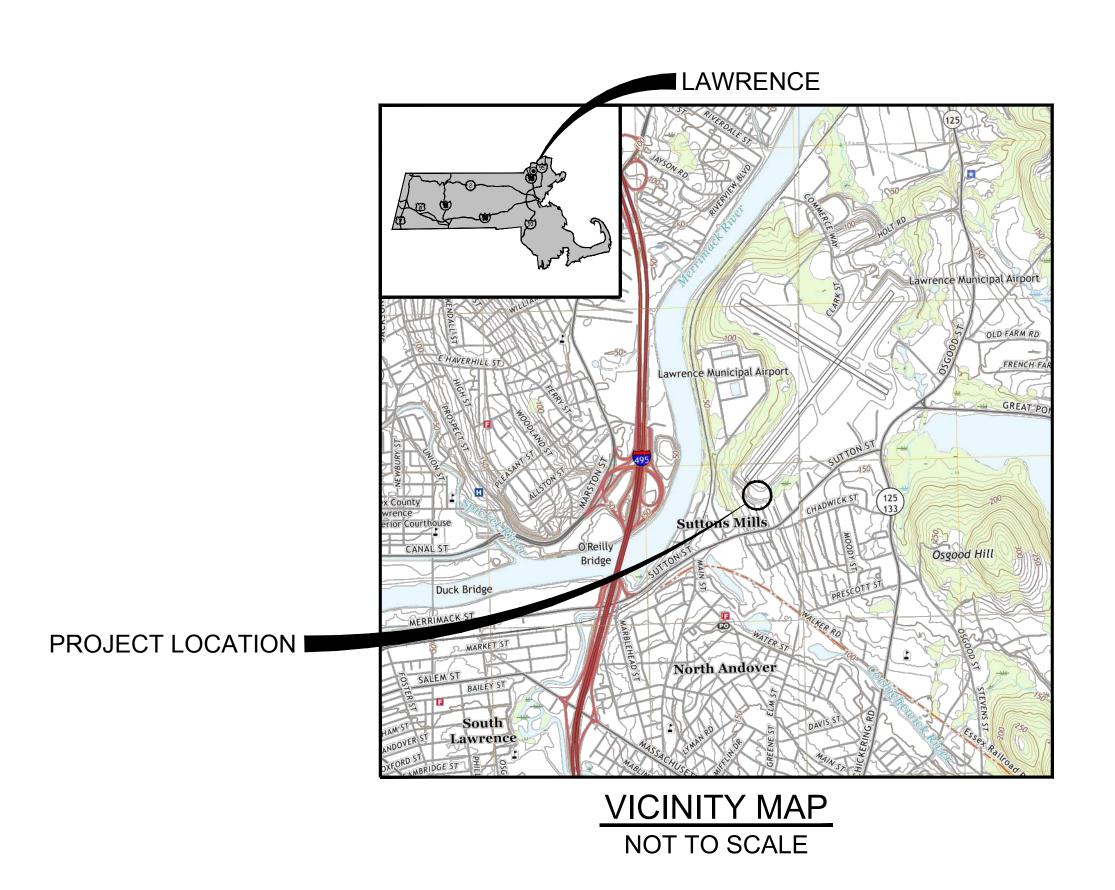


LAWRENCE MUNICIPAL AIRPORT NORTH ANDOVER, MASSACHUSETTS



RUNWAY 5 END DRAINAGE IMPROVEMENTS

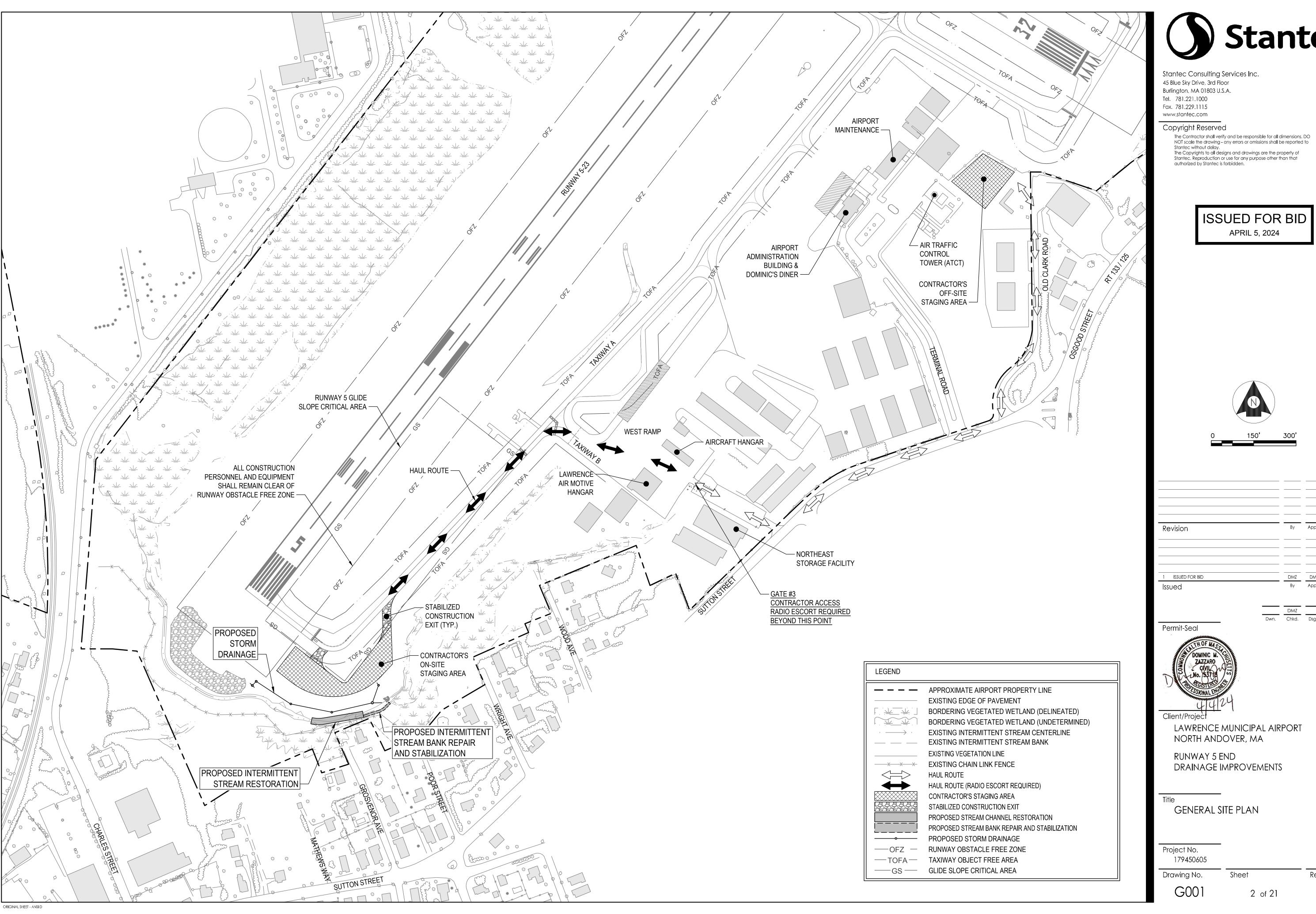
APRIL 5, 2024 STANTEC PROJECT NO. 179450605





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





By Appd. YY.MM.DD

Revision

- 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.



Stantec Consulting Services Inc. 45 Blue Sky Drive, 3rd Floor

Burlington, MA 01803 U.S.A. Tel. 781.221.1000 Fax. 781.229.1115

Copyright Reserved

www.stantec.com

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay. The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden

ISSUED FOR BID

APRIL 5, 2024

By Appd. YY.MM.DD Revision DMZ DMZ 24.04.05 Issued Dwn. Chkd. Dsgn.

Permit-Seal



LAWRENCE MUNICIPAL AIRPORT NORTH ANDOVER, MA

RUNWAY 5 END DRAINAGE IMPROVEMENTS

GENERAL NOTES

Project No. 179450605

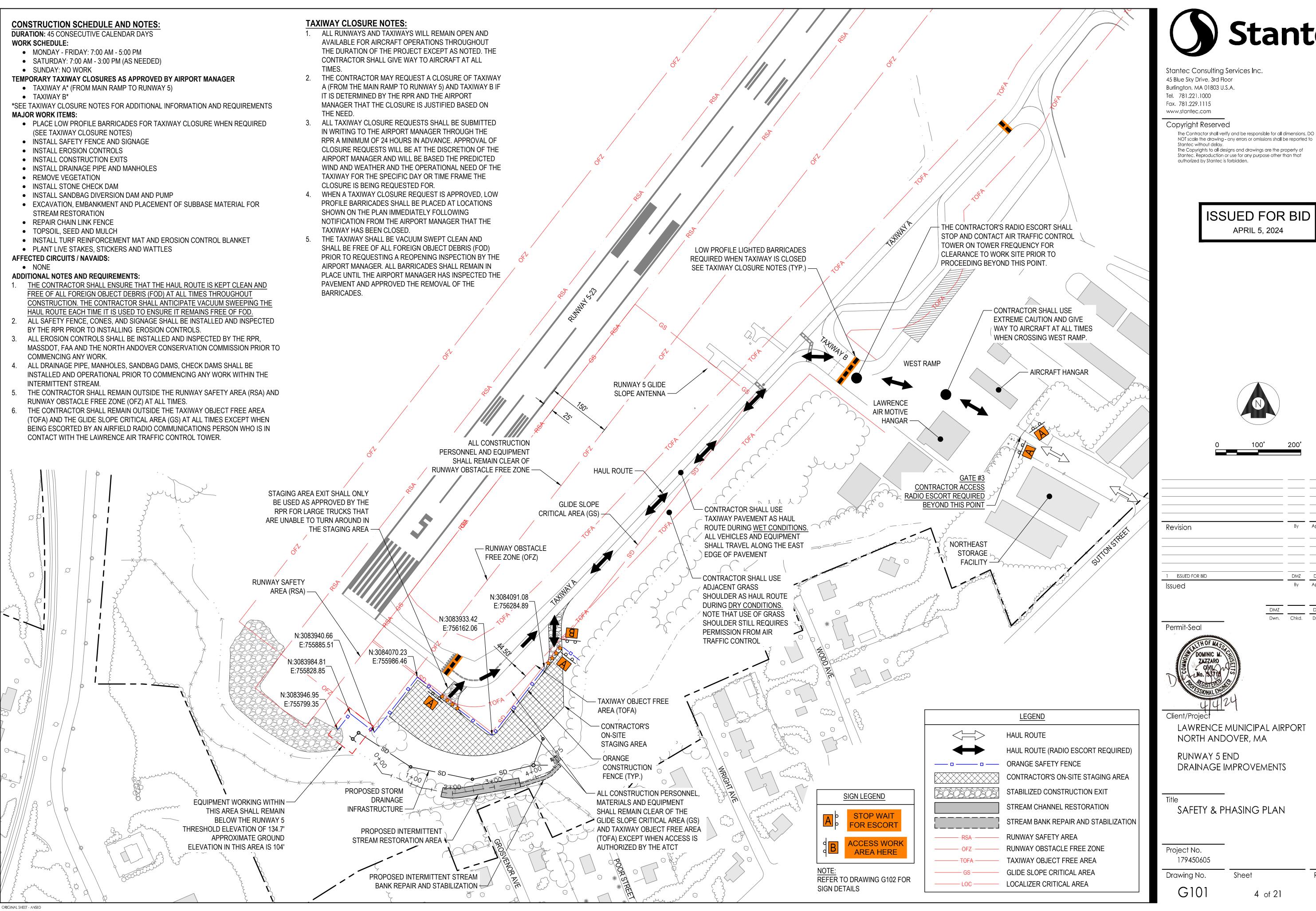
Drawing No.

G002

Sheet

3 of 21

Revision





The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that

ISSUED FOR BID

By Appd. YY.MM.DD

Chkd. Dsgn.

