EXISTING STORM DRAIN PIPE
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR
	SECTION
	REMOVE EXISTING CHAIN LINK FENCE
	PROPOSED CHAIN LINK FENCE



**GRADING PLAN**



**INTERMITTENT STREAM PROFILE**

Revision	By	Appd.	YY.MM.DD
1	DMZ	DMZ	24.04.05
Issued	By	Appd.	YY.MM.DD

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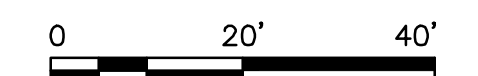
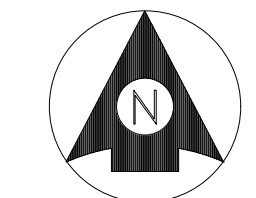
Client/Project: LAWRENCE MUNICIPAL AIRPORT NORTH ANDOVER, MA  
 RUNWAY 5 END DRAINAGE IMPROVEMENTS

Title: GRADING PLAN & PROFILE

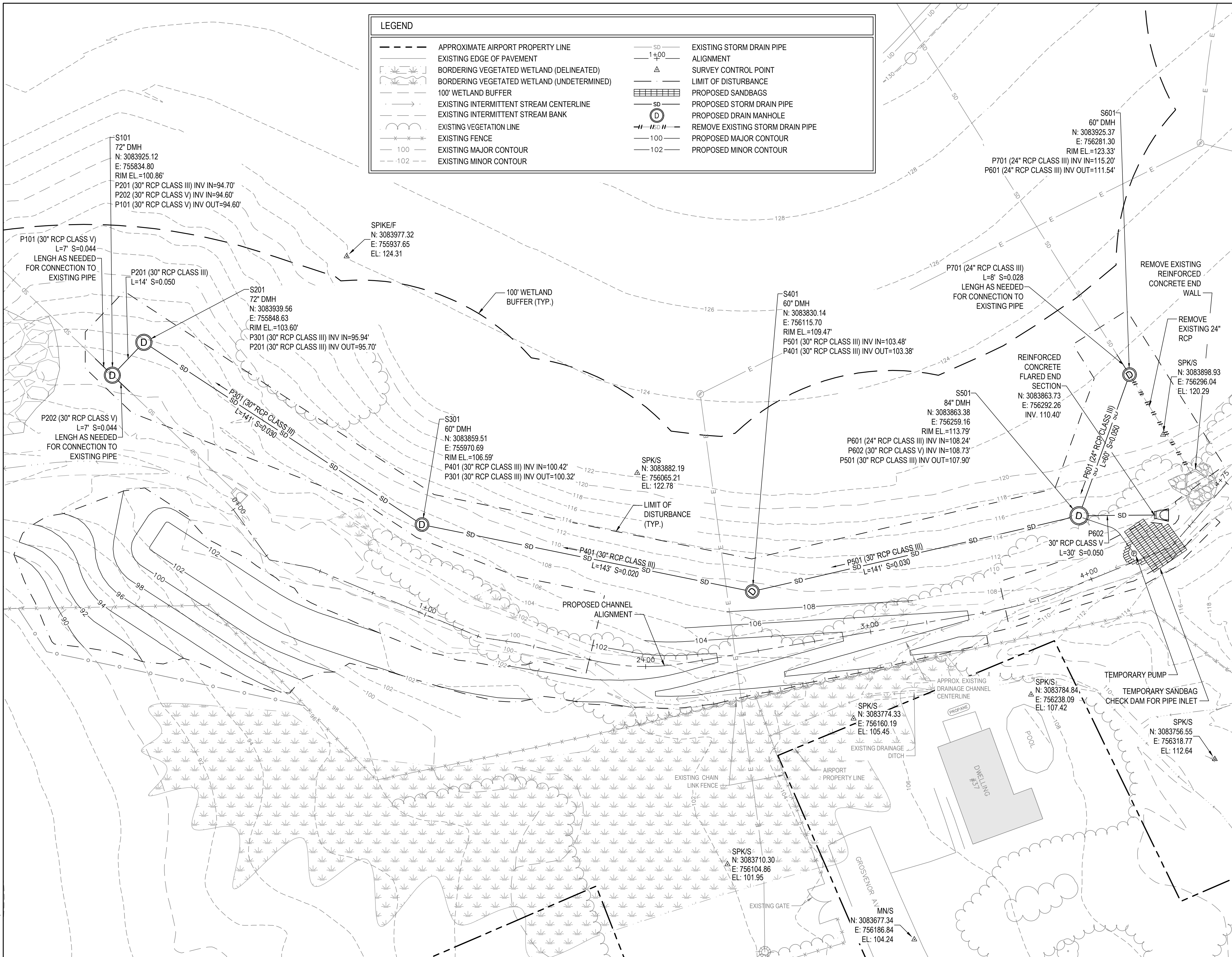
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Drawing No.	Sheet	Revision

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**ISSUED FOR BID**  
 APRIL 5, 2024



LEGEND			
	APPROXIMATE AIRPORT PROPERTY LINE		EXISTING STORM DRAIN PIPE 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 VEGETATION LINE		PROPOSED MAJOR CONTOUR
	EXISTING FENCE		PROPOSED MINOR CONTOUR
	EXISTING MAJOR CONTOUR		
	EXISTING MINOR CONTOUR		



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Issued	By	Appd.	YY.MM.DD

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

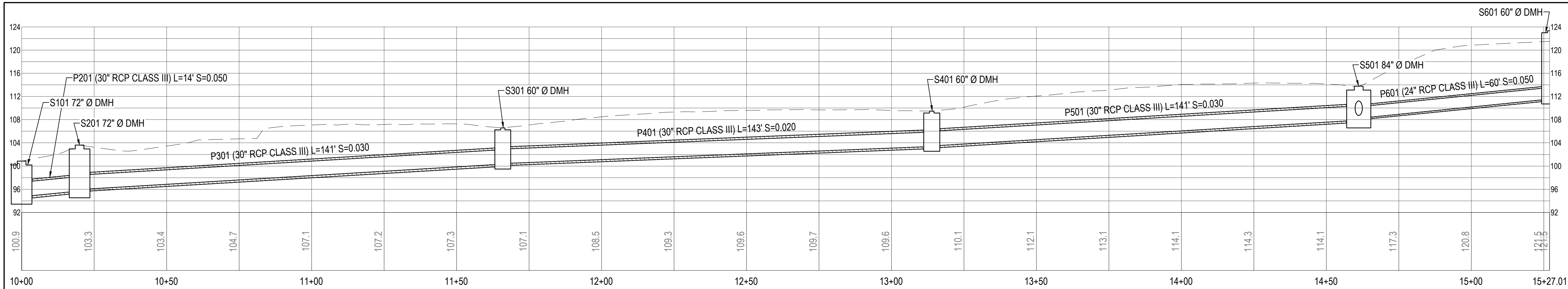
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**DRAINAGE PLAN**

Project No.  
 179450605

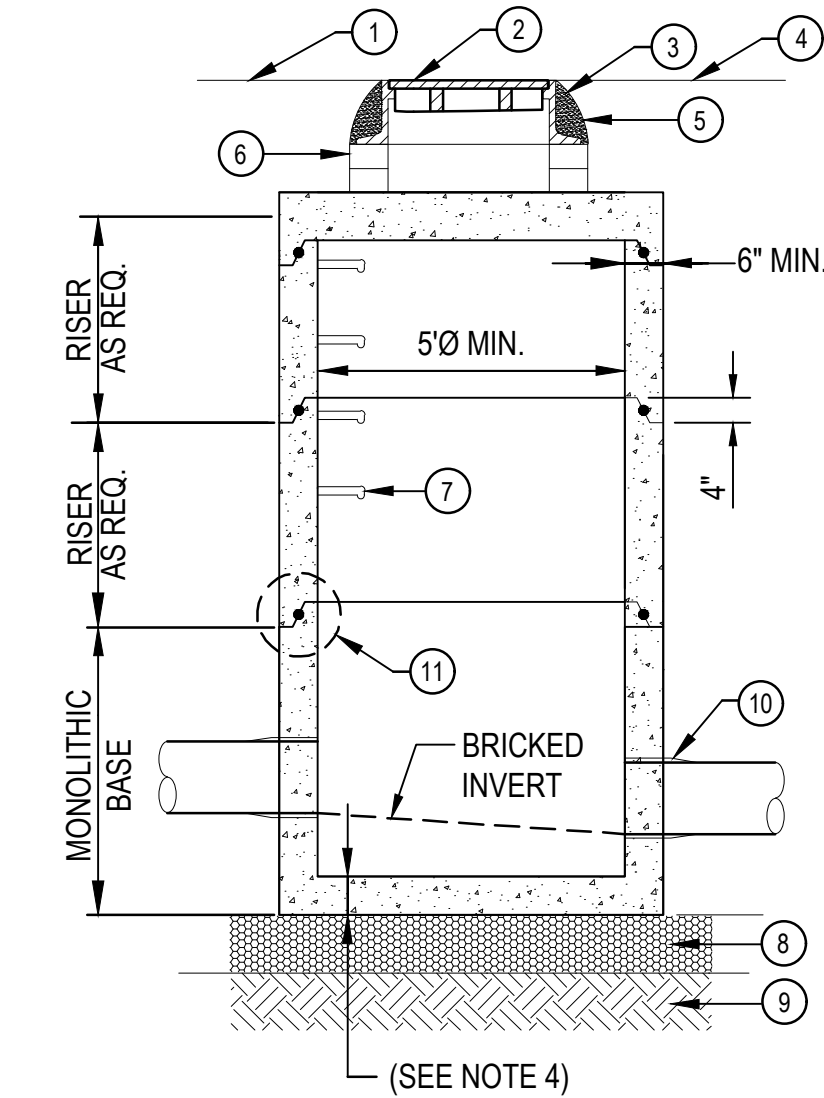
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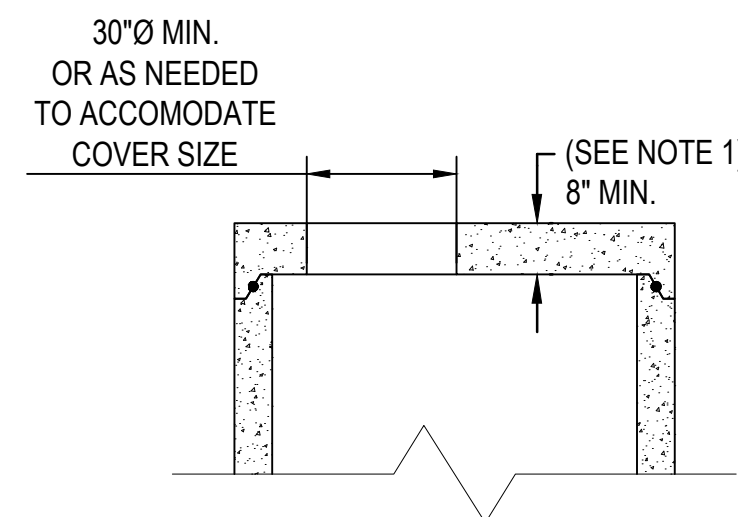


**DRAINAGE PIPE PROFILE**

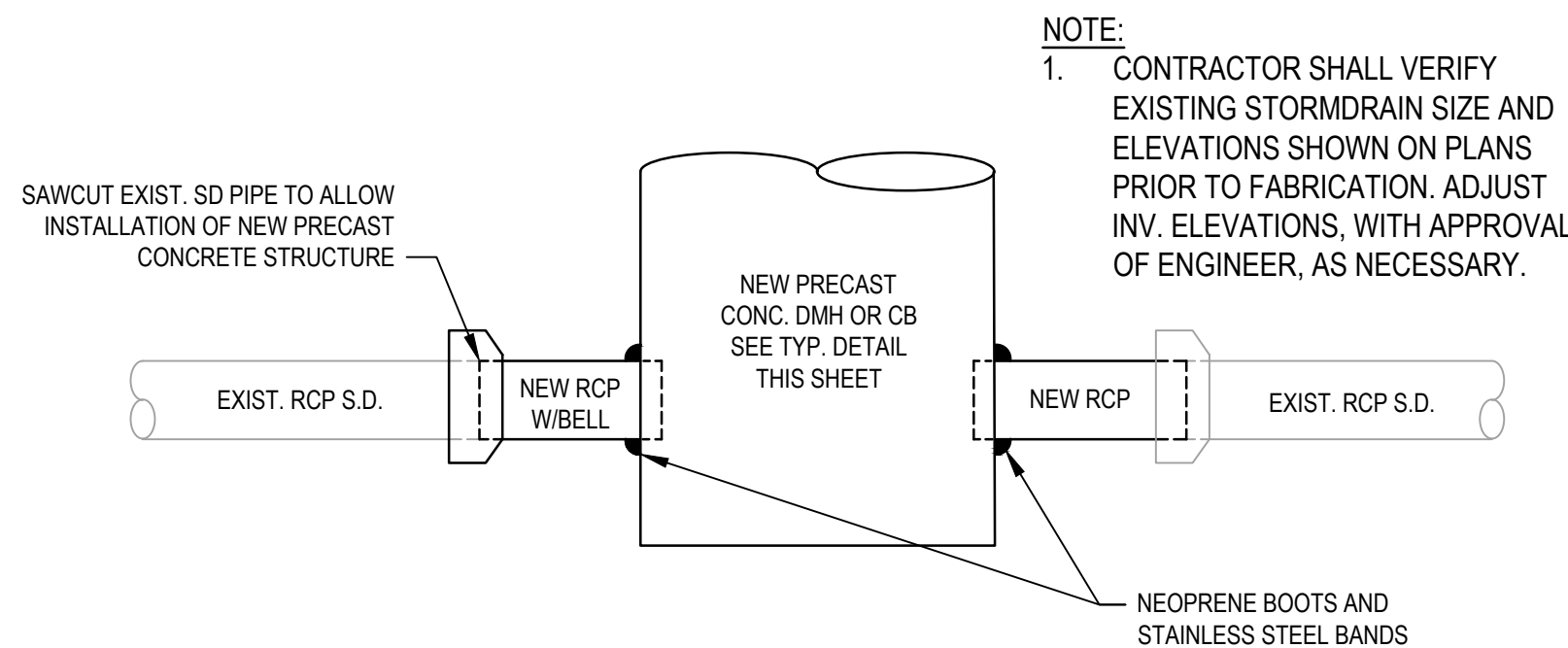


- ① UNPAVED SURFACE (4" TOPSOIL, SEED AND MULCH)
- ② HEAVY DUTY CAST IRON MANHOLE FRAME & COVER (LABELED DRAIN), BOLT DOWN, SHALL MEET AASHTO M306 (LATEST VERSION)
- ③ FRAME TO BE SET IN FULL BED OF MORTAR
- ④ FINISHED GRADE
- ⑤ MORTAR
- ⑥ ADJUST TO GRADE WITH BRICK OR PRECAST CONCRETE RINGS: MAX. 6" 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

- NOTES:
1. PRECAST CONCRETE STRUCTURES AND CASTINGS SHALL ACCOMMODATE H2O 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



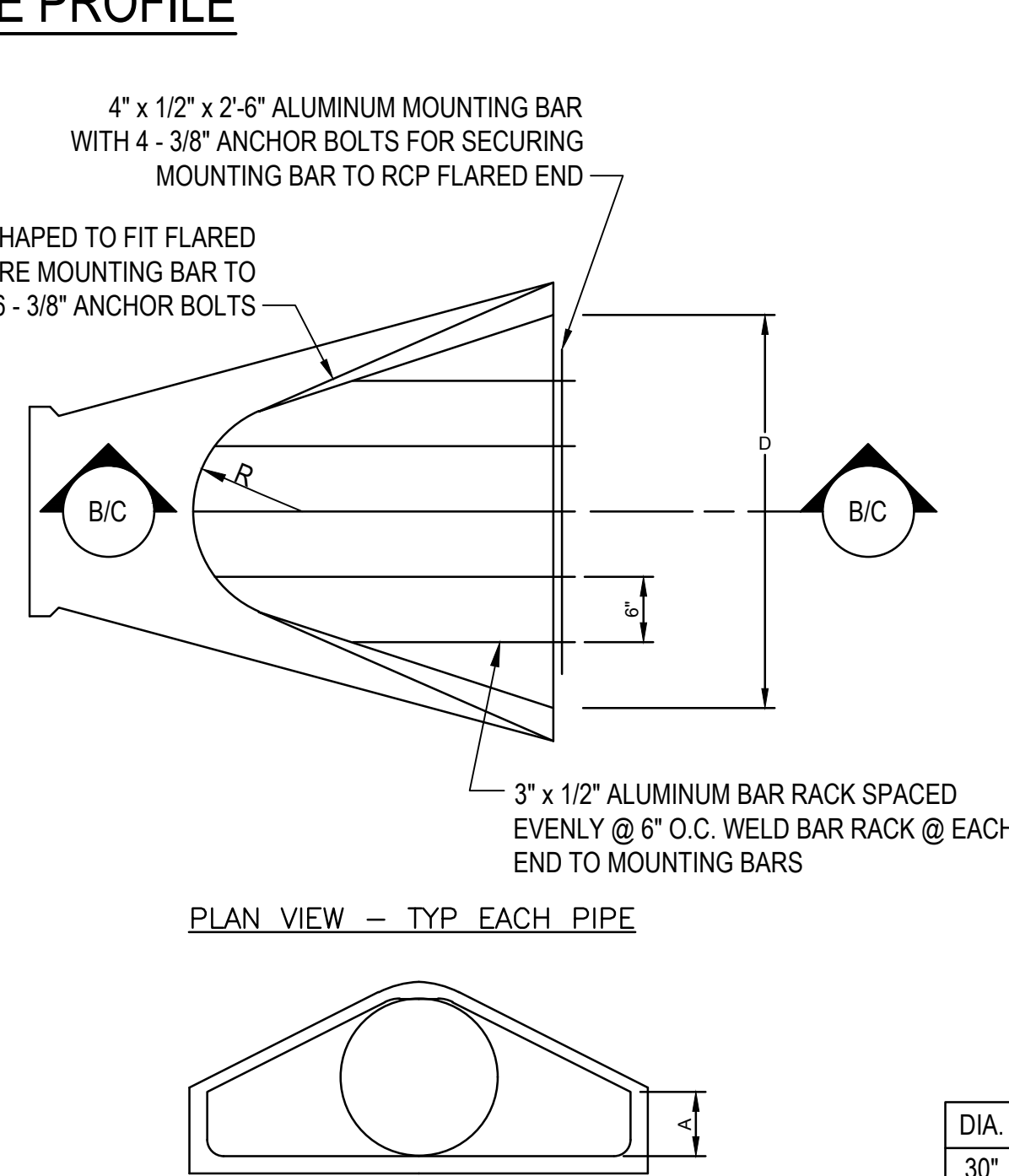
**1 PRECAST CONCRETE MANHOLE DETAIL**  
 NOT TO SCALE



**3 EXISTING STORM DRAIN PIPE CONNECTION TO NEW DRAIN STRUCTURE**  
 NOT TO SCALE

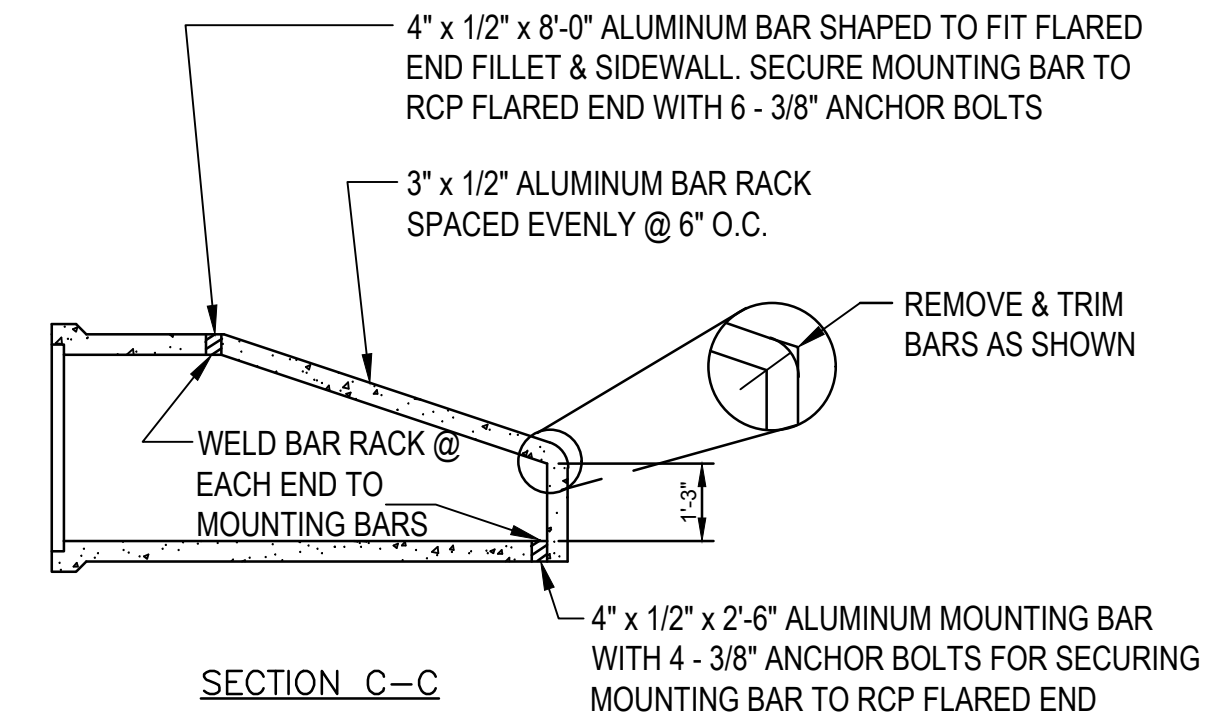
4" x 1/2" x 2'-6" ALUMINUM MOUNTING BAR WITH 4 - 3/8" ANCHOR BOLTS FOR SECURING MOUNTING BAR TO RCP FLARED END