LAWRENCE MUNICIPAL AIRPORT

DRAINAGE IMPROVEMENTS

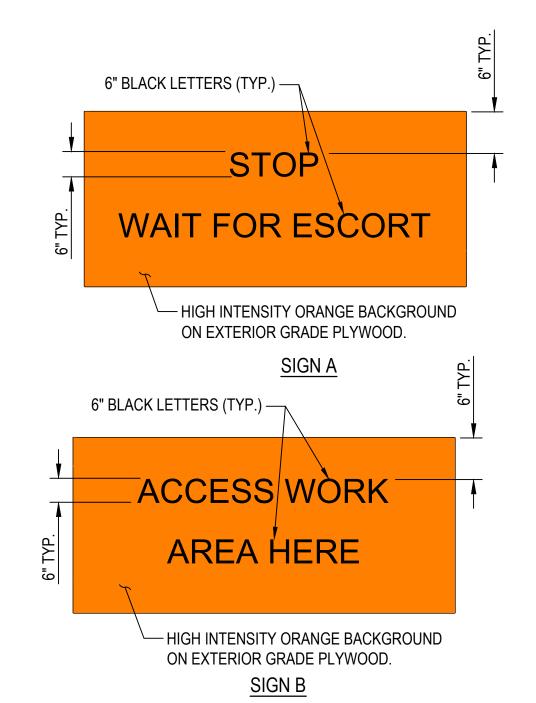
4 of 21

Revision

- 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.
- 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.
- 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)
- 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.
- 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.
- 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:

- SIGN SHALL CONFORM TO LATEST FHWA "STANDARD HIGHWAY SIGNS"
- SIGNS SHALL NOT BE MOUNTED HIGHER THAN 4' ABOVE EXISTING GRADE 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
- 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

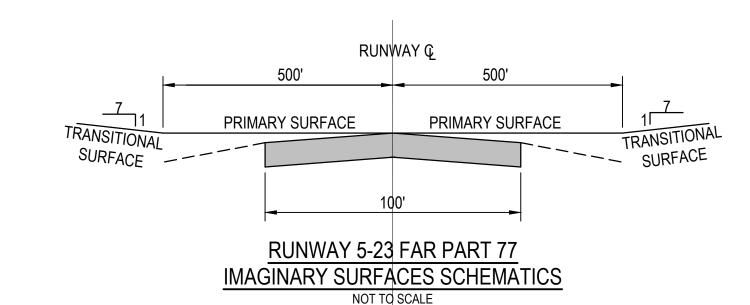
NOT TO SCALE

SOLAR POWERED RED FLASHING LIGHT WITH PHOTOCELL SECURELY FASTENED TO TOP OF CONE 4"± FLUORESCENT ORANGE POLYETHYLENE CONE WITH A MINIMUM OF TWO 6" WHITE REFLECTIVE BANDS $8\frac{1}{2}$ "± 30LB. SOLID OCTAGONAL RUBBER BASE -16½"±

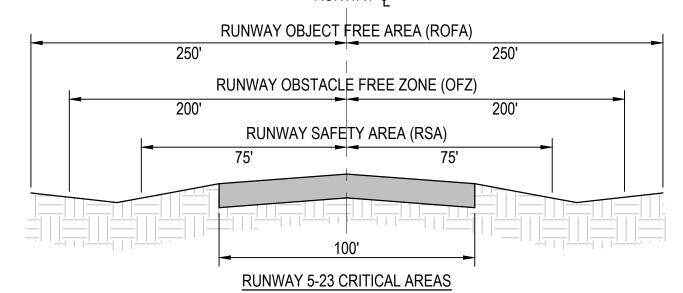
LIGHTED CHANNELIZER CONE

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

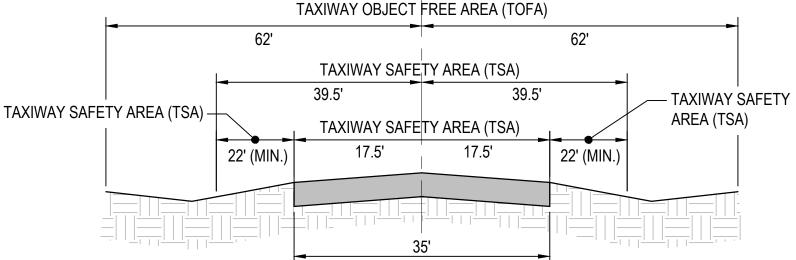
- 1. ALL COSTS ASSOCIATED WITH FURNISHING, INSTALLING AND MAINTAINING SAFETY FENCE, BARRICADES, AND CONES SHALL BE INCIDENTAL TO THE VARIOUS CONTRACT PAY ITEMS. 2. THE LIGHTED SAFETY BARRICADES SHALL BE PLACED WHERE SHOWN ON PLANS AND BE USED
- WHEN A WORK AREA IS DIRECTLY ADJACENT TO AN ACTIVE TAXIWAY 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.
- CHANNELIZER CONES SHALL BE PLACED CONTINUOUSLY AT 4' ON CENTER.



RUNWAY C



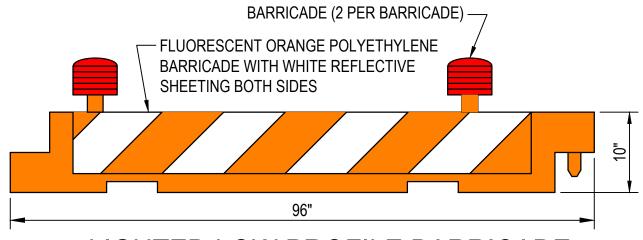
TAXIWAY C



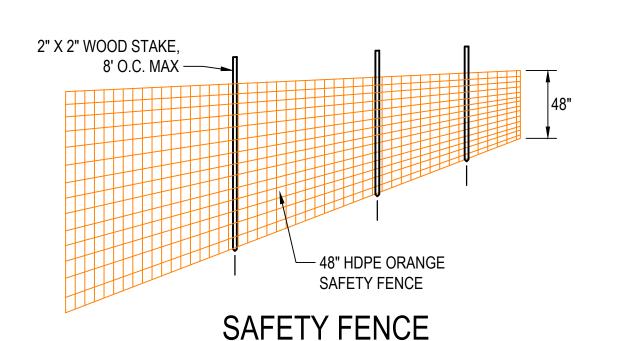
TAXIWAY CRITICAL AREAS

CRITICAL AREAS SCHEMATICS NOT TO SCALE

SOLAR POWERED FLASHING RED LIGHT WITH PHOTOCELL SECURELY FASTENED TO TOP OF



LIGHTED LOW PROFILE BARRICADE



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

Copyright Reserved

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay. The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden

ISSUED FOR BID

APRIL 5, 2024

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

Permit-Seal



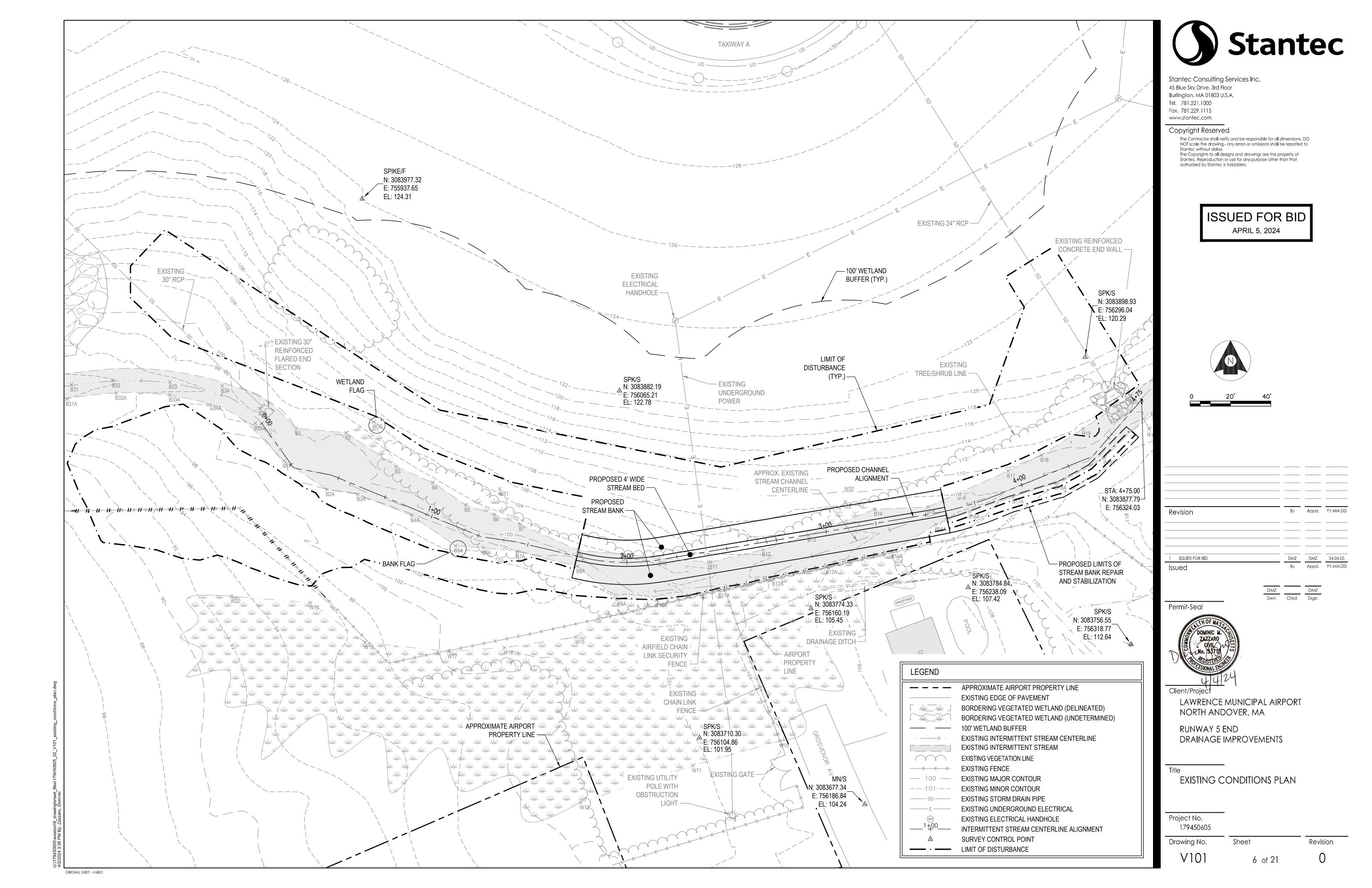
LAWRENCE MUNICIPAL AIRPORT NORTH ANDOVER, MA

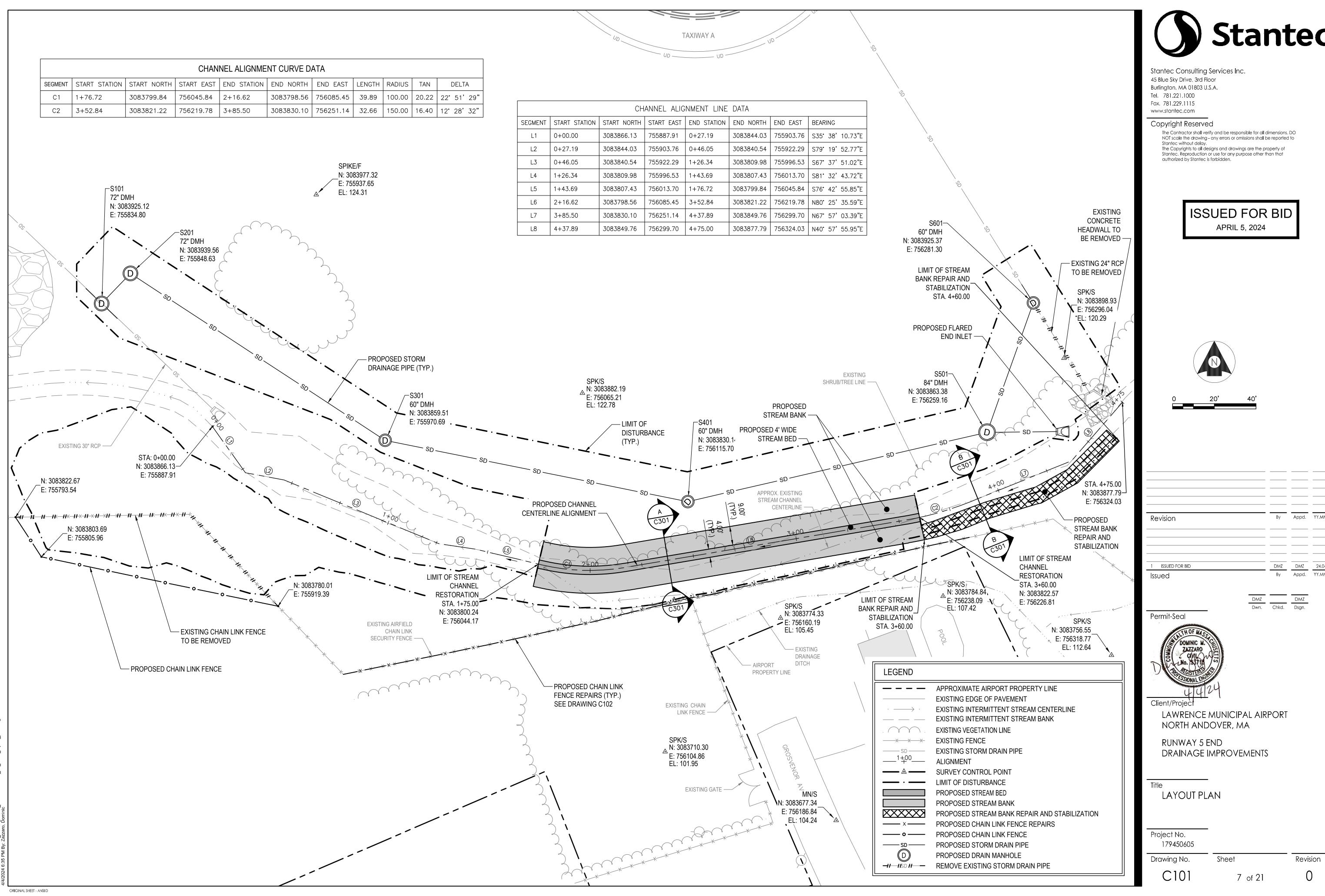
RUNWAY 5 END DRAINAGE IMPROVEMENTS

SAFETY & PHASING NOTES & DETAILS

Project No. 179450605

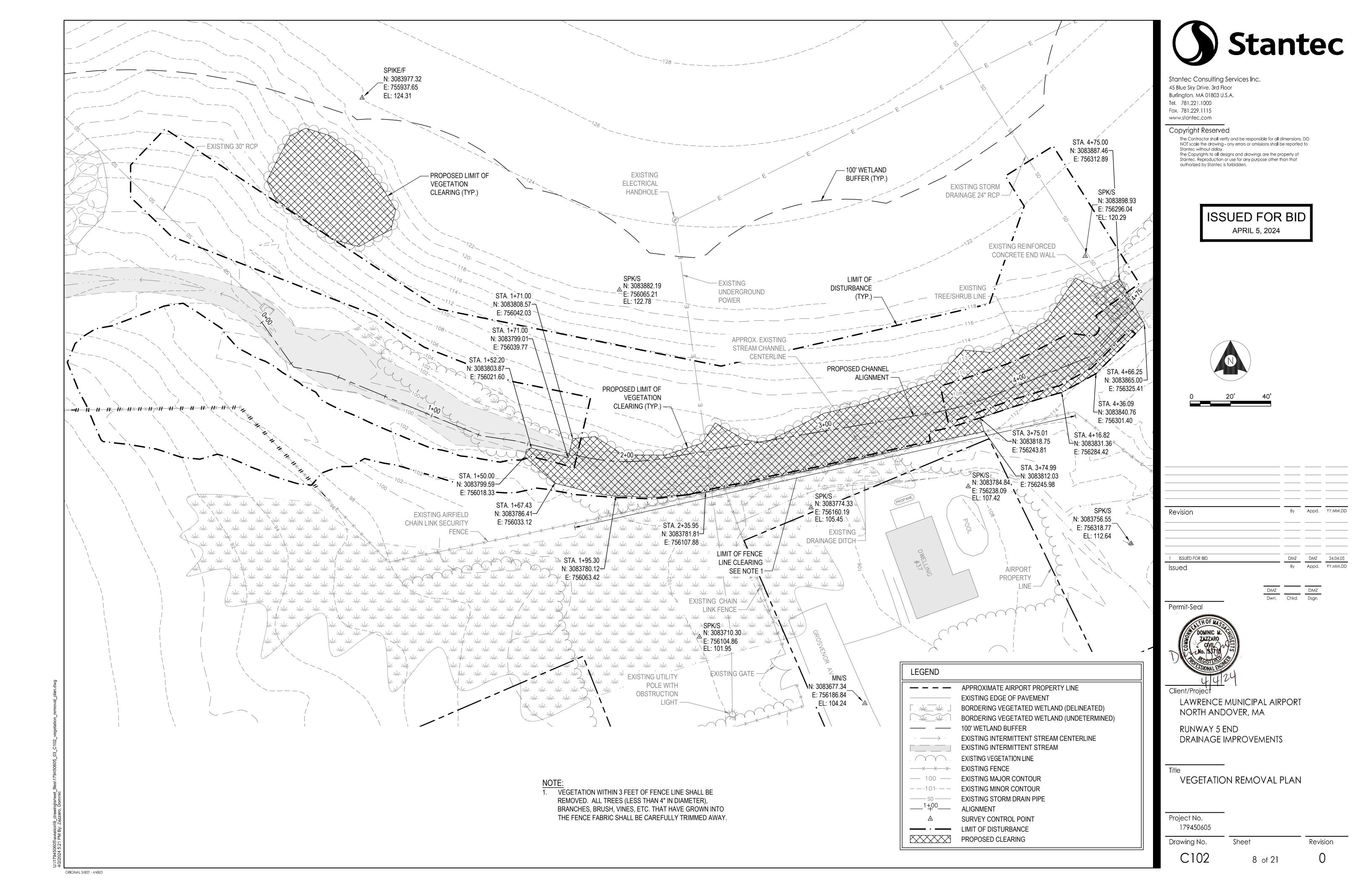
Sheet Revision Drawing No. G102 5 of 21

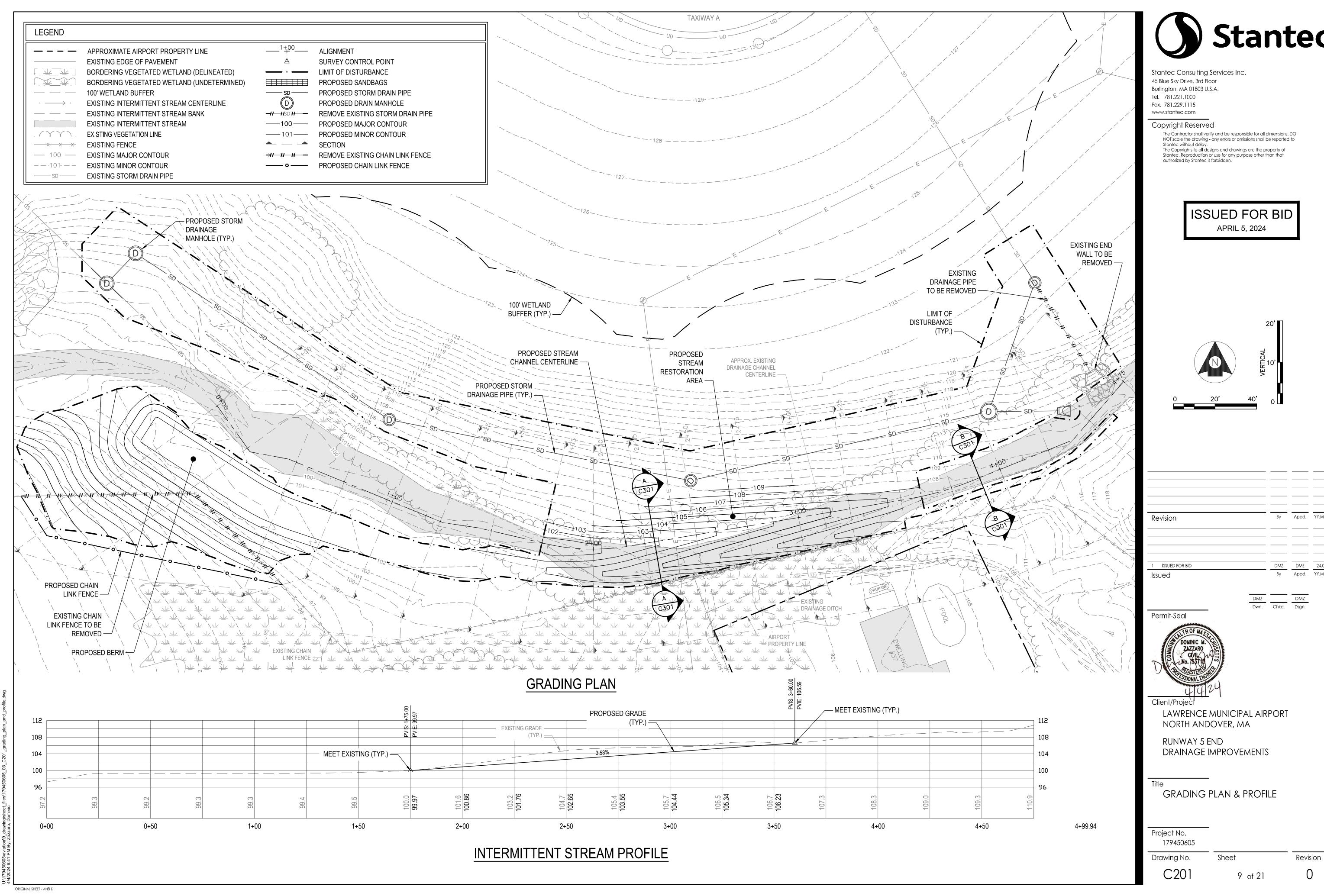


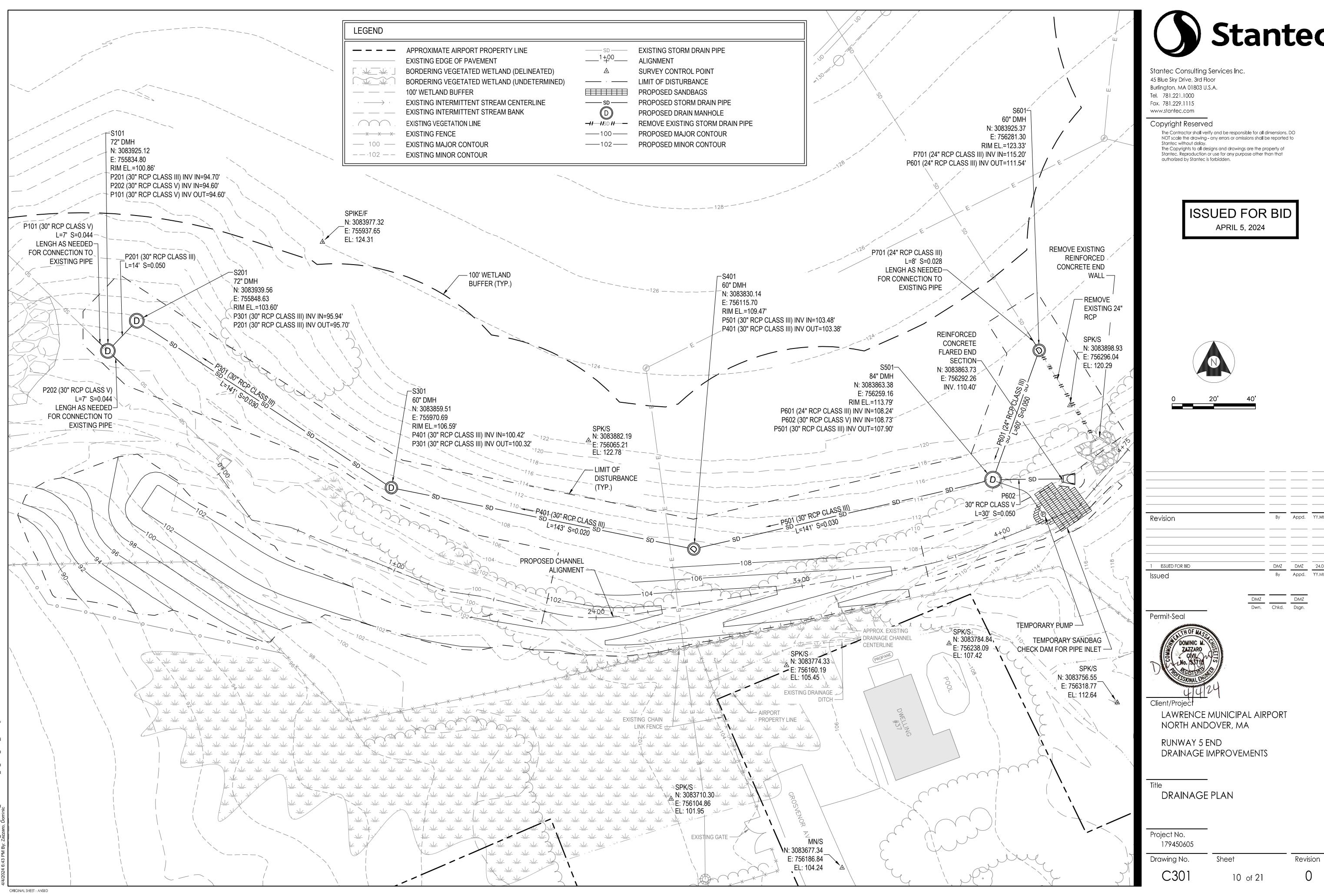




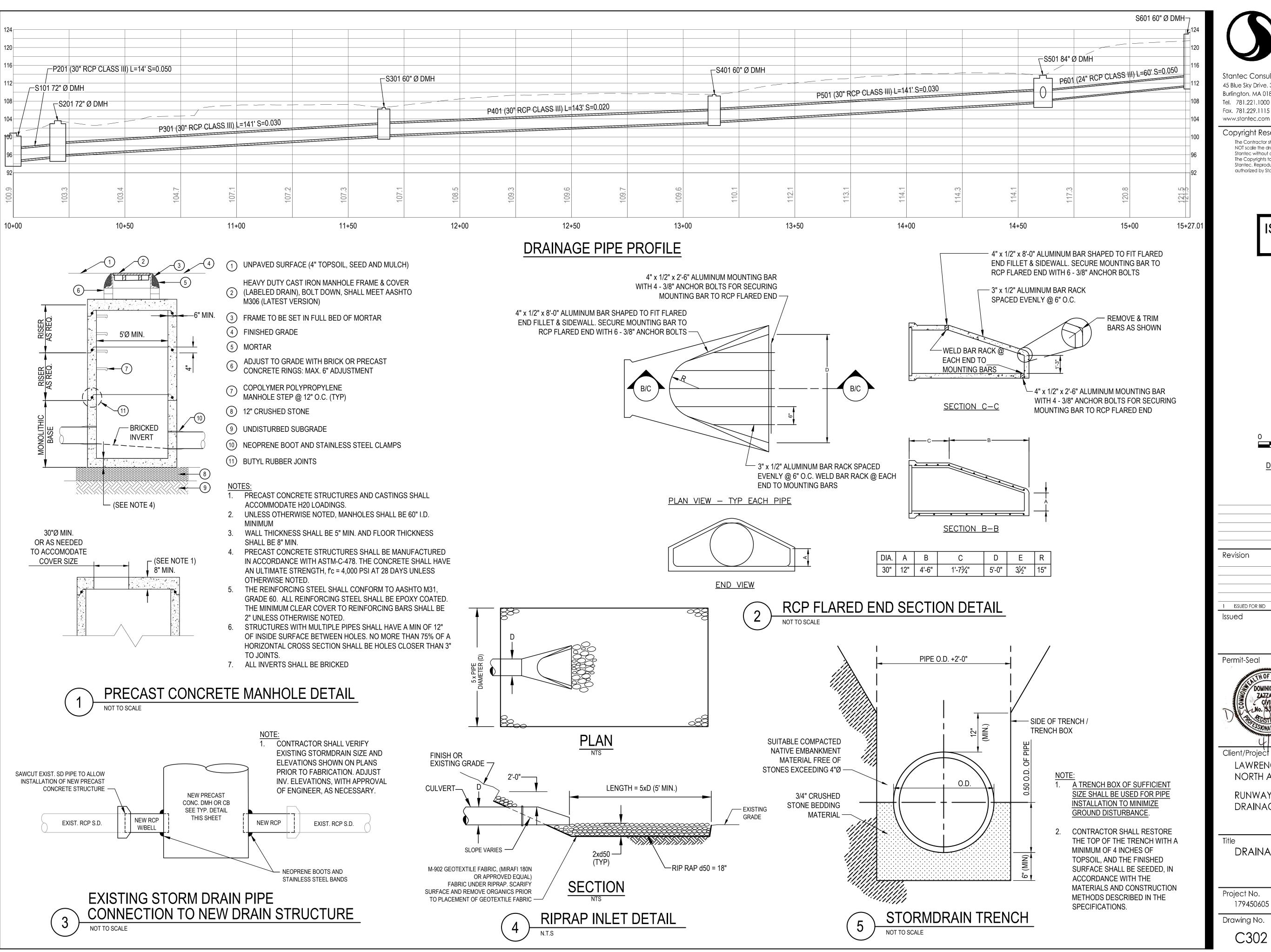
By Appd. YY.MM.DD Appd. YY.MM.DD











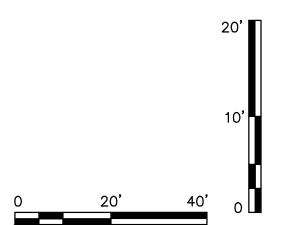
Stantec Consulting Services Inc. 45 Blue Sky Drive, 3rd Floor

Burlington, MA 01803 U.S.A. Tel. 781.221.1000 Fax. 781.229.1115

Copyright Reserved

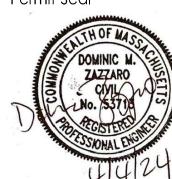
The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay. The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

> **ISSUED FOR BID** APRIL 5, 2024



DRAINAGE PIPE PROFILE SCALE

Revision	Ву	Appd.	YY.MM.DD
1 ISSUED FOR BID	DMZ		24.04.05
Issued	Ву	Appd.	YY.MM.DD