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

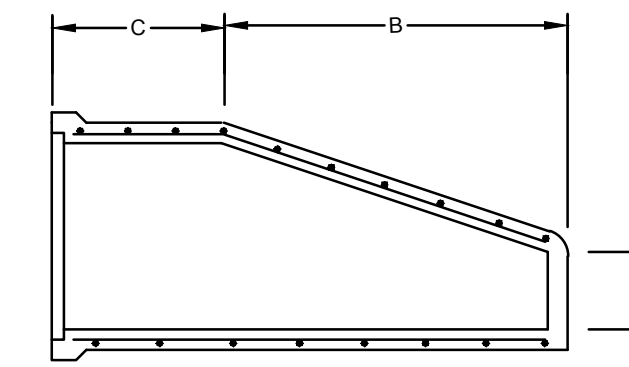


PLAN VIEW - TYP EACH PIPE

END VIEW

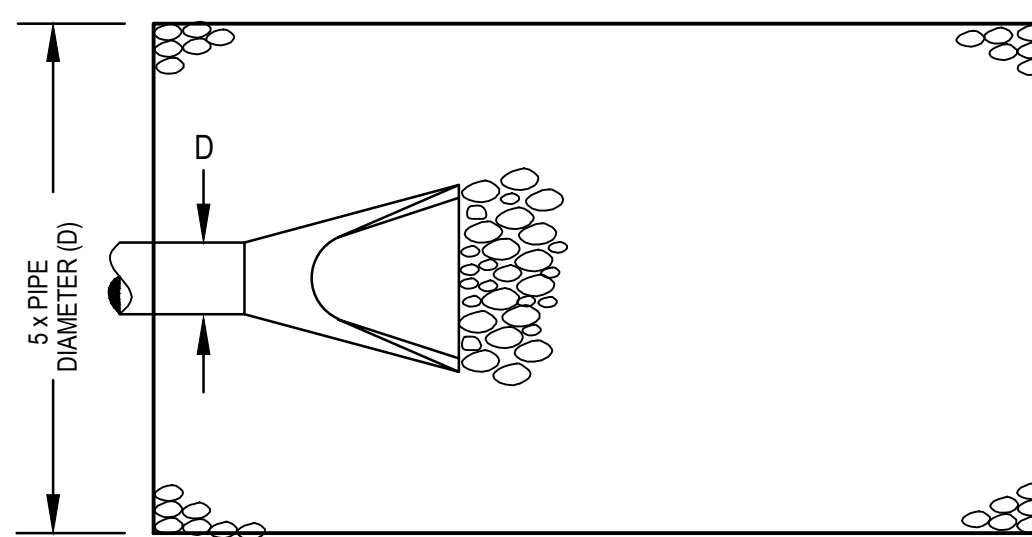


SECTION C-C

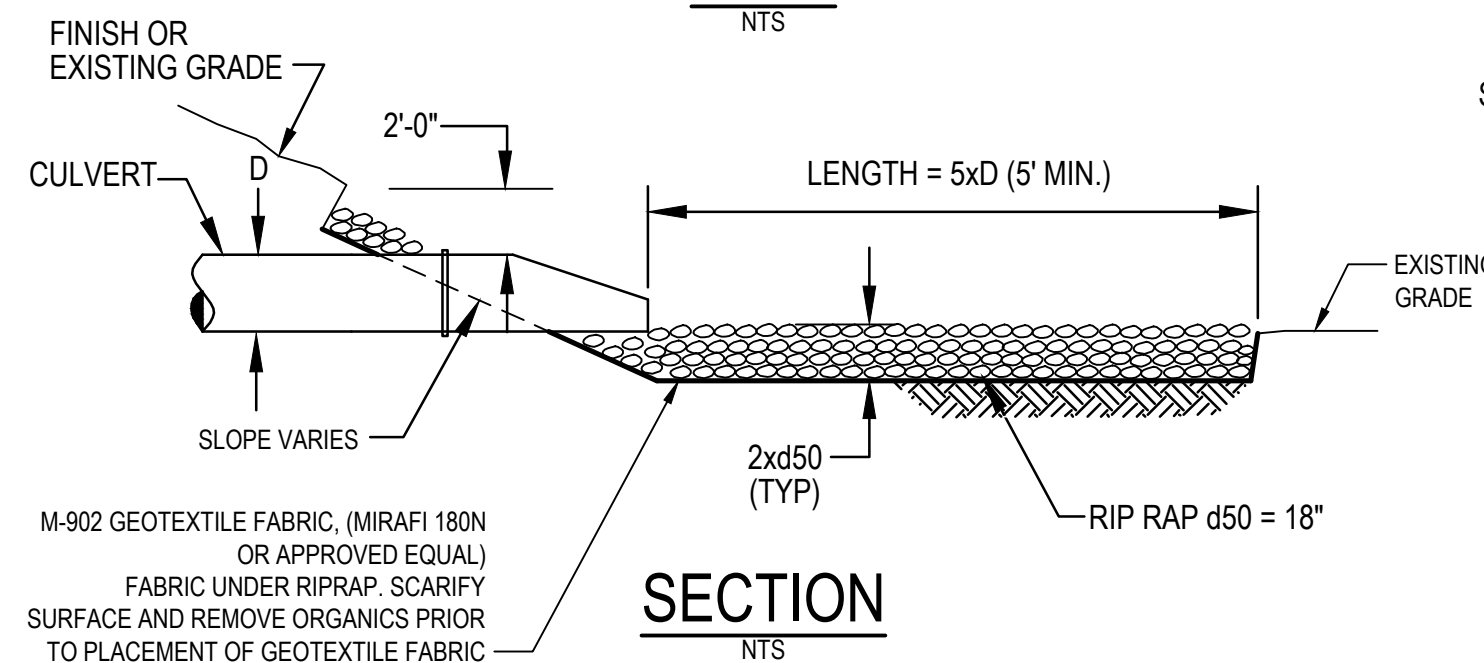


SECTION B-B

**2 RCP FLARED END SECTION DETAIL**  
 NOT TO SCALE

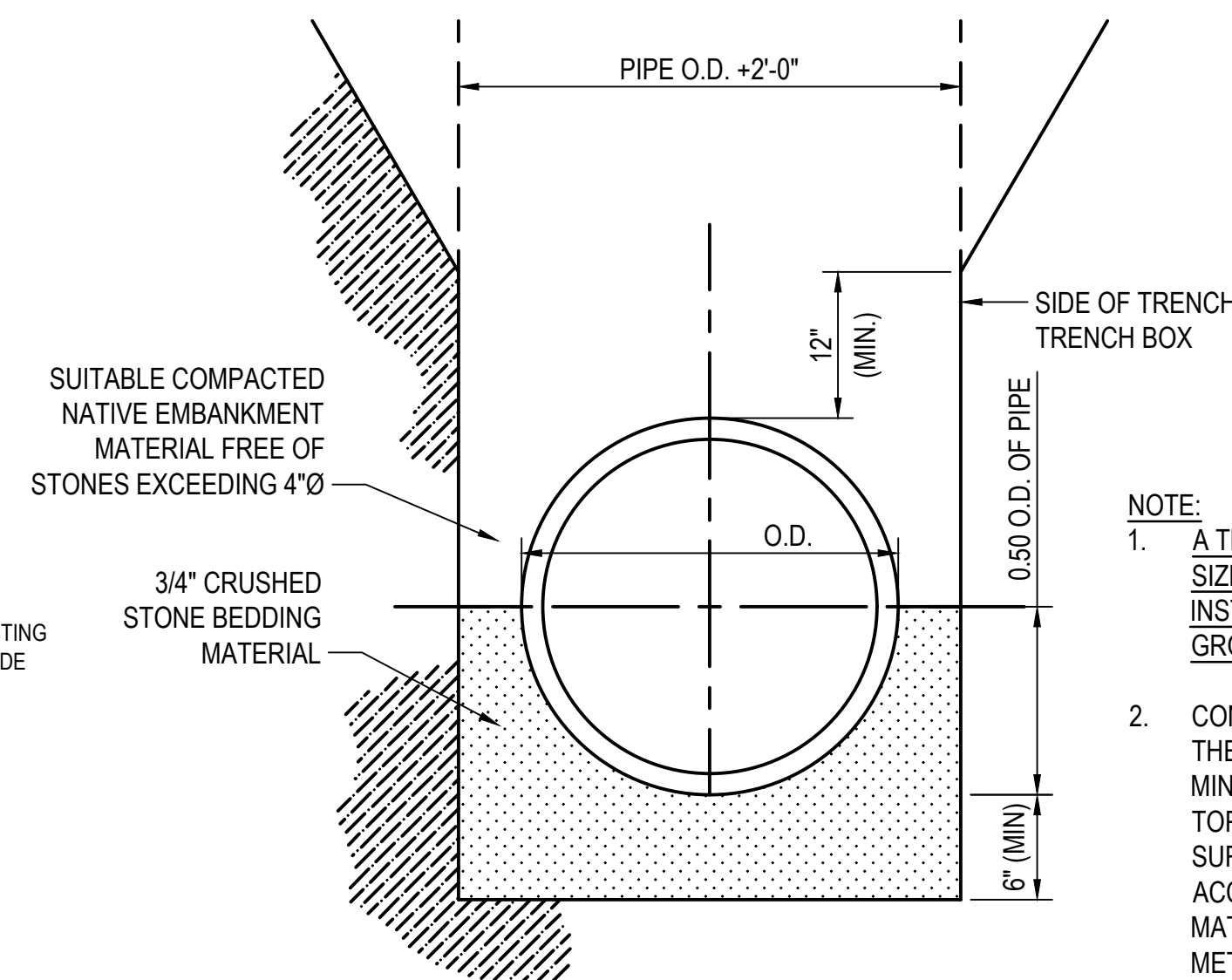


PLAN  
 N.T.S.



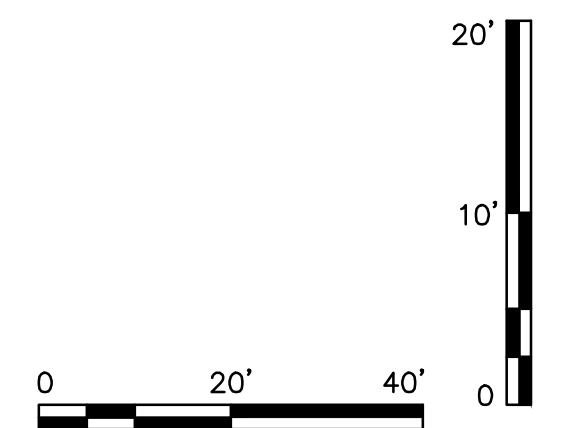
SECTION  
 N.T.S.

**4 RIPRAP INLET DETAIL**  
 N.T.S.



**5 STORMDRAIN TRENCH**  
 NOT TO SCALE

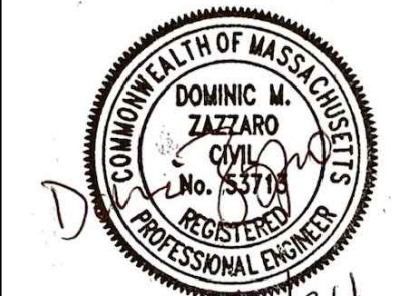
- NOTE:
1. A TRENCH BOX OF SUFFICIENT SIZE SHALL BE USED FOR PIPE INSTALLATION TO MINIMIZE GROUND DISTURBANCE.
  2. CONTRACTOR SHALL RESTORE THE TOP OF THE TRENCH WITH A MINIMUM OF 4 INCHES OF TOPSOIL, AND THE FINISHED SURFACE SHALL BE SEEDED, IN ACCORDANCE WITH THE MATERIALS AND CONSTRUCTION METHODS DESCRIBED IN THE SPECIFICATIONS.



DRAINAGE PIPE PROFILE SCALE

Revision	By	Appd.	YY.MM.DD
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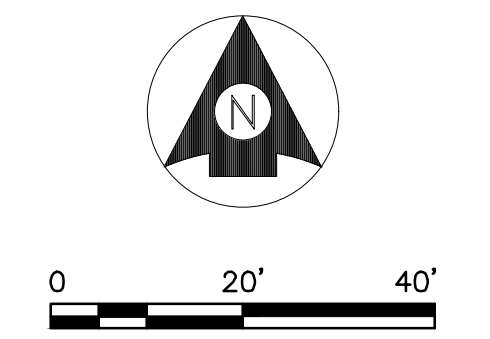


Client/Project  
 LAWRENCE MUNICIPAL AIRPORT  
 NORTH ANDOVER, MA  
 RUNWAY 5 END  
 DRAINAGE IMPROVEMENTS

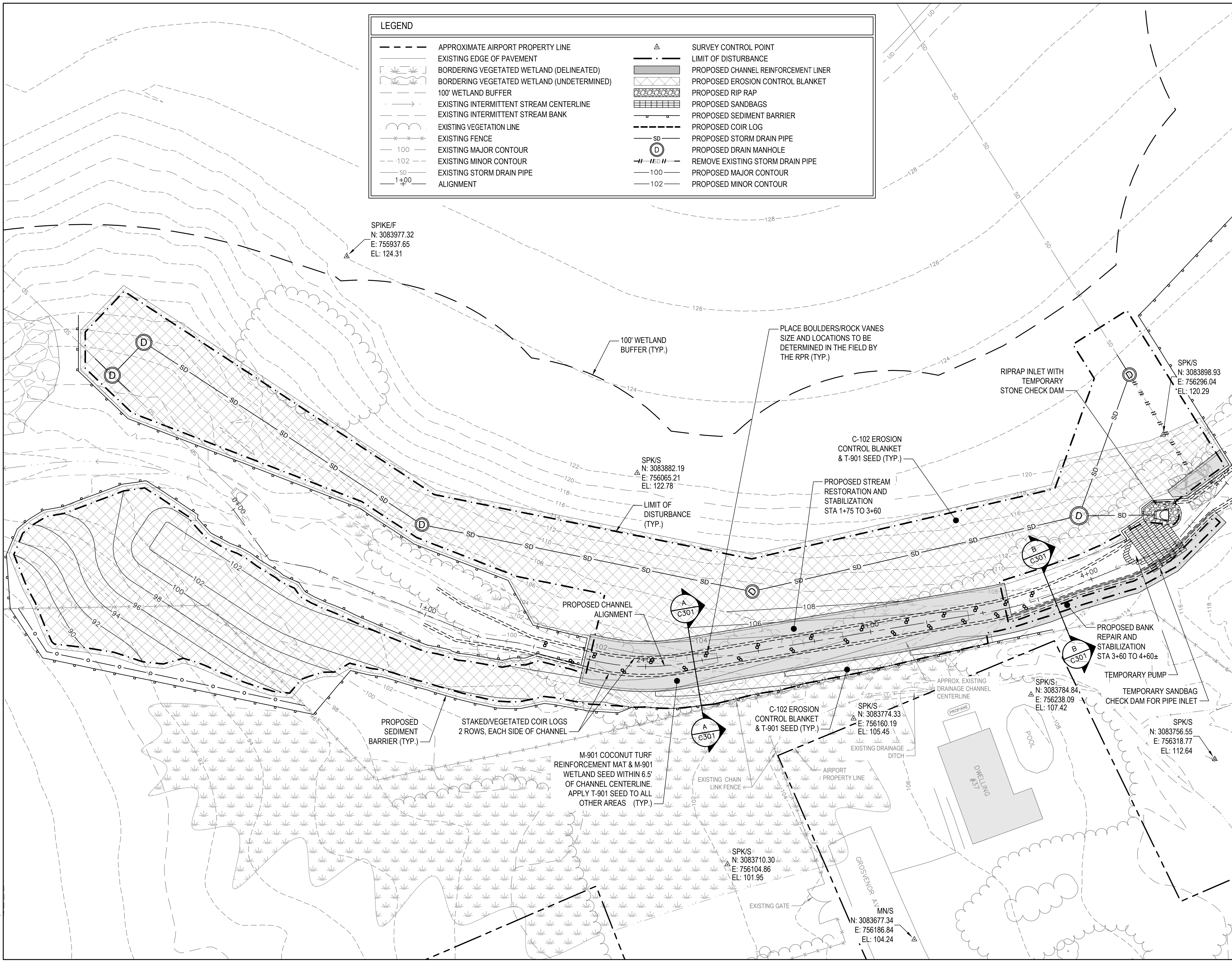
Title  
 DRAINAGE DETAILS

Project No.  
 179450605  
 Drawing No. Sheet Revision

**ISSUED FOR BID**  
 APRIL 5, 2024



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



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1	DMZ	DMZ	24.04.05
Issued	By	Appd.	YY.MM.DD

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

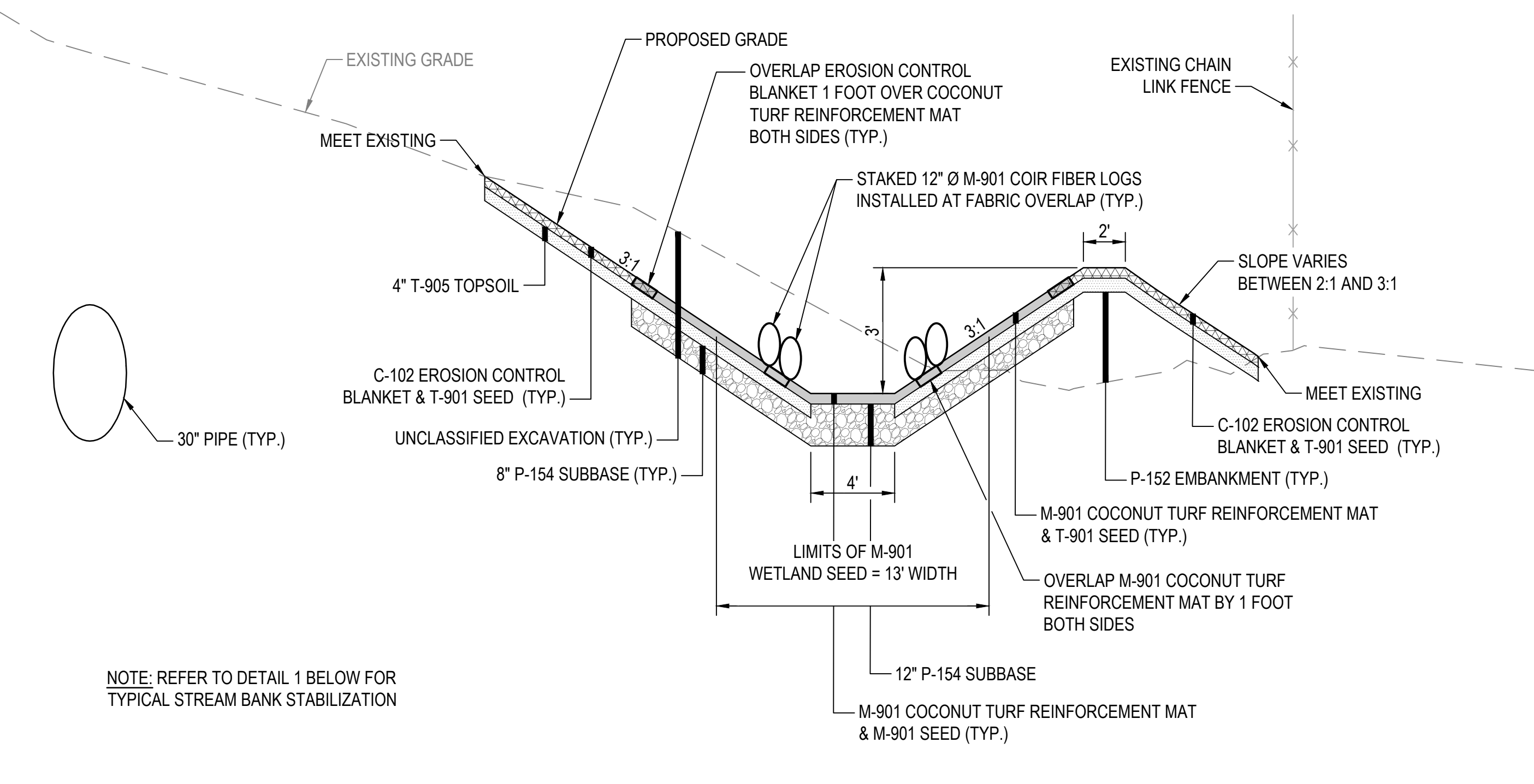
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 STREAM RESTORATION AND  
 EROSION CONTROL PLAN

Project No.  
 179450605

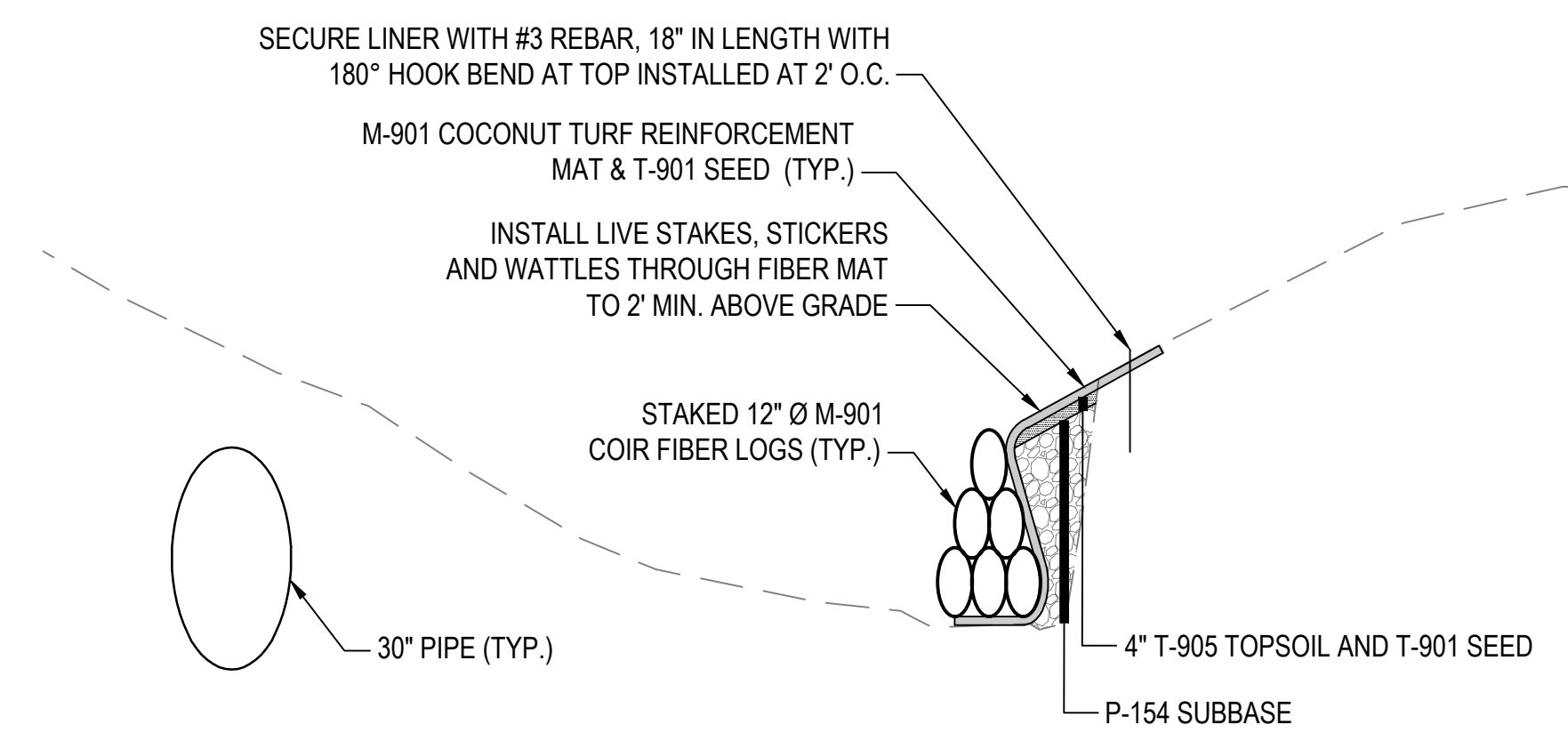
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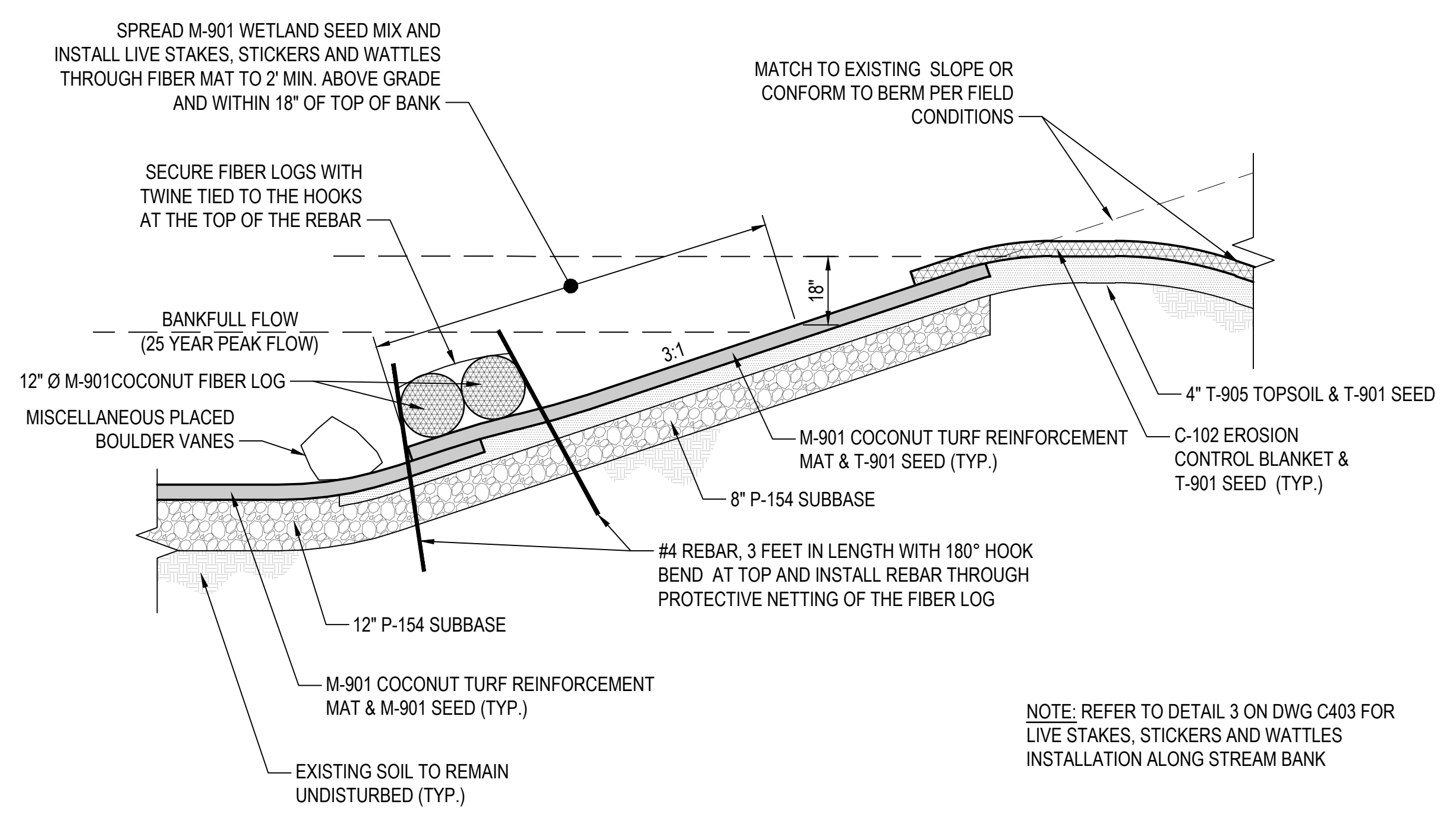


**A-A** STREAM CHANNEL RESTORATION  
 TYPICAL SECTION A-A (STA. 1+75 TO 3+60)



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

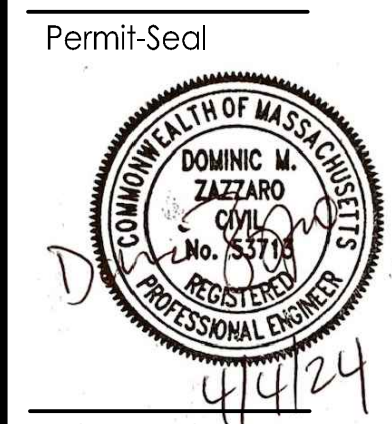
NOTE: REFER TO DETAIL 1 BELOW FOR TYPICAL STREAM BANK STABILIZATION



**1** TYPICAL STREAM BANK STABILIZATION FOR CHANNEL RESTORATION  
 NOT TO SCALE

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1	DMZ	DMZ	24.04.05
Issued	By	Appd.	YY.MM.DD

DMZ Dwn. DMZ Chkd. DMZ Dsgn.



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

Title  
 STREAM RESTORATION -  
 TYPICAL SECTIONS

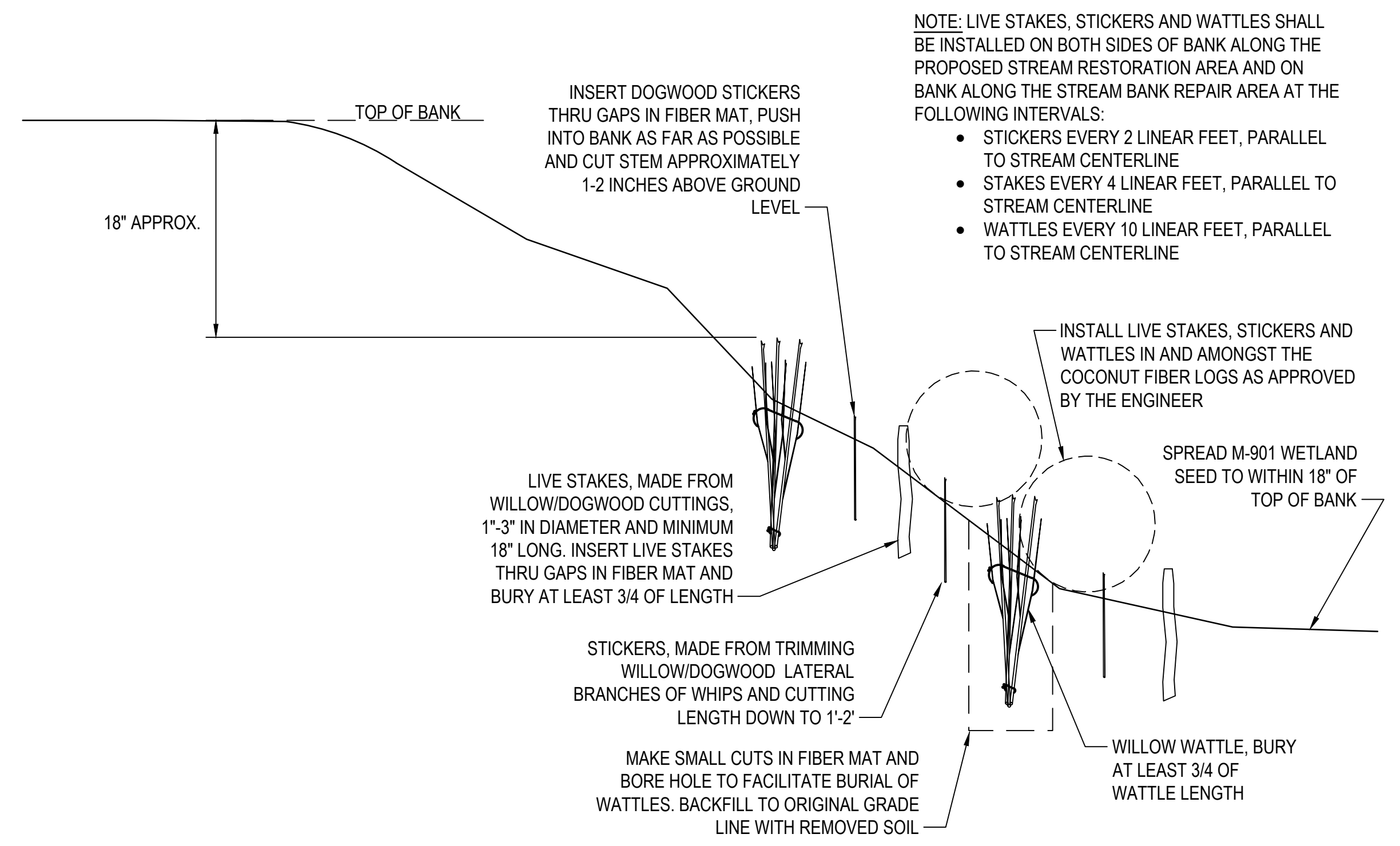
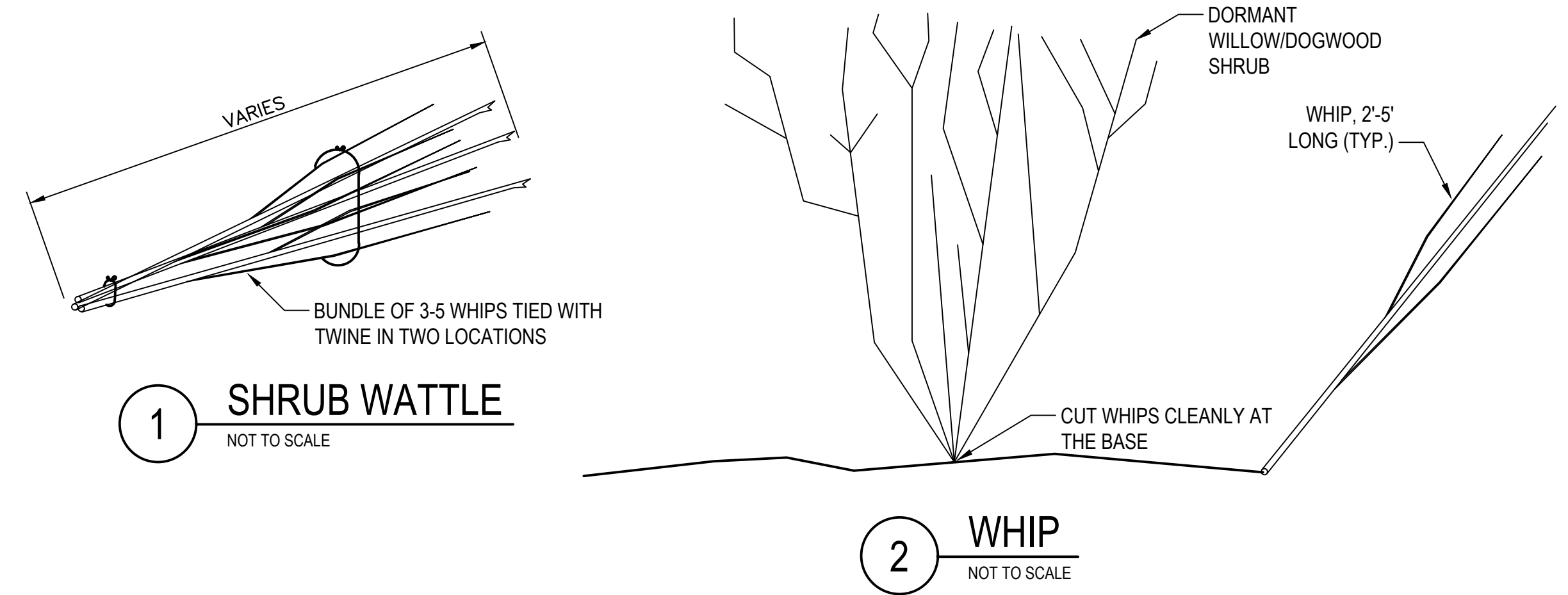
Project No. 179450605	Sheet C402	Revision 0
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**STREAM CHANNEL RESTORATION NOTES:**

- 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.



**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



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

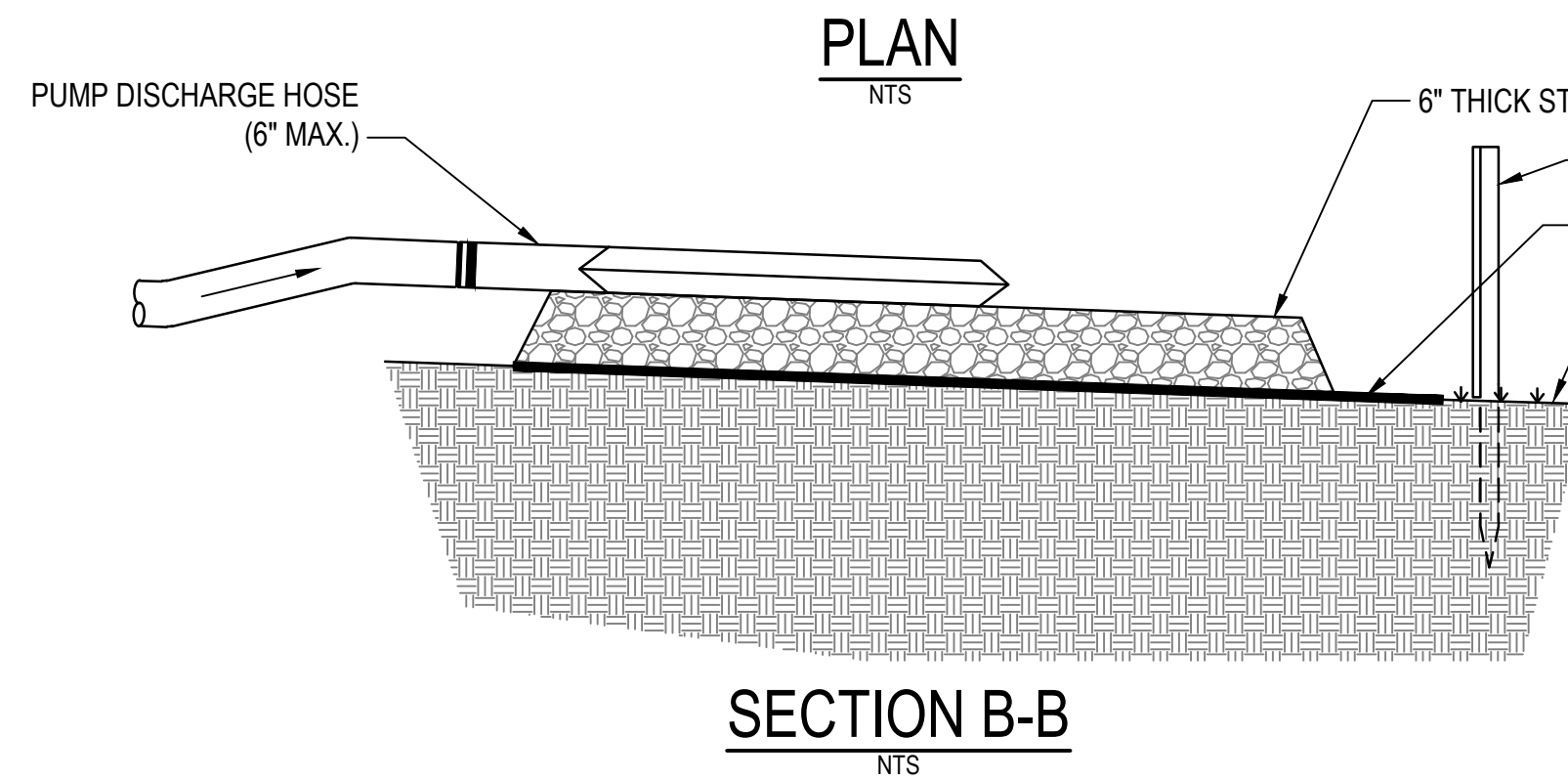
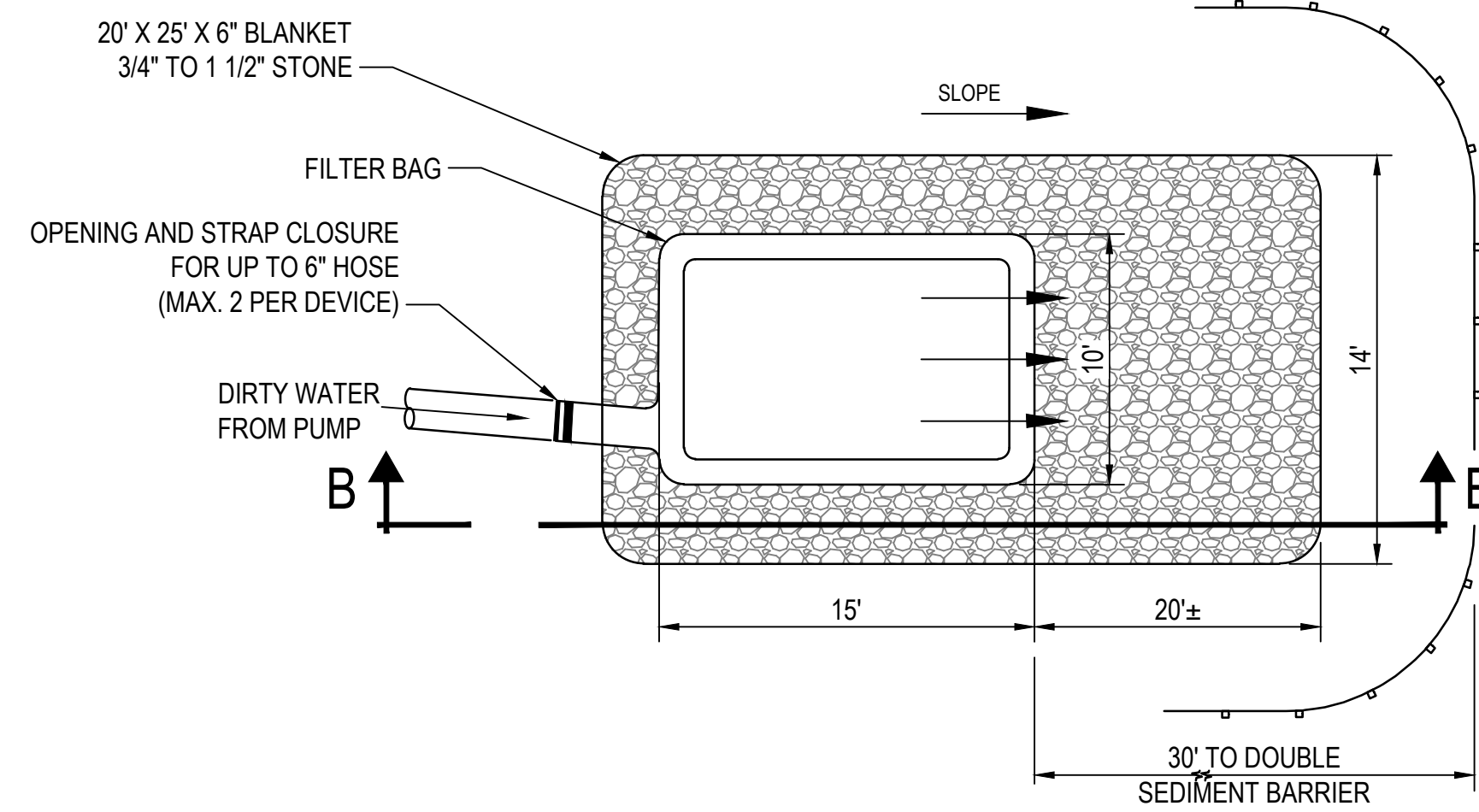
Title  
 STREAM RESTORATION -  
 NOTES & DETAILS

Project No.  
 179450605

Drawing No. Sheet Revision  
 C403 14 of 21 0

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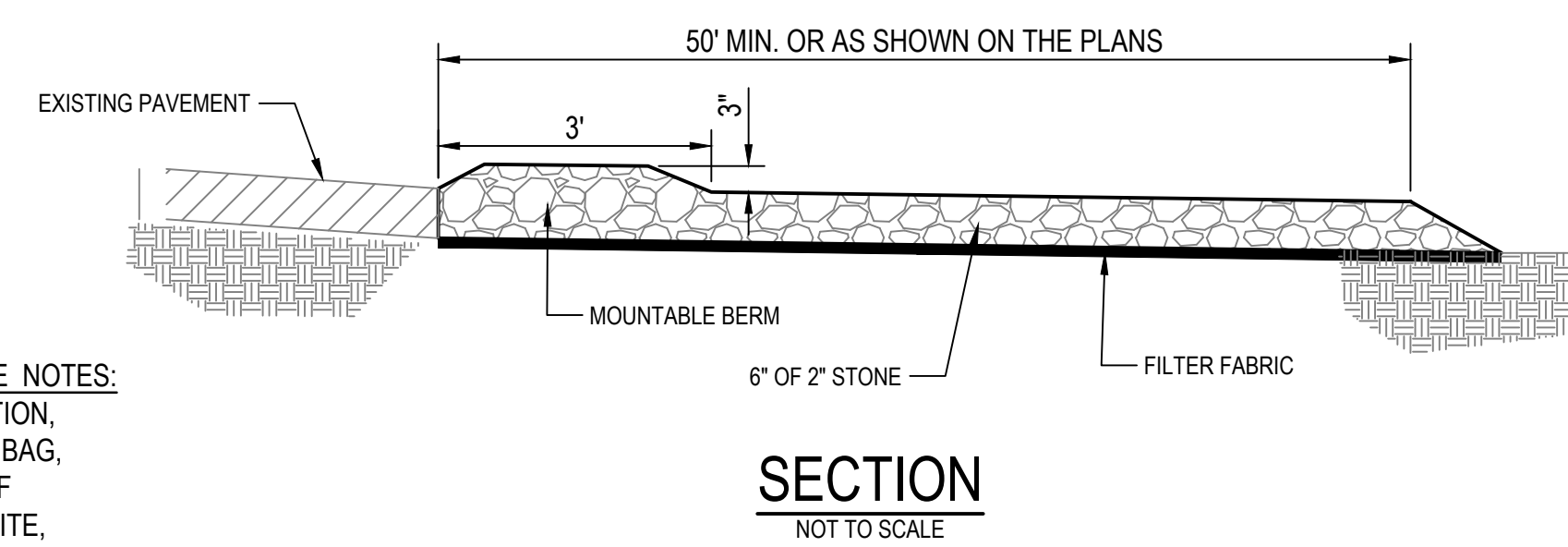
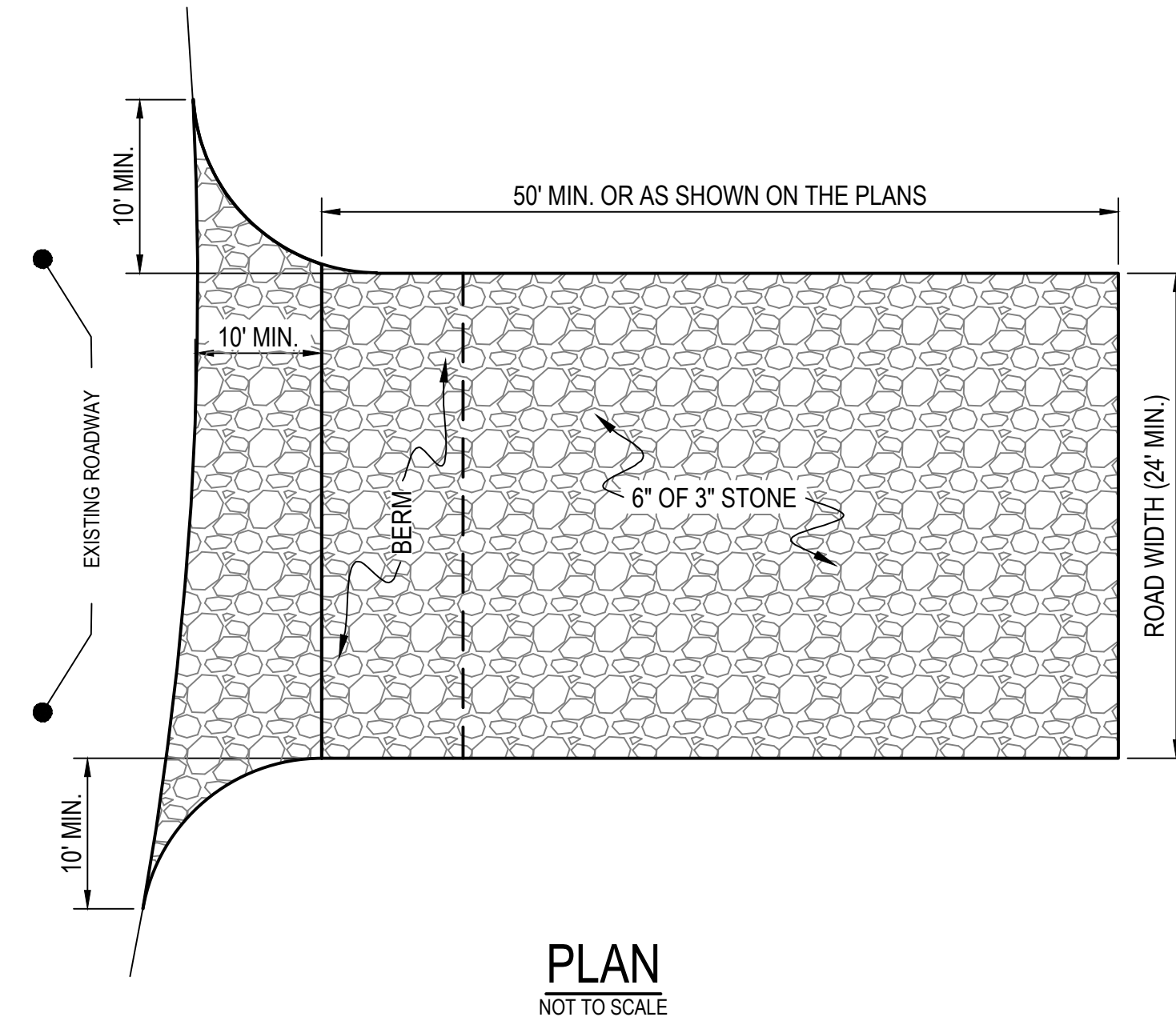
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**1** TEMPORARY DEWATERING SEDIMENT DEVICE  
 NOT TO SCALE