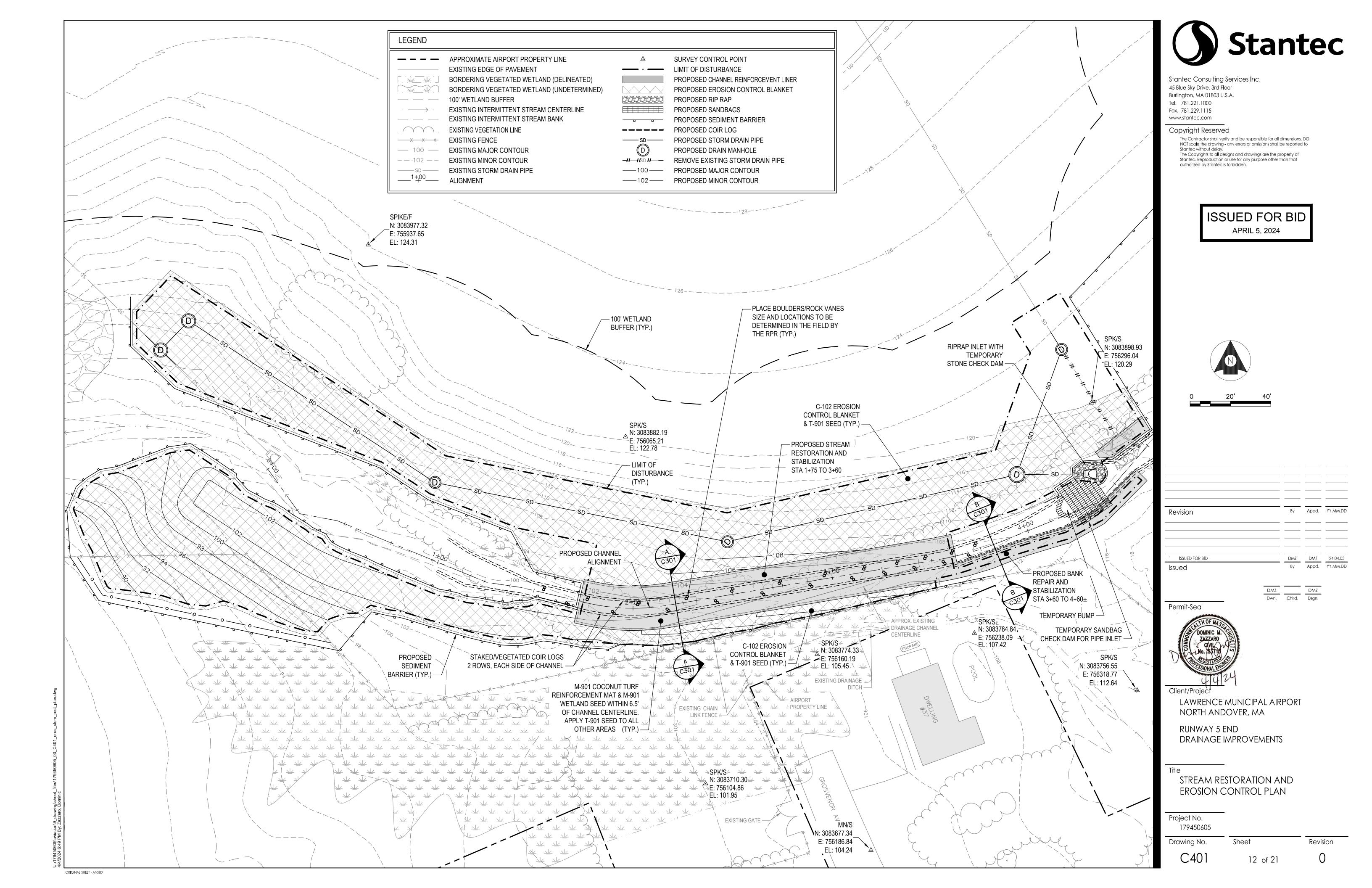
LAWRENCE MUNICIPAL AIRPORT NORTH ANDOVER, MA

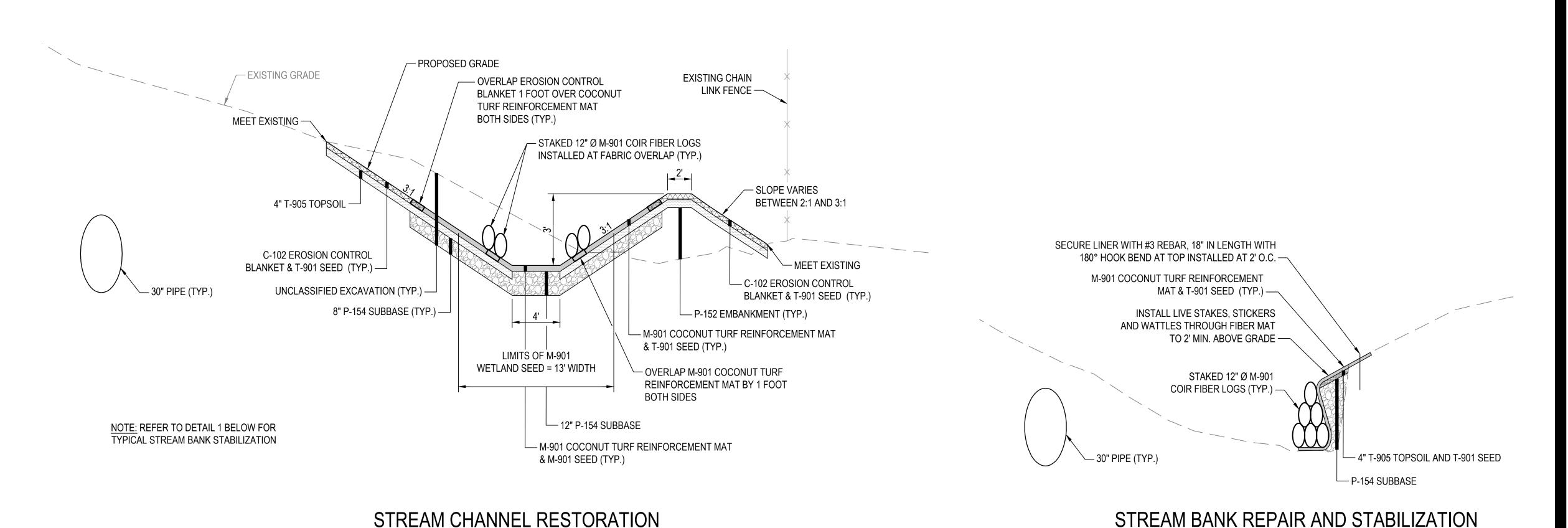
RUNWAY 5 END DRAINAGE IMPROVEMENTS

DRAINAGE DETAILS

Project No. 179450605

Revision Drawing No. Sheet 11 of 21





SPREAD M-901 WETLAND SEED MIX AND INSTALL LIVE STAKES, STICKERS AND WATTLES MATCH TO EXISTING SLOPE OR THROUGH FIBER MAT TO 2' MIN. ABOVE GRADE CONFORM TO BERM PER FIELD AND WITHIN 18" OF TOP OF BANK -CONDITIONS -SECURE FIBER LOGS WITH TWINE TIED TO THE HOOKS AT THE TOP OF THE REBAR -BANKFULL FLOW (25 YEAR PEAK FLOW) 12" Ø M-901COCONUT FIBER LOG -— 4" T-905 TOPSOIL & T-901 SEED MISCELLANEOUS PLACED - M-901 COCONUT TURF REINFORCEMENT - C-102 EROSION **BOULDER VANES -**CONTROL BLANKET & MAT & T-901 SEED (TYP.) T-901 SEED (TYP.) — 8" P-154 SUBBASE #4 REBAR, 3 FEET IN LENGTH WITH 180° HOOK BEND AT TOP AND INSTALL REBAR THROUGH PROTECTIVE NETTING OF THE FIBER LOG └─ 12" P-154 SUBBASE ── M-901 COCONUT TURF REINFORCEMENT MAT & M-901 SEED (TYP.) NOTE: REFER TO DETAIL 3 ON DWG C403 FOR LIVE STAKES, STICKERS AND WATTLES INSTALLATION ALONG STREAM BANK — EXISTING SOIL TO REMAIN

TYPICAL STREAM BANK STABILIZATION FOR CHANNEL RESTORATION

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

UNDISTURBED (TYP.)

NOT TO SCALE

Stantec

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

Copyright Reserved

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.

The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

ISSUED FOR BID
APRIL 5, 2024

Revision

By Appd. YY.MM.DD

I ISSUED FOR BID

DMZ DMZ 24.04.05

ISSUED

DMZ DMZ DMZ YY.MM.DD

DMZ DMZ DMZ DMZ

DMZ DMZ DMZ

DMZ DMZ

DMZ DMZ

DMZ DMZ

DMZ DMZ

DMZ DMZ

DMZ DMZ

DMZ DMZ

DMZ DMZ

DMZ DMZ

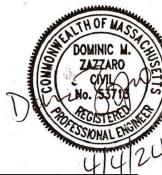
DMZ DMZ

DMZ DMZ

DMZ DMZ

Permit-Seal

TYPICAL SECTION B-B (STA. 3+60 TO 4+75)



Client/Project

LAWRENCE MUNICIPAL AIRPORT NORTH ANDOVER, MA

RUNWAY 5 END DRAINAGE IMPROVEMENTS

Title

STREAM RESTORATION - TYPICAL SECTIONS

Project No. 179450605

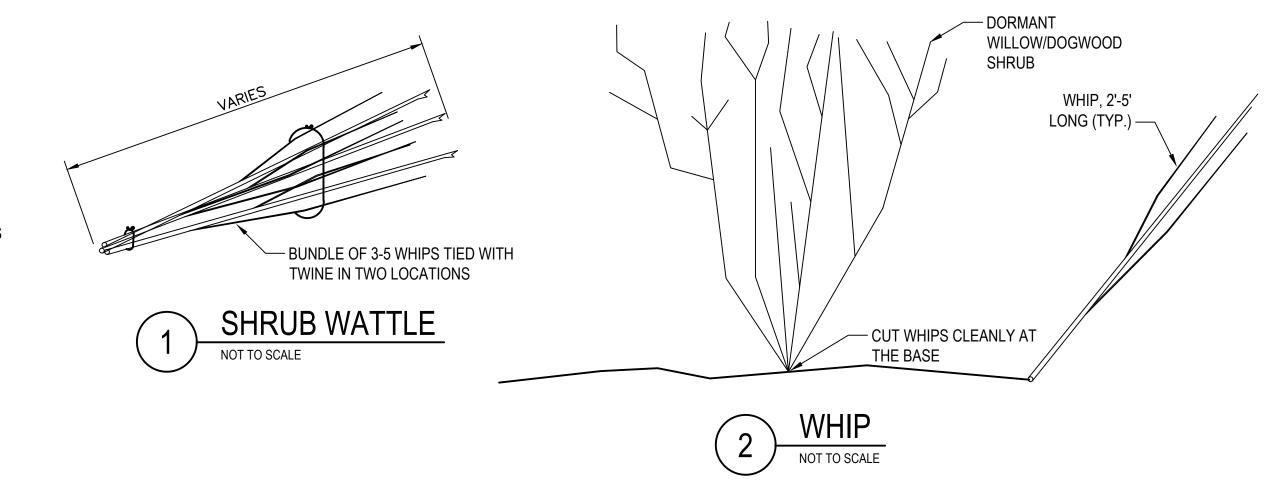
Drawing No. Sheet Revision

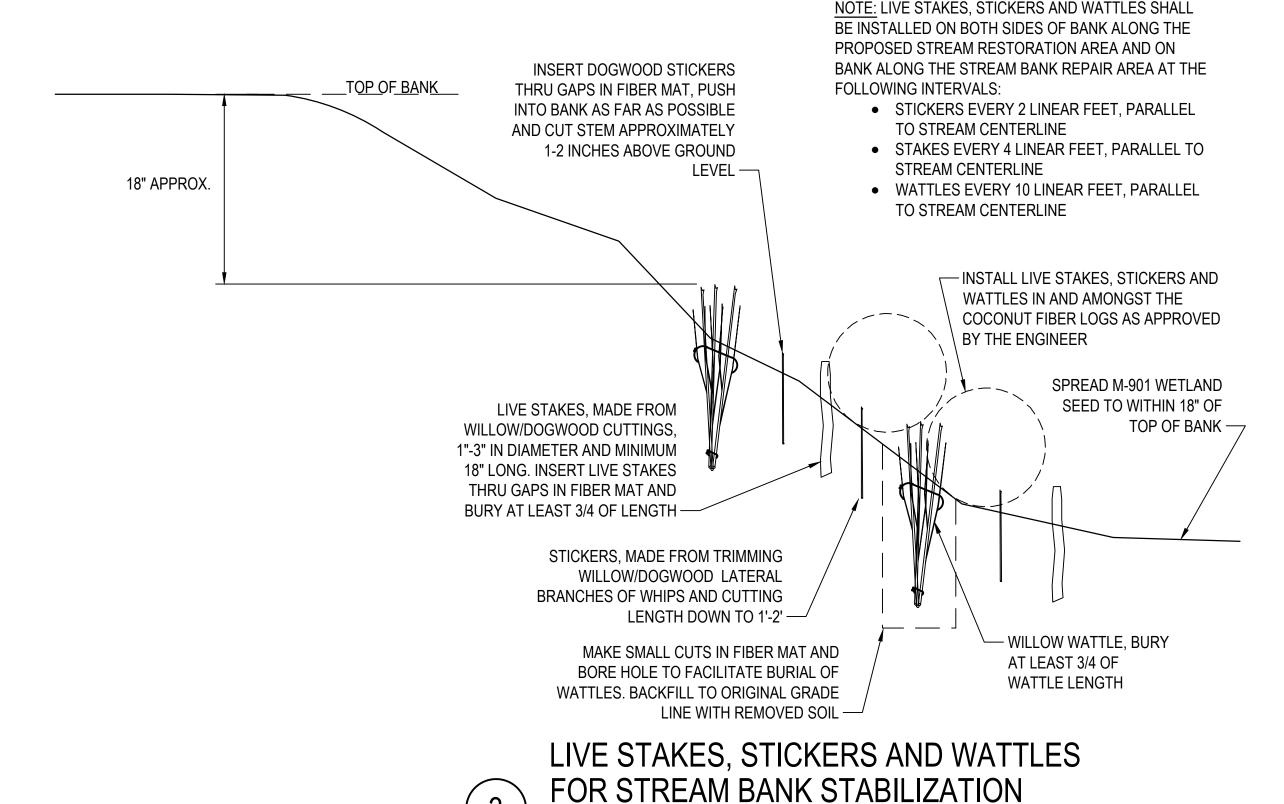
C402 13 of 21 0

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.
- 2. 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.
- 3. 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 STABILE 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.
- 6. 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.
- 10. 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.
- 11. TEMPORARY COFFERDAMS AND DIVERSION MEASURES WILL BE CONSTRUCTED TO FACILITATE DEWATERING USING SHORT DURATION TEMPORARY BYPASS PUMPING DURING CONSTRUCTION DISCHARGING TO AN APPROVED STABILE LOCATION. SAND BAG BERMS AND DIVERSIONS WILL BE EMPLOYED TO DEWATER WORK SITE AND BYPASS STREAM FLOWS.
- 12. 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.
- 13. 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.
- 14. 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.
- 15. 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.
- 16. 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 STABILE AND IS ADEQUATELY RE-VEGETATED, AND THAT TEMPORARY AND PERMANENT MEASURES AND STABILIZATION PRACTICES ARE FUNCTIONING AS INTENDED.
- 17. 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.
- 18. 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.
- 19. CONTRACTOR SHALL INSPECT FOR SCOURING OF THE STREAMBED DOWNSTREAM OR THE ACCUMULATION OF SEDIMENT UPSTREAM OF THE WORK.







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

Copyright Reserved

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay. The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

ISSUED FOR BID

APRIL 5, 2024

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

DMZ DMZ

Dwn. Chkd. Dsgn.