**TEMPORARY DEWATERING SEDIMENT DEVICE NOTES:**

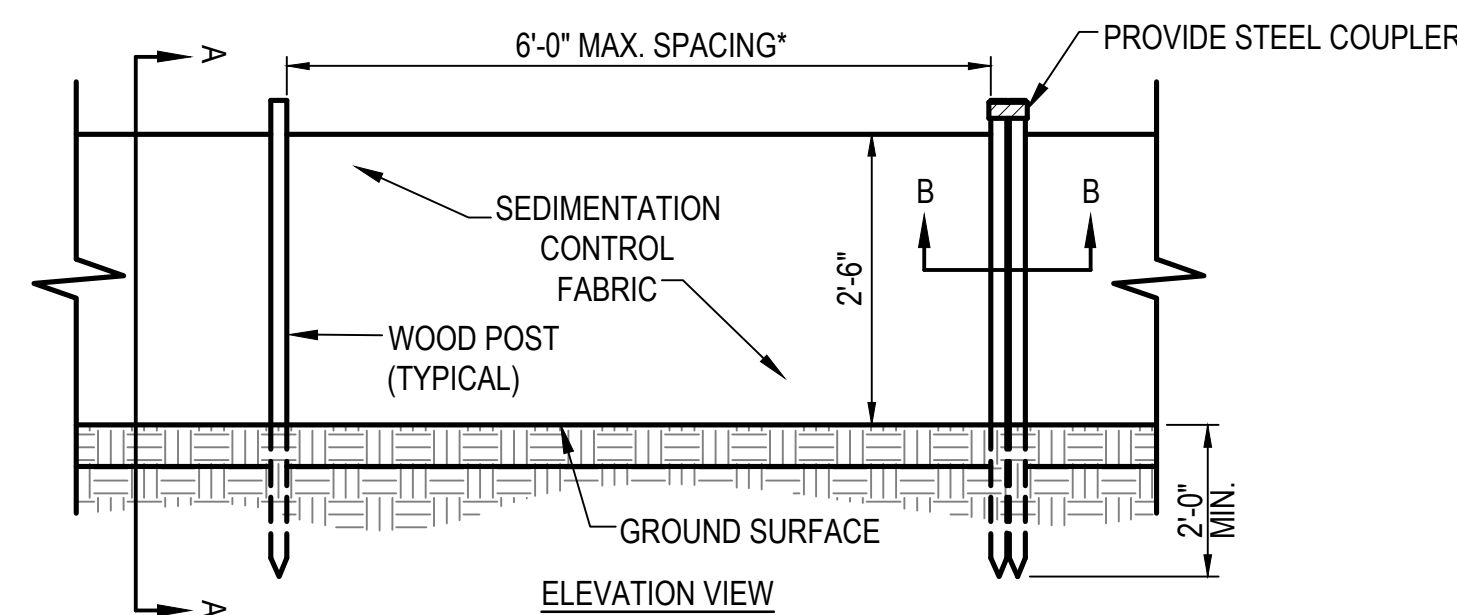
- ALL COSTS ASSOCIATED WITH EXCAVATION, PLACEMENT OF STONE, FABRIC, FILTER BAG, HOSE, SEDIMENT BARRIER, REMOVAL OF STONE/FABRIC AND RESTORATION OF SITE, SHALL BE CONSIDERED INCIDENTAL TO THE INSTALLATION AND REMOVAL OF DEWATERING SEDIMENT DEVICE C-102 PAY ITEM.



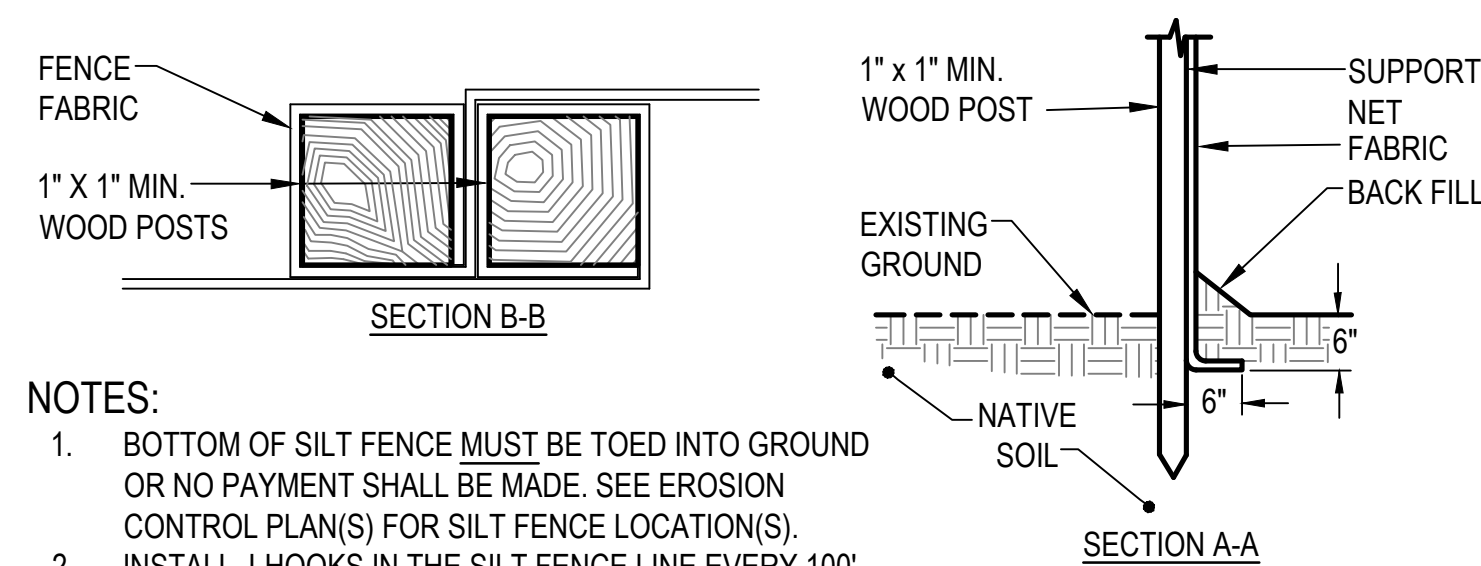
**2** TEMPORARY STABILIZED CONSTRUCTION EXIT  
 NOT TO SCALE

**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.

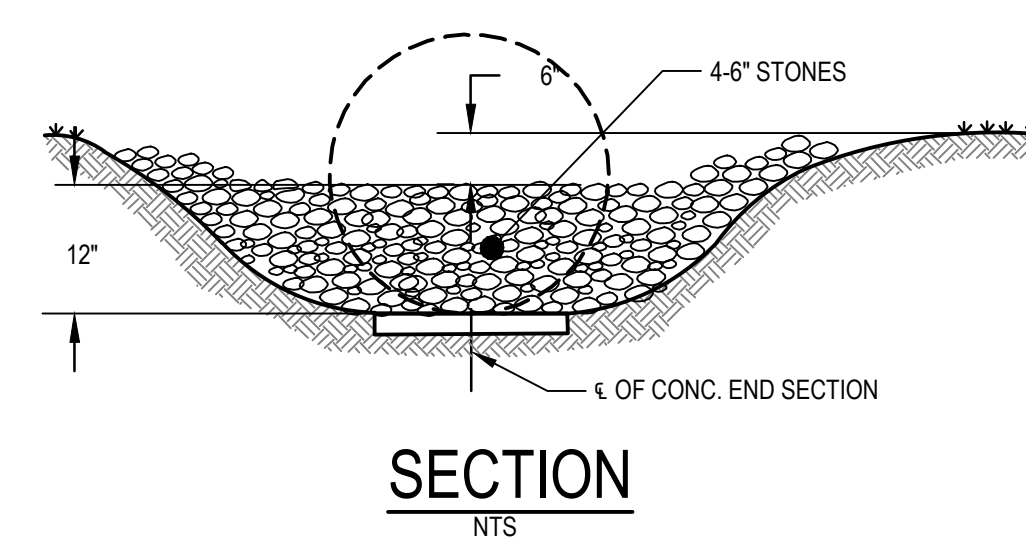


\*NOTE: THE SILT FENCE SHOULD HAVE A MAXIMUM STAKING DISTANCE OF 6', UNLESS THE FENCE IS SUPPORTED BY WIRE FENCE REINFORCEMENT, A MAXIMUM 14 GAUGE AND WITH A MINIMUM MESH SPACING OF 6'.



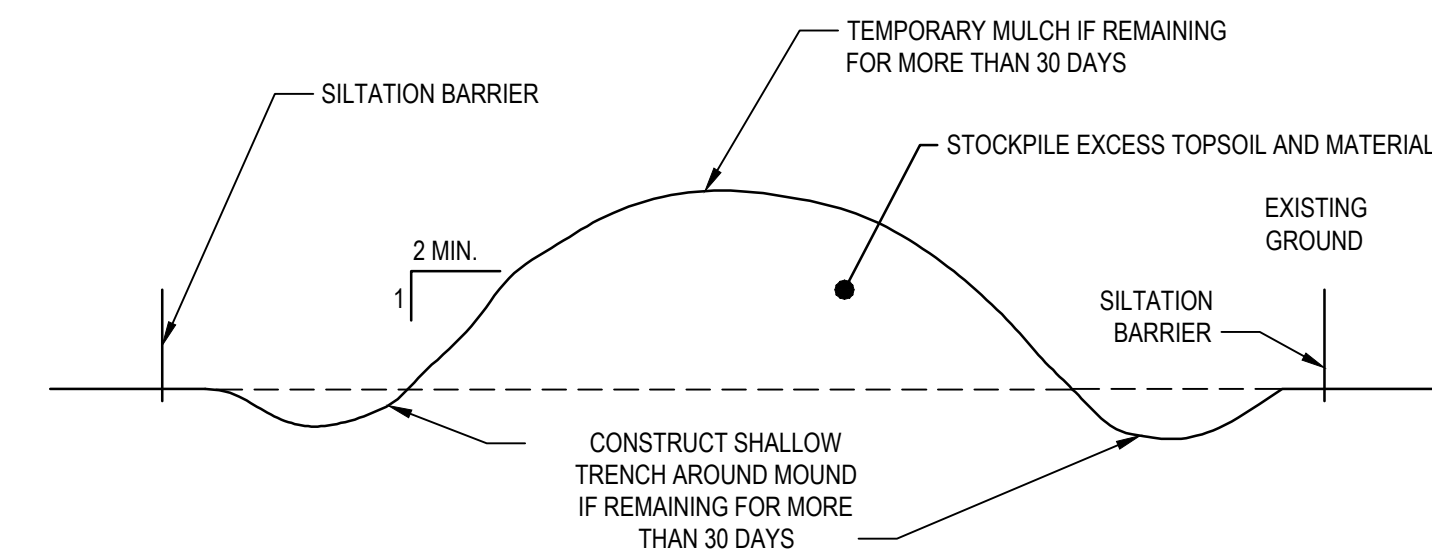
- NOTES:**
- BOTTOM OF SILT FENCE MUST BE TOED INTO GROUND OR NO PAYMENT SHALL BE MADE. SEE EROSION CONTROL PLAN(S) FOR SILT FENCE LOCATION(S).
  - INSTALL J-HOOKS IN THE SILT FENCE LINE EVERY 100' AND AS NEEDED BASED ON SITE TOPOGRAPHY.
  - WHERE DOUBLE SEDIMENT BARRIERS ARE CALLED FOR ON THE PLANS,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

**3** SEDIMENT BARRIER DETAIL  
 NOT TO SCALE

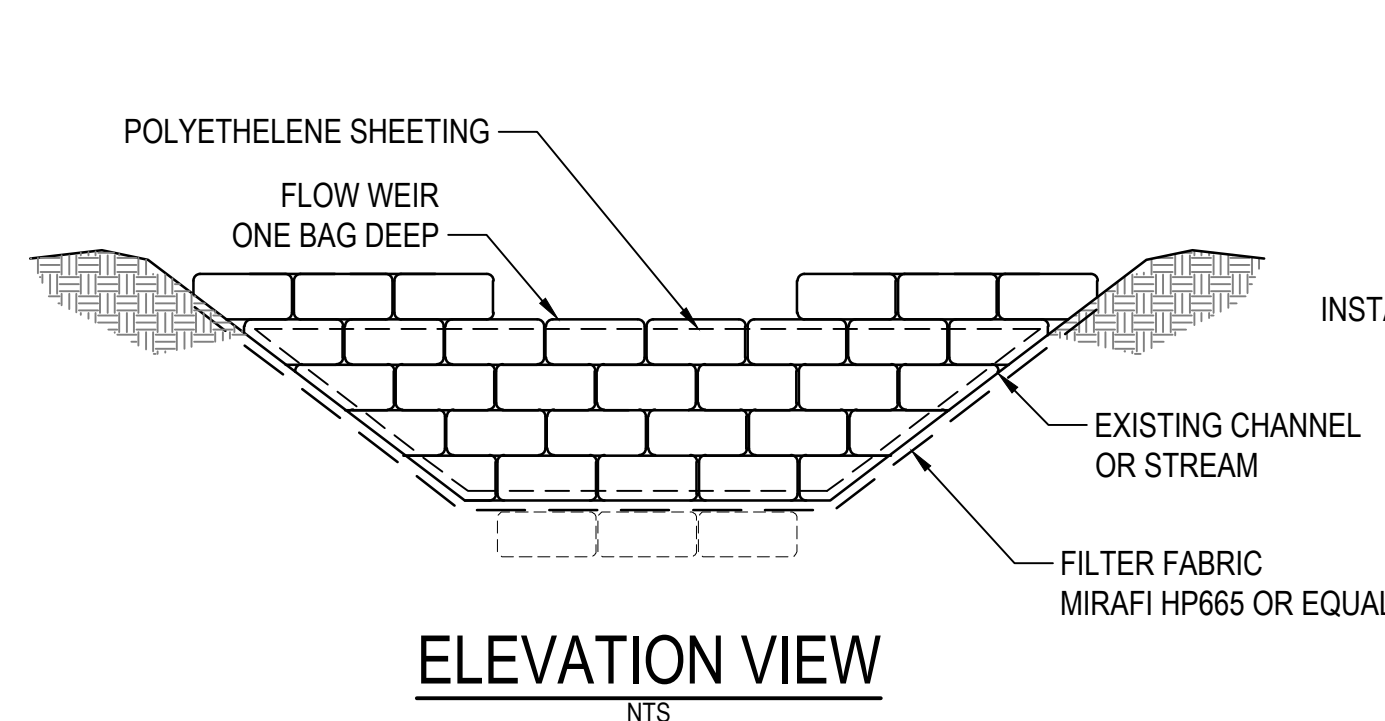


NOTE: SEDIMENT SHOULD BE REMOVED FROM BEHIND CHECK DAM WHEN IT HAS ACCUMULATED TO ONE HALF OF THE ORIGINAL HEIGHT OF THE DAM.

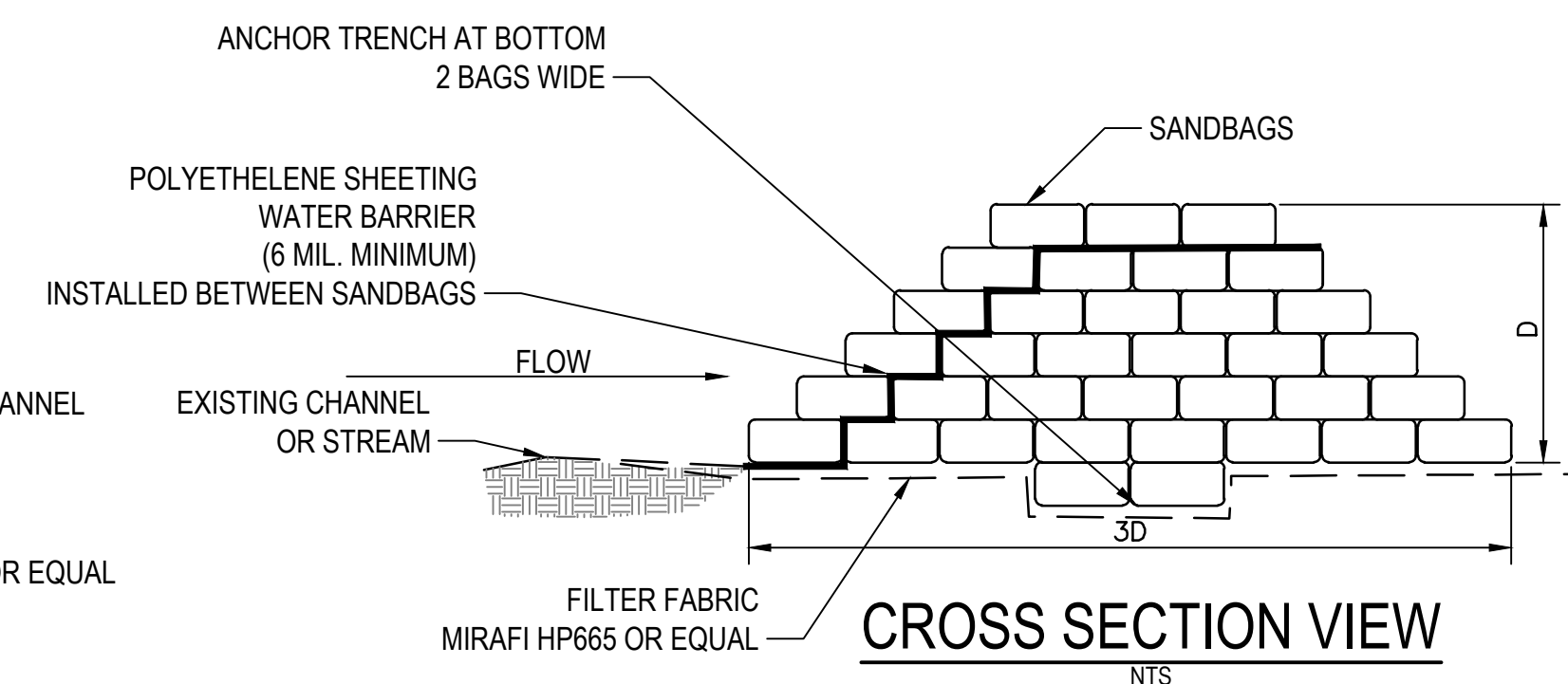
**4** STONE CHECK DAM  
 NOT TO SCALE



**5** TOPSOIL STOCKPILE MOUND  
 NOT TO SCALE



**6** UPSTREAM SANDBAG DIVERSION BERM AND PIPE DETAIL  
 NOT TO SCALE



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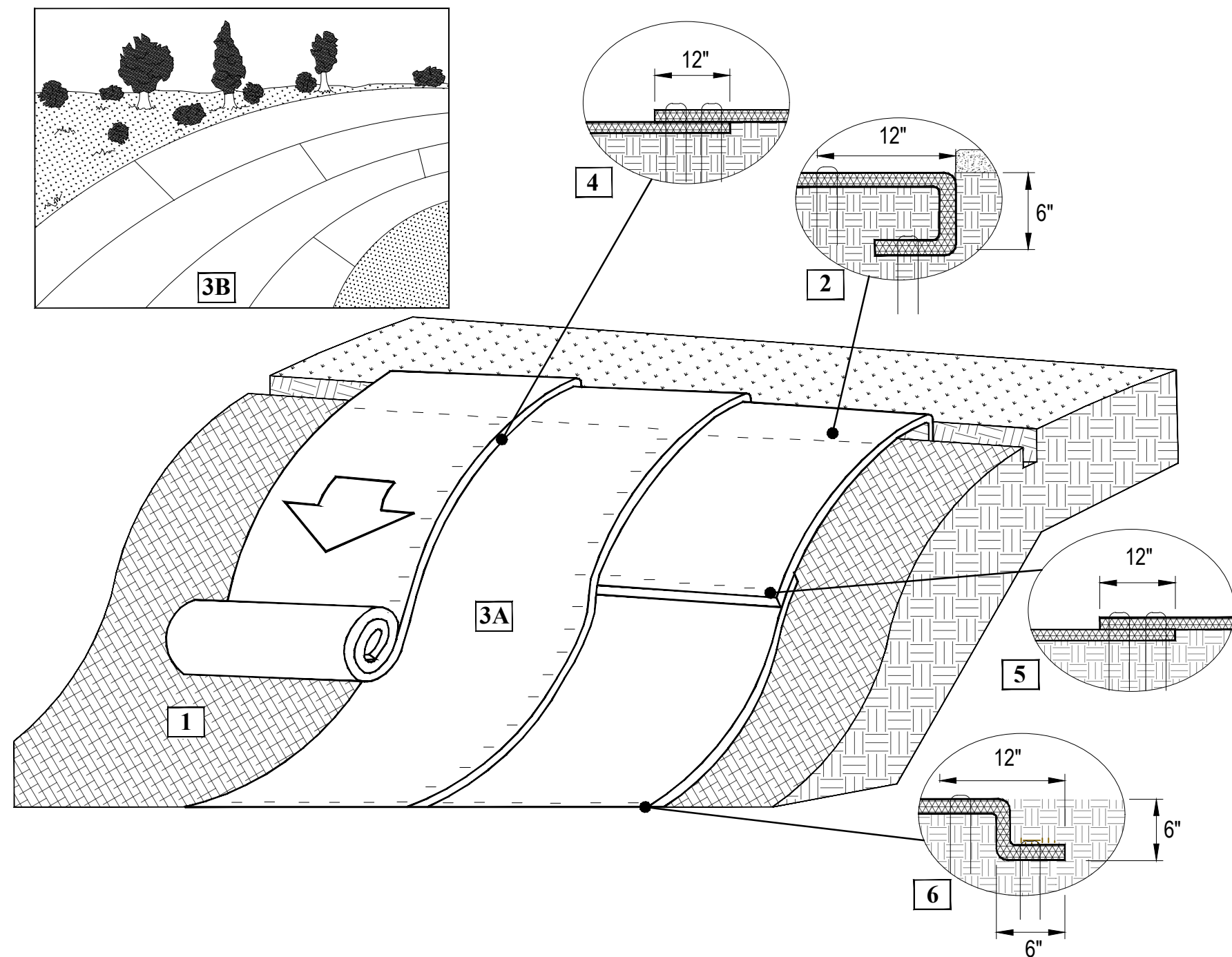