Permit-Seal



LAWRENCE MUNICIPAL AIRPORT NORTH ANDOVER, MA

RUNWAY 5 END DRAINAGE IMPROVEMENTS

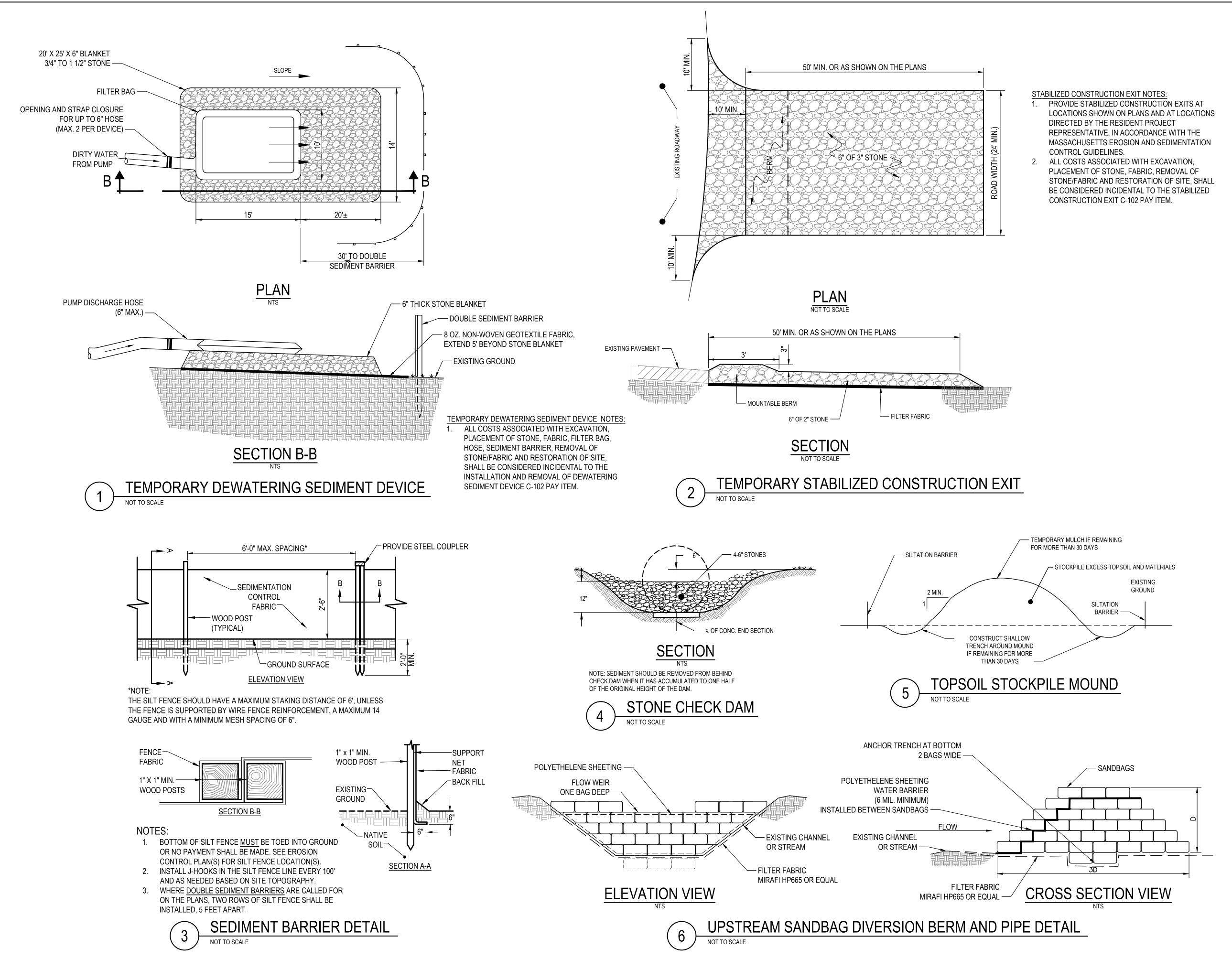
STREAM RESTORATION -**NOTES & DETAILS**

Project No. 179450605

> Sheet Drawing No. C403

14 of 21

Revision



Stanted

Stantec Consulting Services Inc. 45 Blue Sky Drive, 3rd Floor

Burlington, MA 01803 U.S.A. Tel. 781.221.1000 Fax. 781.229.1115

Copyright Reserved

www.stantec.com

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.

The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

ISSUED FOR BID
APRIL 5, 2024

Revision

By Appd. YY.MM.DD

I ISSUED FOR BID

DMZ DMZ 24.04.05

ISSUED SOR BID BY Appd. YY.MM.DD

DMZ
Chkd. Dsgn.

Permit-Seal



Client/Projec

LAWRENCE MUNICIPAL AIRPORT NORTH ANDOVER, MA

RUNWAY 5 END DRAINAGE IMPROVEMENTS

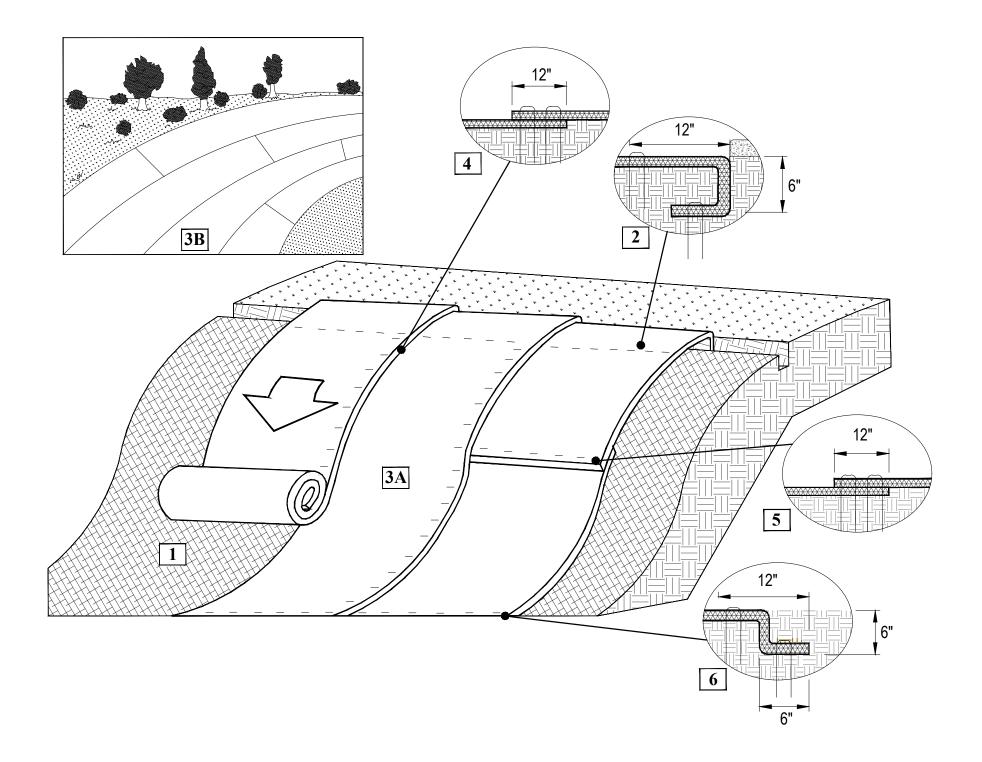
Title

EROSION CONTROL DETAILS - 1

Project No. 179450605

Drawing No. Sheet Revision

C404 15 of 21 0



INSTRUCTIONS:

INSTRUCTIONS:

12"

ENTIRETY OF THE INSTALLATION.

WIDTH OF THE RECPS.

TRENCH AFTER STAPLING.

THE CHANNEL.

- 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 CLODS 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 ST.
- 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 ST 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 BY 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.

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 CLODS AND RAKED SMOOTH SUFFICIENT TO ALLOW INTIMATE CONTACT OF THE RECP WITH THE SOIL OVER THE

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

3. ROLL CENTER RECPS IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. RECPS WILL UNROLL WITH

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/STAKES/PINS SPACED AT STAPART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE

6. ADJACENT RECPS MUST BE OVERLAPPED APPROXIMATELY 4"- 6" AND SECURED WITH STAPLES/STAKES/PINS AT

INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 6" APART AND 12" ON CENTER OVER ENTIRE WIDTH OF

7. IN HIGH FLOW CHANNEL APPLICATIONS A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT (9 -12M)

8. THE TERMINAL END OF THE RECPS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES/PINS SPACED AT S_{T}

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,

MET. BIO-DEGRADABLE FASTENERS SHALL NOT BE USED WITH TURF REINFORCEMENT MAT MATERIALS

TWIST PINS CAN PROVIDE THE GREATEST PULLOUT RESISTANCE. IN HARD OR ROCKY SOILS, STRAIGHT PINS MAY

BY USED WHERE STAPLES OR TWIST PINS ARE REFUSED, PROVIDED THE MINIMUM PULLOUT REQUIREMENTS ARE

APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

5. FULL LENGTH EDGE OF RECPS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF

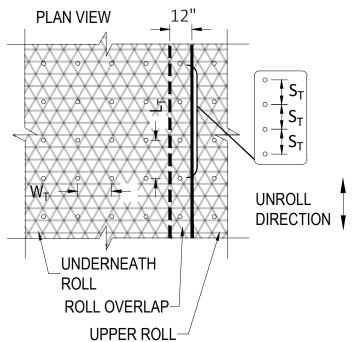
STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE RECPS.

COMPACTED SOIL WITH A ROW OF STAPLES/STAKES/PINS SPACED APPROXIMATELY 12" APART ACROSS THE

APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECPS MUST BE SECURELY FASTENED TO SOIL SURFACE BY

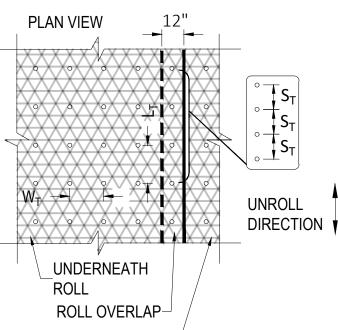
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE RECPS IN A 6" DEEP X 6" WIDE TRENCH WITH

STAPLE PATTERN GUIDE



FOR FIELD CONDITIONS

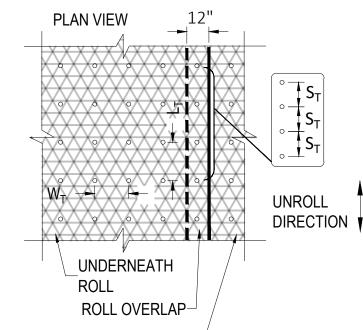
	STAPLE PATTERN	
DIMENSION	С	D
W_{T}	30"	24"
L _T	30"	20"
S _T	18"	18"
NOMINAL FREQUENCY	1.7 / SY	3.0 / SY
APPLICATION	ECB (DEGRADABLE)	TRM (PERMANENT)



° PIN / STAPLE / TWIST PIN, AS APPROPRIATE

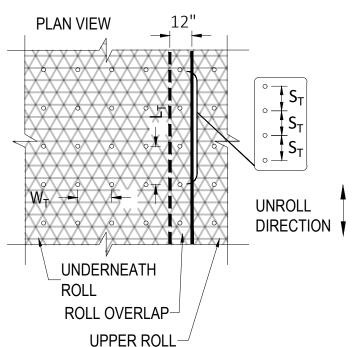
	STAPLE P	ATTERN
DIMENSION	С	D
W _T	30"	24"
L _T	30"	20"
S _T	18"	18"
NOMINAL FREQUENCY	1.7 / SY	3.0 / SY
APPLICATION	ECB (DEGRADABLE)	TRM (PERMANENT

STAPLE PATTERN GUIDE



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

	STAPLE PATTERN
DIMENSION	E
W _T	20"
L _T	20"
S _T	18"
NOMINAL FREQUENCY	3.8 / SY



STAPLE PATTERN
E
20"
20"
18"
3.8 / SY

CRITICAL POINTS

A. OVERLAPS AND SEAMS

B. PROJECTED WATER LINE

C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

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

12"

EROSION CONTROL BLANKET AND TURF REINFORCEMENT MAT INSTALLATION

Project No. 179450605

Revision

Issued

Permit-Seal

Sheet Revision Drawing No. C405 16 of 21

LAWRENCE MUNICIPAL AIRPORT

EROSION CONTROL DETAILS - 2

NORTH ANDOVER, MA

DRAINAGE IMPROVEMENTS

RUNWAY 5 END

ORIGINAL SHEET - ANSI D

Stantec Consulting Services Inc.

45 Blue Sky Drive, 3rd Floor Burlington, MA 01803 U.S.A. Tel. 781,221,1000 Fax. 781.229.1115

Copyright Reserved

www.stantec.com

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay. The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

> **ISSUED FOR BID** APRIL 5, 2024

By Appd. YY.MM.DD

Chkd. Dsgn.

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 CONTROLS 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. THE CONTRACTOR SHALL ANTICIPATE 3 BUSINESS DAYS FOR THE ENGINEER TO SCHEDULE AND COMPLETE THE INSPECTION 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 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.

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 ENCIRCLED 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 AND SHALL BE PERMANENTLY REMOVED AFTER COMPLETION OF WORK REQUIRING SUCH MATERIALS.

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 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.

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.

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.

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 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.

FUGITIVE DUST WILL BE CONTROLLED USING A WATER TRUCK.

<u>DIVERSION CHANNELS</u>

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 BAG), 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 RUPTURES 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 ENCIRCLED WITH A DOUBLE SEDIMENT BARRIER. THE CONTRACTOR WILL BE RESPONSIBLE TO IMPLEMENT ALL THE NECESSARY PROCEDURES OF DISCHARGING THE PUMPED WATER IN COMPLIANCE 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

C FROSION 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 FOR EVERY 3 ROUND MARKERS). THESE MARKERS SHALL REMAIN POSTED AND BE REPLACED AS NECESSARY IN PERPETUITY BY AIRPORT MAINTENANCE. MARKERS MAY BE OBTAINED AT THE CONSERVATION DEPARTMENT (\$2 ROUND/\$3 SQUARE). SEE
- 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 IN 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/COMPOST FILTER TUBES 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 AN 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 TRAHS/DEBRIS OFF-SITE. HOWEVER, NO TRASH CONTAINERS WILL BE ALLOWED WITHIN 50' OF AREAS SUBJECT TO PROTECTION UNDER THE ACT OR LOCAL BYLAW.
- 7. ACCEPTED ENGINEERING AND CONSTRUCTION STANDARDS AND PROCEDURES SHALL BE FOLLOWED IN THE COMPLETION OF THE PROJECT.
- DURING 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. TOPSOIL 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 ENCIRCLED 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.

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

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;

NOTIFYLAWRENCE 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 POSES 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/DAY;
- 5. STORE SPILL RESPONSE EQUIPMENT IN A PRE-ESTABLISHED AND READILY ACCESSIBLE LOCATION. THE SPILL RESPONSE EQUIPMENT SHALL INCLUDE:

<u>SAFETY EQUIPMENT</u>: 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

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 SWPPP 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 ACTIVITIES. 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 EXPECTED

WORK	INTERIM PERIOD		TEMPORARY	SEEDING AND
AREA	(CALENDAR	NO	MULCHING (1)	MULCHING (2)
	DAYS)	TREATMENT		
SENSITIVE	-<7	X		
AREA (3)	7-21		Х	
• •	>21			Χ
NON	<14	Х	•	
SENSITIVE	14-4 5		X	
AREA	>45			Χ

TEMPORARY SEEDING RATES

DATE	SEED	<u>RATES</u>	
		<u>LBS/MSF</u> <u>LE</u>	BS/ACRE
4/1 TO 6/1	ANNUAL RYE GRASS	1.00	40
8/15 TO 9/15	ANNUAL RYE GRASS	1.00	40
5/1 TO 6/30	FOXTAIL MILLET	0.70	30
4/1 TO 7/1	OATS	2.00	80
8/15 TO 9/15	OATS	2.00	80
8/15 TO 10/15	WINTER RYE	3.00	1 20

- (1) MULCHING SHALL BE APPLIED AT A RATE OF 90 LBS/L,000 SQ. FT. (180 LBS/1000 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
- (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
 - (b) THE INTERIM PERIOD FOR ANY EXPOSED AREA SHALL BE LIMITED TO 7 CALENDAR DAYS.
 - (c) WHERE REQUIRED, INSTALLATION OF ADDITIONAL OR DOUBLE SEDIMENT BARRIERS 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
 - (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 DEEMED ACCEPTABLE BY THE ENGINEER IN ACCORDANCE WITH THE SPECIFICATIONS. (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) ONLY UNFROZEN LOAM SHALL BE USED. (a) 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
- (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
- (e) ON SLOPES GREATER THAN 3:1, STRAW MATTING OR EXCELSIOR 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

RATES SHALL APPLY AS SPECIFIED IN THE TEMPORARY SEEDING AND MULCHING SCHEDULE.

F. SEQUENCING OF EROSION AND SEDIMENTATION CONTROLS

IS ESTABLISHED IN ALL SEEDED AREAS, AS AGREED UPON BY THE OWNER AND ENGINEER

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. <u>EROSION & SEDIMENTATION CONTROLS INSTALLATION</u> EROSION CONTROL INSTALLATION MAY OCCUR ALL YEAR LONG, XCEPT THAT SUCH MEASURES 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 ENSITIVE 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.

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:

- AN 80% COVER OF GRASS HAS BEEN ESTABLISHED 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:
- DISTRIBUTED TO AN AREA UNDERGOING FINAL GRADING. GRADED IN AN AESTHETIC MANNER TO CONFORM TO THE TOPOGRAPHY, AND FERTILIZED, SEEDED AND MULCHED IN ACCORDANCE WITH THE RATES PREVIOUSLY STATED.

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 TEMPORARY SEDIMENTATION DEVICES, THE DISTURBED AREAS MUST BE LOAMED (IF NECESSARY), FERTILIZED, SEEDED AND MULCHED IN ACCORDANCE WITH THE RATES PREVIOUSLY STATED.

H. INSPECTION AND MAINTENANCE SCHEDULES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR WEEKLY INSPECTIONS AND REQUIRED MAINTENANCE OF ALL MEASURES UTILIZED ON SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN (7) DAYS AND AFTER ALL RAIN EVENTS TOTALING 0.5". THE CONTRACTOR WILL INSPECT THE EROSION AND SEDIMENTATION CONTROLS IN ACCORDANCE WITH THE SCHEDULE INDICATED ABOVE AND NOTE ANY REQUIRED CORRECTIONS ON THE INSPECTION FORMS AND MAINTENANCE LOGS FOR EROSION CONTROL. WEEKLY AND RAIN EVENT >0.5" INSPECTION REPORTS SHALL BE SUBMITTED ELECTRONICALLY TO THE RESIDENT ENGINEER WITHIN 24-HOURS OF THE INSPECTION. THE RPR MAY ORDER WORK TO STOP IF IT IS DETERMINED THAT SUCH WORK IS NOT IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS, EROSION AND SEDIMENT CONTROLS ARE NOT BEING MAINTAINED OR OPERATED EFFECTIVELY, OR CONSTRUCTION PERIOD RUNOFF IS BEING DISCHARGED TO WETLAND RESOURCE AREAS WITHOUT ADEQUATE CONTROL

Stantec Consulting Services Inc.

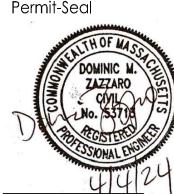
45 Blue Sky Drive, 3rd Floor Burlington, MA 01803 U.S.A. Tel. 781.221.1000

Fax. 781.229.1115 www.stantec.com

Copyright Reserved

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay. The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

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



LAWRENCE MUNICIPAL AIRPORT NORTH ANDOVER, MA

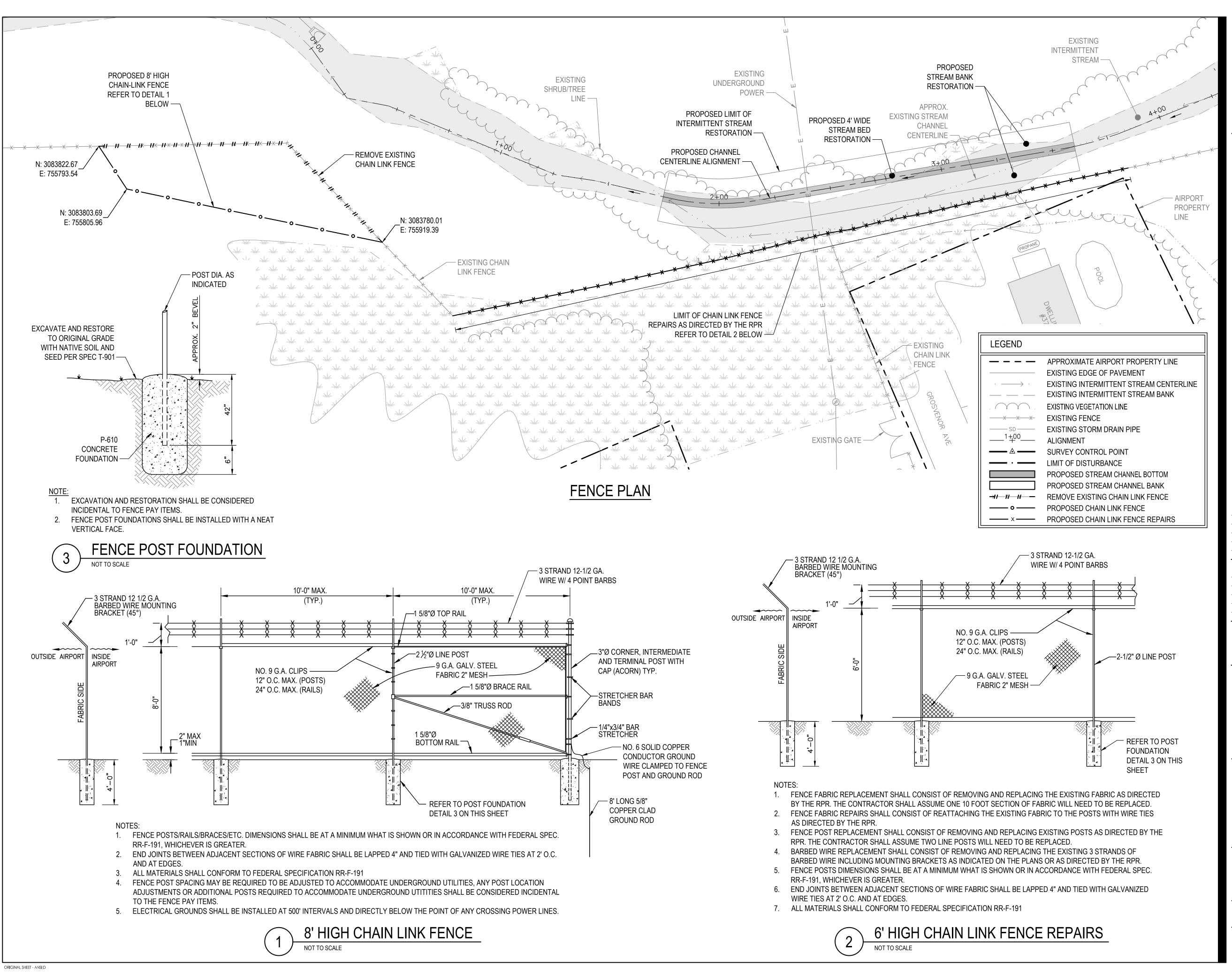
RUNWAY 5 END DRAINAGE IMPROVEMENTS

EROSION CONTROL NOTES

Project No. 179450605

Sheet Drawing No.

Revision



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

Copyright Reserved

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay. The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden

> **ISSUED FOR BID** APRIL 5, 2024



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

DMZ DMZ

Dwn. Chkd. Dsgn.