Client/Project  
 LAWRENCE MUNICIPAL AIRPORT  
 NORTH ANDOVER, MA  
 RUNWAY 5 END  
 DRAINAGE IMPROVEMENTS

Title  
 EROSION CONTROL DETAILS - 1

Project No. 179450605	Sheet C404	Revision 0
Drawing No.	Sheet	Revision

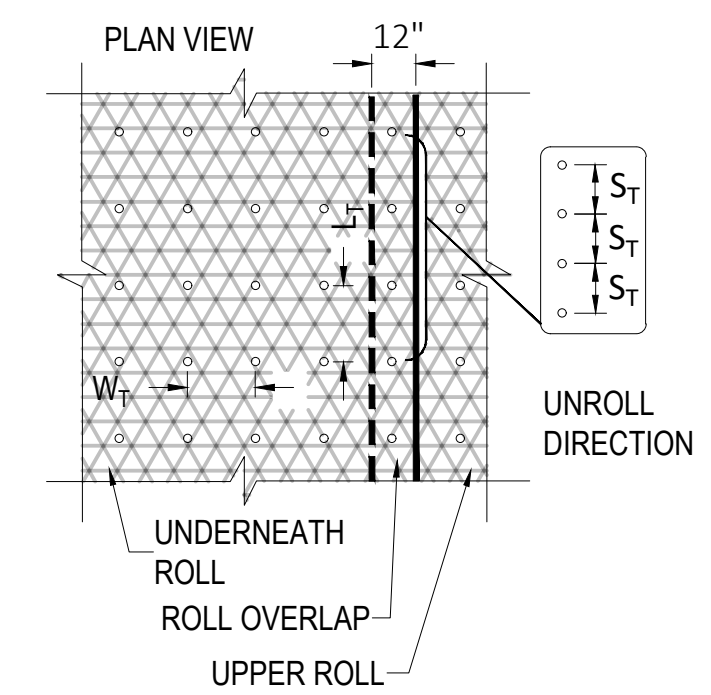
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**INSTRUCTIONS:**

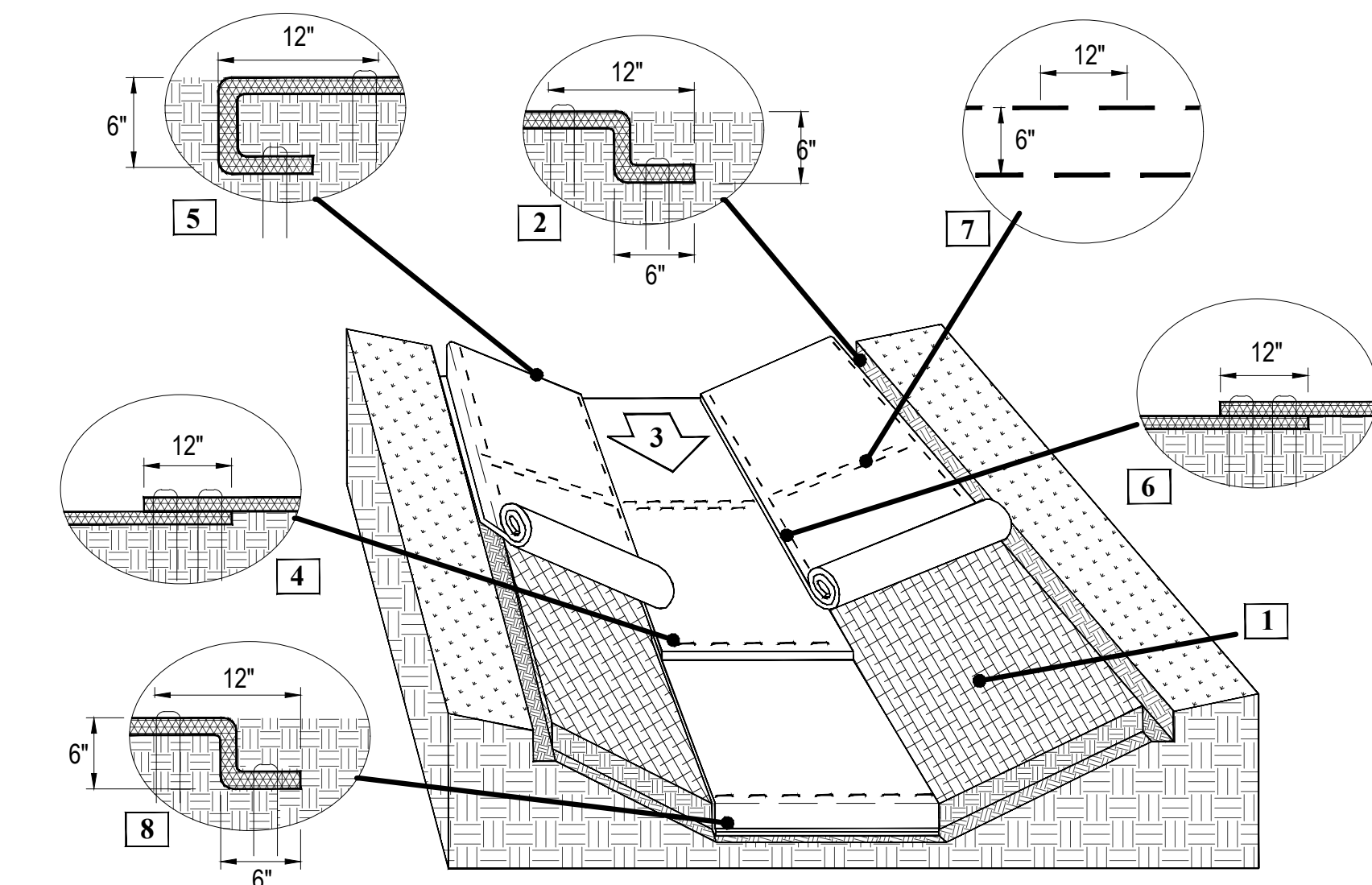
1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECPS), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. GROUND SURFACE MUST BE FREE OF DEBRIS, ROCKS, CLAY CLOUDS AND RAKED SMOOTH SUFFICIENT TO ALLOW INTIMATE CONTACT OF THE RECP WITH THE SOIL OVER THE ENTIRETY OF 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

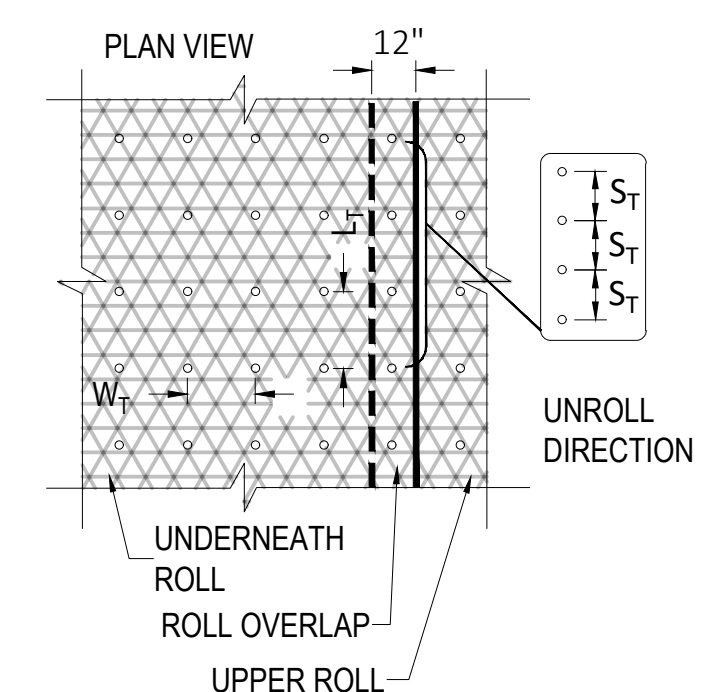
DIMENSION	STAPLE PATTERN	
	C	D
$W_T$	30"	24"
$L_T$	30"	20"
$S_T$	18"	18"
NOMINAL FREQUENCY	1.7 / SY	3.0 / SY
APPLICATION	ECB (DEGRADABLE)	TRM (PERMANENT)



**INSTRUCTIONS:**

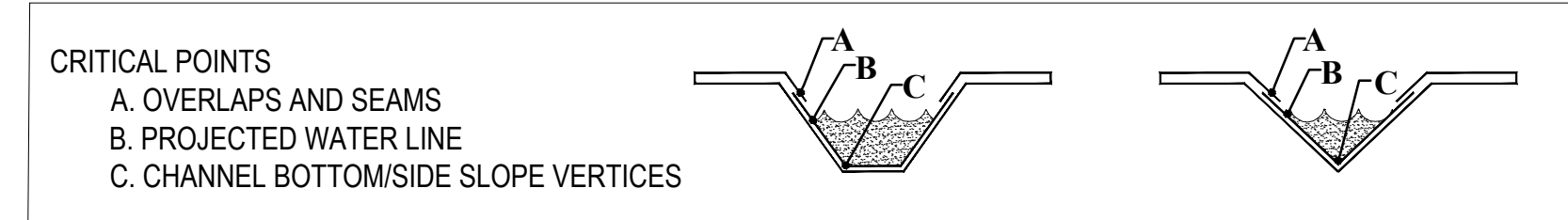
1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECPS), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. GROUND SURFACE MUST BE FREE OF DEBRIS, ROCKS, CLAY CLOUDS AND RAKED SMOOTH SUFFICIENT TO ALLOW INTIMATE CONTACT OF THE RECP WITH THE SOIL OVER THE ENTIRETY OF 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.
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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

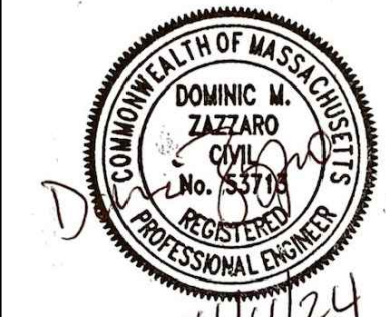
DIMENSION	STAPLE PATTERN
	E
$W_T$	20"
$L_T$	20"
$S_T$	18"
NOMINAL FREQUENCY	3.8 / SY



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

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

Title  
 EROSION CONTROL DETAILS - 2

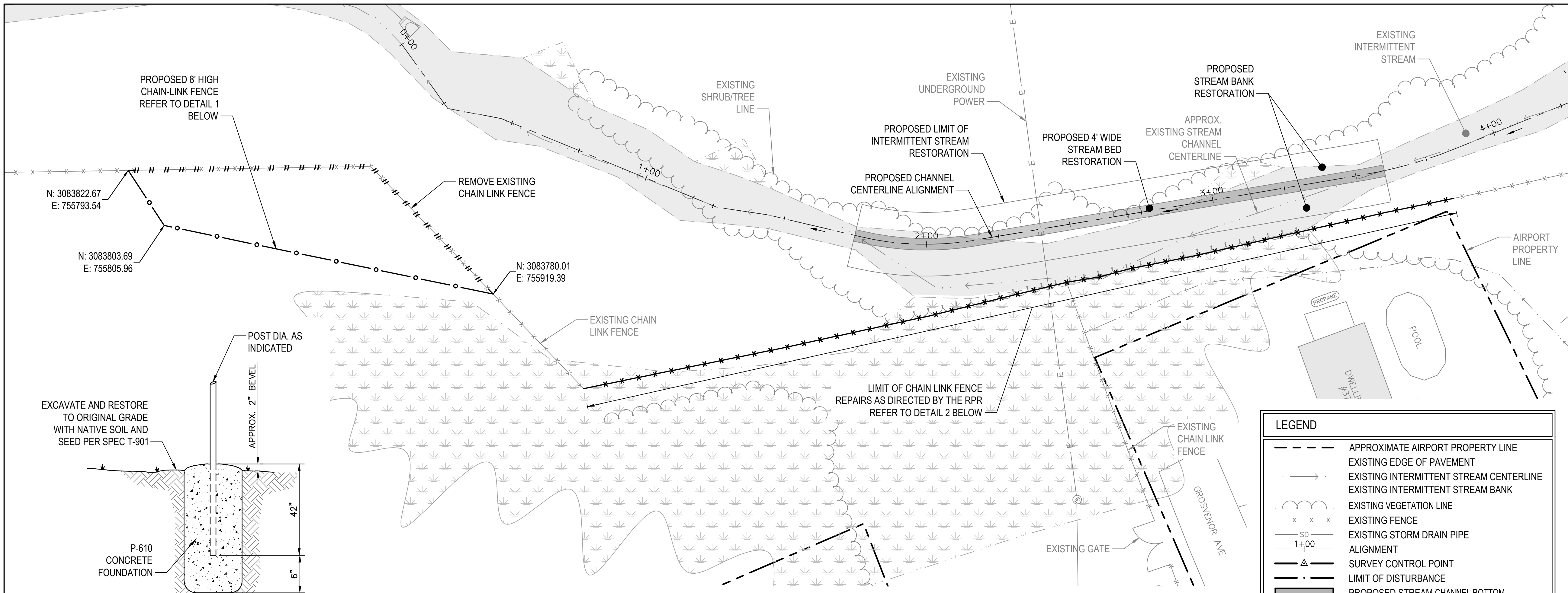
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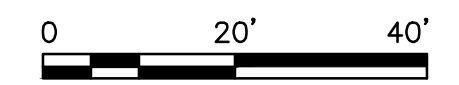
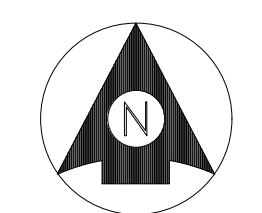




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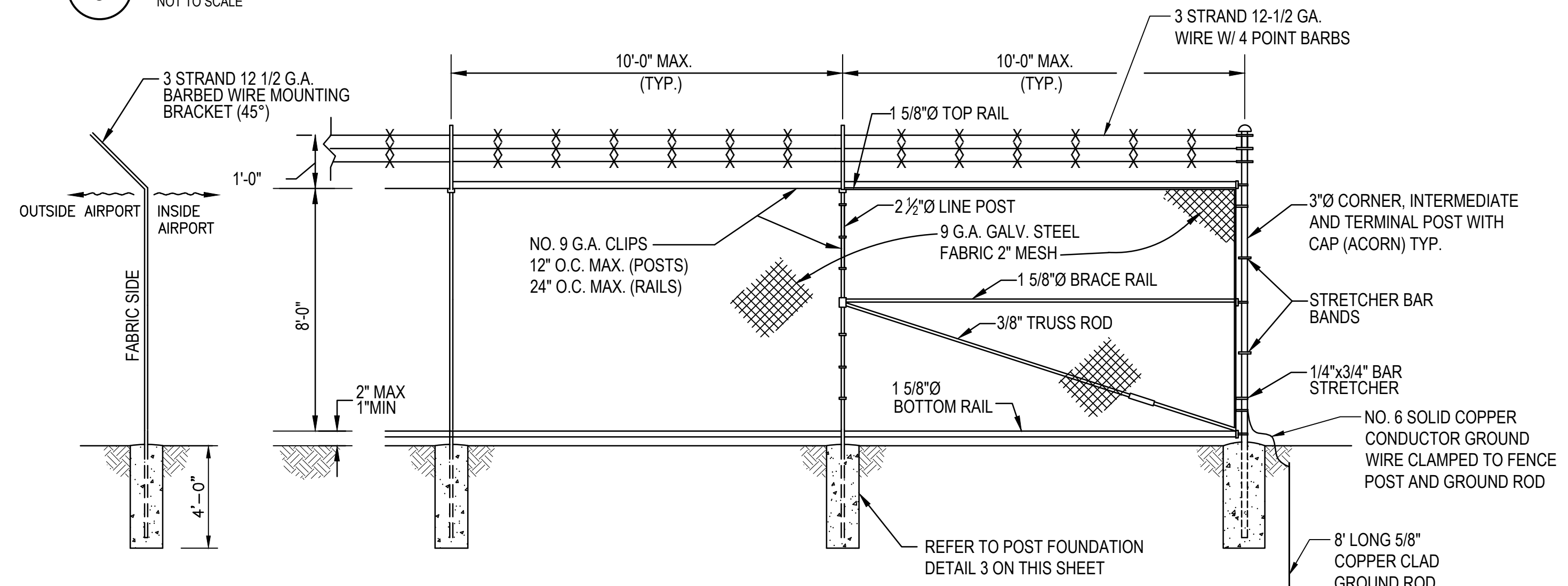
LEGEND	
	APPROXIMATE AIRPORT PROPERTY LINE
	EXISTING EDGE OF PAVEMENT
	EXISTING INTERMITTENT STREAM CENTERLINE
	EXISTING INTERMITTENT STREAM BANK
	EXISTING VEGETATION LINE
	EXISTING FENCE
	EXISTING STORM DRAIN PIPE ALIGNMENT
	SURVEY CONTROL POINT
	LIMIT OF DISTURBANCE
	PROPOSED STREAM CHANNEL BOTTOM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



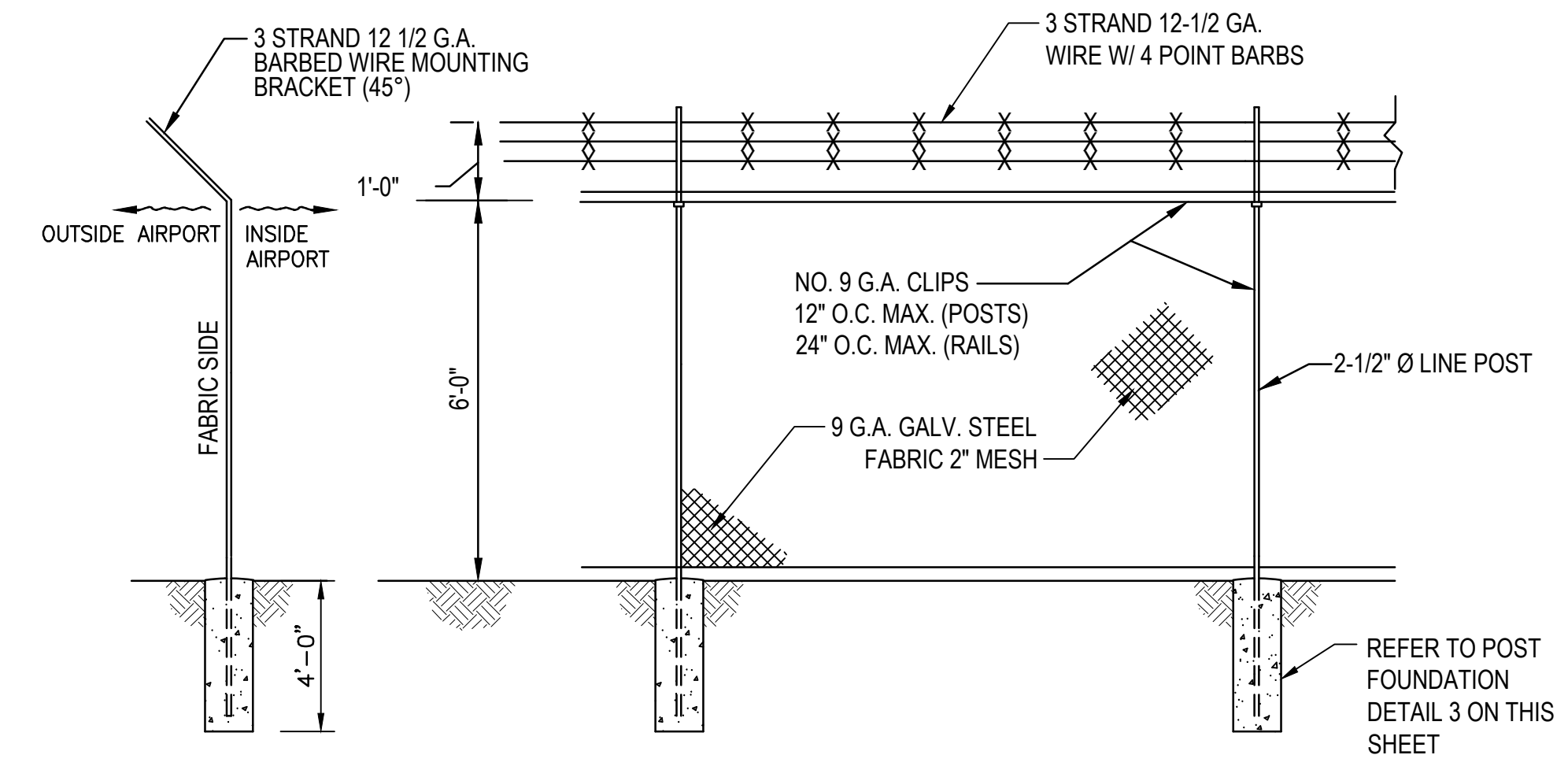
**FENCE PLAN**

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

**3 FENCE POST FOUNDATION**  
 NOT TO SCALE



- 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 REQUIRED TO 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.



- NOTES:**
- FENCE FABRIC REPLACEMENT SHALL CONSIST OF REMOVING AND REPLACING THE EXISTING FABRIC AS DIRECTED BY THE RPR. THE CONTRACTOR SHALL ASSUME ONE 10 FOOT SECTION OF FABRIC WILL NEED TO BE REPLACED.
  - FENCE FABRIC REPAIRS SHALL CONSIST OF REATTACHING THE EXISTING FABRIC TO THE POSTS WITH WIRE TIES AS DIRECTED BY THE RPR.
  - FENCE POST REPLACEMENT SHALL CONSIST OF REMOVING AND REPLACING EXISTING POSTS AS DIRECTED BY THE RPR. THE CONTRACTOR SHALL ASSUME TWO LINE POSTS WILL NEED TO BE REPLACED.
  - BARBED WIRE REPLACEMENT SHALL CONSIST OF REMOVING AND REPLACING THE EXISTING 3 STRANDS OF BARBED WIRE INCLUDING MOUNTING BRACKETS AS INDICATED ON THE PLANS OR AS DIRECTED BY THE RPR.
  - FENCE POSTS 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

**1 8' HIGH CHAIN LINK FENCE**  
 NOT TO SCALE

**2 6' HIGH CHAIN LINK FENCE REPAIRS**  
 NOT TO SCALE

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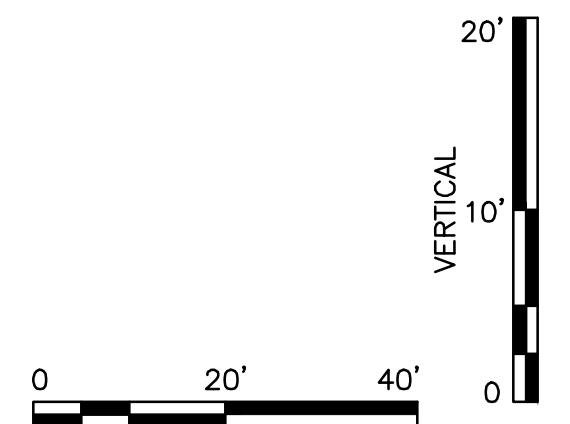
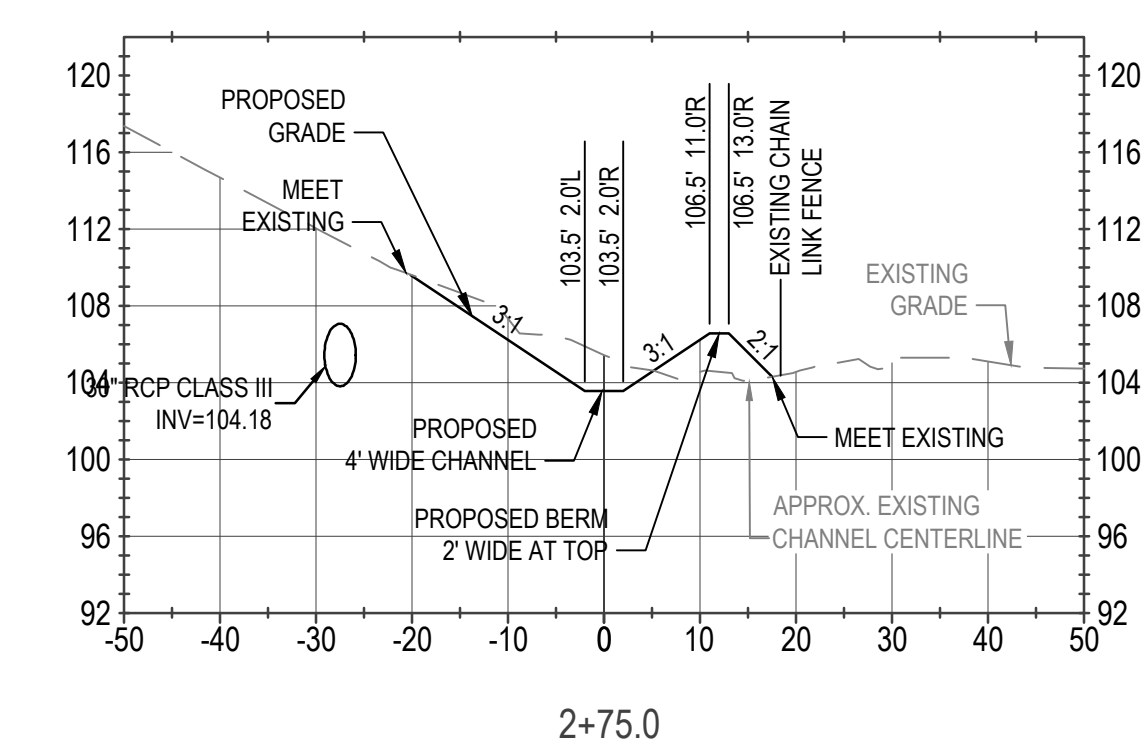
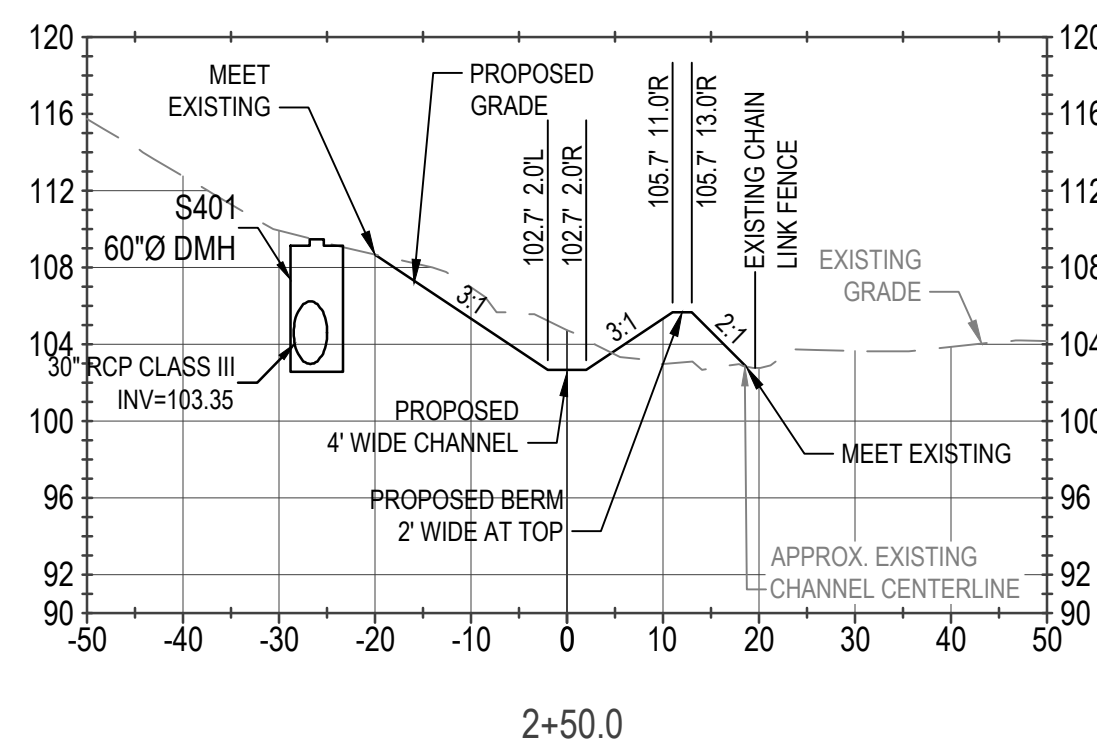
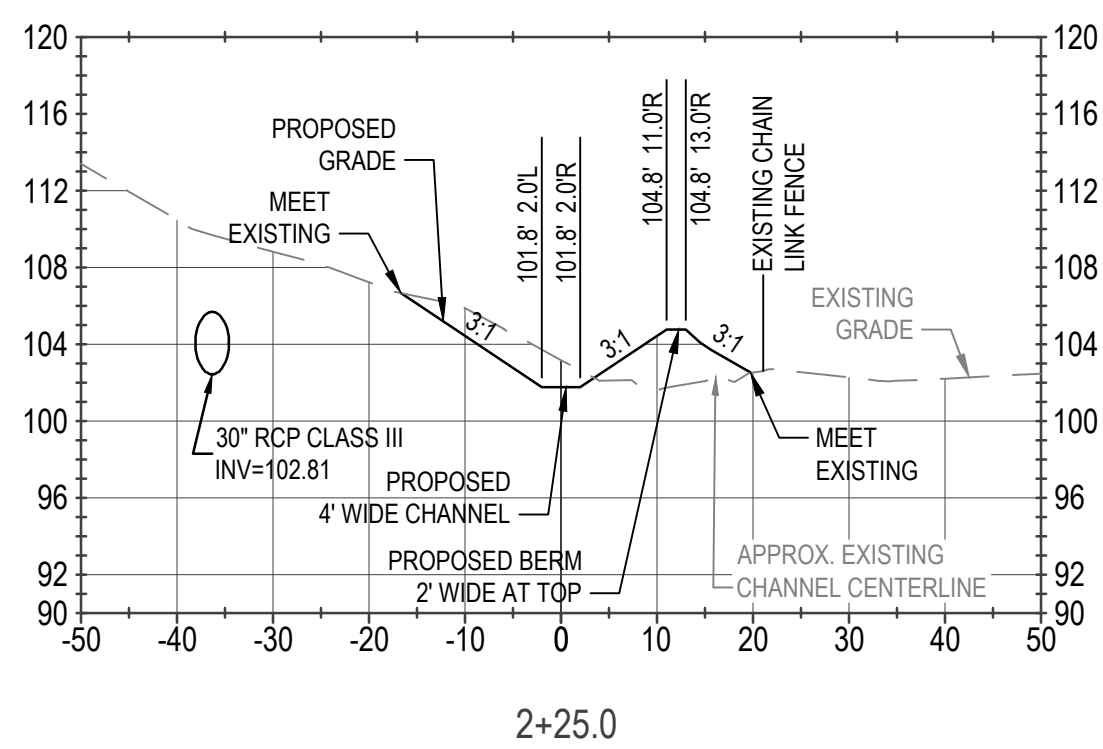
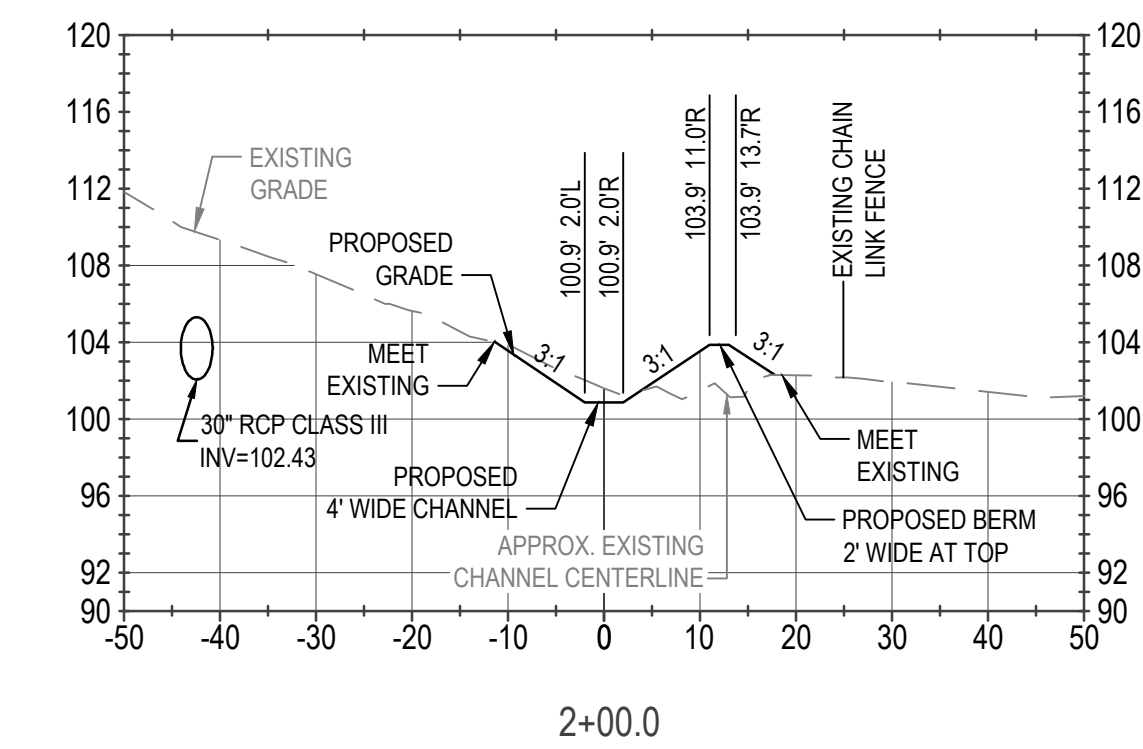
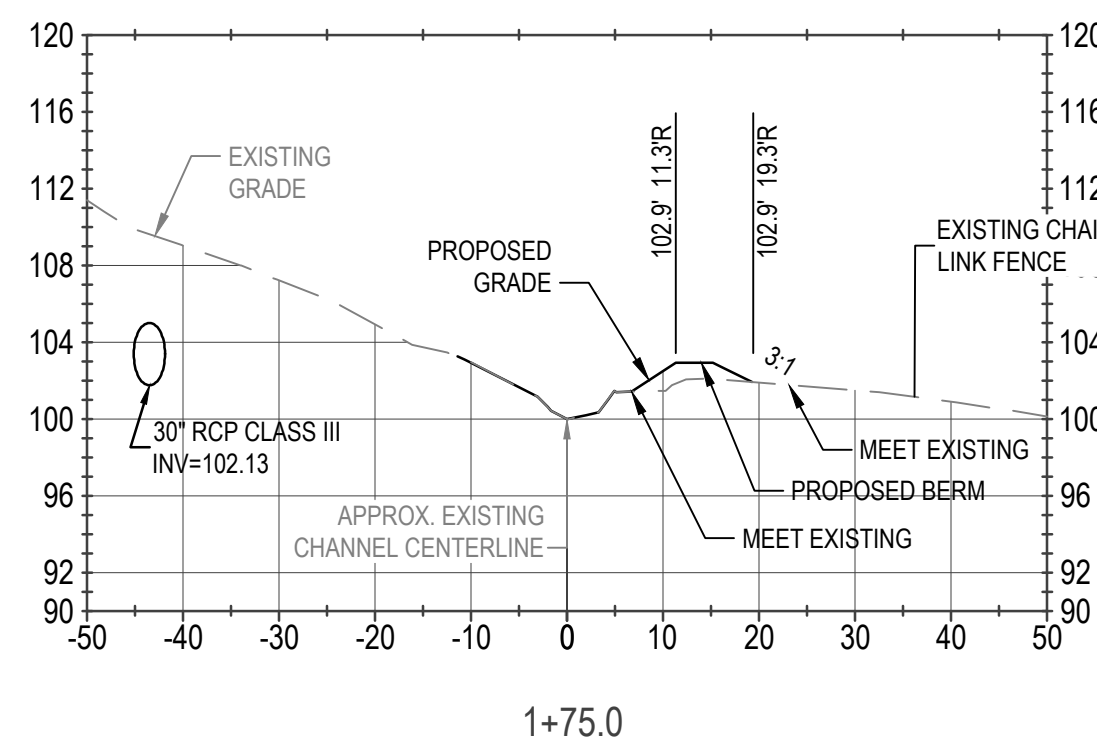
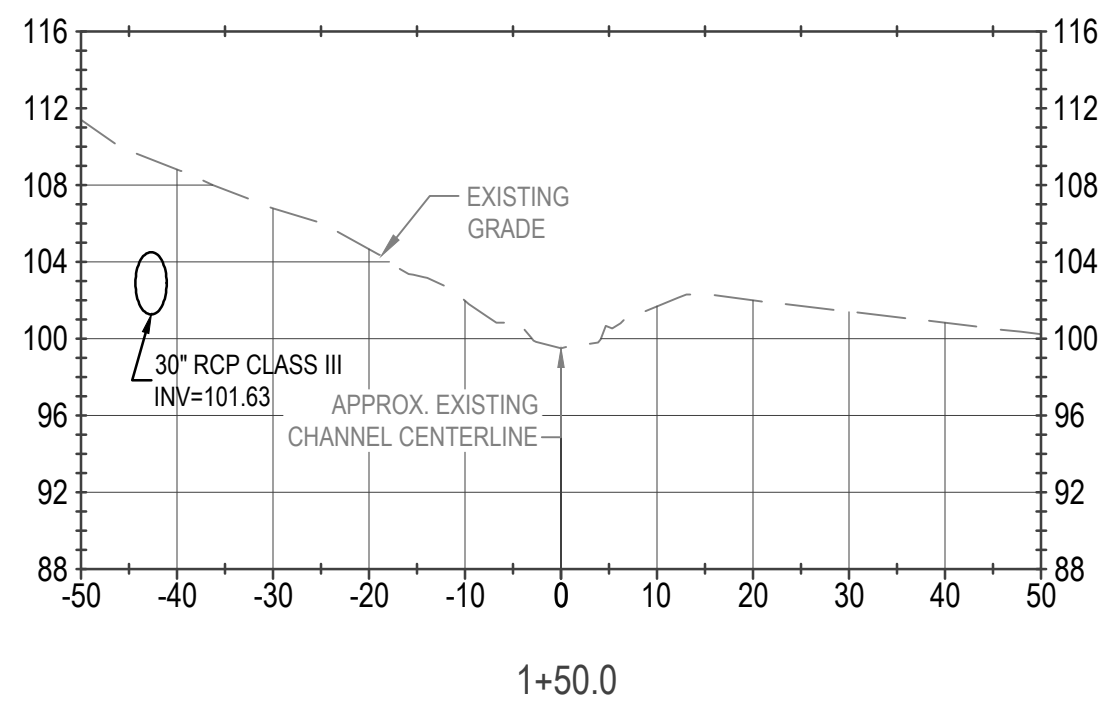
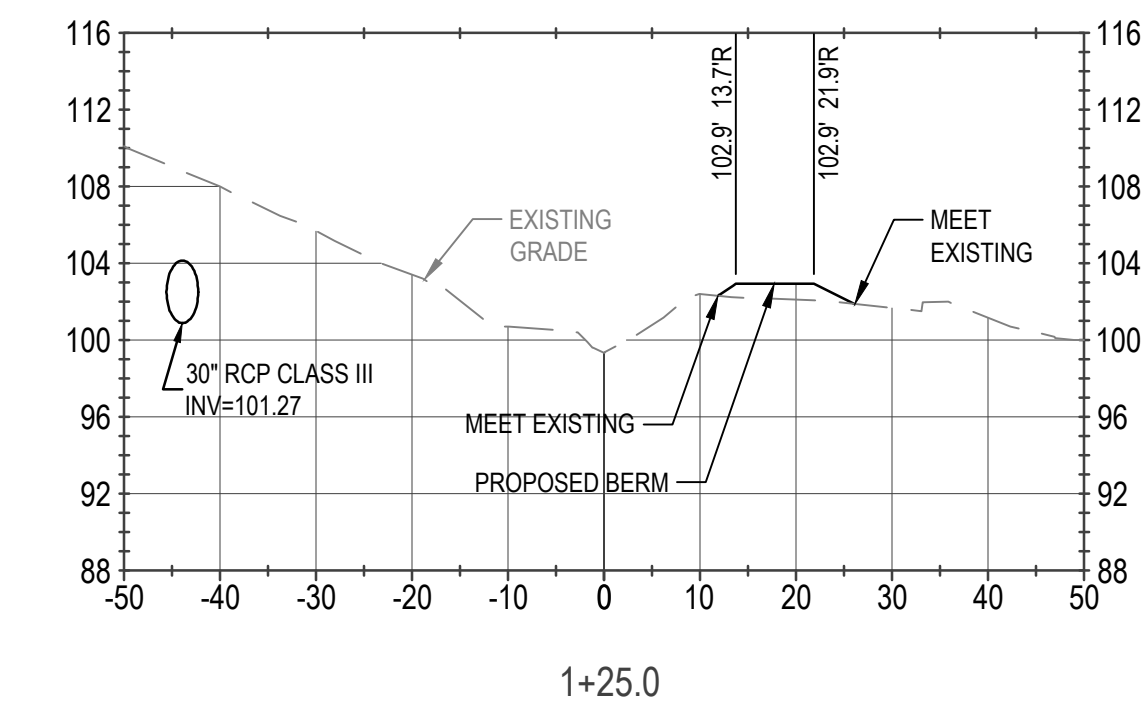
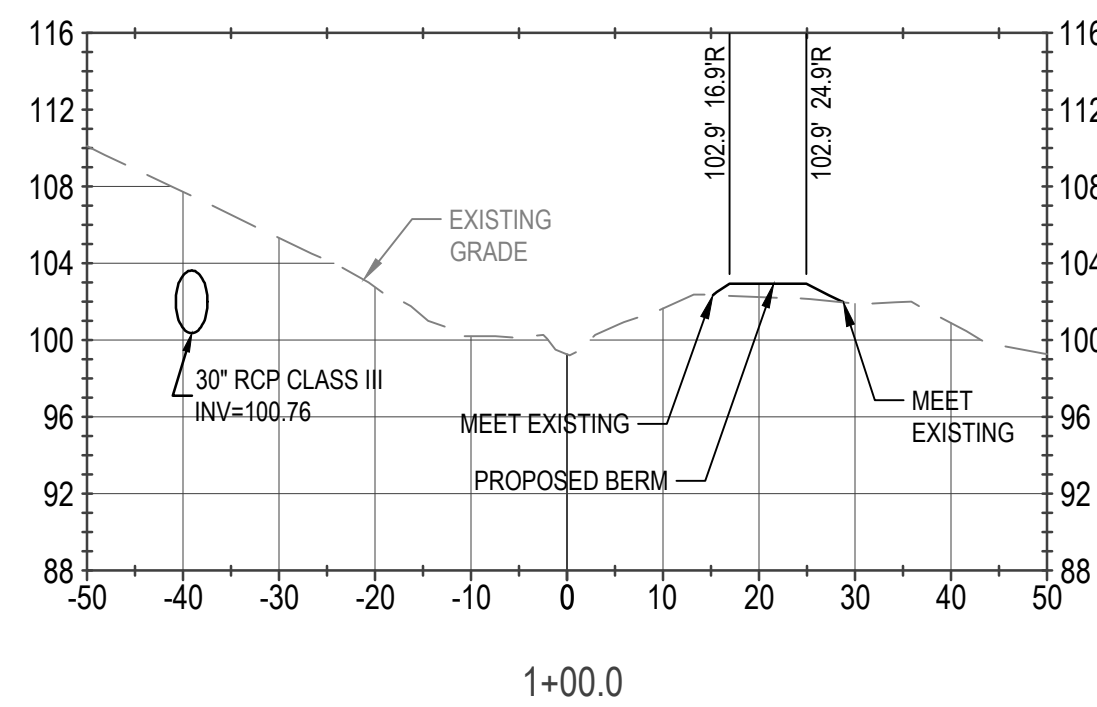
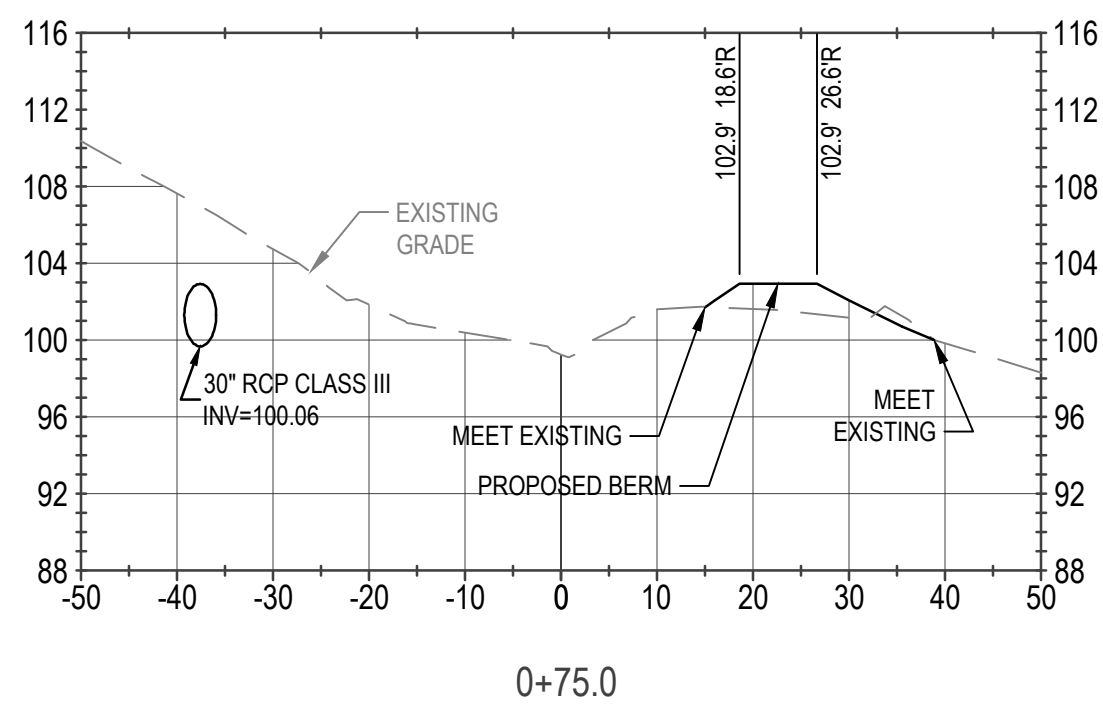
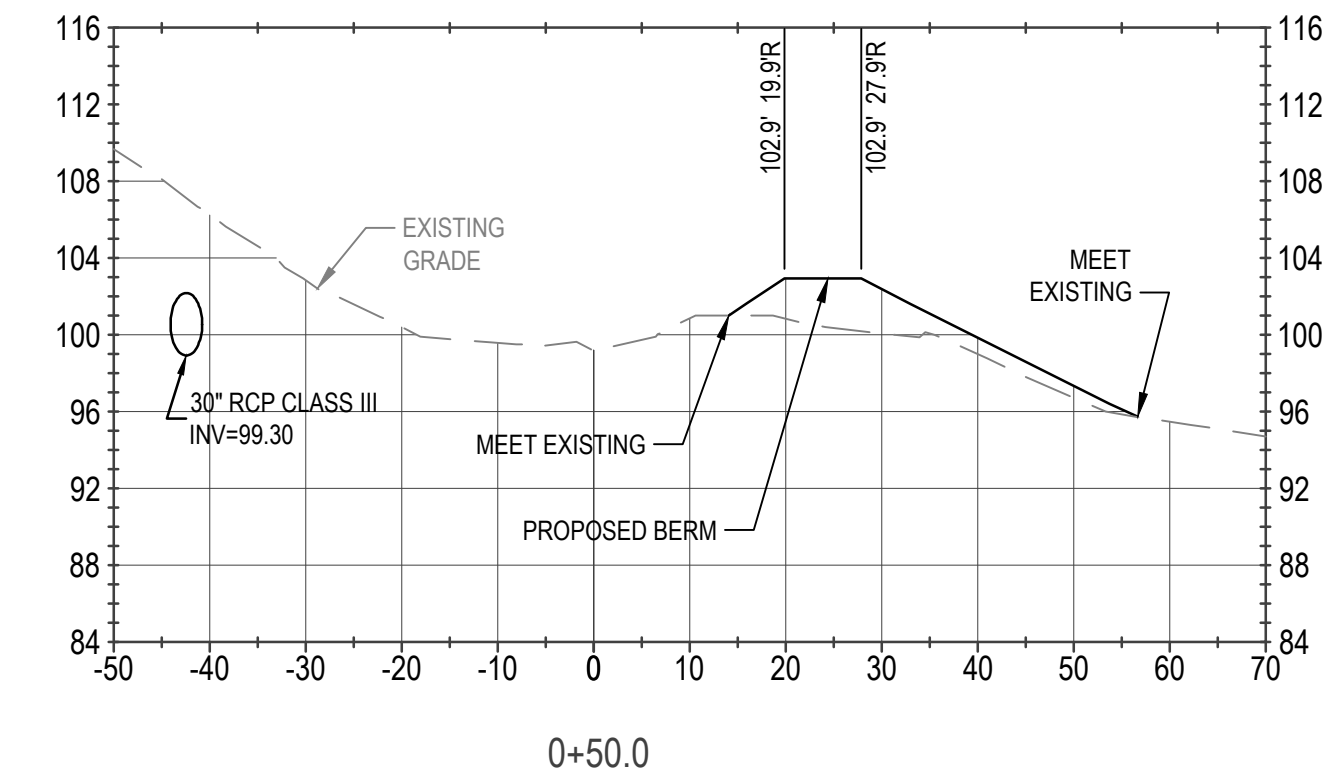
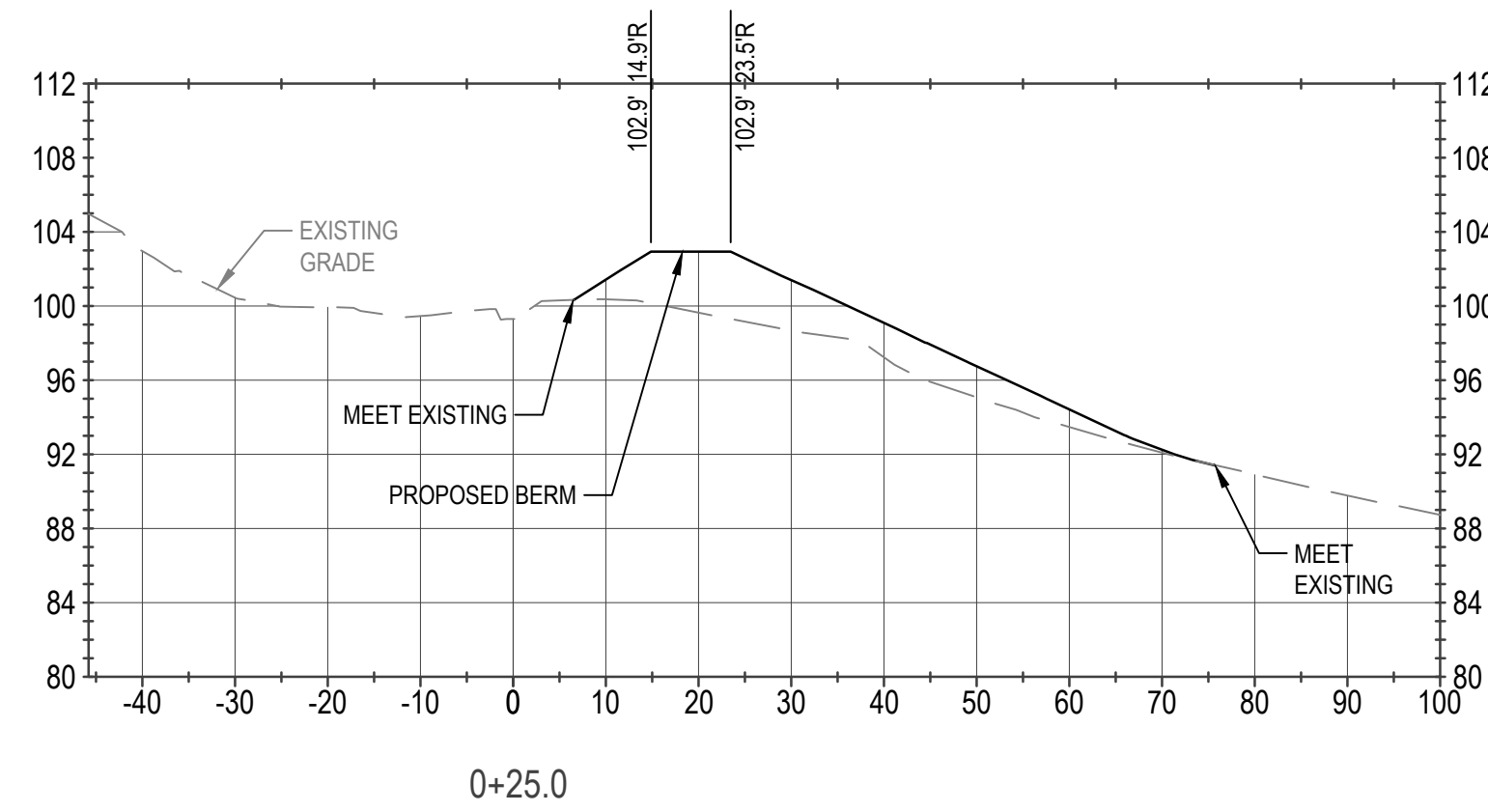
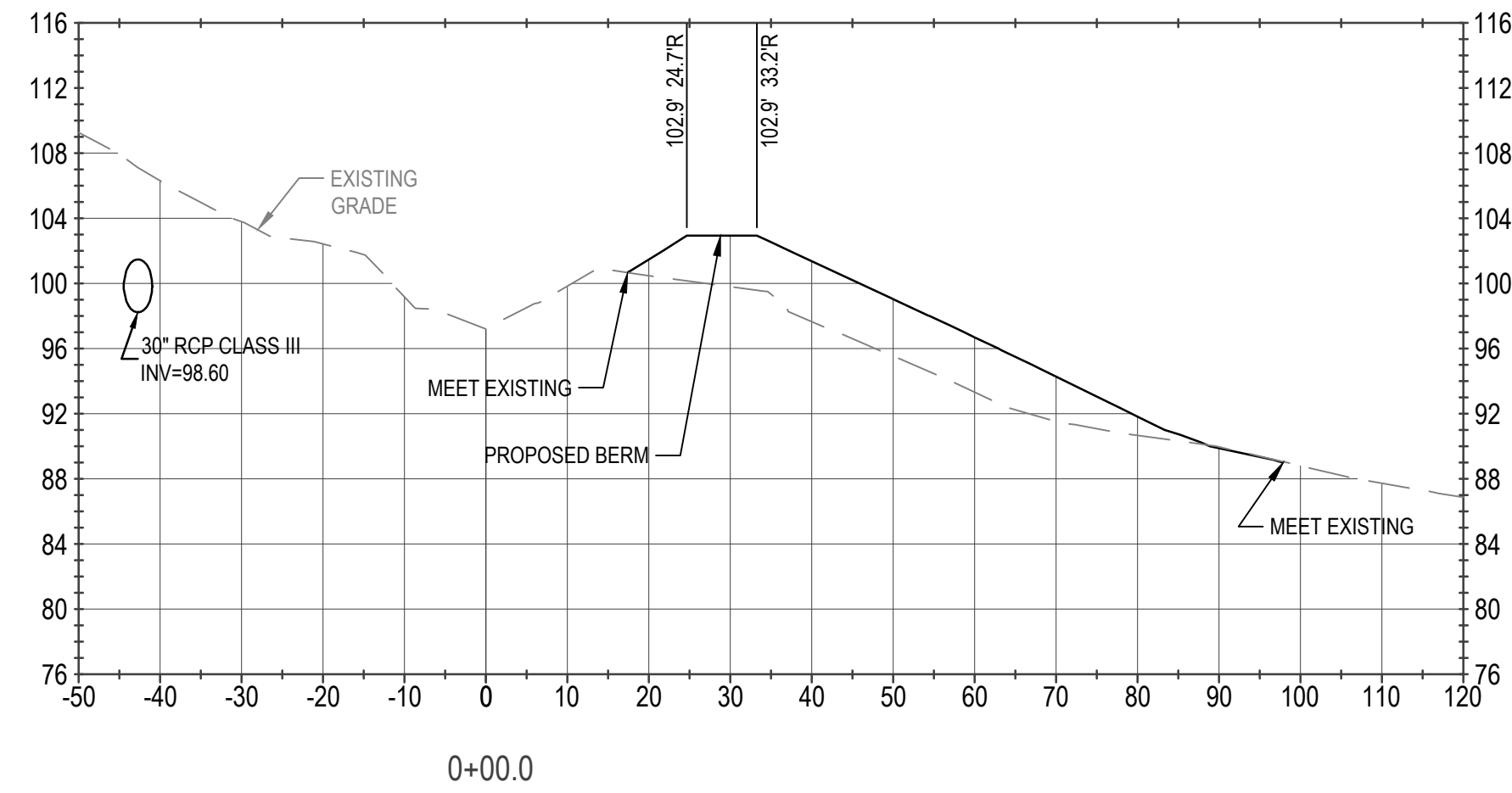
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**LAWRENCE MUNICIPAL AIRPORT**  
**NORTH ANDOVER, MA**  
**RUNWAY 5 END**  
**DRAINAGE IMPROVEMENTS**