Permit-Seal



Client/Project

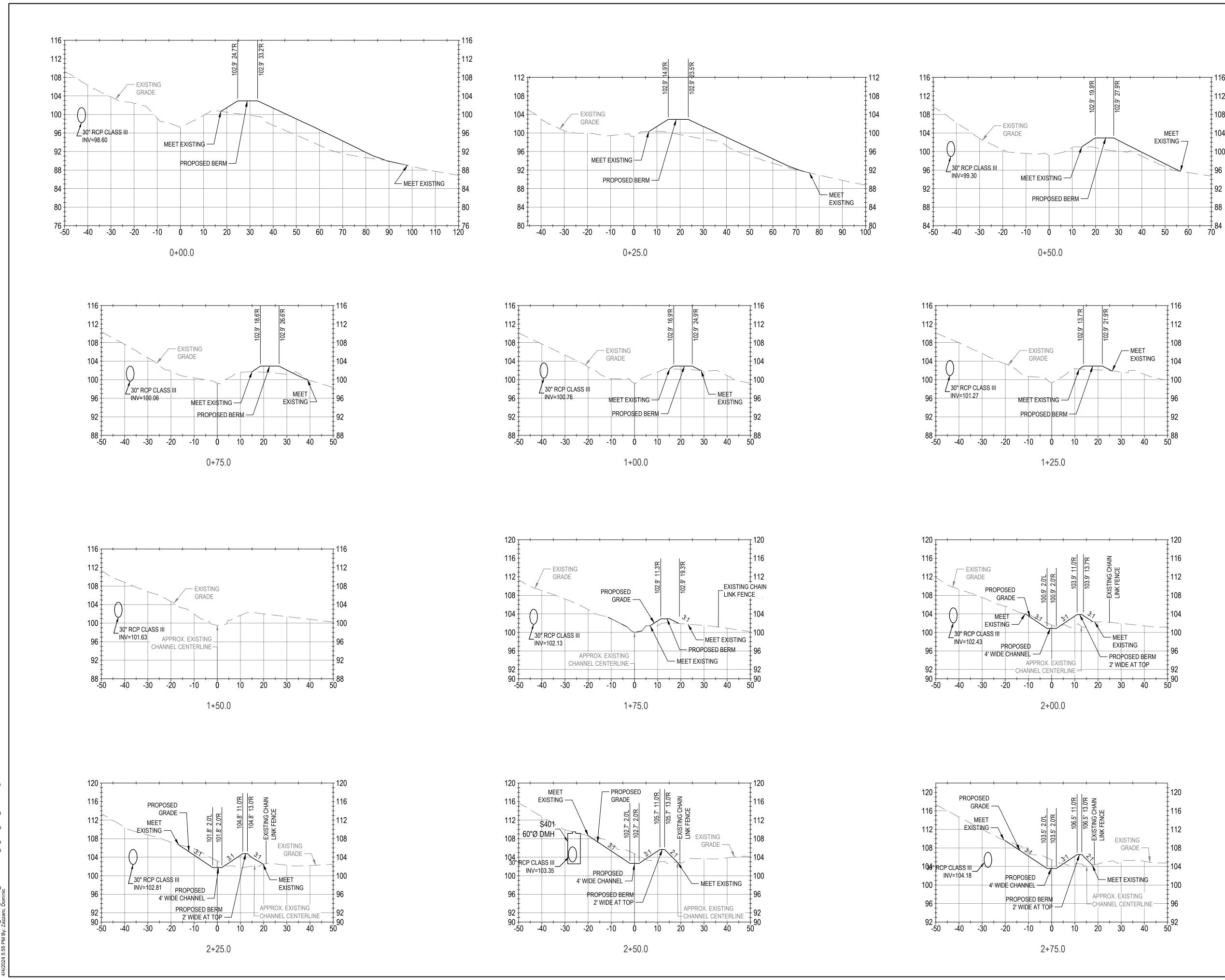
LAWRENCE MUNICIPAL AIRPORT NORTH ANDOVER, MA

RUNWAY 5 END DRAINAGE IMPROVEMENTS

FENCE PLAN AND DETAILS

Project No. 179450605

Drawing No. Sheet Revision C501 18 of 21





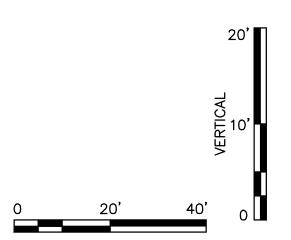
Stantec Consulting Services Inc. 45 Blue Sky Drive, 3rd Floor Burlington, MA 01803 U.S.A. Tel. 781.221.1000 Fax. 781.229.1115

Copyright Reserved

www.stantec.com

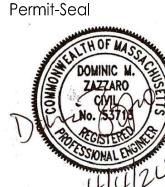
The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay. The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

> **ISSUED FOR BID** APRIL 5, 2024



	- Day	Appd	VV AAAA DI
Revision 	By	Appd.	YY.MM.DE
1 ISSUED FOR BID	DMZ	DMZ	24.04.05

DMZ DMZ DMZ Dwn. Chkd. Dsgn.



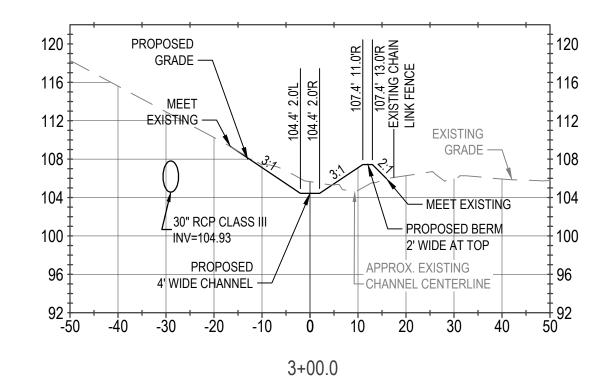
LAWRENCE MUNICIPAL AIRPORT NORTH ANDOVER, MA

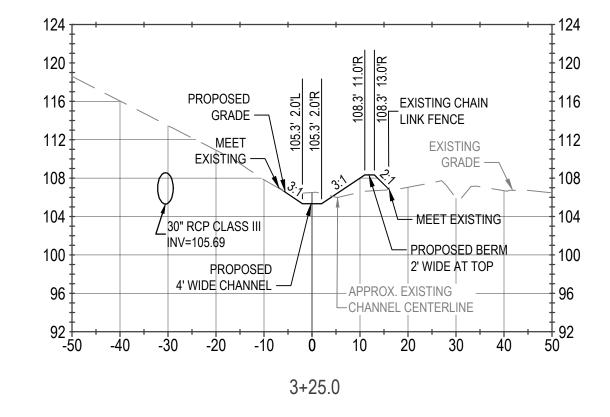
RUNWAY 5 END DRAINAGE IMPROVEMENTS

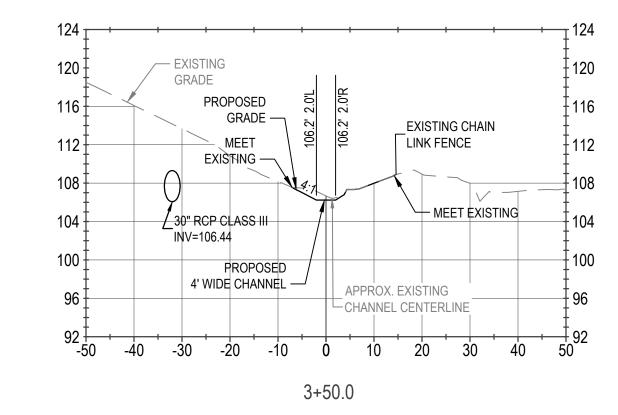
CROSS SECTIONS - 1

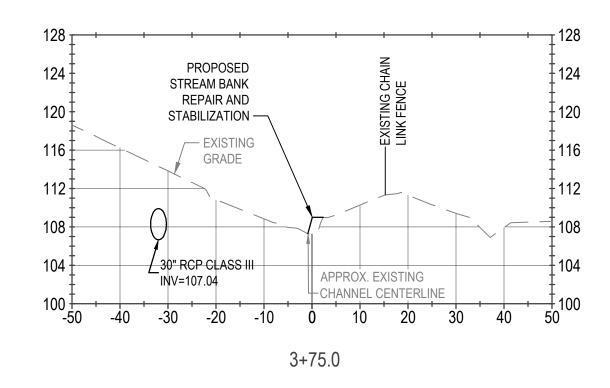
Project No. 179450605

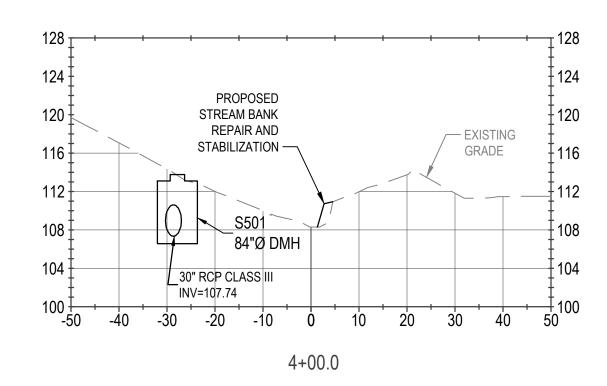
Sheet Revision Drawing No. C601 18 of 21

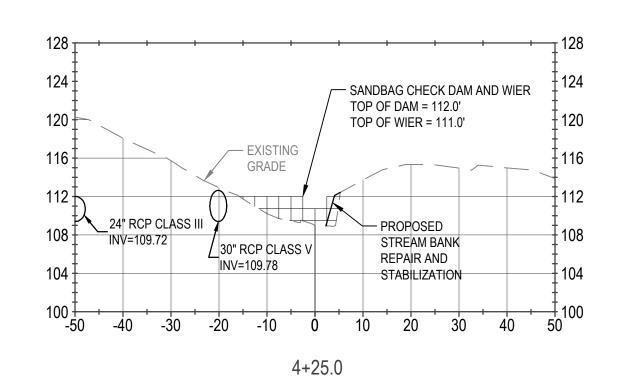


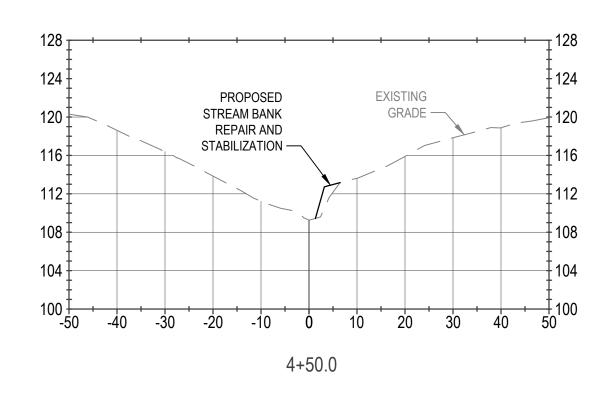


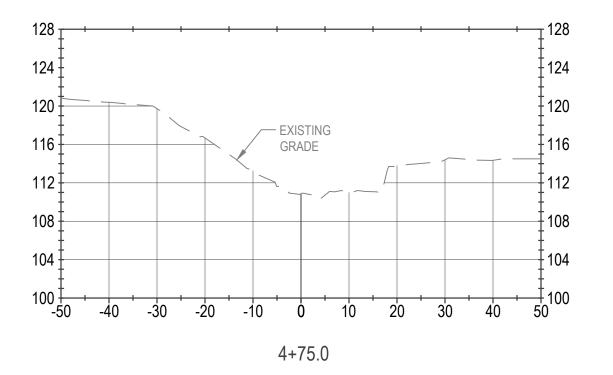














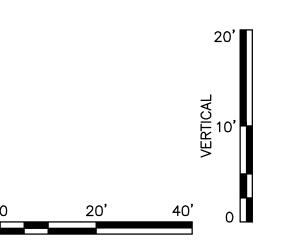
Stantec Consulting Services Inc. 45 Blue Sky Drive, 3rd Floor Burlington, MA 01803 U.S.A. Tel. 781.221.1000 Fax. 781.229.1115 www.stantec.com

Copyright Reserved

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.

The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorized by Stantec is forbidden.

> **ISSUED FOR BID** APRIL 5, 2024



Revision	Ву	Appd.	YY.MM.DD

Permit-Seal



LAWRENCE MUNICIPAL AIRPORT NORTH ANDOVER, MA

RUNWAY 5 END DRAINAGE IMPROVEMENTS

CROSS SECTIONS - 2

Project No. 179450605

Drawing No. Sheet Revision C602

20 of 21