Title  
**FENCE PLAN AND DETAILS**

Project No. 179450605	Sheet	Revision
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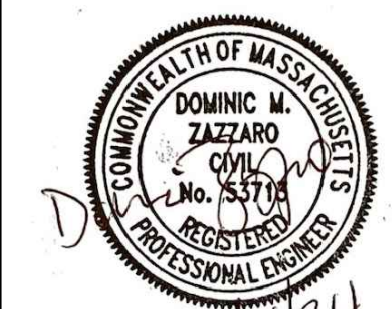
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 APRIL 5, 2024



Revision	By	Appd.	YY.MM.DD
1	DMZ	DMZ	24.04.05
Issued	By	Appd.	YY.MM.DD

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

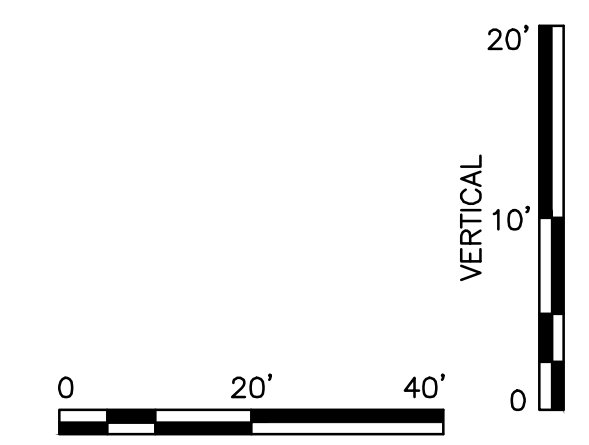
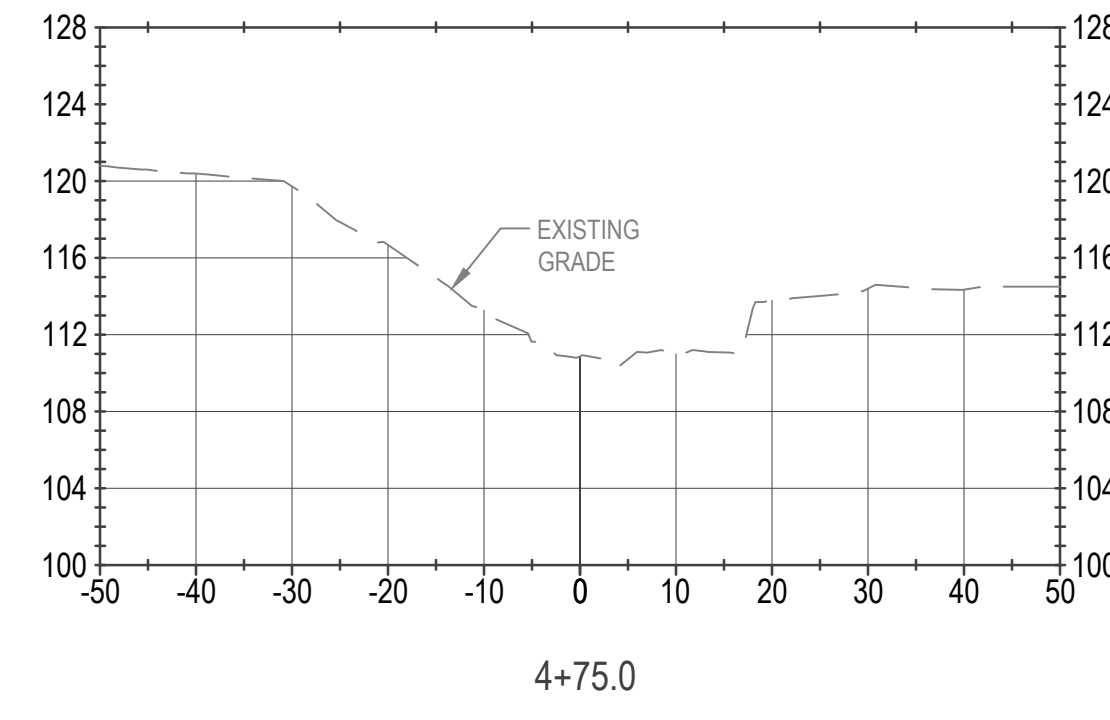
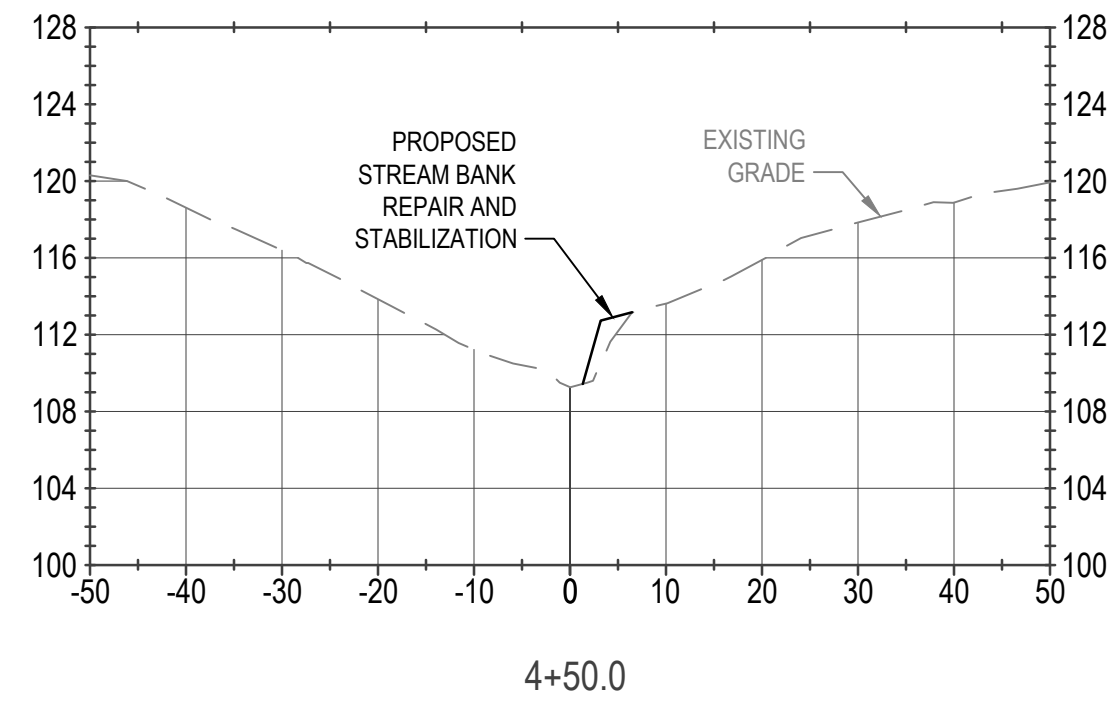
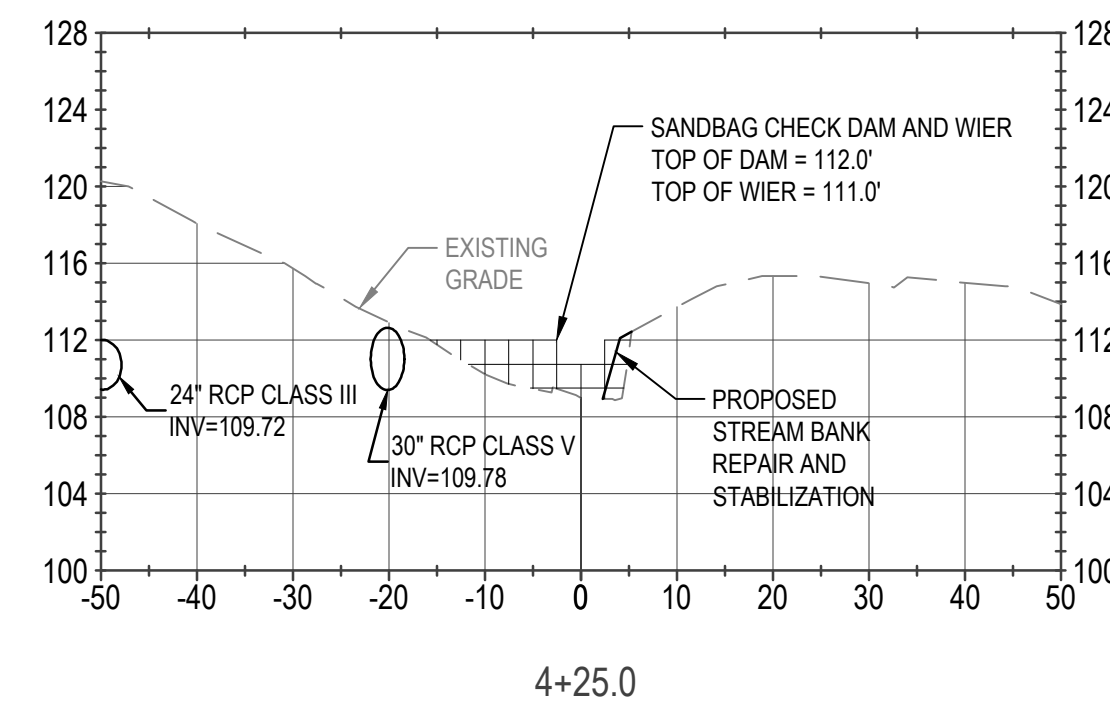
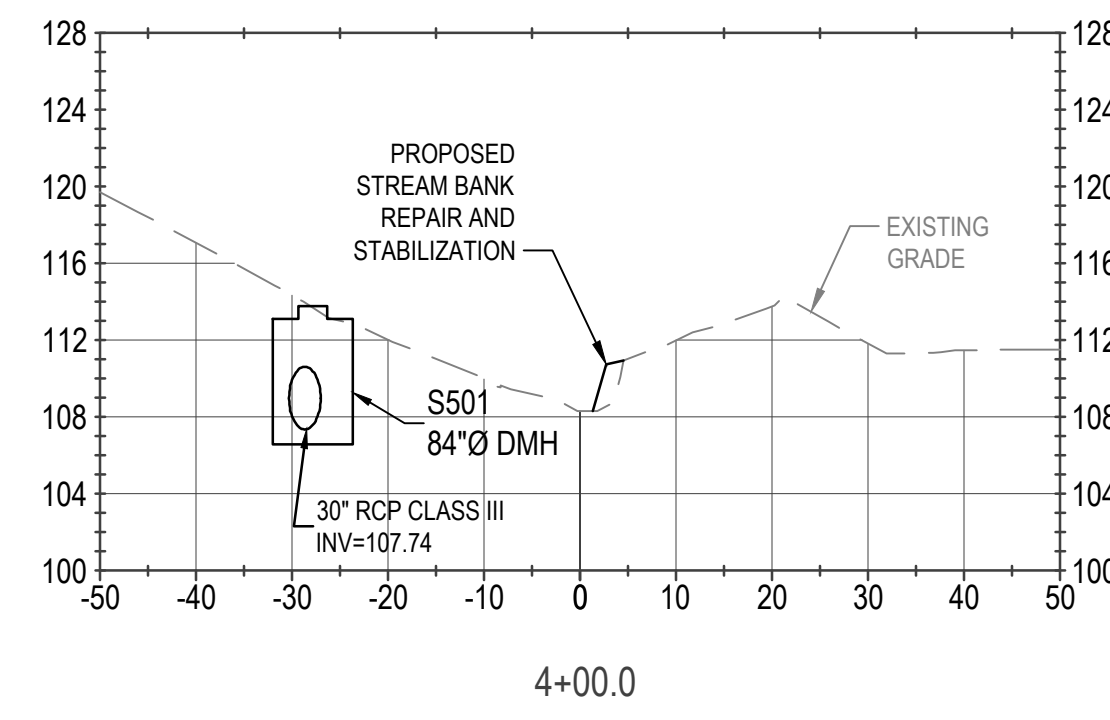
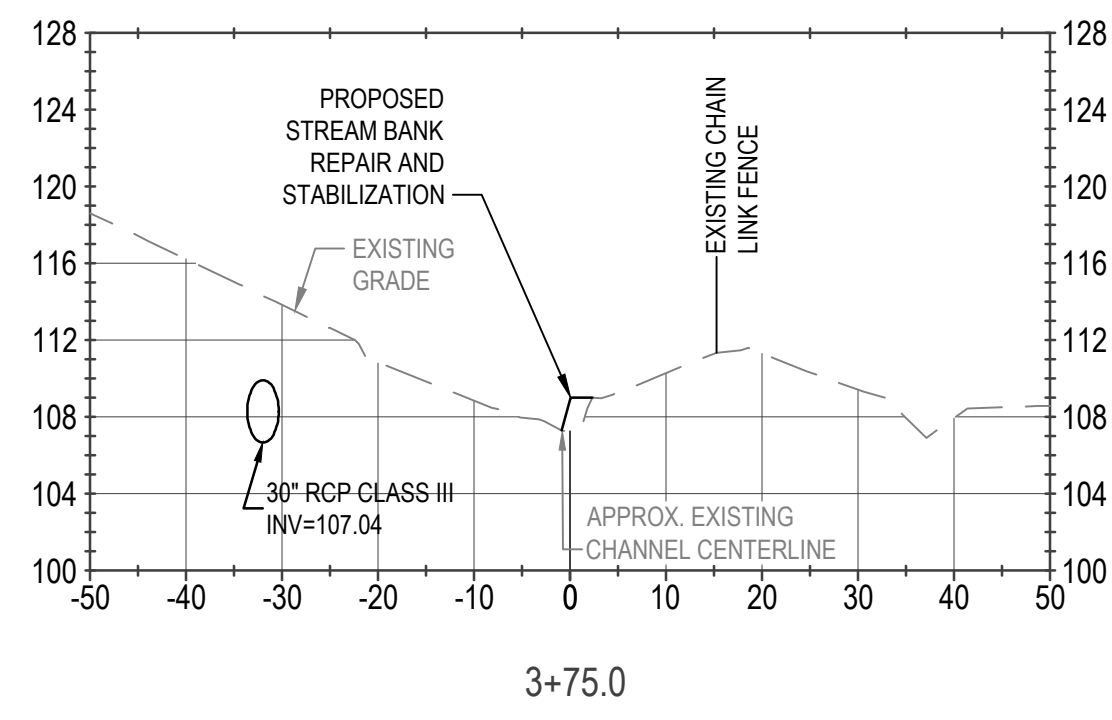
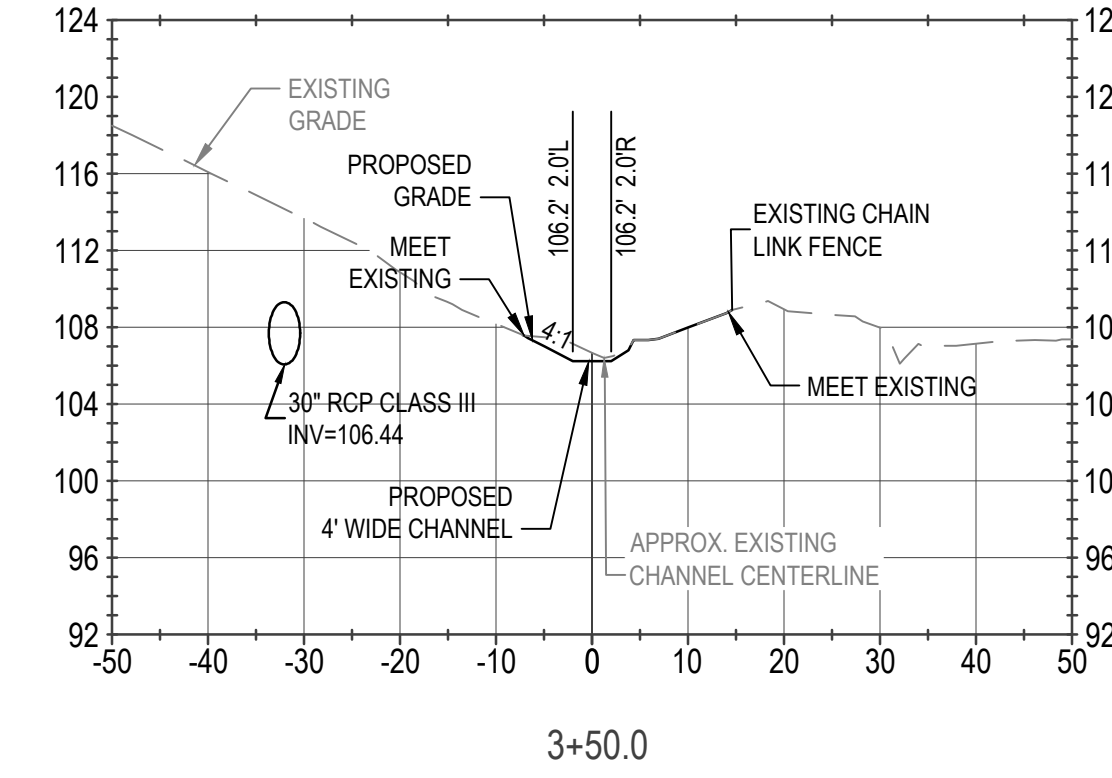
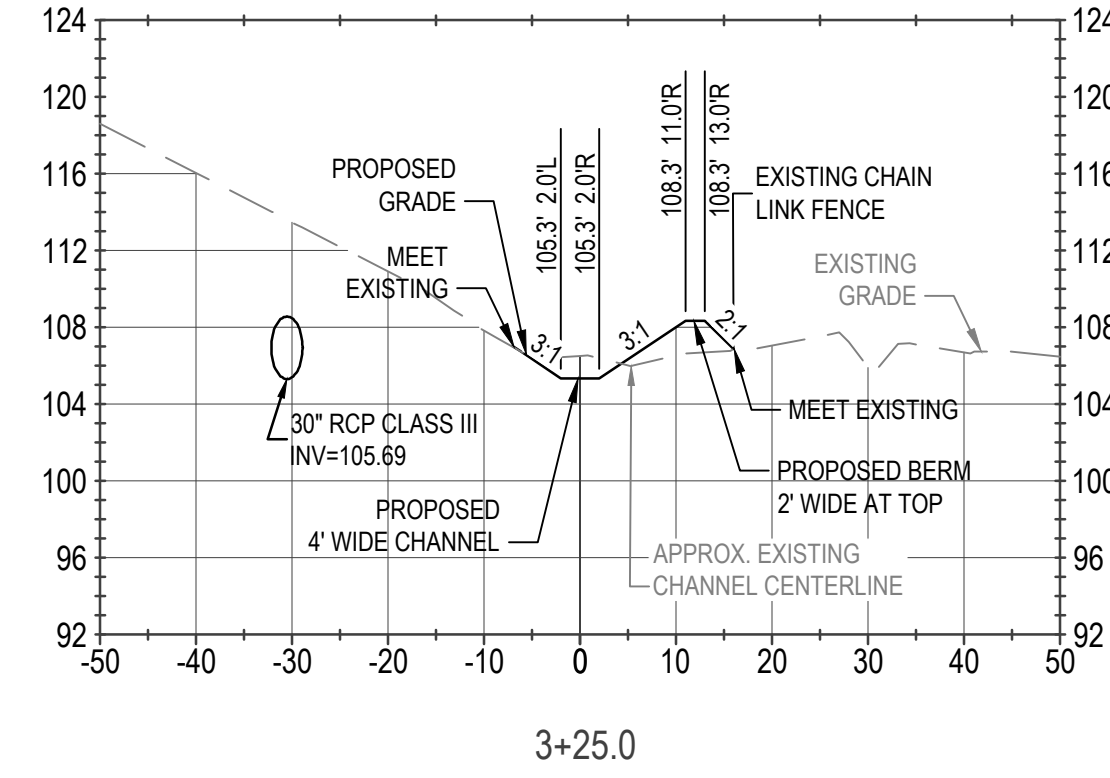
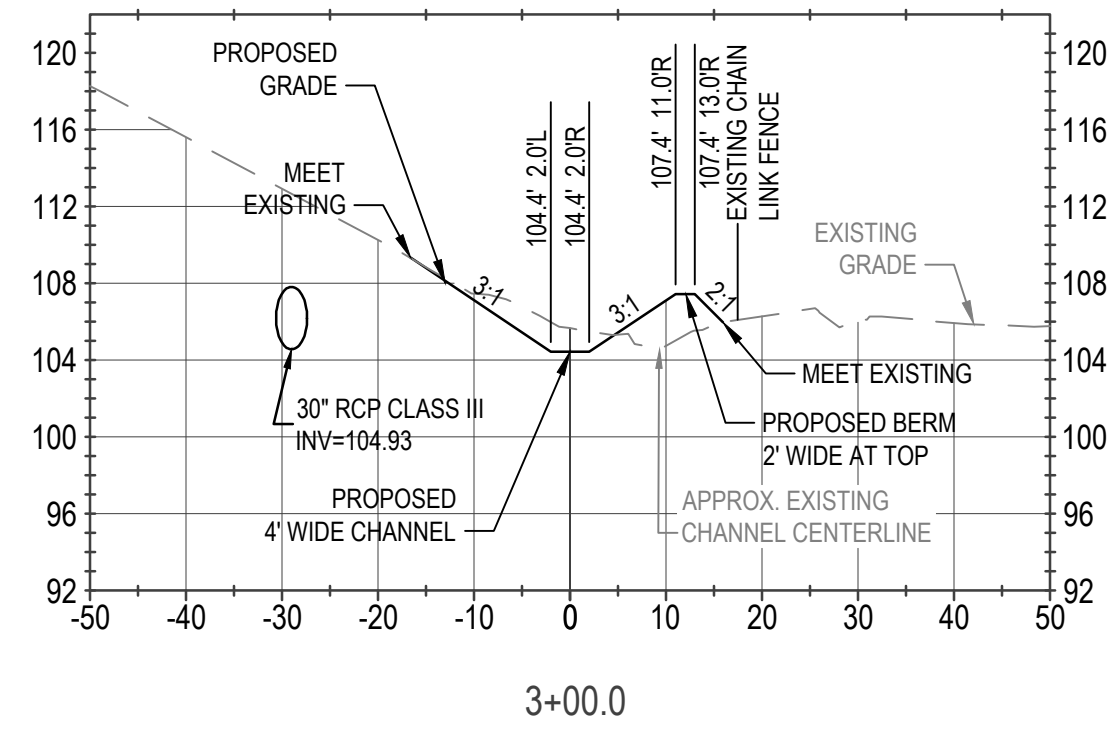
Title  
 CROSS SECTIONS - 1

Project No.  
 179450605

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1	DMZ	DMZ	24.04.05
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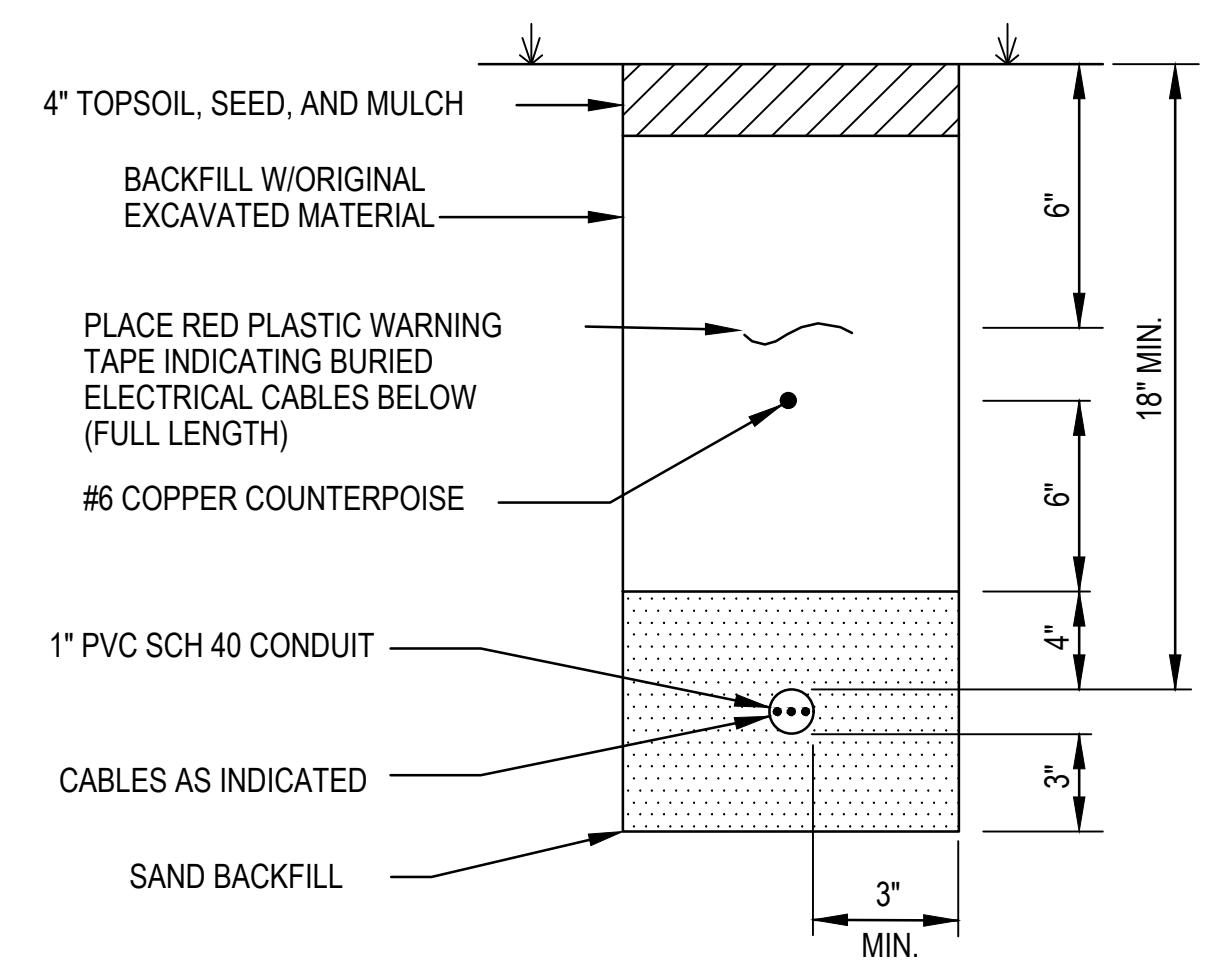
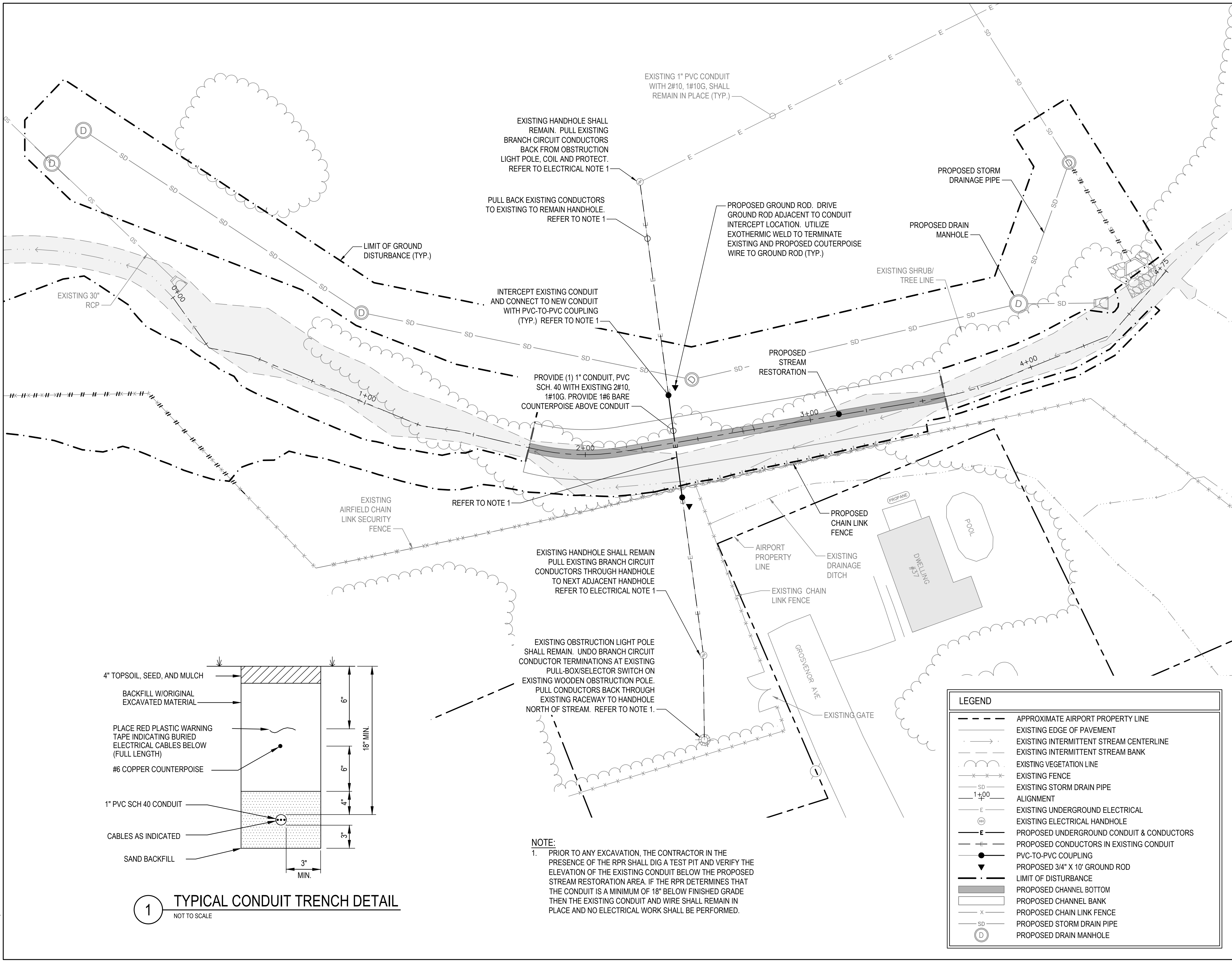
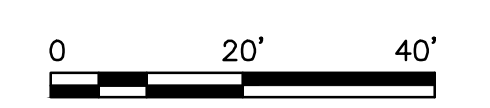
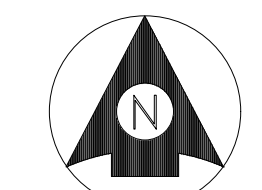
Permit-Seal  
  
 Client/Project

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

Title  
 CROSS SECTIONS - 2

Project No.  
 179450605  
 Drawing No. Sheet Revision  
 C602 20 of 21 0

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 APRIL 5, 2024



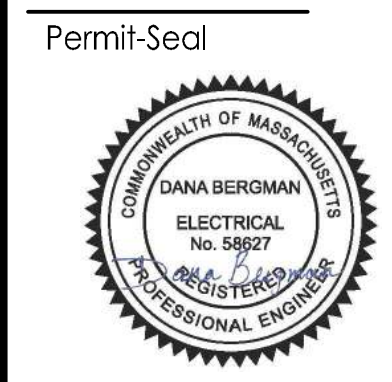
**1 TYPICAL CONDUIT TRENCH DETAIL**  
 NOT TO SCALE

**NOTE:**  
 1. PRIOR TO ANY EXCAVATION, THE CONTRACTOR IN THE PRESENCE OF THE RPR SHALL DIG A TEST PIT AND VERIFY THE ELEVATION OF THE EXISTING CONDUIT BELOW THE PROPOSED STREAM RESTORATION AREA. IF THE RPR DETERMINES THAT THE CONDUIT IS A MINIMUM OF 18" BELOW FINISHED GRADE THEN THE EXISTING CONDUIT AND WIRE SHALL REMAIN IN PLACE AND NO ELECTRICAL WORK SHALL BE PERFORMED.

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
1	DMZ	DMZ	24.04.05
Issued	By	Appd.	YY.MM.DD

DMZ DB HB  
 Dwn. Chkd. Dsgn.



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

Title  
 ELECTRICAL PLAN & DETAILS

Project No.  
 179450605

Drawing No. Sheet Revision

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